1911phae.proj

KG
11366
K886

1080
1085
86
1126
1092

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Howard Lunar Plates.

Measures and Reductions.

Mary Fowler.

Jan. 1st 1913.

Volume X.

Plate no.	Date	Page
1080	1911 May 4.	1
1085	1911 May 5	16
1086	1911 May 5	31
1122	1911 June 3	46
1092	1911 May 6	61

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MC1080. 1913 Jan. 28. 1

Plate constants.

	1	2	3	4
x	5.6541	11.5892	27.2716	31.3148
y	3.3207	11.3478	26.9167	31.0430
x-3	+ 3334	+ 2414	+ 3549	+ 2718
4	25.9418	8.7292	30.6991	14.5899
η	26.7547	9.5900	31.6414	15.5547
4-η	- 8129	- 8608	- 9423	- 9648

Preliminary Reduction.

x-3	-524	+x	-1983
+3334	-1349 =	+1985 + 4 =	+1989 = +6
+2414	-1454 =	+1960 + 12 =	+1972 = -11
+3549	-1596 =	+1953 + 27 =	+1980 = -3
+2718	- 759 =	+1959 + 31 =	+1990 = +7
mean 20.2539	- 977	+ 20	= 19.9599
20.2505	- 977	+ 20	= 19.9565

4-η	+552	-4	+7957
-8129	+2001 =	-7928 - 26 =	-7954 = +3
-8608	+6371 =	-7971 - 9 =	-7980 = -23
-9423	+1500 =	-7923 - 31 =	-7954 = +3
-9648	+1722 =	-7926 - 15 =	-7941 = +16
mean 18.7904	+1114	- 19	= 19.6956
18.7878	+1114	- 19	= 19.6930

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M.C. 1080. 1913 Jan. 28. 1

Plate Constants

	1	2	3	4
x	5.6541	11.5892	27.2716	31.3148
y	3.3207	11.3478	26.9167	31.0430
x-3	+ 3.3334	+ 2414	+ 3549	+ 2718
4	25.9418	8.7292	30.6991	14.5899
7	26.7547	9.5900	31.6414	15.5547
y-7	- 8129	- 8608	- 9423	- 9648

Preliminary Reduction.

x-3	-524		rx		-1983	
+3334	-1349	= +1985	+ 4	= +1989	= +6	
+2414	-1450	= +1960	+12	= +1972	= -11	
+3549	-1596	= +1953	+27	= +1980	= -3	
+2718	- 759	= +1959	+31	= +1990	= +7	
mean 20.2539	= 977		+ 20		= 19.9579	
20.2505	= 977		+ 20		= 19.9565	✓

y-7	+552		-4		+7957	
-8129	+201	= -7928	-26	= -7954	= +3	
-8608	+637	= -7971	- 9	= -7980	= -23	
-9423	+1500	= -7923	-31	= -7954	= +3	
-9648	+1722	= -7926	-15	= -7941	= +16	
mean 18.7904	+1114		-19		= 19.6956	
18.7878	+1114		-19		= 19.6930	

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Comparison Stars - ~~Standard~~ Measures, Reseau reversed on plate

	y		x	
	d	N	d	N
1				
3.6	16888	15811	17866	15918
25.9	74626 0	15231 26	14405 98	93616 5
	60	25	03	70
	81	92	70	09
	25.9420	.9417	3.6585	.6547
	15022	16943	16891	16778
2	77727 34	14237 40	12725 78	10882 78
11.6	30	39	79	84
8.7	20	55	85	73
	8.7290	.7293	11.5890	.5894
3				
27.2	18256	16700	15145	17380
30.6	11261 64	15688 89	78699 69	14670 65
	64	94	60	68
	53	97	46	74
	30.6991	.6991	27.2720	.2712
4				
31.3	15692	13968	15290	18099
14.6	97895	98755	84325 26	19954 50
	74	69	28	50
	81	68	80	
				02
	14.5893	.5905	31.3146	.3149

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MC 1080. 1913 Jan. 1st. 3.

Comparison stars - ~~Standards~~ Measures.
Reseau reversed on plate

	y	d	N	x	d	N
1						
3.6		16888	15811		17866	15918
25.9		7462760	15231726		1440598	9361665
		60	25		05	70
		81	92		70	09
		25.9420	.9417		3.6585	.6547
		15022	16943		16891	16778
2		7727734	14237740		1277578	10882478
11.6		30	39		79	84
8.7		20	55		85	73
		8.7290	.7293		11.5890	.5894
3						
27.2		18256	16700		15145	17380
30.6		11261164	15685889		7869469	14670665
		64	94		60	68
		53	97		46	79
		30.6991	.6991		27.2720	.2712
4						
31.3		15692	13968		15290	18099
14.6		9789795	9875975		8432526	14954950
		94	69		28	50
		81	68		80	
						02
		14.5893	5905		31.3146	.3149

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MC 1080. 1913 Jan 1 4.

Moon-Measures. Reseau reversed on plate
Faint image

V	d	N
19.0	18210	16456
17.2	16876 95	.7706 14
	85	09
	10	43
	17.1325	.1968

d	N
16931	17530
10220 20	14196 30
18	14
20	82
18.3296	.3318

2
18.4
18.0

d	N
16866	18269
8573 70	16541 50
73	43
64	69
18.1708	.1724

3
18.2
18.8
min
in
96

4
18.2
19.0

d	N
16770	17290
8591 00	15460 59
99	58
76	99
18.1822	.1833

5
18.5
20.0

d	N
15704	17378
11308 11	17618 5
21	70
09	71
18.5607	.5603

6
19.0
20.5

	d	N
	15021	15555
	10475 84	10049
	80	48
	17	
	20.4539	

d	N
15021	17570
10475 84	12120 96
80	96
17	70
	.4534

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MC 1080. 1913 Jan 1 4.

Moon - measures. Rescan reversed on plate
Faint image

	4 a	4 N	x a	x N
1				
19.0	18210	16436		
17.2	16876 95	770614		
	85	09		
	10	43		
	17.1325	.1268		
3			16931	17530
18.4			10220 20	14196 30
18.0			14	14
			20	32
			18.3296	.3318
3				
18.2			16860	18269
18.8			857370	16541 50
			73	43
			64	69
			18.1708	.1724
4			16770	17290
18.2			859100	15460 59
19.0			99	58
			76	99
			18.1822	.1833
5			15704	17378
18.5			1130811	117685
20.0			21	70
			09	71
			18.5607	.5603
6				4
19.0	15021	15555	15021	17570
20.5	10475 84	10049	10475 84	121 20 96
	80	49	80	96
	17		17	70
	20.4539			.4534

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MC 1080. 1913 Jan 1. 5

Wilson - Measures Reseau Reversed.

	z	d	w	d	w
20.0		14504	17649		
20.8		59312	16210		
		85	15		
		01	41		
		20.85572	.8564		
	8				
20.3		14491	16455		
20.8		57706	15345		
		69	51		
		97	60		
		20.87279	.8696		

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MC 1080. 1913 Jan 1. 5

Wilson - Leuschner

Reseau reversed.

	d	N
20.0	14504	17649
20.8	59312	16210
	35	15
	01	41
	20.8572	.8564

20.3	14491	16655
20.8	57706	15345
	69	51
	97	60
	20.8729	.8696

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MC 1080. 1913 Jan. 14. 6

Times etc.

Exp. to stars	1911 May 4	12	00		-12 09
" Moon		12	04	27.1	- 12 04 27.3
Clock fast			2	59.3	
M. Sid. T.		12	01	27.9	
" Long		4	44	31.05	
G. Sid. T.		16	45	58.95	
Sid. T. M. Noon.		2	45	00.85	
Interval		14	00	58.10	
Reduction			2	17.77	
G. M. T.		13	58	40.33	

From Am. Eph.

Moon 14h	8h	45m	24s.10		+	23°	31'	01".5
Motion in 1h = 2s.4228				8".976				
" -1.328		-	3.22			+		11.9
Tabular place	8	45	20.88			+23	31	13.4

Moon's parallax 58' 32".6
" semidiam 15' 58".7

age of moon 6 days.

13h
Motion 1m
" 58.6722

+23 39 56.2
8.910
- 8 42.8
+23 31 13.4

R = 9587
Augmentation = 120
Irradiation (L) - 11
ℓ = 9696
R = 20785
(1+a)R = 20783
R² = 43193

a = - 1.1

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1911phae.proj.1

NC 1080. 1913 Jan. 14. 6

Times etc.

Sp. h stars	1911 May 4	12 00		= 12 09
Moon		12 04	27.1	= 12 04 27.3
Clock fast			2 59.5	
M. Sid. T.		12 01	27.9	
Long.		4	44 31.5	
G. Sid. T.		16	45 58.95	
Sid. T. M. noon.		2	45 00.85	
Interval		14	00 58.10	
Reduction			2 17.77	
G. M. T.		13	58 40.33	

From Cunffth.

Moon 14h	8h 45m 24s.10		+ 23° 31' 01".5	
Motion 1m = 2.4228			8.976	
1.328	− 3.72		+	11.9
Tabular place	8 45 20.88		+23 31 13.4	

Moon's parallax 58' 32.6
Semidiam. 15' 58.7

age of moon 6 days.

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No.	ab	ac	bc
1	+ 7.08	− 71.4	− 94.8
2	+ 1.52	+ 136.5	+ 56.1
3	− 0.00	− 31.2	+ 0.0
4	− 0.43	+ 37.2	− 3.8
5	− 2.04	+ 98.0	− 70.0
6	− 2.08	− 33.8	+ 44.9
7	− 0.52	− 10.3	+ 84.6
8	+ 0.00	+ 0.0	+ 22.9
	− 1.79	+125.0	+ 29.9

[aa] = +18.34 [bb] = +12.24

[cc] = −10.51 [bc] = +4.77 (ac) = +4

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MC 1080 1913 Feb. 27. 7

Brooks's Centers

	x	$x - X_0$	Δx	$(x-X_0)^2$	$(x-X_0)^2+(y-Y_0)^2$	O−C
1	19.0000	−1.2512	−6	1.5670	4.3289	+57
2	18.3307	−1.9205	−3	3.6894	4.3161	−71
−3	18.1716	−2.0796	0	4.3247	4.3247	+15
4	18.1828	−2.0684	+1	4.2779	4.3214	−18
5	18.5605	−1.6907	+4	2.8571	4.3174	−58
6	19.0000	−1.2512	+6	1.5640	4.3259	+27
7	20.0000	−0.2512	+8	0.0627	4.3273	+41
8	20.2512	0.0000	+8	0.0000	4.3243	+11
				mean =	4.3232	+4

37

	y	$y - Y_0$	Δy	$(y-Y_0)^2$
1	17.1296	−1.6620	+1	2.7619
2	18.0000	−0.7916	+0	0.6267
3	18.7916	0.0000	0	0.0000
4	19.0000	+0.2084	−0	0.0435
5	20.0000	+1.2084	−0	1.4603
6	20.4536	+1.6620	−1	2.7619
7	20.8568	+2.0652	−1	0.2646
+8	20.8712	+2.0796	−1	4.3243

< 4.2646

Approximate Centers

x = 19.0 y = 17.1296

y: 20.4536

37.5832

Mean y: 18.7916

y: max: 20.8712

R: 2.0796

x: min: 18.1716

Y_0 = 20.2512

X_0 = 18.7916

Y_0 = 20.2512

Y_0 = 18.7916

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MC 1080 1913 Feb. 27. 7

Broom's Center.

	x	$x - X_0$	Δx	$(x-X_0)^2$	$(x-X_0)^2+(y-Y_0)^2$	O-C
1	19.0000	-1.2512	-6	1.5670	4.3289	+57
2	18.3307	-1.9205	-3	3.6894	4.3161	-71
3	18.1716	-2.0796	0	4.3247	4.3247	+15
4	18.1828	-2.0684	+1	4.2779	4.3214	-18
5	18.5605	-1.6907	-4	2.8571	4.3174	-58
6	19.0000	-1.2512	+6	1.5640	4.3259	+27
7	20.0000	-0.2512	+8	0.0627	4.3273	+41
8	20.2512	0.0000	+8	0.0000	4.3243	+11
				mean =	4.3232	+4

	y	$y - Y_0$	Δy	$(y-Y_0)^2$
1	17.1296	-1.6620	+1	2.7619
2	18.0000	-0.7916	+0	0.6267
3	18.7916	0.0000	0	0.0000
4	19.0000	+0.2084	-0	0.0435
5	20.0000	+1.2084	-0	1.4603
6	20.4536	+1.6620	-1	2.7619
7	20.8568	+2.0652	-1	4.2646
+8	20.8712	+2.0796	-1	4.3243

Approximate Center

$x = 19.0$ $y = 17.1296$

$y: \underline{20.4536}$

37.5832

mean y: 18.7916

y: max: 20.8712

R = 2.0796

x: min: 18.1716

X_0 = 20.2512

$X_0 = 20.2512$

$Y_0 = 18.7916$

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MC 1080 1913 Apr. 25 8

Moons Center —

Conditional Equations.

	a	b	c	O	e	O − C
1	− 1.25	− 1.66	+ 1	= + 57	− 68 + 40 + 86	= + 58	− 1
2	− 1.92	− 0.79	+ 1	= − 71	− 105 + 19 + 86	= 0	− 71
3	− 2.08	+ 0.00	+ 1	= + 15	− 113 − 0 + 86	= − 27	+ 42
4	− 2.07	+ 0.21	+ 1	= − 18	− 112 − 5 + 86	= − 31	+ 13
5	− 1.69	+ 1.21	+ 1	= − 58	− 92 − 29 + 86	= − 35	− 23
6	− 1.25	+ 1.66	+ 1	= + 27	− 68 − 40 + 86	= − 22	+ 49
7	− 0.25	+ 2.07	+ 1	= + 41	− 14 − 50 + 86	= + 22	+ 19
8	+ 0.00	+ 2.08	+ 1	= + 11	− 0 − 50 + 86	= + 36	− 25

+173 −120

Areaça (O−C) = 30

Normal Equations.

a	b	c	
+ 18.34	− 1.47	− 10.51	= + 125
− 1.47	+ 12.24	+ 4.77	= + 40
− 10.51	+ 4.77	+ 8.00	= + 4

$\frac{\Delta a}{\Delta c}$ = + 0.547

+ 1.47	− 0.12	− 0.84	= + 10
+ 10.51	− 0.84	− 6.04	= + 72 71½

	+ 12.12	+ 3.93	= + 50
	+ 3.93	+ 1.96	= + 7675½
		1.27½	
	− 3.93	− 1.28	= − 16½
		+ 0.68	= + 5059

$\frac{\Delta b}{\Delta c}$ = − 0.324

c = + 86

− 7.89	− 3.93	= − 1512
+ 4.23		= − 102

b = − 24

− 3.24	+ 1.47	+ 2.46	= + 1
+ 27.00	− 12.24	− 20.50	= − 10
+ 15.10		− 8.05	= + 126
+ 25.53		− 15.73	= + 30
− 13.06		+ 8.05	= − 15
+ 2.04			= + 111

a = + 54

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MC 1080. 1913 Apr. 25.

Moons Center –

Conditional Equations.

	a	b	c	O	c	O − C
1	− 1.75	− 1.66	+ 1	= + 57	− 68 + 40 + 86 = + 58	− 1
2	− 1.92	− 0.79	+ 1	= − 71	− 105 + 19 + 86 = 0	− 71
3	− 2.08	+ 0.00	+ 1	= + 15	− 113 − 0 + 86 = − 27	+ 42
4	− 2.07	+ 0.21	+ 1	= − 18	− 112 − 5 + 86 = − 31	+ 13
5	− 1.69	+ 1.21	+ 1	= − 58	− 92 − 29 + 86 = − 35	− 23
6	− 1.25	+ 1.66	+ 1	= + 27	− 68 − 40 + 86 = − 22	+ 49
7	− 0.25	+ 2.07	+ 1	= + 41	− 14 − 50 + 86 = + 22	+ 19
8	+ 0.00	+ 2.08	+ 1	= + 11	− 0 − 50 + 86 = + 36	− 25

+123 −120

Average (O−C) = 30

Normal Equations.

a	b	c	
+ 18.34	− 1.47	− 10.51	= + 125
− 1.47	+ 12.29	+ 4.77	= + 40
− 10.51	+ 4.77	+ 8.00	= + 4
+ 1.47	− 0.12	− 0.84	= + 10
+ 10.51	− 0.84	− 6.04	= + 72 71½
	+ 12.12	+ 3.93	= + 50
	+ 3.93	+ 1.96	= + 76 75½
	− 3.93	− ~~1.28~~	= − 16½
		+ 0.68	= + 6.59
	− 7.89	− 3.93	= − 15 12
	+ 4.23		= − 102

c = + 86

b = − 24

− 3.24	+ 1.47	+ 2.46	= + 1
+ 27.00	− 12.24	− 20.50	= − 10
+ 15.10		− 8.05	= + 126
+ 25.53		− 15.73	= + 30
− 13.06		+ 8.05	= − 15
+ 2.04			= + 111

a = + 54

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MC 1080 1913 Apr. 28

Moon's Mean Position (1911.0)

X_0 = 20.2512 + 27 = 20.2539

Y_0 = 18.7916 − 12 = 18.7904

from Prelim. Red. X = 19.9599 Y = 19.6956

Plate constants a_x = + 3 +15

b_y = + 5 +13

c = − 8 −27

19.6957

ξ = + 1.9599

log ξ = 0.29224

log sin δ = 9.96370

const = 6.50724

η = − 2.3144

7.0534

log tan δ = 9.6300

ξ^2 − 0.5845

m_1 = 7.2679

m_1 = + 19

m_0 = − 2.3163

log m_0 = 0.36480

const = 7.33115

$(\alpha - A)$ = 3.03365 m

$(\alpha - A)$ = 1.82130

$\alpha - A$ = + 1 06.27

A = 8 41 51

α_0 = 8 42 57.27

Red = + 0.37

α' = 8 42 57.64

$\delta - D$ = − 18 00.6

D = + 23 23 58

δ_0 = + 23 05 57.4

Red = + 6.2

δ' = + 23 06 03.6

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NGC 1080 1913 Apr. 28.

Moon's Mean Position (1911.0)

$X_0 = 20.2512$
$+ 27$
20.2539

$Y_0 = 18.7916$
-12
18.7904

From Prelim. Red. $x = 19.9599$ $y = 19.6956$
Plate constants $ax = + 3$ $+15$
$by = + 5$ $+13$
$c = - 8$ -27
19.6957

$\frac{1}{s} = + 1.9599$
$\log s = 0.29274$
$\therefore \log\delta = 9.96370$
$\therefore$ const $= 6.50724$
$\therefore (\alpha - A) = 1.82180$

$\alpha - A = + 1^m 06^s.27$
$A = 8^h 41^m 51^s$
$\alpha_0 = 8^h 42^m 57^s.27$
Red $= + 0.37$
$\alpha' = 8^h 42^m 57^s.64$

$\eta = - 2.3144$
$\log \tan\delta = 9.63805 - 47$
$\frac{1}{s^2} = 0.58436$
$\therefore \eta_1 = 7.26709$
$\eta_1 = + 19'$
$\eta_0 = - 2.3163$ $\frac{\Delta\eta}{\Delta\alpha} = - 0.324$
$\log \eta_0 = 0.364986_n$
$\therefore$ const $= 7.33115$
$\therefore (\delta - D) = 3.03365_n$
$\delta - D = - 18' 00''.6$
$D = + 23^\circ 23' 58''$
$\delta_0 = + 23^\circ 05' 57''.4$
Red $= + 6.2$
$\delta' = + 23^\circ 06' 03''.6$

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1080 Lunar parallax.

$\alpha' = 8^h\ 42^m\ 57^s.64$

$\theta = 12\ 01\ 27.9$

$= +3\ 18\ 30.3$

$= +\ 49^\circ\ 37'\ 34''$

$+\quad 18\ 00$

$+\quad 49\ 19\ 34$

9.95727
9.99999
01859.1
014317

$\delta = +54^\circ\ 16\ 40$

$\quad\ 23\ 06\ 03$

$\quad\ 31\ 10\ 37$

9.82640
6.23118
9.71406
009052
786216

$\delta - \delta' = +25'\ 01''.7$

$\delta = +23\ 31\ 05.3$

Hamilton $\delta = +23\ 31\ 13.4$

O − C $-\ 8.1$

Cor. to standard $= +\ 0.8$

O − C $-\ 7.3$

See page 13

$\delta' = +23^\circ\ 06'\ 03''.6$

$\pi = 58'\ 32''.6$

986913
823118
9.88186
003767
801984

$\alpha - \alpha' = +35'\ 59''.10$

$= +2^m\ 23^s.94$

See p. 13

$\alpha = 8\ 45\ 21^s.58$

$\alpha = 8\ 45\ 20^s.88$

$+0.70$

-0.09

$+0.61$

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1080 Lunar parallax.

$\alpha' = 8^h\ 42^m\ 57^s.64$ ✓
$\odot = 12\ 01\ 27.9$ ✓
$+3\ 18\ 30.3$ ✓
$= +49^\circ\ 37'\ 34''$ ✓

$+\quad 18\ 00$

$49\ 19\ 34$ ✓.

9.95727 ✓
9.99999 ✓
0.18591 ✓
0.14317 ✓

$\gamma = 54^\circ\ 16\ 40''$ ✓

$23\ 06\ 03$ ✓

$31\ 10\ 37$ ✓

9.82640 ✓
6.23118 ✓
9.71406 ✓
0.09052 ✓
7.86216 ✓

$\delta' = +23^\circ\ 06'\ 03''.6$ ✓

$\pi = 58'\ 32''.6$

9.86913 ✓
6.23118 ✓
9.88186 ✓
0.03767 ✓
8.01984

$\alpha - \alpha' = +35'\ 59''.10$ ✓
$= +2^m\ 23^s.94$

See p. 13

$\delta - \delta' = +2^\circ\ 01'.7$ ✓

$\delta = +23\ 31\ 05''.3$ ✓

Hamilton δ =	$+23\ 31\ 13''.4$ ✓	$\alpha = 8\ 45\ 21^s.58$
$O-C$	$-\ 8''.1$	$+0^s.70$
Cor. to standard no. =	$+\ 0''.8$	$-0^s.09$
$O-C$	$-\ 7''.3$	$+0^s.61$

See page 13

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Pt.	Pos L.	Resid
1	217.°2	+97
2	247.5	−54
3	270.0	+25.
4	275.8	−12
5	305.8	−18
6	322.8	+29
7	352.9	+48
8	0.0	+20

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1080 Moon's Center

	x	$x - X_0$	Δx	$(x-X_0)^2$	$(x-X_0)^2+(y-Y_0)^2$	O − C
1	19.0000	−1.2540	−5	1.5738	4.3304	+111
2	18.3307	−1.9233	−2	3.6998	4.3239	+46
3	18.1716	−2.0824	0	4.3364	4.3364	+171
4	18.1828	−2.0712	+1	4.2894	4.3335	+142
5	18.5605	−1.6935	+3	2.8669	4.3306	+115
6	19.0000	−1.2540	+5	1.5712	4.3384	+191
7	20.0000	−0.2540	+6	0.0642	4.3351	+158
8	20.2540	0.0000	+6	0.0000	4.3306	+113
9				comp R^2 =	4.3193	

	y	$y - Y_0$	Δy	$(y-Y_0)^2$
1	17.1296	−1.6604	+1	2.7566
2	18.0000	−0.7900	0	0.6241
3	18.7900	0.0000	0	0.0000
4	19.0000	+0.2100	0	0.0441
5	20.0000	+1.2100	−1	1.4639
6	20.4536	+1.6636	−1	2.7672
7	20.8568	+2.0668	−2	4.2709
8	20.8712	+2.0812	−2	4.3306
9				

Center $\begin{cases} X_0 = 20.2540 \\ Y_0 = 18.7900 \end{cases}$

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1080 Nuevous Centers

	x	$x - X_0$	Δx	$(x-X_0)^2$	$(x-X_0)^2+(y-Y_0)^2$	$O-C$
1	19.0000	−1.2540	+5	1.5738	4.3304	+111
2	18.3307	−1.9233	−2	3.6998	4.3239	+46
3	18.1716	−2.0824	0	4.3364	4.3364	+171
4	18.1826	−2.0712	+1	4.2894	4.3335	+142
5	18.5605	−1.6935	+3	2.8669	4.3308	+115
6	19.0000	−1.2540	+5	1.5712	4.3384	+191
7	20.0000	−0.2540	+1	0.0642	4.3351	+158
8	20.2540	0.0000	+6	0.0000	4.3306	+113
9						

comp R^2 = 4.3193

	y	$y - Y_0$	Δy	$(y-Y_0)^2$
1	17.1296	−1.6604	+1	2.7566
2	18.0000	−0.7900	0	0.6241
3	18.7900	0.0000	0	0.0000
4	19.0000	+0.2100	0	0.0441
5	20.0000	+1.2100	−1	1.4639
6	20.4536	+1.6636	−1	2.7672
7	20.8568	+2.0668	−2	4.2709
8	20.8712	+2.0812	−2	4.3306
9				

Center { $X_0 = 20.2540$
$Y_0 = 18.7900$

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Formation of Normals.

	a_t	a_{in}	b_{in}
1	+ 2.07	− 138.8	− 184.2
2	+ 1.52	− 88.5	− 36.3
3	− 0.00	− 356.0	+ 0.0
4	− 0.43	− 294.0	+ 29.8
5	− 2.04	− 194.5	+ 139.2
6	− 2.07	− 238.8	+ 317.0
7	− 0.52	− 39.5	+ 327.0
8	+ 0.00	+ 0.0	+ 235.0
	− 1.47	−1350.1	+827.5

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Moon's Center

Conditional Equations

	a	b	O		c	O − c
1	−1.25 − 1.66 =	+111	+ 88 − 74 =	+14		+97
2	−1.92 − 0.79 =	+46	+ 135 − 35 =	+100		−54
3	−2.08 + 0.00 =	+171	+ 146 + 0 =	+146		+25
4	−2.07 + 0.21 =	+142	+ 145 + 9 =	+154		−12
5	−1.69 + 1.21 =	+115	+ 119 + 54 =	+173		−58
6	−1.25 + 1.66 =	+191	+ 88 + 74 =	+162		+29
7	−0.25 + 2.07 =	+158	+ 18 + 92 =	+110		+48
8	+0.00 + 2.08 =	+113	− 0 + 93 =	+93		+20
						+219 − 124
						Average = 43

Normal Equations

a	b	
+1840	− 147	= −1350
− 147	+ 16.26	= +828
+ 147	− 0.12	= − 108
	+ 16.14	= +720

k = +44.6

+18.40 = −1350 + 56 = −1294

a = −70.4

Arc measured = 143° Average = +12.0

$\frac{rc}{n} = 0.12$ $\quad +\frac{12}{0.12} = +1.00$ $\quad \Delta r = +1.1$

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Morris Center

Conditional Equations

	a	b	O			c	O − c
1	−1.25	−1.66	+1.11	+ .88	−.74	+.14	+.97
2	−1.92	−0.79	+.46	+1.35	−.35	+1.00	−.54
3	−2.08	+0.00	+1.71	+1.46	+ 0	+1.46	+.25
4	−2.07	+0.21	+1.42	+1.45	+ .09	+1.54	−.12
5	−1.69	+1.21	+1.15	+1.19	+.54	+1.73	−.58
6	−1.25	+1.66	+1.91	+ .85	+.74	+1.62	+.29
7	−0.25	+2.07	+1.58	+ .18	+.92	+1.10	+.48
8	+0.00	+2.08	+1.13	− 0	+.93	+.93	+.20

+2.19 − 1.24

Average: .43

Normal Equations

a	b	
+18.40	−1.47	= −13.50
−1.47	+16.26	= +6.28
+1.47	−0.12	= −1.08
	+16.14	= +7.20

k = +44.6

+18.40 = −13.50 + 56 = −12.94

a = −70.4

Arc measured: 143° Average: +1.20

$\frac{R^2}{n} = 0.12$ $\quad +\frac{1.2}{0.12} = +1.00$ $\quad \Delta z = +1.1$

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Moons Mean Position (1911.0)

X_0 =	20.2540	Y_0 =	18.7900
$\frac{1}{2}a$	− 35	$\frac{1}{2}b$	+ 22
	20.2505		18.7878

From Plate Constants X_0 = 19.9565 Y_0 = 19.6930

ξ = +1.9565

log ξ = 0.291480
− cos δ = 9.963720
8.507724
1.820544

$\alpha - A$ = +1 06.15

A = 8 41 51

α_0 = 8 42 57.15

Red = + 0.37

α_1 = 8 42 57.52

Lunar par. + 2 23.94

α = 8 45 21.46

Tables 8 45 20.88

O − C + 0.58

η = −23070

Log tan δ = 9.68000
05630
70534
72464

η_1 = +18

η_0 = −23088

log η_0 = 0.363388
733115

$(\Delta - D)$ = 3.032230

$\delta - D$ = − 17 57.0

D = +23 23 58

δ_0 = +23 06 01.0

Red = + 6.2

δ' = +23 06 07.2

Lunar par. + 25 01.7

δ = +23 31 08.9

Tables +23 31 13.4

O − C = − 4.5

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Uncorrected Mean Position (1911.0)

X_0 =	20.2540	Y_0 =	1.87900
Ca	− 35	Cb	+ 22
	20.2505		1.87878

From Plate Constants $X = 19.9565$ $Y_0 = 19.6930$

$\xi = +1.9565$

log ξ =	0.29148		
cos δ =	9.96370		
	8.10724		
	1.82054		
$\alpha - A$	+ 1	06	15
A =	8	41	51
α_0 =	8	42	57.15
Red		+	0.37
α_1 =	8	42	57.52
Lunar par.		+ 2	23.94
α =	8	45	21.46
Tables	8	45	20.88
O − C		+	0.58

$\eta = -2.3070$

log Tan δ =	9.6300		
	05630		
	70534		
	72464		
η_1 =		+ 15	
η_0 =	− 2.3088		
log η_0 =	0.36338		
	73315		
(D − D) =	3.03223		
S − D =	−	17	570
D =	+23	23	58
δ_0 =	+23	06	01.0
Red =		+	62
δ' =	+23	06	072
Lunar par.	+	25	01.7
δ =	+23	31	089
Tables	+23	31	134
O − C =		−	4.5

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Comparison Stars – Standard Coords.

	1	2	3
C	no 1322, mag 7.9	1324, 6.7	1334, 7.1
C	$9^h\ 32^m\ 32^s.29$	$9^h\ 33^m\ 18^s.10$	$9^h\ 37^m\ 46^s.65$
L	.26	.10	.56
E	.26	.09	.62
mean	$9^h\ 32^m\ 32.27$	9 33 18.10	9 37 46.61
Prec	+ 36.62	+ 37.11	+ 37.01
α	9 33 08.89	9 33 55.21	9 38 23.67
A	9 39 08	9 39 08	9 39 08
$\alpha - A$	− 5 59.11	− 5 12.79	− 44.38
Sin ($\alpha - A$)	− 359.07	− 312.76	− 44.38
log ..	2.555518 n	2.495211 n	1.647194 n
" cos δ	9.978882	9.971022	9.971300
" 5°	1.041244 n	0.973473 n	0.125733
δ_0	− 10.9962	− 9.4074	− 1.3358
δ_1	− 59	− 59	−
δ	6.9979	8.5867	16.6637
α	6.8033	8.6372	16.7100
$\alpha - \delta$	− 1946	+ 505	+ 463
δ	$+17^\circ\ 48'\ 22''.2$	$+20^\circ\ 44'\ 55''.0$	$+20^\circ\ 39'\ 00''.9$
L	22.7	54.8	01.3
E	21.6	54.4	01.3
mean	+17 48 22.2	+20 44 54.7	+20 39 01.2
Prec	− 2 56.6	− 2 57.0	− 2 59.6
S	+17 45 25.6	+20 41 57.7	+20 36 01.6
D	+19 01 39.	+19 01 39	+19 01 39
$\delta - D$	− 1 16 13.4	+ 1 40 18.7	+ 1 34 22.6
tan ($\delta - D$)	− 4574.2	+ 6020.4	+ 5664.0
log ..	3.660328 n	3.779631	3.753121
" η_0	0.991479 n	1.111078	1.084271
tan δ	9.5055	9.5773	9.5750
" δ^2	2.0825	1.9470	0.2710
η_1	8.6414	8.5777	6.8994
η_0	− 9.8055	+ 12.9056	+ 12.1414
η_1	+ 438	+ 378	+ 8
η	12.2383	34.9434	34.1422
γ	12.2471	34.9414	34.0502
$\gamma - \eta$	+ 88	− 20	− 920

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Comparison Stars - Standard Coords.

	No.	mag.	No.	mag.	No.	mag.
C	1327	7.9	1324	6.7	1334	7.1
C	9h 32m 32.29		9h 33m 18.10		9h 37m 46.65	
L		.26		.10		.56
E		.26		.09		.62
mean	9h 32m 32.77		9h 33m 18.10		9h 37m 46.61	
prec.	+ 36.62		+ 37.11		+ 37.01	
A	9 33 09.39		9 33 55.21		9 38 23.62	
A	9 39 08.		9 39 08		9 39 08	
α-A	- 5 59.11		- 5 12.79		- 44.38	
(α-A)	- 359.07		- 312.76		- 44.38	
log	2.555518n		2.495521n		1.647179	
log δ	9.997882		9.997102		9.997130	
S°	1.041240		0.973470		0.125730	
B₀	-10.9962		-9.4074		-1.3358	
S₁	- 59		- 59		- 5	
x	6.9979		8.5867		16.6637	
x	6.8033		8.6372		16.7100	
S-S	- 1946		+ 505		+ 463	
δ	+17° 48′ 22.2″		+20° 44′ 55.0″		+20° 39′ 00.9″	
L	22.7		54.8		01.3	
E	21.6		54.4		01.3	
mean	+17 48 22.2		+20 44 54.7		+20 39 01.2	
prec.	- 2 56.6		- 2 57.0		- 2 59.6	
S	+17 45 25.6		+20 41 57.7		+20 36 01.6	
Q	+19 01 39.		+19 01 39		+19 01 39	
S-Q	- 1 16 13.4		+ 1 40 18.7		+ 1 34 22.6	
(S-Q)	- 4574.2		+ 6020.4		+ 5640.0	
log	3.660328n		3.779630		3.753120	
η₀	0.991470n		1.110780		1.084270	
log δ	9.5055		9.5773		9.5750	
log ζ²	2.0825		1.9470		0.2710	
η₁	8.6414		8.5777		6.8994	
η₀	- 98055		+12.9056		+12.1414	
η₁	+ 438		+ 378		+ 8	
ξ	12.23831		34.94340		34.14220	
η	12.24271		34.94140		34.05020	
η-ξ	+ 88		- 20		- 920	

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Comparison Stars – Standard Coords.

	4	hr.	min	sec	mag
C		13	44		7.8
C	9h	48m	34s	03	
L				.08	
E				.03	
mean	9	43	34	.05	
Prec		+	36	.55	
α	9	44	10	.60	
A	9	39	08		
α-A		+ 5	02	.60	
sin(α-A)		+	30	2.58	
log		2.48084			
cos δ		9.97703			
" ξ_0		0.96511			
ξ_0		+ 9.2280			
ξ_1		+		28	
ξ		27.2303			
x		27.1006			
x-ξ		-	1297		
C	+18°	31′	22″	.0	
L				22.2	
E				21.8	
mean	+18	31	22	.0	
Prec		-	3	02.7	
δ	+18	28	19	.3	
D	+19	01	39		
δ-D	-		33	19.7	
tan(δ-D)		-		1999.8	
log		3.30099n			
" η_0		0.63214n			
log tan δ		9.5238			
" ξ^2		1.9302			
" m_1		8.5074			
m_0		-4.2869			
m_1		+		322	
m		17.7453			
y		17.5318			
y-m		-	2135		

	5	hr.	min	sec	mag
		13	47		8.5
	9h	45m	19s	.89	
				.95	
				.89	
	9	45	19	.91	
		+	36	.72	
	9	45	56	.63	
	9	39	08		
	+	6	48	.63	
	+		408	.57	
		2.61127			
		9.97370			
		1.09221			
		+ 12.365		-9	
		+		54	
		30.3708			
		30.3484			
		-	224		
	+19°	47′	26″	.7	
				.8	
				.7	
	+19	47	26	.7	
		-	3	03	.7
	+19	44	23	.0	
	+19	01	39		
	+	42	44	.0	
		+	2564	.1	
		3.40894			
		0.74009			
		9.5549			
		2.1844			
		8.7927			
		+5.4965			
		+	620		
		27.5585			
		27.3144			
		-2441			

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NGC 1085.

Comparison Star - Standard Colors.

	4	No.	mag	5	No.	mag.
C		1344	7.8		1347	8.5
C	9h	43m	34.03	9h	45m	19.89
L			.08			.95
E			.03			.89
mean	9	43	34.05	9	45	19.91
Prec		+	36.55		+	36.72
X	9	44	10.60	9	45	56.63
A	9	39	08	9	39	08
X-A		+ 5	02.60		+ 6	48.63
sin(X-A)		+	302.58		+	408.57
log			2.480849			2.611279
cos δ			9.997703			9.997370
S_0			0.965111			1.092.21
S_0			+9.22800			+12.36549
S_1			+ 28			+ 59
S			27.2303			30.37108
x			27.1006			30.3484
x-3			- 1297			- 1224
C	+18°	31′	22.0″	+19°	47′	26.7″
L			22.2			.8
E			21.8			.7
mean	+18	31	22.0	+19	47	26.7
Prec		−	3 02.7		−	3 03.7
δ	+18	28	19.3	+19	44	23.0
D	+19	01	39	+19	01	39.
δ-D	−	33	19.7	+	42	44.0
sin(δ-D)	−		1999.8		+	2564.1
log			-3.300994			3.408944
S_0			0.632144			0.740094
log tan δ			9.5238			9.5549
S_2^2			1.9302			2.1844
S_1			8.5074			8.7927
m_0			-4.2869			+5.4965
m_1			+ 322			+ 620
m			17.7453			27.5585
4			17.5318			27.3144
4-m			- 2135			- 2441

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Comparison Stars - Measures.

Reseau reversed

4 x

	d	N	d	N
1/				
6.8	18341	17375	18209	18246
12.3	15869 72	9843 45	16241 42	10208 00
mag	75	48	40	05
=7.9	41	71	11	36
	12.2469	.2473	6.8032	.8034
2/				
8.6	16833	14560	17836	15748
34.9	7421 22	13974 70	13710 12	9371 64
	19	72	05	68
mg 6.7	36	48	40	36
	34.9415	.9413	8.6371	.6372
3/				
16.7	15470	15560	14720	14571
34.0	14970 73	6056 53	11815 16	7469 59
	71	51	09	60
mg	76	48	19	69
7.1				
	34.0499	.0504	16.7093	.7107
4/	15246	14337	15150	14951
27.1	9930 30	13668 62	6138 38	13939
17.6	30	59	38	39 40
mg	47	50	37	50
7.8				
	17.5317	.5320	27.1000	.1012
5/	16709	18653	15247	17340
30.5	14535 35	10840 39	10121 29	12460 65
27.3	29	45	20	60
mg	05	63	50	48
6.1				
	27.2175	.2180	30.4875	.4882
or probably star 5 is:				
	16721	17643	17810	16340
	13573 79	10791 92	11291 88	12850 49
	79	10	93	50
	21	49	18	44
	27.3144	.3144	30.3476	.3492

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MC1085. 1913 Jan 2. 18

Comparison stars - measures.

Rosedale reversed.

4 x

	a	N	a	N
1				
6.8	18341	17375	18209	18246
12.3	15869 72	9843 45	16241 42	10208 00
mag	75	48	40	05
=7.9	41	71	11	36
	12.2469	.2473	6.8032	.8034
3				
8.4	16833	14560	17336	15748
34.9	74211 22	13974 70	13710 12	93716 64
mg 6.7	19	72	05	68
	36	48	40	36
	34.9415	.9413	8.6371	.6372
3				
16.7	15470	15560	14720	14571
34.0	14970 73	60556 53	11815 16	74695 9
mag	71	51	09	60
7.1	76	48	19	69
	34.0499	.0504	16.7093	.7107
4	15246	14337	15150	14951
27.1	99330 30	13668 62	61338 38	13939 40
17.6	30	59	38	39
mag	47	50	37	50
7.8				
	17.5317	.5320	27.1000	.1012
5	16709	18653	15247	17340
30.5	14535 35	10840 39	10121 29	12460 65
27.3	29	45	20	60
mag	05	63	50	48
8.5				
	27.2175	.2150	30.4875	.4882
	or probably star 5 to:			
	16721	17648	17810	16340
	13573 79	10791 92	11291 88	12850 49
	79	90	93	50
	21	49	18	44
	27.2144	3144	30.3476	3492

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MC1085 1913 Jan 2.

moon-measures- Reseau reversed on plate

	α		N	
1/				
16.5				
20.0	oblique and irregular			
	16886		16283	
	11502	32	11692	96
	30		69	
	94		00	
	16.4631		.4605	
2/				
16.0	16769		14723	
20.4	18567	81	79255	10
	74		15	
	80		36	
	20.3198		.3145	
3/				
15.5				
21.0				
	17008		17874	
	12206		12679	75
	08	10	80	
	09		79	
	15.5200		.5199	
4/				
15.4				
21.7				
Prism in N				
	15900		17990	
	93499	31	14544	40
	34		39	
	08		00	
	15.3433		.3452	
5/				
15.3				
22.0				
	15887		17012	
	93900	05	13481	82
	06		85	
	98		05	
	15.3506		.3528	
6/				
15.7				
23.0				
	15136		17145	
	12310	09	99538	60
	06		58	
	56		49	
	15.7166		.7192	

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moon - measures - Rescan reversed on plate

4

1/		a		N		a		N	
16.5						16886		16283	
20.0		oblique and irregular				11502	32	11692	96
						30		69	
						94		09	
						16.4681		.4605	
2/									
16.0	16769		14723						
20.9	13567	81	7925	10					
	74		15						
	80		36						
	20.3198		.3185						
3/									
15.5						17008		17874	
21.0						12206		12679	75
						0810		80	
						09		79	
						15.5200		.5199	
4/									
15.4						15900		17990	
21.7						9349	31	14543	40
rim						34		39	
w						08		00	
E						15.3433		.3452	
5/									
15.3						15857		17012	
22.0						9390	05	13481	82
						06		85	
						98		05	
						15.3506		.3528	
6/									
15.7						15136		17145	
23.0						12310	09	9953	60
						06		58	
						56		49	
						15.7166		.7192	

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MC1085. 1913 Jan. 2. 20.

Moon-measures- Reseau reversed on plate.

	y	a		N		d	N
2							
16.0		17841		17070			
23.4		14533	29	10365	74		
		35		66			
		50		75			
		23.33312		.3295			
8							
17.0		17730		17188			
23.8		9380	70	15557	52		
		70		48			
		40		98			
		23.83565		.8362			
9							
17.5		16680		16239			
23.8		7856	41	15049	54		
max		56		59			
in		95		50			
4							
		23.8840		.8844			
10							
18.0		16616		16312			
23.8		8675	60	14213	17		irregular
		61		20			
		30		15			
		23.7962		.7904			

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M C 1085. 1913 Jan. 2. 20.

Woow - Measures of Reseau reversed on plate.

	a		N		d	N
2						
16.0	17841		17070			
23.4	14533	29	10365	74		
	35		66			
	50		75			
	23.33312		.3295			
8						
17.0	17730		17188			
23.8	9380	70	15557	52		
	70		48			
	40		98			
	23.83655		.8362			
9						
17.5	16680		16239			
23.8	7856	48	15049	54		
max	56		59			
i	95		50			
4						
	23.8840		8844			
10						
18.0	16616		16312			
23.8	8675	60	14213	17		irregular
	61		20			
	30		15			
	23.7962		.7904			

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MC1085 1913 Jan. 14. 21

Times Etc.

Exp. to stars	1911 May 5	11h	44m	. - 11 53
" " moon		11	48	30.1ˢ - 11 48 30.3ˢ
Clock fast			2	59.6ˢ
H Sid T.		11	45	30.6ˢ
H long.		4	44	31.05ˢ
G Sid T		16	30	01.65ˢ
Sid T. to moon.		2	48	57.41ˢ
Interval		13	41	04.24ˢ
Reduction			2	14.51ˢ
G.M.T.		13	38	49.73ˢ

From Amer Eph.

moon 13h	9h 38m 59.68ˢ	+19° 33' 25.6"	
motion in 1m 2.2369ˢ		11.561ˢ	
" " 38.829ˢ	+ 1 26.86ˢ	- 7 28.9ˢ	
Tabular place	9 40 26.54ˢ	+19 25 56.7ˢ	

Moon's parallax. 57' 49.2"
Meridian 15 46.9ˢ

age of moon. 7d

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Transit Eqn.

Exp. t Stars 1911 May 5	11h	44m	11 53
moon	11	48 30.1	11 48 30.3
Clock fast		2 59.6	
11 Sid. T.	11	45 30.6	
H long.	4	44 31.05	
G Sid. T	16	30 01 65	
Sid T. M. noon.	2	48 57.41	
Interval	13	41 04.24	
Reduction		2 14.51	
G. M. T.	13	38 49.73	

from Amer Ephs.

Moon 13h	9h	38m	59s.68	+19°	33'	25".6
Motion in 1h 2.2369			11.564			
38.83	+	1	26.76	−	7	28.9
Tabular place	9	40	26.44	19	25	56.7 ✓

Moon's { declination. 57' 49".2
Semidiam. 15 46.9

age of moon. 7d

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MC 1085 1913 Feb. 1

center of plate for 1085–1086.

x	y	R.A.	Decl.
6.64	12.36	9h 33m 09s	+17° 45′ 26″
8.49	35.05	33 55	+20 41 58
16.58	34.15	38 24	+20 36 02
26.94	17.62	44 11	+18 28 19
30.34	27.30	45 57	+19 44 23
5 | 88.99	126.48	195 36	47 16 8
17.80	25.30	9 39 07	+19 27 14
−18	−22	+ 1	− 25 35
20	3.3	A = 9 39 08	D = +19 01 39
31	4.5		
.62	1.39 5		
	139		
	1534.5		

	1	2	3	4	5
x	6.8033	8.6372	16.7100	27.1006	30.3484
y	12.2471	34.9414	34.0502	17.5318	27.5144

Preliminary Reduction

	x − 5	+ 1946	− 1084	− 4x	+ 1349
1	− 1946 =	0	− 1323 =	− 1323 − 27 =	− 1350 = −1
2	+ 505 =	+ 2451	− 3774 =	− 1323 − 35 =	− 1358 = −9
3	+ 463 =	+ 2409	− 3677 =	− 1268 − 67 =	− 1335 = +14
4	− 1297 =	+ 649	− 1893 =	− 1244 − 108 =	− 1352 = −3
5	− 224 =	+ 1722	− 2950 =	− 1228 − 121 =	− 1349 = 0
mean	17.4014 =		− 2357	− 70	= 17.4882

	y − m.	+ 2441	+ 110x =	− 44	− 3226
1	+ 88 =	+ 2529	+ 748 =	+ 3277 − 49 =	+ 3228 = +2
2	− 20 =	+ 2421	+ 950 =	+ 3371 − 140 =	+ 3231 = +5
3	− 920 =	+ 1521	+ 1838 =	+ 3359 − 136 =	+ 3223 = −3
4	− 2135 =	+ 306	+ 2981 =	+ 3287 − 70 =	+ 3217 = −9
5	− 2441 =	0	+ 3339 =	+ 3339 − 109 =	+ 3230 = +4
mean	21.8252		+ 1914	− 87	= 21.9294

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1913 Ser. V. 1

Catalogue of Stars for 1885-1886.

x	y	R.A.	Decl.
16.64	12.56	9h 33m 09s	+17° 45' 26"
8.49	35.05	33 55	+20 41 58
16.58	34.15	28 24	+20 36 02
26.94	17.62	44 11	+18 28 19
30.34	27.30	45 57	+19 44 23
5 88.99	126.48	195 36	47 16 8
17.80	25.30	9 39 07	+19 27 14
		T 1	- 25 35
20	3.3	A 9 39 08	D +19 01 39
31	4.5		
62	139.5		
	139.5		
	1534.5		

	1	2	3	4	5
x	6.8033	8.6372	16.7800	27.1006	30.3484
y	12.2471	34.9414	34.0502	17.5318	27.3144

Preliminary Reduction.

	x-3	+1946	-1084	-4x	+1349
1	-1946 =	0	-1323	-1323 -27	-1350 = -1
2	+505 =	+2451	-3774	-1323 -35	-1358 = -9
3	+463 =	+2409	-3677	-1268 -67	-1335 = +14
4	+1297 =	+649	-1893	-1244 -108	-1352 = -3
5	-224 =	+1722	-2950	-1228 -121	-1349 = 0
mean	17.4014 =		-2357	-10	=17.4882

	y-14	+2941	+1107	-44	-3226
1	+.88 =	+2529	+748 =	+3277 -49	+3228 = +2
2	-20 =	+2421	+950 =	+3371 -140	+3231 = +5
3	-920 =	+1521	+1838 =	+3358 -136	+3223 = -3
4	-2135 =	+306	+2981 =	+3287 -70	+3217 = -9
5	-2441 =	0	+3339 =	+3339 -109	+3230 = +4
mean	21.8258		+1914	-87	21.9294

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Plate Constants.

Conditional Equations.

	a	b	c	x − 5	y − 7
1	+6.80	+12.25	+1 =	−1	+2
2	+8.64	+34.94	+1 =	−9	+5
3	+16.71	+34.05	+1 =	+14	−3
4	+27.10	+17.53	+1 =	−3	−9
5	+30.35	+27.31	+1 =	0	+4

mean Equations.

a	b			
+7.72	+23.60	+1 =	−5.00	+3.50
+24.72	+26.30	+1 =	+3.67	−2.67
+16.95	+14.89	+1 =	−2.00	−3.50
+18.57	+32.10	+1 =	+1.67	+2.00
−17.00	−2.70	=	−8.67	+6.17
−1.62	−17.21	=	−3.67	−5.50
+1.62	+0.26	=	+0.83	−059
	−16.95	=	−2.84	−409
		b =	+0.17	+0.36
−17.00a =		−8.67 + 0.45 =	−8.22	+6.17 + 0.97 = +7.14
			+0.48	−0.42

−5.0	+3.7	−2.0	+1.7	+3.5	−2.7	−3.5	+2.0	
−3.7	−12.0	−8.2	−9.0	−3.2	+10.4	+7.1	+7.8	
−4.0	−4.4	−2.5	−5.4	−8.5	−9.4	−5.3	−11.5	
−12.7	−12.7	−12.7	−12.7	−1.8	−1.7	−1.7	−1.7	

c for x − 5

Residuals x				c	0	0 − c
1	+ 3	+ 2	− 13	= −8	−1	+7
2	+ 4	+ 6	− 13	= −3	−9	−6
3	+ 8	+ 6	− 13	= +1	+14	+13
4	+ 13	+ 3	− 13	= +3	−3	−6
5	+ 15	+ 5	− 13	= +7	0	−7
	− 3	+ 4	− 2	= −1	+2	+3
	− 4	+ 13	− 2	= +7	+5	−2
	− 7	+ 12	− 2	= +3	−3	−6
	− 11	+ 6	− 2	= −7	−9	−2
	− 13	+ 10	− 2	= −5	+4	+9

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Plate Constants

Conditional Equations.

	a	b	c	x − 3	y − 9
1	+6.80	+12.25	+1 :	−1	+2
2	+8.64	+34.99	+1 :	−9	+5
3	+16.71	+34.05	+1 :	+14	−3
4	+27.10	+17.53	+1 :	−3	−9
5	+30.85	+27.31	+1 :	0	+4

mean Equations

a	b			
+7.72	+23.60	+1 :	−5.00	+3.50
+24.72	+26.30	+1 :	+3.67	−2.67
+16.95	+14.89	+1 :	−2.00	−3.50
+18.57	+32.10	+1 :	+1.67	+2.00
−17.00	−2.70	:	−8.67	+6.17
−1.62	−17.21	:	−3.67	−5.50
+1.62	+0.26	:	+0.83	−0.59
	−16.95	:	−2.84	−4.09
	b	=	+0.17	+0.36
−17.00a	= −8.67	+0.45 :	−8.22	+6.17 +0.97 = +7.14
			+0.48	−0.42

−5.0	+3.7	−2.0	+1.7	+3.5	−7.7	−3.5	+2.0	
−3.7	−12.0	−8.2	−9.0	+3.2	+10.4	+7.1	+7.8	
−4.0	−4.4	−2.5	−5.9	−8.5	−9.4	−5.3	−11.5	
−12.7	−12.7	−12.7	−12.7	−1.8	−1.7	−1.7	−1.7	

c for x = 5

Residuals

	x	y	c	O	O − C
1	+ 3	+ 2	−13 :	−8	−1	+7
2	+ 4	+ 6	−13 :	−3	−9	−6
3	+ 8	+ 6	−13 :	+1	+14	+13
4	+13	+ 3	−13 :	+3	−3	−6
5	+15	+ 5	−13 :	+7	0	−7

− 3	+ 4	− 2 :	− 1	+ 2	+ 3
− 4	+13	− 2 :	+ 7	+ 5	− 2
− 7	+12	− 2 :	+ 3	− 3	− 6
−11	+ 6	− 2 :	− 7	− 9	− 2
−13	+10	− 2 :	− 5	+ 4	+ 9

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Pt.	Pos. ∠	Resid.
1	207.2	−99
2	223.0	+77
3	246.4	−36
4	270.0	+74
5	274.9	+71
6	304.8	−109
7	317.0	+12
8	348.7	−190
9	0.0	+91
10	16.8	+77

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Morris Center

	x	$x-X_0$	Δx	$(x-X_0)^2$	$(x-X_0)^2+(y-Y_0)^2$	O − C
1	16.46 18	− 0.9403	− 3	0.8847	4.2146	− 120
2	16.0000	− 1.4021	− 2	1.9664	4.2332	+ 66
3	15.5200	− 1.8821	− 1	3.5427	4.2230	− 36
4	15.3442	− 2.0579	0	4.2350	4.2350	+ 84
5	15.3517	− 2.0504	+ 0	4.2041	4.2348	+ 82
6	15.7179	− 1.6842	+ 2	2.8359	4.2170	− 96
7	16.0000	− 1.4021	+ 2	1.9653	4.2321	+ 55
8	17.0000	− 0.4021	+ 3	0.1614	4.2079	− 187
9	17.4021	0.0000	+ 3	0.0000	4.2354	+ 88
10	18.0000	+ 0.5979	+ 3	0.3578	4.2332	+ 66

mean = 4.2266 + 2

	y	$y-Y_0$	Δy	$(y-Y_0)^2$
1	20.0000	− 1.8248	− 0	3.3299
2	20.3192	− 1.5056	− 0	2.2668
3	21.0000	− 0.8248	− 0	0.6803
4	21.8248	0.0000	0	0.0000
5	22.0000	+ 0.1752	+ 0	0.0307
6	23.0000	+ 1.1752	+ 0	1.3811
7	23.3304	+ 1.5056	+ 0	2.2668
8	23.8364	+ 2.0116	+ 1	4.0465
9	23.8827	+ 2.0579	+ 1	4.2354
10	23.7933	+ 1.9685	+ 1	3.8754

Approximate Center

$x = 160$ $y = 20.3192$
23.3304
43.6496
mean y = 21.8248
y = max 23.8827
R = 2.0579
x = min: 15.3442
mean x = 17.4021

$X_0 = 17.4021$
$Y_0 = 21.8248$

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Morris Center.

	x	$x-x_0$	Δx	$(x-x_0)^2$	$(x-x_0)^2+(y-y_0)^2$	O − C
1	16.4618	− 0.9403	− 3	0.8847	4.2146	− 120
2	16.0000	− 1.4021	− 2	1.9664	4.2332	+ 66
3	15.5200	− 1.8821	− 1	3.5427	4.2230	− 36
4	15.3442	− 2.0579	0	4.2350	4.2350	+ 84
5	15.3517	− 2.0504	+ 0	4.2041	4.2348	+ 82
6	15.7179	− 1.6842	+ 2	2.8359	4.2170	− 94
7	16.0000	− 1.4021	+ 2	1.9653	4.2321	+ 55
8	17.0000	− 0.4021	+ 3	0.1614	4.2079	− 187
9	17.4021	0.0000	+ 3	0.0000	4.2354	+ 88
10	18.0000	+ 0.5979	+ 3	0.3578	4.2332	+ 66
				mean	4.2266	− 2

	y	$y-y_0$	Δy	$(y-y_0)^2$
1	20.0000	− 1.8248	− 0	3.3299
2	20.3192	− 1.5056	− 0	2.2668
3	21.0000	− 0.8248	− 0	0.6803
4	21.8248	− 0.0000	0	0.0000
5	22.0000	+ 0.1752	+ 0	0.0307
6	23.0000	+ 1.1752	+ 1	1.3811
7	23.3304	+ 1.5056	+ 0	2.2668
8	23.8364	+ 2.0116	+ 1	4.0465
9	23.8827	+ 2.0579	+ 1	4.2359
10	23.7933	+ 1.9685	+ 1	3.8754

Approximate Centre

$x = 16.0$ $y = 20.3192$

23.3304

43.6496

mean y $= 21.8248$

y max $= 23.8827$

$R = 2.0579$

x min $= 15.3442$

x max $= 17.4021$

$X_0 = 17.4021$

$Y_0 = 21.8248$

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Formation of Normals

No		ab		am		bm
1	+	1.71	+	113.0	+	218 5
2	+	2.12	-	92.5	-	99.6
3	+	1.54	+	67.6	+	29.6
4		0.00	-	172.8		0.0
5	-	0.36	-	168.0	+	14.8
6	-	1.98	+	161.0	-	113 0
7	-	2.12	-	77.0	+	83 0
8	-	0.80	+	74.9	-	375 8
9		0.00		0.0	+	181 0
10	+	1.18	+	39.6	+	130 0
	+	1.29	-	54.2	+	68.5

[aa] = +20.15 [bb] = +22.11

[ac] = -11.21 [bc] = +4.76 [cc] = +2

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MC1085. 1913 Feb. 3. 25

Moon's Center.

Conditional Equations.

	a	b	c	O		C	O−C
1	−0.94	−1.82	+1	= −120	+ 13 − 15 − 19	= −21	−99
2	−140	−1.51	+1	= +66	+ 20 − 12 − 19	= −11	+77
3	−188	−0.82	+1	= −36	+ 26 − 7 − 19	= −0	−36
4	−206	0.00	+1	= +84	+ 29 0 − 19	= +10	+74
5	−20.5	+0.18	+1	= +82	+ 29 + 1 − 19	= +11	+71
6	−168	+1.18	+1	= −96	+ 23 + 9 − 19	= +13	−109
7	−140	+1.51	+1	= +55	+ 20 + 12 − 19	= +13	+42
8	−0.40	+2.01	+1	= −187	+ 6 + 16 − 19	= +3	−190
9	+0.00	+2.06	+1	= +88	0 + 16 − 19	= −3	+91
10	+0.60	+1.97	+1	= +66	− 8 + 16 − 19	= −11	+77

−434 +432

Average (O−C) = 87

Normal Equations.

a	b	c	
+20.15	+1.29	−11.21	= −54
+1.29	+22.11	+4.76	= +68
−11.21	+4.76	+10.00	= +2

$\frac{\Delta a}{\Delta c}$ = +0.572

−1.29	−0.08	+0.72	= +3
+11.21	+0.72	−6.25	= −30
	+22.03	+5.48	= +71
	+5.48	+3.75	= −28

$\frac{\Delta b}{\Delta c}$ = −0.249

	−5.48	−1.36	= −18
		+2.39	= −46

c = −19

	−8.02	−5.48	= +41
	+14.01		= +112

b = +8

+3.02	−1.29	−2.70	= −1
+52.10	−22.11	−46.50	= −9
+23.17		−13.91	= −55
+53.39		−41.74	= +59
−17.80		+13.91	= −20
+5.57			= −75

a = −14

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Mount Wilson

Conditional Equations.

	a	b	c	O		c	O-C
1	−0.94	−1.82	+1	= −120	+ 13	− 15 − 19	= − 21 − 99
2	− 1.40	− 1.51	+1	= +66	+ 20	− 12 − 19	= − 11 +77
3	− 1.88	− 0.82	+1	= −36	+ 26	− 7 − 19	= − 0 −36
4	− 2.06	0.00	+1	= +84	+ 29	0 − 19	= + 10 +74
5	− 20.5	+ 0.18	+1	= +82	+ 29	+ 1 − 19	= + 11 +71
6	− 1.68	+ 1.18	+1	= −96	+ 23	+ 9 − 19	= + 13 −109
7	− 1.40	+ 1.51	+1	= +55	+ 20	+ 12 − 19	= + 13 +42
8	− 0.40	+ 2.01	+1	= −187	+ 6	+ 16 − 19	= + 3 −190
9	− 0.00	+ 2.06	+1	= +88		0 + 16 − 19	= − 3 +91
10	+ 0.60	+ 1.97	+1	= +66	+ 8	+ 16 − 19	= − 11 +77
							−934 +432

Average O-C: 87

Normal Equations.

a	b	c	
+20.15	+ 1.29	− 11.21	= − 54
+ 1.29	+ 22.11	+ 4.76	= + 68
− 11.21	+ 4.76	+ 10.00	= + 2
− 1.29	− 0.08	+ 0.72	= + 3
+ 11.21	+ 0.72	− 6.25	= − 30
	+ 22.03	+ 5.48	= + 71
	+ 5.48	+ 3.75	= − 28
	− 5.48	− 1.36	= − 18
		+ 2.39	= − 46
	− 8.02	− 5.48	= + 71
	+ 14.01		= + 112

c = − 19

b = + 8

+ 3.02	− 1.29	− 2.70	= − 1
+ 52.10	− 22.11	− 46.50	= − 9
+ 23.17		− 13.91	= − 55
+ 53.39		− 41.74	= + 59
− 17.80		+ 17.91	= − 20
+ 5.57			= − 75

a = + 14

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MC 1085. 1913 Feb 4. 26

Moon's mean position (1911.0)

$X_0 = 17.40021$ ✓ $Y_0 = 21.8248$ ✓

$+\frac{1}{2}a = -7$ ✓ $\frac{1}{2}b = +4$ ✓

17.40014 21.8252 ✓

From fortnightly reduction ∴ data constants

	X	Y
	17.48822 ✓	21.9294
ax	+ 8	− 7
by	+ 4	+ 8
c	− 13	− 2
	17.48811 ✓	21.9293

$\xi = -0.51119$ ✓

$\log \xi = 9.709197$ ✓

∴ $\log \cos\delta = 9.97562$ ✓

∴ const = 8.56724 ✓

$\log(\alpha - A) = 1.226337$ ✓

$\alpha - A = -16.84$ ✓

$A = 9\ 39\ 08.$ ✓

$\alpha_0 = 9^h\ 38^m\ 51.16^s$ ✓

$\text{Red} = +0.67$ ✓

$\alpha' = 9\ 38\ 51.83$ ✓

$\eta = -0.07007$ ✓

$\log \tan\delta = 9.53777$ ✓

∴ $\xi^2 = 9.41844$

∴ $\eta_1 = 6.00955$ ✓

$\eta_1 = +1$ ✓

$\eta_0 = -0.07008$ ✓

$\log \eta_0 = 8.845003$ ✓

∴ const = 7.331155 ✓

$\log(\delta - D) = 1.518886$ ✓

$\delta - D = -33.0$ ✓

$D = +19\ 01\ 39$ ✓

$\delta_0 = +19\ 01\ 06.0$ ✓

$\text{Red} = +3.2$ ✓

$\delta' = +19\ 01\ 09.2$ ✓

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MC 1085. 1913 Feb 4. 26

Moon's mean position (1911.0)

$X_0 = 17.4021$ $\quad Y_0 = 21.8248$

$+\frac{1}{2}a = -17$ $\quad \frac{1}{2}b = +4$

17.4014 $\quad 21.8252$

From position reduction for abs. constants

$x = 17.4882$ $\quad y = 21.9294$

$cx = +8$ $\quad -7$

$by = +4$ $\quad +8$

$c = -13$ $\quad -2$

17.4881 $\quad 21.9293$

$\xi = -0.5119$

$\log \xi = 9.709194_n$

$\log \cos\delta = 9.975624$

$\log \tau = 8.567240$

$(\alpha - A) = 12263.8_n$

$\alpha - A = -16.84$

$A = 9\ 39\ 08.$

$\alpha = 9^h\ 38^m\ 51.16^s$

$R\alpha = +0.67$

$\alpha' = 9\ 38\ 51.83$

$\eta = -0.0707$

$\log \tan\delta = 9.5377$

$\log \xi^2 = 9.4184$

$\log \eta' = 6.0095$

$\eta' = +1$

$\eta_0 = -0.0708$

$\log \eta_0 = 8.850073_n$

$\log r = 7.331155$

$(\delta - D) = 1.51642_n$

$\delta - D = -32.8$

$D = +19\ 01\ 39$

$\delta = +19\ 01\ 06.2$

$R\alpha = +3.2$

$\delta' = +19\ 01\ 09.2$

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1911phae..0Dj..1

1085 Red. ad locum apt.

#	+ α	0 m	31 s = 7° 45′
	H	14	52
	α	9	39
	G	19	08
G	+ α	4	47 = 71° 45′

δ = + 19° 01′

log cos δ	9.9756
i	0.7638 m
(i)	0.7394 m

l cos(G+α)	9.4958
g	0.8700
sin "	9.9776
tang δ	9.5374
1/D	6.8239
(g′)	0.3658
(g)	9.2089

l sin δ	9.5130
cos(H+α)	9.9960
h	1.2923
sin "	9.1298
sec δ	0.0244
1/D	8.8239
(h′)	0.8013
(h)	9.2704

l	+ 0.32	
l	+ 0.16	
l	+ 0.19	
	+ 0.67	
g′	+ 232	
h′	+ 633	
i	− 549	
	+ 316	

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1911phae.proj.1

1085 Rea. ad locum apt.

H + α 0 31 = 7° 45′
H 14 52
α 9 39
G 19 08
G + α 4 47 = 71° 45′

δ = + 19° 01′

log cos δ 9.9756
i 0.7638 n
(i) 0.7394 n

l cos(G+α) 9.4958
0.8700
~~sin~~ 9.9776
~~cos~~ δ 9.5374
15 8.8239

(ξ′) 0.3658
(ξ) 9.2089

l sin δ 9.5130
cos(A+α) 9.9960
h 1.2923
sin " 9.1298
sec δ 0.0244
15 8.8239

(η′) 0.8013
(η) 9.2704

ξ + 0.32
η + 0.16
λ + 0.19
+0.67

ξ′ + 2.32
η′ + 6.33
i − 5.49
+3.16

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1085 Lemur Parallax.

$\alpha' = 9^h\ 38^m\ 51^s.83$ ✓
$\Theta = 11\ 45\ 30.6$ ✓
$\Theta - \alpha' = +2\ 06\ 38.8$ ✓
$= +31^\circ\ 39'\ 42''$ ✓

$+\quad 11\ 54$ ✓

$+\quad 31\ 27\ 48$ ✓

9.957727 ✓
0.000000
0.006906
0.026333 ✓

$\delta' = +19^\circ\ 01'\ 09''.2$ ✓

$\pi = 57'\ 49''.2$

9.869913 ✓
8.225788 ✓
9.720008 ✓
0.025477 ✓
7.840463 ✓

$\alpha - \alpha' = +23'\ 48.53$ ✓
$= +1^m\ 35^s.24$ ✓

$\lambda = 46\ 44\ 08.5$

19 01 09.2 ✓

27 42 59 ✓

9.826400 ✓
8.225788 ✓
9.667855
0.137715 ✓
7.857748 ✓

$\lambda - \lambda' = +24\ 45.6$ ✓

$\delta = +19\ 25\ 54.8$ ✓

Van Allen $\delta = +19\ 25\ 56.7$ ✓

$\alpha = 9\ 40\ 27.07$ ✓

$\alpha = 9\ 40\ 26.54$ ✓

O − C	− 1.9 ✓	+ 0.53 ✓
Red. to stand. n.	− 0.1	+ 0.02
Final (O − C)	− 2.0	+ 0.55

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1085 Lunar Parallax.

$\alpha' = 9^h\ 38^m\ 51^s.83$
$\Theta = 11\ 45\ 30.6$
$\Theta - \alpha' = +2\ 06\ 38.8$
$= +31^\circ\ 39'\ 42''$

$+\quad 11\ 54$

$+\quad 31\ 27\ 48$

9.95727
0.00000
0.06906
0.02633

$\delta' = +19^\circ\ 01'\ 09''.2$

$\pi = 57'\ 49''.2$

9.86913
8.22578
9.72008
0.02547
7.84046

$\alpha - \alpha' = +23'\ 48^s.53$
$= +1^m\ 35^s.24$

$\delta = 46\ 49\ 05.5$

$19\ 01\ 09.2$

$27\ 48\ 56$

9.86640
8.22578
9.66785
0.13782
7.85748

$\delta - \delta' = +24\ 45.6$

$\delta = +19\ 25\ 54.8$

$\alpha = 9\ 40\ 27.07$

Washington $\delta = +19\ 25\ 56.7$

$\alpha = 9\ 40\ 26.54$

O − C -1.9 $+0.53$

Corr. to stand. coordin. -0.1 $+0.02$

Final (O − C) -2.0 $+0.55$

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MC1086. 1913 Febr. 1. 31

Preliminary Reduction.

	1	2	3	4	5
x	6.4802	8.3779	16.4464	27.7846	30.0608
3	6.9979	8.5867	16.6637	27.2303	30.3708
x-3	-5177	-2088	-2173	-4457	-3100
y	12.4770	35.1631	34.2476	17.7068	27.4750
m	12.2383	34.9434	34.1422	17.7453	27.5585
y-m	+2387	+2197	+1054	-385	-835

Star	x-3	+2088	-1369	-2x	+4803
1	-5177	= -3089	-1697 = -4786	-13 = -4799	= +4
2	-2088	= 0	-4782 = -4782	-17 = -4799	= +4
3	-2173	= -85	-4657 = -4742	-33 = -4775	= +28
4	-4457	= -2369	-2408 = -4777	-54 = -4831	= -28
5	-3100	= -1012	-3737 = -4749	-60 = -4809	= -6
mean	17.7136		-2943	-35	: 18.1049

Star	y-m	+137x	-4	-3273	
1	+2387	= +887	= +3274 -12	= +3262	= -11
2	+2197	= +1147	= +3344 -35	= +3309	= +36
3	+1054	= +2253	= +3307 -34	= +3273	= 0
4	-385	= +3670	= +3285 -18	= +3267	= -6
5	-835	= +4118	= +3283 -27	= +3256	= -17
mean	21.6371	+2427	-27		: 21.5503

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1911phae.proj:1

MC1086. 1913 Feb. 1. 31

Preliminary Reductions.

	1	2	3	4	5
x	6.4802	8.3779	16.4464	26.7846	30.0608
	6.4979	8.5867	16.6637	27.2303	30.3708
-3	-5177	-2088	-2173	-4457	-3100
y	12.4770	35.1631	34.2476	17.7068	27.4750
h	12.2383	34.9434	34.1422	17.7453	27.5585
	+2387	+2197	+1054	-385	-835

Star							
1	-5177	-3089	-1697	-4786	-13	-4799	+4
2	-2088	0	-4782	-4786	-17	-4799	+4
3	-2173	-85	-4657	-4742	-33	-4775	+28
4	-4457	-2369	-2408	-4777	-54	-4831	-28
5	-3100	-1012	-3737	-4749	-60	-4809	-6
mean	17.7136		-2943		-35		18.1049

Star							
1	+2387	+887	+3274	-12	+3262	-11	
2	+2197	+1147	+3344	-35	+3309	+86	
3	+1054	+2253	+3307	-34	+3273	0	
4	-385	+3670	+3285	-18	+3267	-6	
5	-835	+4118	+3283	-27	+3256	-17	
mean	21.6371	+2427		-22			21.5503

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MC1086 1913 Feb 3. 32

Plate Constants

Conditional Equations

a	b	c	x − 3	y − n
+ 6.48	+ 12.48	+ 1 =	+ 4	− 11
+ 8.38	+ 35.16	+ 1 =	+ 4	+ 36
+ 16.45	+ 34.25	+ 1 =	+ 28	0
+ 26.78	+ 17.71	+ 1 =	− 28	− 6
+ 30.06	+ 27.48	+ 1 =	− 6	− 17

+ 7.43	+ 23.82	+ 1 =	+ 4.00	+ 12.50
+ 24.43	+ 26.48	+ 1 =	− 2.00	− 7.67
+ 16.63	+ 15.10	+ 1 =	− 12.00	− 8.50
+ 18.30	+ 32.30	+ 1 =	+ 8.67	+ 6.33

− 17.00	− 2.66		= + 6.00	+ 20.17
− 1.67	− 17.20		= − 20.67	− 14.83
+ 1.67	+ 0.26		= − 0.59	− 1.98
	− 16.94		= − 21.26	− 16.81
		b	= + 1.25	+ 0.99
− 17.00 a	= + 6.00	+ 3.34	= + 9.34	= + 20.17 + 2.64 = + 22.81
		a	= − 0.55	− 1.34

+ 4.0	− 2.0	− 12.0	+ 8.7	+ 12.5	− 7.7	− 8.5	+ 6.3
+ 4.1	+ 13.9	+ 9.1	+ 10.0	+ 10.0	+ 32.8	+ 22.3	+ 24.6
− 29.9	− 33.2	− 19.0	− 40.5	− 23.7	− 26.3	− 15.0	− 32.1
− 21.8	− 21.8	− 21.9	− 21.8	− 1.2	− 1.2	− 1.2	− 1.2

			c	o	o − c
− 4	+ 16	− 22	= − 10	+ 4	+ 14
− 5	+ 44	− 22	= + 17	+ 4	− 13
− 9	+ 43	− 22	= + 12	+ 28	+ 16
− 15	+ 22	− 22	= − 15	− 28	− 13
− 17	+ 35	− 22	= − 4	− 6	− 2

− 9	+ 12	− 1	= + 2	− 11	− 13
− 11	+ 35	− 1	= + 23	+ 36	+ 13
− 22	+ 34	− 1	= + 11	0	− 11
− 36	+ 18	− 1	= − 19	− 6	+ 13
− 40	+ 27	− 1	= − 14	− 17	− 3

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Plate Constants

Conditional Equations.

+	6.48	+	12.48	+	1	:	+	9		-	11
+	8.38	+	35.16	+	1	:	+	4		+	36
+	16.45	+	34.25	+	1	:	+	28			0
+	26.78	+	17.71	+	1	:	-	28			- 6
+	30.06	+	7.42	+	1	:	-	6			- 17

+	7.43	+	23.82	+	1	:	+	4.00		+	12.50
+	29.93	+	26.48	+	1	:	-	2.00		-	7.67
+	16.62	+	15.10	+	1	:	-	12.00		-	8.50
+	19.30	+	52.30	+	1	:	+	8.67		L	6.38

-	17.00	-	2.66	a	:	+	6.00			+	20.17
-	1.67	-	17.20		:	-	20.67			-	14.83
+	11.67	+	0.76	a	:	-	0.59			-	1.98
		-	16.94	a	:	+	21.26			-	16.81
				a	:	+	1.25			+	.25
-	17.00	a	+ 6.00	+	3.34	:	19.34		+	20.17	2.64 + 22.81
				a	:	-	0.55			-	1.39

+	4.0	-	2.0	-	12.0		+	8.7		+	12.5	-	7.7	-	8.5	+	6.3
+	4.1	-	13.9	-	9.1		-	10.6		+	10.0	+	32.8	+	22.3	+	24.6
-	29.9	-	33.2	-	19.0		-	40.5		-	23.7	-	26.3	-	14.0	-	32.1
-	21.8	-	21.8	-	21.9		-	21.8		-	1.2	-	1.2	-	1.2	-	1.2

-	4	+	16	-	22	:	-	10		+	9			+	14
-	5	+	44	-	22	:	+	17		+	9			-	13
-	9	+	43	-	22	:	+	12		+	28			+	16
-	15	+	22	-	22	:	-	15		-	28			-	13
-	17	+	35	-	22	:	-	4		-	6			-	2

-	9	+	12	-	1	:	+	2		-	11			-	13
-	41	+	35	-	1	:	+	23		+	36			+	13
-	22	+	34	-	1	:	+	11			0			-	11
-	36	+	18	-	1	:	-	19		-	6			+	13
-	40	+	27	-	1	:	-	14		-	17				- 3

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Comparison Stars - measures.

	y a	y N	x d	x N
V				
6.5	14750	18559	15401	15035
12.5	9980 80	13325 31	10201 04	10230 30
mg	84	26	06	35
7.9	48	51	00	30
	12.4768	.4772	6.4803	.4801
2				
8.4	14673	19590	18349	17486
35.2	12988 90	11220 11	12128 28	13710 10
	90	10	29	05
mg	00	80	51	92
6.7				
	35.1630	.1632	8.3778	.3780
3				
	17361	16566	17500	17266
16.4	14889 86	9035 36	11960 60	12805 00
34.3	79	40	65	00
mg	60	60	04	75
7.1				
	34.2476	.2476	16.4460	.4468
4				
26.8	16132	15517	16571	17213
17.7	9068 72	12587 89	14423 26	9377 78
	67	87	19	71
mg	35	21	79	20
7.8				
	17.7065	.7070	26.7850	.7843
5				
30.2	16391	13808	15230	15316
27.4	12670 16	7598 91	7230 25	13330 29
mg	19	95	30	30
8.5	97	17	29	22
	27.3776	.3781	30.1999	.1987
or:				
	15401	17721	18452	16524
	10653 57	12472 77	9063 60	15915 20
	55	77	58	17
	05	25	50	24
	27.4748	.4752	30.0610	.0607

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MC 1086. 1913 Jan. 3. 33

Comparison Stars - measures.

	a	N	d	N
1/				
6.5	14750	18559	15401	15035
12.5	9980 80	13325 31	10201 04	10230 30
	84	26	06	35
7.9	48	51	00	30
	17.4768	.4772	6.4805	.4801
2/				
8.4	14623	19590	18349	17486
35.2	12.988 90	11220 11	12128 28	13716 10
	90	10	29	05
6.7	00	80	51	92
	35.1630	.1632	8.3778	.3780
3/				
16.4	17361	16566	17500	17266
34.3	148.89 86	9035 36	11960 60	12805 00
	79	40	65	00
7.1	60	60	04	75
	34.2476	.2476	16.4460	.4468
4				
26.6	16132	15517	16571	17213
17.7	9068 72	12587 89	14473 26	9377 78
	67	87	19	71
7.8	35	21	79	20
	17.7065	.7070	26.7850	.7843
5/				
30.2	16391	13608	15230	15316
27.4	12620 16	7598 91	7230 25	13330 29
	19	95	30	30
8.5	97	17	29	22
	27.3776	.3781	30.1999	.1987
or:				
	15401	17721	18452	16524
	10653 57	12472 77	9063 60	15915 20
	55	77	58	17
	05	25	50	24
	27.4748	.4752	30.0610	.0607

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MC 1086 1913 Jan. 3 34.

Moon - measures.

	4 d	N	2 d	N
1			17990	18900
16.5			12714 15	14180 71
20.0			18	69
			99	06
			16.4721	.4727
2				
16.0	18346	16371		
20.5	13350 45	11320 27		
	40	39		
	47	80		
	20.5001	.4953		
3			17075	16300
15.7			14676 71	8720 95
21.0			70	15
			79	66
			15.7596	.7595
4				
15.6			17020	16350
21.5			13559 50	9803 09
Mare in 2c			64	02
			30	59
			15.6535	.6551
5				
15.7			16000	16371
22.0			12875 63	9511 12
			72	05
			01	72
			15.6870	.6863
6				
16.0	16475	15303		
22.8	8753 62	13036 41		
	54	44		
	82	15		
	22.7724	.7734		

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MC 1086 1913 Jan. 5 34.

Moon-measures.

	d	N		d	N
1				17990	18900
16.5				17714 15	14180 71
20.0				18	69
				99	06
				164721	.4727
2					
16.0	18346	16371			
20.5	13350 45	11320 27			
	40	89			
	47	50			
	20.5001	.4953			
3				17075	16300
15.7				14676 71	8720 95
21.0				70	15
				79	66
				15.7596	.7595
4				17020	16350
15.6				13559 50	9803 09
21.5				64	02
mi-				30	59
in					
te				15.6535	.6551
5				16000	16371
15.7				12875 63	9511 12
22.0				72	05
				01	72
				15.6870	.6863
6					
16.0	16475	15303			
22.8	8753 62	13036 41			
	54	44			
	82	15			
	22.7724	.7734			

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MC1086 1913 Jan 3. 35

Moon-Measures.

	4		2	
7	a	n	d	N
16.2			15168	15242
23.0			6878 70	13502 14
			65	07
			68	38
			16.1703	.1733

8			
17.0	15058	14586	
23.5	9398 99	10256 61	
	08	56	
	68	00	
	23.5662	.5666	

9		
17.6	14015	14640
23.6	7065 58	11590 88
max	59	68
ω	25	45
4	23.6961	.6947

10		
18.0	14001	13664
23.6	7249 58	10393 06
	55	92
	11	70
	23.6754	.6731

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Moon - Nagasaki.

Z	d	N
16.2		
23.0		

	d	N
	15168	15242
	6878 70	13502 14
	65	07
	68	38
	16.1703	.1733

8

17.0	15058	14586
23.5	9398 99	10256 61
	08	56
	68	00
	28.5662	.5666

9

17.6	14015	14640
23.6	7065 58	11590 88
mar	59	68
in	25	45
7	23.6961	.6947

10

18.0	14001	13664
23.6	7249 58	10393 06
	55	92
	11	70
	23.6754	.6731

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MC 1086 1913 Jan 14. 36

Times etc.

Exp. th Star	1911 May 5	11h	57m		-12h	06m
" " moon		12	01	10.9s	-12	01 11.1s
clock fast			2	59.6s		
H Sid T.		11	58	11.4s		
H long.		4	44	31.05s		
G Sid T.		16	42	42.45s		
Sid T. in moon		2	48	57.41s		
Interval		13	53	45.04s		
Reduction			2	16.59s		
G.M.T.		13	51	28.45s		

From Am. Eph.

moon 14h		9h	41m	13.81s	+19°	21' 50.9"
motion in 1m = 2.2323s				11.617		
" " -8m.526				19.037	+	1 39.0
Tabular place		9	40	54.78	+19	23 29.9

moon's parallax 57' 48.9"
" semidiam. 15 46.8

Age of moon. 7d

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NGC 1086 1913 Jan 14. 3b

Times etc.

Sp h. transit 1911 May 5	11h	57m	−17° 06′
Moon	12	01	109 −17 01 11.1
clock fast		2	59.6
Sid T.	11	58	11.4
long.	4	44	31.05
Sid T.	16	42	42.45
Sid T. in Moon	2	48	57.41
interval	13	53	45.04
reduction		2	16.59
G.M.T.	13	51	28.45

From Astr. Eph.

Moon 14h	9h	41m	13.81	+19° 21′	50.9
Sun m			11.610		
−8.526			19.04	+ 1	39.0
Interpolated	9	40	54.77	+19 23	29.9

Moon's parallax 57′ 48.9
Semidiam. 15′ 46.8

Age of Moon. 7d

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Point	Pos L	Resid
[1]	217°.0	
2	236.5	+19
3	252.0	−91
4	270.0	+74
5	280.2	+59
6	303.5	−71
7	311.5	+8
8	339.7	−20
9	0.0	+36
10	8.0	−9

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MC1086. 1913 Feb 4.

Moon's Center.

	x	x − X₀	Δx	(x − X₀)²	(x − X₀)² + (y − Y₀)²	O − C
1	16.47724	[− 1.2420]	− 3	[1.5433]	4.2175	[− 206]
2	16.00000	− 1.7144	− 2	2.9398	4.2339	− 42
3	15.75596	− 1.9548	− 1	3.8216	4.2252	− 129
4	15.65543	− 2.0601	0	4.2440	4.2440	+ 59
5	15.68688	− 2.0276	+ 1	4.1108	4.2438	+ 57
6	16.00000	− 1.7144	+ 2	2.9388	4.2329	− 52
7	16.17718	− 1.5426	+ 2	2.3790	4.2414	+ 33
8	17.00000	− 0.7144	+ 3	0.5099	4.2391	+ 10
9	17.71144	0.00000	+ 4	0.00000	4.2440	+ 59
10	18.00000	+ 0.2856	+ 4	0.0818	4.2389	+ 8

mean (except 1) 4.2381 + 3

	y	y − Y₀	Δy	(y − Y₀)²
1	[20.00000]	[− 1.6353]	: 0	[2.6742]
2	20.4977	− 1.1376		1.2941
3	21.00000	− 0.6353		0.4036
4	21.63553	0.00000		0.0000
5	22.00000	+ 0.3647		0.1330
6	22.77729	+ 1.1376		1.2941
7	23.00000	+ 1.3647		1.8624
8	23.56641	+ 1.9311		3.7292
9	23.69543	+ 2.0601		4.2440
10	23.67742	+ 2.0389		4.1571

Approximate Center.

x = 16.0 y = 20.4977
22.7729
43.2706
mean y = 21.6353
y-max = 23.6954
R = 2.0601
x-min = 15.6543
X₀ = 17.7144

Center { X₀ = 17.7144
Y₀ = 21.6353

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1913 Feb. 4. 37

Corona Center.

	x	$x - x_0$	Δ	$(x-x_0)^2$	$(x-x_0)^2 \log(1)$	O - C
1	16.4724	[- 1.2420]	- 3	[1.5433]	4.2175	[- 206]
2	16.0000	- 1.7144	- 2	2.9398	4.2339	- 42
3	15.7596	- 1.9548	- 1	3.8216	4.2252	- 129
4	15.6543	- 2.0601	0	4.2440	4.2440	+ 59
5	15.6868	- 2.0276	+ 1	4.1108	4.2438	+ 57
6	16.0000	- 1.7144	+ 2	2.9388	4.2329	- 52
7	16.1718	- 1.5426	+ 2	2.3790	4.2414	+ 33
8	17.0000	- 0.7144	+ 3	0.5099	4.2391	+ 10
9	17.7144	0.0000	+ 4	0.0000	4.2440	+ 59
10	18.0000	+ 0.2856	+ 4	0.0818	4.2389	+ 8

Mean (except 1) 4.2381 ± 3

	y	$y - Y_0$	$\Delta y (y-Y_0)$
1	[20.0000]	[- 1.6353]	[2.6742]
2	20.4977	- 1.1376	1.2941
3	21.0000	- 0.6353	0.4036
4	21.6353	0.0000	0.0000
5	22.0000	+ 0.3647	0.1330
6	22.7729	+ 1.1376	1.2941
7	23.0000	+ 1.3647	1.8624
8	23.5664	+ 1.9311	3.7297
9	23.6954	+ 2.0601	4.2440
10	23.6742	+ 2.0389	4.1571

Approximate Center.

$x = 16.0$ $y = 20.4977$

22.7729

43.2706

Mean y: 21.6353

y max: 23.6954

R = 2.0601

x min = 15.6543

X_0 = 17.7144

Center $\begin{cases} X_0 = 17.7144 \\ Y_0 = 21.6353 \end{cases}$

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Formation of Normals

No	ab	an	bn
2	+ 1.95	+ 71.9	+ 47.9
3	+ 1.25	+ 251.5	+ 82.5
4	0.00	- 121.6	0.0
5	- 0.73	- 115.7	+ 20.5
6	- 1.95	+ 89.0	- 59.3
7	- 2.10	- 50.8	+ 44.9
8	- 1.37	- 7.1	+ 19.3
9	0.00	0.0	+ 121.6
10	+ 0.59	+ 2.3	+ 16.3
	- 2.36	+ 119.5	+ 293.7

[aa] = + 21.03 [bb] = + 17.12

[ac] = - 11.42 [bc] = + 7.11 [cn] = +3

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MC 1086. 1913 Feb. 4. 38

Moon's Centre.

Conditional Equations.

	a	b	c	O	c	O − c
2	−1.71	−1.14	+1	−42	+28 − 40 − 49	= −61	+19
3	−1.95	−0.64	+1	−129	+33 − 22 − 49	= −38	−91
4	−2.06	0.00	+1	+59	+34 0 − 49	= −15	+74
5	−2.03	+0.36	+1	+57	+34 +13 − 49	= −2	+59
6	−1.71	+1.14	+1	−52	+28 +40 − 49	= +19	−71
7	−1.54	+1.36	+1	+33	+26 +48 − 49	= +25	+8
8	−0.71	+1.93	+1	+10	+12 +67 − 49	= +30	−20
9	0.00	+2.06	+1	+59	0 +72 − 49	= +23	+36
10	+0.29	+2.04	+1	+8	−5 +71 − 49	= +17	−9

+196 −191

Average (O − C) = 43

Normal Equations.

a	b	c	
+21.03	−2.36	−11.42	= +120
−2.36	+17.12	+7.11	= +294
−11.42	+7.11	+9.00	= +3
+2.36	−0.26	−1.28	= +13
+11.42	−1.28	−6.20	= +65
	+16.86	+5.83	= +307
	+5.83	+2.80	= +68
	−5.83	−2.02	= −106
		+0.78	= −38
	−12.15	−5.83	= −142
	+4.71		= +165
−3.78	+2.36	+2.98	= +1
+27.47	−17.12	−21.67	= −7
+17.25		−8.44	= +121
+25.11		−14.56	= +287
−14.55		+8.44	= −166
+2.70			= −95

$\frac{\Delta a}{\Delta c} = +0.504$

$\frac{\Delta b}{\Delta c} = -0.346$

c = −49

b = +35 +

a = −17 −

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M C 1086. 1913 Feb. 4.

Moon's Center.

Conditional Equations.

	a	b	c	O	c	O − c
2	−1.71	−1.14	+1	−42	+28 − 40 − 49	= −61	+19
3	−1.95	−0.64	+1	−129	+33 − 22 − 49	= −38	−91
4	−2.06	0.00	+1	+59	+34 0 − 49	= −15	+74
5	−2.03	+0.36	+1	+57	+39 +13 − 49	= −2	+59
6	−1.71	+1.14	+1	−52	+28 +40 − 49	= +19	−71
7	−1.54	+1.36	+1	+33	+26 +48 − 49	= +25	+8
8	−0.71	+1.93	+1	+10	+12 +67 − 49	= +30	−20
9	0.00	+2.06	+1	+59	0 +72 − 49	= +23	+36
10	+0.29	+2.04	+1	+8	−5 +71 − 49	= +17	−9

+194 −191

Average (O − c) = 43

Normal Equations.

a	b	c	
+21.03	−2.36	−11.42	= +120
−2.36	+17.12	+7.11	= +294
−11.42	+7.11	+9.00	= +3
+2.36	−0.26	−1.28	= +13
+11.42	−1.28	−6.20	= +65
	+16.86	+5.83	= +307
	+5.83	+2.80	= +68
	−5.83	−2.02	= −106
		+0.78	= −38	c = −49
	−12.15	−5.83	= −142
	+9.71		= +165	b = +35

−3.78	+2.36	+2.98	= +	1
+27.47	−17.12	−21.67	= −	7
+17.25		−8.44	= +121	
+25.11		−14.56	= +287	
−14.55		+8.44	= −166	
+2.70			= −95	a = −17

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1914phae..proj..1

MC 1086 1913 Feb. 4 39

Moon.

Mean position (1911.0)

$X_0 = 17.7144$ $Y_0 = 21.6353$

$\frac{1}{2}a$ = — 8 + 18

17.7136 21.6371

From preliminary Reduction $X_0 = 18.1049$ $Y_0 = 21.5503$

" computed plate constants a_x = −10 −24

b_y = +27 +21

c = −22 −1

18.1044 21.5499

$\xi = +0.1044$

$\log \xi = 9.018\,90$

$-\cos\delta = 9.975\,75$

const = 8.507 24

$(\alpha - A) = 0.535\,77$

$\alpha - A = +\ 3.43$

$A = 9\ 39\ 08$

$\alpha = 9^h\ 39^m\ 11^s.43$

Red = + 0.67

$\alpha = 9\ 39\ 12.10$

$\eta = -0.4501$

$\log \tan\delta = 9.5377$

" $\xi^2 = 8.1176$

" $\eta_1 = 4.7087$

$\eta_1 = 0$

$\log \eta_0 = 9.653\,31$

const = 7.331 15

$(\delta - D) = 2.32216$ m

$(\delta - D) = -210.0$

$\delta - D = -\ 3\ 30.0$

$D = +19\ 01\ 39$

$\delta = +18\ 58\ 09.0$

Red = + 3.1

$\delta = +18\ 58\ 12.1$

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C 1086. 1913 Feb. 4. 39

Wood.

Mean positions (1911.0)

$X_0 = 17.7149$ $Y_0 = 21.6353$

$\frac{1}{2}a = -8$ $+18$

17.7136 21.6371

From provisional Reduction $X_0 = 18.1049$ $Y_0 = 21.5503$

computed plate constants $a_x = -10$ -24

$b_y = +27$ $+21$

$c = -22$ -1

18.1044 21.5499

$\xi = +0.1044$

$\log \xi = 9.018780$

$\cos\delta = 9.977575$

$\text{const} = 8.507124$

$(\alpha - A) = 0.53597$

$\alpha - A = +3.43$

$A = 9\ 39\ 08.$

$\alpha = 9^h\ 39^m\ 11^s.43$

$\text{Red} = -0.67$

$\alpha = 9\ 39\ 12.10$

$\eta = -0.4501$

$\log \tan \delta = 9.53777$

$\log \xi = 8.11776$

$\eta_1 = 9.70875$

$\eta_1 = 0$

$\log m_0 = 9.653311_n$

$\log \text{const} = 7.33115$

$(\delta - D) = 2,32216_n$

$(\delta - E) = -210.0$

$\delta - D = -330.0$

$D = +19\ 01\ 39$

$\delta = +18\ 58\ 09.0$

$\text{Red} = -3.1$

$\delta = +18\ 58\ 12.1$

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1086

Red. ad locum apb.

H+α	0	31	= 7° 45′
H	14	52	
α	9	39	
G	19	08	
G+α	4	47	= 71° 45′

δ +18° 58′

l cos δ	9.97558
i	0.7638 n
(i)	07396 n
" sin δ	9.51919
cos(H+α)	9.99600
h	1.29283
sin "	9.12999
sec δ	0.02422
1/D	8.82239
(h′)	0.80022
(h)	9.27033
f	+2.32
Σ	+631
i	−5.49
	+3.14

l cos(G+α)	9.49458
G	0.87011
~~Sin~~ "	9.99776
~~tan~~ δ	9.53662
1/D	8.82239
(g′)	0.36591
(g)	9.20778
l	+0.32
f	+0.16
Σ	+0.19
	+0.67

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1086

Red. ad Locum aph.

H+α	0	31	= 7° 45′
H	14	52	
α	9	39	
G	19	08	
G+α	4	47	= 71° 45′

l cos(G+α)	9.4958
	0.8701
sin ″	9.9776
tan δ	9.5362
1/r	8.1239
(δ′)	0.3659
(δ)	9.2078
δ	+0.32
δ′	+0.16
δ″	+0.19
	+0.67

δ 71° 58′

l cos δ	9.9258
i	0.8138 n
(i)	0.7396 n
″ sin δ	9.9519
cos(H+α)	9.9960
l r	1.7923
sin ″	9.1299
sec δ	0.0242
1/r	8.1239
(h′)	0.8002
(h)	9.2703
δ′	+2.32
δ″	+6.31
i	−5.49
	+3.14

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1086 Red. ad locum opt.

α' = 9h 39m 12.5s10 ✓
θ = 11 58 11.4 ✓
+ 2 18 59.3 ✓
= + 34° 44' 50" ✓

+ 12 55 ✓

+34 31 55 ✓

9.95727 ✓
0.00000
00841 7 ✓
0.04144 ✓

δ' = + 18° 58' 12"1 ✓

Π = 57' 48"9 ✓

9.86913 ✓
8.22575 ✓
9.75584 ✓
0.02536 ✓
7.87608 ✓

α - α' = + 25' 50.64 ✓
= + 1m 43.538 ✓

f = 47 43 45.5 ✓

18 58 12.1 ✓

28 45 33 ✓

9.82640 ✓
8.22575 ✓
9.68226 ✓
0.13070 ✓
7.86511 ✓

δ - δ' = + 25 120

δ = + 19 23 24.1 ✓

α = 9 40 55.48 ✓

Kant Obs δ = + 19 23 29.9 ✓

α = 9 40 54.78 ✓

O - C − 5.8 ✓

+0.70 ✓

Cor to Stand radius + 1.0 ✓

- 0.1 ✓

O - C − 4.8 ✓

+0.59 ✓

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1911phae.proj:1

1086 Red. ad locum apht.

α' = 9h 39m 12.s10
6 = 11 58 11.4
+ 2 18 59.3
= + 34° 44' 50"

+ 12 55

+ 34 31 55

9.95727
0.00000
008417
0.04144

δ' = + 18° 58' 12."1

Π = 57' 48."9

9.86913
8.22575
9.75584
0.02536
7.87608

$\alpha - \alpha'$ = + 25' 50."64
= + 1m 43.s38

δ = 47 43 45.5

18 58 12.1

28 45 33

9.82640
8.22575
9.68226
0.13090
7.86571

$\delta - \delta'$ = + 25 12.3

δ = + 19 23 24.4

Kant Allen δ =	+ 19 23 29.9	α = 9 40 55.48
O - C	- 5.5	+ 0.70
Cor to St and radius	+ 1.0	- 0.1 p
O - c	- 4.5	+ 0.59

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MC 1122 1913 Jan. 10. 46

Comparison Stars - Standard Coordinates.

1.	no.	mag.
C	1504	4.6
C	$10^h\ 59^m\ 51^s.50$	
L	52	
E	50	
mean	10 59 51.51	
Prec	+34.06	
α(1911)	11 00 25.57	
A	11 07 49	
x − A	− 7 23 43	
sin(x − A)	− 443.35	
log	2.646754n	
log cos δ	9.995-95	
log $\bar{3}_0$	1.149994n	
$\bar{3}_0$	−14.1235	
$\bar{3}_1$	− 128	
$\bar{3}$	3.8637	
x	3 87 10	
x − $\bar{3}$	+ 73	
δ	+7° 52′ 36.0	
L	35.9	
E	35.7	
mean	+7 52 35.9	
Prec	− 33.5	
δ(1911)	+7 49 02.4	
D	+9 32 38	
δ − D	−1 43 35.6	
log sin(δ − D)	− 4217.5	
log	3.793624n	
η_0	1.12477n	
log tan δ	9.1377	
$\bar{3}^2$	22999	
η_1	8.4910	
η_0 =	−13.3282	
η_1	+ 310	
η =	8.7028	
y	8.6928	
y − η	− 100	

2.	no.	mag.
	1508	7.3
	$11^h\ 01^m\ 59^s.91$	
	.95	
	.94	
	11 01 59.93	
	− 34.49	
	11 02 34.42	
	11 07 49	
	− 5 14 58	
	− 314.55	
	2.497699n	
	9.999239	
	0.997732n	
	−9.9385	
	− 43	
	8.0572	
	8.2328	
	+ 1756	
	+10° 45′ 12.1	
	11.4	
	11.1	
	+10 45 11.5	
	− 33.6	
	+10 41 37.9	
	9 32 38	
	+1 08 59.9	
	4140.5	
	3.617066	
	0.948216	
	9.2761	
	1.9946n	
	8.3241	
	+ 8.8758	
	+ 211	
	30.8969	
	30.8539	
	− 430	

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	1. no.	mag.	2. no.	mag.
C	1504	4.6	1508	7.5
C	10h 59m 51.50		11h 01m 59.91	
		52		95
		50		94
Mean	10 59 51.51		11 01 59.93	
Prec.	+ 34.06		+ 34.49	
α(1911.1)	11 00 25.57		11 02 34.42	
A	11 07 49		11 07 49	
α − A	− 7 23.43		− 5 14.58	
Sec(α−A)	− 443.35		− 314.55	
log	2.64675n		2.49769n	
log cos δ	9.995-95		9.99239	
$\bar{x}_0$	1.14994n		0.99732n	
$\bar{y}_0$	−14.1235		−9.9385	
$\bar{y}_1$	− 125		− 48	
$\bar{y}$	3.8640		8.0572	
x	3.8710		8.2328	
x − $\bar{y}$	+ 70		+ 1756	
δ	+7° 52′ 36.0		+10° 45′ 12.1	
L	35.9		11.4	
	35.7		11.1	
Mean +7	52 35.9		+10 45 11.5	
Prec.	− 3 33.5		− 3 33.6	
δ(1911.1)	7 49 02.4		+10 41 37.9	
D	+9 32 38		9 32 38	
α − D	−1 43 35.6		+1 08 59.9	
Sec(α−D)	− 6217.5		4140.5	
log	3.793620n		3.617106	
y_0	1.12477n		0.94821	
log tan δ	9.1377		9.2761	
$\bar{y}^2$	22999		1.9946n	
y_1	8.4910		8.3241	
x_0	−13.3282		+ 8.8758	
x_1	+ 310		+ 211	
x	8.7028		30.8969	
y	8.6928		30.6539	
y − x	− 100		− 5439	

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MC 1122. 1913 Jan. 10. 47

Comp. Stars - Standard Coordinates

3	no.	mag.
C	1524	5.8
C	11h 08m 50s.08	
∠		14
Σ		.08
Mean	11 08 50.10	
Prec.	+ 34.28	
α(1911)	11 09 24.38	
A =	11 07 49	
α − A =	+ 1 35.38	
sin(α − A) =	+ 95.38	
log " =	1.97946	
" cos δ =	9.99515	
ξ₀	0.48185	
η₀ =	+3.0329	
ξ₁ =	+ 5	
ξ' =	21.0334	
x =	21.0848	
x − ξ' =	+ 514	
C	+8° 36′ 28.″6	
∠	28.9	
Σ	28.5	
Mean	+8 36 28.7	
Prec.	− 3 35.1	
δ(1911)	+8 32 53.6	
D	+9 32 38	
δ − D	− 59 44.4	
tan(δ − D)	− 35884.8	
log " =	3.55447 n	
" m₀ =	0.88562 n	
log tan δ:	9.1770	
" ξ²	0.0637	
" m₁ =	7.1941	
m₀ =	−7.6846	
m₁ =	+ 16	
m =	14.3170	
y =	14.1674	
y − m =	− 1496	

4	no.	mag.
	1533	8.7
	11h 13m 55s.17	
		.21
		18
	11 13 55.19	
	+ 34.35	
	11 14 29.52	
	11 07 49	
	+ 6 40.52	
	+ 400.46	
	2.60256	
	9.99303	
	1.10283	
	+12.6715	
	+ 58	
	30.6773	
	30.8284	
	+ 1511	
+10°	17′ 52.″7	
	52.5	
	52.1	
+10	17 52.4	
	− 3 36.1	
+10	14 163	
+ 9	32 38	
+	41 38.3	
	+ 29 98.4	
	3.39766	
	6.72881	
	92567	
	2.2057	
	8.5158	
	+5.3556	
	+ 328	
	27.3884	
	27.1645	
	− 2241	

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MC 1722.

1913 Jan. 10.

Comp. Stats - Standard Coordinates

3				4.			
C	15	24	- 5.8		15	33	8.7
C	11h	08m	50.08		11h	13m	55.17
			19				21
			08				18
Mean	11	08	50.10		11	13	55.19
Prec.			+ 34.28				+ 34.33
1(1911)	11	09	24.38		11	14	29.52
A =	11	07	49		11	07	49
α - A =		+ 1	35.38			+ 6	40.52
sin(α-A) =		+	95.38			+	400.46
log " =			1.97946				2.60256
log cos δ =			9.99515				9.99307
30			0.98185				1.10283
30 =			+3.0329				+12.6715
31 =		+	5			+	58
31 =			21.0334				30.6773
x =			21.0848				30.8284
x - 3 =			+ 514				+ 1511
C	+ 8°	36'	28.4		+ 10°	17'	52.7
L			28.9				52.5
b			28.5				52.1
mean	+ 8	36	28.7		+ 10	17	52.4
Prec.	-	3	35.1		-	3	36.1
(1911)	+ 8	32	53.6		+ 10	14	16.3
D	+ 9	32	38		+ 9	32	38
δ - D	-	59	44.4		+	41	38.3
δ - D	-	3	58.98		+	29	98.4
δ =			3.55447m				3.39766
η_0 =			0.88562m				0.72881
log tan δ:			9.1770				9.2567
δ^2			0.9637				2.2057
η_1 =			7.1941				8.5158
η_0 =			-7.6246				+5.3556
η_1 =			+ 16				+ 328
η =			14.3170				27.5884
η =			14.1674				27.1643
η - η =			- 1496				- 2241

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MC1122 1913 Jan 11 48

Comp. Stars - Measures.

	4 d		4 N		X d		X N	
V								
3.9	14479		13430		16390		17808	
8.8	7558	6W	10760	58	15095	96	90909	98
mg	56		63		96		99	
4.6	88		29		92		09	
	8.6926		.6930		3.8706		.8713	
2								
8.2	18880		18578		17771		17190	
30.9	10322	21	17067	57	10036	30	14860	59
mg	21		65		32		58	
7.3	60		18		06		90	
	30.8542		.8536		8.2324		.2331+	
3								
21.0	17121		14590		17416		18170	
14.1	15445	46	62613		8261	58	17321	22
mg	44		66		53		18	
5.8	19		91		10		70	
	14.1676		.1672		21.0846		.0850	
4								
30.8	16100		16496		16780		18468	
27.1	14458	54	81472	38	15059	60	81807	79
mg	53		40		66		82	
8.7	00		00		90		69	
	27.1645		.1641		30.8280		.8289	

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MG1122 1913 Jan. 11 48

Comp. Stars - Dreamers.

	d	N	d	N
1				
3.9	14479	13430	16590	17808
6.8	7558	10860	15095	90900
avg	56	63	96	99
4.6	88	79	92	97
	8.6926	.6930	3.8706	.8713
2				
8.2	18480	18578	17721	17190
30.9	10337	17067	10036	17860
avg	21	65	32	58
7.3	60	18	06	90
	30.8542	.8536	8.2324	.2331
3				
21.0	17121	14590	17416	18170
14.1	15495	82663	8261	17321
avg	41	66	53	18
5.8	19	91	10	70
	1.41676	.1672	2.1.0846	.0850
4				
30.8	16100	16496	16780	18468
27.1	14458	81472	15089	81890
avg	53	40	66	82
8.7	00	00	90	09
	27.1543	.1641	30.8289	.8289

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MC1122. 1913 Jan. 11

Moon - measures - very clear image.

	y d	y N	x d	x N
1/			17868	18275
16.3			9966 60	16129 06
20.0			64	00
			75	39
			16.2089	.7115
3/				
16.0	17131	17916		
20.2	157212 22	9294		
	26	01 96		
	35	10		
	20.1409	.1386		
3/			17951	17935
15.4			11520 25	14350 41
21.0			19	41
			42	31
			15.3576	.3590
4/				
15.3			16891	16996
21.8			9083 80	14797 00
min in x			79	96
			96	95
			15.2189	.2198
5/				
15.3			15880	17008
22.0			8220 10	14679 71
			28	80
			87	10
			15.2334	.2331
6/				
15.7			14826	16089
23.0			11459 50	9444 50
			50	41
			28	58
			15.6626	.6643

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MC1122.

1913 Jan. 31

Mean - measures - very clear images.

	d	N
	17868	18275
	9966 60	16129 06
	64	08
	75	39
	162089	.7115

3		
160	17131	17916
208	15727 12	9299
	36	01 96
	35	10
	201409	.1386

2.		
154	17951	17935
210	11520 25	14350 41
	19	41
	42	31
	153576	.3590

1.		
155	16891	16996
218	9083 80	14797 00
mir	79	96
	96	95
	152189	.7198

5		
153	15880	17008
210	8220 10	14579 71
	28	80
	87	10
	152334	.2331

6		
157	14876	16089
230	11459 50	9444 50
	50	41
	28	58
	156626	.6643

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MC 1122 1913 Jan. 11 50

Moon measures —

	y d	y N	x d	x N
Z				
16.0	19011	14920		
23.3	10681 75	8257 47		
	78	46		
	07	21		
	23.3352	.3327		
8				
17.0	16949	14995		
23.7	9560 54	12367 75		
	58	71		
	50	93		
	23.7395	.7376		
9				
17.3	16939	17009		
23.7	9347 58	14580 90		
mai	53	80		
=	31	10		
4				
	23.7580	.7574		
10	scratch			
17.7	15921	17046	16080	16262
23.7	8924 30	14026 39	13210 13	9120 18
	29	41	25	10
	11	45	80	61
	23.6986	.6989	17.7136	.7146

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MC 1122 — 1913 Jan. 11 — 80

	d	N		d	N
1					
160	19011		19120		
283	10681	75	8257		47
	78		40		
	07		21		
	23.3332		.3387		
8					
170	16949		14995		
237	9560	54	12367		75
	58		71		
	50		93		
	23.7395		.7376		
3					
173	16939		17009		
237	9391	58	14539		90
	53		80		
	31		10		
	23.7580		.7574		
19	Benatek				
177	15921		17046		
237	8924	30	14026	39	
	29		41		
	11		45		
	23.6986		.6989		
				16080	16262
				13214	13 91209 18
				25	10
				80	61
				17.7136	.7146

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Times Etc.

Ephemeris	1911 June 3	14^h	12^m		−	14^h	21^m
" Moon		14	16	35.9	−	14 16	36.0
Clock fast			3	13.1			
H. Sid. T		14	13	22.85			
" Long.		4	44	31.05			
G. Sid T.		18	57	53.90			
Sid T. m. noon		4	43	17.56			
Interval		14	14	36.34			
Reduction			2	20.01			
G. M. T.		14	12	16.33			
From Am Ephem.		h	m	s		°	′ ″
Moon 14h		11	09	02.00		+10	07′ 21.0
Motion in 1m = 1.9975							14.317
" " 12.272			+	24.51		−	2 55.7
Tabular place		11	09	26.51		+10	04 25.3
Moon's parallax			57′	04.8″			
" semidiam			15′	34.8″			

Age of moon. 6d

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1913 Jan. 10

Times Obs.

Sid. time of Obs.	1911 June 3	14^h	12^m		$-$ 14^h	21^m
Moon		14	16	35.9	$-$ 14	16 36.0
Sidereal fast			3	13.1		
Sid. T.		14	13	22.85		
Long.		9	44	31.05		
Sid. T.		18	57	53.90		
G.M.T. Moon		4	43	17.56		
Interval		14	14	36.34		
Reduction			2	20.01		
G.M.T.		14	12	16.33		

From Ans. Eph.

Moon 14h		11	09	02.00	+10	07	21.0
Factor 1m = 1.9969					19.32		
12.27			+	24.51		− 2	55.8
Interpolated		11	09	26.51	+10	04	25.2

Moon's parallax 57′ 04.8″

semidiam. 15′ 34.8″

Age of moon. 6^d

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1911phae.proj.1

MC 1122 1913 Feb. 5. 52

Centre of plates 1122, 1123, ~~1124~~

	x	y	R.A.	Decl.
1	3.73	8.81	11 00 26	+7 49 02
2	8.16	30.96	11 02 34	+10 41 38
3	20.96	14.24	11 09 24	+8 32 54
4	30.74	27.21	11 14 30	+10 14 16
	63.59	81 22	4 | 26 54	37 17 50
	15.90	20.30		
	-18	22	11 06 44	+ 9 19 28
	2.10	1.70	+ 1 05	+ 13 10
	31	465		
	21	3255	$11^h\ 07^m\ 49^s$	~~+9 20 47~~
	63	465		+9 32 38
	65.1	790.5		

Preliminary Reduction.

x - 3 - 764		- 1.5x		+ 604
+73 - 670	= - 600	- 6	= - 606	= - 2
+1756 - 2345	= - 597	- 12	= - 609	= - 5
+514 - 1082	= - 568	- 31	= - 599	= + 5
+1511 - 2068	= - 557	- 46	= - 603	= + 1

y - m + 80.5x		- 24		- 172
-100 + 300	= + 200	- 18	= + 182	= + 10
-430 + 657	= + 227	- 62	= + 165	= - 7
-1496 + 1687	= + 291	- 28	= + 163	= - 9
-2241 + 3475	= + 1234	- 54	= + 180	= + 8

x - 3 - 764		- 1.5x		+ 597
+73 - 660	= - 587	- 6	= - 593	= + 4
+1756 - 2345	= - 589	- 12	= - 601	= - 4
+514 - 1077	= - 563	- 32	= - 595	= + 2
+1511 - 2064	= - 553	- 46	= - 599	= - 2
17237 - 1652		- 26		= 17.17295

y - m + 80.5x		- 4		- 201
-100 + 312	= + 212	- 9	= + 203	= + 2
-430 + 663	= + 233	- 31	= + 201	= 0
-1496 + 1697	= + 201	- 14	= + 187	= - 14
-2241 + 2481	= + 240	- 27	= + 213	= + 12
21.7363 + 1388		- 22		= 21.8528

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IC 1122 1913 Feb. 5. 52

Centre of plates 1122, 1123. ~~1124~~

	x	y	R.A.	Decl.
1	3.73	8.81	11 00 26	+7 49 02
4	8.16	30.96	11 02 34	+10 41 38
5	20.96	14.29	11 09 24	+8 32 54
9	30.79	27.21	11 14 30	+10 14 16
	63.59	81.22	4 26 54	37 17 50
	15.90	20.30		
	18	22	11 06 44	+9 19 28
	2.10	1.70	+1 05	+1 19
	31	465		
	21	3255	$11^h\ 07^m\ 49^s$	+9 20 47
	63	465		
	65.1	790.5		

Preliminary Reduction.

x - 3 - 764	- 1.5x		+ 604
+ 70 - 670	: - 600 - 6	: - 606	: - 2
+ 1756 - 2353	: - 597 - 12	: - 609	: - 5
+ 514 - 1082	: - 568 - 31	: - 599	: + 5
+ 1511 - 2068	: - 557 - 46	: - 603	: + 1

y - m + 80.5x	- 24		- 172
- 100 + 300	: + 200 - 18	: + 182	: + 10
- 430 + 657	: + 227 - 62	: + 165	: - 7
- 1496 + 1687	: + 291 - 28	: + 163	: - 9
- 2241 + 3475	: + 234 - 54	: + 180	: + 8

x - 3 - 764	- 1.5x		+ 597
+ 73 - 660	: - 587	- 6 : - 593	: + 4
+ 1756 - 2345	: - 589	- 12 : - 601	: - 4
+ 514 - 1077	: - 563	- 32 : - 595	: + 2
+ 1511 - 2064	- 553	- 46 : - 599	: - 2
now 17237 - 1652	- 26		: 17.1295

y - m + 80.5x	- 4		- 201
- 100 + 312	: + 212	- 9 : + 203	: + 2
- 430 + 663	: + 233	- 31 : + 201	: 0
- 1496 + 1697	: + 201	- 14 : + 187	: - 14
- 2241 + 2481	: + 240	- 27 : + 213	: + 12
now 21.7363 + 1388	- 22		: 21.8527

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1911phae.proj.1

MC 1122 - 1123 1913 Mar 3. 53

Plate Constants

Conditional Equations. 1123

+3.86a	+8.706	+c =	+4	+2	+4	+6
+8.06	+30.90	+c =	−4	0	−7	−5
+21.03	+14.32	+c =	+2	−14	−18	−14
+30.68	+27.39	+c =	−2	+12	+22	+12

Mean Equations.

a	b	c			
+5.96	+19.80	+1 =	0.00	+1.00	−1.50	+0.50
+25.86	+20.86	+1 =	0.00	−1.00	+2.00	−1.00
+12.44	+11.51	+1 =	+3.00	−6.00	−7.00	−4.00
+19.37	+29.14	+1 =	−3.00	+6.00	+7.50	+3.50
−19.90	−1.06	=	0.00	+2.00	−3.50	+1.50
−6.93	−17.63	=	+6.00	−12.00	−14.50	−7.50
+6.93	+0.37	=	0.00	−0.70	+1.22	−0.52
	−17.26	=	+6.00	−12.70	−13.28	−8.02
		b =	−0.35	+0.74	+0.77	+0.46
		a =	+0.02	−0.14	+0.14	−0.10

Plate 1122

0.0	0.0	+3.0	−3.0	+1.0	−1.0	−6.0	+6.0
−0.1	−0.5	−0.2	−0.4	+0.6	+3.6	+17	+2.7
+6.9	+7.3	+4.0	+10.2	−14.6	−15.4	−8.5	−21.66
+6.8	+6.8	+6.8	+6.8	−13.0	−12.8	−12.8	−12.99

c for (x − 5) c for (y − n)

Plate 1123

−1.5	+2.0	−7.0	+7.50	+0.5	−1.0	−4.0	+3.5
−0.6	−3.6	−1.7	−2.7	+0.6	+2.6	+12	+1.9
−152	−160	−87	−22.4	−9.1	−9.6	−5.3	−15.4
−17.3	−17.6	−17.4	−17.6	−8.0	−8.0	−8.1	−8.0

c for (x − 5) c for (y − n)

Resids Plate 1122			O − C	Resids Plate 1123			O	O − C
+0 − 3 + 7 = +4		+4	0	+1 + 7 − 17 = −9		+4	+13	
+0 − 11 + 7 = −4		−4	0	+1 + 23 − 17 = +7		−7	−14	
+0 − 5 + 7 = +2		+2	0	+3 + 11 − 17 = −3		−18	−15	
+1 − 10 + 7 = −3		−2	1	+4 + 21 − 17 = +8		+22	+14	
−1 + 6 − 13 = −8	+2	+10		−0 + 9 − 8 = −4		+6	+10	
−1 + 23 − 13 = +9	0	−9		−1 + 14 − 8 = +5		−5	−10	
−3 + 14 − 13 = −5	−14	−9		−2 + 7 − 8 = −3		−14	−11	
−4 + 20 − 13 = +3	+12	+9		−3 + 13 − 8 = +2		+12	+10	

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IC 1122 - 1123 1913 Mar. 3. 53

Plate Constants

Conditional Equations. 1123

+3.86 a + 8.706 + c = +4	+2	+4	+6
+8.06 +30.90 + c = −4	0	−7	−5
+21.03 +14.32 + c = +2	−14	−18	−14
+30.68 +27.39 + c = −2	+12	+22	+12

Mean Equations.

a	b	c			
+5.96	+19.80	+1 = 0.00	+1.00	−1.50	+0.50
+25.86	+20.86	+1 = 0.00	−1.00	+2.00	−1.00
+12.44	+11.51	+1 = +3.00	−6.00	−7.00	−4.00
+19.37	+29.14	+1 = −3.00	+6.00	+7.50	+3.50
−19.90	−1.06	= 0.00	+2.00	−3.50	+1.50
−6.93	−17.63	= +6.00	−12.00	−14.50	−7.50
+6.93	+0.37	= 0.00	−0.70	+1.22	−0.52
	−17.26	= +6.00	−17.70	−13.28	−8.02
		b = −0.35	+0.74	+0.77	+0.46
		a = +0.02	−0.14	+0.14	−0.10

Plate 1122

0.0	0.0	+3.0	−3.0	+1.0	−1.0	−6.0	+6.0
−0.1	−0.5	−0.2	−0.4	+0.6	+3.6	+1.7	+2.7
+6.9	+7.3	+4.0	+10.2	−14.6	−15.4	−8.5	−21.6
+6.8	+6.8	+6.8	+6.8	−13.0	−17.8	−17.8	−17.9

c for (x − x) — a for (y − y)

Plate 1123

−1.5	+2.0	−7.0	+7.50	+0.5	−1.0	−4.0	+3.5
−0.6	−3.6	−1.7	−2.7	+0.6	+2.6	+1.2	+1.9
−152	−160	−87	−274	−9.1	−9.6	−5.7	−15.4
17.3	−17.6	−17.4	−17.6	−8.0	−8.0	−8.1	−8.0

c for (x − x) — a for (y − y)

Resids Plate 1122

			O − C
+0 −3 +7 = +4	+4		0
+0 −1 +7 = −4	−4		0
+0 −5 +7 = +2	+2		0
+1 −10 +7 = −3	−2		1
−1 +6 −13 = −8	+2		+10
−1 +23 −13 = +9	0		−9
−3 +14 −13 = −5	−14		−9
−4 +20 −13 = +3	+12		+9

Resids plate 1123

			O − C
+1 +7 −17 = −9	+4		+13
+1 +23 −17 = +7	−7		−14
+3 +11 −17 = −3	−18		−15
+4 +21 −17 = +8	+22		+14
−0 +4 −8 = −4	+6		+10
−1 +14 −8 = +5	−5		−10
−2 +7 −8 = −3	−14		−11
−3 +13 −8 = +2	+12		+10

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Pt	Pos ∠	Resid
1	209°.9	−47
2	218.0	+51
3	248.6	−20
4	270.0	−41
5	277.4	+96
6	308.7	−39
7	332.0	+23
8	353.1	−126
9	0.0	+89
10	13.6	+22

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NC 11 v 2

1913 Mar 3.

54

Moon's Center

	x	x − X₀		Δx	(x − X₀)²	(x − X₀)² + (y − Y₀)²	O − C
1	16.21102	− 1.0306	−	8	1.0638	4.0789	− 53
2	16.00000	− 1.2408	−	7	1.5414	4.0902	+ 60
3	15.35.83	− 1.8825	−	3	3.5449	4.0871	+ 29
4	15.21194	− 2.0214		0	4.0860	4.0860	+ 18
5	15.21332	− 2.0076	+	1	4.0300	4.0996	+ 154
6	15.6634	− 1.5774	+	6	2.4863	4.0835	− 7
7	16.0000	− 1.2408	+	7	1.5378	4.0876	+ 34
8	17.0000	− 0.2408	+	9	0.0576	4.0664	− 178
9	17.2408	− 0.0000	+	9	0.0000	4.0864	+ 22
10	17.71141	+ 0.4733	+	9	0.2249	4.0767	− 75
					mean	4.0842	+ 4

	y	y − Y₀	Δy	(y − Y₀)²
1	20.0000	− 1.7363	− 1	3.0151
2	20.1398	− 1.5965	− 1	2.5488
3	21.0000	− 0.7363	0	0.5422
4	21.7363	0.0000	0	0.0000
5	22.0000	+ 0.2637	0	0.0696
6	23.0000	+ 1.2637	+ 1	1.5972
7	23.3330	+ 1.5967	+ 1	2.5498
8	23.7384	+ 2.0021	+ 1	4.0088
9	23.7577	+ 2.0214	+ 1	4.0864
10	23.6988	+ 1.9625	+ 1	3.8518

Approximate Center

x = 16.0 y: 20.1396
23.3330
43.4726
mean y: 21.7363
y = max: 23.7577
R = 2.0214
x = min = 15.2194
X₀ = 17.2408

Center { 17.2408 = X₀
{ 21.7363 = Y₀

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HC 11 v 2 1913 Mar 3. 54

Moons Center.

	x	x − X₀		Δx	(x − X₀)²	(x − X₀)² + (y − Y₀)²	O − C
1	16.2102	− 1.0306	−	8	1.0638	4.0789	− 53
2	16.0000	− 1.2408	−	7	1.5414	4.0902	+ 60
3	15.3583	− 1.8825	−	3	3.5449	4.0871	+ 29
4	15.2194	− 2.0214		0	4.0860	4.0860	+ 18
5	15.2332	− 2.0076	+	1	4.0300	4.0996	+ 154
6	15.6634	− 1.5774	+	6	2.4863	4.0835	− 7
7	16.0000	− 1.2408	+	7	1.5378	4.0876	+ 34
8	17.0000	− 0.2408	+	9	0.0576	4.0664	− 178
9	17.2408	− 0.0000	+	9	0.0000	4.0864	+ 22
10	17.7141	+ 0.4733	+	9	0.2249	4.0767	− 75
					mean	4.0842	+ 4

	y	y − Y₀	Δy	(y − Y₀)²
1	20.0000	− 1.7363	− 1	3.0151
2	20.1398	− 1.5965	− 1	2.5488
3	21.0000	− 0.7363	0	0.5422
4	21.7363	0.0000	0	0.0000
5	22.0000	+ 0.2637	0	0.0696
6	23.0000	+ 1.2637	+ 1	0.5972
7	23.3330	+ 1.5967	+ 1	2.5498
8	23.7384	+ 2.0021	+ 1	4.0088
9	23.7577	+ 2.0214	+ 1	4.0864
10	23.6988	+ 1.9625	+ 1	3.8518

Approximate Center

x = 16.0 y: 20.1396
23.3330
43.4726
mean y: 21.7363
y = max: 23.7577
R = 2.0214
x = min = 15.2194
X₀ = 17.2408

Center { 17.2408 = X₀
21.7363 = Y₀

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Formation of normals.

No.	ab	ac	bw
1	+ 1.79	+ 54.5	+ 92.2
2	+ 1.98	- 74.5	- 96.0
3	+ 1.39	- 54.5	- 21.5
4	- 0.00	- 36.4	+ 0.0
5	- 0.52	- 309.5	+ 40.0
6	- 1.99	+ 11.1	- 8.8
7	- 1.98	- 42.2	+ 54.4
8	- 0.48	+ 42.8	- 356.0
9	+ 0.00	+ 0.0	+ 44.4
10	+ 0.92	- 35.2	- 147.0
	+ 1.11	- 443.9	- 398.3

[ac] = - 10.77 [bc] = + 5.02

[aa] = + 18.57 [bb] = + 21.27 [cm] = + 4

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MC 1122 1913 Mar 3 55

Moon's Center

Conditional Equations

	a	b	c	O		c	O − C
1	−1.03	−1.74	+1	−53	+65 − 2 − 69	−6	−47
2	−1.24	−1.60	+1	+60	+79 − 1 − 69	+9	+51
3	−1.88	−0.74	+1	+29	+119 − 1 − 69	+49	−20
4	−2.02	+0.00	+1	+18	+128 + 0 − 69	+59	−41
5	−2.01	+0.26	+1	+154	+127 + 0 − 69	+58	+96
6	−1.58	+1.26	+1	−7	+100 + 1 − 69	+32	−39
7	−1.24	+1.60	+1	+34	+79 + 1 − 69	+11	+23
8	−0.24	+2.00	+1	−178	+15 + 2 − 69	−52	−126
9	+0.00	+2.02	+1	+22	0 + 2 − 69	−67	+89
10	+0.47	+1.96	+1	−75	−30 + 2 − 69	−97	+22

+281 −273

Average (O−C) = 55

Normal Equations

a	b	c	
+18.57	+1.11	−10.77	= −444
+1.11	+21.27	+5.02	= −398
−10.77	+5.02	+10.00	= +4

$\frac{\Delta a}{\Delta c} = +0.596$

−1.11	−0.07	+0.64	= +27
+10.77	+0.64	−6.24	= −258
	+21.20	+5.66	= −371
	+5.66	+3.76	= −254
	−5.66	−1.51	= +99
		+2.25	= −155
	−8.54	−5.66	= +382
	+12.66		= +111

$\frac{\Delta b}{\Delta c} = -0.267$

c = −69

b = +1−

+2.38	−1.11	−2.71	= −1
+45.60	−21.27	−42.45	= −17
+20.95		−12.98	= −445
+46.71		−37.43	= −415
−16.20		+12.98	= +145
+4.75			= −301

a = −63+

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IC 1122 1913 Mar 3 55

Moon's Center

Conditional Equations

	a	b	c	O	+	c	O − C
1	−1.03	−1.74	+1	−53	+65	−2−69	−6	−47
2	−1.24	−1.60	+1	+60	+79	−1−69	+9	+51
3	−1.88	−0.74	+1	+29	+119	−1−69	+49	−20
4	−2.02	+0.00	+1	+18	+128	+0−69	+59	−41
5	−2.01	+0.26	+1	+154	+127	+0−69	+58	+96
6	−1.58	+1.26	+1	−7	+100	+1−69	+32	−39
7	−1.24	+1.60	+1	+34	+79	+1−69	+11	+23
8	−0.24	+2.00	+1	−178	+15	+2−69	−52	−126
9	+0.00	+2.02	+1	+22	0	+2−69	−67	+89
10	+0.47	+1.96	+1	−75	−30	+2−69	−97	+21

+287 −275

Average (O−C) = 55

Normal Equations

a	b	c	
+18.57	+1.11	−10.77	= −444
+1.11	+21.27	+5.02	= −398
−10.77	+5.02	+10.00	= +4
−1.11	−0.07	+0.64	= +27
+10.77	+0.64	−6.24	= −258
	+21.20	+5.66	= −371
	+5.66	+3.76	= −254
	−5.66	−1.51	= +99
		+2.25	= −155

c = −69

−8.54	−5.66		= +382
+12.66			= +111

b = +1

+2.38	−1.11	−2.21	= −1
+45.60	−21.27	−42.45	= −17
+20.95		−12.98	= −445
+34.83		−32.45	= −13
−13.73		+12.98	= +5
+7.02			= −440

a = −63

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MC1122 1913 Mar 3.

Gnomonic Mean Position (1911.0)

$X_0 = 17.2408$ $Y_0 = 21.7363$

$\frac{1}{2}a = -37$ $\frac{1}{2}b = 0$

17.2371 21.7363

From Preliminary Reduction $X = 17.1795$ $Y = 21.8528$

Plate Constants $ax = 0$ -2; $by = -8$ $+16$; $c' = +7$ -13

17.1794 21.8529

$\xi = -0.8706$

$\log = 9.939827$

$\log \cos \delta = 9.994397$

$\log \sec = 8.507724$

$(\delta - A) = 1438.61$

$\alpha - A = -27.45$

$A = 11\ 07\ 49$

$\alpha_0 = 11\ 07\ 21.55$

Red $= +0.77$

$\alpha = 11\ 07\ 22.32$

$\eta = -0.1477$

$\log \tan \delta = 9.22259$

$\xi^2 = 98795$

$\eta_1 = 6.1588$

$\eta_1 = +1$

$\eta_0 = -0.1472$

$\log = 9.167911$

$\log \sec = 7.331115$

$(\delta - D) = 1.836766$

$(\delta - D) = -1\ 08.7$

$D = +9\ 32\ 38$

$\delta_0 = +9\ 31\ 29.3$

Red $= +1$

$\delta' = +9\ 31\ 27.8$

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C1122 1913 Mar 3. 56

Groom's Mean Position (1911.0).

$X_0 = 17.2408$ $Y_0 = 21.7363$

$\frac{1}{2}a = -31$ $\frac{1}{2}b = 0$

17.2377 21.7363

From Preliminary Reduction $X = 17.1296$ $Y = 21.8529$

Plate Constants $ax = 0$ -2

$by = -8$ $+16$

$c' = +7$ -13

17.1295 21.8528

$\xi = -0.8706$

log = 9.939877n

cos δ = 9.99397

const = 8.507724

(α - A) = 1.438556n

α - A = − 27.45

A = 11 07 49

α = 11 07 21.55

Red = + 0.77

α = 11 07 22.32

$\eta = -0.1472$

log tan δ = 9.22759

$\delta^2 = 98795$

$\eta_1 = 6.1588$

$\eta_1 = +1$

$\eta_0 = -0.1473$

log = 9.168220n

const = 7.331115

(δ - D) = 1.837196n

(δ - D) = − 1 08.7

D = +9 32 38

δ = +9 31 29.3

Red = − 1.5

δ' = +9 31 27.8

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11 22

Red. ad lower culm. apth.

$\delta = +9^\circ\ 3'$

$H+\alpha$	$0^h\ 1^m = 3^\circ$	
H	13 05	
α	11 07	
G	20 03	
$G+\alpha$	7 10 $= 107^\circ 30'$	

$l\cos(G+\alpha)$	9.4781 m	$l\cos\delta$	9.9940
δ	0.9011	i	0.3910 m
sin	9.9794	(l)	0.3850 m
tan δ	9.2244		
$\frac{1}{15}$	8.8239		
(δ')	0.3792 m	$l\sin\delta$	9.2184
(δ)	89288	$\cos(H+\alpha)$	9.9994
		l	1.3074
		sin	8.7188
		arc δ	0.0060
		$\frac{1}{15}$	8.8239
		(l')	0.5252
		(l)	88561

l	+0.62	δ'	−2.39
$\frac{1}{2}\delta$	+0.08	l'	+3.35
$\frac{1}{2}\alpha$	+0.07	i	−2.43
	+0.77		−1.47

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11 22

Red. add to mean app.

$\delta = +9^\circ\ 31'$

H + α	$0^h\ 18^m = 3^\circ$	
H	13 05	
α	11 07	
G	20 03	
G + α	7 10 = 107° 30′	

$l \cos(G+\alpha)$	9.4781 n	
δ	0.9011	
sin	9.9994	
tan δ	9.2244	
±	8.8239	
(δ′)	0.3792 n	
(δ)	8.9288	
	+0.62	
	+0.08	
	+0.07	
	+0.77	

$l \cos\delta$	9.9940	
i	0.3910 n	
(l)	0.3850 n	
$l \sin\delta$	9.2184	
$\cos(H+\alpha)$	9.9994	
l	1.3074	
sin	8.7152	
arc δ	0.0060	
±	8.8239	
(l′)	0.1252	
(l)	8.8561	
	−2.39	
	+3.35	
	−2.43	
	−1.47	

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1122 Lunar Parallax.

$\alpha' = 11^h\ 07^m\ 22^s.32$
$\delta = 14\ 13\ 22.85$
$+3\ 06\ 00.53$
$+ 46^\circ\ 30'\ 08''$
$+ \quad 15\ 33$
$+ 46\ 14\ 35$

9.95727
0.00000
0.16015
0.11742

$\delta' = 52\ 39\ 09$
$9\ 31\ 28$
$43\ 07\ 41$

9.82640
8.22019
9.83462
0.09965
7.98106

$\delta - \delta' = +32\ 54.6$

$\delta = +10\ 04\ 22.4$

Kant Acc $\delta = +10\ 04\ 25.3$

O − C -2.9

Corr for stand. radius -1.2

O − C -4.1

$\delta' = +9^\circ\ 31'\ 27''.8$

$\pi = 57'\ 04''.8$

9.86913
8.22019
9.86058
0.00675
7.95665

$\alpha - \alpha' = +31'\ 06.74$

$= +2^m\ 04^s.45$

$\alpha = 11\ 09\ 26^s.77$

$\alpha = 11\ 09\ 26^s.51$

$+0.26$

$+0.17$

$+0.43$

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1122 Lunar Parallax.

$\alpha' = 11^h\ 07^m\ 22^s.32$
$\delta = 14\ 13\ 22.85$
$+3\ 06\ 00.53$
$+ 46^\circ\ 30'\ 08''$

$+ \quad 15\ 33$

$+ 46\ 14\ 35$

9.95727
0.00000
0.16015
0.11742

$\phi = 52\ 39\ 09$

$9\ 31\ 28$

$43\ 07\ 41$

9.82640
8.22019
9.83482
0.09965
79806

$\delta' = +9^\circ\ 31'\ 27''.8$

$\pi = 57'\ 04''.8$

9.86913
8.22019
9.8605-8
00675
7.95665

$\alpha - \alpha' = +31'\ 06.74$

$= +2^m\ 04^s.45$

$\delta - \delta' = +32\ 54.6$

$\delta = +10\ 04\ 22.4$ $\quad \alpha = 11\ 09\ 26.77$

Kant Obsn $\delta = +10\ 04\ 25.3$ $\quad \alpha = 11\ 09\ 26.71$

O - C -2.9 $\quad +0.26$

Corr. for stand. radius -1.2 $\quad +0.17$

O - C -4.1 $\quad +0.43$

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1092 Lunar Parallax.

$\alpha' = 10^h\ 30^m\ 53^s.39$

$\alpha = 11\ 42\ 36.8$

$+1\ 11\ 43.4$

$+\ 17^\circ\ 55'\ 51''$

$+\quad\quad 6\ 43$

$+\quad 17\ 49\ 08$

9.957127
0.000000
0.021350
997862

$\delta' = +13^\circ\ 59'\ 11.9$

$\pi = 57'\ 07''.4$

986913
822052
948836
001395
759196

$\alpha - \alpha' = +13'\ 26''.09$

$= +\ 53^s.74$

$\delta = 43\ 35\ 25$

$1.3\ 59\ 12$

$29\ 36\ 13$

982640
822052
769373
016147
790212

$\delta - \delta' = \quad +27\ 26.5$

$\delta = +14\ 26\ 38.4$

least alm $\delta = +14\ 26\ 43.4$

$O - C \quad -\ 5.0$

corr to standard radius $+\ 0.2$

$O - C \quad -\ 4.8$

$\alpha = 10\ 31\ 47.13$

$\alpha = 10\ 31\ 46.52$

$+0.61$

-0.02

$+0.59$

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1092

Lunar Parallax.

$\alpha' = 10^h\ 30^m\ 53^s.39$
$\odot - 11\ 42\ 36.8$
$+1\ 11\ 43.4$
$17^\circ\ 55'\ 51''$

$+ \quad 6\ 43$

$+ \quad 17\ 49\ 08$

9.95727
0.00000
0.02135
9.97862

$\delta' = +13^\circ\ 59'\ 11.''9$

$\pi = 57'\ 07''.4$

9.86913
8.72052
9.48836
0.01395
7.59196

$\alpha - \alpha' = +13'\ 26.''09$

$= +\ 53^s.73$

$\gamma - 43\ 35^m\ 25^s$

$13\ 59\ 12$

$29\ 36\ 13$

9.82640
8.72052
9.69373
0.16147
7.90212

$\delta - \delta' = \quad +27\ 26.5$

$\delta = +14\ 26\ 38.4$

least alm $\delta = +14\ 26\ 43.4$

$\alpha = 10\ 31\ 47.''13$

$\alpha \quad 10\ 31\ 46.''52$

O − C	− 5.0	+0.61
corr to mean radius	+ 0.2	− 0.02
O − C	− 4.8	+0.59

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MC1092 1913 Oct 20. 61

Comparison Stars - Standard Coords

1.	No	mag
C.	1438	5.8
C	10h 26m	51s.54
L		.52
E		.54
mean	10h 26m	51.53
Prec	+	35.26
α(1911.0)	10h 27m	26.79
A	10 31	05
α − A =	− 3	38.21
sin(α − A) =	− 21	8.20
log	2.338855n	
" cos δ	9.985755	
" s_0	0.831844n	
$\bar{x}_0$	−67895	
$\bar{x}_1$	− 12	
$\bar{x}$	11.20933	
x	11.31688	
x − $\bar{x}$	+1075	
C	+14° 39′	02.″1
L		02.0
E		01.4
mean	+14 39	01.8
Prec	− 3	22.4
δ(1911.0)	+14 35	39.4
D	+13 52	15
δ − D	+ 43	24.4
tan(δ − D)	+ 2604.5	
log	3.415722	
" n_0	0.746877	
" tan δ	9.41562	
" $\bar{x}^2$	16637	
" n_1	8.16327	
n_0	+5.55830	
n_1	+ 135	
n	27.59965	
y	27.30600	
y − n	−2905	

2.	No.	mag.
	1439	8.0
	10h 26m	58s.15
		.17
		.15
	10 26	58.16
	+	35.17
	10 27	33.33
	10 31	05.
	− 3	31.67
	−	11.66
		2.325644n
		9.988055
		0.820935n
		−6.6211
		− 10
		11.37791
		11.33588
		− 391
	+13° 25′	59.″8
	26	00.2
		59.0
	+13 25	59.7
	− 3	22.7
	+13 22	37.0
	+13 52	15
	− 29	38.0
	− 1778.0	
	3.249935n	
	0.581085n	
	9.37625	
	16419	
	8.07115	
	−3.81144	
	+ 118	
	18.20044	
	17.90780	
	− 2926	

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MC1092 1913 Feb. 20.

Comparison Stars — Standard Coords

1.	No.	mag.	2.	no.	mag.
C.	1438	5.8		1439	8.0
C	10h 26m 51.54			10h 26m 58.15	
c		.52			.17
c		.54			.15
mean	10h 26m 51.53			10 26 58.16	
Prec	+ 35.26			+ 35.17	
α(1911.0)	10h 27m 26.79			10 27 33.33	
A	10 31 05			10 31 05.	
α−A	− 3 38.21			− 3 31.67	
sin(α−A)	− 21 8.20			− 21 1.66	
log	2.33885n			2.32564n	
log cos δ	9.99857n			9.99880n	
ξ_0	0.83184n			0.82093n	
η_0	−.67695			−.66211	
ξ_1	− 12			− 10	
ξ	11.20933			11.37799	
x	11.31168			11.33588	
x−ξ	+ 1075			− 391	
C	+14° 39′ 02.″1			+13° 25′ 59.″8	
c		07.0		26 00.2	
c		01.4			59.0
mean	+14 39 01.8			+13 25 59.7	
Prec	− 3 22.4			− 3 22.7	
δ(1911.0)	14 35 39.4			+13 22 37.0	
D	+13 52 15			+13 52 15	
δ−D	+ 43 24.4			− 29 38.0	
tan(δ−D)	+ 2604.5″			− 1778.0	
log	3.41572			3.24993n	
log η_0	0.74687			0.58108n	
log tan δ	9.41156			9.37622	
log ξ²	1.66337			1.64199	
log m_1	8.1327			8.0715	
η_0	+ 55″.80			− 38.14	
η_1	+ 1.35			+ 1.18	
η	57.165			18.2004	
y	27.3060			17.9078	
y−η	− 2905			− 2926	

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MC 1092

Comp. Stars – Standard Coords.

	3.	No.	mag	4	No.	mag
C	14	49	7.5		14 53	8.2
C	10h	31m	43.12		10h 33m	50.02
ℓ			.14			49.98
ε			.09			49.98
mean	10	31	43.12		10 33	49.99
Prec		+	35.10		+	35.26
α(1911.0)	10	32	18.22		10 34	25.25
A	10	31	05		10 31	05
α − A		+ 1	13.22		+ 3	20.25
sin(α − A)		+	73.22		+	200.24
log		1.864 63				2.30155
cos δ		9.98814				9.98455
S₀		0.36001				0.79334
S₀		+2.2647	+2.2909			+6.2136
S₁		+	1 +	1		+ 22
S		2.02648	2.02910			2.42158
x		2.02457	2.02457			2.43964
x − x̄		− 191	− 453			+ 1806

C	+13°	23′	06.8	+15°	15′	10.5
η			07.3			10.2
ε			06.7			09.1
mean	+13	23	06.9	+15	15	09.9
Prec	−	3	24.5	−	3	25.2
δ(1911.0)	+13	19	42.4	+15	11	44.7
D	13	52	15	13	52	15
δ − D	−	32	32.6	+1	19	29.7
tan(δ − D)	−		19526	+		47705
log		3.29061n				3.67856
m₀		0.62176n				1.00971
log δ		9.37746				9.43407
S²		07200				1.58671
m₁		7.11480				8.07411
m₀		−4.18566				+10.22600
m₁		+	14			+ 119
m		1.78158				3.22379
μ		1.73844				3.17467
μ − m		−4314				− .4912

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M.C. 1092

Comp. Mars — Standard Coords.

	3. m	mag.	4 m	mag.
C	14 49	7.5	14 53	8.2
C	10h 31m	43.12	10h 33m	50.03
C		.14		49.98
C		.09		49.98
mean	10 31	43.12	10 33	49.99
Prec	+	35.10	+	35.26
α(1911.8)	10 32	18.22	10 34	25.25
A	10 31	05	10 31	05
α − A	+ 1	13.22	+ 3	20.25
cos(α − A)		73.22	−	200.24
log	1.86463		2.30155	
cos δ	9.98314		9.98455	
δ₀	035501		0.79334	
S₀	+2.2647		+6.2136	
S₁	+ 1		+ 22	
S	20.2648		24.2158	
x₀	20.2457		24.3964	
x − S	− 197		+1806	

C	+13°	23′	06.8	+15°	15′	10.5
C			07.3			12.2
C			06.7			09.1
mean	+13	23	06.9	+15	15	09.9
Prec	−	3	24.5	−	3	25.2
δ(1911.8)	+13	19	42.4	+15	11	44.7
D	13	52	15	13	52	15
δ − D	−	32	32.6	+1	19	29.7
cos(δ − D)	−	1952.6		+	47705	
log	3.29061 m			3.67856		
r₀	0.62176 m			1.00971		
tan δ	9.37746			9.43340		
T²	07100			1.58677		
r₁	7.1380			8.07417		
r₀	−4.1856			+10.2260		
r₁	+ 14			+ 119		
r	17.8158			32237		
f	1.38844			31746		
r − r₀	−4314			− .4912		

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1913 Mar. 18

Star 1459
4

d		n	
11082		12295	
	8689	12000	
10778			9594
21.9692		.9701	

x

d		n	
15735		17695	
13705	01	9730	97
	00		29
	35		98
29.7967		.7968	

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MC1092 1913 Jan. 6. 63

Comparison Stars – Measures. Pisean reversed.

4 ×

1		a			r		a		r	
11.3	18219		16729		17831		15420	
27.3	15161	57	9795	99	10998	89	12250	54
	65		90		91		46	
mg.	26		37		81		32	
5.8								
	27.3060		.3060		11.3162		.3174	
2								
11.4	18125		17150		18822		17930	
17.9	90536	0	16226	31	12228	30	14551	45
mg	56		27		21		44	
6.8	37		60		40		35	
	17.9080		.9077		11.3392		.3385	
3		13861		16671		16743		15750	
20.2	10021	21	10527	30	9211	15	13294	93
17.4	27		28		05		93	
mg	75		90		61		68	
7.5								
	17.3842		.3845		20.2453		.2461	
4								
24.5	14586		15709		17985		16830	
31.8	7120	21	13178	75	11953	53	12866	68
mg	22		80		52		65	
6.2	90		21		97		38	
	31.7468		.7466		24.3961		.3967	

5 Star no. 1441 measured 1913 Mar 18.

18.8	16100		18674		17705		14837	
33.2	14730	30	10030	32	16184	79	63740	
	30		30		82		70	
	00		60		02		37	
	33.1370		.1369		13.8477		.8466	

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NC 1092. 1913 Jan 6 4.50

Comparison stars measured.

4

L	a		a	
11.3	18219	16729	17831	15470
27.3	15161 57	9795 99	10998 89	12250 59
	65	90	91	46
m-9	26	37	31	32
s.8				
	27.3060	.3060	11.3167	.3174

2				
11.4	18125	17150	18822	17930
17.9	90536 0	16226 31	12228 30	14551 45
m-9	56	27	21	44
s.8	37	60	40	35
	17.9080	.9077	11.3392	.3385

3				
	13861	16671	16943	15700
20.2	10021 21	10527 30	9211 15	13294 93
17.4	77	28	05	93
m-8	75	90	61	68
7.5				
	17.3842	.3845	20.2453	.2461

4				
24.5	14586	15709	17485	16830
31.5	7120 21	13178 75	11955 53	12866 65-68
m-8	22	80	52	38
8.2	90	21	97	
	31.7468	.7466	24.3961	.3967

5 Star no. 1441 measured 1913 Mar. 18.

	16100	16674	17705	14837
38	14730 30	10030 32	16189 79	63740
2	20	30	82	75
	00	60	02	37
	33.1370	.1369	13.8477	.8466

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Moon – Measures · Reseau Reversed.

	λ	ν	λ	ν
1			18780	14960
16.3			11110 30	12115 65
21.0			03	95
			91	70
			16.27876	.2858
2				
16.0	16575	14835		
21.4	13462 78	7897 00		
	55	88		
	71	43		
	21.3109	.3054		
3				
15.7			17550	18123
22.0			14308 94	11359 60
			96	49
			54	29
			15.6748	.6771
4				
15.6			16490	18190
22.5			12570 70	12072 75
r =			76	76
min.			90	00
			15.6082	.6122
5				
15.7			16430	17236
23.0			13120 14	10560 57
			12	55
			39	50
			15.6682	.6688
6	14912	15741		
16.0	7900 20	12735 50		
23.6	19	50		
	24	60		
	23.7007	.6998		

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MC 1092 1911 Jan. 6 64

d	v
15250	14960
11110 30	12115 05
08	91
91	70
1678276	.2858

16575	14835
13467 98	789700
55	88
71	43
21.3109	.3059

17550	18123
14308 94	11359 60
96	49
59	79
15.6748	.6771

16490	18190
12570 70	12072 75
76	76
90	00
15.6082	.6172

16430	17236
13120 14	10560 57
12	55
39	50
15.6682	.6688

14912	15741
7900 20	12735 50
19	50
24	60
23.7007	.6998

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IMC 1092 1913 Jan. 6 65

Moon - measures - Reseau reversed.

Z	d	N	d	N
16.3			15830	17236
24.0			8488 04	14545 35
			90	40
			28	26
			16.2665	2693

8		
17.0	18187	15218
24.4	13858 63	9555 45
	61	48
	01	38
	24.4332	.4320

9		
17.7	18120	13645
24.5	12728 11	9032 30
	16	20
mean	31	56
2		
9	24.5408	.5377

10		
18.0	18080	13580
24.5	13026 09	8741 40
	02	30
	95	96
	24.5076	.5049

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NGC 1092

1913 Jan. 6

Roscoe reversed

2				
16.3				
24.0				
		15830		17236
		84[illegible]04		14545 35
		90		40
		28		26
		16.2665		2693

8			
17.0	18187		15218
24.9	13855 63		95555 45
	61		48
	01		38
	24432		.4320

9			
17.7	18120		13645
24.5	17728 11		903430
	16		20
mean	3.1		56
L			
1	245408		.5377

10			
18.0	18080		13680
24.5	13026 09		874140
	02		30
	95		96
	245076		.5049

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Times etc.

Exp to stars 1911 May 6	11h	41m		−	11h	50m	
" " moon	11	45	36.5	−	11.	45	36.7
clock fast		2	59.8				
H. Sid T.	11	42	36.8				
H Long.	4	44	31.05				
G. Sid T.	16	27	07.85				
Sid T. in moon	2	52	53.96				
Interval	13	34	13.89				
Reduction		2	13.39				
G.M.T.	13	32	00.50				

From Am Eph.

moon 13h	10h	30m	40.21	+	14°	33′	49″.3
motion in 1m : 2.0715							
T " 32.0083			13.306				
	4	1	06.31	−	7	05	9
Tabular place	10	31	46.52	+	14	26	43.4
moon's parallax			57′ 07″.4				
" semidiam			15′ 35.5″				

Age of moon. 8d

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Times etc.

Coincidences 1911 May 6	11h	41m		−	11h	50m
" " Moon	11	45	36.5	−	11	45 36.7
Clock fast		2	59.8			
M. Sid T.	11	42	36.8			
M. Long.	4	44	31.05			
G. Sid T.	16	27	07.85			
Sid T. in Mean	2	52	53.96			
Interval	13	34	13.89			
Reduction		2	13.39			
G.M.T.	13	32	00.50			

From Conn Ephs.

Moon 13h	10h	30m	40.21	+14°	33′	49″.3
Motion in 2.0714			13.306			
Ephs. 32.08	7	1	06.35	−	7	05.9
Mean place	10	31	46.56	+14	26	43.4
Moon's parallax		57′	07.4			
Semidiameter		15	35.5			

Age of Moon. 8d

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Center of plate for 1092-1093-~~1094~~

	x	y	R.A.	Decl.
1	11.23	27,54	10 27 27	+14 35 39
2	11.29	18.14	27 33	+13 22 37
3	20.20	17 65	32 18	+13 19 42
4	24 29	32.53	34 25	+15 11 45
	4 67.01	4 95.86	4 121 43	156 29 43
	16.75	23.96	10 30 26	+14 07 26
	-18.	-22	+ 39	- 15 11
	1.25	1.96	10 34 05	+13 52 15
	31	465		
	125	980		
	375	784		
	38.75	88.20		
		980		
		1176		
		784		
		911.40		

Using stars 1, 3, + 4 Mos. 1438 - 1449 - 1453

x - 3	-1576.54	-2.7x	+3229
+1075 - 4273	= -3198 - 31	= -3229	= 0
-455 - 2721	= -3174 - 55	= -3229	= 0
+1806 - 4968	= -3162 - 66	= -3228	= +1
17.6437 - 3522		-48	= 17.6096

y - 4	+1545x	-34	+1238
-2905 + 1748	= -1157 - 82	= -1239	= -1
-4314 + 3128	= -1186 - 52	= -1238	= 0
-4912 + 3769	= -1143 - 95	= -1238	= 0
22.5049 + 2726		-68	= 22.8945

Tables $a = +1.0$ $e = -0.1$ $a - e = +1.1$ $b + a = -0.8$
Wes $a = +2.7$ $e = +3.0$ $a - e = -0.3$ $b + a + 2.0$

$c - \omega =$ -1.7 -31 +14 -2.8

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Center of plate for 1092-1093-~~1094~~

	x	y	R.A.	Decl.
1	11.23	27,54	10 27 27	+14 35 39
2	11.29	18.14	27 33	+13 22 37
3	20.20	17 65	32 18	+13 19 42
4	24 29	32.53	34 25	+15 11 45
4	67.01	9586	4 121 43	156 29 43
	16.75	23.96	10 30 26	+14 07 26
	-18.	-22	+ 39	- 15 11
	125	1.46	10 31 05	+13 52 15
	31	465		
	125	980		
	375	784		
	38.75	84.20		
		980		
		1176		
		784		
		911.40		

Stars 1 3 4 ~~was~~ 1436 -1449 -1453

x - 3 - 156.54 - 2.7x + 3229

+1075 - 4273 : - 3195 - 31 : - 3229 : 0

- 453 - 2721 : - 3174 - 55 : - 3229 : 0

+1506 - 4968 : - 3162 - 66 : - 3228 : +1

17.6437 - 3522 - 48 : 17.6096

y - 4 + 1545x - 37 + 1235

- 2905 + 1748 : - 1157 - 52 : - 1239 : -1

- 4314 + 3128 : - 1186 - 52 : - 1236 : 0

- 4912 + 3769 : - 1143 - 95 . - 1238 : 0

225049 + 2726 - 68 : - 2.8945

Tables a = +1.0 b = -0.1 a - c = +1.1 b + a = -0.8

Wes a = +2.7 c = +3.0 a - c = -0.3 b + a + 2.0

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Pt	Pos. ∠	Resid.
~~1~~	222.0	
2	234.0	+7
3	255.6	−71
4	270.0	+12
5	284.1	+126
6	306.0	−35
7	317.5	−57
8	341.5	−30
9	0.0	+53
10	10.0	−9

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MC1092 1913 Mar. 6. 68.

Moon's Center.

	x	x − X₀	Δx	(x − X₀)²	(x − X₀)² + (y − Y₀)²	O − C
1	16.2842	− 1.3610	− 1	1.8526	4.1155	reject
2	16.0000	− 1.6452	− 1	2.7070	4.1379	− 7
3	15.6760	− 1.9692	0	3.8778	4.1320	− 66
4	15.6102	− 2.0350	0	4.1412	4.1412	+ 26
5	15.6685	− 1.9767	0	3.9073	4.1531	+145
6	16.0000	− 1.6452	+1	2.7063	4.1369	− 17
7	16.2679	− 1.3773	+1	1.8967	4.1344	− 42
8	17.0000	− 0.6452	+2	0.4160	4.1355	− 31
9	17.6452	0.0000	+2	0.0000	4.1420	+ 34
10	18.0000	+ 0.3548	+2	0.1260	4.1348	− 38
				Means	4.1386	+ 4

45

	y	y − Y₀	Δy	(y − Y₀)²
1	21.0000	− 1.5042	− 1	2.2629
2	21.3081	− 1.1961	− 1	1.4309
3	22.0000	− 0.5042	0	0.2542
4	22.5042	0.0000	0	0.0000
5	23.0000	+ 0.4958	0	0.2458
6	23.7002	+ 1.1960	+1	1.4306
7	24.0000	+ 1.4958	+1	2.2377
8	24.4326	+ 1.9284	+2	3.7195
9	24.5392	+ 2.0350	+2	4.1420
10	24.5062	+ 2.0020	+2	4.0088

Approximate Center.

x = 16.0 y = 21.3081
23.7002
45.0083

Mean y = 22.5042
M. max = 24.5392
R = 2.0350
x = min = 15.6102
X₀ = 17.6452

Center { X₀ = 17.6452
Y₀ = 22.5042

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MC 1092 1913 Mar. 6. 68.

Moons Center.

	x	x − X₀	Δx	(x − X₀)²	(x − X₀)² + (y − Y₀)²	O − C
1	16.2842	− 1.3610	− 1	1.8526	4.1155	
2	16.0000	− 1.6452	− 1	2.7070	4.1379	− 7
3	15.6760	− 1.9692	0	3.8778	4.1320	− 66
4	15.6102	− 2.0350	0	4.1412	4.1412	+ 26
5	15.6685	− 1.9767	0	3.9073	4.1531	+ 145
6	16.0000	− 1.6452	+ 1	2.7063	4.1369	− 17
7	16.2679	− 1.3773	+ 1	1.8967	4.1344	− 42
8	17.0000	− 0.6452	+ 2	0.4160	4.1355	− 31
9	17.6452	0.0000	+ 2	0.0000	4.1420	+ 34
10	18.0000	+ 0.3548	+ 2	0.1260	4.1348	− 38
				Mean	4.1386	+ 4

	y	y − Y₀	Δy	(y − Y₀)²
1	21.0000	− 1.5042	− 1	2.2629
2	21.3081	− 1.1961	− 1	1.4309
3	22.0000	− 0.5042	0	0.2542
4	22.5042	0.0000	0	0.0000
5	23.0000	+ 0.4958	0	0.2458
6	23.7002	+ 1.1960	+ 1	1.4306
7	24.0000	+ 1.4958	+ 1	2.2377
8	24.4326	+ 1.9284	+ 2	3.7195
9	24.5392	+ 2.0350	+ 2	4.1420
10	24.5062	+ 2.0020	+ 2	4.0088

Approximate Center.

x = 16.0 y = 21.3081
23.7002
45.0083

mean y: 22.5042
y − max: 24.5392
R = 2.0350
y − min: 15.6102
X₀ = 17.6452

Center { X₀ = 17.6452
Y₀ = 22.5042

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No.	ab		am		bm
2	+	1,98	+	11,6	+ 8,9
3	+	0,98	+	130,0	+ 33,0
4	−	0,80	−	53,0	+ 0,0
5	−	0,99	−	287,5	+ 72,5
6	−	1,98	+	28,0	− 20,4
7	−	2,07	+	58,0	− 63,0
8	−	1,25	+	20,2	− 59,8
9	+	0,00	+	0,0	+ 69,3
10	+	0,70	−	13,3	− 76,0
	−	2,63	−	106,0	− 36,0

$[aa] = +19,78$ $(bb) = +17,47$

$[ac] = -10,97$ $(bc) = +7,47$

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MC 1092 1913 Mar 7. 69.

Moon's Center

Conditional Equations.

	a	b	c	O			O − C
2	−1.65	−1.20	+1	= −7	+48	−16−46 = −14	+7
3	−1.97	−0.50	+1	= −66	+58	−7−46 = +5	−71
4	−2.04	+0.00	+1	= +26	+60	+0−46 = +14	+12
5	−1.98	+0.50	+1	= +145	+58	+7−46 = +19	+126
6	−1.65	+1.20	+1	= −17	+48	+16−46 = +18	−35
7	−1.38	+1.50	+1	= −42	+41	+20−46 = +15	−57
8	−0.65	+1.93	+1	= −31	+19	+26−46 = −1	−30
9	0.00	+2.04	+1	= +34	−0	+27−46 = −19	+53
10	+0.35	+2.00	+1	= −38	−10	+27−46 = −29	−9

Normal Equations

+198 −202

Average (O−C) = 44

a =

+19.78 − 2.63 − 10.97 = −106.
− 2.63 + 17.42 + 7.47 = −36
−10.97 + 7.47 + 9.00 = +4

$\frac{\Delta M}{\Delta n}$ = +1.03

+ 2.63 − 0.35 − 1.46 = −14
+10.97 − 1.46 − 6.08 = −59

+ 17.12 + 6.01 = −50
+ 6.01 + 2.92 = −55

$\frac{\Delta M}{\Delta n}$ = 2(−0.35) = −0.71

− 6.01 − 2.12 = +18
+ 0.80 = −37

c = −46

−12.40 − 6.01 = +113
+ 4.72 = +63

b = +13+

− 3.86 + 2.63 + 3.17 = +1
+25.63 − 17.47 − 21.05 = −9

+15.92 − 7.80 = −105
+23.00 − 13.58 = −47

−13.23 + 7.80 = +26
+ 2.69 = −79

a = −29+

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NC 1092 1913 mar. 7. 69.

Mount Wilson

Conditional Equations

	a	b	c	O	C	O − C
2	−1.65	−1.20	+1	−7	+48 − 16 − 46 = −14	+7
3	−1.97	−0.50	+1	−66	+58 − 7 − 46 = +5	−71
4	−2.04	+0.00	+1	+26	+60 + 0 − 46 = +14	+12
5	−1.98	+0.50	+1	+145	+58 + 7 − 46 = +19	+126
6	−1.65	+1.20	+1	−17	+48 + 16 − 46 = +18	−35
7	−1.38	+1.50	+1	−42	+41 + 20 − 46 = +15	−57
8	−0.65	+1.93	+1	−31	+19 + 26 − 46 = −1	−30
9	0.00	+2.04	+1	+34	−0 + 27 − 46 = −19	+53
10	+0.35	+2.00	+1	−38	−10 + 27 − 46 = −29	−9

+198 −202

Average (O−C): 44

Normal Equations

a	b	c	=	
+19.78	− 2.63	− 10.97	= −106.	
− 2.63	+ 17.47	+ 7.47	= −36	
− 10.97	+ 7.47	+ 9.00	= +4	
+ 2.63	− 0.35	− 1.46	= −14	
+ 10.97	− 1.46	− 6.08	= −59	
	+ 17.12	+ 6.01	= −50	
	+ 6.01	+ 2.92	= −55	
	− 6.01	− 2.12	= +18	
		+ 0.80	= −37	c = −46
	− 12.40	− 6.01	= +113	
	+ 4.72		= +63	b = +13
− 3.86	+ 2.63	+ 3.17	= +1	
+ 2.63	− 17.47	− 21.05	= −9	
+ 15.92		− 7.80	= −105	
+ 23.00		− 13.58	= −45	
− 13.23		+ 7.80	= +26	
+ 2.69			= −79	a = −29

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MC1092 Additional Stars 1913 March 18.

Standard Coords

	5	mag	6	mag
Star	1441	8.9	1459	8.9
C	10h 28m 09.30		10 36 46.87	
L	33		88	
Σ			85	
mean	10 28 09.32		10 36 46.87	
Prec	+35.37		+35.09	
α	10 28 44.69		10 37 21.96	
A	10 31 05		10 31 05	
α−A	− 2 20.31		+ 6 16.96	
Sin (α−A)	− 140.31		+ 376.91	
log	2.14709 n		2.57624	
log cos δ	9.98421		9.98702	
log ξ_0	0.63854 n		1.07050	
ξ_0	−4.3505		+11.7624	
ξ_1	− 16		+ 40	
ξ	13.6479		29.7664	
x	13.8472		29.7968	
x−3	+1993		+ 304	
C	+15 24 42.9		+13 59 39.9	
L	.6		.5	
Σ			40.1	
mean	+15 24 42.8		+13 59 39.8	
Prec	− 3 23.1		− 3 26.2	
δ	+15 21 19.7		+13 56 13.6	
D	+13 52 15		+13 52 15.	
δ−D	+ 1 29 04.7		+ 3 58.6	
tan (δ−D)	+ 5345.9		+ 238.6	
log	3.72802		2.37767	
log η_0	1.05917		9.70882	
tan δ	9.4387		9.3947	
ξ^2	1.2771		2.1410	
η_1	7.7692		8.5891	
η_0	+11.4600		+0.5115	
η_1	+ 59		+ 388	
η	33.4659		225503	
y	33.1370		219696	
y−η	− 3289		− 5807	

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M 1092 Additional Stars 1913 Mean 1

Standard Comets

Jan 1941	10 h 28 m 09.30 s	1459 10 36 46.87
mean	10 28 09.32	10 36 46.87
Nc	+ 35.37	+ 35.09
x	10 28 44.69	10 37 21.96
A	10 31 05	10 31 05
x-A	− 2 20.31	+ 6 16.96
m(x-A)	− 140.31	+ 376.91
log	2.147091 n	2.576241
cos δ	9.984211	9.987026
S₀	0.638554 n	1.070501
	− 4.3505 s	+ 11.7624 s
	− 16	+ 40
	13.6479	29.7664
	13.6472	29.7968
x-3	+ 1993	+ 304
C	+ 15 24 42.9 s	+ 13 59 39.9 s
		+ 0.1
mean	+ 15 24 42.8	+ 13 59 39.8 s
Nc	− 3 23.1 s	− 3 26.7 s
δ	+ 15 21 19.7	+ 13 56 13.6
D	+ 13 52 15	+ 13 52 15.
D	+ 1 29 04.7	+ 3 58.6
m(+D)	+ 5345.9	+ 238.6
log	3.728021	2.377671
cos δ	1.015917	9.708882
tan δ	9.43871	9.3947
r	1.27711	2.1410
log	7.76912	8.58891
	+ 1146.00	+ 0.5115 s
	+ 59	+ 388
	33.4659	22.5503
	33.1370	21.9696
r-3	− 3289	− 5807

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1092 Red ad locum alt.

$\delta = +13^\circ\ 59'$

$H+\alpha$	$1^h\ 19^m$	$= 19^\circ\ 45'$
H	$14\ 48$	
α	$10\ 31$	
G	$19\ 09$	
$G+\alpha$	$5\ 40$	$= 85^\circ$

$\log \cos \delta$		9.9869	
i		0.7568	n
(i)		0.7437	n
$\therefore \sin \delta$		9.3832	
$\log \cos(G+\alpha)$	8.9403	$\cos(H+\alpha)$	9.9737
q	0.8724	h	1.2929
$\sin ::$	9.9983	$\sin ::$	9.5288
$\tan \delta$	9.3962	$\sec \delta$	0.0131
$\frac{1}{15}$	8.8239	$\frac{1}{15}$	8.8239
(δ')	9.8127	(h')	0.6498
(δ)	9.0908	(h)	9.6587

f	+0.32	δ'	+0.65
g	+0.12	h'	+4.46
h	+0.46	i	−5.54
	+0.90		−0.43

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1092

Moon's Lunar Position (1911.0)

X_1 = 17.6452 ✓ Y_0 = 22.5042 ✓

$\frac{1}{2}a$ = − 15 ✓ $\frac{1}{2}b$ = + 7 ✓

17.6437 ✓ 22.5049 ✓

From Plate Constants $X = 17.6096$ ✓ $Y = 22.8945$ ✓

$\xi = -0.3904$ ✓ $\eta = +0.8945$ ✓

$\log \xi = 9.591510$ ✓ $\log \tan S = 9.3967$ ✓

$\therefore \cos S \quad 9.998693$ ✓ $\therefore S^2 \quad 9.1852$

$\therefore \cos S^2 \quad 8.507724$ ✓ $\therefore \eta' \quad .553533$

$\therefore (\alpha - A) \quad 109734$ ✓ $\log \eta_0 = 9.951588$ ✓

$\alpha - A$ = + 2.51 ✓ $\therefore \log \cos \delta \quad 7.331155$

$A \quad 10\ 31\ 05$ ✓ $\therefore (\delta - D) = 2.62043$ ✓

$\alpha_0 \quad 10^h\ 30^m\ 52^s.49$ ✓ $\delta - D$ = + 6 57.3 ✓

Red = + 0.90 ✓ $D \quad +13\ 52\ 15$ ✓

$\alpha' = 10\ 30\ 53.39$ ✓ $\delta_0 \quad +13^\circ\ 59'\ 12''3$ ✓

Red = − 0.4 ✓

$\delta' = +13\ 59\ 11.9$ ✓

see page 1610 of this volume for lunar parallax.

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Red. + 0.90

α' = 10 30 53.39

Red. − 0.4

δ' = +13 59 11.9

see page 160 of this Volume for lunar parallax.

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1913 Mar. 14

Plate 1413 for comparison with 1092 etc

	a	N	a	N
1		17572		18770
2.3		10660		16060
24.3		65-9		65-64
mag		40		65-
6.0				
		24.3111		2.2706
2		17875-		16729
10.7		1285-855-		10410 12
9.7		59		07
mag		85-		08
8.9				
		9.6978		10.6306
3	four images	15022		18810
28.6		6710		12048 60
33.2		2011		60
mag		37		33
6.8				
		23.1680		28.6770
4	16440	16791	16266	17893
	15195-00	80343 2	10191	14090
29.4	00	29	90 95-	85-94
11.1	30	13	85-	14
	.1241	11.1322	.3914	29.3911

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1913 Mar. 14.

Plate 1413 for comparison with 1092 etc

	α	N	α	N
1				
2.3		17572		18770
24.3		10660		16060
mg.		65-59		65-64
6.0		40		65-
		24.3111		2.2706
2				
10.7		11-875-		16729
9.7		1285-855-		10410 12
mag		54		07
8.9		8-		08
		9.6978		10.6306
3 poor image				
28.6		15022		18810
23.2		6710		12048 60
mg		20 11		60
6.8		37		33
		23.1680		28.6770
4	16440	16791	16266	17893
29.4	15195-00	80334 32	10191	14090
11.1	00	29	905-	85-94
	30	13	85-	14
	.1241	11.1322	.3914	29.3911

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Standard Coörds.

	Mag		Mag
1 1439	8.0	2/ 1448	8.9
C	10 26 58.15		10ʰ 31 25.03
∠	17		09
2	15		09
mean	10 26 58.16		10 31 25.07
Prec	+ 35.17		+ 35.00
α	10 27 33.33		10 32 00.07
A	10 35 54		10 35 54
α − A	− 8 20.67		− 3 53.93
sin (α − A)	− 500.56		− 233.92
log ··	2.69945 n		2.36907 n
·· cos δ	9.98805		9.99122
·· ξ_0	1.19474 n		0.86753 n
ξ_0	− 15.6582		− 7.3710
ξ_1	− 94		− 37
ξ	2.3324		10.6253
x	2.2706		10.6306
x − ξ	− 618		+ 53
C	+ 13 25 59.8		+ 11 32 32.9
∠	26 00.2		.2
2	59.0		.0
mean	+ 13 25 59.7		+ 11 32 32.4
Prec	− 3 22.7		− 3 25.0
δ	+ 13 22 37.0		+ 11 29 07.4
D	+ 13 04 10.		+ 13 04 10.
δ − D	+ 18 27.0		− 1 35 02.6
tan (δ − D)	+ 11070		− 57049.1
log ··	3.04415		3.75619 n
·· η_0	0.37530		1.08734 n
tan δ	9.3762		9.3079
ξ^2	2.3895		1.7351
η_1	8.8191		8.0964
η_0	+ 2.3730		− 12.2275
η_1	+ 66		+ 12
η	2.4.3796		9.7737
y	2.4.3111		9.6978
y − η	− 685		− 759

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Standard Words.

	Barq		Z 1448	
L	1439	8.0		8.9
C	10 26	58.15	10h 31	25.03
L		17		09
E		15		09
mean	10 26	58.16	10 31	25.07
Parc	+	35.17	+	35.00
X	10 27	33.33	10 32	00.07
A	10 35	54	10 35	54
X-A	- 8	20.67	- 3	53.93
sin(X-A)	-	500.56	-	233.92
log	2.69945n		2.36907n	
log cos δ	9.98805		9.99122	
log r_0	1.19474n		0.86753n	
η_0	-15.6582		-7.3710	
η_1	-	94	-	37
η_2		2.3324		10.6253
η		2.2706		10.6306
$\eta - \eta_2$	-	618	+	53
C	+13 25	59.8	+11 32	32.9
L	26	00.2		.2
E		59.0		.0
mean	+13 25	59.7	+11 32.	32.4
Parc	- 3	22.7	- 3	25.0
S	+13 22	37.0	+11 29	07.4
D	+13 04	10.	+13 04	10.
S-D	+ 18	27.0	- 1 35	02.6
tan(S-D)	+	1107.0	-	5704.1
log	3.04415		3.75619n	
log r_0	0.37530		1.08734n	
log tan δ	9.3762		9.3079	
ξ^2	2.3895		1735-1	
η_1	88191		8.0964	
η_0	+2.3730		-12.2275	
η_1	+	66	+	12
η	24.3796		9.7737	
η_4	24.3111		9.6978	
$\eta - \eta_4$	- 685		- 759	

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1913 Mar 14.

Standard Coords.

	3	mg	4	mg
C	14 67	6.8	14 69	8.5
C	10 41	01.89	10 41	20.67
L		91		71
E		84		83
mean	10 41	01 88	10 41	20.74
Prec	+	34.96	+	34.77
α	10 41	36 84	10 41	55.51
A	10 35	54	10 35	54
α-A	+ 5	42 84	+ 6	01.51
sin(α-A)	+	342.80	+	361.47
log		2.535504		2.558607
cos δ		9.998834		9.999095
S_0		1.030628		1.05626
S_0	+10.7305		+11.3832	
S_1	+	31	+	69
S	+28.7336		29.3901	
sc	28.6770		29.3911	
sc - S	-	566	+	10
E	+13 16	29.7	+11 42	51.2
L		29.0		50.9
E		29.6		50.8
mean	+13 16	29.4	+11 42	51.0
Prec	- 3	27.6	- 3	29.2
δ	+13 13	01.8	+11 39	21.8
D	13 04	10	13 04	10
δ - D	+ 8	51.8	- 1 24	48.2
tan(δ-D)	+	531.8	-	5089.2
log		2.72575		3.706655 n
$m_1 m_0$		0.05690		1.03780 n
tan δ		9.3708		93145
E^2		20612		21125
m_1		8.4854		8.4804
m_0		+1.1400		-10.9095
m_1		+ 306		+ 302
m		23.1706		11.1207
μ		83.1680		11.1222
y - m		- 26		+ 15

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1913 Mar 14.

Standard Coords.

	3	mg	4	mg
c	14 67	6.8	14 69	8.5
c	10 41	01.89	10 41	20.67
ν		91		71
ε		84		83
mean	10 41	01 88	10 41	20.74
Prec	+	34.96	+	34.77
α	10 41	36.84	10 41	55.51
A	10 35	54	10 35	54
ξ	+ 5	42.84	+ 6	01.51
ξ(α-A)	+	342.80	+	361.47
log		2.535-04		2.55807
log cos δ		9.998834		9.999095
S₀		1.030628		1.05626
η₀	+	10.7305	+	11.3832
η₁	+	31	+	69
η	+	28.7336		29.3901
η		28.6770		29.3911
η - ξ		- 566		+ 10
ε	+ 13	16 29.7	+ 11	42 51.2
ε		29.0		50.9
ε		29.6		50.8
mean	+ 13	16 29.4	+ 11	42 51.0
Prec		- 3 27.6		- 3 29.2
δ	+ 13	13 01.8	+ 11	89 21.8
Δ	13	04 10	13	04 10
δ - Δ	+	8 51.8	- 1	24 48.2
tan(δ-Δ)	+	531.8	-	5089.2
log ρ		2.72575		3.70665 n
log ρ₀		0.05690		1.03780 n
tan δ		9.3708		9.3145
ξ²		2612		21125
η₁		8.4854		8.4804
η₀		+1.1400		-10.9095
η₁		+ 306		+ 302
η		23.1706		11.1207
η		83.1680		11.1222
η - η		- 26		+ 15

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1913 Mar 14

Plate Center

	x	y	R.A.	Decl.
1	2.2706	24.3111	10 27 33	+13 22 37
2	10.6306	9.6978	32 00	11 79 07
3	28.6770	23.1680	41 37	13 13 02
4	29.3911	11.1222	41 56	11 39 72
	70.97	6830	143 06	49 44 08
	17.74	17.08	10 35 46	+12 26 02
	-18	-27	+8	+38 08
	0.26	4.92	10 35 54	13 04 10
	31	4.65		
	26	24.60		
	78	2952	A = 10 35 54	
	9.06	1968	D = +13 04 10	
		2287.80		

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1913 Mar 14.

Plate Center

	x	y
1	2.2706	24.3111
2	10.6306	9.6978
3	26.6770	23.1680
4	29.3911	11.1222
	70.97	6830
	17.74	17.08
	-18	-22
	0.26	4.92
	31	4.65
	26	2460
	78	2952
	8.06	1968
		2287.80

	R.A	Dec
	10 27 33	+13 22 37
	32 00	11 79 07
	41 37	13 13 02
	41 56	11 39 22
	143 01	49 44 08
	10 35 46	+12 26 02
	+ 8	+ 38 08
	10 35 54	13 04 10

A = 10 35 54
D = +13 04 10

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plate turned 90°

Star No.	x (N)		4710.1453	x (N)	
1438	17320				
	16290 90	14927	13350	11835 0	
	85	17070	4539 34	11865 60	
	42	70	44	65	
		22	48	72	
	2.1034	33.9145	15.1191	38.3500	

Star 1459

Standard Coords

	1438		1453	
C	10 26 51.54		10 33 50.02	
L	52		4998	
ℓ	54		49.98	
Mean	10 26 51.53		10 33 49.99	
Prec	+ 35.26		+ 35.26	
R	10 27 26.79		10 34 25.25	
A	10 35 54		10 35 54	
R-A	- 8 27.21		- 1 28.75	
Sin(R-A)	- 507.10		- 88.75	
log	2.70509 n		1.94817 n	
log	9.98575		9.98455	
log	1.19808 n		0.43996 n	
ξ_0	-15.7789		-27540	
ξ_1	- 143		- 20	
ξ	2.2793	2.2068	15.2440	
x	2.1034	2.1034	15.1191	
x - ξ	- 1759	- 1034	- 1249	

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plate turned 90°

Star No.	x (N)	y	Star No. 1458	x (N)	y
1438	17520	14927		13350	11835
	16290 90	12070		14539 34	11865 60
	85	70		44	65
	42	22		48	72
	2.1034	33.7145		15.1191	38.3500

~~Star 1459~~

Standard Coords.

	1438		1453	
C	10 26 51.54		10 33 50.02	
L	52		49.98	
ℰ	54		49.98	
mean	10 26 51.53		10 33 49.99	
Prec	+ 35.26		+ 35.26	
α	10 27 26.79		10 34 25.25	
A	10 35 54		10 35 54	
A-A	− 8 27.21		− 1 28.75	
sin(A-A)	− 507.10		− 88.75	
log..	2.705097n		1.948177n	
.. log s	9.985755		9.984555	
.. ξ₀	1.198085		0.439961n	
ξ₀	− 15.7889		− 2.7540	
ξ₁	− 143		− 20	
ξ	2.2793	2.2068	15.2440	
x	2.1034	2.1034	15.1191	
x − ξ	− 1759	− 1034	− 1249	

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