

KG
11365
284

1866phae.proj.28
10
KG 11365.284.

Observations with East
Equatorial.

(Original.)

No. 1.

1866 June 9 to July 6.

June 9th

* Titan
 * (Phoebe)
 * (Dione)
 * (Jettys)
 * Titan

at 8 20

S.P.L.

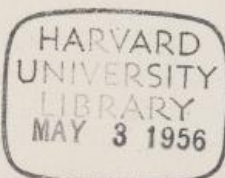


1 2 3
 3

fig 2



KG 11365.284



June 9th

Litan

Position $243^{\circ} 18'$

list

7.14

1 { $30.5-3$
 37.67

8.43^m

28.93

8.47

36.33

7.40

7.76

$27.5-5-$

35.31

$8.5-1$

7.82

26.31

34.13

$8.5-4^m$

7.59

$25-12.0$

32.71

$8.5-6^m$

7.78

23.61

31.39

$8.5-9$

The Planet and satellite as these measures were taken was gradually approaching the edges of the field. The last was taken near the edge

June 9th Saturday

3

Litan. dist 26.06² power 401 942^m
 $\begin{array}{r} 7.43 \\ 33 \end{array} \underline{49}$

7.44 30.09 946^m
 $\begin{array}{r} 37 \\ 53 \end{array}$

7.53 28.52 948
 $\begin{array}{r} 36 \\ 09 \end{array} -$

7.43 29.24 952
 $\begin{array}{r} 36 \\ 67 \end{array}$

7 6.6 25.88 955^m
 $\begin{array}{r} 33 \\ 54 \end{array}$

These measures were made with a power of 401

The Stellas focus was adjusted before making these measures (on this page)

7.47 32.33 90^m 1^m
 $\begin{array}{r} 39 \\ 80 \end{array}$

Same circumstances as those above

June 9

Titan Position $240^{\circ} 20'$ $10^h 8^m$
 $239 \quad 10-$
 $238 \quad 45-$

 $239 \quad 47$ $118 \quad 20$ $10 \quad 12$

Put on lowest power again

$10^h 24^m$ Titan and No. 3 fig 2 Titan, Rhean

Position $183^{\circ} 30'$
 $183 \quad 20$

Distance $10^h 22^m$

$4^r 12$ $37 \quad 48$
 $41 \quad 50$

4.09 40.88
 44.97

$10^h 27^m$

Titan and No 2

Titan and Dione

Position $211^{\circ} 30'$
 $213 \quad 45-$ vision bad
 $211 \quad 20$

dist $42^r 22$
 431 $46 \quad 53$

$10^h 38^m$

Star near equator on the meridian runs along
the wire at position $289^{\circ} 50'$
109 47

June 9

Saturn's Satellites

Rhea, Deane

2 and 3 Position

279° 5'

10^h 44^m

Dist

47 35-

10 49

2.1 2

49 47

Bad Seeing
for these two

* 2 46

51 95-

49 49

10 54

2 06

51.94

54 00

10 55-

1 and 3

Rhea, Kethys

Dist

5-6 5-3

11^h 0^m

4.6 9

6 1 22

This measure of distance is a good one, but
the seeing became too bad to repeat it

61 82

4.4 3-

66 27

Separate with the above result

11^h 8^m

the position is

1 2 and 3 in a line see fig. 2 page 1

Sunday June 10

6

• titan

Fig 1. 8^h 50^m Mean time

Seeing very bad

(Rhea) 1

(Dione) 2



3 (Jethys)

Titan Position

35° 9' 20"
10' 10"
0° 30'
0° 20'

14^h 15^m 45^s
14 21 15
14 22 30
24 00

dist

614

70.64
64 50

14 27 30

616

6436
58.20

14 32 30

Saturn

7

No 3 Position

unsteady

245 5'
246 15'
247 45'

14^h 38^m
14 43
14 45

Dist

61 29
59 26
2 03

14^h 47^m

faint

2.08

65 79
63 71

14 49

The position of this ^{the colour} ~~alt.~~ satellite was measured by placing the wires tang. to the ball of the planet and the satellite in the middle between them. The distance was measured by placing one wire on the satellite and the other across the middle of the planet. In all previous cases the distance had been measured in this way but the positions by placing the wires across the ball of the planet.

No 1 Position

138° 10'
137 30
135 20
136 00

14^h 55^m 40^s
14 59 30
15 1 15
15 3 00

External Thermometry. 8-20

Saturn

June 10

8

No 2 Position

	290° 00'		15 ^h 8 ^m
	290 30'	Time not used	
	<u>290 20</u>		<u>15^h 13^m</u>
Distance	70 ^r .71		15-16
6.10	<u>64.61</u>		
	6.10		
6.02	72.79	observed and	15-19
	<u>66.77</u>	unsteady	
5.91	75.49		15-23 30
	<u>69.58</u>		
6.30	73.85 (355)?		15-28 15-
	<u>67.55</u>	very faint	
5-77	73.37	very faint	15-31 15-
	<u>67.00</u>		

The positions were taken with the wires tangent to the ball in all cases except that of Titan. Seeing was occasionally good - at the close very bad. The time by Sidwell Chronometer No 256.

June 11

Titan

Position

319° 40'

13^h 26

319 45-

13 30

dist

65² 76

13 34

76. 03

1027

10.27

66. 94

13 39

76 83

989

9.89

68 39

13 42

78 61

1022

10.22

71.21

13 46

81 34

1013

The positions and the first measure of distance were taken by twilight. without illumination of wires. The wires across the centre of the planet

June 11

13^h 53

①

② (Tethys)



① Rhea

③ (Dione)

Saturn June 11

No 1

Position

282° 45'

14^h 3^m

282 50

14 630

dist

53^r.91

14 1030

45.95

unsteady

7.96

53^r.74

14 14

7.83

45.91

unsteady

8.06

51.91

14 1630

43.97

unsteady

8.15-

50.20

18 30

42.05-

unsteady

7.82

48.24

21.00

40.42

bad seeing

7.93

46.02

23 00

38.09

Semi-diameters of Planet

45.71

44.80

.91

Saturn June 11

No. 3

Position

$$\begin{array}{r} 314^{\circ} 26' \\ 312 \quad 15' \\ \hline 313 \quad 0' \end{array}$$

$$\begin{array}{r} 14^{\circ} 32' \\ 35' \\ \hline 37 \end{array}$$

dist

$$\begin{array}{r} 46.54 \\ 3.97 \quad \hline 42.57 \end{array}$$
13^h 14
$$\begin{array}{r} 44.91 \\ 3.92 \quad \hline 40.99 \end{array}$$

15-16

clouds prevented any measurement of No. 2
 The positions of No. 3 were taken with the wires
 tang to the ball

Titan - S. P. L Position

$$\begin{array}{r} 319^{\circ} 10' \\ 317 \quad 20' \\ \hline 318 \quad 30' \end{array}$$

$$\begin{array}{r} 10^{\circ} 24' \\ 15' 26' \\ \hline 15' 32' \end{array}$$

dist

$$\begin{array}{r} 10.64 \quad \text{good} \quad 45.72 \\ \hline 35.08 \end{array}$$

15-36

$$\begin{array}{r} 10.55- \quad 45.64 \\ \hline 35.09 \end{array}$$

15-40

June 11

Mr S. P. L.

35.92½

15.45-

34.49

1.43½

35.583-

34.340

1.243-

46

Panthan

1.245

22° 00

N 55.7

20 45

5/9

JW.

199° 15

16.3

120

19° 15.

18.30.

16.4½

bad - 14.40.

16.6½

15.40

16.8.

SPL

15.

NW

13.40.

10.48

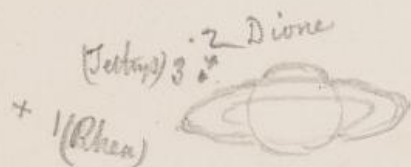
28.40

10.57

14.20

June 15

Friday

Seeing very bad
lowest power on

Litan

Litan

Position

280° 31' 2. W
281 50 B. P
280 16 2. W
281.1' B. P

M. T

9.24 NA

9 33

215

dist

17.630

45.825-
28.195

9.41 2. W

17.195

7.365-
24.560

9.48 B. P

17.46

43.79
26.53

9.56 2. W

17.63

42.25-
24.62

9.59

June 15 -

Titan

Distance

$$\begin{array}{r} 0.703 \\ 16 \ 08 \\ \hline \end{array}$$

58.60

$$\begin{array}{r} 41 \ 37 \\ \hline \end{array}$$

17.23

44.00

$$\begin{array}{r} 36 \ 56 \\ \hline \end{array}$$

17.44

51.82

$$\begin{array}{r} 34 \ 43 \\ \hline \end{array}$$

17.39

N. Y.

10 ^h 2 ^m 13. P10 ^h 10 ^m 13. P

10 22 J. W

10 25 J. W

No 1

Position

294° 45'

$$\begin{array}{r} 294 \ 10 \\ \hline \end{array}$$

10 29 J. W

10 32 B. P

Distance

33.125

41 03

$$\begin{array}{r} 7.905 \\ \hline \end{array}$$

7.90

10 35 J. W

Illumination reached

the last measured the best

7.79

35.77

$$\begin{array}{r} 43 \ 56 \\ \hline \end{array}$$

10 38 J. W

6.97

40.07

$$\begin{array}{r} 47 \ 04 \\ \hline \end{array}$$

10 44 B. P

June 15

No 1 Distance

49.65-

10 47

B.P

41 827.83

Seeing much improved No 3 becomes visible

No 2

137° 20'

139 4'

139 0'

132 45-

105.2 1/2 J.W

105 1/2

105 0-

10 1 B.P

No 3 Position

127° 45'

126 52

123 15-

121 52

124 0

121 45-

11 5 J.W

11 6 J.W

11 9 J.W

11 10 J.W

11 14

dist.

52 49

49 19

3.36

11 16 J.W

3.39

54 43

51 04 96

11 19 1/2 J.W

June 15- 1856

No 223

56 06

52 57

11 22.4

349

55 97

made without

11 30.2

3.28

52 69

the clock

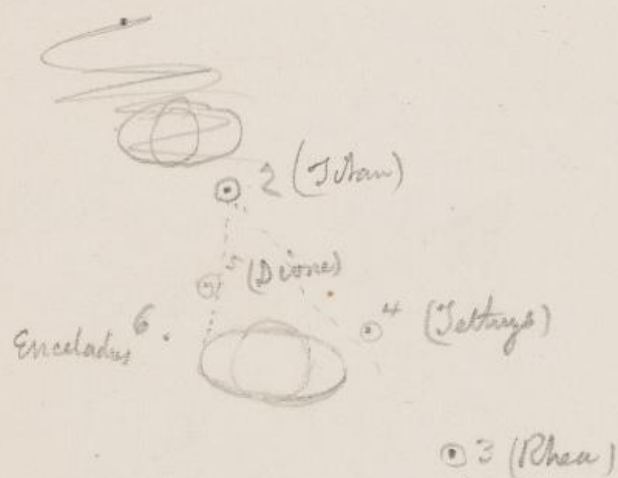
Monday June 25th 1866

⊕ Titan



• very bright star

June 26. 8.33 M.T. S.P.H.



Corr. to obs. times
+ 7^m.

Soz	Saturn Position	35° 20' 10"	2. m	mean time
		171 35-		8 ^h 35-
		171 50		8 42
				8 46
	Distance	39 ^r 38		8 54
	6.205-	45 58.5		8 58
		41.14		9 03 ^m
	6.18	47 32		9 05-
		42.90	G.M.S	
	6.16	49.06		
	6.18	42.11-		
		48.33		

No. 4

June 26

Position

254° 10'

2^d house9 10^m

246 50

lowest house

9 19

251 50

lowest house

9 21

253 20

2^d house

9 24

Dist

44.90

9 26

2.22

42.68

Very
unsteady.

2.245

42.43

9 30

40.185

No 3

Position

~~100° 24'~~~~9 34~~

120 15

9 35

120 20

9 38

120 15

9 39

Distance

35.025

9 41

5.73

29.315

unsteady

6.08

32.70

9 44

26.62

5.87

30.01

9 46

24.134

No 5 Position

127 10
128 50
127 15

L. m

9 49
9 52
9 53
9 55

Rather unsatisfactory measure

Distance

~~221 30~~
~~22~~
19.435
22 845

3.41

3.355

17.625
20.98

9 58

No 2 Position

167 1
168 43
168 34
168 49

10 4
10 7
10 8
10 9

Distance

6.24

17.10
23.34

10 22

6.52

16 53
23.05

10 23

6.50

15.94
22 44

10 25

lowest power
bright star.

283 21
103 6

10 45

out of meridian

thread set for star
to run along it.

283 47
103 53

284 3

104 9

Circle turned
on axis.

~~284 30~~

267 26 29
87 31

lowest power
small star.

267 14 16
87 19

thread set so that
star runs along it.

about 15 m ^{past} ~~from~~
meridian

267 16 19
87 22

June 30

1866

Jupiter

3. Jethys



Planet low seeing very poor

2 Dione
1 Rhea

Diagram 10^h 9^m M I.

Watch time.

No 1 Position

wires tangent to ball
planet unsteady

154 40

10^h 11^m

better measure

153 55

10 13

Distance

illumination on
both sides for the first time.

49.14

10 15

46.715

2.425

48.705

10 17

46.11

2.595

10 18

48.115

45.50

2.615

10 20

47.87

45.28

2.59

No 2 Position 129 29 10 23
 definition bad
 this also poor — 128 25 10 24
 / 127 58 10 26
~~10 29~~

Distance 53.675 10 29
 51.20
 2.475
 Satellite
 object faint 55.02 10 31
 and planet unsteady 52.40
 2.62
 56.79 10 33
 54.22
 2.57

~~No 3~~ Titan Position
 wires across middle 265 40 10 39
 of planet 265 57 40
 Planet very unsteady 266 20 43
 Distance 63.83 46
 44.785
 19.045

$$\begin{array}{r} 58.07 \\ 39.49 \\ \hline 18.58 \end{array}$$

10 52

$$\begin{array}{r} 55.285 \\ 36.525 \\ \hline 18.76 \end{array}$$

10 56

$$\begin{array}{r} 53.22 \\ 34.44 \\ \hline 18.78 \end{array}$$

10 56

{ Bootis

Position

Observer

$$S \left\{ \begin{array}{l} 59 \ 40 \\ 56 \ 36 \\ 57 \ 53 \end{array} \right.$$

$$W \ 56 \ 36$$

$$S \ 59 \ 5$$

$$48.23$$

$$48.74$$

$$\hline 0.51$$

$$46.47$$

$$47.15$$

$$\hline 0.68$$

$$43.38$$

$$43.94$$

$$\hline 0.56$$

$$41.84$$

$$42.30$$

$$\hline 0.46$$

Watch slow of
sidereal clock

$$6^h \ 35^m \pm 10^s$$

at $11^h \ 15^m$ Watch time

Corr to Watch

$$-1^m$$

Walk Time

July 1

sid
Clock 14 5 10
watch 7 32

End. 258 30
Position 259 40
259 20
259 20

8 11 13 14

~~Measure taken~~

in twilight without illum. of wire.

Defn. remarkably good but object faint. Wire across middle of image.

not enough illuminated.

Distances
41.62
Measure 45.025
not very satisf. wire 3.405

illumination applied for position angles.

on both sides.

All these measures of long M.

with power no 2.

(went to the lowest.)

39.425
42.63
3.205

37.64

40.80
3.16

35.74

38.69
2.95

34.77
37.81
3.04

21

21

23

25

26

of
allC
S

July 1 contin: Minus not visible.

Telthys	Position	313 10	8 30
Wires tangent to Planet.		316 3	32
		314 40	33
unsatisfactory at time		[316 50]	34
wire across middle		313 50	36
of planet		313 15	36
		315 55	38

Distance

	30.985	42
	33.84	
1?	[2].855	
	30.79	43
	32.55	
	<u>1.76</u>	
	28.90	46
	30.77	
	<u>1.87</u>	
	27.40	48
	29.13	
	<u>1.73</u>	

G. S. observer.

Rheav.	Position	89 37	8 58
		~~89~~ 14	
		34	
		12	
		<u>89 13</u>	9 4
J w obs.		40.80	
		32.04	
		<u>7.76</u>	9 15
M S obs.		41.09	
		33.07	
		<u>8.02</u>	9 20
J w obs.		40.03	
		32.27	
		<u>7.76</u>	9 23
		28.13	
		30.25	
		<u>7.88</u>	9 25

Dione Position

240 53

9 30

240 30

31

241 30

32

Better than last 242 5

32

241 15

33

Distance

38.19

36

35.12

3.07

39.42

37

36.16

3.26

40.525

39

37.23

3.295

Last two each
double weight.

40.415

41

37.12

3.295

Titan Position

79 0

78 35

very careful measure

79 20

Distance

~~60.73~~
~~60.91~~
~~60.62~~

60.73

60.91

.87

60.62

60.78

43.735

75

745

735

43.74

9 47

9 47

5054

54

S Observer

79 2

79 13

78 58

Distance

[61]47

49.50

11.97

67.65

50.77

16.88

10 7

9

11

13

18

68.51

10 20

51.67

16.84

69.14

10 22

52.27

16.87

4 w obs.

Position of transverse axis of ring

268° 7'

268 4'

Obs'ns on meridional star for zero point.
Star runs~~267 58~~

Clamp Vernier

No 1.

No 2.

267 58

87 56

~~267~~ G. S. Obs.

267 48

87 46

Power no 1.

267 30

87 27

267 36

87 34

Sid. clock

18 0 41

Watch

11 20 50

Therm. $59\frac{1}{4}^{\circ}$ Corr. watch to M.T. $-0^m 3^s$ at beginning of obs
 $-0^m 7^s$ at end.

July 2

Zero of position circle shifted since last night.
G. S. Obs.

Transverse axis of ring

Watch time

Position

Vernier 1

2

7 33

263 56

83 54

263 47

83 45

7 44

264 21

84 19

7 46

Outside Diameter

64.80

7 50

68.994.19

64.79

52

68.964.17

76.68

53

72.504.18

Conjugate axis

75.64

7 59

Outside diam.

74.261.38

39.79

8 3

(41.19?)

39.19

y w obs.

$$\begin{array}{r} 39.65 \\ 41.07 \\ \hline 1.42 \end{array}$$

$$\begin{array}{r} 39.395 \\ 40.865 \\ \hline 1.47 \end{array}$$

g s

$$\begin{array}{r} 40.17 \\ 38.83 \\ \hline \end{array}$$

$$1.34$$

Titan Position

$$66 \ 20$$

$$66 \ 4$$

$$\begin{array}{r} 66 \ 12 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \ 47 \\ 49 \end{array}$$

Distance

$$42.54$$

$$\begin{array}{r} 55.72 \\ \hline \end{array}$$

$$13.18$$

$$8 \ 54$$

p w obs.

$$\begin{array}{r}
 39.65 \\
 41.07 \\
 \hline
 1.42
 \end{array}$$

Rhea Position

218° 0'

9 22

S S Obs

Rhea Position

214 32

215 8

10 1

214 15

Distance

53.39

10 4

50. [49] 15

[4.24] 3.24?

53.35

10 8

50.14

3.21

45.03

10 16

41.76

3.27

40.03

10 13

36.75

3.28

Jethys Position	104 50	10 19
J. Han	244 56	10 31
	244 43	34
	245 4	35
	67.79	38
	55.07	
	12.72	
	67.84	40
	55.00	
	12.84	
	63.96	42
	51.23	
	12 73	

Jethys Position	100 42	10 46
	99 20	10 48
	98 55	10 50
Distance	49.37	10 54
	46.07	3.30
	49.26	56
	45.85	3.41
	49.28	57
	45.85	3.43

Dione Position.

76 50

11 1

78 36

11 3

Obs'ns on mer. star for zero point

Vernier 1

2

264 16

84 14

264 19

84 17

12^h 15^m

264 17

84 15

C - w
diff

Sid Clock.

Watch

6 43 56

19 31 20

12 47 24.

56

19 32 13

12 48 17

56

19 33 5

12 49 9

Corr. to watch - 0^m 18^s

July 3. Tuesday

G. S. Obs. Therm. at 7^h 10^m 74°

Transverse axis position

Vernier 1 264 36
 264 6
 264 5

Conjugate diam. 65.78
64.45

70.23
69.00

76.31
74.95

Transverse 49.31
45.06

45.01
40.84

36.99
32.68

f w obs.

Enceladus ~~Pos.~~ Dist.	35.12	8 32
	~~25.31~~	
	31.95	
	~~25.15~~	
	3.17	
	35.35	35
	<u>31.95</u>	
	3.40	
	35.445	36
	<u>31.937</u>	
Better than either	3.508	
of the prec.	35.535	37
	<u>31.95</u>	
	3.585	
	35.475	38
	<u>32.05</u>	
	3.425	

Position	258° 0'	good measure	42
	257 45		43

Power No 3

Tethys Position

282 30

8 45

280 45

279 45

8 46

G. S Obs

32.01

8 56

Dist.

28.81

3.20

32.23

8 59

29.00

3.23

32.20

9 0

29.09

3.11

Dione

279 5

9 4

279 8 poor

9 6

277 45 also poor

9 8

Power no 2

32.22

9 23

Dist.

27.77

4.45

32.40

9.25

27.80

4.60

32.29

9 26

27.81

4.48

Rhea

Pos.	272 59 good	9 31
	272 49 "	9 33
	272 45	9 35

Dist.

10.79	9 37
17.94	
<u>7.15</u>	
10.81	9 39
17.94	
<u>7.13</u>	
20.90	9 41
28.00	
<u>7.10</u>	

Titan

Pos.	222 53	9 45
	223 7	46
	222 25 poorer than others.	47

Definition bad.
Dist.

13.35	
21.10	50
<u>7.75</u>	
30.46	
38.37	53
<u>7.91</u>	

$$\begin{array}{r} 30.40 \\ 38.35 \\ \hline 7.95 \end{array}$$

9 54

Rhea. (July 3rd 10.5 M.Y. SPL.)

Position

$270^{\circ} 45'$
 $270^{\circ} -$
 $270^{\circ} 15'$

all poor. Definition
grows worse.

10.15. M.Y.

39.07

26.86 12.21

16.57.

23.95. 7.38

10.23. Satellite invisible

Definition. very. bad.

Equator cent.

Star runs along wire 1st reading { 263.55
83.54

ξ Bootis

J W Obs Pos. 55 50
 55 30
 54 40

11 9
 11 10
 11 11

Dist. 50.71
 51.335
 0.625

11 14

G S Obs 59.81

59.22
 0.59

65.56

65.02
 0.54

69.63

69.06
 0.57

Coronae 264
J W Obs. $339^{\circ} 0'$

~~70~~

70.11

69.775

0.335

G. S. Obs. $338^{\circ} 38'$

56.57

56.24

0.33

70 of *Pinchi*

J W Obs. Pos $70^{\circ} 20'$

Dist 50.028

49.308

0.72

G S

57.10

Dist

57.67

0.57

57.13

57.66

0.53

Pos 72 17

$$\begin{array}{r}
 282 \\
 264 \\
 \hline
 546
 \end{array}$$

Maddler

g w obs $71^{\circ} 50'$

Dist 57.638

58.12

0.482

57.622

57.01

0.612

Therm at 12 45 63.5

Watch 12 49 52

Sid. Clock $19\ 37\ 42$

Clock - Watch $6\ 47\ 50$

Corr. to Watch $-0^m\ 23^s$

Observed by double

the other way
 $\frac{.365}{.365}$

Driving the screw
 one way
 $\frac{.398}{.398}$
 Obs. for backlash

$\frac{52.67}{52.385}$
 0.285

$\frac{52.23}{52.49}$
 0.26

backlash of screw perhaps
 neglected. Defining back and
 measure unsatisfactory.

Dist. $\frac{52.115}{52.30}$
 0.185

286 20

283° 48'
 287° 45'

unsure not well def.

Power

τ of ϕ in ϕ

g w

July 5. S.P.H. 1

Rhea. Position M.Y.

294.42	9 ^h . 4.
293.52	9. 15.
<u>294.53</u>	9. 18.

Rhea Distance.

49.53		
<u>58.71</u>	9.18	9.24.

34.50		
<u>43.92</u>	9.42	9.27

34.66		
<u>44.15</u>	9.49	9.30

$$\begin{array}{r} 58.55 \\ 57.925 \\ \hline 0.65 \end{array}$$

$$\begin{array}{r} 58.69 \\ 58.03 \\ \hline 0.66 \end{array}$$

p w lbs

$$\begin{array}{r} 59.10 \\ 58.44 \\ \hline .66 \end{array}$$

g. s. 237.26

$$\begin{array}{r} 45.16 \\ 44.57 \\ \hline 0.59 \end{array}$$

$$\begin{array}{r} 44.285 \\ 44.678 \\ \hline 0.393 \end{array}$$

$$\begin{array}{r} 236.45 \\ 236.45 \end{array}$$

3 roots

50 lb

p w lbs

$$\begin{array}{r} 53.24 \\ 54.24 \\ \hline 53.74 \\ 0.53 \end{array}$$

$$\begin{array}{r} 53.34 \\ 53.345 \\ \hline 0.345 \end{array}$$

$$\begin{array}{r} 340.15 \\ 53.685 \\ \hline 340.15 \end{array}$$

Coronae

July 6 Friday

50 lb lbs.

p w lbs

Jethys.

282°.54'

W.

9.^h37^m

Jethys grows too faint for
measurement being seen only by glimpses

July 7 Sat. Observation of Polaris

$7^h 58^m 49^s.0$ Time by chron.

6 46 34.0 Reading of hour circle.

18 46 27.0

III 268 36 18

III 178 35 36

I 88 35 40

II 358 35 4

51.78

Mic. reading for mid of field

— screen: perhaps inadvertently,
turned a few hundredths
of a revolution after the
adjustment.

15

