

KG
11365
3

A.3

Transit Circle.
September 26th 1849
to
November 29th 1849

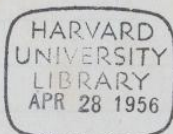
KG11365.3

(1)

1849. Sept-25

For value of 1st div of Level see Oct 29thComp of Newman Bar with Standard of
R. S. of Paris Dec Oct 19th 20th

Nov 22	Em	40	Aquarii
Sept 27	Em	29	Capricorni
Nov. 29	Em.	71	Tauri
"		a	Tauri
"		77	"
"		78	"
"		1391	B.H. C.



On August 30th Twenty levelings. before and after reversal show that the Pivots of the Transit circle are sensibly equal,

Illumination Pivot largest - 0.085

Axis West end too high

1849. August - 16 — 1.75 — 0.117

— " — 20 — 1.42

— " — 30 — 1.45

September - 17 — 2.70

— " — 19 — 2.50

— " — 26 — 2.65

August - 16th Collimation East — 0.20 Ill East

Augth - 17

Azimuths.

1849. August - 16th West East of South — 0.41

Augth - 17

September 26th P.M.

$1491 - 8 \dots 27 \dots 0$ $26 - 20 \dots 32 \dots 0$
 $2419 - 8 \dots 36 \dots 37$ $2419 - 20 \dots 40 \dots 36.5$
 $\quad \quad \quad + 9 \dots 37$ $\quad \quad \quad 8 \dots 36.5$

27th H. East (1491) Polaris L.P.
 8 hrs. min. *B. Draconis*
 C $17 \dots 0 \dots 48.5$ $6 \dots 55.3$ D $13 \dots 07 \dots 02.5$
 D $17 \dots 02 \dots 32.0$ $7 \dots 17.7$
 Hourly $7 \dots 40.5$
 $8 \dots 2.9$
 $8 \dots 25.5$
 $8 \dots 48.0$
 $19 \dots 29 \dots 10.2$

8 hrs. min.
 A $18 \dots 10 \dots 19.6$
 B $\dots 14 \dots 10.3$
 C $18 \dots 00.4$
 D $21 \dots 53.0$
 E $25 \dots 46.4$
 F $29 \dots 37.0$
 G $33 \dots 31.5$
 $7 \overline{) 153 \ 16982}$
 $21 \dots 54.03$
 $18 \dots 21 \dots 52.03$

$18 \dots 20 \dots 52.87$
 $+ 59 \dots 16$

* Septi $16 \dots 6 \dots 315.39$
 v a. Scipm $16 \dots 20 \dots 338 \dots 26$
 y. Draco $16 \dots 21 \dots 257 \dots 18$
 a. Rorah $17 \dots 07 \dots 297 \dots 49$
 B. Draco $17 \dots 26 \dots 259 \dots 58$
 a. Opshund $17 \dots 28 \dots 299 \dots 43$
 y. Draco $17 \dots 53 \dots 260 \dots 53$
 M. Sagitt $18 \dots 04 \dots 333 \dots 28$
 8 hrs. min $18 \dots 21 \dots 225.46$

Pol $13 \dots 07 \dots 0.5$
 $13 \dots 05 \dots 58.4$
 $+ 1 \dots 01.7$

8 hrs. min
 $17 \dots 02 \dots 30.0$
 $17 \dots 01 \dots 29.42$
 $+ 1 \dots 00.58$

B. Draco
 $17 \dots 28 \dots 00.87$
 $17 \dots 29 \dots 01.47$
 $+ 59 \dots 40$

8 hrs. min
 $18 \dots 21 \dots 52.03$
 $18 \dots 20 \dots 52.7$
 $\dots 59 \dots 53$

For Obs on the 25th & 26th
 See another Book.

27th
 B. Capriorni $20 \dots 12 \dots 33.77$
 v. Capriorni $20 \dots 31 \dots 29.16$
 D. d. imb $21 \dots 04 \dots 08.55$
 y. Capriorni $21 \dots 31 \dots 45.82$
 8 " $21 \dots 38 \dots 44.56$

Sept. 27th

B Capricorni

2.53.0

3. 6.7

3.21.0

3.35.4

3.49.4

4. 3.9

20.14.18.2

187.6

60

1247.6

35.37

-2

20.13.33.37

12. 33.70

59.67

γ Capricorni

2. 04.0

2. 18.3

2. 33.0

2. 47.2

3. 1.8

3. 16.0

21.33.30.4

150.7

150.7

1330.7

47.27

21.32.45.27

21.31.45.76

+ 59.51

(4)
No 1491
Ill East-

v Capricorni

147.2

2. 1.7

2.16.4

2.30.6

2.45.0

2.59.5

20.33.14.2

72146

30.66

20.32.28.66

31. 29.29

59.37

δ 1 Limb

4.46.2

5. 1.0

5.15.5

5.30.0

5.44.5

5.58.8

21.06.14.0

210.0

30.0

21.05.28.00

anomy 7.8 mag 328.08

54.2 to be omitted

12.8

27.0

41.2

21.08.55.4

184.6

369.2

21.08.24.92

δ Capricorni

9. 3.0

9. 17.4

9. 31.5

9. 46.0

0. 0.3

0. 14.5

21.40.29

141.7

180

7321.7

45.96

21.39.43.96

144.65

+ 59.27

Dec - 15.45

occultation 328.08

B¹ 1491 - 21. 50. 23.2-8 4 ftB² - 2557 - 21. 50. 39.8-9

0. 14.5 Great

21.50.35.3 6th mag21.50.35.3 6th mag

very good Star is yellowish red

1491 - 21.56.0

2557 - 21.56.16.0-7

(Im of 29 Capricorni)

Occultation of a star of the 6th mag

Immersion on the South

dark limb of the Moon 12.24.36.10

B² 21.50.35.3

59.8

21.49.35.5

12.25.24.85

9.24.10.65

1.32.42

B¹ 21.50.35.9

59.8

21.49.36.4

12.25.24.85

9.24.11.25

1.32.42

122524.85

21.50.39.8

-4.5

21.50.35.3

16.7

21.50.18.7

21.50.35.9

Sept 27th 1849

Im. 29 Capricorni

9.22.38.8 B¹9.22.38.2 B²

21.49.20

21.22.38.23 21.22.38.83

1849. Sept 27/28th

mid wire

South mark

8.006	0.112	= 0.888
.010	.114	.886
.010	.100	.900
.000	.115	.885
.000	.120	.880
	.115	.885
	.110	.899
	.130	.870
	.098	.902
	.108	.892
0.005		<u>887.8</u>

0.888

0.256

0.005

0.005

0.893

0.261

23

23

2679

783

1786

522

20539

0.6003

South

North

0.8878

0.2560

.63.18

(5)
Ill East
North mark.

0.742	.258
.732	.268
.745	.255
.747	.253
.740	.260
.760	.240
.732	.268
.760	.240
.740	.260
.742	.258
	<u>560</u>
	0.2560

Both the Northern and Southern meridian marks appear East of the mid wire, they are therefore both really West of our meridian.

The North mark, is the central white dot on a black ground. on the granite Pier built on the land which we purchased of you.

The Southern mark is the spire on a (ge. Mr J. Dixwell's) House beyond Jamaica Pond.

Sept 3 - Polaris L.P.
D - 13..06..21.0

$$\begin{aligned}
 2 \cdot 14.0 & \\
 0 \cdot 44.5 & \quad \text{on } 1 \cdot 29.5 \\
 0 \cdot 42.0 & \\
 2 \cdot 09.0 & \quad \text{on } 1 \cdot 27.0
 \end{aligned}
 \left. \vphantom{\begin{aligned} 2 \cdot 14.0 \\ 0 \cdot 44.5 \\ 0 \cdot 42.0 \\ 2 \cdot 09.0 \end{aligned}} \right\}
 \begin{aligned}
 1 \cdot 28.2 & = 22 \cdot 03'' - \text{line seg} - 7.8071347 \\
 1 \cdot 28.2 & = 22 \cdot 03'' - \text{line} - 8.4178386 \\
 & \quad \text{line} - 6.2249703 \\
 & \quad = 34.7
 \end{aligned}$$

Equa. value of 1" of the Micrometer - 2.312
1" = 0.023

from mid wire North mark - 10" 0
South m 29.3

(6)

Ill East.

Polaris Sub. Polo.

order of Page G to A, A to G

Ill. West

Ill East

Ill West

Mid wire - 13..06..31.00

mid - 13..06..49.0

+ 1.03

- 1.57

mean of 7 - 13..06..32.03

mean 7 - 13..06..47.43

- 1.01

+ 1.50

mean of wires + 1.03

mean of wires - 1.57

± 0.00

+ 1.50

+ .13

7 wires - 13..06..21.0

7 wires 13..05..48.8

- 3.80

- 5.4

mean 13..06..19.99

+ 1.8

- 3.1

- 1.01

Σ Mean - 2.05

- .13

7 wires 13..06..42.5

W

mean 13..06..42.5

± 0

1.55 - 0.19033

1.80 - 11.58208

47.37

49.07 - 9.81552

0.19033

8.41742

8.60825 (0.041)

7 wires - 13..06..57.3

mean - 13..06..47.5

- 3.8

7 wires - 13..06..02.0

mean - 13..05..56.6

- 5.4

7 wires - 13..07..04.5

mean 13..07..01.4

- 3.7

Mean of the wires is 0.040 on the side of G

Ill. East, Tel. directed to the North Mark, The mean of the wires is nearer to the meridian mark than D, * passes mid wire, after mean of wires for stars below pole, and before mean of wires for stars above pole

Coll. of mid wire Sept. 18th - Ill. East - to stars above pole - 0.002

Ill East

Collimation mean of wires x above

- 0.040

Stars above pole

- 0.042

Sept. 19th Measures for collimation on North Mer. Mark

Ill. West micrometer reads 30.2

Ill East " " 30.0

Mid wire Ill. East, Col mid wire west 0.001 = 0.002

by Polaris Ill East mean of wires west 0.040

Col. of mean of wires, west - 0.042

(7)

Sept. 28 1898.

1491- 20.. 4.. 0

196- 7.. 32.. 5.3

20.. 4.. 0

20.. 3.. 00.4

12.. 29.. 21.4

7.. 33.. 39.0

6.. 58.. 57.19

32.. 52.. 59

38.89

7.. 32.. 24.67

196- 7.. 32.. 05.3

Cann- 16.37

16

13 -35.37

12.. 28.. 34.65

46.75

12.. 29.. 21.40

1503- 7.. 34.. 6

y-10- 12.. 13.. 26.7

7.. 33.. 26.5

12.. 17.. 58.5

12.. 13.. 26.7

- 4.. 31.8

29th Am.

1491- 8.. 0.. 0

1503- 7.. 27.. 1

8.. 0.. 00

59.5

27.. 59.. 00.5

31.. 59.. 00.5

12.. 29.. 21.4

19.. 29.. 39.1

18.. 56.. 53.23

28.. 55.. 25

38.89

16

7.. 26.. 27.47

1503 7.. 27.. 01.00

+ 33.53

Oct 1/7

Sept 32³

1/2 East

1491

a. geminum

9.2

25.5

41.7

58.4

14.5

29.9

7.. 26.. 46.3

160.5

3200

7.. 25.. 55.93

7.. 24.. 59.26

+56.68

Procyon

42.5

56.2

10.1

24.0

37.6

51.3

7.. 33.. 5.4

169.4

3388

7.. 32.. 21.88

7.. 31.. 25.11

+56.77

B. geminum

17.8

33.0

47.4

4.2

26.0

36.0

7.. 37.. 57.4

129.8

4.45

7.. 37.. 02.26

36-05.74

+56.92

a. geminum 7.. 25- 280.08

a. can min 7.. 31- 306.46

B. geminum 7.. 36- 283.57

7.. 41.. 0

1491- 7.. 39.. 43.7

7.. 42.. 0

1491- 7.. 40.. 43.7

12.. 40.. 24.31

46.75

12.. 41.. 11.06

56.8

1491 8.. 00.. 00

196 7.. 14.. 17.0

7.. 59.. 03.2

12.. 41.. 11.06

19.. 17.. 52.14

3.. 09.. 70

19.. 14.. 42.44

19.. 14.. 17.00

- 25.44

16

196 flow- 41.4

225.5

196

405

57.93

55.93

209.8

150

29.8

4.26

- 2

2

(8)

October 1st Am.

1491 - 9.. 57.. 45

1503 - 9.. 16.. 37

$$\begin{array}{r} m.s. \overset{52}{1303} - 9.. 18.. 0 \\ 1141 - 9.. 51.. 33 \\ \hline 33.03.3 \end{array}$$

$$\begin{array}{r} \overset{52}{1303} - 9.. 19.. 0 \\ 1122 - 14.. 04.. 28.7 \\ \hline 4.45.28.7 \end{array}$$

1491 - 10.. 5.. 0 — 10.. 6.. 0 — 10.. 7.. 0
 2419 - 10.. 14.. 52 — 10.. 13.. 10.. 4.. 3 2440 $\overline{59.24.4}$
 1491 - 10.. 8.. 0 — 10.. 9.. 1 — 10.. 10.. 0
 2492 - 10.. 10.. 3.5 2557 - 10.. 9.. 25.7 $\overline{29.10.20.37.3}$

Oct. 1/2^o Am.

Then 50-

$$\begin{array}{r} 1491 - 10.07.40 \\ 1503 - 9.. 22.. 34.5 \end{array}$$

$$\begin{array}{r} 1503 - 9.. 23.. 50 \\ 1508 - 7.. 36.. 00 \\ \hline 10.02.10 \end{array}$$

$$\begin{array}{r} 1503 9.24.45 - 9.25.48 \\ 1508 - 7.. 36.. 58.5 - 7.. 37.. 59 \\ \hline 10.. 12.. 11 \\ \hline 10.36.11 \end{array}$$

$$\begin{array}{r} 1503 - 9.36.0 \\ 1122 - 14.. 21.39.8 \\ \hline 4.45.39.8 \end{array}$$

$$\begin{array}{r} 1503 - 9.. 37.. 0 \\ 1141 - 10.. 10.. 13 \end{array}$$

$$\begin{array}{r} 1491 - 10.22.30 \\ 1503 - 9.37.22 \\ \hline 12.. 40.. 24.31 \\ \hline 46.75 \\ \hline 12.41.11.06 \end{array}$$

$$\begin{array}{r} 1491 - 10.22.30 \\ \hline -56.71 \\ \hline 34.21.33.29 \\ \hline 12.. 41.. 11.06 \\ \hline 21.. 40.. 22.23 \\ \hline 20.. 56.. 33.58 \\ \hline 39 38.45 \\ \hline 21.94 \\ \hline .23 \\ \hline 9.. 36.. 49.20 \\ 1503 - 9.. 37.. 22.00 \\ \hline + 32.80 \\ \hline 29 + 33.53 \\ \hline 2/73 \\ \hline 0.36 \end{array}$$
Oct. 2/3^o Am

1491 - 8.. 15.. 0

196 - 7.. 25.. 18.8

$$\begin{array}{r} 8.. 15.. 0.0 \\ \hline 56.4 \end{array}$$

$$\begin{array}{r} 32.. 14.. 03.6 \\ \hline 12.. 45.. 07.. 59 \\ \hline 15.. 28.. 56.01 \end{array}$$

$$\begin{array}{r} 18.. 56.. 53.24 \\ \hline 27.. 55.. 28 \end{array}$$

$$\begin{array}{r} 7.. 25.. 48.58 \\ \hline 7.. 25.. 18.8 \end{array}$$

$$\begin{array}{r} 196 - 25.78 \\ \hline 16 \end{array}$$

$$\begin{array}{r} 196 - 47.68 \end{array}$$

$$\begin{array}{r} 12.. 44.. 20.84 \\ \hline 46.75 \\ \hline 12.. 45.. 07.59 \end{array}$$

$$\begin{array}{r} 59.5 \\ \hline 56.75 \\ \hline 2/2.75 / 0.55 \\ \hline 22 \\ \hline 2/2.48 / .49 \end{array}$$

$$\begin{array}{r} 59.5 \\ \hline 59.2 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 56.77 \\ \hline 2 \\ \hline 54.8 \end{array}$$

(9)

1849

October 1/2 ^{2nd}
Polaris S.P.S.E. Earth
No. 1491

ga. - 12.40 .. 35.0
 56 - 12.49 .. 27.2
 3.0

was this meant for 13?

D 13.07 .. 03.0
 13.15 .. 45.0
 13.24 .. 34.0

A 13.33 .. 23.0

13.07 .. 00.03
 13.06 .. 58.03
 13.05 .. 59.7
 + 58.9

Spica very faint

7.32.0
 7.45.8
 7.59.7
 8.14.0
 8.27.5
 8.41.6

13.18 .. 55.5

2761

180

7961

13.98

13.18 .. 10.73

13.17 .. 15.23

+ 56.50

449
2.49

Polaris S.P. 13.06 .. 58.60 — 13.05 .. 59.7
 Spica — 13.18 .. 11.79 — 13.17 .. 15.23
 11.16.19
 11.15.53

2.66 East of South

2.10 — 0.32222

1.29 .. 54-
 100.22 .. 19-
 8

0.023 — 8.37123

11.58208

9.47858

9.83189 — 0.68

8.37123

10.00715

52.45.07 — 9.90092
 8.27930 — 0.015

0.66 — 9.81954

1.29 .. 59 — 8.41752

100.22.19 — 9.99284

101.52.18 — 10.00939

42.22.48 — 10.13154

8.37123

0.023 Correction Earth

Spica 13.17 .. 322.41

Polaris S.P.

Level W too high -2.5 = 0.166 — 9.22011

11.58208
 0.80219 — 6.27

Col. + 0.038

8.57978

14.58208

0.16186 — 1.45

0.166 — 9.22011

1.29 .. 59 — 11.58208

42.22.19 — 9.99284

49.07.11 — 10.61809 — 4.15

Col + 0.038 — 8.57978

100.22.19 — 10.00715

8.58693 — 0.04

47.37.12 0.166 — 9.22011

52.45.07 — 10.00715

9.78147

9.00923 — 0.10

Pol. S.P. 13.06 .. 58.3

Level — 4.85

13.06 .. 54.95

Col. — + 1.45

13.06 .. 55.60

Spica

13.18 .. 11.73

Col. — 0.4

13.18 .. 11.69

+ 1.50

13.18 .. 11.79

Polaris

13.06 .. 58.60

+ 0.68

13.06 .. 56.28

13.05 .. 59.7

1419 + 56.18

Spica

13.18 .. 11.79

+ 0.2

13.18 .. 11.81

13.17 .. 15.23

+ 56.28

(10)

October 4th Am

$$1491 - 9 \dots 15 \dots 0$$

$$1503 - 8 \dots 22 \dots 11.3$$

$$1503 - 8 \dots 27 \dots 52 \quad 8 \dots 28 \dots 51 \quad 8 \dots 29 \dots 50 - 8 \dots 30 \dots 50$$

$$1508 - 19 \dots 3 \dots 23.5 - 19 \dots 04 \dots 23 - 19 \dots 05 \dots 22.5 - 19 \dots 06 \dots 23$$

$$\quad \quad \quad 35 \dots 31.5 \quad \quad \quad 35 \dots 32$$

$$1503 - 8 \dots 38 \dots 0 \quad 1503 - 8 \dots 39 \dots 0$$

$$1122 - 13 \dots 24 \dots 0 \quad 1141 - 9 \dots 12 \dots 32.3$$

$$\quad \quad \quad 4 \dots 46 \dots 0 \quad \quad \quad + 33 \dots 32.3$$

$$1503 - 8 \dots 54 \dots 0$$

$$1122 - 13 \dots 40 \dots 0$$

$$\quad \quad \quad 46 \dots 0$$

$$\quad \quad \quad 45 \dots 28.7$$

$$\quad \quad \quad 3) 31.3 / 10.4 \quad R. R \frac{1}{8} L$$

1^R

$$33 \dots 03.3$$

$$3) 29 / 9.7 \quad R. R \frac{1}{8}$$

$$3 - 12 \dots 48 \dots 17.41$$

$$\quad \quad \quad 46.75$$

$$\quad \quad \quad 12 \dots 49 \dots 04.16$$

$$9 \dots 15 \dots 0$$

$$\quad \quad \quad 56.1$$

$$33 \dots 14 \dots 03.50$$

$$12 \dots 49 \dots 04.16$$

$$20 \dots 24 \dots 59.74$$

$$19 \dots 56 \dots 43.41$$

$$\quad \quad \quad 23 \dots 56.07$$

$$\quad \quad \quad 58.84$$

$$\quad \quad \quad 74$$

$$8 \dots 21 \dots 39.06$$

$$8 \dots 22 \dots 11.3$$

$$1503 \quad + 32.24$$

$$20.7$$

$$34.5$$

$$3) 8.8 / 2.93$$

$$25.7 + 2.55$$

$$9.52$$

$$3) 8.2 / 2.7$$

$$2419 \quad + 2.3$$

$$1491 - 9 \dots 52 \dots 0 \quad 1491 - 9 \dots 53 \dots 0 \quad \quad \quad 9 \dots 55 \dots 0 \quad \quad \quad 9 \dots 57 \dots 0$$

$$2492 - 9 \dots 54 \dots 22.6 \quad 2557 - 9 \dots 53 \dots 34.5 \quad 2410 - 9 \dots 47 \dots 22.2 \quad B10 - 9 \dots 54 \dots 53$$

$$1491 - 9 \dots 59 \dots 0 \quad \quad \quad 10 \dots 3 \dots 0 \quad \quad \quad 10 \dots 4 \dots 0$$

$$2419 - 10 \dots 09 \dots 0.2 \quad 424 - 10 \dots 2 \dots 27.6 \quad Jy - 10 \dots 14 \dots 50.8$$

$$\quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad 10 \dots 50.8$$

$$1503 - 9 \dots 32 \dots 0$$

$$1141 - 9 \dots 31 \dots 27$$

$$\quad \quad \quad - 33$$

$$1503 - 9 \dots 33 \dots 0$$

$$1122 - 9 \dots 32 \dots 26$$

$$\quad \quad \quad - 34$$

$$1503 - 9 \dots 27 \dots 10$$

$$1508 - 20 \dots 3 \dots 11$$

$$\quad \quad \quad .36 \dots 01$$

$$1503 - 9 \dots 30 \dots 10$$

$$1508 - 20 \dots 06 \dots 12.5$$

$$10 \dots 36 \dots 02.5$$

$$\quad \quad \quad 12$$

$$\quad \quad \quad 45 \dots 02.5$$

$$1^R \quad 10 \dots 37.3$$

$$3) 13.5$$

$$\quad \quad \quad 4.5$$

$$\quad \quad \quad - .2$$

$$+ 4.1$$

Anti

(11)

(12)

1849

October 5th Am

$$1491 - 10.40.0 - 10.40.28$$

$$1503 - 9.43.2 - 9.43.30$$

$$1503 - 9.46.0 \quad 1503 - 9.47.0$$

$$1141 - 9.45.31 \quad 1122 - 9.46.21.7$$

$$- 29$$

$$- 38.3$$

$$4^+ - 33$$

$$- 34$$

$$+ 4.0$$

RR

$$- 4.3$$

RR

$$1503 - 10.10.5 - 10.11.5$$

$$1508 - 8.58.22 - 20.59.22.5$$

$$10.48.17.5$$

$$10.48.02.5$$

$$15.0$$

$$20$$

$$- 5.0$$

$$1503 - 10.27.0 \quad 1503 - 10.28.0$$

$$1122 - 10.26.28 \quad 1141 - 10.27.28.4$$

$$- 32$$

$$- 31.6$$

$$2 \text{ Am} - 9.25.46 - 1508 \text{ fath} - 10.12.11$$

$$36$$

$$10.48.11$$

$$22.5$$

$$10.48.33.5$$

$$10.48.17.5$$

$$3) 16 \text{ f} 5.3$$

Oct 5th Am. Schw with 1503 and
increased the Rate of No 1508

$$1503 - 10.35.24 - 10.36.25 - 10.38.26 - 10.39.26$$

$$1508 - 10.35.25 - 10.36.26.5 - 10.38.28.5 - 10.39.29$$

1849

Oct-5th

1503 - 11 . 59 . 33

1491 - 23 . 58 . 57

(12)

(11)

Rate of 1508 Increased.

Oct-6th Am1491. Fast (by Rate from 27th ult (am) to 2 Oct) 54.8

1491 - 8 . 34 . 0

196 - 7 . 32 . 28.5

(13)

1849
 Observations and comparisons of the 12 best Chronometers on arrival at Liverpool, September 18th 1849. — By J. Hartnup Esq. Director of the Liverpool Observatory —

Comparison of Clocks and Chronometers

mean time clock — 6^h 0^m 5^s mean time clock — 1507 2239 1507
 sidereal clock — 17^h 37^m 43^s 6^h 03^m 19^s 0 — 1^h 56^m 14^s 5 6^h 08^m 2^s — 2^h 1^m 56^s 5
 4^h 19^m 0^s — 57^m 15^s 0 9^m 25^s —

2227 — 1507 2241 1507 2167 — 1507
 6^h 22^m 32^s — 2^h 19^m 6^s 5 6^h 26^m 16^s 0 — 2^h 21^m 35^s 5 6^h 30^m 22^s 0 — 2^h 23^m 32^s 5
 23^h 32^m — 20^h 7^m 0 27^h 16^m 0 — 22^h 36^m 0 31^h 22^m 0 — 24^h 33^m 0

2207 1507 2248 — 1507 2186 — 1507
 6^h 30^m 43^s 0 — 2^h 25^m 47^s 5 6^h 35^m 10^s 0 — 2^h 28^m 41^s 5 6^h 34^m 49^s 0 — 2^h 30^m 58^s 0
 31^h 43^m 0 — 26^h 48^m 0 36^h 10^m 0 — 29^h 42^m 0 35^h 50^m 0 — 31^h 59^m 5

2222 — 1507 2224 1507 2245 1507
 6^h 37^m 52^s 0 — 2^h 33^m 33^s 0 6^h 42^m 37^s 0 — 2^h 35^m 49^s 5 6^h 43^m 48^s 0 — 2^h 38^m 28^s 5
 38^h 52^m 0 — 34^h 33^m 5 43^h 37^m 0 — 36^h 50^m 0 44^h 47^m 5 — 39^h 28^m 5

2224 ga 1507
 6^h 47^m 25^s 0 — 2^h 40^m 59^s 5
 48^h 25^m 0 — 42^h 00^m 0

Lat N — 53[°] 24['] 47["] 70
 Lon W — 0^h 12^m 00^s 05

Sept 18th Liverpool Observatory.

Illumination West — Transits obs. by J.H. Collimation = -0.01 N.W.
 B. Draconis γ Draconis α Lyrae deviation = +0.07

	10.7	7.6		
25.7	31.7	24.4		Level at 17 ^h 30 ^m Sid. T.
47.4	52.5	40.7	W	E
08.4	13.4	57.4	39.3	58.6
29.6	34.3	13.7	45.7	52.0
50.6	54.7	30.5	39.4	59.2
17 ^h 27 ^m 11.6	17 ^h 53 ^m 18.4	18 ^h 31 ^m 46.6	46.8	57.6
			171.2	221.4

17 ^h 26 ^m 08.29	17 ^h 52 ^m 13.24	18 ^h 30 ^m 57.27
cor - 0.02	- 0.02	- 0.01
time - 0.61	- 0.60	- 0.46
Dev + 0.00	+ 0.00	+ 0.02
17 ^h 26 ^m 07.66	17 ^h 52 ^m 12.62	18 ^h 30 ^m 56.82
17 ^h 27 ^m 01.85	17 ^h 53 ^m 06.88	18 ^h 31 ^m 57.01
sid clock slow - 54.19	- 54.26	- 54.19

sid clock slow
 (Liverpool)

East two high.

No 1507 gaining on solar time - 11^m 59^s 0

(14)

No. 1507 Comp. Chro - gaining on m solar time $11^m 58.8^s$ hourly - 29.866
 therefor

It gains $11^m 58.8^s$ on m.s. time in $24^h 11^m 58.8^s$ of its own time

"	5. 59. 4	"	12. 5. 59. 4	"	"
"	2. 59. 7	"	6. 2. 59. 7	"	"
"	0. 59. 9	"	2. 0. 59. 9	"	"
"	0. 29. 95	"	1. 0. 29. 95	"	"
"	0. 14. 97	"	0. 30. 14. 97	"	"
"	0. 04. 99	"	0. 10. 04. 99	"	"
"	0. 02. 495	"	0. 05. 02. 495	"	"
"	0. 00. 499	"	0. 01. 00. 499	"	"
"	0. 00. 0082	in one second -			

B draconis Sid Clock. Slow of Liverpool

at $17^h 27^m$	54.19
γ draconis 17.52	54.26
α Lyrae 18.34	54.21
at $17^h 26^m$ slow	54.21

Sid. Clock mark'd - $17^h 37^m 43.0$

" " Slow 54.21

$17^h 38^m 37.21$

m. star station at Liverpool $11^h 49^m 11.10$

$5^h 49^m 26.11$

$4^h 59^m 10.85$

$48^h 57.97$

25.93

11

m. solar time at Liverpool $5^h 48^m 28.86$

Greenwich East of α $+12^h 00.05$

Guth. m.s. t $6^h 00^m 28.91$

mean time Clock $6^h 00^m 57.00$

mean time Clock fast of $+28.09$

of Greenwich at 6 hrs

m.s. Clock $6^h 03^m 19.00$

fast of Guth 28.09

Guth t $6^h 02^m 50.91$

No 1507 $13^h 56^m 14.50$

1507 fast of Guth $7^h 53^m 23.59$

at $13^h 56^m \frac{1}{4}$ its own time

Sid time m noon Guth $11^h 49^m 09.13$

acc. in 12^m $+1.97$

Sid at m noon Liverpool $11^h 49^m 11.10$

1507. gaining on its own time in 24 hours $11^m 57.7^s$

1-hour 29.9

1 minute 0.4983

1 second 0.008

30 seconds 0.249

45 seconds 0.373

15 seconds 0.124

5 minutes 2.4945

20 seconds 0.1661

$4^h 06^m 47.5$
 06.285

849 Oct-9th Am

Sec. East (15) (No 1491) (Pg 1491)

a ² Gun	a Can min	B Gun	Level	E	W	
5.2.5	1.37.0	6.12.2				280.11
5.20.0	1.57.0	6.27.7	x 76.5	75.5		306.47
5.36.2	2.4.3	6.43.2	x 76.5	76		286.00
5.52.5	2.18.3	6.59.0	73.5	76.5X		
6.8.6	2.32.0	7.14.3	73.5	76.5X		b = 152.1
6.24.9	2.46.	7.30.0	20.0	285		lev. or cor. for bubble length.
7.26.41.0	7.32.59.7	7.37.45.6	75.0	77.12		= + 0.08
1867	2483	2320		75.0		
180	128.3	186		212		
7/3667	18.33	7/4120				
52.39	-2	58.86				
7.25.50.39	7.32.16.33	7.36.56.86	XI +	1.06 = lev. error		
7.24.59.46	7.31.25.27	7.36.05.97		0.07		
+ 50.93	+ 51.06	+ 50.89				

XI + 1.06 = lev. error
0.07

1491 Oct 2 Am + 56.75
9 " - 50.95
7/5.85/84

No 1491 - 8.57.0

196 - 7.37.36.2

13.08.0.17 8.57.0
46.75 50.95
13.08.46.92 32.50.09.05
13.08.46.92
19.41.22.13
18.56.53.24
40.53.28
21.94
13.
7.38.08.59
7.37.36.2
- 32.39
16
196 13 - 48.39

9.23.0
57
33.22.09.00
13.08.46.92
20.13.22.04
19.56.43.41
12.57.47
21.94
08

8.10.03.30
1503 - 8.10.34.5
+ 31.2

Oct 4. 1503 fort + 32.24
5/ - 1.06/0.21

9c 9.20.00
1491 9.18.21.4

(16)

October 8th 18498^h 15^m M.S.T. A.H.

Coincidence

$$\begin{array}{r} 1491 \quad 9^{\circ} 23.00 \\ 1503 \quad 8^{\circ} 10.34.5 \end{array}$$

$$\begin{array}{r} 9^{\circ} 23.00 \\ 8^{\circ} 10.34.5 \end{array}$$

$$\begin{array}{r} 1491 = 9^{\circ} 25.00 \\ 1503 = 8^{\circ} 12.34.3 \end{array}$$

$$\begin{array}{r} 1503 = 8^{\circ} 14.00.0 \\ 1141 = 8^{\circ} 13.04.6 \\ \hline - .55.4 \end{array}$$

$$\begin{array}{r} 1503 \quad 8^{\circ} 15.00 \\ 1122 \quad 8^{\circ} 14.32.3 \\ \hline - 27.7 \end{array}$$

$$\begin{array}{r} 1491 \quad 9^{\circ} 31.00 \\ \text{Blue 10} \quad 9^{\circ} 28.49.3 \end{array}$$

$$\begin{array}{r} 1491 \quad 9^{\circ} 31.30 \\ 2492 \quad 9^{\circ} 34.24.7 \end{array}$$

$$\begin{array}{r} 1491 \quad 9^{\circ} 33.00 \\ 2440 \quad 9^{\circ} 25.24.2 \end{array}$$

$$\begin{array}{r} 1491 \quad 9^{\circ} 33.30 \\ 2557 \quad 9^{\circ} 34.21.2 \end{array}$$

$$\begin{array}{r} 2419 \quad 9^{\circ} 46.14.6 \\ 1491 \quad 9^{\circ} 36.00.0 \end{array}$$

$$\begin{array}{r} 1491 \quad 9^{\circ} 36.30 \\ \text{John Gibson} \quad 9^{\circ} 47.41.3 \end{array}$$

Oct 9/10 Am.

$$\begin{array}{r} 1419 - 8^{\circ} 33.00 \\ 196 - 7^{\circ} 15.42.7 \end{array}$$

$$\begin{array}{r} 8^{\circ} 33.00.0 \\ \hline 50.1 \\ 32.32.09.9 \\ 13.12.43.48 \end{array}$$

$$19.19.26.42$$

$$18.56.53.24$$

$$18.56.89$$

$$25.93$$

$$.42$$

$$7.16.16.48$$

$$7.15.42.7$$

$$- 33.78$$

$$16$$

$$45.78$$

$$\begin{array}{r} 9^{\circ} 13.11.56.73 \\ \hline 46.75 \\ 13.12.43.48 \end{array}$$

$$1503 - 7.24.00$$

$$196 - 7.22.55.7$$

$$7.24.00.0$$

$$31.0$$

$$7.23.29.0$$

$$196.7.22.55.7$$

$$+ 33.3$$

1849

Oct 10²⁵

(17)

18.2

Centigrade

18.2

760.68

(18)

Oct. 10/11^{am}

1. 12

$$1503 - 8..5..6 \quad 1491 - 9..26..31.5$$

$$1491 - 9..25..16.2 \quad 1503 - 8..06..15$$

$$1503 - 8..12..0 \quad 1503 - 8..13..0$$

$$1122 - 8..11..35 \quad 1141 - 8..11..54$$

$$\begin{array}{r} -25 \\ \hline 5+ \\ -31.6 \end{array}$$

$$6) 6.6 (41.1$$

$$\begin{array}{r} -1.06 \\ \hline 5+ \\ -31.6 \end{array}$$

$$6) 34.4 (5.7$$

$$1503 - 10..11..20 - 10..12..20$$

$$1508 - 2..82 - 52.5$$

$$1503 - 10..13..20 - 10..14..19$$

$$1508 - 11..24..53 - 11..25..52.5$$

$$1..11..33$$

$$1503 - 10..19..19 - 10..26..19.0$$

$$1508 - 11..30..55 - 11..37..58.5$$

$$1..11..36$$

$$1..11..39.5$$

$$1503 - 10..31..19 - 10..33..19 - 10..34..19 - 10..35..19 - 10..36..19$$

$$1508 - 11..43..01 - 11..45..02 - 11..46..02.5 - 11..47..03 - 11..48..03.5$$

$$1..11..42$$

$$1..11..44$$

$$1..11..44.5$$

$$1508 + 01$$

$$1..11..44.5$$

$$1..12..01$$

$$1..12..01.5$$

$$1..11..44$$

$$6) -17 / 2.8$$

$$1503 + 1.8$$

Rate of 1508 - 2.0 during

$$1503 - 10..37..19$$

$$1508 - 11..49..04$$

$$6) -17 / 2.8$$

$$+ 1.8$$

$$2. -$$

29. Oct = 11/12 Am

37.39 1/12 Am

2.24.6

2.57.4

3.14.0

3.36.5

3.59.0

4.21.4

9.24.44.0

7.25.59

36.56

9.23.34.56

+26

-0.6

+0.1

9.23.34.65

22.44.32

+50.28

α Leonis 77.18

0.30.5

0.44.5

0.58.5

1.12.5

1.26.5

1.40.4

10.01.35.0

2677

180

7.187.7

12.53

-2

10.01.10.53

+15

-0.04

-0.01

10.01.10.63

10.00.20.47

+50.16

Mc. East (19) Then

No 1491.

6.5.32

7.24.2

7.38.7

7.54.2

8.8.6

8.24.3

8.34.4

9.38.54.7

244.2

180

9.17

9.38.07.17

4.17

-0.4

9.38.07.20

9.37.17.32

+49.97

7.35.6

7.50.0

8.4.0

8.18.3

8.33.0

8.46.8

10.29.01.2

188.9

60

7.124.9

28.18.41

-2

10.28.16.41

+10

28.16.57

9.24

9.38

10.00

129.02

9.40

02 L.M.

α Leonis - 9.22 - 260.02

ε Leonis - 9.37 - 287.55

α Leonis - 10.00 - 299.41

α Leonis - 10.54 - 249.49

North Mark

0.76 = 240

.74 260

.75 250

.743 257

.754 246

1253

251

South

2.45 West high

0.16

5

0.859

23

2577

1718

19757

0.251

23

753

502

5773

0.143

.130

.140

.140

.110

1297

0.859

251

608

lev. 0.18

Int. West high +0.166

Coc -0.04

Dev. -0.03

α Leonis - 50.28

ε Leonis - 49.97

α Leonis - 50.16

3/49

50.14

at 9.40 sid

α Leonis - 9.22.44.51 - 37.14

ε Leonis - 9.37.17.15 - 32.17

α Leonis - 10.00.20.49 - 47.02

22nd dimb - 10.27.26.37

(20) 11

October - ^{11.02} 12 (Sun)

$$\begin{array}{rclclclcl}
 1491 - 11.0.58 & - & 11.02.22 & - & 11.02.49 & - & 11.07.59 & - & 11.09.32 \\
 1508 - 10.59.44 & - & 11.01.8.5 & - & 11.02.36 & - & 11.06.27.5 & - & 11.08.21 \\
 & & 1.13.5 & & 1.13 & & 1.5 & & 1.11
 \end{array}$$

$$\begin{array}{rcl}
 Te & - & 11.14.0 & - & 11.15.0 \\
 1491 & - & 11.12.13.4 & - & 11.13.13.5
 \end{array}$$

$$\begin{array}{rcl}
 1491 & - & 11.14.0 & 1491 & - & 11.18.0 & - & 11.20.57 \\
 1503 & - & 9.51.30.7 & 1503 & - & 9.53.30.5 & - & 9.56.21
 \end{array}$$

$$\begin{array}{rcl}
 1503 & - & 9.59.0 & 1503 & 10.0.0 \\
 1122 & - & 9.58.36.9 & 1141 & - & 9.58.48
 \end{array}$$

$$\begin{array}{rcl}
 1491 & - & 11.28.0 & - & 11.30.0 & - & 11.31.0 & - & 11.32.0 \\
 2557 & - & 11.28.54.7 & B10 & - & 11.27.42.5 & 2492 & - & 11.3.11.8 & 2440 & - & 11.24.02 \\
 & & 11.33.5 & & 11.35.0 & & & & & & \\
 2419 & - & 11.43.24.5 & Jy & - & 11.46.14.6
 \end{array}$$

$$\begin{array}{rcl}
 0.166 & - & 9.22011 \\
 37.39 & - & 10.21408 \\
 47.37 & - & 9.99340 \\
 9.58 & - & 9.42759 + 0.26
 \end{array}$$

$$\begin{array}{rcl}
 .04 & - & 8.60206 \\
 37.39 & - & 10.21408 \\
 & - & 8.81614 - 0.06
 \end{array}$$

$$\begin{array}{rcl}
 .03 & - & 8.47712 \\
 & & 10.21408 \\
 & & 9.23823 \\
 & - & 7.92943 - 0.01
 \end{array}$$

$$\begin{array}{rcl}
 9.22011 \\
 65.32 & - & 10.04086 \\
 47.37 & - & 9.97833 \\
 17.55 & - & 9.23930 + 0.17
 \end{array}$$

$$\begin{array}{rcl}
 8.60206 \\
 10.04086 \\
 & - & 8.64292 - 0.04
 \end{array}$$

$$\begin{array}{rcl}
 8.47712 \\
 10.04086 \\
 9.48803 \\
 & - & 8.00601 - 0.01
 \end{array}$$

$$\begin{array}{rcl}
 9.22011 \\
 77.18 & - & 10.01076 \\
 47.37 & - & 9.93891 \\
 29.41 & - & 9.16978 + 0.15
 \end{array}$$

$$\begin{array}{rcl}
 8.60206 \\
 10.01076 \\
 & - & 8.61282 - 0.04
 \end{array}$$

$$\begin{array}{rcl}
 8.47712 \\
 10.01076 \\
 9.69479 \\
 & - & 8.18267 - 0.01
 \end{array}$$

(21)

October 12th Evening, Chroby Caledonia, Barrand's
 1491-21..01..40 1491-21..4..45 No 1491. Last - 50.22 fid.
 1503-7..35..35 1503-7..38..39.5 No 1503 — — 33.64 m.s.

1503-7..41..0 1503-7..44..0 1503-7..46..0
 8²6-12..24..0 8²0-12..28..48.4 8²3-12..30..14.5

1491-21..17..44 1491-21..19..10 1491-21..20..40
 1508-9..19..56 1508-9..21..22.5 1508-9..22..53
2.12 2.12.5 02.13

1508-9.25.34 — 9..26..37 1508-9.28..54 — 9..29..56
 8²6-12..40 11.5 — 12..41..14 8²0-12..45..18.5 — 12..46..20

1508-9.31.40 — 9.32..40 — 9.33..40 — 9.34..40
 8²3-12..47..29 — 12..48..29.5 — 12..49..28 — 12..50..27.5

1491-21.35.28 — 21..36..60 — 21..38..23
 1508-9..37..46 — 9..39..18.5 — 9..40..42

1491-21..01..40
 — 50.22
 21..00..49.78
 13..24..33.11
7..36..16.67
 6..58..57.153
 35..54.102
 15.956
110
 7..35..01.364
 7..35..35
+33.64

13..23..46.38
46.73
 13..24..33.11

1503-
 196-
 12.28.48.4
 12.28.00.4

7..46..0.0
32.76
 12..30.14.5
9.1
 0.23.6
 No 883 4..44..55.36

820
 7..44..0.0
32.76
 7..43..27.24
 12..28..00.00
4..44..32.76

876

7..41..0
32.76
 7..40..27.24
 12..25..06.6
4..44..39.36

52.6
12
 1.06.6
 12..24..0
1.06.6
 12.25.06.6

7..46..0
32.8
 7..45..23.2
 883 12..30..14.5
44.51.3

820
 7..44..0
32.8
 7..43..27.2
 12.28.48.4
4..45..21.2

876
 7..41..0
32.8
 7..40..27.2
 12..24..00
4..43..32.8

a piece of Cork was found in
 the escapement of Barrand No 883

Jlc East (22)

No. 1491

Oct-12/13

113.52	83.02	41.23
15 Argus	2 Hydra	1 Urr. Maj
1.15.2	8.59.0	8.42.0
1.30.3	9.12.5	9.21.8
1.45.6	9.26.4	9.23.3
2.0.4	9.40.0	9.44.2
2.15.3	9.52.1	0.15.0
2.30.5	0.18.0	0.25.7
8.02.45.4	8.40.21.9	8.50.46.4
1825	2218	1894
160	60	120
712.15	71281.8	71309.4
8.2.0.36	38.26	42.20
8.01.58.36	8.39.40.26	8.49.44.20
Incl. +.07	+ .13	+ .25
Col. +.04	- .04	- .06
Dev. - .03	- .02	+ .01
8.01.58.36	8.39.38.33	8.49.44.38
8.01.08.25	48.03	8.49.42.38
+50.11	+50.30	8.48.51.89
		+50.49

1497-8.10.54 — 8.14.2
 1103-6.43.00 — 6.46.07.5

1503-6.48.0 — 6.49.0 1503-6.52.0 1503-6.54.0
 823-11.32.14.1 — 11.33.14.2 876-11.34.59.2 820-11.38.49.3

Ce - 8.55.0

1491-8.53.11.6

+0.166 - 9.22011

113.52 - 10.03888

47.37

66.15 - 9.60503

8.86402 - 0.07

0.04 - 8.60206

113.52 - 10.03888

8.64094 - 0.04

8.60206

83.02 - 10.00322

8.60526 - 0.04

8.60206

41.23 - 10.17974

8.78180 - 0.06

0.03 - 8.47712

41.23 - 10.17974

47.37

6.14 - 9.20535

7.86221 / 0.007

0.166 - 9.22011

83.02 - 10.00322

47.37

35.25 - 9.91114

9.13447 - 0.13

0.166 - 9.22011

41.23 - 10.17974

47.37

6.14 - 9.99742

9.39727 - 0.25

0.03 - 8.47712

113.52 - 10.03888

47.37

66.15 - 9.96187

8.47757 - 0.03

8.47712

83.02 - 10.00322

47.37

35.25 - 9.76307

8.24341 - 0.02

No. 1491. Fast

Oct 11. at 9.40 Ld - 50.14

12 - 8.30 - 50.30

.16

144

50.22

1491 - 8.10.54.0

50.30

32.10.03.70

13.24.33.11

18.45.30.59

17.57.03.068

44.52.628

29.918

.588

6.42.26.202

1503 - 6.43.01.0

+33.8

Sat. Oct $\frac{12}{13}$ 1849

299.41

Ill. East.

Polaris S.P.

B²

78.15

42.22

35.53

Polaris 1st wire 12.40 49.07

Spica 13.17 52.46

24

B²

0.30.8

12.40.28.5

1491 0.44.7

0.58.6

1.12.8

1.27.0

1.40.8

12.24.33.0

10.01.55.0

26.97

18.01

718.97

12.81

-2

10.01.10.81

lost by Visitors

15.44.04 Meteor?

cropped field of Vr.

Could not see 5 Urice Minor

13th P.M.First Comparison of the Chronometers received
by the Caldonia Capt. Litch - 12 of Dents (3.30 P.M.)

1491-16.51.20 1491-16.54.20

1503-3.22.01 1503-3.25.00.5

No 1491. Lat - 50.20

No 1503 - " - 34.0

1503-3.43.0

3.44.0

3.45.0

3.46.0

A 2239 8.26.20.8

B 2227-8.24.19.5

C 2241-8.26.42.3

D 2167-8.31.2.1

4.43.20.8

4.40.19.5

4.41.42.3

4.45.02.5

1503-3.47.0

3.49.0

3.51.0

3.52.0

E 2257-8.30.13.1

F 2207-8.31.18.4

G 2248-8.35.33.3

H 2186-8.32.36.4

4.43.13.5

4.42.18.4

4.44.33.3

4.40.36.4

I 2222-8.35.21.6

K 8.40.19.2

L 2245-8.45.48

2246-8.48.10

4.41.21.6

4.44.19.2

4.42.48

4.44.10

1491-17.37.15

17.40.15

1503-4.07.48.5

1503-4.10.48

17.37.15

13.27.42.93

1491-4.51.20.0

50.2

46.75

50.2

17.36.24.80

13.28.29.68

16.50.29.8

13.28.29.68

4.07.55.12

13.28.29.68

3.22.00.12

4.07.55.12

3.59.20.68

2.59.30.571

3.59.20.68

6.58.8.85

21.56.39.6

54.85

.12

.12

4.07.14.50

4.07.48.5

3.21.27.027

1503-4.07.48.5

+34.0

3.22.01.0

33.973

Mc East (2A.F.)

(1491)

October 13

E hrs. min

16.58..56.2

17.00..37.0

02..19.52

04..01.7

05..43.7

158.1

316.2

15.62

17.02..17.62

17.01..27.12

+50.50

B Draconis

6.45.3

7.8.0

7.30.2

7.53.0

8.15.6

8.38.0

17.29..01.0

191.1

180

7137.11

53.01

17.27..51.01

+.06

+.13

+.04

17.27..51.12

17.27..01.00

1491 +50.12

a Herculis

7.56.2

8.10.5

8.24.7

8.39.0

8.53.2

9.7.4

17.09..21.5

17.08..38.93

42.11

36.43

47.14

49.79

2.52.0

3.14.0

3.36.0

3.58.0

4.20.3

4.42.2

17.55..04.5

2270

180

71407.0

58.14

17.53..56.14

+.06

+.13

+.03

17.53..56.24

17.53..06.03

+50.21

Level

E W

X70 67.5

X69 68

X69 68.3

65.0 71.5

65. 71.3

65 71.3

403 417.4

67.2 69.7

67.2

2.58

1.25

+.06

+0.09

1.50.0

2.7.2

2.24.5

2.42.5

3.0.0

3.17.5

18.33..35.0

176.7

120

71296.7

42.39

18.32..40.39

+.05

+.10

+.01

18.32..40.45

18.31..50.26

+50.19

r E hrs. min - 17.01 - 230.06

r a Herculis - 17.07 - 247.49

r B Draconis - 17.27 - 259.58

r y Draconis - 17.53 - 260.53

w Saygitt - 18.04 - 333.28

(a Lyrae - 18.31 - 273.46

(B Lyrae - 18.44 - 279.12

8

Level West too high 0.08

W. Col - 0.038

Dev. West - 0.14

B Lyrae

4.34.5

4.50.8

5.7.3

5.23.4

5.40.0

5.56.2

18.46..12.8

2250

60

7165

23.57

18.45..21.57

+.05

+.09

+.03

18.45..21.64

18.44..31.34

+50.30

50.12

10.21

19

30

182

5020

Oct 13th P.M.

1508- - 6.23.20 — 6.24.51 — 6.26.20
1491-18.14.08 — 18.15.38.5 — 18.17.07

1491-18.48.1.5 1497-18.49.27
1508-6.57.25 1508-6.58.57

No. 1508 loses ~~two~~ seconds in $24^h 12^m$ of its own time

(26)

Oct 15. Am ^{11/2} Mer 65

1491-10..21..30 — 10..24..30 } 1508-10..51..15 — 10..52..14 — 10..53..14
 1503-8..45..24.5 — 8..48..24 } 1503-8..52..30.5 — 8..53..29 — 8..54..28.5

1503-8..59..0 — 9..02..0 — 9..4..0 — 9..5..0
 2239-13..42..20.8 2227-13..42..15.8 2241-13..45..40.2 2167-13..50..5.6

9..06..0 — 9..16..0 — 9..19..0 — 9..20..0 }
 2257-13..49..12.2 2207-13..58..18 2248-14..03..35 2186-14..00..32.8 }

1503-9..21..0 — 9..22..0 — 9..23..0 — 9..24..0
 2222-14..02..19.7 2224-14..06..17.6 2245-14..05..48 2246-14..08..10

1491-11..4..06 — 11..07..4

1503-9..27..53.5 — 9..30..57
 1..36..12.5

1508-12..10..1 — 12..12..0 — 12..13..0 — 12..14..0

1503-10..10..37.5 — 10..12..35.5 — 10..13..35 — 10..14..34.5
 1..59..25 1..59..25.5

10/11 1..11..33.0

48

1..59..33.0

15 1..59..25.0

4 8.0/2.0

1503-10..55..0 — 10..56..0

1141-10..53..36 1122-10..55..39.5

24
15
120
24
36

1491. Oct 13. [#] α & β Lyrid fast- 50.25

15 α & β Lyrid ~ - 49.51

Daily - .37 hours 0.015

Oct 14/15

JL East
N^o 1491

(27)

E Hydree

9 12
 9 25.5
 B 9 39.2
 9 53.2
 8 40 07.0
 136.9
 2738
 12
 39.38
 8 39 37.38
 .04
 +.11
 +.02
 8 39 37.47
 8 38 48.08
 1491 fast 49.39

a Leonis

0 29.7 g 12 40 23.8
 0 43.5 f 12 49 18.0 54.2
 0 57.4 e 12 58 04.2 46.2
 B 1 11.5 d 13 06 54.0 49.8
 1 25.6 c 13 15 41.5 47.5
 1 39.4 b 13 24 29.0 47.5
 10 01 52.0 a 13 33 17.0 48.0

2611
 -180
 781.1
 11.59
 -2
 10 01 09.59
 -.04
 +.11
 +.01
 10 01 09.67
 10 00 20.54
 +49.13

Polaris S.P.
 B

13 06 52.5 - 2
 13 06 40.25
 13 06 00.70
 + 50.15 44.15
 + 49.16
 .99 = 0.03526

.99 - 9.99564
 1.29.30 - 8.41549
 22.18.00 - 9.98924
 78.47.30 - 10.00837
 42.22.46 - 10.13852
 8.54726 - 0.03526

1491 9 20.0
 146 7 24 55.4

9 20.0
 49.30
 33 01 10.70
 13 32 26.24
 19 28 44.46
 18 56 53.24
 27 55.41
 43.88
 .46
 7 25 32.99
 7 24 55.4
 -36.59
 16
 .52.59

Level W too high - 2" = +0.13

Col. West - 0.042

dev. Polaris & Sirius 1/2 + 0.023

or 15th " Polaris & a Leonis + 0.035

Oct 12 + 50.16 Rate
 15 + 49.13
 3)103/0.34

mean of wires - 13 06 52.5

mid. wire - 13 06 54.0
1.5

22.5 line - 6.02182

8.41549
 4.43731

0.17609
 8.41307
 8.58916 - 0.0324

Ill East - No 1491 (28)

Oct-15

P.D. 57.21

52.48

Moses G Farmer
Salem.

α Lyr	1.49.0	Bdysr	4.31.5
	2.6.4	T.H.G	4.47.7
β	2.24.0		5.5.5
	2.41.3		5.20.7
	2.59.0		5.37.3
	3.16.5		5.53.5
18.33	34.2	18.46	10.7
	230.4		206.9
	60		60
	729.04		1146.9
	41.49	18.45	20.99
	-2		+12
18.32	39.49		-0.5
	+16		-0.0
	-0.5	18.45	21.06
	-0.2	18.44	31.30
18.32	39.58		49.76
18.31	50.31		9.27
	+49.27		103

13⁺ + 50.25
18 49.51
74
-6.37
+49.57
49.15
14
17 48.96

1491-9.33.30
1503-7.49.42.5
13.39.32.59
46.75
13.40.19.34

Oct 17th Am. 1491-9.33.30.0
48.96
33.32.41.04
13.40.19.34
19.52.21.70
18.56.53.24
31.54.49
20.94
70
7.49.06.36
1503.7.49.42.5
+36.2

1503-8.2.0
196-8.0.44.5
8.2.36.2
8.01.23.8
196.8.0.44.5
36.3
16
-55.3

1849.

(29)

October 15th Recd Mr. Hartnup's comparisons of 15 (vents and
Barrauds) Chronometers - dates Sept. 18 - 22 - 25 & 28th

Sept. 18th - Liverpool Observatory

Lideral Clock - $17^h 37^m 43.00$ - Slow of Sept. at $17^h 56^m - 54.23$

54.23	
17..38..37.23	
11..49..11.10	
5..49..26.13	
4..59..10.852	
48..57.972	
25.929	
130	

mean time - at all noon $5..48..28.883$
 Mean time Clock - $6..00..57.00$
 Fast of Liverpool - $12..28.12$
 Liverpool west of GWT - $12..00.05$
 M.T.C. fast of GWT - $+ 28.07$ Sept. 18th at 6^h P.M.

Sept. 22^o - Lid. Clock - $12..27..54.0$ Lid GWT noon - $12..04..55.34$
 Lid - $16..49..45.00$ - 56.28 honey logs - 0.02 $12..04..57.31$

56.36	
16..50..41.36	
12..04..57.31	
4..45..44.05	
3..59..20.682	
44..52.628	
43.890	
0.50	
4..44..57.240	
4..57..22.0	

M.T. at Liverpool $0..23..49.057$
 M.T. Clock - $0..36..14.00$
 Fast of all pool - $+ 12..24.964$
 all pool west of GWT - $12..00.05$
 M.T.C. fast of GWT - $+ 24.89$ Sept. 22^o at 0.36

12.24.75
 12.00.05
 + 24.70

4) 3.18
 24) .79 (0.03

Sept. 25th Lid. Clock - $14..10..10.0$ Lid clock slow at $17..38 - 57.27$
 honey logs $.01$

57.24	
14..10..07.24	
12..16..46.97	
1..54..20.27	
0..59..50.170	
53..57.153	
19.445	
.269	
1..54..01.537	
2..06..25.00	
12..23.46	
12..00.05	
+ 23.41	

Lid GWT - $12..16..45.00$
 12.16.46.97

M.T.C. fast of GWT - $+ 23.41$ Sept. 25th at 2^h P.M.

(30)

Liverpool

Sept-28th Litoral block — $\begin{matrix} h & m & s \\ 13.. & 43.. & 42.00 \end{matrix}$ — Flow at $\begin{matrix} h & m \\ 15.. & 33 \end{matrix}$ — $\begin{matrix} 58.07 \\ 0.11 \end{matrix}$

" Flow — $\begin{matrix} 58.05 \end{matrix}$

$\begin{matrix} 73.. & 44.. & 40.05 \end{matrix}$

$\begin{matrix} 12.. & 28.. & 36.62 \end{matrix}$

$\begin{matrix} 1.. & 16.. & 03.43 \end{matrix}$

$\begin{matrix} 0.. & 59.. & 50.170 \end{matrix}$

$\begin{matrix} 15.. & 57.. & 379 \end{matrix}$

$\begin{matrix} 2.992 \end{matrix}$

$\begin{matrix} .429 \end{matrix}$

Lipool. m.s.t — $\begin{matrix} 1.. & 15.. & 50.970 \end{matrix}$

m.s. block — $\begin{matrix} 1.. & 28.. & 13.00 \end{matrix}$

$\begin{matrix} 12.. & 22.. & 03 \end{matrix}$

$\begin{matrix} 12.. & 00.. & 05 \end{matrix}$

Fast of Gwr — $\begin{matrix} + & 21.98 \end{matrix}$

Sept-28th at $\begin{matrix} h & m \\ 1.. & 28 \end{matrix}$

L.A. Gwr — $\begin{matrix} 12.. & 28.. & 34.65 \end{matrix}$

$\begin{matrix} 1.97 \end{matrix}$

$\begin{matrix} 12.. & 28.. & 36.62 \end{matrix}$

Sept-28th Litoral block — $\begin{matrix} 14.. & 57.. & 59.00 \end{matrix}$

$\begin{matrix} 58.07 \end{matrix}$

$\begin{matrix} 14.. & 58.. & 57.07 \end{matrix}$

$\begin{matrix} 12.. & 28.. & 36.62 \end{matrix}$

$\begin{matrix} 2.. & 30.. & 20.45 \end{matrix}$

$\begin{matrix} 1.. & 59.. & 40.341 \end{matrix}$

$\begin{matrix} 29.. & 55.. & 085 \end{matrix}$

$\begin{matrix} 19.945 \end{matrix}$

$\begin{matrix} .449 \end{matrix}$

m.s. at Lipool — $\begin{matrix} 2.. & 29.. & 55.820 \end{matrix}$

$\begin{matrix} 2.. & 41.. & 18.0 \end{matrix}$

$\begin{matrix} 12.. & 22.. & 18 \end{matrix}$

$\begin{matrix} 12.. & 00.. & 05 \end{matrix}$

$\begin{matrix} + & 22.13 \end{matrix}$

Sept-18th

Fast of Gwr

Sept-25th

m.c. hourly rate 0.02

M.T.C — $\begin{matrix} h & m & s \\ 6.. & 03.. & 19.00 \end{matrix}$

$\begin{matrix} - & 28.07 \end{matrix}$

Gwr m.s.t — $\begin{matrix} 6.. & 02.. & 50.93 \end{matrix}$

1507 — $\begin{matrix} 13.. & 56.. & 14.5 \end{matrix}$

1507 fast m.s.t $\begin{matrix} 7.. & 53.. & 23.57 \end{matrix}$ Gwr

M.T.C — $\begin{matrix} h & m & s \\ 4.. & 24.. & 26.00 \end{matrix}$ — $\begin{matrix} 8.. & 39.. & 58.30 \end{matrix}$

$\begin{matrix} + & 23.36 \end{matrix}$

Gwr m.s.t. $\begin{matrix} 4.. & 24.. & 02.64 \end{matrix}$

$\begin{matrix} 13.. & 40.. & 48.00 \end{matrix}$

$\begin{matrix} 9.. & 16.. & 45.36 \end{matrix}$

$\begin{matrix} 9.. & 16.. & 36.6 \end{matrix}$

$\begin{matrix} 3) & 8.76 & / 2.9 \end{matrix}$

$\begin{matrix} 8.. & 39.. & 58.30 \end{matrix}$

$\begin{matrix} 9.. & 15.. & 58.30 \end{matrix}$

$\begin{matrix} 36.3 \end{matrix}$

$\begin{matrix} 9.. & 16.. & 36.6 \end{matrix}$

Sept-22nd M.T.C — $\begin{matrix} 3.. & 04.. & 57.00 \end{matrix}$

$\begin{matrix} - & 24.80 \end{matrix}$

Gwr m.s.t. $\begin{matrix} 3.. & 04.. & 26.20 \end{matrix}$

1507 — $\begin{matrix} 11.. & 44.. & 24.50 \end{matrix}$

$\begin{matrix} 8.. & 39.. & 58.30 \end{matrix}$

1507 should be fast — $\begin{matrix} 8.. & 39.. & 54.36 \end{matrix}$

$\begin{matrix} 13.94 \end{matrix}$

1507 gaining

25th — M.T.C — $\begin{matrix} 3.. & 11.. & 38. \end{matrix}$

Sept-28th — $\begin{matrix} 2.. & 06.. & 07.0 \end{matrix}$

$\begin{matrix} 21.98 \end{matrix}$

$\begin{matrix} 2.. & 05.. & 45.02 \end{matrix}$

$\begin{matrix} 11.. & 57.. & 27.00 \end{matrix}$

$\begin{matrix} 9.. & 51.. & 41.98 \end{matrix}$

$\begin{matrix} 9.. & 57.. & 36.22 \end{matrix}$

$\begin{matrix} 3) & 5.76 & / 1.89 \end{matrix}$

$\begin{matrix} 9.. & 16.. & 45.36 \end{matrix}$

$\begin{matrix} 36 \end{matrix}$

$\begin{matrix} 9.. & 52.. & 45.36 \end{matrix}$

$\begin{matrix} 1.9.14 \end{matrix}$

$\begin{matrix} 51.. & 36.. & 22 \end{matrix}$

No. 1507

$\begin{matrix} 15.79 & / & 1.93 \text{ gaining} \end{matrix}$

1849 October 17th Mon: 70
PM

1491-16.42.20 — 16.45.20

1503-2.57.22.5 — 3.00.22

1503-3.2.0 — 3.3.0 — 3.4.0 — 3.5.0

2239-7.45.19.9 2227-7.43.11 2241-7.45.37 2167-7.50.8.2

2257-7.49.9.2 2207-7.49.16.2 2248-7.52.35.4 2186-7.49.27.5

2222-7.51.16.5 2224-7.55.14 2245-7.54.45.7 2246-8.28.8.5

1491-17.34.13 — 17.37.11

1503-3.49.07 — 3.52.04.5

17.34.13.0 13.43.29.15

49.5 467.5

17.33.23.50 13.44.15.90

13.44.15.95

3.49.07.55

2.59.30.511

48.57.972

6.981

.549

3.48.30.013

1503-3.49.07.00

+36.99

13^{*} — +34.00

4)299(0.73

40130² 1.46
20 Am 1.82
36.99
38.81

1503-7.53.0

196-7.52.36.2

7.53.0

38.8

7.52.21.2

7.51.36.2

-45

1503-7.57.0

196-7.55.36

7.57.0

38.8

7.56.21.2

7.55.36

-45.2

16

61.2

Oct. 17th

Ill East (32)

1121

No 1491

P.D. 7^h.43

2 hrs. min.

a Heron's P.D. 7^h.26

58.54.2

7.55.0

00.36.3

8.9.5

17.02.17.8

8.23.8

4.01.0

B 8.38.0

5.42.0

8.52.1

141.3

9.06.3

282.6

17.05.20.4

12

295.6

17.02.16.26

7/285.6

- .30

37.94

+ .95

17.02.16.91

17.01.26.45

50.46

17.08.35.94

- .04

aw +30

50.16

17.08.36.05

17.07.46.53

49.52

.289

.850

33

2550

867

1700

578

19550

6645

North mer. mark { South mark

.700 .300 0.170 .830

.720 .281 .140 .860

.707 .293 .140 .860

.720 .280 .165 .835

.710 .290 .135 .865

5443

.289

12250

.850

.289

.56.1

Level

E W

.345

85.0

1725

2960

29.325

+ 57 - 64

59.5 - 63 +

+ 58 - 63

58 - 64 +

+ 58.5 - 62

58 - 64 +

6/49.0 6/20

58.2 63.3

58.2

15.1

2.55

=.167 West to high

Lrc - 0.04

- 0.035

+

023

15

115

23

.345

29

3105

690

10.005

1829

9 October - 18th / 19th

Her 58

$1491 - 10 \dots 14 \dots 20 \quad \text{---} \quad 10 \dots 17 \dots 20 \quad \left\{ \begin{array}{l} 1508 \quad 11 \dots 13 \dots 42 \quad 1508 - 11 \dots 14 \dots 42 \\ 1503 - \underline{8 \dots 22 \dots 36.5} \quad \text{---} \quad \underline{8 \dots 25 \dots 36} \quad \left\{ \begin{array}{l} 1503 \quad 8 \dots 27 \dots 18 \quad 1503 - 8 \dots 28 \dots 17.5 \\ \underline{2 \dots 46 \dots 24} \quad \underline{2 \dots 46 \dots 24.5} \end{array} \right. \end{array} \right.$

$1503 - 8..33..0$ — $8..34..0$ — $8..35..0$ — $8..36..0$
 $2239 - 13..16..18.2$ $2227 - 13..14..6.3$ $2241 - 13..16..34.1$ $2167 - 13..21..9.3$
 $\rightarrow 8..37..0$ — $8..38..0$ — $8..40..0$ — $8..41..0$
 $2257 - 13..20..5.4$ $2207 - 13..20..13.2$ $2248 - 13..24..35.3$ $2186 - 13..21..23.4$ }
 $\rightarrow 8..42..0$ — $8..43..0$ — $8..44..0$ — $8..45..0$
 $2222 - 13..23..12.8$ $2224 - 13..27..11.4$ $2245 - 13..26..43.4$ $2246 - 13..29..0.8$

1503 - 8.59.0 — 9.0.0
1141 - 8.57.17.2 1122 - 8.59.44.4

$$\begin{array}{r} 1491 - 10 \cdot 14 \cdot 20 \\ \quad \quad \quad 49.8 \\ \hline 34 \cdot 13 \cdot 30.2 \\ 13 \cdot 48 \cdot 12.4 \\ \hline 20 \cdot 25 \cdot 17.8 \\ \quad \quad \quad 3 \cdot 20.7 \\ \hline 8 \cdot 21 \cdot 57.1 \\ 1503 \cdot 8 \cdot 22 \cdot 36.5 \\ \quad \quad \quad + 39.4 \end{array}$$
$$\begin{array}{r} 30.319 \\ \underline{254} \\ 121276 \\ 151595 \\ 60638 \\ \hline 770.1026 \end{array}$$

Bd a dya 20⁺ - 49.75
15 - 49.51
13 - 50.26

(34)

1849 Oct. 19th

Comparison of Prof. Gayot's Barometer

Newman. Mm. Ernst. 223_m Mm. Def 254) 769.60 (30.299
 30.332 66.9 ~~15.6~~ 769.64 18.6
 30.319 77.0 769.60 18.6 0.020

76
 769
 2520
 2286
 234

Oct. 20th Am
 M. East

α Leonis

Loc - 0.042
 Line + 0.166
 Devia - 0.035

299.41

1491 0 - 30.3 1491 - 10.19.20
 0 - 44.2 1503 - 8.13.42

0 - 58.5

B 1 - 12.4

1 - 26.5

1 - 40.4

10 - 01 - 54.5

266.8

160

7186.8

12.40

-2

10 - 01 - 10.40

Polaris L.P.

g - 12 - 40 - 27.0

f 49 - 18.3

e 58 - 03.2

d Clouds -

c 13 - 15 - 42.2

b Clouds

a

me. from c - 20th - 19.2
 21

α Spica 18.31 - 273.44

β Deneb 18.44 - 279.12

22 Am - 1491.9.13.0

196 - 7.48.6.5

13.59.15.56

13.0.0

46.71

49.79

14.00.02.31

33.52.10.21

14.00.02.31

19.52.07.90

18.56.53.24

17.57.46

6.98

.50

7.48.52.60

7.48.6.5

46.1

16

6.0.1

α Spica 1 - 48.8 β Deneb 4 34.0

2 - 6.8 4 - 50.5

2 - 24.3 5 - 6.5

B 2 - 41.8 B 5 - 23.0

2 - 59.5 5 - 39.5

3 - 17.2 5 - 56.0

18 - 33 - 34.5 18 - 46 - 12.4

232.9

60.9

71252.9

41.84

-2

18 - 32 - 39.84

18 - 31 - 50.19

44.65

221.9

60.9

1161.9

23.13

-2

18 - 45 - 27.13

31.14

44.54

(35)

Oct 20th Comparison of Prof Guyot's Barometer Ernst 223

Standard Newman	Dep millimeter	Ernst Ther	Bar.	Mercur.
30.282	62.5	0.59	17.5	768.57
30.281	63.0	0.54	17.8	768.60

30.282
 - 256
 121128
 151410
 60564
 7691628
 76857
 .59

20 Oct 19th

Mean of five comparisons by Prof Guyot

No 57 Newman ^{millimetre} 0.54 higher than Ernst 223

Royal Obs. Paris. Delcroix 0.567 higher than Ernst 223

(36)

Oct-22-

1491-18.. 27.54 — 18..30 ..50

1503-4.. 23..04.5 — 4..26...0

1503-4..29..0 — 4..30..0 — 4..31..0 — 4..32..0
 2239-9..12..17 2227-9..09..58.8 2241-9..12..29.3 2167-9..17..14

— 4..33..0 — 4..34..0 — 4..35..0 — 4..36..0
 2257-9..16..1.2 2207-9..16..9.8 2248-9..19..36.3 2186-9..16..15.7

— 4..37..0 — 4..38..0 — 4..39..0 — 4..40..0
 2222-9..18..7.2 2224-9..22..7 2245-9..21..40.5 2246-9..24..5.5

3
 Bagnam Mc East No. 1491.
 B Blephar B E Pyari
 49.2 58.7
 2.8 12.5
 16.5 26.4
 30.4 40.3
 44.2 54.4
 58.0 8.2
 21..27..36.0 mid 21..38..22.0
 8..16.5 2225
 8..56.2 2825
 21..29..36.5 40.36
 21..25..11.8 21..37..38.36
 2129
 30.41
 21 24..28.41

a Cephei-21..14-250..26

Bagnam-21..23-318..36

Blephar-21..26-242..29

E Pyari-21..36-303..12

a Bagnam 21..58-313..26

1491-21..40..054

1503-7..35..38

1491-21..44..03

1503-7..38..41.5

(37)

Oct 22/23 Mc East. n 1491

2 Hydree

55.9
12.3
26.4
40.3
57.0
08.

1318
2620

8. 39. 38.26
8. 38. 48.31
1491 + 49.89

270.8
180
719.8
12.97
10.01. 10.97
10.00. 20.74
+ 50.23

221.8
180
329.8
40.26

1491- 9. 33. 44
1503- 7. 26. 27

1491- 9. 36. 44
1503- 7. 29. 26.5

2 Hydree - 8. 39. 30. 25
Lunmg 8. 48. 263. 46
a Hydree 9. 20. 304. 23
a Leo 10. 0. 299. 41
a lunmg. 10. 04. 249. 49

1491 9. 21. 00
196 7. 12. 14.7

1491- 10. 25. 3
1122- 8. 17. 30.5

10. 25. 3
49.9

34. 24. 13.1
14. 3. 58.7
20. 20. 14.4
3. 14.9

8. 16. 54.5
8. 17. 30.5
C + 36.0
18
+ 20

196 slow - 47.33
1. 03. 3
14. 03. 11. 71
46.75
14. 03. 58. 66
3. 07. 41
14. 00. 51. 28

1503- 7. 25. 0
196- 7. 26. 29.6

14. 3. 11. 91
46.75
03. 58. 66

Colina Majori

9. 0. 13. - -
1491 13.8
43.8
mid win 13.5
43.3
10 56 13.1

127.5
25.50
-12
13.50
-2
10.55. 11.50

11. 46.6
Polaris S.P.

12. 40. 26.0 G
12. 49. 18.5 J
12. 58. 06.5 E
y.P.M. 06. 54.0 D
13. 15. 42.0 C
13. 24. 29.5 B
13. 33. 12.5 A
7248. 09.0
21. 06. 52.74
13. 06. 50.77

10. 55. 11.50
13. 06. 52.41
2. 11. 40.91

Col - 0.04
Lunel + 0.06
Dev - 0.07

309.0
26
29

Oct 22 Tuesday at 8^h 40^m A.M.

1503

For the Caledonia

1508 12..09..30

1508 12..10..29

- 12..11..27

1503 8..35..10.5

1503 8..36..09

- 8..37..065

Oct. 23 - 2^d Rell.

1491-16..17..57

16..21..06

1491-16..23..12

16..24..42

1503-2..9..34

14..12..42.5

1508-5..51..57.5

5..53..28

28..45.5

28..46

1503-2..20..0

2..21..0

2..22..0

2..23..0

2239-7..03..16.1

2227-7..00..56.7

2241-7..03..28.2

2167-7..08..14.9

4..43..16.1

4..39..56.7

4..41..28.2

4..45..14.9

2..24..0

2..25..0

2..26..0

2..27..0

2257-7..06..57.2

2207-7..7..9

2248-7..10..36.3

2186-7..07..13.5

4..42..59.2

4..42..09.0

4..44..36.3

4..40..13.5

2..28..0

2..29..0

2..30..0

2..31..0

2224-7..12..6.2

2245-7..11..39.5

2246-7..14..4.7

2222-7..12..05.5

4..44..06.2

4..42..39.5

4..44..04.7

4..41..05.5

1508-6..10..57

6..11..57

6..13..21

6..14..20

2248-7..18..14.5

7..19..14

2186-7..16..14.5

7..17..13

1508-6..16..15

6..17..15

6..18..42

6..19..42

2222-7..19..59

7..20..58.5

2224-7..25..25.5

7..26..25

6..20..30

6..21..29.5

6..22..30

6..23..42

6..24..43

2245-7..25..46

7..26..45

7..27..45

2246-7..30..21.5

7..31..22

1508-6..26..32

6..27..30

6..28..42

6..29..42

2239-7..32..21.5

7..33..19

2227-7..31..11

7..32..10.5

6..31..21

6..32..20

6..33..50

6..34..50

2241-7..35..20

7..36..18.5

2167-7..41..34.5

7..42..34.5

6..36..49

6..37..50

6..39..3

6..40..0

2257-7..42..16.5

7..43..17

2207-7..43..39

7..44..35.5

6..41..0

2207-7..45..35

1503-3..05..27

3..06..30

3..07..30

1491-5..18..46

1508-6..43..02

6..44..05.5

6..45..06

1508-5..47..50.5

37..35

37..35.5

37..36

29..04.5

1491-5..20..25

5..21..40

1491-5..20..25

5..20

1508-6..49..20

6..50..45.5

1503-31..50

30.5-40.5

1..29..05

1..29..05.5

26..26

1491-5..31..20

5..34..20

Put the 12 Chros, by Dent, on

1503-3..22..45

3..25..44.5

board the Caledonia this after-

noon in the Capt's State Room in

charge of Mr Campbell the Officer

(39)

October 23^d

JCC Earth No 1491.

ε Pegasi

α Aquarii

6.59.0

8.15.0

7.13.0

8.29.0

7.27.0

8.42.7

7.40.8

8.56.2

7.54.5

9.10.0

8.8.5

9.23.6

21.38.22.5

21.59.37.5

13.38

2140

26.76

3940

21.37.38.76

5629

21.36.48.51

21.08.54.29

1491

+50.25

46.75

03

46.62

16

30.62

ε Pegasi 21.36 — 303.12

α Aquarii 21.18 — 313.26

δ Pegasi 22.33 — 302.20

Fomalhaut 22.49 — 342.48

α Pegasi 22.57 — 297.59

21^d

1491 9.41.00

1122 7.29.42.3

Oct. 25 All 50.3

1491 9.44.00.0

186 196 7.27.18.7

9.43.09.7

14.14.58.77

19.31.17.93

3.11.89

19.28.06.04

7.27.18.7

-47.34

16

196 Slow - 1^m.03.34

J/Boston

9.43.09.70

14.14.05.02

19.32.04.68

3.12.01

19.28.52.67

19.27.18.70

-1.33.97

+30.62

196 - 1.03.35

J/Boston

(40)

(40)

October 25th

Ill. East - n° 2491.

North mark

B. Draconis

6 . 45.0

7 . 7.5

7 . 30.0

7 . 53.3

8 . 15.

8 . 37.3

17 . 29 . 0.0

188.5

180

7/368.1

17 . 27 . 52.5

17 . 27 . 50.59

1491 - 17 . 39 . 46 — 17 . 42 . 45

1503 - 3 . 23 . 20.5 — 3 . 26 . 19

1503 - 3 . 28 . 14 — 3 . 29 . 13

1508 - 7 . 29 . 56.5 — 7 . 30 . 56

0.730 - .270

.715 .29.0

.720 .28.0

.710 .29.0

.725 .27.5

5/42.5

28.5

B. Draconis

2 . 57.4

3 . 13.4

3 . 35.5

3 . 57.5

4 . 19.5

4 . 41.5

17 . 55 . 03.6

2224

180

7/402.4

57.49

17 . 53 . 55.49

Sunel Thru 55

E W

+ 69 — 67.5

65. — 70.7 +

+ 68.5 — 68

65 — 69.5 +

+ 68.5 — 68

65.5 — 69 +

6/41.5 4/52.7

66.9 68.8

66.9

1/9

0.95 + 0.06

len. = +0.06

B. Draconis 17 . 26 . 289.58

B. Draconis 17 . 53 . 260.52

Length

0.19.5 - 0.80.5

.15.5 .84.2

.18.0 .88.0

.18.5 .85.0

.16.0 .84.0

21.7

84.4

28.5

55.9

Sun 0.844 5

0.85

23

255

176

1955

0.285

0.29

23

87

58

.667

Col - 0.04

Inli + 0.06

New - 0.07

October 28th

Mc East No. 1491-

 δ Aquila γ Aquila

5.6

16.4

19.0

30.5

32.8

44.4

46.5

58.5

0.4

12.5

14.0

26.2

19..19 ..27.9

19..40 ..40

1460

3260

1621

46.57

3242

19..18..44.57

19..39..56.42

19..39..06.35

50.07

 α Aquila

37.0

57.0

4.6

18.5

32.5

46.4

19..45 ..0.3

1903

1303

18.61

19..44..16.61

 δ Aquila - 19..17 - 309.34 γ Aquila - 19..39 - 302..08 α Aquila - 19..23 - 303..55 β Aquila - 19..47 - 306..22

29 Capricorn 21..07 - 328..11

 ϵ Capricorn 21..13 - 329..51 δ Capricorn 21..33 - ϵ Capricorn 21..38 - 329..12 ϵ Aquarii 21..58 - 326..59

Oct 25

1491 9..44..00

47..37

1503 7..24..57.2

1..30

9..43..09.93

270..00

14..15..01.57

312..32

19..28..08.36

79..46

3..11..37

237..36

19..24..56.99

19..24..57.20

50.1

1491 10..02..00

+0.20

Bow 7..42..34.8

30.62

10..01..09.4

1503 +30.82 of Post

14..15..48.32

19..45..21.6

3..14..2

1503 = 7..31..00

19..42..07.4

196 = 7..29..25.7

19..42..34.8

1..34.3

274

30.8

16.0

196 Slow 1..03.5 of Post

Bow + 11.4 of Post.

1503 - 7..39..00

Bow 7..38..40.6

7..39..00

30.80.8

7..38..24.2

Bow 7..38..40.6

11.4

(42)

47.37

Oct 26th 11th Dec 1849

52.24

42.22

10.02

26.05

47.37

21.30

Polaris S.p.

Clouds

12^h 54^m 10.³ 3rd wire very uncertain just past the wire12. 58. 36 0.30 past 3rd wire

Clouds

13 23 48 0.47 before last wire but one

13 .. 24 .. 32.0 6th wire

14.34 82.16

42.22

27.46

74.46

ε Ursa 17.01 2d 39.54

42.22

α Hercules 17.07 27.48

32.24

Jell East No 1491

very faint

β Ursa Minoris ε Ursa Minoris

faint
α Hercules

14. 44. 21.0

50. 13.0

51. 05.0

51. 57.2

52. 49.5

53. 42.3

54. 34.6

222.6

402.6

57.51

14 .. 51 .. 55.51

16. 58. 53.0

17. 00. 34.5

" 02. 16.0

" 03. 59.0

" 05. 40.5

203.0

406.0

16.60

17. 02. 14.60

~~38~~

could not see

~~the star~~

38.5

52.4

06.7

17. 09. 21.1

As for Ursa

45.0

07.4

29.8

52.4

15.0

37.5

00.2

1873

3673

52.47

17. 29. 50.47

17th 36.9

Oct. 26th α Lyrae

1 .49.0

2 .6.5

2 .24.0

2 .41.5

2 .59.2

3 .16.8

18 .33 .34.5

231.5

1291.5

41.64

2

78 .32 .39.64

Ill East. No 1491.

 β Aquila

8 .4.9

8 .18.7

8 .32.6

B 8 .46.4

9 .0.0

9 .14.0

19 .19 .27.6

144.2

180

77324.2

46.30

79 .18 .44.30

 α Lyrae 18.31 - 273.45 β Lyrae 18.44 - 279.11 δ Lyrae 21.00 - 274.23 ϵ Lyrae 21.06 - 282.47

col - 0.04

dual + 0.06

div - 0.14

 ϵ Lyrae 6 .37.0

6 .53.0

7 .8.8

7 .24.21

7 .40.3

7 .55.9

21 .08 .12.0

231.4

1291.4

24.49

2

21 .07 .22.49

Arrival ⁽⁴⁴⁾ of the Europa.

October 26th 4^{1/2} PM

Bar . New

$1491 - \underline{18.20.25} = 18.23.24$ $1491 + \underline{18.24.50} = 18.26.20$
 $1503 - \underline{\begin{array}{r} 3.59.58 \\ 9.33 \end{array}} = 4.02.56.5$ $1508 - \underline{\begin{array}{r} 20.18.20.5 \\ 8.19.57 \end{array}} =$

1503-4 .06 .53 1503-4 .07 .52
1508-8 .20 .52 1508-8 21 .52

$1508 - 8.30.43 \rightarrow 8.31.42$ } $1508 - 8.33.25 \rightarrow 8.34.21$
 $\times 227 - 8.55.09 \rightarrow 8.56.07.5$ } $\times 258 - 8.57.34.5 \rightarrow 8.58.33$
 $\quad 8.36.04 \rightarrow 8.42.04$ } $1508 - 8.44.10 \rightarrow 8.45.11$
 $\times 250 - 8.59.09 \rightarrow 9.05.06$ } $\times 230 - 9.20.21 \rightarrow 9.21.21.5$

$1508 - 8.46.43 \quad \text{---} \quad 8.51.45 \quad 8.52.45 \quad \left. \begin{array}{l} 1508 - 8.54.16 \\ * 1506 - 9.16.43 \end{array} \right\} \quad 1508 - 8.54.16 \quad \text{---} \quad 8.56.12$
 $\text{---} \quad 8.57.58 \quad \text{---} \quad 8.58.58 \quad \left. \begin{array}{l} 9.00.15 \\ * 7127 - 9.26.26.5 \end{array} \right\} \quad 9.01.15$
 $* 715 - 9.24.13.5 \quad \text{---} \quad 9.25.11 \quad \left. \begin{array}{l} 2665 \\ 8.59.35 \end{array} \right\} \quad 9.00.34.5$

1503- 5.52.0 — 6.14.0 — 6.15.0 — 6.16.0
 1109- 10.29.55 776- 11.4.55 222- 10.57.48.4 310- 10.10.47
 4 " 37 " 05.5 4 " 50 " 55.0 4 " 42 " 48.4 3 " 54 " 47.0
 — 6.18.0 — 6.19.0 — 6.21.0 — 6.22.0
 715- 10.58.33.2 2663- 10.32.39 227- 10.59.30.3 258- 11.00.15
 4 " 40 " 33.2 4 " 13 " 39.0 4 " 39 " 30.3 4 " 38 " 15.0
 — 6.23.0 — 6.24.0 — 6.25.0 — 6.27.0
 250- 11.00.11.7 230- 11.14.22.2 } 1506- 11.09.12.5 1127- 11.13.27.7
 4 " 37 " 11.7 4 " 50 " 22.2 4 " 44 " 12.5 4 " 46 " 27.7

Oct 26 1849
Polaris S.P. 27

B² 12.40.24.0
49. 19.0
about, faint 58. 08.0
06. 51.5
about, Cloudy 15. 44.0
24. 25.5
33. 15.5
7/48. 07.5
06. 52.5
13. 06. 50.50

Difficult &
uncertain
from naked
Clouds.

α Lyrae 1. 49.0
2. 6.5
2. 26.2
B 2. 41.8
2. 59.5
3. 17.0
18. 33. 34.5
23.25
7/29.2.5
41.79
18. 32. 39.79
49.98
49.87

δ Aquila 51.0
19.0
32.6
46.5
0.3
14.0
19. 19. 27.8
1452
3252
46.46
19 18. 44.46

B Lyrae
lost
23.0 min
B 39.3
58.9
18. 46. 12.3

α Lyrae - 18. 31 - 273. 45
B Lyrae - 18. 44 - 279. 11
 δ Aquila - 18. 58 - 298. 44
 δ Aquila - 19. 17 - 309. 34

Ill East
North

70 .300
72 .280
72.5 .275
75 .250
76 .240
165
733 267

could not well see
the marks
South

Level

E ~ W
64.5 - 68. +
+ 62 - 68.5
65 - 67.5 +
+ 63 - 67.5
64.5 - 67.0 +
+ 63.5 - 67
1/22.5 1/45.5
63.8 67.6
63.8
13.6
1.9 west too high

120 0.880
haze

5
0.13 =

lev. = +0.13

Oct. 27*

1491-19.05.30 — 19.08.27
 1503-4.41.0.5 — 4.43.57

Then 67

1503-4.46.0 — 4.47.0 — 4.48.0 — 4.49.0
 227-9.24.29.4 258-9.25.11.7 250-9.25.8.3 230-9.34.23.7
 — 4.50.0 — 4.51.0 — 4.56.0 — 4.57.0
 1506-9.34.13.5 1127-9.37.29.5 715-9.36.29.5 1503-9.10.34.4
 — 4.58.0 — 4.59.0 } 2 5.1.0 — 5.3.0
 310-8.52.44.9 222-9.41.46 } 776-9.51.55.9 1105-9.40.2
 1503-5.6.22 — 5.07.22
 1508-9.32.50 — 9.33.50.5

(47)

Oct-29²⁸ L Am

Ther 63

$$\begin{array}{r}
 1491-10.09.58 \\
 1503-7.39.08 \\
 \hline
 29.08
 \end{array}
 \quad
 \begin{array}{r}
 10.13.0 \\
 7.48.7.5 \\
 \hline
 29.7.5
 \end{array}$$

$$\begin{array}{r}
 1503-8.01.0 \\
 715-12.41.24.2 \\
 \hline
 2663-12.16.26.8 \\
 310-11.58.42.2 \\
 222-12.47.42.2 \\
 \hline
 2-8.6.0 \\
 776-12.56.54 \\
 1109-12.43.56.7 \\
 227-12.47.27.4 \\
 258-12.48.5.4 \\
 \hline
 8.11.0 \\
 250-12.48.3 \\
 230-13.02.27 \\
 1506-12.57.15 \\
 1127-13.00.35
 \end{array}$$

$$\begin{array}{r}
 1503-8.16.0 \\
 1141-8.13.40.8 \\
 1122-8.17.2 \\
 1503-8.25.19 \\
 1508-13.11.23 \\
 13-12.23.5
 \end{array}$$

$$\begin{array}{r}
 1491-10.49.0 \\
 9-10-10.46.07 \\
 2492-10.54.57.5 \\
 79-11.03.16
 \end{array}$$

$$\begin{array}{r}
 1491-10.52.0 \\
 2557-10.53.40.8 \\
 2440-10.45.1.7 \\
 2419-11.06.20.2
 \end{array}$$

$$\begin{array}{r}
 1503-8.28.78 \\
 1508-13.14.23.5
 \end{array}$$

$$\begin{array}{r}
 1491-11.3.0 \\
 497-8.31.0.7 \\
 11.3.0.0 \\
 49.8 \\
 35.02.10.20 \\
 14.27.37.98 \\
 20.34.32.22 \\
 -3.22.25 \\
 8.31.09.97 \\
 8.31.00.7 \\
 -9.27 \\
 16 \\
 -25.27
 \end{array}$$

$$\begin{array}{r}
 11.4.0 \\
 239-8.32.20.7 \\
 11.4.49.8 \\
 35.03.10.20 \\
 14.27.37.98 \\
 20.35.32.22 \\
 3.22.40 \\
 8.32.09.82 \\
 8.32.20.7 \\
 +10.88 \\
 -16 \\
 -5.12
 \end{array}$$

$$\begin{array}{r}
 14.26.57.27 \\
 46.75 \\
 16.27.37.98
 \end{array}$$

(48)

750

October 29th
c.g. 29.775

B-29.780

CS 202-29.830

c.f. 2899-29.775-66

B 67-29.830

c.f. 371-29.812

Standard
29.840 - 71

1491-21..44..0

179-21..47..2.2

21..44..0

21..43..10

21..47..2.2

+3.52.2

38

-3.14.2

21..45..0

2857-21..44..33.8

21..45..0

21..44..10

21..44..33.8

+23.8

Sept. 15

1.09.8

44/46.0 f1.5

44

200

2..54..5

+23.8

-3..18.3

3..14.2

12.5

3..16.2

23.8

1.5

.3

(49)

Other end = Seals 51

October 29/30 AM.

X end of Scale

d " $\times$ End of Scale
 $60.7 = 59.4$ } 60 to 120
 $62.5 = 60.4$ }

$$55.74 \text{ div} = 59.4''$$

From 5 to 59

$$56.5 \text{ div} = \underline{60.4}$$

36 59

$$56.8 \text{ div} = 59.9$$

4 to 60

61.6 " = 59.9

60 to 121

Scale 15

$$55.0 = 59.4$$
$$56.0 = 60.4$$

Value of Divisions of the Level of the
Transit Circle

For further reductions see June 28th 1852.

Croft End was North

Level

	$N \times$		S
N	5	54.5	123
	59.5	68.5	54.5
	61.5		61.5
	<u>121.0</u>	7.0	<u>58.0</u>
	58.0		
	0.970		0.970

Microm A

$N \times$	S	
4	123	0.22
57	55.5	
61	67.5	1.22
60	60.5	
<u>121</u>	<u>7.0</u>	<u>2.22</u>
58.5	58.0	
0".975	0".970	

Microscope

$\sum x$		S
3		123.5
59	56	55.5
	63	62.5
<u>122</u>		<u>5.5</u>
		59.0
<u>59.5</u>		0'' 83
0.992		

$N \times$	S	
3	123	0.52
60 57	66.5	56.5
62	61.0	1.52
<u>122.</u>	<u>5.5</u>	<u>2.52</u>
59.5	58.7	
0.992	0.978	

Temp supposed about 50°

Value of a division of the Level near the middle
of its scale is $= 1.02$

at the extremes of its scale $\sim = 0.93$ 1.07 α 0.98

Sun June 28 1852

$$\begin{array}{r} 267 \\ + 23 \\ \hline 290 \end{array}$$

(50)

Oct 29/30

Level Ill East.

W	E
X 64.3	62.5
X 64.3	62.0
65.0	61.5 X
<u>65.0</u>	<u>61.5 X</u>
64.65	61.87
<u>61.87</u>	
2) 2.78	
1.39	

0.09 $\text{len.} = +0.09$

W + 1.4

Polaris L.P.

Ill East. Clouds

1491-

f- 12.49 .. 11.2

micrometer

13.09..45 2" from D

B hrs min

49 .. 20.8

50 .. 12.4

51 .. 04.2

B 51 .. 57.3

52 .. 49.2

53 .. 41.2

14 .. 54 .. 34.0

289.218.0

7) 309.2

57.03

14 .. 51 .. 55.03

Ill East

1491

48.0 1 min

6.2 ~

clouds

3 Aquilae

8. 38.5

8. 52.5

9. 6.6

B 9. 20.5

9. 35.0

9. 49.0

19.00 .. 03.0

20.51

6.6

2) 14.51

20.73

18.59 .. 18.73

18.58 .. 29.33

49.40

B hrs min 14.51 - 237.37

 α Corona - 15.28 - 285.09 α Lyrae - 18.31 - 273.45 β Lyrae - 18.44 - 279.11

Level + 1.39 = 0.09

Col - 0.04

az - 0.07

Oct $\frac{30}{38}$

1491 10..07.00
 196 7..26.37.7
 10..06.40.7
 14..34.44.36
 19..31.26.36
 3..12.90
 19..28.44.45
 19..26.37.7
 -1..36.75
 30.62
 -1..06.13
 196 -1..06.42 of Best

Oct 31st

All East at 1491

5 Pegasi	Fomalhaut	α Urs. Maj' S.P.
4..7.0	9..23.5	3..42.5
4..20.7	9..39.0	4..12.0
4..35.0	9..55.0	4..42.0
B 4..49.0	B 0..10.1	B 5..12.0
5..3.0	0..27.0	5..41.6
5..17.0	0..42.6	6..11.2
22..35..31.0	22..50..58.8	22..56.41.0
162.7	257.0	202.3
180	180	180
7/342.7	877	7/82.3
48.96	11.0	11.76
22..34..46.96	22..50..09.00	22..55..09.76
+08	+02	-05
-04	-05	+09
+08	22..50..08.97	22..55..09.80
22..34..48.08	19	50..08.97
33..58.45	22..50..09.16	50..00.83
+48.63	26.23	5..01.61
	48.96	.78

0.78 - 9.89209
 129.25 - 9.88793
 27.27 - 9.66368
 156.52 - 9.59425
 42.23 - 10.13156
 9.16951 = 0.1477 az East of South

α Aquarii 21..58 - 313.26
 5 Pegasi 22..33 - 302.20
 Fomalhaut 22..49 - 342.48
 α Pegasi 22..57 - 298.00
 α Urs. Maj' S.P. 22..54 - 194.57
 Piscium 23..32 - 307.35
 Piscium 284.08
 Piscium 298.02

50.5
 4.4
 18.5
 32.3
 23..33..46.2

5 Pegasi

39.0
 53.0 damp ment
 7.5 out would not
 21.4 see the wings
 36.0 well
 50.0

0..07..04.0

210.9

1509

2156

0..06..19.56

2156

2

(52)

Oct 31

Thurs 60.

$$1491 - 6.54.22 \quad 1508 -$$

$$1508 - 9.28.12 \quad 1503$$

$$44 - 9.31.54 \quad 9.32.50$$

$$50 - 4.17.57.5 \quad 4.18.53$$

$$1508 - 9.33.57 \quad 1492 - 19.2.10 \quad 19.5.14 \quad 19.08.15$$

$$1503 - 4.19.53.5 \quad 1503 - 4.22.04 \quad 4.25.7.5 \quad 4.28.08$$

$$\quad \quad \quad 5.13.57.5 \quad \quad \quad 2.40.06 \quad 12.40.06.5 \quad 1.40.07$$

$$1497 - 19.12.0 \quad 19.13.0 \quad 19.15.0 \quad 19.16.0$$

$$179 - 19.15.10 \quad 2857 - 19.12.35.8 \quad 277 - 19.16.48.2 \quad 2419 - 19.27.28.2$$

$$2440 - 19.17.0 \quad 19.18.0 \quad 19.20.0 \quad 19.22.0$$

$$2452 - 19.23.8.2 \quad B10 - 19.17.7.3 \quad 19 - 19.34.23.3$$

$$424 - 19.23.0$$

$$424 - 19.21.53.7$$

$$1503 - 4.44.0 \quad 4.45.0 \quad 4.47.0 \quad 4.48.0$$

$$1122 - 4.44.5.4 \quad 1141 - 4.42.17 \quad 497 - 4.46.19.2 \quad 1169 - 9.24.48.5$$

$$1503 - 4.49.0 \quad 4.50.0 \quad 4.57.0 \quad 4.52.0$$

$$776 - 9.40.01.1 \quad 222 - 9.32.35 \quad 310 - 8.45.39.8 \quad 2663 - 9.5.13$$

$$715 - 4.53.0 \quad 4.55.0 \quad 4.56.0 \quad 4.58.0$$

$$715 - 9.33.15.7 \quad 227 - 9.33.23.8 \quad 258 - 9.33.55.4 \quad 250 - 9.34.54.2$$

$$1127 - 4.59.0 \quad 5.0.0 \quad 5.1.0$$

$$1127 - 9.45.42.3 \quad 230 - 9.50.31 \quad 1506 - 9.45.17$$

(53)

Dates of departure and arrival of Steamers carrying
Chronometers belonging to the Longitude Expedition.

1849
 May 9th *Chilaboa* left Boston with 8 Chronometers
 May 18th " arrived at Liverpool " "
 Aug 3rd *Hibernia* left Liverpool
 " 16 " arrived at Boston bringing 47 Chronometers
 " 28 " left Boston carrying 12 " "
 Sept 11 *Caledonia* left Boston " 12 " "
 " 25 *Europa* left Boston " 12 " "
 " 18th *Canada?* arrived at Liverpool " 12 " "
 Oct 12th *Caledonia* arrived at Boston bringing 15 " "

1st 2nd? * see note yes by Bullen et al. of no. 1568.

Nov- 2nd 8th M East- 1491

α Leonis

0..29

0..43.0

6..57.0

B 1..11.2

1..25.2

1..39.3

10..01..53.4

12581

180

778.7

11.16

-2

10..01..09.16

Level Mer 36

E N

+ 87 - 80

+ 81 - 85 +

+ 86.3 - 80

+ 81 - 84.7 +

4/153 4/9.7

83.82 82.45

83.82

211.37

0.68

-0.04

west two days

err. = -0.06

a Leo - 10..00..299.41

a Leo May. 10..54 - 249.49

North mark

0.762 .238

762 .238

299.04

(Suppose these 2nd P.M.)
yes

Polaris. S.P.

12..57..59.5 E

13..06..47.0 mid wire

13..15..36.0 C

3/20..22.5

13..06..47.5

-2

13..06..45.5

δ Aquila

3.4

17.2

31.0

B 44.6

58.3

12.1

19..19..26.0

1926

3126

44.66

19..18..42.66

δ Aquila

14.3

28.5

42.3

B 56.3

10.4

24.3

19..40..38.1

2142

3942

56.31

19..39..54.31

β Aquila

3.9

17.7

31.5

48 45.4

59.3

13.0

27.0

1978

3178

4540

19..48..43.40

α Aquila T.H.S.

33.1

46.9

01.0

14.7

28.6

42.5

19..44..56.5

added April 2nd 1850

Note I suppose that the time of taking the above transit of α Leonis was Nov 2nd 1844 & after the 3rd P.M. or 2nd P.M. perhaps on the original date 2nd P.M. was altered by me to 1st P.M. on the 3rd P.M. as I recalled. A reason for supposing the original afternoon date to have been correct is because the obs. of α Aquila was taken by T.H.S. who was usually here only on Sat. & Sunday & Wednesday afternoon & Sat. was the 3rd.

$\frac{1}{2}$ Am

Nov. 3 Am ^(5th) This must have been $\frac{1}{2}$ Am.

(Nov. 2. Am by 1508 mCB)

Ther 59

$$\begin{array}{r}
 1491 - 11.12.53 \quad 5 - 11.15.58 \quad 11.19.0 \\
 1503 - 8.26.14 \quad 24 - 8.8.29.18.5 \quad 8.32.20 \\
 \hline
 2.46.39 \quad 2.46.39.5 \quad 2.46.40
 \end{array}$$

$$\begin{array}{r}
 1508 - 14.8.0 \quad 14.09.0 \quad 14.10.0 \\
 1503 - 8.33.59.5 \quad 8.34.59 \quad 8.35.58.5
 \end{array}$$

$$\begin{array}{r}
 1503 - 8.39.0 \quad 8.40.6 \quad 8.41.0 \quad 8.42.0 \\
 11.27 - 13.25.46.2 \quad 258 - 13.17.57.4 \quad 230 - 13.31.33.2 \quad 1306 - 13.26.17.4 = 1506? \\
 \hline
 4.46.46.2 \quad 4.37.51.4 \quad 4.50.33.2 \quad 4.44.17.4 \\
 8.43.0 \quad 8.44.0 \quad 8.45.0 \quad 8.46.0 \\
 227 - 13.21.22.3 \quad 250 - 13.20.48.7 \quad 1109 - 13.21.42.6 \quad 786 - 13.37.4.3 \\
 \hline
 4.38.22.3 \quad 4.36.48.7 \quad 4.36.42.6 \quad 4.51.04.3 \\
 8.50.0 \quad 8.51.0 \quad 8.52.0 \quad 8.53.0 \\
 222 - 13.32.33 \quad 310 - 12.45.40 \quad 2263 - 13.05.7.6 \quad 715 - 13.33.12 \\
 \hline
 4.42.33.0 \quad 3.54.40.0 \quad 4.13.07.6 \quad 4.40.12.0 \\
 8.56.0 \\
 497 - 8.54.18.6 \\
 \hline
 8.58.18.6
 \end{array}$$

1508 fast of 1503. Oct 29th Am. 4.46.04.5 at 8.26.19 by 1503 mean mean time rate.

$$\begin{array}{r}
 1508 - \text{Nov. 2. Am. } 5.34.00.5 \quad \text{at } 8.33.59. \\
 \hline
 47.56.0 \\
 3.9 \\
 \hline
 7.40 = 3.5 \\
 \hline
 3.9
 \end{array}$$

Days 4/47.59.9

This shows that the date should have been Nov. 2nd Am.

1506 + 1503

$$\begin{array}{r}
 28 \\
 29 \text{ Am } 4.44.15
 \end{array}$$

1503
2663

$$\begin{array}{r}
 \text{Oct 29th Am } 4.46.04.5 \quad \text{N } 3.534.00.5 \\
 \hline
 5.34.00.5 \\
 4.47.55.5 / 12. \\
 \hline
 3.16
 \end{array}$$

$$\begin{array}{r}
 28 \\
 29 \quad 4.13.26.8 \\
 31. Pk. 4.13.13.0 \\
 \hline
 5.13.8 / 2.76 \\
 \hline
 5.52
 \end{array}$$

$$\begin{array}{r}
 222 \\
 29. Am \quad 42.42.2 \\
 31. Pk \quad 42.35.0 \\
 \hline
 5.7.2 \quad 1.44 \\
 \hline
 2.88 \\
 1.44 \\
 \hline
 4.32 \\
 3.5 \\
 \hline
 30.7
 \end{array}$$

(57)

Nov 3rd All Saturday

48.43

1491 49.58.00

Bow 7.10.19.6

49.57.11.57

14.46.34.00

B 14.10.37.57

3.08.5

19.07 29.07

19.10.19.60

+2.50.53

30.62

Bow +3.21.15

of Boston

1503-7.26.6

239-7.29.42

1491-10.15.0

1503-7.24.34.9

22

B. 29.5

43.4

57.5

11.5

25.6

39.5

10.01.54.0

267.0

33.50

10.00.09.587

10.00.21.07

48.50

261.0

180

81.0

11.57

9

5th All

48

1491 10.21.00

196 7.21.05.3

10.20.12

14.54.27.11

19.25.44.89

3.10.97

19.22.33.92

19.21.05.30

1.28.62

30.62

196 Bow - 0.58.00

1491 10.26.00

(58)

Oct-6th Am

Ther 65

$14.91 - 10.43.57 - 10.45.18 \quad 1508 - 14.07.22 - 14.08.21$
 $1508 \quad 14.03.02 - 14.04.29.5 \quad 1503 - 7.45.53.5 - 7.46.52$
 $1503 \quad 7.50.0 \quad 2 \quad 7.52.0 \quad - \quad 7.53.0 \quad - \quad 7.54.0$
 $1109 - 12.26.29.3 \quad 776 - 12.43.12 \quad 222 - 12.35.27.4 \quad 310 - 11.48.40.4$
 $+ 503 - 7.55.0$
 $2663 - 12.54.54 \quad \left\{ \begin{array}{l} 715 - 7.57.0 \\ 12.37.6 \end{array} \right. \quad - \quad 7.58.0 \quad - \quad 12.38.6.1$

1491-11.03.10 1491-11.4.0
1503-8.00 57.5 1503-8.1.41.3

1829.

Nov 6th P.M.

$\begin{array}{r} \text{Cm} \\ 1491-18..07.35 \\ 1503-3..04.07 \\ \hline \end{array}$

1503-3.11.0 — 3.12.0
✓ 227-7.49.21-250-7.48.35.8

1503 By its rate 6th at 3 PM Fast + 59.9 going well
1491 " " 48.7 not very well
1503 By Camp with 1491 + 57.7

18.. 07.. 35.0 15.. 02.. 20.72
48.7 46.74
18.. 06.. 46.30 03 06.96
15.. 03.. 06.96
3 .. 03 .. 39.34
30.09
3.. 03 .. 09.25
3.. 04.. 07.00
+ 57.75

We cannot, that I see, make much use of the above comparisons

(60)

Nov 8th Adl.

(47.7)

Brought up by rate
not quite correct.

1491 10. 36.00

1503 7. 25. 56.3

10. 35. 12.3

15. 06. 16.77

19. 28. 55.53

3. 11. 50

19. 25. 44.03

7. 25. 56.30

~~1503~~ just 0. 12. 27

30. 66

1503 just of +0. 42. 93

Boston 59.16

+54.93

1141 7. 38. 00

151 12. 20. 49.7

4. 42. 49.7

as Chro did not lose after 3rd to 12th.Nov 12th Adl 1503 + 50.4 of Bort.

(61)

Nov-10⁺Ile. East
no 1491

β Aquila 19.39 - 302.08
 α Aquila 19.43 - 303.55
 β Aquila 19.47 - 306.22

β Aquila	α Aquila	β Aquila
9 15.4	3 36.0	8 4.8
9 29.5	3 49.7	8 18.9
9 43.3	4 3.5	8 32.6
B 9 57.2	B 4 17.3	B 8 46.5
0 11.2	4 31.3	9 0.3
0 25.3	4 45.0	9 14.2
19 40 39.2	19 44 59.0	19 49 28
221.2	241.8	145.3
180	120	180
7/401.2	7/121.8	7/325.3
57.31	17.40	46.47
-2	-2	-2
19 39 55.31	19 44 15.40	19 48 44.47

South base North
 111.889 750.250
 116.884 760.240
 116.884 760.240
 114.3 757
 0.866 248
 23 23
 2656 744
 1772 496
 2.0376 5704

Level
 E W
 66.5 72 +
 + 70 - 68
 66 - 72 +
 + 70 - 68.5
 + 65 - 72.5 +
 + 70.3 - 68
 421.0
 68.0 70.02
 2.0
 1.0 = 0.07

cor. for temp.
 +0.07

β Cygni	δ Cygni	α Cephei
0 10.3	6 36.4	α Cephei 23.3
0 26.0	6 52.3	4 53.0 29.7
0 43.5	7 8.6	5 22.0 29.0
B 1 1.0	B 7 23.8	B 5 57.0 29
1 18.5	7 39.5	6 20.2 29.2
1 35.7	7 55.3	6 49.5 29.3
21 01 53.3	21 08 11	21 17 19.0
186.8	226.7	238.0
180	60	120
7/16.3	7/166.7	7/358.0
21 01 0.9	23.81	51.14
-2	-2	-2
21 00 58.40	21 07 21.81	21 15 49.14
00 09.74	6 32.42	4 59.86
+49.16	+49.39	+49.28

21.0 = 0.07
 61 Cygni 21.0 - 274.22
 δ Cygni 21.6 - 282.46
 α Cephei 21.14 - 250.26
 β Aquarii 21.23 - 318.36

since box came over.

(62)

Miri + 64

Nov-10th

1491-20..13..05 — 20..16..05

1503-4..53..39.5 — 4..56..39

1503- 8..47-4..59..644 — 5..00..44 — 5..01..44 — 5..02..43

1508- 58..45-12..13..42.5 — 12..14..43 — 12..15..43.5 — 12..16..43

1503-5..14..0 — 5..15..0 — 5..16..0 — 5..18..0

1506-9..58..23.8 222-9..57..18.5 310-9..10..38.6 1122-5..18..8.8

1503-5..19..0

1141-5..15..25.5

1491-20..41..0 — 20..42..0 — 20..44..0 — 20..45..0

2857-20..40..38 179-20..45..36.4 B 10-20..41..57.3 2440-20..35..55

1491-20..46..0 — 20..47..0 — 20..48..0 — 20..49..0

2557-20..48..9.2 2419-20..58..43.4 1492-20..54..9.5 24-21..02..2

1491-20..50..0

333-20..58..2.5

1491-21..20..0 — 21..21..0

1491-21..20..23.4 — 21..21..23.5

10th - PolarisF 1..24..25-6th wire1..27..20 Micron, 2 turns from 6th wire

28..52 — 3 — — — — — } Micron at 100

30..22 — 4 — — — — — }

y 1..33..18.5 last wire

2.4

$$\frac{2.4}{0.47} = \frac{2.4}{0.47} \approx 5.1$$

$$\alpha \text{ Arietis } 59..5.5$$

y 1..06..48.61

F 1..06..47.49

1..06..47.90 Mean of 2

-2
1..06..45.90

2..0..20.0

1159

2318

3518

1..59..33.18

$$\frac{26}{60} \frac{78}{27}$$

$$\frac{1566}{27} \frac{807}{27}$$

$$\frac{31587}{269} \frac{3219}{269}$$

$$\frac{17}{60} \frac{1020}{24}$$

$$\frac{31054}{3.51}$$

1..24..25.0

17..36.41

1..06..48.61

win F

1.43865

8.41490

3.02375

1056.22

17.36.22

1..33..18.5

26.31.47

1..06..47.71

win G

6.61570

8.41490

3.20080

1587.80

26..27.80

(63)

1849 Nov. 10th Expt Lemp 54 - The steamer Cambria, Capt Litch arrived at East Boston, and the Chronometer at Cambridge at 6 P.M.

Comparisons with mean solar Chronometer No. 1503

1491 - 22.. 12 .. 45 — 22.. 15.. 45
1503 - 6.. 53 .. 00 — 6.. 55.. 59.5

1503 - 6.. 58.. 0 — 8.. 0.. 0 — 7.. 2.. 00 — 7.. 3.. 0
*159 - 11.. 39.. 36.5 *191 - 11.. 43.. 38.7 *190 - 11.. 44.. 46.3 *183 - 11.. 38.. 45.5
4.. 41.. 36.5 4.. 43.. 38.7 4.. 42.. 46.3 4.. 35.. 45.5

1503 - 7.. 5.. 0 ^{2d} rather 7.. 07.. 0 — 7.. 9.. 0 — 7.. 12.. 0
*180 - 11.. 45.. 56 *190 - 7.. 10.. 26.2 *1522 - 11.. 58.. 13.5 *1570 - 11.. 50.. 16.1
4.. 40.. 56.0 0.. 03.. 26.2 4.. 49.. 13.5 4.. 38.. 16.1

7.. 13.. 0 — 7.. 19.. 0 — 7.. 21.. 0 — 7.. 22.. 0
*6701 - 12.. 04.. 31 *1521 - 12.. 01.. 52.6 *1488 - 11.. 56.. 30.4 *1505 - 12.. 06.. 31.5
4.. 51.. 31.0 4.. 42.. 52.6 4.. 35.. 30.4 4.. 44.. 31.5

1503 - 7.. 24.. 0 — 7.. 26.. 0 — 7.. 27.. 0 — 7.. 29.. 0
*6755 - 12.. 10.. 1.8 *1579 - 12.. 08.. 6.3 *1492 - 12.. 14.. 11.2 *1502 - 11.. 57.. 21.5
4.. 46.. 01.8 4.. 42.. 06.3 4.. 47.. 11.2 4.. 28.. 21.5

1491 - 22.. 52.. 35 — 22.. 55.. 35
1503 - 7.. 32.. 43.5 — 7.. 35.. 43

15.. 18.. 06.43
46.. 7.5
15.. 18.. 53.18

1503 - 7.. 37.. 55 — 7.. 39.. 52 — 7.. 40.. 52
1508 - 14.. 53.. 12.5 — 14.. 55.. 10.5 — 14.. 56.. 11

22.. 12.. 45.0
49.3
22.. 11.. 55.7
15.. 18.. 53.2
6.. 53.. 02.5
1.. 07.7
6.. 51.. 54.0
1503 6.. 53.. 00.0
+ 1.05.2

1491 - 23.. 03.. 16 — 22.. 4.. 41 — 22.. 6.. 15
1508 - 14.. 58.. 43 — 15.. 0.. 08.5 — 15.. 01.. 43

(64/13)

Nov-10⁺ - Coincidence comparisons

1508-15.558 — 15.06.58 } — 15.07.16 — 15.08.16.
 1488-12.25.05 — 12.26.04.5 } 1505-12.36.23 — 12.37.22.5

1508-15.10.4 — 15.11.03 } — 15.13.0 — 15.14.0
 6755-12.40.40 — 12.41.38.5 } 1519-12.39.39 — 12.40.38.5

1508-15.15.48 — 15.16.48 } — 15.18.07 — 15.19.7
 1492-12.47.30.5 — 12.48.30 } 1502-12.30.58.5 — 12.31.58

1508-15.21.28 — 15.22.28 } — 15.24.20 — 15.25.20
 1570-12.44.12.5 — 12.45.12 } 6701-13.00.18 — 13.01.17.5

— 15.27.38 — 15.28.38 } — 15.30.31 — 15.31.32
 1521-12.54.56 — 12.55.58.5 } 1522-13.4.08.5 — 13.05.09 }

1508-15.32.58 — 15.33.58 } — 15.35.17 — 15.36.18-37.18
 Lukens 190-8.21.46.5 — 8.21.46.1 } 180-13.00.34.5 — 13.01.35-2 34.5
 3 3.5

1508-15.39.18 } — 15.42.16 — 15.43.17 } — 15.44.25
 180-13.04.33.5 } 159-13.08.10.5 — 13.09.11 } 191-13.12.20.5
 4.5

1508-15.45.25 — 15.46.25 } — 15.48.19 — 15.49.18 }
 191-13.13.20 191-13.14.19.5 } #190-13.15.20 — 13.16.18.5 }

1508-15.50.53 — 15.51.53
 183-13.10.52 — 13.11.51.5

1508-15.54.26 — 15.55.27 — 15.56.27
 1503-8.38.38 — 8.39.38.5 — 13.40.38

1491-10.02.8 1491-24.06.45 — 24.08.11 — 24.9.35 — 24.11.4
 1508-5.58.21 1508-16.02.33.5 — 16.04.0 — 16.5.24.5 — 16.6.54
 55.48.5 85.49 55.49.5 55.50

7.13.58
 7.15.17
 1.19
 6.1
 579.139

(65)

Nov-11/72

measures

Mirror

The South mark on Mr J. J. Wells' Stables
The Pole and Bruck distinctly seen

B

South Mark .102 .898
 .102 .898
 .137 .863
 .132 .868
 .130 .870

133

005

.872

23

2618

1744

2.0056

.274

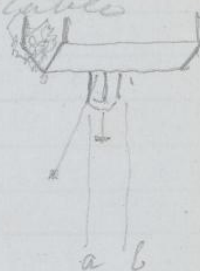
23

822

548

0.6302

a 1.550 - b 0.835
 1.550 .846
 1.570 .830
 160 1113
 1.520 838
 838
 0.682



North mark

B .730 .270
 .720 .280
 .736 .264
 .740 .260
 .730 .270
 731
 005
 .274

There is a tree on the Eastern side of the Cupola, that should be cut down
 its branches stretch out so as nearly to touch the mark.

It is not an evergreen, looks like an elm.

Nov 11/12 Am

(66)
Ill. East
No. 1491 α Leonis

0 ..30.8

0 ..44.8

0 ..58.9

1 ..13.2

1 ..27.2

1 ..41.2

10 ..01 ..55.1

2712

180

271.2

13.073

10 ..01 ..11.073

0 ..21.31

49.702 α Leo maj

5.9

44.0 (min)

B 14.5

44.0

13.7

10 ..56 ..44.0 α Leo 10..0 - 299..41 α Leo maj 10..54 - 249..491503 - fast of Cam - 1..06.4
of Boston 50.4

11..41 ..296.5

11..45 - 257.51

 β Leonis

31.4

45.5

B 0.0

14.0

28.4

42.3

11 ..42 ..56.6

2182

982

1403

11 42..12.03

1491 - 10 ..46 ..24

1503 - 7 ..20 ..41

10 ..46 ..24

49.7

34..45..34.3

15..22..49.74

19..22..44.56

3..10.5

7 ..19 ..34.0

1503 - 7 ..20 ..41

Fast of Cam 1..07.0

15..22..02.99

46.75

15..22..49.74

1503 - 7 ..52..0

1122 - 7 ..54 ..7.8

7 ..52..0.0

1..6.7

7 ..52..53.3

7..52..07.8

1 ..14.5 γ Leo maj 33.0

56.3

20.0

B 43.7

7.4

30.8

11 ..47 ..52.6

2458

3058

43.69

11 46..41.69

(67)

1849- Nov-12 Mon

Ther.

1491-16.10.42

1503-12.44.06

1503-0.46.0

0.47.0

0.48.0

0.49.0

183-5.21.35.4 #190-5.29.38 191-5.31.32 159-5.30.34.8

1488-0.50.0
5.25.260.51.0
5.35.32.50.52.0
5.38.2.50.53.0
5.35.6.61452-0.54.0
5.41.13.80.55.0
5.23.13.30.56.0
5.38.54.50.57.0
5.48.33.81510-0.59.0
5.37.13.31.00.0
5.49.20.41.01.0
1.4.24.31.02.0
5.42.54.1222-1.4.0
5.46.15.41.5.0
5.49.25.41.6.0
5.00.38.71.37.0
1.33.15.2

1503-1.07.56

1.08.55

1508-8.43.55.5

8.44.55

1491-16.58.0

16.59.0

5.1.0

5.02.0

2457-16.57.38.3 179-5.02.42 424.5.1.43.4 Jg-5.15.07.7

1491-17.5.0

17.6.0

17.7.0

17.8.0

2557-17.7.12.4 2419-17.17.47.5 B10-17.3.54.3 2492 17.14.20.2

1491-17.9.0

17.10.0

2440-16.59.55.3

333-17.17.48.8

(68)

H₀₀₅ = 12 - th

Jell East

No. 1491.

5 Aquila

8 Aquila

B 8 .53.0

8 .18.8

9 .06.9

8 .32.5

9 .21.3

8 .46.3

9 .35.3

9 .0.0

9 .49.5

9 .13.7

19 .00 .03.5

19 .19 .27.5

208.5

1488

60

180

7148.5

73238

59 .21.21

46.26

-2

-2

18 .59 .19.21

19 .18 .44.26

18 .58 .29.14

19 .17 .54.26

50.07

50.00

5 Aquila 18.58 - 298.44

8 Aquila 19.17 - 309.36

7 Aquila 19.39 - 302.08

α Aquila 19.43 - 303.55

β Aquila 19.47 - 306.22

level

E 8r

66 - 72 +

+ 70 - 68.5

66 - 72 +

lev. 2.1^s 1.1 = 0.07 + 70 - 68

68 70.1 lev. + 0.07

15.25 .59.54 16.10 .42.0

46.25 50.1

15.26 .46.29 16.09 .51.9

15.26 .46.3

0 .43 .05.6

7.7

0 .42 .50.5

1503 - 0 .44 .06.0

+ .1 .07.5

γ Aquila

16.3

α Aquila

36.7

β Aquila

5.7

30.2

50.5

19.5

44.2

4.3

33.3

58.1

18.2

47.0

12.0

32.0

1.0

26.0

45.9

14.8

19 .40 .40.0

19 .44 .00.0

19 .49 .28.5

2268

1876

1498

4068

1276

3298

58.11

18.23

47.11

19 .39 .56.11

19 .43 .16.23

19 .48 .45.11

List of Chronometers employed on the expedition for
ascertaining the difference of meridians of Greenwich & Cambridge

1849 May 9th *Glebonia* taken out by Richard F. Bond.

	marked	owners.	where owned
c No 310-	Tobias, belonging to the Phila ^a High School obse.	U.S. Coast Survey	
c 715-	Hornby - " -	Wm Bond & Son	Boston.
c 2663-	Parkinson & Goodsham - " -	" -	" -
c 776-	Barrand - belonging to -	" -	" -
c 1109.	Lithrolance Davis & Co - " -	Wm Bond & Son	" -
c + 10.	Charles Young - " -	Wm Bond & Son	" -
c 6755.	Thos. Porthouse - " -	Thos. Porthouse	London.
c 6701.	Thos. Porthouse - " -	Thos. Porthouse	London.
c 2857-	Parkinson & Goodsham - " -	Wm Bond & Son	Boston.
c 180-	John Hutton - " -	John Hutton & Co	London.
c 1519.	John Fletcher - " -	Wm Bond & Son	Boston.
c 1570.	do - do - " -	Wm Bond & Son	Boston.
c 1508 -	do - do - " -	Wm Bond & Son	Boston.
c 1506 -	do - do - " -	Wm Bond & Son	Boston.
c 1505 -	do - do - " -	Wm Bond & Son	Boston.
c 1507 c 1503 -	do - do - " -	Wm Bond & Son	Boston.
c 1127 -	John Fletcher - " -	John Fletcher	London.
c 1454 -	John Fletcher - " -	Wm Bond & Son	Boston.
c 1488 -	" - " - " -	Wm Bond & Son	Boston.
c 1491 -	" - " - " -	Wm Bond & Son	Boston.
c 1492 -	" - " - " -	Wm Bond & Son	Boston.
c 1502 -	" - " - " -	Wm Bond & Son	Boston.
c 1522 -	" - " - " -	Wm Bond & Son	Boston.
c 1521 -	" - " - " -	Wm Bond & Son	Boston.
c 258 -	W Shepherd - " -	W Shepherd	Liverpool.
c 250 -	" - " - " -	Shepherd	Liverpool.
c 230 -	" - " - " -	Shepherd	Liverpool.
c 227 -	" - " - " -	Shepherd	Liverpool.
A 2239 -	Edw ^a Dent, - " -	Mr Dent or E & G W Blunt.	London or N. York.
B 2227 -	" - " - " -	" -	" -
C 2261 -	" - " - " -	" -	" -
D 2167 -	" - " - " -	" -	" -
E 2257 -	" - " - " -	" -	" -
F 2207 -	" - " - " -	" -	" -
G 2248 -	" - " - " -	" -	" -

	Makers	Owners
^c H. 2186	Edw ^a Dent	Mr Dent or E Hgt Blunt. London or New York.
^c I - 2222	" "	" " " "
^c K 2224	" "	" " " "
^c L 2245	" "	" " " "
^c O - 2246	" "	" " " "
^c 6 ² / ₃ - Barraud		Wm Bond Hor - Boston
^c x 906 John Fletcher		Wm Bond Hor - Boston
^c x 8 ² / ₃ - Barraud's p.		Wm Bond Hor - Boston
^c 190 - J Lukens		J. C. Walker U.S.C. Survey
^c 2690. Parkinson & Frodham		Wm Bond Hor Boston.
Pocket = 2312 Parkinson & Frodham		Wm Bond Hor Boston.
^c 1507 - John Fletcher		U.S.C. Survey - Washington

of these Nos. 310-715-2663-776-1109-10 and 190²⁸⁵⁷ were taken from Boston by R. F. Bond in the *Hibernia*. The remainder were received at the Cambridge Observatory August 16th having been brought out together with the eight first mentioned, by R. F. Bond in the Steamer *Hibernia* Capt Stone.

^c No 10 Charles Young, was then withdrawn for adjustment.

^c H Edw^a Dent, retained main spring broke.

^c 6²/₃ - Barraud, Pocket, sent to the Observatory, Washington

^c x 906. John Fletcher. do - sent to " "

^c x 8²/₃ - Barraud's do - sent to " "

^c 2690 - Parkinson & Frodham do - sent to " "

^c 2312. Parkinson & Frodham do - sent to " "

one other Pocket Fletcher or Hutton which R wore in his Pocket.

222. Shepherd Shepherd - Liverpool

^c 1507 - Coincidence Chronometer

^c 1508 - do do. subsequently adjusted for the same purpose and I returned No 1507 to Mr Hartnup for his own use in comparing our Chronometers at Liverpool.

^c x 1491. I have adjusted as a fiducial Chronometer

Oct-12th Three additional Chron. were received by the *Caledonia*

these were made by Barraud No^s 876-820-883. belonging to Wm Bond Hor.

Nov-10th Four additional Chronometers were received by the *Cambria*.

these were made by John Hutton No^s 154-191-190-183. belonging to Wm Bond Hor

^c 2857. was withdrawn after the first voyage and transferred to Prof: Baiche

(71)

Nov 13^{12h} Dec 1879

$$\begin{array}{r}
 1491 = 10..45..00 \\
 1503 = 7..15..23 \\
 \hline
 10..44..10.0 \\
 15..25..59.54 \\
 19..18..10.46 \\
 \hline
 3..09..74 \\
 19..15..00.72 \\
 7..15..23.00 \\
 \hline
 22.28 \\
 30.63
 \end{array}$$

1503 + 52.90 part of Boston

Pull 16
1..08.9 of Lamb

$$1491 - 21..17..0$$

$$179 - 21..20..45.2$$

179 was then reduced to mean solar time

14th Jan

$$\begin{array}{r}
 1491 - 28..49..0 \\
 1503 - 8..15..17.2
 \end{array}$$

$$\begin{array}{r}
 11..49..50.02 \\
 35..48..09.48 \\
 15..30..42.85 \\
 \hline
 20..17..27.13 \\
 \hline
 3..19..45 \\
 20..14..07.64 \\
 \hline
 15..17.2 \\
 1503 + 109.52
 \end{array}$$

$$12^+ \text{ part of Lamb} = 1..07..0$$

2.5

$$\delta \text{ Leonis} - 11..06 - 291..03$$

13th Jan

Leonis

N.E. East - N° 1491

$$\begin{array}{r}
 6..13.0 \quad 1491 - 11..10..0 \quad 12..29..56.10 \\
 6..28.0 \quad 1493 - 12..11..48.5 \quad 46.75 \\
 6..43.0 \quad 11..10..0 \quad 12..30..42.85 \\
 6..57.5 \quad 50. \\
 7..12.5 \quad 35..09..10.00 \\
 7..27.3 \quad 15..30..42.85 \\
 11..07..42.1 \quad 19..38..27.15 \\
 \hline
 2234 \quad 3..13.1 \\
 182 \quad 7..35..14.0 \\
 7/4034 \quad 12..11..48.5 \\
 57.63 \quad 4..36..34.5 \\
 \hline
 11..06..55.63 \quad 16 \\
 50.02 \quad 4..38..18.5
 \end{array}$$

Polaris L.P.

quite steady
and well defined

$$\begin{array}{r}
 9 \quad 12..40..18.8 \\
 8 \quad 12..49..09.2 \\
 2 \quad 12..57..56.5 \\
 2 \quad 13..06..46.8 \\
 C \quad 13..15..34.5 \\
 B \quad 13..24..23.3 \\
 * \quad 13..33..11.8 \\
 \hline
 7/47..20.9 \\
 13..06..45.84 \\
 \hline
 13..06..43.84 \\
 54.61 \\
 + 44.23
 \end{array}$$

(72)

Nov-13/14 Am

Temp 60

1503-8..24..0 ——— 8..25..0 ——— 8..26..0 ——— 8..28..0
 1570-13..02..10 6701-13..16..37 1521-13..08..56.1 6755-13..14..03
 ——— 8..29..0 ——— 8..30..0 ——— 8..32..0 ——— 8..33..0
 1505-13..13..33.3 1488-13..5..21.6 1522-13..21..26.6 190-8..36..26.8
 ——— 8..34..0 ——— 8..36..0 ——— 8..38..0 ——— 8..46..0
 180-13..14..50.8 1519-13..18..05.5 } 1492-13..25..17 1502-13..14..4.2
 ——— 8..50..0 ——— 8..52..0
 190-13..32..29.5 191-13..35..24.2

1503-8..59..0
 179-13..58..59.5
 1503-9..59..50 ——— 9..00..50 ——— 9..10..0 ——— 9..12..0
 1508-16..57..41.5 ——— 16..58..42 310-13..04..39.5 222-13..54..12.4
 ——— 9..13..0
 1506-13..57..26.8

 α Protis 14..8 -242.25

North mark		Zero D	α Protis	Level	Nov. 56.5
75.27	.248	001	8..55.3	E W	
77.56	.225	000.5	9..9.7	67.5-72.5 +	
77.76	.223	990 - .010	9..24.4	+ 69.5-70.5	
7401	.260	000	9..39.0	67.5-72.5 +	
7406	.260	000	9..53.5	+ 69.7-70	
0 7426	.258	-000	0..08.0	68.5 71.4	
	17274	4896	14..10..22.8	68.5 71.4	
	0.248	999	272.7	2.9	
		-001	727.7	1.4 = 0.09	
			38.96	1491-14..39..14	
			-2	1503-11..05..08.5	
			14..09..36.96		
			6..46..40		
			-50.16		

26-14..46..0 1491-14..50..14
 1491-14..46..16.5 179-4..16..01

Ke Ear (73) \

Nov-14

No. 1491

Palares ^{not} unsteadyg.			α Arietis		
T3	0	49.12.5	8	57.9	
C	0	58.01.0	9	7.0	
D	1	06.57.0	9	21.9	
E	1	15.43.2	9	36.5	
F	1	24.26.0	9	57.5	
G	1	33.18.0	8	6.5	
		152.133.7	2	0.21.2	
		2674		1965	
		50.74		60	
				7/2565	
				36.64	
				-2	
				1.59.34.64	
				43.93	
				+50.71	
cor to Mean		+48			
		1.06.49.62			

α Arietis 1. 58 - 289.38

13.06.43.44
1.06.52.50
12.00.08.16

Palares 14/15000

6	15.7	1491-11.25.40
6	29.0	179-12.48.02.5
6	43.9	11.25.40.0
6	58.7	50.9
7	73.3	35.24.49.1
7	28.6	15.34.39.4
11	07.43.0	19.50.09.7
	231.2	3.17.0
	180	7.46.54.7
	7/411.2	12.48.02.5
	58.74	5.02.07.8
	-2	1503-8.0.0
11	06.56.74	179-12.59.55.6
6	05.81	4.59.55.4
	50.93	

15.33.52.65
46.75
15.34.39.46

1491-11.32.20
1503-7.54.45.5
11.32.20
50.9
35.31.29.1
15.34.39.4
19.56.49.7
3.16

59.5
59.5
3.7
2.3
179-1.4
1503-+1.11.4
16
+55.4

5.02.07.4
1.11.4
5.00.56.0

(74)

Nov 14th (15th Am)

Polaris L.P.

Mc East,

No 1491.

12..40 ..14.2 G high wind. & unsteady

12..49 ..09.3 G

12..57 ..55.0 E

13..06 ..47.5 D

13..15 ..36.0 C

13..24 ..26.3 B

13..33 ..15.0 A

224 2033

44

42 3233

06 .. 46.19

13 ..06 ..44.19

 α Perotis. +

09 39.8 D

09 54.2 E

10 9.0 F

14 ..10 ..23.5 G

1265

4/ 6.5

14 .. 10 ..01.62

21.91

14 ..09 ..39.71

2

14 ..09 ..37.71

D to D 00.0

E .. 13.77

F .. 27.46

G .. 41.27

82.50

20.625

Cor/Mun. min - 032

20.593 = 1.31372

19.56' 20 0.02692

21.91 = 1.34064

15th Polaris Blazing

1 ..06 ..49.6 midwire

(75)

Nov. 15/16 Am

Int Ther at 5 Am. 54°
10.30 62

1491-12..05..26 1503-8..26..0 — 8..26..59
1503-8..23..51 1508-16..47..31 — 16..48..30.5

1503-8..34..0 — 8..36..0 — 8..40..0 — 9..1..0
310-12..28..40.4 222-13..18..8.5 1506-13..24..28.2 191-13..44..16

9..2..0 — 9..4..0 — 9..10..0 } 9..11..0
190-13..44..19.5 1502-13..31..53.7 1492-13..57..20 } 1519-13..53..3.2

9..14..0 — 9..15..0 — 9..18..0 — 9..21..0
1488-13..49..16 1505-13..59..33 6755-14..04..2.5 1510-13..59..5

9..23..0 — 9..28..0 — 9..20..0 — 9..36..0
6701-14..14..41 1521-14..10..57.8 1522-14..19..34 190-9..39..26.7

9..37..0 — 9..38..0
180-14..17..47 1519-14..20..3

1491-12..05..26.0
50.86
15..37..49.21
46.75
15..38..35.96
36.04..35.14
15..38..35.96
20.25..59.18
3.20.85
8..40..0
1..12.7
8..38..47.3
4..44..32
13..23..19.3
13..24..28.2
+ 1..08.9
1503 8..23..57
+ 1..12.67

(76)

Mc East

Nov 15/16 Am
polaris L.P.

12 .. 40 .. 14.5 G

12 .. 49 .. 09.0 F

12 .. 57 .. 56.0 E

13 .. 06 .. 46.0 D

13 .. 15 .. 33.2 C

lost B

13 .. 33 .. 13.5 A

1632

3264

44.64

13.. 06.. 42.64

cor mean of wind + 49

13.. 06.. 43.13

Arcturus

8 56.0

9 10.3

9 25.0

9 39.6

9 54.3

0 9.0

14 .. 10 .. 23.6

2178

60

712778

39.69

-2

14 .. 06 .. 37.69

8 .. 46.63

+ 50.86

No 1491

15.. 37.. 49.21

4675

15.. 38.. 35.96

12.. 05.. 26.0

50.86

36 .. 04 .. 35.14

15.. 38.. 35.96

20 .. 25 .. 59.14

3 .. 20 .. 45

8 .. 22 .. 38.33

8 .. 23 .. 57

1503 1 .. 12.7

omitting F

6

4

6

8

5

7

(77)

1849 Nov. 21

Ill. East
No 1491

α Cygni 6 .. 15.4
 6 .. 34.5
 6 .. 53.8
 7 .. 13.8
 7 .. 32.7
 7 .. 52.0
 20 .. 38 .. 11.4

2131
 120
 7193.7
 13.30
 -2

70 .. 37 .. 11.30
 20 .. 36 .. 18.05
 +53.25

δ Pegasi 4 .. 11.8 Homalhaut 27.5
 4 .. 26.0 9 43.5
 4 .. 40.0 9 .. 59.5
 4 .. 53.7 0 .. 15.4
 5 .. 7.5 0 .. 31.3
 5 .. 21.4 0 .. 47.4
 22 .. 35 .. 35.3 22 .. 51 .. 03.3

1957
 1807
 71375.7

53.67
 -2
 22 .. 34 .. 51.67
 33 .. 58.17
 +53.50

2279
 126
 71107.9
 15.41
 -2
 22 .. 50 .. 13.41
 49 .. 19.91
 +53.50

α Cygni - 20.36 - 267.38
 61 Cygni - 21.00 - 274.22
 5 Cygni - 21.06 - 282.46
 α Cephei 21.15 - 250.26
 Bagnarii 21.23 - 318.36
 B. Cephei 21.26 - 242.29
 ϵ Pegasi 21.36 - 303.12

Level

E W
 + 74 - 72
 70 - 74 +
 + 72 - 72
 71.5 - 73 +
 + 73 - 71
 71 - 73 +
 11.5 15

71.9 72.5 $\frac{11.5}{13.1}$ lev. = +0.03
 22.5 0.6
 0.02 = 0.3
 +0.3 W.E. too high

δ Pegasi - 22.33 - 302.21
 Homalhaut 22.49 - 342.48
 α Pegasi - 22.57 - 297.59

 α Pegasi

7 .. 29.5
 7 .. 44.0
 7 .. 58.3
 8 .. 12.4
 8 .. 26.4
 8 .. 40.5

22 .. 58 .. 54.7

2658
 186
 7185.8
 12.26
 -2

22 .. 58 .. 10.26
 57 .. 16.96
 +53.30

Nov 21st

Mc East (1/8)

No. 1491

 α Andromeda

0 46.8
 1 2.5
 1 18.5
 1 34.2
 1 49.8
 2 5.3
 0 02 21.0

 1881
 62
 72387
 34.01
 01 32.01
 0 38.57

 +53.44

 γ Pegasus

look
 57.6
 12.0
 26.2
 40.7
 54.4
 0.07 08.7

 1909
 3818
 2618

0.06 24.18 omitting 4
 +02 cor mean of wing
 0.06 24.20

α Androm 0.0 - 284.08
 γ Pegasus 0.5 - 298.03
 α Umi min 0.40 - 223.52

1491-1.37.35 - 1.40.34
 15039.34.12.5 - 9.37.11

1491-1.42.0 - 1.43.0
 1491-1.42.9.7 - 1.43.9.7

 α^2 Pegasus

A 12 40 21.2
 B 49 07.5
 C 58 0.0
 D 06 45.3
 E 15 37.0
 F look
 G 33 20.0

 1235
 2470

omitting B 48.70
 0.06 46.70
 cor mean of wing - 49
 0.06 46.21

Polaris L.P.

G 12 40 12.2
 H 49 08.0
 I look
 D 13 06 46.0
 C 15 31.5
 B 24 24.7
 A 33 20.0

 1109
 2218

omitting C 46.18
 13.06 44.18
 cor. mean of wing +08
 13.06 44.26

 δ 19.58

14.06

arcturus

292.25

look
 9 27.2
 9 42.0 -82.50
 9 57.0 +13.715
 10 11.5 5/68785
 14 10 26.4 -13.757

 1641 +832
 3282 -13.725
 56.82 1.13752
 cor. mean of wing 14.60 0.02692
 42.22 1.16444
 14 09 40.22 14.60

G+F 68.733
 B+A 68.562

171
 034
 032
 .002

Mean G F D B A + 0.002000 = Mean of all

(79)

Nov. 21/22 Am

Int. Ther 62

1491-12.42.05 — 12.45.5
 1503-8.36.57.5 — 8.39.54

1491-13.54.37 — 13.56.5 — 14.19.0 — 14.20.0
 1508-7.23.11.5 — 7.24.40 2857-14.18.41.1 424-14.19.11

1508-7.27.20 — 7.42.24 } — 7.29.0 — 7.30.0
 H 190-14.35.10.5 — 14.50.07 } 191-14.37.53 — 14.38.57.5 2m 52.5

— 7.50.40 — 7.51.40 — 7.53.47 — 7.54.47
 1141-10.11.33.5 — 10.12.33 1519-15.01.29 — 15.02.28.5

— 7.55.55 — 8.0.54 — 7.57.57 — 7.58.56
 1492-15.09.10 — 15.14.06.5 1502-14.51.7 — 14.52.05.5

— 8.03.31 — 8.04.31 } — 8.06.38 — 8.07.36
 1522-15.19.11.5 — 15.20.11 } 180-15.12.56 — 15.13.53.5

— 8.9.0 — 8.10.0 — 8.11.44 — 8.12.44
 d-190-10.38.19.5 — 10.39.19.3 6755-15.23.23 — 15.24.22.5

— 8.13.35 — 8.14.36 + — 8.17.48 — 8.18.48 2
 1505-15.23.46 — 15.24.46.5 } 1488-15.18.22 — 15.19.21.5

— 8.20.23 — 8.21.24 — 8.22.50 — 8.23.50
 1521-15.29.03 — 15.30.03.5 6701-15.40.14.5 — 15.41.14

— 8.24.59 — 8.26.0 — 8.28.14 — 8.29.14
 1510-15.28.22 — 15.29.22.5 310-14.48.34 — 14.49.33.5

— 8.30.39 — 8.31.39 2 — 8.32.26 — 8.33.27
 222-15.38.09.5 — 15.39.09 } 1506-15.42.26.5 — 15.43.27

— 8.35.8 — 8.36.8 { 1508-8.39.38 — 8.41.04 — 8.42.34
 1503-10.00.35.5 — 10.01.35 } 1491-15.10.38 — 15.12.03.5 — 15.13.35

1508-8.44.6 — 8.45.06 { 26-15.18.7 — 15.22.87 — 15.24.11
 1503-11.9.29 — 11.10.28.5 } 1508-8.47.18.5 — 8.51.50 — 8.53.24.5

1491-15.29.0 — 15.31.0 — 15.33.0 — 15.34.0
 289-15.42.57.9 2557-15.33.35 2419-15.45.8.8 9 10-15.30.26.8

— 15.36.0 — 15.37.0 — 15.39.0 — 1503-11.35.0
 2492-15.42.55.2 2440-15.28.26.6 333-15.37.57 439-10.58.42.6

Standard

30.030 - 64

Aneroid

30.020 - 61

1849

(80)

Nov-22 Immersion of 40 Aquarii (ymag.)

2557- 22^h 17^m 0 22^h 18^m 00^s?239- 6^h 08^m 9^s 2

Obs. Immersion

W.C.B. with Chron. No 239 — 6^h 13^m 25^s 6 beats

2.4

6^h 13^m 22.6239 fast 0^h 50.06^h 12^m 32.62557 Fast + 3^m 29^s 2 at 22^h 17^m
Rate gaining daily + 2^s 39.

Im 40 Aquarii

Nov 22nd 6^h 12^m 32.6 W.C.B.Camb. M.S.E. 6^h 12^m 30.9 G.P.B.G.P.B. with Chron. 2557 — 22^h 23^m 19.7 — 13 beats
6.52557 22^h 23^m 13.22557 fast 3^m 29.222^h 19^m 44.016^h 06^m 11.866^h 13^m 32.141^h 01.206^h 12^m 30.942557 — 22^h 25^m 0239 — 6^h 15^m 8.3

Nov-23

1491-17 25.20 — 28 { 1491-17 27.50 — 17 29.17

1503-1 15.28 — 36 { 1503-11 5.37 — 11 07.04.5

1508-11 8.50 — 11 09.49 — 11 10.49

1503-1 21.09 — 1 22.07.5 — 1 23.07

23 Swr

Landronide

y Pegasi

0 48.0

5 44.4

1491-1^m 12.46

1 4.0

5 59.0

1503-9^m 01.37.5

1 19.6

6 13.2

1 35.2

6 27.2

1 50.6

6 41.7

2 06.4

6 55.5

0 02 22.0

0 07 11 0.0

1.858

2514

77245.8

77197.4

35.11

27.34

0 01 33.11

0 06 25.34

0 00 38.55

5 30.77

+ 54.56

+ 54.57

mer Minke

North

South

0.710

.240

Invis.

.710

.290

note well

.715

.285

.720

.280

.710

.290

52.09.5

52.17

7.5

4 03.22.5

4 05.10.5

1.480

1849

Nov-25^t

Caledonia (81) Capt Litch.

Ther 66°

1491-23.18 46 — 23.21.53
 1503 7.00.05.5 — 7.03.12

1503-7.5.0 — 7.7.0 — 7.8.0 — 7.9.0
 D 2167-11.50.25.4 } 2257-11.49.14.5 } 2207-11.49.26.8 } 2239-11.51.36.2
 B 2227-7.10.0 — 7.11.0 — 7.12.0 — 7.13.0
 G 2241-11.47.42 } G 2248-11.50.38 } H 2186-11.51.27
 I 2222-7.14.0 — 7.15.0 — 7.16.0 — 7.22.0
 K 2224-11.53.54.8 } L 2245-11.57.55.5 } 2246-12.05.25

1491-23.43.18 — 23.46.20
 1503-7.24.33.5 — 7.27.35

1491-23.52.22 — 23.53.49 1504-5.50.19 — 5.52.79
 1508-5.48.18 — 5.49.45.5 1503-7.36.35.5 — 7.37.35
 55.56 55.56.5

1508 5.53.19 — 6.07.28 — 6.08.28 1491-0.14.38 — 0.16.5
 1503 7.38.34.5 — 7.52.36.5 — 7.53.36 1508-6.10.41.5 — 6.12.9

1508-18.14.47 — 18.15.46 } 18.17.35 — 18.18.35
 2239-12.42.28 — 12.43.26.5 } 2227-12.40.20.5 — 12.41.20
 1508-18.20.12 — 18.21.11 } 18.22.39 — 18.23.40
 2241-12.44.54.25 } 12.45.50.5 } 2167-12.53.51.5 — 12.54.06
 — 18.25.6 — 18.26.6 } 18.26.47 — 18.28.49
 2257-12.52.20 — 12.53.19.5 } 2207-12.53.12.5 — 12.55.13.5
 — 18.29.49 — 18.31.49 } 18.33.8 — 18.34.8
 2248-12.59.36 — 13.01.35 } 2186-12.56.30.5 — 12.57.30
 — 18.34.56 — 6.35.56 } 6.39.47 — 6.40.47 }
 2222-12.59.45.5 — 1.0.45 } 2224-1.08.41.5 — 1.9.4 }
 — 6.42.13 — 6.43.13 } — 6.45.12 — 18.46.12
 2245-1.08.59.5 — 13.9.59 } 2246-1.13.26.5 — 13.14.26

1491-0.52.39 — 0.54.07 — 0.55.35
 1508-6.48.55.5 — 6.50.24 — 6.51.52.5

(82) (8)

Nov. 25th
α Andromedae

M. Earl 1491

α Androm 0.0 - 284.08
γ Pegasi 0.5 - 298.03

20.3

Elong 2

* seen with great difficulty.

36.0

13.725 rec'd Sun Nov 21

Polaris S.P.

384
128

51.4

28° 15'

arc min June

312.23

22.7.3

21 0.05508 D

13 .06 .47.8 - 0.032 rec S = -1.24

21.21

0 .2 .83

23? 1.13752

13 .06 .45.8 - 1.24 = 44.56

291.02

138.0

1.19260

13 .05 .49.1

B 237.37

27.60

15.58

+ 56.7

292.25

51.60

arc min - 15.58 Jwines

0 .01 .36.02

B hrs. min

min March South North

0 .01 .34.02

49.27.1

0.170 .830 .710.290 293

5 .45.9

50.19.0

.165 .835 .710.290 293

γ Pegasi 6 .0.8

51.11.3

1843

.175 .825 .710.290 293

6 .14.2

52.03.5

2529

.175 .825 .710.290 293

6 .28.0 * hardly seen

52.55.7

1686

.120 .880 .705.295 6739

6 .42.4

53.47.7

19389

.155 .845 .700.300

6 .56.3

14 .54 .40.0

.157 .707

0 .07 .11.0

2043

.843 .293

71.98.6

14 .52 .03.47

Level

28.37

14 .52 .01.47

E W

0 .06 .26.37

14 .57 .05.97

65 68.5 +

55.62

+ 55.50

+ 65.5 - 68.

0 .06 .26.37

+ 55.50

+ 64.5 - 68 +

55.62

+ 55.50

+ 66 - 66.5 +

25/26 Nov

β Leonis 6 .19.6

α Leonis

6 .34.2

9 .0.9

+ 64.5 - 68 +

6 .49.0

9 .15.4

+ 66 - 66

7 .3.8

9 .30.2

+ 66 - 66

7 .18.5

9 .44.7

+ 66 - 66

7 .33.0

9 .59.4

+ 66 - 66

11 .07 .48

10 .14.0

+ 66 - 66

2061

14 .10 .28.8

+ 66 - 66

180

1934

+ 66 - 66

2267

120

+ 66 - 66

03.73

713134

+ 66 - 66

273

44.77

+ 66 - 66

11 .07 .01.73

14 .9 .42.77

+ 66 - 66

11 .06 .06.11

8 .47.01

+ 66 - 66

+ 55.62

+ 55.76

+ 66 - 66

lev. + 0.08

0.07

11.1 hr. high.

Nov. 25/26 moon

Int. Ther 70 Sgt.

1503
+ 1. 26.3

1491-12.53.0 — 12.55.48 — 13.11.20 — 13.14.20

1503-8.32.7 — 8.34.54.5 — 8.50.24 — 8.53.23.5

1503-8.56.0 — 8.57.0 — 8.58.0 — 8.59.0

2239-13.38.35 2227-13.34.40 2241-13.37.35.2 2167-13.44.26

4.42.35.0

4.37.40.0

4.39.35.2

4.45.26.0

1503-9.0.0 — 9.1.0 — 9.4.0 — 9.5.0

2257-13.42.13 2207-13.42.25.6 2248-13.48.50 2186-13.43.25

4.42.13.0

4.41.26.9

4.44.50.0

4.38.25.0

— 9.6.0 — 9.7.0 — 9.8.0 — 9.9.0

2222-13.45.53.7 2224-13.50.24 2245-13.49.54.5 2246-13.52.24.3

4.39.53.7

4.43.24.0

4.41.54.5

4.43.24.3

1503-9.10.45 — 9.11.45

1508-7.32.15 — 7.33.15.5

10.21.30

10.21.30.5

1503-9.23.0 — 9.24.0 — 9.25.0 — 9.26.0

180-14.03.30 Int. 190-9.27.45.4 1522-14.15.14.3 1502-13.53.4.7

4.40.30.0

0.03.45.4

4.50.14.3

4.27.04.7

9.27.0 — 9.28.0 — 9.29.0 — 9.30.0

1592-14.14.33.2 1519-14.09.47.7 6755-14.15.1.3 1505-14.14.34

4.47.33.2

4.41.47.7

4.46.01.3

4.44.34.0

— 9.31.0 — 9.32.0 — 9.33.0 — 9.34.0

1488-14.05.46.8 1521-14.15.11.5 6701-14.25.0 1570-14.11.44.3

4.34.46.8

4.43.11.5

4.52.00.0

4.37.44.3

— 9.34.0 — 9.37.0 — 9.38.0 — 9.39.0

1506-14.20.36.4 222-14.18.56 310-13.32.55.8

4.46.36.4

4.41.56.0

3.54.55.8

1503-9.40.0 1491-14.3.0 — 14.4.0 — 14.5.0

439-9.03.18.7 2857-14.2.42.2 2440-13.54.56.3 2492-14.12.21.5

1491-14.41.0 — 14.42.0 — 14.43.0 — 14.44.0

10-14.37.15.7 2557-14.44.42.2 2419-14.55.15.7 424-14.42.49

1491-14.45.0

98-14.59.5.2

2nd

1503-8.9.0

1141-8.03.38.5

Nov 26/27

1/2

(84)

$$\begin{array}{r} 1676.17.14.77 \\ 46.75 \\ \hline 1675.01.52 \end{array}$$

Arcturus - 14.08.292.25

$$\begin{array}{r} 1491 - 11.51.24 - 12.06.40 \\ 1503 - 7.26.46 - 7.36.0.5 \end{array}$$

Polaris S.P.

Greenwich 100 miles

$$\begin{array}{r} 12.40.08.0 \text{ G} \\ 12.49.04.0 \text{ F} \\ 12.57.52.7 \text{ E} \\ 13.06.44.8 \text{ D} \\ 13.15.33.0 \text{ C} \\ 13.24.24.0 \text{ B} \\ 13.33.11.6 \text{ A} \end{array}$$

1491 - 12.52.45

1503 - 8.27.57

1585

31.70

43.70

41.70

Mean of 5

13.06.41.70

13.06.46.59

1503 - 8.37.0 — 8.38.0 — 8.39.0 — 8.40.0

2239 - 13.19.33.5 2227 - 13.15.36.3 2241 - 13.18.32.3 2167 - 13.25.26.7

1503 - 8.44.0 — 8.45.0 — 8.46.0 — 8.52.0

2257 - 13.26.11.2 2207 - 13.26.24.6 2248 - 13.32.50.8 2186 - 13.30.22.8

$$\begin{array}{l} 2222 - 13.32.57.8 \\ 2224 - 13.37.23.3 \\ 2245 - 13.36.53.6 \\ 2246 - 13.39.23.5 \end{array}$$

1503 9.9.36 — 9.10.35 — 9.11.35

1508 19.43.04 — 7.44.03.5 — 7.45.04

10.33.28

10.33.28.5

10.33.29

10.21.30

10.21.30.5

11.58.5

11.58.5

26 + 3.45

3 3.56.2

7) 11.2/1.6

7 42 2

3.2

3.59.6

8.44.0

1.27.5

8.42.32.5

13 27.04.5

26.11.2

- 53.3

3.6

(85)

Nov 27/28 Am

R 57

1491-12... 57 .49 1503-8 .30 .27 — 8 .31 .26 — 8 .32 .26
 1503-8 .29 .05 1508-19 .15 .33 — 19 .16 .32.5 — 19 .17 .33
 1503 8 .34 .0 — — 8 .35 .0 — — 8 .36 .0 — 8 .37 .0
 2239-13 .16 .32.2 2227-13 .12 .33.1 2241-13 .15 .29.6 2167 13 .22 .28
 1503-8 .38 .0 — — 8 .39 .0 — — 8 .40 .0 } — 8 .41 .0
 2257-13 .20 .10 2207-13 .20 .23.3 2248-13 .24 .57.7 } 2186 .13 .19 .20
 — 8 .41 .0 — — 8 .42 .0 — — 8 .43 .0 — — 8 .44 .0
 2222 13 .20 .50 2224-13 .25 .22 2245-13 .24 .53 2246-13 .27 .22.5

Nov 28⁺ Am1491^{pm}

Ept Th 36- Int Th 65

1491-15 .25 .32 1492-15 .27 .40 — 15-29 .8 1503-10 .57 .53
 1503-10 .52 .28.5 1508-9 .52 .57.5 — 9 .54 .20 1508-9 .56 .10
 4 .33 .03.5 6 .25 .11.5 6 .25 .12
 1503-10 .58 .53
 1508-9 .57 .10.5

1508-9 .59 .30 — 10 .00 .30 — 10 .1 .22 — 10 .02 .21
 2239-15 .43 .42.5 — 15 .44 .42 2227-15 .40 .33 — 15 .41 .31.5
 — 10 .03 .41 — 10 .04 .30 — 10 .05 .32 — — 10 .07 .36
 2241-15 .44 .45 2167-15 .51 .38.5 — 15 .52 .40 2241-15 .48 .38
 — 10 .09 .08 — 10 .10 .8 } — 10 .11 .26 — 10 .12 .26
 2257-15 .52 .54.5 — 15 .53 .54 } 2207-15 .54 .25 — 15 .55 .24.5
 — 10 .13 .58 — 10 .14 .58 } — 10 .15 .47 — 10 .16 .47
 2248-16 .00 .25 — 16 .01 .24.5 } 2186-16 .55 .37.5 — 15 .56 .37
 — 10 .17 .38 — 10 .18 .38 — 10 .19 .28 — 10 .20 .28 }
 2222-15 .58 .58.5 — 15 .59 .58 2224-16 .04 .20.5 — 16 .05 .20 }
 — 10 .21 .8 — 10 .22 .9 — 10 .23 .23 — 10 .24 .23
 2245-16 .4 .31.5 — 16 .05 .32 2246-16 .08 .14 — 16 .09 .13.5
 — 10 .26 .5 — 10 .27 .05 — 10 .28 .0 — 10 .28 .40
 150-16 .07 .59 — 16 .08 .58.5 2190-11 .33 .15.9 — 11 .33 .56
 — 10 .30 .22 — 10 .31 .22 } — 10 .32 .57 — 10 .33 .57
 1522-16 .22 .16 — 16 .23 .15.5 } 1519-16 .15 .59 — 16 .16 .58.5
 — 10 .35 .17 — 10 .36 .16 — 10 .37 .52 — 10 .38 .52
 1492 16 .24 .18.5 — 16 .25 .17 1502-16 .06 .4.5 — 16 .07 .04
 — 10 .39 .59 — 10 .40 .59 — 10 .42 .42 — 10 .43 .42 }
 1521-16 .24 .38 — 16 .25 .37.5 1570-16 .21 .42.5 — 16 .22 .42 }

(86)

Nov. 28/29⁺

Polaris SP

12.. 40.. 12.05
 49.. 7.28
 57.. 57.05
 13.. 06.. 47.00
 15.. 34.36
 24.. 27.28
 33.. 11.54

 747.. 16.2
 06.. 45.17
 -2
 13.. 06.. 43.17
 13.. 05.. 47.42
 +55.75

No 180 fast of Canab - H. 41. 56.1
 26²² Jan 29²¹ +0.7
 Arcturus No 1503 fast of X and 1. 30.2
 9.. 2.4 0. 57. 8 47.8
 9.. 17.0 1.. 6.5 6.. 1.9
 9.. 31.6 1.. 22.5 6.. 16.0
 9.. 46.3 1.. 38. 6.. 30.0
 0.. 01.0 1.. 53.4 6.. 44.1
 0.. 15.3 2.. 9.0 6.. 58.5
 14.. 10.. 30.1 0.. 02.. 24.6 0.. 07.. 13.0

 1437 2050 72713
 160 060 32.18
 7323.7 7285 37.86 0.. 6.. 28.14
 46.24 0.01.. 35.86 5.. 30.71
 14.. 09.. 44.24 0.. 38.47 +57.47
 8.. 47.06
 +57.18

1491-14.. 18.. 24 — 14.. 24.. 30 1491-14.. 30.. 50 — 14.. 33.. 54
 180-14.. 25.. 57.5 — 14.. 32.. 02.5 1503-9.. 57.. 55.5 — 10.. 0.. 59
 1491-14.. 45.. 50 — 10.. 4.. 32.. 64.5 4.. 32.. 65.0
 180-14.. 53.. 19 1492 16..

8
 1503-10.. 45.. 31 — 10.. 46.. 31 — 10.. 48.. 18 — 10.. 49.. 19
 6701-16.. 39.. 0 — 16.. 39.. 59.5 1506-16.. 34.. 15 — 16.. 35.. 15.5
 — 10.. 50.. 29 — 10.. 52.. 30 — 10.. 54.. 7 — 10.. 55.. 9
 222-16.. 33.. 37 — 16.. 35.. 37 310-15.. 50.. 23 — 15.. 51.. 24.5

— 10.. 56.. 52 — 10.. 57.. 52
 1141-11.. 52.. 29 — 11.. 53.. 28.5
 1491-16.. 35.. 50 — 16.. 37.. 14 — 16.. 38.. 42 — 16.. 40.. 7 — 16.. 41.. 32
 1508-11.. 01.. 24.5 — 11.. 02.. 49 — 11.. 04.. 17.5 — 11.. 05.. 43 — 11.. 07.. 08.5
 4.5 3.5 35.5 36 5.. 36.5

1491-16.. 44.. 0 — 16.. 45.. 0 — 16.. 46.. 0 — 16.. 47.. 0
 2492-16.. 51.. 44.2 333-16.. 42.. 52 1310-16.. 42.. 7.4 2257-16.. 49.. 48.5
 — 16.. 48.. 0 — 16.. 49.. 0 — 16.. 50.. 0 — 16.. 51.. 0
 2419 17.. 00.. 20.4 2440-16.. 39.. 47.6 424-16.. 49.. 5.2 79-17.. 05.. 16.3

1503-12.. 19.. 00 26 — 16.. 55.. 0 26 — 16.. 56.. 0 16.. 49.. 00
 439-11.. 42.. 0 1491-16.. 55.. 0.5 1491-16.. 56.. 0.4 16.. 47.. 03.0
 17.. 00.. 20.4
 2419 +13.. 17.4

30th Am

1503-9.. 8.. 52 — 9.. 9.. 50 — 9.. 10.. 50 — 9.. 11.. 50
 1508-8.. 18.. 12 — 8.. 19.. 10.5 — 20.. 20.. 11 — 20.. 21.. 11.5

(87) 8

Nov 29

Mc East

 α Lyra α Cygni 1491.

1	56.1	6	19.4
2	13.4	6	38.5
2	31.3	6	58
2	48.6	7	17.3
3	6.4	7	36.6
3	24.0	7	58.0
18	33	20	38
	41.6		15.4
	227.4		240.2
	120		120
	1341.4		127.2
	48.77		17.31
18	32	20	37
	46.77		15.31
	49.49		17.67
	58.28		+57.44

α Lyra	18.31	273.44
β Lyra	18.44	279.11
δ Lyra	18.58	298.15
ϵ Lyra	19.17	309.34
ζ Lyra	19.39	302.08
η Lyra	19.43	303.54
θ Lyra	19.47	306.21
α Cygni	20.36	267.38

Level

E	W
76	82 +
+ 81	77.5
+ 76	82 +
+ 81	77.5
437.4	319.0
78.5	79.7
	78.5
	1.2
	.6

lev. +0.06

Im 71 Tauri
1491- 9^h 58^m 03^s - 4 poor obs.

D. limb very unstable

Im. 71 Tauri Nov 29 1849

M.P.T. 5^h 22^m 22.96 B'

77 10 38 44.2 - 4 pretty well within the second. D. limb yet very unstable

Im. 77 Tauri

M.P.T. 6^h 02^m 57.56 B'

1491 fast +57.3

78 10 42 22.3 - B well.

at 6.48 a beautiful colour

Im. 78 Tauri

M.P.T. 6^h 06^m 34.96 B'

1491-2.0 v

2557-2 2.48.7 -48.8

1391- 11 29 44.8 - 4 good, slightly projected on the disc.

Im. 1391 Tauri

M.P.T. 6^h 53^m 49.76

2557 9 PB limb

2.01 10.0 -25

12.5

2.00 57.50

2.00 57.5

2.48.75

 α Tauri 1 58 13.7 - 12

7 58 07.7

1 57 10.4

16 33 49.74

9 23 22.66

1 32.29

1159 9 21 50.37

Dec 1st Am Lamp Co

1503- 7.140.0

222- 12.21.57

Im. Aldebaran

Nov. 29th M.P.T. 9^h 21^m 50.4 7rCB

51.4 9 PB

Interovals of the wires of the Transit Circle, by Polaris

Date	A to D	B to D	C to D	E to D	F to D	G to D	
Nov 21 ^h	26 ^m 24.1	17 ^m 37.8	8 ^m 45.3	8 ^m 51.7	Lost	26 ^m 34.7	B
" 21 S.P.	26 ^m 34.0	17 ^m 38.7	8 ^m 45.5	Lost	17 ^m 38.0	26 ^m 33.8	B
" 15 S.P.	26 ^m 27.5	Lost	8 ^m 47.2	8 ^m 50.0	17 ^m 37.0	26 ^m 31.5	B
" 14 S.P.	26 ^m 27.5	17 ^m 38.8	8 ^m 48.5	8 ^m 52.5	17 ^m 38.2	26 ^m 33.3	B x
" 14	Lost	17 ^m 38.5	8 ^m 50.0	8 ^m 52.2	17 ^m 35.0	26 ^m 27.0	B
" 13 S.P.	26 ^m 25.0	17 ^m 36.5	8 ^m 47.7	8 ^m 50.3	17 ^m 37.6	26 ^m 28.0	B x
" 1 S.P.	Lost	Lost	8 ^m 49.0	8 ^m 47.5	Lost	Lost	B
Oct 26	26 ^m 24.0	17 ^m 34.0	8 ^m 52.5	8 ^m 43.5	17 ^m 32.5	26 ^m 27.5	B x
" 22	26 ^m 18.5	17 ^m 35.5	8 ^m 48.0	8 ^m 47.5	17 ^m 35.5	26 ^m 28.0	B x
" 14	26 ^m 23.0	17 ^m 35.0	8 ^m 47.5	8 ^m 49.8	17 ^m 36.0	26 ^m 30.2	x
" 1	26 ^m 20.0	17 ^m 31.0	8 ^m 42.0	Lost	17 ^m 35.8	26 ^m 28.0	
Sept 18	26 ^m 13.8	17 ^m 34.0	8 ^m 40.5	8 ^m 54.0	17 ^m 40.0	26 ^m 30.8	
" 17	~~~~~	17 ^m 31.3	~~~~~	~~~~~	17 ^m 31.7	~~~~~	
" 13	26 ^m 15.4	17 ^m 30.7	8 ^m 44.7	8 ^m 50.8	17 ^m 38.0	26 ^m 28.3	x
" 11	26 ^m 19.5	17 ^m 32.7	8 ^m 47.5	~~~~~	17 ^m 31.5	26 ^m 23.5	
" 8	~~~~~	17 ^m 33.5	8 ^m 46.0	8 ^m 46.0	17 ^m 30.5	~~~~~	
" 7	~~~~~	17 ^m 33.2	8 ^m 47.7	8 ^m 46.1	17 ^m 31.3	~~~~~	
" 6	~~~~~	~~~~~	8 ^m 47.0	8 ^m 46.5	~~~~~	~~~~~	B
" 3	26 ^m 18.0	17 ^m 31.5	8 ^m 45.3	8 ^m 47.4	17 ^m 31.0	26 ^m 23.5	B x
Aug 30	26 ^m 23.3	17 ^m 33.0	8 ^m 48.0	8 ^m 46.3	17 ^m 31.5	26 ^m 15.0	23.3
" 27	26 ^m 20.7	17 ^m 28.7	8 ^m 45.2	8 ^m 44.8	17 ^m 32.3	~~~~~	B
" 22	~~~~~	17 ^m 32.0	8 ^m 46.0	8 ^m 45.8	17 ^m 32.2	~~~~~	
" 20	26 ^m 17.0	17 ^m 31.0	8 ^m 43.0	8 ^m 48.0	17 ^m 31.0	26 ^m 23.0	x
" 16	26 ^m 17.7	17 ^m 29.3	8 ^m 49.0	8 ^m 43.0	17 ^m 28.0	26 ^m 17.8	x
" 9	26 ^m 11.7	17 ^m 29.2	8 ^m 45.8	8 ^m 44.7	~~~~~	26 ^m 24.3	
" 8	26 ^m 12.5	~~~~~	8 ^m 49.0	8 ^m 46.2	~~~~~	26 ^m 23.0	
	26 ^m 20.7	17 ^m 34.5	8 ^m 46.7	~~8^m 47.9~~	17 ^m 34.0	26 ^m 27.0	24.9 27.3
	17 ^m 34.9	8 ^m 46.7	6	8 ^m 48.0	8 ^m 47.9	17 ^m 34.0	
	8 ^m 45.8	8 ^m 47.8	8 ^m 46.7	8 ^m 47.9	8 ^m 46.1	8 ^m 52.9	
	A to B.	B to C	C to D	D to E	E to F	F to G.	

Means all revised.

The large differences are owing to the change of Dec. of Polaris

