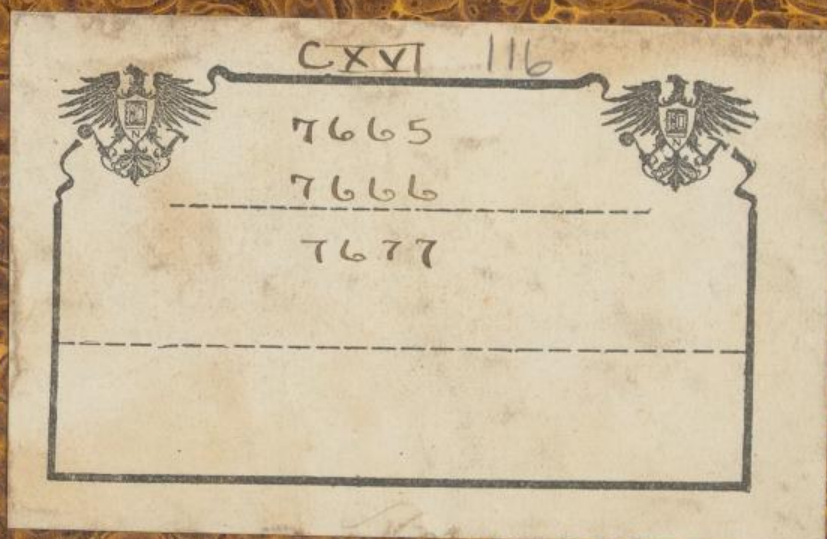


KG
11366
v.969



1
11
17

2
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28
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2
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mic
9

3
21
15

7665

Stars measures

1916 Jan 22

1

a

u

a

u

u

1 20279
11.4 16780
17.3 8088
70

11.3493

19839
13314
1919
29

.3485

19335
1712010
10
19

172225

20051
12266
5860
36

.2222

2 18970
22.4 14868
12.9 6968
707

22.4102

17592
1170903
0203
92

.4113

1390501
97
134747

12.9573

16680
1565851
60

.9576

3 18570
28.8 1001513
24.1 14
59

28.8547

18339
1689085
53

.8547

13131
12512
1317

24.0617

13162
6364
12530

.0633

Moon measures

Scratch

22.3 17880
15.5 1388996
9296
81

22.3988

15701
971017
16
07

.4010

17520
1345771
70
20

25.4054

16280
10348
3940
80

.4062

2
22.0
15.3
min
j

17280
1365850
57
72
15.3622

17247
10860
6558
50
3602

3
21.0
15.7

17339
1068080
89
18
15.6641

17170
1381010
11
70
.6640

7665

Stars measures

1916 Jan 22

1

α	δ	α	δ
1 20279	19839	19335	20051
114 16780	13314	17120	12266
173 8088	1919	10	5860
70	29	19	36
<u>173493</u>	<u>3483</u>	<u>172225</u>	<u>2222</u>
2 18970	17592	13905	16080
224 14868	11709	97	15658
129 69	02	13474	60
70	92		
<u>224102</u>	<u>4115</u>	<u>129573</u>	<u>9576</u>
3 18570	18339	13131	13162
288 10015	16890	12512	6367
241 14	8885	1317	12530
59	53		
<u>288547</u>	<u>8547</u>	<u>240617</u>	<u>0633</u>

Moon measures

α	δ	α	δ
1 Shatch		17	
22.0 17880	15701	17520	16280
15.5 13889	9710	13457	10348
92	16	70	3940
81	07	20	80
<u>223988</u>	<u>4010</u>	<u>154054</u>	<u>4062</u>
2 22.0		17280	17247
15.3		13658	10860
min		57	65
9		72	58
		153622	50
			<u>3602</u>
3 21.0		17339	17170
15.7		10680	13810
		89	11
		18	70
		<u>156641</u>	<u>6640</u>

7665 Moon - measures 1916 Jan 22. 2

d

N

d

N

4	16309	17528
20.6	10280	13574
16.0	8689	7079
	10	20
	<u>20.6025</u>	<u>.6649</u>

5	20215374	17452
17.0	1379190	905952
	81	57
	72	50
	<u>20.1587</u>	<u>.1606</u>

6	15379	18428
20.1	13944	988490
17.2	3334	8390
	89	30
	<u>20.1443</u>	<u>.1456</u>

7	20421	18371
20.4	1728906	1149991
18.0	9806	9091
	20	74
	<u>20.3123</u>	<u>.3120</u>

8
21.0
18.7

20383
12479
6869
79
<u>18.7905</u>

19800
17710
1417
94
<u>.7915</u>

Density 2

7665 *muon - measures* 1916 Jan 22 2

$$\begin{array}{r}
 4 \quad 16309 \\
 20.6 \quad 10280 \\
 16.0 \quad 8689 \\
 \quad 10 \\
 \hline
 20.6025
 \end{array}
 \qquad
 \begin{array}{r}
 17528 \\
 13574 \\
 7079 \\
 20 \\
 \hline
 6049
 \end{array}$$

$$\begin{array}{r}
 5 \quad 20215374 \\
 170 \quad 1379190 \\
 \quad 81 \\
 \quad 72 \\
 \hline
 20.1587
 \end{array}
 \qquad
 \begin{array}{r}
 17452 \\
 905952 \\
 57 \\
 50 \\
 \hline
 1606
 \end{array}$$

$$\begin{array}{r}
 6 \quad 15379 \\
 20.1 \quad 13944 \\
 172 \quad 3334 \\
 \quad 89 \\
 \hline
 20.1443
 \end{array}
 \qquad
 \begin{array}{r}
 18428 \\
 988490 \\
 83 \\
 30 \\
 \hline
 1456
 \end{array}$$

$$\begin{array}{r}
 7 \quad 20421 \\
 20.4 \quad 1728906 \\
 18.0 \quad 98 \\
 \quad 20 \\
 \hline
 20.3123
 \end{array}
 \qquad
 \begin{array}{r}
 18371 \\
 1149991 \\
 9091 \\
 74 \\
 \hline
 3120
 \end{array}$$

$$\begin{array}{r}
 8 \\
 21.0 \\
 18.7
 \end{array}$$

$$\begin{array}{r}
 20383 \\
 12479 \\
 6869 \\
 79 \\
 \hline
 187908
 \end{array}
 \qquad
 \begin{array}{r}
 19800 \\
 17710 \\
 1417 \\
 94 \\
 \hline
 7915
 \end{array}$$

density 2

7665	Times etc							3
right star	1915 Jan 20	2 ^h 24 ^m			-2 ^h 36 ^m			
... from		2 30	18.4	-2 30	18.7			
clock slow		0	34.2					
H. Sid T.		2 30	52.75		6 - 2 = +2 ^h 18 ^m			
H. Long		4 44	31.05					
G. Sid T.		7 15	23.80					
Sid T. in hour		19 55	07.82					
Int. time		11 20	15.98					
Real		1	51.45					
G. M. T.		11 18	24.53					

From Nautical	RA		Decl.		
known 18 ^h	0 12 22.04		+4 51 34.0		
Meridian 1.8205			14.207		
... 18.409	+ 33.51		+ 4 21.5		
Tabular place	0 12 55.55		+4 55 55.5		

known age	5.5 days		
parallax	55	10.71	
secularian	15	04.0	
R		904.0	
Augmentation		+ 9.7	
Irradiation 2		- 0.1	
R		913.6	
R		1.9584	
AK		- 935	
(1+a)R		1.8649	
R ²		3.4778	
934 = 10.4			
904 = 9.7			
a = -501.4			
- 24.			
477.4			

7665	Trines etc						3
Expt slas	1915 Jan 20	2 ^h 24 ^m		-2 ^h 36 ^m			
from		2 30	18.4	-2 30	18.7		
clock slow		0	34.2				
H. L. T.		2 30	52.75	6 - 2 - 12 ^h 18 ^m			
H. Long		4 44	31.05				
@ L. T.		7 15	23.80				
Sat. T. in hour		19 55	07.82				
Interval		11 20	15.98				
Recd		1	5 ^h 1.45 ^m				
Q. M. T.		11 18	24.53				

From handalm	RA	Recd.			
know 11 ^h	0 12 22.04	+4 51	34.0		
W. L. T. 1.8205		17 207			
18.409	+ 33.51	+ 4	21.5		
Tabula place	0 12 55.55	+4 55	55.5		

knows age	5.5 days.		
parallel	55	10.71	
scandian	15	04.0	
R		904.0	
Augmentation		+ 97	
T. radiation		- 0.1	
R		913.6	
R		19584	
at		- 935	
(1+a)/R		1.8649	
R ²		3.4778	
934 = 10.7			
904 = 9.7			
- 501.4			
- 24			
477.4			

7665

Plate Center + Constants

4

x	y	R.A.	Decl.
18.3489	17.2224	0 05 33	+4 21 33
22.4108	12.9574	11 35	3 46 44
28.8547	24.0625	15 07	5 17 20
<u>36.261</u>	<u>54.24</u>	<u>0 31 75</u>	<u>8 4 97</u>
20.87	18.08	0 10 45	+4 28 32
-22	-18	+	38
1.13	.08	0 11 23	+4 27 53
33	490		
38	39		

$$\text{Center} \left\{ \begin{array}{l} A = 0^h 11^m 20^s \\ D = +40^\circ 28' 00'' \end{array} \right.$$

$$\begin{array}{rclcl} x - \bar{x} & +500x & +11y & +1.4y & -10535 \\ +4655 + 5674 = & +10329 + 189 = & +10518 + 16 = & +10534 = & -1 \\ -843 + 11205 = & +10362 + 143 = & +10505 + 31 = & +10536 = & +1 \\ -4197 + 14427 = & +10230 + 265 = & +10495 + 40 = & +10535 = & 0 \\ 220101 + 11005 & + 189 & + 31 & = & 220791 \end{array}$$

$$\begin{array}{rclcl} y - \bar{y} & +100y & -7.9x & +2.1y & -8971 \\ +413 + 8611 = & +9024 - 90 = & +8934 + 36 = & +8970 = & -1 \\ +2642 + 6479 = & +9121 - 177 = & +8944 + 27 = & +8971 = & 0 \\ -2883 + 12031 = & +9148 - 228 = & +8920 + 51 = & +8971 = & 0 \\ 172271 + 8614 & -174 & +36 & = & 17.1776 \end{array}$$

$$\text{Table } a = -0.3 \quad e = -1.8 \quad a - e = +1.5 \quad b + a = -3.5$$

$$\text{Obs } a = -501.4 \quad e = -502.1 \quad a - e = +0.7 \quad b + a = -3.1$$

$$-501.1 \quad -500.3 \quad +0.4$$

Plate Center - Crumpton

x	y	R	A	Decl.
17.3489	17.2224	0 05 33	+4	21 33
22.4108	12.9574	11 35	3	46 44
28.8547	24.0645	15 07	5	17 20
<u>62.61</u>	<u>54.24</u>	<u>0 31 75</u>		<u>84 97</u>
20.87	18.08	0 10 45	+4	28 32
22		+	38	- 39
1.43	0.8	0 14 23	+4	27 53
33	4.90			
38	39			

Center } A = $0^h 14^m 20^s$
 } D = $+40^\circ 28' 00''$

$$\begin{aligned}
 &2 - 3 \quad +500x \quad +11y \quad +1.4z \quad -10535 \\
 &+4655 + 5674 = +10329 - 189 = +10518 - 16 = +10534 = -1 \\
 &- 843 + 11205 = +10362 + 143 = +10505 + 31 = +10536 = +1 \\
 &-4197 + 14427 = +10230 + 265 = +10495 + 40 = +10535 = 0 \\
 &220161 + 11005 \quad + 189 \quad 31 \quad = 220791
 \end{aligned}$$

$$\begin{aligned}
 &y - 4 + 500y \quad -7.9x \quad +2.1y \quad -8971 \\
 &+4.13 + 8611 = +9024 - 90 = +8934 + 36 = +8970 = -1 \\
 &+2642 + 6479 = +9121 - 177 = +8944 + 27 = +8971 = 0 \\
 &-2483 + 12031 = +9148 - 228 = +8920 + 51 = +8971 = 0 \\
 &172271 + 8614 \quad -174 \quad +36 \quad = 172176
 \end{aligned}$$

$$\begin{aligned}
 \text{Table 1: } &-0.3 \quad x = -1.8 \quad a = 2.2 + 1.5 \quad b + a = 3.5 \\
 \text{Table 2: } &-501.4 \quad -503.1 \quad a = 2.2 + 0.7 \quad b + a = 3.1
 \end{aligned}$$

	ξ	η	$\Delta\xi$	$-\Delta\eta$		$+1.4\eta$	$+2$
1	-11.11	-0.83	-30	+33	-2	-0	-2
2	+0.50	-5.31	-0	-1	-1	-2	-3
3	+7.27	+6.35	+17	-22	-3	+0	-2
M	+0.08	-0.82		0		0	<u>+2</u>
			$\Delta\eta$	-1.4η		$-\Delta\xi$	-2
			-2	+1	=	-1	+3
			-7	+7	=	+3	-1
			+17	-9	=	+5	+2
			0	+1		-0	<u>-1</u>

Standard Coordinates

Cape No. 13 m 8.1				Cape No. 25 m 7.0				Cape No. 34 m 9.0			
L	0°	04"	47.20	0°	10"	49.26		0°	14"	20.92	
L			.24			.32				.98	
E			.23			.25				.94	
Mean	0	04	47.22	0	10	49.28		0	14	20.95	
Pres		+	46.12		+	46.15			+	46.20	
A	0	05	33.34	0	11	35.43		0	15	07.15	
A	0	11	20	0	11	20		0	11	20	
a-A	-	5	46.66	+ 0		15.43		+ 3		47.15	
sin(A)		-	346.62	+		15.43		+	2	27.14	
log			2.53985 m			1.18837				2.35630	
cos			9.99874			9.99905				9.99815	
-3			1.04583 m			9.69466				0.86169	
3	-	11.1131		+ 0.4951				+ 7.2727			
3	-	35		- 0				+	1)		
3		10.8834		22.4951				29.2744			
2		11.3489		22.4108				28.8547			
2-3		+ 4655		- 843				- 4197			
C	+4	16	32.9	+ 3°	41'	44.2		+ 5	12	20.2	
L			32.5			44.5				20.7	
E			31.9			43.9				19.7	
Mean	+4	16	32.4	+ 3	41	44.2		+ 5	12	20.2	
Pres	+	5	00.6	+	5	00.3		+	5	00.1	
S	+4	21	33.0	+ 3	46	44.5		+ 5	17	20.3	
D	+4	28	00	+ 4	28	00		+ 4	28	00	
S-D	-	6	27.0	-	41	15.5		+	49	20.3	
tan(S-D)		-	387.0		-	2475.6		+	29	60.1	
log			2.58771 m			3.39368 m				3.47130	
no			9.91886 m			0.72483 m				0.80245	
tanS			8.8820			8.8198				8.9665	
32			2.0946			9.3893				17.284	
31			80270			52625				79433	
30	-	0.8296		- 5.3068				+ 6.3453			
31	+	107		+	0			+	55		
32		17.1811		12.6932				24.3508			
33		17.2224		12.9574				24.0625			
3-32		+ 413		+ 2642				- 2883			

Standard Coordinates.

Cap. No. 13 m. 1.1 Cap. No. 21 m. 1.70 Cap. No. 30 m. 1.50

L	0° 04' 47.20	0° 10' 49.26	0° 14' 20.92
b	24	32	98
l	23	25	94
mean	0 04 47.22	0 10 49.28	0 14 20.95
Prob	+ 46.12	+ 46.15	- 46.20
X	0 05 33.34	0 11 35.43	0 15 07.15
A	0 11 20	0 11 20	0 11 20
$\lambda - A$	- 5 46.66	+ 0 15.43	+ 3 47.15
$\sin(\lambda - A)$	- 346.62	- 15.43	+ 227.14
log	2.53985	1.18837	2.35630
cos	999874	999905	999815
Σ	1.04583	9.69466	0.86169
Σ	- +1.1131	+0.4951	- +.72727
Σ	- 35	0	- 1 1
Σ	10.8834	22.4951	29.2744
X	11.3489	22.4108	28.8547
$\lambda - \Sigma$	+ 46.55	- 843	- 4197

C	+4 16 32.9	+3° 41' 44.2	+5 12 20.2
L	32.5	44.5	20.7
E	31.9	43.9	19.7
mean	+4 16 32.4	+3 41 44.2	+5 12 20.2
Prob	- 5 00.6	+ 5 00.3	+ 5 00.1
S	TT 21 33.0	+3 46 44.5	+5 17 20.3
D	-4 28 00	+4 28 00	+4 28 00
S-D	- 6 27.0	- 41 15.5	+ 49 20.3
$\sin(S-D)$	- 387.0	- 2475.6	+ 2960.1
log	2.58771	3.39368	3.47130
η_0	991886	072483	0.80245
tanS	8.8820	8.8198	8.9665
η_2	2.0946	9.3893	17.284
η_1	80270	52625	77433
η_0	-0.8296	-5.3068	+6.3453
η_1	+ 197	+ 0	+ 55
η_2	17.1811	12.6932	24.3508
η_3	17.2224	12.9574	24.0625
η_4	+ 413	+ 2642	- 2883

Linear Center

	x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0)^2 + (y - y_0)^2$	$o - c$
1	22.3999	+0.3899	-6	0.1515	3.4690	-88
2	22.0000	-0.0100	-6	0.0001	3.4821	+43
3	21.0000	-1.0100	-5	1.0211	3.4647	-131
4	20.6037	-1.4063	-4	1.9788	3.4848	+70
5	20.1596	-1.8504	-0	3.4240	3.4755	-23
6	20.1450	-1.8650	+0	3.4782	3.4782	+4
7	20.3122	-1.6978	+2	2.8818	3.4795	+17
8	21.0000	-1.0100	+5	1.0191	3.4664	-114

$$R^2 = 3.4778$$

	y	$y - y_0$	Δy	$(y - y_0)^2$	x	$\leftarrow$
1	15.4058	-1.8212	-2	3.3175		168
2	15.3612	-1.8658	-2	3.4820		180
3	15.6640	-1.5630	-2	2.4486		213
4	16.0000	-1.2270	-2	1.5060		229
5	17.0000	-0.2270	0	0.0515		263
6	17.2270	0.0000	0	0.0000		270
7	18.0000	+0.7730	+1	0.5977		293
8	18.7912	+1.5642	+2	2.4473		327 159

$$\begin{aligned}
 x &= 21.0 & y &= 15.6640 \\
 & & & \underline{1.87912} \\
 & & & 34.4552 \\
 y &= 17.2276 \\
 y - \text{min} &= 15.3612 \\
 R &= 1.8664 \\
 x - \text{min} &= 20.1450 \\
 x_0 &= 22.0114
 \end{aligned}$$

$$\begin{aligned}
 \text{Center} & \left\{ \begin{aligned} x_0 &= 22.0100 \\ y_0 &= 17.2270 \end{aligned} \right.
 \end{aligned}$$

Unknown Center

	x	$x - X_0$	Δx	$(x - X_0)^2$	$(x - X_0)(y - Y_0)$	$y - Y_0$
1	22.3999	+0.3899	-6	0.1515	3.4690	-68
2	22.0000	-0.0100	-6	0.0001	3.4821	+43
3	21.0000	-1.0100	-5	1.0211	3.4647	-131
4	20.6037	-1.4063	-4	1.9788	3.4848	+70
5	20.1596	-1.8504	-0	3.4240	3.4755	-23
6	20.1450	-1.8650	-0	3.4782	3.4782	+4
7	20.3122	-1.6978	+2	2.8818	3.4795	+17
8	21.0000	-1.0100	+5	1.0191	3.4664	-114

$$R = 3.4778$$

	y	$y - Y_0$	Δy	$(y - Y_0)^2$	x	$\leftarrow$
1	15.4058	-1.8212	-2	3.3173		168
2	15.3612	-1.8658	-2	3.4820		180
3	15.6640	-1.5630	-2	2.4436		213
4	16.0000	-1.2270	-2	1.5060		229
5	17.0000	-0.2270	0	0.0515		263
6	17.2270	0.0000	0	0.0000		270
7	18.0000	+0.7730	+1	0.5977		293
8	18.7912	+1.5642	+2	2.4473		327 159

$$x = 21.0 \quad y = 15.6640$$

$$18.7912$$

$$34.4552$$

$$y = 17.2270$$

$$y = 15.3612$$

$$R = 1.8664$$

$$x = 20.1450$$

$$X_0 = 22.0114$$

$$\text{Center} \left\{ \begin{array}{l} X_0 = 22.0100 \\ Y_0 = 17.2270 \end{array} \right.$$

1	- 0.71	-	34.3	+ 160.0
2	+ 0.02	-	0.4	- 80.4
3	+ 1.58	+ 132.4		+ 204.2
4	+ 1.74	-	98.8	- 86.1
5	+ 0.43	+ 42.5		+ 5.3
6	+ 0.00	-	7.5	+ 0.0
7	- 1.39	-	28.9	+ 13.1
8	- 1.58	+ 115.2		- 178.0
	+ 0.17	+ 20.2		+ 38.1

		+ 45
- a	- b	+ ΔC
+ 10	- 20	+ 35
- 0	- 21	+ 24
- 27	- 17	+ 1
- 38	- 13	- 6
- 50	- 2	- 7
- 50	+ 0	- 5
- 46	+ 9	+ 8
- 27	+ 17	+ 35

Moon's Center

	O	C	O - C	Corr
1	+0.39 - 1.82 = -88	+1 - 5 = -4	-84	-49
2	-0.01 - 1.87 = +43	-0 - 5 = -5	+48	+72
3	-1.01 - 1.56 = -131	-1 - 4 = -5	-126	-125
4	-1.41 - 1.23 = +70	-2 - 3 = -5	+75	+69
5	-1.85 - 0.23 = -23	-3 - 1 = -4	-19	-26
6	-1.87 + 0.00 = +4	-3 + 0 = -3	+7	+2
7	-1.70 + 0.77 = +17	-2 + 2 = 0	+17	+25
8	-1.01 + 1.56 = -114	-1 + 4 = +3	-117	-82
	-8.47 - 4.38		+147 - 346	

Normal Equations.

Average = 62

$$+13.95 + 0.17 = +20 - 8.47$$

$$+ 0.17 + 13.85 = +38 - 4.38$$

$$- 0.17 - 0.00 = -0 + 1.03$$

$$+ 13.85 = +38 - 3.35$$

$$b = +2.7 - 0.24$$

$$+13.95 = +20$$

$$a = +1.4 - 0.60$$

Arc 159

 $\frac{\sum r}{n}$

$$\frac{\sum r}{n} = .19$$

$$-25$$

$$\frac{-25}{19} = -1.31$$

$$\Delta R = -1.6$$

$$\text{Corr} = -0.6$$

$$\text{True } \Delta R = -1.0$$

$$-2 R = -3.73 - 2 R \text{ Corr} + 2.23 + 45$$

$$\Delta \delta = -0.54 - 11 \Delta \delta = -0.3$$

$$\Delta a = -1.34 - 27 \Delta \alpha = -0.04$$

moon's center

7

	O	C	O-C
1	+0.39 - 1.82 = -88	+1-5 = -4	-84
2	-0.01 - 1.87 = +43	-0-5 = -5	+48
3	-1.01 - 1.86 = +131	-1-4 = -5	+126
4	-1.41 - 1.23 = +70	-2-3 = -5	+75
5	-1.85 - 0.23 = -23	-3-1 = -4	-19
6	-1.87 + 0.00 = +4	-3+0 = -3	+7
7	-1.70 + 0.77 = +17	-2-2 = 0	+17
8	-1.01 + 1.56 = -114	-1+4 = +3	-117

$$+147 - 346$$

$$\text{Average} = -6.2$$

Normal Equations.

$$+13.95 + 0.17 = +20$$

$$+ 0.17 + 13.85 = +38$$

$$- 0.17 - 0.00 = -$$

$$+ 13.85 = +38$$

$$h = +2.7$$

$$+13.95 = +20$$

$$a = 71.4$$

$$\text{arc } 15.9$$

$$\frac{\sum v}{n}$$

$$\frac{P}{n} = .19$$

$$-25$$

$$\frac{-25}{19} = -1.31$$

$$\text{DR} = -1.6$$

Mean Position (1915.0)

8

$$\begin{array}{r} X_0 = 22.0100 \\ + 1 \\ \hline 22.0101 \end{array} \quad \begin{array}{r} Y_0 = 17.2270 \\ + 1 \\ \hline 17.2270 \end{array}$$

From plate constant $X = 22.0791$ $Y = 17.1776$

$$z = +0.0791$$

$$\eta = -0.8224$$

$$\begin{array}{r} \log z = 8.89818 \\ \dots \cos = 9.99874 \\ \hline 8.550724 \end{array}$$

$$\begin{array}{r} \log \tan \delta = 8.8795 \\ 7.7964 \\ \hline 7.0534 \\ \hline 5.7293 \end{array}$$

$$\dots (z - A) = 0.39220$$

$$\log \eta_0 = \begin{array}{r} 9.91508 \\ \hline 7.33115 \end{array}$$

$$X - A + 2.47$$

$$\dots (d - D) = 2.58393$$

$$H \quad 0 \quad 11 \quad 20$$

$$\delta - D = - \quad 6 \quad 23.6$$

$$\alpha_0 = 0 \quad 11 \quad 22.47$$

$$\text{Red} \quad + 0.17$$

$$D = +4 \quad 28 \quad 00$$

$$\alpha' = 0 \quad 11 \quad 22.64$$

$$S = +4 \quad 21 \quad 36.4$$

$$\text{Red.} \quad + 2.8$$

$$J' = +4 \quad 21 \quad 39.2$$

Jovian Mean Position (1915.0)

8

$$\begin{array}{rcl}
 X_0 = 22.0100 & Y_0 = 17.2270 & \\
 \hline
 \alpha = & +1 & \\
 22.0101 & & 17.2270
 \end{array}$$

From plate constant $X = 22.0791$ $Y = 17.1776$

$$\xi = +0.0791$$

$$\eta = -0.8224$$

$$\begin{array}{rcl}
 \log B & : & 8.89818 \\
 \cos S & : & 999874 \\
 & & 8.50724
 \end{array}$$

$$\begin{array}{rcl}
 \log T_m & : & 8.8795 \\
 & & 7.7964 \\
 & & 7.0534 \\
 \hline
 & & 5.7293
 \end{array}$$

$$(a-A) = 0.39220$$

$$\begin{array}{rcl}
 \log \eta_0 & : & 9.91508 \\
 & & 7.33115 \\
 \hline
 & & 2.58393
 \end{array}$$

$$\alpha - A = + 2.47$$

$$(d-D) = 2.58393$$

$$H \quad 0 \quad 11 \quad 20$$

$$S-D = - 6 \quad 23.6$$

$$\alpha_0 \quad 0 \quad 11 \quad 22.47$$

$$Red = - 0.17$$

$$D = + 4 \quad 28 \quad 00$$

$$\alpha = 0 \quad 11 \quad 22.64$$

$$S = + 4 \quad 21 \quad 36.4$$

$$Red. = + 2.8$$

$$d' = + 4 \quad 21 \quad 39.2$$

$$\begin{array}{r}
 0 \quad 08 \quad 51.48 \\
 \underline{51.42} \\
 + 0.06
 \end{array}$$

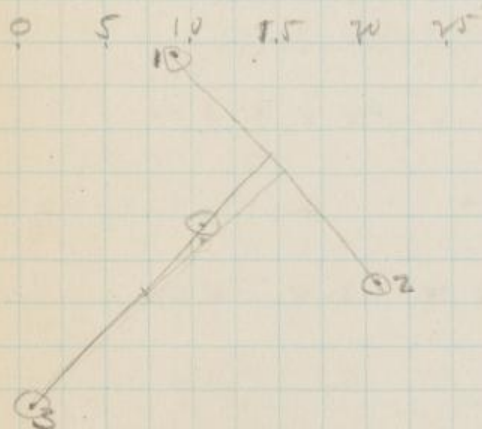
$$\begin{array}{r}
 +14 \quad 42 \quad 45.9 \\
 \underline{39.8} \\
 + 6.1
 \end{array}$$

$$\begin{array}{r}
 0 \quad 21 \quad 02.94 \\
 \underline{02.69} \\
 + 0.25
 \end{array}$$

$$\begin{array}{r}
 + \quad 1 \quad 28 \quad 10.5 \\
 \underline{08.3} \\
 + 2.2
 \end{array}$$

$$\begin{array}{r}
 0 \quad 00 \quad 59.33 \\
 \underline{59.11} \\
 + 0.22
 \end{array}$$

$$\begin{array}{r}
 - \quad 6 \quad 18 \quad 59.8 \\
 \underline{59.0} \\
 - 0.8
 \end{array}$$



$$+15$$

$$+10$$

$$+5$$

$$0$$

$$-5$$

$$0.15$$

$$17$$

$$\begin{array}{r}
 37 \\
 +41 \\
 \underline{12} \\
 29
 \end{array}$$

7665

Red. ad locus rph.

9

$$\delta + 4^{\circ} 21' 36''$$

$$H + \alpha \quad 22 \quad 20.2 = 335^{\circ} 3'$$

$$H \quad 22 \quad 08.8$$

$$\alpha \quad 0 \quad 11.4$$

$$Q \quad 20 \quad 15.5$$

$$Q + \alpha \quad 20 \quad 26.9 = 306^{\circ} 44'$$

$$\cos S \quad 9.9987$$

$$i \quad 0.6085 m$$

$$(i) \quad 0.6072 m$$

$$\sin S \quad 8.8810$$

$$\cos(H + \alpha) \quad 9.9574$$

$$h \quad 1.3024$$

$$\sin \dots \quad 9.6251 m$$

$$\cos S \quad 0.0013$$

$$8.8239$$

$$\cos(Q + \alpha) \quad 9.7768$$

$$g \quad 0.9606$$

$$\sin \dots \quad 9.9039 m$$

$$\tan S \quad 8.8821$$

$$8.8239$$

$$g' \quad 0.7374$$

$$g \quad 8.5705 m$$

$$h' \quad 0.1408$$

$$h \quad 9.7527 m$$

$$f \quad +0.78$$

$$-0.04$$

$$h \quad -0.57$$

$$+0.17$$

$$g' \quad +5.46$$

$$+1.38$$

$$l \quad -4.05$$

$$+2.79$$

7665

Red oak locust - hb.

9

 $\delta + 4^{\circ} 21' 36''$

$$H + A \quad 22 \quad 20.2 = 335^{\circ} 3'$$

$$H \quad 22 \quad 08.8$$

$$A \quad 0 \quad 11.4$$

$$G \quad 20 \quad 15.5$$

$$G + A \quad 20 \quad 26.9 = 306^{\circ} 44'$$

$$\cos S \quad 99987$$

$$i \quad 0.6085$$

$$h \quad 0.6072$$

$$\cos(G+A) \quad 97768$$

$$g \quad 0.9606$$

$$h \quad 99039$$

$$\cos S \quad 88821$$

$$88239$$

$$g' \quad 0.7374$$

$$h' \quad 85705$$

$$f \quad +0.78$$

$$g \quad -0.04$$

$$h \quad -0.57$$

$$+0.17$$

$$\cos S \quad 88810$$

$$\cos(H+A) \quad 99574$$

$$h \quad 13024$$

$$g \quad 9.6251$$

$$\cos S \quad 00013$$

$$88239$$

$$h' \quad 0.1408$$

$$h \quad 9.7527$$

$$g' \quad +546$$

$$h' \quad +138$$

$$i \quad -405$$

$$+2.79$$

7665

Lunar Parallax.

10

$$\begin{aligned} \alpha' &= 0^h 11^m 22.64 \\ \delta &= 230 52.75 \\ \alpha - \alpha' &= +2 19 30.11 \\ &= +34^0 52' 32'' \end{aligned}$$

$$= 11 38$$

$$+34 40 54$$

$$9.95727$$

$$0.00000$$

$$0.08496$$

$$0.04223$$

$$\gamma = 47 47 07$$

$$4 21 39$$

$$43 25 28$$

$$9.82640$$

$$8.20561$$

$$9.83721$$

$$0.13040$$

$$7.99962$$

$$S - S' = +34 20.9$$

$$S = +4 56 00.1$$

$$\text{Ampl } S = +4 55 55.5$$

$$O - C = +4.6$$

Curv. of Plate

$$\text{Curv} = 0$$

$$\text{2nd Ord. Ref.} = -0.3$$

$$S = +04 35 59.8$$

$$O - C = +4.3$$

$$S = +4^0 21' 39.2$$

$$\pi = 55' 11.71$$

$$9.86913$$

$$8.20561$$

$$9.75724$$

$$0.00161$$

$$7.83359$$

$$\alpha - \alpha' = +23 26.10$$

$$+ 1^m 33.74$$

$$\alpha = 0 12 56.38$$

$$\alpha = 0 12 55.55$$

$$+0.83$$

Curv

$$\text{Curv} = 0$$

$$\alpha = 0 12 56.34$$

$$O - C = +0.79$$

7665 Human Parallax

10

$$\begin{array}{r} \delta: 0^{\circ} 11' 22.64 \\ \epsilon: 2 \quad 30 \quad 52.75 \\ G-X + 2 \quad 19 \quad 30.11 \\ \quad + 34^{\circ} 52' 32'' \end{array}$$

$$\begin{array}{r} \delta: +4^{\circ} 21' 39.2 \\ \epsilon: 55' 11.71 \end{array}$$

$$\begin{array}{r} - \quad 11 \quad 38 \end{array}$$

$$\begin{array}{r} - 34 \quad 40 \quad 54 \end{array}$$

$$\begin{array}{r} 9.95727 \\ 0.00000 \\ 0.08496 \\ \hline 0.04223 \end{array}$$

$$\begin{array}{r} \delta: 47 \quad 47 \quad 07 \end{array}$$

$$\begin{array}{r} 4 \quad 21 \quad 39 \end{array}$$

$$\begin{array}{r} 43 \quad 25 \quad 28 \end{array}$$

$$\begin{array}{r} 9.82640 \\ 8.20561 \\ 9.83721 \\ \hline 0.13040 \\ 7.99962 \end{array}$$

$$\begin{array}{r} S-S \quad + 34 \quad 20.9 \end{array}$$

$$\begin{array}{r} S \quad + 4 \quad 56 \quad 00.1 \end{array}$$

$$\text{Cur Eph } S: +4 \quad 55 \quad 55.5$$

$$\begin{array}{r} O-C \quad + 4.6 \end{array}$$

$$\begin{array}{r} \text{Cur. of Plate} \quad 0 \end{array}$$

$$\begin{array}{r} \text{2nd} \quad - 0.3 \end{array}$$

$$\begin{array}{r} \text{2nd Ord. Ref.} \quad 0.0 \end{array}$$

$$\begin{array}{r} S: 04 \quad 55 \quad 59.8 \end{array}$$

$$\begin{array}{r} O-C \quad + 4.7 \end{array}$$

$$\begin{array}{r} 9.86913 \\ 8.20561 \\ 9.75724 \\ \hline 0.00161 \\ 7.83359 \end{array}$$

$$\begin{array}{r} \alpha-X: + 23 \quad 26.52 \end{array}$$

$$\begin{array}{r} + 1 \quad 33.74 \end{array}$$

$$\begin{array}{r} \alpha \quad 0 \quad 12 \quad 56.38 \end{array}$$

$$\begin{array}{r} \alpha \quad 0 \quad 12 \quad 55.55 \end{array}$$

$$\begin{array}{r} + 0.83 \end{array}$$

$$\begin{array}{r} \text{Cur} \quad 0 \end{array}$$

$$\begin{array}{r} \text{2nd} \quad - 0.04 \end{array}$$

$$\begin{array}{r} \alpha: 0 \quad 12 \quad 56.34 \end{array}$$

$$\begin{array}{r} O-C \quad + 0.79 \end{array}$$

11.
162
22
123
28
231
22
15
mi2
25
133
21
16

7666 Stars - measures

1916 Jan 24.

11

α	δ	α	δ	α	δ	α	δ
✓ 11.2	20159	17740	19430	16884			
16.8	18361	9513	10959	15331			
	6855	1111	5058	3530			
	40	28	10	62			
	<u>11,1794</u>	<u>1782</u>	<u>16,8456</u>	<u>8451</u>			
22.3	17789	1619.0	18839	16294			
12.5	15470	8698.00	12728	12308			
	70	97	13026	6963			
	80	80	29	78			
	<u>22,2516</u>	<u>2516</u>	<u>12,6105</u>	<u>6079</u>			
28.6	17170	19894	17380	15940			
23.6	10525	16539	10056	13241			
	22	3629	5659	5150			
	60	90	60	30			
	<u>28,6639</u>	<u>6642</u>	<u>23,7308</u>	<u>7310</u>			

Moon - measures.

α	δ	α	δ	α	δ
1		16565	17920		
22.5		11669	12812		
15.5		7180	1106		
minim		59	20		
y		<u>15,4891</u>	<u>4890</u>		
2		15305	18879		
22.0		9810	14313		
15.6		2009	5049		
		89	66		
		<u>15,5483</u>	<u>5484</u>		
3	20037	18370			
21.3	18172	10276			
16.0	5959	8270			
	38	73			
	<u>21,1874</u>	<u>1904</u>			

7666 Stars - measures

1916 Jan 24.

44

$\begin{array}{r}
\text{✓ } 20159 \\
112 \quad 18361 \\
168 \quad \quad 68 \\
\quad \quad \quad 40 \\
\hline
111794
\end{array}$

$$\begin{array}{r} 17740 \\ 9513 \\ \hline 1111 \\ 28 \\ \hline 1782 \end{array}$$

$$\begin{array}{r} 19430 \\ 10959 \\ \hline 5058 \\ 10 \\ \hline 168456 \end{array}$$

✓
1 6 8 8 4
1 5 3 3 1
3 1 → 30
6 2
8 4 1 1

$$\begin{array}{r} 23 \overline{) 2516} \\ \underline{46} \\ 177 \\ \underline{154} \\ 230 \\ \underline{230} \\ 0 \end{array}$$

$$\begin{array}{r}
 16190 \\
 869800 \\
 97 \\
 80 \\
 \hline
 2516
 \end{array}$$

$$\begin{array}{r} 18839 \\ 12728 \\ 13026 \\ 29 \\ \hline 12.6105 \end{array}$$

16794
1234863
89
78
6079

$$\begin{array}{r} 3 \\ 286 \quad 17170 \\ 286 \quad 10525 \quad 26 \\ \quad \quad 22 \\ \quad \quad 60 \\ \hline 286639 \end{array}$$

19894
16539
3629
90
6642

$$\begin{array}{r} 17380 \\ 10056 \\ \hline 56 \\ 60 \\ \hline 237308 \end{array}$$
$$\begin{array}{r} 11940 \\ 13241 \\ 5150 \\ 30 \\ \hline 7310 \end{array}$$

Lewis - Measures

$$\begin{array}{r} 1 \\ 225 \\ 15 \end{array}$$
$$\begin{array}{r} 16569 \\ 11669 \\ 7180 \\ 59 \\ \hline 154891 \\ 15305 \\ 981609 \\ 20 \\ 89 \\ \hline 155483 \end{array}$$
$$\begin{array}{r} 17920 \\ 1281200 \\ 1100 \\ 20 \\ \hline 4890 \end{array}$$
$$\begin{array}{r} 3 \\ 21.3 \\ 16.0 \\ \hline 20037 \\ 18172 \\ 5959 \\ 38 \\ \hline 21.1874 \end{array}$$
$$\begin{array}{r} 18370 \\ 1027670 \\ 8270 \\ 73 \\ \hline 1904 \end{array}$$

7666

moon-measures

1916 Jan. 24

α

N

α

N

$$\begin{array}{r} 4 \\ 21.0 \\ 16.2 \end{array}$$

$$\begin{array}{r} 18901 \\ 16840 \\ 41 \\ 74 \\ \hline 16,2060 \end{array}$$

$$\begin{array}{r} 19150 \\ 11188 \\ 7180 \\ 30 \\ \hline 2046 \end{array}$$

$$\begin{array}{r} 5 \\ 20.7 \\ 17.0 \end{array} \quad \begin{array}{r} 18466 \\ 1199099 \\ 88 \\ 70 \\ \hline 20.6475 \end{array} \quad \begin{array}{r} 19238 \\ 1572125 \\ 29 \\ 29 \\ \hline .6490 \end{array}$$

$$\begin{array}{r} 6 \\ 20.6 \\ 17.3 \\ \text{minh} \\ X \end{array} \quad \begin{array}{r} 18500 \\ 1239194 \\ 99 \\ 60 \\ \hline 20.6105 \end{array} \quad \begin{array}{r} 20216 \\ 1630204 \\ 01 \\ 05 \\ \hline .6090 \end{array}$$

$$\begin{array}{r} 7 \\ 20.7 \\ 18.0 \end{array} \quad \begin{array}{r} 17541 \\ 1025851 \\ 61 \\ 42 \\ \hline 20.7285 \end{array} \quad \begin{array}{r} 20180 \\ 1745556 \\ 50 \\ 73 \\ \hline .7286 \end{array}$$

$$\begin{array}{r} 8 \\ 21.0 \\ 18.5 \end{array} \quad \begin{array}{r} 17853 \\ 1299900 \\ 97 \\ 40 \\ \hline 18.4847 \end{array} \quad \begin{array}{r} 15786 \\ 1062427 \\ 28 \\ 80 \\ \hline .4843 \end{array}$$

$$\begin{array}{r} 9 \\ 21.3 \\ 18.7 \end{array} \quad \begin{array}{r} \text{Scratch} \\ 17487 \\ 1368583 \\ 81 \\ 85 \\ \hline 21.3803 \end{array} \quad \begin{array}{r} 17871 \\ 1169088 \\ 80 \\ 67 \\ \hline .3817 \end{array} \quad \begin{array}{r} 17778 \\ 918890 \\ 89 \\ 71 \\ \hline 18.8583 \end{array} \quad \begin{array}{r} 16831 \\ 1540609 \\ 09 \\ 09 \\ \hline .8580 \end{array}$$

Density 1.

7666

moon measures

1916 Jan. 24

a

a 8

a

$$\begin{array}{r} 4 \\ 210 \\ 163 \end{array}$$

18901

19150

16840

11188

41

7180

74

30

1620602046

5 18466

19238

20.7 1199099

1572125

17.0 88

29

70

29

20.64755.6490

6 18500

20216

20.6 1239194

1630204

17.3 99

01

17.3 00

05

X 20.6105.6090

7 17541

20180

20.7 1025851

1745552

18.0 61

50

42

73

20.7285.7286

$$\begin{array}{r} 8 \\ 210 \\ 181 \end{array}$$

17853

15786

1299900

1062427

97

28

40

80

1848474843

9 Scatter

21.3 17487

17871

17778

16831

18.7 1368583

11690

918890

1540609

81

8088

89

09

85

67

71

09

21.3803.3817188583.8580

Density 1.

7666 Times etc.
 Epherstars 1915 Jan 20, 2^h 41^m - 2^h 53^m
 ... moon 2 46 58.5 - 2 46 59.0
 Clockslow 6 342

H. SidT. 2 47 32.95 $\theta - \alpha = +2^{\circ} 34'$
 H. long 4 44 31.05
 G. SidT. 7 32 04.00
 SidT. h. moon 19 55 07.82
 Interval 11 36 56.18
 Read 1 54.18
 G. h. T. 11 35 02.00

From Kant. Alau.

R.A. Need.
 Moon 11^h 0^h 12^m 22.04 + 4^h 5^m 1^s 34.6
 Motion in 1.8205 14.200
 ... 35.033 + 1 03.78 + 8 17.5
 Tabular place 0 13 25.82 + 4 59 51.5
 25.20 4 27 29

Moon's age 5 days.

934 = 9.95
 904 = 9.3

parallel 55 11.29
 semicircle 15 03.9
 R 903.9
 Augmentation + 9.3
 Irradiation (1) + 0.2
 R 913.4
 R 1.9580
 ak - 936
 (1+ak) R 1.8644
 R2 34760

$\alpha = -502.0$

+ 24
 4780

7666 *Taurus etc.*
 Ephemeris 1915 Jan 20, 2^h 41^m - 2^h 53^m
 Moon 2 46 58.5 - 2 46 59.0
 Clockslow 0 34.2

H. Sidt 2 47 32.95 6 - 22 + 22 34^m
 H. long 4 44 31.05
 G. Sidt 7 32 04.00
 Sidt to Moon 19 55 07.82
 Interval 11 36 56.18
 Recd 1 54.18
 G. Sidt 11 35 02.00

From Kant Alman.

R.A. Neel.
 Moon 11^h 0^h 12^m 22^s 04 + 4^h 5^m 1^s 34^o
 Motion 1.8205 14.200
 35.033 + 1 03.78 + 8 17.5
 Tabular place 0 13 25.82 + 4 59 51.5

Moon's age 5 days.

934 - 9.95^m
 904 - 9.3

a - -502.0

24.

478.0

parallax 55 11.29
 semidiam 15 03.5
 R 903.9
 Augmentation + 9.3
 Irradiation 1 + 0.2
 R 913.4
 R 1.9588
 R - 936
 (1+a) R 1.8644
 R2 3.4760

7666

Plate Constants

14

x	11.1788	22.2516	28.6640
$\bar{x}$	10.8834	22.4951	29.2744
$x - \bar{x}$	+2954	-2435	-6104
y	16.8454	12.6092	23.7309
$\bar{y}$	17.1811	12.6932	24.3508
$y - \bar{y}$	-3357	-840	-6199

$$\begin{array}{rcll}
 x - \bar{x} + 100x & +40.5y & +2x & -9247 \\
 +2954 + 5589 = +8543 + 682 = +9225 + 22 = +9247 & & & = 0 \\
 -2435 + 11126 = +8691 + 511 = +9202 + 45 = +9247 & & & = 0 \\
 -6104 + 14332 = +8228 + 961 = +9189 + 57 = +9246 & & & = -1 \\
 224754 + 11238 & +703 & +45 & = 22.7493
 \end{array}$$

$$\begin{array}{rcll}
 y - \bar{y} + 100y & -352x & +2.2y & -4710 \\
 -3357 + 8423 = +5066 - 393 = +4673 + 37 = +4710 & & & = 0 \\
 -840 + 6305 = +5465 - 783 = +4682 + 28 = +4710 & & & = 0 \\
 -6199 + 11865 = +5666 - 1009 = +4657 + 52 = +4709 & & & = -1 \\
 173494 + 8674 & -791 & +38 & = 17.6765
 \end{array}$$

$$\begin{array}{l}
 \text{Tables } a = -0.7 \quad e = -2.1 \quad a - e = +1.4 \quad b + a = -4.6 \\
 \text{Obs } a = -502.0 \quad e = -502.2 \quad a - e = +0.2 \quad b + a = -5.3 \\
 -501.3^{\vee} \quad -500.1^{\vee} \quad -0.7^{\vee}
 \end{array}$$

7666

Plate Constants

14

x	11.1788	22.2516	28.6640
z	10.8834	22.4951	29.2744
x-z	+2.2954	-2.435	-6.104
y	16.8454	12.6092	23.7309
y	17.1811	12.6932	24.3598
y-y	-3357	-840	-6199

$$\begin{aligned}
 x-z &+ 100x & + 40.5y & + 2x & - 92.47 \\
 + 2954 + 5589 & = + 8543 + 682 & = + 9225 + 22 & = + 9247 & = 0 \\
 - 2435 + 11126 & = + 8691 + 511 & = + 9202 + 45 & = + 9247 & = 0 \\
 - 6104 + 14332 & = + 8228 + 961 & = + 9189 + 57 & = + 9246 & = -1 \\
 22475 + 11238 & & + 708 & + 45 & = 22.7493
 \end{aligned}$$

$$\begin{aligned}
 y-y &+ 100y & - 35.2x & + 2.2y & - 47.10 \\
 - 3357 + 8423 & = + 5066 - 393 & = + 4673 + 37 & = + 4710 & = 0 \\
 - 840 + 6305 & = + 5465 - 783 & = + 4682 + 28 & = + 4710 & = 0 \\
 - 6199 + 11865 & = + 5666 - 1009 & = + 4657 + 52 & = + 4709 & = -1 \\
 173494 + 8674 & & - 791 & + 38 & = 17.6905
 \end{aligned}$$

$$\begin{aligned}
 \text{Table } a &= -0.7 & c &= -2.1 & c-d &= +1.4 & b+a &= -4.6 \\
 \text{Obs } a &= -502.0 & c &= -502.2 & a-d &= +0.2 & b+a &= -5.3
 \end{aligned}$$

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80
81
82
83
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97
98
99
100

7666

moving center

15

	x	$x - X_0$	Δx	$(x - X_0)^2$	$(x - X_0)^2 + (y - Y_0)^2$	$0 - c$
1	22.4680	0.0000	-7	0.0000	3.4492	-268
2	22.0000	-0.4680	-7	0.2197	3.4518	-242
3	21.1889	-1.2791	-5	1.6374	3.4496	-264
4	21.0000	-1.4680	-5	2.1565	3.4581	-179
5	20.6482	-1.8198	-1	(3.3126)	3.4317	neg 443
6	20.6098	-1.8582	0	3.4529	3.4529	-231
7	20.7286	-1.7394	+2	3.0248	3.4526	-234
8	21.0000	-1.4680	+5	2.1536	3.4500	-260
9	21.3810	-1.0870	+6	1.1803	3.4676	-84

 $R^2 = 3.4760$

	y	$y - Y_0$	Δy	$(y - Y_0)^2$	L
1	15.4890	-1.8570	-2	3.4492	180
2	15.5484	-1.7976	-2	3.2321	195
3	16.0000	-1.3460	-2	1.8122	223
4	16.2053	-1.1407	-1	1.3016	232
5	17.0000	-0.3460	0	(0.1197)	251
6	17.3460	0.0000	0	0.0000	270
7	18.0000	+0.6540	+1	0.4278	291
8	18.4845	+1.1385	+1	1.2964	308
9	18.8582	+1.5122	+2	2.2873	324 144

Center

$$x = 21.0 \quad y = 16.2053$$

$$18.4845$$

$$34.6898$$

$$Y_0 = 17.3449$$

$$y_{\text{min}} = 15.4890$$

$$R = 1.8559$$

$$x_{\text{min}} = 20.6098$$

$$X_0 = 22.4657$$

$$\text{Center} \begin{cases} X_0 = 22.4680 \\ Y_0 = 17.3460 \end{cases}$$

7666

mean center

15

	x	x - $\bar{X}_0$	Δx	$(x - \bar{X}_0)^2$	$(x - \bar{X}_0)(y - \bar{Y}_0)$	O - C
1	22.4682	0.0000	-7	0.0000	3.4492	-268
2	22.0000	-0.4680	-7	0.2197	3.4518	-242
3	21.1889	-1.2791	-5	1.6374	3.4496	-264
4	21.0000	-1.4680	-5	2.1565	3.4581	-179
5	20.6482	-1.8198	-1	3.3158	3.4317	-242
6	20.6098	-1.8582	0	3.4529	3.4529	-231
7	20.7286	-1.7394	+2	3.0248	3.4526	-234
8	21.0000	-1.4680	+5	2.1536	3.4500	-260
9	21.3810	-1.0870	+6	1.1803	3.4676	-84

 $R^2 = 3.4760$

	y	y - $\bar{Y}_0$	Δy	$(y - \bar{Y}_0)^2$	C
1	15.4890	-1.8570	-2	3.4492	180
2	15.484	-1.7976	-2	3.2321	190
3	16.0000	-1.3460	-2	1.8122	223
4	16.2053	-1.1407	-1	1.3016	232
5	17.0000	-0.3460	0	0.1197	251
6	17.3460	0.0000	0	0.0000	270
7	18.0000	+0.6540	+1	0.4278	291
8	18.4845	+1.1385	+1	1.2964	308
9	18.8582	+1.5122	+2	2.2873	324

199

Center

$$x = 21.092162053$$

$$18.4845$$

$$34.6898$$

$$y = 17.3449$$

$$y = 15.4890$$

$$R = 1.8559$$

$$x = 20.6098$$

$$\bar{X}_0 = 22.4657$$

$$\text{Center} \left\{ \begin{array}{l} \bar{X}_0 = 22.4680 \\ \bar{Y}_0 = 17.3460 \end{array} \right.$$

Formation of Hounsab.

1	- 0.00	- 0.0	+ 498.0
2	+ 0.85	+ 113.8	+ 435.5
3	+ 1.73	+ 338.0	+ 356.5
4	+ 1.67	+ 263.0	+ 204.0
5	- 0.00	+ 430.0	- 0.0
6	- 1.13	+ 407.0	- 152.0
7	- 1.67	+ 382.0	- 296.3
8	- 1.65	+ 91.6	- 126.8
9	- 0.20	+ 2025.4	+ 918.9

- a	- G	+ 75 + ΔC
- 0	- 30	+ 45
- 24	- 29	+ 22
- 65	- 22	- 12
- 75	- 18	- 18
- 95	+ 0	- 20
- 89	+ 10	- 4
- 75	+ 18	+ 18
- 56	+ 24	+ 43

7666

Moon's Center

0

C

16

O-C

corr

1	0.00 - 1.86 = -268	+	0 - 128 = -128	-	140 - 95
2	-0.47 - 1.80 = -242	-	69 - 123 = -192	-	50 - 28
3	-1.28 - 1.35 = -264	-	188 - 93 = -281	+	17 + 5
4	-1.47 - 1.14 = -179	-	216 - 78 = -294	+	15 + 97
5	-1.86 + 0.00 = -231	-	274 + 0 = -274	+	43 + 23
6	-1.74 + 0.65 = -234	-	256 + 45 = -211	-	23 - 27
7	-1.47 + 1.14 = -260	-	216 + 78 = -138	-	122 - 104
8	-1.09 + 1.51 = -84	-	161 + 103 = -58	-	26 + 17
9	-938 - 2.85				

+175 - 361

Average = 67

Normal Equations.

$$+13.83 - 0.20 = +2025 - 9.38$$

$$- 0.20 + 13.81 = + 919 - 2.85$$

$$+ 0.20 - 0.00 = + 29 - 0.13$$

$$+ 13.81 = + 948 - 2.986 = + 68.6 - 0.22$$

$$+ 13.83 = +2025 + 14 = +2039$$

$$a = +147.2 - 0.68$$

Arc 144

 $\frac{\Sigma v}{n}$

$$\frac{p}{n} = .13$$

$$-21$$

$$\frac{-21}{13} = -1.62 \quad \Delta R = -2.0$$

$$\text{Corr} = -1.0$$

$$\text{True } \Delta R = -1.0$$

$$-2R = -3.73 \quad -2R \text{ Corr} + 3.73 + 75$$

$$\Delta b = -0.82 - 16 \Delta \delta = -0.4$$

$$\Delta a = -2.54 - 51 \Delta \alpha = -0.08$$

7666

Moon's Center

16

0

C

0-C

1	0.00 - 1.86 = -268	+	0 - 124 = -128	-140
2	-0.47 - 1.80 = -242	-	69 - 133 = -192	-50
3	-1.28 - 1.35 = -264	-	188 - 93 = -241	+17
4	-1.47 - 1.14 = -179	-	216 - 78 = -294	+115
5	-1.86 - 0.00 = -231	-	274 - 0 = -274	+43
6	-1.74 + 0.65 = -234	-	256 - 45 = -211	-22
7	-1.47 + 1.14 = -260	-	216 - 78 = -130	-122
8	-1.09 + 1.51 = -84	-	161 - 103 = -58	-26
9				

+175 = 36

Average = 67

Normal Equations.

$$+1383 - 020 = +2025$$

$$-020 + 1381 = +919$$

$$+020 - 000 = +29$$

$$-1351 = +948$$

$$b = +686$$

$$+1383 - 42025 + 14 = +2039$$

$$a = +147.2$$

Arc 144

 $\frac{\sum v}{n}$

$$\frac{p}{n} = 13$$

$$-21$$

$$-\frac{21}{13} = -1.62 \quad AR = -20$$

7666 Moon's mean Position (1915.0)

17

$$\begin{array}{r} X_0 = 22.4680 \\ + 74 \\ \hline 22.4754 \end{array}$$

$$\begin{array}{r} Y_0 = 17.3460 \\ + 34 \\ \hline 17.3494 \end{array}$$

From plate Constant $X = 22.7493$ $Y = 17.6705$

$$\xi = +0.7493$$

$$\eta = -0.3295$$

$$\begin{array}{r} \log \xi = 9.87466 \\ \log \cos = 9.99871 \\ \hline 8.50724 \end{array}$$

$$\begin{array}{r} \log \tan \delta = 8.8446 \\ 9.7493 \\ \hline 7.0534 \\ 5.6473 \end{array}$$

$$\log(\alpha - 4) = 1.36871$$

$$\log \gamma_0 = 9.51786$$

$$\alpha - A = 23.37$$

$$A = 0 \quad 11 \quad 20$$

$$\log(\delta - D) = 2.18671$$

$$\alpha_0 = 0 \quad 11 \quad 43.37$$

$$\delta - D = - \quad 2 \quad 33.7$$

$$\text{Red} = + 0.17$$

$$D = +4 \quad 28 \quad 00$$

$$\alpha' = 0 \quad 11 \quad 43.54$$

$$\delta_0 = +4 \quad 25 \quad 26.3$$

$$\text{Red} = + 28$$

$$\delta' = +4 \quad 25 \quad 29.1$$

1916phae.prj.19

1916phae.prj.19

1916phae.prj.19

1916phae.prj.19

1916phae.prj.19

1916phae.prj.19

1916phae.prj.19

1916phae.prj.19

1916phae.prj.19

1916phae.prj.19

1916phae.prj.19

1916phae.prj.19

7666 Moon's mean Position (1915.0)

17

$$X_0 = 224680$$

$$Y_0 = 173460$$

$$\begin{array}{r} 224680 \\ + 74 \\ \hline 224754 \end{array}$$

$$\begin{array}{r} 173460 \\ + 34 \\ \hline 173494 \end{array}$$

From plate Constant $X = 227493$ $Y = 176706$

$$Z = +0.7493$$

$$Z = -0.3295$$

$$\begin{array}{r} \log 2 = 9.87466 \\ \log 3 = 9.95871 \\ \log 4 = 8.50724 \end{array}$$

$$\begin{array}{r} \log 12 = 8.8446 \\ \log 13 = 9.7493 \\ \log 14 = 7.0534 \\ \hline 5.6473 \end{array}$$

$$(x-4) = 1.36871$$

$$\begin{array}{r} \log 7 = 9.51786 \\ \log 8 = 7.33115 \end{array}$$

$$a-A = 23.37$$

$$A = 0.1120$$

$$(x-D) = 2.18671$$

$$a = 0.1143.37$$

$$(x-D) = -32.33.7$$

$$Red = 0.17$$

$$D = +4.28.00$$

$$x = 0.1143.54$$

$$S = +4.25.26.3$$

$$Red = 2.8$$

$$S = +4.25.29.1$$

7666 Red. ad locum app.

18

S + 4° 25' 26"

$$H + \alpha \quad 22^{\circ} 20.4 = 335^{\circ} 6'$$

$$H \quad 22 \quad 08.7$$

$$\alpha \quad 0 \quad 11.7$$

$$G \quad 20 \quad 15.5$$

$$G + \alpha \quad 20 \quad 27.2 = 306^{\circ} 48'$$

$$\cos S \quad 9.9987$$

$$i \quad \underline{0.6050 \text{ m}}$$

$$(i) \quad 0.6077 \text{ m}$$

$$\sin S \quad 8.8873$$

$$\cos(H + \alpha) \quad 9.9576$$

$$h \quad 1.3024$$

$$\sin \quad 9.6243 \text{ m}$$

$$\cos \quad 0.0013$$

$$8.8239$$

$$\cos(G + \alpha) \quad 9.7774$$

$$g \quad 0.9606$$

$$\sin \quad 9.9035 \text{ m}$$

$$\tan S \quad 8.8886$$

$$8.8239$$

$$g' \quad 0.7380$$

$$g \quad 8.5766 \text{ m}$$

$$f \quad +0.78$$

$$g \quad -0.04$$

$$h \quad -0.57$$

$$\underline{+0.17 \text{ v}}$$

$$a' \quad 0.1473$$

$$L \quad 9.7519 \text{ m}$$

$$g' \quad +5.47$$

$$w \quad +1.40$$

$$i \quad -4.05$$

$$\underline{+2.82}$$

7666 Red. ad. brownish white

18

$$S + 4'' 25' 26''$$

$$H + \lambda \quad 22^\circ 20.4' - 335^\circ 4'$$

$$H \quad 22 \quad 08.7$$

$$K \quad 0 \quad 11.7$$

$$G \quad 20 \quad 15.5$$

$$G + \lambda \quad 20 \quad 27.2 - 306^\circ 48'$$

$$\cos S \quad 9.9987$$

$$i \quad 0.6090$$

$$q \quad 0.6089$$

$$\cos(H + \lambda) \quad 9.7774$$

$$g \quad 0.9606$$

$$\sin \quad 9.9035$$

$$\tan S \quad 8.8886$$

$$8.8239$$

$$S \quad 0.7380$$

$$S \quad 8.5746$$

$$f \quad +0.78$$

$$g \quad -0.04$$

$$h \quad -0.57$$

$$+0.17$$

$$\cos S \quad 8.8873$$

$$\cos(H + \lambda) \quad 9.9576$$

$$h \quad 1.3024$$

$$\sin \quad 9.6243$$

$$\cos S \quad 0.0013$$

$$8.8239$$

$$S \quad 0.4473$$

$$h \quad 9.7519$$

$$S \quad +5.47$$

$$h \quad +1.40$$

$$L \quad -4.05$$

$$+2.82$$

6

a

7666 human Parallel
 $\alpha' = 0'' 11'' 43.54$
 $\theta = 2 47 32.95$
 $\theta - \alpha' = +2 35 49.41$
 $= + 38^\circ 57' 21''$

$\tau = 12 52$

38 44 37

9.95727
 0.00000
 0.10793

 0.06520

$\gamma = 49 17 05$

4 25 29

44 51 36

9.82640
 8.20526
 9.84842
 0.12036

 8.00044

$\delta - \delta' = +34 24.8$

$\delta = 4 59 53.9$

Amph $\delta = +4 59 51.5$

$\theta - \epsilon = +2.4$

Curv. of Plate 0

2nd Ord. Ref. 0.0

2nd. - 0.4

$\delta = +4 59 53.5$

$\theta - \epsilon = +2.0$

$\delta = 4^\circ 25' 29.1''$ 17

$\tau = 55' 11.29''$

9.86913
 8.20526
 9.79848
 0.00166

 7.87453

$\alpha - \alpha' = +25' 45.04''$

$= + 43.00''$

$\alpha = 0 13 26.54$

$\alpha = 0 13 25.82$

$+0.72$

2nd. - 0.08

$\alpha = 0 13 26.46$

$\theta - \epsilon = +0.64$

7666

Human Parallax

17

$\alpha - 0^{\circ} 11' 43.04''$
 $\theta - 2' 47' 32.95''$
 $G - \alpha - +2' 35' 49.91''$
 $+ 38^{\circ} 57' 29''$

$\Gamma - 12' 52''$

$38' 44' 37''$

9.95727
 0.00000
 0.10793

 0.06520

$\gamma - 49' 17' 05''$

$3' 52' 49''$

$45' 24' 16''$

9.82640
 8.20526
 9.85253
 0.12036

 8.00455

$S - S' - +34' 44.4''$

$S - 27' 33.7''$

$\text{Amplitude} +4' 59' 51.5''$

$0 - C$

Curvature of Plate

$\text{2nd Ord. Ref.} 0.0$

$\text{2nd.} - 0.4$

$S - 4' 59' 53.5''$

$0 - C +2.0$

$S - 3^{\circ} 52' 49.3''$

$\Gamma - 55' 11' 29''$

9.86913
 8.20526
 9.79848
 0.00166

 7.87453

$\lambda - \alpha' - +25' 45.11''$

$+ 43.01''$

$\alpha - 0' 13' 26.05''$

$\alpha - 0' 13' 25.82''$

$\text{2nd.} - 0.18$
 $\alpha - 0' 13' 26.46$
 $0 - C +0.64$

7677

stars - measures

1916 Jan. 31

20

$$\begin{array}{r} \alpha \\ \frac{1}{18.0} \quad 10529 \\ 8.4 \quad 10200 \quad 00 \\ 91 \end{array}$$

$$\begin{array}{r} \alpha \\ 1324030 \\ 4030 \\ 12912 \end{array}$$

$$\begin{array}{r} \alpha \\ 15570 \\ 1177171 \\ 7971 \\ 00 \end{array}$$

$$\begin{array}{r} \alpha \\ 19109 \\ 1283640 \\ 2940 \\ 10 \end{array}$$

$$\underline{18.0332}$$

$$\underline{.0325}$$

$$\underline{8.3732}$$

$$\underline{.3726}$$

$$\begin{array}{r} \frac{2}{243} \quad 20179 \\ 20.2 \quad 17340 \\ 4040 \\ 80 \\ 24.2839 \end{array}$$

$$\begin{array}{r} 18096 \\ 10926 \\ 2028 \\ 09 \\ \underline{.2820} \end{array}$$

$$\begin{array}{r} 20566 \\ 18840 \\ 3842 \\ 78 \\ \underline{20.1728} \end{array}$$

$$\begin{array}{r} 18018 \\ 972032 \\ 2032 \\ 14 \\ \underline{.1709} \end{array}$$

$$\begin{array}{r} \frac{3}{24.6} \quad 20374 \\ 8.6 \quad 13469 \\ 25178 \\ 61 \\ \underline{28.6891} \end{array}$$

$$\begin{array}{r} 15855 \\ 1274048 \\ 5248 \\ 58 \\ \underline{.6891} \end{array}$$

$$\begin{array}{r} 20068 \\ 13556 \\ 4951 \\ 43 \\ \underline{8.6500} \end{array}$$

$$\begin{array}{r} 17550 \\ 1404450 \\ 40 \\ 44 \\ \underline{.6497} \end{array}$$

moon - measures

$$\begin{array}{r} \frac{1}{22.0} \\ 15.2 \end{array}$$

$$\begin{array}{r} 20140 \\ 1869608 \\ 9808 \\ 40 \\ \underline{15.1439} \end{array}$$

$$\begin{array}{r} 20188 \\ 1160962 \\ 9862 \\ 27 \\ \underline{.1475} \end{array}$$

$$\begin{array}{r} \frac{2}{21.1} \quad 13808 \\ 16.0 \quad 13260 \\ 5560 \end{array}$$

$$\underline{21.0550}$$

$$\begin{array}{r} 1465655 \\ 5055 \\ 14098 \end{array}$$

$$\underline{.0556}$$

[Faint, illegible handwritten notes on graph paper]

7677

Stars - measures

1916 Jan. 31

20

$$\begin{array}{r} \frac{1}{180} \quad \overset{a}{10529} \\ 84 \quad 1020000 \\ 91 \end{array}$$

$$\begin{array}{r} \overset{a}{1324030} \\ 4030 \\ 12912 \end{array}$$

$$\begin{array}{r} \overset{a}{15570} \\ 1177171 \\ 79 \\ 00 \end{array}$$

$$\begin{array}{r} \overset{a}{19109} \\ 1283640 \\ 29 \\ 10 \end{array}$$

$$\underline{18.0332}$$

$$\underline{0325}$$

$$\underline{8.3732}$$

$$\underline{3726}$$

$$\begin{array}{r} \frac{2}{243} \quad 20179 \\ 22 \quad 17340 \\ 4040 \\ 80 \end{array}$$

$$\begin{array}{r} 18096 \\ 10926 \\ 2028 \\ 09 \end{array}$$

$$\begin{array}{r} 20566 \\ 18840 \\ 3842 \\ 78 \end{array}$$

$$\begin{array}{r} 18018 \\ 972032 \\ 2032 \\ 14 \end{array}$$

$$\underline{24.2839}$$

$$\underline{2820}$$

$$\underline{20.1728}$$

$$\underline{1709}$$

$$\begin{array}{r} \frac{3}{246} \quad 20374 \\ 86 \quad 13469 \\ 7178 \\ 61 \end{array}$$

$$\begin{array}{r} 15855 \\ 1274048 \\ 5248 \\ 58 \end{array}$$

$$\begin{array}{r} 20068 \\ 13556 \\ 4951 \\ 43 \end{array}$$

$$\begin{array}{r} 17550 \\ 1704450 \\ 40 \\ 44 \end{array}$$

$$\underline{28.6891}$$

$$\underline{6891}$$

$$\underline{8.6500}$$

$$\underline{6497}$$

Moon - measures

$$\begin{array}{r} \frac{1}{220} \\ 152 \end{array}$$

$$\begin{array}{r} 20140 \\ 1869608 \\ 9808 \\ 40 \end{array}$$

$$\underline{15.1439}$$

$$\begin{array}{r} 20138 \\ 1160502 \\ 9802 \\ 27 \end{array}$$

$$\underline{1475}$$

$$\begin{array}{r} \frac{2}{211} \quad 13508 \\ 160 \quad 13260 \\ 5560 \end{array}$$

$$\begin{array}{r} 1465655 \\ 5055 \\ 14098 \end{array}$$

$$\underline{21.0550}$$

$$\underline{0556}$$

2
1

5
21
1

6
2
1

2
1

2
1

7677 Moon - measures

1916 Jan 31

$$\begin{array}{r}
 3 \quad 18519 \\
 20.8 \quad 1008499 \\
 16.8 \quad 9099 \\
 \text{min} \quad 28 \\
 \times \quad 20.8436
 \end{array}$$

$$\begin{array}{r}
 19980 \\
 18445 \\
 3931 \\
 89 \\
 .8457
 \end{array}$$

$$\begin{array}{r}
 4 \quad 18521 \\
 20.8 \quad 1004142 \\
 17.0 \quad 4642 \\
 33 \\
 20.8480
 \end{array}$$

$$\begin{array}{r}
 19975 \\
 18460 \\
 6168 \\
 80 \\
 .8487
 \end{array}$$

$$\begin{array}{r}
 5 \\
 21.0 \\
 17.5
 \end{array}$$

$$\begin{array}{r}
 17700 \\
 11570 \\
 6200 \\
 95 \\
 17.6120
 \end{array}$$

$$\begin{array}{r}
 20532 \\
 1664160 \\
 15060 \\
 22 \\
 6122
 \end{array}$$

$$\begin{array}{r}
 6 \\
 21.3 \quad 16995 \\
 18.0 \quad 1469098 \\
 8998 \\
 157 \\
 21.2307
 \end{array}$$

$$\begin{array}{r}
 20278 \\
 1260500 \\
 90 \\
 85 \\
 .2315
 \end{array}$$

$$\begin{array}{r}
 7 \\
 22.0 \\
 18.5
 \end{array}$$

$$\begin{array}{r}
 16937 \\
 11060 \\
 6970 \\
 17 \\
 18.5863
 \end{array}$$

$$\begin{array}{r}
 16830 \\
 1268986 \\
 8186 \\
 31 \\
 .5855
 \end{array}$$

$$\begin{array}{r}
 8 \\
 22.5 \\
 18.6 \\
 \text{may} \\
 \text{ing}
 \end{array}$$

$$\begin{array}{r}
 16897 \\
 969295 \\
 9795 \\
 01 \\
 18.7205
 \end{array}$$

$$\begin{array}{r}
 16871 \\
 1407775 \\
 8875 \\
 70 \\
 .7209
 \end{array}$$

Density 1

7677

Moon - measured

1916 Jan 31

$$\begin{array}{r}
 3 \quad 18519 \\
 20.8 \quad 1008499 \\
 168 \quad 9099 \\
 \text{min} \quad 28 \\
 \times \quad 20.8436 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 19950 \\
 18445 \\
 3931 \\
 89 \\
 \hline
 8457
 \end{array}$$

$$\begin{array}{r}
 4 \quad 18521 \\
 20.4 \quad 1004142 \\
 17.0 \quad 46 \\
 33 \\
 \hline
 20.8480
 \end{array}$$

$$\begin{array}{r}
 19975 \\
 18460 \\
 6168 \\
 80 \\
 \hline
 8487
 \end{array}$$

$$\begin{array}{r}
 5 \\
 21.0 \\
 17.5
 \end{array}$$

$$\begin{array}{r}
 17700 \\
 11570 \\
 6200 \\
 95 \\
 \hline
 176120
 \end{array}$$

$$\begin{array}{r}
 20532 \\
 1664160 \\
 5000 \\
 22 \\
 \hline
 6122
 \end{array}$$

$$\begin{array}{r}
 6 \\
 21.3 \quad 16995 \\
 18.0 \quad 1469098 \\
 8598 \\
 11 \\
 \hline
 21.2307
 \end{array}$$

$$\begin{array}{r}
 20278 \\
 1260500 \\
 90 \\
 85 \\
 \hline
 2315
 \end{array}$$

$$\begin{array}{r}
 7 \\
 22.0 \\
 18.5
 \end{array}$$

$$\begin{array}{r}
 16937 \\
 11060 \\
 6970 \\
 17 \\
 \hline
 185863
 \end{array}$$

$$\begin{array}{r}
 16830 \\
 1268986 \\
 8186 \\
 31 \\
 \hline
 5855
 \end{array}$$

$$\begin{array}{r}
 8 \\
 22.5 \\
 18.6 \\
 \text{max} \\
 \text{avg}
 \end{array}$$

$$\begin{array}{r}
 16897 \\
 969295 \\
 9795 \\
 01 \\
 \hline
 187205
 \end{array}$$

$$\begin{array}{r}
 16871 \\
 1407775 \\
 8875 \\
 70 \\
 \hline
 7209
 \end{array}$$

Density 1

7677

Times etc

Exhibition 1915 Jan. 26, 3^h 41^m - 3^h 53^m
 Moon 3 47 06.8 - 3 47 07.2
 clock slow 0 31.0

H. Sid T, 3 47 38.0 0^h 2^m - 1^h 15^m
~~SH. Sid T,~~ 4 44 31.05
 G. Sid T, 8 32 09.05
 Sid T. in moon 20 18 47.17
 Intervals 12 13 21.88
 Red 2 00.14
 G. H. T. 12 11 21.74

townshankell

R A

Decl.

Moon 12^h 5^m 02^s 02.30 + 27° 43' 04.2
 Motion 2.2767 2.050
 " 11.3623 + 25.87 + 23.3
 Tabular place 5 02 28.17 + 27 43 27.5

Moon's age 11 days

parallax 54' 45".72

Meridian 14 56.8

R 896.8

934 = 14.7

Augmental in

+ 13.6

899 = 13.6

Irradiation

+ 2

R 910.6

R 1.9519

ak - 928

a - - 499.2

(1+a) R 1.8591

+ 24

R² 3.4563

475.2

7677

Times etc

Exhibition	1911 Jan. 26	3 ^h 41 ^m	- 3 ^h 13 ^m
Moon		3 47	06.8 - 3 47 07.2
clock slow		0 31.0	
H. Sid T.		3 47	38.0 0 42 - 1 ^h 15 ^m
H. Sid T.		4 44	31.05
G. Sid T.		8 32	09.05
Sid T. in hour		20 18	47.17
Interval		12 13	21.88
Red		2	00.14
G. Sid T.		12 11	21.74

townhankden

R A

Decl

Moon 12 ^h	5 ^h 02 ^m	02.30	+ 27° 43'	04.2
Moon 1 ^h 22767			2.050	
11.3625		25.87		23.3
Tabula place	5 ^h 02 ^m	28.17	+ 27 43	27.5

Moon's age 11 days.

parallax

Meridian

R

Amplitude

Irradiation

R

R

ak

(1+a)R

R²

934 14.7

934 13.6

a = 499.2

+ 24

475.2

54 45.72

14 56.8

896.8

13.6

+ 2

910.6

1.9519

- 928

1.8591

3.4563

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Plate Centre & Constants

x	y
18.0328	8.3729
24.2830	20.1718
28.6891	8.6498
<u>71.00</u>	<u>37.19</u>
23.67	12.40
-22	-18
1.67	5.60
33	490
<u>56</u>	<u>2740</u>
	45' 40"

RA	Decl.
5 00 38	+26 18 51
04 25	+27 55 25
07 06	+26 21 20
<u>15 11 69</u>	<u>179 94 96</u>
5 04 03	+26 51 52
56	+45 40
<u>5 03 07</u>	<u>+27 37 32</u>

Center $\left\{ \begin{array}{l} A = 5^h 03^m 10^s \\ D = +27^\circ 37' 30'' \end{array} \right.$

$$\begin{array}{rclcl}
 x - \bar{x} + 500y & -38.4x & -0.8x - 0.3y & -12949 & \\
 +4269 + 9016 = +13285 & -318 & +12967 - 18 = 3 & +12950 & = +1 \\
 +1599 + 12142 = +13741 & -767 & +12974 - 29 = 6 & +12949 & = 0 \\
 -1041 + 14345 = +13304 & -329 & +12975 - 28 = 3 & +12949 & = 0 \\
 22.7027 + 11351 & -641 & -18 - 5 & & = 22.4765
 \end{array}$$

$$\begin{array}{rclcl}
 y - \bar{y} + 500x & +36.5x & +2.9y + 3x & -9665 & \\
 +4800 + 4186 = +8986 & +658 & +9644 + 16 = +5 & +9665 & = 0 \\
 -1353 + 10086 = +8733 & +886 & +9619 + 38 = +7 & +9664 & = -1 \\
 +4269 + 4325 = +8594 & +1047 & +9641 + 16 = +9 & +9666 & = +1 \\
 16.8641 + 8432 & +829 & +32 + 7 & & = 16.8276
 \end{array}$$

Tables. $a = +0.7$ $x = +0.7$ $a - x = 0.0$ $b + a = +0.5$
 Obs $a = -499.2$ $x = -501.9$ $a - x = +2.7$ $b + a = +1.5$
 -499.9 -502.6 $+1.0$

7677

Plate Center & Countmark

x

18.0328

24.2830

28.6891

71.00

23.67

32

1.67

56

y

8.3729

20.1718

8.6498

37.19

12.40

18

5.60

2740

45 40

R.H.

5 00

04

7 06

5 11

5 04

-

5 03

Decl

+26 18

+27 15

+26 21

79 94

26 51

+45 46

+27 37

32

Center } A = $5^h 03^m 10^s$
 (D = $+27^\circ 37' 30''$)

2-3 +1224 -384 -082-0.34 -12949
 +4249+9014 +13285 -318 +12967-14-3 +12950
 +11559-12142 +13741 -767 -12974-19-6 +12949
 -1041 +14345 +13304 -329 +12970-23-3 +12949
 227027 +11351 -641 -18-5 -224765

7-7 +1202 +3648 +1.97+32 -9665
 +4802+4186 +8986+658 +9644+16+5 +9665
 -1353+10086 +8733+886 +9619-38+7 +9664
 +4269+4325 +8594+1047 +9641+16+9 +9666
 168641 +8432 +829 +32+7 = 168276

Tables. a = +0.7 b = +0.7 c = -2.0 d = +0.5
 Obs a = -499.2 b = -501.9 c = -127 d = +1.5

ξ	η	$\Delta\xi$	-3.95	$+1.71$	$+5^-$
1	-9.39	-10.12	-13	$+15 \approx +2$	$-7 \approx -5^-$
2	+2.12	+2.30	0	$-7 \approx -7$	$+1 \approx -6$
3	+6.79	-9.80	+27	$-23 \approx +1$	$-6 \approx -5^-$

M	+0.88	-1.17	-2	-1	<u>+2</u>
---	-------	-------	----	----	-----------

$\Delta\eta$	-2.71	$+1.5$	$+6$
-32	$+27 \approx -5^-$	$-0 \approx -5^-$	
+0	$-6 \approx -6$	$+0 \approx -6$	
-33	$+26 \approx -7$	$+1 \approx -6$	

0	+3	0	<u>+9</u>
---	----	---	-----------

7677				Standard Coordinates				Cincinnati P.M.			
Cape W. 731 mg 6.6				Cape W. 740 mg 6.0				Cape W. 741 mg 6.8			
C	4	59	41.93	5	03	28.34	5	06	10.05		
L			96			35			06		
E			91			34			9.99		
Mean	4	59	41.93	5	03	28.34	5	06	10.03		
Pre	+		55.66	+		56.39	+		55.67		
A	5	00	37.59	5	04	24.73	5	07	05.70		
A	5	03	10	5	03	10	5	03	10		
$\alpha-A$	-2		32.41	+1		14.73	+3		55.70		
$\alpha(A-A)$	-		152.41	+		74.73	+		235.69		
log	2.18	301	m	1.87	349		2.37	234			
WSS	9.95	249		9.94	624		9.95	234			
T ₀	0.64	274	m	0.32	697		0.83	192			
Σ	-4.39	28		+2.12	31		+6.79	08			
Σ	-	13			0		+	24			
Σ	17.60	59		24.12	31		28.79	32			
α	18.03	28		24.28	30		28.68	91			
$\alpha-\Sigma$	+4.26	9		+1.59	9		-1.04	1			
C	+26	17	33.6	+27	54	12.7	+26	20	10.5		
L			33.2			12.0			10.9		
E			32.9			12.0			10.3		
Mean	+26	17	33.2	+27	54	12.2	+26	20	10.6		
Pre	+	1	17.6	+	1	12.8	+	1	07.6		
S	+26	18	50.8	+27	55	25.0	+26	21	17.7		
D	+27	37	30	+27	37	30	+27	37	30		
S-D	-1	18	39.2	+17		55.0	-1	16	12.3		
$\alpha(A-D)$	-		4720.0	+		1075.0	-		4573.1		
log	3.67	394	m	3.03	141		3.66	021	m		
η_0	1.00	509	m	0.36	256		0.99	136	m		
WSS	9.69	42		9.72	43		9.69	50			
Σ	1.28	55		0.65	40		1.66	42			
η_1	8.03	31		7.43	17		8.41	26			
η_0	-1.01	179		+2.30	44		-9.80	30			
η_1	+	108		+	27		+	25-9			
η	7.89	29		20.30	71		8.22	29			
η	8.37	29		20.17	18		8.64	98			
$\eta-\eta$	+	4800		-1.35	3		+	4269			

7677

Standard Coordinates

Cable No. 731 m 6.6

Cable No. 740 m 6.0

Cable No. 741 m 6.6

C	4	59	41.93	5	03	28.34	5	06	10.05
L			96			35			106
E			91			34			999
Mean	4	59	41.93	5	03	28.34	5	06	10.03
Pres	+		55.66	-		56.39	+		55.75
A	5	00	37.59	5	04	24.73	5	07	05.78
A	5	03	10	5	03	10	5	03	10
x-A	-2		32.41	+1		14.73	+3		55.78
m(A-A)	-		152.41	+		74.73	+		235.77
log	2.18	301	m	1.87	349		2.37	250	
log	9.95	249		9.94	624		9.95	234	
T ₀	06	42	74m	03	26	97	08	32	08
Σ	-4	39	28	+2	12	31	+6	79	33
Σ	-		13			0	+		24
Σ	17	60	59	24	12	31	28	79	57
Σ	18	03	28	24	28	30	28	68	91
Σ -3	+	4	26	9	59	9	-	1	06
C	+26	17	33.6	+27	54	12.7	+26	20	10.5
L			33.2			12.0			12.9
E			32.7			12.0			10.3
Mean	+26	17	33.2	+27	54	12.2	+26	20	10.6
Pres	+	1	17.6	-	1	12.8	+	1	09.4
S	+26	18	50.8	+27	55	25.0	+26	21	20.0
D	+27	37	30	+27	37	20	+27	37	30
S-D	-1	18	39.2	+17	55.0		-1	16	10.0
m(b-b)	-		4720.0	+		1075.0	-		4570.8
log	3.67	394m		3.03	141		3.65	999m	
log	1.00	509m		0.36	256		0.99	114m	
log	9.69	42		9.72	43		9.69	50	
Σ	1.28	55		0.65	40		1.66	42	
Σ	8.03	31		7.43	17		8.41	26	
Σ	-1	0.11	79	+2	30	74	-	7.79	80
Σ	+		108	+		27	+		21.9
Σ	7.69	29		20.30	71		8.22	79	
Σ	8.37	29		20.17	18		8.64	98	
Σ	+		4800	-		1853	+		4719

7627

Moon's Center

	x	$x - x_0$	$\Delta(x - x_0)^2$	$(x - x_0)^2 + (y - y_0)^2$	$O - C$
1	22.0000	-0.7000	0.4900	3.4528	-35
2	21.0553	-1.6447	2.7050	3.4567	+4
3	20.8446	-1.8554	3.4425	3.4425	-138
4	20.8484	-1.8516	3.4284	3.4461	-102
5	21.0000	-1.7000	2.8900	3.4452	-111
6	21.2311	-1.4689	2.1577	3.4414	-149
7	22.0000	-0.7000	0.4900	3.4446	-117
8	22.7000	0.0000	0.0000	3.4362	-201

34563

	y	$y - y_0$	$\Delta(y - y_0)^2$	L	
1	15.1457	-1.7213	2.9628	202	
2	16.0000	-0.8670	0.7517	272	
3	16.8620	0.0000	0.0000	270	
4	17.0000	+0.1330	0.0177	277	
5	17.6121	+0.7451	0.5552	299	
6	18.0000	+1.1330	1.2837	308	
7	18.5859	+1.7189	2.9546	338	
8+	18.7207	+1.8537	3.4362	360	158

Center $x = 22.0$ $y = 15.1457$ 18.5859 33.7316 $y_0 = 16.8658$ $y - \text{min} = 18.7207$ $R = 1.8549$ $x - \text{min} = 20.8446$ $x_0 = 22.5995$ Center $\begin{cases} x_0 = 22.7000 \\ y_0 = 16.8670 \end{cases}$

7677

Known Center

	x	y	$x - x_0$	$(x - x_0)^2$	$(x - x_0)^2 + (y - y_0)^2$	O-C
1	22.0000	0.7000	0.4900	3.4528	-3.5	
2	21.0553	-1.6447	2.7050	34567	+4	
3	20.8446	-1.8554	3.4425	34425	-138	
4	20.8484	-1.8516	3.4284	34461	-102	
5	21.0000	-1.7000	2.8900	34452	-111	
6	21.2311	-1.4689	2.1577	34414	-149	
7	22.0000	0.7000	0.4900	34446	-117	
8	22.7000	0.0000	0.0000	34362	-201	
				34563		

	x	y	$x - x_0$	$(y - y_0)^2$	L
1	15.1457	-1.7213	2.9628	202	
2	16.0000	-0.8670	0.7517	292	
3	16.8620	0.0000	0.0000	270	
4	17.0000	+0.1330	0.0177	279	
5	17.6121	+0.7451	0.5552	294	
6	18.0000	+1.1330	1.2837	308	
7	18.5859	-1.7189	2.9546	338	
8	18.7207	+1.8537	3.4362	360	
					158

Center $x = 22.0$ $y = 15.1457$ 18.5859

33.7316

 $y_0 = 16.8658$ $y_{\text{min}} = 18.7207$ $R = 1.8549$ $x_{\text{min}} = 20.8446$ $x_0 = 22.6995$ Center $\begin{cases} x_0 = 22.7000 \\ y_0 = 16.8670 \end{cases}$

Formation of Normals.

1	+ 1.20	+ 24.5	+ 60.2
2	+ 1.43	- 6.6	- 3.5
3	- 0.60	+ 256.5	- 0.6
4	- 0.24	+ 189.0	- 13.3
5	- 1.27	+ 188.8	- 83.4
6	- 1.66	+ 219.0	- 168.2
7	- 1.20	+ 82.0	- 201.5
8	+ 0.00	- 0.0	- 372.0
	<u>- 1.74</u>	<u>+ 953.2</u>	<u>- 781.7</u>

- a.	- b	+ 14 + DC
- 35	+ 19	+ 58
- 75	+ 9	+ 8
- 85	- 0	- 11
- 85	- 1	- 12
- 78	- 8	- 12
- 67	- 12	- 5
- 32	- 19	+ 23
- 0	- 20	+ 54

7677 Moon's Center

	O	C	O-C	Corr
1	$-0.70 - 1.72 = -35$	$-38 + 99 = +61$	-96	-38
2	$-1.64 - 0.87 = +4$	$-90 + 50 = -40$	$+44$	$+52$
3	$-1.86 + 0.00 = -138$	$-102 - 0 = -102$	-36	-47
4	$-1.85 + 0.13 = -102$	$-101 - 7 = -108$	$+8$	-4
5	$-1.70 + 0.75 = -111$	$-93 - 43 = -136$	$+25$	$+13$
6	$-1.47 + 1.13 = -149$	$-80 - 65 = -145$	-4	-9
7	$-0.70 + 1.72 = -117$	$-38 - 99 = -137$	$+20$	$+43$
8	$+0.00 + 1.85 = -201$	$+0 - 106 = -106$	-95	-41
	$-9.92 + 2.89$		$+97$	-231

Normal Equations

Average = 41

$$+15.60 - 1.74 = +953 - 9.92$$

$$-1.74 + 11.96 = -782 + 2.89$$

$$+1.74 - 0.19 = +106 - 1.10$$

$$+11.77 - 676 + 1.79$$

$$b = -57.5 + 0.15$$

$$+15.60 = +953 - 100 = +853$$

$$a = +54.6 - 0.62$$

Arc 158

 $\frac{\sum v}{n}$

$$\frac{\sum p}{n} = .19$$

$$-17$$

$$\frac{-17}{.19} = -89$$

$$\Delta R = -1.0$$

$$\text{Corr} = -1.0$$

$$\text{True } \Delta R = 0.0$$

$$-2R = -3.72 \quad -2R \cdot \text{Corr} = +3.72 + 74$$

$$\Delta b = +0.56 + 11 \quad \Delta S = +0.3$$

$$\Delta a = -2.31 - 46 \quad \Delta \alpha = -0.08$$

7677

Moon's Center

0

C

O-C

1	-0.70 - 1.72 = -35	-38 + 99 = +61	-96
2	-1.64 - 0.87 = +4	-90 + 50 = -40	+44
3	-1.86 + 0.00 = -138	-102 - 0 = -102	-36
4	-1.85 + 0.13 = -102	-101 - 7 = -108	+8
5	-1.70 + 0.75 = -111	-93 - 43 = -136	+25
6	-1.47 + 1.13 = -149	-80 - 65 = -145	-4
7	-0.70 + 1.72 = -117	-38 - 99 = -137	+20
8	+0.00 + 1.85 = -201	+0 - 106 = -106	-95
			+97-231
			Average -41

Normal Equations

$$+15.60 - 1.74 = +953$$

$$-1.74 + 11.96 = -782$$

$$+1.74 - 0.19 = +106$$

$$+11.77 = -676$$

$$b = -57.5$$

$$+15.60 + 953 - 106 = +853$$

$$a = +546$$

Circ 158

 $\frac{\sum v}{n}$

$$\frac{b}{n} = 19$$

$$-17$$

$$\frac{-17}{19} = -89 \quad \Delta R = -10$$

7677 Moon's Mean Position (1915.6)

$$\begin{array}{r} X_0 = 227000 \\ + 27 \\ \hline 227027 \end{array} \quad \begin{array}{r} Y_0 = 168670 \\ - 29 \\ \hline 168641 \end{array}$$

From Plate Constant $x = 22.4765$ $y = 16.8276$

$$z = +0.4765$$

$$\eta = -1.1724$$

$$\begin{array}{r} \log \xi = 9.67806 \\ - \log \zeta = 9.94803 \\ \hline 8.50724 \end{array}$$

$$\begin{array}{r} \log \tan \delta = 9.7134 \\ 9.3561 \\ \hline 7.0534 \\ 6.1229 \end{array}$$

$$\alpha - A = 1.22279$$

$$\begin{array}{r} \mu_1 = +1 \\ \mu_0 = -1.1725 \end{array}$$

$$\alpha - A = +16.70$$

$$\begin{array}{r} \log \mu_0 = 0.06912 \\ 7.33115 \end{array}$$

$$A = 5 \ 03 \ 10$$

$$\alpha_0 = 5 \ 03 \ 26.70$$

$$\alpha - D = 2.73797$$

$$\text{Red} = +1.97$$

$$S - D = -9 \ 07.0$$

$$\alpha' = 5 \ 03 \ 28.67$$

$$D = +27 \ 37 \ 30$$

$$S_0 = +27 \ 28 \ 23.0$$

$$\text{Red} = +1.12$$

$$S' = +27 \ 28 \ 34.2$$

7677 known mean Position (1918.0)

$$X = 227000$$

$$Y = 168670$$

$$+ 27$$

$$- 29$$

$$227027$$

$$168641$$

From plate constant $X = 2.4765''$ $Y = 16.8276''$

$$3 = +0.4765''$$

$$4 = -1.1724''$$

$$\log 5 = 9.67806$$

$$+ 0.35 = 9.94803$$

$$8.50724$$

$$\log \tan 5 = 9.7134$$

$$9.3561$$

$$7.0534$$

$$6.1229$$

$$(x - A) = 1.22279$$

$$m_1 = +1$$

$$m_2 = -1.1725$$

$$x - A = +16.70$$

$$A = 5^h 03^m 10^s$$

$$\log m_1 = 0.06912$$

$$7.23115$$

$$y = 5^h 03^m 26.70^s$$

$$(d-1) = 2.73797$$

$$Red = +1.97$$

$$S-D = -9.070$$

$$\alpha' = 5^h 03^m 28.67^s$$

$$D = +27^h 37^m 30^s$$

$$S_0 = 127^h 28^m 23.0^s$$

$$Red = +1.12$$

$$S' = +27^h 28^m 34.2^s$$

$$\begin{array}{r} 4 \quad 58 \quad 02.69 \\ \underline{00.84} \\ + 1.85 \end{array}$$

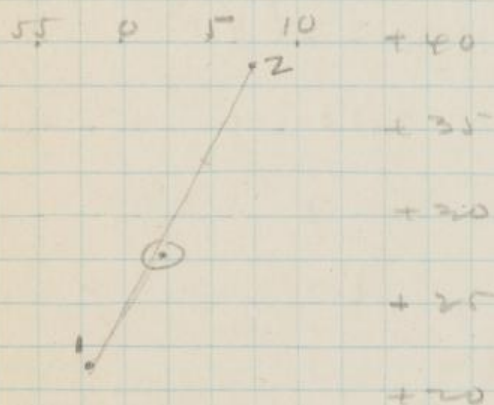
$$\begin{array}{r} + 21 \quad 28 \quad 19.6 \\ \underline{09.8} \\ + 9.8 \end{array}$$

$$\begin{array}{r} 5 \quad 07 \quad 38.74 \\ \underline{36.54} \\ + 2.20 \end{array}$$

$$\begin{array}{r} + 38 \quad 23 \quad 19.4 \\ \underline{05.6} \\ + 13.8 \end{array}$$

$$\begin{array}{r} 35 \\ 1.99 \end{array}$$

$$\begin{array}{r} 40 \\ 9.8 \\ 1.4 \\ 1.2 \end{array}$$



7677

Red. ad locum ahl.

 $S_0 = +27^\circ 28' 23''$

$$\begin{array}{rcl}
 H + \alpha & 2^h & 48.5 = 42^\circ 8' \\
 H & 21 & 451 \\
 \alpha & 5 & 03.4 \\
 G & 20 & 24.6 \\
 a + \alpha & 1 & 28.0 = 22^\circ 0'
 \end{array}$$

$$\begin{array}{rcl}
 l \cos S & & 9.9480 \\
 i & & 0.6800m \\
 (i) & & 0.6280m
 \end{array}$$

$$\begin{array}{rcl}
 l \cos(G + \alpha) & & 9.9672 \\
 g & & 0.9665m \\
 \sin \dots & & 9.5736 \\
 \tan. S & & 9.7160 \\
 & & 8.8239
 \end{array}$$

$$\begin{array}{rcl}
 g' & & 0.9337 \\
 g & & 9.0800
 \end{array}$$

$$\begin{array}{rcl}
 h & + & 0.85 \\
 g & + & 0.12 \\
 h & + & 1.00 \\
 \hline
 & + & 1.97 \checkmark
 \end{array}$$

$$\begin{array}{rcl}
 l \sin S & & 9.6640 \\
 \cos(H + \alpha) & & 9.8702 \\
 h & & 1.2989 \\
 \sin \dots & & 9.8266 \\
 \sec S & & 0.0520 \\
 & & 8.8239
 \end{array}$$

$$\begin{array}{rcl}
 h' & & 0.8331 \\
 h & & 0.0014
 \end{array}$$

$$\begin{array}{rcl}
 g' & + & 8.59 \\
 h' & + & 6.81 \\
 i & - & 4.25 \\
 \hline
 & + & 11.15
 \end{array}$$

7677

Red. ad brown apt.

S. + 27° 28' 23"

$$H+A \quad 2^h \quad + 8.5 = 42^{\circ} 8'$$

$$H \quad 21 \quad 451$$

$$A \quad 5 \quad 03.4$$

$$G \quad 20 \quad 24.6$$

$$C+A \quad 1 \quad 28.0 = 22^{\circ} 0'$$

$$L \cos S \quad 99480$$

$$i \quad 06800m$$

$$(i) \quad 0.6280m$$

$$L \cos(G+A) \quad 99672$$

$$g \quad 0.9665$$

$$\sin \quad 95736$$

$$\cos S \quad 97160$$

$$88239$$

$$g' \quad 0.9337$$

$$g \quad 9.0800$$

$$h + 0.85$$

$$g + 0.12$$

$$u + 1.00$$

$$+ 197^{\circ}$$

$$L \cos S \quad 96640$$

$$\cos(H+A) \quad 98702$$

$$h \quad 12989$$

$$\sin \quad 98266$$

$$\cos S \quad 0.0520$$

$$88239$$

$$h' \quad 0.8331$$

$$h \quad 0.0014$$

$$g' \quad + 859$$

$$h' \quad + 681$$

$$i \quad - 425$$

$$+ 1115$$

7677

Lunar Parallax

$$\begin{array}{rcl}
 \alpha' & = & 5 \quad 03 \quad 28.67 \\
 \theta & = & 3 \quad 47 \quad 38.0 \\
 \theta - \alpha & = & -1 \quad 15 \quad 50.67 \\
 & - & 18^\circ \quad 57' \quad 40''
 \end{array}$$

$$- \quad 7 \quad 26$$

$$- \quad 18 \quad 50 \quad 14$$

$$\begin{array}{r}
 9.95727 \\
 0.00000 \\
 \hline
 0.02391 \\
 9.98118
 \end{array}$$

$$42 \quad 45 \quad 32$$

$$27 \quad 28 \quad 34$$

$$16 \quad 17 \quad 00$$

$$\begin{array}{r}
 9.82640 \\
 8.20218 \\
 9.44776 \\
 0.16013 \\
 \hline
 7.63647
 \end{array}$$

$$S - S' \quad +14 \quad 53.1$$

$$S \quad 7 \quad 27 \quad 43 \quad 27.3$$

$$\text{Ann Eph S} \quad +27 \quad 43 \quad 27.5$$

$$O - C \quad - \quad 0.2$$

$$\begin{array}{rcl}
 \text{Curv. of Plate} & + & 0.7 \\
 \text{Dev.} & + & 0.3
 \end{array}$$

$$2^{\text{nd}} \text{ Ord. Ref.} \quad 0.0$$

$$S - +27 \quad 43 \quad 27.6$$

$$O - C = \quad + \quad 0.1$$

$$S = +27^\circ 28' 34''$$

$$IT \quad 54' 45.72$$

$$9.86913$$

$$8.20218$$

$$9.51179 \sim$$

$$0.05296$$

$$\hline 7.63606 \sim$$

$$\alpha - \alpha' = -14' \quad 52.25$$

$$= - \quad 57.48$$

$$\alpha \quad 5 \quad 02 \quad 29.19$$

$$\alpha \quad 5 \quad 02 \quad 28.17$$

$$+ \quad 1.02$$

$$\begin{array}{rcl}
 \text{Curv} & + & 0.01 \\
 \text{Dev} & - & 0.08
 \end{array}$$

$$\alpha \quad 5 \quad 02 \quad 29.01$$

$$O - C \quad + \quad 0.94$$

7677

Lunar Parallax

$\alpha = 5^h 03^m 28.67^s$
 $\delta = 3^{\circ} 47' 38.0''$
 $\alpha - \delta = -1^h 15^m 50.67^s$
 $- 18^{\circ} 57' 40''$

$- 7^h 26^m$

$- 18^h 50^m 14^s$

995727

000000

002391

998118

43 45 32

27 28 34

16 17 00

9.82640

820218

944776

016013

763647

$\delta - \delta' + 14^{\circ} 53.1'$

$S 727^{\circ} 43' 27.3''$

Amplified $+27^{\circ} 43' 27.5''$

$\alpha - \epsilon - 0.2$

Curv. of Plate $+0.9$

Dev. $+1.2$

2nd Ord. Ref. 0.0

$\delta + 27^{\circ} 43' 27.6''$

$\alpha - \epsilon = +0.1$

$S = +27^{\circ} 28' 34.2''$

$\Pi 54' 45.72''$

986913

820218

951179

005296

763606

$\alpha - \alpha' = -14^{\circ} 52.25'$

$= - 59.48''$

$\alpha 5^h 02^m 29.19^s$

$\alpha 5^h 02^m 28.17^s$

$+ 1.02''$

Curv $+0.01$

Dev -0.08

$\alpha S 02^m 29.11^s$

$\delta - \epsilon + 0.94''$

1916

