1917plate_proj.2

KG
11366
v.1031

CLXXIX

179

Plate No.	Date	Page
12507	March 12. 1917	1
12508	" " "	11
12525	" 13 "	21

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12507 Star Measures 1

1

21.5	17818		16648		17483	16365
6.5	13.174	76	11.278	83	12158	11686 87
	78		88		64	88
	18		48		83	65
	21.4642		21.4635		6.53222	6.53222

2

22.0	17235		17448		16721	16867
26.3	17072	73	75	03	13886 91	9683 84
	74		08		96	93
	35		48		21	67
	22.0162		22.0155		26.2830	26.2821

3

30.1	17900		17202		16002	16440
17.1	16304	02	8798		15109 08	7330
	00		98		07	30
	10		02		02	40
	30.1609		30.1596		17.0894	17.0890

Moon.

1

24.0					19180	16822
13.3					16653	9357
					53	57
					80	22
					13.2527	13.2555

2

25.0					18512	16888
13.5					13550 54	12820
					58	20
					12	88
					13458	13432

3

26.6	17979		16086			
14.0	12150	49	11908			
	48		08			
	79		86			
	25.5830		25.5822			

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12507 Star Measures 1

1	17818		16648		17483		16365
21.5	13174	76	11278	83	12158	61	11686	57
65	78		88		64		88	
	18		48		83		65	
	21.4692		21.4635		6.5322		6.5322	

3	17235		17448		16791		16867
22.0	17072	73	75988	03	13886	91	9683	88
26.3	74		08		96		93	
	35		48		91		67	
	22.0162		22.0155		26.2830		26.2821	

3	17900		17202		16082		16440
30.1	16304	0	87988		15109	08	7330	
17.1	00		98		07		30	
	10		02		02		40	
	30.1609		30.1596		17.0894		17.0890	

Moon

1	19180				19180		16822
24.0	16653				16653		9357	
13.3	53				53		57	
	80				80		22	
	18255				18255		13.2535	

3					18512		16888
25.0					13550	54	12820	
13.5					58		20	
					12		88	
					13495		13493	2

3	17979		16086				
25.6	12150	49	11908				
14.0	48		08				
	79		86				
	25.5830		25.5822				

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12507 Troca 2

4 17008 16791
25.8 91005 14688
14.3 00 88
08 91
25.79008 25.78897

16432 18312
13205 11542
00 42
32 12
14.32232 14.32230

5 16842 16760
25.9 71090 16500
15.0 03 04
42 60
259736 25.97142

6 16862 16749
25.9 70499 16550
15.1 47 56
62 49
25.98114 25.98004

7 16883 16724
25.8 90888 14332
16.0 80 32
83 24
25.77199 25.78808

8 16413 16660
25.0 53006 14763
16.8 06 63
13 60
16.81107 16.81103

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12 5° 0 T

Moon

4

25 8°	17 0 0 8	16 7 9 1	16 4 3 2	18 3 1 2
14 3	9 1 0 0 5	14 D 8 8	13 2 0 0	11 5 4 2
	0 0	8 7	0 0	4 2
	0 8	9 1	3 2	1 2
	25 7 9 0 8	25 7 8 9 7	14 3 2 8 2	14 3 2 3 0

3

25 9	16 8 4 2	16 7 6 0	
15 0	7 1 0 9 0 6	16 5° 0 0	12
	0 3	0 4	
	4 2	6 0	
	25 9 7 3 6	25 9 7 4 2	

5

25 9	16 8 6 2	16 7 4 9	
15 1	7 0 4 9	16 5° 5° 0	44 53
	4 7	5 6	
	6 2	4 9	
	25 9 8 1 4	25 9 8 0 4	

7

25 8	16 8 8 3	16 7 2 4	
16 0	6 0 8 8	14 5° 3 2	84
	8 0	3 2	
	8 3	2 4	
	25 7 7 9 9	25 7 7 0 8	

8

25 0			
16 8			
		16 4 1 3	16 6 6 0
		5 3 0 6	14 7 6 3
		0 6	6 3
		1 3	6 0
		16 8 1 0 7	16 8 1 0 3

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12507 Luna. 3

Date March 12, 1917

Exp. & Stars	11	58		16	10	
" " Moon	16	04	15.5	16	04	15.8
clock fast		14	24.0			
M. Sid. Time	15	49	51.65			
" Long.	04	47	31.05	$\Theta = +1^h 11^m$		
G. S. T.	20	34	22.70			
" " M. N	23	18	14.54			
Interval	21	16	08.16			
Reduction		03	29.06			
G. M. T.	21	12	39.10	21h	21086	

From Naut. Alm.			R.A.			Dec.	
Moon	21h	14	38	24.558	−20	14	03.3
Motion 1m				2.2041		−	8.698
" 12.6517				27.88	−	01	50.0
Tabular Place.	14		38	52.46	−20	15	53.3

Moon age 19d

Parallax	56′	27.6
Semi-Diam.	15	24.6
		924.6
		6.5
		−0.3
		930.8
		1.99528
		−95.3
		1.89998
		3.60966

R.
Aug
Dir (5)
R
R
aR
1+aR
R²

a = −501.9
+ 2.4
−4779

934″ = 6.6

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1917phae..proj..2

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1917phae_proj.2

Date March 12. 1917

Exp ℓ Stars	11	58		16	16	10
" " Moon	16	04	15.5	16	04	15.8
clock fast		14	24.0			
H Sid Time	15	49	51.65			
" Long	04	44	31.05 "			
G S T	20	34	22.70			
" " M. T	23	18	14.54			
Interval	21	16	08.16			
Reduction		03	29.06			
G M. T	21	12	39.10	21.	ℓ21086	

From Naut Alm			R.A.			Dec.	
Moon	21ʰ	14	38	24.58	−20	14	03.3
Motion 1ᵐ				2.2041			8.698
" 12.6517				27.88	−	01	50.0
Tabular Place	14		38	52.46	−20	15	53.3

Moons age 19d

Parallax	54	27.6
Semi-Diam	15	24.6
R		924.6
Aug		6.3
Dir		−0.3
R		930.8
R		1.9952
a R		9.52
1+a/R		1.00999
R=		368.96

a = −501.9
+ 24
−4779

134" = 6.6

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S	η
-0.65	-12.48
$+0.01$	$+8.28$
$+8.52$	-1.38
$+2.13$	-3.43

ΔS	$-2S$	$+1$
-2	$+1$	$=-1$
$+0$	-0	$=0$
$+10$	-17	$=-1$
	-4	$=-3$ $=-0.01$

$\Delta\eta$	-3η	$-1.2S$	$+10$
-48	$+37$	$=-11$	$+1=-10$
$+15$	-25	$=-10$	$-0=-10$
-3	$+4$	$=+1$	$-10=-9$
	$+10$		$-3=+17$ $=+0.8$

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12507

Standard Coordinates

	Cafe No. 1989 mg 7.1	Cafe No. 1990 mg 7.2	Cafe No. 2001 mg 6.4
C	14 35 24.48	14 35 47.62	14 40 30.44
η	24.53	47.69	30.45
ξ	24.52	47.65	30.49
m	14 35 24.51	14 35 47.65	14 40 30.46
Prec	58.07	57.31	57.72
α	14 36 22.58	14 36 44.96	14 41 28.18
A	14 36 44.47	14 36 44.47	14 36 44.47
α-A	− 21.89	+ 0.49	+ 43.71
Sin	− 21.89	+ 0.49	+ 283.69
log	1.340255n	9.690220	2.452284
log δ	9.996636	9.974155	9.970666
log ξ	9.813855n	8.171759	0.930774
ξ₀	− 0.65214	+ 0.0148	+ 8.5258
ξ₁	− 0002	0000	+ 0016
ξ	21.34844	22.0148	30.5274
x	21.46438	22.0158	30.1602
x-ξ	+ .11594	+ .0010	− .3672
C	− 22 11 21.1	− 19 29 55.3	− 20 45 07.3
η	20.7	55.5	06.9
ξ	20.8	54.2	06.6
m	− 22 11 20.9	− 19 29 55.0	− 20 45 06.9
Prec	− 04 24.9	− 04 24.6	− 04 21.5
δ	− 22 15 44.0	− 19 34 19.6	− 20 49 28.4
D	− 20 38 43.4	− 20 38 43.4	− 20 38 43.4
δ-D	− 01 37 0.6	+ 1 04 23.8	− 10 45.0
tan	− 5822.2	+ 38643	− 6450
log	3.765094n	3.587071	2.809556n
log η₀	1.096244n	0.918221	0.140711n
log tan δ	9.612121n	9.505309n	9.580211n
log sec²	9.629277	6.37432	1.86615
log x	6.29332n	2.94775n	8.49351n
η₀	− 12.48 01	+ 8.2836	− 1.3827
η₁	− 0002	0000	− 0313
η	5.51975	26.2836	16.5860
η	6.53221	26.2826	17.0892
log	1.01265	2.0010	1.5033

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Standard Coordinates

	Cape No. 1989 mg 7.1	Cape No. 1990 mg 7.2	Cape No. 2001 mg 6.4
C	14 35 24.48	14 35 47.62	14 40 30.44
G	24.53	47.69	30.45
E	24.52	47.65	30.49
m	14 35 24.51	14 35 47.65	14 40 30.46
Prec	58.07	57.31	57.72
α	14 36 22.58	14 36 44.96	14 41 28.18
A	14 36 44.47	14 36 44.47	14 36 44.47
α-A	− 21.89	+ 0.49	+ 43.71
Sec	− 21.89	+ 0.49	+ 253.69
log	1.341025n	9.690220	2.452844
log cos δ	9.966436	9.974155	9.970664
log Sδ	9.813835n	8.171159	0.930714
ξ.	− 0.65514	+ 0.40148	+ 8.55258
ξ₁	− .0002	0000	+ 0016
ξ	21.34884	22.01148	30.52744
x	21.46398	22.01558	30.16002
x-ξ	+ .11514	+ .00410	− .36742
C	− 22 11 21.1	− 19 29 55.3	− 20 45 07.3
G	20.8	55.5	06.9
E	20.8	54.2	06.6
m	− 22 11 20.9	− 19 29 55.0	− 20 45 06.9
Prec	− 14 24.9	− 04 24.6	− 04 21.5
δ	− 22 15 44.0	− 19 34 19.6	− 20 49 28.4
D	− 20 38 43.4	− 20 38 43.4	− 20 38 43.9
δ-D	− 01 37 0.6	+ 1 04 23.8	− 10 45.0
tan	− 58.202	+ 3864.3	− 645.0
log	3.765194n	3.587101	2.809456n
log η₀	1.096224n	0.918222	0.140711n
log log S	9.61121n	9.55509n	9.55802n
log S²	9.62217	6.34432	1.86615
log A.	6.29322n	2.94755n	8.49351n
η₀	−12.48401	+08.28336	− 1.3827
η₁	− .0002	2.00000	+ .0313
η	5.51197	26.28336	16.55860
ξ	6.53222	26.28426	17.08492

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Plate Center + Constants

22.0158	26.2826	14	13.6	44.96	-19 34 19.6
22.	18.	=	0.49	-01	04 23.8
.0158	-8.2826	14	13.6	44.47	-20 38 43.4
31	4665				
-.4898	-3863.8				

A 14 36 44.47

D -20 38 43.40

X-S +500X +43.9Y +1.9X -12213

+1154+10732 = 11886 +286 = 12172 +41 = 12213

+0.0,0+11008 = 11018 +1153 = 12171 +42 = 12213

+3672+15080 = 11408 +749 = 12157 +57 = 12214

24.0794+12040 +665 +46 = 24.13326

Y-M+500Y -38.6X +14.3Y-12657

+10125+3266 = 13391 -828 = 12563 +94 = 12657

-0010+13141 = 13131 -850 = 12281 +375 = 12656

+5032+8545 = 13577 -1164 = 12413 +244 = 12657

15.1528+7576 -929 +217 = 14573.5

Table a = -011.1 c = -12.3 a-c = +11.2 b+d = -6.1

-5011.9 -5143 +12.4 -5.3

-5008 -5020 +1.2 +0.8

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Plate Center + Constants

X

22.0158 = 26.2826 = 14 36 44.96 = -19 34 19.6

22. — 18 — 0.49 = -01 — 04 23.8

.0158 = 8.2826 = 14 36 44.47 = -20 38 43.4

31

4898 = 3838.1

14 36 44.47

= -20 38 43.40

X-S +50 X + 43.9 Y + 1.9 X -12213

+1154 +10732 = 11886 +286 = 12172 +41 = 12213

+0010 +11008 = 11018 +1153 = 12171 +42 = 12213

-3672 +15080 = 11408 +749 = 12157 +57 = 12214

24.0794 +12040 +665 +46 = 24.1332

Y-M +500 Y -38.6 X + 14.3 Y -12457

+10125 +3266 = 13391 -826 = 12563 +94 = 12657

+0010 +13141 = 13131 -550 = 12281 +375 = 12656

+5032 +8545 = 13577 -1164 = 12413 +244 = 12657

15.1528 +75.76 -929 +217 = 145735

Factors a = -01.1 b = -12.3 a-c = +11.2 d+d = -61

-5011.9 -5143 +124 -5.3

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12507 Moon Center 6

			Δx	$(x-x_0)^2$	$+(y-y_0)^2$	O-C
1	24 08 10	+0.0000	− 11	0.0000	3.6168	+ 72
2	25 00 00	+0.9190	− 10	0.8427	3.5986	− 110
3	25 58 26	+1.5016	− 7	2.2527	3.5846	− 150
4	25 79 02	+1.7092	− 5	2.9197	3.6098	+ 2
5	25 97 39	+1.8929	− 1	3.5827	3.6061	− 35
6	25 98 09	+1.8999	− 0	3.6096	3.6096	− 0
7	25 78 03	+1.6993	+ 5	2.8893	3.6081	− 15
8	25 00 00	+0.9196	+ 10	0.8464	3.5980	− 116
					3.6096	

		Δy		arc
1 y.	13 25 31	− 1.8999	− 19	3.6168	180 ″
2	13 49 45	− 1.6585	− 16	2.7559	151 ″
3	14 00 00	− 1.1530	− 11	1.3319	128 ″
4	14 32 31	− 0.8299	− 8	0.6901	116 ″
5	15 00 00	− 0.1530	− 1	0.0234	95
6	15 15 30	− 0.0000	− 0	0.0000	90 ″
7	16 00 00	+0.8470	+ 8	0.7188	63 ″
8	16 81 05	+1.6573	+ 16	2.7526	29 ″

Range 151

approx. Center

Y = 25 y = 13.4945
16.8105
30.3050

y_0 15. 15 25
y_{mi} 13. 25 31
R 1.8994
Com R 1.8999
Y max 25.9809
X_0 24.0810

Moon Center { X_0 24.0810
y_0 15. 15 30
15.

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12507 Moon Center

			Δx	$(x-x_0)^2$	$+(y-y_0)^2$	O-C
1	24 0 8 1 0	+ 0 0 0 0 0	- 11	0 0 0 0 0	3 6 1 6 8	+ 72
2	25 0 0 0 0	+ 0 9 1 9 0	- 10	0 8 4 2 7	3 5 9 8 6	- 110
3	25 5 8 2 6	+ 1 5 0 1 6	- 7	2 2 5 2 7	3 5 8 4 6	- 150
4	25 7 9 0 2	+ 1 7 0 9 2	- 5	2 9 1 9 7	3 6 0 9 8	+ 2
5	25 9 7 3 9	+ 1 8 9 2 9	- 1	3 5 8 2 7	3 6 0 6 1	- 35
6	25 9 8 0 9	+ 1 8 9 9 9	- 0	3 6 0 4 6	3 6 0 9 6	- 0
7	25 7 8 0 3	+ 1 6 9 9 3	+ 5	2 8 8 9 3	3 6 0 8 1	- 15
8	25 0 0 0 0	+ 0 9 1 9 0	+ 10	0 8 4 6 4	3 5 9 8 0	- 116
					3 6 0 9 6	

			Δy		arc
1	13 25 31	- 1 8 9 9 9	- 19	3 6 1 6 8	180
2	13 49 45	- 1 6 5 8 5	- 16	2 7 5 5 9	151
3	14 0 0 0	- 1 1 5 3 0	- 11	1 3 3 1 9	128
4	14 3 2 3 1	- 0 8 2 9 9	- 8	0 6 4 0 1	116
5	15 0 0 0 0	- 0 1 5 3 0	- 1	0 0 2 3 4	95
6	15 15 30	- 0 0 0 0 0	- 0	0 0 0 0 0	90
7	16 0 0 0 0	+ 0 8 4 7 0	+ 8	0 7 1 8 8	67
8	16 8 10 5	+ 1 6 5 7 5	+ 16	2 7 5 2 6	29

Range 15'

approx Center

x = 25° y = 13 49 45
16 8 10 5
30 30 50

y_0 15 15 25
y max 13 25 31
R 1 8 9 9 4
Corr R 1 8 9 9 9
x max 25 9 8 0 9
x_0 24 0 8 1 0

Moon Center { x_0 24 0 8 1 0
y_0 15° 15' 30

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Formation of Normals.

1	−0.00	+ 0.0	−137.0
2	−1.52	−101.0	+182.7
3	−1.72	−225.0	+172.5
4	−1.42	+ 3.4	− 1.7
5	−0.28	− 66.2	+ 5.3
6	−0.00	− 0.0	+ 0.0
7	+1.45	− 25.5	− 12.7
8	+1.53	−107.0	−192.5
	+2.98	+ 3.4	+360.5
	−4.94	−52.47	−343.9
	−1.96	−521.3	+ 16.6

	a	b	c	cor. o − c.
	+ 0	+ 2	− 6	+ 59 "
a + 5	+ 5	+ 2	− 1	− 88 "
	+ 7	+ 1	0	−107 "
b − 1	+ 8	+ 1	+ 1	+ 53 "
	+ 9	+ 0	+ 1	+ 25 "
c − 8	+ 9	0	+ 1	+ 61 "
	+ 8	− 1	− 1	+ 40 "
	+ 5	− 2	− 5	− 86

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12507 Conditional Equations. 7

+ x-x₁	y-y₁	O-C					O-C
+0.00	−1.90	= +72	− 0	+ 7	= + 7		+ 65
+0.92	−1.66	= −110	− 29	+ 6	= − 23		− 87
+1.50	−1.15	= −150	− 47	+ 4	= − 43		− 107
+1.71	−0.83	= + 2	− 53	+ 3	= − 50		+ 52
+1.89	−0.15	= − 35	− 59	+ 0	= − 59		+ 24
+1.90	−0.00	= − 0	− 60	+ 0	= − 60		+ 60
+1.70	+0.85	= − 15	− 53	+ 3	= − 56		+ 41
+0.92	+1.66	= −116	− 29	− 6	= − 35		− 81
	369				+242	−275	
	5					av. 64	

+16.94 − 1.96 = −521.3 +10.54

− 1.96 + 1.89 = + 16.6 − 3.18

+ ( ) − 023 = − 60.3 + 1.21

−1.97 −0.17Δ

+11.66 = − 43.7 b = −3.75

+16.94 = −521.3 − 74 = −528.7 a = −31.2

+0.60Δ

arc 1.5-1

$\frac{p}{n}$ = .17 ✓

$\frac{\Sigma v}{n}$ = −4.1 ✓

$\frac{-4.1}{.17}$ = −24 ✓

ΔR = −0.3 ✓

corr +0.1

True ΔR = −0.4

R = 1.90

−2RC. −0.38

Δk = +0.06 Δδ = 0.0

Δa = −0.23 Δα = −0.01

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12507 Conditional Equations 7

+0.00	−1.40	=	+72	−	0	+	7	=	+17	+	65
+0.42	−1.66	=	−110	−	29	+	6	=	−23	−	47
+1.50	−1.15	=	−150	−	47	+	4	=	−43	−	107
+1.71	−0.83	=	+ 2	−	53	+	3	=	−50	+	52
+1.69	−0.15	=	− 35	−	59	+	0	=	−59	+	24
+1.40	−0.00	=	− 0	−	60	+	0	=	−60	+	60
+1.70	+0.85	=	− 15	−	53	−	3	=	−56	+	41
+0.92	+1.66	=	−116	−	29	−	6	=	−35	−	81
									+242	−	275
										arc	64

+1694 − 196 = −5213 +10.54

− 196 + 1189 = + 16.6 − 318

+ ( ) − 023 = − 603 + 121

−0.17Δ

+1166 = − 43.7 1 = − 3.75

+16.94 = −5213 − 74 = −5287 a = − 31.2

+0.60Δ

arc 15°1

$\frac{p}{n}$ = .17

$\frac{\Sigma v}{n}$ = −4.1

$\frac{-41}{17}$ = − 24

ΔR = − 0.3

Corr° +6.1

Corr ΔR = − 0.4

R = 1.90

−2RC = − 0.28

Δk = + 0.06 Δδ = 0.0

Δq = − 0.23 ΔA = − 0.01

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12507

Means Mean Positions

X_0 = 24.0810
− 16.
24.0794 ✓

Y_0 = 15.1530
− 2
15.1528 ✓

From Plate Constants

14.57335 ✓
18.
$\eta_1 + \eta_0$ − 3.42655

S_0 24.1332 ✓
22.
S_0 + 2.1332 ✓

log tan δ 9.58661n ✓
log S_1^2 06581 ✓
7.05734
log η_1 7.29766n ✓

log S_0 0.32903 ✓
cos δ_0 9.99899 ✓
8.50754
log Sin(α−A) 1.85190 ✓

η_1 − 0.00020
η_0 − 3.42435 ✓

α−A + 71.11
+ 1 11.11

A 14 36 44.47 ✓ log η_0 05346 0n ✓
7.33115
α_0 14 37 55.58 ✓ log Tan δ−D 3.20345n ✓

Red + 2.64 δ−D − 1597.5
− 26 37.5 ✓

α' 14 37 58.22 ✓ D −20 38 43.4

δ_0 −21 05 20.9 ✓

Red − 12.7

δ' −21 05 33.6 ✓

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12507

Moons Mean Position

X_0 : 24 08 10
− 1.6
24 07 94

Y_0 : 15° 15 30
− 2
15° 15 28

From Plate Constants

14.5735
15
$\eta_1 + \eta_0$ − 34265

S_0 24 1332
22
S_0 + 2.1332

log S_0 0329 03
Cor ξ_0 9969 89
8507 24
log Σx N 1.8818 90

log $\sin \delta$ 9.5861 n
log S_0^2 0652 1
7.0534
log η_1 7.2976 n

η_1 − 00020
η_0 − 34245

$x - A$ + 8.110
+ 1 11.10

A 14 36 44.47
α_0 14 37 55.57

log η_0 0534 60 n
7331 15
log $\tan \delta - z$ 3.2034 5 n

Red + 2.64

$\delta - z$ − 1597.5
− 26 37.5
ξ − 20 38 43.40

δ_0 − 21 05 20.9

Red − 12.7

α' 14 37 58.20

δ' − 21 05 33.7

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(1) 14 30 16.856 −41 47 45.32
13.824 37.92
3.032 −7.40

(2) 14 38 43.550 −5 18 09.85
41.050 17 52.80
2.500 −17.05

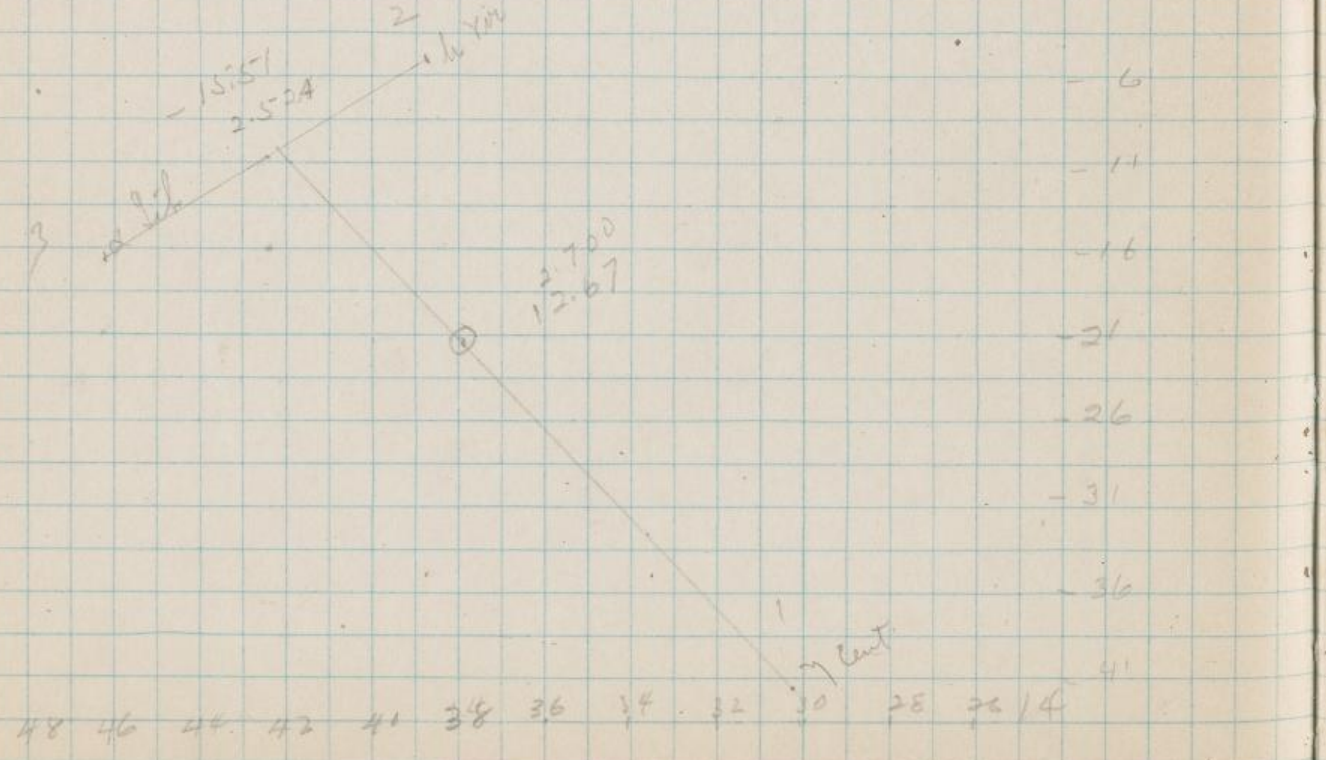
(3) 14 46 19.561 −15 42 05.18
17.008 41 51.20
2.553 −13.98

2.553
2.500
.053

17.05
13.98
3.07

3.032
2.524
.508

15.51
7.40
8.11



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12507 Reduction to Apparent Place 9

H+α	9h	11.6	137° 54.0	δ₀	−21° 05.8 s
H	18	33.6			
α₀	14	38.0		log cos δ₀	9.9699
G	22	52.1		log ϱ	0.9070 n.
G+α	13	30.1	202° 31.5	log (1)	0.8769 n

log cos G+α	9.9655 n		log sin δ	9.5561 n
log ϱ	1.0420		Corr H	9.8704 n
sin G+α	9.5833 n		" h	12744
tan δ	9.5862 n		Sin H+α	9.8268
	8.8239		Sec δ₀	0.0301
				88239
log g′	1.0075 n		log h′	0.7009
g	9.03.54		h	9.9547

f	+1.634	g	−10.177
g	+0.108	f	+35.022
h	+0.901	h	−7.332
Red.	+2.643	Red.	−12.687

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H+χ	9	11.6	137° 54.6	δ_0	-21° 05' 57"
H	18	33.6			
χ_0	14	38.0		log cos δ_0	9.96999
G α	22	52.1		log i	0.49070 n
G+χ	13	30.1	202° 32.5	Log IV	0.87669 n

log cos G+χ	9.96556 n		log sin i	9.55562 n
log γ	1.04220		Log HR	9.87804 n
sin (G+χ)	9.58233 n		i	12744
tan ϕ	9.54623 n		sin H+χ	9.82688
	8.82239		Sec δ_0	0.03011
				88239

log γ'	1.00756 n	log k	0.70049
γ	9.03559	k	9.95471

Δ	+1.634
q	+0.108
L	+0.902
Red.	+2.643

q	10.177
L	+5.022
i	-7.532
Red	-12.687

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12507

Lunar Parallax

10

α	14	37	58.22	
θ	15	49	51.65	
$\theta - \alpha$	+ 1	11	53.43	
=	+ 17	58	21.45	
$\frac{1}{2}\alpha\alpha'$	+	06	52.16	
$\theta - \delta - \frac{1}{2}\alpha\alpha' + 17$		52	29.29	

9.995727

log sin $\frac{1}{2}\alpha\alpha'$ 0.000000

sec ϕ 0.002149

log tan γ 9.997876

γ 43 35 57.7

δ −21 05 33.6

$\gamma - \delta'$ 64 41 31.3

9.826400

log sin Π 8.215455

sin $\gamma - \delta'$ 9.956180

cosec γ 0.161400

sin $\delta - \delta'$ 8.159943

$\delta - \delta'$ + 49 37.6

δ −20 15 56.0

g.h.δ −20 15 53.3

O-C − 2.7

corr. + 0.9

2nd Coord. Ref: + 0.2

δ −20 15 55.1

O-C + 1.8

Π 56 27.6

9.869913

log sin Π 8.215455

sin $\phi - \alpha'$) 9.489934

sec δ' 0.027755

sin $\alpha\alpha'$ 7.601677

$\alpha - \alpha'$ + 13 44.82

= + 54.96

α 14 38 53.18

g.h.α 14 38 52.46

O-C + 0.72

− 0.01

α 14 38 53.17

O-C + 0.71

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1917phae..proj..2

12507

Lunar Parallax

10

α	14	37	58.22
Θ	15	49	51.65
$\Theta - \alpha'$	+1	11	53.43
=	+17	58	21.45
$\frac{1}{2}\chi\chi'$	+17	04	52.16
$\Theta - \xi - \frac{1}{2}\alpha\alpha'$	+17	52	29.29

	9.995727
log cos $\frac{1}{2}\chi\chi'$	0.000000
Sec $\xi\alpha$	0.021449
log tan γ	9.977176

γ	43	35	57.7
ξ'	-21	05	33.7
$\gamma.\delta'$	64	41	36.1

	9.826400
log sin π	8.215445
Sin $\gamma.\xi'$	9.956180
Cosec γ	0.161400
Sin $\delta\delta'$	8.159423

$\delta\delta'$ 47 37.6

δ	-20	15	56.1
eph δ	-20	15	53.3
O-C			2.9
Corr.			+0.9
2nd Coord Ref:			+0.2
δ	-20	15	55.1
O-C			-1.8

π	57	27.6	
	9.869913		
log sin π	8.215445		
Sin $\xi(\alpha-\alpha')$	9.489434		
Sec ξ	0.027745		
Sin $\chi\chi'$	7.601167		
$\alpha - \alpha'$	+13	44.32	
=		+54.96	

α	14	38	53.18
eph α	14	38	53.246
O-C			+0.072
			-0.01
α	14	38	53.17
O-C			+0.71

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Star Measures

1	16848	16692	16922	16557
20.9	72485	16283	12871	10717
6.3	38	87	75	67
	48	92	22	57
	20.9605	20.9593	6.4049	6.4055
2	16961	17840	16614	18264
21.5	11999	12800	15070	97879
26.2	01	61	70	97
	61	40	14	64
	21.4961	21.4961	26.1544	26.1528
3	17672	18570	19336	17092
29.6	11207	15033	9686	16742
16.9	09	35.34	80	52
	72	70	36	70 92
	29.6464	29.6464	16.9653	16.9655

Nova

1		17582 17190
24		83 88 16370
12.9		58 78
		82 90
		12.9194 12.9194
2		16960 16700
24.1		7802 15.254
12.9		02 56
		60 00
		12.9158 12.9154
3		17550 16072
25		16340 7280
13.1		50 80
		50 72
		13.1205 13.1208

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12508

Star Measures

L	1.6848	16692	16922	16657
21.9	72483	16283 85	12871 73	10717
63	38	87	75	07
	48	92	22	57
	20.9605	20.9593	64049	64055
2	16961	17840	16619	18264
21.5	11999 00	12800 01	15070	97847
262	01	02	70	97
	61	90	14	64
	21.4961	21.4961	26.1544	26.152
3	17672	18570	19336	17092
24.6	11207 08	15033 34	9686 73	16742
169	09	33	80	52
	72	70	36	47
	29664	29664	16965 3	965

Mean

1		17582	17190
24		53 88	16350 34
129		88	38
		82	90
		129194	129184
		16960	16708
		7802	15835254
		02	56
		60	06
		12.9158	12.9154
		17550	16072
		16340 45	1280
		50	60
		50	72
		17.1205	13.1206

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12

12508

Moon Measures

4	18132	16880
35.9	95.08,0	15.500
140	12	00
	32	80
	258622	258620

5	17372	16170
26.0	16861 63	6670 73
14.8	65	76
	72	70
	260509	260503

6	17387	16172
26	16968 64	6608 03
15.	60	98
	87	72
	260423	260431

1	18842	17152
25.6	12470	13590
16.0	70	30
	52	52
	256372	256378

8		
25.0		
16.4		

	17622	16006
	12490	11142 44
	90	46
	22	06
	165132	165138

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12508

Moon Measures

4	18132	16880
59	95'08,0	15'500
40	12	00
	32	80
	25.8622	25.8620

-	17342	16170
0.0	16861,63	6670,73
1.8	65	76
	72	70
	260509	26.0503

2	17387	16172
26	16968,64	6608,03
15'	60	98
	87	72
	26.0423	26.0431

2	18842	17152
23'6	12457,50	13530,14
6.0	76	30
	52	52
	25.6282	25.6278

8	17622	16006
25.0	12490	11242,44
16.4	90	46
	22	06
	16.5132	16.5188

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12508

Lunar Etc

Date March 12, '17

Exp. & Stars	16	12			16	24	
" Moon	16	17	44.80		16	17	45.1
Clock fast		14	24.0				
H. Sid. Time	16	03	20.95	$\Theta = +1^h\,24^m$			
H. Long	04	44	31.05				
Sid. Time	20	47	52.00				
" " Mn	23	18	14.54				
Interval	21	29	37.46				
Red		03	31.27				
G. M.T.	21	26	06.19		21	43	05

From Naut. Alm.	R.A.			Decl.		
Moon 21h	11	38	24.58	−20	14	03.3
Motion 1m			2.2047			8.687
Motion 26.1 0316			57.55	−	03	46.7
Tabular Place	14	39	22.13	−20	17	50.0

Moon's Age 19d

934" = 6.4

Parallax 56 27.9

Semi-diam 15 24.7

R 924.7

Orig 6.3

Corr 5 −0.3

R 930.7

R 1.9957

aR −9.56

(1+aR) 1.89995

R² 3.6081

a = −5.03.3
+24
−479.3

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125-0.8

Lunes Etc

Date March 12, 17

Exp 4 Stars	16	12		16	24	
" Mean	16	17	44.8	16	17	45.1
Clock fast		14	24.0			
H Sid Lunes	16	03	20 95			
H Young	04	44	31.05			
4 Sid Lunes	20	47	52.00			
" " M. N	23	18	14.54			
Interval	21	29	37.46			
Red		03	31.27			
4 M T	21	26	06.19	21h	43 5-05	

From Naut. Alm RN					Decl.		
Mean 21h	14	38	24.58	-20	14	03.3	
Motion 1 m			2.2047			8.687	
Motion 26.10316			57.55		- 03	46.7	
Tabular Place	14	39	22.13	-20	17	50.0	

Moon Lege 191

Parallax 56 279
Semi-diam 15 247
R 9247
Corr 0.3
Inc 5 -0.3
R 9307
R 19951
a R -956
1+aR 1.89995
R 2 3.60871

934" = 0.4

a = -5:033
+24
-4793

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13508 Plate Constants 14

X	20.9599	21.4961	29.6464
S	21.3484	22.0148	30.5274
X-S			

y	6.4052	26.1536	16.9654
η	5.5197	26.2836	16.5860
y-η			

X-S +500X + 52.3y + 3.3x - 6999

- .3883 + 10480 = 6595 + 335 = 6930 + 69 = 6999
- .5187 + 10748 = 5561 + 1368 = 7429 + 70 = 6999
- .8810 + 14823 = 6013 + 867 = 6900 + 98 = 6998
24.1507 + 12075 +777 + 80 = 24.7440

y-η +500ξ - 43.8x + 15.5y - 1242

+.8855 + 3.203 = 12061 - 918 = 11143 + 99 = 11242
- .1300 + 13977 = 11777 - 941 = 11836 + 405 = 11241
+ .3794 + 8483 = 12277 - 1298 = 10979 + 263 = 11242
14.8165 + 7408 - 1058 + 230 = 14.3503

Talus a = -1.8 b = -13.3 a-b = +11.5 b+d = -8.0
- 5033 - 5155 + 12.2 - 8.5

-5015 -5022 + 0.7 - 0.5

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1	+ 0.29	- 30.2 1/4 mT	- 384.0 1/4 m
2	0.00	0.0	- 87.5
3	- 1.45	- 24.6	+ 49.4
4	- 1.40	+ 3.4	- 1.6
5	0.00	+ 7.6	0.0
6	+ 0.34	+ 18.9	+ 1.8
7	+ 1.75	- 22.2	- 17.7
8	+ 1.45	- 1.7	- 3.4
	+ 3.54	+ 299	+ 512
	- 3.14	- 636	- 3122
	+ 0.40	- 33.7	- 2510

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12508 Plate Constants 14

x	20.9599	21.4961	24.6464
s	21.3984	22.1148	31.5274
x-s			

y	6405.2	26.1536	16.9654
η	5.5197	26.2836	16.5860
y-η			

x-s +5.00x + 5.23y + 3.3x - 69.9

- 3.8835 + 1.0480 = 6.5995 + 3.35 . 6930 + 69 = 6999
- 5.187 + 1.0748 = 5.561 + 1.368 = 7.429 + 70 = 6999
- 8.810 + 1.4823 = 6.013 + 5.87 = 6.400 + 98 = 6998
24.1507 + 1.2075 + 777 + 80 = 24.7840

y-η +5.00y - 9.38x + 15.5y - 1.242

- 8.855 + 3.203 = 12.061 - 9.18 = 11.143 + 4.9 = 11.242
1.300 + 1.3077 = 11.777 - 9.41 = 11.836 + 4.05 = 11.241
.3794 + 8.453 = 12.277 - 12.98 = 10.979 + 2.63 = 11.242
14.8165 + 7.408 - 10.58 + 2.30 = 14.3303

Zaths a = -1.8 b = -13.3 a-b = +11.5 b+η = -8.0
- 5.033 - 5.153 + 12.2 - 8.5

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Moon Center

+7.5

1	24.0000	-0.1510	-14	0.0232	3.6283	+	202
2	X_0 24.1510	0.0000	-14	0.0000	3.6127	+	46
3	25.0000	+0.8490	-13	0.7186	3.6052	-	29
4	25.8660	+1.7150	-6	2.4392	3.6083	+	2
5	26.0506	+1.8996	0	3.6085	3.6085	+	4
6	26.0418	+1.8908	+1	3.5755	3.6091	+	10
7	25.6346	+1.4836	+9	2.2038	3.6066	-	15
8	25.0000	+0.8490	+13	0.7230	3.6079	-	2
					3.6081.		

+12

1	12.9206	-1.8964	-23	3.6051
2	X_0 12.9186	-1.8984	-23	3.6127
3	13.1200	-1.6970	-20	2.5866
4	14.0000	-0.8170	-10	0.6691
5	X_0 14.8170	0.0000	0	0.0000
6	15.0000	+0.1830	+2	0.0336
7	16.0000	+1.1830	+14	1.4028
8	16.5135	+1.6965	+20	2.8849

Remeasured Moon
Residuals better
but Moon center
not changed
much

O-C

1.	-0.15	-1.90	= +202 ½	+ 0	+ 31	= + 31	+ 171
2	0.00	-1.90	= + 46	0	+ 31	= + 31	+ 15
3	+0.85	-1.70	= - 29	- 2	+ 28	= + 26	- 3
4	+1.71	-0.82	= + 2	- 3	+ 14	= + 11	- 9
5	+1.90	0.00	= + 4	- 4	0	= - 4	+ 8
6	+1.89	+0.18	= + 10	- 4	- 3	= - 7	+ 17
7	+1.48	+1.18	= - 15	- 3	- 19	= - 22	+ 7
8	+0.85	+1.70	= - 2	- 2	- 28	= - 30	+ 28
							+246 - 12

+13.81 +0.40 > - 33.7

av. 32

+ 0.40 +15.11 = -25.10

- ( ) - ( ) = + 1.0

+15.11 = -25.0 h = -16.5

+13.81 = -33.7 + 6.6 = - 27.19 = - 1.96

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1917phae..proj.2

125-08

15

Moon Center

		Δx	$(x-x_0)^2$	$+(y-y_0)^2$	O-C
1	24.0000	−0.1500 − 14	0.0229	3.6325	+244
2	24.1500	−0.0000 − 14	0.0000	3.6241	+160
3	25.0000	+0.8500 − 13	0.7203	3.6049	−32
4	25.8621	+1.7121 − 6	2.9292	3.5983	−98
5	26.0506	+1.9006 − 0	3.6123	3.6123	+42
6	26.0427	+1.8927 − 1	3.5819	3.6155	+74
7	25.6375	+1.4885 + 9	2.2153	3.6181	+100
8	25.0000	+0.8500 + 13	0.7247	3.6096	+15
				3.6081	

		Δy	$(y-y_0)^2$	arc
1	12.9194	−1.8976 − 23	3.6096	185°
2	12.9156	−1.9014 − 23	3.6241	180°
3	13.1206	−1.6964 − 20	2.8846	153°
4	14.0000	−0.8170 − 10	0.6691	115°
5	14.8170	−0.0000 − 0	0.0000	90°
6	15.0000	+0.1830 + 2	0.0336	84°
7	16.0000	+1.1830 + 14	1.4028	51°
8	16.5135	+1.6965 + 20	2.8849	27°

Range 158

$y = 25$ $y = 13.1206$

16.5135

29.6341

y_0 14.8170

y_{min} 12.9156

R 1.9014

Corr R 1.8995

x_{max} 26.0506

Moon Center $\begin{cases} x_0 & 24.1500 \\ y_0 & 14.8170 \end{cases}$

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15

Moon Center

		Δx	$(x-x_0)^2$	$+(y-y_0)^2$	O-C
1					
1	24.0000	-0.1500 - 14	0.0229	3.6325	+244
2	24.1500	-0.0000 - 14	0.0000	3.6241	+160
3	25.0000	+1.8500 - 13	0.7203	3.6049	-32
4	25.8621	+1.7121 - 6	2.9292	3.5983	-98
5	26.0506	+1.9006 - 0	3.6123	3.6123	+42
6	26.0427	+1.8927 - 1.	3.5819	3.6155	+74
7	25.6395	+1.4895 + 9	2.2153	3.6181	+101
8	25.0000	+0.8500 + 13	0.7247	3.6096	+15
				3.6081	

		Δy	$(y-y_0)^2$	arc
1	12.9194	-1.8976 - 23	3.6086	185
2	12.9156	-1.9014 - 23	3.6241	180
3	13.1206	-1.6964 - 20	2.8846	153
4	14.0000	-0.8170 - 10	0.6691	116
5	14.8170	-0.0000 - 0	0.0000	40
6	15.0000	+0.1830 + 2	0.0336	84
7	16.0000	+1.1831 + 14	1.4008	51
8	16.5135	+1.6965 + 20	2.8849	27

Range 158

Y = 25 y - 13.1206
16.5135
29.6341
y_0 14.8170
y_m 12.9156
R 1.9014
Corr R 1.8995
x_{max} 26.0506

Moon Center { x_0 24.1500 ; y_0 14.8170

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Formation of Normals

1	+ 0.29	− 9.1	− 115.8
2	+ 0.00	− 1.00	− 304.2
3	− 1.44	− 27.2	+ 54.4
4	− 1.40	− 167.8	+ 80.4
5	− 0.00	+ 7.98	− 0.0
6	− 0.34	+ 140.0	− 113.3
7	+ 1.76	+ 149.0	+ 118.0
8	+ 1.44	+ 12.7	+ 25.5
	+ 3.49	+ 38.15	+ 27.83
	− 3.18	− 204.1	− 438.3
	+ 0.31	+ 177.4	− 155.0

	a	b	c	Cor. O − C
a = + 5	− 1	+ 3	− 6	+ 220 "
	− 0	+ 3	− 5	+ 135 "
b = − 2	+ 4	+ 3	− 1	+ 6 "
	+ 8	+ 2	+ 2	− 127 "
c = − 8	+ 9	+ 0	+ 1	+ 18 "
	+ 9	+ 0	+ 1	+ 48 "
	+ 7	− 2	− 3	+ 90 "
	+ 4	− 3	− 7	+ 15 "

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Conditional Equations.

	$x - x_0$	$y - y_0$	O - C			O - C
1	- 0.15	- 1.90	= +244 1/4	- 2	+ 30	= +18 + 226
2	- 0.00	- 1.90	= +160	- 0	+ 20	= +20 + 140
3	+ 0.85	- 1.70	= - 32	+ 11	+ 18	= +39 + 7
4	+ 1.71	- 0.82	= - 98	+ 22	+ 9	= +31 - 129
5	+ 1.90	- 0.00	= + 42	+ 25	+ 0	= +25 + 17
6	+ 1.89	- 0.18	= + 74	+ 25	+ 2	= +27 + 47
7	+ 1.49	+ 1.18	= +100	+ 19	- 12	= + 7 + 93
8	+ 0.85	+ 1.70	= + 15	+ 11	- 18	= - 7 + 22
						+552 -129

13.81 + 0.31 = +1774 + 8.54 arc 85

+ 0.31 + 15.11 = - 1550 - 3.62

- ( ) - 0.00 = - 40 - 0.19

- 0.25 Δ

+15.11 = - 159.0 b = - 10.5

13.81 = +177.4 + 33 = +180.7 c = + 13.1

+ 0.62

arc 158.

$\frac{p}{2} = .21^2$

$\frac{\Sigma x}{2} = +53$

$\frac{+53}{.21} = +25.3$

Δ R = + 3.1

corr'n ± 0.1

True Δ R = + 3.0

R = 1.90

-2Rc = - 0.38

Δk = + 0.10 Δδ = + 0.0

Δα = - 0.24 Δa = - 0.01

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Conditional Equations.

	$\delta \cdot \lambda_0$	$\delta - \delta_0$	$O - C$			$O - C$
1	$-0.15''$	-1.40	$= +1244\frac{1}{2}''$	-2	$+20$	$= +18 + 22$
2	-0.00	-1.90	$= +1160$	-0	$+20$	$= +20 + 14$
3	$+0.85''$	$=1.70$	$= -32''$	$+11$	$+18$	$= +39 +$
4	$+1.71$	-1.82	$= -98''$	$+22$	$+9$	$= +31 - 1$
5	$+1.90$	-0.00	$= +42''$	$+25''$	$+0$	$= +25'' + 1$
6	$+1.88$	-0.18	$= +74''$	$+25''$	$+2$	$= +27 + 4$
7	$+1.49$	$+1.18$	$= +100''$	$+19$	-12	$= +7 + 9$
8	$+0.85''$	$+1.70$	$= +15''$	$+11$	-18	$= -7 + 2$
						$+552 - 129$

$13.81 \quad + 0.31 = +1774 \quad +8.59$ cor $8.5''$

$+0.31 \quad +15.11 = -1550 \quad -3.62$

$-(\quad) \quad - 0.00 = - \quad 40 \quad - 0.19$

$- 0.250$

$+15.11 = -1590 \quad \Delta = -10.5''$

$13.81 \quad +1774 + 33 = +1807 \quad \delta = +13.1$

$+0.62$

arc $15''.8$.

$R - 1.90$

$\frac{D}{2} = .21''$

$-2Rc. \quad -0.38$

$\frac{EK}{2} = +5''3$

$\Delta\lambda = +0.00 \quad \Delta\delta = +0.0$

$\frac{+5''3}{.21} = +25.3''$

$\Delta\alpha = -0.24 \quad \Delta\Delta = -0.01$

$\Delta R = +3,1$

corn's ± 0.1

True $\Delta R = \pm 3.0$

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Means Mean Positions.

γ_0 24.15.10 − 2 = 24.15.08

14.81.70 − 8 = 14.81.62

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Provis Mean Position.

X_0	24	15	00		
			+.7		
	24	15	07		
Y_0	14	8	17	0	
				−	5
	14	8	16	5	

From Plate Constants.

	24	74	40		
	22				
S_0	+ 2	74	40		
	14	35	03		
	18				
	− 3	64	97		

log S_0	0	43	83	8	
cos δ_0	9	96	98	1	
	8	50	72	4	
log $S_0 \times A$	1	96	13	3	
log tan δ	9	58	68		
S_0^2	0	87	68		
	7	05	34		
log n.	7	51	70		

$\alpha - A$	+	9	1.48		
	+	01	31.	48	
A	14	36	44.	47	
α_0	14	38	15.	95	
Red			+ 2.	64	
α	14	38	18	59	

n_1	− 0.	00	33		
n_0	− 3.	64	64		
log n_0	0	56	18	7	
	7	33	11	5	
log tan $\delta - \Delta$	3.	23	07	2	
$\delta - \Delta$	−	17	01.	1	
	−	28	21.	1	
Δ	−20	38	43.	4	
δ_0	−21	07	04	5	
Red			− 12.	7	
δ	−21	07	17.	2	

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Means Mean Position.

X_0	24 15 00	Y_0	14 8 17 0
	+ 7		− 5
	24 15 07		14 8 16 5

From Plate Constants.

	24 7 4 4 0		14 35 0 3
	22		18
S_0	+ 2 7 4 4 0		− 3 6 4 9 7

log S_0	0 4 3 6 3 8	log $\tan \delta$	9 5 8 6 8 n
Cm δ_0	9 9 6 9 8 1	S_0^2	0 8 7 6 8
	8 5 0 7 2 4		7 1 5 3 4
log sin A	1 9 6 1 3 3	log n.	7 5 1 7 0 n

X. A	+ 9 1. 4 8	n.	− 0 0 0 3 3
	+ 0 1 3 1. 4 8	η_0	− 3 6 4 6 4
A	1 4 3 6 4 4. 4 1	log η_0	0 5 6 1 8 1 n
			7 3 3 1 1 5
X_0	14 3 8 1 5. 9 5	log $\tan \delta \cdot \xi$	3 2 3 0 7 2 n
Red	+ 2. 6 4	$\delta \cdot \xi$	− 1 7 0 1. 1
			− 2 5 2 1. 1
X'	14 3 8 1 8 5 9	ξ	− 2 0 3 8 4 3. 4
		δ_0	− 2 1 0 7 0 4 5
		Red	− 1 2. 7
			− 0 7 1 7 2
		δ	− 2 1 0 7 1 7 2

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Lunar Parallax

α'	14	38	18.59
θ	16	03	20.95
$\theta - \alpha'$	+1	25	02.36
=	+21	15	35.40
$\frac{1}{2}\alpha - \alpha$		+08	04.47
$\theta - \alpha' - \frac{1}{2}\alpha$	+21	07	30.93

	9.995727
log cos $\frac{1}{2}\alpha - \alpha$	0.000000
sec $\theta - \alpha' - \frac{1}{2}\alpha$	0.003022
log tan γ	9.987749

γ	44	10	28.8
δ'	-21	07	17.2
$\gamma - \delta'$	65	17	46.0

	9.982648
log sin π	8.215499
sin $\gamma - \delta'$	9.958332
cosec χ	0.156867
sin $\delta - \delta'$	8.157071

$\delta - \delta'$	+	49	21.5
δ	-20	17	55.7
Sph δ	-20	17	50.0
O - C		-	5.7
Corr.		+	0.7
2nd Ord. Ref.		+	0.2
δ	-20	17	54.8
O - C		-	4.8

π		57'	27.9"
			986913
log sin π			8.215499
" sin $\frac{1}{2}\chi$			9.555942
" sec $\frac{1}{2}\delta$			0.827784
log sin $\alpha - \alpha$			7.671885
$\delta - \alpha$		+16	08.95
=		+1	04.59

α	14	39	23.18
Sph α	14	39	22.13
O - C		+1.05	
Corr.		-0.01	
α	14	39	23.17
O - C			1.04

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12508

Lunar Parallax

α'	14	38	18.9
θ	16	03	21.95
$\theta - \alpha'$	+1	25	02.36
=	+21	15	35.40
$\frac{1}{2} \chi \cdot \chi$		+08	04.47
$\theta - \alpha' - \frac{1}{2}\chi\chi$	+21	07	30.93

	9.9 5 7 2 7
log cos $\frac{1}{2}\chi\chi$	0.0 0 0 0 0
sec $\alpha' - \frac{1}{2}\chi\chi$	0.0 3 0 2 2
log tan χ	9.4 8 7 4 9
χ	44 10 28.8
δ'	−21 07 17.2
$\chi \cdot \delta'$	65 17 46.0

	9.8 2 6 4 8
log sin π	8.2 1 5 4 9
sin $\chi \cdot \delta'$	9.9 5 8 3 2
cosec χ	0.1 5 6 8 6
sin $\delta \cdot \delta'$	8.1 5 7 0 7
$\delta \cdot \delta'$	+49 21.5
δ	−20 17 55.7
Eph δ	−20 17 50.0
O − C	−5.7
Corr.	+0.8
2nd Ord Ref.	+0.2
δ	−20 17 54.8
O − C	−4.8

π	5.6	2.9	

	9.8 6 9 1 3
log sin π	8.2 1 5 4 9
sin $\frac{1}{2}\chi'$	9.5 5 9 4 2
" sec $\frac{1}{2}\delta$	0.0 2 7 8 4
log sin $\chi \cdot \chi$	7.6 7 1 8 8
$\chi \cdot \chi$	+16 08.95
=	+1 04.59

α	14	39	23.18
Eph α	14	39	22.13
O − C			+1.05
Corr.			−0.01
α	14	39	23.17
O − C			1.04

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12508. Reduction to Apparent Place

α_0	3 3	1 1.9	1 3 7	5 8.5	
H	1 8	3 3.6			
α_0	1 4	3 8.3			
G	2 2	5 2.1			
$G+\alpha_0$	3 7	3 0.4	2 0 2	3 6.0	

δ_0 -21 07.1

0.9070n
9.9698
0.8768n

cos $G+\chi_0$ 9.9653n
q 1.0420
sin $G+\chi_0$ 9.5847n
tan δ_c 9.5868n
8.8239

sin δ 9.5567n
cos $H+\alpha_0$ 9.8709n
cos $H+\alpha_0$ 1.2744
sin $H+\alpha_0$ 9.8257
sec δ 0.0302
8.8239

g' 1.0073n
g 9.0374

l' 0.7020
l 9.9542

g +1.635
q 0.109
l 0.900
+2.644

g' +0.170
l' +5.035
i −7.530
−12.665

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2508.

Reduction to Apparent Place

α_0 3 3 1 1 7 1 3 7 5 8 5

H 1 8 3 3 6

λ_0 1 4 3 8 3

G 2 2 5 2 1

α_0 3 1 3 0 4 2 0 2 3 6 0

δ_0 -21° 0 7 1

0 9 0 7 0

9 4 6 9 8

0 3 1 6 4 n

log C + x_0 9 9 6 5 3 n

y 1 0 4 2 0

sin $\xi + x_0$ 9 3 8 4 7 n

cos ξ_0 9 5 8 6 8 n

8 8 2 3 4

sin δ 9 5 5 6 4 n

cos δ 9 8 7 0 9 n

1 2 7 4 4

sin $\eta + x_0$ 9 8 2 5 7

cos ξ 0 0 3 0 2

8 8 2 3 4

ξ' 1.0 0 7 3 n

η' 9.0 3 7 4

ξ' 0.7 0 2 0 n

η' 9.9 5 4 2

ξ +1 6 3 5"

η 0.1 0 9

ξ^2 0 9 0 0

+ 2.6 4 4

ξ' -10.1 7 0

η' + 5.0 3

ξ^2 - 7.3 0

-12.6 6 5"

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12525 Star Measures 21

1	17031	16172	16743	16680
15.9	73274 28	15868 73	12766 69	10645 43
4.4	29	78	72	41
	31	72	43	80
	159703	15.9701	4.3974	4.3969
2	17788	16006	16268	16486
23.9	79999 95	15810 06	78955 92	14849 52
23.8	91	02	89	55
	88	06	68	86
	23.9793	23.9800	23.8376	23.8366
3	16792	16070	17230	16122
28.4	12650 48	10202 07	95720	13826 21
5.7	46	12	20	16
	92	70	30	22
	28.4144	28.4137	5.7710	5.7699

Moon

1			17232	16892
23			14871 75	92505
13.3			79	52 51
			32	92
			13.2357	13.2359
2			17437	16917
23.2			15156 53	92112 11
13.3			50	10
			37	17
			13.2284	13.2294
3			17913	18645
24.0			13784 80	12780
13.4			76	80
			13	45
			13.4133	13.4135

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1 25 25

Star Measure

1	17031	16172	16743	16680
-5.9	7327 28	15868 73	12766 69	10645 43
14	29	76	72	41
	31	72	43	80
	159703	159701	43974	43963
	17788	16006	16268	16486
4	7999	15810 06	7895 92	14849 52
8	91 93	02	89	55 52
	88	06	68	86
	229793	239800	238376	238366
	16792	16070	17290	16122
4	12650 48	10202 11	9520	13826 21
7	46	12	20	16
	92	70	30	22
	28.9144	28.4131	51710	57699

Moon

1			17232	16892
13			14871 73	9250
33			79	52 57
			32	92
			132357	132359
2				
			17437	16917
32			15156 53	9212 11
33			50	10
			37	17
			132284	132294
2				
			17913	18645
10			13784 80	12780
4			76	80
			13	45
			134033	134135

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Moon

24.7	17788	18520
10	10710	15599
	10	99
	88	20
	24.72178	24.70717

5)

5.0	17232	17652
6.0	16342 40	8547 48
	38	49
	32	52
	25.08932	25.08896

5.0	17249	19363
6.2	16303	10310 +1
	03	12
X	49	63
	25.09946	25.09948

24.9	19706	17218
6.0	10798	16122
	96	22
	06	18
	24.89908	24.89904

24.0	17078	16928
6.8	8290 92	15.71516
	94	17
	78	28
	16.87786	16878 8

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1925-25

Times etc
Moon

24.7	17788	18520
40	10710	15395 97
	10	94
	88	20
	24.71178	24.70777

5)

5.0	17232	17652
5.0	16342 40	8547 48
	36	49
	32	52
	25.08892	25.08896

5.2	17249	19363
5.2	16303	10310 11
	03	12
X	49	63
	25.09446	25.09448

Z

49	19706	17218
6.0	10794	16122
	94	22
	06	18
	24.89906	24.89904

17076		16928
8290	42	15715 16
94		17
78		28
16.81786		16.81788

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12S-2S

Twins Etc

Date Mar. 13, 17

Exp'd Star	15	37			15	49	
" " Moon	15	42	46.5		15	42	46.7
clock fast		14	25.2				
Z. Sid Time	15	28	21.40				
Z. Long.	04	44	31.05				
G. Sid Time	20	12	52.45				
" " " N.N	23	22	11.09				
Interval	20	50	41.36				
Red		03	24.89				
G. M.T	20	47	16.47		20	78791	

$\theta = -0^{h}4^{m}$

Trans Naut. Alm		R.A.			Decl.		
Moon 20h	15	30	36.53		-23	06	18.2
Motion 1m			2.3369				6.117
" 47.2.745		01	50.47			-04	49.2
Tabular Place	15	32	27.00		-23	11	07.4

Moon Age 20d

934" = 6.5'

a = -504.9
+240
-480.9

Parallax	57	02.0
Semidiam	15	34.0
R		934.0
Dmg		6.5
Dec 6'		-0.4
R		940.1
R		2014.9
qR		-967
(1+q)R		1.9180
= Rz		36787

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125 25"

Lines Etc

Date Mar 13. 17

Expt Stars	15	37			15	49	
" " Moon	15	42	46.5		15	42	46.7
clock fast		14	25.2				
71 Sid Time	15	28	21.4				
71 Long.	04	44	31.05				
h Sid Time	20	12	52.45				
" " " M.N	23	22	11.09				
Interval	20	50	41.36				
Red		03	24.89				
h M.T	20	47	16.47		20h	47m	38.91

Trans Mount Alm		RA			Decl.		
Moon 20h	15	30	36.53	-23	06	18.2	
Motion 1m			2.369			6.117	
47.2745"		01	50.47		-07	49.2	
Tabular Place	15	32	27.00	-23	11	07.4	

Moon Age 20d

934" = 64

Parallax	57	02.0	
Semidiam	15	34.0	
R		934.0	
Aug		64	
Dr 6		-04	
R		9400	
R		20149	
4R		-904	
(1+4R		8.9180	
= R2		36787	

a = .3049
+ 240
-480.9

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125-25' Plate Centre + Constants. 24

23.9796 23.8371 13 32 55.11 -22 52 0.6
22. 18. -01 01.37 - 45 23.0
-1.9796 -5.8371
31"

Plate Centre { A = 15 31 53.74
D = -23 37 23.6

X-S +5000x -55.8y +49x -12389
+45.70+7985 = 125 55 5 - 245 = 12310 + 78 = 12388
+1611+11990 = 13601 - 1330 = 12271 + 118 = 12389
-1635+14207 = 12572 322 = 12250 + 139 = 12389
23.17.58" +115.88 - 845" +113 = 23.02.35"

y-η+5009 +54.4x +208xy -13729
+105.71+2198 = 12769 +869 = 13638 +91 = 13729
+0011+11918 = 11929 +1304 = 13233 +496 = 13729
+9178+2885 = 12063 +1546 = 13609 +120 = 13729
15.14.50"+7572 +1261 +315 = 14.6869

Tables a = -0.8 e = -14.8 a-e = +14.0 b+d = +0.5"
@M. -504.9 -520.8 +15.9 +1.4

-5041 -506.0 +1.9 +0.9

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125-25' Plate Center + Constants 24

23.9796 23.8371 15 3 2 5 5 11 +22 5 2 0.6.
27 18 -01 01 37 -45 23.0
-1.9796 -5.8371
31

Plate Center { A = 15 31 53.74
D = -23 37 23.6

X-S+500x -55.8y +4.9x -12389
+45.90+7985 = 125 55 -245 = 12310+78=1238
+1611+11990=13601 = 1330=12271+118=12389
-1635+14207=12572 832=12370+139=12389
23.175.8+115.88 -845 +113=23.1220

y-η+500y +54.4x +208y -13724
+105.71+2198=12768+869 = 13638+91=13729
+0011+11618=11929+1304 = 13233+496=13729
+9178+2845=12063+1546 = 13609 +120=13729
15.1450+7572 +1261 +315=14.6869

Tables a = -0.8 e = -14.8 a-e = +14.0 b+d = +0.-
Q M. = -504.9 -520.6 +15.9 +1.4

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S	η
−6.48	−14.64
+1.82	+ 5.84
+6.57	−13.12
m +1.02	−3.31

ΔS	−65	+3η	+7
−41	+38 = −3	−4 = −7	
+ 2	−11 = −9	+2 = −7	
+36	−39 = −3	−4 = −7	
	−6	−1	0 =

Δη	−4.1η	−1.25	+22
−90	+60 = −30	+ 8 =	−22
+ 5	−24 = −19	− 2 =	−21
−68	+54 = −14	− 8 =	−22
	+13	− 1	= +34′

= +1,7′

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12S-25 Standard Coordinates 25

	Cafe No. 2113	Mg 75	Cafe No. 2124	Mg 6	Cafe No. 2137	Mg 82
C	15 27	09.55	15 31	55.19	15 34	38.99
9		09.56		55.24		39.64
8		09.57		55.26	Condrba	39.09
m	15 27	09.56	15 31	55.23	15 34	39.04
Prec	01	0.76		59.88	+11	0.89
α	15 28	10.32	15 32	55.11	15 35	39.93
A	15 31	53.74	15 31	53.74	15 31	53.74
α - A	- 03	43.42	+ 1	01.37	+ 03	46.19
Sin "		-223.41	-	+ 61.37		226.18
log "	2.349100n		1.787496		2.355445	
log Cos δ	9.995542		9.996445		9.995613	
log S₀	0.811766n		0.259665		0.817782	
S₀	-64827		+1.8183		+65739	
S	- 41		+ 2		+ 36	
S	15.51302		23.81835		28.57775	
X	15.97002		23.97796		28.41140	
Y-S	+ .4570		+ .1611		- .1635	
C	-25 27	39.7	-22 48	35.8	-25 16	02.7
9		40.5		36.5		02.7
8		38.0		35.8	Condrba	02.5
Mean	-25 27	39.4	-22 48	36.0	-25 16	02.6
Prec	- 03	30.2	- 03	24.6	- 03	21.3
δ	-25 31	09.6	-22 52	0.6	-25 19	23.9
D	-23 37	23.6	-23 37	23.6	-23 37	23.6
δ-D	- 01 53	46.0	+ 45	23.0	- 1 42	0.3
log '	- 6828.5		+ 2723.2		- 6122.1	
log "	2.834320n		3.435508		3.786920n	
log n₀	1.165472n		0.766623		1.118074n	
log tan δ	-9.67289n		9.62500n		9.67500n	
log S₀²	1.62335		0.5193		1.63556	
log n₁	8.35558n		7.19777n		8.36400n	
n₀	-14.63776		+5.83776		-13.12422	
n₁	- 0.0227		- .016		- .0231	
η	3.33397		23.83600		4.85227	
y	4.39668		23.83771		5.77035	
y-η	+1.05771		+ .00011		+ .91778	

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1 25 25 Standard Coordinates 25

	Cafe No 2113	Mg 7.5	Cafe No 2124	Mg 6	Cafe No. 2137	Mg 8.2
C	15 27	09.58	15 31	55.19	15 34	38.99
g		09.56		55.24		39.04
ε		09.57		55.26	Condon	39.04
m	15 27	09.56	15 31	55.23	15 34	39.04
ν.c.	01	0.76		59.88	+11	0.89
λ	15 28	16.32	15 32	55.11	15 35	39.93
A	15 31	53.74	15 31	53.74	15 31	53.74
λ-A	- 03	43.42	+ 1	01.37	+ 03	46.1
Sin "		-22.341		+61.37		226.18
log "	2.349100		1.787746		2.355445	
log cos δ	9.995542		9.964455		9.995613	
" S.	0.811760		0.259465		0.817842	
S.	-64827		+1.8183		+65739	
S.	- 41		+ 2		+ 36	
S	15.51132		23.81855		28.57775	
x	15.97026		23.97746		28.41400	
y-S	+ 45.70		+ 1.611		- 1.635	
C	-25 27	39.74	-22 48	35.8	-25 16	02.7
g		40.5		36.5		02.7
ε		38.0		35.8	Condon	02.5
Mean	-25 27	39.4	-22 48	36.0	-25 16	02.6
Prec	- 03	30.21	-03	24.6	03	21.3
δ	-25 34	09.6	-22 52	0.6	-25 19	23
Φ	-23 37	23.6	-23 37	23.6	-23 37	23.
S.Z	- 01 53	46.0	+ 1 45	23.0	- 1 42	0.2
tan "		-66285		+27235		-61221
log "	3.833432		3.435058		3.786922	
" m.	1.165471		0.766623		1.116407	
log tan S	-9.01789		9.62500		9.67500	
S.²	16235		0.5193		16356	
log λ.	8.35558		7.19717		8.36400	
η.	-14.6376		+5.8376		-13.1242	
η.	- 0227		- 16		- 0231	
η	4.3397		23.83688		4.8527	
y	4.3468		23.83871		5.7705	
y-η	+1.0571		+ .0011		+ .9178	

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1 25-25 Moon Cents 26

	x	x-x₀	+Δy	(x-x₀)²	+(y-y₀)²		O-C
1	23.00000	-0.17700	+2	0.03132	3.69000	+	113
2	23.17700	0.00000	+2	0.00000	3.68860	+	78
3	24.00000	+0.82300	+2	0.67776	3.68778	+	.91
4	24.70706	+1.52968	+1	2.34334	3.66004	−	183
5	25.08474	+1.90124	+0	3.61572	3.67835	−	.2
6 X	25.09447	+1.91177	+0	3.65794	3.67794	+	7
7	24.89006	+1.71136	−1	2.92361	3.66674	−	113
8	24.00000	+0.82300	−2	0.67770	3.68776	+	89
					3.67787		

	y	Δy		arc
1	13.23588	−1.91026	3.65588	185°
2 y	13.22787	−1.91173	3.65860	180°
3	13.41334	+1.77326	3.01026	155°
4	14.00000	−1.14660	1.31570	127°
5	15.00000	−0.14660	.0.02213	94°
6	15.14660	+0.00000	0.00000	90°
7	16.00000	+0.85340	0.73113	63°
8	16.87871	+1.73271	3.01106	25°

Range 160°

Approx Cents

X = 24 | y = 13.41334
16.87871
30.29205
y₀ 15.14660
y−y₀ 13.22787
R 1.91173
Com R 1.91180
X max 25.09447
X₀ 23.17767

Moon Cents { X₀ 23.17700
Y₀ 15.14.60

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1 2 5 2 5

Moon Centre

26

	x	x − x₀	+ Δ y	(x − x₀)²	+ (y − y₀)²		O − C
1	23 00000	− 0 1770	+ 2	0 0312	3 6900	+	1 1 3
2	23 1770	0 0000	+ 2	0 0000	3 6860	+	7 8
3	24. 0000	+ 0 8230	+ 2	0 6776	3 6878	+	9 1
4	24. 7078	+ 1. 5268	+ 1	2 3434	3 6604	−	1 8 3
5	25. 0894	+ 1. 9124	+ 0	3 6572	3 6785	−	2
6	25. 0947	+ 1. 9177	+ 0	3 6794	3 6744	−	1
7	24. 8906	+ 1. 7136	− 1	2 9361	3 6674	−	1 1 3
8	24. 0000	+ 0. 8230	− 2	0. 6770	3 6876	+	8 9
					3. 6787		

	y	y − y₀	Δ y		Calc
1	13 23 5 8	− 1. 9102	− 26	3 6588	185
2	13 2287	− 1. 9173	− 26	3 6860	180
3	13 4134	− 1. 7326	− 24	3 0102	155
4	14 0000	− 1. 1460	− 16	1 3170	127
5	15 0000	− 0 1460	− 1	0 0213	94
6	15 1460	+ 0 0000	+ 0	0 0000	90
7	16 0000	+ 0 8540	+ 12	0 7313	63
8	16 8787	+ 1. 7327	+ 24	3. 0106	25

Approx Centre

x = 24 y = 13 4134

16 8787

30 2921

y_0 15 1460

$y - y_0$ 13. 2287

R 1. 9173

Corr R

25. 0947

23. 1167

Moon Centre $\begin{cases} x_0 & 23\,1770 \\ y_0 & 15\ 14.60 \end{cases}$

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Formation of Normals

1	+ 0.34	− 20.3	− 214.8
2	+ 0.00	+ 0.0	− 140.0
3	− 1.42	+ 74.6	− 157.8
4	− 1.76	− 281.0	+ 205.0
5	− 0.29	− 3.8	+ 0.3
6	+ 0.00	+ 13.5	+ 0.0
7	+ 1.45	− 193.5	− 96.0
8	+ 1.42	+ 730	+ 154.0
	+ 3.21	+ 161.1	+ 3593
	− 3.47	− 498.6	− 6086
	− .26	− 337.5	− 2493

	a	b	c	Cor. O − C
9 = + 5	− 1	+ 4	− 5	+ 66
	0	+ 4	− 4	+ 30
b = − 2	+ 4	+ 3	− 1	+ 75
	+ 8	+ 2	+ 2	− 166
c = − 8	+ 9	+ 0	+ 1	− 41
	+ 10	0	+ 2	+ 56
	+ 8	− 2	− 2	− 56
	+ 4	− 3	− 7	+ 137

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12525 Conditional Equations 27

	O - C			O - C
1	- 0.18	- 1.91 = + 113	+ 4 + 38 = + 42	+ 71
2	0.00	- 1.92 = + 73	+ 0 + 39 = + 39	+ 34
3	+ 0.82	- 1.73 = + 91	- 20 + 35 = + 15	+ 76
4	+ 1.53	- 1.15 = - 183	- 38 + 23 = - 15	- 168
5	+ 1.91	+ 0.15 = - 2	- 47 + 3 = - 44	- 42
6	+ 1.92	+ 0.00 = + 7	- 47 - 0 = - 47	+ 54
7	+ 1.71	+ 0.85 = - 113	- 42 - 17 = - 59	- 54
8	+ 0.82	+ 1.73 = + 89	- 20 - 35 = - 55	+ 144
	571			+ 379 - 264
				arc 80

+ 1400 - 0.26 = - 337.5 + 8.53
- 0.26 + 15.43 = - 249.3 - 4.28
+ ( ) - 0.00 = - 62.8

- 0.27 Δ

+ 15.43 = - 312.1 b = - 20.2

+ 1400 - 337.5 - 5.3 = - 342.8 a = - 24.5
+ 0.61

arc 160

R = 1.92

$\frac{p}{n}$ = .22

$\frac{\Sigma K}{n}$ = + 144

$\frac{+144}{.22}$ = + 655

- 2Rc = - 0.38

Δh = + 0.10 Δδ = + 0.

Δq = - 0.23 Δα = -

ΔR = + 0.8

Corr + 0.1

True ΔR = + 0.7

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12525 Conditional Equations 27

	O - C				D - C
1	- 0.18	- 1.91	= + 1.13	+ 4 + 38 = + 42	+ 71
2	0.00	- 1.92	= + 0.73	+ 0 + 39 = + 39	+ 34
3	+ 0.82	- 1.73	= + 0.91	- 20 + 35 = + 15	+ 71
4	+ 1.53	- 1.15	= - 1.83	- 38 + 23 = - 15	- 169
5	+ 1.91	+ 0.05	= - 2	- 47 + 3 = - 44	- 42
6	+ 1.42	+ 0.85	= + 7	- 47 - 0 = - 47	+ 54
7	+ 1.71	+ 0.85	= - 1.13	- 72 - 17 = - 89	- 54
8	+ 0.82	+ 1.73	= + 0.89	- 20 - 35 = - 55	+ 144
				+ 379 - 264	
				or 80	

+ 1400 - 0.26 = - 337.5 + 5.3

- 0.26 + 15.43 = - 249.3 - 4.28

+ 0.1 - 0.00 = - 62.8

- 0.270

+ 15.43 = - 312.1 b = - 20.2

+ 1400 - 337.5 - 5.3 = - 392.8 a = - 24.5

+ 0.61

Arc 160

R. 192

$\frac{R}{R_1} = 22$

- 2RC. = 0.38

$\frac{\Sigma V}{n} = + 14.4$

$\frac{+144}{22} = +6.5.5$

Δi = + 0.10 Δδ = + 0

Δq = - 0.23 Δλ = -

ΔR = + 0.8

Corr. + 0.1

True ΔR + 0.7

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1225-25

Nodus Mean Position 28

X_0 23.1770
−12
23.1758

Y_0 15.1460
−10
15.1450

From Plate Constants.

23.0225
22
+1.0225

14.6869
+8
−3.3131

log S_0 0.000966
log Cos δ_0 9.960555
8.507241
Sin $\alpha - A$ 1.541487

log Tan δ 9.64966
" S_0^2 0.00193
7.05341
log η_1 6.72233

$\alpha - A$ + 34.82

η_1 −0.00005
η_0 −3.31260

log η_0 0.520177
7.331155
log Tan $\delta \cdot \delta$ 3.189022

A 15° 31′ 53.74

α_0 15 32 28.56

$D - D$ − 1545.3
25 45.3

Red 2.51

α' 15 32 31.07

δ −23 37 23.6

δ_0 −24 03 08.9

Red −9.6

δ' −24 03 18.5

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12S-25

Means Mean Positions 24

X_0 23 17 7 0
−1 2
23 17 5 8

Y_0 1 5 1 4 6 0
−10
1 5 1 4 5 0

From Plate Constants.

23.0225
22
+1.0225

146869
18
−3.3131

log S_2 0.000966
log cos δ_0 9.960555
8.507 24
$\delta \times A$ 1.54187

$\alpha - A$ +34.82

A 15 31 53.74

α_0 15 32 28.56

Red 2.51

α' 15 32 31.07

log λi 9.64966
S_2 0.00193
7.05334
log η 6.72223

η_1 −0.00005
η_0 −3.3126

log η_0 0.520177
7.331155
log λi 3.189402

$\delta - \varepsilon$ −15 45.3
25 45.3
ε −23 37 23.6

δ_0 −24 03 08.9

Red −9.1

δ' −24 03 18.

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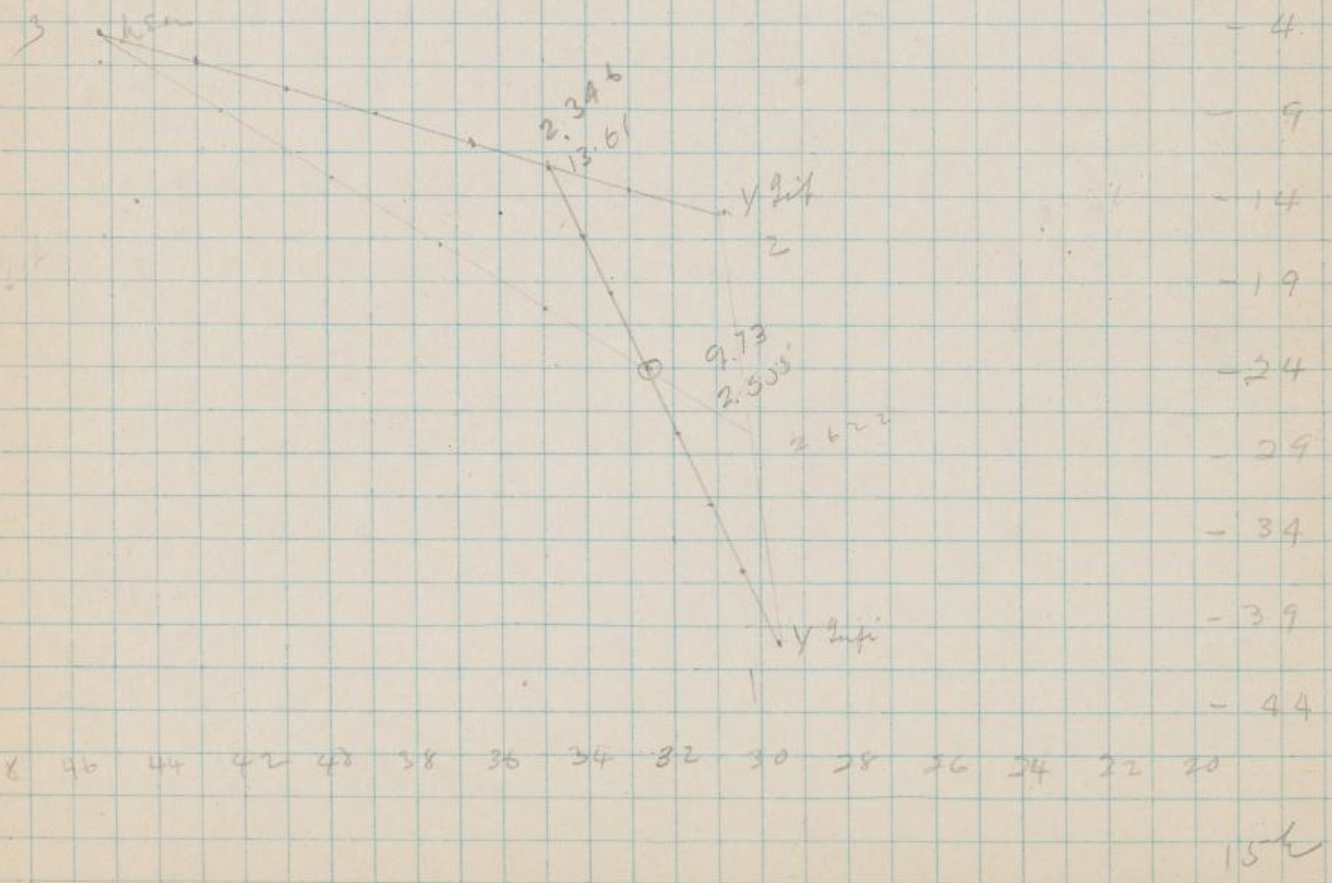
(1) 15 29 39.077 − 40 53 24.58
36.230 20.03
+ 2.847 − 4.55

2 15 30 55.253 − 14 31 1.07
52.856 30 48.31
+ 2.397 −1 12.76

3 15 45 19.425 − 3 10 53.11
17.206 37.38
+ 2.219 − 15.73

2.397
2.219
.178

12.76
2.97



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1917phae.proj.2

12525 Reduction to Apparent Place 29

H+α	10	01.8	150°	27.0	δ_0	−34° 03.1
H	18	29.3			log cos δ_0	9.96053
α	15	32.5			" q	0.90800n
G	22	53.2			(i)	0.86853n
Q+X	14	25.7	216°	25.5		

log cos G+X	9.90566n
" q	1.04350
" Sin G+X	9.77366n
" tan δ_0	9.64996n
	8.82239

log Sin δ_0	9.61024n
" Cos H+α	9.99395n
" log h	1.27420
Sin H+X	9.69300
Sec δ_0	0.03950
	8.82239

log g'	0.94919n
" g	9.29060

	9 + 1.640
	g + 0.195
	h + 0.677
Red.	+ 2.512

	log h' 0.82390
	" h 9.83060

g	− 8.894
h	+ 6.667
i	− 7.388
	− 9.615

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12525

Reduction to Apparent Place

H+X	10	01.8	150°	270	δ_0 -24° 03.1
H	18	29.3			
X	15	32.5			log cos δ_0 9.96057
G	22	53.2			log 6 0.96060n
G+X	14	25.7	216°	25.5	(6) 0.86565n

log cos G+X 9.90569n
log g 1.04357
log sin G+X 9.77874n
log tan δ_0 9.64996n
8.82239

log g' 0.97491n
g' 9.29406

g +1.6401
g +0.1935
λ +0.6777
Red. +2.5112

log sin δ_0 9.61021n
cos H+X$_0$ 9.99395n
log k 1.27422
sin H+X$_0$ 9.69300
sec δ_0 0.03955
8.82239

log k' 0.82399
k 9.83306

g -8.8914
k +6.6667
i -7.3888
-9.6135

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Lunar Parallax

α	15	32	31.07	π	57'	02.0	
Θ	15	28	21.40				
$\Theta - \alpha'$		− 4	09.67			9.869113	
=	− 1°	02	25.05	log sin π		8.219863	
$\frac{1}{2}\alpha - \alpha'$			−25.00	" " $\Theta - \alpha'$		8.259005	
$\Theta - \alpha' - $ "	− 1	02	00.05	sec δ'		0.036582	
		9.995727		log sin x		6.384541	
log cos $\frac{1}{2}(\alpha - \alpha')$		0 0 0 0 0 0		$\alpha\alpha'$		−50.00	
log tan $\frac{1}{2}(\Theta - \alpha')$		0 0 0 0 0 7					
log tan y		9.995734		=		− 3.33	
y	42	11	26.4				
δ'	−24	03	18.5				
$y - \delta'$	66	14	44.9				
		9 8 2 6 4 0					
log sin π		8 2 1 9 8 3					
sin $y - \delta'$		9.961535					
Cosec y		0 1 7 2 8 9					
sin $\delta - \delta'$		8.180067					
$\delta - \delta'$	+	52	06.9				
δ	−23	11	11.6	α	15	32	27.74
Eph δ	−23	11	07.4	Eph α	15	32	27.00
O − C			−4.2	O − C			+0.74
Corr.			+1.4	Corr			0.00
2nd Cld. Ref.			+0.3				
δ	−23	11	09.9				
O − C			−2.5				

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Lunar Parallax

α	15	32	31.07	π	57'	02.0	
θ	15	26	21.4				
$\theta - x$		- 4	04.67				
	- 1	02	25.05			986413	
$\frac{1}{2} x - x'$			- 25.00	log sin π		821943	
$\theta - x' - y$	- 1	02	00.05	$\theta - x' - y$		825400	n
				sec δ		003658	
	9.95727			log sin x		638454	n
log cos $\frac{1}{2}$ x x'	000000						
sec $\theta - x' - y$	000006			$\theta - y'$	-	50.00	
log tan y	9.95733						
					-	3.33	
y	42	11	26.4				
ξ'	-24	03	18.5				
$y - \xi'$	66	14	44.9				
	9.82640						
log sin π	9.21943						
sin $y - \xi'$	9.96155						
cosec y	0.17289						
sin $\xi - \xi'$	8.18067						
$\delta - \delta'$	+	52	06.9				
δ	- 23	11	11.6	α	15	32	27.74
$\frac{1}{2} h \delta$	- 23	11	07.4	$\frac{1}{2} h$	15	32	27.00
O-C			- 4.2	O-C			+ 0.74
Corr.			+ 1.4	Corr.			0.00
2nd Corr. Ref			+ 0.3				
δ	- 23	11	08.9				
O-C			- 2.8				

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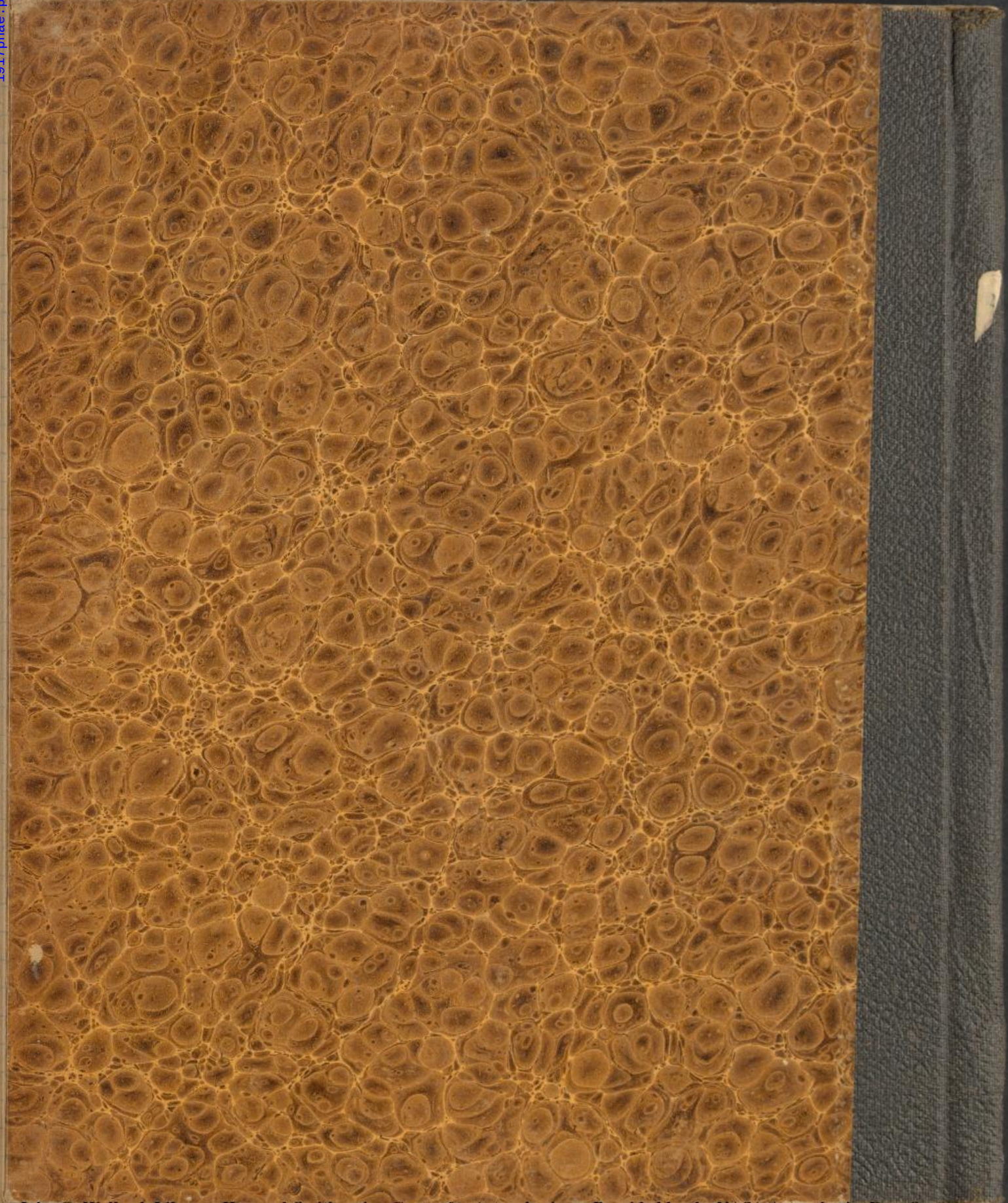
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