KG
11365
497

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Parallax Constants

$\varphi' = 42^\circ\ 12$ = Geocentric latitude

$\log \varphi' = 9.957748$

Refraction Constants

$\varphi = 42^\circ\ 23$

On Chandler's formula $\pm g' Fg$, if $\odot$ is in N half of sq rule (inside) it will have the upper sign or +, if in the S. half, it will have the lower half or −, and the quantity = log Diag × 2.

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Log. ρ = +9.99935 ✓

" π = +0.94694 ✓

" cos φ' = +9.26970 ✓

Log $\rho \pi \cos \varphi'$ = +0.21799 ✓

Log ρ = +9.99935 ✓

" π = +0.94694 ✓

" sin φ' = 9.82719 ✓

Log $\rho \pi \sin \varphi'$ = +0.77348 ✓

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KG-113 65.588

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KG 11365.494

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Comet Wells (See Red. B. 5, P. 26)
Apl. 8, 1882

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4 in Ledger

Comet Cruls

Oct. 12, 1882

	∈		*		∈ − *			
6h	30	0.7 ✓	27	56.2 ✓				
	30	44.8 ✓	28	14.0 ✓				
	60	45.5 ✓	56	10.2 ✓	+4	35.3 ✓	+2	17.65 ✓
	33	11.6 ✓	31	6.7 ✓				
	33	56.4 ✓	31	24.6 ✓				
	67	8.0 ✓	62	31.3 ✓	+4	36.7 ✓	+2	18.35 ✓
	46	22.7 ✓	44	20.6 ✓				
	47	12.4 ✓	44	40.3 ✓				
	93	35.1 ✓	89	0.9 ✓	+4	34.2 ✓	+2	17.10 ✓
	51	13.8 ✓	49	12.1 ✓				
	51	52.0 ✓	49	20.2 ✓				
	103	5.8 ✓	98	32.3 ✓	+4	33.5 ✓	+2	16.75 ✓

~~1.85 ✓~~
~~2m 17.46~~
~~17.81~~
+2m 17.46

323 94.4
6h 40 34.3 ✓
+2 9.2 ✓
6h 42 43.5 ✓
13 24 36.17 ✓
17 18 6.8
~~-2 48.4~~
~~17 5 18.4~~
~~4 44 31.0~~
~~21 49 49.4~~ G. M. T.

17 12 6.2 ✓
−2 −0.1 ✓
17 12 16.7 ✓
4 44 31.0 ✓
21 −9 47.7 ✓ Gr. M. T.

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1882phae.proj..498.

Δ ∈	Δ ★	∈ − ★
44.1 ✓	17.8 ✓	26.3 ✓
44.8 ✓	17.9 ✓	26.9 ✓
~~39.7~~ ✓	19.7 ✓	30.0 ✓
38.2 ✓	8.1 ✓	30.1 ✓

log. 113.3 = 2.05423 ✓ 24.32 = 1.4ᵛ209 ✓
" 7.5 = 0.87506
" cos δ = 9.99013
~~830.7~~ ~~= 2.91942~~ 2.31722
~~4154~~ 207.6 −1. ᵏ3.2 ✓
103.8 −6 55.4
−12° 10′ ~~7.5~~ 3″
~~12 17 49~~
~~− 12 11 ᵏ57.3~~ ✓

2.05423
0.87506
9.98994
830.3 = 2.91923
−18 50.3″
1.ᵏ209
0.ᵏ7506
9.99004
207.6 = 2.31723 ✓
−3′ 27″.6 ✓

log. 113.3 = 2.05423
" 7.5 = 0.87506
" cos. δ = 9.98952
2) 829.5 = 2.91881
414.8

Wrong comp. ★ used in this reduction

2.05423
0.87506
9.98992
−829.1 = 2.91861

−6′ 54.8
−12 32 27.7
−12 39 22.5

−3′ 49.1″

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1882phae.proj..498.

(see p. 64)

Comet Cruls

Oct. 12, 1882

W. T. $10^h\ 32^m.0$ = 10 17 17.02 ✓ | − 12 14 57.9 ✓ (1825.0)

+1 25.~~23~~ 2.90 | − 8 35.0

Mid. Pl. = 10 18 ~~42.25~~ 40.92 | − 12° 23 32.9

154° 40′ ~~35.25~~ 13.80 ″ ✓

Log. $\frac{u}{15}$ = +0.12612 ✓

" sin. λ = +9.63147 ✓

" tan α = −9.34188 ✓

−0.1257 = −9.09947 ✓

+3.07076 ✓

+2.9449 = +0.46908 ✓

Log. 57 = +1.75587 ✓

167.86 ✓ 2.22495 ✓

Log. u = +1.30221 ✓

" cos. δ = −9.95612 ✓

" 57 = +1.75587 ✓

−1033.3 = −3.01421 ✓

(* 1825.0) = 10^h 17 17.02 ✓ | − 12 14 57.9

+2 47.86 ✓ | − 17 13.3

(* 1882.0) = 10^h 20 4.88 | − 12° 32 11.2

+2 2.22 | − 16.5

app. Pl. * = 10^h 20 7.10 | − 12° 32 27.7

+2 17.37 | − 13 49.1

app. Pl. ☌ = 10^h 22 24.47 | − 12° 46 16.8

This is the wrong comp. *.

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1882phae.proj..498.

In ledger.

Comet Cruls
Oct. 12, 1882
Appr. Place Reduction

See p. 66.

$\mathfrak{H} = +3.178^{7}$ $\quad \mathfrak{G} = 0^{h}\ 56.0$ $\quad H = 4^{h}\ 34.4$

$\mathfrak{G} = 0^{h}\ 56.0^{7}$ $\quad \alpha = 10\ 20.1$ $\quad \alpha = 10\ 20.1$

$H = 4^{h}\ 34.4^{7}$ $\quad \mathfrak{G}+\alpha = 11\ 16.1$ $\quad 14\ 54.5$

$\log g = +1.3297^{7}$

$\log h = +1.2777^{7}$ $\quad \delta = -12^{\circ}\ 32\ 11$

$\log i = +0.8841^{7}$

$\log 1/15 = +8.8239$

$\log g = +1.3297$

$\log \sin(\mathfrak{G}+H) = +9.2796$

$\log \tan \delta = -9.3471$

$-0.060 \quad -8.1803$

$\log 1/15 = +8.8239$

$\log h = +1.2777$

$\log \sin(H+\alpha) = -9.8388$

$\log \sec \delta = +0.0105$

$-0.893 = -9.9509$

-0.060

-0.953

$+3.178$

$+2.225$ = cor. in R.A.

$\log \frac{g}{15} = +1.3297$

$\log \cos(\mathfrak{G}+\alpha) = -9.9919$

$-20.97 = -1.3216$

$\log h = +1.2777$

$\log \cos(H+\alpha) = -9.8597$

$\log \sin \delta = -9.3366$

$+2.98 = +0.4740$

$\log i = +0.8841$

$\log \cos \delta = +9.9895$

$+7.47 = +0.8736$

$+2.98$

$+10.45$

-20.97

-10.52 = cor. in Dec.

Wrong star used see p. 66.

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1882phae.proj..498.

Comet ~~Cuth~~ Pons-Brooks

Nov. 8 ~~Oct 14~~, 1883

Lettered * to be joined. Unlet. * (unknown)

~~Geo~~ Let. * = +51°2206 (8.3 A)

Pr.A. 17089 = 17 19 30.69 +51 42 1.1 (1842.0)
+0 28.80 −1 11.3
17 19 59.49 +51 40 49.8
259 59 52.35

Log. $\frac{u}{15}$ = 0.12610
" sin L = 9.99335
" tan L = +0.10221
−1.6660 = −0.22166
+3.0708
+1.4048 = 0.14762
41 = 1.61278
+57.60 = 1.76040

Log u = 1.30219
" cos L = −9.23977
" 41 = 1.61278
−142.8 = 2.15474

17 19 30.69' +51 42 1.1"
" +0 57.60 " −2 22.8
*1883.0 = 17 20 28.29 +51 39 38.3
−0.46 +15.17
17 20 27.83 +51 39 54.0
+e 10.76 −13 19.0
Apr. Pl. 17 20 38.59 +51 26 35.0

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1882phae.proj..498.

In ledger

Comet limbs
Oct. 14, 1882.

Lamont 694 =	10^h	13^m	54.98^s	$-13°$	$1'$	$57.0''$	(1850.0)
		$+0$	46.91		-4	47.0	
Mid. Pl. =	10	14	41.89	$-13°$	6	44.0	
	$153°$	40	28.35				

Log. $\frac{m}{15}$ = +0.12609
" sin Δ = +9.64689
" tan. Δ = −9.36723
−0.1381 = −9.14021

+3.0709
+2.9328 = +0.46728
32 = +1.50515
93.85 = 1.97243

Log. u = +1.30218
" cos. Δ = −9.95245
" 32 = +1.50515
−575.1 = −2.75978

(* 1850)	10^h	13	54.98^s	$-13°$	$1'$	$57.0''$	
		$+1$	33.85		-9	35.1	
(* 1882)	10	15	28.83 ✓	$-13°$	11	32.1 ✓	
		$+2.28$ ✓			-10.3 ✓		
app. Pl. * =	10	15	31.11 ✓	$-13°$	11	42.4 ✓	

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1882phae.proj..498.

Inledger.

Comet Encke
Oct. 14 1882
App. Place Reduction

$f_1 = +3.190'$

$\mathfrak{G} = 0^h 57.1'$ $\quad \mathfrak{G} = 0\ 57.1'$ $\quad \mathfrak{H} = 4\ 26.0'$

$\mathfrak{H} = 4^h 26.0'$ $\quad \alpha = 10\ 15.5'$ $\quad \alpha = 10\ 15.5'$

$11\ 12.6'$ $\quad 14\ 41.5'$

$\log. g. = +1.33117'$

$\log. h = +1.2786'$

$\log. i = +0.8784'$ $\quad \delta = -13^\circ\ 11\ 32''$

$\log. 1/\Delta = +8.8239'$

$\log. g. = +1.33117'$

$\log. \sin(\mathfrak{G}+\alpha) = +9.3125'$

$\log. \tan \delta = -9.3700'$

$-0.069' = -8.8381'$

$\log 1/\Delta = +8.8239'$

$\log. h = +1.2786'$

$\log. \sin(\mathfrak{H}+\alpha) = -9.8113'$

$\log. \sec. \delta = +0.0116'$

$-0.842' = -9.9254'$

$-0.069'$

$-0.911'$

$+3.190'$

$+2.279' =$ cor. in R.A.

$\log. g = +1.33117'$

$\log. \cos(\mathfrak{G}+\alpha) = -9.9906'$

$-21.00'' = -1.3228'$

$\log. h = +1.2786'$

$\log. \cos(\mathfrak{H}+\alpha) = -9.8819'$

$\log. \sin \delta = -9.3584'$

$+3.30'' = +0.5189'$

$\log. i = +0.8784'$

$\log. \cos \delta = +9.9884'$

$+7.36'' = +0.8668'$

$+3.30'$

$+10.66'$

-21.00

$-10.34' =$ cor. in Dec.

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1882phae.proj..498.

Comet ~~Coulvier~~ Pons-Brooks
Oct. 30, 1882

Comp. ✳ = Dm. +53° 1963 (Unlettered)

W. 10h

Let ✳ to be joined to Comp. ✳ = Dm. +52 2027 9.3 (B.)

B.B VI +52° 2027 = 17 4 4.80 +52 52 21.8 1855
+0 19.01 -1 7.9
Mid. Pl. = 17 4 23.81 +52 51 13.9
256 5 57.15

Log $\frac{u}{15}$ = 0.12608
" sin ✳ = -9.98709
" tan ✳ = 0.12058
-1.7130 = -0.23375
3.0710
+1.3580 = 0.13290
1.44716
38.02 = 1.58006

Log u = 1.30218
" cos ✳ = -9.38065
" 28. = 1.44716
-134.9 = 2.12999

17 4 4.80 +52 52 21.8
+0 38.02 -2. 14.9
✳ 1883.0 17 4 42.82 +52 50 6.9
-0.58 +15.3
Ap. Pl. ✳ 17 4 42.23 +52 50 22.2
-0 33.59 -3 10.8
17 4 8.64 +52 47 11.4

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1882phae.proj..498.

Dec. 22/883

Comet Pons Brooks

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1882phae.proj..498.

Comet Finds
Oct. 30, 1882

In ledger.

Ω.A. 10374 =	9h	59	53.69	− 19	4	27.9	(1850)
	+	0	45.46		− 4	37.8	
		4	39.12				
Mid. Pl. =	10	0	39.15	− 19°	9	5.7	
	150°	9′	47.25″				

log. $\frac{u}{15}$	= 0.1269	log. u	= +1.30218
" sin. ∠	= +9.69682	" cos. ∠	= −9.98825
" tan. ∠	= −9.54069	" 32	= +1.50515
− 0.2310	= −9.36360	− 556.7	= 2.74558
3.0709			
2.8399	= 0.45331		
32	= 1.50515		
90.88	= 1.95846		

(* 1850.0)	9h	59	53.69	− 19	4	27.9	
		+ 1	30.88		− 9	16.7	
(* 1882.0)	10h	1	24.57	− 19	13	44.6	
		+ 0	2.70		− 0	9.5	
	10h	1	27.27	− 19	13	54.1	

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1882phae.proj..498.

In ledger.

Comet Cubs

Oct. 30, 1882

Appr. R. Reductions

$\mathfrak{G} = +3.312^{\tau}$ $\quad \mathfrak{G} = 0^h 59.2^{\tau}$ $\quad \mathcal{H} = 3^h 19.5^{\tau}$

$\mathfrak{G} = 0^h 59.2^{\tau}$ $\quad \alpha = 10\ 1.4^{\tau}$ $\quad \alpha = 10\ 1.4$

$\mathcal{H} = 3^h 19.5^{\tau}$ $\quad \mathfrak{G}+\alpha = 11\ 0.6$ $\quad \mathcal{H}+\alpha = 13\ 20.9$

Log. $g = +1.3492^{\tau}$

" $h = +1.2879^{\tau}$

" $i = +0.8088^{\tau}$ $\quad \delta = -19\ 13\ 45^{\tau}$

Log $1/15 = +8.8239^{\tau}$

Log. $g = +1.3492^{\tau}$

" $\sin(\mathfrak{G}+\alpha) = +9.4087^{\tau}$

" $\tan. \delta = -9.5426^{\tau}$

$-0.133^{\tau} = -9.1244^{\tau}$

Log $1/15 = +8.8239^{\tau}$

Log. $h. = +1.2879^{\tau}$

" $\sin(\mathcal{H}+\alpha) = -9.5386^{\tau}$

" $\sec. \delta = +0.0249^{\tau}$

$-0.474^{\tau} = -9.6753^{\tau}$

-0.133^{τ}

-0.607^{τ}

$+3.312^{\tau}$

$+2.705^{\tau}$ Cor. in R.A.

Log. $g = +1.3492^{\tau}$

" $\cos.(\mathfrak{G}+\mathcal{H}) = -9.9852^{\tau}$

$-21.60^{\tau} = -1.3344^{\tau}$

Log. $h = +1.2879^{\tau}$

" $\cos(\mathcal{H}+\alpha) = -9.9724^{\tau}$

" $\sin. \delta = -9.5176^{\tau}$

$+6.00^{\tau} = +0.7779^{\tau}$

" $i = +0.8088^{\tau}$

" $\cos. \delta = +9.9751^{\tau}$

$+6.08^{\tau} = +0.7839^{\tau}$

$+6.00^{\tau}$

$+12.08^{\tau}$

-21.60^{τ}

-9.52^{τ} cor. in Dec.

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1882phae.proj..498.

In Ledger

Comet Encke
Oct. 30, 1882

~~Dr.A. 10374 = 9h 59 53.69 −19 4 27.9 (7.8) (1850)~~
Dr.A. 10381 = 10h 0 15.65 −18 58 44.1 (9.0) 1850
+0 45.47 −4 38.1
Mid. Pl. = 10h 1 1.12 −19 3 22.2
150° 15 16.80

Log. $\frac{u}{15}$ = +0.12609
" sin α = +9.69561
" tan α = −9.53835
−0.2291 = −9.36005
+3.0709 =
+2.8418 = +0.45359
32 = +1.50515
90.94 = +1.95874

Log u = +1.30218
" sec.α = −9.93864
" 32 = +1.50515
557.2 = 2.74597

(* 1850.c) = 10h 0 15.65 −18 58 44.1
+1 30.94 −9 17.2
(* 1882.0) = 10h 1 46.59 −19° 8 1.3
+0 2.70 −0 9.6
app. Pl. * = 10h 1 49.29 −19° 8 10.9

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1882phae.proj..498.

Oct. 30, 1882

In ledger.

Comet Cuels

Appr. R. Reduction

f = +3.312" $\mathfrak{G}$ = 0h 59.2" $\mathfrak{H}$ = 3 19.5"

$\mathfrak{G}$ = 0h 59.2" α = 10 1.8" α = 10 1.8"

$\mathfrak{H}$ = 3h 19.5" $\mathfrak{G}+\alpha$ = 11 1.0" $\mathfrak{H}+\alpha$ = 13 21.3"

Log. f = +1.3492"

" h = +1.2879" α = −99° 8 1.3"

" i = +0.8088"

Log. 1/15 = +8.8239"

" f = +1.3492"

" sin($\mathfrak{G}+\alpha$) = +9.4059"

" tan α = −9.5402"

−0.132" = −9.1192"

Log. 1/15 = +8.8239"

" h = +1.2879"

" sin($\mathfrak{H}+\alpha$) = −9.5407"

" sec. α = +0.0247"

−0.476" = −9.6772"

−0.132"

−0.608"

+3.312"

+2.704" = cor. in R.a.

Log. f = +1.3492"

" cos. $\mathfrak{G}+\alpha$ = −9.9854"

− 21.61" = −1.3346"

Log. h = +1.2879"

" cos $\mathfrak{H}+\alpha$ = −9.9721"

" sin. α = −9.5156"

+5.96" = +0.7756"

" i = +0.8088"

" cos. α = +9.9753"

+6.08" = +0.7841"

+5.96"

+12.04"

− 21.61"

−9.57" = cor. in Dec.

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1882phae.proj..498.

In ledger.

Jan. 15, 1883

Contact Circles

see p. 28

Geo. A. (5445) = 6^h 33 9.72 | −26 26 29.3 (1850)
+0 38.64 | −0 46.7
Mid. Pl. = 6^h 33 49.56 | −26° 27 16.8
98° 27 40

$\log \frac{u}{15}$ = +0.12609
" sin α = +9.99525
" tan α = −9.69688
−0.6580 = −9.81822
+3.0709
+2.4129 = +0.38254
$3\frac{3}{2}$ = +1.51851
+79.62 = 1.90105

$\log u$ = +1.30218
" cos α = −9.16748
" $8\frac{3}{2}$ = +1.51851
−97.3 = −1.98817

(* 1850.0) = 6^h 33 9.72 | −26 26 29.3
+1 19.62 | −1 37.3
(* 1883.0) = 6 34 29.34 | −26 28 6.6
+0 2.24 | −0 13.9
App. Pl. * = 6 34 31.58 | −26 28 20.5

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1882phae.proj..498.

Dr Ledger.

Jan 15, 1883
Comet Auds
App. Pl. Reduction

$R = +0.973'$ $G = 3\ 4.2'$ $H = 22\ 24.4'$
$G = 3\ 4.2'$ $\alpha = 6\ 34.5'$ $\alpha = 6\ 34.5'$
$H = 22\ 24.4'$ $G+\alpha = 9\ 38.7'$ $H+\alpha = 28\ 58.9'$
$\log. g = +0.9601'$ $24\ 0'$
" $h = +1.3040'$ $\delta = -26\ 28\ \gamma'$ $4\ 58.9'$
" $i = -0.5491'$

$\log. 1/15 = +8.8239'$
" $g = +0.9601'$
" $\sin G+\alpha = +9.7621''$
" $\tan \delta = -9.6971'$
$-0.175' = -9.2432'$

$\log. 1/15 = +8.8239'$
" $h = +1.3040'$
" $\sin. H+\alpha = +9.9843''$
" $\sec. \delta = +0.0481'$
$+1.446' = +0.1603'$
$+0.973'$
$+2.419'$
$-0.175'$
$+2.244'$ = cor. in R. a.

$\log. g = +0.9601'$
" $\cos. G+\alpha = -9.9116''$
$-7.44' = -0.8717'$

" $h = +1.3040'$
" $\cos. H+\alpha = +9.4207'$
" $\sin \delta = -9.6490'$
$-2.36' = -0.3737'$

" $i = -0.5491'$
" $\cos. \delta = +9.9519'$
$-3.17' = -0.5010'$
$-7.44'$
$-2.36'$
$-12.97'$ = cor. in Dec.

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1882phae.proj..498.

In ledger.

Jan. 26, 1883

Comet Ands

Ap. A. 4982 = $6^h\ 14\ 21.86$ $-23^\circ\ 34\ 18.1$ (1850)

$+0\ \ 41.07$ $-0\ 20.2$

mid. Pl = $6^h\ 15\ 2.93$ $-23^\circ\ 34\ 38.3$

$93^\circ\ 45'\ 43.95''$

Log. $\frac{u}{15}$ = +0.12609

" sin. α = +9.99907

" tan. δ = -9.63990

$-0.5822'$ = -9.76506

+3.0709

$+2.4887'$ = 0.39597

33 = 1.51851

+82.13 = +1.91448

Log. u = +1.30218

" cos δ = -8.81702

" 33 = +1.51851

= +1.63791

434.2 = -1.63771

(* 1850.0) = $6^h\ 14\ 21.86'$ $-23^\circ\ 34\ 18.1'$

$+1\ 22.13'$ $-0\ 43.4'$

(* 1883.0) = $6^h\ 15\ 43.99$ $-23^\circ\ 35\ 1.5$

$+0\ 2.14$ $-0\ 15.4$

app. Pl. * = $6^h\ 15\ 46''.13$ $-23\ 35\ 16.9$

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1882phae.proj..498.

In ledger.

Jan. 26, 1883
Comet Curtis
Appr. R.A. Reduction

$f = +1.087'$ $\quad \mathfrak{G} = 2^h\ 48.8'$ $\quad \mathfrak{H} = 21\ 41.5'$

$\mathfrak{G} = 2^h\ 48.8'$ $\quad \alpha = 6\ 15.7'$ $\quad \alpha = 6\ 15.7'$

$\mathfrak{H} = 21\ 41.5'$ $\quad \mathfrak{G}+\alpha = 9\ 4.5'$ $\quad \mathfrak{H}+\alpha = 3^h\ 57.2'$

$\log. g = +0.9801'$

$\log. h = +1.2978'$

$\log. i = -0.6897'$

$\alpha = -23^\circ\ 35\ 2'$

$\log. 1/\Delta = +8.8239'$

$\log. g = +0.9801'$

$\log. \sin(\mathfrak{G}+\alpha) = +9.8408'$

$\log. \tan \alpha = -9.6400'$

$-0.193' = -9.2848'$

$\log. \cos(\mathfrak{G}+\alpha) = -9.8578'$

$-6.88' = -0.8379'$

$\log. 1/\Delta = +8.8239'$

$\log. h = +1.2978'$

$\log. \sec \alpha = +0.0379'$

$+1.241' = +0.0940'$

$+1.087'$

$+2.328'$

$-0.193'$

$+2.135'$ = cor. in R.A.

$\log. h = +1.2978'$

$\log. \cos(\mathfrak{H}+\alpha) = +9.7081'$

$\log. \sin \alpha = -9.6022'$

$-4.06' = -0.6081'$

$\log. i = -0.6897'$

$\log. \cos \alpha = +9.9621'$

$-4.49' = -0.6518'$

$-6.88'$

$-4.06'$

$-15.43'$ = Cor. in Dec.

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1882phae.proj..498.

Ledger

Apr. 8, 1882
Comet Wells
Precession Computations.

Ap. A. 1846.1 = 18h 33 37.34 +46° 40′ 22.4″ (1850.0)

+0 33.40′ +0 58.6

Mid. Pl. = 18 34 10.74′ +46° 41′ 21.0

278° 32′ 41.10′

Log. $\frac{n}{15}$ = +0.12610

" sin. λ = −9.99515

" tan. δ = +0.02562

−1.2463

+0.1873 = +0.09563

+3.0708

+1.8245 = +0.26114

40 = 1.60206

+30. = +2.17502

72.98 = 1.86320

Log. n = +1.30219

" cos. α = −9.17196

" 40 = +1.60206

808.8 = −2.90581

Log $\frac{n}{15}$ = +0.12610

" sin λ = −9.99515

" tan. δ = +0.02562

−1.4024 = −0.14687

+3.0708

+1.6684 = +0.22230

40 = 1.60206

+66.74 = 1.82436

Log. n = +1.30219

" cos. α = +9.17196

" 40 = +1.60206

119.2 = +2.07621

(+1842) = 18h 33 37.34′ +46° 40 22.4″

+1 6.74′ +1 59.2″

(+1882) = 18h 34 44.08′ +46° 42 21.6″

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1882phae.proj..498.

Dr. Ledger.

Apr. 8, 1882
Comet Wells
Appr. Place Reduction.

$f = +1.731'$ $\quad \odot = 1^h\ 16.7'$ $\quad \mathfrak{H} = 16^h\ 36.6'$

$\odot = 1^h\ 16.7'$ $\quad \alpha = 18\ 34.7'$ $\quad \alpha = 18\ 34.7'$

$\mathfrak{H} = 16^h\ 36.6'$ $\quad \odot + \alpha = 19\ 51.4'$ $\quad \mathfrak{H} + \alpha = 35\ 11.3'$

$\log g = +1.0772'$ $\quad 24'$

$\log h = +1.2775'$ $\quad 11\ 11.3'$

$\log i = -0.8856'$ $\quad \delta = +46^\circ\ 42\ 22'$

$\log 1/15 = +8.8239'$

$\log g = +1.0772'$

$\log \sin(\odot + \alpha) = -9.9465'$

$\log \tan \delta = +0.0259'$

$-0.747' = -9.8735'$

$\log 1/15 = +8.8239'$

$\log h = +1.2775'$

$\log \sin(\mathfrak{H} + \alpha) = +9.3241'$

$\log \sec \delta = +0.1637'$

$+0.388' = +9.5892'$

$+1.731'$

$+2.119'$

$-0.747'$

$+1.372' =$ Cor. in R.A.

$\log g = +1.0772'$

$\log \cos(\odot + \alpha) = +9.6694'$

$+5.58' = +0.7466'$

$\log h = +1.2775'$

$\log \cos(\mathfrak{H} + \alpha) = -9.9901'$

$\log \sin \delta = +9.8620'$

$-13.48' = -1.1296'$

$\log i = -0.8856'$

$\log \cos \delta = +9.8363'$

$-5.27' = -0.7219'$

-13.48

$-18.75'$

$+5.58'$

$-13.17' =$ Cor. in Dec

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1882phae.proj..498.

Lw ledger

Apr. 18, 1882
Comet Wells
Precession Computation

Ec. A. 1925 =	19^h 6 22.65		$+55^\circ$ 25 56.5 (1842)
	+0 24.28		+1 54.6
Mid. Eq. =	19 6 46.93		$+55^\circ$ 27 51.1
	286° 41 43.95		

log. $\frac{n}{15}$ =	+0.12610
" sin δ =	−9.98132
" tan δ =	+0.16228
−1.8608 =	−0.26970
+3.0708	
+1.2100 =	+0.08279
40 =	+1.60206
+48.40 =	+1.68485

log. n =	+1.30219
" cos. δ =	+9.45832
" 40 =	+1.60206
+230.4 =	2.36257

(* 1842.0)	19^h 6 22.65		$+55^\circ$ 25 56.5
	+0 48.40		+3 50.4
(* 1882.0)	19 7 11.05		$+55^\circ$ 29 46.9

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1882phae.proj...498.

Dr. ledger.

Apr. 18, 1882

Comet Wells

Appr. Place Reduction

Δ = +1.788′ α = 1h 16.4′ α = 15h 55.2′

α = 1h 16.4′ δ = 19 7.2′ δ = 19 7.2′

α = 15 55.2′ 20′ 23.6′ $\Delta\alpha$ = 11 2.4′

log. ρ = +1.0911′

" h = +1.2825′ α^0 = +55° 29′ 47″

" i = −0.8522′

log. $\sin\alpha$ = +8.8239′

" ρ = +1.0911′

" $\sin\Delta\alpha$ = −9.9085′

" $\tan\delta$ = +0.1628′

−0.969′ = −9.9863′

log. $\sin\alpha$ = +8.8239′

" h = +1.2825′

" $\sin(\alpha+\Delta\alpha)$ = +9.3956′

" $\sec\delta$ = +0.2468′

+0.561′ = +9.7488′

+1.788′

+2.349′

+0.969′

+1380″ = cor. in R. A.

log. ρ = +1.0911′

" $\cos\alpha$ = +9.7682′

+7.23′ = +0.8593′

" h = +1.2825′

" $\cos(\alpha+\Delta\alpha)$ = −9.9861′

" $\sin\alpha$ = +9.9160′

−15.30′ = −1.1846′

" i = −0.8522′

" $\cos\alpha$ = +9.7532′

−4.08′ = −0.6054′

−15.30′

−19.38′

+7.23′

−12.15″ = cor. in Dec.

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1882phae.proj..498.

Duplicate ledger

Cruls Comet

(see B.5 p. 44)

Dec. 29, 1882

Precession computation

Cr. A. (-15° to -31°) No. 6765 = $7^h\ 18\ 24.68$ $-29°\ 51\ 22.9$ 1850

$+0\ \ 37.58$ $-1\ \ 47.5$

Mid. Pl. $7\ \ 19\ \ 2.26$ $-29°\ 53\ \ 10.4$

$109°\ 45\ \ 33.90$

Log. $\frac{n}{15}$ = 0.12609 Log. n = +1.30218

" sin. α = +9.97365 " cos. δ = -9.52901

" tan δ = -9.75944 " 32 = +1.50515

-0.7231 = -9.85918 216.9 = -2.33634

$+3.0709$

$+2.3478$ = +0.37066

32 = 1.50515

$+75.13$ = +1.87581

(* 1850) = $7^h\ 18\ 24.68$ $-29\ \ 51\ \ 22.9$

$+1\ \ 15.13$ $-3\ \ 36.9$

(* 1882) = $7^h\ 19\ \ 39.81$ $-29°\ 54\ \ 59.8$

$+0\ \ 4.60$ $-0\ \ 13.8$

ap. pl. * = $7^h\ 19\ \ 44.41$ $-29°\ 55\ \ 13.6$

$+11.77$ $+8\ \ 26.3$

ap. pl. S. nuc. = $7\ \ 19\ \ 56.18$ $-29°\ 46\ \ 47.3$

$+1.3$

$-29\ \ 46\ \ 26.0$ 1st or Southern nucleus.

$7^h\ 19\ \ 44.41$ $-29\ \ 55\ \ 13.6$

$+0\ \ 12.50$ $+9\ \ 22.4$

ap. pl. N. nuc. = $7^h\ 19\ \ 56.91$ $-29°\ 45\ \ 51.2$

$+1.3$

$7\ \ 19\ \ 56.69$ $-29\ \ 45\ \ 49.9$ 2d or Northern nucleus.

Cor for Refr. = $-0.''02$ $+1.''3$

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1882phae.proj...498.

7 19 44.41
+11.77
7 19 56.18

-29 55 13.6 Appl. to *
+4 46.3
-29 46 27.3

7 19 44.41
+0 12.53
7 19 56.94

-29 55 13.6
+9 23.0
-29 45 50.6

49.46 = 1. 6977
7.5 = 0.47506
cos δ = 9.93419
324.3 = 2.51100
44 6.0
56 1.7 = 9 21.7
13
23.0

log 55.30 = 1.74273
" 7.5 = 0.47506
" cos. δ = 9.93719
359.5 = 2.55556
44 6.0
2) 526.5
263.2 = +4° 23.″2

-29 55 13.6
-29 50 50.4

1.74273
0.47506
9.93419
359.7 = 2.55594
44 6.0
526.3 = +4 46.3

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1882phae.proj...498.

$\Delta = +3.889''$ $\quad \mathfrak{G} = 0^h\ 58.6''$ $\quad \mathfrak{H} = 23\ 28.9''$

$\mathfrak{G} = 0\ 58.6''$ $\quad \alpha = 7\ 19.7''$ $\quad \alpha = 7\ 19.7''$

$\mathfrak{H} = 23\ 28.9''$ $\quad \mathfrak{G}+\alpha = 8\ 18.3''$ $\quad \mathfrak{H}+\alpha = 30\ 48.6''$

$\log g = +1.4186''$ $\quad 24''$

$\log h = +1.3099''$ $\quad 6\ 48.6''$

$\log i = -0.0777''$ $\quad \delta = -29^\circ\ 55'\ 0''$

$\log 1/15 = +8.8239''$

$\log g = +1.4186''$

$\log \sin(\mathfrak{G}+\alpha) = +9.9156''$

$\log \tan \alpha = -9.7600''$

$-0.828'' = -9.9181''$

$\log 1/15 = +8.8239''$

$\log h = +1.3099''$

$\log \sin \mathfrak{H}+\alpha = +9.9902''$

$\log \sec \alpha = +0.0621''$

$+1.535'' = +0.1861''$

$+3.889''$

$+5.424'$

$-0.828'$

$+4.596 =$ cor. in R.A.

$\log g = +1.4186''$

$\log \cos(\mathfrak{G}+\alpha) = -9.7539''$

$-14.88'' = -1.1725''$

$\log h = +1.3099''$

$\log \cos(\mathfrak{H}+\alpha) = -9.3231''$

$\log \sin \alpha = -9.6979''$

$+2.14'' = +0.3309''$

$\log i = -0.0777''$

$\log \cos \alpha = +9.9379''$

$-1.04'' = -0.0156''$

$-14.88''$

$-15.92'$

$+2.14$

$-13.78 =$ cor. in Dec.

$\log 55.30' = 1.74273$

$\log 7.5 = 0.87506$

$\log \cos \alpha = 9.993787$

$359.5' = 2.555566$

886.0

$2(+526.5 = +4\ 23.2$

$-29\ 55\ 13.6$

$-29\ 50\ 50.4$

1st mer. of $\mathfrak{S}$ $+8\ 26.3$

2nd mer. of h $+9\ 22.4$

$\log 49.74' = 1.69671$

$\log 7.5 = 0.87506$

$\log \cos \alpha = 9.93787$

$323.3' = 2.50964$

886.0

562.7

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1882phae.proj..498.

In ledger Vol. p. 18.

Comet Cals

Jan. 15, 1883

Precession computation

Do. a. 45°±-31°). No. 5445 = $6^h\ 33\ 9.72$ $-26\ 26\ 29.3$ (1850)

$+0\ 39.83$ $-0\ 47.5$

Mid. Pl. $6^h\ 33\ 49.55$ $-26\ 27\ 16.8$

$98°\ 27'\ 23.25''$

Log. $\frac{m}{15}$ = 0.12609

" sin α = +9.99525

" tan δ = −9.69688

−0.6580 = −9.81822

+3.0709

+2.41 29' = 0.38254

33 = +1.51851

+79.62 = +1.90105

Log. m = +1.30218

" cos α = −9.16748

" 33 = +1.51851

−97.3 = −1.98817

(* 1850.0) = $6^h\ 33\ 9.72'$ $-26\ 26\ 29.3'$

$+1^m\ 19.62$ $-\ 1\ 37.3$

(* 1883.0) = $6\ 34\ 29.34^v$ $-26°\ 28\ 6.6^v$

$+\ 2.24$ $-\ 0\ 13.0$

App. pl. * = $6\ 34\ 31.58$ $-26°\ 28\ 19.6$

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1882phae.proj..498.

Jan 15 1883

Comets Cubs

App. Pl. Reduction

Inledger.

$A = +0.973'$
$G = 3^h\ 4.2'$
$H = 22^h 24.4'$
$\log g = +0.9601'$
$\log h = +1.3040'$
$\log i = -0.5491'$

$L = 3^h\ 4.2'$
$\alpha = 6\ 34.5'$
$9\ 38.7'$

$H = 22\ 24.4'$
$\alpha = 6\ 34.5'$
$28\ 58.9'$
24
$4\ 58.9'$

$\delta = -26^\circ\ 28'\ 7''$

$\log 1/\Delta = +8.8239'$
$\log g = +0.9601'$
$\log \sin (G+H) = +9.7621'$
$\log \tan \alpha = -9.6971'$
$-0.175' = -9.2432'$

$\log 1/\Delta = +8.8239'$
$\log h = +1.3040'$
$\log \sin (H+\alpha) = +9.9843'$
$\log \sec \alpha = +0.0481'$
$+1.446' = +0.1603'$
$+0.973'$
$+2.419'$
$-0.175'$
$+2.244 =$ cor. in R.A.

$\log g = +0.9601'$
$\log \cos (G+H) = -9.9116'$
$-7.44' = -0.8717'$

$\log h = +1.3040'$
$\log \cos (H+\alpha) = +9.4207'$
$\log \sin \alpha = -9.6490'$
$-2.36' = -0.3737'$
$\log i = -0.5491'$
$\log \cos \delta = +9.9519'$
$-3.17' = -0.5010'$
$-2.36'$
$-7.44'$
$-12.97' =$ cor. in Dec.

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1882phae.proj..498.

In ledger.

Swift's Comet

Feb. 1, 1883

Precession Computation

Oz.A. 4790 (-15°-31') $6^h\ 6\ 20.58$ $-21°\ 42\ 43.7$ (1850)

$+0\ 41.92$ $-0\ 9.1$

Mid. Pl. $6^h\ 7\ 2.50$ $-21°\ 42\ 52.8$

$91°\ 45'\ 37.50''$

Log. $\frac{m}{15}$ = 0.12609
" sin. α = +9.99979
" tan. δ = -9.60015
-0.5322 = -9.72603
$+3.0709$
$+2.5387$ = +0.40461
33 = +1.51851
$+83.78$ = +1.92312

Log. m = +1.30218
" cos. α = -8.48743
" 33 = +1.51851
20.3 = -1.30812

(* 1850.0) = $6^h\ 6\ 20.58^{\checkmark 7}$ $-21°\ 42\ 43.7^{\checkmark 7}$

$+1\ 23.78^{\checkmark}$ $-0\ 20.3^{\checkmark}$

(* 1883.0) = $6\ 7\ 44.36^{\checkmark}$ $-21\ 43\ 4.0^{\checkmark}$

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1882phae.proj..498.

Feb. 1, 1883

Inledge. Encke Comet

App. Pl. Reduction

$\mathfrak{H}$ = + 1.120″ $\mathfrak{G}$ = 2ʰ 46.6″ $\mathfrak{H}$ = 21 17.6″

$\mathfrak{G}$ = 2ʰ 46.6″ α = 6 7.7″ α = 6 7.7″

$\mathfrak{H}$ = 21 17.6″ $\mathfrak{G}+\alpha$ = 8 54.3″ $\mathfrak{H}+\alpha$ = 27 25 3″

24″

3 25.3″

Log g = +0.9895″

" h = +1.2939″ α = − 21° 43 4″

" i = −0.7449″

Log. 1/15 = +8.8239″

" g = +0.9895″

" sin ($\mathfrak{G}+\alpha$) = +9.8602″

" tan α = −9.6002″

− 0.188″ = −92738″

" 1/15 = +8.8239″

" h = +1.2939″

" sin ($\mathfrak{H}+\alpha$) = +9.8924″

" sec. α = +0.0320″

+1.102″ +0.0422″

+1.120″

+2.222″

−0.188″

+2.034″ = cor. in R.A.

Log. g = +0.9895″

" cos. ($\mathfrak{G}+\alpha$) = −9.8384″

−6.73″ −0.8279″

" h = +1.2939″

" cos. ($\mathfrak{H}+\alpha$) = +9.7958″

" sin α = −9.5682″

− 4.55″ = −0.6579″

" i = −0.7449″

" cos α = +9.9680″

−5.16″ = −0.7129″

−6.73″

−4.55″

−16.44″ = Cor. in Dec.

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1882phae.proj..498.

Auld Comet

Inledger

Feb. 5, 1883

Precession computation

B.A. No. 4697 (-15° to -31)	6	2	48.30	-20	39	35.1	1850
	+0	42.37		-0	34.0	
Mid. Pl.	6	3	30.67	-20	39	39.1	
	90°	52	40.05				

log. $\frac{m}{15}$ = +0.12609
" sin. α = +9.99995
" tan. δ = +9.57644
-0.5041 = +9.70248
+3.0709
+2.5668 = +0.40940
33 = 1.51851
84.71 = 1.92791

log. m = +1.30218
" cos. α = -8.18524
" 33 = +1.51851
-10.1 = -1.00593

(* 1850) = 6h 2 48.30 -20 39 35.1
+1 24.71 -0 10.1
(* 1883.0) = 6 4 13.01 -20 39 45 2

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1882phae.proj..498.

Feb. 5, 1883

In ledger. Circle Correct

App. Pl. Reduction

$F = +1.171'$ $G = 2^h 40.1'$ $\mathfrak{A} = 21\ 1.4'$

$G = 2^h 40.1'$ $\alpha = 6\ 4.2'$ $\alpha = 6\ 4.2'$

$\mathfrak{A} = 21\ 1.4'$ $G+\alpha = 8\ 44.3'$ $\mathfrak{A}+\alpha = 27\ 5.6'$

$24'$

$3\ 5.6'$

$\log g = +0.9982'$

$\log h = +1.2913'$ $\delta = -20°\ 39\ 45'$

$\log i = -0.7755'$

$\log 1/15 = 8.8239'$

$\log g = +0.9982'$

$\log \sin (G+\alpha) = +9.8773'$

$\log \tan \delta = -9.5765'$

$-0.189'$ $-9.2759'$

$\log 1/15 = 8.8239'$

$\log h = +1.2913'$

$\log \sin (\mathfrak{A}+\alpha) = +9.8599'$

$\log \sec \delta = +0.0288'$

$+1.009' = +0.0039'$

$+1.171'$

$+2.180'$

$-0.189'$

$+1.991' =$ corr in R. a.

$\log g = +0.9982'$

$\log \cos (G+\alpha) = -9.8176'$

$-6.54' = -0.8158'$

$\log h = +1.2913'$

$\log \cos \mathfrak{A}+\alpha = +9.8386'$

$\log \sin \delta = -9.5476'$

$-4.76' = -0.6775'$

$\log i = -0.7755'$

$\log \cos \delta = +9.9712'$

$-5.58' = -0.1467'$

$-6.54'$

$-4.76'$

$-16.88' =$ corr in Dec.

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1882phae.proj..498.

Cruls Comet
Feb. 7, 1883.

In Ledger

D.R.A. 4709-10 (-15°-31°) 6^h 3 20.36 -20° 28 45.4
+ 0 42.40 − 0 4.8
Mid. Pl. 6^h 4 2.76 -20° 28 50.2

91° a 41.40

Log. $\frac{u}{15}$ = +0.12609
" sin. α = +9.99993
" tan. δ = −9.57229
−0.4992 = −9.69831
+3.0709
+2.57 17" = +0.41022
33 = +1.51851
84.87 = 1.92873

Log. u = +1.80218
" cos. α = −8.24678
" 33 = +1.51851
−11.7 = −1.06747

(1850) = 6^h 3 20.36" − 20 28 45.4"
+1 24.87 − 0 11.7
(1883) = 6 4 45.23" − 20 28 57.1"

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1882phae.proj..498.

Lwledge.

Feb. 7, 1883

Encke Comet

appr. Pl. Reduction

$f = +1.187^{\tau}$ $\mathfrak{A} = 2^h 36.7^{\tau}$ $A = 20\ 53.2^{\tau}$

$\mathfrak{L} = 2^h 36.7^{\tau}$ $\alpha = 6\ 4.8^{\tau}$ $\alpha = 6\ 4.8^{\tau}$

$A = 20\ 53.2^{\tau}$ $\mathfrak{L}+\alpha = -8\ 41.5^{\tau}$ $A+\alpha = 2\ 58.0^{\tau}$

$\log g = +0.9988^{\tau}$

$\log h = +1.2899^{\tau}$ $\delta = -20^{\circ}\ 28'\ 57^{\tau}$

$\log i = -0.7898^{\tau}$

$\log 1/5 = +8.8239^{\tau}$

$\log g = +0.9988^{\tau}$

$\log \sin \mathfrak{L}+\alpha = +9.8819^{\tau}$

$\log \tan \alpha = -9.5723^{\tau}$

$-0.189^{\tau} = -9.2769^{\tau}$

$\log g = +0.9988^{\tau}$

$\log \cos \mathfrak{L}+\alpha = -9.8114^{\tau}$

$-6.46^{\tau} = -0.8102^{\tau}$

$\log 1/5 = +8.8239^{\tau}$

$\log h = +1.2899^{\tau}$

$\log \sin A+\alpha = +9.8457^{\tau}$

$\log \sec \alpha = +0.0284^{\tau}$

$+0.973^{\tau} = +9.9879^{\tau}$

-0.189^{τ}

$+0.784^{\tau}$

$+1.187^{\tau}$

$+1.971^{\tau}$ = cor. in R.A.

$\log h = +1.2899^{\tau}$

$\log \cos A+\alpha = +9.8582^{\tau}$

$\log \sin \alpha = -9.5440^{\tau}$

$-4.87^{\tau} = -0.6871^{\tau}$

$\log i = -0.7898^{\tau}$

$\log \cos \alpha = +9.9716^{\tau}$

$-5.77^{\tau} = -0.7609^{\tau}$

-6.46^{τ}

-4.87^{τ}

-17.10^{τ} = cor. in Dec.

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1882phae.proj..498.

Cruls Comet

Feb. 13, 1883

Ledger.

Precession Computation

Pk.A. 4559 (-15°-31) $5^h\ 55\ 50.08$ $-18°\ 37\ 7.6$ (1850)

$+0\ 43.28$ $+0\ 6.1$

Mid. Pl. = $5^h\ 55\ 48.36$ $-18\ 34\ 13.7$

$88°\ 57'\ 5.40''$

Log. $\frac{m}{15}$ = 0.12609

" sin α = +9.99993

" tan. δ = -9.52629

-0.4491 = -9.65231

+3.0709 =

+2.6218 = 0.41859

33 = 1.51851

+86,52 = +1.93710

Log. m = +1.30218

" cos. α = +8.26362

" 33 = +1.51851

+12.1 = +1.08431

(1885.0) = $5^h\ 55\ 50.08$ ✓ $-18\ 34\ 7.6$ ✓

$+1\ 26.52$ ✓ $+0\ 12.1$ ✓

(1883.0) = $5^h\ 57\ 16.60$ ✓ $-18\ 33\ 55.5$ ✓

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1882phae.proj..498.

Feb. 13 1883

Inledgu,

Curtis Comet

Appr. Pl. Reduction

$f = +1.212^{\tau}$ $\quad \mathfrak{G} = 2^h 33.8^{\tau}$ $\quad \mathfrak{H} = 20^h 28.5^{\tau}$

$\mathfrak{G} = 2^h 33.8^{\tau}$ $\quad \alpha = 5\ 57.3^{\tau}$ $\quad \alpha = 5\ 57.3^{\tau}$

$\mathfrak{H} = 20^h 28.5^{\tau}$ $\quad \mathfrak{G}+\alpha = 8\ 31.1^{\tau}$ $\quad \mathfrak{H}+\alpha = 2^h 25.8^{\tau}$

$\log g. = +1.0034^{\tau}$

$\log h. = +1.2860^{\tau}$ $\quad \nu = -18^\circ\ 33'\ 56''^{\tau}$

$\log i = -0.8250^{\tau}$

$\log. 1/15 = +8.8239^{\tau}$

$\log g = +1.0034^{\tau}$

$\log \sin \mathfrak{G}+\alpha = +9.8978^{\tau}$

$\log \tan \nu = -9.5262^{\tau}$

$-0.178^{\tau} = -9.2518^{\tau}$

$\log. 1/15 = +8.8239^{\tau}$

$\log h = +1.2860^{\tau}$

$\log \sin \mathfrak{H}+\alpha = +9.7739^{\tau}$

$\log \sec \nu = +0.0232^{\tau}$

$+0.807^{\nu} = +9.9070^{\tau}$

-0.178^{ν}

$+0.629^{\nu}$

$+1.212^{\nu}$

$+1.841^{\nu}$ = cor. in R.A.

$\log. g. = +1.0034^{\tau}$

$\log \cos. (\mathfrak{G}+\alpha) = -9.7871^{\tau}$

$-6.17^{\nu} = -0.7905^{\tau}$

$\log h = +1.2860^{\tau}$

$\log \cos. (\mathfrak{H}+\alpha) = +9.9055^{\tau}$

$\log \sin. \nu = -9.5030^{\tau}$

$-4.95^{\nu} = -0.6945^{\tau}$

$\log i = -0.8250^{\tau}$

$\log \cos \nu = +9.9768^{\tau}$

$-6.34^{\nu} = -0.8018^{\tau}$

-6.17^{ν}

-4.95^{ν}

-17.46^{ν} = Cor. in Decl.

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1882phae.proj..498.

Mar. 1 1883.

Comet a 1883.

In Ledger

D.m. +31° 5012

6.2

II h W. 23 1073 =	23	49	55.04	+31	24	26.4	(7.8) 1825
		+1	27.96		+9	50.2	
Mid. Pl. =	23	51	23.00	+31°	34	16.6	
	357°	50′	45″				

Log. $\frac{u}{15}$ = +0.12611 ✓
" sin. α = −8.58009
" tan. δ = +9.78850
−0.0312 = −8.49470°
+3.0707 ✓
+3.0395 ✓ = 0.48266
58 = 1.76343
176.29 ✓ = 2.24609 ✓ 23

Log u = +1.30221 ✓
" cos. α = +9.99969 ✓
" 58 = +1.76343 ✓
+1162.4 ✓ = +3.06533 ✓

	23	49	55.04 ✓	+31°	24	26.4 ✓	
		+2	56.29 ✓		+19	22.4 ✓	
* 1883.0 =	23	52	51.33 ✓	+31°	43	48.8 ✓	

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1882phae.proj..498.

In Ledger.

Mar. 1, 1883

Comet a. 1883

Appr. Pl. Reduction

Wrong, see B 11. p 43 for correct reduction

$f = +1.309$

$G = 2^h\ 22.4$ $\quad G = 2^h\ 22.4$ $\quad H = 19\ 21.9$

$H = 19^h\ 21.9$ $\quad \alpha = 23\ 52.9$ $\quad \alpha = 23\ 52.9$

$\log g = +1.0213$ $\quad G+\alpha = 2\ 15.3$ $\quad H+\alpha = 19\ 14.8$

$\log h = +1.2774$

$\log i = -0.8865$ $\quad \delta = +31^\circ\ 43\ 49$

$\log 1/15 = +8.8239$

$\log g = +1.0213$

$\log \sin(G+\alpha) = +9.7456'$

$\log \tan\alpha = +9.7912'$

$+0.241 = +9.3820$

$\log 1/15 = +8.8239$

$\log h = +1.2774$

$\log \sin(H+\alpha) = -9.9764'$

$\log \sec\delta = +0.0703'$

$-1.406 = -0.1480$

$+1.550$

$+0.144 =$ cor. in R.A.

$\log g = +1.0213$

$\log \cos(G+\alpha) = +9.9194'$

$8.72 \quad +0.9407$

$\log h = +1.2774$

$\log \cos H+\alpha = +9.5060'$

$\log \sin\alpha = +9.7209'$

$+3.19 = +0.5043$

$\log i = -0.8865$

$\log \cos\delta = +9.9297'$

$-6.55 \quad -0.8162$

$+11.91$

$+5.36 =$ cor. in Dec.

For more correct reduction see B 11, p 43.

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1882phae.proj..498.

In ledger

Mar. 2, 1883

Comet a. 1883

Precession Computation

D. m. +31° 9 8.2

II (56k. (occ son. atmd)

W. 0h 57) = 0h 1 47.~~46~~ 39 ✓ +31 42 20.~~6~~ 7 ✓ 8 (1825.0)

+1 29.20 +9 41.7

Mid. Pl. = 0h 3 16.66 +31° 52 2.3

0° 49′ 9.90″

Log. $\frac{m}{15}$ = +0.12611

" sin. α = +8.15537

" tan α = +9.79355

+0.0119 = +8.07503

+3.0707

+3.0826 = +0.48891

58 = 1.76343

+178.89 = +2.25234

Log. m = +1.30221

" cos. α = +9.99996

" 58 = +1.76343

+116.3.1 = +3.06560

(+1825.0) 0h 1 47.~~46~~ 39 ✓ +31° 42 20.~~6~~ 7 ✓

+2 58.89 ✓ +19 23.1 ✓

(+1883.0) 0h 4 46.~~85~~ 28 ✓ +32° 1 43.~~7~~ 2

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1882phae.proj..498.

Mar. 2, 1883

In Ledger.

Comet a, 1883
appr. R. Reduction

$A = +1.3$

$G = 2^h 2$

$H = 19^h$

$\log g = +1.02$

$\log h = +1.2770$

$\log i = -0.889$

$G = 2^h 2$

$\alpha = 0\ 4.8$

$G+\alpha = 2^h 26.7$

$= 2\ 27.6$

$\alpha = +32\ 1\ 4$

$H = 19$

$\alpha = 0\ 4.8$

$H+\alpha = 19$

$= 19$

$\log 1/5 = +8.$

$\log g = +1.02$

$\log \sin G+\alpha = +9.7$

$\log \tan \alpha = +9.7463$

$+0.26 = +9.4$

$\log 1/5 = +8.8239$

$\log h = +1.2770$

$\log \sin H+\alpha = -9.97$

$\log \sec \alpha = +0.0717$

-1.39

$+1.32$

$+1.57$

$+0.18$ = cor. in R. a.

$+0.194$

$\log 1/5 = +1.02$

$\log \cos G+\alpha = +9.90$

$+8.48 = +0.92$

$\log h = +1.2770$

$\log \cos H+\alpha = +9.54$

$\log \sin \alpha = +9.7246$

$+3. = +0.54$

$\log i = -0.889$

$\log \cos \alpha = +9.9283$

$-6.57 = -0.817$

$+12.0$

$+5.4$ = cor. in Dec.

$+5.40$

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1882phae.proj..498.

In ledger

Mar. 8, 1883

Comet a, 1883

Precession Reductions

D.m. +31° 185 6.9

W. II 0h 1505 = 0h 58′ 21.81 +31 4 34.9 7 1825.

+1 34.92 +9 22.9

Mid. Pl. = 0h 59 56.73 +31 13 57.8

14° 59 10.95

Log n/15 = +0.12611

" sin. α = +9.41261

" tan. δ = +9.78276

+0.2096 = +9.32148

3.0707

3.2803 = +0.51591

58 = +1.76343

190.26 = +2.27934

Log. n = +1.80221

" cos. α = 9.98497

" 58 = +1.76343

1123.6 = +3.05061

(* 1825.0) 0h 58 21.81 +31 13 57.8

+3 10.26 +18 43.6

(* 1883.0) 1h 1 32.07 +31 32 41.4

+31 ℄ 34.9

+18 ℄ 43.6

+31 23 18.5

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1882phae.proj..498.

Mar. 8, 1883

Comet a, 1883

app. Pl. Reductions

Troxy, Lee

B. 11. p. 42 for

Correct reduction

Ledger.

$A = +1.346$ $\quad$ $G = 2^h\ 18.9$ $\quad$ $H = 18\ 51.7$

$G = 2^h\ 18.9$ $\quad$ $L = 1\ 1.5$ $\quad$ $H+L = 19\ 53.2$

$H = 18^h\ 51.7$ $\quad$ $G+L = 3\ 20.4$

$\log g = +1.0289$

$\log h = +1.2749$ $\quad$ $\Delta = +31^\circ\ 32\ 41$

$\log i = -0.9011$

$\log. 1/15 = 8.8239$

$\log. g = +1.0289$

$\log \sin G+L = +9.8849$

$\log \tan. \Delta = +9.7881$

$+0.336 = 9.5258$

$\log. 1/15 = +8.8239$

$\log. h = 1.2749$

$\log \sin H+L = -9.9447$

$\log \sec. \Delta = +0.0694$

$-1.297 = -0.1129$

$+1.682$

$+0.385$ = cor. in R.A.

$\log. g = 1.0289$

$\log. \cos (G+L) = +9.8072$

$= +8.6311$

$+6.86 = +0.8361$

$\log. h = +1.2749$

$\log. \cos. (H+L) = +9.6759$

$\log. \sin. \Delta = 9.7186$

$+4.67 = +0.6694$

$\log. i = -0.9011$

$\log. \cos. \Delta = +9.9306$

$-6.79 = -0.8317$

$+11.53$

$+4.74$ = cor. in Dec.

For more correct reduction, see B. 11. p. 42.

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1882phae.proj..498.

Ludlodge

Feb. 28, 1883.

Ξ a, 1883

Precession Computation

D.M. +31° 4988 8.0

Ll. 46809 =	23	43	4.45	+31	17	46.2	8 1800
		+2	4.92		+13	50.2	
Mid. Pl. =	23	46	3.37	+31°	31	36.4	
	356°	30	50.55				

Log. $\frac{n}{15}$ = 0.12614
" sin. α = -8.78391
" tan. δ = +9.71842
-0.0 425
* ~~0.0503~~ = -8.62847
+3.0704
+3.0279 = 0.48 ~~0.02~~ 15
83 = +1.91908
251.32 = 2.40023

Log. n = 1.30223
" cos. α = +9.99930
" 83 = 1.91908
1661.5 = +3.22051

(* 1800.0) =	23	43	4.45 ✓	+31	17	46.2 ✓	
		4	11.32 ✓		+27	41.5 ✓	
(* 1883.0) =	23	47	15.77 ✓	+31	45	27.7 ✓	

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1882phae.proj..498.

Feb. 28, 1883

Dr Ledger.

Comet a, 1883

Asph. Pl. Reduction

f = +1.308	G = 2^h 22.9	H = 19 26.1
$\log q$ = +1.0203	α = 23 47.3	α = 23 47.3
$\log h$ = +1.2778	$G+\alpha$ = 2^h 10.2	$H+\alpha$ = 19 13.4
$\log i$ = −0.8838	δ = +31° 45′ 28″	

$\log .1/15$ = +8.8239
" g = +1.0203
" sin. $G+\alpha$ = +9.7308
" tan. α = 9.7917
+0.233 = +9.3667

$\log .1/15$ = +8.8239
" h = +1.2778
" sin. $H+\alpha$ = −9.9774
" sec. δ = 0.0704
−1.411 −0.1495
+1.536
+0.125 = cor. in R. a.

$\log .$ g = +1.0203
" cos. $G+\alpha$ = +9.9258
+8.83 = +0.9461

" h = +1.2778
" cos. $H+\alpha$ = +9.4981
" sin. α = +9.7213
+3.14 = +0.4972

" i = −0.8838
" cos. δ = +9.9296
−3.51 = −0.8134
+11.97
+5.46 = cor in Dec.

Although the above computation is not perfectly exact, the errors in quantities from Almanac are so slight that it would make no practical difference in the result. Hence no re-reduction is necessary.

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1882phae.proj..498.

Dr Lodge

Jan. 3 1887 (see p. 184)

Finlay's Comet

Dm. +0° 19 = 0h 6 21.9 +0° 34.8 (6.8) K

W. 0h 99 = 0h 4 50.34 +0 25 39.3 (1825.0)

+1 35.27 +10 21.6

Mid. Pl. = 0h 6 25.51 +0 36 0.9

1° 36 22.65

Log. $\frac{u}{15}$ = 0.12611

" sin. t = +8.44774

" tan. χ = +8.02022

+0.0004 = +6.59407

3.0707

+3.0711 = 0.48729

Δ^2 = 1.7~~6000~~ 9239

~~+59.69~~ = ~~220327~~

190.40 2.27968

Log. u = 1.30220

" cos. χ = +.999983

" Δ^2 = 1.7~~6000~~ 9239

1242.9 = +3.09442

(* 1825) 0h 4 50.34 +0 25 39.3

+3 10.40 +20 42.9

(* 1887.0) = 0h 8 0.74 +0° 46 22.2

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1882phae.proj..498.

Jan. 31 1887

In Ledger. Finlay's Comet

$A = -0.481^{\tau}$ $\mathfrak{G} = 7^h\ 20.3^{\tau}$ $\mathfrak{H} = 23\ \ 10.0^{\tau}$

$\mathfrak{G} = 7^h\ 20.3^{\tau}$ $\alpha = 0\ \ 8.0^{\tau}$ $\alpha = 0\ \ 8.0^{\tau}$

$\mathfrak{H} = 23\ \ 10.0^{\tau}$ $7\ \ 28.3^{\tau}$ $23\ \ 18.0^{\tau}$

$\log. g = +0.9591^{\tau}$

$\log. h = +1.3087^{\tau}$ $\delta = +0^{\circ}\ 46'\ 22''$

$\log. i = -0.2817^{\tau}$

$\log. 1/15 = +8.8239^{\tau}$

$\log. \sin.(\mathfrak{G}+\alpha) = +9.9670^{\tau}$

$\log. g = +0.9591^{\tau}$

$\log. \tan. \alpha = +8.1301^{\tau}$

$+0.008^{\tau} = +7.8801^{\tau}$

$\log. 1/15 = +8.8239^{\tau}$

$\log. h = +1.3087^{\tau}$

$\log. \sin(\mathfrak{H}+\alpha) = -9.2606^{\tau}$

$\log. \sec. \alpha = +0.0000^{\tau}$

$-0.247^{\tau} = -9.3932^{\tau}$

-0.481^{τ}

-0.728^{τ}

$+0.008^{\tau}$

$-0.720^{\prime\prime} =$ cor. in R.A.

$\log. g = +0.9591^{\tau}$

$\log. \cos. \mathfrak{G}+\alpha = -9.5750^{\tau}$

$-3.42^{\tau} = -0.5341^{\tau}$

$\log. h = +1.3087^{\tau}$

$\log. \cos. \mathfrak{H}+\alpha = +9.9927^{\tau}$

$\log. \sin. \alpha = +8.1299^{\tau}$

$+0.27^{\tau} = +9.4313^{\tau}$

$\log. i = -0.2817^{\tau}$

$\log. \cos. \alpha = +0.0000^{\tau}$

$-1.91^{\tau} = -0.2817^{\tau}$

-3.42^{τ}

$-5.33^{\prime\prime}$

$+0.27^{\prime\prime}$

$-5.06 =$ cor. in Dec.

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1882phae.proj..498.

June 27, 1887 (sec. p. 192).

Dr Hedgu.

Barnard's Comet (this May 12)

$\mathcal{L}$ 30602 =	16h	39	14.97	+1°	15	20.0 (1800.0)
	+2	12.33		−5	1.2	
Mid. Pl. =	16	41	27.30	+1°	10	18.8
	250°	21′	49.5″			

Log. $\frac{u}{15}$ = +0.12614
" sin. α = −9.97398
" tan. α = +9.31073
−0.25875 = −9.41085
+3.07705
+2.81830 = +0.44917
87 = +1.93952
244.73 = 2.38869
264.89 2.42306

Log. u = +1.30229
" cos α = −9.97398
" 87 = +1.93952
1681.6 − 3.21573
−586.3 = 2.76815

* 1800.0 =	16	39	14.97	+1°	15	20.0
	+4	24.89		−9	46.3	
* 1887.0 =	16	43	39.86	+1°	5	33.7
	+0	2.09		+0	6.4	
ap. Pl. *	16	43	41.95	+1°	5	40.1
	+1	21.39		+1	3.17	
ap. Pl. ∈	16	45	3.34	+1°	6	43.8

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1882phae.proj..498.

June 27, 1887 sec. p. 192

In ledger. Barnard's Comet.

f = +0.844
G = 3 36.8
H = 11 37.4
log. g = +0.9744
" h = +1.3102
" i = +9.9398

G = 3h 36.8
α = 16 43.7
$G+\alpha$ = 20 20.5

H = 11 37.4
α = 16 43.7
$H+\alpha$ = 28 21.1
24
4 21.1

α = +1° 5 34

log. 1/15 = +8.8239
" g = +0.9744
" sin $G+\alpha$ = -9.9127
" tan. α = +8.2801
-0.010 = -7.9911

log. 1/15 = +8.8239
" h = +1.3102
" sin $H+\alpha$ = +9.9583
" sec. α = +0.0001
+1.237 = +0.0925
+0.844
+2.081
-0.010
+2.071 = cor. in R.A.

log. g = +0.9744
" cos. $G+\alpha$ = +9.7600
+5.42 = 0.7344

" h = +1.3102
" cos. $H+\alpha$ = +9.6215
" sin. α = +8.2800
+0.66 = +9.2117

" i = +9.9398
" cos. α = +9.9999
+0.89 = +9.9397
+5.42
+0.16
+6.45 = cor. in Dec.

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1882phae.proj..498.

In Ledger

July 12, 1887

Barnard's Comet. (disc. May 12)

Precession computation

B.	17	15	15.13	+6°	48	17.3	(1855.0)
		+0	46.66		−1	2.6	
Mid. Pl. =	17	16	1.79	+6°	46	~~19.9~~	
	259°	0′	26.″85		7	14.7	

Log. $\frac{m}{15}$ = 0.12608
" sin. α = −9.99196
" tan. δ = +9.07563
−0.1562 = −9.19367

+3.0710
+2.9148 = +0.46461

32 = 1.50515
+93.27 = +1.96976

Log. m = 1.30217
" cos α = −9.28031
" .32 = +1.50515
−122.4 = −2.08763

* 1855.0 =	17	15	15.13 ✓	+6°	48	17.3 ✓	✓
		+1	33.27 ✓		−2	2.4 ✓	
* 1887.0 =	17	16	48.40 ✓	+6°	46	14.9 ✓	
		+0	2.10 ✓		+0	10.1 ✓	
App. Pl. *	17	16	50.50 ✓	+6°	46	25.0 ✓	

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1882phae.proj..498.

Inledgue. July 12, 1887

Barnard's Comet (close May 12)

$A = +0.983'$ $\mathfrak{G} = 3^h\ 17.1'$ $\mathfrak{H} = 10^h\ 44.4'$

$\mathfrak{G} = 3^h\ 17.1'$ $\alpha = 17\ 16.8'$ $\alpha = 17\ 16.8'$

$\mathfrak{H} = 10^h\ 44.4'$ $\mathfrak{G}+\alpha = 20\ 33.9'$ $\mathfrak{H}+\alpha = 28\ 1.2'$

$\log. g = +0.9932'$ 24

$\log. h = +1.3063'$ $\delta = +6^\circ\ 46\ 15''$ $4\ 1.2'$

$\log. i = +0.4541'$

$\log. 1/15 = +8.8239'$

$\log. g = +0.9932'$

$\log. g = +0.9932'$

$\log. \cos(\mathfrak{G}+\alpha) = +9.7939'$

$6.12' = 0.7871'$

$\log. \sin(\mathfrak{G}+\alpha) = -9.8936'$

$\log. \tan. \alpha = 9.0745'$

$-0.061' = -8.7852'$

$\log. h = +1.3063'$

$\log. \cos(\mathfrak{H}+\alpha) = +9.6950'$

$\log. \sin. \alpha = +9.0715'$

$+1.18' = +0.0728'$

$\log. 1/15 = +8.8239'$

$\log. h = +1.3063'$

$\log. \sin(\mathfrak{H}+\alpha) = +9.9388'$

$\log. \sec. \alpha = +0.0030'$

$+1.182^0 = +0.0720'$

$+0.983'$

$+2.165'$

$-0.061'$

$+2.104'$ = corr. in R.A.

$\log. i = +0.4541'$

$\log. \cos. \alpha = 9.9970'$

$+2.83'$

$+6.12'$

$+1.18'$

$+10.13''$ = corr. in Dec.

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1882phae.proj..498.

Ln ledger

July 12, 1887

Barnard's Comet (close. May 12)

Precession Computation.

W. $17^h 25.8$ = 17^h 13 31.76 $+6^\circ$ 42 32.3 (1825.0)

+1 30.40 −2. 5.2

Mid. Pl. = 17 15 2.16 +6 40 27.1

258° 45′ 32.40″

Log. $\frac{n}{15}$ = 0.12611 Log. n = 1.80220

" sin. ϕ = −9.99159 " cos. ϕ = −9.28990

" tan. α = 9.06825 " 62 = 1.79239

−0.1534 = −9.18595 − 242.4 = −2.38449

+3.0707

+2.9173″ = 0.46498

62 = 1.79239

180.87 = +2.25737

(* 1825.0) = 17^h 13 31.76″ $+6^\circ$ 42 32.3″

+3 0.87 − 4 2.4

(* 1887.0) = 17^h 16 32.63 $+6^\circ$ 38 29.9

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1882phae.proj...498.

Ledger.

July 12, 1887

Barnard's Comet

$f = +0.983^7$ $\mathfrak{G} = 3^h\ 17.1^7$ $H = 10^h\ 44.4^7$

$\mathfrak{G} = 3^h\ 17.1^7$ $\alpha = 17\ \ 16.5^7$ $\alpha = 17\ \ 16.5^7$

$H = 10^h\ 44.4^7$ $\mathfrak{G}+\alpha = 20\ \ 33.6^7$ $28\ \ 0.9^7$

$\log g = +0.9932^7$ $H+\alpha = 4\ \ 0.9^7$

$\log h = +1.3063^7$

$\log i = +0.4541^7$ $\Sigma = +6^\circ\ 38'\ \ 30''^7$

$\log 1/15 = +8.8239^7$

$\log g = +0.9932^7$

$\log \sin \mathfrak{G}+\alpha = -9.8940^7$

$\log \tan \Sigma = +9.0661^7$

$-0.060^7 = +8.7772^7$

$\log 1/15 = +8.8239^7$

$\log h = +1.3063^7$

$\log \sin H+\alpha = +9.9385^7$

$\log \sec \Sigma = +0.0029^7$

$+1.187^7 = +0.0716^7$

$+0.983^7$

$+2.170^7$

-0.060^7

$+2.110^7$ = cor. in R.A.

$\log g = +0.9932^7$

$\log \cos H+\alpha = +9.7932^7$

$+6.12^7 = +0.7864^7$

$\log h = +1.3063^7$

$\log \cos H+\alpha = +9.6960^7$

$\log \sin \Sigma = +9.0632^7$

$+1.16^7 = +0.0655^7$

$\log i = +0.4541^7$

$\log \cos \Sigma = +9.9971^7$

$+2.83^7 = +0.4512^7$

$+6.12^7$

$+1.16^7$

$+10.11^7$ = cor. in Dec.

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1882phae.proj..498.

Comet Barnard (1885 a) (See B.5. p. 162)

Im ledger.

July 10 1885 (copied from Ch. paper)

(* b)

Schy. 6184 = 17 12 43.61 ✓ −6 17 11.1 ✓ (1865 ✓)

* 1885.0 +1 4.31 −1 21.2

~~Mean Pl.~~ = 17 13 47.92 −6 18 22.3

+2 18.72

(* c)

W. 17h 312 = (1885.0) 17 19 48.69 ✓ −6 28 30.6 ✓

+0 2.~~66~~ 98 ✓ +0 ~~4.5~~ 8.9 ✓

Appr. Pl. * = 17 19 51.67 ✓ −6 28 21.7 ✓

−3 42.10 ✓ −2 41.9 ✓

Appr. Pl. ○ = 17 16 9.57 ✓ −6 3~~2~~1 3.6 ✓

Gr. M. T. obs. = 14h 25m 5.2s ✓

4 44 31. ✓

9 41 20. ✓ C. M. T.

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1882phae.proj..498.

In ledger. Comet Barnard (1885 a)

July 10, 1885

$f = +1.647^r$ $\mathfrak{G} = 2\ 49.7^r$ $\mathfrak{H} = 10\ 49.9^r$

$\mathfrak{G} = 2\ 49.7^r$ $\alpha = 17\ 19.8^r$ $\alpha = 17\ 19.8^r$

$\mathfrak{H} = 10\ 49.9^r$ $\mathfrak{G}+\alpha = 20\ 9.5^r$ $\mathfrak{H}+\alpha = 4\ 9.7^r$

$\log g = +1.1633^r$

$\log h = +1.3069^r$ $\alpha = -6^\circ\ 28'\ 31''^r$

$\log i = +0.4234^r$

$\log .\frac{1}{5} = +8.8239^r$

$\log g = +1.1633^r$

$\log \sin \mathfrak{G}+\mathfrak{H} = -9.9266^r$

$\log \tan \alpha = -9.0550^r$

$+0.093^r = +8.9688^r$

$\log .\frac{1}{5} = +8.8239^r$

$\log h = +1.3069^r$

$\log \sin \mathfrak{H}+\mathfrak{H} = +9.9476^r$

$\log \sec \alpha = +0.0028^r$

$+1.206^r = +0.0812^r$

$+0.093^r$

$+1.647^r$

$+2.946^r$ = cor. in R.A.

$\log .g = +1.1633^r$

$\log \cos \mathfrak{G}+\mathfrak{H} = +9.7287^r$

$+7.80^r = +0.8920^r$

$\log h = +1.3069^r$

$\log \cos \mathfrak{H}+\mathfrak{H} = +9.6655^r$

$\log \sin \alpha = -9.0522^r$

$-1.06^r = -0.0246^r$

$\log i = +0.4234^r$

$\log \cos \alpha = +9.9972^r$

$+2.63^r = 0.4206^r$

7.80^r

$+10.43^r$

-1.06^r

$+9\ 37^r$ = cor. in Dec.

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1882phae.proj..498.

Comet Barnard a. disc. July 7. (see B5 P.158)

Ledger.

July 9 1885 Copied from Sch. papers.

W. 17h 2 54 = (1885.0)	17	16	32.49		−6	13	0.0	
		+2°	2.93			+0	8.9	
a/pp. Pl. * =	17	16	35.33		−6	12	51.1	
		+1	13.85			+11	44.8	
a/pp. Pl. ∝ =							.3	

W. 17h 2 54 = (1885.0)	17	16	32.18		−6	12	43.6	
		+0	2.93			+0	8.9	
a/pp. Pl. *	17	16	35.11		−6	12	34.7	
		+1	13.85	v		+11	44.8	v
a/pp. Pl. ∝ =	17	17	48.96		−6	0	49.9	

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1882phae.proj..498.

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1882phae.proj..498.

In ledger

Comet Barnard, a close. July 7 (ors. B.5 p.166)

July 11 1885 (copied from B. paper and obs. B.

* d used

W. * 17h 218 = 1825

~~Mint~~ * 1885.0

∈ − *

17	11	16 58	−6	55	12.8
	+3	13.80		−4	5.4
17	14	30.38	−6	59	18.2
	−0	14.38		*5	47.5
17	14	26.00	−7	5	5.7
	+8	~~3.31~~ 3.03		*0	~~5.6~~ 5.4
17	14	~~19.31~~ 19.03	−7	5	~~0.1~~ 59

This obs. all red. and copied on double sheet ledger.

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1882phae.proj..498.

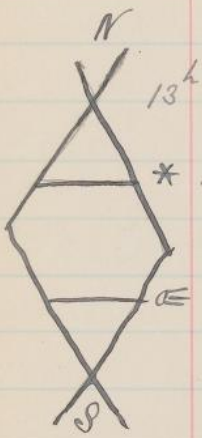
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1882phae.proj..498.

Comet Wells 1882 I

Apr. 25 1882

(Rec. Acc. B. 27 p. 138) {From Chronograph Sheet}



	E		*		E − *			
13h	48	19.0	51	29.6				
	48	58.2	52	36.0				
	97	17.2	104	5.6	−6m	48.4s	−3	24.20s
	53	27.0	56	35.5				
	54	8.1	57	44.1				
	107	35.1	114	19.6	6	44.5s	8	22.25s
								6.45
							−3m	23.22s

	204	523	
Mean Sets 13h	51	13.1	N.R.
	+1	27.3	
13	52	40.4	
2	14	22.4	
11	38	18.0	
	−1	54.4	
11	36	23.6	C. M. T.
4	44	31.0	
16	20	54.6	= Gr. M. T. (corrected)

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1882phae.proj...498.

Δ∈ Δ☆ ∈☆

o 39.2″ 1ᵐ 6.4ˢ 1 45.6″

o 41.1′ 1ᵐ 8.6ˢ 1 49.7″
15.3
1ᵐ 47.6ˢ

Log. 107.6 = 2.03181″
" 7.5 = 0.87506″
" cos.δ = 9.65856′
367.7′ = 2.56543″

886.0
518.3′
259.15′ = −4 19.2′
+62 53 53.5
+62 49 34.3″

2.03181′
0.87506′
9.65863′
368.6 = 2,56650″

886.0
517.4′ = −8 37.4″ ✓

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1882phae.proj..498.

Comet Wells. 1882 I.

Apr. 25, 1882.

Dm. +62° 1759 =

See page 88

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1882phae.proj..498.

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Comet. Ends (see p. 6)

Oct. 12, 1882

Precession Computation

In ledger.

$L(-9°, -15°)$ 711 = $10^h\ 18\ 5.77$ $-12\ 0\ 12.8$ (1850)

$+0\ 47.17$ $-4\ 49.7$

Mid. Pl. = $10^h\ 18\ 52.94$ $-12\ 5\ 2.5$

$154°\ 43'\ 14''10$

Log. $\frac{m}{15}$ = 0.12609 Log. m = 1.30216

" sin. α = +9.63046 " cos. α = −9.95628

" tan α = −9.33059 " 32 = +1.50515

−0.1222 = −9.08714 −580.2 = −2.76359

+3.0709

+2.9487 = 0.46963

32 = +1.50515

84.36 1.97478

$*$ 1850.0 = $10^h\ 18\ 5.77$ ✓ $-12°\ 0\ 12.8$ ✓

$+1\ 34.36$ ✓ $-9\ 40.2$ ✓

$*$ 1882.0 = $10^h\ 19\ 40.13$ ✓ $-12°\ 9\ 53.0$ ✓

$+0\ 2.22$ ✓ -10.5 ✓

Ap. Pl. $*$ = $10^h\ 19\ 42.35$ ✓ ✓ $-12°\ 10$ ~~8.5~~ ✓

$+2\ 17.46$ -3 ~~3.5~~ 27.6

Appr. Pl. α = ~~$10^h\ 21\ 59.72$~~ -13 ~~50.3~~

~~$-12°\ 23\ 59.8$~~

Ap. pl. α = $10\ 21\ 59.81$ ✓ ✓ $-12°\ 13'\ 31.''1$ ✓

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1882phae.proj..498.

Feb. 1, 1883.

Comet Circle -

Apt. Place Reduce.

f.	+1.120'	g	2 46.6	H	21 17.6
g.	2 46.6'	α	10 19.7	α	10 19.7
H.	21 17.6'	g+α =	12 66.3	H+α =	31 37.3

log g +0.9895-'
" h. +1.2939'
" i. -0.7449'

δ -12° 10.0'

log $\frac{1}{rs}$ +8.8239
log q +0.9895-
" sin(g+α) -9.4554
" tan δ -9.3336
+8.6024 = +0.040

log $\frac{1}{rs}$ +8.8239
" h. +1.2939
" sin(H+α) +9.9596
" sec δ +0.0099
+0.1873 = +1.223
f = +1.120
+2.343

log g. +0.9895-
" cos(g+α) -9.9815
-0.9710 = -9.35

log h. +1.2939.
" cos(H+α) -9.6148
" sin δ -9.3238
0.2325 = +1.71

log i. -0.7449
" cos δ. +9.9901
0.7350 = +5.43
-5.63
79

Wrong ~~star~~ date - need -

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1882phae.proj..498.

See p. 7.

Comet Crule –
Oct
Sept. 12. 1882.
Aph. Sp. redue.

f.	+3.178	g.	0 56.0	H	4 34.4
g.	0h 56.0	α	10 19.7	α	10 19.7
H.	4h 34.4	g+α	11h 15.7	H+α	14h 54.1

log g +1.3297
log h. +1.2777
log i. +0.8841

δ = −12° 10' 0"

log 1/15 +8.8239
" g. +1.3297
" sin (g+α) +9.2835
" tan δ −9.3336
−8.7707 = −0.059

log 1/15 +8.8239
" h. +1.2777
" sin (H+α) −9.8380
" sec δ +0.0099
−9.9495 = −0.890
f. = +3.178
+ 2.229

log g. +1.3297
" cos (g+α) −9.9919
−1.3216 = −20.97

log h. +1.2777
" cos (H+α) −9.8604
" sin δ. −9.3238
+0.4619 = +2.90

log i. +0.8841.
" cos δ +9.9901
+0.8742 = +7.48

−10.59

This reduction is what should have been on p. 7.

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1882phae.proj..498.

Dec. 10, 1885

Comet Bonnard (1885 c)

APP. PLACE Reduction.

$f = +2.714$ '7 $\quad G = 1\ 55.1$ '7 $\quad H = 0\ 39.0$ '7

$G = 1^h\ 55.1$ '7 $\quad \alpha = 4^h\ 4.3$ $\quad G+\alpha = 5\ 59.4$ '7. $\quad H+\alpha = 4\ 43.3$ '7

$H = 0\ 39.0$ '7

$\log. g = +1.3057$ ✓7

" $h = +1.3094$ '7 $\quad \delta = +5°\ 23\ 15$

" $i = +0.1758$ '7

$\log. \sin 15 = +8.8239$ '7

" ~~sin~~ $g = +1.3057$ '7

" $\sin. G+\alpha = +10.0000$ '7

" $\tan \alpha = +8.9746$ '7

$+0.127$ ✓ $= +9.1042$ '7

$\log \sin 15 = +8.8239$ '7

" $h = +1.3094$ '7

" $\sin H+\alpha = +9.9752$

" $\sec \alpha = +0.0019$ ✓

$+1.289$ ✓ $= +0.1104$ '7

$+0.127$ ✓

$+2.714$ ✓

$+4.130$ ✓ = cor. in R.A.

$\log g = +1.3057$ ✓

" $\cos G+\alpha = +7.4180$ ✓

$+0.05$ ✓ $= +8.7237$ ✓

$\log h = +1.3094$ ✓

" $\cos H+\alpha = +9.5165$ ✓

" $\sin \alpha = +8.9726$ ✓

$+0.63$ ✓ $= +9.7985$

" $i = +0.1758$ ✓

" $\cos \alpha = +9.9981$ ✓

$+1.49$ ✓ $= +0.1739$ ✓

$+0.05$ ✓

$+0.63$ ✓

$+2.17$ ✓ = cor. in Dec.

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1882phae.proj..498.

Dec. 6 1885

Comet Barnard (1885 2)

APP. PLACE Reduction.

$f = +2.660'$ $\mathfrak{G} = 1^h\ 57.5'$ $H = 0\ 54.1'$

$\mathfrak{G} = +1^h\ 57.5'$ $\lambda = 4\ 14.9$ $\lambda = 4\ 14.9$

$H = +0\ 54.1'$ $6\ 12.4'$ $H+\lambda = 5\ 9.0$

Log. $g = +1.2995'$

" $h = +1.3083'$ $\lambda = +4^\circ\ 58\ 43$

" $i = +0.3144'$

Log. $1/15 = +8.8239'$

" $g = +1.2995'$

" sin $\mathfrak{G}+\lambda = +9.9994'$

" tan $\lambda = +8.9400'$

$+0.116' = +9.0628'$

Log. $1/15 = +8.8239'$

" $h = +1.3083'$

" sin $H+\lambda = +9.9892'$

" sec. $\lambda = +0.0016'$

$+1.327' = +0.1230'$

$+2.660'$

$+0.116'$

$+4.103'$ = cor. in R.A.

Log. $g = +1.2995'$

" cos. $\mathfrak{G}+\lambda = -8.7327'$

$-1.08' = -0.0322'$

Log. $h = +1.3083'$

" cos $H+\lambda = +9.3438'$

" sin $\lambda = +8.9384'$

$+0.39' = +9.5905'$

" $i = +0.3144'$

" cos $\lambda = +9.9984'$

$+2.06' = +0.3128'$

$+0.39'$

$+2.45'$

$-1.08'$

$+1.37'$ = cor. in Dec.

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1882phae.proj..498.

Mar. 1, 1883

Comet Brooks-Swift (1883 a)

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1882phae.proj..498.

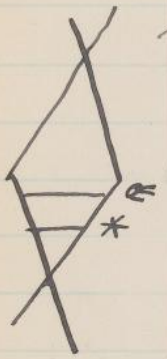
APP. PLACE Redvction.

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1882phae.proj..498.

Mar. 1, 1883 (B. 236 used.)

Comet Brooks Swift (1883, a)



	⊏		✳		⊏ − ✳			
	5 57	2.4	54	56.2				
	57	44.5	55	28.4				
	114	46.9	110	24.6	4	22.3	2	11.15
	60	30.3	58	23.8				
	61	12.2	58	55.8				
	121	42.5	117	19.6	4	22.9	2	11.45
6h	4	48.9	2	38.3				
	5	29.0	3	12.2				
	10	17.9	5	50.5	4	27.4	2	13.70
	8	31.6	6	18.2				
	9	10.7	6	53.1				
	17	42.3	13	11.3	4	31.0	2	15.50
	15	40.0	13	22.8				
	16	18.1	13	58.6				
	31	58.1	27	21.4	4	36.7	2	18.35
								70.15
							+2	14.03

53

6 ~~29~~ 3 20 7.7

5 ~~29~~ ~~38.8~~

Mean Tests 6 5 38.8 NR

+0 26.3 = Chron. ~~Corr~~ Cor.

6 6 5.1

22 36 34.4

7 29 30.7

-1 13.6

7 28 17.1 = C. m. T.

4 44 31.0

12 12 48.1 = Gr. m. T.

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1882phae.proj..498.

Δ α	Δ δ	α − δ
42.1″	32.2″	9.9″
41.9″	32.0″	9.9″
40.1″	33.9″	6.2″
39.1″	34.9″	4.2″
38.1″	35.8″	2.3″
		32.7
		⊙ 6.54

Log. 6.54 = 0.81558 — 0.81558 —
" 7.5 = 0.87506″ 0.87506 —
⊙ cos δ = 9.92967 — 9.92966 —
41.7 — = 1.62031″ + 41.7 — = 1.62030 —
20.8 — = + ⊙ 20.8 — + ⊙ 41.7 —

+31 43 54.2 —
+31 44 15.0

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1882phae.proj..498.

In ledger.

Mar. 1, 1883

Comet Brooks—Swift

Precession Computation

Comp. Stars = Dm. +31° 5012 (6.2)

Dm. place = 23 51 26.9 +31° 33.3 K

W_2 23h1073 = 23h 49m 55.04s +31° 24′ 26.4 (1825)

+1 27.96 2 41.2

Mid. Pl. = 23 51 23.00 +31° 34 7.6

357° 50 45.0

Log. $\frac{n}{15}$ = +0.12612

" sin ∠ = −8.57505

" tan ∠ = +9.78849

−0.0309 = −8.48966

3.0707

3.0398 = 0.48284

58 = 1.76343

176.31 = 2.24627

Log. n = 1.80221

" cos ∠ = +9.99969

" 58 = 1.76343

1162.3 = +3.06533

* 1825.0	23h 49m 55.04 ✓	+31° 24	26.4 ✓
	+2 56.31 ✓	+19	22.3 ✓
* 1883.0	23 52 51.35 ✓	+31° 43	48.7 ✓

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1882phae.proj..498.

Mar. 1, 1883

Comet Brooks-Swift

App. Place Reduction

$A =$
$\mathfrak{A} =$
$H =$
$\log g =$
$\quad\quad h =$
$\quad\quad i =$

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1882phae.proj..498.

In ledger

Comet Cruls (sup. 26)

Mar. 7, 1883

(Goulds Gen. Cat. no. 7013) =	5	51	19.56	−13	53	24.0	(1875.0)
		+0	10.97		+0	3.0	
Mid. Pl. =	5	51	30.53	−13°	53	27.0	
	87°	52′	37.″95				

Log $\frac{u}{15}$ = +0.12606
" sin α = +9.99970
" tan δ = −9.98711
−0.33033
−1.2968 = − 0.11287
9.51899
+3.07712
+1.77444 = 0.43789
+2.74009
Log. 8 = 0.90309
14.2 = 1.15214
+21.93 = 1.34098

Log. u = 1.30215
" cos α = 8.56869
" 8 = 0.90309
+5.9 = 0.77393

(* 1875.0) =	5	51	19.56 ✓	−13	53	24.0 ✓	
		−0	21.93 ✓			+5.9 ✓	
* 1883.0 =	5	51	41.49 ✓	−13°	53	29.9 / 18.1 ✓	
		+0	1.47 ✓		−0	17.8 ✓	
Apr. Pl. *	5	51	42.96 ✓	−13	53	47.7 / 35.9 ✓	

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1882phae.proj..498.

In Ledger

Comet Cruls
Mar. 7 1883

$f = +1.360^{7}$ $\quad \mathfrak{G} = 2^{h}\ 16.8^{7}$ $\quad H = 18\ 55.1^{7}$

$\mathfrak{G} = 2^{h}\ 16.8^{7}$ $\quad \lambda = 5\ 51.7^{7}$ $\quad 5\ 51.7$

$H = 18\ 55.1^{7}$ $\quad \mathfrak{G}+\lambda = 8\ 8.5^{7}$ $\quad 24\ 46.8^{7}$

$\log g = +1.0299^{7}$ $\quad 24$

" $h = +1.2751^{7}$ $\quad H+\lambda = 0\ 46.8^{7}$

" $i = -0.8998^{7}$ $\quad \alpha = -13^{\circ}\ 53'\ 30''$ 18.1

$\log 1/15 = +8.8239^{7}$ $\quad \log g = +1.0299^{7}$

" $g = +1.0299^{7}$ $\quad$ " $\cos \mathfrak{G}+\lambda = -9.7257^{7}$

" $\sin \mathfrak{G}+\lambda = +9.9278^{7}$ $\quad -5.70^{7} = -0.7556^{7}$

" $\tan \lambda = -9.3931^{7}$

$-0.150^{7} = -9.1747^{7}$

$\log h = +1.2751^{7}$

" $\cos H+\lambda = +9.9909^{7}$

" $\sin \alpha = -9.3804^{7}$

$-4.43^{7} = -0.6464^{7}$

$\log 1/15 = +8.8239^{7}$

" $h = +1.2751^{7}$

" $\sin H+\lambda = +9.3071^{7}$

" $\sec \lambda = +0.0129^{7}$

$+0.262^{7} = +9.4190^{7}$

" $i = -0.8998^{7}$

" $\tan \alpha = +9.9871^{7}$

$-7.71^{v} = -0.8869^{7}$

$+1.360^{7}$

$+1.622^{v}$

-0.150^{v}

$+1.472^{v}$ = corr. in R. A.

-5.70^{v}

-4.43^{v}

-17.84 = corr. in Dec.

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1882phae.proj..498.

Comet Calc
Apr. 6, 1883

W_1	5^h	14	97	= 5^h	56	51.64 ✓	
				+	1	22.71	
Mid. Pl.				= 5^h	58	14.35	
					89°	33′	35.25″

	−29	17	2.3 ✓	(1825.0)
	+ 0	7	8	
	−29	16	54.5	

Log. $\frac{u}{15}$	= +0.12612
" sin δ	= +9.99999
" tan δ ✓	= −9.54386
−0.2185	= 9.66997
+3.0707	
+2.6030	= +0.45518
+2.8522	= +0.41547
58	= 1.76343
+50.97	= 2.17890
+165.43	= +2.21861

Log. u	= 1.30221 ✓
" cos. δ	= +9.99999
	+7.88865
" 58	= 1.76343 ✓
+8.947 ✓	= +0.95119
	3.06563

(* 1825)	=	5^h	56	51.64 ✓	−9	17	2.3 ✓
		-7 +2	45	43 ✓	7 +0	8	9 ✓
(* 1883.0)	=	5^h	59	37.07 ✓	−9	16	53.4 ✓

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Comet Finlay
Apr. 6, 1883

On ledger.

$f = +1.503'$ $\mathfrak{L} = 2^h\ 9.7'$ $\mathfrak{A} = 16\ 46.1'$
$g = 2^h\ 9.7'$ $\mathfrak{H} = 5\ 59.6'$ $\mathfrak{a} = 5\ 59.6'$
$\mathfrak{A} = 16\ 46.1'$ $\mathfrak{L}+\mathfrak{a} = 8\ 9.3'$ $\mathfrak{A}+\mathfrak{a} = 22\ 45.7'$
$\log g = +1.0646'$
$\log h = +1.2766'$ $\alpha = -9^\circ\ 16\ 53'$
$\log i = -0.8911'$

$\log \sin 15 = +8.8239'$
$\log g = +1.0646'$
$\log \sin(\mathfrak{L}+\mathfrak{a}) = +9.9268'$
$\log \tan\alpha = -9.2133'$
$-0.107' = -9.0286'$

$\log \sin 15 = +8.8239'$
$\log h = +1.2766'$
$\log \sin(\mathfrak{A}+\mathfrak{a}) = -9.5022'$
$\log \sec \alpha = +0.0057'$
$-0.406' = -9.6084'$
$-0.107'$
-0.513^v
$+1.503^v$
$+0.990^v$ = cor. in R.A.

$\log g = +1.0646'$
$\log \cos(\mathfrak{L}+\mathfrak{a}) = -9.7281'$
$-6.20' = -0.7927'$

$\log h = +1.2766'$
$\log \cos(\mathfrak{A}+\mathfrak{a}) = +9.9768'$
$\log \sin\alpha = -9.2076'$
$-2.89' = -0.4612$ [07]

$\log i = -0.8911'$
$\log \cos\alpha = +9.9943'$
$-7.68' = -0.8854'$
$-6.20'$
$-2.89'$
-16.77^v = cor. in Dec.

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1882phae.proj..498.

Dr ledger

Comet Cruls

Jan. 23, 1883

Precession Computation

Oe.a. 5129 = $6^h\ 20\ 58.47$ $-24^\circ\ 9'\ 7.''1$ (1850)

$+0\ 40.97$ $-0\ 30.4$

Mid. Pl. $6^h\ 21\ 39.44$ $-24^\circ\ 9\ 37.5$

$95^\circ\ 24'\ 51.''60$

Log. $\frac{n}{15}$ = 0.12609

" sin α = +9.99806

" tan α = −9.65185

−0.5970 = −9.77600

+3.0709

+2.4739 = 0.39338

33 = 1.51851

81.64 = 1.91189

Log n = 1.30218

" cos. α = −8.97478

" 33 = 1.51851

−62.4 = −1.79547

(* 1850.0) $6^h\ 20\ 58.47$ $-24^\circ\ 9\ 7.1$

$+1\ 21.64$ $-1\ 2.4$

(* 1883.0) $6^h\ 22\ 20.11$ $-24\ 10\ 9.5$

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Comet Wells. Precession

In ledger

Mar. 31, 1882.

Comp. Star = Dm. +40° 3341 (9.3)

W.2 $18^h 41^m 3$ = 18^h 13 35.77 +40 29 6.6 (1825.0)

+0 55.00 +0 33.9

Mid. Pl. = 18 14 30.77 40 29 40.5

273° 37 41.55

Log. $\frac{u}{15}$ = +0.12612

" sin α = 9.99913

" tan α = +9.93141

-1.1394 = -0.05666

3.0707

+1.9313 = 0.28585

57 = 1.75587

110.08 = 2.04172

Log. u = 1.30221

" cos α = +8.80130

" 57 = 1.75587

+72.3 = +1.85938

(* 1825.0) 18^h 13 35.77 +40° 29 6.6

+1 50.08 +1 12.3

(* 1882.0) 18^h 15 25.85 +40° 30 18.9

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App. Pl. Reduction

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Comet Wells

Am ledger

Apr. 20, 1882

Comp. Star = D M. +57° 1986 (6.0)

Ap. A.	19h 19	92-3 =	19h	17	22.13	+57° 20 51.5 (1842)
			+0	22	22.12	+2 12.2
Mid. Pl. =			19	17	44.25	+57° 23 3.7
			289	26	3.75	

Log. $\frac{n}{15}$	= 0.12610	Log n	= 1.30219
" sin λ	= -9.97453	" cos λ	= +9.52209
" tan λ	= 0.19388	" 40	= 1.60206
-1.9702	-0.29451	+266.9	= +2.42634
+3.0708			
+1.1006	= 0.04163		
40	= 1.60206		
44.02	= 1.64369		

(* 1842.0)	19h	17	22.13	+57°	20	51.5
	+0		44.02	+ 4		26.9
(* 1882.0)	19	18	6.15	+57	25	18.4
			+1.36			-11.6
ap. Pl. * =	19	18	7.51	+57	25	6.8
		-1	41.51			
ap. Pl. ☉ =	19	16	26.00			

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Comet Wells

Apr. 24, 1882

Comp Star = Dm. +61° 1888 (8.7)

B.B VI +61° 1888 = 19 37 50.22 ✓ +61° 40 27.9 ✓ (1855)

+0 13.36 * +2 17.3 *

19h 38 3.58 +61° 42 45.2

294 30 53.7°

Log. $\frac{u}{15}$ = +0.12608 ✓

" sin t = -9.95898 ✓

" tan t = +0.26908 ✓

-2.2602 = -0.35414 ✓

+3.0710 ✓

+0.8108 ✓ = 9.90891 ✓

33 = +.51851

27 = 1.43136

2.89 = 1.34027

26.76 = +.42742

Log. u = 1.30218 ✓

" cos t = +9.61797 ✓

33 = 1.51854

27 = 1.43136

24.7 = 2.35151

+2746 = +2.42866

(*1855.0) = 19h 37 50.22 +61° 40 27.9

0 26.76 4 34.6

(* 1882) = 19 38 16.98 +61° 45 2.5

no obs. found on this date.

* Precession for mid. Pl. computed ~~on~~ for 16.5 yrs, by mistake instead of 13.5 yrs. but 27 yrs. used as a factor

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Comet Wells.
Apr. 25, 1882.

In ledger.

Comp. Stat = Dm. +62° 1759 (6.7)

Fred. Lal. 3294-5 = 19h 46 49.30 +62 40 19.1 (1790)
+0 34.82 +6 548
Mid. Pl. = 19h 46 14.48 +62° 47 13.9
296° 33 37.20

Log. u/Δ = +8.12615
" sin α = 9.95456
" tan α = +0.28886
-2.32258 = -0.36657
= 0.36647
+3.07703
+0.74445 = 9.87186
+0.7503 +9.27523
92 = 1.96379
68.50 = 1.83565
69.03 = 1.83902

Log. u = 1.30225
" cos α = +9.65044
" 92 = 1.96379
825.0 = +2.91648
Δ 33.4 = 2.92028

(* 1790.0) 19h 46 49.30 +62° 40 19.1
+1 8.50 +13 45.0
(* 1882.0) 19h 47 57.80 +62 54 44
+1.30 -10.6
App. Pl. * = 19 47 59.10 +62 53 53.5
-3 23.22 +8 37.4
App. Pl. α = 19 44 35.88 +62 45 16.1
App. Pl. α = 19 44 36.41 +62 45 24.5

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In ledger

Comet Wells.

June 22, 1882.

Comp Star = +14° 1989 (6.8) N

W, 8^h 1180 =	8	44	4.76	+14° 29	8.0	(1825)
		+1	34.93	−6	15.1	
Mid. Pl. =	8^h	45	39.69	+14	22 52.9	
	131°	24′	55.″35			

Log. $\frac{u}{15}$ = 0.12612
" sin. α = +9.87502
" tan α = +9.40894
+0.2571 = +9.41008

+3.0707
+3.3278 = 0.52215

57 = 1.75587
189.68 = 2.27802

Log. u = 1.30221
" cos. α = −9.82054
" 57 = 1.75587
756.2 = −2.87862

(* 1825.0) =	8^h	44	4.76 ✓	+14°	29	8.0 ✓
		+3	9.68 ✓		−12	36.2 ✓
(* 1882.0) =	8^h	47	14.44 ✓	+14°	16	31.8 ✓

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1882phae.proj..498.

Comet Wells

June 22, 1882

{A.P. Place Reduction}

Ledgers

$f = +2.374^{\tau}$ $\quad \mathfrak{G} = 1^h 15.5^{\tau}$ $\quad \mathcal{H} = 11\ 54.2^{\tau}$

$G = 1^h 15.5^{\tau}$ $\quad \alpha = 8^h 47.2^{\tau}$ $\quad \alpha = 8\ 47.2^{\tau}$

$\mathcal{H} = 11^h 54.2^{\tau}$ $\quad G+\alpha = 10^h 2.7^{\tau}$ $\quad \mathcal{H}+\alpha = 20\ 41.4^{\tau}$

$\log g = 1.2136^{\tau}$

$\log h = 1.3106^{\tau}$ $\quad \alpha = +14^{\circ}\ 16\ 32^{\tau}$

$\log i = +9.9348^{\tau}$

$\log 1/15 = +8.8239^{\tau}$

$\log g = +1.2136^{\tau}$

$\log \sin(G+\alpha) = +9.6900^{\tau}$

$\log \tan \alpha = +9.4056^{\tau}$

$+0.136^{\tau} = +9.1331^{\tau}$

$\log 1/15 = +8.8239^{\tau}$

$\log h = +1.3106^{\tau}$

$\log \sin(\mathcal{H}+\alpha) = -9.8820^{\tau}$

$\log \sec \alpha = +0.0136^{\tau}$

$-1.072^{\tau} = -0.0301^{\tau}$

$+2.374^{\tau}$

$+1.302^{\tau}$

$+0.136^{\tau}$

$+1.438^{\checkmark}$ = cor. in R.A.

$\log g = +1.2136^{\tau}$

$\log \cos(\mathcal{H}+\alpha) = -9.9405^{\tau}$

$-14.26^{\tau} = -1.1541^{\tau}$

$\log h = +1.3106^{\tau}$

$\log \cos(G+\alpha) = +9.8112^{\tau}$

$\log \sin \alpha = +9.3920^{\tau}$

$+3.29^{\tau} = +0.5138^{\tau}$

$\log i = +9.9848^{\tau}$

$\log \cos \alpha = +9.9864^{\tau}$

$+9.3212^{\tau}$

$+0.21^{\tau}$

$+3.26^{\tau}$

$+3.47^{\tau}$

-14.26^{τ}

$-10.79^{\checkmark}$ = cor. in Dec.

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1882phae.proj..498.

Comet Barnard

Sept. 14, 1882.

In ledger.

Comp. Star = Dm. +15° 1573 K

W. 7^h 550 =	7^h	17	24.67	+16°	6′	11.0
		+1	37.81		-3	9.5
Mid. Rl.	7	19	2.48	+15°	57	1.5
	109°	45′	37.20″			

(1825.0)

Log $\frac{n}{15}$ = +0.12612
" sin. α = +9.97365
" tan δ = +9.45607
+0.35596 = 9.55584
+3.0707
+3.43039 = 0.53533

57 = 1.75587
195.52 = 2.29120

Log n = 1.30221
" cos. α = -9.52903
" 57 = 1.75587
-386.5 = -2.58711

(* 1825.0) =	7^h	17	24.67 ✓	+16	0	11.0 ✓
		+3	15.52 ✓		-6	26.5 ✓
(* 1882.0) =	7^h	20	40.19 ✓	+15°	53	44.5 ✓
Ap. pl.			+2.73 ✓			-4.1 ✓
Ap. pl. * =	7	20	42.92 ✓	+15	53	36.4 ✓
δ = - * =		-1	25.23 ✓		+10	16.4 ✓
Ap. pl. δ =	7	19	17.69 ✓	+16	3	50.8 ✓

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Ledger

Comet Barnard
Sept. 18, 1882

Comp. Star = Dm. +12° 1588 - K

W_1 7^h 769 =	7^h	23	23.26	+12	55	23.6 (1825.0)
		+1	35.67		−3	23.5
Mid. Pl. =	7	24	58.93	+12°	52	0.1
	111°	14′	43.95			

Log. $\frac{u}{15}$ =	+0.12612
" sin α =	+9.96943
" tan δ =	9.35873
+c.2846 =	+9.45428
+3.0707	
+3.3553 =	0.52573
57 =	1.75587
191.25 =	2.28160

Log. u =	1.30221
" cos α =	−9.55914
" 57 =	1.75587
−414.2 =	−2.61722

(* 1825.0)	7^h	23	23.26 ✓	+12	55	23.6 ✓
		+3	11.25 ✓		−6	54.2 ✓
(* 1882.0)	7^h	26	34.51 ✓	+12	48	29.4 ✓
		+0	2.75 ✓			−7.8
ap. Pl. *	7^h	26	37.26 ✓	+12	48	21.6 ✓
		+0	36.66 ✓		−2	57.2 ✓
ap. Pl. =	7^h	27	13.92 ✓	+12°	45	24.4 ✓

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1882phae.proj...498

Inledger. Comet Barnard Sept 18 1882

$f = +3.056'$ $\mathfrak{G} = 0^h\ 56.4'$ $\mathfrak{H} = 6^h\ 16.8'$

$\mathfrak{G} = 0^h\ 56.4'$ $\alpha = 7\ 26.6'$ $\alpha = 7\ 26.6'$

$\mathfrak{H} = 6^h\ 16.8'$ $\mathfrak{G}+\mathfrak{H} = 8\ 23.0'$ $\mathfrak{H}+\alpha = 13\ 43.4'$

$\log g = +1.3127'$

" $h = 1.2733'$

" $i = +0.9096'$ $\Delta N = +12°\ 48\ 29'$

$\log 1/\Delta = +8.8239'$

" $g = +1.3127'$

" $\sin(\mathfrak{G}+\alpha) = +9.9093'$

" $\tan\alpha = +9.3569'$

$+0.253' = +9.4026'$

" $1/\Delta = +8.8239'$

" $h = 1.2733'$

" $\sin(\mathfrak{H}+\alpha) = -9.6395'$

" $\sec\alpha = +0.0109'$

$-0.559' = -9.7476'$

$+0.253'$

$-0.306'$

$+3.056'$

$+2.750'$ = cor. in R.A.

$\log g = +1.3127'$

" $\cos(\mathfrak{G}+\alpha) = -9.7666'$

$-12.01' = -1.0793'$

$\log h = +1.2733'$

" $\cos(\mathfrak{H}+\alpha) = -9.9542'$

" $\sin\alpha = +9.3457'$

$-3.74' = -0.5732'$

$\log i = +0.9096'$

" $\cos\alpha = 9.9891'$

$+7.92' = +0.8987'$

$-3.74'$

$+4.18'$

-12.01

$-7.83'$ = cor. in Dec.

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1882phae.proj..498.

In ledger

Comet Pons-Brooks.

Oct 15, 1883

Comp. Star = Dm. +55° 1865 (Unlettered)
Compared with +55° 1462 = Bach. 16 K 3 V.

Oc. a. 16345 =	16	35	56.61	+55	59	49.5 (1842)
		+0	25.05		−2	27.2
Mid. Pl =	16	36	21.66	+55	57	22.3
	249	5	24.90			

log $\frac{u}{15}$ =	+0.12610
" sin α =	−9.97041
" tan α =	+0.17030
−1.8485 =	−0.26681
	+3.0708
−1.2223 =	0.08718
41 =	1.61278
50.11	1.69996

log. u =	1.30219
" cos α =	−9.55254
" 41 =	1.61278
−293.4 =	−2.46751

(* 1842,0) =	16	35	56.61	+55	59	49.5
		+0	50.11		−4	53.4
(* 1883,0) =	16	36	46.72	+55	54	56.1

(Red. Ledger Book II. p. 26.)

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1882phae.proj...498.

Comet Pons — Brooks. {Ap. Place. Reduction}

Oct 15. 1883.

In ledger.

$f = +2.935^{7}$
$G = 1^h\ 23.9\ 24.4$
$H = 4^h\ 22.8\ 18.6$
$\log g = +1.3128^{19}$
" $h = +1.2790^{5}$
" $i = +0.8761^{61}$

$G = 1^h\ 23.9\ 24.4$
$\alpha = 16\ 36.8$
$G+\alpha = 18^h\ +.2\ 0.7$

$H = 4^h\ 22.8\ 18.6$
$\alpha = 16\ 36.8$
$H+\alpha = 20\ 55.4\ 59.6$

$\alpha = +55°\ 54'\ 56''$

Log. $\frac{1}{15} = +8.8239$
" $g = +1.3128^{19}$
" $\sin(G+\alpha) = -10.0000$
" $\tan\alpha = +\ 8.1690\ 9.7485$
$-2.025 = -0.3048^{54}$
$-2.017 = -0.3048$

Log $\frac{1}{15} = +8.8239$
" $h = +1.2790^{5}$
" sin $H+\alpha = -9.9580^{03}$
" sec $\alpha = +0.2515^{1}$
$-1.637^{9} = -0.2199^{47}$
$-2.025^{0} \quad -0.2043 = -1.601$
-3.662^{9}
$+2.935$
$-0.727^{3} = $ cor. in R.A.
-0.724

$+2.935^{v} \quad -2.017^{v}$
-1.601
-3.618
$+2.935^{v}$
Cor. in $r = -0.683$

Log. $g = +1.3128^{19}$
" cos $G+\alpha = +7.7000^{4849}$
$+0.06 \quad +9.0128$
$+0.70 \quad 8.7968$

" $h = +1.2790^{5}$
" cos $(H+\alpha) = +9.8487$
" sin $\alpha = +9.9182$
$+11.11 \quad +1.0383^{459}$
$+11.11 = +1.0357^{v}$
" $i = +0.8761^{61}$
" cos $\alpha = 9.7483^{2}$
$+4.28^{21} \quad +0.6245^{46}$
$+0.70 \quad +4.2^{11} = +0.6250$
$+11.11$
$+15.20 = $ cor. in Dec.
$+15.88$

$+0.06$
$+11.11$
$+4.2^{v}$
$15^{v}.39$

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1882phae.proj..498.

Comet Pons – Brooks Rec B4. p148.

Oct 16, 1883.

Comp. Star = Dm. +55° 1876 (~~two letters illegible~~)
~~Compared with +55° 1~~

Dm. place. = 16h 42 39.6 +55° 34.1 A

Re. a. 1883.7 = 16h 42m 23.56s +55° 36 8.0 (1842)
+0 25.25 -2 17.1
Mid. Pl. = 16 42 48.81 +55° 33 50.9
250 42 12.15

Log. $\frac{u}{15}$ = 0.12610
" sin A = -9.97489
" tan A = +0.16390
-1.8403 = -0.26489
+3.0708
+1.23057 = 0.09009
41 = 1.61278
50.45 = 1.70287

Log. u = 1.30219
" cos A = 9.51912
" 41 = 1.61278
271.7 = 2.43409

(* 1842.0) = 16 42 23.56 +55 36 8.0
+0 50.45 -4 31.7
(* 1883.0) = 16 43 14.01 +55 31 36.3
ap. Pl. corr. = -0.66 +15.6
ap. Pl. * = 16 43 13.35 +55 31 51.9
-3 17.44 +6 39.5
ap. Pl. = 16 39 55.91 +55 38 31.4

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Comet Pons–Brooks

Oct 18, 1883

On ledger.

Comp. Stat = Dun. +55° 1873 (collected)
Compared with + 55° 1440 = Oa A. 16563

Oa.a.16563 =	16^h	45	17.34	+55	24	53.4	(1842)
		+0	25.36		−2	12.0	
Mid. Pl. =	16	45	42.70	+55	22	41.4	
	251	25	40.50				

Log. $\frac{u}{15}$ = 0.12610
" sin α = −9.97677
" tan α = 0.16088
−1.83355 = −0.26375
+3.07708
+1.23353 = 0.09177
41 = 1.61278
50.65 = 1.70455

Log. u = 1.30219
" cos α = −9.50311
" 41 = 1.61278
261.9 = −2.41808

(+ 1842.0) =	16^h	45	17.34	+55	24	53.4	
		0	50.65		−4	21.9	
(+ 1883.0) =	16	46	7.99	+55	20	31.5	

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Comet Pons–Brooks
Oct 18 1883

$f = +2.954'$ $\quad \odot = 1^h 25.2'$ $\quad \mathfrak{A} = 4\ 10.2'$

$\odot = 1^h 25.2'$ $\quad \alpha = 16\ 46.1'$ $\quad \alpha = 16\ 46.1'$

$\mathfrak{A} = 4^h 10.2'$ $\quad \odot + \alpha = 18\ 11.3'$ $\quad \mathfrak{A} + \alpha = 20\ 56.3'$

$\log g = +1.3156'$

" $h = +1.2806'$ $\quad \alpha' = +55\ 20\ 31.5'$

" $i = +0.8661'$

$\log \sin 15 = +8.8239'$

" $g = +1.3156'$

" $\sin \odot + \alpha = -9.9995'$

" $\tan \alpha = +0.1603'$

$-1.992' = -0.2993'$

$\log \sin 15 = +8.8239'$

" $h = +1.2806'$

" $\sin \mathfrak{A} + \alpha = -9.8564'$

" $\sec \alpha = +0.2451'$

$-1.607' = -0.2060'$

$-1.992'$

$-3.599'$

$+9.954'$

$-0.645' =$ cor. in R. A.

$\log g = +1.3156'$

" $\cos \odot + \alpha = +8.6926'$

$+1.02' = +0.0082'$

$\log h = +1.2806'$

" $\cos \mathfrak{A} + \alpha = +9.8424'$

" $\sin \alpha = +9.9152'$

$+10.92' = +1.0382'$

$\log i = +0.8661'$

" $\cos \alpha = +9.7549'$

$+4.18'$

$+1.02'$

$+10.92'$

$+16.12' =$ cor. in Dec.

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Comet Barnard 1884

Sept. 12 1884

Ledger

Stone C.C. 10448 = 19^h 8 34.42 $-30°$ 40′ 1.6″ (1880)

+0 7.66 +0 11.8

19^h 8 42.08 $-30°$ 40 13.4

39 49.8

287 10 31.20

$\log \frac{u}{15} = +0.12606$

" $\sin t = -9.98019$

" $\tan \delta = -9.77298$

$+0.7572 = +9.87923$

$+3.0712$

$3.8284 = 0.58302$

$4 = 0.60206$

$15.31 = 1.18508$

$\log u = 1.30215$

" $\cos t = +9.47026$

" $4 = +0.60206$

$+23.7 = +1.37447$

(* 1880.0) 19^h 8 34.42 $-30°$ 40 1.6

+0 15.31 +0 23.7

(* 1884.0) 19^h 8 49.73 $-30°$ 39 37.9

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1882phae.proj..498.

On ledger. Sept. 12, 1884

Comet Barnard (1884 b)

$f = +2.454'$ $G = 1^h 52.4'$ $H = 6^h 40.1'$

$g = 1^h 52.4'$ $\alpha = 19\ 8.8'$ $\alpha = 19\ 8.8'$

$h = 6^h 40.1'$ $G+\alpha = 21\ 1.2'$ $H+\alpha = 1\ 48.9'$

$\log. f = +1.2588'$

" $h = +1.2742'$ $\alpha = -30^\circ\ 39\ 38''$

" $i = +0.9049'$

$\log. 1/\Delta = +8.8239'$

" $f = +1.2588'$

" $\sin(G+\alpha) = -9.8472'$

" $\tan\alpha = -9.7729'$

$+0.504' = +9.7028'$

$\log. 1/\Delta = +8.8239'$

" $h = +1.2742'$

" $\sin(H+\alpha) = +9.6600'$

" $\sec.\alpha = +0.0654'$

$+0.666' = +9.8235'$

$+0.504'$

$+2.454'$

$+3.624$ ✓ = cor. in R.A.

$\log. f = +1.2588'$

" $\cos(G+\alpha) = +9.8518'$

$+12.90' = +1.1106'$

$\log. h = +1.2742'$

" $\cos(H+\alpha) = +9.9490'$

" $\sin\alpha = -9.7075'$

$-8.53' = -0.9307'$

$\log. i = +0.9049'$

" $\cos\alpha = +9.9346'$

$+6.91' = +0.8395'$

$+12.90'$

$+19.81'$

$-8.53'$

$+11.28$ ✓ = cor. in Dec.

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1882phae.proj..498.

Comet Barnard, 1884 b

Sept. 13, 1884

Imledge

Comp. Star = B.A.C. 6609 (7)

Star C.C. 487	19^h	14	3.04	−29	49	40.6 (1880)
	+0		7.60	+0		12.7
Mid. Pl. =	19^h	14	10.64	−29	49	27.9
	288	32	39.60			

Log. $\frac{u}{15}$ = 0.12606
" sin t = −9.97684
" tan L = −9.75836
+0.7265 = +9.86126
+3.0712
+3.7977 = 0.57952
4 = 0.60206
+15.19 = +1.18158

Log. u = +1.30215
" cos t = +9.50245
" 4 = +0.60206
+25.5 = +1.40666

(* 1880.0) =	19^h	14	3.04 ✓	−29	49	40.6 ✓
	+0		15.19 ✓	+0		25.5 ✓
(* 1884.0) =	19	14	18.23 ✓	−29	49	15.1 ✓

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1882phae.proj..498.

In Ledger. Sept 13, 1884
= Barnard 1884.0 =

$\mathcal{A}$ = +2.465″ $\mathcal{L}$ = 1h 51.8″ H = 6 35.9″
$\mathcal{G}$ = 1 51.8″ ☌ = 19 14.3″ ☌ = 19 14.3″
H = 6 35.9″ $\mathcal{L}$++ = 21 6.1″ H++ = 25 50.2″
Log. g = +1.2603″ 24″
" h = +1.2740″ 1 50.2″
" i = +0.9061″ $\mathcal{N}$ = -29 49 15″

Log. 1/15 = +8.8239″
" g = +1.2603″
" sin $\mathcal{L}$++ = -9.8376″
" tan $\mathcal{N}$ = -9.7583″
+0.479″ = +9.6801″

Log. 1/15 = +8.8239″
" h = +1.2740″
" sin (H++) = +9.6651″
" sec. $\mathcal{N}$ = +0.0617″
+0.668″ = +9.8247″
+0.479″
+2.465″
+3.612″ ✓ = cor. in R.A.

Log. g = +1.2603″
" cos $\mathcal{L}$++ = +9.8608″
+13.21″ = +1.1211″

Log. h = +1.2740″
" cos H++ = +9.9477″
" sin $\mathcal{N}$ = -9.6966″
-8.29″ = -0.9183″

" i = +0.9061″
" cos $\mathcal{N}$ = +9.9383″
+6.99″ = +0.8444″
+13.21″
+20.20 ✓
-8.29 ✓
+11.91 ✓ = cor. in Dec.

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1882phae.proj..498.

Comet Wolff

Sept 26, 1884

In lodger

Comp. Stat = Dhm +19° 4697 (9.5)

B.B. VI +19° 4697 = 21h 17 28.43 +19° 21' 20.1" (1855)

+ 0 40.08 +3 40.2

Mid. Pl. = 21 18 8.51 +19° 25 0.3

319 32 7.65

Log. $\frac{u}{15}$ = +0.12608

" sin α = -9.81223

" tan δ = +9.54714

-0.3058 = -9.48545

+3.0710

+2.7652 = 0.44173

29 = 1.46240

+80.19 = 1.90413

Log u = 1.30218

" cos α = +9.88128

" 29 = 1.46240

442.4 = +2.64586

(* 1855.0) 21h 17 28.43 ✓ +19° 21 20.1 ✓

+1 20.19 ✓ +7 22.4 ✓

(* 1884.0) 21h 18 48.62 ✓ +19 28 42.5 ✓

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Comet Wolff

Dunlodge, Nov. 6, 1884

D Comp. Star = Dm. +0° 4876

W_1 $22^h\ 43^m$ = $22^h\ 18\ 53.92$ $+0°\ 46\ 4.0$ (1825)

+1 30.33 +8 55.1

Mid. Pl. = 22 20 24.25 +0° 54 59.1

335 6 3.75

Log. $\frac{m}{15}$ = +0.12612

" sin t = −9.62430

" tan t = +8.20401

−0.0090 = −7.95443

+3.0707

+3.0617' = 0.48596

59 = 1.77085

180.65 = 2.25681

Log m = 1.80221

" cos t = +9.95763

" 59 = +1.77085

1073.2 = +3.03069

(* 1825.0) $22^h\ 18\ 53.92$ ✓

+3 0.65 ✓

(* 1884.0) 22 21 54.57 ✓

+0 2.79 ✓

Ap. Pl. * = 22 21 57.36 ✓

α − * = +2.32 ✓

M. pl. α = 22 21 59.68 ✓

+0 46 4.0 ✓

+0° 54 59.1 ✓

+17 53.2 ✓

+1° 12 52.3 ✓

+0 24.2 ✓

+1° 13 16.5 ✓

+0 46 4.0 ✓

+17 53.2 ✓

+1 3 57.2 ✓

+24.2 ✓

+1 4 21.4 Ap. pl. * ✓

+3 3.7 ✓

+1 7 25.1 ✓

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1882phae.proj...498:

Comet Wolff

Nov 6, 1884

In ledger.

Wrong - for correct reduction see B 11 p 44-

$f = +2.387$ $\quad$ $g = 2^h\ 2.7$ $\quad$ $h = 2\ 50.1$

$g = 2^h\ 2.7$ $\quad$ $\alpha = 22\ 21.9$ $\quad$ $\alpha = 22\ 21.9$

$h = 2^h\ 50.1$ $\quad$ $g+\alpha = 24\ 24.6$ $\quad$ $h+\alpha = 1\ 12.0$

$\log g = 1.2581$

$\log h = 1.2927$

$\log i = +0.7602$ $\quad$ $\alpha'' = +1^\circ\ 12\ 52$

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

$\log g = 1.2581$

$\log \sin(g+\alpha) = +9.0298$

$\log \tan \alpha = +8.3263$

$+0.008 = +7.4381$

$\log g = 1.2581$

$\log \cos(g+\alpha) = +9.9975$

$+18.02 = +1.2556$

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

$\log h = 1.2927$

$\log \sin(h+\alpha) = +9.4900$

$\log \sec \alpha = 0.0001$

$+0.404 = 9.6067$

$+2.387$

$+0.003$ ✓

$+2.794$ = cor. in R.A.

$\log h = 1.2927$

$\log \cos(h+\alpha) = +9.9782$

$\log \sin \alpha'' = 8.3262$

$+0.40 = 9.5971$

$\log i = +0.7602$

$\log \cos \alpha = 9.9999$

$+5.76 = 0.7601$

$+0.40$

$+18.02$ ✓

$+24.18$ = cor in Dec.

Wrong year of almanac used. see B 11, p 44 for more correct reduction.

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1882phae.proj..498.

Comet Barnard 1885 a

In ledger

July 15, 1885

W_I $17^h\ 73$ = 17^h 3 43.31 ✓ -9 27 30.6 ✓ (1825)

+1 38.58 − 2 26.4

Mid. Pl. = 17 5 21.89 $-9°$ 29 57.0

256° 20 28.85

Log $\frac{u}{15}$ = 0.12611 Log m = 1.30221

" sin ϕ = −9.98754 " cos ϕ = −9.37317

" tan ϕ = −9.22357 " 60 = 1.77815

+0.2174 = +9.33722 −284.1 = −2.45353

3.0707

+3.28817 = 0.51694

60 = 1.77815

+197.28 = 2.29509

(* 1825.0) 17^h 3 43.31 ✓ −9 27 30.6 ✓

+3 17.28 ✓ − 4 44.1 ✓

(* 1885.0) 17^h 7 0.59 ✓ $-9°$ 32 14.7 ✓

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1882phae.proj...498.

In ledger.

July 15 1885

= Barnard 1885a

$f = +1.702"$
$\mathfrak{L} = 2\ 43.4"$
$H = 10\ 31.9"$
$\log q = +1.1669"$
" $h = +1.3049"$
" $i = +0.5161"$

$\mathfrak{L} = 2^h\ 43.4"$
$L = 17\ 7.1"$
$19\ 50.5"$

$H = 10\ 31.9"$
$L = 17\ 7.1"$
$27\ 39.0"$
24
$3\ 39.0"$

$\lambda = -9°\ 32\ 15"$

$\log \sin 15° = +8.8239"$
" $q = +1.1669"$
" $\sin (\mathfrak{L}+L) = -9.9474"$
" $\tan \lambda = -9.2261"$
$-0.146" = -9.1643"$

$\log \sin 15 = +8.8239"$
" $h = +1.3049"$
" $\sin (H+L) = +9.9120"$
" $\sec \lambda = +0.0061"$
$+1.114" = +0.0469"$
$+1.702"$
$+2.816"$
-0.146
$+2.670$ = cor. in R.a.

$\log q = +1.1669"$
" $\cos (\mathfrak{L}+H) = +9.6662"$
$+6.81" = +0.8331"$

$\log h = +1.3049"$
" $\cos (H+L) = +9.7613"$
" $\sin \lambda = -9.2193"$
$-1.93" = -0.2855"$

" $i = +0.5161"$
" $\cos \lambda = +9.9939"$
$+3.24" = +0.5100"$
$+6.81"$
$+10.05"$
$-1.93"$
$+8.12$ = cor. in Dec.

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Comet Barnard, 1885 a.

July 15, 1885

In ledger

W. I	17h 38 =	17h	1	59.62	−10°	24′	44.9″ (1825)
			+1	39.24		−2	30.6
Mid. Pl. =		17	3	38.86	−10	27	15.5
		255	54	42.90			

Log. $\frac{u}{15}$	= +0.12611	Log. u	= +1.30221
" sin t	= −9.98674	" cos δ	= −9.38634
" tan δ	= −9.26604	" 60	= +1.77815
+0.2393	= +9.37889	−292.9	= −2.46670
+3.0707			
+3.3100	0.51989		
60 =	1.77815		
+198.60	= 2.29798		

(* 1825.0) =	17h	1	59.62 ✓	−10°	24	44.9 ✓
		+3	18.60 ✓		−4	52.9 ✓
(* 1885.0) =	17	5	18.22 ✓	−10°	29	37.8 ✓

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Comet Barnard (1885 a)

Ledger,

Aug. 6, 1885.

A. Or. 15881-2 = $16^h\ 34\ 46.20^{\nu}\ \downarrow$ $-20^\circ\ 24\ 22.8$ 8.9 ($18^{50}_{\ 2}$)

$1\ \ 1.88$ $\quad -2\ \ 7.2$

Mid. Pl. = $16^h\ 35\ 48.08$ $\quad -20\ 26\ 30.0$

248 57 120

Log. $\frac{u}{15}$ = 0.12609
" sin α = -9.97001
" tan δ = -9.57139
+0.4650 = +9.66749
+3.0710
+3.5360[7] = 0.54851
35 = 1.54407
+123.76 = 2.09258

Log. u = 1.30218
" cos α = -9.55531
" 35 = 1.54407
-252.1 = -2.40156

(1850.0) $16^h\ 34\ 46.20^{\nu}\ \checkmark$ $-20^\circ\ 24\ 22.8\ \checkmark$

$+2\ \ 3.76\ \checkmark$ $\quad -4\ \ 12.1\ \checkmark$

(1885.0) $16^h\ 36\ 49.96\ \checkmark$ $-20^\circ\ 28\ 34.9\ \checkmark$

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1882phae.proj...498.

In ledger. Aug 6 1885

= Barnard 1885a

$f = +1.872'$ $\quad \mathfrak{G} = 2^h 30.2'$ $\quad H = 9^h 10.6'$

$\mathfrak{G} = 2^h 30.2'$ $\quad \lambda = 16\ 36.8'$ $\quad \lambda = 16\ 36.8'$

$H = 9\ 10.6'$ $\quad \mathfrak{G}H = 19\ -7.0'$ $\quad 25\ 47.4'$

$\log g = +1.1878'$ $\quad 24'$

$\log h = +1.2928'$ $\quad HH = 1\ 47.4'$

$\log i = +0.7586'$ $\quad \lambda = -20^\circ 28\ 35''$

$\log 1/15 = +8.8239'$

$\log g = +1.1878'$

$\log \sin \mathfrak{G}H = -9.9812'$

$\log \tan \lambda = -9.5722'$

$+0.367' = +9.5651'$

$\log g = +1.1878'$

$\log \cos \mathfrak{G}H = +9.4597'$

$+17.68' = +1.2475'$

$\log 1/15 = +8.8239'$

$\log \sin HH = +9.6548'$

$\log h = +1.2928'$

$\log \sec \lambda = +0.0284'$

$+0.631' = +9.7999'$

$+0.367'$

$+1.872'$

$+2.870'$ = cor. in R.A.

$\log h = +1.2928'$

$\log \cos HH = +9.9504'$

$\log \tan \lambda = -9.5438'$

$-6.12' = -0.7870'$

$\log i = +0.7586'$

$\log \tan \lambda = 9.9716'$

$+5.37' = +0.7302'$

$+17.68'$

$+23.05'$

$-6.12'$

$+16.93'$ = cor. in Dec.

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Comet Brooks, 1885 ff

Ineldgen, 1886, Jan. 5

Comp. * = Dm. +8° 4472 (7.5)

W, $20^h 74^m$ = 20^h 28 11.37 +7 59 38.8 (1825)
+1 29.06 +6 8.4
Mid. Pl. = 20^h 29 40.43 +8° 5 47.2
307° 25 6.45

Log. $\frac{m}{15}$ = +0.12611
Log. sin α = -9.89989
" tan δ = +9.15307
-0.1510 = -9.17907

Log. m = +1.30221
" cos δ = +9.78364
" 61 = +1.78533
+743.3 = +2.87118

+3.0707 #
+2.9197 = 0.46533
61 = 1.78533
178.10 = 2.25066

(* 1825.0) = 20^h 28 11.37 +7 59 38.8 ✓
+2 58.10 +12 23.3 ✓
(* 1886.0) = 20^h 31 9.47 +8° 12 2.1

See also Book K, p. 25.

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Comet Brooks 1885 I

Jan. 1, 1886.

{ ap. Place Reduction

$f_1 = -0.150''$
$\log g = 6\ 22.9''$
$\mathcal{H} = 23\ 16.6''$
$\log g = +0.9904''$
$\log h = +1.3092''$
$\log i = -0.2208''$

$\mathcal{L} = 6^h\ 22.9''$
$+ \quad 20\ 12.2''$
$2\ 35.1''$

$\mathcal{H} = 23\ 16.6''$
$+ \quad 20\ 12.2''$
$19\ 28.8''$

$\mathcal{L} = +6\ 12\ 4''$

$\log \sqrt{15} = +8.8239''$
$\log g = +0.9904''$
$\log \sin \mathcal{G}+\mathcal{L} = +9.1796''$
$\log \tan \mathcal{L} = +9.0360''$
$+0.044'' = +8.6470''$

$\log \sqrt{15} = +8.8239''$
$\log h = +1.3092''$
$\log \sin \mathcal{H}+\mathcal{L} = -9.9666''$
$\log \sec \mathcal{L} = +0.0026''$
$-1.266'' = -0.1023''$
$-0.150''$
$-1.416''$
$+0.044''$
$-1.372'' =$ corr R.a.

$\log g = +0.9904''$
$\log \cos \mathcal{G}+\mathcal{L} = +9.8918''$
$+7.62'' = +0.8822''$

$\log h = +1.3092''$
$\log \cos \mathcal{H}+\mathcal{L} = +9.5772''$
$\log \sin \mathcal{L} = +9.0335''$
$+8.32'' = +9.9199''$

$\log i = -0.2208''$
$\log \cos \mathcal{L} = +9.9974''$
$-1.65'' = -0.2182''$
$+845''$
$+6.80'' =$ corr Dec

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1882phae.proj..498.

Comet Brooks 1885 c

Sept. 3 1885

In ledger.

Comp. Stat = Dm. +37° 2464 (8.8) K

W_2	$13^h 10^m 61$	=	13^h	46	44.96	+ 37° 31 19.3	1825
				+1	18.30	− 8 57.9	
Mid. Pl.		=	13	48	3.26	+ 37 22 21.4	
			207	0	48.90		

Log. $\frac{u}{15}$ = +0.12611
" sin α = −9.65725
" tan δ = +9.88298
−0.4638 = −9.66634

+3.0707
+2.6069 = +0.41612

60 = 1.77815
156.41 = 2.19427

Log. u = 1.30221
" cos α = −9.94983
" 60 = 1.77815
−1072.0 = −3.03019

(* 1825.0)	13^h 46	44.96 ✓	+37° 31 19.3 ✓
	+2	36.41 ✓	− 17 52.0 ✓
(* 1885.0)	13 49	21.37 ✓	+37 13 27.3 ✓

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1882phae.proj..498.

Sept 3, 1885

Comet Brooks 1885 c.

Am Ledger

Comp. Star = DM. +37° 2465 (9.4)

B.B VII 37° 2465 = 13h 48 9.47 +37° 21 14.2 (9.4) (1855

+ 0 39.12 − 4 28.0

Mid. Pl. = 13h 48 48.59 +37° 16 46.2

207° 12′ 8.″5

Log $\frac{n}{15}$ = 0.12608

" sin α = −9.66005

" tan δ = +9.88152

− 0.4652 = −9.66765

+3.0710

+26058 = 0.41594

30 = 1.47712

78.17 = 1.89306

Log. n = 1.30218

" cos α = −9.94910

" 30 = 1.47712

− 535.1 = −2.72840

(✳ 1855.0) = 13h 48 9.47 +37° 21 14.2

+1 18.17 − 8 55.1

(✳ 1885.0) = 13 49 27.64 +37° 12 19.1

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Comet Brooks, 1885 c

Sept. 6, 1885

Lubelsga

Comp. Star = Dm. +38° 2513

B.B. VII +38° 2513 = 14 0 3.65 +38 37 31.3 (9.5) 1855

+0 38.12 -4 20.6

Mid. Pl. = 14 0 41.77 +38° 33 10.7

210° 10 26.55

Log. $\frac{u}{15}$ = 0.12608

Log. sin α = -9.70125

" tan L = +9.90143

-0.5355 = -9.72876

+3.0710

+2.5355 = +0.40577

30 = 1.47712

+763.6 = 1.88289

Log. u = 1.30218

" cos α = -9.93677

" 30 = 1.47712

-520.1 = -2.71607

(* 1855) = 14 0 3.65 +38° 37 31.3

+1 16.36 -8 40.1

(* 1885.0) = 14 1 20.01 +38° 28 51.2

+0 0.20 +0 8.1

ap. Pl. * = 14 1 20.21 +38° 28 59.3

+3 14.64 -0 31.7

Ap. pl. ε = 14 4 34.85 +38 28 27.6

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In Ledger,

Comet Brooks (1885 c)

Sept. 6 1885

$f = +2.075^{7}$ $\quad g = 2\ 12.0^{7}$ $\quad H = 7\ 6.3^{7}$

$G = 2^{2}\ 12.0^{7}$ $\quad \alpha = 14\ 1.3^{7}$ $\quad \alpha = 14\ 1.3^{7}$

$H = 7\ 6.3^{7}$ $\quad G+\alpha = 16\ 13.3^{7}$ $\quad H+\alpha = 21\ 7.6^{7}$

$\log g = +1.2081^{7}$

" $h = +1.2759^{7}$

" $i = +0.8949^{7}$ $\quad \Delta = +38°\ 28'\ 51''$

$\log 1/5 = +8.8239^{7}$

" $g = +1.2081^{7}$

" $\sin(G+\alpha) = -9.9511^{7}$

" $\tan \alpha = 9.9003^{7}$

$-0.7864^{7} = -9.8847^{7}$

$\log g = +1.2081^{7}$

" $\cos(G+\alpha) = 9.6521^{7}$

$-6.61^{7} = -0.8203$

0.8602^{7}

$\log 1/5 = +8.8239^{7}$

" $h = +1.2759^{7}$

" $\sin(H+\alpha) = -9.8346^{7}$

" $\sec \alpha = 0.1064^{7}$

$-1.099 = -0.0408^{7}$

-0.764^{7}

-1.863^{7}

$+2.075^{7}$

$+0.195^{7}$ ✓ = cor in R. A.

0.212^{7}

$\log h = +1.2759^{7}$

" $\cos(H+\alpha) = +9.8635^{7}$

" $\sin \alpha = +9.7940^{7}$

$+8.58^{7} = +0.9334^{7}$

$\log i = +0.8949^{7}$

" $\cos \alpha = +9.8936^{7}$

$+6.14^{7} = +0.7885^{7}$

-7.35^{7}

-6.61

1.11

-0.47^{7}

$+8.58^{7}$

$+8.11^{7}$ = cor. in Dec.

$+7.47^{7}$

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Comet Brooks. 1885 d

Sept. 6, 1885

Dunlap.

Comp. Star = +38° 2520

W_2 14h 77-8	=	14h	3	8.64s	+38°	49	42.8" (1825)
		+1		15.60		-8	37.2
Mid. Pl. =		14	4	24.24	+38°	41	5.6
		211	6	3.60			

Log. $\frac{w}{15}$ = 0.12611

" sin α = -9.71311

" tan α = +9.90348

-0.5530' = -9.74270

+3.0707

+25177" = 0.4039101

60 = 1.77815

+151.06 = 2.16916

Log w = 1.30221

" cos α = -9.93261

" 60 = 1.77815

-1030.3 = -3.01297

(* 1825.0) = 14h 3 8.64 ✓

+2 31.06 ✓

(* 1885.0) = 14 5 39.70 ✓

+38° 49 42.8 ✓

-17 10.3 ✓

+38° 32 32.5 ✓

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Comet Brooks 1885 c

Sept. 1, 1885

In ledger.

Comp. Stat = Dm. +39° 2738 (9.1)

W₂ 14ʰ 1ᵐ 17ˢ =	14	7	12.03	+39	14	59.0 (1825)
		+1	14.82		−8	31.5
Mid. Pl. =	14	8	26.85	+39	6	27.5
	212	6	42.75			

Log. $\frac{u}{15}$ = +0.12611
" sin α = −9.72556
" tan δ = +9.91004
−0.5777 −9.76171
+3.0707
+2.4930 = 0.39672

Log. u = 1.30221
" cos. δ = −9.92789
" 60 = 1.77815
−1019.2 = −3.00825

60 = 1.77815
149.58 = 2.17487

(α 1825.0)	14	7	12.03 ✓	+39	14	59.0 ✓
		+2	29.58 ✓		−16	59.2 ✓
(α 1885.0) =	14	9	41.61 ✓	+38°	57	59.8 ✓
		+0	0.20 ✓		+0	8.2 ✓
ap. Pl. α =	14	9	41.81 ✓	+38°	58	8.0 ✓

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Dr Cedgen.

Comet Brooks (1885 c)

Sept 7, 1885

$\mathfrak{A} = +2.078'$ $\mathfrak{G} = 2\ 11.3'$ $\mathfrak{H} = 7\ 2.1'$

$\mathfrak{G} = 2\ 11.3'$ $\alpha = 14\ 9.7'$ $\alpha = 14\ 9.7'$

$\mathfrak{H} = 7\ 2.1'$ $\mathfrak{G}+\alpha = 16\ 21.0'$ $\mathfrak{H}+\alpha = 21\ 11.8'$

Log ϱ = 1.2080'

" h = 1.2756'

" i = 0.8969' δ = +38 58 0'

Log 1/15 = +8.8239'

" ϱ = +1.2080'

" sin $\mathfrak{G}+\alpha$ = -9.9582'

" tan α = +9.9078'

-0.790' = -9.8979'

Log 1/15 = +8.8239'

" h = +1.2756'

" cos $(\mathfrak{H}+\alpha)$ = -9.8259'

" sec. α +0.1093'

-1.083' = -0.0347'

-0.790'

-1.873'

+2.078'

+0.205' = cor. in R.A.

Log. ϱ = +1.2080'

" cos $\mathfrak{G}+\alpha$ = -9.6219'

-6.76' = -0.8299'

Log h = +1.2756'

" cos $\mathfrak{H}+\alpha$ = +9.8708'

" sin α = +9.7986'

+8.81' = +0.9450'

" i = +0.8969'

" cos α = +9.8907'

+6.13' = +0.7876'

+8.81'

+14.94'

-6.76'

+8.18' = cor. in Dec.

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Comet Fabry

Dec. 2, 1885

Ledger.

Comp. Star = DM. +20° 87 - (5.5)

W½	$0^h 8^m 38^s$	=	0^h	30	43.65 ✓	+20	28 37.7 ✓ (1825)
				+1	34.11		+9 56.4
Mid. Pl. =			0^h	32	17.76	+20	38 34.1
			8°	4	26.40		

Log. $\frac{u}{15}$	= +0.12611	Log u	= 1.30221
" sin α	= +9.14753	" cos α	= 9.99567
" tan α	= +9.57603	" 60	= 1.77815
+0.0707	= +8.84967	1191.3	= 3.07603
3.0707	=		
+3.1414	= 0.49713		
	1.77815		
188.49	= 2.27528		

(* 1825.0) =	0^h	30	43.65 ✓		+20	28	37.7 ✓
		+3	8.49 ✓			+19	51.3 ✓
(* 1885.0) =	0^h	33	52.14 ✓		+20°	48	29.0 ✓

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Comet Fabry

Dec. 2, 1885

Ledger.

Comp. Star = Dm. +21° 88 (8.7)

W_2 0^h 29-30 — 0^h 33 43.30 ↓ +20 50 ~~50.2~~ 0 2.8 ↓ mean

+1 34.35 +9 55.5

Mid. Pl = 0^h 35 17.65 +20 59 58.3

8° 49 24.75

Log. $\frac{u}{15}$ = +0.12611 Log. u = 1.30221

" sin α = +9.18581 " cos α = 9.99483

" tan α = +9.58417 " 60 = 1.77851

+0.0787 = +8.89609 1190.0 = 3.07555

3.0707

+3.1494' = 0.49823

60 = 1.77851

189.12 = 2.27674

(* 1825.0) 0^h 33 43.30 ✓' +20° 50 2.8 ✓'

' -+3 9.12 ✓ ' +19 50.0 ✓

(* 1885.0) = 0^h 36 52.42 ✓ +21° 9 52.8 ✓

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Comet Fabry

Dec. 3, 1885

Ledger.

Comp. Star = Dm. +20° 87

This comp. star is the same as was used on Dec. 2.

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Comet Fabry

Dec. 3, 1885

Ln ledger

Comp. Place = D.M. +20° 84

W_2 $0^h 8^m 8^s.9 - 9^s.10$ = 0^h 29 34.68 ✓ +20 46 53.1 ✓ (1825)

+ 1 34.08 + 9 56.7

Mid. Pl. = 0^h 31 8.76 +20 56 49.8

7° 47 11.40

Log. $\frac{u}{15}$ = +0.12611

" sin α = +9.13188

" tan δ = +9.58298

+0.0693 = +8.84097

+3.0707

+3.14000 = 0.49693

60 = 1.77851

188.56 = 2.27544

Log. u = 1.30221

" cos α = 9.99598

" 60 = 1.77851

1193.2 = +3.07670

(* 1825.0) 0^h 29 34.68 ✓ +20° 46 53.1 ✓

-+3 8.56 ✓ + 19 53.2 ✓

(* 1885.0) 0^h 32 43.24 ✓ +21° 6 46.3 ✓

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Comet Fabry.

Dec. 11, 1885

An Ledger.

Comp. Star = Dm. +20° 39.

B.B VII +20° 39 — $\frac{1}{2}$ 0h = = 0h 18 22.22 +20 38 57.5 (1855)

+0 46.68 +4 59.8

Mid. Pl. = 0h 19 8.90 +20 43 57.3

0 19 14.90

4° 47 13.50

Log. $\frac{u}{15}$ = +0.12608

" sin α = +8.92145

" tan δ = +9.57808

+0.0422 = +8.62561

+0.0424 = +8.62747

3.0710

+3.1132 = 0.49321

+3.1134 = 0.49324

30 = 1.47712

93.40 = +1.97033

+93.50 = 1.97036

Log. u = 1.30218

" cos α = 9.99848

" 30 = 1.47712

+599.5 = +2.77778

(* 1855.0) = 0h 18 22.22 +20 38 57.5

+1 33.40 +9 59.5

(* 1885.0) = 0h 20 55.62 +20° 48 57.0

+0 3.35 +0 25.2

0h 20 59.97 +20 49 22.2

$\Theta \equiv -\alpha$ −3 33.99 −2 22.2

App. Pl. Θ = 0 16 25.98 +20 47 0.0

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1882phae.proj..498.

Comet Faboy

(Swledge.) Dec. 11, 1885

$f = +2.723'$ $\mathfrak{G} = 1\ 54.5'$ $\mathcal{H} = 0^h\ 35.3'$

$\mathfrak{G} = 1^h\ 54.5'$ $\lambda = 0\ 19.9'$ $\lambda = 0\ 19.9'$

$\mathcal{H} = 0^h\ 35.3'$ $\mathfrak{G}+\lambda = 2^h\ 14.4'$ $\mathcal{H}+\lambda = 0^h\ 55.2'$

$\log g = +1.3064'$

" $h = +1.3096'$

" $i = +0.1325'$ $\lambda = +20°\ 48\ 57.0'$

$\log 1/\Delta = +8.8239'$

" $g = +1.3064'$

" $\sin \mathfrak{G}+\lambda = +9.7430'$

" $\tan \lambda = 9.5800'$

$+0.284' = +9.4533'$

" $1/\Delta = +8.8239'$

" $h = +1.3096'$

" $\sin \mathcal{H}+\lambda = +9.3975'$

" $\sec \lambda = +0.0293'$

$+0.347' = +9.5403'$

$+0.284'$

$+2.723'$

$+3.354'$ ✓ cor in R.A.

$\log g = +1.3064'$

" $\cos \mathfrak{G}+\lambda = +9.9206'$

$+16.87' = +1.2270'$

$\log h = +1.3096'$

" $\mathcal{H}+\lambda = +9.9873'$

" $\sin \lambda = +9.5507'$

$+7.04' = +0.8476'$

" $i = +0.1325'$

" $\cos \lambda = +9.9707'$

$+1.27' = +0.1032'$

$+7.04'$

$+16.87'$

$+25.18'$ ✓ cor. in Dec.

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Comet Fabry

Dec. 12, 1885

Ln Ledger.

Compr. Star = Dm. +20° 19.

B.B.VI +20° 19 = 0h 10 0.11 +20 36 53.3 (1855)

+0 46.42 +5 0.6

Mid. Pl. 0h 10 46.53 +20° 41 53.9

2° 41' 37.''95

Log. $\frac{n}{15}$ = 0.12608

" sin α = 8.67205

" tan δ = 9.57730

+0.0237 = +8.37543

3.0710

+3.0947 = 0.49062

30 = 1.47712

92.84 = 1.96774

Log. n = 1.30218

" cos α = 9.99952

" 30 = 1.47712

600.9 = +2.77882

(1855.0) = 0h 10 0.11 +20° 36 53.3

+1 32.84 +10 0.9

(1885.0) = 0h 11 32.95 +20° 46 54.2

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Comet Brooks 1886 a.

May 1, 1886.

Lulledger

Comps. Stat. = γ Cassiopeiae.

(*1886.0) =	0	49	49.97 ✓	+60	5	56.7 ✓ (From chron. Ephe.)
app. pl. cor. =			−0.46 ✓			−9.7 ✓
" " * =	0h	49	49.51 ✓	+60°	5	47.0 ✓

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Comet Brooks 1886

May 6 1886

Lulledger.

Comp. Star = Dm. +35° 5047 (8.2 B)

B.B. VI +35 5047 = 23 25 15.67 +35 12 38.8 (1855)

+0 45.40 +5 7.1

Mid. Pl. = 23 26 1.07 +35° 17 45.9

Log. $\frac{u}{15}$ = 0.12608

" sin ϕ = -9.16948

" tan L = +9.85000

-0.1398 = -9.14556

+3.0710

+2.9312 = 0.46705

31 = 1.49136

90.87 = 1.95841

Log. u = 1.30217

" cos ϕ = +9.99520

" 31 = 1.49136

614.8 = 2.78873

(* 1855.0) 23h 25 15.67 +35° 12′ 38.8″

+1 30.87 +10 14.8

(* 1886.0) 23 26 46.54 +35° 22 53.6

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Comet Brooks (1886 I)

May 21, 1886

Ludlodge.

Comp. Stat = Dm. +24° 4725 (9.3)

B.B.VI +24 4725 = 23 4 11.32 ✓ +24 32 29.5 ✓ (1855)

+0 45.32 +5 1.5

Mid. Pl. = 23 4 56.64 +24° 37 31.0

346° 14 9.60

Log. $\frac{u}{15}$ = 0.12608

" sin. α = -9.37660

" tan δ = +9.66122

-0.1458 = -9.16390

+3.0710

+2.92522 = 0.46616

31 = 1.49136

+90.68 = 1.95752

Log. u = 1.30217

" cos. α = +9.98734

" 31 = 1.49136

+603.8 = +2.78087

(* 1855.0) 23h 4 11.32 ✓ +24 32 29.5 ✓

1 30.68 ✓ +10 3.8 ✓

(* 1886.0) 23h 5 42.00 ✓ +24 42 33.3 ✓

Ap. pl. +0.09 ✓ -6.3 ✓

23 ✓ 42.09 ✓ +24 42 27.0 ✓

δ = -* = +2 ✓ 2.67 -3 ✓ 3.1 ✓

Ap. pl. δ = 23 ✓ 39.76 ✓ +24 39 33.9 ✓

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Mar. 4, 1883

Comet Brooks–Swift

In ledger.

B.B VII +32° 79 = 0^h 23 41.21 +32 1 37.3 (1855)

+0 44.23 +4 39.2

0^h 24 25.44 +32 6 16.5

6° 6′ 21.6″

Log. $\frac{u}{15}$ = ~~3.0710~~ 0.12609

" sin δ = 9.02680

" tan δ = 9.79755

+0.0892 = +8.95064

3.0710

3.1602 = 0.49972

28 = 1.44716

88.45 = 1.94688

Log. u = 1.36218

" cos δ = 9.99753

" 28 = 1.44716

558.3 = 2.74687

(*1855.0) = 0^h 23 41.21 +32 1 37.3

+1 28.45 +9 18.3

*1883.0 = 0^h −25 9.66 +32° 10 55.6

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Aph. 25 1883

Comet Brook Swift

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Jan. 12 1883

Comet Cals

Lehlodge.

Ap.a.(-15-31)5778-19-20 = 6 42 35.18 ✓ -27° 12 57.8 ✓ (1850)

+0 39.55 - 0 56.7

Mid. Pl. = 6 43 14.73 -27° 13 54.5

100° 48' 40.95"

Log. $\frac{u}{15}$ = +0.12609

" sin ϕ = +9.99222

" tan L = -9.71150

-0.6758 = -9.82981

+3.0709

+2.3951 = 0.37933

33 = 1.51851

79.04 = 1.89784

Log. u = 1.30218

" cos ϕ = -9.27318

" 33 = 1.51851

-124.1 = -2.09387

(* 1850.0) = 6h 42 35.18s -27 12 57.8"

+1 19.04 -2 4.1

(* 1883.0) = 6h 43 54.22 -27° 15 1.9

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Comet Calls

Jan 12, 1883

A =
G =
H =
Log g =
" h =
" i =

Log 1/15 =
" g =
" sin (G+H) =
" tan α =

Log 1/15 =
" h =
" cos (H+α) =
" sec. α =

Log g =
" cos (G+H) =

Log h =
" cos (H+α) =
" sin α =

Log. i =
" cos α =

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Apl. 2 1883.

Comet Cubs.

In ledger.

W. $5^h 14^m 63$ = 5^h 55 · 44.01 -9° 36 ′ 29.2 ″ (1825.0)

+1 22.48 +0 10.~~12~~

Mid. Pl = 5^h 57 6.49 -9° 36 18.~~8~~ 5

89° 16 37.35

Log. $\frac{m}{15}$ = +0.12612

" sin α = +9.99997

" tan δ = -9.22847

-0.2262 = -9.35456

+3.0707

+28445′ = 0.45401

58 = 1.76343

+164.99 = 2.21744

Log. m = 1.30221′

" cos δ = 8.10~~647~~ 097.

" 58 = 1.76343

+14.7′ = +1.16661

(* 1825.0) 5^h 55 44.01″ -9° 36 29.2″

+2 44.99 +0 14.7

*1883.0 5^h 58 29.00 -9° 36 14.5

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Apr. 2 1883

Comet Circle

{Red. to A.P. Place}

$f = +1.495'$ $\quad G = 2^h\ 10.3'$ $\quad H = 17\ 3.0'$

$G = 2\ 10.3'$ $\quad t = 5\ 58.5'$ $\quad t = 5\ 58.5'$

$H = 17\ 3.0'$ $\quad \overline{8\ 8.8'}$ $\quad \overline{23\ 1.5'}$

$\log g = +1.0632'$

$\log h = +1.2752'$

$\log i = -0.8991'$ $\quad \alpha = -9^\circ\ 36\ 14''$

$\log 1/15 = +8.8239'$

$\log g = +1.0632'$

$\log \sin G+t = +9.9274'$

$\log \tan \alpha = \underline{-9.2284'}$

$-0.110' = -9.0429'$

$\log 1/15 = +8.8239'$

$\log h = +1.2752'$

$\log \sin (H+t) = -9.4023'$

$\log \sec \alpha = \underline{+0.0061'}$

$-0.322' = -9.5075'$

$-0.110'$

$-0.432'$

$+1.495'$

$+1.063' =$ Cor. in R.A.

$\log g = +1.0632'$

$\log \cos G+t = \underline{-9.7266'}$

$-6.16' = -0.7898'$

$\log h = +1.2752'$

$\log \cos H+t = +9.9857'$

$\log \sec \alpha = \underline{-9.2223'}$

$-3.04' = -0.4832'$

$\log i = -0.8991'$

$\log \cos \alpha = \underline{+9.9939'}$

$-7.82' = -0.8930'$

$-6.16'$

$-3.04'$

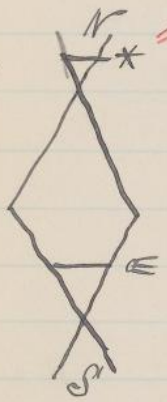
$-17.02' =$ Cor. in Dec.

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1882phae.proj..498.

Comet Pauls.

13. Mar. 31, 1883.



	1st mic	2nd mic	*	1st mic. − *	2nd mic. − *
	11 42.4	11 44.0	8 58.9		
	11 52.5	11 54.0	9 15.9		
	23 34.9	23 38.0	18 14.8	+5 20.1	+5 23.2
	15 6.2	15 7.6	12 22.2		
	15 15.9	15 18.1	12 39.9		
	30 22.1	30 25.7	25 2.1	5 20.0	5 23.6
	18 37.6	18 39.0	15 54.0		
	18 47.2	18 49.8	16 11.8		
	37 24.8	37 28.8	32 5.8	5 19.0	5 23.0
	21 54.5	21 55.8	19 11.8		
	22 5.3	22 7.8	19 29.2		
	43 59.8	44 3.6	38 41.0	5 18.8	5 22.6
	25 17.6	25 19.2	22 34.0		
	25 28.9	25 30.3	22 52.2		
	50 46.5	50 49.5	45 26.2	5 20.3	5 23.3
	28 44.3	28 45.8	26 0.6		
	28 55.0	28 57.0	26 18.7		
	57 39.3	57 42.8	52 19.3	5 20.0	5 23.5
	33 47.7	33 49.3	31 5.6		
	34 0.1	34 1.6	31 23.3		
	67 47.8	67 50.9	62 28.3	5 19.5	5 22.6

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Δ 1st mic	Δ 2nd mic	*	1st mic. − *	2nd mic − *
−10.1°	−10.0°	+17.0°	+6.9 ✓	+7.0 ✓
−9.7°	−10.5°	+17.7°	+8.0 ✓	+7.2 ✓
9.6°	10.8°	17.8°	+8.2 ✓	+7.0 ✓
10.8°	12.0°	17.4°	+6.6 ✓	+5.4 ✓
11.3°	11.1°	18.2°	+6.9 ✓	7.1 ✓
10.7°	11.2°	18.1°	+7.4 ✓	+6.9 ✓
12.4°	12.3°	18.3°	+5.9 ✓	+6.0 ✓

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1882phae.proj..498.

Comet Cruls
Mar. 13, 1883.

1st mic.	2nd mic.	*	1st mic − *	2nd mic. − *
37 43.9	37 45.6	35 0.7		
37 55.8	37 58.0	35 19.0		
75 39.7 c	75 43.6 c	70 19.7 c		
			5 20.0	5 23.9
			5 19.71 v	5 23.21 v
24 12.2 v	24 13.9 v		+2 39.85 v	+2 41.60 v

1st ⏑ mic.

7	24	12.2 v
23	23	3.1 v
Δ	0	19.1 v
	−1	16.7 v
7	9	0.4
4	44	31.
12	43	31.
Chr. cor. =	+1	37.4 v
12	42	9. v Gr. m. T.

2d ⏑ mic.

7	24	13.9 v
23	23	3.1 v
Δ	0	20.4 v
	−1	16.7 v
7	9	2.1 v
4	44	31. v
12	43	33. v
	+1	37.4 v
12	42	11. v

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Comet Cels

Mar 13/883

Δ 1st mic. Δ 2nd mic. ✱ 1st mic. − ✱ 2nd mic. − ✱

−11.9″ −12.4″ +18.3″ +6.4″ +5.9″

56.3 52.5

7.04 6.56

log 7.04 = 0.84572

" 7.5 = 0.87506

" cos δ = 9.98971

+51.3 = 1.71049

886.0

834.7 = 937.5

−15 37.5

−13 54.7

−7 42.4

−6 57.4

−12 25 26.3

−12 32 28.8

−12 33 15.3

log 7.04 = 0.84572

" 7.5 = 0.87506

" cos δ = 9.98952

+51.3 = 1.71012

886.0

834.7 = 937.5

−13 54.7

−15 37.5

log 6.56 = 0.81690

" 7.5 = 0.87506

" cos δ = 9.98949

+44.0 = 1.64145

886.0

930.0 = −15′ 34.0

log 6.60 = 0.81958

" 7.5 = 0.87506

" cos δ = 9.98971

48.3 = 1.68431

886.0

837.7 = +13 57.7

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1882phae.proj..498.

Comet Cruls.

Ambulgue. Mar. 13, 1883.

Gl. 11197 = 5h 44 38.68 ✓ −12° 26′ 46.4″ ✓ (7.3) (1800)
1 55.16 +0 55.7
Mod. Pl. = 5h 46 33.84 −12° 25 50.7
86° 38′ 27.60″

Log. w/15 = +0.12614
" sin α = 9.99925
" tan δ = −9.34488
−0.2942 = −9.46866
+3.0704
+2.7762″ = 0.44345
83 = 1.91908
230.43 = 2.36253

Log. w = 1.30223 ✓
" cos α = 8.76808 ✓
" 83 = 1.91908 ✓
+97.6 = +1.98939 ✓
+97.5 = 1.9891 ✓

(* 1800.0) = 5h 44 38.68 ✓ −12 26 46.4 ✓
+3 50.43 +1 37.6
(* 1883.0) = 5 48 29.11 ✓ −12 25 8.8 ✓
+0 1.34 −0 17.6
ap. Pl. * = 5 48 30.45 ✓ −12 25 26.4 ✓
+2 39.85 −1 37.
ap. Pl 1st mic = 5 51 10.30 ✓ −13 54.7
−12 39 21.1
−12 41 4.0 ✓

Mp. pl. * 5 48 30.45 ✓ −12 25 26.4 ✓
+2 41.60 −1 34.0
ap. Pl. 2nd mic. = 5 51 12.05 −13 57.7
−12 39 24.1 ✓
−12 41 0.5

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1882phae.proj:498:

Comet Cals

Ledger. Mar. 13, 1883

$f = +1.376'$ $\mathfrak{G} = 2^h 17.2'$ $\mathcal{H} = 18^h 29.2'$

$\mathfrak{G} = 2^h 17.2'$ $\lambda = 5\ 48.5'$ $\lambda = 5\ 48.5'$

$\mathcal{H} = 18^h 29.2'$ $\mathfrak{G}+\lambda = 8\ 5.7'$ $\mathcal{H}+\lambda = 0\ 17.7'$

$\log g = +1.0356'$

$\log h = +1.2737'$ $\lambda = -12°\ 25'\ 9''$

$\log i = -0.9076'$

$\log 1/\Delta = 8.8239'$

$\log g = 1.0356'$

$\sin(\mathfrak{G}+\lambda) = +9.9311'$

$\tan\lambda = -9.3428'$

$-0.136' = -9.1334'$

$\log 1/\Delta = 8.8239'$

$\log h = 1.2737'$

$\cos(\mathcal{H}+\lambda) = 8.8772$ ~~-9.7172~~

$\sec\lambda = +0.0103'$

$+0.097' = +8.9851'$

$+1.376'$

$+1.473'$

$-0.136'$

$+1.337' =$ cor. in Dec.

$\log g = +1.0356'$

$\cos(\mathfrak{G}+\lambda) = -9.7172'$

$-5.66' = -0.7528'$

$\log h = +1.2737'$

$\cos(\mathcal{H}+\lambda) = +9.9987'$

$\sin\lambda = -9.3326'$

$-4.03' = -0.6050'$

$\log i = -0.9076'$

$\cos\lambda = +9.9897'$

$-7.89' = -0.8973'$

$-5.66'$

$-4.03'$

$-17.58' =$ cor.

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1882phae.proj..498.

Comet Wolff

Sept. 21, 1884

Comp. * = +21° 4518 2.

2. 41437 = 21h 10 9.57 +21 32 39.7 (1800)

+1 53.95 +10 21.6

Mid. Pl. = 21h 12 3.52 +21° 43 1.3

318 0 52.80

Log. $\frac{n}{15}$ = +0.12614

" sin α = -9.82539

" tan δ = +9.60020

-0.3562 = -9.55173

+3.0704 =

+2.7142 = +0.43364

84 = 1.92428

+228.00 = 2.35792

Log. n = 1.30223

" cos α = +9.87118

" 84 = 1.92428

+1252.3 = +3.09769

* 1800 = 21h 10 9.57 ✓ +21° 32' 39.7 ✓

+3 48.00 ✓ +20 52.3 ✓

* 1884 = 21h 13 57.57 ✓ +21° 53 32.0 ✓

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1882phae.proj..498.

Comet Pons – Brooks.

In ledger. Oct 1, 1883.

Comp. * = Dm. +58° 1649 (8.8)

B.B VI +58° 1649 = 16 32 27.94 ✓ +58° 39 14.8 ✓ (8.8) 1855

+0 14.48 −1 44.6

Mid. Pl. = 16 32 42.42 +58° 37 30.2

248 10 36.30

Log. $\frac{u}{15}$ = 0.12609

" sin α = −9.96770

" tan δ = 0.21481

−2.03852 = −0.30860

+3.0710

+1.0358 = 0.01528

28 = 1.44716

+29.00 = +1.46244

Log. u = 1.30218

" cos δ = −9.87025

" 28 = 1.44716

−208.7 = −2.31959

(* 1855.0) = 16h 32 27.94 ✓ +58° 39 14.8 ✓

+0 29.00 ✓ −3 28.7 ✓

(* 1883.0) = 16 32 56.94 ✓ +58° 35 46.1 ✓

− 0.56 ✓ + 17.6 ✓

App. Pl. * 16 32 56.38 ✓ +58 36 3.7 ✓

−10 42.32 +9 22.2

App. Pl. α = +16 22 14.26 +58 45 25.9

27 38.42

16 27 35.22 ✓

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1882phae.proj..498.

Oct 1 1883.

Comet Pons Brooks.

$f = +2.864$ ✓
$G = 1\ 23.5$ ✓
$H = 5\ 22.3$ ✓
$\log f = +1.3010$ ✓
" $h = +1.2740$ ✓
" $i = +0.9056$ ✓

$G = 1\ 23.5$ ✓
$\alpha = 16\ 32.9$ ✓
$17\ 56.4$ ✓

$H = 5\ 22.3$ ✓
$\alpha = 16\ 32.9$ ✓
$21\ 55.2$ ✓

$\Omega = +58°\ 35\ 46$ ✓

$\log \frac{1}{15} = +8.8239$ ✓
" $g = +1.3010$ ✓
" $\sin G+\alpha = +9.9999$ ✓
" $\tan \lambda = +0.2143$ ✓
-2.183 ✓ $= -0.3391$ ✓

$\log \frac{1}{15} = +8.8239$ ✓
" $h = +1.2740$ ✓
" $\sin H+\alpha = -9.7144$ ✓
" $\sec \lambda = +0.2831$ ✓
-1.246 ✓ $= -0.0954$ ✓
-2.183 ✓
-3.429 ✓
$+2.864$ ✓
-0.565 ✓ cor. in R.A.
$-0,56$ ✓

$\log g = +1.3010$ ✓
" $\cos G+\alpha = -8.1919$ ✓
-0.31 ✓ $= -9.4929$ ✓

" $h = +1.2740$ ✓
" $\cos H+\alpha = +9.9321$ ✓
" $\sin \lambda = +9.9312$ ✓
$+13.72$ ✓ $= +1.1373$ ✓

$\log i = +0.9056$ ✓
" $\cos \lambda = +9.7169$ ✓
$+4.19$ ✓ $= +0.6225$ ✓
$+13.72$ ✓
$+17.91$ ✓ # cor.
-0.31
$+17.60$ ✓ = cor in Dec.

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1882phae.proj..498.

Oct. 3 1883

In Ledger. Comet Pons–Brooks

Comp. * = Dm. +58° 1644 (9.0)

BB.VII +58° 1644 = 16 28 31.64 ✓ +58 13 5.5 ✓ (1855)

+0 15.22 −1 49.1

Mid. Pl. = 16 28 46.86 +58 11 16.4

247 11 42.90

Log. $\frac{u}{15}$ = 0.12609

" sin t = −9.96465

" tan t = 0.20739

−1.9867 = −0.29813

+3.0710

+1.0843 = 0.03515

1.44716

+30.36 = 1.48231

Log. u = 1.30218

" cos t = −9.58807

" 28 = 1.44716

−217.6 = −2.33771

(* 1855.0) 16h 28 31.64 ✓ +58° 13 5.5 ✓

+0 30.36 − 3 37.6

(* 1883.0) 16 29 2.00 ✓ ✓ +58° 9 27.9 ✓

−0.62

−0.58 +16.8 ✓

App. Pl. * 16 29 1.42 ✓ +58° 9 44.7 ✓

−0 26.85 ✓ +11 22.5 ✓

app Pl. ⊙ = 16 28 34.57 ✓ +58 21 7.2 ✓

16 28 34.57 ✓3

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1882phae.proj...498.

Oct 4 1883

Comet Pons-Brooks

see P. 166

$f = +2.873^7$
$\mathfrak{L} = 1^h\ 24.8^7$
$H = 5\ 9.5^7$
$\log g = +1.3032^7$
$\log h = +1.2748^7$
$\log i = +0.9016^7$

$\mathfrak{L} = 1^h\ 24.8$ ✓
$\alpha = 16\ 26.4$ ✓
$\mathfrak{L}+\alpha = 17\ 51.2$ ✓ $= 17\ 51.0$ ✓

$H = 5\ 9.5$ ✓
$\alpha = 16\ 26.4$ ✓
$H+\alpha = 21\ 35.9$ ✓ $= 21\ 36.7$ ✓

$\alpha = +58°\ 9\ 28$

$\log 1/5 = +8.8239$ ✓
$\log g = +1.3032$ ✓
$\log \sin(\mathfrak{L}+\alpha) = -9.9997$ ✓
$\log \tan \alpha = +0.2069$ ✓
-2.157 ✓ $= -0.3339$ ✓

$\log 1/5 = +8.8239$ ✓
$\log h = +1.2748$ ✓
$\log \sin(H+\alpha) = -9.7671$ ✓
$\log \sec \alpha = +0.2777$ ✓
-1.376 ✓ $= -0.1389$ ✓

-2.156
-3.555
$+2.473$
-0.682

-1.376 ✓
-2.157 ✓
-3.533 ✓
$+2.273$ ✓
-0.660 ✓

Ap. pl. rd.

$\log g = +1.3032$ ✓
$\log \cos(\mathfrak{L}+\alpha) = 8.5837$ ✓
-0.77 ✓ $= 9.8869$ ✓ $= 9.7211$

$\log h = +1.2748$ ✓
$\log \cos(H+\alpha) = +9.9179$ ✓
$\log \sin \alpha = +9.9292$ ✓
$+12.94$ ✓ $= +1.1179$ ✓
$+13.0$ ✓

$\log i = +0.9016$ ✓
$\log \cos \alpha = +9.7223$ ✓
$+4.21$ ✓ $= +0.6239$ ✓

$+12.94$
$+17.15$
-0.77
$+16.38$

$+4.21$ ✓
$+13.0$ ✓
$+17.26$ ✓
-0.53 ✓
$+16.73$ ✓

Ap. pl. rd.

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1882phae.proj..498.

Oct 3, 1883

B.4, 168, 170

Comet Pons-Brooks

Comp. * = Dm. +58° 1641

Oc.a 16267 = 16h 25 39.10 +58° 35 16.6 (1842) 7.8

+0 21.81 −2 42.8

Mid. Pl. = 16 26 0.91 +58° 32 32.8

246 30 13.65

Log. $\frac{u}{15}$ = 0.12610 Log u = 1.30219

" sin. L = −9.96246 " cos L = −9.60063

" tan L = 0.21340 " 41 = 1.61278

−2.0040 = −0.30191 −327.8 = −2.51560

+3.0708 808

+1.0704 = +0.02954

668

41 = +1.61278

74

+43.88 = 1.64232

086

(* 1842.0) = 16 25 39.10 +58 35 16.6

+0 43.88 −5 27.8

(* 1883.0) = 16 26 22.98 +58 29 48.8

84

−0.62 +16.48

ap. Pl. * 16 26 22.22 +58 30 5.2

+2 13.03 −9 3.5

apPl. ⊕ 16 28 35.29 +58 21 1.7

16 28 35.25 2.1

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Oct. 4, 1882. B.

Comet Pons-Brooks.

Comp. Stars = Dm. +58° 1645

~~Ac.a.16814~~ = ~~16 28 41.44~~ ~~+58 6 Z~~

Ac.a.16310 = 16 28 26.98 +58° 10 34.1 (8.1)

+0 22.28 −2 40.5

16 28 49.26 +58° 7 53.6

247° 12 18.90

Log $\frac{u}{\Delta}$ = 0.12610

" sin t = −9.96469

" tan ζ = 0.20643

−1.9825 = −0.29722

+3.0708

+1.0883 = +0.036775

41 = 1.61278

+44.62 = 1.64953

Log u = 1.30219

" cos ζ = −9.58819

" 41 = 1.61278

−318.5 = −2.50316

(*1842) 16 28 26.98 +58° 10 34.1

0 44.62 − 5 18.5

(*1883.0) = 16 29 11.60 +58° 5 15.6

ap. Pl. cor. = −0.68 +16.4

ap. Pl. * 16 29 10.92 +58 5 32.0

+0 0.36 +2 20.4

ap Pl. ⊕ = 16 29 11.32 +58 7 52.4

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Oct. 4, 1883. B.

Comets Pons-Brooks

Comp. Star = Dm +58° 1644

Same * used on Oct. 3 (see page 164)

(* 1883.0) =	16	29	2.00	+58	9	27.9
			−0.68			+16.8
App. Pl. *	16	29	1.32	+58	9	44.7
		+0	21.09		−2	5.2
	16	29	22.41	+58	7	39.5
			+12.26			
	16	29	11.9			

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~~Mar. 13, 1883~~
~~Comet Brooks - Swift~~

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1882phae.proj..498.

Mar. 13 1883

Comet Brooks Swift

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1882phae.proj..498.

Mar. 16, 1883

Comet Brooks-Swift

Comp. * = Dec. +28° 36′9

W_2 2h 69 = 2h 2 17.45 ✓ +28° 22 21.7 ✓ (1825)

+1 39.64 +8 20.8

Mid. Pl. = 2 3 57.09 +28 30 42.5

30 59 16.35

Log. $\frac{w}{15}$ = 0.12612

" sin d = 9.71169

" cos L = 9.73498

+0.3739 = +9.59279

+3.0707

+3.4446 = 0.53714

58 = 1.76343

199.79 = 2.30057

Log. w = 1.30221

" cos d = 9.93316

" 58 = 1.76343

+997.2 = 2.99880

(* 1825.0) 2h 2 17.45 ✓ +28° 22 21.7 ✓

+3 19.79 ✓ +16 37.2 ✓

* 1883.0 2h 5 37.24 ✓ +28° 38 58.9 ✓

+0 0.61 ✓ +0 2.7 ✓

App. Pl. * = 2h 5 37.85 ✓ +28° 39 1.6 ✓

∈ − * = +1 31.64 ✓ +7 23.2 ✓

App. pl. ∈ = 2 7 9.49 ✓ +28 46 24.8 ✓

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1882phae.proj..498.

Dr Lodge. Mar. 16, 1883

Comet Brooks Swift

$f = +1.4017$
$\mathfrak{G} = 2^h 15.9'$
$\mathfrak{H} = 18^h 16.2'$
$\log g = +1.0434$
" $h = +1.2733$
" $i = -0.9096$

$\mathfrak{G} = 2^h 15.9'$
$\alpha = 2\ 5.6'$
$\mathfrak{G}+\alpha = 4\ 21.5'$

$\mathfrak{H} = 18\ 16.2'$
$\alpha = 2\ 5.6'$
$\mathfrak{H}+\alpha = 20\ 21.8'$

$\alpha = +28°\ 38\ 58.9'$

Log 1/5 = +8.8239'
" g = +1.0434'
" sin $\mathfrak{G}+\alpha$ = +9.9586'
" tan α = +9.7375'
+0.366' = +9.5634'

" 1/5 = +8.8239'
" h = +1.2733'
" sin $\mathfrak{H}+\alpha$ = -9.9110'
" sec α = +0.0567'
-1.161' = -0.0649'
+1,773'
+0.612' = cor. in R.A.

Log g = +1.0434'
" cos $(\mathfrak{G}+\mathfrak{H})$ = +9.6198'
+4.60' = +0.6632'

" h = +1.2733'
" cos $(\mathfrak{H}+\alpha)$ = +9.7633'
" sin α = +9.6808'
+5.22' = +0.7174'

" i = -0.9096'
" cos α = +9.9433'
-7.13' = -0.8529'
+9.82'
+2.69' = cor. in Dec.

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1882phae.proj..498.

Mar. 25, 1883

Comet Brooks-Swift

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1882phae.proj..498.

{Ap. Place Reduction}

Mar. 25, 1883

In ledger.

Comet Brooks–Swift

Δ = +1.432'
$\mathcal{G}$ = 2 12.9'
$\mathcal{H}$ = 17 37.3'
Log g = +1.0476'
" h = 1.2734'
" i = −0.9088'

$\mathcal{G}$ = 2 12.9
$\alpha = 3^h\ 4.1$
$\mathcal{G}+\alpha$ = 5 17.0

$\mathcal{H}$ = 17 37.3
α = 3 4.1
$\mathcal{H}+\alpha$ = 20 41.4

α = +29° 2

Log. 1/15 = +8.8239
" g = +1.0476
" sin $\mathcal{G}+\alpha$ = 9.9923
" tan α = 9.7444
+0.406 = +9.6082

Log 1/15 = +8.8239
" h = +1.2734
" sin $\mathcal{H}+\alpha$ = −9.8820
" sec. α = 0.0583
−1.090 = −0.0376
+1.838
+0.748 = cor. in R.A

Log. g = +1.0476
" cos $\mathcal{G}+\alpha$ = +9.2707
+2.08 = +0.3183.

" h = +1.2734
" cos $\mathcal{H}+\alpha$ = +9.8112
" sin α = +9.6860
+5.90 = +0.7706

" i = −0.9088
" cos α = +9.9417
−7.09 = −0.8505
+7.98
+0.89 = cor in Dec.

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1882phae.proj..498.

Jan. 1 1886,
Comet Brooks V 1885.

AP. Place.
Reduction

f = −0.156
G = 6 22.9
H = 23 16.6
log g = +0.9904
" h = +1.3092
" i = −0.2208

G = 6 22.9
ℓ = 20 14.8
26 37.7
24
2 37.7

H = 23 16.6
ℓ = 20 14.8
43 31.4
24
19 31.4

α = +6° 22 14.

log 1/15 = +8.8239
" g = +0.9904
" sin G+ℓ = +9.8028
" tan α = +9.0478
+0.046 = +8.6649

log 1/15 = +8.8239
" h = +1.3092
" sin H+ℓ = +9.8810
" sec. α = +0.0027
+0.826 = +9.9168
+0.046
+0.872
−0.150
+0.722 = cor. in R.A.
= 0.1003 = 1.260

log g = +0.9904
" cos G+ℓ = +9.8879
+7.56 = +0.8783

log h = +1.3092
+9.8492
" cos H+ℓ = +9.1584
" sin α = +9.0454
−1.80 = −0.2560
+0.22 = +9.9432

log i = −0.2208
" cos α = +9.9973
−1.65 = −0.2181
−1.80
−3.45
+7.56
+4.11 = cor. in Dec.

−0.150
−1.260
−1.410
+0.046
−1.364

+7.56
+0.44
+8.00
−1.65
+6.79 = Cor. in δ.

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1882phae.proj..498.

AP. Place
Reduction

Jan. 5, 1886
Comet Brooks V, 1885

$f = -0.093'$ $\quad G = 6^h\ 14.2'$ $\quad H = 23\ 1.5'$
$g = 6\ 14.2'$ $\quad \alpha = 20\ 31.2$ $\quad \alpha = 20\ 31.2$
$H = 23\ 1.5'$ $\quad G+\alpha = 2\ 45.4'$ $\quad H+\alpha = 19\ 32.7'$
$\log g = +0.9874'$
$\log h = +1.3080'$ $\quad \alpha = +8^\circ\ 12\ 2$
$\log i = -0.3473'$

$\log 1/15 = +8.8239'$
$\log g = +0.9874'$
$\log \sin(G+\alpha) = +9.8200'$
$\log \tan \alpha = +9.1586'$
$+0.062' = +8.7899'$

$\log 1/15 = +8.8239'$
$\log h = +1.3080'$
$\log \sin(H+\alpha) = +9.9634'$
$\log \sec \alpha = 0.0045'$
$-1.259' = -0.0998'$
$-0.093'$
$-1.352'$
$+0.062'$
$-1.290' =$ cor. in R.A

$\log g = +0.9874'$
$\log \cos G+\alpha = +9.8755'$
$+7.29' = +0.8629'$

$\log h = +1.3080'$
$\log \cos H+\alpha = +9.5950'$
$\log \sin \alpha = +9.1542'$
$+1.14' = +0.0572'$

$\log i = -0.3473'$
$\log \cos \alpha = +9.9955'$
$-2.20' = -0.3428'$
$+8.43'$
$+6.23' =$ cor. in Dec.

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1882phae.proj..498.

Dec. 30, 1885

Comet II 1885 Brooks

A.R. Place

Reduction

$f = +2.901$
$g = 1^h 48.2$
$H = 23\ 24.1$
$\log g = +1.3277$
" $h = +1.3096$
" $i = -0.1399$

$g = 1^h 48.2$
$\alpha = 20\ 5.8$
$21\ 54.0$

$H = 23\ 24.1$
$\alpha = 20\ 58$
$19\ 29.9$

$L = +5^\circ\ 39\ 9$

$\log 1/15 = +8.8239$
" $g = +1.3277$
" $\sin G+L = -9.7181$
" $\tan L = +8.9955$
$-0.073 = -8.8652$

$\log 1/15 = +8.8239$
" $h = +1.3096$
" $\sin H+L = -9.9655$
" $\sec L = +0.0021$
$-1.262 = -0.1011$
-0.073
-1.335 ✓
$+2.901$ ✓
$+1.566$ ✓ = cor. in R.A.

$\log g = +1.3277$
" $\cos G+L = +9.9308$
$+18.13 = +1.2585$

$\log h = +1.3096$
" $\cos H+L = +9.5818$
" $\sin L = +8.9934$
$+0.77 = +9.8848$

$\log i = -0.1399$
" $\cos L = +9.9979$
$-1.37 = -0.1378$
$+18.90$
$+17.53$ ✓ = cor in Dec

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1882phae.proj..498.

~~Dec. 12, 1885~~

Comet Fabry

	∈		*		∈ − *		
2h	33	25.6	30	40.4			
	33	58.0	31	27.3			
	67	23.6	62	7.7	5	15.9	2 37.95
	47	28.8	44	45.4			
	48	1.1	45	33.0			
	95	29.9	90	18.4	5	11.5	2 35.75
	51	3.0	48	19.7			
	51	35.6	49	7.1			
	102	38.6	97	26.8	5	11.8	2 35.90
	54	40.2	51	57.0			
	55	13.0	52	45.3			
	109	53.2	104	42.3	5	10.9	2 35.45
							5.05
							+2 36.01



	373	14	5.3
2h	37	32	.5
	+2	37	.2
2	40	9	.7
17	26	10	.2
9h	13	59	.5
	−1	30	.8
9	12	28	.7
4	44	31	.0
13	56	59	.7 = Gr. M. T. (uncor.)
	−1	57	.5
13	55	2	.2 = " (cor.)

A	375	25	.3 ✓
2h	46	57	.7 ✓
	+2	37	.2 ✓
2	49	32	.9 ✓
17	26	10	.2 ✓
9	23	22	.7 ✓
	−1	32	.3 ✓
9	21	50	.4 ✓
	−1	57	.5 ✓
9	19	52	.9 ✓

C. M. T. =

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1882phae.proj...498.

$\Delta\alpha =$	$\Delta *$	$\varepsilon - *$
32.4°	46.9°	14.5°
32.3°	47.6°	15.3°
32.6°	47.4°	14.8°
32.8°	48.3°	15.5°

+20 47 19.6 ✓ = * 44 ✓
−0 ✓2.6
+20 ✓46 27.0

+20 47 19.6 ✓
−1 ✓7.3 ✓
+20 ✓7 3✓.3 ✓

0.1
15.02 ✓

Log. 15.02 = ~~1.17167~~ = +1.17667 ✓
" 7.5 = ~~0.87506~~ = +0.87✓06 ✓
" cos α = ~~9.97076~~ = +9.97076 ✓
104.1 = ~~2.01749~~ = 2.02249 = 10✓.3
52.0 = ~~— 0 52.0~~ ✓2.6

+1.17667 ✓
+0.87✓06 ✓
+9.97021 ✓
+2.02249 ✓ = 10✓.3

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1882phae.proj..498.

Jan. 3, 1887. (see p. 46.)

Comet Fintay.



	E.		*.		E − *.			
3	29	42.5	34	3.5				
	30	27.0	34	35.4				
	60	9.5	68	38.9	− 8	29.4	4	14.70
	36	59.1	41	17.0				
	37	40.8	41	48.5				
	74	39.9	83	5.5	8	25.6	4	12.80
	43	8.6	47	24.5				
	43	48.5	47	56.4				
	86	57.1	95	19.9	8	22.8	4	11.40
	49	12.5	58	27.2				
	49	50.9	53	57.1				
	99	3.4	107	24.3	8	20.9	4	10.45
	55	23.7	59	35.8				
	56	0.1	5	5.2				
	111	23.8	119	41.0	8	17.2	4	8.60
								57.95
							− 4	11.59

430	133.7	
43	13.4	
+0	7.5	= Chron. cor. (236)

Chron. to 3h

3h	43	20.9
18	51	56.9
8	51	24.0
	+1	27.4 (Cor. for 1327.)
8	51	50.0 = C. m. T.
4	44	31.0
13	36	21.0

3	43	13.4
(Cor. for 236 + 1327)	+0	24.6
3	43	38.0
18	51	56.9
8	51	41.1
	−1	27.1
8	50	14.0 C. m. T.
4	44	31.0
13	36	45.0 Gr. m. T.

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1882phae.proj..498.

∠⊕	∠*	⊕−*
44.5°	31.9°	12.6°
41.7°	31.5°	10.2°
39.9°	30.9°	9.0°
38.4°	29.9°	8.5°
36.4°	29.4°	7.0°

+0 46 22.2″
−″.1
+0 46 17.1 Appfel.*
−0 3″.″
+0 4″ 41.6″

200.9
+0.1 2″

153.6″
30.72″

47.3
0 9.46

Log. 9.46 = 0.97589°
" 7.5 = 0.87506°
" cos δ = 9.99996
−7.0.94 = 1.85091°
− 1 10.94″

0.97″49″
0.87″06″
9.99996″
1.4″091
−1′ 10.″94″

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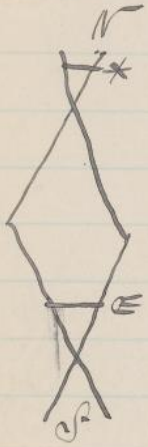
1882phae.proj..498.

1886 IV.

June 1, 1886

Brooks Third Comet

	∈	*	∈ − *
14	30 3.7	30 39.4	
	30 28.7	30 57.2	
	60 32.4	61 36.6	1 4.2 0 32.10
	31 18.3	31 53.8	
	31 44.1	32 12.0	
	63 2.4	64 5.8	1 3.4 0 31.70
	32 33.3	33 9.2	
	32 59.1	33 27.1	
	65 32.4	66 36.3	1 3.9 0 31.95
	35 1.0	35 37.0	
	35 26.9	35 55.0	
	70 27.9	71 32.0	1 4.1 0 32.05
	36 14.2	36 51.0	
	36 41.6	37 8.9	
	72 55.8	73 59.9	1 4.1 0 32.05
	37 30.0	38 5.0	
	37 56.0	38 28.3	
	75 26.0	76 28.3	1 2.3 0 31.15
			11.00



Mean Sets = 14 34 1.4 ✓ OVR 9 54 16.6 ✓ C. m. J. − 0 31.83 ✓

+2 13.8

14 36 15.2 ✓

4 40 21.0 ✓

9 55 54.2 ✓

1 37.6 ✓

9 54 16.6

4 44 31.0

14 38 47.6

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1882phae.proj...498...

$-\Delta\alpha$	$+\Delta\delta$	$-\alpha+\delta$
25.0″	17.8″	−7.2″
25.8″	18.2″	−7.6″
25.8″	17.9″	−7.9″
25.9″	18.0″	−7.9″
27.4″	17.9″	−9.5″
26.0″	18.3″	−7.7″

+3	KK	33.6
		−7.0
+3	KK	26.6
	−6	√3.2
+3	37	33.8

	−	47.8
−	0	7.97 √

Log. −7.97 √ = 0.90146 √
" 7.5 = 0.87506 √
" cos δ = 9.99907 √
−59.65 √ = 1.77559 √

886.0
826.4 √ = −13′ 46.4″ √

0.90146 √
0.47506 √
9.99913 √
1.77565 √ = √59.7
Δδ 6.0
Δ 26.3 = −13′ 46.3″

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1882phae.proj..498.

Sect B.4 P.64

for. Precession Reductions.

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1882phae.proj...498

Ap. Place Reductions
Brooks Third Comet
June 1, 1886

$f = +0.895'$ $\quad \odot = 3^h 51.8'$ $\quad \mathfrak{A} = 13^h 8.1'$

$\odot = 3\ 51.8'$ $\quad \alpha = 12\ 2.9$ $\quad \alpha = 12\ 2.9$

$\mathfrak{A} = 13\ 8.1'$ $\quad \odot + \alpha = 15\ 54.7'$ $\quad \mathfrak{A} + \alpha = 1\ 11.0'$

$\log g = +1.0423'$

$\log h = +1.3071'$ $\quad N = +3^\circ\ 44\ 34$

$\log i = -0.4105'$

$\log 1/15 = +8.8239'$

$\log g = +1.0423'$

$\log \sin \odot + \alpha = -9.9316'$

$\log \tan \delta = +8.8157'$

$-0.041' \quad = -8.6135'$

$\log 1/15 = +8.8239'$

$\log h = +1.3071'$

$\log \sin \mathfrak{A} + \alpha = +9.4841'$

$\log \sec \delta = +0.0009'$

$+0.413' \quad = +9.6160'$

$+0.895'$

$+1.308'$

$-0.041'$

$+1.267' =$ cor. in R.A.

$\log g = +1.0423'$

$\log \cos \odot + \alpha = -9.7159'$

$-5.73' = -0.7582'$

$\log h = +1.3071'$

$\log \cos \mathfrak{A} + \alpha = +9.9788'$

$\log \sin \delta = +8.8148'$

$+1.26' = +0.1007'$

$\log i = -0.4105'$

$\log \cos \delta = +9.9991'$

$-2.57' \quad = -0.4096'$

$-5.73'$

$-8.30'$

$+1.26'$

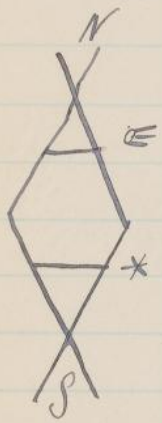
$-7.04' =$ cor. in Dec.

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1882phae.proj..498.

Nov. 25, 1886 (R. 42, p. 205)

Comet Barnard (1886 IX)



	E	*		
10	30 20.2	34 26.2		
	30 49.5	35 13.3		
	61 9.7	69 39.5	δ 29.8	4 14.90
	36 4.0	40 7.5		
	36 32.7	40 54.5		
	72 36.7	81 2.0	δ 25.3	4 12.65
	41 33.9	45 34.6		
	42 1.9	46 21.5		
	83 35.8	91 56.1	δ 20.3	4 10.15
				37.70
				− 4 12.57

Mean Sats = 10h

216 822
36 13.7
+1 32.6 = chron. corr. (incl. 1327)

37 46.3 ✓

16 18 11.2 ✓

1δ 19 35.1 ✓

3 0.1 ✓

1δ 16 35.0 C. m. T.

~~4 44 31.0~~

~~11 3 3.9~~ = Gr. m. T.

~~23~~ 1 6.0

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1882phae.proj...498.

$\Delta\alpha$	$\Delta\delta$	$\alpha+\delta$
29.3°	47.1°	/ 16.4°
28.7°	47.0°	/ 15.7°
28.0°	46.9°	/ 14.9°

47.0'

/ 15.67'

Log 75.67 = 1.87892' 1.87892'

" 7.5 = 0.87506' 0.87506'

" cos α = 9.98226' 2.98215'

544.8' = 2.73624° 544.7' = 2.73613'

886.0 / 342.2' = +5 42.2' 886.0 / 341.3' = +5 41.3' ✓

+2 50.6'

+16 16 0.9

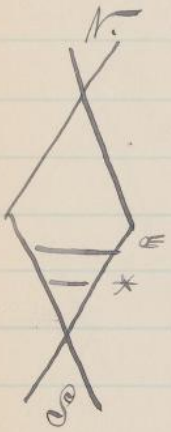
16 18 52.0' (1.5)

1882phae.proj..498.

June 27, 1887.

Barnard 12 Comet

(see p. 48)



	E	*		
15	54 0.7	52 43.3		
	54 28.0	53 2.8		
	108 28.7	105 46.1	2 42.6°	1 21.30°
	56 6.1	54 49.0		
	56 33.6	55 8.5		
	112 39.7	109 57.5	2 42.2°	1 21.10°
	58 8.0	56 51.0		
	58 36.4	57 11.0		
	116 44.4	114 2.0	2 42.4°	1 21.20°
	0 21.1	59 4.4		
	0 50.1	59 24.5		
	121 11.2	118 28.9	2 42.3°	1 21.15°
	2 26.0	1 8.5		
	2 55.1	1 28.2		
	125 21.1	122 36.7	2 44.4°	1 22.20°
				1.95
				+1 21.39°

5 82 145.1 ✓

Mean Sects = 15 58 26.5 K.R.

+3 15.0 ✓✓

16 1 41.5 ✓

6 37 25.5

9 24 16.0

−1 32.4

9 22 43.6

4 44 31.0

14 7 14.6 = G. M. T. of obs.

Chron. cor. (including 1327) ✓

16 1 41.5 ✓

6 21 53.9 ✓

9 39 47.6 ✓

−1 35.0 ✓

9 38 12.6 ✓ Ch. M. T.

4 44 31. ✓

14 22 44. ✓ Gr. M. T.

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1882phae.proj...498.

ΔE	$\Delta *$	$E - *$
27.3°	19.5	7.8°
27.5°	19.5°	8.0°
28.4°	20.0°	8.4°
29.0°	20.1°	8.9°
29.1°	19.7°	9.4°

2.5

0^m 8.5

Log. 8.5 = 0.92942
" 7.5 = 0.87506
" cos α = 9.99992
63.7 ' = 1.80440°
+1 3.7 '

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1882phae.proj..498.

Comet Brooks 1885 VII.

Sept 2 1885

Comps. * = Dm. +36° 2411. 9.3 B = (Star a)

B.B. VI +36° 2411 = 13h 41m 34.71s ✓ +36 48 58.8 ✓ (1855)

+ 0 39.66 — 4 31.5

Mid. Pl. = 13 42 14.37 +36 39 27.3

205 33 35.55

log. m/5 = 0.12608
" sin φ = -9.63493
" tan φ = +9.87170
-0.4293 = -9.63271
+3.0710
+2.6417 = 0.42188
30 = 1.47712
79.25 = 1.89900

log m = 1.30218
" cos φ = 9.95528
" 30 = 1.47712
542.7 = 2.73458

	13	41	34.71 ✓	+36	43	58.8 ✓	
		+1	19.25 ✓		-9	2.7 ✓	
* 1885.0 =	13	42	53.96 ✓	+36	34	56.1 ✓	
			+0.16 ✓			+7.7 ✓	
ap. Pl. *	13	42	54.12 ✓	+36	35	3.8 ✓	
		-0	25.19 ✓		+3	2.7 ✓	
ap. Pl. ∝	13	42	28.93 ✓	+36	38	6.5	

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1882phae.proj..498.

Dec. 30 1885

Comet Brooks 1885 V.



	E	*J.	E-*	
1h	17 33.6	16 24.4		
	17 45.1	16 34.3		
	35 18.7	32 58.7	-2 20.0	1 10.0
	19 9.0	18 0.0		
	19 21.2	18 9.7		
	38 30.2	36 9.7	-2 20.5	1 10.25
	20 45.0	19 36.4		
	20 57.6	19 45.4		
	41 42.6	39 21.8	-2 20.8	1 10.40
	22 22.0	21 14.0		
	22 36.5	21 22.5		
	44 58.5	42 36.5	-2 22.0	1 11.00
				1.65
				+1 10.41 ✓

Mean 4 = 1h

	158	150.0	
	20	-3.8	
	-1	5.9	
	1 18	57.9	
	18 37	8.3 ✓	
	6 41	49.6 ✓	
	-1	5.8 ✓	
	6 40	43.8 ✓	C. m. T.
	4 44	31.0 ✓	
	11 25	14.8 =	Gr. m. T.

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1882phae.proj...498.

$\Delta\alpha$	$\Delta\delta$	$\alpha + \delta$
11.5°	9.9°	21.4°
12.2°	9.7°	21.9°
12.6°	9.0°	21.6°

$\frac{14.5°}{4)\overline{58.0}}$ $\frac{8.5°}{4)\overline{37.1}}$ $\frac{23.0°}{7.9}$

12.70 9.28 21.98

Log 21.98 = 1.34203

" 7.5 = 0.87506

" cos δ = 9.99788

164.0 = 2.21497

886.0

722.0

361.0 = −6 1.0

5 39 26.4

5 33 25.4

1.34203

0.87506

9.99796

164.1 = 2.21505

886.0

721.9 = −12 1.9

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1882phae.proj..498.

Comp Star. = +5° 4440 (9.4 B) = *g

B.B. VI +5° 4440 = 20 4 17.38 +5° 33 56.7 (1855)

Already reduced and entered on ledger.

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1882phae.proj...498.

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1882phae.proj..498.

Dec. 30, 1885

Comet Brooks 1885 V

	∈		☀/h		∈ − ☀		
	56	24.0	59	1.4			
	57	17.5	59	7.2			
	113	41.5	118	8.6	4 27.1	2	13.55
	59	21.5	1	58.5			
	60	13.5	2	3.7			
	119	35.0	124	2.2	4 27.2	2	13.60
	2	20.5	4	57.0			
	3	12.0	5	1.5			
	125	32.5	129	58.5	4 26.0	2	13.00
	5	40.7	8	16.5			
	6	33.4	8	22.2			
	132	14.1	136	38.7	4 24.6	2	12.30
	9	50.0	12	24.2			
	10	40.7	12	29.7			
	140	30.7	144	53.9	4 23.2	2	11.60
	12	46.5	15	20.5			
	13	36.8	15	25.5			
	146	23.3	150	46.0	4 22.7	2	11.35
							75.40
Mean Boston	4	49.8					−2 12.57
	−1	5.9	chron. cor. (include. 1027).				
	1	3 43.9		6	25	32.3	
	18	37 8.3		4	44	31.0	
	6	26 35.6		11	10	3.3 = G. M. T.	
		−1 3.3					
	6	25 32.3					

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$\Delta\alpha$	$\Delta\delta$	$\alpha - \delta$
53.5	5.8	47.7
52.0	5.2	46.8
51.5	4.5	47.0
52.7	5.7	47.0
50.7	5.5	45.2

$$\begin{array}{r} 50.3 \\ 6)\overline{310.7} \\ 51.7 \end{array} \qquad \begin{array}{r} 5.0 \\ 6)\overline{31.1} \\ 5.2 \end{array} \qquad \begin{array}{r} 45.3 \\ 1.2 \\ \hline 46.50 \end{array}$$

$$\begin{array}{rrr} & -2 & 53.6^{7} \\ +5 & 32 & 57.1 \\ \hline +5 & 30 & 3.5^{7} \end{array}$$

$$\begin{array}{lll} \text{Log. } 46.50 = & 1.66745 & 1.66745 \\ \text{" } 7.5 = & 0.87506 & 0.87506 \\ \text{" cos. } \delta = & 9.99796^{7} & 9.99800^{7} \\ \hline 347.1^{7} = & 2.54047 & 347.1^{7} = 2.54051 \end{array}$$

$$1\overline{83.6} = -2\ 53.6 \quad -5\ 47.1$$

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In ledger

Dec. 30, 1885

Comet Brooks 1885 V

Comp. * = Dm. +5° 4457 9.0 K = *k

W I 20h 17m 1 = 20 6 8.84 +5° 22 3.6 (1825)

+1 29.89 +5 14.7

20 7 38.73 +5° 27 18.3

301 54 40.95

Log. $\frac{m}{15}$ = +0.12611

" sin ϕ = −9.92884

" tan ϕ = +9.80273

−0.1084

+8.977 = −0.05298

+3.0707 9.03495

+1.9410 0.47162

+2.96.23 0.28803

60 = 1.77815

+176.46 2.06618

+177.73 = 2.24977

Log m = +1.30220

" cos ϕ = +9.72313

" 60 = 1.77815

+636.0 = +2.80348

(* 1825.0) 20 6 8.84 +5 22 3.6

+2 57.73 +10 36.0

(* 1885.0) = 20 9 6.57 +5 32 39.6

+1.57 +17.5

ap. Pl. * = 20 9 8.14 +5 32 57.1

−2 12.57 −5 47.1

ap. Pl. ☌ = 20 6 55.57 +5° 27 10.0

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Nov. 25 1886. 2cc p. 190

Comet Barnard 1886 IX.

Comp. α = +16° 26′ 54″ 8.7 K.

~~W_2 14h 456 = 14 20 0.74 +16° 27′ 29.9″ 182~~

W_2 14h 461. = 14 20 14.28 +16 32 43.8 (1825)
+1 26.68 −8 20.8
Mid. Pl. = 14 21 40.96 +16 24 23.0
215° 25′ 14.″40

Log $\frac{u}{15}$ = 0.12611
" sin α = −9.76311
" tan δ = +9.46899
−0.2281 = −9.35821
+3.0707
+2.8426 = 0.45372
61. = 1.78533
+173.40 = 2.23905

Log. u = 1.30220
" cos α = −9.91112
" 61 = 1.78533
−996.9 = −2.99865

(* 1825.0) 14 20 14.28 +16 32 43.8
+2 53.40 −16 36.9
*1886.0 = 14 23 7.68 +16 16 6.9
Ap. pl. = +0 0.69 −0 6.0
Ap. Pl. * = 14 23 8.37 +16 16 0.9
−4 12.57 +5 41.3
Ap. pl. = 14 18 55.80 16 21 42.2

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1882phae.proj..498.

Nov. 25 1886

{Asp. Place Reduction}

= Barnard 1886 IX

f = +2.203 ✓
G = 2^h 3.9 ✓
H = 1^h 36.7 ✓
log g = +1.2249 ✓
" h = +1.3038 ✓
" i = +0.5536 ✓

G = 2 3.9 ✓
l = 14 23.1 ✓
$G+l$ = 16 27.0 ✓

H = 1^h 36.7 ✓
l = 14 23.1 ✓
$H+l$ = 15 59.8 ✓

α = +16° 16 7 ✓

Log 1/15 = +8.8239 ✓
" g = +1.2249 ✓
" sin $G+l$ = -9.9632 ✓
" tan α = +9.4651 ✓
-0.300 ✓ = -9.4771 ✓

Log 1/15 = +8.8239 ✓
" h = +1.3038 ✓
" sin $H+l$ = -9.9373 ✓
" sec. α = +0.0177 ✓
-1.210 ✓ = -0.0827 ✓
-0.300 ✓
-1.510 ✓
+2.203 ✓
+0.693 = cor. in R.A. ✓

Log. g = +1.2249 ✓
" cos $G+l$ = -9.5963 ✓
-6.63 ✓ = -0.8212 ✓

Log. h = +1.3038 ✓
" cos $H+l$ = -9.6996 ✓
" sin α = +9.4474 ✓
-2.82 ✓ = -0.4508 ✓

" i = +0.5536 ✓
" cos. α = +9.9823 ✓
+3.44 ✓ = +0.5359 ✓
-9.45 ✓
-6.01 ✓ = cor. in Dec. ✓

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1882phae.proj..498.

Comet Barnard (Lee 5.126)

Aug. 14. 1884.

Star used in $2\frac{d}{11}$ series on this date.

Comp. * = Gould Gen. Cat. 23169. 7.8.

	17 0 7.93 ✓	−36 28 22.2 ✓ (1875.)
	+0 18.12	−0 23.3
Mid. Pl.	17 0 26.05	−36 28 45.5
	255° 6′ 30.″75	

Log. $\frac{11}{15}$ = 0.12606
" sin ℓ = −9.98516
" tan ℓ = −9.86888
+0.9553 = +9.98010

3.0712
+4.02657 = 0.60493
9 = 0.95424
36.24 = 1.55917

Log n = 1.30215
" cos ℓ = −9.40992
" 9 = 0.95424
−46.4 = −1.66631

* 1875.0 =	17h 0m 7.s93 ✓	−36° 28′ 22.″2 ✓
	+0 36.24 ✓	−0 46.4 ✓
* 1884.0 =	17 0 44.17 ✓	−36 29 8.6 ✓
	+3.77	−0.8
ap. Pl. * =	17 0 47.94 ✓	−36 29 9.4 ✓
	+9 23.75 ✓	−3 55.0
ap. Pl. ⊂ =	17 10 11.69 ✓	−36° 33′ 4.″4 ✓

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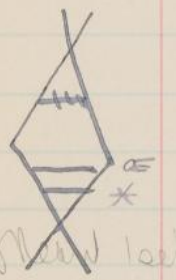
1882phae.proj..498.

Aug. 14. 1884. (See p. 210.)

(at 11 aerials on this date)

Comet Bernard.

	α≡		*a		α≡−*		
16	30	17.2 ✓	14	17.7 ✓			
	31	6.0 ✓	14	46.7 ✓			
	61	23.2″	37	4.4″	+24 18.8″	+12 9.40″	



Mean look = 18h 30 41.6 ✓

+2 42.1 = Chron. cor.

18 33 23.7 ✓

9 34 1.5 ✓

8 59 22.2 ✓

−1 28.4 ✓

8 57 53.8 ✓

4 44 31.0

13 42 24.8 = Gr. M. T. of obs.

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1882phae.proj..498.

$\Delta\varepsilon$ $\Delta\chi$ $\varepsilon - \chi$

48.8° 29.0° 19.8°

Log 19.80 = 1.29667
" 7.5 = 0.87506
" cos. χ = 9.90474
119.3' = 2.07647

~~596~~ = ~~+ 0~~ ~~596~~

+1 59.3'

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1882phae.proj..498.

210 (See p. 204) Comet Barnard. 1884 (b) II.

Aug. 14. 1884.

Comp. * a = Gould's Cat. Gen. 23113. (7.0)

	$16^h\ 57\ 18.49$ ✓	$-36^\circ\ 33\ 51.6$ ✓ (1875)
	$+0\ \ 18.12$	$-0\ \ 24.4$
Mid. Pl. =	$16\ \ 57\ \ 36.61$	$-36\ \ 34\ \ 16.0$
	$254^\circ\ 24'\ 9.''15$	

$\log \frac{n}{15}$ = +0.12606	$\log n$ = 1.30215
" $\sin \alpha$ = −9.98371	" $\cos \alpha$ = −9.42955
" $\tan \alpha$ = −9.87034	" ϱ = 0.95424
+0.9553 = +9.98011	48.52 = −1.68594
+3.0712	
+4.0265 = 0.60493	
ϱ = 0.95424	
36.24 = 1.55917	

(* 1875.0)	$16\ \ 57\ \ 18.49$ '	$-36^\circ\ 33\ \ 51.6$ "
	' $+0\ \ 36.24$	" $-0\ \ 48.5$
(* 1884.0)	$16\ \ 57\ \ 54.73$	$-36\ \ 34\ \ 40.1$
	$+0\ \ 3.77$	-0.8
ap. Pl. * =	$16\ \ 57\ \ 58.50$	$-36\ \ 34\ \ 40.9$
	$+12\ \ 9.40$	$+1\ \ 59.3$
ap. Pl. α =	$17\ \ 10\ \ 7.90$	$-36\ \ 32\ \ 41.6$

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1882phae.proj..498.

Comet Barnard (1884 b = II)

Aug 14, 1884 {ap. Place Reduction}

$f = +2.281'$ $\quad \mathfrak{G} = 2^h\ 2.8'$ $\quad \mathfrak{H} = 8^h\ 38.7'$

$\mathfrak{G} = 2^h\ 2.8'$ $\quad \alpha = 16\ 57.9'$ $\quad \mathfrak{H} + \alpha = 25\ 36.6'$

$\mathfrak{H} = 8^h\ 38.7'$ $\quad \mathfrak{G} + \alpha = 19\ 0.7'$

$\log g = +1.2380'$

$\log h = +1.2876'$ $\quad \delta = -36^\circ\ 34\ 40'$

$\log i = +0.8114'$

$\log \sin 15 = +8.8239'$

$\log \sin \mathfrak{G} + \alpha = -9.9845'$

$\log g = +1.2380'$

$\log \tan \delta = -9.8704'$

$+0.826' = +9.9168'$

$\log \sin 15 = +8.8239'$

$\log h = +1.2876'$

$\log \sin \mathfrak{H} + \alpha = +9.6118'$

$\log \sec \delta = +0.0953'$

$+0.659' = +9.8186'$

$+0.826'$

$+2.281'$

$+3.766' =$ cor. in R.A.

$\log g = +1.2380'$

$\log \cos \mathfrak{G} + \alpha = +9.4179'$

$+4.53' = +0.6559'$

$\log h = +1.2876'$

$\log \cos \mathfrak{H} + \alpha = +9.9602'$

$\log \sin \delta = -9.7752'$

$-10.55' = -1.0230'$

$\log i = +0.8114'$

$\log \cos \delta = +9.9047'$

$+5.20' = +0.7161'$

$+4.53'$

$+9.73'$

$-10.55'$

$-0.82' =$ cor. in Dec.

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1882phae.proj..498.

(See B. v. p. 130)

Comet Barnard 1884, b – II

Aug 16, 1884

Comp. * = Gould's South. Jones 17^h 1104 (8)

	17^h	16	17,78	− 36	20	20.9	(1875)
		+ 0	18.33		− 0	17.0	
Mid. Pl. =	17	16	36.11	− 36	20	37.9	
	259	9	1.65				

Log $\frac{m}{15}$	= +0.12606	Log m	= 1.30215
" sin Δ	= − 9.99217	" cos Δ	= −9.27469
" tan Δ	= −9.86673	" 9	= 0.95424
+0.9660	= +9.98496	− 34.0	= 1.53108
+3.0712	=		
+4.0372	= 0.60608		
9	= 0.95424		
+36.33	= 1.56032		

* 1875.0	17	16	17.78′	− 36	20	20.9′	
		-′ + 0	36.33		′ − 0	34.0	
* 1884.0	17	16	54.11	−36	20	54.9	
			+ 3.84			+ 1.0	
ap. Pl. * =	17	16	57.95	−36	20	55.9	
		+ 0	41.30			3 + 0	20.5
ap. Pl. ≏ =	17	17	39.25	−36	20	33.4	

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1882phae.proj...498.

Aug 16, 1884

Comet Barnard, 2

$f = +2.306'$ $\quad \mathfrak{G} = 2^h\ 1.6'$ $\quad \mathfrak{H} = 8^h\ 30.9'$

$\mathfrak{G} = 2^h\ 1.6'$ $\quad \lambda = \frac{17\ 16.9'}{19\ 18.5'}$ $\quad \lambda = \frac{17\ 16.9'}{25\ 47.8'}$

$\mathfrak{H} = 8^h\ 30.9'$

$\log g = +1.2416'$

$\log h = +1.2864'$ $\quad \beta = -36\ 20\ 55'$

$\log i = +0.8221'$

$\log 1/5 = +8.8239'$

$\log g = +1.2416'$

$\log g = +1.2416'$

$\log \sin \mathfrak{G}+\mathfrak{H} = -9.9740'$

$\log \tan \beta = \frac{-9.8668'}{+0.806' = +9.9063'}$

$\log \cos \mathfrak{G}+\mathfrak{H} = +9.5261'$

$+5.86' = +0.7677'$

$\log 1/5 = +8.8239'$

$\log h = +1.2864'$

$\log \sin \mathfrak{H}+\mathfrak{H} = +9.6563'$

$\log \sec \beta = +0.0940'$

$+0.726' = +9.8606'$

$+2.306'$

$+3.032'$

$+0.806'$

$+3.838' =$ cor. in R. A

$\log \cos \mathfrak{H}+\mathfrak{H} = +9.9501'$

$\log \sin \beta = \frac{-9.7728'}{-10.22' = -1.0093'}$

$\log i = +0.8221'$

$\log \cos \beta = +9.9060'$

$+5.35' = +0.7281'$

$+5.86'$

$+11.21'$

$-10.22'$

$+0.99' =$ cor. in Dec.

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{Sm. R. 5, p. 128}

Aug 15, 1884

Comet Barnard 1884 b

Comp. * = Gould's A. G. $17^h\ 9^m\ 50^s$ (9.) = *f

	17^h	14^m	6.15^s	$-36°$	$23'$	$12.6''$ (1875)
			$+0\ 18.08$			$-0\ 17.9$
Mid. Pl. =	17^h	14^m	24.23^s	$-36°$	$23'$	$30.5''$
	258	36	3.45			

Log. $\frac{u}{15}$ = 0.12606
" sin α = −9.99185
" tan δ = −9.86749
+0.9658 = +9.98490
+3.0712
+4.0370 = 0.60606
g = 0.95424
+36.33 = 1.56030

Log u = +1.30215
" cos δ = −9.29588
" g = +0.95424
−35.6 = −1.55227

(* 1875.0)	17^h	14^m	6.15^s	$-36°$	$23'$	$12.6''$
			$+0\ 36.33$			$-0\ 35.6$
(* 1884.0)	17^h	14^m	42.48^s	$-36°$	$23'$	$48.2''$
ap. Pc. cor. =			$+0\ 3,80$			$+0\ 0.1$
ap. Pl. * =	17^h	14^m	46.28^s	$-36°$	$23'$	$48.1''$
			$-1\ 41.18$			$+3\ 6.2$
ap. Pl. α =	17^h	13^m	5.10^s	$-36°$	$20'$	$54.3''$
						$+3.$

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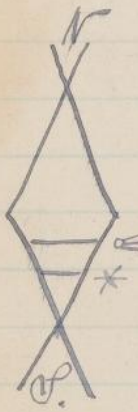
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Mar. 7 1883

(see p. 76)

Comet Curb



	1st mic	2nd mic.	3rd mic	*		
7h	40 8.5	40 9.9	40 11.0	41 14.4		
	40 55.0	40 56.9	40 58.4	41 22.9		
	81 3.5 ✓	81 6.8 ✓	81 9.4 ✓	82 37.3 ✓	1 33.8 ✓	1 30.5 ✓
	42 6.8	42 8.7	42 10.4	43 12.8		
	42 53.8	42 55.9	42 57.2	43 20.8		
	85 0.6 ✓	85 4.6 ✓	85 7.6 ✓	86 33.6 ✓	1 33.0 ✓	1 29.0 ✓
	44 32.0	44 33.4	44 34.6	45 37.7		
	45 18.1	45 20.3	45 22.2	45 45.6		
	89 50.1 ✓	89 53.7 ✓	89 56.8 ✓	91 23.3 ✓	1 33.2 ✓	1 29.6 ✓
	46 25.0	46 26.7	46 28.5	47 32.0		
	47 13.5	47 15.7	47 17.2	47 40.3		
	93 38.5 ✓	93 42.4 ✓	93 45.7 ✓	95 12.3 ✓	1 33.8 ✓	1 29.9 ✓
	49 19.2	49 21.4	49 23.2	50 26.1		
	50 7.7	50 10.2	50 11.8	50 35.3		
	99 26.9 ✓	99 31.6 ✓	99 35.0 ✓	101 1.4 ✓	1 34.5 ✓	1 29.8 ✓
	50 56.4	50 58.8	51 0.5	52 4.1		
	51 45.3	51 48.2	51 50.2	52 13.0		
	102 41.7 ✓	102 47.0 ✓	102 50.7 ✓	104 17.1 ✓	1 35.4 ✓	1 30.1 ✓
	57 29.7	57 31.0	57 32.3	58 35.8		
	58 17.8	58 20.4	58 21.8	58 45.0		
	115 47.5 ✓	115 51.4 ✓	115 54.1 ✓	117 20.8 ✓	1 33.8 ✓	1 29.4 ✓
					27.0	5.3
mean =	7h 47 40.6 ✓	47 42.7 ✓	47 44.2 ✓		- 1 33.86	- 1 29.76
					- 0 46.93 ✓	- 0 44.88 ✓

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1882phas.proj..498.

		Δ 1st mic.	Δ 2nd mic	Δ 3rd mic	Δ ✳	1st mic–✳	2nd mic–✳	3rd mic–✳
1	27.9	47.5	47.0	47.4	8.5	39.0 / ~~56.0~~	38.5 / ~~55.5~~	38.9 / ~~55.~~
1	26.0	47.0	47.2	46.8	8.0	39.0 / ~~55.0~~	39.2 / ~~55.2~~	38.8
1	26.5	46.1	46.9	47.6	7.9	38.2 / ~~54.0~~	39.0 / ~~54.8~~	39.7
1	26.6	48.5	49.0	48.7	8.3	40.2 / ~~56.8~~	40.7 / ~~57.3~~	40.4
1	26.4	48.5	48.8	48.6	9.2	39.8 / ~~57.7~~	39.6 / ~~58.0~~	39.4
1	26.4	48.9	49.4	49.7	8.9	40.9 / ~~57.8~~	40.5 / ~~58.3~~	40.8
1	26.7	48.1	49.4	49.5	9.2	38.9 / ~~57.3~~	40.2 / ~~58.6~~	40.3
	4.5	332.6	337.7	332.3	60.0	274.6 / 39.09 / ~~39.23~~	277.7 / 39.67	278.3 / 308.3 / 39.76 / ~~44.04~~
1	26.64	47.66	48.24	48.33	8.57			
0	43.32							

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2.18

Mar. 7, 1883
Comet Curtis

(Lea p. 761)

Log 3909 = 1.59362
" 7.5 = 0.87506
" cos δ = 9.98708
285.6 = 2.45576

142.8 = +2 22.8

−13 53 47.7

−13 51 24.9

Log. 39.67 = 1.59846
" 7.5 = 0.87506
" cos δ = 9.98708
288.8
302.4 = 2.48060
6

144.4 24.4
+2 31.2

−13 53 47.7

−13 51 16.5
23.3

Log 39.76 = 1.64385
" 7.5 = 0.87506
" cos δ = 9.98708
320.6 = 2.50599
160.3

+2 40.3

−13 53 47.7

−13 51 7.4

3909 = 1.59207
1.59362
0.87506
9.98718

285.7 = 2.45586
24.7 = 2.39131
+4 45.9 +4' 47.7

+4 48.9

1.59846
0.87506
9.98718

288.9 = 2.46070

39.76 = 1.59944
1.64385
0.87506
9.98719

= 2.50610
20.17
29.5 = 2.46170
+5 20.7 +4' 49.5

5 51 42.96
−0 46.33
1 3.86

5 50 39.10

6.03

−13 53 47.7
+4 48.9

13 49 2.0 = Asp. Pl. 1st mve.
−13 47 1.2

5 51 42.96
−0 46.33
1 29.76

5 50 3.20

4.04

−13 53 47.7
+4 48.9

13 48 58.8 = Asp. Pl. 2nd mve.
−13 47 7.0

5 51 42.96
−0 43.32
1 26.64

5 50 16.32

9.64

−13 53 47.7
+4 49.5
+5 20.7

13 48 27.0 = Asp. Pl. 3rd mve.
−13 47 46.4

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1882phae.proj..498.

Mean of Comet Times

7	47	40.6	7	47	42.7	7	47	44.2
	+1	34.1		+1	34.1		+1	34.1
7	49	14.7	7	49	16.8	7	49	18.3
23	0	13.8	23	0	13.8	23	0	13.8
8	49	0.9	8	49	3.0	8	49	4.5
	−1	26.7		−1	26.7		1	26.7
8	47	34.2	8	47	36.3	8	47	37.8
8	48	31.0	8	48	31.0	8	48	31.0
13	32	5.2	13	32	7.3	13	32	6.8

Gr. M. T.

Par. Comp. Mar. 7. 1883.

γ = 7 49.2

R.A. = 5 51.0

H.A. = +1 58.2

Dec. −13° 49'

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Comet Pons Brooks

Dec. 22 1883

Comp. * = Dm. +34° 4111 (7.2 K)

1

W 2 20h 1172 = 20 33 48.11 √ +34 46 25.9 √ (1825)

1 7.77 +6 0.2

Mid. Pl = 20 34 12.58 +34 52 26.1

308 33 8.70

log r/Δ = 0.12612 log r = 1.30221

" sin ℓ = -9.89322 " cos ℓ = +9.79465

" tan L = +9.84319 " 58 = 1.76343

-0.7287 = -9.86253 724.9 = 2.86029

+3.0707

+2.3420 = 0.36959

58 = 1.76343

135.84 = 2.13302

20 33 4.81 +34 46 25.9

+2 15.84 12 4.9

20 35 20.65 +34 58 30.8

+1.61 +28.1

Ap. Pl. * = 20 35 22.26 +34 58 58.9

" " Æ = +0 27.38 −1 48.8

20 35 49.64 +34 57 10.1

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