1882phae.proj...497.

KG
11365
496

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497..

KG-11365.496

Value of diagonal 46.0

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics - Provided by the NASA Astrophysics Data System

1882phae.proj..49

Obs. of Comet Crals Mar. 7. 1883.

1st Assistant.	2d " obs.	3d " obs.	☆
K0 4.5	K0 9.9	K0 11.0	K1 1K.K
K0 5.0	K0 6.9	K0 8.K	K1 2.9
21 3.5	21 6.2	21 9.K	22 37.3
K2 6.2	K2 8.7	K2 10.K	K3 12.8
K2 3.2	K2 5.9	K2 7.2	K3 20.2
25 0.6	25 2.6	25 7.6	26 33.6
KK 32.0	KK 33.K	KK 36.6	K5 37.7
K5 18.1	K5 20.3	K5 22.2	K5 K5.6
29 5.1	29 5.7	29 6.2	91 23.3
K6 25.0	K6 26.7	K6 28.5	K7 32.0
K7 13.5	K7 15.7	K7 17.2	K7 K0.3
93 3A.5	93 K2.K	93 K5.7	95 12.3
K9 19.2	K9 21.K	K9 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.K
50 56.K	50 5A.8	51 0.5	52 K.1
51 K5.3	51 K8.2	51 50.2	52 13.0
102 K1.7	102 K7.0	102 50.7	10K 17.1
57 29.7	57 31.0	57 32.3	58 35.8
58 17.8	58 20.K	58 21.8	58 K5.0
115 K7.5	115 51.K	115 55.K	117 20.8

1 33.8	1 30.5	1 27.9
1 33.0	1 29.0	1 26.0
1 33.2	1 29.6	1 26.5
1 33.8	1 29.9	1 26.6
1 3K.5	1 29.8	1 26.K
1 3 5.K	1 30.1	1 26.K
1 33.3	1 29.K	1 26.7
27.0	208.3	126.5
1 33.865	1 29.76	1 26.64
−0 K6.93	−0 K4.88	−0 43.32

K6.5	K7.0	K7.K
K7.0	K7.2	K6.8
K6.1	K6.9	K7.6
K8.5	K9.0	K8.7
K8.5	K8.8	K8.6
K8.9	K9.0	K9.7
K8.1	K9.K	K9.5

38.0	38.5	38.9	8.5
39.0	39.2	38.8	8.0
38.2	39.0	39.7	7.9
40.2	40.7	40.K	8.3
39.3	39.6	39.K	9.2
40.0	40.5	40.8	8.9
38.9	41.2	40.3	9.2
1273.6	277.7	278.3	
39.09	39.67	39.76	

Log 39.09 = 1.5920 7
" 7.5 = 0.8758 06
" cos δ = 9.9872 5
228.7 = 2.K58 38 = K' KK7

Log. 39.67 = 1.599 886
" 7.5 = 0.8758 06
" cos δ = 9.9872 5
228.9 = 2.K6 077 = K KA9

Log. 39.76 = 1.599 K5
" 7.5 = 0.8758 06
" cos δ = 9.9872 5
229.6 = 2.K6 176 = K 49.6

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

KG 11365.496

HARVARD
UNIVERSITY
LIBRARY
MAY 8 1956

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Tolls. 1st series. (1327 mean) Ferd.

Mar. 19. 1882.



Comet	Star	E − *		E − * / 2	
11 33 7.0	11 31 38.0				
33 53.9	32 21.2				
67 0.9	63 59.2	+3	1.7	+1	30.85
36 20.5	34 50.9				
37 6.0	36 33.8				
73 26.5	70 24.7	+3	1.8	+1	30.90
39 29.3	37 39.5				
40 14.3	38 42.1	+3	3.0	+1	31.50
79 43.6	76 21.6	+3	22.0	+1	41.00
43 12.2	41 49.0				
43 58.7	42 25.0				
87 10.9	84 14.0	+3	2.9	+1	31.45
47 50.9	46 21.7				
48 36.7	47 2.8				
96 27.6	93 24.5	+3	3.1	+1	31.55
403 49.5			155.75		45.75
			31.150		
40 22.9					33.45
					31.25

mean of times = 11 40 23.0

23 47 32.4

11 52 0.6

−1 +6.2

(N. R.) 11 50 53.8 Cor. (uncorrected.)

+1 9.9 Chr. Cor.

11 52 3.7

11 40 23.0

+1 9.9 Chr. Cor.

11 41 32.9

23 47 29.9

11 53 3.0

−1 +6.2

11 51 6.2 C. M. T.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

	1 $\Delta\alpha$	2 $\Delta\delta$	Col. 1 − Col. 2
1			
0	46.9	33.8	13.1
0	46.5	32.9	13.6
0	46.0	32.6 42.6	13.4 107.6
0	46.5	42.0	4.5 88.0
0	45.8	41.1	4.7 86.9
			17.9
	3^m 49.7	231.8	0^m 358
	0^m 45.94	0^m 46.36	18.9
		211.8	3.7
		0^m 42.36	

Log. 3.58 = 0.55388 (7)
" 7.5 = 0.87506 (7)
" cos. δ = 9.92140
23.7 = 1.3739

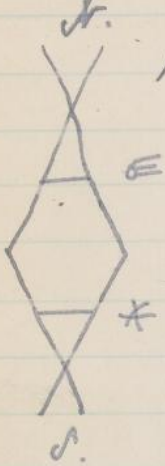
3.58 = 0.55388 (7)
7.5 = 0.87506 (7)
cos. δ = 9.92140
23.7 = 1.37407

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Stella. 2d series (Ford.) (1327 used)

Aug. 19. 1882.



	Comet.		Star.					
16h	18m	26.0	16h	15m	53.2			
	18	37.5		16	27.1			
	37	2.5		32	20.3	4	42.2	21.10
	22	26.2		19	53.6			
	22	36.0		20	26.1			
	45	22		60	20.7	4	41.5	20.75
	30	48.2		29	0.0			
	31	28.6		29	35.5			
	62	16.7		64	35.5	3	41.2	70.60
	36	14.7		34	23.0			
	36	67.8		35	2.0			
	73	6.5		69	25.0	3	41.5	70.75
	39	39.0		37	45.9			
	40	14.4		38	24.9			
	79	53.4		76	10.8	3	42.6	79.30
	42	44.5		40	50.9			
	43	19.6		41	30.3			
	86	4.1		82	21.2	3	42.9	71.45
	45	35.6		44	0.4			
	46	29.82		44	40.0			
	92	25.8		88	40.8	3	45.0	72.60
	52	35.0		50	40.5		44.8	
	53	9.6		51	18.5			
	105	44.6		101	59.0	3	45.6	72.80
	56	26.6		54	31.9			
	57	0.5		55	9.8			
	113	27.1		109	41.7	3	45.4	72.70
16	59	34.2		57	38.9			
17	0	7.6	16	68	16.9			
	119	41.8		115	55.8	3	46.0	73.00

3.7

814 — 438

729 — 219.0

40 — 44.2

mean & auto = 45 — 47.4 N.R.

19 — 38.95

1 — 51.82

414.60

12 45 5.95

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Δ ☉	Δ ☽	☉ + ☽
~~12.5'~~	~~33.9'~~	~~46.4'~~ (1)
~~9.8'~~	~~29.5'~~	~~39.3'~~ (2)
40.3'	35.5'	75.8'
37.1'	39.0'	76.1'
35.4'	39.0'	74.4'
35.1'	39.4'	74.5'
~~34.8'~~ ~~35.X'~~ 33.6'	39.6'	73.2'
34.6'	38.0'	72.6'
~~33.9~~ ~~34.9'~~	37.9'	71.8'
33.4'	~~38.0~~	71.4'
~~306.3~~ ~~30.68~~ ~~305.1~~ ~~30.51~~ 283.4'	~~369.8~~ ~~36.98~~ 306.4'	~~675.4~~ ~~67.54~~ 589.7'
= 35.42'	= 38.30'	= 73.71'

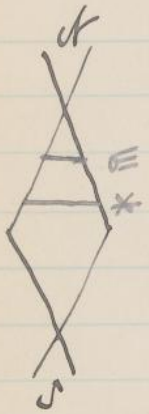
Log 73.71 = 1.86753
" 7.5 = 0.87506
" cos. δ = 9.92140
461.3 = 2.66399
AG.0
426.7 = +7' 4.7

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Brooks. (~~1881 I~~) (~~Prod. 1327~~)
Mar. 22. 1882. (2nd series)

(Prod. 1327.)



Comet.	Star.		
16h 52m 34.5s	16h 52m 10.2		
52 56.5	52 48.7		
105 31.0	104 53.9	37.1	18.55
53 54.5	53 29.8		
54 16.4	54 3.2		
108 10.9	107 33.0	37.9	18.95
55 11.1	54 46.4		
55 32.2	55 20.0		
110 53.3	110 6.4	36.9	18.45
57 13.0	56 47.4		
57 32.8	57 20.4		
11K 45.8	11K 7.8	38.0	19.00 ~~19.50~~
58 17.1	57 51.2		
58 46.6	58 34.2		
117 3.7	116 25.4	38.3	19.15
16 59 36.2	16 59 10.3		
17 0 6.0	16 59 53.4		
119 42.2	119 3.7	38.5	19.25
			113.35
			+ 18.89
675 56.9			

Mean Diff = 56.9 / 19.7 R.A.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.prdj..497.

		e − x
22.0	33.5	11.5 ~~55.5~~
21.9	33.4	11.5 ~~55.3~~
21.1	33.6	12.5 ~~54.7~~
19.8	33.0	13.2 ~~52.8~~
29.5	43.0 ~~43.0~~	13.5 ~~72.5~~
29.8	43.1	13.3 ~~72.9~~
144.1	219.6	75.5
24.02	36.60	12.58

Log 12.58 = 1.09968
7.5 = 0.87506

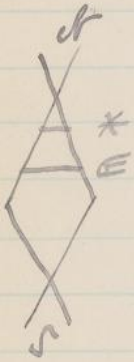
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

8 This cannot prop. be used from deflection sheet.

Comet Wells. (~~2nd Series~~)

(Prod. 1327) Comet. ✓ Mar. 22. 1882 (1st Series) Star.



Comet.	Star.		
1 29.5	1 57.9		
2 30.7	2 5.6		
1 0.2 ✓	1 3.5 ✓	−3.3 ✓	−1.65 ✓
3 1.2	3 30.2		
4 2.8	3 37.9		
1 4.0 ✓	1 4.1 ✓	−4.1 ✓	−2.05 ✓
4 33.4	5 1.1		
5 34.1	5 9.1		
10 7.5 ✓	10 10.2 ✓	−2.7 ✓	−1.35 ✓
6 8.1	6 36.0 ~~8 10.3~~ 6 44.2 ~~8 19.0~~		
7 8.9			
13 17.0 ✓	13 20.2 ✓	−3.2 ✓	−1.60 ✓
7 42.6	8 10.3		
8 43.8	8 19.0		
16 26.4 ✓	16 29.3 ✓	−2.9 ✓	−1.45 ✓
9 23.1	9 50.9		
10 24.0	9 59.0		
19 47.1 ✓	19 49.9 ✓	−2.8 ✓	−1.40 ✓
			9.150
70° 42.2' .7			−1.58' .7

Mean Corr.= 5 53.5 .7 A.R.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.prgj..497.

Δδ		Δ*	E − *
1	1.2	7.7	53.5 ~~8.9~~
1	1.6	7.7	53.9 ~~9.8~~
1	0.7	8.0	52.7 ~~8.7~~
~~1~~	~~0.8~~		
1	0.8	8.2	52.6 ~~9.8~~
~~1~~	~~1.2~~		
1	1.2	8.7	52.5 ~~9.9~~
1	0.9	8.1	52.8 ~~9.0~~
6	6.4'	48.4'	317.7 ~~52.95~~
1	1.07'	0m 8.07'	0m 53.00

Log 53.00 = 1.72428

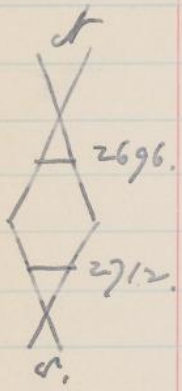
7.5 = 0.87506

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Transits of Stars.

Mar. 23. 1882.



V	* − V	E − *	E − * / 2
+57° 2696	+57° 2712.		
2 1.5	8 6.2		
2 57.5	8 57.3		
4 59.0	17 3.5	12m 04.5	6m 2.25
10 31.5	16 33.2		
11 26.0	17 27.5		
21 56.5	34 0.7	12 4.2	6m 2.10
18 28.7	24 29.1		
19 20.8	25 25.1		
37 49.5	49 54.2	12m 4.7	6m 2.35
			18 6.70
			6 2.23
64 45.0			

Mean date = 10 47.5 N.R.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ ☉	Δ ☽	☉ + ☽
56.0 ′	51.1 ′	107.1 ′
53.5 ′	54.3 ′	107.8 ′
52.1 ′	56.0 ′	108.1 ′
161.6 ′	161.4 ′	323.0
53.87 ′	53.81	m a 107.67 ′

Log 107.67 = 2.03210 ′

" 7.5 = 0.87506 ′

" cos. δ = 9.58285

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

12 2696 = ☌ in Reductions

Transits of Mars.

Mar. 24. 1882.



	V		V		☌ − ✱		☌ − ✱ (2)	
	+57° 2696		+57° 2712.					
	14	26.0						
	~~18~~	~~33.2~~						
	14	33.2						
0 hr.	13	53.4	0 hr.	19	33.2			
	14	26.0		20	47.5			
	24	19.4		40	20.7	12 m	1.3	6 m 0.6
	29	36.0		35	26.8			
	30	17.8		36	32.2			
	9	3.8		71	9.0	12 m	5.2	6 m 2.60
	37	16.8		43	5.0			
	37	56.0		44	12.8			
	7	12.8		87	17.8	12 m	5.0	6 m 2.50
	44	51.0		30	38.0			
	45	28.2		51	46.0			
	90	19.2		102	24.0	12 m	4.8	6 m 2.40
	53	3.3		58	49.0			
	53	39.5	1 hr.	0	0.0			
	106	42.8		108	49.0	12 m	6.2	6 m 3.10
1 hr.	0	48.2		6	38.2			
	1	22.1		7	44.7			
	122	10.3		134	17.9	12 m	5.6	6 m 2.80
	8	34.0		14	14.1			
	9	5.1		15	30.2			
	137	39.1		149	44.3	12 m	5.2	6 m 2.60
								~~42 16.85~~
								−42 17.1
								−6 2.4

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

1 α	1 *	2696+2712
32.6	1m 14.3	1m 46.9
41.8	1m 5.4	1m 47.2
39.2	1m 7.8	1m 47.0
37.2	1m 8.0	1m 48.2
36.2	1m 11.0	1m 47.2
33.9	1m 14.5	1m 48.4
31.1	1m 16.1	1m 47.2
252.0	127.16	329.1
36.00	18.16	47.01

mean = 1m 18.16

log 107.01 = 2.02942
7.5 = 0.87506

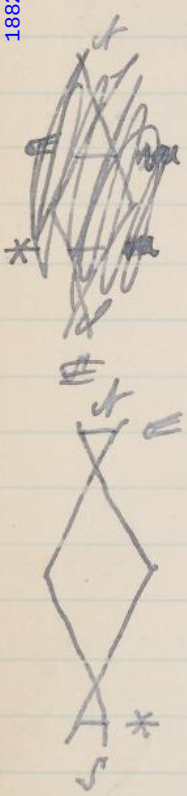
John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Wells

March 25th 1882

(Frock 1327)



Comet.		Star.			
12h	8m 17.0	12h	8m 40.6		
	8 25.2		8 47.9		
	16 42.2		17 28.4	46.2	23.10
	9 16.9		9 40.0		
	9 24.5		9 47.2		
	18 41.4		19 27.2	45.8	22.90
	10 15.1		10 38.2		
	10 23.2		10 46.1		
	20 38.3		21 24.3	46.0	23.0
	11 25.2		11 48.0		
	11 33.6		11 55.5		
	22 58.8		23 43.5	44.7	22.35
	12 28.5		12 67.0		
	12 36.9		12 58.9		
	25 5.4		25 49.9	-44.5	-22.25
	13 29.0		13 52.0		
	13 37.9		14 0.0		
	27 6.9		27 52.0	-46.1	-22.55
	14 29.3		14 52.0		
	14 38.0		15 0.0		
	29 7.3		29 52.0	-44.7	-22.35
	15 30.9		15 52.1		
	15 39.5		16 1.0		
	31 10.4		31 53.1	-42.7	-21.35
	16 55.0		17 18.1		
	17 4.1		17 26.0		
	33 59.1		34 44.1	-45.0	-22.60
	17 53.9		18 17.0		
	18 3.6		18 25.4		
	35 57.5		36 42.4	-44.9	-22.45

Mean 10 sets 12h 13m 4.4 M.R.

225.30 ÷ 10 = 22.53

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Δ ☾	Δ ☀	☾ + ☀
8.2	7.4	15.6
7.6	7.2	14.8
8.1	7.9	16.0
8.4	7.5	15.9
8.4	7.9	16.3
8.9	8.0	16.9
8.7	8.0	16.7
8.6	7.9	16.5
9.1	7.9	17.0
9.7	8.4	18.1
85.7	78.1	163.8
m 8.57	m 7.81	m 16.38

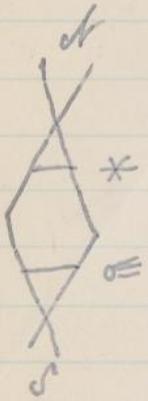
Log 16.38 = 1.21431
" 7.5 = 0.87506
" cos. δ = 9.77412

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Brooks.

Mar. 24. 1882



Comet.		Star.					
0h	~~13m 53.4~~	0h	~~20m 47.6~~				
	~~19 33.2~~		~~20 49.0~~				
	~~33 26.6~~		~~41 36.6~~		~~8 10.0~~		~~4 5.00~~
	~~21 59.8~~		~~27 52.3~~				
	~~22 43.2~~		~~28 56.7~~		-12 6.0	-6m	3.00
	~~27 52.3~~		~~28 56.8~~		~~5 56.3~~		~~2 58.15~~
	~~44 43.0~~		~~56 49.0~~				
	29 36.0		35 26.7				
	30 17.8		36 32.2				
	59 53.8		71 58.9	-12	5.1	-6	2.55
	37 16.8		43 5.0				
	37 56.0		44 12.2				
	25 12.8		87 17.7	-12	4.9	-6	2.45
	48 51.0		50 38.0				
	46 28.3		51 47.0			-6	2.65
	910 19.3		102 25.0	-12	5.7	~~5 7.85~~	
	53 3.5		58 49.0				
0h	53 39.8	1h	0 0.1				
	106 43.3		~~118~~ 49.1	-12	5.8	-6	2.90 ~~7.90~~
1	0 48.2		6 31.2				
	1 22.2		7 44.7				
	122 ~~20.4~~ 10.4		134 ~~25.9~~ 15.9	-12	5.5	-6	2.75
1	8 34.0		14 14.1				
	9 5.1		15 30.2				
	137 39.1		149 44.3	-12	5.2	-6	2.60

~~0h 42m 16.30~~

~~53 3m 22.7~~

Mean pairs 0h 45m 28.7 J.R.

~~41 69.25~~

~~5m 18.66~~

~~42m 24.10~~

~~6m 3.44~~

19.1.0

-6m 2.73

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Δ α	Δ δ	α + δ
~~5 39.8~~	~~0 2.0~~	~~5 41.8~~
~~0 43.4~~	~~1 4.4~~	~~1m 47.8~~
~~4 49.1~~	~~1 1.8~~	~~5 50.9~~
0 41.8	1 5.5	1m 47.3
0 39.2	1 7.7	1m 46.9
~~0 37.3~~ ~~22.7~~	1 9.0	1m ~~46.3~~ ~~31.7~~
0 36.3	1 11.1	1m 47.4
0 34.0	1 13.5	1m 47.5
0 31.1	1 16.1	1m 47.2
~~4 294.0~~	~~66.7~~	~~360.7~~
~~4 44.92~~	~~1.84~~	330.4
		1m 47.20

Log 107.20 = 2.03019

" 7.5 = 0.87506

"

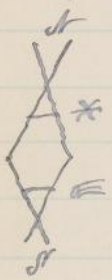
1882phae.proj..497.

Comet Brooks.

See Red. B. 2. p. 102

Mar. 28. 1882.

(Prod 132)



Comet.		Star.					
0h 2	1.0	0h 0	56.7				
2	38.0	1	28.8		43.5	1	21.75
5	28.0	2	24.5	2	43.5	1	3.75
5	24.0	4	15.2			1	6.75
6	2.8	4	37.9				
11	26.5	8	42.1	2	44.7	1	22.35
9	8.4	7	49.0	2	38.7	1	69.3
9	47.9	8	23.0				
18	56.3	16	25.0		44.3		22.15
11	38.9	10	29.2	2	28.3	1	4.15
12	18.9	10	53.9				
23	57.8	21	13.1	2	44.7	1	22.35
14	5.2	12	49.0				
14	48.5	13	29.1		29.9		
28	57.7	26	38.1	2	45.6	1	22.80
16	28.5	15	49.1				
17	16.0	15	48.6				
33	39.5	30	57.7	2	46.8	1	23.40
						1	26.40
19	1.5	17	42.2				
19	42.8	18	16.2				
38	44.3	35	57.4	2	46.9	1	23.45
21	36.0	20	16.0				
22	17.8	20	51.4				
43	53.8	41	37.9	2	46.4	1	23.20
24	6.2	22	45.1				
24	47.0	23	20.8				
48	52.2	46	5.9	2	46.3	1	23.15
26	38.7	25	17.1				
27	20.1	25	53.0				
53	57.8	51	10.1	2	47.1	1	23.85
29	24.2	28	4.0				
30	8.1	28	40.4				
57	32.3	56	44.4	2	47.9	1	23.95
							23.90
							23 2.9
						+	29.90
							1m 21.17

Mean Nats 0h 16m 42.8s A.R.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ E	Δ *	E **
38.0	33.1	71.1
38.8	33.7	72.5
39.5	~~40.0~~ 34.0	~~79.5~~ 73.
40.0	~~35.7~~ 34.7	74.7
~~45.3~~ 39.3	~~34.1~~ 35.1	~~78.4~~ 74.4
~~41.5~~ 42.	~~40.5~~ 34.	82.0 77.0
41.3	35.0	76.3
41.8	36.4	77.2
41.8	35.7	77.5
~~41.4~~ ~~42.4~~	35.9	78.3
43.9	36.4	80.3
~~454.3~~	~~390.5~~	~~843.8~~
~~41.30~~	~~35.48~~	~~76.71~~
~~449.3~~		11 | 32.8
~~4975~~		76.71

7.71 = 1.8791
7. = 0.87506
cos δ = 9.89279
2 \| 36 = 2.64700
22.1 = -3' 41.8
+3 37 27.1
Mid Dec. = +3 33 47.3

1.8791
0.87506
9.89316
444.0 = 2.6437
46.0
42.0 = -7' 22.0

(11 sets)

log 76.71 = 1.8845
" 7. = 0.87506
" cos δ = 9.79638

1882phae.proj..497.

Comet Wells (Continued)

Mar. 28. 1882.

(Frod 1327)



Comet.	Star.				
0h 31 59.1	0h 30m 38.1				
32 42.6	31 15.1				
64 41.7c	61 53.2c	2	48.5	1	24.25
36 18.0	33 56.8				
36 1.1	34 33.2				
71 19.1c	68 30.0c	2	49.1 / 48.1	1	24.50
38 24.9	37 3.1				
39 8.9	37 40.4				
77 33.8c	74 43.5c	2	50.3	1	25.15
41 8.7	39 47.8				
41 53.7	40 25.1				
83 2.4c	80 12.9c	2	49.5 / 39.5	1	24.75 / 19.75
43 56.6	42 35.8				
44 42.3	43 13.3				
88 38.9c	85 49.1c	2	49.8	1	24.90
	45 18.0				
	45 55.9				
47 42.5	46 20.8				
48 28.4	46 59.0				
96 10.9c	93 19.8c	2 / 3	51.1 / 2.1	1	25.55 / 1.05
50 18.1	48 56.4				
51 4.3	49 34.5				
101 22.4c	98 30.9c	2	51.5 / 52.5	1	25.75 / 26.25
53 17.0	51 38.3				
54 4.6	52 34.1				
107 21.6c	104 29.4c	2	52.2 / 42.2	1	26.10 / 21.1
55 55.6	54 34.0				
56 43.0	55 12.9				
112 38.6c	109 46.9c	2	51.7	1	25.85
58 44.8	57 23.1				
59 32.9	58 2.1				
118 17.7c	115 25.2c	2	52.5	1	26.75 / 26.2
					253.10
Mean 10 sets 0h 46m 3.4	0c A.R.			+1	25.31

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Δ ∈	Δ ☀	∈ + ☀
43.5'	47.0'	90.5'
43.1'	36.4'	79.5'
44.0'	37.3'	81.3'
45.0'	37.3'	82.3'
45.7'	37.5'	83.2'
45.9'	38.2'	84.1'
46.2'	38.1'	84.3'
47.6'	38.8'	86.4'
47.4'	38.9'	86.3'
48.1'	39.0'	87.1'
456.5'	378.5'	835.0'
45.65'	37.85'	83.50'

log 83.50 = 1.92169
7.5 = 0.87506

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Wells

Mar. 29. 1882

Prod. 1327



Comet.	Star.		
12h 2 39.2	12h 2m 22.2		
3 28.7	3 11.2		
6 7.9	5 33.4	34.5	17.25
4 25.6	4 9.1		
5 16.1	4 57.8		
9 41.7	9 6.9	34.8	17.40
6 10.9	5 53.9		
7 1.2	6 43.6		
13 12.1	12 37.5	34.6	17.30
7 50.1	7 32.9		
8 40.7	8 22.9		
16 30.8	15 55.8	35.0	17.50
9 35.2	9 18.5		
10 27.1	10 9.2		
20 2.3	19 27.7	34.6	17.30
11 13.3	10 56.0		
12 4.0	11 45.7		
23 17.3	22 41.7	35.6	17.80
13 1.2	12 44.1		
13 53.2	13 34.5		
26 54.4	26 18.6	35.8	17.95 ~~17.40~~
14 41.1	14 23.8		
15 33.5	15 14.0		
30 14.6	29 37.8	36.8	18.40
16 21.9	16 3.9		
17 13.6	16 54.6		
33 35.6	32 58.6	37.0	18.50
18 48.5	18 ~~31.0~~ 31.0		
19 41.2	19 22.1	36.6	18.30
38 29.7	37 53.01	~~36.7~~	~~18.35~~
			177.70
~~12h 21m 46.6~~		4 m	17.77

Mean 10 obs 12h. 10m 57.3 J.R.

1882phae.proj..497.

A E	A *	E + *
49.5'	49.0'	98.5'
50.5'	48.7'	99.2'
50.3'	49.7'	100.0'
50.6'	50.0'	100.6'
51.9'	50.7'	102.6'
50.7'	~~49.7~~ 49.7'	100.4'
52.0'	50.4'	102.4'
52.4'	50.2'	102.6'
51.7'	50.7'	102.4'
52.7'	51.1'	103.8'
		1012.5"
		101.25'

Log 101.25 = 2.00540"
" 7.5 = 0.87506"
" cos. δ = 9.88840

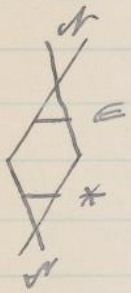
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Wells.

March 31. 1882

Prod. 132



Comet		Star						
12h 16	44.0	12h 15	30.8					
17	20.1	16	31.0					
34	4.1	32	1.8	2	2.3	1	1.15	
					~~2.3~~			
19	25.5	18	11.1					
20	0.3	19	11.9					
39	25.8	37	23.0	2	2.8	1	1.40	
21	54.0	20	34.0					
22	23.2	21	39.7					
44	17.2	42	13.7	2	3.5	1	1.75	
24	26.9	23	6.1					
24	54.2	24	12.0					
49	21.1	47	18.1	2	3.0	1	1.50	
26	52.0	25	35.8					
27	24.0	26	36.9					
54	16.0	52	12.7	2	3.3	1	1.65	
29	21.6	28	2.2					
29	50.1	29	5.9					
59	11.7	57	8.1	2	3.6	1	1.80	
31	46.1	30	25.0					
32	13.2	31	29.8					
63	59.3	61	64.8	2	4.5	1	2.25	
							11.50	
						+1m	1.64	

Mean 7 sets 12h 24m 36.8s J. R

+1 15.5

12 25 52.3

0 35 48.5

11 50 3.8

1 56.8

11 48 7.5

4 44 31

16 32 39. = G. M. T. (corrected)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Δ δ	Δ α	≡ + α
36.1″	0.2ˢ	36.3″
34.8″	0.8ˢ	35.6″
29.2″	5.7ˢ	34.9″
27.3″	6.9ˢ	34.2″
32.0″	1.1ˢ	33.1″
28.5″	3.7ˢ	32.2″
27.1″	4.8ˢ	31.9″

7 | 215.0 | 7 | 23.2 | 238.2″
30.71 | 3.31 | 34.03″

Log 94.03 = 1.97327″
" 7.5 = 0.87506″
" cos δ = 9.88107″
536.3″ = 2.72940″

886.0″
2(349.7″ = 174.8″ = +2 54.8″
+40 30 5.2
+48 33 0.0″

1.97327″
0.87506″
8.72
9.88
466.8 = 2.66917
535.9″ = 2.72905″

886.0″
350.1″ = +5 50.1″

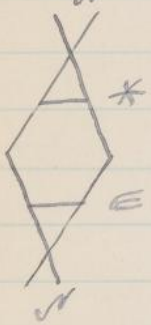
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Tolls.

Appr. & Star.

(Prod. 1327)



	Comet.	Star.		
N	13h 33 32.5	13h 33 22.7		
	34 22.5	34 16.9		
	67 55.0	67 39.6	15.4'	7.70'
	~~35 54.6~~	34 54.2		
	~~3~~	3.9		
	~~35 54.5~~	~~35 54.5~~		
	35 3.9			
	~~35 48.5~~	34 54.2		
		35 48.5		
	35 54.6	~~35~~ 3.9		
	70 58.4	70 42.7	15.7'	7.85'
	36 34.1	36 24.3		
	37 25.9	37 19.1		
	74 0.0	73 43.4	16.6'	8.30'
	38 7.5	37 57.5		
	38 59.1	38 52.3		
	77 6.6	76 49.8	16.8'	8.40'
	41 41.2	41 31.5		
	42 34.0	42 26.8		
	83 15.2	83 58.3	16.9'	8.45'
	43 25.6	43 15.9		
	44 18.5	44 10.9		
	87 44.1	87 26.8	18.3'	9.15'
				49.85'
			+ 0m	8.31'

Mean beats = 13h. 38min 29.9 7c N.R.
+1 19.9 7

13 39 49.8c
1 7 20.9 7

12 32 28.9c
2 3.3 7

12 30 25.6c
4 44 31.0

17 14 56.6c = Gr. Mn. T. (cor.)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ E	Δ *	E + *
50.0'	54.2'	104.2'
50.6'	54.3'	104.9'
51.8'	54.8'	106.6'
51.6'		
~~52.6'~~	54.8'	106.4'
52.8'	55.3'	108.1'
52.9'	55.0	107.9'
		638.1'
		106.35'

$-2\ 49.4$

$+46\ 42\ 8.4$

$+46\ 39\ 19.0$

Log 106.35 = 2,02673'

" 7.5 = 0.87506'

" cor = 9.83689'

547.1' = 2.73808'

886.0

338.9'

169.4' = −2 49.4'

2.02673'

0.87506'

9.83657'

547.5' = 2.73836

886.0

338.5' = −5 38.5'

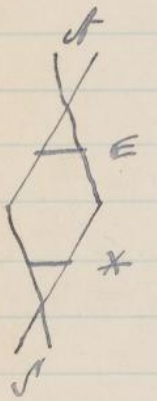
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Wells

April 18. 1882.

(17 rod 1327)



Comet.	Star.		
13h 32m 52.2	13h 32m 46.0		
33 58.0	33 57.6		
66 58.2	66 37.6	12.6	6.30
34 47.0	34 37.1		
(?) 45 48.1	35 43.9		
70 35.1	70 21.0		
36 34.8	36 24.6	14.0	7.00
37 35.6	37 32.0		
73 10.4	73 56.6	13.8	6.90
38 27.2	38 15.9		
39 26.5	39 23.5		
77 53.7	77 39.4	14.3	7.15
40 15.8	40 3.1		
41 13.2	41 10.0		
81 29.0	81 13.1	15.9	7.95
~~43 32.5~~	~~43 11.1~~		
44 11.0	43 57.2		
45 7.9	45 4.2		
89 18.9	89 1.4	17.5	8.75
45 52.3	45 37.3		
46 47.6	46 44.5		9.0 ~~9.55~~
92 39.9	92 21.8	18.1	
47 39.3	47 23.2		
48 31.1	48 30.2		
96 10.4	95 53.4	19.0	8.50
49 57.1	49 34.1		
50 43.3	50 40.1		
100 34.4	100 14.2	20.2	10.10
51 36.0	51 19.1		
52 28.1	52 26.0		
104 4.1	103 45.1	19.0	9.50
			81.70

13 42 41.4
+1 23.7
13 44 5.1
1 46 46.5
11 57 18.6
1 57.5
11 55 21.1
4 44 31.0
16 39 52.1 =
Syn. M. T. (Cor.)

Mean 18 pairs = 13h 42m ~~38.3~~ 41.4 M.R.

+ 0 - 8.170

1882phae.proj..497.

Co2. Reduction

Δ α	Δ δ	Ξ + δ
1 ~~46.8~~	1 5.6	2m ~~11.4~~ 10.4
1 1.1	1 6.8	2m 7.9
1 0.8	1 7.4	2m 8.2
0 59.3	1 7.6	2m 6.9
0 57.4	1 6.9	2m 4.3
0 56.9	1 7.0	2m 3.9
0 55.3	1 7.2	2m 2.5
0 51.8	1 ~~7.0~~	1m 58.8
0 52.2	1 6.0	1m 58.2
0 52.1	1 6.9	1m 59.0
		40.1
		2m 40.1

Log. 124.01 = 2.093946
" 7.5 = 0.875066
" Cos α = 9.755321
= 2.724173

526.9
886.0
2(359.1)
179.6 = +2 59.6

+55 29 34.8
+55° 32 34.4

+2 59.6

2.093946
0.875066
9.755265
2.724119

526.2
886.0
359.8 = +5 59.8

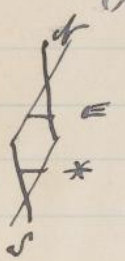
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Wells.

April 20. 1882.

(Prod. 1327)



Comet	Star			
14h 50m 22s.2	14h 52m 4s.8			
50 37.1	52 21.0			
100 59.3	104 25.8	− 3	26.5	− 1 43.25
~~52 37.0~~				
~~53 10.5~~				
54 25.6	56 6.3			
54 38.3	56 21.9	− 3	24.3	− 1 42.15
109 3.9	112 28.2	~~− 6~~	~~35.7~~	~~− 3 17.85~~
56 43.0	58 22.3			
56 53.2	58 38.0	− 3	24.1	− 1 42.05
113 36.2	117 0.3	~~− 3~~	~~24.1~~	~~− 1 47.05~~
14h 59 15.5	15h 0 59.0			
14h 59 27.1	15h 1 9.2			
118 42.6	120 4.2	− 3	21.6	− 1 40.80
6 29.0	8 8.8			
6 40.0	8 18.8			
~~13~~ 9.0	16 27.6	− 3	18.6	− 1 39.30
13 3	136			
				207.55
				− 1 41.510

Mean of pts 14h 57m 33.1s R.A.
+1 24.6

14 58 57.7 =
1 54 39.6
13 4 18.1
2 8.57
13 2 9.6
4 44 31
17 46 41 = G. M. T. (~~Cor.~~)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ α	Δ δ	α + δ
14.9	16.2	31.1
12.7	15.6	28.3
10.2	15.7	25.9
11.6	14.2	25.8
11.0	10.0	21.0
		132.1
		26.42

Log 26.42 = 1.42193
" 7.5 = 0.87506
" cos. δ = 9.73119
106.7 = 2.02818

1.42193
0.87506
9.72991
106.4 = 2.02690

886.0
2 | 779.3 = 389.6 = +6 29.6

106.4
886.0
779.6 = 7 12 52.6

+57 25 6.8
+57° 31 36.4

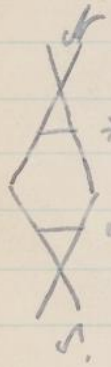
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Wells.

April 25. 1882

(Prod. 1327)



Comet.	Star.			
$13^h\ 48^m\ 19.^s0$	$13^h\ 51^m\ 29.^s6$			
48 58.2	52 36.0	−6	48.4	− 3 24.20
97 17.2	104 5.6			
53 27.0	56 34.5			
54 8.1	57 44.0	6	47.4	− 3 22.20
107 35.1	114 18.5	3	7.6	− 1 33.80
				−5 56.00
				−3 23.20
204 52.3				

Mean Dec. = 51° 13.′1 N.R.

1882phae.proj..497.

$\Delta\alpha$	$\Delta\delta$	$\alpha+\delta$
39.2	1 6.4	1 47.6
41.1	1 9.5	1 50.6
		96.2
80.3	2 16.9	1 48.10

Log 108.10 = 2.03383
" 7.5 = 0.87506
" cos. δ = 9.65956
2.56886

Log 108.10 = 2.03383 — 2.03383
" 7.5 = 0.87506 — 0.87506
" cos δ = 9.65856 — 9.65962
369.4 = 2.56745 — = 2.56851

370.3
886.0
515.7 = −8 35.7

886.0
516.6
258.3 = −4 18.3

+62 53 53.5
+62 49 35.2

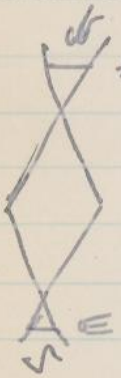
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Wells.

June 4. 1882.

(Prod. 1327)

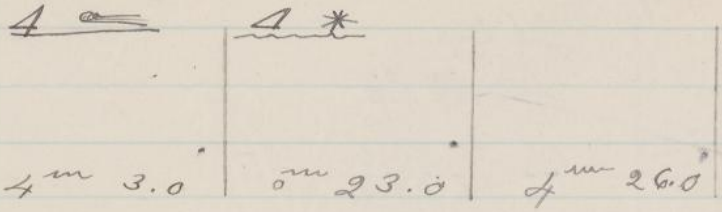


Comet.	Star.	$\alpha' - *$	$\frac{\alpha' - *}{2}$
$20^h\ 9^m\ 48^s.9$	$20^h\ 9^m\ 21^s.0$		
13 57.9	9 44.0		
~~21 47.0~~	~~21 37.3~~	$4^m\ 35^s.8$	$2^m\ 17^s.90$
23 40.8 ✓	19 5.0 ✓		

Only one set taken (There should be only 4 taps instead of 6, so that the correct tap-and order is not known at and the set must be rejected.)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.



42

Log 266.0 = 2.42488

7.5 = 0.87506

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

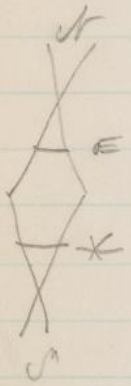
1882phae.proj..497.

July 1 set taken – and this prob. ~~Thing~~ somewhat troubled by clouds as the interval is very long.

Count Wells.

June 22. 1882

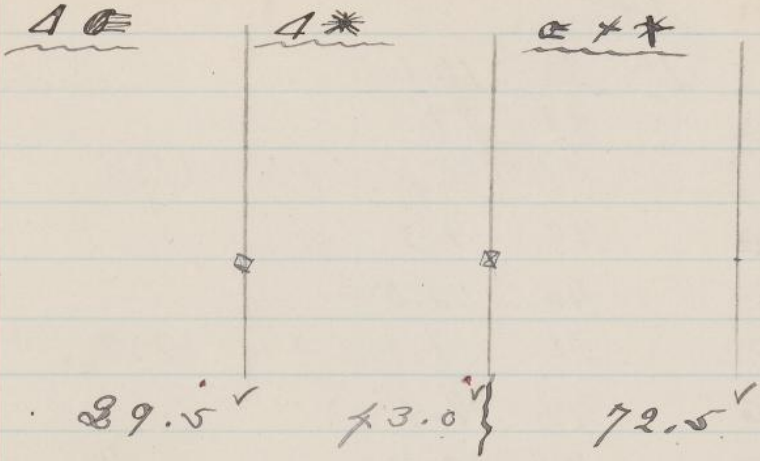
	Count.	Star.	E − *	E − * (2)
~~Prod. 13~~				
B. 236				
Right check by chronometer	14h 57m 23.8 ✓	~~15h 35m 3.0~~ ✓		
	14 57 53.6	15 35 46.6 ✓		
	11 ✓ 17.4	10 49.6		
(7 rod. 1327)	14 55 39.5	15 33 18.0		
from Chronograph	14 56 9.0	15 34 1.0	75 30.5	~~37 46.25~~ ✓
To be used	111 48.5	67 19.0	~~44 29.5~~	~~22 14.75~~
		10		
		147 19.0		
		111 48.5		
		2 | 75 30.5		
		− 37 45.2 ✓		
		+ 29		
		44.36		
		− 37		



	111	48.5 ✓
14	55	54.2 ✓
	+ 1	45.5
14	57	39.7 ✓
	2.16	
6	3	~~3.1~~
	3	
8	54	~~36.16~~
	1	27.6 ✓
8	53	~~9.6~~ ✓
4	44	31.0
13h	37	~~40.5~~ ~~46.0~~ ✓

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.



Log. 72.5 = 1.86034 ⁷
" 7.5 = 0.87506 ⁷
" cos. δ = 9.986 39 ⁷
527.0 ⁷ = 2.72155 79
886.0
359.0 ⁷
179.5 ⁷ = +2 59.5 ⁷
+14 16 21.0
+14 19 20.5 ⁷

1.86034 ⁷
0.87506 ⁷
9.986 39 ⁷
526.8 ⁷ = 2.72169 ⁷
886.0 ⁷
359.2 = +5 59.2 ⁷
13.3
+6 12.5

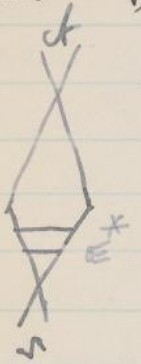
John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Count Barnard.

Sept. 18. 1882.

(Prod. 13 27)



	Count		Star				
2h	39	3.0	2h 38	16.1			
	39	23.9	38	59.2			
	78	26.9	77	15.3	+1	11.6	+ 35.80
	40	52.2	40	9.3			
	41	17.5	40	52.5			
	82	14.7	81	1.8	1	12.9	36.45
	42	57.6	42	9.4			
	43	17.3	42	52.5			
	86	14.9	85	1.9	1	13.0	36.50
	45	9.5	~~44~~	~~21.0~~			
			~~45~~	~~4.0~~			
	46	23.5	45	34.1			
	46	41.1	46	16.9			
	93	4.6	91	51.0	1	13.6	36.80
	47	54.2	47	5.0			
	48	12.2	47	47.8			
	96	6.4	94	52.8	1	13.6	36.80
	49	29.1	48	39.5			
	49	46.2	49	21.9			
	99	15.3	98	1.4	1	13.9	~~36.85~~ 36.9
	51	~~32~~ 31.6	50	13.4			
	51	20.0	50	55.6			
	102	~~23~~ 22.6	101	9.0	1	13.6	37.30 ~~36.80~~
							~~50~~
							~~256.00~~
							~~64~~
							~~+0 36.57~~
							+0 36.66

Mean Pass 2h 45m 33.3s M.T.R.
+21.6
2 47 34.9
11 49 59.4
14 57 35.5
2 27.0
14 55 8.5
4 44 31.
19 39 40. = Gr. M. T. (corr.)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.prgj..497.

Col. 1. $\Delta\delta$	Col. 2. $\Delta\alpha$	~~$\alpha - \alpha$~~ Col 2 − Col. 1
20.9	43.1	~~64.0~~ 22.2
20.3	43.2	~~63.5~~ 22.9
19.7	43.1	~~62.8~~ 23.4
17.6	42.8	~~60.4~~ 25.8
18.0	42.8	~~60.8~~ 24.8
17.1	42.4	~~59.5~~ 25.3
18.4	42.2	~~59.6~~ 24.8
130.0	19.6	169.6
18.57	42.80	24.23

$\log 24.23 = 1.38435$

$\log 7.5 = 0.87506$

$\log \cos\delta = 9.98896$

$\log 177.2 = 2.24837$

$-88.6 = -1\ 28.6$

$+12\ 48\ 21.6$ (m. A.)

$+12\ 46\ 53.0$

1.38435

0.87506

9.98910

$177.2 = 2.24851$

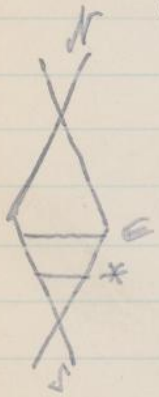
$-2\ 57.2 = \frac{\alpha - \ast}{\Delta\delta}$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Cards

Oct. 3. 1882



Comet.	Star.			
5h 36 27.8	5h 35 6.4			
36 48.4	35 18.2			
73 16.2	70 24.6	2	51.6	1 25.80
38 41.4	37 20.9			
39 0.2	37 29.2			
77 41.6	74 50.1	2	51.5	1 25.75
40 50.1	39 29.9			
41 6.5	39 36.0			
81 56.6	79 5.9	2	50.7	1 25.35
42 57.1	41 36.0			
43 14.1	41 44.5			
86 21.2	83 20.5	2	50.7	1 25.35
57 14.0	~~55 34.7~~			
57 36.6	~~56 8.3~~			
104 50.6	56 8.3			
59 22.1	102 0.0	2	50.6	1 25.30
59 43.5	58 1.0			
6h 118 5.6	58 16.2			
1 29.8	6h 116 17.2	2	48.4	1 24.20
1 50.5	0 8.5			
123 20.3	0 22.3			
3 36.9	120 30.8	2	49.5	1 24.75
3 ~~5~~ 9	2 16.5			
127 ~~3~~ .8	2 28.8			24.25
5 40.3	124 44.3	2	47.5	1 ~~23.75~~
5 58.2	4 15.8			
131 38.5	4 30.9			
12 54.1	128 49.7	2	48.8	1 24.40
13 10.9	12 32.8			
146 5.0	12 44.9			
15 9.0	143 17.7	2	47.3	1 23.65
~~15 24.5~~	13 47.0			
150 33.5	13 58.3			
17 21.9	147 45.3	2	48.2	1 24.10
17 36.0	15 59.4			
154 57.9	16 10.4			
	152 9.8	2	48.1	1 24.03
			296.5	~~296.45~~
			24.75	24.70

Mean 12 sets = 5h 57m ~~22.5~~ 23.5 N.P.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

E - *

20.6	11.8	8.8 32.4
18.8	8.3	10.5 27.1
16.4	16.1	10.3 32.5
17.0	8.5	8.5 25.5
22.6	16.6	6.0 39.2
21.4	15.2	6.2 36.6
20.7	13.8	6.9 34.5
18.0	13.3	5.7 4.7 31.3
17.9	12.1	5.8 30.0
16.8	12.1	4.7 28.9
15.5	11.3	4.2 26.8
14.1	11.0	3.1 25.1
12 | 210.8 = 17.6	12 | 150.7 = 12.5	807 = 6.72

Log. 6.72 = 0.82797
7.5 = 0.87506

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Count Cruls.

Oct. 20. 1882.

{ 7d. 13 27 }



	Count		Star					
6h	5	30.8	6h	4	6.1			
	5	47.9		4	26.4			
	11	18.7		8	32.5	2	46.2	1 23.10
	7	42.3		6	18.8			
	8	2.2		6	40.2			
	15	44.5		12	59.0	2	45.5	1 22.75
	9	56.0		8	32.0			
	10	16.8		8	54.9			
	20	12.8		17	26.9	2	45.9	1 27.95
	12	9[illegible].2		10	46.2			
	12	31.1		11	9.5			
	24	34.3		21	55.7	2	48.6	1 21.80
	24	39.0		23	17.1			
	25	6.9		23	44.6			
	49	45.9		47	1.7	2	44.2	1 22.10
	26	56.8		25	35.0			
	27	25.1		26	3.2			
	54	21.9		51	38.2	2	43.7	1 21.85
	[illegible]	15.3		27	55.5			
	29	30.0		28	8.8			
	58	45.3		56	4.3	2	41.0	1 20.50
	32	45.1		31	24.2			
	33	0.2		31	39.2			
	65	45.3		63	3.4	2	41.9	1 20.95
	34	54.8		33	34.3			
	35	14.0		33	50.9			
	70	8.8		67	25.2	2	45.6	1 21.80
								197.80
								m 1 21.97

16 21 45.3
+2 11.0
16 23 56.3
C.m.T.

Mean 9 sets

6h	20	35.7	21	6	16.3
	13	56		+2	11.0
16	24	26.6	21	8	27.3
	−2	41.3			
16	21	45.3 = C.m.T.			
4	44	31.0			
21	6	16.3 = G.m.T. (uncor.)			

197.80 h
+ 1m 21.98 m
m 198.30
m 22.03

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

α Comet	α Star	Comet − Star	
17.1′	20.3′	−3.2′	−3.2
19.9′	21.4′	−1.5′	−1.5
20.8′	22.9′	−2.1′	−2.1
21.9′	23.3′	−1.4′	−1.4
27.9′	27.5′	+0.4′	+0.4
28.3′	28.2′	+0.1′	+0.1
14.7′	13.3′	+1.4′	+1.4
15.1′	15.0′	+0.1′	+0.1
19.2′	16.6′	+3.6′	+3.6

9 | 187.9 | 20.94

9 | 189.0 | 20.83

12.8′

1.42

9 | −2.6′ | 0.29

Log 1.42 = 0.15229

" 7.5 = 0.87506

" cos δ = 9.98047

10.2 = 1.00782

5.1 = + 0 5.1

− 17 3 14.6

− 17 3 9.5

+ 0′ 5.1 =

3.6 = 0.5563 ✓

7.5 = 0.87506 ✓

cos δ = 9.98047 ✓

+2.″1 = 1.3123 ✓

+2.29 = 9.36240 ✓

7.5 = 0.87506 ✓

cos δ = 9.98047 ✓

+2.″1 = 0.31793

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

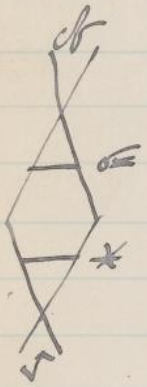
Comet Cauls

(sub B.8 p. 26)

Dec. 29. 1882.

(Prod. 13 27.) Comet. Star.

6h South. Asc. North. Asc.



South. Asc.	North. Asc.		S. Nucl.	N. Nucl.
45 37.1	45 41.0	45 29.0		
46 9.2	46 7.8	45 52.0		
91 46.3	91 48.8	91 21.0	+25.3	+27.8
49 10.5	49 14.2	49 3.9		
49 43.9	49 41.2	49 27.0		
98 54.4	98 55.4	98 30.9	23.5	24.5
50 17.5	50 20.6	50 9.2		
50 49.0	50 47.1	50 32.6		
101 6.5	101 7.7	100 41.8	24.7	25.9
51 16.8	51 20.1	51 10.0		
51 49.5	51 47.6	51 32.6		
103 5.3	103 7.7	102 48.6	23.7	25.1
52 20.3	52 23.2	52 13.2		
52 52.2	52 49.8	52 36.9		
105 12.5	105 13.0	104 49.1	23.4	25.9
53 20.0	53 25.9	53 14.8		
53 54.0	53 52.0	53 38.3		
107 14.0	107 17.9	106 53.1	24.9	24.8
54 28.3	54 31.0	54 20.4		
55 0.0	54 57.2	54 44.2		
109 28.3	109 28.2	109 4.6	23.7	23.6
55 27.8	55 30.0	55 20.2		
55 59.0	55 57.1	55 42.8		
111 26.8	111 28.1	111 4.0	23.8	25.1
56 26.2	56 29.8	56 19.3		
56 58.2	56 56.5	56 42.8		
113 24.4	113 26.3	113 2.1	22.3	24.2
			2/+23.57	2/+25.10
			+11.79	+12.55

5h 52 18.9
18 32 8.0
12 20 10.9

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

	Δ S. Nue.	Δ N. Nue.	Δ ✳	S. Nue. + ✳	N. Nue. + ✳
2 d Π. Nue.	32.1	26.8	23.0	55.1	49.8
6 ⊽2 19.6					
14 32 ⊽4.0					
12 20 11.6	33.4	27.0	23.1	56.5	50.1
2 1.3					
12 14 10.3					
⊀ ⊀⊀ 31.					
17 2 ⊀1.	31.5	26.5	23.4	54.9	49.9
+2 33.					
17 ⊽ 14.					
	32.7	27.5	22.6	55.3	⊽0.1 ~~49.1~~
	31.9	26.6	22.7	54.6	49.3
	32.0	26.1	23.5	55.5	49.6
	31.7	26.2	23.8	55.5	50.0
	31.2	26.1	23.6	54.8	49.7
	32.9 / 32.06	26.7 / 26.61	23.5 / 23.24	55.5 / 49 7.7	50.2 / 44 ⊽.7
				55.30	~~49.74~~ 49.46

log. 55.30 = 1.74273

" 49.46 = 1.69377

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Couls.

Jan. 12. 1883.

(Prod. 1327)

	Comet 1st mic.	Comet 2d mic.	Star 1st obs.	Star 2d obs.	1st mic.–*	2nd mic.–*
8h	7 4.1	7 7.5	8 5.0	8 14.5 / 8 31.2		
	7 41.1	7 40.3	8 31.2 / 8 14.5	8 49.6		
	14 45.2°	14 47.8°	16 19.5° / 16 36.2	17 20.7° / 17 4.0	1 51.0	1 48.4
	9 15.0	9 17.9	10 15.0	10 29.9		
	9 51.1	9 50.5	10 40.8	10 59.8		
	19 6.1°	19 8.4°	20 55.8°	21 24.7°	1 49.7	1 47.4
	11 17.0	11 19.3	12 26.8 / 16.8	12 43.2 / 26.5		
	11 52.1 / 12 16.8	11 51.5	12 43.2	13 1.5		
	23 33.8 / 23 9.1	23 10.8	25 36.3 / 25 9.0	25 28.3	1 50.9	1 49.2
	13 22.5	13 25.3	14 22.5	14 32.2		
	13 57.5	13 56.8	14 49.2	15 7.8		
	27 20.0°	27 22.1°	29 11.7°	29 40.0°	1 51.5	1 49.6
	15 26.2	15 29.9	16 25.9	16 36.2		
	16 0.4	16 0.1	16 53.5	17 12.0		
	31 26.6°	31 30.0°	33 19.4°	33 48.2°	1 52.8	1 49.4
	17 28.8	17 31.9				
	17 59.5	18 2.5	18 59.0	19 9.0		
	18 33.7	18 33.0	19 26.8	19 45.2		
	36 33.2°	36 35.5°	38 25.8°	38 54.2°	1 52.6	1 50.3
					308.7	1 294.3
					−1 51.45	−1 49.05

Mean Greenwich = 8h 12m 41.7s R.A. 8 12 42.9

19 27 19.8 19 27 19.8

12 45 21.9 12 45 23.1

−2 5.4 2 5.4

12 43 16.5° = C. m. T. 12 43 17.7

4 44 31.0 4 44 31.0

17 27 47.5° = Gr. m. T. 17 27 48.7

+2 40.0 +2 40.0

17 30 27.5° = Gr. T. corr. 17 30 28.7 = Gr. T. corr.

12 43 16.5

+2 40.0

12 45 56.5 C. m. T. corr.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Δ 1st hue	Δ 2nd hue.	Δ ✱	1st hue ✱ + ✱	2nd hue. + ✱
37.0	32.8	26.2	1m 3.2	0 59.0
36.1	32.6	25.8	1 1.9	0 58.4
35.1	32.2	26.4	1 1.5	0 58.6
35.0	31.5	26.7	1 1.7	0 58.2
34.2	30.2	27.6	1 1.8	0 57.8

Cor for Refr.
+0.06 +1.4

34.2	30.5	27.8	1 2.0	0 58.3
6/31.6	6/9.2	6/40.5	12.1	58.3
35.27	31.63	26.75	1 2.0	0 58.38

Log. 62.0 = 1.79239
" 7.5 = 0.87506
" cos. δ = 9.94891
413.4 = +2.61636
886.0
472.6
236.3 = +3 56.3
−27 15 1.9
−27 11 5.6

+7′ 52.4

Log. 58.38 = 1.76626
" 7.5 = 0.87506
" cos δ = 9.94891
= 1.74825
= 2.59023

389.3
886.0
496.7

56.01
886.0
830.0
415.0 = +6 55.0
−27 9 88.7
−27 2 43.7

+13 49.9
+8 16.7

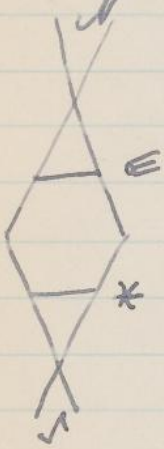
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Count Cards.

(Prod. 1327)

Jan. 15. 1883.



	Count.	Star.				
7h	33m 3.9s	7h	30m 56.8s			
	33 45.3		31 46.2			
	66 49.2c		62 43.0c	-4	6.2	2 3.10
	36 20.2		34 13.3			
	37 2.0		35 3.3			
	73 22.2c		69 16.6c			
	47 58.0		45 50.2			
	48 38.1		46 41.2			
	96 36.1c		92 31.2c	4	4.7	2 2.45
	31 3.8		48 56.1			
	51 43.3		49 47.4			
	102 47.1c		98 43.5c	4	3.6	2 1.80

Mean 4 sets = 7h 42m 26.8c S. R.

19 39 9.5

12 3 17.3

−1 58.5

12 1 18.8c = C. M. T.

4 44 31.0

16 45 49.8 = Gr. M. T. (uncor.)

+2 41.4 Chr. cor.

16 48 31.2c = " cor.

4 44 31

12 h 0. C. M. T.

1882phae.proj..497.

41.4	49.4	90.8
41.8	50.0	91.8
40.1	51.0	91.1
39.5	51.3	90.8
4)162.8	4)201.7	365.5
40.70	50.42	91.12

Log. 91.12 = 1.96080
" 7.5 = 0.87506
" Cos. α = 9.95190
618.7 = 2.78776
886.0
2726 = 4 34.3
274.3 + 2 16.3
-26 28 19.6
-26 26 3.3

1.96080 1.9961
0.87506 0.8706
9.95204 9.9520
2.78790 2.7671

618.9 = 2.78790
886.0
2724 = +4 32.4
274.1 = +4 34.1
0.6 Cor. for Ref.
+4 34.7

Cor. for Ref.
+0.03 +0.6

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Circls.

Jan. 23. 1883.

[Prod. 132]



Comet.		Star.				
7h	35m 27.6	7h	36m 28.3			
	36 8.9		36 34.9			
	71 36.5		73 2.9	-1	26.4	- 43.20
	37 14.2		38 14.0			
	37 57.2		38 21.1			
	75 8.4		76 35.1	-1	26.7	- 43.35
	39 20.0		40 20.2			
	40 0.9		40 27.0			
	79 20.9		80 47.2	-1	26.3	- 43.15
	40 46.8		41 47.3			
	41 28.3		41 54.2			
	82 15.1		83 41.5	-1	26.4	- 43.20
	42 37.9		43 38.8			
	43 20.1		43 45.2			
	85 58.0		87 24.0	-1	26.0	- 43.00

Mean Pute = 7h. 39m 25.9sec. M. R.

	20	10	42.0
11	28	43.9	
	-1	52.8	
11	26	51.1	= C. m. T.
4	44	31	
16	11	22	= Gr. m. T. Concor.
	+2	45	= Chr. corr.
16	14	7	= " Col.
4	44	31	
11	29	36.	

215.40 | - 215.90
-0 43.080 | 0 - 53.18
-0.03 Corr for Ref.
-0 43.11

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Δ ∈	Δ ☀	∈ + ☀
41.3'	6.9'	48.2'
41.0'	7.1'	48.1'
40.9'	6.8'	47.7'
41.5'	6.9'	48.4'
42.2'	6.4'	48.6'
√206.9	√34.1	241.0'
41.38	6.82	48.20

Log 48.20 = 1.68305
" 7.5 = 0.87506
1 cos α = 9.96015

329.8 = 2.51826

886.0

556.2 = −9 16.2
− 4 38.1
−24 10 24.3
−24 15 2.4

1.68305
0.87506
9.95988

329.6 = 2.51799

886.0

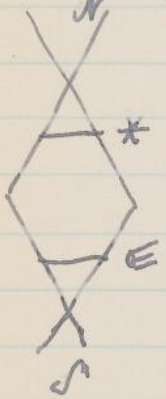
556.4 = −9 16.4
−1.0 Cor. for Refr.
−9 17.4

1882phae.proj..497.

Comet Cuels.

Feb. 1. 1883.

(Freed. 1327)



Comet.	Star.	⊏ − *	⊏ − * / 2
6h 42 32.8	6h 41 23.0		
42 34.5	41 33.9		
85 ~~17~~ 3	82 56.9	2 ~~1~~ 0.4	+1 ~~10.20~~ 5.20
~~7.~~			

6h 42 33.6 Fl. R.
20 46 11.0
9 56 22.6
-1 37.7
9 54 44.9 = C. m. T.
4 44 31.0
14 39 15.9 = Gr. m. T. (uncor.)
+2 50.4
14 42 6.3 = " Cor.
4 44 21.
9 57 35.

1882phae.proj..497.

$\Delta\alpha$	$\Delta\delta$	$\alpha\cos\delta$
1.7″	10.9″	12.6″

Log. 12.6 = 1.10037 ″

" 7.5 = 0.87506 ″

" cos. δ = 9.96801 ″

87.8″ = 1.94344.

886.0″ / 798.2″ = −13 18.2″

−6 39.1″

−21 43 20.4

−21 49 59.5″

1.10037 ″

0.87506 ″

9.96767 ″

87.7″ = 1.94310 ″

886.0″ / 798.3″ = −13 18.3″

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Ceraski.

7 Feb. 5. 1883

Prod (327) Comet. ~~Star~~.



	1st Nucleus	2nd Nucleus	Star	1st Nuc. – *	2nd Nuc – *
8h	42 39.9	42 42.0	42 29.0		
	43 9.6	43 11.9	42 44.9		
	85 49.5	85 53.9	85 13.9	35.6	40.0
	44 30.9	44 32.2	44 19.2		
	44 57.6	45 1.0	44 35.2		
	89 28.5	89 33.2	88 54.4	34.1	38.8
	45 34.0	45 35.7	45 23.0		
	46 2.5	46 5.2	45 39.0		
	91 36.5	91 40.9	91 2.0	34.5	38.9
	~~46 36.4~~	~~46 37.8~~	~~46 25.0~~		
			46 41.2		
8 48 21.3	47 13.8	47 15.8	47 3.3		
21 1 57.2					
11 46 24.8	47 41.9	47 45.6	47 19.2		
– 1 55.7					
11 44 28.4	94 55.7	95 1.4	94 22.5	33.2	38.9
4 44 31.0					
16 28 59.4	48 22.2	48 24.0	48 11.2		
+2 53.1	48 80.2	48 54.2	48 27.1		
16 31 52.5	97 12.4	97 18.2	96 38.3	34.1	39.9
	49 28.0	49 29.4	49 17.2		
8 48 18.8	49 56.8	50 0.0	49 32.3		
21 1 57.2	99 24.8	99 29.4	98 49.5	35.3	39.9
11 46 21.6					
– 1 55.7	50 33.8	50 35.2	50 23.2		
11 44 25.9	51 2.9	51 6.5	50 38.9		
4 44 31	101 36.7	101 41.7	101 ~~+2~~ 2. 1	34.6	39.6
16 28 56.9	51 37.7	51 39.4	51 27.9		
Gr. Mn T. (mean)	52 7.0	52 10.1	51 48.1		
	103 44.7	103 49.5	103 11.0		
16 28 56.9	52 40.6	52 42.0	52 30.6	33.7	38.5
+2 53.1	53 9.8	53 12.6	52 46.8		
16 31 50.0	105 50.4	105 54.6	105 ~~+2~~ 16.4		
4 44 31.				34.0	38.2
11 47 19.				309.1	352.7
Mean Ast = 8h. 48m 18.8 R.R.			half mean = m 17.8	34.3	39.19 → m 19.59

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ 1st Nus.	Δ 2nd Nus.	Δ *	1st Nus + *	2nd Nus + *	
29.7	29.9	15.7	45.6 ~~43.8~~	~~44.0~~	45.8
26.7	28.8	16.0	42.7 ~~40.7~~	~~42.8~~	44.8
28.5	27.5	16.0	44.5 ~~42.5~~	~~43.6~~	45.5
28.1	29.8	15.9	44.0 ~~42.2~~	~~43.9~~	45.7

Cos. Reduction

Log. 44.26 = 1.64601
" ~~8.7~~ 7.5 = 0.87506
" cos δ = 9.97111
310.6 = 2.49218

886.0 / 575.4 = 9 35.4
− 4 47.7
− 20 40 2.1
−20 44 49.8

∴ − 9 35.6 = $\frac{\text{E}-*}{\Delta\text{L}}$ (2nd red.)

Log .45.81 = 1.66096
" ~~8.7~~ 7.5 = 0.87506
" cos. δ = 9.97111
321.5 = 2.50713

886.0 / 564.5 = 9 24.5
− 4 42.2
− 20 40 2.1
−20 44 44.3

∴ − 9 24.7 = $\frac{\text{E}-*}{\Delta\text{L}}$ (2nd red)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ 1st Nuc.	Δ 2nd Nuc.	Δ ✳	1st Nuc + ✳	2nd Nuc + ✳	
A.T.					
29.7'	29.9'	15.9"	45.6' ~~13.8~~	~~14.0~~	45.8'
26.7'	28.8'	16.0"	42.7' ~~16.7~~	~~12.8~~	44.8'
28.5'	27.5'	16.0"	44.5' ~~12.5~~	~~13.5~~	45.5'
28.1'	29.8'	15.9"	44.0' ~~12.2~~	~~13.9~~	45.7'
28.0'	30.2'	15.9"	43.9' ~~12.1~~	~~14.8~~	~~46.1~~'
28.8'	30.6'	15.1"	43.9' ~~13.7~~	~~15.5~~	45.7'
29.1'	31.3'	15.7"	44.8' ~~13.4~~	~~15.5~~	~~47.0~~'
29.3'	30.7'	15.2"	44.5' ~~14.1~~	~~15.5~~	45.9'
29.2'	31.96'	15.2"	44.4' ~~14.0~~	~~15.4~~	45.8'
29.60"	30.16'	15.66"	~~14.65~~ 39.8.3"	130.4	41 2.3'
			~~12.94~~ mean = 44.26'	130.99	45.81'

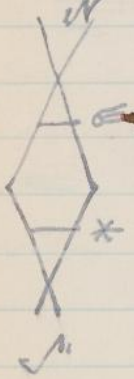
John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Count Cards.

726.7.1443

(Trad 1327)



1st Circumpolar	2nd Circumpolar	Star	1st Nav – *	2nd Nav – *
9h 12 55.9	17 59.2	19 34.3		
18 10.1	18 12.1	19 41.7		
36 6.0	36 11.3	39 16.0	–3m 10.0	–3m 4.7
20 41.2				
~~20 7.9~~	20 44.9	22 52.6		
20 55.2	20 57.0	23 6.1		
41 36.4	41 41.9	45 58.6	–4m 22.2	–4m 16.7
24 2.5	24 6.8	26 12.5		
24 14.5	24 16.0	26 27.4		
48 17.0	48 22.8	52 40.2	–4m 23.2	–4m 17.4
26 50.8	26 54.1	28 59.2		
27 1.2	27 2.5	29 15.0		
53 52.0	53 56.6	58 14.2	–4m 22.2	–4m 17.6
31 54.1	31 58.7	34 11.2		
32 13.1	32 14.0	34 20.2		
64 ~~7~~ 8.2	64 12.7	68 31.4	–4m 27.2	–4m 18.7

~~8 100.8~~ ~~7 5.1~~

~~–4m 8.16~~ ~~–4m 8.02~~

~~9h 24m 23.8s~~

206 113.6

~~half mean~~ ~~–2m 4.08~~ ~~–2m 4.51~~

9 0.8	7 0.4
–4m 22.70	–4m 17.60
–2m 11.35	–2m 8.80

Ref. +21

Mean Data = 9h 25m 59.20s M.R

21	9	50.3
12	16	8.9
	2	0.6
12	14	8.3
4	44	31.0
16	58	39.3 = G. M. T. (mean)
	+2	54.2
17	1	33.5 = "

(Jan 1 mc)

14 44 31

12 17 3.

9	26	1.8
21	9	50.3
12	16	11.5
	–2	0.6
12	14	10.9

12	14	10.9
4	44	31
16	58	42
	+2	54
17	1	36

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ 1st Pairs.	Δ 2nd Pairs	Δ Star	1st Trig + *	2nd Trig + *
~~14.2'~~	~~12.9'~~	~~7.4'~~	~~21.6~~	~~20.2~~
14.0'	12.1'	13.6'	27.6	25.7
12.0'	9.2'	14.6'	26.6	23.8
10.4'	~~8~~ 8.4'	15.8'	26.2	24.2
~~18~~ 18.0'	15.3'	9.8'	27.0	24.3
4 | 54.4	4 | 45.0	4 | 39.0	~~129.0~~	~~116.3~~
13.60 ✓	11.2 ✓	13.2 ✓	~~2580~~	~~2366~~
			107.4	98.0
			26.85 ✓	24.50 ✓

Log 26.85 = 1.42894 '
" 7.5 = 0.87506 '
" Cos α = 9.97162 '
188.6' = 2.27562 '

886.0'
697.4' = 11 37.4'
+5 48.7'
-20 29 14.2
-20 23 25.5'

∴ +11 37.2 = ⟵ − *
Δ α

24.50 = 1.38917 '
7.5 = 0.87506 '
Cos α = 9.97162 '
172.1' = 2.23585 '

886.0
713.9' = +11 53.9'
5 57.0'
-20 29 14.2
-20 23 17.2'

∴ +11 53.8 = ⟵ − *
Δ α

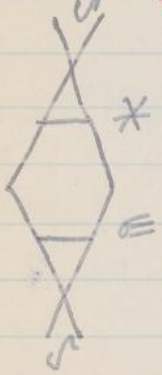
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Cmlo.

Feb. 13. 1883.

(Prod 1327)



Comet.		Star.				
~~8h~~ 9h.		~~9h~~ 28	~~22.9~~			
		~~28~~	~~34.2~~			
31	23.2	30	43.8			
31	37.1	31	4.0			
63	0.3	61	47.8	1	12.5	36.25
32	47.8	32	9.6			
33	5.1	32	29.9			
65	52.9	64	39.4	1	13.5	36.75
~~34~~	~~7.1~~	~~33~~	~~29.0~~			
~~34~~	~~23.5~~	33	48.3			
35	31.2	34	34.2			
35	50.1	35	13.6			
71	21.3	70	7.7	1	13.6	36.80
36	~~49.5~~	36	11.9			
~~36~~	51.1	~~36~~	~~30.1~~			
39	3.1	38	~~28~~ 9.8			
39	23.2	38	45.2		11.3	3 5.6
78	26.3	77	~~14.1~~ 15.0	1	~~12.2~~	~~36.10~~
~~40~~	39.1	40	~~45.2~~			
40	40.2	40	22.2		~~52~~ 3.6	~~26.80~~
~~81~~ 80	~~19.0~~ 20.	80	~~24.4~~ 7	0	~~53.6~~	~~26.30~~

~~172.70~~

~~34.54~~

~~145.90~~

~~38.48~~

+36.36

~~9h. 35m 0.1~~

8 | 277 100.8

9h 34m 50.10

Mean facts

21	33	29.6	
12	1	20.5	
	-1	58.2	
11	59	22.3	

N.R.

11	59	22.3	
4	44	31.6	
16	43	53.3	= Gr. m. t. Cincy
	+2	58	
16	46	51	= 11 cal.

12 2 20.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ Comet Δ Star α = +

13.9' 20.2' 34.1'

17.3' 20.4' 37.7'

18.9' 19.3' 38.2'

20.1' 15.4' 35.5'
~~16.8~~ ~~36.8~~

~~0.4~~ ~~7.0~~ ~~7~~
~~10.4~~ ~~18.8~~ ~~54~~

4)70.2 7)73 62.9
17.55 10.42 12.58

145.5'
36.38'

258.7'
886.0
627.3'
313.6' = -5 13.6'
-18 34 13.0
-18 39 26.6'

Log 36.38 = 1.56086'
" 7.5 = 0.87506'
" cos δ = 9.97680'
258.7' = 2.41272'

1.56086' 2585
0.87506' 886.0
9.97655' 627.5
258.5' = 2.41247' -10 27.5

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882mae.proj..497.

Comet d 1883

(R 31.93)

Feb. 24. 1883

(Prod. 1327)

Comet.	Ft. Star.	Bk. Star.	O – Ft. Stars.	O – Bk. Stars.
5h 24m 15.0	5h 24m 32.5	5h 20m 34.0		
24 52.0	25 22.9			
26 31.0	5h 24 15.0	5h 24 32.5		
5h 24m 16.5	5h 24m 32.5	5h 26m 31.0		
27 27.0	24 52.0	25 22.9		
24 52.0	25 22.9	27 27.0		
53m 58.0	49 7.0	49 55.5	4m 51.0	+4m 2.6
	49 7.0	49 55.5	48.4	51.0
27 53.9	28 11.3	29 0.5		
28 39.8	28 29.8			
33 53.0	35.7	31 53.8		
31 35.7	31 53.8	33 52.9		
34 51.2	32 10.9	32 42.5		
32 10.9	32 42.5	34 51.2	4m 57.6	+4m 7.9
68m 44.2	64 36.3	66 44.1	49.7	57.8
63 46.6	63 46.6	64 36.3		
38 44.1	36 17.2	36 35.8		
36 17.2	36 35.8	38 44.1		
39 35.0	37 2.1	37 33.0		
78m 19.1	37 33.0	39 35.0		
73 19.3	74 18.8	78 39.1	4m 59.8	+4m 10.3
	73 19.3		59.5	59.8
		74 8.8	4m 168.4	20.8
			4m 56.13	+4m 6.93
			half mean = 2m 28.06	+2m 3.46

Mean Date = 5h 31m 30.27 M.R.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ C	Δ Hr Stad.	Δ Bus. Stad.	C + Hr Stad	C + Bus Stad
56.0 ~~37.0~~	37.0 ~~50.4~~	50.4 ~~56.0~~	1m 33.0	1m 46.4
58.2 ~~35.2~~	35.2 ~~48.7~~	48.7 ~~58.2~~	1m 33.4	1m 46.9
50.9 ~~44.9~~	44.9 ~~57.2~~	57.2 ~~50.9~~	1m 35.8	1m 48.1
			102.2	141.4
			1m 34.07	1m 47.13

Log 94.07 = 1.97345 (50)

Log 7.5 = 0.87506

Log 107.13 = 2.02991

Log 7.5 = 0.87506

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comets 1883.

Feb. 26. 1883.

Comet.	1st " star.	2d " star.	3d " star.	4th " star.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

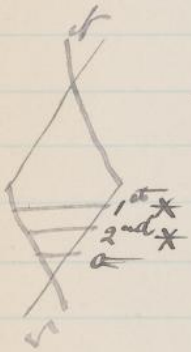
1882phae.proj..497.

Comet a 1883.

(R 31. p. 104)

Feb. 28. 1883.

Comet	1st Star	2nd Star	C − 1st Star.	C − 2nd Star.
6h 1m 3.5	6h 2m 28.2	6h 3m 38.8		
1 13.6	3 26.1	4 26.1		
2 17.1	5 54.3	8 4.9	−3m 37.2	−5m 47.8
4 48.7	6 13.8	7 23.2		
5 1.0	7 11.5	8 11.3		
9 49.7	13 27.3	15 34.5	−3m 35.6	−5m 44.8
8 40.0	10 3.2	11 12.9		
8 53.1	11 2.1	12 2.2		
18 33.1	21 5.3	23 14.1	−3m 32.2	−5m 42.0
12 23.5	13 45.5	14 55.0		
12 37.9	14 45.2	15 45.0		
25 8.4	28 30.7	30 40.0	−3m 29.3	−5m 38.6
16 3.0	17 23.6	18 32.9		
16 18.9	18 24.2	19 24.5		
32 21.9	35 47.8	37 57.4	−3m 25.9	−5m 35.5
			160.2	208.7
			−3 32.04	−5 41.74
			−1 46.02	−2 50.87



Mean of Stds = 6h. 8m 42.3s M.T.

22 32 47.57

7 36 44

−1 14.7

7 34 49.7

Half mean (1st star used.)

7 34 49.7

−0 52.5

7 33 57.2

C. m. T. 12 19 18.7 = Gr. M. T. of obs. (uncor.)

− 0 52.5

12 18 26.2 = " " Corrected.

161.2

−3 32.2

−1 46.1

7 34 49.7

−0 52.5

7 33 57.2

C. m. T.

7 34 49.7

−0 52.5

7 33

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497...

$\Delta\alpha$ =	Δ 1st Star	Δ 2nd Star	α − 1st *	α − 2nd *
10.1 s	56.9 s	47.3 s	$\bar{o}$ 46.8 s	$\bar{o}$ 37.2
12.3 s	57.7 s	48.1 s	$\bar{o}$ 45.4 s	$\bar{o}$ 35.8
13.1 s	58.9 s	48.3 s	$\bar{o}$ 45.8 s	$\bar{o}$ 36.2
14.4 s	59.7 s	50.0 s	$\bar{o}$ 45.3 s	$\bar{o}$ 35.6
15.9 s	60.6 s	51.6 s	$\bar{o}$ 44.7 s	$\bar{o}$ 35.7
÷ 15.4	÷ 293.4		238.0 s	180.5 s
13.16 s	5.76		$\bar{o}$ 45.60 s	$\bar{o}$ 36.10 s

Log 45.60 = 1.65896 s
" 7.5 = 0.87506 s
" cos δ = 9.92956 s
290.8 s = 2.46358 s
145.4 s = −2h 25.4 s
+31 45 33.2
+31 43 7.8 s

~~36.10 = 1.55750 s~~
~~7.5 = 0.87506~~

1.65896 s
0.87506 s
9.92975 s
290.9 = 2.46377 s

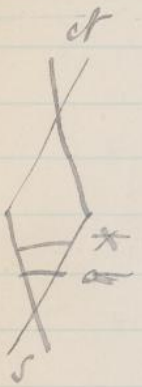
− 4′ 50.9″ ✓

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet a 1883 (R 31, 113).

Mar. 2nd 1883.



Comet	Star		
6h 19m 58.8	6h 19m 28.9		
20 8.0	20 24.5		
39 58.8	39 53.4	+5.4	+2.70
21 11.2	20 48.2		
21 38.8	21 45.0		
42 40.0	42 33.2	+6.8	+3.40
22 32.3	22 8.9		
22 50.4	23 5.2		
45 22.7	45 14.1	+8.6	+4.30
23 53.9	23 29.3		
24 11.5	24 26.3		
48 5.4	47 55.6	+98.8	+4.40
26 14.1	24 49.9		
25 34.5	26 47.2		
50 48.6	50 37.1	+11.5	+5.75
	29 21.0		
27 35.5	27 10.1		
27 55.2	28 8.9		
55 30.7	56 19.0	+11.7	+5.85
28 57.1	28 30.5		
34 49.8	34 21.5		
35 4.9	35 15.4		
69 54.7	69 36.9	+17.8	+8.90
36 5.0	35 37.0		
37 22.1	37 32.0		
73 27.1	73 9.8	+18.1	+9.05
			44.85

Mean Sats = 6h 26 36.8
22 40 31.0
7 46 5.8
1 16.3
7 44 49.5

7 44 49.5
4 44 31.0
12 29 20.5 = G.m.T. (Comet)

7 44 49.5
+1 3 16
7 46 21,3 = Cor. C. m. T. obs.

+ 0m 5.61

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Δ Comet	Δ Star	Comet − Star
0m 17.2	0 55.6	38.4 ~~42.8~~
0 17.6	0 56.8	39.2 ~~74.4~~
0 18.1	0 56.3	38.2 ~~74.4~~
0 17.6	0 57.0	39.4 ~~74.6~~
0 20.4	0 57.3	36.9 ~~77.7~~
0 19.7	0 58.8	39.1 ~~78.5~~
0 ~~14~~ 15.1	0 53.9	38.8 ~~69.0~~
1 17.1	1 56.0	37.9 ~~72.1~~
8)202.8	8)310.7	307.9
25.35	63.84	38.49

Log 38.49 = 1.58535
" 7.5 = 0.87506
" cos δ = 9.92828
(244.7 = 2.38869

122.4 = −2′ 2.4″
+32 1 49.1
31° 59 46.7

1.58535
0.87506
9.92844
244.8 = 2.38885

−4 4.8
+32 1 49.1
+31 57 44.3

Log 38.49 = 1.58535
7.5 = 0.87506

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet a 1883 (R 31. 169)

March 4. 1883.

(Prod. 3457)

	Comet.	1st Star.	2nd Star.	Ø = -1st *	Ø = -2nd *
	5h 44 59.1	5h 45 56.8	5h 46 22.1		
	45 23.8		46 49.1		
2 d/u *	47 30.2	48 26.9	48 53.2		(Ø = -2 d/u *)
	47 55.0	49 20.2	49 19.2		
1st *	95 25.2	97 47.1	98 12.4	-2m 21.9	-2m 47.2
	49 59.9	50 55.2	51 22.2		
	50 24.9	51 48.8	51 47.9		
	100 24.8	102 44.0	103 10.1	-2m 19.2	-2m 45.3
	52 9.8	53 4.5	53 6.9		
	52 35.2				
	54 21.8	55 15.1	55 43.1		
	54 48.5	56 9.2	56 7.8		
	109 10.3	111 24.3	111 50.9	-2m 14.0	-2m 40.6
	56 36.7	57 29.8	57 57.8		
	57 3.0	58 24.0	58 22.2		
	113 39.7	115 53.8	116 20.0	-2m 14.1	-2m 40.3
	5h 58 47.5	5h 59 39.2	6h 0 7.7		
	5h 59 15.0	6h 0 34.1	6h 0 31.9		
	118 2 5	120 13.3	120 39.6	-2m 10.8	-2m 37.1
	6 0 58.8	6 1 50.2	6 2 18.9		
	6 1 27.0	6 2 45.8	6 2 42.9		
	122 25.8	124 36.0	125 1.8	-2m 10.2	-2m 36.0
					246.5
				-2m 15.03	-2m 41.08
				-1m 17.51	-1m 20.54

Meanlocsto = 5h 54 55.7 M.R
+1 32.5 Chron. corr.
5h 56 28.2
22 48 24.1
4 8 4.1
1 10.1
7 6 54.0

7h 6 54.0
+ 44 31.0
11 51 25.0 = Gr. M. T. cor.

Use 2 d/u star only.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae_proj_0497

1st " short = +31° 69 (4.V)

2 d " " = +32° 79 (9.0)

Δ =	Δ 1st *	Δ 2nd *	= −1st *	= +2nd *
24.8	53.3	26.0	28.5	50.8 +2
25.0	53.6	25.7	28.6	50.7 .47
26.7	54.1	24.7	27.4	51.4
26.3	54.2	24.4	27.9	50.7
27.5	54.9	24.2	27.4	51.7
28.2	55.0	24.0	27.4	52.2
6 | 154.5		6 | 149.0	167.2	307.5
26.4		24.83	27.87	51.25

32.3
46.0
60.7

Sup. 27.87 = 1.44574
7.5 = 0.87506
cos. Δ = 9.99883
2.24903

560.4 = 51.25 = 1.70969
9' 20.4 7.5 = 0.87506
cos. Δ = 9.92827
325.8' = 2.51 23

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Cruls
Mar. 7. 1883

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

~~(4 obs.)~~

These obs. through clouds. Count a 1883 (A 31.1 A)

1/2 weight ✓

Mar. 8. 1883.

Comet.		Star.			
6h	~~6~~ 17.1	6h	~~6~~ 47.3		
	6 38.0		6 6.5		
	10 ~~55.1~~ 56.4		11 53.8		
	~~7 38.8~~		~~8 17.2~~		
	8 ~~6.8~~		8 28.0		
	15 ~~4 47.0~~		16 ~~36.2~~		
	8 54.0		9 23.2		
	9 17.5		9 42.8		
	18 ~~11.5~~		19 6.0		
	12 26.8		12 54.0		
	12 49.1		13 14.9		
	25 15.9		26 8.9		

~~6h 8m 46.4s~~

~~57.7~~	~~29.35~~	
~~57.7~~	~~28.85~~	
~~51.2~~	~~25.60~~	
54.5	~~27.25~~ 27.2	
53.0	26.50	
~~108.20~~		
~~0 27.05~~		
	-83.10	
-0	27.70	✓

~~53 12 1.5~~

~~6h 8m 10.42~~ 3.2

~~23 4 10.32~~

~~7 5 0.10~~

~~1 9.6~~

~~7 3 50.5 = C. m. T.~~

~~4 44 31.0~~

~~11 48 21.5 = Gr. m. T. (uncer.)~~

6 9 3.2 ✓ Long. of Cinti.

+1 35.3 ✓ Cor. to Chr.

6 10 39.1 ✓

23 4 10.3 ✓

7 6 28.8 ✓

-1 9.9 ✓

7 5 18.9 ✓ C. m. T. ✓

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ Comet	α Star	∠ + ∗	
~~20.9~~ ~~19.9~~	19.2″	~~40.1~~ ~~39.1~~	40.1
~~28.4~~	~~19.8~~	~~47.2~~	
23.5′	19.6′	43.7′	43.1
22.3′	20.9′	~~43.2~~ ~~42.6~~′	43.2 ~ 5
3 | 6.7	3 | ~~9.7~~		3 | 6.4
22.23	19.90		42.13

mean = ~~0m 43.15′~~

125.4

0m 41.80

~~42.13~~

Log ~~41.80 = 1.62118~~ 42.13 1.62479

" 7.5 = 0.87506′

" cos δ = 9.93 ~~89~~ 055

~~2.42813~~ 679

269.2 # = 2.43020

886.0

~~618.8~~ #

3094 = +5′ ~~8.4~~ ″

1.62479

~~1.62118~~

0.87506

9.93015

269.0

~~266.9~~ # ~~2.42639~~ ≈ 2.42920

886.0

~~619.1~~ = ~~+10 19.1~~

617.0 = +10 17.0

+31 32 46.1 = Δ p. pl. ∗

+31 37 ~~54~~.5

+31 32 46.1

+10 19.0

+31 42 ~~3.1~~ Δ p. pl. ∠

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Count Cauls

Mar. 13. 1883

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Circle. (R 31. 1905)

April 2. 1883.

Comet	1st Star.	2nd Star
9h 35 48.8	9h 36 15.2	9h 36 18.0
35 47.8		

1st Nucleus	2nd Nucleus	1st Star	2nd Star	1st nuc − *
9h ~~9p~~ 45.8	9h ~~9p~~ 47.8	9h 11 57.8	9h 11 58.8	
~~10~~ 15.2	~~10~~ 18.0	12 9.3	12 48.2	
20 1.0 v.	20 5.8 v.	24 7.1 v.	24 47.0	−4 6.1 v
~~14 40.2~~	14 42.9	~~16 52.1~~	16 54.0	
15 14.2	~~15 16.8~~	17 5.2	17 43.9	
~~29 54.4~~	29 59.7	~~33 57.3~~	34 37.9	~~4 2.9~~
~~39 4.2~~	~~39 7.0~~			
~~39 38.8~~	~~39 40.5~~			
40 7.2	40 9.5	42 19.9	42 20.9	
40 41.1	40 43.4	42 36.0	43 13.8	
80 48 3 v.	80 52.9 v.	84 54.9 v.	85 34.7	−4 6.6 v
				0.7
				4 6.3 v
				~~2 3.2~~
				−2 3.1 v

Ref. this set

(use 1st & 4th star)

9h 21m 47s.8
0 42 44.1
8 39 3.2
25.0
8 37 38.2
4 44 31.0
3 22 9.2 = Gr. M. T. (mean) 3451 used.

1st nuc.	2d nuc.
mean. δ = Incl. = 9 2v 12.3 v	9 2v 1K.7 v
Chr. cor. = +1 3K.0 v	+1 3K.0 v
9 26 K6.3 v	9 26 K4.7 v
0 K2 KK.1 v	0 K2 KK.1 v
4 KK 2.2 v	4 KK 4.6 v
−1 2v.9 v	−1 2v.9
4 K2 36.3 v	4 K2 34.7 v
K KK 31.0 v	K KK 31.
13 27 7.3 v	13 27 10. Gr. m. T.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

1st. star on opposite page to be used.

2nd mc − *	Δ 1st mc	Δ 2nd mc	Δ *	1st mc − *	2nd mc − *
−4 1.3 ✓	29.4 ✓	30.2 ✓	11.5 ✓	17.9 ✓	18.7 ✓
~~3 57.6~~	~~34.0~~	~~33.9~~	~~13.1~~		
−4 2.0 ✓	33.9 ✓	33.9 ✓	15.1 ✓	18.8 ✓	18.8 ✓
3.3 ✓	2 | 63.3 ✓	~~4.1~~	.6.6 ✓	.7 ✓	1.5
(−4 1.6 ✓ ✓	3 1.6 ✓	−32.05	13.30 ✓	18.35 ✓	18.75 ✓
−2 0.82 ✓		4.1 ✓			
		3 2.0 ✓ ✓			

log. 18.35 ✓ = 1.26364 ✓
" 8.7 = 0.87506 ✓
" cos α = 9.99386 ✓
(135.7 ✓ = 2.13256 ✓
867.8 ✓ = +1 7.8 ✓

1.26364 ✓
0.87506 ✓
9.99389 ✓
135.7 = 2.13259 ✓
+2 15.7 ✓

−9 36 31.5
−9 35 23.7 ✓

log. 18.75 ✓ = 1.27300 ✓
" 8.7 = 0.87506 ✓
" cos δ = 999386 ✓
138.7 ✓ = 2.14192 ✓

+2 18.7 ✓

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.









John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.







John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

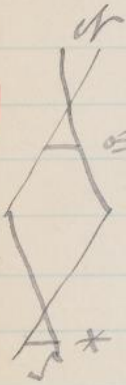
1882phae.proj..497.

~~(1st set)~~

Comet Cruls.

(R 31.209)

April 6. 1883.



	1st Nucleus.	2nd Nucleus.	Star.	1st Nuc *	2nd Nuc *
	9h 25 ~~22~~ 23.4	9h 25 25.5	9h 26 56.3		
	25 44.6	25 46.2	27 8.0		
	51 ~~8~~.0	51 11.7	54 ~~4~~.5	−2m 52.5	−2m 52.8
	28 6.5	28 9.1	29 38.9		
	28 26.1	28 28.9	29 50.2		
	56 32.6	56 37.0	59 29.1	−2m 56.5	−2m 51.1
	~~30 55.3~~	~~30 58.2~~			
	31 51.1	31 53.1	33 23.6		
9h 33m 15.5	32 9.8	32 12.8	33 35.0		
+1 31.9	64 0.9	64 5.9	67 58.6	−2m 57.7	−2m 52.7
9 34 47.4	34 16.5	34 18.0	35 48.2		
0 58 30.3	34 33.2	34 36.0	35 58.4		
8 36 17.1	68 48.7	68 54.0	71 46.6	−2m 57.9	−2m ~~57.9~~ 52.6
−1 24.6	37 56.7	~~37 59.3~~ 37 59.3	39 30.2		
2 34 52.5	38 16.0	38 14.4	39 40.8		
6 44 31.0	76 12.7	76 14.7	79 11.0	−2m 58.3	−2m ~~58.3~~ 53.3
13 19 23.5	40 46.8	40 49.0	42 20.2		
Gr. Cor. m.T.	41 7.0	41 9.8	42 31.8		
	81 53.8	81 58.8	84 52.0	−2m 58.2	−2m ~~58.2~~ 53.2

1st Nuc.	
9h 33m 13.0	
0 58 30.3	
8 34 42.7	
−1 24.3	
8 33 18.4	
4 44 31.0	
13 17 49.4	= Gr. m. T. (uncor.)
+1 31.9	= Chr. cor.
13 19 21.3	= Correct Gr. T. (1st Nuc.)

~~−2 57.64~~ ~~−2 52.6~~

~~−1 28.84~~ ~~−1 26.31~~

−2 57.52 −2 52.62

−1 28.76 −1 26.31

8451 use cols

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Δ 1st hwc	Δ 2nd hwc.	Δ ☀	1st hwc − ☀	2nd hwc − ☀
− 0m 21.2	− 0m 20.7	+ 0m 11.5	− 0m 9.7	− 0m 9.2
0m 19.6	0m 19.8	0m 11.3	− 0m 8.3	− 0m 8.5
0m 18.7	0m 19.7	0m 11.4	− 0m 7.3	− 0m 8.3
0m 17.7	0m 18.0	0m 10.2	− 0m 7.5	− 0m 7.8
0m 19.3	0m 19.1	0m 10.6	− 0m 8.7	− 0m 8.5
0m 20.2	0m 20.8	0m 11.6	− 0m 8.6	− 0m 9.2
6 | 116.7	6 | 112.1	6 | 66.6	50.1	51.5
19.45	19.62	11.10	− 0m 8.35	− 0m 8.58

Log. 8.35 = 0.92169
" 7.5 = 0.87506
" cos ☀ = 9.99427
−61.8 = 1.79102
886.0
824.2
412.1 = +6 52.1
−9 16 53.4
−9 10 1.3 +13 44.2

8.58 = 0.93349
7.5 = 0.87506
cos ☀ = 9.99427
−63.5 = 1.80282
886.0
822.5
+13 42.5

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

(1st Series)

Comet Brooks (1912)

Sept. 4. 1883

{Chron. / Shut}

Comet	1st Star	2nd Star	$\alpha - 1^{st}$	$\alpha - 2^{nd}$
22^h 21 28	19 42.4	19 57.3		
22 11.8	20 12.2	20 33.8		
43 14.6	39 54.6	40 31.1	$+3^m$ 20.0	2^m 43.5
		2		

Chronograph failed, and another series taken by eye and ear transits (see p. 86)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

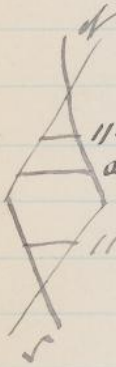
86 1st Star = 1138 } +64°
2nd " = 1139 } d Tauri

Count Brooks. (1812)

{From Book} {For Sept. 5th 1883 See Book 33 page 39}

Sept. 4. 1883.

Count.	1st Star. *1138.	2nd Star *1139.	∠ − 1st	∠ − 2nd
0h 19 16.0	0 18 0.5	0 18 22.7		
20 36.2	18 38.0	18 50.5		
39 52.2	36 38.5	37 13.2	+ 3m 13.7	2m 39.0
22 24.2	21 10.2	21 34.5		
23 44.5	21 49.2	22 2.2		
46 8.7	42 59.4	43 36.7	+ 3m 9.8	2m 32.0
25 42.6	24 32.0	24 55.2		
27 4.0	25 10.6	25 22.1		
52 46.6	49 42.6	50 17.3	+ 3m 4.0	2m 39.3
			27.0	100.3
			3m 9.00	2m 33.4
			+1m 34.50	+1m 16.70



Mean ∠ times =	0h 23m 7.9	0h 23 7.9
Chron. cor.	− 2m 20.1	+ 2 20.1
	0h 20 47.8	0h 25 28.0
Sid. T. Count. M. V.	10 53 50.2	10 53 50.2
	13 26 57.6	13 31 37.8
	2 12.2	− 2 13.2
C. M. T. of obs =	13 24 45.4	13 29 24.6 C. M. T.
	4 44 31	4 44 31
G. M. T. =	18 9 16	18h 13m 57s

The above obs. apparently affected by clouds. The fourth set was lost in clouds - no gen above obs. Yr wt.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

	(1138)	(1139)	($2\frac{d}{n}$ *)	(1^{st}_{n} *)
4 Comet	4 1st Star	4 2nd Star	Θ − 1139	Θ + 1138
1m 20.2 N	0m 37.5	0m 27.8	52.4	1 57.7
1m 20.3	0m 39.0	0m 27.7	52.6	1 59.8
1m 21.4	0m 38.6	0m 26.9	54.5	
1.9	2V.1	22.4	159.5	2m 0.0
1 20.63	0 34.37	0 27.47	0m 53.17	177.0
				1m 59.0

(Θ and $2\frac{d}{n}$ dist)

Log 53.17 = 1.72567 − 7

7.5 = 0.87506 − 7

9.63239

− 171.0 = 2.23312

− 2 V1.0

119.0 = 2.07555 − 7

7.5 = 0.87506 − 7

9.63239

342A = 2.V4300

446.0

V03.2 = 4' 23.11.2

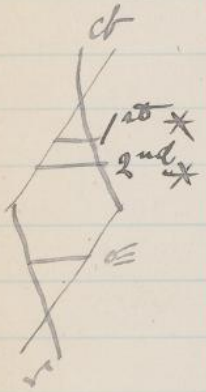
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Brooks. (1812).

Sept. 7. 1883.

{From Book} (Red. 33-50)



Comet.	1st Star.	2nd Star.	= − 1st ✶	= − 2nd ✶
19 5 59.5	19 8 32.3	19 9 25.7		
7 8.4	9 6.0	10 32.9		
13 7.9	17 38.3	19 58.6	− 4m 30.4	− 6m 50.7
11 17.0	13 49.0	14 42.0		
12 23.5	14 22.2	15 49.2		
23 40.5	28 11.2	30 31.2	− 4 30.7	− 6m 50.7
16 35.1	19 7.2	20 1.4		
17 41.5	19 40.7	21 7.6		
34 16.6	38 47.9	41 9.0	− 4 31.3	− 6m 52.4
21 41.1	24 14.1	25 7.2		
22 46.3	24 46.2	26 14.0		
44 27.4	49 0.3	51 21.2	− 4 32.9	− 6m 53.8
26 47.8	29 22.0	30 16.0		
27 54.7	29 54.5	31 21.0		
54 42.5	59 16.5	61 37.0	− 4 34.0	− 6 54.5
			159.3	262.1
			− 4m 31.86	− 6m 52.42
			− 2m 15.93	− 3m 26.21

Mean of C. Times = 19h 17m 1.5

Chron. Cor. + 2 26.1

19h 19 27.6

11 5 39.8

8 13 47.8

− 1 20.9

C. M. T. = 8 12 26.9

4 44 31

Gr. M. T. = 12 56 58.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

$A =$	$4\ 1^{st}\ x$	$A\ 2^{nd}\ x$	$\alpha = +1^{st}\ x$	$\alpha = +2^{nd}\ x$
$1^m\ 8.9^s$	33.7^s	$1^m\ 7.2^s$	$1^m\ 42.6^s$	$2^m\ 16.1^s$
$1\ 6.5^s$	33.2^s	$1\ 7.2^s$	$1^m\ 39.7^s$	$2^m\ 13.7^s$
$1\ 6.4^s$	33.5^s	$1\ 6.2^s$	$1^m\ 39.9^s$	$2^m\ 12.6^s$
$1\ 5.2^s$	32.1^s	$1\ 6.8^s$	$1^m\ 37.3^s$	$2^m\ 12.0^s$
$1\ 6.9^s$	32.5^s	$1\ 5.0^s$	$1^m\ 39.4^s$	$2^m\ 11.9^s$
			198.9^s	66.3^s
			$1^m\ 39.78^s$	$2^m\ 13.26^s$

~~1.99904~~

Log $99.78 = 1.99904^s$

$7.5 = 0.87506^s$

9.64027

$326.9^s = 2.51437^s$

$\Delta\alpha\ 6.0$

$\delta\delta 9.1^s = -9'\ 19.1''$

$133.26 = 2.12470^s$

$7.5 = 0.87506^s$

$\cos\delta = 9.64051^s$

$436.4^s = 2.60027^s$

$\Delta\alpha\ 6.0$

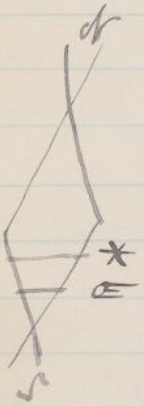
$449.2^s = -7\ 29.2$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Brooks (1882) (1st Series) {From Brook}

Sept. 9. 1883. (Rad. 33-56)



	Comet.	Star.	C − *	C − * / ν	
20	11 38.6	20 13 19.5			
	12 9.8	14 52.2			
	23 48.4	28 11.7	−4	23.3	−2 11.65
	15 10.5	16 51.5			
	15 45.0	18 20.0			
	30 55.5	35 18.5	−4	23.0	−2 11.50
	~~37.0~~		~~+4~~		~~+2 18.50~~
	18 48.2	20 29.7			
	19 22.0	22 4.8			
	38 10.2	42 34.5	−4	24.3	−2 12.15
	22 34.0	24 15.7			
	23 2.1	25 43.4			
	45 36.1	49 59.1	−4	23.0	−2 11.50
	26 4.5	27 46.9			
	26 34.4	29 13.6			
	52 38.9	57 0.5	−4	21.6	−2 10.80
					57.60
					−2m 11.52

Mean ν Sets = 20h. 19m 6.9 G.M.T.

1882phae.proj..497.

Δ ∈	Δ ☀	∈ − ☀	∈ − ☀
31.2′	32.7′	1ᵐ ~~69.9~~ 1.5	
34.5′	35.5′	1ᵐ ~~70.0~~ 1.0	
33.8′	35.1′	1ᵐ ~~68.9~~ 1.3	
28.1′	27.7′	0ᵐ ~~59.8~~ 59.6	
29.9′	26.7′	0ᵐ ~~56.8~~ 56.8	
		0.2′	
		1ᵐ .04′	

Log. 60.04 = 1.77844′
7.5 = 0.87506′

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Brooks (1812). (2nd. Series.) {From Book}

(Red. 33-57)

Comet.	Star.		
20h 31 13.2	20h 31 19.0		
31 50.2	31 46.0	− 0.6	− 0.30
63 3.4	63 4.0	~~3.4~~	
33 4.3	33 23.2		
33 54.0	33 36.2		
66 58.3	66 59.4	− 1.1	− 0.55
34 18.7	34 37.0		
35 ~~4~~.5	34 50.5		− 2.15
69 23.2	~~70~~ 69 27.6	− 4.3	− ~~7.15~~
36 35.1	36 64.9		
87 22.2	37 9.5		
73 57.3	74 4.4	− 7.1	− 3.55
39 38.6	~~39~~ 55.1		
40 22.9	~~40~~ 12.0		
80 1.5	80 7.1	− 5.6	− 2.80
41 59.0	42 15.2		
42 40.0	42 31.0		
84 39.0	84 46.2	− 7.2	− 3.60
44 42.0	45 0.1		
46 25.6	45 16.0		
90 7.6	90 16.1	− 8.5	− 4.25
45 45.0	46 3.2		
46 29.8	46 18.5		
92 14.8	92 21.7	− 6.9	− 3.45
46 ~~44.0~~	~~47 15.5~~ 46 1.0		
47 25.2	~~47 12.0~~ 46 11.5	− 6.3	− 3.1
~~94 0.2~~	~~92 15.5~~	+ 1 53.7	+ ~~56.85~~
~~93 12.2~~	92 55.5		
70 39 41.9			
582 152.6			
			− 77.50
			+ 113.70
			+ 36.90
			+ 4.02
			22.9,5
			3.28

Mean Zets 20h 41 45.2

1882phae.proj...497.

Δ Comet	Δ Sun	= + x
37.0	26.0	63.0
49.7	13.0	62.7
~~55~~ 55.8	13.5	59.3
47.1	14.6	61.7
44.3	16.9	61.2
41.0	15.8	56.8
43.6	15.9	59.5
44.8	15.3	60.1
41.2	13.5	54.7

~~540.0~~

log 59.04 = 1.77115

log 7.5 = 0.87506

1m 00.0

413.9

59.04

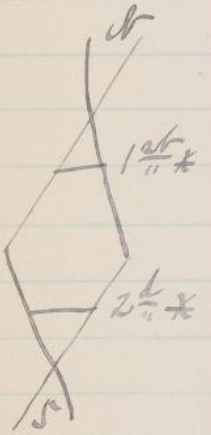
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Brooks (1812) (From Book)

Sept. 7. 1883. (Red. 33-59)

(1st * used with ☉ on this date but not a Col. *)



1st * Star	2d * Star	1st * − 2nd *	(1st * − 2nd *)/2
21h 38 34.0	21h 39 59.5		
39 22.0	40 55.0		
77 56.0	80 54.5	− 2m 58.5	− 1m 29.25
41 10.2	42 35.9		
41 59.0	43 30.7		
83 9.2	86 6.6	− 2 57.4	− 1 28.70
43 43.8	45 10.0		
44 33.2	46 4.0		
88 17.0	91 14.0	− 2 57.0	− 1 28.50
46 19.0	47 45.1		
47 9.0	48 39.9		
93 28.0	96 25.0	− 2 57.0	− 1 28.50
49 15.7	50 40.4		
50 4.0	51 36.0		
99 19.7	102 16.4	− 2 56.7	− 1 28.35
52 22.3	53 48.6		
53 11.2	54 42.6		
105 33.5	108 31.2	− 2 57.7	− 1 28.85
		344.3	172.15
		~~− 2 68.86~~	~~− 1 28.69~~
		~~− 1 34.43~~	

Mean of 6 sets = 21h 45m 38.6 S.T.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

1st X	2nd X	1st X + 2nd
48.0 '	55.5 '	1m 43.5 '
48.8 '	54.8 '	1m 43.6 '
49.4 '	54.0 '	1m 43.4 '
50.0 '	54.8 '	1m 44.8 '
48.3 '	55.6 '	1m 43.9 '
48.9 '	54.0 '	1m 42.9 '
		1m 262.1 '
		1m 43.68 '

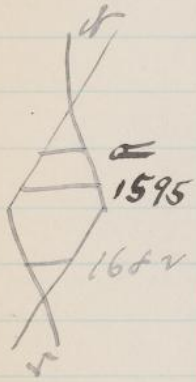
Log 10368 = 2.01570 '
7.5 = 0.87506 '

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

(1st Series) Comet Brooks (1882) (From Book)

Sept. 21. 1883. (Red. 33-73474)



Comet.	+61° 1595.	+60° 1682	α − 1595	α − 1682
20h 21 52.3	20h 22 46.2	20 23 44.8		
22 52.2	24 28.2	25 22.1		
44 44.5	47 14.4	49 6.9	− 2m 29.9.7	− 4m 22.4.7
29 4.1	30 0.3	31 5.6		
30 17.4	31 48.3	32 36.6		
59 21.5	62 48.6	63 42.1	− 2 27.1.7	− 4m 20.6.7
34 0.0	34 55.0	36 0.0		
35 11.7	36 43.2	37 31.2		
69 11.7	71 38.2	73 31.2	− 2 26.5.7	− 4 19.5.7
38 15.6	39 13.0	40 8.1		
39 23.1	40 51.8	41 48.9		
77 38.7	80 4.8	81 57.0	− 2 26.1.7	− 4 18.3.7
42 22.5	43 18.1	44 13.7		
43 29.2	44 18.7 (57.0)	45 54.3		
85 51.7	88 15.1	90 8.0	− 2 23.4.7	− 4 16.3.7
			153.0.7	97.1.7
			− 2 26.60.7	− 4 17.42.7
			− 1 13.30.7	− 2 9.71.7

Mean Sᵈ ate = 20h 33m 40.8 G.R.
+ 2 51.0
20h 36 31.8.7
12 0 51.6.7
8 35 40.2.7
1 24.5
C. m. S. T. = 8h 34 15.7.7
4 44 31
Gr. m. S. T. 13 18 47

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497...

Comet	1595	1682	$\Theta - 1595$	$\Theta + 1682$
59.9″	42.0′	37.3″	0 42.1″	2m 37.2″
1m 13.8″	48.0′	30.9″	0m 34.7″	2m 44.2″
1m 11.7″	48.2′	31.2″	0m 36.5″	2m 42.9″
1m 7.5″	48.8′	40.8″	0m 31.3″	2m 48.3″
1m 6.7″	38.9′	40.6″	0m 32.2″	2m 47.3″
			176.8′	219.9′
			0m 35.36″	2m 43.98″

Log. 35.36 = 1.54851″

7.5 = 0.87506″

124.6 $\frac{9.6 \Delta \nu \nu}{} = 2.10915''$

163.98 = 2.21479″

7.5 = 0.87506″

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

(2nd series) Comet Brooks (1812) (from Book)

Sept. 21. 1883

Comet	* 1595	* 1598	* 1682
21h 20 35.3	21h 21 21.7	21h 22 0.7	21h
22 24.4	26 44.3	27 14.0	
28 29.0	29 16.6	30 18.8	29 53.8
30 62.1	31 11.0	35 6.2	33 38.4
⊠ Probably 1 sec. early		⊠	
35 26.7	36 17.1	37 17.3	36 52.6
37 51.8	38 10.4	42 5.4	40 38.0
42 35.5	43 23.2	44 25.5	43 59.7
44 58.6	45 17.2	49 12.6	47 45.0
49 40.4	50 29.7	51 32.2	51 4.3
52 4.5	52 21.5	56 17.6	54 50.3

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

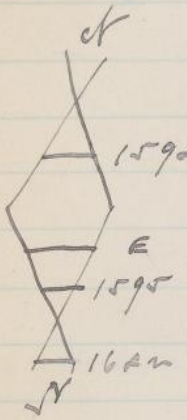
1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

2nd Series Comet Brooks (1882). (From Book)

Sept. 21. 1883



Comet.	* 1595.	* 1682.	* 1598.	α − 1595
21h 20 35.3	21h 22 0.7	~~21h 28 44.3~~	21h 25 44.3	
21 21.7	22 24.4	~~27 14.0~~	27 14.0	
41 57.0	44 25.1		52 58.3	− 2m 28.1s
28 29.0	29 53.3	30 52.1	33 38.4	
29 16.6	30 18.3	31 11.0	35 6.2	
57 45.6	60 11.6	62 3.1	68 44.6	− 2 26.0
95 26.7	36 52.6	~~37 51.8~~ 40 38.0	~~40 38.0~~ ~~37 51.8~~	
36 17.1	37 17.8	~~40 38.0~~ 38 10.4	~~38 10.4~~ 42 5.4	
71 43.8	74 10.4	~~42 5.4~~ ~~76 2.2~~ ~~82 43.4~~ 44 58.6	~~76 2.2~~ ~~82 43.4~~ 82 43.4	− 2 26.6
42 35.5	43 59.7	~~47 45.0~~ 45 17.2	~~47 45.0~~ 49 12.6	
43 23.2	44 25.5	~~49 12.6~~ ~~90 57.6~~ 90 13.8	~~45 17.2~~ ~~96 57.6~~ 96 57.6	
85 58.7	88 25.2	~~92 53.2~~ 92 4.5	~~90 13.8~~ ~~54 50.3~~ 54 50.3	− 2 26.5
49 40.4	51 4.3	~~54 50.3~~ 52 21.5	~~52 4.5~~ 56 17.5	
60 29.7	51 32.2	56 17.6	~~62 21.6~~	
100 10.1	102 36.6	~~111 7.8~~ 104 26.0	~~104 26.0~~ 111 7.8	− 2 26.4
				13.6
				− 2 26.72
				− 1 13.36

Mean Sets 21h 35m 45.5s
+ 2m 51.1
21h 38m 36.6s

12 0 51.6
9 37 45.0
− 1 34.9
C.M.T. 9 36 10.4
4 44 31.
Gr. M.T. 14h 20m 41.4

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

$\alpha - 1682$	$\alpha - 1598$	$\Delta\alpha$	Δ 1595	Δ 1682	Δ 1598
	−11 1.3	46.4	23.7		1 29.7
−4 17.5	−10 59.0	47.6	25.0	18.9	1 29.8
−4 18.4	−10 59.6	50.4	25.2	18.6	1 27.4
~~−10 59.6~~	~~−4 18.4~~			~~27.4~~	~~18.6~~
−4 17.1	−10 58.9	47.7	25.8	18.6	1 27.6
~~−10 58.9~~	~~−4 17.1~~			~~27.6~~	~~18.6~~
−4 15.9	−10 57.7	49.3	27.9	17.0	1 27.2
~~−10 57.7~~	~~−4 15.9~~			~~27.2~~	~~17.0~~
~~34 193.7~~	~~−38 121.7~~	241.4	127.6	73.1	113.7
~~−8 78.42~~	~~−6 60.34~~	48.28	25.52	18.28	139.7
~~−4 39.21~~	~~−3 30.17~~				27.94

$\alpha - 1595$	$\alpha + 1682$	$\alpha + 1598$
22.76	66.56	76.22
68.9	296.5	
−4m 17.22	−10m 59.30	mean
−2m 8.61	−5m 29.65	half mean

Log 22.76 = 1.35717 | 66.56 = 1.82321 | 76.22 = 1.88207

7.5 = 0.87506 | 7.5 = 0.87506 | 7.5 = 0.87506

22.2 = 9.62557 / 1.91720

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Brooks (1892) (Chron. Nut)

Oct. 5, 16h 3.

Comet. Star.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

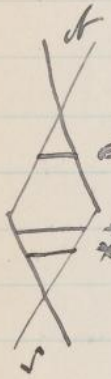
(144 Series) Comet Brooks (1882) (From Book)

~~See also Book 2, page 62~~

Sept. 22. 1883

R 33. p. 20

Comet	* 1675	* 1676	α − 1675	α − 1676
22h 30 39.6	27 15.0	28 42.4		
31 28.0	28 33.9	29 14.7		
62 7.6	55 48.9	57 57.1	6m 18.7	4 10.5
36 31.0	32 6.5	33 34.0		
36 19.8	33 24.7	34 6.4		
71 50.8	65 31.2	67 40.4	6m 19.6	4 10.4
40 59.5	37 36.0	39 3.5		
41 50.0	38 54.3	39 35.2		
82 49.5	76 30.3	78 38.7	6 19.2	4 10.8
45 59.8	42 37.0	44 4.3		
46 50.6	43 54.7	44 35.8		
92 50.4	86 31.7	88 40.1	6 18.7	4 10.3
51 19.7	47 48.5	49 ~~11.6~~ 10.7		
51 57.6	49 ~~10.7~~ 14.6	49 55.8		
103 17.3	96 ~~54.2~~ 58.1	99 ~~10.4~~ 6.5	6 ~~23.1~~ 19.2	4 ~~6.9~~ 10.8



Mean Sets = 22h 41m 17.6s M.R

	~~99.3~~		~~48.9~~
6m	~~19.86~~	4m	~~9.78~~
3m	~~9.93~~	2m	~~4.89~~
	45.4		
6	19.1	4m	~~10.6~~ 2.8
+3	9.55	+2	5.3

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

α	$\Delta 1675$	$\Delta 1676$	$\alpha+1675$	$\alpha+1676$
~~48.4~~	1 18.9	32.8	2m 7.3	1m 20.7
48.8	1 18.2	32.4	2m 7.0	1m 21.2
50.5	1 18.3	31.7	2m 8.8	1m 22.2
50.8	1 17.7	31.5	2m 8.5	1m 22.3
37.9	1 ~~27.2~~ 31.1	~~42~~ 45.1	~~2m 51~~ 9.0	~~1m 19.1~~ 23.0
			~~36.7~~	~~1.5.5~~
			~~8m 7.3.4~~	~~1m 21.0~~
			40.6	9.4
			2m 8.1	1m 21.9

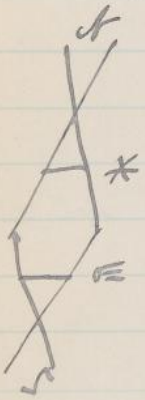
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

(2nd Series) Comet Brooks (1882) (From Book)

(See also Book 2 page 63) Sept. 22. 1883. R 33. p. 40.

	Comet.		* 1682.				
22h	55m 46.2		22h 58m 8.8				
	56 42.3		58 33.6				
	112 28.5		116 42.4	-4	13.9	-2	6.95
22h	59 22.4		23h 1 28.1				
23	0 1.4		23h 2 9.6				
	119 23.8		123 37.7	-4	13.9	-2	6.95
	~~2 43.2~~						
	~~42 37.0~~		5 1.4				
	3 34.2		5 29.9				
	126 17.4		130 31.3	-4	13.9	-2	6.95
	5 58.2		7 54.5				
	6 27.2		8 44.6				
	132 25.4		136 39.1	-4	13.7	-2	6.85
	9 9.7		11 20.9				
	9 53.4		11 55.9				
	139 3.1		143 16.8	-4	13.7	-2	6.85
							34.55
							-2 6.91



22h 62m 57.8s

Mean Rate 23h 2m 57.8s M.T.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

~~C = + X~~

36.1	24.8	80.9
39.0	41.5	80.5
51.0	28.5	79.5
29.0	50.1	79.1
43.7	35.0	78.7
		398.7
		1 m 19.74

Log 79.74 = 1.90168
7.5 = 0.87506

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

(1st Series) Comet Brooks. (1882) (From Book)

Sept. 26. 1883. R. 33. p. 28.

Comet.	* D.M. 1681.			
1h 58 23.4	1h 57 22.1			
59 14.2	57 30.7	2m 44.8	1m 22.40	
147 37.6	134 52.8	44.8	0	22.40
2h 1 4.5	1h 59 55.7	15.2		
1 46.0	2h 0 11.2			
* 122 50.5	120 6.9	2 43.6	1 21.80	
3 19.7	2 13.0			
E 4 3.4	2 26.5			
127 23.1	124 38.6	2 44.6	1 22.30	
~~5 36.9~~	~~4 30.2~~			
~~6 26.2~~	~~4 42.5~~			Rej. this set.
~~132 3.1~~	~~129 12.7~~	~~2 50.4~~	~~+ 26.20~~	
8 39.6	7 34.5			
9 27.6	7 45.0			
138 7.2	135 19.6	2 47.7	1 23.85	
11 12.2	10 6.2			
12 0.0	10 16.0			
143 12.2	140 22.2	2 50.0	1 25.00	

~~2h. 4m 56.1~~

~~140.55'~~

~~80.55'~~

~~1m 13.40'~~

115.35'

+ 1m 23.07'

Means of sets 2h. 4m 56.4 5.1 K.R

+ 2 58.9

2h 7m 54.0

12 20 34.3

C. A. 13 47 19.7

2 15.5

C. m. T = 13 45 4.2

4 44 31

Gr. m. T = 18h 29m 35

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

1 ⊏	1 ✶	⊏ + ✶
~~2 50.8~~	8.6	~~2 59.4~~
0 41.5	15.5	0 57.0
~~0 53.7~~	~~12.0~~	~~65.7~~
~~0 49.3~~	~~12.3~~	~~61.6~~
0 48.0	10.5	58.5
0 47.8	9.8	57.6
		288.7
		8 57.74

Rej. this set.

Log 57.74 = 1.76148
7.5 = 0.87506
9.70252
2143 = 2.33906
446.0
667.7 = -11 7.7

1882phae.proj..497.

110

(2nd Series) Comet Brooks (1912) (From Book)

½ wt. Sept. 26. 1883 R. 33. p. 29.

Comet.	*D. M. 1727.		
2h 15 18.2	2h 14 20.7		
15 40.7	16 3.3		
30 58.9	30 24.0	34.9	17.45
17 17.0	16 17.0		
17 42.8	18 0.0		
34 59.8	34 17.0	42.8	21.40
20 18.6	19 19.2		
20 42.3	21 2.2		
41 0.8	40 21.4	39.4	19.70
22 16.3	21 15.2		
22 41.6	22 59.6		
44 57.8	44 14.8	43.0	21.50
24 27.4	23 30.5		
24 43.0	25 1.2		
48 10.4	48 31.7	28.7	14.35
			9.40
			+0m 8.88



Mean sets = 2h 20m 6.8 ✓

+ 2 58.9 ✓

2h 23 5.7 ✓

12 20 34.3 ✓

14 2 31.4 ✓

2 18.0 ✓

C. M. T. = 14 0 13.4 ✓

~~4 44 31.~~

Gr. M. T. = ~~18h 44 44~~

O. obs.

Above sets ½ wt.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

1 ☉	1 ☆	☉ − ☆
22.5	42.6	20.1 ~~65.1~~
25.8	43.0	17.2 ~~68.8~~
23.8	43.0	19.2 ~~18.2~~ ~~66.8~~
25.2	44.4	19.2 ~~69.6~~
15.6	30.7	15.1 ~~46.3~~
112.9	203.7	~~89.8~~
22.58	40.74	~~17.96~~
		90.8
		18.16

$\log 78.16 = 1.89298$

$7.5 = 0.87506$

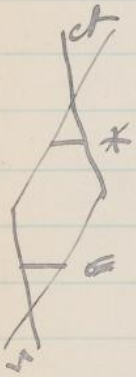
$+29.11 = 2,47056$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Brooks. (1892) (Chron. Mult.)

Oct. 5. 1892. R. 33. p. 115.



Comet.	Star.		
0h 4 41.9	0h 4 28.9		
5 49.9	5 8.9		
10 31.8	9 37.8	52.0	26.00
6 30.3	6 18.1		
7 37.9	6 58.0		
14 8.2	13 16.1	52.1	26.05
8 32.2	8 37.8		
9 58.5	9 18.0		
18 50.7	17 55.8	54.9	27.95
12 27.0	11 26.8		
13 12.0	12 30.9	55.1	27.55
25 17.8	24 27.9	50.2	25.10
15 13.8	14 59.8		
16 20.0	15 38.8		
31 33.8	30 38.6	55.2	27.60
17 50.8	17 37.8		
18 38.2	18 15.8		
36 49.0	35 53.6	55.4	27.70
		160.40	163.85
		26.72	27.31

Mean 6 sets = 0h. 11m 25.9 R.A.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497...

Δ ☉	Δ ☽	☉ + ☽
1 8.0	40.0	1m 48.0
1 7.6	39.9	1m 47.5
1 6.3	40.2	1m 46.5
~~1 6.1~~ 1m 7.0	~~34.1~~ 39.7	~~1m 40.2~~ 46.9
1 6.2	39.0	1m 45.2
1 7.4	38.0	1m 45.4
		278.5
		1m 46.42

Log 106.42 = 2.02702
7.5 = 0.87506

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Brooks 1812

Reductions of this Comet in other Books.

Date. 1883	Book.	Page.
Dec. 22.	3	160
Nov. 8.	3	158
Oct. 30.	3	156
Oct. 18.	3	154
Oct. 17.	3	152
Oct. 16.	3	148
Oct. 5.	3	146
Sept. 5.	2	48
~~2 series~~ Sept. 6.	2	50 = 1st series 54 = second series
Sept. 21.	2	58

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

(Comp. * + 58° 1641) Comet Brooks (1892) {Mrat Eq}

V Oct. 1. 1892

Comet.			Star.		
22h	34	39.8	22h	33	21.2
	34	49.0		33	27.8
	34	58.0		33	56.0
	35	8.2		34	0.4
	139	35.0		134	44.4
	39	0.0		37	41.5
	39	9.0		37	48.1
	39	18.0		38	14.0
	39	27.0		38	20.2
	156	54.0		152	23.8
	54	58.0		49	19.8
	55	3.8		49	27.6
	55	22.2		50	15.2
	55	28.3		50	23.8
	220	52.3		199	26.4
23h	22	54.2	23h	17	38.9
	23	1.0		17	51.0
	23	43.4		18	14.2
	23	50.1		18	23.2
	93	28.7		72	7.3
	39	0.0		37	41.5
	39	9.0		37	48.1
				38	14.0
				38	20.2

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1962phec.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

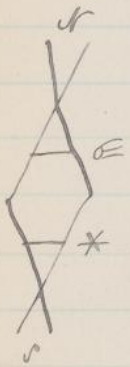
1882phae.proj..497.

R 33. p. 33.

Comet Brooks (1882) ~~R. 33.~~

Sept. 3. 1883

Chronograph.



Comet.	Star.			
22^h 8 53.5	6 31.5			
9 39.4	7 4.2			
18 32.9	13 35.7	4 57.2	2	2 X8.60
12 41.3	10 18.8			
13 25.2	10 53.0			
26 6.5	21 11.8	4 54.7	2	2 17.35
16 28.8	14 8.2			
17 16.7	14 42.0			
33 46.5	28 50.2	4 55,3	2	27.65
20 21.0	18 1.1			
21 8.9	18 34.3	~~5 4.5~~		
41 39.9	36 35.4	~~4~~ 4 54.5	2	2 7.25 ~~27.25~~
24 14.5	21 53.2			
25 1.1	22 27.8			
49 15.6	44 21.0	4 54.6	2	2 17.30
~~27 57.5~~	~~26 40.2~~			
~~27 58.8~~	26 14.3	=		
~~55 46.0~~	~~51 54.5~~	~~4 4.5~~	~~2~~	~~0.75~~
30 50.2	28 31.0			
31 38.8	29 5.8			
62 29.0	57 36.8	4 52.2	2	26.10

~~22^h 20^m 32.5~~

281 39.4

Mean Antares = 22^h 23 28.3 R.A.

~~195.00~~

~~2 57.58~~

164.25

$+2^m$ 27.38

1882phae.proj..497.

Δ ☌	Δ ☍	☌ ☍
45.9	32.7	78.6
43.9	34.2	78.1
~~47.9~~ 47.9	33.8	81.7
47.9	33.2	81.1
46.6	34.6	81.2
~~1.0~~	~~34.1~~	~~35.1~~
48.6	34.8	83.4
~~519.2~~		
~~74.17~~		
484.1		
80.70		

Log. 80.70 = 1.90687

7.5 = 0.87506

9.63 ∨9

2∨3.2 / 46.0 = 2.413∨2

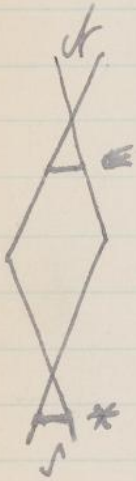
6 32.4 = 10 32.4

1882phae.proj..497.

Comet Barnard

July 25 1884

{Book 37 Page 1}



Comet.	Star.				
17h 28 6.6	17h 30 10.2				
28 45.4	30 23.3				
56 52.0	60 33.5	-3	41.5	-1	50.75
30 50.0	32 52.3				
31 27.4	33 5.2				
62 17.4	65 57.5	-3	40.1	-1	50.05
33 35.5	35 38.5				
34 13.3	35 50.6				
67 48.8	72 1 28.1	~~-4~~ -3	40.3	-1 ~~-2~~	0.1 ~~20.15~~
36 52.5	38 55.7				
37 29.1	39 6.7				
74 21.6	78 2.4	+3	40.8	-1 -0	50.40
39 51.4	41 55.4				
40 22.9	42 3.6				
80 19.3	83 59.0	-3	39.7	-1	49.85
42 41.8	44 43.6				
43 23.5	44 59.2				
86 5.3	89 42.8	-3	37.5	-1	48.75
				~~269.95~~	~~299.95~~
				~~-1m 44.99~~	~~+ 39.99~~
				299.9	
				-1m 49.99 = mean.	
				-0.1 = Ref. corr.	
				-1m 49.87 = Corr (E - *)	

Meridian = 17h. 35m 38.7s Sid. T.
+ 25.5
17 36 4.2
8 15 10.4
9 20 53.8
- 1 31.9
C. M. T. = 9h 19 21.9
4 44 31
G. M. T. = 14h 3 53

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ α	Δ x	α − x
38.8″	13.1″	25.7″ ~~51.9~~
37.4″	12.9″	24.5″ ~~50.8~~
37.8″	12.1″	25.7″ ~~49.9~~
36.6″	11.0″	25.6″ ~~47.6~~
36.5″	8.2″	28.3″ ~~44.7~~
~~21.7~~ 21.7″	15.6″	26.1″ ~~47.8~~
6 | 224.8″	72.9″	155.9″
37.13″	12.15″	= 25.98″

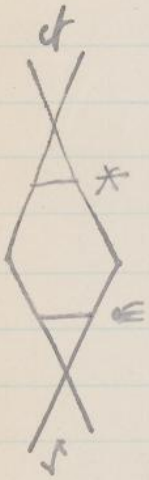
Log 25.98 = 1.41464″
7.5 = +0.87506″
" cos δ = +9.89966
154.6″ = 2.14936″
884.8″
735.2″ = +12 15.2″

1882phae.proj..497.

Comet Barnard

July 28. 1884.

{Book 37 Page 9}



Comet.	Star.		
18h 0 22.9	18h 0 17.0		
1 2.3	0 57.2	11.0'	
1 25.2	1 14.2	~~39.4~~	5.50
4 27.0	4 16.0		
5 6.6	4 59.1	~~28.5~~	9.2
9 ~~43~~ 3.6	9 15.1	~~39.6~~	~~14.25~~
5 59.2	5 40.3		
6 32.0	6 23.4	27.5'	
12 31.2	12 3.7	~~32.8~~	13.75
7 25.9	7 4.1		
8 3.5	7 46.1	39.2	
15 29.4	14 50.2	~~37.6~~	19.60
~~10~~ 12.4	~~9 58.5~~		
10 47.8	10 39.6	~~22.1~~	
21 ~~0.2~~	20 ~~38.1~~	~~35.4~~	~~11.05~~
~~18h 5m 59.9'~~		~~64.15~~	

~~0m 12.83~~
~~59.15~~
~~Mean 11.43~~

37
~~58~~ 119.4

Mean Sidereal ~~18h 4m 52.4~~ J.R

+28.0

18 20.4

8 27 0.1

9 34 20.3
−1 34.7

9 36 ~~4~~ 5.6

14 44 31.

14 21 17.

8.10'
+0m 12.02'

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ ☉	Δ ☆	☉ + ☆
39.4'	40.2'	79.6'
~~39.6~~ ~~28.8~~	43.1'	82.7'
~~32.8~~ ~~27.8~~	43.1'	75.9'
37.6'	42.0'	79.6'
~~35.4~~	~~41.1~~	~~76.5~~
4|149.4	4|168.4	~~39 4.3'~~
37.35	42.10	~~1 m 18.86~~
		317.8'
		79.45'

Log) 79.45 = 1.90009

7.5 = 0.87506

9.900 f 2

474.2' = 2675 97'

229.8'

415.6' = -6' 55"6

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Count Barnard

July 30. 1884

{Book 37 / Page 12}



Count.		Star.					
17h 51	23.3	17h 50	3.2				
52	36.3	51	5.3				
103	59.6	101	8.5	2	51.1	1	25.55
54	53.3	53	27.7				
55	55.2	54	31.7				
110	48.5	107	59.4	2	49.1	1	24.55
18h 7	45.3	18h 6	23.3				
8	30.5	7	23.5				
136	15.8	133	46.8	2	29.0	1	14.50
10	23.0	8	59.0				
11	11.4	10	0.7				
141	34.4	138	59.7	2	34.7	1	17.35
14	14.0	13	27.7				
14	29.3	13	38.7				
148	43.3	147	6.4	1	36.9	0	48.45
15	35.2	14	49.1				
15	50.5	14	59.2				
151	25.7	149	48.3	1	37.4	0	38.70
16	58.7	16	13.5				
17	14.8	16	23.0				
154	13.6	152	36.6	1	37.0	0	48.50
18	22.3	17	38.3				
18	40.3	17	47.1				
157	2.6	155	25.4	1	37.2	0	48.60
22	15.0	21	26.8				
22	28.2	21	39.4				
164	43.2	163	6.2	1	37.0	0	48.50

(crossed out)

18h 10m 24.3

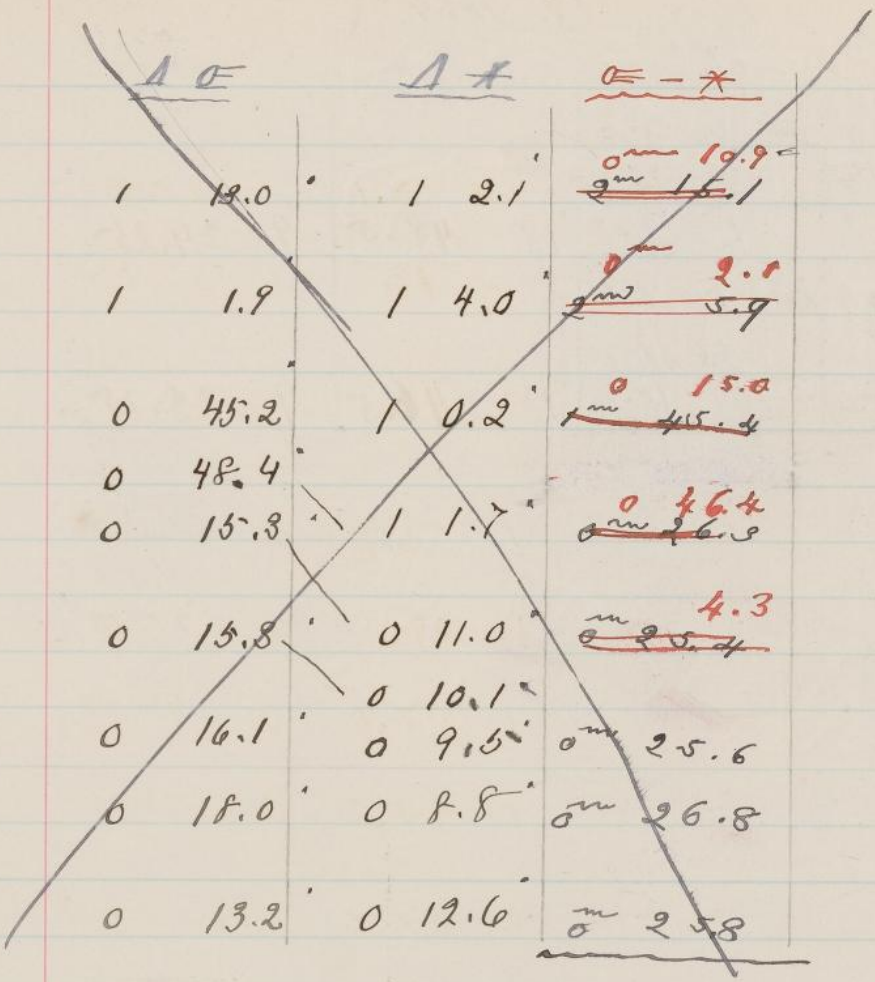
~~24.70~~ 324.70

~~1m 08~~ 1m 2.74

Something wrong in the above and no new light can be got from Book. so rejected.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.



1 ⊙		1 ☆		⊙ − ☆
1	18.0	1	2.1	0m 10.9 ~~2m 16.1~~
1	1.9	1	4.0	0m 2.1 ~~2m 5.9~~
0	45.2	1	0.2	0 15.0 ~~1m 45.4~~
0	48.4			
0	15.3	1	1.7	0 46.4 ~~0m 46.3~~
0	15.8	0	11.0	4.3 ~~0m 25.4~~
		0	10.1	
0	16.1	0	9.5	0m 25.6
0	18.0	0	8.8	0m 26.8
0	13.2	0	12.6	0m 2 58

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

126

(See Red. B. A. / p. 206

Comet Barnard

Aug. 14. 1884.

{Book 18 87 / Page 43}



Comet			Star						
18h	49	37.8	18h	40	5.4				
	50	26.4		41	10.3				
	100	3.2 / 4		81	15.7	18	48.5	9	24.25
19h	3	36.7	18h	54	6.8				
	4	21.3		55	4.7				
	127	58.0		109	11.5	18	46.5	9	23.25

18h 57 0.6 SC
+2 43.6 (21)

18h 59 42.7

9 34 1.5
.2

9 25 47.7

1 32.7

9 24 8.5 = C. m. T.

4 44 31.0

14 8 39.5 = G. m. T. (cor.)

48 47.50
24.00
9 23.75

7.50
+9 23.7

1882phae.proj...497.

$\Delta\alpha$	$\Delta\delta$	
48.6 ✓	+64.9 ✓	113.5 ~~63.5~~
44.6 ✓	057.9 ✓	102.5
2 | 93.2	122.4	~~108.0 = Mean.~~
46.6	61.20	104.0 ✓ = Mean.

Log 108.0 = 2.03342 ✓
" 7.5 = 0.87506 ✓
" cos δ = 9.90526 ✓
651.2 ✓ = 2.81374 ✓
886.0
234.8 ✓ = −3 54.8 ✓
−36 29 8.6
−36 33 3.4 ✓
~~+1 57.4~~
~~−36 31 6.0~~

2.03342 ✓
0.87506 ✓
9.~~90526~~ 90508
650.7 = 2.81378
886.0
~~2363~~
2350 = −3 55.0 ✓
−36 29 9.K ✓
−36 33 K.K ✓

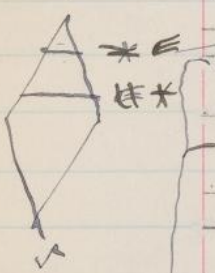
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

128 (Stars observed in 2 sets. "f" " " 1 set. "g" " " 1 set.) Comet Barnard (Star f used)

Aug. 16. 1884. {Book 87 Pages 51}

(See B.F. fo. 214) V



∈	*e	*f	∝ − *e	∈ − *f
18h 14m 48.2	18h 1m 56.7	18h 15m 35.1		
15 41.2	2 24.0	16 42.7		
30 29.4	4 20.7	32 17.8	26m 8.7	−1m 48.4
31 17.0	18 19.2	32 27.5		
32 29.7	19 15.4	33 5.0		
63 46.7	37 34.6	65 32.3		
34 51.1		33 43.8	26m 18.1	−1m 45.6
35 8.1		34 32.3		
69 59.2		68 15.6		−1 43.6 7
36 50.4		35 44.3		
36 58.9		36 22.0		
73 49.3		72 6.3		1 43.0 7
38 27.2		37 19.7		
38 35.0		37 59.0		
77 2.2		75 18.7		1 43.5 7
39 59.5		38 54.3		
40 8.4		39 33.0		
80 7.9		78 27.3		1 40.6 7
41 40.7		40 35.2		
41 47.9		41 13.0		
83 28.6		81 48.2		1 40.4 7
43 28.3		42 24.3		
43 36.7		43 3.0		
87 5.0		85 27.3		1 37.7 7
45 3.4		43 57.7		
45 10.7		44 36.7		
90 14.1		88 33.4		1 40.7 7
46 30.0		45 24.2		
46 36.8		46 2.7		
93 6.8		91 26.9		−1 39.9 7
				9.4
∈	*g	*f		−1 41.18
18h 50m 29.2	18h 39m 47.5	18h 51m 21.7		
50 47.8	51 51.3	51 33.3		
19 17.0	115 41.8	102 35.0		

Chrom. cor. = + 2 44.8

18h	40	55.8	
18	43	40.6	
9	37	58.0	
9	5	42.6	
	−1	29.4	
9	4	13.2	

9	4	13.2	
4	44	31.0	
13	48	44.2	= Gr. M. T.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

ΔE $\Delta *$ $E *$

17.0	49.0	32.0
8.5	37.7	29.2
7.8	39.3	31.5
8.9	38.7	29.8
7.2	37.8	30.6
8.4	38.7	30.3
7.3	39.0	31.7
6.8	38.5	31.7
8)71.9	8)308.7	6.8
8.99	38.84	30.85

Log 30.85 = 1.48926
" 7.5 = 0.87506
" cos Δ = 9.90576
186.2 = 2.27008

93.1 = +1 33.1
−36 23 48.1
−36 25 21.2
−36 22 15.0

1.48926
0.87506
9.90576
186.2 = 2.27008
93 6.2
+3 6.2

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

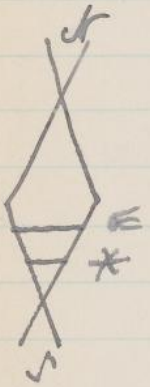
Comet extremely faint, no nucleus.

Comet Barnard

Aug. 16. 1884

{Book 37}
{Page 58}

(Lee B. L. p. 212)



Comet.	Star.		
18h 14 59.3	18h 14 18.4		
15 35.8	14 51.4		
30 35.1	29 9.8	1 25.3	0 42.65
~~16 62.4~~	~~15 58.8~~		
17 8.4	16 27.0	Rej. this sat.	
~~37 .8~~	~~32 25.8~~	~~+ 75.0~~	0 ~~42.50~~ ~~42.60~~
18 8.9	17 30.6		
18 30.3	17 48.7		
36 39.2	35 19.3	1 19.9	0 39.95
~~18h 16m 54.2~~ ~~48.6~~			~~135.10~~
			~~0 45.03~~
			~~+ 5.10~~
			~~0h 41.70~~
			42.60
			+0 41.30

Mean = 18 16 42.6

+ 2 46.0

18h 19m 34.6

9 41 54.6

8h 37 40.0

− 1 24.8

C. m. T. = 8h 36 15.2

4 44 31

Gr. m. T. = 13 2 0 46 (Cor)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Δ ε	Δ x	ε − x
		3.5
0 36.5	0 33.0	~~0 6.95~~
~~0 26.0~~		
~~6.0~~	~~0 28.2~~	~~3 4.8~~
		3.3
0 21.4	0 18.1	~~0 39.5~~
		6.8
2 | 7.9	2 | 1.1	3.4
24.9	2.1.1 = 0	

Log. 3.4 = 0.53148
" 7.5 = 0.87506
& cos α = 9.90603
20.5 = 1.31257

+0 = 20.5

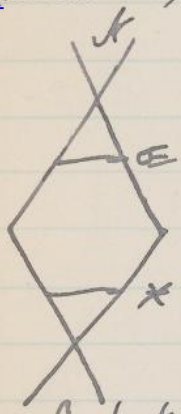
1882phae.proj..497.

Comet Barnard.

Sept. 12. 1884.

{Book 37 / Page 137}

(Bond 236)



½ wt. (2)

Comet.	Star.		
19h 13 11.5	19h 13 26.4		
~~13~~ 40.0	14 7.0		
26 51.5	27 33.4	-0 31.9	-0 15.95
14 35.1	14 49.5		
15 3.8	15 29.9		
29 38.9	30 19.4	-0 40.5	-0 20.25
~~16 35.2~~	~~16 49.5~~		
17 3.7	17 30.1		
~~33 38.9~~	~~34 19.6~~	~~-0 40.7~~	~~-0 20.35~~
19 33.3	19 47.0		
20 1.7	20 27.7		
39 35.0	40 14.7	-0 39.7	-0 19.85
20 56.5	21 9.4		
21 24.8	21 49.8		
42 21.3	42 59.2	-0 37.9	-0 18.95
½ wt (2) 22 34.0	22 47.1		
23 1.8	23 26.8		
45 35.8	46 13.9	-0 38.1	-0 19.05
~~23 59.3~~	24 12.2		
24 ~~27.4~~	~~24 57.2~~		
~~48 26.7~~	49 9.4	~~-0 42.7~~	~~-0 21.35~~
			~~135.75~~
			~~0m 19.39~~
			94.05
			-0m 18.810

~~19h 19m 0.6~~

Mean Sets = 19h 18 24.2 R.A.

+3 36.7

19h 22 ± 0.9

11 28 21.5

C ~~Sun~~ T = 7 53 29.4

1 17 6

~~Gr.~~ = 7 52 21.8 = C. M. T.

4 44 31.0

12 36 52.8 = Gr. M. T. (col.)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

A C	A *	C *
~~28.5~~ 28.5	40.6	~~79.1~~ 79.1
28.7	40.4	69.1
~~28.5~~	~~40.6~~	~~69.1~~
28.4	40.7	69.1
28.3	40.4	68.7
27.8	39.7	67.5
~~28.1~~	~~45.0~~	~~79.1~~
171.7	201.8	~~65.7~~
28.34	40.36	~~9.39~~

Log. 68.70 = 1.83696
" 7.5 = 0.87506
" cos α = 9.93461
443.2 = 2.64663

886.0
442.8 ≈

221.4 = +3 41.4
−30 39 26.6
−30 35 45.2

343.5
68.70

1.83696
0.87506
9.93489
443.5 = 2.64691

886.0
442.5 = +7 22.5

"3 d. and 6 th. sets not quite so good"

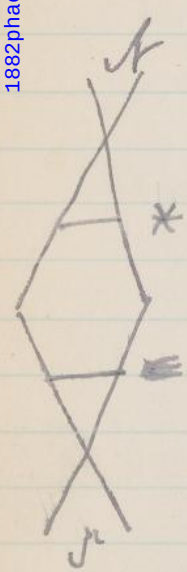
John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Barnard.
Sept. 13. 1884.

{Book 37 / Page 144}

(See ~~next~~ page ~~2~~ 136)



Comet.	Fl. *			
19h 29 27.2	19h 30 49.3			
29 44.4	31 10.3			
59 11.6	61 59.6	-2 48.0	-1 24.00	
32 21.7	33 44.4			
32 40.3	34 5.3			
65 2.0	67 49.7	-2 47.7	-1 23.85	
34 23.7	35 46.8			
34 43.2	36 7.5			
69 6.9	71 54.3	-2 47.4	-1 23.70	
36 25.2	37 52.2			
36 49.3	38 12.1			
73 17.5	76 4.3	-2 46.8	-1 23.40	
38 33.0	39 56.2			
38 52.7	40 15.2			
77 25.7	80 10.4	-2 44.7	-1 22.35	
			119.30	
			-1m 23.46	

Mean Sects = 19h 34 24.4 S.R.
+3 38.1
19h 38 2.5
11 32 18.1
8h 5 44.4
1 18.6
C. m.T. = 8h 4 24.8
4 44 31
Gr. m.T. = 12h 48m 56

(con.)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

A ☉	A ☽	☾ + X
17.2	21.0	38.2
18.6	20.9	39.5
19.5	20.7	40.2
21.1	19.9	41.0
19.7	20.0	39.7

√96.1 √102.5 √19.86
19.22 20.50 39.72

log 39.72 = 1.59901
" 7.5 = 0.87506
" cos X = 9.93833
= 2.41240

1.59901
0.87506
9.93795
= 2.41202

258.5
886.0
627.5
313.8 = -5 13.8

258.2
886.0
627.8 = -10 27.8 ✓

-29 49 3.2
-29 54 17.0

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

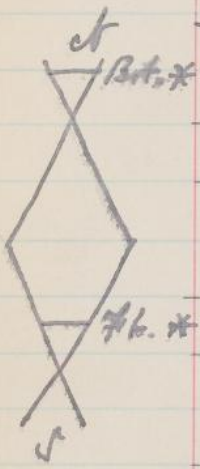
(See p. 134)

Comet Barnard.

Sept. 13. 1884.

{Book 37 Page 145}

Ft. star of this date. located ~~with~~ by comp. with Brt. *.



Ft. *	Brt. *	Ft. * − Brt. *			
19h 41 48.7	19h 42 15.3				
42 9.7	42 23.1				
83 58.4°	84 38.4°	−0	40.0′	−0	20.00″
42 41.1	43 7.8				
43 2.2	43 15.7				
85 43.3°	86 23.5°	−0	40.2′	−0	20.10″
43 33.5	44 0.4				
43 55.4	44 8.5				
87 28.9°	88 8.9°	−0	40.0′	−0	20.00″
44 32.5	44 59.4				
44 37.7	45 7.4				
89 26.7°	90 6.8°	−0	40.1′	−0	20.05″
45 32.7	45 59.5				
45 34.0	46 7.4				
91 26.7°	92 6.9°	−0	40.2′	−0	20.10″
46 28.3	46 55.3				
46 50.2	47 3.6				
93 18.5°	93 58.9°	−0	40.4′	−0	20.20″
					120.45″
				−0m	20.07″

Mean 6 sets = 19h 44m 16.9s M.R

1882phae.proj...497.

Δ Rt. ✳	Δ Dec. ✳	Rt ✳ − Dec ✳
21.0	7.8	13.2
21.1	7.9	13.2
21.8	8.1	13.8
21.7	8.0	13.7
21.3	7.9	13.4
21.9	8.3	13.6
	80.9	
	m 0	13.48

Log 13.48 = 1.12969

7.5 = 0.87506

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

In first 3 sets ✱ in upper half.
" last 3 " " " lower "

Comet ~~Barnard~~ Wolff.

Sept. 21. 1884

{Book 437 Page 168}

	Comet	✱ +21° 4518	✱ +21° 4531	G−4518	G−4531
1st	21h 45m 2.4	21h 43 5.2	21h 46 20.3		
	45 14.7	43 27.7	46 27.9		
	90 17.1	86 32.9	92 48.2	+3m 44.2	−2 31.1
3rd	21h 53 18.7	21h 51 20.9	21h 54 35.9		
	53 35.3	51 48.2	54 48.8		
	106 54.0	103 9.1	109 24.7	+3m 44.9	−2 30.7
4th	21h 57 17.7	21h 55 30.9	21h 58 31.3		
	57 50.8	55 51.7	59 7.0		
	115 8.5	111 22.6	117 38.3	+3 45.9	−2 29.8
5th	22h 1 30.7	21h 59 54.2	22h 2 44.1		
	2 3.9	22h 0 5.7	2 20.2		
	123 34.6	119 59.9	126 4.9	+3 34.7	−2 30.3
6th	22h 5 24.6	22h 3 38.2	22h 6 38.9		
	5 58.3	3 59.2	7 13.9		
	131 22.9	127 37.4	133 52.8	+3 45.5	−2 29.9
~~2nd~~	~~21h 4~~	21h 3 38.2	21h		
		3 59.2			
2nd	21h 48 49.7	21h 46 53.2	21h 50 8.2		
	49 21.3	47 33.9	50 34.2		
	98 11.0	94 27.1	100 42.4	+3 43.9	−2 31.4
				2/+3 44.6m	−2 30.3
				+1 42.4m	−1 15.2

21h 55m 27.3

use comet with G 31.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

∴ In first 3 sets all in south half.
∴ " last 3 " " " north "

E−4518 / 2		E−4581 / 2		Δ Counts	Δ4518	Δ4581	E−V531	E Δ V531
1	52.10	−1	15.55	12.3	22.5	7.6	4.7	10.2
1	52.45	−1	15.35	16.6	27.3	12.9	3.7	10.7
1	52.95	−1	14.90	33.1	20.8	35.7	2.6	12.3
1	47.35	−1	15.15	33.2	11.5	35.5	2.3	11.7
1	52.75	−1	14.95	33.7	21.0	35.0	1.3	12.7
1	51.95	−1	15.70	31.6	40.7	26.0	5.6	9.1
	309.55		91.60				20.2	66.7
1	51.59	−1	15.27				3.37	11.12

Log. 8.37 = 0.52763
" 7.5 = 0.87506
" Cos. δ =

11.12 = 1.04610
7.5 = 0.87506
Cos. δ =

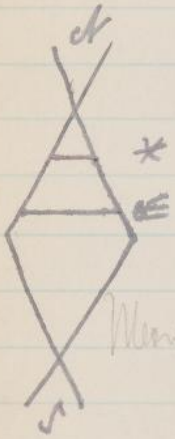
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Wolff.

Sept. 22. 1884.

{Book 37
Page 174}



Comet.	Star.				
$19^h\ 51\ 50.2$	$19^h\ 50\ 50.4$				
52 33.9	50 57.3				
104 24.1	101 47.7	2	36.4	+1 18.20	
$20^h\ 3\ 8.7$	$20^h\ 2\ 9.6$				
3 55.0	2 17.8				
127 3.7	124 27.4	2	36.3	1 18.15	
				36.35	
				+1 no 18.18	

Mean sect $19^h\ 57^{no}\ 52.0$ S.R

1882phae.proj...497.

$\Delta\Theta$	$\Delta\varphi$	$\Theta - \varphi$
43.7″	6.9″	36.8 ~~50.6~~
46 3″	8.2″	38.1 ~~57.5~~
		74.9″
		$\frac{1}{2}$ 37.45″

Log 37.45 = 1.573465″
" 7.5 = 0.875506″
" cos. δ = 9.96890
26.5″ = 2.417461″
− ∠ 21.5″

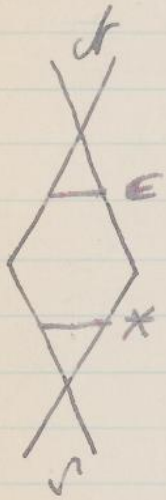
"Obs. fairly good"
Other sets stopped
by clouds.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Wolff.

Sept. 26. 1884 {Boole 37 Page 178}



	Comet.		Star.					
22h	18 21.9	22h	18 41.6					
	19 8.5		19 0.7					
	37 30.4	7	37 42.3	7	− 0	11.9	− 0	5.95
	20 11.8		20 27.4					
	20 55.2		20 50.7	7				
	41 7.0	7	41 18.1		− 0	10.1	− 0	5.05
	22 40.0		23 5.6					
	23 33.6		23 18.5					
	46 13.6	7	46 24.1	7	− 0	10.5	− 0	5.25
	24 30.7	7	24 56.2					
	25 24.4		25 9.5					
	49 55.1		50 5.7	7	− 0	10.6	− 0	5.30
	27 12.0		27 37.6					
	28 5.7		27 50.8					
	55 17.7	7	55 28.4	7	− 0	10.7	− 0	5.35
	29 53.4		30 19.5					
	30 48.4		30 32.7					
	60 41.8	7	60 52.2	7	− 0	10.4	− 0	5.20
	32 3.0		32 28.3					
	32 52.4		32 42.0					
	65 0.4	7	65 10.3	7	− 0	9.9	− 0	4.95
	~~33 49.6~~		~~34 15.6~~					
	~~34 43.1~~		~~34 29.0~~					
	~~68 33.3~~		~~68 44.6~~		~~− 0~~	~~11.3~~	~~− 0~~	~~5.65~~
	37 55.5		38 22.3					
	38 52.3		38 34.7					
	76 47.8	7	76 57.0	7	− 0	9.2	− 0	4.60
	39 54.6		40 21.6					
	40 51.7		40 34.8				− 0	4.20
	~~79~~ 80 46.3	7	80 55.9		~~+~~	9.6	~~− 0~~	~~34.80~~

~~82.10~~

~~− 0 8 21~~

46.95

− 0 5.22 ✓

~~22 h. 29 m. 5.6 s~~

Mean geto = 22h 28 31.1 ✓ M.R

+ 2 5.3

22 30 36.4 ✓

12 23 33.2 ✓

10 7 3.2 ✓

− 1 39.4 ✓

10 5 23.8

4 44 31.0

14 49 54.8 = Gr. M. T. (corr)

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497

Δ α	Δ δ	α + δ
46.6	19.1	65.7 ✓
43.4	23.3	66.7 ✓
53.6	12.9	66.5 ✓
53.7	13.3	67.0 ✓
53.7	13.2	66.9 ✓
55.0	13.2	68.2 ✓
54.4	13.7	68.1 ✓
~~54.1~~	~~13.4~~	~~67.5~~
56.8	12.4	69.2 ✓
57.1	12.7	69.8 ✓

~~75.6~~

~~7.56~~

608.1

67.57 ✓

+3 24.2

+19 29 12.5

+19 32 36.7

Log 67.57 ✓ = 1.82975

" 7.5 = 0.87506

" cos. δ = 9.97423

477.6 = 2.67904

886.0

408.4 = +6 48.4 ✓

1.82975

0.87506

9.97423

477.6 = 2.67904

886.0

408.3

204.2 = +3 24.2 ✓

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

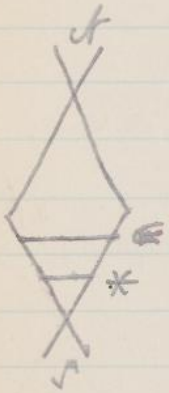
1882phae.proj..497.

Comet Wolff.

Sept. 29. 1884.

(Book 37 / Page 144)

(Bond 230)



Comet	Star		
21h 0 8.4	20h 59 22.5		
0 51.9	20h 59 43.7		
121 0.3	119 6.2	1 54.1	57.05
2 48.2	21h 2 2.4		
3 32.0	2 28.9		
126 20.2	124 26.3	1 53.9	56.95
6 4.1	5 17.9		
6 47.7	5 39.6		
132 51.8	130 57.5	1 53.3	~~56.65~~ 57.15
7 54.0	7 7.3		
8 37.0	7 29.0		
136 31.0	134 36.3	1 54.7	57.35
~~9 46.1~~	~~8 59.2~~		
10 27.9	9 21.0		
~~140 13.0~~	~~138 20.2~~	~~1 52.8~~	~~56.40~~
11 47.1	11 0.2		
12 22.0	11 14.0		
144 9.1	142 14.2	1 54.9	57.45
13 40.1	12 53.0		
14 22.5	13 14.4		
148 2.6	146 7.4	1 55.2	57.60
17 4.2	16 16.4		
17 45.9	16 38.0		
154 50.1	152 54.4	1 55.7	57.85

~~21h. 8m 57s~~

~~57.80~~

~~0 57.78~~

401.40

+57.34

Mean gets = 21h 8m 50.4 N.R

+ 2 9.5

21h 10 59.9

12 35 22.9

8 35 37.0

−1 24.5

C. to. ☉ = 8 34 12.5

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ ☉	Δ ☆	☉ − ☆
43.6	21.2	22.3 ✓ ~~64.7~~
43.8	21.5	22.3 ✓ ~~65.3~~
43.6	21.7	21.9 ✓ ~~65.3~~
~~0~~ 43.0	21.7	21.3 ✓ ~~64.7~~
~~41.8~~	~~21.8~~	~~20.0~~ ~~63.6~~
34.9	13.8	21.1 ✓ ~~48.7~~
42.4	21.4	21.0 ✓ ~~63.8~~
41.7	21.6	20.1 ✓ ~~63.3~~ ~~42.0~~ 21.25
		150.0 ✓
		21.43 ✓

Log 21.43 ✓ = 1.33102

" 7.5 = 0.87506

" cos. α = 9.97808 = +2′ 32.4″

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882hae.proj..497.

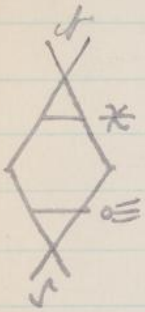
7 sets reduced elsewhere.

Comet Wolff.

Oct. 1. 1884.

{Book 37 Pages 190-192}

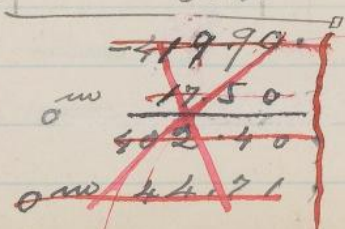
(Bond 236)



Comet	Star			
21^h 3 8.7	21^h 4 7.8			
3 37.9	4 23.0			
6 46.6	8 30.8	-1	44.2	- 52.10
5 7.1	6 6.0			
5 35.8	6 21.0			
10 42.9	12 27.0	-1	44.1	- 52.05
Some cloud 9 14.8	10 9.8			
9 39.8	10 28.4			
18 54.6	20 38.2	-1	43.6	- 51.80
Cloudy ½ wt. ~~28 33.4~~	~~29 24.4~~			
~~28 53.3~~	~~29 44.8~~			
~~57 26.7~~	~~59 9.2~~	-1	~~42.5~~	~~- 51.25~~
30 13.7	31 4.7			
30 33.7	31 24.1			
60 47.4	62 28.8	-1	41.4	- 50.70
31 44.6	32 36.3			
32 4.4	32 55.6			
63 49.0	65 31.9	-1	42.9	- 51.45
33 11.4	~~33~~ 34 3.3			
33 31.7	~~33~~ 34 22.3			
66 43.1	~~66~~ 68 25.6	~~-1~~ +0	~~42.5~~ 17.5	~~- 51.25~~ 8.75
34 40.9	35 32.7			
35 0.9	35 51.1			
69 41.8	71 23.8	-1	42.0	- 51.00
36 12.6	37 4.8			
36 33.5	37 22.9			
72 46.1	74 27.7	-1	41.6	- 50.80

Mean Dec's = 2^h 23 45.5 NR

Abandon this reduction. See top of page.



John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Δ δ	Δ α	δ + α
29.2′	15.2″	44.4″
27.7′	15.0′	42.7″
25.0′	18.6′	43.6″
~~19.9′~~	~~20.4′~~	~~40.3′~~
20.0′	19.4′	39.4″
19.8′	19.3′	39.1″
20.3′	19.0′	39.3″
20.0′	18.4′ / ~~20.8~~	38.4″ / ~~40.0~~
20.9′	18.1′ / ~~20.9~~	~~39.0″~~ / ~~41.8~~
		~~36 6.9~~

Log. 40.80 = 1.61066
" 7.5 = 0.87506
" cos. δ = 9.97995

m 40.77
367.2
δ m 40.80 .

φ 0.46 = 1.61130 ✓
7.5 = 0.87506 ✓
cos. δ = 9.97994 ✓
292.6 = 2.46620 ✓
426.0
293.8 = −9′ 13.8″

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

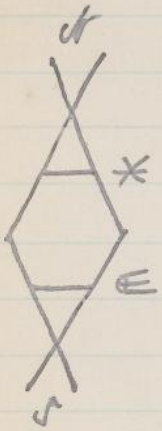
1882phae.proj..497.

Comet Wolff.

Oct. 6. 1884.

{Book 37 / Page 199}

(Bond 236)



Comet.	Star.				
$21^h\ 21\ 1.9$	$21^h\ 22\ 1.8$				
21 30.5	22 47.6				
42 32.4	44 49.4	−2	17.0	−1	8.50
23 29.7	24 29.8				
23 58.4	25 15.4				
47 28.1	49 45.2	−2	17.1	−1	8.55
26 27.8	27 30.1				
26 58.3	28 12.9				
53 26.1	55 43.6	−2	17.9	−1	8.96
33 51.9	34 59.0				
34 26.5	36 36.7				
68 18.4	70 35.7	−2	17.3	−1	8.65
36 32.2	37 38.7				
37 6.6	38 16.0				
73 38.8	75 54.7	−2	15.9	−1	7.95
39 29.3	40 39.1				
40 6.4	41 12.8				
79 35.7	81 51.9	−2	15.2	−1	8.10
42 35.0	43 45.5				
43 12.8	44 18.1				
85 47.8	88 3.6	−2	15.8	−1	7.90
~~44 39.6~~	45 50.0				
45 17.3	~~46 22.4~~				
~~89 56.9~~	91 12.4	−1	15.5	−0	37.75
					95.85
					−1 4.48

Mean Sects = $21^h\ 33^m\ 47.8^s$ N.R.

$+\ 2\ 18.3$

$21^h\ 36^m\ 6.1$

$13\ 2\ 4.8$

$8^h\ 34\ 1.3$

$1\ 24.2$

C. M. T. = $8^h\ 32\ 37.1$

$4\ 44\ 31$

Gr. M. T. = $13^h\ 17^m\ 8$

this obs.
Prob. reduced elsewhere

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

A ☌	A ✶	☌ + ✶
28.6	45.8	74.4
28.7	45.6	74.3
30.5	42.8	73.3
34.6	~~46.7~~ 37.7	~~81.3~~ 72.3
34.4	37.3	71.7
37.1	33.7	70.8
37.8	32.6	70.4
37.7	32.4	70.1
		577.3

$\frac{1}{2}$ m 2.16

Log. 62.16 = 1.79351
" 7.5 = 0.87506
" cos. δ = 9.98543

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

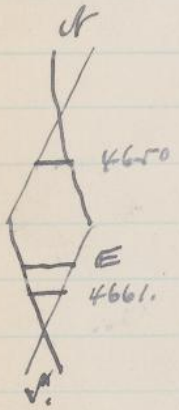
1882phae.proj..497.

Comet Wolff.

Oct. 11. 1884

{Book 37 / Page 216} (Rad.)

(Bond 236)



Comet.	* D.M. 12° 4661.	* D.M. 12° 4650.	E − 4661	E − 4650
1h 3 46.1	1h 5 23.3	1h 0 51.5		
4 24.0	5 41.2	1 22.0		
8 10.1	11 4.5	2 13.5	− 2 54.4	+ 5 56.6
9 12.3	10 49.5	6 17.2		
9 49.2	11 7.0	6 47.5		
19 1.5	21 56.5	13 4.7	− 2 55.0	+ 5 51.8
11 40.4	13 17.1			
12 17.5	13 35.0			
23 57.9	26 52.1		− 2 54.2	55.8
14 4.6	15 40.6			
14 41.0	15 58.8			
28 45.6	31 39.4		− 2 53.8	
16 24.0	18 0.2			
17 0.7	18 18.3			
33 24.7	36 18.5		− 2 53.8	
18 47.4	20 22.9			
19 25.5	20 41.2			
38 10.9	41 3.1		− 2 53.2	

1h 12m 37.6 G.M.T.

	324.4	113.4
−2m	54.07	+45m 56.70
half mean =	−1m 27.04	+2m 58.35

1h 27m 11.6
1h 6m 47.9 } G.M.T for 2nd Set

1h 12m 37.6 — 1h 6m 47.9

− 21.6

1h 12m 16.0

13 22 41.5

11 49 34.5

1 56.2

C.M.T. = 11h 47m 38.3

4 44 31

G.M.T. = 16h 32m 9

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

$\Delta\alpha$	Δ 4661	Δ 4650	$\alpha - 4661$	$\alpha + 4650$
37.9	17.9	30.5	20.0	68.4
36.9	17.5	30.3	19.4	67.2
37.1	17.9		19.2	
36.4	18.2		18.2	
36.7	18.1		18.6	
36.1	18.3		17.8	
221.1			113.2	135.6
36.85			18.87	67.80

Log 18.87 = 1.27577
" 7.5 = 0.87506
" cos. δ = 9.99026
134.6 2,14109
+2 14.6

67.80 = 1.83123
7.5 = 0.87506
cos. δ = 9.99000
2,69629

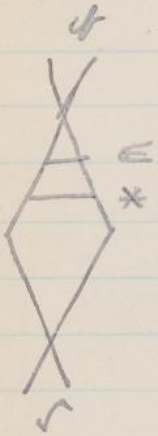
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Wolff
Oct. 13. 1884

{Book 38
Page 2}

(Bond 236)



Comet.	✱ D.M. 11°4653				
21h 58 31.7	22h 1 45.9				
58 53.9	2 16.0				
117 25.6	124 1.9	−6	36.3	−3	18.15
22h 3 40.7	6 54.8				
4 3.8	7 25.0				
127 44.5	134 19.8	−6	35.3	−3	17.65
7 55.0	11 9.4				
8 18.2	11 39.0	−6	35.2	−3	17.60
136 13.2	142 48.4	+3	24.8	+1	42.40
12 31.3	15 45.7				
12 54.7	16 14.7				
145 26.0	152 0.4	−6	34.4	−3	17.20
16 49.7	20 4.4				
17 14.0	20 33.8				
154 3.7	160 38.2	−6	34.5	−3	17.25

Mean Rate, 22h 8m 5.3 M.R

−12 112.65 −15 87.85
+2 84.80 −3 17.57.0
−11 27.85
· 2 17.57
3

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

$\Delta \varepsilon$	$\Delta \alpha$	$\varepsilon - \alpha$
22.2	30.1	~~5 2.3~~ 7.9
23.1	30.2	~~5 3.3~~ ~~7.1~~
23.2	29.6	~~5 2.8~~ 6.4
23.4	29.0	~~5 2.4~~ 5.6
24.3	29.4	~~5 3.7~~ 5.1
		32.1
		δ^m 6.42

Log 6.42 = 0.80754
" 7.5 = 0.87506
" Cos. δ = 9.99161
+47.~' = 1.67421

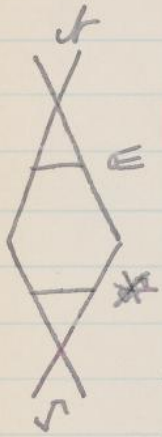
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Wolff. Oct. 18. 1884.

{Book 35 Page 11}

(Bond 236)



Comet.	Star				
$22^h\ 13\ 27.8$	$22^h\ 9\ 59.4$				
13 55.4	10 26.6				
27 23.2	20 25.0	6	58.2	3	29.10
18 13.5	14 43.9				
18 41.0	15 10.6				
36 54.5	29 54.5	7	0.0	3	30.0
27 20.2	23 50.7				
27 49.0	24 17.0				
55 9.2	48 7.7	7	1.5	3	30.75
37 16.0	33 44.2				
37 43.4	34 13.5				
74 59.4	67 57.7	7	1.7	3	30.85
41 43.3	38 11.0				
42 11.4	38 40.5				
83 54.7	76 51.5	7	3.2	3	31.60
					152.30
					$+3^m\ 30.46$

Mean Sets = $22^h\ 27^m\ 50.1$

$-\ 6.7$

$22^h\ 27\ 43.4$

$13\ 50\ 17.4$

$8\ 37\ 26.0$

$1\ 24.8$

C. to. T. = $8^h\ 36\ 1.2$

$4\ 44\ 31.$

Gr. to. T. = $3^h\ 51\ 30.2$

$13\ 20\ 32.$ = Gr. to T.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

$\Delta\alpha$.	$\Delta\delta$.	$\alpha+\delta$
27.6″	26.2′	53.8″
27.5″	26.7′	54.2″
28.8″	26.3′	55.1″
27.4″	29.3′	56.7″
28.1″	29.5′	57.6″
		277.4″
		$\frac{1}{5}$ 55.48″

Log 55.48 = 1.74414″
" 7.5 = 0.87506″
" cos. δ = 9.99472 (80)″

411.2″ = 2.61400″
886.0″
474.8 =
237.4″ = +3 57.4″
8 50 49.3
8 54 46.7″

1.74414″
0.87506″
9.99472
411.1″ = 2.61392
886.0
474.9″ = +7 54.9″

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

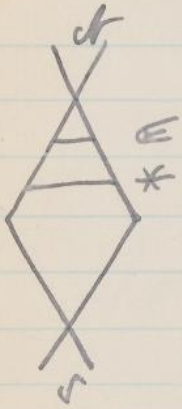
1882phae.proj..497.

Comet Wolff.

Nov. 6. 1884

{Book 38 / Page 32}

(Bond 236)



Comet.	Star.		
~~23h 42 27.7~~	~~23h 47 14.0~~	~~1.7~~	~~0.85~~
~~47 30.4~~	48 2.4		
~~95 18.1~~	~~95 16.4~~		
49 23.4	49 9.2		
49 46.5	49 57.8		
~~99~~ 89 9.9	99 ~~6.0~~ 7	3.9	1.95
51 51.2	51 36.5		
52 10.7	52 21.2		
104 1.9	103 57.7	+ 4.2	+ 2.10
54 50.0	54 35.7		
55 12.7	55 23.0		
110 2.7	109 58.7	4.0	2.00
24h 0 24.0	24h 0 9.6		
0 48.2	0 58.0		
121 12.2	121 7.5	4.7	2.35
2 27.0	2 12.3		
2 54.5	3 3.5		
125 21.5	125 15.8	5.7	2.85
5 24.5	5 10.0		
5 51.8	6 1.0		
131 16.3	131 11.0	5.3	2.65
		~~14.75~~	
		~~0m 2.11~~	
		13.90	
		+ 0m 2.32	

~~23h 56m 10.2~~
~~2.46~~
~~8246~~

690 64.5

Greenwich 23h 57m 35.4 M.R.
+ 43.2

23h 58m 18.6
15 5 11.9
8h 53 6.7
1 27.3
C. M. T. = 8h 51 39.4
4 44 31
Gr. M. T. = 13h 36m 10

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

A ⊖	A ✳	⊖ − ✳	
~~22.7~~	~~48.4~~	~~25.7~~ ~~71.4~~	
23.1	48.6	25.5 ~~71.7~~	25.5 ✓
~~29.5~~	44.7	~~25.2~~ ~~74.2~~	25.2 ✓
22.7	47.3 ~~72.3~~	24.6 ~~70.0~~	24.6 ✓
24.2	48.5	24.3 ~~72.7~~	24.3 ✓
27.5	51.2	23.7 ~~78.7~~	23.7 ✓
27.3	51.0	23.7 ~~78.3~~	23.7 ✓
		~~162.7~~	
		~~23.24~~	

Log 24.50 = 1.38917 ✓
" 7.5 = 0.87506 ✓
" cos. α = 9.99990 ✓
189.7 ✓ = 2.26413 ✓

91.8 = +1 31.8

+1° 13 16.5
+1° 14 48.3

147.0
24.50

1.38917 ✓
0.87506 ✓
9.99990 ✓
∓183.7 = 2.26413

+3 3.7 ✓

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

1st Series

Comet 1885. II.

Barnard 1885. a

July 9. 1885.

(Book 40) (Page 26) (see B.8 p.56)

Comet.	Star.				
19h 33 1.2	19h 31 49.0				
33 16.3	31 59.0				
66 17.5	63 48.0	2	29.5	1	14.75
34 40.6	33 28.0				
34 53.5	33 38.5				
69 34.1	67 6.5	2	27.6	1	13.80
36 22.0	35 10.8				
36 37.0	35 20.7				
72 59.0	70 31.5	2	28.5	1	13.75
38 51.2	37 40.0				
39 5.0	37 49.8				
77 56.2	75 29.8	2	26.4	1	13.20
40 36.9	39 24.5				
40 51.3	39 35.5				
81 28.2	79 0.0	2	28.2	1	14.10
42 25.0	41 12.8				
42 38.0	41 23.2				
85 3.0	82 36.0	2	27.0	1	13.50
42 23.0	41 9.7				
42 34.8	41 22.0				
104 57.3	102 31.7	2	25.6	1	12.80

99h 99m 52.5

450 198.0

Mean Greenwich = 19h 27m 46.5 M.T.

3

98.10

9.90

13.70

83.10

+1m 13.85

1882phae.proj...497.

$\Delta\alpha$	$\Delta\delta$	$\alpha+\delta$
15.1″	10.0″	25.1′″
12.9″	10.5″	23.4′″
15.0″	9.9″	24.9′″
13.8″	9.8″	23.6′″
14.4″	11.0″	25.4′″
13.0″	10.4″	23.4′″
~~11.3′~~	~~19.3′~~	~~23.6′~~

~~169.4~~

~~m 24.24~~

145.8′ ″
24.30

Log 24.30 = 1.38561″
7.8 = 0.87506″
9.99744
181.2″ = 2.25811″
886.0″
704.8 = + 11 44.8″

"Obs. difficult"

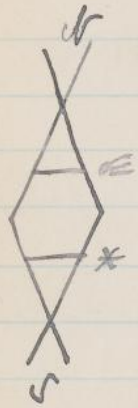
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

2nd Series

Comet 1885. II.
Barnard 1885. a.
July 9. 1885.

{Book 40
Page 22}



Comet	Star				
19h 54 3.0	19h 52 51.0				
54 16.6	53 4.1				
10s 19.6'	10s 55.1'	2	+4.5	1	7.25'
54 46.7	54 34.9				
56 0.0	55 48.2				
11s 46.7'	11s 23.1'	2	23.6	1	11.80'
57 33.6	56 21.8				
57 47.4	56 34.7				
11s 21.0'	11s 56.5'	2	+4.5	1	7.25'
					26.30'
					12.10'
					8.77

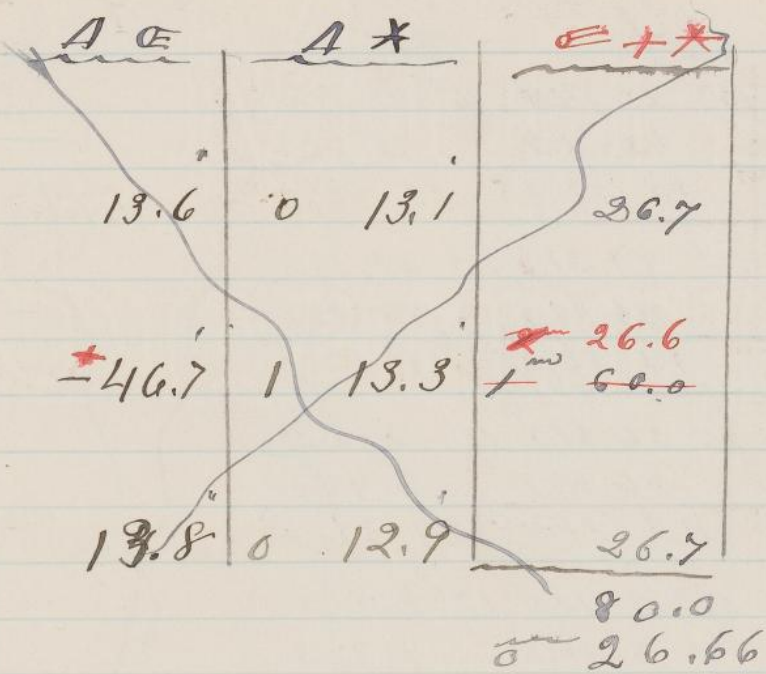
~~19 56m 4.6'~~

334 873'

19h 55m 54.6'

Reg. Star uncertain

1882phae.proj..497.



Log. 26.66 = 1.42586
7.5 = 0.87506

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

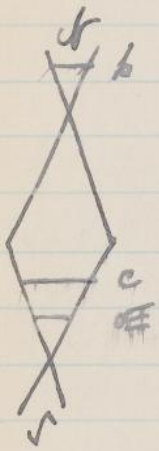
1882phae.proj..497.

Comet 1885. II.
Barnard 1885. a.
July 10. 1885

(see B.8 p57)

(Book 40
Page 30
See p. 164)

(Bond 236)



Comet.	*b.	*c.
16h 44 5.5	16h 41 54.5	16h 47 37.7
44 31.2	42 2.5	48 21.9
8° 36.7'	83 57.0'	95° 59.6'
16h 51 42.1	16h 49 31.0	16h 55 13.3
52 6.7	49 39.2	55 58.7
103 48.8'	99 10.2'	111 12.0'
16h 58 32.0	16h 56 21.2	17h 2 3.5
58 56.2	56 29.8	2 49.0
117 28.2'	112 51.0'	124 52.5'
17h 5 21.6	17h 3 10.0	17h 8 32.1
5 43.1	3 18.3	9 37.3
131 4.7'	126 28.3'	138 29.4'
17h 12 9.2	17h 9 57.7	17h 15 40.1
12 30.0	10 6.2	16 25.2
144 39.2'	140 3.9'	152 5.3'

Mean Sets = 16h 58m 33.7s M.R

4m 39.7	7	22.9	
4 38.6	−7	23.2	
4 37.2	−7	24.3	
4 36.4	−7	24.7	
4 35.3	−7	26.1	
18 7.2		121.2	
4m 37.44		−7m 24.24	
+2m 18.72		−3m 42.12	

Use only *b

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

$A\alpha$	$A*b$	$A*c$	$\alpha-b$	$\alpha-c$
25.7	8.0	44.7	17.7	18.6
24.6	8.2	45.4	19.4	20.8
24.2	8.6	45.5	15.6	21.8
21.5	8.3	45.2	13.2	23.7
20.8	8.5	45.1	12.3	24.3
			7.52	108.6
			15.04	2172

Log 15.04 = 1.17726
" 7.5 = 0.87506
" Cot. δ 9.99736
112.1 = 2.04967
886.0
773.9

21.72 = 1.33686
7.5 = 0.87506
9.99720
2.20912
$-16^{\circ}.0$
$-2\ 4^{\circ}.0$

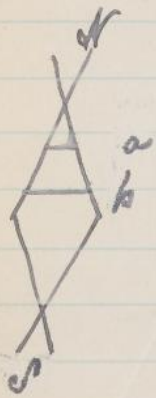
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet 1885. II.
Barnard 1885. a.
July 10. 1885

{Book 40 Page 32 also p. 162}

(Bond 236)



*b	*a	*b − *a			
17h 17m 47.0	17h 20m 53.2				
18 39.3	20 59.5				
36 26.3	41 32.7	−5	26.4	−2m	+3.20
21 23.0	24 29.0				
22 14.7	24 35.2				
43 37.7	49 4.2	−5	26.5	−2m	+3.25
24 48.5	27 55.0				
25 40.5	28 0.7				
50 29.0	55 55.7	−5	26.7	−2	+3.35
28 14.5	31 21.0				
29 6.2	31 26.5				
57 20.7	62 47.5	−5	26.8	−2	+3.40
31 54.2	35 1.0				
32 45.6	35 6.1				
64 39.8	70 7.1	−5	27.3	−2	+3.65

Mean Facts = 17h 25m 18.4s M.R.

21 6.85
−2m 3.370
−1m 21.68

Obs. used was that with star c — See p. 162 of this book — also book A. p. 5 K.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

4 * b	4 * a	* b - * a
52.3	6.8	46.0
51.7	6.2	45.5
52.0	5.7	46.3
51.7	5.5	46.2
51.4	5.1	46.3
		230.3
		46.06

Log 46.06 = 1.663382
7.5 = 0.875061

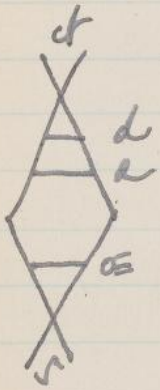
1882phae.proj..497.

Comet 1885. II.
Barnard 1885. a.
July 11. 1885.

(see B.8 p. 58)

{Book 40.
Page 34.}

(Bond 236)



Comet	✱ δ.	✱ E	E − ✱ d	E − ✱ E
16h 30 55.8	16h 31 11.7	16h 33 31.9		
36 35.0	31 46.5	34 8.5		
62 30.8	62 58.2	67 40.4	−0 27.4	−5m 9.6
34 31.0	34 38.3	36 58.5		
35 1.0	35 20.9	37 43.2		
69 32.0	69 59.2	74 41.7	−0 27.2	−5 9.7
39 42.7	39 56.2	42 17.8		
40 19.8	40 33.5	42 55.6		
80 2.5	80 31.7	85 13.4	−0m 29.2	−5 10.9
43 20.0	43 30.7	45 50.8		
43 52.5	44 10.7	46 32.2		
87 12.5	87 41.4	92 23.0	−0 28.9	−5 10.5
47 20.0	47 30.5	49 51.0		
47 51.0	48 10.2	50 31.8		
95 11.0	95 40.7	100 22.8	−0 29.7	−5 11.8
51 22.0	51 32.5	53 52.3		
51 52.3	52 12.0	54 34.5		
103 14.3	103 44.5	108 26.8	−0m 30.2	−5 12.5
			17 2.6	65.0
			−0m 28.7	−5 10.8
			−0m 14.38	−2m 31.80
				−2 35.42

Mean beats = 16h 41m 27.6 M.R
Chron. error = −0 29.5
16 40 59.1
1.0
7 19 4.8
9 21 54.3
− 0 32.4
9 21 22.8 = C. m. T.
4 44 31.0
14h 5m 53.8 = Gr. m. T.

Star d used

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497

A ∝	A×d	A×e	∝+×d	∝+×e
39.2	34.8	36.6		
30.0	42.6	44.7		
37.1	35.3	37.8		
32.5	40.0	41.4		
31.0	39.7	40.8		
30.3	39.5	42.2		
200.1	231.9	243.5		
0m 33.70	0m 38.65	40.58	1m 12.35	1m 14.26

Log 72.35 = 1.85944 — 74.28 = 1.87087

" 7.5 = 0.87506 — 7.5 = 0.87506

" cos. α = 9.99672

538.5 = 2.73122

886.0

347.5 = −5m 47.5

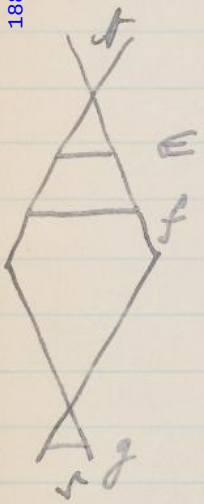
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet 1885 II.
Barnard 1885 a.
July 12. 1885.

{Book 40 Page 39}

(Bond 236)



Comet	✱ f	✱ g	E − ✱f	E − ✱g
16h 36 30.0	16h 34 51.5	16h 37 49.7		
36 40.7	35 44.5	37 58.5		
73 10.7	70 36.0	75 48.2	2m 34.8	− 2 37.5
16h 39 58.8	16h 38 20.2	16h 41 19.0		
40 9.5	39 13.5	41 27.5		
80 8.3	77 33.7	82 46.5	2 34.6	− 2 38.2
16h 47 28.0	16h 45 ~~57.2~~	16h 48 49.5		
47 38.6	46 42.0	48 55.7		
95 6.6	92 33.2	97 45.2	2 33.4	− 2 38.6
16h 50 57.5	16h 49 21.2	16h 52 19.5		
51 8.0	50 12.0	52 25.5		
102 5.5	99 33.2	104 45.0	2 32.3	− 2 39.5
16h 55 25.0	16h 53 48.7	16h 56 47.6		
55 35.3	54 38.7	56 52.8		
111 0.3	108 27.4	113 40.4	2 32.9	− 2 40.1
16h 59 23.4	16h 57 48.5	17h 0 46.7		
59 35.0	58 37.9	0 52.4		
118 58.4	116 26.4	121 37.1	2 32.0	− 2 40.7
17 4 30.7	17 2 56.1	17 5 54.9		
4 46.2	3 49.5	6 37		
9 16.5	6 45.6	11 58.4	2 30.9	− 2 41.9
17 7 59.6	17 6 26.2	17 9 28.6		
4 14.5	7 20.6	9 33.6		
16 15.1	13 46.8	18 58.2	2 28.3	− 2 43.1
			259.1	319.6
			+2m 32.39	−2 39.95
			+1 16.20	

Mean Dec = 8 48 121.4
16h 52 52.6

1882phae.proj...497.

Δ Comet	$\Delta * f$	$\Delta * g$	$\Sigma - * f$	$\Sigma - * g$
10.7	53.0	8.8		
10.7	53.3	8.5		
10.6	50.8	6.2		
10.5	50.8	6.0		
10.3	50.0	5.2		
11.6	49.4	5.7		
16.1	54.4	9.0		
15.9	54.4	9.0		
96.4	415.1	58.4		
12.05	51.89	7.30	39.84	4.75

Log. 39.84 = 1.60032

7.5 = 0.87506

cos = 9.99607

296.1 = 2.47145

4.75 = 0.67669

7.5 = 0.87506

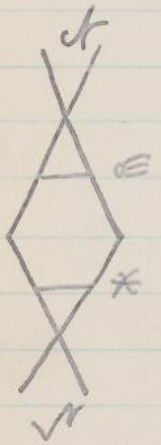
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet 1885 II
Barnard 1885 a.
July 15 1885

{Book 40
Page 45}

(Bond 236)



Comet.	Star			
~~19h 57 43.9~~	~~19h 57 59.0~~			
~~58 25.3~~	~~58 23.7~~			
116 19.2	116 33.3	− 14.1	− 7.05	
19h 58 55.3	19h 59 1.9			
59 ~~29.7~~ 7	59 36.0			
118 ~~25.0~~ 3	118 37.9	− ~~12.9~~ 14	− ~~6.45~~ 7.45	
19h 59 55.4	20h 0 3.0			
20h 0 28.2	0 36.2			
120 23.6	120 39.2	− 15.6	− 7.80	
20h 0 56.4	20h 1 3.1			
1 28.8	1 36.6			
122 25.2	122 39.7	− 14.5	− 7.75	
20h 2 15.4	20h 2 22.0			
2 47.2	2 55.3			
125 2.6	125 17.3	− 14.7	− 7.35	
~~20h 3 12.1~~	~~20h 3 18.3~~			
* {52.2(?)} 3 44.0	* 3 57.2			
~~126 56.1~~	~~127 15.5~~			
			~~38~~ 7 .40	
			− ~~8~~ 7.~~28~~ 4	

~~20h 0m 47.6~~

20h 0m 15.3

− 1 28.8

19 58 51.5

17 34 ~~47.2~~

12 24 4.3

− 2 1.9

12 22 2.4 = C. M. T.

4 44 31.0

17 6 33.4 = Gr. M. T.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Δ E.	Δ *.	E ✳
31.4'	34.1'	65.5'
34.4'	34.1'	68.5'
32.8'	33.2'	66.0'
32.4'	33.5'	65.9'
31.8'	33.3'	65.1'
~~31.9'~~	~~9~~	
160.4	164.2	329.0'
32.16	33.64	65.80'

Log. 65.80 = 1.81823'
" 7.5 = 0.87506'
" Cos α = 9.99396'
486.7'
886.0'
399.3' = 2.68725'

1.81823'
0.87506'
9.99402'
486.8' = 2.68731'
886.0
399.2' = +6 39.2"

199.6' = +3 19.6'

-9 32 6.6
-9 28 47.0'

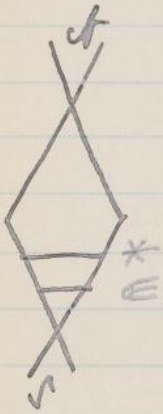
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet 1885 II.
Barnard 1885 a.
July 17. 1885.

{Book 40}
{Page 49}

(Bond. 236)



Comet.	Star			
19 19 26.8	19 21 5.5			
19 45.6	21 36.0			
39 12.4	42 41.5	-3	29.1	-1 44.55
25 59.5	27 37.2			
26 35.0	28 26.8			
52 34.5	56 4.0	-3	29.5	-1 44.75
30 2.0	31 39.3			
30 36.4	32 29.4			
60 38.4	64 8.7	-3	30.3	-1 45.15
35 14.9	36 51.5			
35 48.7	37 41.9			
71 3.6	74 33.4	-3	29.8	-1 44.90
41 32.0	43 9.0			
42 5.2	43 59.5			
83 37.2	87 8.5	-3	31.3	-1 45.65
45 12.6	46 50.0			
45 44.9	47 40.9			
90 57.6	94 30.9	-3	33.4	-1 46.70
				271.70
				-1 45.28

Mean Log. = 19h 33m 10.3 G. M. T.
- 1 22.1

19 31 48.2
7 42 40.3
11 49 7.9
1 56.2
C. M. T. = 11 47 11.7
4 44 31
Gr. M. T. = 16 31 43

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

$\Delta\alpha$	$\Delta\delta$	$\alpha - \delta$
18.8	30.5	~~49.3~~ 11.7
35.5	49.6	~~85.1~~ 14.1
34.4	50.1	~~84.5~~ 15.7
33.8	50.4	~~84.2~~ 16.6
33.2	50.5	~~83.7~~ 17.3
32.3	50.9	~~83.2~~ 18.6

$6 \overline{)124.0}$ $\quad$ $6 \overline{)282.0}$ $\quad$ 94.0

31.33 $\quad$ 47.00 $\quad$ 15.67

Log 15.67 = 1.19507

" 7.5 = 0.87506

" cos 2 = 9.99268

$\overline{115.6} = 2.06281$

$57.8 \quad -0 \quad 57.8$

$-10 \quad 29 \quad 30.2$

$-10 \quad 30 \quad 28.0$

1.19507

0.87506

9.99265

$115.6 = 2.06278$

$-1 \quad 55.6$

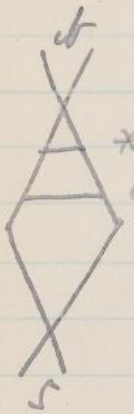
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet 1885 II.
Barnard 1885 a.
Aug. 6. 1885.

{Book 40
Page 72}

(Bond 236)



Comet	Star					
17 55 0.8	17 54 16.0					
55 44.0	54 28.8					
110 44.8	108 44.8	2	0.0	1	0.00	
57 13.8	56 29.2					
57 58.0	56 42.6					
115 11.8	113 11.8	2	0.0	1	0.00	
17 59 31.2	17 58 46.2					
18 0 14.3	17 58 59.8					
119 45.5	117 45.6	2	0.0	1	0.00	
~~18 4 56.5~~	~~18 4 12.9~~					
~~5 43.0~~	~~4 28.0~~					
~~130 39.5~~	~~128 48.9~~	~~1~~	~~40.6~~	~~0~~	~~59.80~~	
8 24.0	7 40.0					
9 10.3	7 54.7					
137 34.3	135 34.7	1	59.6	0	59.80	
14 11.8	13 28.5					
15 1.8	13 46.0					
149 13.6	147 14.5	1	59.1	0	59.55	
24 16.2	23 35.2					
25 4.6	23 48.1					
169 20.8	167 23.3	1	57.5	0	58.75	
28 56.5	28 15.0					
29 44.5	28 28.3					
178 41.0	176 43.3	1	57.7	0	58.85	

~~18h 9m 26.96~~

977 210.8

18h 10m 2.20 M. T.

− 1 3.5

18h 8 58.7

9 1 31.4

9h 7 27.3

9h 7m 27.3

1 29.7

9 5 57.6

4 44 31

13h 50 29 = G.M.S.

~~99~~
~~3 287.25~~

~~0m 59.98~~
~~58.40~~

3m 236.95

+0m 59.56

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

$\Delta\varepsilon$	Δx	$\varepsilon - x$
43.2	12.8	30.4 ~~56.0~~
44.2	13.4	30.8 ~~57.6~~
43.1	13.1	30.0 ~~56.2~~
~~46.5~~	~~15.0~~	~~31.5 61.5~~
46.3	14.7	31.6 ~~61.0~~
50.0	17.5	32.5 ~~67.5~~
48.4	12.9	35.5 ~~61.8~~
48.0	13.3	34.7 ~~61.8~~
7 | 323.2	97.7	~~19.7.6~~ ~~24.62~~
46.17	13.96	

$2 \mid 326.4$
113.4
$-1 \quad 53.4$
$-20 \; 28 \quad 18.0$
$-20 \; 30 \quad 11.4$

225.5
$\sigma = 32.22$

$\text{Log } 32.22 = 1.50813$
$\text{Log } 7.5 = 0.87506$
$\text{Log cos} = 9.97166$
$226.4 \quad = 2.35485$

1.50813
0.87506
9.97158
$2263 = 2.35477$
$-3 \quad 46.3$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

1st Series Ex + x a.

Comet 1846 I.

{Book 40 Page 179}

(Bond 236)

Comet V — Fabry 1885 (d) Star "a" Dec 2. 1885



Comet	Star				
23h 47m 18.7s	23h 44m 49.6s				
47 34.0	45 1.0				
94 52.7	89 50.6	5	2.1	2	31.05
50 22.5	47 53.2				
50 37.5	48 5.2				
101 0.0	95 58.4	5	1.6	2	30.80
54 7.0	51 38.1				
54 22.2	51 49.5				
108 29.2	103 27.6	5	1,6	2	30.80
57 9.3	54 40.6				
57 24.2	54 52.2				
114 33.5	109 32.8	5	0.7	2	30.40

Mean Hour 23h. 52m 21.9 G.M.T.
− 0 17.5 = full corr.
23 52 4.4
16 46 44.7
7 5 19.7
1 9.7
7 4 10.0 = C.m.T.
4 44 31.0
11 48 41.0 = Gr. m. T (Col)

123.05
2m 30.40
123.00
+2m 30.75

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

$\alpha = +x$

15.3	11.4	26.7
15.0	12.0	27.0
15.2	11.4	26.6
14.9	11.6	26.5
		106.8
		$\frac{m}{0}$ 26.70

Log 26.70 = 1.42651
" 7.5 = 0.87506
" cos. δ = 9.99069
187.2 = 2.27226

886.0
698.8
349.4 = δ +5 49.4
+20 48 53.3
+20 54 42.7

1.42651
0.87506
9.99041
187.1 = 2.27198

886.0
698.9 = +11 38.9

1882phae.proj..497.

Comet 1886 I.
Fabry 1885 (b)
Dec. 2. 1885

2nd Series ε ϕ.* b

(Book 40 Page 179)

(Bond 236)

Comet.	Star. b			
23h 58m 15.s0	23h 58m 43.s5			
58 35.4	23 59 5.7			
116 50.4	117 49.2	-0	58.8	-0 29.40
23h 59 42.5	0 0 11.2			
0 3.0	0 0 34.0			
119 45.5	120 45.2	-0	59.7	-0 29.85
0 1 6.2	1 35.0			
1 26.3	1 57.2			
122 32.5	123 32.2	-0	59.7	-0 29.85
2 14.0	2 42.6			
2 34.0	3 5.5			
124 ~~58~~.0	125 48.1	-0	60.1	-0 ~~30~~.05

~~112.15~~
~~0 38.54~~

119.15
-0 29.79

24h 0m 30.s8			
-0 17.5	481	176.4	
24 0 13.3	24 ~~8~~0	29.5	Mean Sets
16 46 44.7	16 46	44.7	
7 13 28.6	17 13	44.8	
1 11.6	1	11.0	
7 12 17.6	7 12	33.8	
4 44 31.0	-0	17.5	
	7 12	16.3	
	4 44	31.0	
11 56 48.6 = Gr. M. T. (corr.)	11 56	47.3 = Gr. M. T.	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497...

		C + X
20.4'	22.2"	42.6"
20.5'	22.8"	43.3"
20.1'	22.2"	42.3"
20.0'	22.9"	42.9"
		171.1
		42.78"

Log. 42.78 = 1.63124
" 7.5 = 0.87506
" cos. δ = 9.97062
299.9 = 2.47699
886.0
586.1
293.0 = − 4 53.0
+20 48 53.3
+20 44 0.3

1.63124
0.87506
9.97092
360.1 = 2.47722
886.0
585.9 = −9 45.9

1882phae.proj..497.

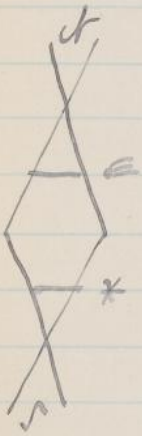
Comet 1886 I. 1st Series ε and *a

Fabry 1886 (a)

Dec. 2. 1886

{Book 40 Page 181}

(Bond 236)



Comet		Star a						
4	30 33.5	4	28 32.9					
4	30 49.9	4	28 47.6					
	61 25.4		57 20.5	4	4.9	2	2.45	
4	33 42.2	4	31 40.0					
	33 56.9		31 56.0					
	67 39.1		63 35.0	4	4.1	2	2.05	
	36 18.1		34 16.0					
	36 32.2		34 31.0					
	72 50.3		68 47.0	4	3.3	2	1.65	
	39 9.5		37 7.2					
	39 23.5		37 22.5					
	78 33.0		74 29.7	4	3.3	2	1.65	
							7.80	
							+2m 1.95	

Mean Setting ^{h} 35^m 3.5

$-0^m\ 11^s.4$ = full corr.

4	34	52.1
16	50	41.2
11	44	10.9
	1	55.4
11	42	15.5
4	44	31.0
16	26	46.5 = Gr. m. T.

4	3	3.5
	−0	11.4
4	3	2.1
16	46	44.7
11	44	7.4
	1	6.0
11	46	11.4 C. m. T.

4	3	3.5
	−1	1.0
4	33	2.5
16	46	44.7
11	47	7.2
	1	6.4
11	47	13.0 C. m. T.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497...

$\epsilon + \chi$

14.4″	14.7″	29.1″
14.7″	15.0″	29.7″
14.1″	15.0″	29.1″
14.0″	15.3″	29.3″
		87.2″
		29.30″

Log 29.30 = 1.46687″
" 7.5 = 0.87506″
" cos δ = 9.99113
20.6″ 2.31306″
46.0
640.6″ = +11 20.6″

1882phae.proj..497.

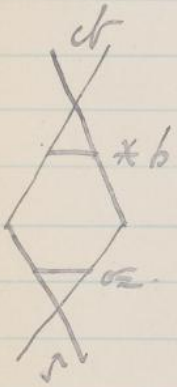
Comet 1886 I. 2nd Series α and *b

Fabry 1885 (b)

Dec. 2. 1885.

{Book 40 Page 161}

(Bond 236)



Comet		Star b.					
4 40 10.0		4 41 4.5					
40 27.0		41 28.7					
80 37.0		82 33.2	−1	56.2	−0	58.10	
41 49.0		42 43.6					
42 5.5		43 7.4					
83 54.5		86 51.0	−1	56.5	−0	58.25	
43 36.1		44 31.0					
43 52.5		44 54.5					
87 28.6		89 25.5	−1	56.9	−0	58.45	
45 30.2		46 25.7					
45 47.2		46 49.4					
91 17.4		93 15.1	−1	57.7	−0	58.85	
				233.56.5			
				−0 58.41			

Mean Date 4h 42m 54.7 G.M.T.

	−0	11.4
4	42	43.3
16	50	41.2
11	5	2.1
	1	56.6
11	50	5.5
4	44	31.0
	6	84.5
16	34	36.5

K	Kr	√K.7
	−0	11.K
K	Kr	K3.3
16	K6	KK.7
11	√√	√2.6
	1	√7.3
11	√K	1.3 C. M. T.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497...

		ε + x
17.0°	24.2°	41.2°
16.5°	23.8°	40.3°
16.4°	23.5°	39.9°
17.0°	23.7°	40.7°
		162.1°
		0 40.52°

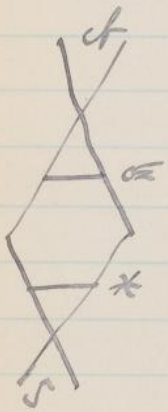
Log 40.52 = 1.60767 °
" 75 = 0.87506 °
" cos. δ = 9.97015
243.7° = 2.45224°
46.0°
602.3° = −10 2.3°

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet 1886 I. 1st Series α and *a
Fabry 1886 (a)
Dec. 3. 1886.
{Book 40 Page 182}

(Bond 236)



Comet.		Star a			
0 52	57.5	0 53	9.5		
53	31.2	53	17.0		
106	28.7	106	26.5	2.2	1.10
54	9.5	54	22.0		
54	43.6	54	28.9		
108	53.0	108	50.9	2.1	1.05
55	19.2	55	32.0		
55	53.2	55	39.0		0.70
111	12.4	111	11.0	1.4	~~0.70~~
57	18.7	57	29.2		
57	50.4	57	39.0		
115	9.1	115	8.2	0.9	0.45
59	1.0	59	12.0		
59	32.7	59	21.1		
118	33.7	118	33.1	0.6	0.30

~~3.65~~
~~m 0 0.73~~
3.60
+ m 0 0.72

Mean Rate = h 0 m 56 1.7 Sid.R
− 0 11.4

0 55 50.3
16 50 41.2
8 5 9.1
1 19.5
8 3 49.6
4 44 31.0
12 48 20.6 = Gr. M. T. (Col.)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497

$\delta + x$

33.7′	7.5′	41.2′
34.0′	6.9′	40.9′
34.0′	7.0′	41.0′
31.7′	9.8′	41.5′
31.7′	9.1′	40.8′
		205.4′
		+1.08′

Log +1.08 = 1.61363′ 1.61363′

" 7.5 = 0.87506′ 0.87506′

" cos. δ = 9.97~~+8~~69′ 9.97045′

+288.0′ = 2.45938′ 287.4 = 2.45914′

886.0

598.0′

299.0′ = +4 59.0′ 886.0

598.6 = +9 58.6′

+20 48 53.2

+20 53 52.2′

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

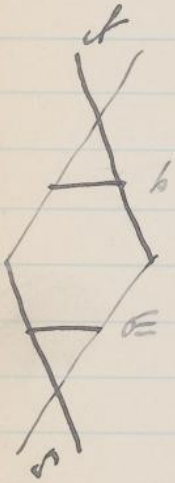
1882phae.proj..497.

Comet 1886 I
Faby 1885 (b)
Dec. 3. 1885.

2nd Series ☆ and * b.

{Book 40 Page 182}

(Bond 236)



	Comet.		Star b.					
1	2 44.2	1	1 38.7					
	3 16.2		2 2.8					
	6 0.4		3 41.5		2	18.9	1	9.45
	4 57.0		3 51.6					
	5 28.7		4 15.3					
	10 25.7		8 6.9		2	18.8	1	9.40
	6 54.9		5 49.6					
	7 26.5		6 13.4					
	14 21.4		12 3.0		2	18.4	1	9.20
	10 25.0		9 20.8					
	10 57.5		9 44.0					
	21 22.5		19 4.8		2	17.7	1	8.85
	12 25.5		11 21.3					
	12 57.4		11 44.4					
	25 22.9		23 5.7		2	17.2	1	8.60
								45.50
								+1m 9.10

Mean Fact = 1h. 7m 45.3
− 0 11.4
1 7 33.9
16 50 41.2
8 16 52.7
1 21.4
8 15 31.3
4 44 31.0
13 0 2.3 = Gr. M. T. (Col)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497...

32.0′	24.1′	56.1′
31.7′	23.7′	55.4′
31.6′	23.8′	55.4′
32.5′	23.2′	55.7′
31.9′	23.1′	55.0′
		277.6′
		55.52′

Log 55.52 = 1.74445′
" 7.5 = 0.87506′
" cos. δ = 9.99980′
388.4′ = 2.58931′

886.0′
497.6′
248.8′ = −4 8.8′

+21 7 10.5
+21 3 1.7′

1.74445′
0.87506′
9.99001′
388.6′ = 2.58952′

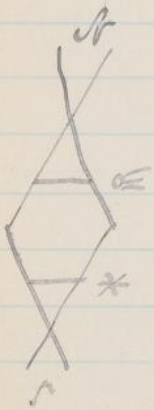
886.0
497.4′ = −8 17.4′

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet 1886 I. 1st Swiss α and * a
Fabry 1885(a)
Dec. 3, 1885
{Book 40 Page 103}

(Bond 236)



Comet.	Star a	α − *			
4 22 31.0	4 22 51.5				
22 53.0	23 12.4				
45 24.0	46 3.9	−0	39.9	−0	19.95
23 30.7	23 51.5				
23 53.0	24 12.2				
47 23.7	48 3.7	−0	40.0	−0	20.00
24 31.9	24 53.0				
24 54.5	25 13.9				
49 26.4	50 6.9	−0	40.5	−0	20.25
25 37.7	25 58.5				
26 0.5	26 19.4				
51 38.2	52 17.9	−0	39.7	−0	19.85
26 38.7	26 59.5				
27 1.0	27 20.5				
53 39.7	54 20.0	−0	40.3	−0	20.15
			100.20		
			−0		20.04

Mean Fact. 4h 24m 45.2s NR.
−a 17.5
4h 24m 27.7s

4 24 45.2
−0 11.4
4 24 33.8
16 50 41.2
11 33 52.6
1 53.7
11 31 58.9 C. M. T.
4 44 31.0
16 16 29.9 = Gr. M. T. (Cor.)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Δ Comet	Δ Star	α + *
22.0	20.9	42.9
22.3	20.7	43.0
22.6	20.9	43.5
22.8	20.9	43.7
22.3	21.0	43.3
		216.4
		ᾱ +43.28

Log 43.28 = 1.63629
" 7.5 = 0.87506
" cos. δ = 9.97045

303.4 = 2.48180

886.0
582.6
291.3 = +4 51.3

+20 48 53.2
+20 53 44.5

1.63629
0.87506
9.97045

303.3 = 2.48180

886.0
582.7 = +7 42.7

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet 1886 I.
Fabry 1885 (b)
Dec. 3. 1885.

2nd Series ⊖ and * b
(Book 40.)
p. 183

(Bond 236)

	Comet.	Star.	⊖ − *		
4	28 58.7	4 28 1.5			
	29 17.0	28 35.8			
	58 15.7	56 37.3	1 38.4	0m 49.20	
	30 31.5	29 35.2			
	30 51.1	30 9.4			
	61 22.6	59 44.6	1 38.0	0m 49.00	
	32 2.8	31 6.5			
	32 21.6	31 40.7			
	64 24.4	62 47.2	1 37.2	0m 48.60	
	34 8.2	33 12.0			
	34 27.5	33 46.4			
	68 35.7	66 58.4	1 37.3	0 48.65	
	35 50.7	34 55.0			
	36 10.2	35 29.0			
	72 0.9	70 24.0	1 36.9	0 48.45	
				243.90	
				+0m 48.780	

Mean Dec. 4° 32 27.9 (Bonn)
− 0 11.4

4 32 16.5

16 50 41.2
16 46 44.7
35.3
11 45 31.8
1 55.6
11 43 36.2
4 44 31
16 28 7 = Gr. M. T. 0h (Col)

4 32 16.5
16 50 41.2
11 41 35.3
− 1 54.9
11 39 40.4 C. M. T.
4 44 31.0
16 24 11.4 Gr. M. T.

C. M. T.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497..

A Comet	A Stars	∈ + x
18.3	34.3	52.6
19.6	34.2	53.8
18.8	34.2	53.0
19.3	34.4	53.7
19.5	34.0	53.5
		266.6
		53.32

Log 53.32 = 1.72689
" 7.5 = 0.87506
" cos δ = 9.99[6980]
373.0 = 2.57175

886.0
513.0
256.5 = −4 16.5
+21 7 10.5
+21 2 54.0

1.72689
0.87506
9.99701
373.2 = 2.57196

886.0
512.8 = −8 32.8 ✓

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet 1886 I. (R.A. 18h 18m)

Fabry 1885 (a)

Dec. 5. 1885

(Bond 236)

Comet			Star a						
6	37	15.6	6	38	~~39.1~~ 44.0				
	37	54.0		39	~~42.5~~ 38.3				
	75	9.6		78	~~51.6~~ 82.3	12.7	−3	−1	35.60
6	40	41.0	6	42	~~6.4~~ 8.5				
	41	20.0		43	~~7.9~~ 4.2				
	82	1.0		85	12.2	11.2	−3	−1	35.60
									71.95
								−1	35.98

Mean Sets $6^h\ 39^m\ 17^s.6$ A.R.

S. C. C. obs.

E			* a						
6	17	~~47.0~~ 24.0	6	19	~~16.0~~ 24.0				
	16	~~47.9~~ 15.0		20	~~20.5~~ 15.0				
	36	29.9		39	39.0	9.1	−3	−1	34.55
6	23	~~47.~~ 34.0	6	24	~~34.4~~ 34.0				
	23	~~57.2~~ 34.0		25	~~37.9~~ 34.0				
	~~46~~ 47	~~40.4~~ 1.9		50	12.5	~~2.1~~ 10.6	−3	−1	35.30
									69.85
								−1	34.92

$6^h\ 20^m\ 52^s.9$

S. C. C. obs.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497

Δ Comet	Δ Star	∈ − ✳
38.4″	0 + 54.3″	15.9″
39.0″	0 ✳ 55.7″	16.7″
110.0″		32.6″
0m 55.0″		16.30″

		∈ + ✳
55.9″	31.0″	1 46.9″
52.5″	55.5″	1m 48.0″
		94.9″
		1m 47.45″

Log 107.45 = 2.03120″
" 7.5 = 0.87506″
" cos. δ = 9.97080

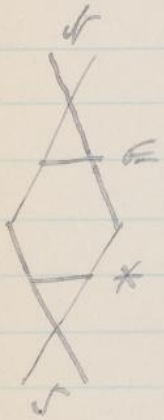
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet. 1846. I.
Faboy 1846 (b)
Dec. 5. 1846.

See (Reob. B. 4, p. 10)

(Rec. B 40 p. 185)



	E		* b
6h	2h	40.5	2h 29.5
	29	0.0	2h 47.0
	30	2K.0	30 1K.5
	30	4K.0	30 32.0
	33	55.5	33 4K.0
	33	1K.0	33 2.0

S. C. C. obs.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

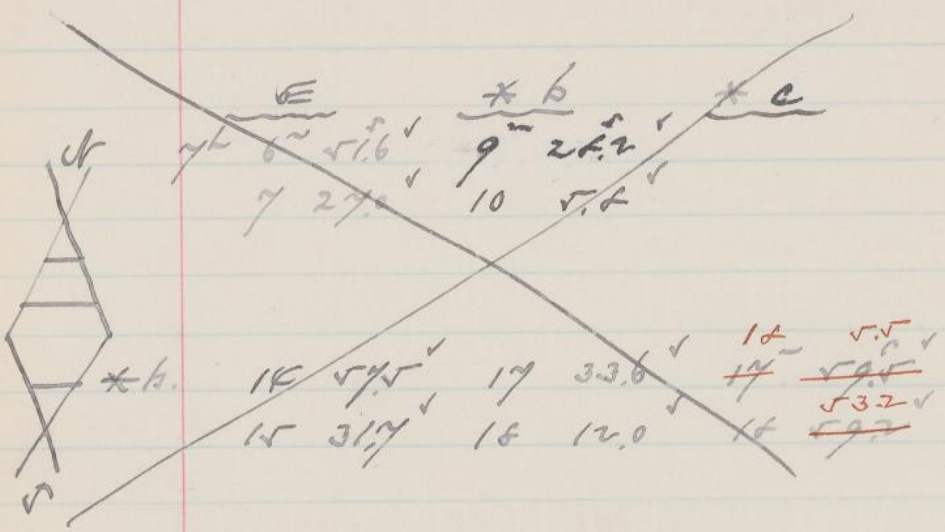
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Barnard's Comet. (R 40, 187)

Dec. 5. 14h 5m.

(See Red. h 6/0. 10d.)



John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Barnard's Comet. (R. 40. p. 144)
Dec. 5. 1884.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

For additions see Rel. B. 6. fo. 102.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

B.236

Comet Sawerthal. Apr. 16. 1882.

(B.47 p. 11)

	Comet.		Star.				
17	44	18.2	46	24.7			
	44	42.0	47	4.4			
	29	0.2	93	33.1	4	32.9	2 16.4
	47	45.1	49	55.0			
	44	8.3	50	30.1			
	9	53.8	100	25.1	4	31.7	2 15.2
	51	15.2	53	24.5			
	51	37.7	53	59.5			
	102	52.9	107	24.0	4	31.1	2 15.5
	54	42.4	56	51.3			
	55	3.6	57	26.0			
	109	46.0	114	17.3	4	31.3	2 15.6
	58	6.1	60	14.3			
	58	27.4	60	44.9			
	116	33.5	121	3.2	4	29.7	2 14.8
							28.3

mean of 8 lines = 17 51 24.6 — mean = 2 15.670

+1 44.2 = Chr. corr.

17 53 8.8

−1 41 0.9

16 12 7.9

−2 39.3

16 9 28.6 = C. w. J. obs.

4 44 31.

20 54 0 = Br. w. J. obs.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

$\Delta\alpha$	$\Delta\delta$	
23.8	35.7	59.5
23.2	35.1	58.3
22.5	35.0	57.5
21.2	34.7	55.9
21.3	34.6	55.9
112.0 / 22.40	173.1 / 35.02	37.1

57.42 = Mean.

57.42 = 1.75906
7.5 = 0.87506
cos.δ = 9.97902
410.3″ = 2.61314
$\frac{\Delta\Delta 6.0}{475.7''} = 47' 55.7''$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet. Swarthout.

Apr. 16. 1882.

B B. VI. (K33) 22 48 26.7 v +17° 2v' 27.1 v (7.8) (1855)

48.v1 v +v 14.8

22 49 1v.26 v +17 30 41.9 v

342 18 48.9 v

$\frac{m}{1v}$ = +0.1260 8 v +1.30217 v

sin α = n 9.48279 v cos α = +9.99897

Cor δ = +9.49903 33 = +1.v1 8 v1

−0.1281 = n9.10770 630.4 = +2.7996 v

3.0710

+2.9429 = 0.4687 8 v

33. = 1.v1 8 v1 v

+97.12 = 1.9872 9

22 48 26.7 v +17 2v 27.1 v

+1 37.12 v +10 30.4 v

* 1888.0 = 22 v0 3.87 v +17 3v v7.v v

−0.83 v −9.7 v

Ap. pl. * = 22 v0 3.04 v +17 3v 47.8 v

−2 1v.67 v +7 vv.7 v

" " ε = 22 47 47.37 v +17 43 43.v v

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Comet Swarenthal.

Apr. 16. 1882.

Ap. fol. red.

$f = -0.02\overset{\prime}{4}$

$g = 6^{\prime}\overset{\prime}{.}\ 6.\overset{\prime}{3}$

$h = 16\ \ 1.\overset{\prime}{2}$

$\log g = +0.70\overset{\prime}{4}\overset{\prime}{4}$

" $k = +1.\overset{\prime}{2}\overset{\prime}{4}17$

" $i = -0.\overset{\prime}{6}\overset{\prime}{7}\overset{\prime}{4}0$

6 6.3 ′

22 ′0.1 ′

4 ′6.4 = (G+L)

16 1.2

22 ′0.1

14 ′1.3 = (H+L)

Log $\frac{1}{r}$ = +0.2239 ′

" g = +0.7044 ′

" $\sin(G+L)$ = +9.9430 ′

" $\cos\delta$ = +9.′014 ′

+0.104 ′ +9.0171 ′

" $\frac{1}{r}$ = +0.2239

" h = +1.2417

" $\sin(H+K)$ = −9.4323

" $\sec\delta$ = +0.0204

−0.909 ′ −9.′967 ′

−0.024 ′

−0.933

+0.104

−0.829 = Cor in K

Log g = +0.7044 ′

" $\cos(G+L)$ = +9.4377 ′

+1.40 +0.146′ ′

" h = +1.2417 ′

" $\cos(H+K)$ = −9.46′4 ′

" $\sin\delta$ = +9.4401 ′

−4.24 −0.6276 ′

" i = −0.4′4′40 ′

" $\cos\delta$ = +9.9792 ′

−6.47 −0.4372

−4.24

−11.11 ′

+1.40 ′

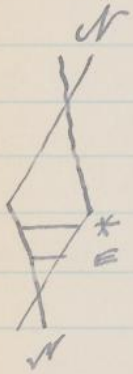
−9.″71 = Cor. in δ.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Swift 1st.

Sept. 6. 1882.



	Comet.	Star.				
17h	15m 16.7s ✓	15m 8.1s ✓				
	15 37.7 ✓	15 56.6 ✓				
	30 54.4 ✓	31 4.7 ✓	0m	10.3s ✓	0	5.15 ✓
	17 19.0 ✓	17 10.3 ✓				
	17 40.1 ✓	17 58.2 ✓				
	34 59.1 ✓	35 8.5 ✓	0	9.4 ✓	0	4.70 ✓
	18 50.4 ✓	18 42.1 ✓				
	19 12.1 ✓	19 30.0 ✓				
	38 2.5 ✓	38 12.1 ✓	0	9.6 ✓	0	4.80 ✓
	20 26.0 ✓	20 12.1 ✓				
	20 43.0 ✓	21 0.1 ✓				
	41 4.0 ✓	41 12.2 ✓	0	8.2 ✓	0	4.10 ✓
	24 17.7 ✓	24 9.6 ✓				
	24 40.7 ✓	24 56.8 ✓				
	48 58.4 ✓	49 6.4 ✓	0	8.0 ✓	0	4.00 ✓
	25 37.9 ✓	25 30.0 ✓				
	26 1.2 ✓	26 17.0 ✓				
	51 39.1 ✓	51 47.0 ✓	0	7.9 ✓	0	3.95 ✓
						26.70
17	20	28.1 ✓			(α − *) =	− 0m 4.45s
		+ 47.0 ✓ Chr. Cor.				
17	21	15.1 ✓				
1	1	35.4 ✓				
16	19	39.7 ✓				
	− 2	40.5 ✓				
16	16	59.2 ✓	= C. M. T. obs.			
4	46	31. ✓				
21	1	30. ✓	= Gr. M. T. obs.			

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

$\Delta\delta$	$\Delta *$	
21.0	48.5	27.5
21.1	47.9	26.8
21.7	47.9	26.2
22.0	48.0	26.0
23.0	47.2	24.2

23.3 | 47.0 | 23.7

6) 132.1 | 6) 286.5 | 34.4

22.02 | 47.7 | 25.73 = mean.

25.73 = 1.41044

7.5 = 0.47506

cos δ = 9.99436

190.5 = 2.27946

3' 10.5

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Swift Apr. 6. 1882.

Comp. Star = +9° 50′ 40″ (7.7 M)

M. 22h 36m.	22h 16m 1.79s ✓	+9° 50′ 30″.6 ✓
	+1 33.41 ✓	+9 27.9 ✓
	22 17 35.60 ✓	+9 18 58.5 ✓
	334° 23′ 54.0 ✓	

$\frac{u}{r}$ = 0.12618 ✓
sin f = u 9.63560 ✓
tan f = 9.20377 ✓
−0.0924 ✓ = u 8.96548
3.0707
+2.9783 = 0.47396 ✓
63. = 1.79934 ✓
187.63 = 2.27330 ✓

log. u = 1.30220 ✓
cos i = 9.99512 ✓
63. = 1.79934 ✓
1139.4 = 3.05666

	22 16 1.79 ✓	+8 55 30.6 ✓
	+3 7.63 ✓	+18 59.4 ✓
*18880 =	22 19 9.42 ✓	+9 19 30.0 ✓
Ap. pl. red.	−0.93 ✓	−4.1 ✓
Ap. pl. * =	22 19 8.49 ✓	+9 19 25.9 ✓
∈ − * =	−0 4.47 ✓	−3 10.5 ✓
Ap. pl. ∈ =	22 19 4.02 ✓	+9 11 11.4 ✓

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

Apr. 6. 1882.
Comet Swift. (Ap. pl.)

$f = -0.^{\circ}064$ ✓
$S = 6^{h}\ 19.^{m}9$ ✓
$H = 16\ \ 42.^{s}7$ ✓
Log $g = +0.6944$ ✓
" $k = +1.2769$ ✓
" $c' = -0.4492$ ✓

6 19.9
22 19.2
4 39.1 = S+L

16 42.7 ✓
22 19.2 ✓
1 1.9 = H+L

Log $\frac{1}{\Delta}$ $= +0.4239$ ✓
" g $= +0.6944$ ✓
" sin (S+L) $= +9.9724$ ✓
" tan δ $= +9.2114$ ✓
$+0.0\,\checkmark\,0 = +0.7021$ ✓

Log $\frac{1}{\Delta}$ $= +0.4239$ ✓
" k $= +1.2769$ ✓
" sin (H+L) $= -9.4\,\checkmark\,30$ ✓
" sec δ $= +0.0\,0\,\checkmark\,7$ ✓
-0.911 ✓ $\quad -9.9\,\checkmark\,9\,\checkmark$ ✓
-0.064 ✓
-0.975 ✓
$+0.0\,\checkmark\,0$ ✓
$-0.9\,2\,9$ ✓ App. pl. α

Log $g = +0.6944$ ✓
" cos (S+L) $= +9.\,\checkmark\,3\,4\,7$ ✓
$+1.71$ ✓ $\quad +0.2331$

" $k = +1.2769$ ✓
" cos (H+L) $= -9.4\,\checkmark\,9$ ✓
" sin δ $= +9.20\,\checkmark\,9$ ✓
-2.13 ✓ $\quad -0.32\,2\,\checkmark$

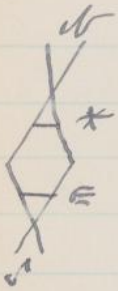
" c' $= -0.4492$ ✓
" cos δ $= +9.9943$ ✓
$-7.6\,\checkmark$ ✓ $\quad -0.4\,4\,3\,\checkmark$
-2.13 ✓
$-9.7\,4$ ✓
$+1.71$ ✓
-4.07 ✓ Ap. pl. δ

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Swarthout. (B 46. p. 134)

Mar. 23. 1882.



	Comet.	Star.				
17	7	47.1	13	32.5		
	2	2.2	13	53.4		
	15	47.9	27	25.9	11 38	5 49.00
	14	34.0	20	20.7		
	14	52.7	20	43.2		
	29	26.7	41	3.9	11 37.2	5 46.60
	21	42.1	27	27.7		
	22	2.2	27	51.5		
	43	44.3	55	19.2	11 34.7	5 47.35
	24	42.5	34	27.0		
	29	4.5	34	52.1		
	57	47.0	69	19.1	11 32.1	5 46.05
	36	25.1	42	4.2		
	36	44.4	42	35.9		
	73	13.2	84	44.7	11 30.9	5 45.45
						36.45

Mean of times = 17 22 0.0 (E − *) = −5 47.290

+34.1 Chr. Cor.

17 22 34.1

0 6 27.6

17 16 6.5

− 2 49.7

17 13 16.8 = C. M. T. obs.

4 44 31.

21 57 48. = Gr. M. T. obs.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj...497.

$\Delta\epsilon$	$\Delta\alpha^*$	
17.7	20.9	38.6
18.7	22.5	41.2
20.3	23.8	44.1
22.0	25.1	47.1

$\frac{23.6}{5\overline{)109.3}\ 20.46}$ $\frac{27.1}{5\overline{)119.7}\ 23.88}$ $\frac{50.7}{221.7}$

44.3 = mean.

44.3 = 1.646 40

cos δ = 9.99717

7.5 = 0.87506

330.4 = 2.51903

$\frac{\Delta\alpha\ 9.8}{5\ 5\ 9.4} = -9'\ 19.''4 = \Delta\delta$.

1.64640

0.87506

9.99714

330.4 = 2.51904

$\frac{\Delta\alpha\ 6.0^s}{330.4}$

$5\ 5\ 5.6 = 9''\ 15.''6$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

Comet Swarthout. (#6, p. 140)

Mar. 23. 18##.

Comp. * = ν Aq. −6° ν#27 (6.2B)

(BD VI Suppl.) 21ʰ 40ᵐ 0.23ˢ ν −6° 3ν′ 11.7″ ν (mean of 3 determinations)

+51.9# ν +4′ 31.1″ ν

21 40 ν227 ν −6 30 #0.6 ν

3ν′ 13′ 3″.2 ν

$\frac{w}{\nu}$ = 0.1760# ν log w = 1.30217 ν

sin x = w 9.7ν6223 ν cos x = 9.914#ν1 ν

tan Δ = w 9.0ν7#3 ν 3.3. = 1.ν1#ν1 ν

+0.0#70 ν = +#.93974 +ν#3.″ν = 2.73ν19 ν

3.07(0 ν = 0.49941 ν

~~+2.9##0~~ ~~3.1ν#0~~ = ~~0.4#9#00~~

33 = 1.ν1#ν1 ν

= ~~1.99337~~ ν

10#.21 ν = 2.01792 ν

21 #0 0.23 ν −6 3ν 11.7″ ν

+1 ##.21 ν +9 3.ν ν

* 18##.0 = 21 #1 ##.## ν −6 26 #.2 ν

Ap. pl. rcd. −1.16 ν −4.# ν

Ap. pl * = 21 #1 #3.2# ν −6 26 13.0 ν

−ν #7.29 ν −9 1ν.0″ ν

Ap. pl. E = 21 3ν νν.99 ν −6 3ν 2#.8 ν

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1902phec.proj..407

Comet Barnerthal.

Jmar. 23.1282.

$f = -0.^{m}1\nu1$ ν
$g = 6^{h}\ 44.\nu^{s}$ ν
$H = 17\ \ 42.\nu$ ν
Log g = +0.7020 ν
" h = +1.2733 ν
" i = −0.909ν ν

6 44.ν′ ν
21 41.7′ ν
4 26.2″ ν = (G+L)

17 42.ν′ ν
21 41.7′ ν
1ν 2 42.ν′ ν = (H+K)

Log $\frac{1}{\nu}$ = +0.2239 ν
" g = +0.7020 ν
" sin(G+L) = +9.9626 ν
" Cos δ = w9.0ν23 ν
−0.03ν w2.ν404 ν

Log g = +0.7020 ν
" cos(G+L) = +9.ν99ν ν
+2.00 +0.3070 ν

Log $\frac{1}{\nu}$ = +0.2239 ν
" h = +1.2733 ν
" sin(H+K) = −9.890ν ν
" sec δ = +0.0027 ν
−0.979 ν −9.9907 ν
−0.03ν ν
−0.1ν1 ν
−1.16ν ν Hp. pl. ν

Log h = +1.2733 ν
" cos(H+K) = −9.79ν4 ν
" sin δ = w9.0496
+1.3ν +0.1213

Log i = −0.909ν ν
" cos δ = +9.9973 ν
−2.07 −0.9064 ν
+3.3ν
−4.7ν Hp. pl. ν

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1892phas.proj..497.

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John C. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1882phae.proj..497.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System