

KG
11365
14

A.14

Transit Circle
from
Dec. 1st 1852
to

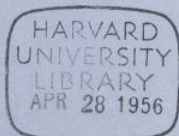
July 8th 1853

Magnetic Variation 1708 to 1853

KG-11365.14

KG 1136

KG 11865,14



(489)

Observed times at Cambridge Observatory noted in aid of Capt Charles Wilkes Experiments for ascertaining the velocity of Sound.

Chro. 239. of Boston, m. L. E. losing daily 1.5
1852. Nov. 22^d - The order in which the cannon were to be fired was as follows. all that were heard were recorded as
1 - Navy-yard, Charlestown, Station at East window of Parlour
2 - Cambridge at Table, Watertown at South window.
4 - South Boston observer at South window.

Chro No 239. Charlestown gun not heard by me
First gun - 9..01..48.2. Cambridge

2	3..51.2. Watertown Arsenal, 8 feet S.E. of chair at Table
3	6..03.2 - South Boston
4	9..9..43.3 - Camb. Bar - 30.202
5	12..08.8 - Watertown Alt. Therm. + 35°
6	13..51.8 - So. Boston Wet bulb + 33
7	17..44.1 - Camb.
8	20..40.2 - Watertown
9	22..02.7 - So. Boston.
10	25..43.9 - Camb.
11	27..56.6 - Watertown.
12	30..01.5 - So. Boston
13	33..44.5 - Camb.
14	35..50.0 - Watertown.
15	38..06.5 - So. Boston.
16	41..44.2 - Camb.
17	44..10.3 - Watertown
18	46..07.2 - So. Boston
19	49..44.8 - Camb.
20	50..57.5 - Watertown
21	54..04.0 - So. Boston
22	57..41.7 - Camb.
23	10..00..05.0 - Watertown.
24	2..06.8 - So. Boston.
25.	5..42.6 - Camb.
26	7..54.6 - Watertown
27	10..04.0 - So. Boston.
28	13..41.8 - Camb.
29	15..49.7 - Watertown
30	18..07.9 - So. Boston

(490)

Experiments for velocity of Sound.

1852.

Dec 1st - Eng -

Chro. 924 - 12..08..0 used by D.F. Bond

239 - 10..08..16 --- W.C. Bond.

Standard Barometer - 30.378

Attach'd Therms - 64°

Wet Bulb Ther.

External Ther - 32.

WB 239 - 4^m 9..41..11.2 Flash of Charlestown gun - no sound heard
 44..04.3 Flash - do - do - do
 47..05.1 Flash - " - " - Sound heard at Camb
 47..24.1 Sound - Charlestown.
 50..25.3 Sound - do -

Last gun at Charlestown neither seen or heard

9..57..41.2 Cambridge gun. sharp, roll of 1.5

10..00..41.8 - Camb. Sharp and full.

3..40.0 - do - not so sharp.

Nearly calm
6 Char.

6..39.4 - do - Strong and full 1°

9..40.5 - do - full.

10..11..00.5 -

First Watertown gun not heard.

10..16..26.2 - Watertown, Round

21..26.0 - do - Faint

24..24.7 - do - Round

27..24.3 - do -

Heard nothing from Fort Independence

Cirrus - 1 -
nearly calm.

Barometer - 30.390

Att'd Thermometer 62

External Therm° - 32.

Note, The Fort gun was not fired

(491)

Richard with Chro. No. 945.

No. 1 - 57.0 - Flash, no sound heard

2 - 11..44..57.0 - Flash

3 46.. ~~52~~.0 Flash 4 beats off
11..47..08.5 - Report

Charlestown gun.

Cambridge

1 - 11..57..25.4 duration of Report two seconds, sharp at first

2 25.8 till 36 seconds making it 10.2 duration.

3 24.6

(492)

1852.

Dec² - 2^d P.M.

Experiments on the velocity of Sound

Recorded by the Spring-Governor.

Charlestown Gun a 12 pounder

R. F. Bona

Electric clock, gaining - 5 tenths of a second on sidereal time

Flash	Report	Interval	Report Ends
E.C. 2, 33, 54.50	34, 13.45	18.95	34, 26.70
36, 54.30	37, 13.40	19.10	37, 24.95
39, 55.15	40, 14.10	18.95	40, 25.20
42, 55.15	43, 14.15	19.00	43, 25.60
45, 55.15	46, 14.15	19.00	46, 27.25
		19.00	

Observer stationed with break-circuit key at the window of the small room over the east front door of the Observer's house

E.C. Slow - 45.2 of C & gaining 9.25
 $\frac{16}{1.01.2}$

M.T.C. losing .7 - Slow - 48.36 of Boston
 $\frac{16}{32.36}$ of Cambridge

(493)

Recorded by the Spring-governor
Electric Lateral clock gaining on Lateral time
Fort Independence Boston Harbor

R. F. Bond

Flash	Report	Interval	Report-Ends
2,, 49,, 10.22	2,, 49,, 41.75~	31.53	49,, 46.45~
52,, 03.70	52,, 33.40	31.70	52,, 39.80
53,, 4.77	53,, 36.63~	31.88	53,, 41.20
2,, 58,, 5.90	2,, 58,, 37.80	31.90	58,, 42.40
3,, 01,, 4.95~	3,, 1,, 36.70	31.75	1,, 41.20
4,, 11.47	04,, 43.25~	31.78	4,, 48.2
7,, 13.73	7,, 43.57	31.84	7,, 50.9
10,, 14.60	10,, 46.38	31.78	10,, 51.5~
13,, 19.40	13,, 51.10	31.70	13,, 55.3
<u>3,, 16 19.75~</u>	<u>16,, 51.50</u>	<u>31.75~</u>	<u>16 56.9</u>
		31.761	

(494)

1852 - December, 2 - P.M. In connection with Capt. Chas. Wilkes & L.N.

Experiments for ascertaining the velocity of Sound, Cambridge Observatory, at the East window of the Parlour, observed, Flash and Sound by Chronometer No. 239. Losing daily -1.5 on mean solar time.

at 9 P.M. Standard Barometer -30.400

at a Thermometer -63°

External Therm $^{\circ}$ -37

By the Gun, pounder fired at the Navy-yard Charles town.

Flash	Report	Elapsed time	
not seen	9.. 31.. 57.2	\pm correction	rattling.
Chron. 239 - 9.. 34.. 29.2	34.. 47.3	18.1	
37.. 32.8	37.. 57.0	18.2	
40.. 32.5	40.. 51.4	18.9	
43.. 32.5	43.. 57.4	18.9	
46.. 34.0	46.. 52.6	18.6	
49.. 33.3	49.. 52.1	18.8	
52.. 33.5	52.. 52.2	18.7	
55.. 33.0	55.. 57.7	18.7	louder
58.. 32.8	58.. 57.5	18.7	
		18.62	
		last .5 18.70	
		sd on m.s. 5	
		18.75	

The wind during the time was very light from the S.E.W. hardly perceptible, nearly calm, clear except a few scattered ware clouds near the northern horizon, with some faint auroral light.

The Reports were slightly double, never exceeding the tenth of a second on the first impression, there followed a long rattling reverberation, there was a small difference in the strength of the sound

one person marked the Flash while another noted the time, a personal equation is therefore involved in the Flash observations.

(495)

Experiments on the velocity of sound continued on the same Evening, observer in the same station as during the preceding observations.

By the Gun pounder fired at Fort Independence

	Flash	Report	Elapsed time	
Chro. 239	$10..01..47.2$	$10..02..17.8$	30.6	not sharp, full and round.
	$4..40.2$	$5..11.2$	31.0	
	$7..41.0$	$8..11.9$	30.9	
	$10..41.3$	$11..12.3$	31.0	
	$13..39.9$	$14..11.0$	31.1	
	$16..46.0$	$17..17.0$	31.0	
	$19..47.5$	$20..18.7$	31.2	
	$22..48.0$	$23..19.0$	31.0	
	$25..52.3$	$26..23.5$	31.2	
	$28..52.2$	$29..23.0$	30.8	
			30.98	

Standard Bar. 30.340
 at $^{\circ}$ Therm $+61^{\circ}$
 External Therm $+35^{\circ}$
 Wet Bulb $+29.8$

M. I. Clock - $10..34..5$

239 - $10..34..44.4$

M. I. C. Slow of Camb. - 32.36

Height of our Barometer cistern
 above the mean level of the sea at
 Charlestown Dry Dock gates. 71.3

239 fast of Camb. - 12.04

239 - Slow of Boston - 3.96

Electric Sidereal Clock - $3..24..0$

EL - $3..26..0$

239 - $10..36..31.3$

239 - $10..38..20.8$

239 is Slow of Boston - 3.96

The condition of the sky and the force and direction of the wind continued as at first with little or no variation.

(496) L <

(497)

Navy Yard
Boston

(498)

Experiments to see if ΣC goes differently with the circuit on from what it does with the circuit off.

Dec. 3/4 Am. Noon

M.B. 23,49,20 E.C. 16,46,00
 1615 16,44,32.5 1615 16,46,50.4
 + 16,55,12.5 - 50.4

50.4 M.C.
 16,54,22.1 at 23,49,20

54, 23.3 23, 56, 00

54, 24.2 24, 01, 47

9.6 167.07

16, 54, 23.20 at 23, 55, 42

16, 52, 46.97

2, 04.65

16 54, 51.62

54, 52.40

54, 53.10

16, 54, 52.56

2, 48.00

2, 52.30

2, 57.21

7.51

2, 52.37

23, 55, 42

2, 56.55

1.09

0.95

0.74

0.79

ΣC 1615

16, 46 + 50.4

19, 46 50.6

23, 12 50.75

2 52 51.05

Circuit

ΣC 223

16, 53 - 58.7

19, 51 58.6

23, 24 58.6

23, 10 58.4

Circuit

(499)

Dec 4th 1852

EC 16.. 49.. 00.0 Mre-23 56.. 00
 194 16.. 46.. 56.7 194-16.. 48.. 20.0
 + 2 03.3 + 16 52 .. 20.0

EC 16.. ~~58~~.. 00
 223 16.. ~~57~~¹.. 1.3
 + 58.7

Coincidence
 MFC 0.. 01.. 47
 223 16.. 55.. 12.5
 + 16.. 53.. 25.5

EC = 17.. 00.. 00
 223 = 16.. 59.. 1.3
 + 58.7

Direct
 MFC 0.. 01.. 00
 223 16.. 54.. 25.3
 16.. 53 .. 25.3

After this interval the following comparisons were made

EC ~~18~~ 19.. 41.. 00
 194 19.. 38.. 55.35
 + 2.. 04.65

MFC 2.. 48.. 00
 194 19.. 40.. 46.97
 + 16.52 .. 46.97

EC 19.. 46.. 00
 1615 19 46 50.6
 - 50.6

Coin
 MFC - 2.. 52 30
 1615 = 19.. 48 13.0
 + 16.. 55 .. 43.0

MFC T₂.. 53.. 0
 1615 19.. 48.. 43.1
 + 16.. 55 .. 43.1

EC 19.. 51 00
 223 19.. 50.. 1.4
 + 58.6

MFC 2.. 57.. 21.0
 223 19.. 51.. 15.5
 + 16.. 53 .. 54.5

MFC 3.. 00 00
 223 19.. 53 54.95
 + 16.. 53. 54.95

The circuit was then closed at
 EC 19.. 57^m

(500)

Dec 4th 1852

The circuit having been running 3^h and 20^m
 The following comparisons were made

		coin		Direct
2C	23. 12. 00	MPC	6 20. 16	- 6 22 00
1615	23. 12. 50.75	1615	23 16. 33.5	- 23 18. 17.7
	- 50.75		+ 16. 56 17.5	56 17.7
2C	11. 20. 00	MPC	6 28 00	6. 26. 00
194	11. 17 53.6	194	23. 21. 21.5	- 23. 19. 21.2
	+ 2. 06 4		16. 53. 21.5	53 21.2
2C	23. 25. 0.0	MPC	6. 31. 36	- 6. 32. 00
223	23. 24. 1.4	223	23. 26. 06	- 23 26 30.1
	+ 0. 58 6		16. 54. 30	52. 30.1

Note The arc of vibration of the pendulum
 was noted before & after closing circuit & at the end of the
 closed circuit - the arc was apparently shortened but
 by a quantity barely perceptible

	MPC
16. 55. 26.75	6. 20. 16 1.27
55. 27. 90	28. 00
55. 28. 60	31. 36 0.99
16. 55. 27.75	6. 26. 37
	2. 52. 37
	3. 34. 00

(301)

Dec 4th PM continues
After breaking circuit

2C 2.. 52.00
1615 2.. 52.. 51.05
- 51.05

MTC 10 0 80
1615 2.. 57 2.0
+ 16.. 56 .. 54.0

9.. 59.. 00
2.. 55.. 53.7
56 .. 53.7

2C 3.. 00.. 00
194 2.. 57.. 51.7
+ 2.. 08.3

MTC 10 7 39 right 10.. 5 .. 00
194 3.. 1.. 35 3 58.. 55.05 ?
+ 16.. 53 .. 56 MTC 10.. 11.00.0

194 3 4, 56.5

2C 3.. 10 00.0
223 3.. 9.. 1.6
+ 58.4

MTC 10.. 17 55
223 3.. 13.. 2.5
+ 16.. 55 07.5

MTC 10.. 16.. 00
223 13 11.. 6.2 }

16.. 56.. 02.95 10.. 00.. 8 1.22

56.. 04.. 30 7.. 39 1.68

56 05.. 90 17.. 55

16.. 56.. 04.. 38 10.. 08.. 34

6.. 26.. 37

3.. 41 .. 57

10.. 20.. 9.0
223 9 15.. 7.8

(572) .

Rate of ΣC by closed Circuit

Let x = the difference between ΣC & a chronometer or clock at t_0
 z = their relative rate in ^{an hour} a second of time which is
 nearest to sidereal time with open circuit
 z' = their relative rate with closed circuit
 $t_0 \approx 17^h.00^m$ of ΣC

 ΣC fast of 1615

$$\begin{array}{rcl}
 t_0 \approx 17.00 & \begin{array}{l} 1615 \\ -50.4 = x_0 - 0.24z \\ -50.6 = x_0 + 2.46z \\ -0.20 = +2.70z \end{array} & \left. \begin{array}{l} \text{Before breaking circuit} \\ \text{making} \end{array} \right\} z = -0.
 \end{array}$$

$$\begin{array}{rcl}
 t_0 \approx 23.12 & \begin{array}{l} -50.75 = x'_0 + 0.00z \\ -51.05 = x'_0 + 2.67z \\ -0.30 = +2.67z \\ -0.50 = 6.37z \end{array} & \left. \begin{array}{l} \text{After breaking circuit} \end{array} \right\}
 \end{array}$$

$$\begin{array}{l}
 17y \ 1615 \\
 z = -0.098 \quad \text{at } 21^h.59^m \text{ with open circuit} \\
 21.58
 \end{array}$$

$$\begin{array}{rcl}
 t_0 \approx 19.46 & \begin{array}{l} -50.6 = x''_0 + 0z' \\ -50.75 = x''_0 + 2.43z' \\ -0.15 = 2.43z' \\ z' = -0.044 \end{array} & \left. \begin{array}{l} \text{with closed} \\ \text{circuit.} \end{array} \right\} \\
 & & \text{at } 21^h.30^m
 \end{array}$$

(503) 501 Closed Circuit Rate of EC

By 194

$$\begin{aligned}
 t_0 &= 16.49 & + 2.03.30 &= x_0 + 0.9 & \text{open circuit} & \text{Before closing} \\
 & & + 2.04.65 &= x_0 + 2.873 \\
 & & + 1.35 &= 2.873 \\
 & & z &= +0.470 & \text{at } 21.15^h 18.15^m
 \end{aligned}$$

$$\begin{aligned}
 t_0 &= 20.20 & + 2.06.40 &= x'_0 + 0.9 & \text{open circuit} & \text{After breaking} \\
 & & + 2.08.30 &= x'_0 + 3.673 \\
 & & + 1.90 &= 3.673 \\
 & & z &= +0.518 & \text{at } 25.10^h 10^m
 \end{aligned}$$

$$\begin{aligned}
 t_0 &= 19.41^m & + 2.04.65 &= x''_0 + 0.9 \\
 & & + 2.06.40 &= x''_0 + 3.653 \\
 & & + 1.75 &= 3.653 \\
 & & z' &= +0.480 & \text{at } 21.30 \text{ closed circuit}
 \end{aligned}$$

By 223

$$\begin{aligned}
 t_0 &= 16.53 & + 58.70 &= x_0 + 0.9 \\
 & & + 58.60 &= x_0 + 2.973 \\
 & & - 0.10 &= 2.973 \\
 & & z &= -0.033 & \text{open circuit}
 \end{aligned}$$

$$\begin{aligned}
 t_0 &= 23.25 & + 58.60 &= x'_0 + 0.9 \\
 & & + 58.40 &= x'_0 + 3.753 \\
 & & - 0.20 &= 3.753 \\
 & & z &= -0.053 & \text{open circuit}
 \end{aligned}$$

$$\begin{aligned}
 t_0 &= 19.51 & + 58.60 &= x''_0 + 0.003 \\
 & & 58.60 &= x''_0 + 3.973 \\
 & & z' &= 0.000 & \text{closed circuit}
 \end{aligned}$$

(504) .85

By M.P.C

EC part of M.P.C

$$t_0 = M.P.C \quad 23..55..42$$

$$+ 16..54..23.20 = x_0 + 0 \eta$$

$$16..54..52.56 = x_0 + 2^h.56^m.55^s \times \eta$$

$$+ 29.36 = 2^h.56^m.55^s \times \eta$$

$$29.36 = 2.9487 \eta$$

$$\eta = 9.958$$

Before making circuit

$$t_0 \quad 6..26..37$$

$$16..55..27.75 = x'_0 + 0 \eta$$

$$16..56..4.38 = x'_0 + 3^h.41^m.57^s \times \eta$$

$$+ 36.63 = 3^h.41^m.57^s \times \eta$$

$$36.63 = 3.700 \eta$$

$$\eta = 9.900$$

After breaking circuit

$$t_0 \quad 2..52..37$$

$$16..54..52.56 = x''_0 + 0 \eta'$$

$$16..55..27.75 = x''_0 + 3^h.34^m.00^s \times \eta'$$

$$+ 35.19 = 3^h.34^m.00^s \times \eta'$$

$$35.19 = 3.567 \eta'$$

$$\eta' = 9.866$$

Closed circuit

$$29.36 = 1.46776$$

$$36.63 = 1.56384$$

$$35.19 = 1.54642$$

$$2.949 = 0.46960$$

$$3.70 = 0.56820$$

$$3.567 = 0.95230$$

$$9.958 = 0.99816$$

$$9.900 = 0.99564$$

$$9.866 = 0.99412$$

10.00 =

15

(505)
Closed Circuit Rate of E.C.
Summary of Results

1615	194	223	M.P.C.
$z = -0.074$	$= +0.470$	$= -0.033$	$= +9.958$
$z = -0.082$	$+0.480$	$= -0.000$	
mean -0.078	$+0.475$	$= -0.016$	
$z' = -0.044$	$+0.518$	$= -0.053$	

By comparisons with

1615	194	223	M.P.C.	
$z = -0.074$	$+0.470$	-0.033	$+9.958$	Before closing
-0.082	$+0.518$	-0.053	$+9.900$	After breaking
Mean -0.078	$+0.494$	-0.043	$+9.929$	Mean
$z' = -0.044$	$+0.480$	0.000	$+9.866$	Circuit on
$+0.034$	-0.014	$+0.043$	-0.063	

The hourly increase of rate of E.C. when the circuit is closed over its rate when there is no circuit by comparisons made with three chronometers & the mean time clock - its rate for three hours preceding & three hours following the period during which the circuit was closed being compared with its rate with closed circuit gives the following results

Gaining Rates positive

Open circuit rate - Closed circuit rate = -

Closed circuit rate - Open circuit rate	$= +0.034$	By comparison with	1615
"	$= -0.014$	"	194
"	$= +0.043$	"	223
"	$= -0.063$	"	M.P. Clock
Final Result	$= 0.000$		
With a probable error	$= \pm 0.031 = \pm 0.016$		

We may therefore conclude that the passage of the circuit does not affect the hourly rate of E.C. by the amount of the probable error of the above result.

(506)

a = -0.102
b = +0.002
c = -0.045

(507)

Ill East

Rate of E.C. + 0.570

Dec. 7/8 Am

C.M.S. obs.

E.C.	E.C.	E.C.	E.C.
η Bootis	α Bootis	Venus II limb	Moon's II limb
13.40	29.45	54.75	42.45
27.90	44.00	9.00	56.70
+ 19°.08	+ 19°.57	- 11°.24	- 11°.48
42.50	58.75	22.85	10.35
57.05	13.20	37.16	25.70
11.55	28.00	51.05	40.20
26.00	42.45	5.15	54.50
13.47.40.80	14.08.57.20	14.31.19.55	14.41.09.15
219.20	273.05		239.05
180	180		60
7)399.20	7)93.05		7)179.05
57.03	13.29		25.58

13.46.57.03

c - .04

a - .04

b + .00

r - .03

- 2 + 42.04

13.47.38.96

13.47.39.97

14.08.13.29

- .04

- .04

00

- .03

+ 42.04

14.08.55.22

14.8.55.21

14.40.25.70

- .04

- .08

00

- .05

+ 42.04

14.41.27.57

η Bootis - 42.05

α Bootis - 42.03

u = - 42.04

(508)

Fl. East

Dec. 8/9 Ann.

E.C.

a Bootis

30.45

44.80

59.35

14.05

28.80

43.20

14.08. 57.80

278.45

180

98.45

14.08. 14.06

14.08. 55.25

41.19

Dec. 12/13 Ann.

E.C.

a Bootis

33.20

47.80

2.45

17.10

31.60

46.20

14.09. 01.00

179.35

60

2119.35

14.08. 17.05

14.08. 55.36

38.31

Dec. 13/14 Ann.

E.C.

a Bootis

34.23

48.80

3.25

17.95

32.20

47.15

14.09. 02.00

185.58

60

7125.58

14.08. 17.94

14.08. 55.37

37.48

Dec. 8/9 Ann.

M.S.B. 21.11.45

1615 14.26.34.0

21.8

14.26.12.2 17.09.34.19

17.10.20.93 46.74

21.15.51.27 17.10.20.93

3.29.02

21.12.22.25

21.11.45

37.25

16

53.25

Dec. 12/13 Ann.

M.S.B. 20.11.57.30

1615 14.28.21.5

37.89

14.27.43.61

17.26.07.16

21.01.36.45

3.26.67

20.58.09.78

20.57.36

39.78

16

56.78

17.25.20.42

46.94

17.26.07.16

2.53.63

4.41
55.72
60.19

53.78

5.6

61.38

(509)

509

Dec. 17/18 Ann.

Elb.	Elb.
α Corona Borealis	α Serpentinis

~~1st~~

42.60

19.20

56.45

34.60

10.15

50.20

24.10

5.50

38.00

21.00

57.70

15. 28. 36.50

15. 37. 05.80

1852

(570)

a - 0.160

b - 0.008

c - 0.092

Rate of El + 0.80

December 18 Pm

Ill. East

1615 ⁻	E.C.	El	E.C.
$t_0 = 23^h$ Piscium	27 Piscium	33 Piscium	α Andromeda
— 32.34.86	list	30.80	24.50
+4.49 ^{am} 4.5	"	44.80	40.20
18.0	-4.22 ^{clouds} "	-6.32 ^{56.60}	+28.16 ^{55.80}
32.0	"	12.45	11.40
45.5	"	26.20	27.00
23.33.59.5	59.95	39.95	42.50
$\Sigma = 159.5$	23.57.14.00	23.57.53.90	00.00.58.15
cor = -68.86		264.70	259.55
5/90.64		150	120
18.13		7/84.70	79.55
-2		12.10	00.00.11.36
16.13		23.57.12.10	00.00.46.70
23.33.16.13		c - .09	35.34
		a - .12	
		b - .01	
		r - .03	0.00.11.36
c - .09		-a + 35.50	- .10
a - .10			- .05
b - .01			- .01
r - .02			- .03
-u +35.50			+ 35.50
23.33.22.15	23.57.7.57	23.57.47.35	0.00.46.69
		23.57.47.44	0.00.46.70

i Piscium 1615 + 53.76
 α Andromeda E.C. - 35.51
 r Pegasi - 35.48
 β Ceti - 35.50
- 35.50

$$\begin{aligned} a &= -0.184 \\ b &= -0.008 \\ c &= -0.107 \end{aligned}$$

(372)

Ill. East

Rate of $\delta\delta + 0.90$ Dec. 21st P.M.

$\delta\delta$ α Arietis	$\delta\delta$ ϵ Beti	$\delta\delta$ ϵ^2 Beti	$\delta\delta$ γ Beti	$\delta\delta$ Monsi limb
$t_0 = 1^h$ 35.70	clouds 03.57.90	6.00	26.90	3.05
+22°.46' 50.50	+6°.09' 21.60	+7°.48' 19.70	+2°.37' 40.60	+11°.19' 17.70
5.15	25.50	33.95	54.40	31.80
20.25	39.45	47.70	6.05	45.90
35.10	53.40	1.70	21.85	0.40
50.00	27.20	15.25	35.30	14.60
1. 59. 5.00	2. 05. 21.20	2. 20. 29.40	2. 35. 49.50	2. 37. 29.15
20.1.70	$\Sigma = 158.35$	153.70	236.80	142.60
160	cor = -41.56	150	150	150
7) 141.70	6) 116.79	7) 333.70	7) 56.50	7) 32.60
1. 58. 20.24	2. 19. 47.67	2. 35. 4.10		46.06
1. 58. 20.24	19.46	2. 19. 47.67	2. 35. 08.10	2. 36. 46.08
	29			
	39.46			

2. 04. 39.48

c	- .11	- .11	- .11	- .11
a	- .07	- .10	- .11	- .10
b	- .01	- .01	- .01	- .01
r	- .04	- .04	- .05	- .06
- 22	+33.06	33.06	33.06	33.06
1 58 53.07	2 5 12.26	2 20 20.45	2 35 40.87	2 37 19.86
1 58 53.16	2 5 12.43	2 20 20.57	2 35 40.91	

α Arietis - 33.15
 γ Beti - 33.10
 α Beti - 32.99
 α Persei - 33.01
- 33.06

(573)

Dec. 21st Pm

E.C.

Saturn's I limb

54.60

8.20

22.40

36.45-

50.55-

4.80

2,, 39,, 18.80

E.C.

 α Ceti

21.30

+3° 30' 36.00

clench

3.00

16.75-

30.45-

2,, 34,, 44.40

 $\Sigma = 152.10$

cor = -13.78

6) 138.32

23.05

- 20

2,, 54,, 03.05

c - .11

a - .11

b - .01

r - .07

- u + 33.06

2 54 35.81

2 54 35.74

E.C.

 α Persei

12.75.06

+49° 20' 36.05

57.05-

78.35-

39.00

00.30-

3,, 14,, 21.55

 $\Sigma = 172.30$

cor = -63.13

6) 109.17

18.19

3,, 13,, 18.19

- .17

+ .03

- .01

- .08

+ 33.06

3 13 56.92

3 13 51.00

Dec. 21/22

E.C.

 α Coronae Borealis

last

22.45-

38.00

53.45-

8.80

24.20

15,, 28,, 40.00

extremely faint

$$\begin{aligned} a &= -0.194 \\ b &= -0.008 \\ c &= -0.114 \end{aligned}$$

(574)

Rate of Eb - 0.90

Dec. 22 Pm.

E.B.	E.B.	E.B.	E.B.	E.B.
845 B.A.B.	α Beti	α Beti	α Persi	Moons I limb
$t_0 = 2^h$ + 9.29'				
45.85	36.60	22.60	15.85	14.80
00.00	+ 8.19' 50.65	+ 8.30' 36.60	+ 49.47 36.80	+ 15.32 29.40
13.90	4.40	50.00	58.00	43.75
27.75	18.25	3.80	19.25	58.30
41.60	32.40	17.50	40.00	12.60
55.70	46.10	31.30	1.10	27.30
2. 37.09.75	2. 52.00.13	2. 54.45.35	3. 14.22.35	3. 24.41.95
7/194.55	18.5.3	207.15	193.35	228.10
2. 36. 27.79	60	180	60	180
	7/125.53	2/ 27.15	7/133.35	7/408.10
	2. 51.18.36	2. 54.03.88	3. 13.19.05	58.30
2. 36. 27.79	2. 51.18.36	2. 54.35.73	3. 13.50.99	
c - .11	- .11	31.85	31.94	
a - .11	- .11	2. 52.03.88	3. 13.19.05	3. 23.58.30
b - .01	- .01	c - .11	- .17	- .11
r - .02	- .03	a - .12	+ .03	- .09
- u + 32.14	+ 32.14	b - .01	- .01	- .01
2 36 59.68	2 51 50.26	r - .03	- .04	- .05
2 36 59.68	2 51 50.41	+ 32.14	+ 32.14	+ 32.14
		2 54 35.78	3 13 58.40	3 24 30.18
		2 54 35.73	3 13 50.99	3 24 30.18

Dec. 22/23 Am.

M.C. 22.14.45 18.04.46.00
 16.15.16.25 55.5 46.74
 1. 11.27 18.05.32.74

16.24.44.23
 18.05.32.74 α Beti - 32.12
 22.19.11.49 α Persi - 32.19
 3. 39.39 γ Lave - 32.11
 22.15.32.10 - 32.14
 22.14.45.00
 47.10
 16
 1. 03.10

(575)

Dec. 22 Pm.

E.C.

 η Tauri

28.40

+23.39 43.25

58.20

13.15

28.17

43.20

3. 38. 58.40

272.77

180

92.77

3. 38. 13.25

3. 38. 45.11

31.86

3. 38. 13.25

c - .11

a - .08

b - .01

r - .06

+ 32.14

3 38 45.15

3 38 45.10

E.C.

A Tauri

44.40

+21.40 59.25

14.00

28.60

43.75

58.20

3. 56. 13.30

261.50

60

7)201.50

3. 55. 28.78

3. 55. 28.78

- .11

- .08

- .01

- .07

+ 32.14

3 56 00.65

3 56 0.55

a Alt - 32.12

a Ricci 32.19

 η Tauri - 32.11

(576)

Magnetic Declination observed at Cambridge and vicinity

Cambridge	1708	West	9°.00'
"	42	"	8°.00
"	57	"	7.20
"	61	"	7.14
"	63	"	7.00
"	80	"	7.02
Beverly	81	"	7.02
Cambridge	82	"	6.46
"	83	"	6.52
"	88	"	6.38
Boston	1793	"	6.30
Salem	1805	"	5.57
"	8	"	5.20
"	10	"	6.22
Cambridge	10	"	7.30
"	35	"	8.51
Dorchester	38	"	9.04
"	39	"	9.02
Cambridge	40	"	9.18
"	41	"	9.25
"	42	"	9.37
"	43	"	9.39
"	44	"	9.39
"	45	"	9.35
"	49	"	9.38

" 1852 " 10.08
 " 1852e " 10.39

The range of diurnal variation is about ten minutes.
 The maximum dec. takes place about 1^h and 2^h P.m.
 The minimum dec. takes place about 7^h and 8 A.m.

The occasional perturbations extend
 sometimes to two and three degrees

1852

(517)

Dec. 26/27 Am.

E.C.	E.C.	E.C.	E.C.
ϵ Bootis	α Librae	α Corona Borealis	α Serpentis
+28° 18.60	-15° 33.60	+27° 12.60	-9° 51.40
34.20	47.80	28.00	5.15
49.20	2.00	43.45	18.95
5.30	16.25	38.80	32.90
20.70	30.55	14.40	46.70
36.30	44.85	29.60	00.50
14.38, 51.80	14.42, 59.15	15.28, 45.15	15.37, 14.60
216.60	234.20	232.00	170.20
180	120	180	60
2136.60	2114.20	21412.00	21230.20
14.38, 05.23	14.42, 16.31	15.27, 58.86	15.36, 32.88
cul. -.13	cul. -.12	cul. -.13	cul. -.12
az. -.07	az. -.19	az. -.07	az. -.17
lev. -.01	lev. .00	lev. -.01	lev. .00
14.38, 05.02	14.42, 16.00	15.27, 58.65	15.36, 32.59
14.38, 82.20	14.42, 48.22	15.28, 25.82	15.36, 59.67
27.18	27.22	27.17	27.08

Dec. 26/27 Am.

M.T.C. 20, 27, 45	
1615 14, 54, 36.5	
1, 20.85	
18.20, 82.23	14.53, 16.65
46.74	18.21, 18.97
18.21, 18.97	20.31, 56.68
	3, 21.82
	20, 28, 34.86
	20, 27, 45.00
	49.86
	16
	1, 05.86

E.C. 1, 07.96 1, 10.76

(578)

1852

Dec. 28/29 Amv.

E. b.

a Corona Borealis

14.80

30.20

45.70

1.05

16.60

32.00

15.28.47.60

187.95

180

7.95

15.28.01.13

col. - .13

wt. - .07

lev. - .01

15.28.00.92

15.28.25.88

24.96

Jann

1853

(579)

Jan. 4/5 Am
E.C.

a Ophiuchi

4.90
 +13° 19.10
 83.20
 47.20
 1.30
 15.30
 17.28, 29.35
 150.55
 180
 330.55
 17.28 47.22
 col - .12
 az - .12
 lev. - .04
 17.27, 46.97
 17.28, 4.24
 E.C. slow 17.27

Jan. 5/6 Am.

E.C.

a Coronae Borealis

23.65
 38.85
 54.60
 9.95
 25.20
 40.60
 15.28, 56.15

flipping

Jan. 4/5 Am

E.C. 17.39.00

236 17.39.38.4

16.13

M.Y.C. 22.40.00

236 17.41.43.0

16.13

17.41.26.87

18.56.47.99

22.44.38.88

3.43.57

22.40.55.31

22.40

55.31

16

1.11.31

18.56.01.25

46.74

18.56.47.99

(520)

1833

Jan. 9/10 Am.

El.

8 Ophiuchi

45.40
-3 59.05
12.83
26.60
40.35
53.95
16.07, 08.10
246.28
60

7/186.28
16.06, 26.61
cul. - .04
az. - .20
lev. - .62
16.06, 26.35
16.06, 36.81
10.46

Jan. 10/11 Am

El.

α Ophiuchi

+12° 13.85
27.70
41.80
55.80
10.15
24.10
17.28, 38.25
201.65
180

391.65
17.27.55.95
cul. - .04
az. - .15
lev. - .07
17.27.55.69
17.28.04.59
8.90

6.3

16.5

4.2

Jan 9/10 Am

El. 16.11.00

M.V.B. 20.53.00

1126 21.13.30.0

236 16 11. 38.3
27.84

236 16.14. 23.2
27.84

236 16 34. 56.8

16.13. 55.36

19.15. 44.04

19.16. 30.78

46.74

20.57. 24.68

19.16. 30.78

3. 25.99

20.53. 58.59

20.53

58.59

16.

1. 14.55



(521)

Jan. 13/14 Am.

This morning the Chronometers all agree in making E.C. lose about five seconds since a corresponding hour yesterday. The time was sent to Boston by it at the usual hour (10 o'clock), and immediately afterwards I (C.W.T.) wound it up rather more slowly than ever before. There has been no great change of temperature in the room within the above limits -

Jan. 14/15 Am.

E.C.

7 Draconis

+51 54.30
 16.30
 30.25
 0.30
 22.40
 44.40
 17.54.06.90
 182.85
 180
 2.80

17.53.00.40
 cor. - .16
 az. + .07
 lev. - .11
 17.53.00.20
 17.53. 9.23
 9.05

1. 14.54
 1. 11.54
 + 3 28.66
 3.30
 1. 14.54
 1. 17.89
 .16
 1. 1.89

(522)

$$a = -0.359$$

$$b = -0.080$$

$$c = -0.110$$

$$\text{Rate of Eb} + 1.20$$

1853

Ill East

Jan. 16/17 Am.

Jan. 17 Pm.

E.b.
 α OphiuchiE.b.
 $t_0 = 0^h$ β BetiE.b.
 γ PisciumE.b.
 δ Piscium
 $+13^0$ 17.70

31.70

45.80

59.95

14.20

28.05

17.28.42.20

239.50

180

7/419.50

17.27.59.93

17.28.4.10

ax. - 16

len. 06

17.27.59.61

17.28.4.71

5.10

 $-18.45'$ 38.00

52.30

7.00

21.70

0.36.36.00

 $\Sigma = 155.00$

cor = - .13

5/154.87

30.97

24

6.97

0.36.06.97

c - .11

a - .32

b - .04

r - .03

- u +4.70

0 36 11.17

0 36 11.17

 $+4.45'$ 14.20

28.20

42.00

55.90

9.50

1.34.23.40

173.60

120

7/293.60

1.33.41.94

- .11

- .23

- .06

- .07

+ 4.70

1 33 46.17

1 33 46.17

 $+6.25'$ 1.36.51.40

28.20

42.00

55.90

9.50

1.37.32.99

 $\Sigma = 57.40$

cor = +41.59

92.99

- .11

- .21

- .06

- .08

+ 4.70

1 37.37.23

1 37.37.23

Jan. 16/17 Am.

E.b. 17.36.00

236 17.36.15.7

10.6

 β Beti

M.C. 21.49.40

236 17.38.35.2

10.6

17.38.24.6

19.44.06.68

21.54.17.92

3.33.31

21.50.42.61

21.49.40

1.02.61

16

1.18.61

M.C. 22.59.00

236 18.48.7.2

19.43.19.94

46.74

19.44.06.68

(5.23.)

Jan 17. Pm.

E.b.

 α I limb

3.80

18.00

+9°.33' 32.00

46.30

0.70

14.50

2.19.29.00

144.60

140

7)324.60

46.37

2.18.46.37

c -.11

a -.20

b -.08

r -.12

-u +4.70

2 18 50.59

E.b.

845 B.A.G.

13.34

27.40

+9°.29' 41.50

53.20

9.20

23.20

2.37.37.15

206.99

140

7)386.99

7)386.99

2.36.55.28

2.36.55.28

-.11

-.20

-.08

-.13

+4.70

2 36 59.49

2 36 59.46

E.b.

 π Arietis

18.00

32.25

+16°.51' 46.85

0.80

15.30

29.50

2.41.44.15

186.85

180

7)6.85

7)6.85

2.41.00.98

2.41.00.98

-.11

-.16

-.04

-.13

+4.70

2 41 5.24

2 41 5.13

Jan, 18/19 Am.

E.b.

 α Ophiuchi

20.90

35.00

49.00

03.20

17.40

31.30

17.28.43.45

203.25

180

23.25

17 28 3.32

cul - .10

ax - - .16

lv - .06

17.28.03.00

17.28.4.76

1.76

B.C. -4.70

-4.70

(524)

Jan. 19/20 Am.

E.C.

 α Ophiuchi

22.45

36.30

50.50

4.80

18.70

32.80

17.28, 47.00

212.53

Kv

32.53

17.28, 04.65

col. - .10

ox. - .16

lev. - .06

17.28, 04.33

17.28, 4.80

0.47

Jan. 21 Pm

E.C.

15 Orionis

36.60

50.85

5.15

19.30

33.50

47.80

5.02, 02.25

E.C.

 α Aurigae

58.45

13.15

32.35

52.20

12.00

31.40

5.05, 51.45

Jan. 19/20 Am.

M.C.B.

236

21, 49.05 E.C. 17.55, 00.00

17, 50.00.0 236 17.55, 19.3

18.83

18.83

17.49.41.17

19.55.56.35

21.53.44.82

3.35.22

21.50.09.60

21.49.05

1.04.6

66

1.20.6

(525)

Jan. 25 Pm.

E.C.

α Andromeda

lost

lost

37.70

53.45

8.80

24.55

00, 01, 40.25

Jan. 25 Pm.

E.C. 00, 15, 00

M.L.B. 3, 57, 40

236 00, 15, 26.8

236 00, 19, 37.0

Jan. 25/26 Am.

E.C.

 α Ophiuchi

stern estimate
 31.00
 44.86
 59.00
 13.00
 27.20
 41.30

17.28.53.25
 270.60

1800

7) 91.60

17.28.13.08

col. - .10

ax. - .16

lev. - .06

17.28.12.76

17.28.04.92

7.84

(526)

Ill East

Jan. 26/27 Am.

236

 α Lyrae

43.9 - 4 lbs.
 1.4
 19.0
 36.4
 54.0
 11.3

18.33.29.6

Jan. 27/28 Am.

236

 α Lyrae

43.6 - 0 lbs.
 1.5
 18.6
 36.6
 54.2
 12.0

18.33.29.7

Jan. 25/26 Am.

E.C. 17 33.00. 11.26.21. 12.30

236 17.33.28.0 236 17 37.19.5

17.32.52.16

35.84

236 fast 35.84

17.36.43.66

20.19.33.68

20.17.07.97

33.29.23

21.13.38.74

21.21.23.80

12.08.74

11.26.1.421.57.35

236 17.33.28.0 236 17 37.19.5

35.84

18.21.56.16

20.19.33.69

22.02.20.47

3.36.62

21.58.43.83

21.57.35

12.08.85

12

24.85

(527)

Jan. 30/31 Am.

E.b.	E.b.
<i>a Herenlis</i>	<i>a Ophirchi</i>
27.75	38.00
+15 ^a 42.00	+13 ^a 52.20
56.00	6.15
10.15	20.25
24.45	34.30
38.70	48.50
17.08, 53.00	17.29, 2.70
252.05	202.10
180	60
72.05	7) 142.10
17.08, 10.29	17.27, 20.30
cul. - .05	cul. - .05
mx. - .20	mx. - .21
lev. - .08	lev. - .08
17.08, 09.96	17.28, 19.96
17.07, 55.21	17.28, 51.07
14.75	14.89

Feb 1st Am.

236	E.b. 17.34.00
<i>a Ophirchi</i>	236 17.34.34.8
16.0	
30.5	
44.6	
58.9	
13.0	
27.0	
17 29 41.0	

Jan. 30/31 Am.

M.G. 20. 33. 50	E.b. 17.20.00
236 17. 18. 32.5	236 17.20.34.3
49.19	
20.38.31.73	17. 17. 43.31
40.74	20. 39. 18.42
20.39.18.97	20.38.24.84
	3. 22.88
	20.35.01.96
	20.39.50.00
	1. 11.96
	16
	1. 27.96

(528)

Ill. East

Feb. 2nd Pm.

E.C.

 α Gauri

+16° 4.80

19.00

33.45

47.90

2.00

16.35

4^h 28^m 30.85

154.35

180

7) 334.35

4^h 27^m 47.76

col. - .05

ax. - .20

lev. - .08

4^h 27^m 47.434^h 27^m 29.16

18.27

Feb. 8th Pm.

E.C.

 α Cassiopea

20.76

45.10

9.45

33.95

58.30

22.65

00^h 33^m 47.20E.C.
 β Icti

6.70

21.40

35.95

50.45

4.97

00^h 37^m 19.60

Feb. 8/9 Am.

E.C.

 α Merculis

39.95

53.97

8.25

22.35

36.50

30.70

17.09.04.87

216.69

60

7) 256.69

17.08.22.38

col. -.05

ax. -.20

lv. -.08

17.08.22.05

17.07.55.46

26.59

E.C.

 α Ophiuchi

50.20

4.00

18.15

32.00

46.40

00.30

17.29.14.70

165.75

60

7) 225.75

17.28.32.25

col. -.05

ax. -.21

lv. -.08

17.28.31.91

17.28.5.31

26.60

Feb. 8 Am.

E.C. 00.44.00

236 00.44.47.7

M.C. 3.30.20

236 0.48.13

Feb. 8/9 Am.

E.C. 17.52.00

236 17.52.47.5

M.C. 20.33.40

236 17.54.23.5

1. 14.1

17.51.33.4

17.53.09.4

1. 14.1

21.14.00.73

21. 14. 47.47

46.74

14.47.47

20.38.21.93

3. 22.88

20.34.59.07

20.33.40

1. 19.07

16

1. 35.07

$$\begin{aligned} a &= -0.390 \\ b &= -0.167 \\ c &= -0.143 \end{aligned}$$

(530)

Pl. East

Rate of El + 1.56

Feb. 12 P.m.

	α Cassiopea	ϵ Polaris U.C.	ϵ C. Moon's limb	α Arietis
$t_0 = 0^h$	28.10	38.59.60	$+22^\circ 48'$ 46.33	40.10
$+55^\circ 50'$	52.65	47.56.15	0.90	54.80
	16.80	56.51.35	14.85	9.90
	41.20	lost	28.75	24.70
	5.85	lost	42.85	39.70
	29.90		56.90	54.50
	0.33.54.50		1.15.11.0	2.00.09.65
	1229.00		7201.60	233.35
	60		28.80	60

$$7 \overline{) 289.00} \\ 0.32.41.28$$

$$2.00.14.28.80$$

$$7 \overline{) 173.35} \\ 1.59.24.76$$

$$0.32.41.28$$

$$c - .26$$

$$-.14$$

$$-.15$$

$$a + .17$$

$$-.25$$

$$-.14$$

$$b - .29$$

$$-.13$$

$$-.17$$

$$r - .04$$

$$-.02$$

$$-.13$$

$$-u - 31.47$$

$$-31.47$$

$$-31.47$$

$$0.32.9.25$$

$$2.00.13.56.79$$

$$1.58.52.70$$

$$0.32.9.26$$

$$1.58.52.44$$

$$\begin{aligned} \alpha \text{ Cassiopeiae} &+ 31.20 \\ \alpha \text{ Arietis} &+ 31.73 \\ &+ 31.47 \end{aligned}$$

(53)

Feb. 13/14

E.B.

α Lyrae

+38

39.00

1456.60

3114.05

31.80

49.45

7.02

18.33.24.85

222.77

00

222.77

18.32.31.82

ed. - .10

az. - .04

lev. - .20

18.32.31.47

18.31.56.06

35.41

E.B.

β Lyrae

+33

24.20

40.70

57.05

13.40

29.85

46.20

18.46.02.80

214.20

120

94.20

18.45.13.46

ed. - .09

az. - .06

lev. - .20

18.45.13.11

18.44.37.52

35.59

E.B.

α Aquilae

Observer Mr. Young

29.20

43.00

56.60

10.80

29.85

38.45

18.44.52.70

214.20

120

94.20

18.45.13.46

ed. - .09

az. - .06

lev. - .20

18.45.13.11

18.44.37.52

35.59

Feb. 13/14

E.B. 18.55.00

236 18.53.53.8

18.54.24.59

1.29.21

M.B. 21.19.10

236 19.50.01.5

1.29.21

18.58.32.29

21.34.30.25

21.24.02.04

3.30.35

21.20.31.69

21.19.10

1.21.69

16

1.37.65

21.33.43.51

21.34.30.26

21.34.30.26

3.30.35

21.20.31.69

21.19.10

1.21.69

16

1.37.65

$$\begin{aligned} a &= -0.398 \\ b &= -0.160 \\ c &= -0.140 \end{aligned}$$

(532)

Ill. East

Rate of E.C. + 1.60

Bad seeing

Feb. 14 Pm	E.C.	E.C.	E.C.	E.C.	E.C.
Moons limb	α beti	δ Arietis	α Persei	δ Louni	
+12° 22' 19.35	+3° 31' 30.55	+19° 10' 6.00	+49° 20' 23.00	+8° 31' 48.40	
$t_0 = 2^h$ 33.75	44.25	20.45	44.20	2.55	
48.00	37.95	34.80	5.20	16.45	
2.25	11.75	49.40	26.40	30.20	
16.70	25.45	4.00	47.45	44.20	
31.00	39.10	18.70	8.80	57.90	
2. 46. 45.25	2. 55. 53.10	3. 14. 33.15	3. 15. 29.70	3. 18. 12.10	
196.30	262.15	166.50	7164.75	7211.80	
180	140	180	3. 14. 26.39	3. 17. 30.26	
7) 16.30	7) 62.15	7) 346.50			
2.33	2. 55. 11.73	3. 03. 49.50			
2. 46. 02.33	2. 55. 11.73	3. 03. 49.50	3. 14. 26.39	3. 17. 30.26	
c -.14	-.14	-.14	-.21	-.14	
a -.20	-.26	-.57	+ .07	-.23	
b -.18	-.12	-.15	-.25	-.13	
r -.06	-.07	-.07	-.09	-.09	
- u - 35.93	- 35.93	- 35.93	- 35.93	- 35.93	
2 45 25.87	2 54 35.21	3 3 13.04	3 13 49.98	3 16 53.74	
	2 54 35.11	3 3 12.89	3 13 49.93	3 16 53.75	

$$\begin{aligned} \alpha \text{ Ali} &+ 36.01 \\ \alpha \text{ Persei} &+ 35.84 \\ &+ 35.93 \end{aligned}$$

(533) 22

Ill. East

Feb. 14/15 Am
E.C.

α Lyrae

41.15

58.75

16.40

33.80

51.40

9.00

18, 33, 26.40

$$a = -0.402 \quad (534)^{-1}$$

$$b = -0.150$$

$$c = -0.139 \quad \text{Ill East}$$

$$\text{Rate of Eb} + 1.60$$

Feb. 15 Pm		Stars unstepped					
$t_0 = 3^h$	Elb	Elb	Elb	Elb	Elb	Elb	Elb
δ Arietis	α Persei	θ Tauri	Moon's limb	η Tauri	λ Tauri		
+19°.10'	+49°.20'	+8°.31'	+16°.29'	+23°.39'	+12°.04'		
7.85	24.95	50.30	44.85	37.75	28.10		
22.40	46.15	4.30	59.40	52.80	42.20		
36.60	6.70	18.25	13.75	7.75	36.30		
51.30	28.10	32.00	28.90	22.80	chop 55		
51.95	49.40	46.00	43.25	37.80	24.35		
20.30	10.00	59.85	57.90	52.90	38.36		
3.04.35.00	3.15.31.45	3.18.14.00	3.34.12.50	3.40.08.00	3.53.52.60		
179.40	7196.75	7224.70	260.35	219.80	$\Sigma = 179.20$		
180	3.14.28.11	3.17.32.10	260	60	Cor = 42.04		
7)359.40			7)200.35	7)159.50	4)221.24		
3.03.51.34			28.62	22.83	55.31		
					10.31		
3.03.51.34	3.14.28.11	3.17.32.10	3.38.28.62	3.39.22.83	3.53.10.31		
c -.14	-.21	-.14	-.14	-.15	-.14		
a -.17	+.07	-.23	-.18	-.14	-.20		
b -.14	-23	-.12	-.14	-.15	-.13		
r -.02	-.02	-.03	-.04	-.05	-.06		
-u +1.22.24	+1.22.24	+1.22.24	+1.22.24	+1.22.24	+1.22.24		
-u -37.86	-37.86	-37.86	-37.86	-37.86	-37.86		
3 3 13.03	3 13 49.82	3 16 53.72	3 32 50.20	3 38 44.50	3 52 31.92		
3 3 12.87	3 13 49.91	3 16 53.72	3 32 50.20	3 38 44.50	3 52 31.85		

$$\alpha \text{ Persei} - 1^m 22.33 + 37.67$$

$$\eta \text{ Tauri} - 1^m 22.16 + 37.84$$

$$- 1^m 22.24 + 37.76$$

(535)
Sll. East
 $a = 0.410$
 $b = 0.145$
 $c = 0.138$ Rate of Eb + 1.60

Feb. 16/17 Am.

Eb

a Lyra

44.15

1.80

1.9.40

36.90

54.55

12.25

18, 33, 30.00

199.05

60

7/259.05

18, 32, 37.00

ed. - 1.10

ad. - .04

len. - .21

18, 32, 36.65

18, 31, 56.12

40.53

Feb. 17 Pm.

E.B.

a Aurigae

+ 45° 51' 32.20 - 8° 23'

51.81

11.65

31.50

51.00

10.70

5, 07, 30.90

7/219.76

5, 06, 31.39

E.B.

β Orionis

07.28.51

42.33

56.00 + 22° 27' 53.40

10.15

23.90

37.80

5, 08, 52.00

Σ = 179.85

cor = - 69.35

5/11 0.50

22.10

12

10.10

E.B.

Moon's limb

22.90

38.16

53.40

8.60

23.94

38.90

5, 15, 54.20

240.15

150

7/60.15

6.59

E.B.

β Tauri

54.50

10.20

25.94

41.38

56.95

12.75

5, 18, 28.23

230.06

60

7/290.06

5, 17, 41.43

5, 06, 31.39

c - .20

a + .03

b - .20

r - .01

- u - 41.09

5 5 49.66 92

5 5 49.93

5, 08, 10.10

- .14

- .32

- .09

- .02

- 41.09

5 7 28.44

5 7 28.35

5, 15, 08.59

- .14

- .15

- .14

- .02

- 41.09

5 14 27.05

5, 17, 41.43

- .15

- .12

- .17

- .08

- 41.09

5 16 59.87

5 16 59.95

Feb. 16/17 Am.

M. 2, 6

20, 31, 20

Eb

18, 25, 00

236 18, 24, 04.0

236 18, 25, 57.8

1, 38.33

18, 24, 19.47

1, 38.33

21.45, 33.17

18, 22, 25.67

40.74

21, 46, 19.91

21, 46, 19.91

20, 36, 05.76

3, 22.50

20, 32, 43.26

31, 20

1, 23.26

16

1, 39.26

a Aurigae + 41.02

β Orionis 41.18

β Tauri 41.01

δ Orionis + 41.15

f ~~Tauri~~ + 41.09

$$\begin{aligned} a &= -0.410 \\ b &= -0.145 \\ c &= -0.188 \end{aligned}$$

(536)

Ill. East Rate of E.C. + 1.60

Feb. 17 Pm	Continued	
E.C.	E.C.	E.C.
$t_0 = 5^h$	8 Orionis	5 Lanni
lost $18^h 45.66$	30.45	48.95
+ 21° 48'	- 0° 25'	+ 21° 03'
0.22	44.00	3.90
15.15	57.85	18.30
29.90	11.50	33.25
44.70	25.35	47.95
59.65	39.00	2.55
5 ^h 20 14.52	5 ^h 25 ^m 52.85	5 ^h 30 17.40
$\Sigma = 164.14$	261.00	172.30
cor = -44.31	180	60
6) 119.83	7) 81.00	7) 232.30
19.97	5 ^h 25 ^m 11.57	5 ^h 29 ^m 33.19
10		
29.97		
5 ^h 19 ^m 29.97	5 ^h 25 ^m 11.57	5 ^h 29 ^m 33.19
c - .14	- .14	- .14
a - .15	- .28	- .16
b - .14	- .10	- .14
r - .02	- .03	- .03
- u - 41.09	- 41.09	- 41.09
5 18 48.45	5 24 29.93	5 28 51.63
5 18 48.29	5 24 29.87	5 28 51.61

(537)

Ill. Coast

Feb. 20/21 Am.

E.B.		E.B.
α Lyrae		β Lyrae
+38° 51.30	+33°	lost
8.90		lost
26.50		9.20
44.30		25.60
1.70		42.05
19.15		58.40
18, 33, 37.00		18, 46, 15.00
188.85		76.85
120		20
2) 308.85		3) 26.85
18, 32, 44.12		18, 45, 25.62
18 col - .11		18 col - .70
42.47.07		42.47.04
lev. - .23		lev. - .20
18, 32, 43.71		18, 45, 25.28
18, 31, 36.25		18, 44, 37.70
47.46		47.58

Feb. 21 Pm.

E.B.		E.B.		E.B.	
15 Argus		40 Cancri		Anon. 7 mag.	
lost		49.80		52.70	
37.05		4.45		7.40	
52.20		19.15		21.80	
7.15		33.75		36.35	
22.40		48.65		50.80	
37.20		3.05		5.40	
8, 02, 52.40		8, 32, 17.85		8, 36, 19.95	
				8, 37, 53.05	

20/21 Am

M.B. 20, 14, 10	E.B. 18, 24, 00
236 18, 22 50.5	236 18, 25, 01.8
1, 49.3	18, 23, 12.5
22, 01, 19.39	1, 49.3
46.74	
22 02 06.13	
20, 18, 55.07	
3, 19.69	
20, 15, 35.38	
20, 14, 10	
1, 25.38	
16	
1, 41.38	

Feb. 21 Pm
 E.G.
 ε Hydra
 lost
 49.15
 3.10
 18.85
 8.40, 30.90

Feb. 23/24 Am.
 236
 36 5.4
 23.0
 40.4
 α 58.0
 15.7
 33.5
 18.34.50.9
 226.9
 180
 7) 4069
 58.13
 -2
 18.33.56.13
 cul. -.14
 ax. -.05
 lo. .16
 18.33.55.78
 18.31.56.34
 1.59.44

(538) 1852phae East

Feb. 25/26
 E.G.
 α. Aquilar
 49.20
 + 4 3.00
 17.00
 30.90
 44.90
 58.70
 19.45.12.75
 216.45
 00

7) 216.45
 19.44.30.92
 cul. -.11
 ax. -.22
 lo. -.11
 19.44.30.48
 19.43.35.10
 55.38

Feb. 23/24 Am

E.G. 18.27.00

236 18.28.07.3

22.13.09.05
 46.79
 22.13.55.79

M.L. 20.19.20

236 18.40 3.0

1 59.44

18.38.03.56

22.13.55.79

20.24.07.77

3.20.54

20.20.47.23

20.19.20

1.27.23

16

1.43.23

Feb. 25/26 Am.

E.G. 19.53.00

236 19.54.10.3

19.52.04.62

2.05.38

22.21.02.16

46.79

22.21.48.90

M.L. 21.31.00

236 19.55.55.0

2 5.38

19.57.49.62

22.21.48.90

21.36.00.72

3.32.32

21.32.28.40

21.31.00

1.28.40

16

1.43.40

(539)

gle. East

March 2/3 Am
E.6

a Cygni

27.00
+45 46.25
5.75
25.10
44.60
3.80

20.38, 23.15

175.65

00

7) 175.65

20.37, 25.09

col. — .09

ax. + 103

lev. — .22

20.37, 24.81

20.36 23.31

1.07.50

March 6/7
E.6

a Lyrae

10.90
28.40
+39 45.95
3.45
21.00
38.60

18.33, 56.40

204.70

180

7) 24.70

18.33, 03.53

col. — .09

ax. — .04

lev. — 20

18.33, 03.20

18.31, 56.68

1.06.52

1.5

4/5.0/1.2

Mar

March 2/3 Am

E.6 20.45.00

236 20.46.19.2

20.43.58.5

2.20.7

M.26. 21.58.25

236 20.47.25.5

2.20.7

20.45.04.8

22.40.44.92

22.41.31.66

46.74

22.03.33.14

3.36.85

21.59.56.31

21.58.25

1.31.31

18

1.47.31

March 6/7 Am

M.26. 21.38.36 E.6 20.45.00

236 20.40.13.0 236 20.43.58.7

2.3 1.06.6

22.56.31.14

20.40.10.7

20.43.53.4

22.57.17.85

22.57.17.85

2.3

21.42.52.85

3.43.27

21.39.09.58

21.38.35

1.50.6

57.51.4

6.2

-1.45.2

1.34.58

16

1.30.58

(540) (150)

March 9/10 Am.

E.C.

 α Aquilae

+8°

5.23

19.15

33.20

49.00

00.96

14.80

19. 45. 28.80

149.16

180

7) 329.16

19. 44. 49.02

col. -.07

az. -.25

lev. -.13

19. 44. 46.57

19. 43. 35.36

1. 11.21

Ill. East

March 12 Pm.

E.C.

 α Orionis

+7°

45.30

59.10

12.90

26.90

40.85

54.45

5. 49. 08.60

24810

60

7) 188.10

5. 48. 26.87

col. -.07

az. -.25

lev. -.12

5. 48. 26.43

47. 12.50

1. 13.93

March 6/7 Am.

M.L. 21. 52. 25

236 20. 54. 53.5

2.3

20. 54. 53.2

22. 57. 17.85

21. 57. 35.35

3. 35.26

21. 53. 59.49

52.25

1. 34.49

16

1. 50.49

March 9/10 Am

M.L. 20. 41. 45 E.C. 19. 59. 00

236 19. 56. 04.5 236 19. 57. 59.4

10.61

57. 48. 79

1061

23. 08. 20.80 19. 55. 53.89

28. 09. 07.54 23. 9. 7.54

20. 46. 46.35

3. 24. 24

20. 43. 22.11

20. 41. 45

1. 37.11

16

1. 53.11

1.3

3

39

6

93

(521)

March 13/14 Am.

E.C.

2 Aquilae

49.60

3.40

17.30

31.40

45.30

59.00

19.41.13.40

219.50

vv

7) 219.50

19.40.31.36

cul-.08

az-.23

lw-.14

19.40.30.91

19.39.15.13

1.15.78

E.C.

a Aquilae

10.15

24.00

37.85

51.80

5.70

19.48

19.45.33.40

182.30

180

7) 362.30

19.44.51.76

cul-.07

az-.25

lw-.13

19.44.51.31

19.43.35.49

1.15.82

13/14 Am

E.C. 19.55.00

236 19.54.7.4

W.H. 20.26.00

236 19.56.19.00

23.2

19.53.44.2

23.2

19.55.55.8

23.24.07.01

23.24.53.75

46.74

20.31.02.05

23.24.53.75

3.21.67

20.27.40.38

20.26

1.40.38

16

1.56.38

1852phae.proj. 1

$a = -0.401$ Rate of C.C. 80 (542)
 $b = -0.150$
 $c = -0.072$ Ill East

March 15 Pm

$+49^{\circ} 20'$ E.C.
 α Persei
 $\delta = 3^h$
 25.10 14.04.46
 46.50 + 18.52' 36.30
 7.50 51.10
 28.45 6.10
 50.10 20.95
 3.16.11.00 33.63
 $\Sigma = 168.65$
 $\text{Cor} = -63.13$
 $6) 105.52$
 17.59
 10
 7.59
 3.15.07.59
 $c = .10$
 $a + .07$
 $b = .23$
 $r = .02$
 $u = 18.04$
 3 13 49.27
 3 13 49.22

E.C.
 Moon's Limb
 21.40
 36.30
 51.10
 6.10
 20.95
 33.63
 4.03.50.50
 222.00
 120
 $7) 42.00$
 6.00

E.C.
 α Tauri
 4.20
 18.65
 32.95
 47.10
 1.30
 15.70
 4.29.30.20
 150.10
 180
 $7) 330.10$
 $4.28.47.15$

March 16/17 Am.

E.C.
 α Cygni
 lost
 $+45^{\circ}$
 7.15
 26.40
 46.80
 5.20
 24.75
 20.38.44.15
 109.30
 120
 $5) 229.30$
 20.37.45.86
 $\text{al.} = .09$
 $\text{ax.} = .02$
 $\text{lev.} = .122$
 20.37.45.57
 20.36.23.68
 $1.21.89$

8.28. —
 $1.59.5$
 8.29.59.5
 8.28.11.6
 $-1.47.9$
 4.44.16
 4.46.03.9

6.51.37.2
 $4.46.03.9$
 $11.37.41.1$
 11.38
 $+18.9$ on 14.8

α Persei +1 17.95
 α Tauri +1 18.13
 +1 18.04

1.10.38
 142.72
 $3) 2.34.72$
 $1.58.72$
 1.4
 200.12

20.57.00
 $1.21.9$
 $20.55.38.1$
 56.110
 32.9
 $1.58.72$
 $7.59.44$

March 16/17

E.C. 20.57.00 M.C. 21. 16. 30
 236 20.56.11.0 236 20. 58. 59.0
 $23.35.56.67$
 46.74
 $23.36.43.41$
 $20.58.26.1$
 $23.36.43.41$
 $21.21.42.69$
 $3.29.97$
 $21.18.12.72$
 $21.16.30$
 $1.42.72$

$$a' = -0.372^{(52.3)} \quad \text{Rate of L.C.} + 1.77$$

$$b = -0.130$$

$$c = -0.071$$

March 19 Pm

E.b. Castor	E.b. Pollux	E.b. Moon's limb	E.b. ♄ Gemma	20/21 Am. E.b. α Cygni
$t = 7^h$ 50.35	21.25	7.00	9.45	55.20
+ 32°. 12'	+ 5°. 36'	+ 24°. 01'	+ 27°. 05'	
6.60	35.00	22.40	25.00	14.60
22.80	48.80	37.85	40.40	33.85
38.95	2.55	53.07	55.90	52.90
55.15	16.45	8.60	11.40	12.45
11.45	30.20	24.05	26.85	31.70
7^h 27. 27.80	7^h 33. 44.00	7^h 39. 39.40	7^h 46. 42.50	20^h 57. 51.20
213.10	198.25	192.37	211.50	
60	140	160	180	
7^h 27. 27.80	7^h 33. 44.00	7^h 39. 39.40	7^h 46. 42.50	
7. 26. 39.01	7. 33. 2.61	53.19	7. 45. 55.93	
7^h 26. 39.01	7^h 33. 02.61	7^h 38. 53.19	7^h 45. 55.93	
c - .08	- .07	- .08	- .08	
a - .08	- .25	- .14	- .12	
b - .15	- .10	- .14	- .15	
r - .03	- .04	- .04	- .06	
- u - 1.25.84	- 1.25.84	- 1.25.84	- 1.25.84	
7^h 25 12.53	7^h 31 36.31	7^h 37 26.95	7^h 44 29.68	
7^h 25 12.89	7^h 31 36.26		7^h 44 29.88	

$$\text{Castor} + 1^m 25.58$$

$$\text{Pollux} + 1^m 25.89$$

$$+ 1^m 25.84$$

$a = -0.353$
 $b = -0.125$
 $c = 0.074$ Ill East
 (524.2) Rate of E.C. $+1\frac{1}{2}$

March 21 Pon

E.C.		E.C.	Nov E.C.	E.C.	E.C.
8 Caneri...		a. Hydra	Moon's limb	8 Leonis	8 Leonis
$\lambda = 8^h$	6.25	10.80	57.05	15.50	38.70
$+ 18^m.41'$	21.00	$- 8^m.01'$ 24.80	$+ 20^m.22'$ 12.00	$+ 24^m.27'$ 30.70	$+ 20^m.35'$ 53.40
Ill. limb	35.75	38.50	26.80	45.70	8.05
pen. marks found	50.00	52.45	41.70	00.80	22.75
	4.600	6.45	56.50	15.90	37.40
	lost 19.02	20.20	11.40	31.00	52.15
8. 38. 33.80		9. 22. 34.25	9. 34. 26.40	9. 39. 46.15	10. 14. 07.00
$\Sigma = 151.40$		187.45	231.85	185.75	219.45
cor = +28.96		186	66	180	66
6) 180.36		7) 362.45	7) 291.85	7) 5.75	7) 159.45
30.06		9. 21. 52.49	41.69	9. 39. 00.82	10. 13. 22.78
30.06					

8. 37. 50.06	9. 21. 52.49	9. 33. 41.69	9. 39. 00.82	10. 13. 22.78
c - .08	- .07	- .08	- .08	- .08
a - .15	- .28	- .14	- .12	- .13
b - .68	- .08	- .12	- .13	- .12
r - .05	- .10	- .11	- .12	- .16
- u - 1 29.68	- 1. 29.68	- 1. 29.68	- 1 29.68	- 1 29.68
8 36 19.99	9 20 22.28	9 32 11.56	9 37 30.69	10 11 52.61
8 36 19.87	9 20 22.30		9 37 29.86	10 11 52.50

a Hydra + 1^m 29^s 66
 8 Leonis + 1^m 29^s 70
 + 1 29.68

$$a = -0.340 \quad (5\% \text{ error})$$

$$b = -0.120$$

$$c = -0.075$$

Ill. East Side of E.C. + 1.75

March 22 Pm.

ϵ Leonis	α Leonis	γ Leonis	Moon's Limit	χ Leonis
+24° 27' 17.25	+12° 41' 22.60	+20° 35' 40.45	+14° 30' 37.70	+12° 57' 17.15
$t = 9^m$ 32.40	36.85	55.10	52.50	+8° 08' 31.15
47.45	51.00	9.80	71.00	45.00
2.40	5.00	24.40	21.20	58.90
17.65	19.13	39.15	35.95	12.95
32.65	33.00	53.75	50.40	26.60
9. 39. 47.90	10. 02. 47.20	10. 14. 08.60	10. 31. 05.00	10. 59. 40.60
197.70	214.78	231.25	209.75	232.35
9. 39. 18.24	10. 02. 4.97	10. 13. 24.46	10. 31. 21.39	10. 58. 58.91
17.70				
9. 39. 02.53				
37. 30.66				
1. 31.87				
9. 39. 02.53	10. 02. 04.97	10. 13. 24.46	10. 31. 21.39	10. 58. 58.91
c - .08	- .07	- .08	- .07	- .07
a - .12	- .18	- .14	- .29	- .20
b - .13	- .10	- .12	- .06	- .10
r - .05	- .08	- .09	- .11	- .15
- 11 - 1 31.50	- 1 31.50	- 1 31.50	- 1 31.50	- 1 31.50
9 37 29.85	10 00 33.04	10 11 52.53		10 57 26.89
9 37 29.66	10 00 33.02	10 11 52.49		10 57 26.75

$$\begin{array}{r} \epsilon \text{ Leonis} + 1^m 31.549 \\ \alpha \text{ Leonis} + 1 31.52 \\ \hline + 1 31.50 \end{array}$$

$$(546) \quad a = -0.322 \\ b = -0.117 \\ c = -0.076$$

Rate of L.C. = 1.75

Ill. East

March 22 Pm

March 23 Pm

E.L. m Leonis	E.L. x Leonis	E.L. 8 Leonis	E.L. m Leonis	E.L. 8 Hydra et Bootes
+14°.06 00.70	+8°.08' 18.85	+21°.20' 7.45	+14°.06' 16.25	-13°.59' 52.03
15.00	32.90	22.05	30.70	20.30
29.15	46.30	37.14	45.00	34.25
43.20	00.30	51.85	59.10	48.30
57.60	14.20	6.45	13.20	2.70
11.60	28.15	21.30		
11. 10. 26.00	10. 59. 42.00	11. 04. 36.20	11. 10. 27.55	10. 14. 16.95
<u>183.25</u>	<u>182.90</u>	<u>182.45</u>	<u>Σ = 191.80</u>	<u>180.38</u>
<u>120</u>	<u>180</u>	<u>180</u>	<u>cor = -42.42</u>	<u>60</u>
7)303.25	7)2.90	7)362.45	6)149.38	7)240.38
11. 09. 43.32	10. 59. 00.41	11. 07. 51.78	24.89	11. 13. 34.84
			24.89	
11. 09. 48.32	10. 59. 00.41	11. 07. 51.78	11. 09. 44.89	11. 13. 34.84
c - .07	c - .08	- .09	- .08	- .08
a - .17	a - .19	- .13	- .16	- .27
b - .11	b - .10	- .12	- .11	- .06
r - .16	r .00	- .01	- .01	- .02
- u - 1 31.50	- u - 1 33.45	- 1 33.45	- 1 33.45	- 1 33.45
11 8 11.31	10 57. 26.59	11 6 17.98	11 8 11.08	11 12 00.46
11 8 11.18	10 57 26.75	11 6 17.99	11 8 11.18	11 12 0.44

(54722-0)

Ill East

March 23 Em.

	E.b.	E.b.	E.b.	E.b.
	Moon's limb	γ Virginis	β Leonis	γ Virginis
	32.80	11.25	25.45	36.25
ill clipped	+9.09 47.00	+7.21 25.08	+15.24 39.70	+9.33 50.10
	1.00	38.80	53.90	4.00
	15.40	52.70	8.15	17.70
	29.70	6.70	22.40	31.85
	43.65	20.70	36.70	45.85
	11.26 58.20	11.40 34.45	11.43 51.20	12.00 00.00
	227.75	189.68	237.50	185.75
	120	150	160	60
	7)107.75	7)369.68	7)57.50	7)125.75
	15.39	11.39 52.81	11.43 08.21	11.59 17.96
	11.26 15.39	11.39 52.81	11.43 08.21	11.59 17.96
c	-.08	-.08	-.08	-.08
a	-.19	-.20	-.15	-.19
b	-.10	-.09	-.11	-.10
r	-.03	-.05	-.05	-.07
-u-	1.33.45	1.33.45	1.33.45	1.33.45
		11 38 18.94	11 41 34.37	11 57 44.07
		11 38 19.10	11 41 34.38	11 57 44.20

β Leonis + 1^m 33.44
 β Leonis + 1 33.44
 δ Virginis & δ Leonis + 1.33.47
+ 1 33.45

(52,8)(50)

Ill. East
March 23/24 Am.
E.C.

3 Cygni
26.40

+30 42.25
58.00
13.90
29.95
45.60

21.09.01.45
217.53
120

97.33
21.08.13.95
cul. -.11
ay. -.09
lev. -.18

21.08.13.57
21.06.39.52
1.34.05

March 25 Pm.
Between 4^h 30^m and 5^h this afternoon, the
transit-circle was reversed to Ill. West

March 23/24 Am

M.T.C. 21.06.10 E.C. 21.18.00
236 21.14.41.5 236 21.17.22.7
56.7

0.03.32.54 21.13.44.8
46.74 0. 4.19.28
0.04.19.28 21.09.25.52
3.27.96
21.05.57.56
21.06.10
Cam. +12.44
13 -3.56

21.18.00
1.34.05
21.16.25.55
21.17.22.7
56.75

M. Time Clock has
been put forward
two minutes

(3219)

Ill. East - on March 25

March 30 Pm.

E.C.

E Orionis

-1° 49.70
 3.70
 17.35
 31.10
 44.95
 58.60

5, 31, 12.30
 217.70

5, 30, 31.10

5, 30, 31.10

cul + .02

at - .16

ln. - .08

5, 30, 30.88

5, 28, 44.54

1, 46.29

E.C.

a Orionis

+7° 17.05
 31.15
 44.80
 58.80
 12.60
 26.40

5, 49, 40.30
 231.10

180

7, 411.10

5, 48, 58.73

+ .02

- .15

- .06

5, 48, 58.52

5, 47, 12.19

1, 46.33

M26 - 9.7

$$a = -0.392$$

$$b = -0.140$$

$$c = -0.070$$

(5350)

1853

Ill. East on Mar 25 Date of Eb + 1.78

March 18 The sheet on which these observations were made was laid aside and not read off till now.

Hence their position in the book

El	El	El	El	El	El
α Aurigae	β Orionis	β Tauri	δ Orionis	α Leporis	ϵ Orionis
$t_0 = 5^h$ 14.30	lost 08.10.72	36.95	12.40	lost 26.55.63	28.00
+45.51 34.25 -8.23'	lost 24.54	52.45	-0.25' 26.15	-17.56' 10.00	-1.18' 41.60
53.70	38.25	+26.29' 8.10	39.95	24.40	55.45
13.60	52.23	23.50	53.70	38.85	9.10
33.20	6.10	39.45	7.45	53.35	22.95
52.90	20.13	55.00	21.20	7.75	36.70
5.08.12.60	5.09.34.20	5.19.10.60	5.26.35.00	5.28.22.13	5.30.50.50
21455 120	$\Sigma = 150.91$	226.05	195.85	$\Sigma = 156.48$	244.30
7)94.55	cor = -69.36	260	150	cor = -43.24	180
5.07.13.55	5)81.55	7)166.05	7)375.55	6)113.24	7)64.30
	16.31	5.18.23.72	5.25.53.69	18.87	5.30.9.19
	36			35.87	
	52.31				
5.07.13.51	5.08.52.31	5.18.23.72	5.25.53.69	5.27.38.87	5.30.09.19
c -.10	-.07	-.08	-.06	-.07	-.07
a +.44	-.31	-.41	-.27	-.36	-.27
b -.29	-.09	-.17	-.10	-.07	-.10
r -.02	-.02	-.03	-.03	-.04	-.04
-21 -1 23.94	-1 23.94	-1 23.94	-1 23.94	-1 23.94	-1 23.94
5 5 49.24 29	5 7 27.84	5 16 59.39	5 24 29.29	5 26 14.39	5 28 44.77
5 5 49.23	5 7 27.84	5 16 59.41	5 24 29.38	5 26 14.41	5 28 44.79

α Aurigae	+ 1.23.93
β Orionis	+ 1.23.98
β Tauri	+ 1.23.92
δ Orionis	+ 1.23.95
α Leporis	+ 1.23.92
ϵ Orionis	+ 1.23.92
	+ 1.23.94

(837.)

Ill. East Dec Mar. 25

March 18

E.C. Moon's Limb	E.C. x Geminum
21.05	+ 20.47 3.85
+ 24.31 36.40	18.25
51.95	33.00
7.40	47.65
22.95	2.40
38.40	16.90
6.42.54.0	6.57.31.85
232.15	154.00
150	160
7)52.15	7)324.00
7.45	6.56.27.71

6.42.07.25	6.56.47.71
- .08	- .08
- .15	- .14
- .15	- .14
- .13	- .15
- 1 23.94	6.55 23.94
	6.55 23.26
	6.55 23.20

(532) (Sun Mar 26)

Ill East

April 8 Pm
E.b.

a Zauri

+16 50.60

50.00

19.35

33.60

48.00

2.10

4, 30, 16.60

185.25

60

235.25

4, 29, 33.60

+1.02

-1.12

-1.10

4, 29, 33.40

4, 27, 28.15

2, 05.25

Ill East Sun Mar 25

April 10/11 Pm
E.b.

a Cygni

39.60

+44 59.25

18.45

8 38.05

57.20

16.50

20, 39, 35.95

265.00

00

265.00

20, 38, 37.86

col. +.04

02, +1.01

lv. -1.15

20, 38, 37.76

20, 36, 24.47

2, 13.29

April 5 Pm.
E.b.

a Orionis

30.70

+7 44.80

58.55

12.30

26.15

40.15

5, 49, 53.80

266.45

180

286.45

5, 49, 12.35

+1.02

-1.15

-1.08

5, 49, 12.14

5, 47, 12.10

2, 00.04

April 8 Pm

E.b. 4, 34.00

236 4, 33, 49.3

4, 34.00

2, 05.2

4, 31, 34.8

4, 33, 49.3

1, 54.5

11.26 3, 27, 10

236 4, 37, 2.1

1, 54.5

4, 35, 07.6

1, 07, 24.12

3, 27, 43.44

34.02

3, 27, 09.42

3, 27, 10.00

-1.58

1, 06, 37.38

46.74

1, 07, 24.12

(533)



April 14/15 Am.

E.C.

β Aquarii

26.45

-6°

40.50

54.40

8.35

22.05

35.80

21.26.49.60

237.05

180

7) 57.05

21.26.08.16

cul. + .02

az. - .18

lev. - .07

21.26.07.93

21.23.48.26

2.19.67

E.C.

ε Pegasi

38.35.10

+9°

49.20

3.20

17.10

30.90

44.80

21.39.38.70

239.00

120

7) 119.00

21.39.17.00

cul. + .02

az. - .14

lev. - .09

21.39.16.79

21.36.57.17

2.19.62

E.C. rundown 15 Lon.

Chron. 236 rundown Apr. 14

April 10/11 Am.

E.C. 20.45.00

236 20.44.52.08

20.45.00

2.13.3

20.42.46.7

44 52.07

2.05.37

M.S.B. 19.40.10

236 21.00.48.0

2.05.32

20.58.42.63

1.15.17.23

19.43.25.40

3.13.87

19.40.11.53

19.40.10

1.53

16.

17.53

April 14/15

E.C. 22.59.00

236 22.55.57.6

22.59.00

2.19.8

22.56.40.2

22.55.57.6

42.6

1.30.16.71

46.74

1.31.03.45

M.S.B. 21.24.40

236 22.58.36.6

42.6

22.59.19.1

1.31.03.45

21.28.15.65

3.31.04

21.24.44.61

21.24.40

4.61

16.

20.61

$$a = -0.237$$

$$b = -0.075$$

$$c = -0.105$$

(537) ... rate of E.C. +1.60

EC had run down before these obs.

G.P.B.

Ill. West

Reobachter G.P.B.

April 15 P.m.

E.C.	E.C.	E.C.	E.C.	E.C.
ϵ Canis Maj.	Moons I limb	α Perimoon	Procyon	κ Perimoon
52.23.70	14.03.35 +32.12'	lost -00.21	31.15.00	35.08.65
-28.46'	39.65	25.16.45	+5.36'	29.90
+24.38'	19.00	32.90	42.75	23.95
55.23	34.47	49.10	56.50	38.90
47.00	49.90	05.05	10.30	54.15
26.55	05.35	26.21.50	24.05	9.30
42.25	20.85	32.72	32.37.90	24.30
6. 53. 57.80	7. 15. 36.25	$\Sigma = 125.00$	21.6.40	7. 36. 39.54
256.18	169.17	com -81.18	15.0	198.79
180	180	5.43.52	7.396.40	15.0
76.18	7. 549.17	8.76	7. 31. 56.63	7. 378.79
6. 53. 10.88	49.88	32.76	7. 31. 56.63	7. 35. 54.11
6. 53. 10.88	7. 14. 49.88	7. 25. 48.97	7. 31. 56.63	7. 35. 54.11
c +.04	$\pm .04$	+0.32	+0.04	+0.04
a -.26	-.08	-.05	-.15	-.08
b -.03	-.08	-.08	-.06	-.08
r +.01	-.02	-.03	-.03	-.04
u -20.29	-20.29	-20.29	-20.29	-20.29
6 52 50.18	7 14 29.34	7 25 12.19	7 31 36.00	7 35 33.57
6 52 50.39		7 25 12.38	7 31 35.82	7 35 33.67

ϵ Canis +20.25
 ? Castor +20.61
 Procyon +20.47
 * 20.29
 + 20.43

(553)

1853 April 17/18

G.P.13.

2C

α Capriop.

0...31...45.4

9.7

34.3

58.6

0...33...23.0

1710

0...32...34.20

Σ inst Cor -0.5

0...32 34.15

R 0...32 9 16

+24.99

110.

April 17/18

G.C. 00.40.00

M.L. 22.54.10

236 00.38.52.5

236 00.40.13.5

00.40.00

42.51

24.99

00.40.56.01

1.42.06.37

0039.35.01

1.42.53.11

46.74

0038.52.5

22.58.02.90

1.42.53.11

42.51

3.45.75

22.54.17.15

22.54.10

7.15

10

23.15

15 = 4.61

18 = 7.15

5.356

0.0

21.5

22.5

27.2

27.

(536) X 20.

1853

April 18th

$$a = -0.231 \quad \text{Rate of P.C.} + 1.64$$

$$b = -0.075$$

$$c = -0.103$$

	<i>AR</i>	
83 Cancri	9 ^h 10 ^m	294.03
α Hydrea	9 ^h 20 ^m	
λ Leonis	9 ^h 23 ^m	288.46
ϵ Leonis	9 ^h 37 ^m	
α	10 ^h 01 ^m	
γ Leonis	10 ^h 11 ^m	291.48

<i>El</i>	<i>El</i>	<i>El</i>	<i>El</i>	<i>El</i>	<i>El</i>
83 Cancri	α Hydrea	λ Leonis	ϵ Leonis	α Leonis	ϵ Ilimb
10.28.70	20.06.30	23.00.60	37.10.50	16.45'	<i>lost</i>
+ 18° 20' 43.36	- 8° 01'	+ 23° 37'	+ 24° 27'	+ 12° 41'	+ 17° 00'
37.85	33.90	30.30.1	40.90	44.50	14.65
12.25	47.85	45.65	56.10	58.70	29.35
26.80	1.85	0.60	11.15	12.65	44.00
41.15	15.70	15.60	26.25	26.70	58.75
9 ^h 11.35.70	9 ^h 21.29.65	9 ^h 24.30.55	9 ^h 38.41.30	10 ^h 01.40.60	10 ^h 03.13.25
26.5.80	15.5.45	139.10	212.05	230.30	
150	150	150	150	150	
7) 85.60	7) 335.45	7) 319.10	7) 392.05	7) 410.30	
9 ^h 11.12.26	9 ^h 20.47.92	9 ^h 23.45.59	9 ^h 37.56.01	10 ^h 00.58.61	10 ^h 02.29.37
<i>c</i> + .104	+ .104	+ .104	+ .104	+ .104	+ .104
<i>a</i> - .10	- .10	- .08	- .08	- .12	- .11
<i>b</i> - .07	- .04	- .08	- .08	- .06	- .06
<i>n</i> - .01	- .02	- .03	- .04	- .07	- .07
- <i>u</i> - 25.51	- 25.51	- 25.51	- 25.51	- 25.51	- 25.51
9 10 46.46	9 20 22.07	9 23 19.78	9 37 30.19	10 00 32.75	10 02 02.03.52
9 10 46.38	9 20 21.94	9 23 19.82	9 37 30.33	10 0 32.75	

(537) 20

E.C.

r Leonis

³³
33.90
+ 20.35 48.85

3.50

18.05

32.77

47.50

10. 13. 08.95

186.52

60

7) 126.52

10. 12. 18.07

10. 12. 18.07

~~1.06~~
~~1.07~~

- .09

- .07

- .08

- 25.51

10 11 52.21

10 11 52.24

α Hydrae

+25.64

ϵ Leonis

25.37

α Leonis

+25.57

+25.51

+25.65

(558) c.

April 19th 1853 α Leonis 10^h 00^m γ Leonis 10^h 11291^m 48 ϵ Leonis 10^h 56 δ Leonis 11^h 06 δ Hydorae 11^h 11

$a = -0.229$

Rate of E.C. +1.66

$b = -0.073$

$c = -0.103$

G.P.B. observed

April 19

E.C.	E.C.	E.C.	E.C.	E.C.
α Leonis	γ Leonis	Moons I think	δ Leonis	δ Hydorae
+12 ^m 41' 18.15	+20 ^m 35' 11.35.90	+12 ^m 07' 56.43.96	+21 ^m 20' 6.01.27	-13 ^m 59' 11.45.73
32.20	50.55	58.55	16.00	59.80
46.35	5.17	52.67	30.67	13.95
11.15 00.46	19.85	27.12	45.60	28.30
14.45	34.55	41.47	00.45	42.27
28.60	49.20	55.90	14.90	56.60

α Leonis	+27.39 ⁵³
γ Leonis	+27.35 ⁵⁰
δ Leonis	+27.29 ⁴⁴
δ	+27.35
	+27.49

10 ^h 01 ^m 42.70	10 ^h 13 ^m 13.85	10 ^h 58 ^m 10.25	11 ^h 07 ^m 29.60	11 ^h 13 ^m 10.65
$\Sigma = 182.45$	199.07	269.91	138.49	257.30
Cor = +.05	60	60	150	960
6) 182.50	7) 139.07	7) 189.91	7) 131.549	7) 197.30
30.41	10 ^h 12 ^m 19.87	10 ^h 57 ^m 27.13	11 ^h 06 ^m 45.49	11 ^h 12 ^m 28.18

10 ^h 00 ^m 00.41	10 ^h 12 ^m 19.87	10 ^h 57 ^m 27.13	11 ^h 06 ^m 45.49	11 ^h 12 ^m 28.18
+0.04	+0.04	+0.04	+0.04	+0.04
C -2.70	C -2.70	C -2.70	C -2.70	C -2.70
a -.12	-.09	-.12	-.09	-.19
b -.06	-.07	-.06	-.07	-.04
r .00	-.02	-.07	-.08	-.08
-u -27.34	-27.34	-27.34	-27.34	-27.34
10 00 32.79	10 11 52.24		11 6 17.80	11 12 0.43
10 0 32.74	10 11 52.23		11 6 17.85	11 12 0.31

(539)

Ill. West

$$a = -0.225$$

$$b = -0.072$$

$$c = -0.100$$

Rate of S.C. + 1.69

G.P.B. observed

April 21

E.C.	E.C.	E.C.	E.C.
Moon's I limb	12 Can. Ven.	♄ Virginis	♌ Virginis
46.38.80	lost	lost 10.75	17.16.92
52.95	49. 22.63	2.24.70	-10° 30.90
-0.04'	49. 22.63	-4.45' 38.30	-10.24' 44.87
21.00	49. 22.63	52.15	58.90
35.15	49. 22.63	5.90	12.95
44.12	49. 22.63	19.80	26.90
12 48.33.30	12.50.33.80	13. 3.33.45	13.18.40.83
207.27	Σ = 171.51	Σ = 174.30	232.27
60	Cor = -88.84	Cor = -41.40	180
7) 47.27	5) 82.97	6) 132.90	7) 412.27
21.04	16.59	22.15	13.17.58.89
12.47.21.04	12.49.40.59	13.02.52.15	col. + .02
6. 1.04	6. 1.04	13.02.52.15	02. - .19
a - .14	- .02	a - .16	ln. - .06
b - .05	- .09	b - .05	β. 17.58.66
r + .01	+ .01	r .00	13.17.28.24
-u - 30.31	- 30.31	-u - 30.31	30.42
12 46.50.54	12 49.10.05	13 2 21.53	13.17.58.89
13 49.10.04	13 2 21.55	c 1.04	- .18
		a	- .04
		b	- .02
		r	- .02
		-u - 30.31	13.17.28.24
			13 17 28.24

(560) 11.11.11

April 21

312.23

445

317.08

Q ₁ 5	12 ^h 45 ^m	
12 Can. Ven	12 ^h 49	
β Virgi	13 ^h 02	317.08
α Virg.	13 ^h 17	

April 22/23 Am.

E.L. E.M.Y.

α Cassiopei

lost

lost

lost

42.20

6.60

00, 33, 30.85

lost

0, 32, 42.20

32, 9.25

32.96

April 26 Pm.

E.M.Y.

E.L.

E.L.

δ Orionis

ε Orionis

24, 26.15

28, 41.70

40.10

55.55

53.85

29.15

7.55

22.90

21.00

36.80

34.90

50.45

5, 25, 48.80

5, 30, 04.20

(561)

500. West

April 27/28 Am
 E.C. C.M.S.
 a Andromeda

40.80
 +28° 56.85
 1, 12.25
 27.95 -
 43.65
 58.95
 00, 02, 14.65
255.10
160

7) 195.10
 00, 01, 27.87
 out + .02
 92. - .07
 60. - .13
 00, 01, 27.69
 0, 00, 46.48
41.21

W.C.B.
 E.C.
 Polaris U.C.
 00, 39, 00.50
 47, 52.70
 lost
 1, 5, 46.60
 14, 36.95
 23, 32.65
32, 24.35

April 27/28 Am.

E.C. 00, 05, 00 1926. 21, 39, 00
 236 00, 03, 36.8 236, 0, 4 24.0

41.95
 00, 05, 00 0, 05, 05.99 2, 21, 31.91
41.21 2, 22, 18.65 46.74
 00, 04, 18.79 21, 42, 47.34 2, 22, 18.65
 00, 03, 36.8 3, 33, 49
41.99 21, 39, 13.91
 21, 39, 00
 13.91
 16
 29.91

(562)

Int Cor for Fomalhaut - 0.25

May 1/2 Am.
Fomalhaut

22..49..30.7

49..46.8

50..02.8

50..18.7

50..34.6

50..50.5

51..05.8

186.9

66.9

129.9

18.56

-21

22..50..18.31

22..49..30.26

+ 48.05

May 4th P.M.
W.C.B.
E.C.-8 α Hydrea

20.32.35

luto

00.00

13.90

27.85

41.65

9.21.55.60

129.70

60

5) 69.70

9.21.13.94

cor. +.02

at. -.19

lw. -.07

9.21.14.18

9.20.21.72

52.46

May 1/2 Am.

M.Lb. 20..05..35

236 22..46..32.0

22..46..32.0

42.25

22..47..14.25

2..38..04.87

20..09..09.38

3.18.09

20..05..51.29

20..05..35.00

46.29

m.Lc - 13. 32.29

at 10h? - 32.39

E.C. 22..50..00

236 22..48..29.7

48.05

22.49..81.95

22.48.29.7

- 42.25

(563)

1853 May 9^{8/4} Am 84 Th 47 Int Th 50 Ill. west

South mark

South mark

Zero

420

.880

.070

405

.900

.070

417

.880

.065

420

.885

.070

420

.888

.065

Copied into the book
of Marks

May 7¹¹ Pm W. C. B.

E. C.

Sirius

38.53.70

8.00

22.50

36.80

51.00

5.35

6.40.19.75

6.39.19.10

60

7.257.10

6.39.36.73

6.38.39.35

57.38

E. C.

a Hydrae

20.37.76

51.65

5.55

19.40

33.85

47.20

9.22.01.00

195.90

60

7.135.90

9.21.19.41

9.20.27.60

57.73

May 10 Pm W. C. B.

E. C.

Sirius

-17°

00.25

14.70

28.80

43.50

57.50

12.00

6.40.26.25

183.00

120

7.303.00

6.39.43.29

cul. - .05

ar. - .15

br. - .03

6.39.43.06

6.38.39.31

1.375

$$\begin{aligned} a &= -0.032 \\ b &= +0.020 \\ c &= -0.018 \end{aligned}$$

(564) Rate of c + 2.3
 Ill West

May 13 Pm

E.C. RFB Procyon	E.C. RFB β Gem.	E.C. E.W.Y Moon's limb	E.C. ϵ Leonis E.W.Y	E.C. α Leonis W.C.B
32.06.85	36.42.90	57.15.15	37.56.80	1.02.45
+5°.36' 19.80	+28°.23' 58.80	+24°.07' 30.75	+24° 11.95	+13° 16.65
8" 33.70	7.14.50	46.05	+24°.27' 27.00	+12°.41' 30.50
47.50	29.90	2. 1.50	42.05	44.65
33. 1.15	45.60	16.95	57.25	58.70
15.00	1.10	32.15	12.30	12.80
7. 33.28.65	7. 38.16.75	7. 52.47.70	9. 39.27.35	10. 02.26.80
151.65	7.209.55	190.25	234.70	192.55
180	7.37.29.92	180	60	120
7.33.31.65		7.10.25	7. 294.70	812.55
7.32.47.38		1.46	9. 38.42.10	10. 01.44.64
c -.02	- .02	- .02	col-.05	col-.05
a -.02	- .01	- .01	ax-.07	ax-.08
b -.02	- .02	- .02	lv-.05	lv-.04
r +.05	+ .04	+ .05	9. 38.41.93	10. 01.44.47
- u -1 11.93	- 1 11.93	- 1 11.93	9. 37.29.97	10. 00.32.44
7 31 35.44	7 36 18.00		1. 11.96	1. 12.03
7 31 35.43	7 36 18.07			
			9. 38.42.10	10. 01.44.64
			c -.02	- .02
			a -.01	- .01
			b -.02	- .02
			r +.15	+ .19
			- u -1 11.93	- 1 11.93
			9 37 29.97	10 00 32.47
			9 37 29.97	10 0 32.44
[Procyon] + 1 11.92				
[Pollux] 11.86				
ϵ Leonis 11.93				
[α Leonis] + 1 11.96				
1. 11.93				

(565)
Ill. West

$$\begin{aligned} a &= -0.023 \\ b &= -0.026 \\ c &= -0.022 \end{aligned} \quad \text{Rate of } (c + 25)$$

May 14 P.m.
E.C. C.N.Y.
Moon's Ilimb

E.C. N.C.B.
a Hydrae

E.C. C.N.Y.
e Leonis

E.C. R.F.B.
a Leonis

46.25.05	20.54.60	37.59.26	1.04.90
+22.04'	8.45	+24.27	18.90
55.50	22.15	29.40	+12.41' 33.05
10.50	36.15	44.65	47.15
26.00	50.10	59.75	1.25
41.00	3.90	14.80	15.20

$$\begin{aligned} 46.47.56.55 \\ 254.75 \\ 150 \\ 7 \overline{) 74.75} \\ 10.65 \end{aligned}$$

$$\begin{aligned} 9.22.17.80 \\ 193.15 \\ 60 \\ 7 \overline{) 253.15} \\ 9.21.36.16 \end{aligned}$$

$$\begin{aligned} 9.39.29.80 \\ \Sigma = 178.40 \\ \text{Cor} = -75.46 \\ 5 \overline{) 102.94} \\ 20.59 \\ 24 \\ 44.59 \end{aligned}$$

$$\begin{aligned} 10.02.29.35 \\ 149.80 \\ 160 \\ 7 \overline{) 329.80} \\ 10.01.47.11 \end{aligned}$$

8.47.10.65

9.21.36.16

9.38.44.59

10.01.47.11

c - .02

- .02

- .02

- .02

a - .01

- .02

- .01

- .01

b - .02

- .01

- .02

- .02

r + .02

- .03

- .06

- .10

- u - 14.52

- 14.52

- 14.52

- 14.52

9 20 21.56

9 37 29.96

10 00 32.44

9 20 21.58

9 37 29.96

10 00 32.42

[a Hydrae]

+ 174.50

e Leonis

14.52

[a Leonis]

+ 14.54

14.52

1853.

May 17th P.M. - obs. by G. P. B.

$$(576) \quad a = -0.007 \\ b = 0.000 \\ c = 0.000$$

$$\text{Col} = 0.033 \\ \text{az} = +0.025 \\ \text{incl} = +0.003$$

$$\text{Rate of EC} = +2.1$$

 $t_0 = 10^h$ a Leo. May +62.32 δ Leonis +21.20 δ Hydrea -13.59 δ 1st Limb

EC - 10..54..29.25

11..06..54.30

11..12..38.65

11..27..27.30

54..59.45

7 09.20

2 52.85

41.70

55..29.35

7 23.50

3 07.05

55.85

55..58.90

7 38.70

3 21.15

10.15

56..28.85

7 53.35

3 35.30

22.30

56..58.70

8 08.10

3 49.65

38.65

10 57..28.20

11..08..22.85

11..14..03.50

11..28..52.70

292.70

7210.30

298.45

100.00

120.70

7210.30

7210.45

100.00

55..58.96

11..07..38.61

11..13..21.21

11..28..52.70

-07

-03

-03

11..28..52.70

+02

+01

+02

11..28..52.70

+01

+00

+00

11..28..52.70

N.A. 10..54..37.96

11..06..17.56

11..12..00.04

11..28..52.70

EC 1..20..96

1..21..03

1..21..16

Moon 11.28.10.09
60
60
60
11.28.49.58 γ Virginis +7.27 β Leonis +15.23 π Virginis +7.26 δ Leonis +15.24

11..38..58.25

11..42..12.60

11..54..00.75

9 12.25

2 26.70

4 14.70

9 26.10

2 40.90

4 28.45

9 39.95

2 55.40

4 42.40

9 53.85

3 9.60

4 56.30

40 07.75

3 23.75

5 10.05

11..40..21.50

11..43..38.05

55..23.45

279.65

448.00

176.60

11279.65

77387.00

77387.00

11..39..39.95

11..42..55.30

11..54..42.37

-03

-03

-03

+02

+01

+02

+00

+00

+00

11..39..39.95

11..42..55.30

11..54..42.37

11..38..18.16

11..41..34.11

11..53..21.27

1..21..10

1..21..17

1..21..09

 δ Virginis +7.21

α Ursa +1.21.19
 δ Leo +1.21.19
 β Leo +1.21.19
 γ Leo +1.21.19

α Ursa +1.21.19
 δ Leo +1.21.19
 β Leo +1.21.19
 γ Leo +1.21.19

α Ursa +1.21.19
 δ Leo +1.21.19
 β Leo +1.21.19
 γ Leo +1.21.19

1853

(567)

May-20th P.M. - Obs. by G.P.B.
$$\begin{aligned} 2 & -0.013 \\ 6 & +0.008 \\ 6 & -0.006 \end{aligned}$$

$$\begin{aligned} \text{Cool} & -0.033 \\ \text{az} & +0.025 \\ \text{incl} & +0.003 \end{aligned}$$
Rate of E.C. 5th. α Virginis-10.23

13..18..13.60

27.75

41.70

55.65

9.65

23.45

13..19..37.50

209.30

186

7/389.30

55.61

-0.03

+0.02

13..18..55.60

17..28.23

E.C. fast 1..27.37

 ζ Virginis 0.9

13..27..59.40

13.30

26.90

40.75

54.45

8.20

13..29..21.60

224.80

60

7/284.80

13..28..40.69

-0.03

+0.02

13..28..40.68

13..27..13.47

1..27.21

 η Bootis 19.8

13..48..25.85

40.50

54.85

9.55

24.10

38.65

13..49..53.05

226.55

160

7/266.55

13..49..09.51

-0.03

+0.01

13..49..06.49

13..47..42.33

2..27.16

Dis 1st Limb.

14..11..33.95

48.55

2.80

-9^h 18'

17.15

31.50

45.60

14..13..50.00

179.75

60

7/119.75

17.11

14..12..17.11

c - .01

a - .01

b + .01

r - .10

-u - 127.23

 ϵ Bootis 27.42 unk. 8 mag. one wire lost.

39.16.39

14..45..24.50

32.01

38.45

47.49

52.50

14..40..02.90

6.70

18.65

20.45

33.90

34.40

14..40..49.60

 $\Sigma = 105.05$

Cor = -93.09

4/11.96

2.99

 α Virginis - 14 10 49.77 η Bootis ϵ Bootis

	α Virginis	ζ Virginis	η Bootis	ϵ Bootis	Unk.
to 13 ^h	13..18..55.61	13..28..40.69	13..49..09.51	14..40..02.90	
c.	- .01	- .01	- .01	- .01	
a.	- .01	- .01	- .01	.00	
b.	.00	+ .01	+ .01	+ .01	
-r	- .03	- .04	- .07	- .14	
-w	- 1 27.23	- 1 27.23	- 1 27.23	- 1 27.23	
	13 17 28.33	13 27 13.41	13 47 42.23	14 38 35.83	
	13 17 28.24	13 27 13.47	13 47 42.33	14 38 35.46	

 α Virginis + 1.27.32 η Bootis + 1.27.08 ϵ Bootis + 1.27.28

-1 27.23

(578)

May 27th PM
α Leonis G-

EC - 10. - 1. 29.15
 1. 43.30
 1. 57.30
 2. 11.50
 2. 25.70
 2. 34.90
 2. 52.40
 261.25
 - 180
 7/81.25

10. 02. 11.66

-0340120

SA 10. 00. 32.32
 1. 39.27

May 31/32 Am
Polaris. WCB

EC. 0. 49. 25.55
 58. 16.15
 1. 07. 12.17 mid.
 16. 03.40
 24. 55.80
 5. 35. 53.57
 EC 1. 07. 10.71

α Arietis G.P.B.

1. 59. 55.30
 10.75
 25.53
 40.45
 55.30
 10.25
 2. 01. 25.15
 222.73
 60
 7/282.73
 2. 00. 40.55
 -2
 2. 00. 40.53
 1. 58. 52.76
 EC. +1. 47.77

Rate +1.88

(569)

(33)

June 5/6 Am

WCB Homalshank.

236 - 32.0 - 2

47.8

49.3.6

19.4

38.4

22 49.57.3

204.8

180

7124.8

3.54

-2

22.49.01.54

-5

22.49.01.49

HA - 22.49.31.23

236 - 29.74

2.29.5

EC Part +1.59.76

1.49.79

5/11.99/2.4

10

19

15

49

1.59.76

June 9/10 Am

Polaris

236 - 13.05.7.5 mid w

-2

13.05.05.5

EC 1.11.0.0

236 - 1.18.22.3

10 Pm

E.C. 14.57.00

236 14.54.23.6

7 36.5

6 20.5

3/6.0/2

20.5

26.6

-3.9

(570)

Ill. West

June 11th - Ill. west
Lirius

G.W.Y. obs.
E.B. June 9 Pm. E.B.
8 Leonis 8 Hydorae et Crateris

42.15	26.60
57.05	40.85
11.70	34.90
26.45	9.00
41.20	23.35
55.90	37.40
11.09.10.75	11.14.51.50
245.20	243.60
60	180
7) 185.20	63.60
11.08.26.46	11.14.09.08
11.06.17.29	11.11.55.79
2,09.17	2,09.29

236 - 31.6

46.0

0.5

15.0

29.1

43.4

6.38.57.7

223.3

-120

7) 103.3

14.76

-2.76

6.38.12.76

6.38.39.16

236 -26.40



N.B. June 10 Pm
E.B. has been stopped a while for cleaning the
pallets

(571)

June 11 Pm.
E.C.

C.W.R. observed
 α Leonis
 10.00
 24.45
 38.40
 52.50
 6.80
 20.60

10.01 34.70

187.95

180

7/367.45

10.00 52.49

N.A. 10.00 32.14

20.35

June 13/14 Am.
E.C. α Arietis

58.83.65
 48.72
 03.65
 18.60
 33.35
 48.25

2.00 03.27

189.49

12.6

69.49

+6.0

129.49

1.59 18.50

1.58 53.13

+25.43

June 18th

E.C. 12.08.0

 γ Virginis +1

12.12 9.35
 22.23.45
 37.00
 51.00
 13. 4.70
 18.10

32.10

175.70

180

355.70

12.12 50.82

1. 02

12.12 50.80

12.12 23.58

27.22

 γ Virginis 0°

12.33 59.35
 34. 13.15
 26.80
 40.60
 54.35
 35. 8.15

21.75

224.15

60

7 284.15

12.34 40.59

12.34 40.57

12.34 13.47

27.10

June 10/11 Am.

E.C. 2.59.00 M.G. 21.41.45

236 2.58.13.8 236 3. 1. 4.0

87.0

3. 01.31.0

5. 16.47.14

21.45.43.86

3. 33.90

21.42.09.96

41.45

24.96

16

40.96

5.15.00.40

46.94

375.47.14

June 13/14 Am

E.C. 2.06.00 M.G. 20.32.00

236 2. 5. 10.3 236 2. 3. 00.0

24.27

2. 6. 00.0

25.43

2. 5. 34.5

236 2. 5. 10.30

-24.27

5. 26.50.07

46.70

5. 27.36.81

3. 22.32

13

26. 3. 24.27

5. 27.36.81

20.35.47.46

19. 56.43.41

34. 56.27

46.87

46

20.32.25.01

M.G. 20.32.00

25.01

16

41.01

allowed 41.2 Hour of Britain 42.5

26.30

(572)

1853 June 15/16 Am

Ref of Ec + 108

 α Capriopce
EC - 0... 31... 26.70

31... 57.65 24.95

2... 15.50 23.55 - 1.0

2... 40.33 24.83 + 0.88

3... 04.90 24.57 - 0.26

3... 29.20 25.30 + 0.73

0... 3... 53.60 24.40 - 0.90

221.88

60
71281.88

0... 32... 40.27

A.A. 0... 32... 11.33

E.C. + 28.94

June 16 P.M. 1853 Ill. West

J. H. Obs.

 α Leonis E.C. α Ursae Majoris

10... 0... 19.70

33.60

+ 12... 41' 47.85

1... 1.70

15.65

29.50

44.10

792.50

180

12.50

10... 1... 1... 79

+ 0.0124, 0.003 = - 0.02

10... 1... 1... 77

10... 0... 32.09

0... 0... 29.68

10... 0... 01.79

+ .04

+ .01

+ .01

+ .06

+ .00

- 29.92

10 0 31.95

10 0 32.09

first three were lost δ Leonis

11... 6... 2.90 + 21°

17.85

+ 12... 32' 10... 55... 06.60 + 21... 20' 32.35

36.40

47.40

56... 6... 40

7... 1... 90

56.40

16.85

31.35

150.60

7330.60

11... 6... 47.23

+ 02

11... 6... 47.21

11... 6... 17.22

29.99

11... 06... 47.23

+ .01

+ .01

+ .00

+ .07

- .08

11 6 17.31

11 6 17.22

 β Leonis + 15°

11... 41... 21.00

35.50

+ 15... 24' 49.50

42... 3... 90

18.00

32.45

46.75

207.10

180

7 27.10

11 42... 03.87

- .02

11... 42... 03.85

11... 41... 33.80

30.05

11... 42... 03.87

+ .01

+ .01

+ .01

+ .06

- .13

11 41 33.82

11 41 33.80

$\begin{matrix} +0.011 \\ +0.067 \\ +0.005 \end{matrix}$

(573)

June 16th P.M. El West
E.C. a Virginis - 10 Noon

13 ^h 17 ^m 16.00	13 ^h 44 ^m 25.75
-10 ^o 24'	30.25 142.5 -6 ^o 24' 39.90
44.00	13.75 -0.50 53.90
58.15	14.15 +0.50 45 ^m 8.20
18 ^m 11.95	13.80 -0.75 22.40
26.40	14.45 +0.65 36.60
40.15	13.75 -0.70 50.70
227.10	237.45
180	180
7 407.10	7 57.45
13 ^h 17 ^m 58.16	13 ^h 45 ^m 8.21
-01	
13 ^h 17 ^m 58.14	
13 ^h 17 ^m 28.08	13 ^h 45 ^m 08.21
30 ^m 06	

13^h 17^m 58.15

$\begin{matrix} c \\ a \\ b \\ r \\ u \end{matrix}$

$\begin{matrix} +.01 \\ +.01 \\ +.04 \\ -.25 \end{matrix}$

13^h 17^m 28.0813^h 17^m 28.08

E.C.

Polaris

0^h 39^m 28.048^m 22.557^m 15.91^h 6^m 9.415^m 0.123^m 52.932^m 45.3220^m 174.17 40^m 174.11^h 06^m 7.9June 17th P.M.E.C. a Leonis 43^o10^h 0^m 21.50

35.65

49.70

1^h 3.8017^m 9032^m 10

45.95

206.60

180

7 26.60

10^h 1^m 3.80

-02

10^h 1^m 3.78A.A. 10^h 0^m 32.080^h 0^m 31.70

H.H. Obs.

B.A.C. 4649

13^h 47^m 5.50

19.45

+54^o 28'

33.20

46.80

48^m 1.00

14.85

28.65

149.45

180

7 329.45

13^h 47^m 47.0613^h 47^m 47.06

+01

+01

+01

+04

-28

13^h 47^m 16.98

H.H. Obs.

El West Maj - first three wire cut

2nd wire cut

Cal - 0.033

Ar + 0.025

incl + 0.003

10^h 55^m 8.65

38.50

56^m 8.25

38.00

(574)

June 18th P.M. All. West 1853.
 E.C. Pirius a Leonis

L.H. Obs.
 a Mese Majoris

6^h 38^m 28.90

10^h 00^m 23.20

48.60

37.50

57.75

51.35

10^h 54^m 40.40

39^m 12.30

1^h 5.55

55^m 10.35

26.60

19.75

40^m 20.20

40.80

33.75

56^m 10.00

265.30

47.80

39.75

180

218.90

85.30

180

6^h 39^m 12.19

38.90

10^h 01^m 5.56

June 18th P.M. All. West

E.C. a Virginis

E.C. a Mese Majoris

E.C. a Bootes

a Bootes

13^h 17^m 19.90

13^h 41^m 15.15

13^h 47^m 32.10

14^h 8^m 48.40

33.90

36.55

46.85

9^m 9.80

-10° 24'

47.90

+50° 03'

57.95

48.01.10

+19° 57'

17.50

18^m 1.85

42^m 19.50

+19° 08' 16.00

32.60

b=14"

15.95

41.00

30.50

47.80

29.70

43^m 2.50

45.00

10^m 1.85

43.70

43^m 23.65

59.60

16.40

7 192.90

196.30

231.15

167.85

13^h 18^m 1.84

60.00

120

60

13^h 18^m 1.83

7 136.30

13^h 48^m 15.88

14^h 9^m 32.55

13^h 17^m 28.07

13^h 41^m 19.47

13^h 48^m 15.95

14^h 9^m 32.52

33.74

13^h 40^m 45.92

13^h 47^m 42.18

14^h 8^m 58.55

13^h 18^m 01.84

13^h 42^m 19.67

13^h 48^m 15.85

14^h 09^m 32.52

+ .01

+ .01

+ .01

+ .01

.00

.00

.00

.00

+ .04

+ .11

+ .07

+ .07

+ .05

+ .02

+ .01

+ .01

13^h 17^m 28.07

13^h 41^m 19.47

13^h 47^m 42.18

14^h 08^m 58.55

Rate of El. +1.55

+0.002
+0.000
+0.008

(575)

J. L. H. obs

June 18th P.M. 1853 Ill west
E.C. 2^d LibraeE.C. 5th Librae

E. Moon

E.C. 4th Opusculi

Opusculi E.C.

14^h 42^m 37.40

52.00

-15^h 26^m 43^s 6.15

20.40

34.70

48.90

44^h 3.307^h 20^m 2.85

46.01

14^h 43^m 20.4114^h 43^m 20.41

+.01

.00

+.04

- .05

- 33.84

14 42 46.67

14 42 46.53

14^h 48^m 40.85- 10^h 49^m 55.1549^h 9.00

23.15

37.00

51.05

50^h 5.00

221.20

7^h 16^m 1.2014^h 49^m 23.0314^h 49^m 23.03

+.01

.00

+.04

- .05

- 33.84

14 48 49.19

14 48 49.31

15^h 41^m 5.65

20.65

-16^h 47^m 35.55

50.65

42^h 57.40

20.40

35.30

173.70

7^h 35^m 3.70

50.53

15^h 41^m 50.5315^h 41^m 50.53

+.01

.00

+.04

- .11

- 33.84

16^h 15^m 22.10-19^h 41^m 37.00

51.40

16^h 6.10

20.75

35.15

49.60

222.10

7^h 42^m 1.0

6.01

16^h 16^m 06.0116^h 16^m 06.01

+.01

.00

+.04

- .15

- 33.84

16 15 32.07

16 15 32.04

16^h 22^m 36.40-16^h 17^m 57.0023^h 4.80

19.40

33.60

48.15

24^h 2.20

197.55

7^h 13^m 7.55

6.0

16^h 23^m 19.3616^h 23^m 19.36

+.01

.00

+.04

- .15

- 33.84

16 22 45.42

16 22 45.67

Inquirer June 18th P.M. Ill. west Ill.E.C. 17^h 10^m 2.30

20.50

32.20

50.15 - 16.8 = 48.47

11^h 1.75 + 1.58 =

20.30

31.50

158.20

11.68

157.02

18.0

7337.12

17^h 10^m 48.16

α Virginis + 33.77

γ Ursae Maj + 33.69

γ Bootis + 33.81

α Bootis + 34.04

α² Librae + 33.85

+ 33.84

(576)

June 20th P.M. 1853 All. West J.S.A.E.C. Sirius - 16^h 38^m 32.50^s ^{from wire} ^{lost} α Virginis - 10^h 53^m 43.90^s γ Mrae Napier + 60^h η Bootis + 19^h

6 ^h 38 ^m 32.50 ^s	10 ^h 53 ^m 43.90 ^s	13 ^h 17 ^m 23.00 ^s	13 ^h 41 ^m 18.40 ^s	13 ^h 47 ^m 35.35 ^s
39 ^m 46.55 ^s	54 ^m 13.75 ^s	87 ^m 00 ^s	40 ^m 00 ^s	50 ^m 10 ^s
39 ^m 15.50 ^s	43.60	50.90	42 ^m 1.45 ^s	48 ^m 4.40 ^s
29.80	55 ^m 13.50 ^s	18 ^m 51.00 ^s	22 ^m 70 ^s	19 ^m 00 ^s
44.25	43.55	19 ^m 00 ^s	44 ^m 00 ^s	33.60
58.45	56 ^m 12.95 ^s	33.00	43 ^m 5.70 ^s	48.95
228.95	42.95	46 ^m 90 ^s	27.00	49 ^m 2.70 ^s
120				198.20
7 ^h 108.95	214 ^m 20 ^s	214 ^m 80 ^s		
	120 ^m 00 ^s	180		
6 ^h 39 ^m 15.56 ^s	70 ^m 4 ^m 20 ^s	734 ^m 80 ^s		
002	10 ^h 55 ^m 13 ^m 46 ^s	13 ^h 18 ^m 4.97 ^s	13 ^h 42 ^m 22.75 ^s	13 ^h 48 ^m 19.03 ^s
6 ^h 39 ^m 15.54 ^s				
6 ^h 38 ^m 39.20 ^s	10 ^h 55 ^m 13 ^m 42 ^s	13 ^h 18 ^m 4.96 ^s	13 ^h 42 ^m 22.71 ^s	13 ^h 48 ^m 19.01 ^s
+ 36.34	10 ^h 54 ^m 36 ^m 88 ^s	13 ^h 17 ^m 28.05 ^s	13 ^h 41 ^m 45.85 ^s	13 ^h 47 ^m 42.15 ^s
	+ 36.54	+ 36.91	+ 36.83	+ 36.86

E.C. α Bootis + 19^h

14 ^h 8 ^m 51.50 ^s
9 ^m 6.35 ^s
20.90
35.45
50.25
10 ^h 4.85 ^s
18.50
187.80
7 ^h 247.80

14 ^h 9 ^m 35.40 ^s
16 ^h 9 ^m 35.37 ^s
16 ^h 8 ^m 58.54 ^s
+ 36.83
37.01
37.05
- 72 ^m 29 ^s
36.96

 α Bootis + 27^h

14 ^h 38 ^m 25.65 ^s
41.55 ^s
56.85 ^s
39 ^m 12.10 ^s
28.10
43.40
59.10
266.75
180
7 ^h 286.75

14 ^h 39 ^m 12.39 ^s
14 ^h 39 ^m 12.36 ^s
6 ^m 35.35 ^s
+ 37.01

 β Librae - 8

15 ^h 9 ^m 2.60 ^s
16.60 ^s
30 ^m 50 ^s
44.55 ^s
56.60 ^s
10 ^h 12.60 ^s
26.40
191.80
120
7 ^h 311.80

15 ^h 9 ^m 44.55 ^s
15 ^h 9 ^m 44.53 ^s
9 ^m 7.45 ^s
+ 37.05

Jupiter both limbs in all

17 ^h 9 ^m 5.20 ^s
19.75
34.35
34.75
46.30
49.50
10 ^h 1.20
4.45
15.90
19.80
30.60
34.05
1.70
23.34
1.67

17 ^h 9 ^m 1.84 ^s
5.20
16.39
19.75
31.35
34.75
46.30
49.50
10 ^h 1.20
4.45
15.90
19.80
30.60
34.05
1.70
23.34
1.67

(577)

June 21st P.M. 1858 Ill. West
E.C. a Virginis13^h 17^m 24.70

38.75

52.90

18^h 6.75

20.80

34.45

48.65

227.00

7 47.00

13^h 18^m 6.7113^h 18^m 6.7013^h 17^m 28.04

+ 38.66

June 23rd P.M. 1858 Ill. West
E.C. a Ursa Majoris a Virginis10^h 53^m 48.9554^h 18.90

48.85

55 18.50

48.45

56 18.20

47.85

7 249.70

120

129.70

10^h 55^m 18.53

4

10^h 55^m 18.4910^h 54^m 36.79

+ 41.70

13^h 17^m 28.15

42.15

56.20

18^h 10.00

24.15

37.90

51.90

250.45

180

7 70.45

13^h 18^m 10.06

1

13^h 18^m 10.0513^h 17^m 28.03

+ 42.02

June 23rd P.M. 1858 Ill. West
E.C. a Ursa Majoris a Bootis13^h 40^m 23.45

44.95

42^h 6.20

27.70

49.20

48^h 10.60

31.90

7 194.08

13^h 42^m 27.71

4

13^h 42^m 27.6713^h 41^m 45.81

+ 41.86

13^h 47^m 40.45

58.25

48^h 9.70

24.20

38.65

53.25

49^h 7.80

229.20

7 169.20

13^h 48^m 24.17

2

13^h 48^m 24.1513^h 47^m 42.12

+ 42.03

14^h 8^m 56.409^h 11.30

25.75

40.45

55.25

19^h 9.75

24.45

223.30

7 283.30

14^h 9^m 40.47

3

14^h 9^m 40.4414^h 8^m 58.51

+ 41.93

(578)

June 25 - Ill west - L.H.
 α Leonis a Ursae Majoris

10.00.49.10

10.54.22.35

1. 8.00

51.65

16.90

65.21.70

31.20

57.75

45.10

56.21.35

145.30

51.6.8.80

60

60

10.01.17.06

108.80

2

10.55.21.76

10. 1.17.04

4

10. 0.32.03

10.55.21.72

45.01

10.54.36.74

44.98

8C- 10.13.0

236-10.11.53.5

M.C-3 .00.10

236-10.15.53.5

mtc-3.3.0

236-10.18.44

δ Leonis

δ Hydrae et Crateris

α Bootis

J.L.H.

11. 6.17.90

11. 12. 2.50

14. 8.59.85

32.80

16.60

9. 14.45

47.45

30.60

29.55

7. 2.25

44.85

44.10

16.90

58.90

58.65

31.70

13. 13.25

10. 13.15

46.40

27.25

27.80

195.40

193.95

247.55

180

120

60

7.15.40

7.13.95

7.307.55

11. 7. 2.20

11. 12. 44.85

14. 9.43.94

02

2

3

11. 7. 2.18

11. 12. 44.83

14. 9.43.91

11. 6. 17.13

11. 11. 59.63

14. 8. 58.50

45.05

45.20

45.41

(579)

July 1st Am.
E.C. C.W.Y.
a Arietis

2.85
+22 18.60
32.75
47.60
2.65
17.60

2.00 32.25
133.50
180

7) 333.50
1. 59. 47.64
col. - .03
az. + .02
lev. + .10

1. 59. 47.73
1. 58. 53.67
54.06

July 1/2 Am
E.C. C.W.Y. As
a Tauri

27.42.15
56.45
10.75
25.10
39.70
53.85

4. 29. 08.05
235.05
60

7) 175.05
4. 28. 25.00
4. 27. 28.78
56.22

July 1st Am.

E.C. 2. 10.00 M.T.B. 19. 44. 30

236 2. 8. 49.6 236 2. 22. 40.0

2. 10.00
E.C. fast 54.06

2. 09. 05.94

2. 8. 49.6

236 slow 16.34

16.34 6.33.51.50

2. 22. 56.34 46.74

6. 34. 38.30 6. 34. 38.30

19. 48. 18.04

3. 14.67

19. 46. 03.37

19. 44. 30

33.37

16

49.37

(580)

July 5/6 Am.
E.C. C.M.T.

a Lauri

3.05

16.50

31.85

46.20-

0.55

14.60

4, 27, 29.05

141.80

180

7/321.80

4, 26, 45.97

4, 27, 28.88

42.91

July 5/6 Am.

M.T.C. 21, 53, 00

236 4, 51, 22.0

11.91

4, 51, 33.91

6, 54, 21.09

21 57, 12.82

3, 35.79

21, 53, 37.03

21, 53, 00

37.03

16

53.03

E.C. 4, 52, 00

236 4, 52, 31

6, 53, 34.35

46.74

6, 54, 21.09

4, 52, 00

42.91

4, 52, 42.91

4, 52, 31

11.91

x July 5th P.M.

E.C. 16, 26, 00

M.T.C. - 9, 33, 35

236 16, 24, 45.2

236 - 16, 29, 54.5

July 5th P.m.After this comparison of 236 with
E.C. the latter was adjusted

(581)

July 6/7 Am

Ecl. West
C. W. Y. observed

E.C.	E.C.	E.C.	E.C.
α Andromeda	π Pegasi	α Cassiopea	Polaris W.C.
—	—	—	00,38,27.55
—	28.95	39.65	47,27.00
—	43.05	24.00	00,56,15.15
4.80	57.10	28.40	1 5,13.00
20.45	11.40	62.70	14,04.00
36.00	25.50	17.25	22,55.70
00,00,51.45	00,05,39.80	00,32,41.35	1,31,50.00

(582)

Ill. West

July 7 Pm.

E.L.	E.L.
Polaris	α Virginis
12,, 38,, 26.80	1.45
47,, 20.45	13.90
56,, 12.95	29.50
13 5,, 5.40	43.50
14,, 7.00 doubt	57.70
22,, 48.40	11.45
13,, 31,, 49.90	13,, 17,, 25.40

E.L.
 η Ursa Majoris

56.75
18.45
39.85
1.20
22.40
43.90
13,, 42,, 5.15

July 7/8 Am.

E.L.
 α Andromeda

17.05
32.95
48.20
4.05
19.75
35.45
0,, 00,, 50.70

E.L.
 γ Pegasi

13 13.75
28.20
42.25
56.45
10.35
24.70
00,, 05,, 39.05

(583)

July 7/8 Am.

Ill West

E.C.	E.C.
α Cassiopea	Polaris W.C.
14.20	00, 38, 29.00
38.75-	47, 23.40
3.00	56, 16.00
27.75-	1, 5, 12.20
57.95-	14, 3.40 doubt full
16.23-	22, 55.00
00, 32, 40.50	1, 31, 49.70

