

KG  
11366  
v. 797

*Time Service*  
Sept 3-1887 to Oct 24-1888



















1887  
Sept. 3.3

Continued from back 138

109 Hercules.

$\alpha$  Lyrae

.18  
.4  
+ .07  
+ .02  
54.64  
.73  
  
1.23  
.6  
.138  
- .14  
+ .02  
8.65  
8.53

2.0	6.5	8.5
4.3	4.3	.6
6.5	2.0	.5
8.8	2.0	.8
1.0	7.6	.6
5.6	3.2	.8
7.7	1.0	8.7
0.0	9.0	9.0
2.1	6.6	8.7

1.8	4.8	6.6
4.5	2.0	6.5
7.0	9.4	6.4
9.8	7.0	6.8
2.4	4.2	6.6
7.8	8.8	6.6
0.2	6.2	6.4
3.0	3.3	6.3
5.8	0.9	6.7

04.4  
6.6

18.4  
5.3

18 18 04.35  
18 18 54.73  
- 50.38  
- .06  
- .80  
51.24

18 32 18.28  
18 33 8.53  
- 60.25  
- .01  
- .80  
51.06

$\gamma$  Cygni

5.7	9.6	5.3
8.5	6.8	5.3
1.0	4.1	5.1
3.9	1.3	5.2
6.5	8.8	5.3
1.9	3.4	5.3
4.4	0.5	4.9
7.3	7.9	5.2
0.0	5.3	5.3

51.24  
.06  
.15

Average =  $51.515 = \#1327$  slow.

.15  
.6  
- .090  
+ .02  
13.01  
12.94

22.5  
11.4

20 17 22.60  
20 18 12.94

50.84  
51.16



Sept 4.3

 $\alpha$  Lyrac.

R Lyrac.

.23  
 .7  
 - .161  
 + .02  
 8.65  
 8.51  
 .24  
 .7  
 - .168  
 - .17  
 + .02  
 55.82  
 55.67

1.9 4.6 6.5  
 4.3 1.9 6.2  
 7.0 9.3 6.3  
 9.7 6.7 6.4  
 2.1 4.0 6.1  
 7.7 8.8 6.5  
 0.1 6.0 6.1  
 2.9 3.4 6.3  
 5.4 0.8 6.2  
 18.0  
 2.6

18 32 18.14

18 33 8.57

- 50.37

- .01

- .80

51.18

6.4 3.9 0.3  
 9.4 1.0 0.4  
 2.3 8.1 0.4  
 5.2 5.1 0.3  
 8.1 2.5 0.6  
 4.0 6.7 0.7  
 6.7 3.9 0.6  
 9.5 0.9 0.4  
 2.3 8.1 0.4  
 05.2  
 4.3

18 51 05.23

18 51 55.67

- 50.44

- .00

- .80

67.24

51.21



phi. 5.3

$$\begin{array}{r}
 .29 \\
 \underline{.2} \\
 .058 \\
 + .06 \\
 + .02 \\
 17.60 \\
 \underline{17.68}
 \end{array}$$

$$\begin{array}{r}
 .21 \\
 \underline{.2} \\
 + .042 \\
 + .02 \\
 3.54 \\
 \underline{3.60}
 \end{array}$$

$$\begin{array}{r}
 .38 \\
 \underline{.2} \\
 .076 \\
 + .08 \\
 + .03 \\
 35.70 \\
 \underline{35.81}
 \end{array}$$

L Herculis.

$$7.2 \quad 6.7 \quad 3.9$$

$$0.3 \quad 3.7 \quad 4.0$$

$$3.1 \quad 0.9 \quad 4.0$$

$$6.1 \quad 7.8 \quad 3.9$$

$$9.0 \quad 4.9 \quad 3.9$$

$$5.1 \quad 9.0 \quad 4.1$$

$$8.1 \quad 5.9 \quad 4.0$$

$$1.0 \quad 3.0 \quad 4.0$$

$$4.0 \quad 0.0 \quad 4.0$$

$$7.0 \quad 27.0$$

$$18.8$$

$$17 \quad 35 \quad 26.99$$

$$17 \quad 36 \quad 17.68$$

$$- 50.69$$

$$+ .01$$

$$- .80$$

$$51.50$$

$$48$$

$$42$$

$$.53$$

$$.55$$

$$15.6$$

$$.02$$

 $\mu$  Herculis.

$$9.6 \quad 6.1 \quad 5.7$$

$$1.9 \quad 3.8 \quad 5.7$$

$$4.2 \quad 1.6 \quad 5.8$$

$$6.7 \quad 9.2 \quad 5.9$$

$$8.9 \quad 7.0 \quad 5.9$$

$$3.5 \quad 2.1 \quad 5.6$$

$$6.0 \quad 9.9 \quad 5.9$$

$$8.3 \quad 7.7 \quad 6.0$$

$$6.7 \quad 5.3 \quad 6.0$$

$$12.9$$

$$17.4$$

$$17 \quad 41 \quad 12.92$$

$$17 \quad 42 \quad 3.60$$

$$- 50.68$$

$$- .05$$

$$- .80$$

$$51.53$$

 $\xi$  Idraconis

$$7.0 \quad 2.8 \quad 9.8$$

$$0.8 \quad 9.0 \quad 9.8$$

$$4.8 \quad 5.1 \quad 9.9$$

$$8.5 \quad 1.5 \quad 0.0$$

$$2.4 \quad 7.9 \quad 0.3$$

$$9.8 \quad 0.1 \quad 9.9$$

$$3.5 \quad 6.3 \quad 9.8$$

$$7.4 \quad 6.3 \quad 0.1$$

$$1.2 \quad 8.8 \quad 0.0$$

$$45.0$$

$$18.6$$

$$17 \quad 50 \quad 44.98$$

$$17 \quad 51 \quad 35.81$$

$$- 50.83$$

$$+ .08$$

$$- .80$$

$$51.55$$



Sept. 8.3	109	Herculis		110	Herculis.		B. Lyrae.		
.20	1.4	5.9	7.3	6.7	1.0	7.7	0.7	0.0	0.7
<u>.1</u>	3.6	3.7	7.3	9.0	8.7	7.7	3.1	7.6	0.7
- .02	5.8	1.6	7.4	1.1	6.4	7.5	5.8	5.0	0.8
+ .02	8.1	9.2	7.3	3.4	4.2	7.6	8.1	2.7	0.8
54.64	0.3	7.0	7.3	5.5	2.0	7.5	0.7	0.2	0.9
<u>54.64</u>	5.0	2.5	7.5	0.0	7.6	7.6	5.5	5.3	0.8
.19	7.0	0.3	7.3	2.1	5.2	7.3	8.0	3.0	1.0
<u>.1</u>	9.2	8.1	7.3	4.2	3.1	7.3	0.4	0.5	0.9
- .02	1.6	5.9	7.5	6.7	1.0	7.7	3.0	7.9	9.9
+ .02									
49.72									
<u>49.72</u>									
.22			03.7			58.8			05.5
<u>.1</u>			<u>12.9</u>			<u>14.7</u>			<u>8.0</u>
- .022	18	18	03.68	18	39	58.77	18	45	05.42
+ .02	18	18	54.64	18	40	49.72	18	45	56.26
56.26			- 50.96			- 50.95			- 50.84
<u>56.26</u>			- .06			- .07			- .03
			- .80			- .80			- .80
			51.82			51.82			51.67

$$\begin{array}{r}
 .82 \\
 .82 \\
 .67 \\
 3 \overline{) 2.31} \\
 \underline{51.77}
 \end{array}$$

Sept. 9. 3

 $\gamma$  Lyrac. $\epsilon$  Aquilae.

$.22$   
 $.2$   
 $-.044$   
 $+.02$   
 $44.82$   
 $44.80$   
 $.17$   
 $.2$   
 $-.034$   
 $+.02$   
 $14.92$   
 $14.91$

9.1	8.0	7.1	2.7	5.1	7.8
1.7	5.6	7.3	4.8	2.9	7.7
4.0	3.1	7.1	6.8	0.8	7.6
6.4	0.8	7.2	9.0	8.8	7.8
9.0	8.2	7.2	1.1	6.7	7.8
3.8	3.4	7.2	5.5	2.3	7.8
6.2	1.0	7.2	7.6	0.3	7.9
8.8	8.7	7.5	9.8	8.2	8.0
1.2	6.1	7.3	1.8	6.0	7.8

$53.7$   
 $11.8$

$18 \ 53 \ 53.62$   
 $18 \ 64 \ 44.80$   
 $-51.18$   
 $- .03$   
 $- .80$   
 $52.01$

$24.0$   
 $17.2$

$18 \ 59 \ 23.91$   
 $19 \ 0 \ 14.91$   
 $-51.00$   
 $- .08$   
 $- .80$   
 $51.88$

51.95-



Sept. 10.3

♂ Lepus

$$\begin{array}{r}
 .23 \\
 .3 \\
 \hline
 .069 \\
 - .07 \\
 + .02 \\
 28.67 \\
 \hline
 28.62 \\
 \\
 .24 \\
 .3 \\
 \hline
 - .072 \\
 + .02 \\
 28.84 \\
 \hline
 28.79
 \end{array}$$

1.2	3.3	4.5
4.0	0.9	4.9
6.4	8.1	4.5
9.1	6.8	4.9
1.7	3.0	4.7
7.0	7.8	4.8
9.5	5.1	4.6
2.2	2.7	4.9
5.0	9.8	4.8
	37.6	
	7.1	
19	11	37.31
19	12	28.62
		- 57.31
		- .02
		- .80
		52.13

♂ Cygni.

8.3	6.6	4.9
6.1	3.8	4.9
4.1	0.6	4.7
7.1	7.8	4.9
9.0	5.0	5.0
5.9	9.2	5.1
8.9	6.3	5.2
1.7	3.3	5.0
4.6	0.4	5.0
	37.6	
	9.2	
19	40	37.48
19	41	28.79
		- 50.31
		+ .01
		- .80
		52.10

52. 12

Seph. 11.3

B Delphinii.

E Cygnus.

E Delphinii

$$\begin{array}{r}
 .11 \\
 .4 \\
 - .044 \\
 + .02 \\
 \hline
 17.39 \\
 \hline
 17.37 \\
 \\
 .14 \\
 .4 \\
 - .056 \\
 - .06 \\
 + .02 \\
 \hline
 40.92 \\
 \hline
 40.88
 \end{array}$$

$$4.8 \quad 7.2 \quad 2.0$$

$$6.7 \quad 5.1 \quad 1.8$$

$$8.8 \quad 3.0 \quad 1.8$$

$$1.0 \quad 1.0 \quad 2.0$$

$$3.0 \quad 8.8 \quad 1.8$$

$$7.4 \quad 4.4 \quad 1.8$$

$$9.4 \quad 2.3 \quad 1.7$$

$$1.7 \quad 0.1 \quad 1.8$$

$$3.9 \quad 8.0 \quad 1.9$$

$$6.0$$

$$17.6$$

$$20 \quad 31 \quad 25.93$$

$$20 \quad 32 \quad 17.37$$

$$- 51.44$$

$$- .08$$

$$- .80$$

$$52.32$$

2 Cygnus

1st + last 5 wires not obs'd.

$$3.8 \quad 7.3 \quad 1.1$$

$$6.7 \quad 4.7 \quad 1.4$$

$$9.9 \quad 1.7 \quad 1.6$$

$$2.8 \quad 8.5 \quad 1.3$$

$$45.7$$

$$6.1$$

$$20 \quad 36 \quad 45.68$$

$$20 \quad 37 \quad 37.42$$

$$- 51.74$$

$$+ .01$$

$$- .80$$

$$52.53$$

$$4.5 \quad 4.0 \quad 8.5$$

$$6.8 \quad 1.4 \quad 8.2$$

$$9.3 \quad 8.8 \quad 8.1$$

$$1.9 \quad 6.3 \quad 8.2$$

$$4.3 \quad 3.8 \quad 8.1$$

$$9.2 \quad 9.0 \quad 8.2$$

$$1.8 \quad 6.6 \quad 8.4$$

$$4.1 \quad 4.1 \quad 8.2$$

$$6.9 \quad 1.8 \quad 8.7$$

$$49.1$$

$$2.76$$

$$20 \quad 40 \quad 49.14$$

$$20 \quad 41 \quad 40.88$$

$$- 51.74$$

$$- .03$$

$$- .80$$

$$52.57$$

$$8.7 \quad 0.6 \quad 9.3$$

$$0.8 \quad 8.7 \quad 9.5$$

$$2.9 \quad 6.6 \quad 9.5$$

$$4.9 \quad 4.5 \quad 9.4$$

$$7.1 \quad 2.4 \quad 9.5$$

$$1.2 \quad 8.2 \quad 9.4$$

$$3.2 \quad 6.0 \quad 9.2$$

$$5.3 \quad 4.0 \quad 9.3$$

$$7.5 \quad 2.0 \quad 9.5$$

$$59.7$$

$$13.3$$

$$20 \quad 26 \quad 59.70$$

$$20 \quad 27 \quad 51.22$$

$$- 51.52$$

$$- .09$$

$$- .80$$

$$52.41$$

$$52.32$$

$$52.57$$

$$52.41$$

$$52.53$$

$$1.83$$

$$52.46$$



Sep 14.4	π Pegasi.			7 Lacertae			10 Lacertae.		
.05	9.1	8.1	7.2	7.3	1.0	8.3	5.8	8.7	4.5
<u>.7</u>	1.7	5.7	7.4	0.3	7.9	8.2	8.4	5.8	4.2
-.035	4.2	3.2	7.4	3.7	4.7	8.4	1.1	3.2	4.3
-.04	6.6	1.0	7.6	7.0	1.4	8.4	3.8	0.7	4.5
+ .02	9.2	8.5	7.7	0.1	8.2	8.3	6.4	8.1	4.5
<u>61.06</u>	4.0	3.6	7.6	6.6	2.0	8.6	1.7	2.8	4.5
61.04	6.5	1.1	7.6	9.8	8.8	8.6	4.4	0.1	4.5
.05	8.9	8.6	7.5	2.9	5.7	8.6	7.0	7.7	4.7
<u>.7</u>	1.2	6.1	7.3	6.0	2.4	8.4	9.7	5.0	4.7
-.04			23.8			49.1			22.2
+ .02			<u>14.1</u>			<u>3.9</u>			<u>4.6</u>
<u>41.71</u>	22	3	23.74	22	25	49.31	22	33	22.24
41.69	22	4	61.04	22	26	41.69	22	34	14.62
.02			7.30			52.38			52.38
<u>.7</u>						+ .03			-.01
-.014						- .80			<u>.80</u>
+ .02						<u>53.15</u>			53.19
<u>14.61</u>									
14.62									

eph. 15.3

♂ Cygni.

2.0	6.0	8.0
5.1	3.0	8.1

8.1	9.8	7.9
-----	-----	-----

1.5	6.5	8.0
-----	-----	-----

5.0	3.2	8.2
-----	-----	-----

1.2	6.9	8.1
-----	-----	-----

4.7	3.9	8.6
-----	-----	-----

7.9	0.5	8.4
-----	-----	-----

0.9	7.1	8.0
-----	-----	-----

34.1
------

20.4
------

19	32	34.07
----	----	-------

19	33	26.66
----	----	-------

- 52.59
---------

+ .03
-------

- .80
-------

53.36
-------

♂ Cygni.

6.8	4.8	1.6
-----	-----	-----

9.7	2.0	1.7
-----	-----	-----

2.6	9.1	1.7
-----	-----	-----

5.5	6.3	1.8
-----	-----	-----

8.6	3.5	2.1
-----	-----	-----

4.3	7.6	1.9
-----	-----	-----

7.1	4.7	1.8
-----	-----	-----

0.0	1.9	1.9
-----	-----	-----

3.0	8.9	1.9
-----	-----	-----

36.0
------

17.4
------

19	40	35.92
----	----	-------

19	41	28.67
----	----	-------

- 52.75
---------

+ .01
-------

- .80
-------

53.54
-------

γ Cygni.

3.0	7.0	0.0
-----	-----	-----

5.8	4.1	9.9
-----	-----	-----

8.4	1.6	0.0
-----	-----	-----

1.3	9.0	0.3
-----	-----	-----

4.0	6.2	0.2
-----	-----	-----

9.2	0.8	0.0
-----	-----	-----

2.1	8.2	0.3
-----	-----	-----

4.9	5.5	0.4
-----	-----	-----

7.4	2.8	0.2
-----	-----	-----

20.1
------

20.4
------

20	17	20.07
----	----	-------

20	18	12.74
----	----	-------

- 52.67
---------

- .01
-------

+ .80
-------

53.48
-------

.35
.54
.48
138
.45



Sept. 16.3

δ Cygni

$$\begin{array}{r}
 .27 \\
 .9 \\
 \hline
 - .243 \\
 + .02 \\
 26.86 \\
 \hline
 26.64
 \end{array}$$

$$\begin{array}{r}
 .24 \\
 .9 \\
 \hline
 - 216 - \\
 - .22 \\
 + .02 \\
 28.84 \\
 \hline
 28.64
 \end{array}$$

$$\begin{array}{r}
 1.3 \quad 5.7 \quad 7.0 \\
 4.8 \quad 2.7 \quad 7.5 \\
 8.1 \quad 9.1 \quad 7.2 \\
 1.2 \quad 6.1 \quad 7.3 \\
 4.2 \quad 3.0 \quad 7.2 \\
 0.8 \quad 6.7 \quad 7.5
 \end{array}$$

$$\begin{array}{r}
 4.1 \quad 3.4 \quad 7.5 \\
 7.5 \quad 0.0 \quad 7.5 \\
 0.7 \quad 7.0 \quad 7.7 \\
 33.8 \\
 13.2
 \end{array}$$

$$\begin{array}{r}
 19 \quad 32 \quad 33.69 \\
 19 \quad 33 \quad 26.64 \\
 \hline
 - 52.95 \\
 + .03 \\
 - .80 \\
 \hline
 53.72
 \end{array}$$

δ Cygni.

$$\begin{array}{r}
 6.5 \quad 4.8 \quad 1.3 \\
 9.6 \quad 2.0 \quad 1.6 \\
 2.4 \quad 9.0 \quad 1.4 \\
 5.3 \quad 6.1 \quad 1.4 \\
 8.3 \quad 3.2 \quad 1.5 \\
 3.9 \quad 7.4 \quad 1.3
 \end{array}$$

$$\begin{array}{r}
 7.1 \quad 4.4 \quad 1.5 \\
 9.9 \quad 1.7 \quad 1.6 \\
 3.0 \quad 8.7 \quad 1.7 \\
 35.8 \\
 14.1
 \end{array}$$

$$\begin{array}{r}
 19 \quad 40 \quad 35.74 \\
 19 \quad 41 \quad 28.64 \\
 \hline
 - 52.90 \\
 + .01 \\
 - .80 \\
 \hline
 53.69
 \end{array}$$

$$\begin{array}{r}
 .72 \\
 .59 \\
 \hline
 .71
 \end{array}$$

eph. 17.3

+ .02

37.29

37.31

+ .02

40.78

+ .02

47.08

47.10

~~2 Cygni~~~~5.2 0.4~~~~8.0 7.6~~~~1.1 4.7~~~~4.0 1.9~~~~7.0 6.0~~~~2.8 3.0~~~~5.6 0.0~~~~8.6 7.2 .8~~~~1.3 4.5 3.0~~

44.5

2 Cygni

5.2 3.3 8.5

8.0 0.3 8.3

1.1 7.6 8.7

4.0 4.7 8.7

7.0 1.9 8.9

2.8 6.0 8.8

5.6 3.0 8.6

8.6 0.0 8.6

1.3 7.2 8.5

44.5

6.1

20 36 44.32

20 37 37.31

- 52.99

+ .01

- .80

53.78

53.78

53.96

53.86

3/ 2.60

53.87

E Cygni

3.0 2.5 5.5

5.3 0.0 5.3

7.9 7.4 5.3

0.3 5.0 5.3

2.8 2.6 5.4

7.8 7.6 5.4

0.1 5.0 5.1

2.8 2.7 5.5

5.1 0.1 5.2

47.7

12.7

20 40 47.67

20 41 40.80

- 53.13

- .03

- .80

53.96

32 Vulpec

0.8 7.6 8.4

3.1 5.1 8.2

5.4 2.8 8.2

7.8 0.4 8.2

0.1 8.1 8.2

4.9 3.3 8.2

7.0 1.0 8.0

9.4 8.7 8.1

1.7 6.5 8.2

54.1

1.8

20 48 54.09

20 49 47.10

- 53.01

- .05

- .80

53.86



Sept 29.3	Vlogzi	Elogzi	32 Value
.22	1.3 5.0 6.3	1.6 1.0 2.6	9.4 6.0 5.4
.14	2.8 2.4 .2	4.0 8.6 .6	1.5 2.7 5.2
+1.09	6.5 9.5 .0	6.3 6.0 .3	2.8 1.1 4.9
+1.02	9.3 7.0 .3	8.9 3.6 .5	6.1 8.9 5.0
12.46	2.0 4.2 .2	1.1 1.0 .1	8.5 6.5 5.0
.57	7.3 9.0 .3	6.3 6.0 .3	2.2 2.0 5.2
.17	6.3 6.2 .5	8.8 3.7 .5	5.6 9.5 5.1
.14	2.7 2.4 .1	1.1 1.0 .1	6.0 7.1 5.1
+1.07	5.5 0.9 .4	3.7 8.7 .4	6.3 5.0 5.3
+1.02			
40.61	18.2	46.0	52.6
.70	2.5	3.4	10.8
.18	-18.13	46.18	52.57
.4	20 18 12.57	20 41 40.70	20 49 37.01
+1.07	-54.44	-54.52	-54.44
+1.02	-.01	-.03	-.05
46.92	-1.80	-1.80	-1.80
7.01	55.25	55.35	55.29
.19	Vlogzi		
.14	8.7 3.0 1.7		
+1.08	1.1 6.6 1.1	55.25	
+1.02	4.0 7.3 1.3	.75	
60.01	6.6 4.7 1.3	.29	
.11	9.4 2.0 1.4	.23	
	5.0 6.6 1.6	55.28 = average	
	7.6 3.9 1.5		
	0.2 1.1 1.3		
	3.0 8.3 2.3		
	205.7		
	13.2		
	05.69		
	20 53 00.11		
	-54.42		
	-.01		
	-1.80		

14

Sept 19.3

D Lyrae

S Cygni.

X Cygni.

8.8 1.0 9.8

5.6 3.9 9.5

1.9 5.7 7.6

1.2 8.3 9.5

8.4 0.9 9.3

4.5 3.1 7.6

4.0 5.9 9.9

1.4 8.1 9.5

7.2 0.4 7.6

6.5 3.1 9.6

4.6 5.1 9.7

0.0 7.8 7.8

9.1 0.6 9.7

7.3 2.5 9.8

3.0 5.1 8.1

4.5 5.3 9.8

3.3 6.5 9.8

8.2 9.8 8.0

7.0 2.7 9.7

6.1 3.8 9.9

1.0 7.0 8.0

9.8 0.0 9.8

9.1 0.9 0.0

3.7 4.2 7.9

2.2 7.3 9.5

2.0 7.8 9.8

6.2 1.7 7.9

34.9

34.8

19.0

16.12

16.1

17.5

19 10 34.85

19 40 34.85

20 17 18.92

19 12 28.44

19 41 28.57

20 18 12.65

- 53.59

- 53.72

- 53.73

- .02

+ .01

- .01

- .80

- .80

- .80

54.41

54.51

54.54

.41

.51

.54

146

45



Sept 20.3

l Cygni.

J Cygni.

S Cygni.

$$\begin{array}{r}
 -32 \\
 \underline{3} \\
 -10 \\
 +03 \\
 53.28 \\
 \underline{53.21}
 \end{array}$$

$$\begin{array}{r}
 .31 \\
 .3 \\
 \underline{-09} \\
 +.02 \\
 26.59 \\
 \underline{26.52}
 \end{array}$$

$$\begin{array}{r}
 .27 \\
 .3 \\
 \underline{-08} \\
 +.02 \\
 28.60 \\
 \underline{28.54}
 \end{array}$$

$$\begin{array}{r}
 5.8 \ 2.2 \ 8.0 \\
 9.3 \ 9.0 \ 8.3 \\
 2.7 \ 5.6 \ 8.3 \\
 6.0 \ 2.1 \ 8.1 \\
 9.2 \ 9.0 \ 8.2
 \end{array}$$

$$\begin{array}{r}
 5.8 \ 2.3 \ 8.1 \\
 9.1 \ 9.1 \ 8.2 \\
 2.3 \ 5.7 \ 8.0 \\
 6.0 \ 2.4 \ 8.4
 \end{array}$$

$$\begin{array}{r}
 59.1 \\
 \underline{1.7}
 \end{array}$$

$$\begin{array}{r}
 19 \ 25 \ 59.09 \\
 19 \ 26 \ 53.21 \\
 \hline
 -54.12 \\
 +.04 \\
 -.80 \\
 \hline
 54.88
 \end{array}$$

88

77

74

$$\begin{array}{r}
 31 \ 239 \\
 \underline{.79}
 \end{array}$$

$$\begin{array}{r}
 0.6 \ 4.5 \ 5.1 \\
 3.7 \ 1.3 \ 5.0 \\
 7.0 \ 8.1 \ 5.1 \\
 0.0 \ 5.0 \ 5.0 \\
 3.3 \ 1.8 \ 5.1
 \end{array}$$

$$\begin{array}{r}
 9.8 \ 5.2 \ 5.0 \\
 2.9 \ 2.1 \ 5.0 \\
 6.1 \ 8.8 \ 4.9 \\
 9.3 \ 5.6 \ 4.9
 \end{array}$$

$$\begin{array}{r}
 32.7 \\
 \underline{9.8}
 \end{array}$$

$$\begin{array}{r}
 19 \ 32 \ 32.52 \\
 19 \ 33 \ 26.52 \\
 \hline
 -54.00 \\
 +.03 \\
 -.80 \\
 \hline
 54.77
 \end{array}$$

$$\begin{array}{r}
 5.4 \ 3.6 \ 9.0 \\
 8.5 \ 0.9 \ 9.4 \\
 1.2 \ 8.0 \ 9.2 \\
 4.1 \ 5.0 \ 9.1 \\
 7.0 \ 2.0 \ 9.0
 \end{array}$$

$$\begin{array}{r}
 2.9 \ 6.1 \ 9.0 \\
 6.0 \ 3.3 \ 9.3 \\
 8.7 \ 0.4 \ 9.1 \\
 2.0 \ 7.5 \ 9.5
 \end{array}$$

$$\begin{array}{r}
 34.6
 \end{array}$$

$$\begin{array}{r}
 40 \\
 39 \\
 \underline{11.2}
 \end{array}$$

$$\begin{array}{r}
 19 \ 41 \ 34.59 \\
 19 \ 41 \ 28.54 \\
 \hline
 -53.95 \\
 +.01 \\
 -.80 \\
 \hline
 54.74
 \end{array}$$

16 Apr 23.7 see page 13

Apr. 25.4

 $\pi^2$  Lysini

16 Pizani

 $\pi$  Pizani

.16  
 .2  
 +.03  
 +.02  
 40.10  
 .15

20 4.0 6.1 0.1  
 0.1 7.0 3.6 0.0  
 3.1 0.1 0.0 0.1  
 6.1 3.1 7.0 0.1

0.1 5.9 6.0  
 2.6 3.6 6.2  
 4.9 1.1 6.0  
 7.0 8.9 5.9

6.8 5.7 2.5  
 9.0 3.0 2.0  
 1.2 0.7 1.9  
 4.0 7.9 1.9

6.1 3.9 0.0

9.1 6.2 6.0

6.3 5.5 1.8

2.4 7.4 9.8

4.0 2.0 6.0

1.2 0.8 2.0

5.3 4.1 9.4

6.0 0.0 6.0

3.9 8.3 2.2

8.5 1.0 9.5

8.3 7.8 6.1

6.1 5.8 1.9

1.8 7.9 9.7

0.7 5.0 5.7

8.6 3.4 2.0

44.9

02.9

21.0

17.6

18.8

0.2

21 41 44.93

21 46 02.99

22 05 21.01

42 40.15

47 57.89

At end to 00.96

+55.22

+54.90

39.95

+ 03

- .05

- .80

- .80

55.99

55.75

 $\gamma$  Lepini

5.9 3.1 9.0

9.7 9.1 8.8

3.4 5.1 8.5

7.0 1.4 8.4

1.0 7.5 8.5

9.0 2.9 8.9

0.1 2.9 8.9

1.8 8.4 8.5

4.4 7.0 8.8

3.0 5.8 8.8

4.1 7.0 8.8

5.7 8.4 9.1

7.0 9.8 9.0

8.1 0.9 9.0

7.3 2.0 8.9

0.7 5.1 8.7

2.0 4.8 9.0

3.1 5.8 8.9

04.5

35/14.1

04.40

22.06 59.62

-55.22

+ 08

80



Lp 28.3

36 basin

1 Pizani

74 basin

.18	0.1	7.5	7.6
.1	2.4	7.5	5.1
- .02	4.7	5.1	2.8
+ .02	2.1	2.8	8.3
27.88	2.7	2.8	8.0
	4.4	3.3	.7
.20	6.7	1.0	.7
.1	9.0	8.6	.6
- .02	1.5	6.2	.7
+ .02			
40.10			

14.0

15.4

.17			
.1	21	07	13.81
- .02			
+ .02		08	10.00
10.00			

-56.19

-1.04

-1.80

57.03

54.00
.01

71<sup>2</sup> basin

2.6	5.0	7.6
5.5	1.8	7.3
8.5	8.6	7.1
1.7	5.5	7.2
4.7	2.4	7.1
1.0	6.0	7.0
4.3	3.0	7.3
7.3	9.9	7.2
0.5	6.7	7.2

43.9

11.9

21 41 48.63

42 40.10

-56.47

+ .03

-1.80

57.24

6.0	9.7	5.7
6.0	7.3	.3
0.3	5.0	.3
2.6	3.0	6
4.7	1.0	.7
9.0	6.7	.7
1.2	4.5	.7
3.5	2.2	.7
5.7	0.1	.8

58.0

15.5

21 15 57.82

16 54.01

-56.19

-1.07

-1.80

57.06

57.03

.06

Mean = 57.13

.18

.24

4.8	8.4	3.0
7.4	5.7	3.1
0.0	3.0	3.0
2.6	0.1	2.7
5.3	7.6	2.9
0.8	2.3	3.1
3.5	9.7	3.4
6.1	7.0	3.1
8.7	4.1	2.8

31.5

9.6

21 31 31.51

32 27.88

-56.37

-1.01

-1.80

57.18

A value of  $\sigma$  in this <sup>(2)</sup> basin  
as large would have given

57.11

.20

.20

.18

Mean = 57.17

To be conservative however, take  
a value twice as large, when  
we have

57.07

.13

.19

.21

Mean = 57.15

Oct. 5.4  $\eta$  Aquarii

.09	42.8	84.0	126.8
<u>.3</u>	4.7	2.0	6.7
+ .02			
+ .02	7.0	9.7	6.7
<u>0.1.22</u>	8.9	8.0	6.9
.26			

.17	.12
<u>.2</u>	<u>.2</u>
+ .03	+ .02
+ .03	+ .02
<u>10.10</u>	<u>10.10</u>
.10	.10
.84	.84

.15	.12
<u>.2</u>	<u>.2</u>
+ .03	+ .02
+ .03	+ .02
<u>41.40</u>	<u>41.40</u>
.46	.46
.10	.10
.12	.12
+ .02	+ .02
+ .02	+ .02
<u>14.42</u>	<u>14.42</u>
.46	.46

21	59	03.39
60	01.26	
-	57.87	
	1.28	
	<u>.80</u>	
	58.95	

(Mean  
min)

7 Lacerta

1.3	5.0	6.3
4.3	1.8	6.1
7.7	8.4	6.1
0.8	5.1	5.9
4.0	1.9	5.9
0.4	5.9	6.3
3.7	2.6	6.3
6.8	9.5	6.3
9.9	6.1	6.0

43.0	
<u>1.2</u>	
22	25
26	41.46
-	58.40
	+ .08
	<u>.80</u>
	59.12

= average

 $\eta$  Pegasi

8.0	7.0	5.0
0.5	5.0	.0
3.0	2.1	.1
5.6	2.9	.5
8.0	7.0	.3
2.8	2.4	.2
5.1	0.0	.1
7.8	2.4	.5
0.1	0.50	.1
2.7	0.7	0.7
	<u>0.5</u>	
	0.2.61	

22	04	02.61
25	00.80	
-	58.19	
	-.08	
	<u>.86</u>	
	59.07	

 $\eta$  Aquarii

7.0	8.0	5.0
9.0	6.0	5.0
1.0	4.0	5.0
3.0	5.7	4.9
5.0	2.6	4.9
9.1	4.5	5.0
1.2	6.1	4.8
3.4	1.6	4.9
5.4	9.5	4.9
	<u>17.3</u>	
	8.7	

22	28	37.46
29	35.56	
-	58.10	
	-.28	
	<u>.80</u>	
	59.18	

3 Lacerta

8.9	4.9	3.8
2.0	1.6	.6
5.1	8.2	.3
8.9	5.0	.9
2.0	1.9	.9
8.7	5.0	.7
2.0	4.9	.9
5.1	8.2	.5
8.6	5.1	.7
	<u>12.0</u>	
	16.3	

22	18	12.86
19	10.26	
-	58.40	
	+ .10	
	<u>.80</u>	
	59.10	

10 Lacerta

0.0	2.5	2.5
2.5	9.9	.4
5.0	7.1	.1
7.7	4.6	.3
0.2	1.9	.1
5.8	6.7	.5
8.3	4.0	.3
9.9	0.3	.2
3.6	8.9	.8

22	33	16.0
34	14.46	
-	58.31	
	-.04	
	<u>.80</u>	
	59.15	



Oct 10.4  $\bar{C}$   $\bar{P}$   $\bar{P}$   $\bar{P}$ 

.07	3.4	7.6	1.5
.3	5.8	6.6	1.8
<u>7.02</u>	8.0	3.8	.8
<u>7.02</u>	0.1	1.5	.6
29.17	2.4	9.1	.5
.05	7.0	4.9	.9
.3	9.1	2.6	.7
<u>7.02</u>	1.3	0.3	.6
<u>7.02</u>	3.6	8.0	.6
29.17			
.07			
.3			
<u>7.02</u>			
<u>7.02</u>			
5.55			

23 14 05.84

15 05.55

-59.71

-14

-80

60.65

4 barish

10.1	97.0	197.1
14.6	92.6	.2
18.9	88.3	.2
23.1	84.0	.1
27.3	79.7	.0
6.3	4.0	.3
7.9	9.6	.5
9.2	8.6	.3
0.8	6.9	.7
2.1	5.3	.4
3.6	3.7	.3
5.0	2.1	.1
6.3	0.7	.0
7.9	9.3	.2
9.1	8.0	.1
0.7	6.6	.3
2.1	5.1	.2

53.5

95721.4

23 18 53.61

70 Pz in

8.6	0.6	9.2
0.6	8.5	9.1
2.6	6.3	8.9
4.9	4.1	9.0
6.9	2.0	8.9
1.1	8.0	9.1
3.1	6.0	9.1
5.3	3.9	9.2
7.4	1.7	9.1
		29.5
		10.1

23 22 29.53

27 29.17

-59.64

-80

C Androm...

1.5	7.4	8.9
4.1	4.6	.7
7.0	1.7	.7
9.6	9.0	.6
2.4	6.1	.5
8.0	0.5	.5
0.9	7.7	.6
3.7	5.0	.8
6.6	2.1	.7
		19.3

6.3

23 31 19.33

32 39.17

-59.84

00

-80

60.64

Oct 12.4

.04  
 .5  
 +.02  
 +.02  
 32.60  
 .64

.02  
 .5  
 +.01  
 +.02  
 29.77  
 .80

.02  
 .5  
 +.01  
 +.02  
 24.10  
 .13

o bairiot.  
~~3 Androm~~

9.0  
 2.0  
 5.0  
 8.0  
 1.0

7.0 1.9  
 0.4 8.4  
 3.4 5.4  
 6.6 2.5

29.5

3 Androm  
~~o bairiot~~

1.7 6.1 7.8  
 3.8 4.1 7.9  
 5.9 2.3 8.2  
 8.3 9.8 8.1  
 0.5 7.6 8.1  
 5.0 3.0 8.0  
 7.2 0.7 7.9  
 9.2 8.5 7.7  
 1.9 6.1 8.0

24.0

18.7

0 40 23.98

48 24.13

-60.15

.14

-.80

61.09

61.08

4 Androm

6.3 8.6 4.9  
 8.7 5.9 .6  
 1.5 3.2 .7  
 4.0 0.8 .8  
 6.8 8.1 .9  
 2.0 2.9 4.9  
 4.9 0.4 5.3  
 7.1 7.6 4.7  
 9.8 5.0 4.8

32.2

7.8

0 49 32.41

32.64

-60.28

.04

-.80

61.07



13.4  $\sqrt{\text{Pagnini}}$   
~~Oct 4.4~~  $\sqrt{\text{Androm.}}$

	5.88	8.8	4.6
.02	8.1	6.6	4.7
.3	0.3	4.4	.7
+ .01	2.5	2.2	.7
+ .02	4.7	9.1	.8
35.98	8.9	6.0	.9
6.01	1.0	3.8	.8
.01	3.1	1.8	.9
.7	5.1	9.5	.6
+ .02			
27.96			
.98			

27.3  
 7.0  
 00 06.27.37  
 07 27.98  
 -1 00.61  
 -.17  
 -.80  
 1<sup>m</sup> 01.58  
 1 01.54

$\sqrt{\text{Androm.}}$

5.9	2.0	8.9	0.9
4.2	6.3	.5	
6.7	4.0	.7	
9.0	1.8	.8	
*	9.5	-	
5.9	4.7	.6	
83	2.1	.4	
0.9	0.0	.9	
3.0	7.6	.6	
5			

35.3  
 5.7  
 00 01 35.34  
 02 36.01  
 -1 00.67  
 -.09  
 -.80  
 1<sup>m</sup> 01.56

22

Oct 14.4

 $\alpha$  Androm.

8.4	8.4	9.8
3.6	0.7	9.3
5.8	3.5	9.3
8.8	0.3	9.1
0.8	9.0	9.8

8.7	4.1	9.8
7.8	1.7	9.5
0.0	9.1	9.1
2.4	7.0	9.4

34.8
14.9

34.78

2 36.01

-1 01.23

-.09

-.80

02.12

 $\gamma$  Pegasi

5.4	8.1	3.5
7.8	6.0	3.8
9.9	3.9	2.8
2.2	1.8	4.0
4.2	9.8	9.0

8.3	5.3	3.6
0.4	3.2	3.6
2.8	1.2	4.0
4.8	9.2	4.0

26.9

17.2

26.90

0 7 27.98

-1 01.08

-.16

-.80

1 02.04

 $\pi$  Androm.

8.4

1.0

3.3

6.0 0.3 6.3

8.4 7.7 6.1

3.1 2.8 5.9

5.8 0.4 6.2

8.2 8.0 6.2

0.4 5.5 5.9

53.0

0.6

0 29 53.05

30 54.17

1 01.72

-.07

-.80

1 01.99

 $\alpha$  Cassio.

2.7	5.7	2.4
6.0	2.2	8.2
9.4	8.5	7.9
3.2	5.0	8.2
7.0	0.9	7.9

4.7	4.0	2.7
8.0	0.0	8.0
1.8	6.4	8.2
5.2	2.6	7.8

08.8

20.1

9.05

10.40

01.45

+.13

-.80

2.12

2.04

1.99

2.12

1<sup>m</sup> 2<sup>s</sup> 07 = average.



Oct-15, 3

3 Lacertae

7 Lacertae

10 Lacertae

113	5.0	1.5	6.5	7.8	1.2	9.0	6.3	9.0	5.2
	2.2	8.0	6.2	1.0	5.0	9.0	9.0	6.4	.4
	1.8	4.5	6.3	4.0	4.9	8.9	1.7	3.9	.6
+ .02	5.0	0.8	5.8	6.2	1.7	8.9	4.0	1.4	.4
+ .02	7.9	7.8	5.7	0.4	2.8	9.2	2.0	8.5	.5
14.29	4.9	1.8	6.7	6.9	2.0	9.0	2.4	3.0	.4
	8.4	7.8	6.2	0.3	9.0	9.3	4.9	0.6	.5
.34	1.5	4.3	5.8	3.0	6.0	9.0	7.3	7.9	.2
	4.9	1.3	6.2	6.0	2.7	8.7	0.0	5.1	.1
		7.8				39.0			
						9.0			

20.2  
1.06

25 39.47  
26 41.28

- 1 01.81

+ .06

- .80

1 02.55

1 02.71

22 33 12.69

34 14.34

- 1 01.67

- .03

- .80

1 02.50

.21  
.2  
+ .04  
+ .02  
9.89  
10.05

22 18 8.06

22 19 10.05

- 1 01.99

+ .08

- .80

1 02.71

.18  
.2  
+ .04  
+ .02  
41.22  
41.28

.71

.55

.50

Average = 1<sup>m</sup> 02<sup>s</sup>.59

Oct. 17.4 10 Lacutan

5.4 7.9 3.3

8.0 5.0 3.0

0.5 2.6 3.1

3.0 9.9 2.9

5.8 7.2 3.0

1.0 2.0 2.0

3.7 9.4 3.1

6.3 6.8 3.1

8.9 4.0 2.9

11.49.8

22 33 11.52

34 14.31

- 1 02.79

-.03

-.80

1 03.62

0 Androm.

6.0 1.0 7.0

8.6 8.1 6.7

1.5 5.4 6.9

4.0 2.9 6.9

7.0 0.1 7.1

2.7 4.5 7.2

5.2 9.0 7.1

8.0 6.1 7.0

0.8 3.6 6.9

43.6  
40.89.4

22 55 43.49

56 46.44

- 1 02.95

.00

-.80

1 03.75

Average = 1 m 03.68



Oct 19.4

3 Lacerta

2.7	9.3	2.0
5.9	5.9	1.8
9.2	2.3	1.5
2.4	9.0	1.4
6.0	5.8	1.8

2.7	9.0	1.7
5.6	5.7	1.3
9.2	2.3	1.5
2.4	9.1	1.5

.24
.2
- .048
+ .02
9.99
9.96

.22
.2
- .044
+ .02
41.22
41.20

.13
.2
- .026
+ .02
45.04
45.03

η Pizani

7.4	4.7	2.1
9.6	2.4	2.0
2.0	9.9	1.9
4.3	7.6	1.9
6.8	5.2	2.0

1.7	0.5	2.2
3.9	5.0	1.9
6.3	5.8	2.1
8.7	3.2	1.9

41.0

0.0

22	37	41.0
	37	45.03
	1	04.03
		-.09
		-.80

7 Lacerta

5.3	9.0	4.3
8.4	5.8	4.2
1.5	2.8	4.3
4.8	9.4	4.2
<del>2.2</del>	6.3	—

4.4	9.9	4.3
7.7	6.6	4.3
0.8	3.6	4.4
3.7	0.2	3.9

37.0

1.9

22	25	37.11
	26	41.20
	-1	04.09
		+ .06

+.06

-.80

1 04.83

10 Lacerta

4.1	6.9	1.0
6.9	4.1	1.0
9.3	1.6	0.9
2.0	8.6	0.6
4.7	6.0	0.7

0.1	0.8	0.9
2.6	8.1	0.7
5.1	5.5	0.6
7.7	2.9	0.6

10.3

7.3

22	33	10.38
	34	14.28
	-1	03.90

-.03

-.80

1 04.73

.89
.83
.73
.92

1<sup>m</sup> 04.84 = Average

Oct 23.4 Br. 3077

 $\tau$  Pegasi

	0.9	5.8	6.7
.09	4.9	1.7	.6
.4	8.6	8.0	.6
<u>+.03</u>	2.0	4.4	.4
<u>+.02</u>	5.8	0.9	.4
05.39	3.7	-	-
<u>.54</u>	7.1	9.8	.9
.20	1.0	5.9	6.9
<u>.4</u>	5.0	2.2	7.2
<u>+.08</u>			
<u>+.03</u>			
54.78			
<u>.49</u>			

	7.1	2.0	9.2
	9.5	9.7	9.2
	1.7	7.6	9.3
	4.0	5.1	9.1
	6.0	3.0	9.0
	0.5	8.6	9.1
	2.8	6.4	9.2
	5.1	4.3	9.4
	7.7	2.0	9.7
	59.7		
	11.9		

23 06 48.36

23 13 59.63

07 54.49

15 05.44

1 06.13

- 1 05.81

+.14

-.12

-.80

-.80

1 06.79

1 06.73

.79

.73

Average = 1<sup>m</sup> 06.76



Oct-29-3

 $\eta$  Pegasi~~3 Lacerta~~

3 Lacerta

7 Lacerta

.24  
 .1  
 - .05  
 + .02  
 41.00  
 40.97

1.9 8.9 0.8  
 4.2 6.6 0.8  
 6.3 4.0 0.3  
 8.8 2.0 0.8  
 1.0 9.4 0.4

7.0 3.0 10.0  
 0.0 9.9 9.9  
 2.2 6.3 9.0  
 6.6 3.5 0.1  
 9.8 0.2 0.0

9.3 3.1 2.4  
 2.9 0.1 3.0  
 6.1 7.0 3.1  
 9.0 4.0 3.0

6.0 6.8 1.8  
 8.4 2.7 1.1  
 0.7 0.0 0.7  
 2.9 7.7 0.6  
 35.2

6.9 3.4 0.3  
 0.3 9.9 0.2  
 3.6 6.8 0.4  
 6.7 3.5 0.2  
 0.1

2.0 0.7 2.7  
 8.8 4.0 2.8  
 1.9 0.6 2.5  
 4.9 7.9 2.8  
 8.0 4.3 2.3

.26  
 - .05  
 + .02  
 9.75  
 9.72

22 36 35.37  
 37 44.90  
 - 1 09.53  
 - .09  
 - .80

22 18 0.04  
 22 19 9.72  
 - 1 09.68  
 + .09  
 - .80

31.1  
 6.7  
 22 25 31.35  
 26 40.97  
 - 1 08.62  
 + .07  
 - .80

.18  
 .2  
 - .03  
 + .02  
 14.13  
 14.12

1 10.42

1 10.39

1 09.35

.15  
 - .03  
 + .02  
 44.91  
 44.90

10 Lacerta

8.1 0.8 8.9  
 0.8 8.2 9.0  
 3.2 5.6 8.8  
 6.0 3.0 9.0  
 8.7 0.5 9.2

.18  
 .2  
 - .04  
 + .02  
 60.48  
 60.46

4.0 5.0 9.0  
 6.9 2.3 9.2  
 9.4 9.9 9.3  
 2.0 7.0 9.0  
 4.6  
 10.0

22 33 4.53  
 34 14.12  
 - 1 09.59  
 - .03  
 - .80  
 1 10.42

 $\pi$  Pegasi

5.2  
 2.8  
 0.4  
 8.0  
 5.7

1.3 1.8 3.1  
 3.8 8.2 2.0  
 6.0 6.0 2.0  
 8.4 3.6 2.0  
 51.0

22 3 51.11  
 4 60.46  
 - 1 09.38

Average = 1<sup>m</sup> 10.44

- .80



Image almost continuously<sup>2</sup> 'nebulous' - condensation<sup>3</sup> slight.

Nov. 1.4

$\pi$  Androm.

$\delta$  Androm.

$\gamma$  Androm.

.03  
 .5  
 +.01  
 +.02  
 32.61  
 .64

9.2 8.1 7.3  
 1.4 8.8 6.7  
 4.3 3.2 7.5  
 6.3 0.6 6.9  
 8.7 8.0 6.7  
 3.8 3.8 7.1  
 5.9 0.7 6.6  
 8.3 8.3 6.6  
 0.8 5.8 6.6  
 43.4

5.8 3.5 9.3  
 7.8 1.0 8.8  
 0.6 8.8 9.4  
 2.9 6.3 9.2  
 5.2 3.9 9.1  
 0.8 9.2 9.5  
 2.7 6.8 9.5  
 4.9 4.2 9.1  
 7.3 2.0 9.3  
 9.8

5.8 5.1 3.8  
 8.3 2.8 0.9  
 0.0 0.0 1.1  
 3.4 7.4 0.8  
 1.5 2.1 .6  
 4.0 9.5 .5  
 6.6 7.0 .7  
 9.0 4.5 .5

.05-  
 .5-

+.03  
 +.02  
 54.13  
 54.14

0 29 8.4  
 0 29 43.44  
 310 54.14  
 - 1 19.68  
 -.06  
 -.80  
 1 11.54

0 32 12.0  
 0 32 09.63  
 33 20.50  
 - 1 10.87  
 -.08  
 -.80  
 1 11.75

21.9 21.9  
 14.9  
 0 49 21.77  
 50 32.64  
 1 10.87  
 -.03  
 -.80  
 1 11.70

.05-  
 .5-

-.03  
 +.02  
 20.51  
 20.50

.54  
 .75  
 .70  
 1<sup>m</sup> 11.66 = Average.

Nov. 2.4 Image fairly good. No thin stars taken however.

1 Diffuse, like a small telescopic comet. 2 Not frequently changing to the ordinary form of a star-image. 3 <sup>Increased illumination of</sup> central point of maximum brightness.



Feeling good. Diffraction rings discernible in images.

29

Nov. 3.3

Collimation of Mer. Circ.

Previous = 2130.6

28.3	N	S	
8.7	21 18.7	21 36.8	57.7
8.9	13.5	7.5	7.5
8.2	14.0	7.1	7.7
9.2	14.1	37.1 1/2	57.6 1/3
28.7	13.4	21 47.4	
	21 13.7		
			21 13.7
			47.4
			21 30.6 as before

Nov. 3.4

$\alpha$  Androm.

$\mu$  Androm.

$\delta$  Androm.

1.2	8.0	9.2	8.0	7.1	5.1	5.2	2.8	8.0
3.5	5.5	9.0	0.6	5.0	.6	7.8	0.3	8.1
5.7	3.3	9.0	3.0	2.6	.6	0.1	8.0	8.1
8.1	0.9	9.0	5.4	0.1	.5	2.4	5.7	8.1
0.4	8.6	9.0	8.0	-	-	4.8	3.3	8.1
5.0	3.9	8.9	3.0	2.7	.7	9.2	8.4	7.6
7.7	1.7	9.4	5.4	0.1	.5	1.7	6.0	7.7
9.8	9.0	8.8	0.6	5.1	.7	4.1	3.7	7.8
2.0	8.8	8.8	5.4	0.1	.5	6.5	11.0	7.5
	24.6							09.0
	9.7							18.0
h m	24.51		7.9	7.9	.8	h m	8.95	
2	35.90		0.6	5.1	.7	32	20.50	
-1	11.39				42.0	33	11.55	
	-.09				13.5	-1	-.08	
	-.80		0	29	42.79		-.80	
	1	12.28		30	54.12		1	12.43
				-1	11.38			
					-.06			
					-.80			
				1	12.24			

Images small but not bright.  
 Relay and chronograph located for first time.

Nov. 6.4

X Androm.

21 Androm.

9.8	6.7	6.5
2.1	4.2	.3
4.5	1.8	.3
6.9	9.5	.4
9.0	<del>7.6</del>	.1
2.9	<del>2.6</del>	.5
	0.1	
6.1	<del>4.8</del>	.2
8.5	<del>6.1</del>	.3
0.8	<del>8.5</del>	.2

$$\begin{array}{r} 23.1 \\ \hline 20.6 \end{array}$$

2.9

0 01 23.15

02 35.88

- 1 12.73

- .09

- .80

1 13.62

7.1	8.3	5.4
0.2	5.3	5.2
6.0	9.3	5.3
8.9	6.6	5.5
1.9	3.4	5.3
4.7	0.7	5.4
		17.6
		<u>8.7</u>

0	3	17.67
	4	30.51
- 1		12.84

+ .02

- .80

1 13.62

.12
<u>2</u>
- .02
+ .02
<u>30.51</u>
30.51



6 Andromeda

2 Lindy on .

9.0	4.6	4.6
1.2	3.0	4.2
3.1	1.0	4.1
5.8	2.8	4.6
8.0	5.0	4.0

3.0	5.3	1.6	4.6
6.3	7.5	9.2	4.6
7.5	9.7	8.8	4.3
7.9	2.3	24.9	4.8

$$\begin{array}{r} 22.8 \\ \times 4.0 \\ \hline 0 \quad 4 \quad m \\ \quad 1 \quad 22.21 \\ \quad 2 \quad 35.86 \\ \hline \quad \quad 13.65 \end{array}$$
$$\begin{array}{r} 1.00 \\ - .80 \\ \hline 1.14.46 \end{array}$$
$$\begin{array}{r} 14.54 \\ - .80 \\ \hline 13.74 \end{array}$$

Average 1<sup>m</sup> 14.<sup>s</sup> 50

Nov. 12.3

7 Pegasi

4 Carinae

70 Pegasi

.13  
 .4  
 + .05  
 + .02  
 .05.15  
 .22

.39  
 .4  
 + .18  
 + .02  
 52.09  
 52.84

.11  
 .4  
 + .04  
 + .02  
 26.84  
 28.80

1.88  
 .91  
 4.95  
 .24

— 2.9  
 — 0.6  
 — 8.3  
 4.9 6.0 0.9  
~~8.0~~ 3.9 1.9  
 1.4 9.3 0.7  
 3.7 7.0 0.7  
 6.0 4.9 0.9  
 8.1 2.5 0.6

50.4  
 4.2

23 13 50.38  
 15 05.22  
 — 1 14.84  
 — .12  
 — .80  
 1 15.76

4.0 1.2 5.2  
 8.7 6.7 5.4  
 2.7 2.4 5.1  
 7.0 8.0 5.0  
 1.2 4.0 5.2  
 0.3 5.0 5.3  
 4.5 0.6 5.1  
 9.0 6.4 5.4  
 3.1 1.9 5.0

37.4  
 11.1  
 37.58  
 52.84  
 15.26

1.8 3.7 5.5  
 3.0 2.0 5.0  
 5.9 9.0 4.9  
 7.6 9.8 5.4  
 6.5 4.8 5.4  
 1.8 8.2 5.0  
 4.7 0.6 5.3  
 6.6 9.0 5.0

35- 28.6  
 23 18 37.58  
 19 52.84  
 — 1 15.26

+ .24  
 — .80  
 15.81

3.1 4.9 8.0  
 5.0 3.0 8.0  
 7.2 0.8 8.0  
 9.4 9.0 8.4  
 1.8 6.8 8.1

6.0 2.7 8.7  
 7.9 0.3 8.2  
 0.0 8.3 8.3  
 2.0 6.0 8.0

14.0  
 1.7  
 14.09  
 23 22 28.90  
 — 1 14.81  
 — .18  
 — .80  
 15.79

Average 1 15.79



o Cassiope.

u Androm.

Nov. 13.4

$$\begin{array}{r}
 .10 \\
 .3 \\
 \hline
 +.03 \\
 +.02 \\
 \hline
 29.59 \\
 29.64
 \end{array}$$

$$\begin{array}{r}
 .07 \\
 .3 \\
 \hline
 +.02 \\
 +.02 \\
 \hline
 32.54 \\
 32.58
 \end{array}$$

3.8	5.0	8.8
6.8	1.9	8.7
9.9	9.0	8.9
2.9	5.6	8.5
5.8	—	—
1.9	6.0	7.9
4.8	5.2	8.0
7.9	0.2	8.1
1.1	7.0	8.1

14.0

3.0

4		14.18
0	38	29.64

—	1	15.46
---	---	-------

+.05

-.80

1 16.21

1.6	2.0	4.6
3.7	0.3	4.0
6.2	8.0	4.2
8.9	5.3	4.2
1.5	2.5	4.0

7.0	7.5	4.5
9.2	4.9	4.1
1.8	2.3	4.1
4.7	9.8	4.5

17.0

2.2

4		17.12
0	50	32.58

—	1	15.46
---	---	-------

-.03

-.80

1 16.29

Average 1 16.25

34

Nov. 1514

Y Androm.

B Androm.

.07  
 $\frac{.1}{.17}$   
 +.01  
 +.02  
 32.54  
 $\frac{57}{57}$

0.0 2.1 2.1

2.6 9.6 .3

5.0 7.0 .0

7.9 4.3 .2

0.4 1.9 .3

6.0 6.6 .6

8.2 4.0 .2

1.0 1.3 .3

3.5 8.9 .4

.04  
 $\frac{.1}{.14}$   
 $\frac{.004}{.144}$

+ .02

27.92

27.94

16.0

2.3

0 49 16.12

50 32.57

- 1 16.45

-.03

-.80

1 17.28

- 6.7

- 8.9

- 1.7

- 9.0

- 6.5

- 0.7

4.1 9.0 3.1

6.7 6.7 3.4

8.9 4.1 3.0

11.6

4.1

1 2<sup>m</sup>

11.59

3

27.94

- 1

16.34

-.05

-.80

1 17.20

Average 1<sup>m</sup> 17.24



Nov 17.4

2 Androm.

.15	5.1	2.4	7.5
.3	7.7	9.9	7.6
<u>-.04</u>	0.1	4.4	4.5
+ .02	2.3	8.0	7.3
30.77	4.8	2.6	7.4
35	9.3	8.0	7.3
	1.8	5.8	7.6
	4.0	3.3	7.3
	6.4	0.9	7.3

18.8  
13.6

0	1	18.72
	2	36.77
- 1		17.05
		-.09
		-.80
	1	17.94

.12  
.3  
-.04  
+ .02  
28.74  
28.72

22 Androm.

3.5-3.0	6.5
6.4 9.8	.3
9.3 6.7	.0
2.1 3.9	.0
5.4 0.6	.0
1.7	-
4.4 2.0	.4
7.5 9.1	.6
0.0 6.0	.0

13.3  
2.0  
0 03 13.12  
04 30.35  
- 1 17.23  
+ .02  
- .80  
18.01

6 Androm.

6.2	7.2	2.4
8.5	4.6	8.2
1.3	1.9	3.2
3.7	9.8	3.0
6.0	7.0	3.0
1.6	1.7	3.3
4.0	9.0	3.0
6.6	6.6	3.2
9.2	4.0	3.2

11.7  
11.2  
11.59

0	11	28.72
	12	
- 1		17.13
		+ .11
		-.80
	1	17.82

Average 1<sup>m</sup> 17.93

36

Nov 20.3

Androm.

$$\begin{array}{r}
 .41 \\
 .4 \\
 \hline
 - .04 \\
 + .02 \\
 \hline
 54.00 \\
 \hline
 53.98
 \end{array}$$

0.9	0.1	1.0
3.0	7.1	0.1
5.6	4.9	0.5
8.0	2.7	0.7
0.6	—	—
5.6	5.0	0.6
8.0	2.7	0.7
0.3	0.3	0.6
3.0	7.8	0.8

35.5

18.5

0 29 35.32

30 53.98

- 1 18.66

- .06

- .80

1 19.52

Androm.

7.8	5.5	3.3
0.0	2.8	2.8
2.6	0.8	3.1
5.1	8.0	3.1
7.0	5.9	2.9

1.8	1.1	2.9
4.3	8.8	3.1
6.9	6.3	3.2
9.0	3.9	2.9

01.2

9.5

1.5

0 33 20.37

- 1 18.87

- .08

- .80

1 19.75

$$\begin{array}{r}
 .52 \\
 .75 \\
 \hline
 19.64
 \end{array}$$

Averages



## 61 Cygni

5.8	8.1	8.9
8.3	5.8	4.1
1.1	2.9	4.0
3.7	0.3	4.0
6.0	7.9	3.9
0.5	2.5	4.0
4.3	9.8	4.1
6.8	7.1	3.9
9.1	4.0	

31.8

16.4

21	0	31.98
	1	31.38

19.40

- .08

- .80

1 20.23

114

123

137

1<sup>m</sup> 20.25 = Average

## V Cygni

Nov. 21.2

2.0	5.8	8.8
4.7	4.0	
7.5	1.0	.7
0.5	8.0	.5
3.0	5.3	.3
8.4	0.2	.6
1.0	7.6	.6
4.0	4.9	.9
6.7	2.0	.7

39.0

5.6

20 57 39.29

2.9	52	58.62
0.3	-1	19.53
7.8		.01
0.2		-.80
3.0	1	20.14

5.8
1.0

## τ Cygni

2.9	4.7	7.6
5.3	2.0	7.3
7.8	9.2	7.0
0.2	6.9	7.1
3.0	4.8	7.3
8.3	9.1	7.4
1.0	6.6	7.6
3.7	4.0	7.7
5.0	1.3	7.3

58.5

12.8

8 58.67

21 19 18.20

- 1 19.53

- .80

58.84

- .11

+ .02

.75

- .10

+ .02

51.46

31.38

.21

.6

- .13

+ .02

.26

.4

+ .08

+ .02

18.10

18.20

Images good in spite of low fog. Diffraction rings and discs discernible.

Nov. 16.4

Fringing

B Arctis

J Androm.

4.8	2.1	6.9	1.8	6.0	7.8	1.1	6.1	7.2
7.1	9.8	6.9	4.0	3.8	7.8	2.7	3.1	6.8
9.5	7.2	6.7	6.1	1.3	7.4	6.3	0.6	6.9
1.7	4.8	6.5	8.2	9.1	7.3	9.3	8.0	7.3
4.0	2.3	6.3	0.3	6.9	7.2	5.0		
--	--		5.1	2.8	7.9			
			7.1	0.5	7.6			
1.3	5.6	6.9	9.3	8.1	7.4	7.2	9.3	6.5
3.7	3.3	7.0	1.8	5.9	7.5	0.1	6.5	6.6
6.0	1.0	7.0				3.1	3.7	6.8
		18.6			03.8	5.8	1.0	6.8
		6.8			14.3			
		18.40			03.75			

$$\begin{array}{r}
 1 \quad 46 \quad 42.03 \\
 - 1 \quad 23.63 \\
 \hline
 .09 \\
 - \\
 .80 \\
 \hline
 1 \quad 24.52
 \end{array}$$

$$\begin{array}{r}
 1 \quad 48 \quad 27.22 \\
 - 1 \quad 23.47 \\
 \hline
 .14 \\
 - \\
 .80 \\
 \hline
 1 \quad 24.41
 \end{array}$$

$$\begin{array}{r}
 38.7 \\
 7.6 \\
 \hline
 1 \quad 55 \quad 28.45 \\
 57 \quad 01.97 \\
 \hline
 1 \quad 23.52 \\
 .00 \\
 - .80 \\
 \hline
 1 \quad 24.32
 \end{array}$$

$$\begin{array}{r}
 .62 \\
 .41 \\
 .32 \\
 .45 \\
 .50 \\
 \hline
 1 \quad 24.44 \\
 \text{average}
 \end{array}$$

B Triang.

B Arctis

4.4	4.6	9.0
7.0	2.0	9.0
9.4	9.6	9.0
2.0	7.0	9.0
4.7	4.4	9.1
9.4	9.7	9.1
2.0	7.0	9.0
4.5	4.5	9.0
7.0	2.0	9.0

Remarkable Accordance

$$\begin{array}{r}
 29.6 \\
 9.8 \\
 \hline
 2 \quad 01 \quad 29.52 \\
 02 \quad 53.11 \\
 \hline
 1 \quad 23.59 \\
 - .06 \\
 \hline
 1 \quad 23.53
 \end{array}$$

6.0	0.8	6.8
8.0	8.2	6.2
0.2	6.0	6.2
2.4	3.8	6.2
4.5	1.3	6.1
9.3	7.1	6.4
1.9	5.0	6.9
3.9	2.6	6.7
6.0	0.7	6.7

$$\begin{array}{r}
 28.2 \\
 4.4 \\
 \hline
 28.13 \\
 51.71 \\
 - 1 \quad 23.58 \\
 \hline
 - .80 \\
 \hline
 1 \quad 24.50
 \end{array}$$

A remarkable and annoying effect of  
rate, due to high temperature



Nov. 29.2

74 Cygni

 $\pi^2$  Cygni

16 Pegasi.

120  
13  
- .06  
+ .02  
26.61  
57

3.5 7.6 1.1  
6.2 4.9 1.1  
9.0 1.9 0.9  
1.9 9.4 1.3  
4.2 6.9 1.1  
9.9 1.2 1.1  
2.7 8.3 1.0  
4.9 5.7 0.8  
7.7 2.1 0.8

- 3.5  
- 0.2  
- 7.2  
- 4.0  
- 0.6  
- 8.0  
- 1.6  
- 8.3  
9.0 3.2 4.2  
12.1  
12.1

- 3.8  
0.5 1.6 2.1  
2.8 9.0 1.8  
4.9 6.8 1.7  
7.0 4.3 1.3  
1.9 0.0 1.9  
4.0 7.8 1.8  
6.0 5.4 1.4  
8.3 3.1 1.4  
30.7  
14.1

16  
3  
- .04  
+ .02  
56.91  
56.88

00.3  
9.5  
21 31 00.50  
22 26.57  
- 1 26.07

21 42 38.53  
- 1 26.43  
+ .06  
- .80  
1 27.19

21 46 30.83  
47 56.88  
- 1 26.05  
11  
1.80  
1 26.96

26  
3  
- .08  
+ .02  
38.59  
38.53

- .02  
- .80  
1 26.82

82  
96  
26.89 Average

40

Images very bad (large)

Dec. 1.4

O Pencil

 $\alpha$  Triang. $\beta$  Antin

.05	8.9	2.9	1.8	0.2	7.2	7.5	—	1.0
.5	2.0	9.7	1.7	2.5	4.8	7.3	—	8.9
+ .03	5.0	6.8	1.8	5.0	2.5	7.5	—	6.5
+ .13	8.2	3.0	1.2	7.0	0.2	7.2	3.8	4.5
27.15	1.3	0.1	1.4	9.3	8.0	7.3	6.0	2.1
.19	8.3	8.7	2.0	4.7	3.0	7.7	0.3	2.1
	9.4	2.5	1.9	6.7	0.9	7.6	2.5	5.7
	0.8	1.3	2.1	8.9	8.3	7.2	4.6	3.2
.12	1.6	0.4	2.0	1.3	6.0	7.3	6.8	1.0
.5	2.8	9.4	2.2			13.8		
+ .06	3.8	8.3	2.1			13.4		
+ .02	4.5	7.3	1.8	1 45	13.71			58.9
39.08	5.5	6.2	1.7	1 46	42.02			13) 13.3
.15	6.5	5.0	1.5	—	28.29		1 47	59.02
	7.6	3.7	1.3	—	.09		48	27.19
.06	8.4	2.5	0.9	—	.50		—	28.17
.5	9.9	1.9	1.8	1	29.18		—	.13
+ .03								.80
+ .02								1 29.10
42.01								
42.02								

 $\beta$  Triang.

35) 30.2  
 1 35 10.86  
 36 39.16  
 — 1 28.30  
 + .07  
 — .80  
 1 29.03

.03  
 .18  
 .10  
 1 29.10 Average

Dec. 2.2 Front surface of objective and 5 of the surfaces of lens in the eye-piece of micra. circ. cleaned. The surface from the eye, of the lens next the eye could not be reached. The prism in eye-piece did not need touching.



Image good and steady.

Dec. 24	S Persei	3 Persei.	E Persei
.08	5.0 -	1.7 9.9 1.6	3.6 7.0 0.6
.3	8.0 -	4.0 7.3 1.3	6.3 4.4 0.7
<u>.102</u>	1.0 -	6.4 4.8 1.2	9.0 2.6 1.0
+1.02	4.1 -	8.8 2.2 1.0	1.7 9.0 0.7
	7.0 -	0.9 0.0 0.9	4.0 6.4 0.4
	3.1 8.0	5.8 5.1 0.9	9.6 1.1 0.7
	6.0 8.4 9.5	8.2 2.8 1.0	2.0 8.5 0.5
	9.5 1.4 6.0	0.9 0.5 0.4	5.0 6.0 1.0
	4.1 3.1	3.1 7.8 0.9	7.6 3.0 0.6
	7.5	35.5	50.2
		9.7	6.4
	-31 8.4.2	45- 35.51	3 48 50.34
	-50 2.0	3 47 5.90	50 20.81
	-110 8.4	-1 30.39	-1 30.47
	-4.1 5.4	- 0.8	- .02
	5.1 9.5 4.6	- 1.80	- .80
	8.0 6.0 .0	1 31.27	1 31.29
	1.0 3.1 .1		
	4.1 0.0 .1		
	27.0		
	0.8		
	3 33 27.09		
	34 57.81		
	-1 30.72		
	+0.4		
	- .80		
	1 31.48		

48  
27  
29  
31.35 Coverage

42

Image good.

Dec 5.2

o Androm.

B Pegasi

T Pegasi

.20  
 .1  
 +.02  
 +.02  
 45.51  
 .55

6.0 1.1 7.1  
 8.9 8.5 .4  
 1.6 5.7 .3  
 4.3 3.0 .3  
 7.0 0.1 .1  
 2.8 4.6 .4  
 5.4 1.9 .3  
 8.0 9.0 .0  
 1.0 6.4 .6

.16  
 .1  
 +.02  
 +.02  
 19.90  
 19.94

13.6  
 12.1  
 22 55 13.64  
 56 45.55  
 -1 31.91  
 .00  
 -1.80  
 1 32.71

5.0 1.3 6.3  
 7.2 9.0 6.2  
 9.6 6.7 6.3  
 1.9 4.3 6.2  
 4.1 1.9 6.0  
 9.0 7.2 6.2  
 1.0 5.1 6.1  
 3.5 2.7 6.2  
 5.8 0.3 6.1

48.0  
 1.6  
 48.08  
 19.94  
 22 58 31.86  
 -1 .10  
 -1.80  
 +1 32.76

1.0 5.4 .4  
 3.0 3.2 .2  
 5.1 1.0 .1  
 7.2 8.9 .1  
 9.8 6.8 .3  
 4.1 2.0 .1  
 6.5 9.8 6.3  
 8.6 17.5 6.1  
 6.0 18.2 6.2

33.0  
 1.8  
 33.09  
 4.90  
 23 15 31.81  
 -1 .12  
 -1.80  
 +1 32.73

+ 1 32.73 Average.



O Anderson

B Pegasi

Bn. 3077.

17	5.1	0.3	8.4
4.3	7.8	7.7	.5
7.0	0.4	5.0	.4
9.9	3.1	2.0	.1
2.7	6.0	9.1	.1
1.7	3.9		.6
4.3	1.0		.3
7.0	8.7		.7
9.9	5.4		.3

12.9

13.3

22 5-5 12.70

56 45.53

- / 32.83

ac

-80

1 93.63

$$\begin{array}{r} 63 \\ 63 \\ 73 \end{array}$$

1  $\overline{33.67}$  Average

4.0	0.3	.3
6.3	8.0	.3
8.7	5.8	.5
1.0	3.5	.5
3.3	1.0	.3
8.0	6.4	.4
0.2	4.1	.3
2.4	1.8	.2
5.0	9.4	4.4

47.0

3.2

47.17

19.92

22 58 19.92

29 75

10

152

65

۳۳. ۶۵-

20.3

$$35 \overline{) 8.0}$$

20.23

28 7 58.31

33.08

+

33.7

$N$	$\tan \delta$	$\delta$	$1^{\text{st}} \text{ diff.}$	$\frac{10}{1^{\text{st}} \text{ diff.}}$
-1.25	-.3375	-18° 39	5 17	.032
1.15	.2375	-13 22	5 32	.030
1.05	.1375	-7 50	5 41	.029
0.95	-.0375	-2 9	5 44	.029
.85	+.0625	+3 35	5 39	.029
.75	.1625	9 14	5 29	.030
.65	.2625	14 43	5 13	.032
.55	.3625	19 56	4 53	.034
.45	.46	24 <sup>49</sup> 56	4 33	.037
.35	.56	29 22	4 10	.040
.25	.66	33 32	3 48	.044
.15	.76	37 20	3 27	.048
- .05	+.86	40 47	3 7	.053
+ .05	.96	43 54	2 50	.059
.15	1.06	46 44	2 34	.065
.25	1.16	49 18	2 19	.072
.35	1.26	51 37	2 6	.079
.45	1.36	53 43	1 55	.087
.55	1.46	55 38	1 45	.095
.65	1.56	57 23	1 35	.105
.75	1.66	58 58	1 28	.114
.85	1.76	60 26	1 20	.125
.95	1.86	61 46	1 14	.135
1.05	1.96	63 0	1 8	.147
1.15	2.06	64 8	1 3	.159
1.25	2.1625	65 11	58	.172
1.35	2.26	66 9	55	.182
1.45	2.36	67 4	50	.200
1.55	2.46	67 54	47	.213
1.65	2.56	68 41		



Dec 8.2

$$\begin{array}{r}
 .15 \\
 \underline{.2} \\
 -.04 \\
 +1.02 \\
 13.36 \\
 \hline
 13.34
 \end{array}$$

$$\begin{array}{r}
 .15 \\
 \underline{.2} \\
 -.03 \\
 +1.02 \\
 44.26 \\
 \hline
 .25
 \end{array}$$

$$\begin{array}{r}
 .14 \\
 \underline{.2} \\
 -.03 \\
 +1.02 \\
 7.25 \\
 \hline
 .24
 \end{array}$$

10 Lacertae

$$\begin{array}{r}
 815 \\
 13 \\
 39 \\
 67 \\
 9 \\
 \hline
 \end{array}
 \begin{array}{r}
 5.5 \\
 3.0 \\
 0.1 \\
 7.7 \\
 4.8 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 8.5 \quad 9.7 \quad 8.2 \\
 1.3 \quad 7.0 \quad 8.3 \\
 3.9 \quad 4.3 \quad 8.2 \\
 6.7 \quad 1.8 \quad 8.5 \\
 9.0
 \end{array}$$

$$\begin{array}{r}
 39.0 \\
 \hline
 1.2
 \end{array}$$

$$\begin{array}{r}
 39.12 \\
 13.34 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1 \quad 34.22 \\
 \quad \quad .03 \\
 \quad \quad .80 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1 \quad 35.05
 \end{array}$$

11 Pegasi

$$\begin{array}{r}
 6.4 \quad 3.9 \quad .3 \\
 8.9 \quad 1.7 \quad .6 \\
 1.0 \quad 9.1 \quad .1 \\
 3.9 \quad 6.8 \quad .7 \\
 6.0 \quad 4.2 \quad .2
 \end{array}$$

$$\begin{array}{r}
 0.8 \quad 9.7 \quad .5 \\
 3.0 \quad 7.1 \quad .1 \\
 5.4 \quad 4.9 \quad 0.3 \\
 7.8 \quad 2.3 \quad 0.1
 \end{array}$$

$$\begin{array}{r}
 10.0 \\
 \hline
 2.9
 \end{array}$$

$$\begin{array}{r}
 10.15 \\
 44.25 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1 \quad 34.10 \\
 \quad \quad .03 \\
 \quad \quad .80 \\
 \hline
 134.93
 \end{array}$$

11 Pegasi

$$\begin{array}{r}
 0.8 \quad 5.7 \quad .5 \\
 3.0 \quad 3.6 \quad .6 \\
 5.2 \quad 1.2 \quad .4 \\
 7.6 \quad 2.9 \quad .5 \\
 9.7 \quad 6.6 \quad .3 \\
 4.3 \quad 2.2 \quad .5 \\
 6.5 \quad 9.9 \quad .4 \\
 8.8 \quad 7.9 \quad .7 \\
 1.0 \quad 5.4 \quad 6.4
 \end{array}$$

$$\begin{array}{r}
 33.1
 \end{array}$$

$$\begin{array}{r}
 4.4
 \end{array}$$

$$\begin{array}{r}
 33.23
 \end{array}$$

$$\begin{array}{r}
 7.24
 \end{array}$$

$$\begin{array}{r}
 1 \quad 34.01
 \end{array}$$

$$\begin{array}{r}
 .14
 \end{array}$$

$$\begin{array}{r}
 .80
 \end{array}$$

$$\begin{array}{r}
 1 \quad 34.95
 \end{array}$$

$$\begin{array}{r}
 35.05
 \end{array}$$

$$\begin{array}{r}
 4.93
 \end{array}$$

$$\begin{array}{r}
 4.95
 \end{array}$$

$$1^m \quad 34.98 = \text{average}$$

Dec.  
Jan 12.3

2 Triang.

.10	1.3	8.4	9.7
.4	3.7	6.1	9.8
+ .04	6.0	3.8	9.8
+ .02	8.4	1.5	9.9
61.78	0.7	9.1	9.8
.84	5.7	4.3	0.0
	8.0	2.0	0.0
	0.3	9.6	9.9
	2.7	8.1	9.8
		0.50	
		16.7	
		04.88	
	1.46	41.92	
	- 1	37.04	
	-	.09	
	-	.80	
	1	37.93	
.094			
+ .04			
+ .02			
41.86			
41.92			
.07			
.4			
+ .03			
+ .02			
51.58			
51.63			

3 Triang.

1.0	1.0	2.0
3.5	8.2	1.7
6.0	6.0	2.0
8.5	3.4	1.9
1.0	0.9	1.9
6.0	5.9	1.9
8.7	3.3	2.0
1.0	1.0	2.0
3.4	8.5	1.9
		16.0
		18.3
		10.96
2	2	53.01
- 1		37.05
-		.06
-		.80
1		37.91

y Audum.

7.1	2.6	9.7
0.0	9.9	9.9
2.7	7.0	9.7
5.4	4.3	9.7
8.1	1.4	9.5
3.9	6.0	9.9
6.9	3.3	0.2
9.4	0.5	9.9
2.0	7.6	9.6

24.9
17.0
1 55 24.89
57 01.84
- 1 36.95
.00
- .80
1 37.75

2 Aricles.

2.2	7.0	.2
4.8	8.0	.8
6.9	2.7	.6
9.0	0.2	.2
1.3	8.2	.5
5.8	3.8	.6
8.0	1.6	.6
0.0	9.1	.1
2.3	6.9	9.2
14.7		
13.5		
14.71		
2 0 51.63		
- 1 36.92		
-		.12
-		.80
1 37.84		

.93
.75
.84
.91
1 37.86 = Average



Dec 14.2

Collimation of Merid. Circ.

Done at 2130.3

Probably slightly disturbed by Mr. Clark's mistake

16.5

1.8

N

S

.4

2102.0

2138.2

59.1

.8

1.7

7.9

9.4

.9

2.2

8.0

9.2

16.7

2.3

38.0 1/3

59.2 1/3

2.0

59.2 1/3

2.04

48.63

Old 30.6

02.04

Now 25.3

25.3

Set at 2128.0

56.2  
 7.0  
 38.2  
 3.0  
 35.6  
 38.6  
 28.2  
 4) 0.4  
 0.1  
 of incl  
 down 7v.

48

Russian Transit

Dec. 16.4 5<sup>h</sup> 11<sup>m</sup> 10<sup>s</sup>

	C.W.	C.E.
Outlier	20.9 130.0 30.9	
Latin	31.2 118.3 29.5	
	42.4 107.6 30.0	
	53.4 96.7 30.1	
	64.1 85.7 29.8	
	<u>0.3</u>	
	35 75.03	

35 47.66

1 04.90

C.W. 36 52.56 computer middle

37 56.10

1 04.90

36 51.20

C.W. 36 51.20

Diff due to collimation

3.07

=

1.53

408

680

136

C = 2.08

1.36

0.163

408

816

136

C = 0.64

1<sup>st</sup> atrop.C = 0.22 1<sup>st</sup> atrop.

35.08

04

12

n = 1.55

2<sup>nd</sup> atrop on 50 gms C = 0.51

1.17 1.19

51 51

117 119

585 595

5967 6059

All correction  
upside  
for level.

3 Pers C.E.	-1 40.21
C Aug' C.W.	.48
C Pers C.E.	.26
2 Pers C.W.	.25
Amage	-1 40.30
Base	+0.20

Clock slow = 1<sup>m</sup> 40<sup>s</sup> 10

by Russ.

5<sup>h</sup> 11<sup>m</sup> 10<sup>s</sup>

	C.W.	1 <sup>st</sup> atrop	C.W. 2 <sup>nd</sup> atrop
20.9	64.1	85.0	25.7 70.0 95.7
31.2	53.4	84.6	36.7 58.3 95.0
	<u>42.4</u>		<u>47.6</u>
	<u>2.0</u>		<u>3.3</u>
	34 <sup>m</sup> 42.40		35 <sup>m</sup> 47.66
	35 <sup>m</sup> 47.66		34 42.40
Mean	35 <sup>m</sup> 15.03	Diff	1 05.26
	Computer middle time		36 51.92

C.E. next to last day

346 77.4 112.0

45.5 67.0 112.5

56.0

0.5

37 56.10

38 60.64

Mean 38 28.37

35 15.03

3<sup>h</sup> 36<sup>m</sup> 51.70

38 38.12

-1 43.42

-1 39.90

2.27) 3.52 (1.55

2.27

1250

1135

1151

C.E. last day

48.5 83.0 131.5

59.1 71.9 131.0

60.7

3.2

38 60.64

37 56.10

Diff 1 04.54

1 09.26

Mean Diff 1 04.90

3 Pers -1 40.09

1 Aug' -1 39.70

-1 39.90

3 Pers, last day = 0.614

Aug' " = 0.649

0.631

5 H.E. " = 2.90

2.27



643

recd = 1.17

recd = 1.19

1.17

4501

643

643

752

643

1.19

787

643

643

765

1.17

22

234

234

257

1.19

22

238

238

2618

3 P. E.

27.8 3.6 1.4

31.6 9.6 .2

35.6 5.5 .1

39.9 1.4 .3

43.9 7.1 .0

47.4 8.9 .3

51.4 4.9 1.3

0.4 0.5 0.9

4.9 6.3 1.2

8.9 2.6 0.9

7.4 3.9 1.3

1.6 9.8 1.4

25.6

14.9

3 45 25.60

0.25

26.86

47 05.95

- 1 40.09

Approx. correction  
for coll. only

1.55

.30

.46

1.55

.26

930

310

.40

3 45 25.60

47 05.95

- 1 40.35

- .46

- 1 40.81

+.60

- 1 40.21

1.19 C.W.

4.0 2.3 6.3

8.0 8.0 6.0

2.1 3.6 5.7

6.7 9.7 6.4

1.0 5.5 6.5

9.0 6.9 5.9

3.4 2.7 6.1

7.6 8.4 6.0

2.0 4.1 6.1

6.0 0.0 6.0

4.8 1.4 6.2

8.9 7.1 6.0

03.0

1.2

4 48 03.05

0.26

02.79

49 42.52

- 1 39.73

- 1 39.70

4 48 03.05

49 42.52

- 1 39.47

- .40

- 1 39.87

- .61

1 40.48

Lower

5.4 32.0 31.6

34.8 9.0 25.8

5.8

5.8 32.0 31.2

36.4 8.4 28.0

3.2

5.8

819.0

1.125

recd = 1.35

5625

3375

1125

1.52

.13

456

1.52

.1975

Buck = 0.20  
west end highCorrection for m only

(as given by the above handling)  
The correction for irregularity of profile is about  $0.03 \pm$  which would  
account for a discrepancy of  $0.06$  between the two sides.

4) 3.2 4) 5.8  
0.8 1.45  
1.35 0.8  
1.02 0.65  
1.15 0.16  
1.20 0.13  
1.35 0.16  
1.40 0.16  
1.45 0.16  
1.50 0.16  
1.55 0.16  
1.60 0.16  
1.65 0.16  
1.70 0.16  
1.75 0.16  
1.80 0.16  
1.85 0.16  
1.90 0.16  
1.95 0.16  
2.00 0.16  
2.05 0.16  
2.10 0.16  
2.15 0.16  
2.20 0.16  
2.25 0.16  
2.30 0.16  
2.35 0.16  
2.40 0.16  
2.45 0.16  
2.50 0.16  
2.55 0.16  
2.60 0.16  
2.65 0.16  
2.70 0.16  
2.75 0.16  
2.80 0.16  
2.85 0.16  
2.90 0.16  
2.95 0.16  
3.00 0.16  
3.05 0.16  
3.10 0.16  
3.15 0.16  
3.20 0.16  
3.25 0.16  
3.30 0.16  
3.35 0.16  
3.40 0.16  
3.45 0.16  
3.50 0.16  
3.55 0.16  
3.60 0.16  
3.65 0.16  
3.70 0.16  
3.75 0.16  
3.80 0.16  
3.85 0.16  
3.90 0.16  
3.95 0.16  
4.00 0.16  
4.05 0.16  
4.10 0.16  
4.15 0.16  
4.20 0.16  
4.25 0.16  
4.30 0.16  
4.35 0.16  
4.40 0.16  
4.45 0.16  
4.50 0.16  
4.55 0.16  
4.60 0.16  
4.65 0.16  
4.70 0.16  
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Dec 16.4 cont. c Pusi c. E.

q Pusi l. W.

- 4.5 -

4.2 7.0 1.2

- 0.4 -

9.7 1.7 1.4

- 4.2 -

4.9 6.3 1.2

3.7 9.0 2.7

0.6 1.1 1.7

9.1 3.8 2.9

6.0 5.0 1.0

9.7 3.8 2.7

6.9 4.1 1.0

4.8 8.2 2.8

2.2 8.8 1.0

9.9 7.1 2.8

7.8 3.4 1.2

5.0 7.8 2.1

3.0 7.9 0.7

0.5 2.7 1.0

8.9 2.6 1.5

1.0 1.9 2.9

9.9 1.5 1.4

6.1 6.6 2.7

5.0 6.0 1.0

51.3

40.6

5.9

14.9

3 58 51.35

3 14 40.60

60 32.64

16 20.47

-1 41.29

-1 39.87

+2.8

+4.0

-1 41.01

-1 39.47

-1 39.47

-1 39.47

2.8 1.54 55

-1 39.47

140

1 40.25

corrected for Wonly

3/1.54  
.51

-1 41.01

-1 39.47

2.8 1.54 55

140

-1 41.01

+7.5

-1 40.26

1.48

.57

148

740

.7548

1.52

.57

152

760

.7752



Dec. 16.4 *M. vid. line.*

*T. Tamin*

9.9	4.3	4.2
2.1	2.0	.1
4.1	9.9	.0
6.3	7.7	.0
8.7	5.4	.1
3.1	1.0	.1
5.4	8.9	.3
7.6	6.5	.1
0.0	4.1	.1

52.0

1.0

4 33 52.05

35 31.73

-1 39.68

-.12

-.80

1 40.60

+ 40.74 average

*4 lanes*

6.9	6.9	1.8
0.2	0.8	8.0
4.0	4.2	4.0
8.0	8.0	0.2
1.8	2.0	6.8

*4 Camalops*

3.9	8.8	2.7
7.4	5.0	2.8
1.2	1.0	2.2
5.0	7.2	2.2
9.0	3.8	2.8
6.8	6.2	3.0
7.9	5.0	2.9
9.0	3.9	2.9
0.1	2.8	2.9
1.3	1.3	2.6
2.8	0.0	2.8
4.0	9.0	3.0
5.0	7.7	2.7
6.3	6.2	2.5
7.6	5.1	2.7
9.0	3.9	2.9
0.2	2.6	2.8

01.3

35 12.7

01.33

4 38 41.589

-1 40.286

+ .15

-.80

1 40.88

91

Continued.

Merid. Circle

Dec. 16.4

9.0	1.8	0.8
1.0	9.6	0.6
3.0	7.3	0.3
5.1	5.3	0.4
7.3	3.1	0.4

1.8	5.8	0.6
4.0	6.8	0.7
6.0	4.5	0.3
8.1	2.3	0.4

50.2

4.9

50.26

4 29 29.99

- 1 39.73

.15

.80

1 40.68

in Perseus

1.5	—	—
4.2	—	—
7.0	—	—
0.0	—	—

1.5	3.9	5.4
4.2	1.0	5.2
7.0	5.3	5.3
0.0	3.7	5.7

52.8

6.4

52.71

4 25 32.77

- 1 40.08

.00

.80

1 40.88

.06
.2
+
7.01
+
7.02
82.76
82.79

.60

.71

.68

.88

1 40.77 Average.



# Sec 18.2 Roll<sup>n</sup> of Am. line.

Roll <sup>n</sup>	N.	S	S
11.6	2193.9	2143.2	2163.1
11.9	2.1	43.2	65.0
11.0	4.0	42.4	62.9
12.2	1.9	45.6	64.2
12.1	2.2	14.4	15.2
8.8	14.1	42.88	63.04
18.76	2192.82		42.88
Set at 11.8	2152.96		2152.96
	<del>2172.89</del>		
	2122.89		
Previous	25.3		
Set at	2124.1		

19.2  
X 2C 18.2

$$\begin{array}{r} .20 \\ .23 \\ - .06 \\ + .02 \\ 38.11 \\ \hline 38.07 \end{array}$$

$$\begin{array}{r} .21 \\ .5 \\ - .05 \\ + .02 \\ 29.83 \\ \hline 29.78 \end{array}$$

$$\begin{array}{r} .12 \\ .3 \\ - .04 \\ + .02 \\ 28.47 \\ \hline .45 \end{array}$$

$$\begin{array}{r} .91 \\ .3 \\ - .27 \\ + .07 \\ 46.38 \\ \hline 46.18 \end{array}$$

$$\begin{array}{r} .15 \\ .8 \\ - .05 \\ + .02 \\ 35.38 \\ \hline .34 \end{array}$$

$$\begin{array}{r} .16 \\ .5 \\ - .08 \\ + .02 \\ 28.81 \\ \hline .25 \end{array}$$

70 Pegasi

$$\begin{array}{r} 5.6 \\ 6.3 \\ 4.2 \\ 3.0 \quad 2.2 \quad .2 \\ 5.0 \quad 0.0 \quad .0 \\ 9.2 \quad 6.0 \quad .2 \\ 1.2 \quad 4.0 \quad .2 \\ 3.3 \quad 1.8 \quad .1 \\ 5.4 \quad 9.8 \quad 5.2 \\ \hline 47.6 \end{array}$$

$$\begin{array}{r} 23 \quad 21 \quad 47.58 \\ 23 \quad 26.45 \\ - 1 \quad 40.87 \\ 1 \quad 42.64 \end{array}$$

$$\begin{array}{r} 4.12 \quad 1.47 \quad (.48) \\ 1.648 \\ \hline 12.2 \end{array}$$

$$m = .48$$

22 Andromeda

$$\begin{array}{r} 9.0 \quad 8.0 \quad 7.0 \\ 2.0 \quad 5.0 \quad 7.0 \\ 4.8 \quad 2.0 \quad 6.8 \\ 7.8 \quad 9.0 \quad 6.8 \\ 0.8 \quad 6.0 \quad 6.8 \\ 6.7 \quad 0.1 \quad 6.8 \\ 9.8 \quad 7.2 \quad 7.1 \\ 2.5 \quad 4.5 \quad 7.0 \\ 5.4 \quad 1.1 \quad 6.5 \\ \hline 46.2 \end{array}$$

$$\begin{array}{r} 0 \quad 02 \quad 8.0 \\ 48.42 \\ 04 \quad 29.73 \\ - 1 \quad 41.35 \end{array}$$

$$\begin{array}{r} + .01 \quad .03 \\ .80 \\ \hline 1 \quad 42.10 \\ 42.08 \end{array}$$

γ Lephei

$$\begin{array}{r} 6.9 \quad 0.0 \quad 6.9 \\ 6.2 \quad 1.1 \quad 7.3 \\ 5.0 \quad 2.2 \quad 7.2 \\ 4.1 \quad 2.8 \quad 6.9 \\ \hline 08.6 \\ 4.9 \end{array}$$

$$\begin{array}{r} 33 \quad 03.54 \\ 23 \quad 34 \quad 46.18 \\ - 1 \quad 42.64 \end{array}$$

$$\begin{array}{r} \text{tan. } 4.337 \\ .215 \\ \hline 4.122 \end{array}$$

α Andromeda

$$\begin{array}{r} 1.0 \quad 7.7 \quad .7 \\ 3.1 \quad 5.2 \quad .3 \\ 5.4 \quad 2.9 \quad .3 \\ 7.8 \quad 0.8 \quad .6 \\ 0.0 \quad 8.2 \quad .2 \\ 5.0 \quad 3.5 \quad .5 \\ 7.2 \quad 1.2 \quad .4 \\ 9.5 \quad 6.9 \quad .4 \\ 1.8 \quad 6.5 \quad 8.3 \\ \hline 54.0 \end{array}$$

$$\begin{array}{r} 3.7 \\ 54.19 \\ 0 \quad 2 \quad 38.34 \\ - 1 \quad 41.15 \\ \hline .16 \\ .80 \\ \hline 1 \quad 42.11 \end{array}$$

ι Andromeda

$$\begin{array}{r} 2.0 \quad 4.9 \quad 3.9 \\ 1.9 \quad 2.0 \quad .9 \\ 4.6 \quad 9.2 \quad .8 \\ 7.2 \quad 6.4 \quad .6 \\ 0.0 \quad 3.7 \quad 3.7 \\ 5.9 \quad 8.1 \quad 4.0 \\ 8.6 \quad 5.1 \quad 3.7 \\ 1.2 \quad 2.6 \quad 3.8 \\ 4.0 \quad 9.7 \quad 3.7 \end{array}$$

$$57.0$$

$$17.1$$

$$\begin{array}{r} 23 \quad 30 \quad 56.90 \\ 32 \quad 38.07 \\ - 1 \quad 41.17 \end{array}$$

$$.00$$

$$-.80$$

$$1 \quad 41.99$$

α Andromeda

$$\begin{array}{r} 1.7 \quad 2.5 \quad .5 \\ 4.1 \quad 0.1 \quad .2 \\ 6.8 \quad 7.3 \quad .1 \\ 9.1 \quad 2.9 \quad .0 \\ 1.7 \quad 2.3 \quad .0 \\ 7.0 \quad 7.1 \quad .1 \\ 9.5 \quad 4.8 \quad .3 \\ 2.0 \quad 2.0 \quad 4.0 \\ 4.5 \quad 9.4 \quad 4.4 \\ \hline 47.0 \end{array}$$

$$\begin{array}{r} 1.6 \\ 10 \quad 47.08 \\ 12 \quad 28.25 \\ - 1 \quad 41.17 \\ \hline .08 \\ .80 \end{array}$$

$$1 \quad 42.05$$



1.97  
2.05  
2.11  
2.05  
42.05 Average

56

# Russian Transit.

## Circle West.

19.3  
Dec. 18.3

50 Cass.

B. Muirg.

C. Muirg.

1.11  
.3  
- .03  
+ .02  
52.96

8.1 1.7 0.8 2.5-  
4.4 3.1 9.3 2.4  
5.8 4.4 8.0 2.4  
7.6 8.8 6.7 2.5  
7.6 5.0 2.6  
0.2 2.7 2.9  
1.7 1.0 2.7  
3.0 0.0 3.0  
4.2 8.3 2.5  
5.4 6.4 1.8  
5.1 4.0 2.1  
9.7 2.7 2.4  
11.5

2.0 2.5 5-  
6.3 8.0 .3  
0.5 3.8 .3  
4.8 9.6 .4  
9.1 8.2 .3  
7.8 6.4 .4  
2.0 2.0 .0  
6.2 7.9 .1  
0.7 3.6 .3  
4.8 9.2 .0  
3.3 0.7 4.0  
7.8 6.3 4.1  
2.0 12.0  
2.7

9.5 8.2 .7  
3.7 4.0 .5  
7.8 9.7 .7  
2.1 5.6 .5  
6.3 1.2 .5  
5.0 28.5 .8  
9.1 4.2 .4  
3.2 0.0 .6  
7.6 8.9 .9  
2.0 7.3 .5  
0.2 3.1 .5  
4.5 38.8

.12  
.23  
- .07  
+ .02  
33.72  
33.70

1 52 6.3  
11.25  
53 54.94  
- 1 43.69

2 01 11.66  
02 52.96  
- 1 41.29  
- .33  
- 1 41.62

20.2  
58.81  
- .46  
2 08 58.35  
10 39.56  
- 1 41.22  
- .33  
- 1 41.54

.07  
.83  
- .02  
+ .02  
23.67  
23.67

## Circle East.

36 New Cassio.

Arietis

P. Persei

.08  
.5  
- .04  
+ .02  
39.58  
.56

6.1 3.2 9.5  
7.8 1.8 9.6  
9.4 0.3 9.7  
1.2 - -  
2.9 7.0 9.9  
7.0 3.8 0.5  
7.7 1.5 9.2  
40.0

9.0 4.0 3.0  
2.5 0.0 2.5  
46.1  
1.6  
46.32

5.9 6.1 .0  
1.5 1.0 .5  
6.5 5.6 .1  
2.0 0.2 .2  
7.3 4.8 .1  
8.0 4.0 .0  
3.5 2.6 .1  
8.9 3.2 .1  
4.2 8.0 .2  
9.7 2.3 .0

.44  
.3  
- .13  
+ .05  
55.02  
54.94

13 9.4  
2 25 39.72  
27 26.80  
1 46.58

41 Arietes  
6.7 7.2 .4  
0.5 3.8 .3  
4.5 9.8 .3  
8.4 5.9 .3  
2.5 1.9 .4  
0.5 4.0 .5  
4.2 9.8 .0  
8.3 6.0 .3  
2.2 2.0 .2  
6.1 8.1 .2  
4.2 0.0 .2  
8.1 6.0 4.1  
42.0  
3.2  
42.12

0.5 1.8 .3  
5.8 6.4 .2  
51.2  
2.0  
51.08  
+ .51  
2 34 51.59  
36 38.70  
- 1 42.13  
+ .33  
- 1 41.78

.38  
.3  
- .11  
+ .05  
26.86  
26.30

2 4 42.12  
- 1 41.73



$$\begin{array}{r}
 .58 \\
 \times 3 \\
 \hline
 .17 \\
 + .08 \\
 \hline
 18.02 \\
 \hline
 18.25
 \end{array}$$

48<sup>m</sup>48<sup>m</sup>Circle E. 1<sup>st</sup> tally;  
(1<sup>st</sup> wire lost)

$$\begin{array}{r}
 27.0 \\
 45.8 \\
 4.2 \\
 \hline
 23.0
 \end{array}$$

$$\begin{array}{r}
 5m \\
 48 \\
 \hline
 55.00
 \end{array}$$

47 H. Cephei

Circle D.  
(middle tally &  
one wire on each side).

$$\begin{array}{r}
 8.0 \quad 6.7 \quad 4.7 \\
 5.0 \quad 8.8 \quad 3.8 \\
 3.7 \quad 1.0 \quad 4.7 \\
 \hline
 31.8
 \end{array}$$

48<sup>m</sup>

$$\begin{array}{r}
 1.0 \\
 \hline
 32.14 \\
 28.14 \\
 \hline
 04.00 \\
 .191 \\
 \hline
 05.764
 \end{array}$$

Circle E  
(last tally except  
last wire.)

$$\begin{array}{r}
 33.7 \\
 32.1 \\
 10.1 \\
 \hline
 29.2
 \end{array}$$

$$\begin{array}{r}
 5m \\
 48 \\
 \hline
 01.28
 \end{array}$$

$$\begin{array}{r}
 48 \\
 \hline
 55.00 \\
 48 \\
 \hline
 28.14
 \end{array}$$

tang.

$$\begin{array}{r}
 .657 \\
 .505 \\
 \hline
 .581
 \end{array}$$

$$\begin{array}{r}
 .581 \\
 5.129 \\
 \hline
 4.548
 \end{array}$$

$$\begin{array}{r}
 41.22 \\
 41.12 \\
 \hline
 41.17
 \end{array}$$

$$\begin{array}{r}
 41.22 \\
 41.12 \\
 \hline
 41.17
 \end{array}$$

$$\begin{array}{r}
 32.14 \\
 38.14 \\
 \hline
 2 \quad 49 \quad 30.514 \\
 51 \quad 18.3125
 \end{array}$$

$$\begin{array}{r}
 32.14 \\
 38.14 \\
 \hline
 1 \quad 48.17
 \end{array}$$

$$\begin{array}{r}
 32.14 \\
 38.14 \\
 \hline
 1 \quad 41.17
 \end{array}$$

$$\begin{array}{r}
 4.55 \quad 6.94 \quad (1.53 = m) \\
 455 - \\
 \hline
 2390 - \\
 2275 - \\
 \hline
 115
 \end{array}$$

$$2C = 0.764$$

$$C = 0.382$$

From 50 Cassiopeia, & 47 Orion, using  $n = 1.53$   
 $C$  is obtained = 0.362

From 35 Her. Cassiopeia & 41 Andromeda, using  $n = 1.53$ ,  
 $C$  is obtained = 0.47

ke 21.3

$$\begin{array}{r}
 .07 \\
 .5- \\
 \hline
 -.04 \\
 +.02 \\
 \hline
 60.41 \\
 \hline
 .39
 \end{array}$$

$$\begin{array}{r}
 .07 \\
 .5- \\
 \hline
 -.04 \\
 +.02 \\
 \hline
 53.35 \\
 \hline
 .36
 \end{array}$$

 $\rho$  Persei

0.2	3.9	5.1
4.2	1.3	5.5
6.8	2.8	5.6
9.3	5.9	5.2
2.0	8.3	5.3
7.0	8.1	5.1
9.9	5.7	5.6
2.4	3.0	5.4
5.0	0.4	5.4

$$\begin{array}{r}
 17.8 \\
 \hline
 13.0 \\
 \hline
 17.68 \\
 \hline
 2.54 \quad 60.39 \\
 \hline
 -1 \quad 42.71 \\
 \hline
 \quad .05- \\
 \hline
 \quad .80 \\
 \hline
 1 \quad 43.56
 \end{array}$$

 $\beta$  Persei

3.5	8.7	1.2
6.0	4.9	0.9
8.9	2.2	1.1
1.7	9.5	.2
4.4	5.9	.3
9.9	1.6	.5
2.6	8.9	.5
5.2	6.0	.2
8.0	8.4	1.4

$$\begin{array}{r}
 10.4 \\
 \hline
 12.0 \\
 \hline
 10.63 \\
 \hline
 3 \quad 0 \quad 53.36 \\
 \hline
 -1 \quad 42.73 \\
 \hline
 \quad .02 \\
 \hline
 \quad .80 \\
 \hline
 1 \quad 43.55
 \end{array}$$



Dec 24.3 Y Yang.

0.0	9.8	9.8
2.3	7.0	.3
5.0	4.5	.5
7.5	1.9	.4
9.9	9.5	.4
9.6	4.8	.8
7.6	2.3	.9
0.0	9.9	.9
2.3	7.4	.7

54.915.6

2 08 54.82

10 39.50

- 1 44.68

- .10

- .80

1 45.58

.701 45.64

Average.

v Arcturus

0.8	5.0	.8
3.0	2.7	.7
5.0	0.5	.5
7.1	8.2	.3
9.3	6.0	.3
4.0	1.6	.6
6.2	9.3	.5
8.5	7.0	.5
6.6	5.0	.5

42.814.62<sup>h</sup> 30 42.77

32 29.46

- 1 44.69

- .21

- .80

1 45.70

7
<u>.2</u>
+1.01
+0.2
<u>27.43</u>
.46

1887.  
60

	Clock 1327 slow	Date of Comp.	Corr.	Clock Comp.	Standard Clock fast
	run 5				5
Nov. 1.4	1 11.66			1 11.50	-.16
3.3	1 12.32	3.4	+0.4	1 12.49	+.13
6.4	1 13.62			1 13.77	+.15
8.3	1 14.50	8.4	+0.3	1 14.33	-.20
12.3	1 15.79			1 16.00	+.21
13.4	1 16.25			1 16.54	+.29
15.4	1 17.24			1 16.40	-.54
17.4	1 17.93			1 17.80	-.13
20.3	1 19.64			1 19.12	-.52
21.2	1 20.25			1 19.63	-.62
26.4	1 24.44			1 22.69	-1.75
29.2	1 26.89			1 26.23	-.66
				12)5.36	
					.447

Date.	Standard Clock fast		
Nov. 0.9	-.30	(+.50)	
1.9	-.05	-.25	-.75
2.9	+.15	+.20	+.45
3.9	+.06	-.09	-.29
4.9	+.05	-.01	+.08
5.9	+.10	+.05	+.06
6.9	0.00	-.10	-.15
7.9	-.20	-.10	-.10
8.9	-.08	-.26	+.32
9.9	+.13	+.12	+.09
10.9	+.30	+.21	+.04
11.9	+.36	+.17	-.12
12.9	+.27	+.05	-.13
13.9	+.15	-.08	-.04
14.9	-.24	-.12	-.27
15.9	-.32	-.39	+.31
		-.08	+.18



16.9	-.22	+.10	+.12
17.9	0.00	+.22	- .27
18.9	-.05	-.05	- .25
19.9	-.35	-.30	+ .40
20.9	-.25	+.10	- .02
21.9	-.17	+.08	-.15
22.9	-.24	-.07	-.28
23.9	-.57	-.35	- .40
24.9	-1.37	-.75	+ .39
25.9	-1.70	-.36	+ .56
26.9	-1.50	+.20	-.17
27.9	-1.47	+.03	+ .84
28.9	-.60	+.87	-.87
29.9	-.60	0.00	- .10
30.9	(-70)	-.10	

$$\begin{array}{r}
 9.08 \\
 2.75 \\
 \hline
 30 \overline{) 11.83} \\
 \underline{.394}
 \end{array}$$

$$\begin{array}{r}
 4.82 \\
 3.38 \\
 \hline
 30 \overline{) 8.20} \\
 \underline{.273}
 \end{array}$$

Dec 28.3 V Penni

J Penni

η Yauri

$\begin{array}{r} .09 \\ 14 \\ \hline .102 \\ + .02 \\ \hline 25.73 \end{array}$   
 $\begin{array}{r} .10 \\ 2 \\ \hline .02 \\ + .02 \\ \hline 57.76 \end{array}$

0.5 6.0 6.5  
 2.1 3.1 .2  
 6.0 0.5 .5  
 8.9 7.7 .6  
 1.5 4.9 .4  
 7.0 9.4 .4  
 0.0 6.6 .6  
 2.7 3.9 .6  
 5.4 1.0 .4

$\begin{array}{r} 48.2 \\ 4.4 \\ \hline \end{array}$

3 35 48.23  
 37 25.73  
 $- 1$  47.50  
 .00  
 $- .80$   
 1 48.30

$\begin{array}{r} .05 \\ 2 \\ \hline .01 \\ + .02 \\ \hline 49.90 \\ 49.89 \end{array}$

$\begin{array}{r} 43 \\ 29 \\ \hline 1 48.34 \end{array}$  average

9.9 -  
 2.9 -  
 8.9 -  
 1.9 -  
 8.0 2.2 0.2  
 1.2 9.3 0.5  
 4.2 6.3 0.5  
 7.2 1.2 0.4

$\begin{array}{r} 10.2 \\ 1.8 \\ \hline \end{array}$

3 33 10.20  
 34 57.76  
 $- 1$  47.56  
 $- .07$   
 $- .80$   
 1 48.43

0.1 8.0 .1  
 2.3 2.9 .2  
 4.6 0.6 .2  
 6.9 8.3 .2  
 9.0 6.0 .50  
 3.7 1.7 5.4  
 6.0 9.3 6.3  
 8.1 7.0 5.1  
 0.3 4.9 5.2

$\begin{array}{r} 02.6 \\ 11.3 \\ \hline \end{array}$

3 39 02.59  
 40 49.89  
 $- 1$  47.30  
 $- .19$   
 $- .80$   
 1 48.29



Let us use  $n = \frac{1}{2}$  for the present.

Dec. 1897.  
64

	Clock 1827 slow.	Rate of Comp.	Corr.	Stand. clock Paderp.	Stand. clock fast.
Dec. 1.4	1 29.10			1 28.17	- .93
3.4	1 31.35			1 30.56	- .79
5.2	1 32.78			1 32.29	- .44
6.2	1 33.67			1 33.46	- .21
8.2	1 34.98			1 35.54	+ .56
12.3	1 37.86			1 38.01	+ .25
16.4	1 40.77	16.6	+ .09	1 41.39	+ .53
19.2	1 42.05			1 42.34	+ .29
21.3	1 43.56	21.0		1 43.49	+ .16
24.3	1 45.64			1 45.16	- .48
28.3	1 48.34	28.4	+ .07	1 47.78	- .53
29.3	1 49.05	29.4	+ .07	1 48.66	- .46
				12	5.63
					.469

Dec.	Stand. clock fast.	(-30)	
0.9	- .70		+ .18
1.9	- .62	+ .08	- .03
2.9	- .57	+ .05	- .11
3.9	- .63	+ .06	+ .19
4.9	- .50	+ .13	- .07
5.9	- .46	+ .04	+ .52
6.9	+ .10	+ .56	- .03
7.9	+ .43	+ .33	- .24
8.9	+ .52	+ .09	- .11
9.9	+ .50	- .02	- .03
10.9	+ .45	- .05	- .12
11.9	+ .28	- .17	+ .24
12.9	+ .35	+ .04	+ .14
13.9	+ .56	+ .21	- .13
	7.67		2.14



		$+ .18$	
14.9	$+ .74$		$- .40$
15.9	$+ .52$	$- .22$	$+ .08$
16.9	$+ .38$	$- .14$	$+ .10$
17.9	$+ .34$	$- .04$	$+ .15$
18.9	$+ .35$	$+ .01$	$- .11$
19.9	$+ .25$	$- .10$	$+ .05$
20.9	$+ .22$	$- .05$	$- .42$
21.9	$+ .25$	$- .47$	$+ .41$
22.9	$- .31$	$- .06$	$- .04$
23.9	$- .41$	$- .10$	$- .01$
24.9	$- .50$	$- .11$	$+ .11$
25.9	$- .50$	$0.00$	$+ .05$
26.9	$- .45$	$+ .05$	$- .10$
27.9	$- .50$	$- .05$	$+ .05$
28.9	$- .50$	$0.00$	$+ .26$
29.9	$- .30$	$+ .26$	$- .17$
30.9	$- .21$	$+ .09$	$- .12$

Jan. (0.19)  $(- .24) - .03$

6.73	2.63
7.67	2.14
<u>31) 14.40</u>	<u>31) 4.77</u>
.465	.154

1888

Jan. 3.2

Collimation of Merid. Circ.

after the taking out, cleaning, and replacing  
of micrometer frame carrying reticle.

Collimator

N.

S

<del>8.3</del>	2948.1	2682.6	2704.6
<del>9.9</del>	47.2	<del>82.6</del>	03.2
9.5	47.3	2682.6	2703.9
9.9	<del>3042.6</del>		<del>682.6</del>
9.0	<del>1044.2</del>		2693.2
3/ 27.14	2947.5		<del>1214.2</del>
			2947.5

Set at 9.5. ~~Set at~~Setting for collimation  $\mu = 2820.4$ 

Above was using middle wire.

We will now use next to middle on each side

Feeling so bad	2783.2	2850.2	2869.5
now that we	81.7	50.0	69.4
will use the	81.6	50.1	69.5
previous setting	2782.2		50.1
			2859.8
			2782.2

Result of second trial 2821.0

" " 1st " 20.4  
Set at 2820.7



Jan 3.5

Gr 1378

Blancin

X Genier

.45-	9.5-	0.5	0.0
.2	6.8	3.0	9.8
+ .09	4.1	5.3	9.4
+ .06	1.1	8.6	9.7
48.67	9.8	0.2	9.6
.82	4.7	0.3	0.0
	7.3	3.1	0.4
	0.0	0.3-0.6	0.6
.18	2.5-	3.1	0.8
.2	4.7	0.6	0.4
+ .048	7.2	5.3	0.2
+ .02	0.0	5.7	9.8
86.77	2.2	3.0	9.5
.88	4.7	2.8	0.0
	7.3	2.8	0.3
.25-	6.9	2.8	1.8
.2	3.0	0.6	9.8
+ .05-	6.0	1.8	9.1
+ .03		7.3	8.7
02.40		9.8	0.3
.48		56.0	
.18		57.3	
.2		56.0	
+ .04			
+ .02			
26.88			
.94			
.23			
.2			
+ .05-			
+ .02			
10.57			
.58			

4.0	5.8	.8
5.0	3.6	.6
8.0	1.4	.4
0.0	9.2	.2
2.0	7.1	.1
6.2	3.0	.2
8.3	1.0	.3
0.3	2.8	.1
2.3	6.8	9.1

3.0	9.9	.9
5.3	7.6	.9
7.7	5.2	.9
0.0	2.7	.9
2.5	0.4	.9
7.0	5.7	.9
9.3	3.4	.9
1.8	1.1	.9
4.0	8.8	2.8

84.6
12.4
8 8 34.65
10 26.94
- 1 52.29
- .36
- .80
1 53.45

46.6
8.0
7 54 46.42
56 38.83
- 1 52.41
- 2.48
- 19
- .80
1 53.40

27 Lognier

31 Lognier

6.4	3.2	.6
8.8	9.8	.6
3.0	6.4	.4
6.2	3.0	.2
9.9	9.8	.7
6.2	3.0	.2
9.8	9.8	.2
3.0	6.3	.3
6.3	6.0	9.3

9.5	6.0	5.5
2.4	3.2	5.6
5.1	0.6	5.7
7.9	7.9	5.8
0.9	5.0	5.9
6.5	9.6	6.1
9.3	6.4	5.7
2.1	3.6	5.7
5.0	0.8	5.8

Lans 74° 13' = 3.528

9 02 = .168

3.370

1	53.45
	.40
	.41
	.48

1 53.44 Annage.

7 58

0

- 1

13.1
09.69
2.48
52.79
+ .18
- .80
1 53.47

8 13

15 10.58

- 1 52.70

+ .02

- .80

1 53.48



Jan 5.3

$$\begin{array}{r} .18 \\ + .4 \\ \hline 1.072 \\ - .07 \\ + .02 \\ \hline 1.55 \\ \hline 1.50 \end{array}$$
$$\begin{array}{r} 115 \\ + 4 \\ \hline - 106 \\ + 102 \\ 5277 \\ \hline 5273 \end{array}$$
$$\begin{array}{r} 111 \\ - 4 \\ \hline 107 \\ + 02 \\ \hline 35.68 \\ \hline 35.66 \end{array}$$
$$\begin{array}{r} .14 \\ \underline{.4} \\ -.06 \\ + .02 \\ \hline 57.41 \\ \underline{.67} \\ .09 \\ \underline{.4} \\ -.04 \\ + .02 \\ \hline 49.88 \\ \underline{.86} \end{array}$$

$\gamma$  Androm.

9.5	5.0	4.5
2.2	2.0	4.2
5.2	9.4	4.6
8.1	6.6	4.7
0.8	4.0	4.8
<u>6.2</u>	<u>8.4</u>	<u>4.6</u>

9.0 5.8 4.8  
1.8 3.0 4.8  
4.6 0.2 4.8  
~~1.55~~ 07.2  
6.0

$$\begin{array}{r} 1 \ 55 \quad 07.32 \\ 1 \ 57 \quad 1.50 \\ - \quad 1 \quad 54.18 \\ \hline \quad \quad \quad - .01 \\ \quad \quad \quad - .80 \\ \hline 1 \quad 54.99 \end{array}$$

*J. Pessier*

0.8	5.1	5.9
4.0	2.0	6.0
6.5	9.1	5.7
0.0	6.0	6.0
		02.8

$$\begin{array}{r} 8.4 \\ 3 \overline{) 33} \phantom{00} \\ \underline{24} \phantom{00} \\ 9 \phantom{00} \\ 3 \overline{) 34} \phantom{00} \\ \underline{27} \phantom{00} \\ 7 \phantom{00} \\ 1 \overline{) 54.74} \phantom{00} \\ \underline{54} \phantom{00} \\ 0 \phantom{00} \\ 1 \overline{) 55.47} \phantom{00} \\ \underline{55} \phantom{00} \\ 0 \phantom{00} \end{array}$$

β Trianguli

3.5	3.2	6.7
6.2	1.0	7.2
8.4	8.3	6.7
0.9	6.0	6.9
3.3	3.5	6.8
8.2	8.3	6.5

$$\begin{array}{r} 0.8 \quad 6.0 \quad 6.8 \\ 3.4 \quad 3.7 \quad 7.1 \\ 5.9 \quad 1.0 \quad 6.9 \\ \hline 58.6 \\ \hline 8.2 \end{array}$$
$$\begin{array}{r} 2,058.48 \\ 2252.73 \\ -15430 \\ -11 \\ -80 \\ \hline 155.21 \end{array}$$

η Γαυρι

3.3	8.2	1.5
5.3	5.6	0.9
7.7	3.7	1.4
9.9	1.4	1.8
2.1	9.0	1.1
6.7	4.8	1.6
8.8	2.4	1.2
1.0	0.4	1.4
3.4	8.0	1.4
	5.5	8

$$\begin{array}{r} 3 \ 38 \ 40 \\ \hline 12.5 \\ 55.66 \\ 49.86 \\ \hline 1 \ 54.20 \\ \hline \end{array}$$

$\gamma$  Persée

3.2	9.0	2.2
5.9	6.0	1.9
8.9	3.5	2.4
1.7	0.6	2.3
4.4	7.8	2.2
<u>0.0</u>	<u>2.3</u>	<u>2.3</u>

$$\begin{array}{r} 3.0 \quad 9.3 \quad 2.8 \\ 5.6 \quad 6.8 \quad 2.4 \\ 8.2 \quad 4.0 \quad 2.2 \\ \hline 41.0 \\ \hline 21.2 \end{array}$$
$$\begin{array}{r} 3 \ 35 \ 41.12 \\ 3 \ 37 \ 35.66 \\ - \quad 1 \ 54.54 \\ \hline \phantom{00} .00 \\ - \phantom{00} .80 \\ \hline 1 \ 55.34 \end{array}$$

54.99  
5.21  
5.34  
5.47  
5.23

5-57. 25 Average.



Jan 7.4

$$\begin{array}{r}
 .03 \\
 .6 \\
 \hline
 .02 \\
 + .02 \\
 29.99 \\
 \hline
 29.99
 \end{array}$$

$$\begin{array}{r}
 .02 \\
 .6 \\
 \hline
 + .01 \\
 + .02 \\
 57.58 \\
 \hline
 58.61
 \end{array}$$

$$\begin{array}{r}
 .02 \\
 .6 \\
 \hline
 + .01 \\
 + .02 \\
 13.24 \\
 \hline
 .27
 \end{array}$$

2 Jauri.

3.0	—	
5.1	—	
7.2	1.7	8.9
9.3	9.5	8.8
1.5	7.2	8.7
5.9	3.0	8.9
8.0	0.9	8.9
0.1	8.7	8.8
2.3	6.5	8.8

$$\begin{array}{r}
 34.4 \\
 \hline
 6.2
 \end{array}$$

4 27 34.41

4 29 29.99

— 1 55.58

— .31

— .80

1 56.69

3 Jauri.

9.9	4.0	3.9
2.0	1.8	3.8
4.2	9.6	3.8
6.4	7.3	3.7
8.6	5.2	3.8
3.0	0.8	3.8
5.3	8.6	3.9
7.5	6.4	3.9
9.7	4.1	3.8

$$\begin{array}{r}
 02.0 \\
 \hline
 17.4
 \end{array}$$

5 29 01.92

5 30 58.61

— 1 56.69

— .26

— .80

1 56.75

B Jauri

54.0	41.0	5.0
6.5	8.7	8.2
8.7	6.2	4.9
1.1	4.0	5.1
3.5	1.6	5.1
—	—	—
—	—	—
—	—	—
—	—	—

5.3

17.58

13.27

55.74

.18

.80

1 56.72

P Aurigae.

0.1	7.3	9.4
3.0	6.5	9.5
6.0	3.5	9.5
9.0	0.6	9.6
—	1.7	—
—	8.6	—
4.0	5.6	9.6
6.8	2.8	9.6

29.8

10.0

5 6 29.77

8 28.74

— 1 55.97

+ .06

.80

1 56.75

$$\begin{array}{r}
 1 \ 56.69 \\
 .75 \\
 .72 \\
 .71 \\
 \hline
 1 \ 56.72
 \end{array}$$

Average

70

an. 8-3

 $\alpha$  Ceti. $\rho$  Persi. $\beta$  Persi.

$$\begin{array}{r}
 .10 \\
 .7 \\
 \hline
 -.07 \\
 +.02 \\
 \hline
 25.45 \\
 \hline
 25.40
 \end{array}$$

$$\begin{array}{r}
 .14 \\
 .7 \\
 \hline
 -.10 \\
 +.02 \\
 \hline
 60.28 \\
 \hline
 60.20
 \end{array}$$

$$\begin{array}{r}
 .13 \\
 .7 \\
 \hline
 -.09 \\
 +.02 \\
 \hline
 53.24 \\
 \hline
 53.17
 \end{array}$$

$$\begin{array}{r}
 -.19 \\
 -.07 \\
 \hline
 +.02 \\
 \hline
 13.58 \\
 \hline
 .53
 \end{array}$$

$$\begin{array}{r}
 57.21 \\
 .21 \\
 .20 \\
 .10 \\
 \hline
 57.18 = \\
 \text{Average}
 \end{array}$$

8.9 0.1 9.0

0.8 8.0 8.8

3.0 6.0 9.0

5.1 4.0 9.1

7.0 1.9 8.9

1.2 7.8 9.0

3.2 5.7 8.9

5.3 3.6 8.9

7.4 1.6 9.0

29.6

9.2

2 54 29.41

2 56 25.40

- 1 55.99

- .42

- .80

1 57.21

 $\delta$  Arietis

5.6 9.3 4.9

7.8 8.0 4.8

0.1 5.0 5.1

2.2 2.8 .0

4.3 0.7 .0

8.8 6.2 .0

1.0 4.0 .0

3.2 1.8 .0

5.3 2.8 5.1

17.7

9.6

3 3 17.51

5 13.53

- 1 56.02

- .28

- .80

1 57.10

7.6 0.1 7.7

0.1 7.3 7.4

2.8 4.8 7.6

5.4 2.0 7.4

8.1 9.8 7.9

3.3 4.4 7.7

6.0 1.9 7.9

8.7 9.1 7.8

1.3 6.5 7.8

03.9

16.2

2 56 03.85

2 57 60.20

- 1 56.35

- .06

- .80

1 57.21

9.8 4.0 .8

2.3 1.1 .4

5.1 8.5 .6

7.8 8.8 .6

0.6 3.0 .6

5.9 7.7 .6

2.6 4.8 .4

1.4 2.3 .7

4.2 9.5 3.7

56.8

13.2

2 58 56.80

3 0 53.17

- 1 56.37

- .03

- .80

1 57.20

On Jan 5 & 7. Great difficulty was experienced in observing due to the varying currents of air at the slit. The images were very unsteady, sometimes becoming so large as to entirely disappear. It was found that on closing the doors at the ends of the room and opening all windows, this effect almost entirely disappeared, images being good.



Jan. 9.3

S Persei.

r Persei.

S Persei.

$$\begin{array}{r}
 .13 \\
 .8 \\
 \hline
 - .110 \\
 + .02 \\
 57.71 \\
 \hline
 57.63 \\
 \\
 .11 \\
 .8 \\
 \hline
 - .09 \\
 + .02 \\
 35.68 \\
 \hline
 35.61
 \end{array}$$

$$\begin{array}{r}
 0.0 \ 0.8 \ 0.8 \\
 3.0 \ 7.7 \ 0.7 \\
 6.1 \ 4.8 \ 0.9 \\
 9.0 \ 1.8 \ 0.8 \\
 2.1 \ 8.7 \ 0.8 \\
 8.0 \ 2.8 \ 0.8 \\
 1.2 \ 9.7 \ 0.9 \\
 4.3 \ 6.5 \ 0.8 \\
 7.4 \ 3.3 \ 0.7
 \end{array}$$

$$\begin{array}{r}
 00.4 \\
 \hline
 7.6
 \end{array}$$

$$3 \ 33 \ 00.40$$

$$3 \ 34 \ 57.63$$

$$- \ 1 \ 57.23$$

$$+ \ .09$$

$$- \ .80$$

$$1 \ 57.94$$

$$\begin{array}{r}
 0.5 \ 6.2 \ 6.7 \\
 3.4 \ 3.6 \ 7.0 \\
 6.1 \ 0.8 \ 6.9 \\
 8.9 \ 7.8 \ 6.7 \\
 1.7 \ 5.0 \ 6.7 \\
 7.2 \ 9.7 \ 6.9 \\
 0.1 \ 6.8 \ 6.9 \\
 3.0 \ 4.0 \ 7.0 \\
 5.6 \ 1.3 \ 6.9
 \end{array}$$

$$\begin{array}{r}
 38.5 \\
 \hline
 8.2
 \end{array}$$

$$3 \ 35 \ 38.43$$

$$3 \ 37 \ 35.61$$

$$- \ 1 \ 57.18$$

$$.00$$

$$- \ .80$$

$$1 \ 57.98$$

$$\begin{array}{r}
 4.8 \ 3.0 \ .6 \\
 7.0 \ 0.6 \ 6 \\
 9.4 \ 8.2 \ .6 \\
 1.8 \ 3.6 \ .4 \\
 4.2 \ 3.1 \ .3 \\
 9.0 \ 8.4 \ .4 \\
 1.5 \ 6.0 \ .5 \\
 4.0 \ 3.7 \ .7 \\
 6.3 \ 1.2 \ 7.5
 \end{array}$$

$$08.8$$

$$14.4$$

$$3 \ 45 \ 08.76$$

$$47 \ 5.85$$

$$- \ 1 \ 57.09$$

$$- \ .15$$

$$- \ .50$$

$$1 \ 58.04$$

S Persei

$$\begin{array}{r}
 .18 \\
 .8 \\
 \hline
 - .08 \\
 + .02 \\
 20.80 \\
 \hline
 20.74
 \end{array}$$

$$\begin{array}{r}
 6.8 \ 0.4 \ .2 \\
 9.5 \ 7.6 \ .1 \\
 2.1 \ 5.0 \ .1 \\
 4.8 \ 2.2 \ .0 \\
 7.5 \ 9.7 \ .2 \\
 3.0 \ 4.2 \ .2 \\
 4.6 \ 1.6 \ .2 \\
 8.3 \ 8.0 \ .3 \\
 1.0 \ 6.4 \ .4
 \end{array}$$

$$23.8$$

$$11.5$$

$$3 \ 48 \ 23.61$$

$$50 \ 20.74$$

$$- \ 1 \ 57.13$$

$$.04$$

$$- \ .80$$

$$1 \ 57.97$$

$$1 \ 57.94$$

$$57.98$$

$$58.04$$

$$57.97$$

$$1 \ 57.98 - \text{Average}$$

72

Jan 11.3

$$\begin{array}{r}
 .00 \\
 + .02 \\
 \hline
 60.14 \\
 \hline
 60.16
 \end{array}$$

$$\begin{array}{r}
 .00 \\
 + .02 \\
 \hline
 53.11 \\
 \hline
 53.13
 \end{array}$$

70

p Persei.

$$\begin{array}{r}
 5.0 \ 7.7 \ 2.7 \\
 7.8 \ 5.9 \ 2.9
 \end{array}$$

$$\begin{array}{r}
 0.3 \ 2.4 \ 2.7 \\
 3.0 \ 9.9 \ 2.9
 \end{array}$$

$$\begin{array}{r}
 5.5 \ 7.2 \ 2.7 \\
 \hline
 1.0 \ 2.0 \ 3.0
 \end{array}$$

$$\begin{array}{r}
 3.6 \ 9.5 \ 3.1 \\
 6.1 \ 6.9 \ 3.0
 \end{array}$$

$$\begin{array}{r}
 8.8 \ 4.4 \ 3.2 \\
 \hline
 01.4
 \end{array}$$

$$\begin{array}{r}
 01.4 \\
 \hline
 8.6
 \end{array}$$

$$\begin{array}{r}
 2 \ 56 \ 01.46 \\
 2 \ 57 \ 60.16
 \end{array}$$

$$\begin{array}{r}
 -1 \ 58.70 \\
 - \quad .06 \\
 - \quad .80 \\
 \hline
 1 \ 59.56
 \end{array}$$

$$\begin{array}{r}
 0 \ \text{Tauri.} \\
 7.8 \ 9.6 \ .4 \\
 0.1 \ 7.4 \ .5 \\
 2.1 \ 5.3 \ .4 \\
 4.1 \ 3.3 \ .4 \\
 6.2 \ 1.3 \ .5 \\
 0.6 \ 7.0 \ .6 \\
 2.4 \ 5.0 \ .4 \\
 4.5 \ 2.9 \ .4 \\
 6.6 \ 0.9 \ 7.5
 \end{array}$$

$$\begin{array}{r}
 48.8 \\
 \hline
 13.9 \\
 \hline
 48.72 \\
 18 \ 47.22 \\
 -1 \ 58.49 \\
 - \quad .38 \\
 - \quad .80 \\
 \hline
 1 \ 59.67
 \end{array}$$

$$\begin{array}{r}
 3 \ 16 \ 48.72 \\
 18 \ 47.22 \\
 -1 \ 58.49
 \end{array}$$

$$\begin{array}{r}
 - \quad .38 \\
 - \quad .80 \\
 \hline
 1 \ 59.67
 \end{array}$$

$$\begin{array}{r}
 1 \ 59.56 \\
 .67 \\
 .82 \\
 .67 \\
 .68 \\
 \hline
 1 \ 59.68
 \end{array}$$

$$\begin{array}{r}
 .67 \\
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 \hline
 1 \ 59.68
 \end{array}$$

$$\begin{array}{r}
 \text{Average.} \\
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 \end{array}$$

B Persei.

$$\begin{array}{r}
 7.1 \ 1.5 \ 8.6 \\
 9.8 \ 8.7 \ 8.5
 \end{array}$$

$$\begin{array}{r}
 2.7 \ 5.9 \ 8.6 \\
 5.4 \ 3.1 \ 8.5
 \end{array}$$

$$\begin{array}{r}
 8.1 \ 0.7 \ 8.8 \\
 3.5 \ 5.1 \ 8.6
 \end{array}$$

$$\begin{array}{r}
 6.2 \ 2.4 \ 8.6 \\
 9.0 \ 9.6 \ 8.6
 \end{array}$$

$$\begin{array}{r}
 1.7 \ 7.0 \ 8.7 \\
 \hline
 54.1
 \end{array}$$

$$\begin{array}{r}
 54.1 \\
 \hline
 5.6
 \end{array}$$

$$\begin{array}{r}
 2 \ 58 \ 54.29 \\
 3 \ 0 \ 53.13
 \end{array}$$

$$\begin{array}{r}
 -1 \ 58.84 \\
 - \quad .03 \\
 - \quad .80 \\
 \hline
 1 \ 59.67
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e Persei

$$\begin{array}{r}
 2.3 \ 2.8 \ 2.1 \\
 2.4 \ 9.6 \ 2.0
 \end{array}$$

$$\begin{array}{r}
 3.6 \ 6.3 \ 1.9 \\
 8.7 \ 3.2 \ 1.9
 \end{array}$$

$$\begin{array}{r}
 2.0 \ 0.0 \ 2.0 \\
 8.1 \ 3.8 \ 1.9
 \end{array}$$

$$\begin{array}{r}
 1.6 \ 0.8 \ 2.4 \\
 4.7 \ 7.5 \ 2.2
 \end{array}$$

$$\begin{array}{r}
 8.0 \ 4.2 \ 2.2 \\
 \hline
 21.0
 \end{array}$$

$$\begin{array}{r}
 21.0 \\
 \hline
 0.6
 \end{array}$$

$$\begin{array}{r}
 3 \ 14 \ 21.03 \\
 16 \ 20.16
 \end{array}$$

$$\begin{array}{r}
 -1 \ 59.13 \\
 + .11 \\
 - .80 \\
 \hline
 1 \ 59.82
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 \end{array}$$



Jan 12.4

✓ Orionis

β Aurigae

α Orionis

$$\begin{array}{r}
 .01 \\
 .001 \\
 + .02 \\
 \hline
 11.21 \\
 \hline
 11.23
 \end{array}$$

0-2 3.0 3.2

0.1 8.1 8.2

~~4.2~~

2.3 0.8 3.1

3.0 5.1 8.1

6.8 8.0 4.8

4.7 8.9 3.6

6.1 2.5 8.6

8.9 6.1 5.0

6.8 6.6 3.4

8.5 9.4 7.9

0.9 4.1 5.0

8.8 4.2 3.0

1.7 6.8 8.5

3.0 2.0 5.0

2.9 0.2 3.1

7.7 0.9 8.6

4.8 0.1 4.9

5.1 8.0 3.1

0.8 7.9 8.7

9.1 5.9 5.0

7.4 5.9 3.3

3.6 5.1 8.7

1.0 3.7 4.7

9.5 3.8 3.3

6.6 2.1 8.7

3.3 1.6 4.9

11.7

19.5

5.2 9.3 4.5

11.8

23.5

07.4

5 59 11.62

5 49 19.24

8.2

6 1 11.23

5 57 19.65

5 47 07.43

- 1 59.61

- 2 00.41

5 49 7.05

- .32

+ .04

- 1 59.62

- .80

- .80

- .39

2 00.73

2 01.17

- .80

2 00.81

Residual

0.73 -0.17

1.17 +0.37

0.81 -0.09

Average for  
clock slow2<sup>m</sup>00<sup>s</sup>.90

0.18 Avg. Residual

The result 2<sup>m</sup>00<sup>s</sup>.90 is

hardly accurate within 0.1, but its error is probably less than 0.2 J.R.E.

Very unusual difficulty was experienced in making the above observations owing to bad seeing. The difficulty was not disposed of by opening the windows as before.

an 14.3

 $\gamma$  Androm. $\alpha$  Arietis. $\beta$  Triang.

1.7	6.9	8.6	7.2	1.8	9.0	5.8	6.0	1.8
4.3	4.1	8.4	9.4	9.6	9.0	8.1	3.2	1.3
7.2	1.4	8.6	1.7	7.2	8.9	0.6	0.8	1.4
0.0	8.7	8.7	4.0	5.2	9.2	3.2	8.3	1.5
2.8	5.9	8.7	6.1	3.0	9.1	5.7	6.0	1.7
8.2	0.5	8.7	0.8	8.4	9.2	0.8	0.6	1.4
1.0	7.6	8.6	2.9	6.2	9.1	3.1	8.1	1.2
4.0	4.9	8.9	5.1	4.0	9.1	5.8	5.7	1.5
6.8	2.0	8.8	7.2	1.8	9.0	8.1	3.1	1.2

59.3

49.5

50.8

6.3

10.1

13.8

1	54	59.33	1	58	49.53	2	0	50.73
---	----	-------	---	----	-------	---	---	-------

1	57	1.33	2	0	57.28	2	2	52.59
---	----	------	---	---	-------	---	---	-------

-	2	02.00	-	2	01.75	-	2	01.86
---	---	-------	---	---	-------	---	---	-------

-		.01	-		.24	-		.11
---	--	-----	---	--	-----	---	--	-----

-		.80	-		.80	-		.80
---	--	-----	---	--	-----	---	--	-----

2	02.81	2	02.79	2	02.77
---	-------	---	-------	---	-------

 $\gamma$  Coli. $\gamma$  Arietis.

9.7 1.2 0.9

3.5 7.7 1.2

1.6 9.0 0.6

5.6 5.6 1.2

3.7 7.0 0.7

7.8 3.2 1.0

6.0 5.0 1.0

0.1 0.9 1.0

8.1 2.8 0.9

2.2 8.8 1.0

2.2 8.8 1.0

6.7 4.4 1.1

4.2 6.6 0.8

8.8 2.2 1.0

6.2 4.6 0.8

1.0 0.0 1.0

8.3 2.4 0.7

8.3 7.6 0.9

10.3

25.5

7.7

9.9

2 20 10.41

2 30 13.52

22 11.95

32 27.24

- 2 01.54

- 1 01.72

- .38

- .26

- .80

- .60

2 2.72

1 02.78

$$\begin{array}{r}
 .20 \\
 .3 \\
 \hline
 .06 \\
 + .02 \\
 \hline
 1.37 \\
 \hline
 1.33
 \end{array}$$

$$\begin{array}{r}
 .15 \\
 .3 \\
 \hline
 .045 \\
 + .02 \\
 \hline
 51.30 \\
 \hline
 51.28
 \end{array}$$

$$\begin{array}{r}
 .17 \\
 .3 \\
 \hline
 .051 \\
 + .02 \\
 \hline
 52.62 \\
 \hline
 52.59
 \end{array}$$

$$\begin{array}{r}
 .13 \\
 .3 \\
 \hline
 .04 \\
 + .02 \\
 \hline
 11.94 \\
 \hline
 11.96 \\
 \hline
 .14 \\
 \hline
 .04 \\
 + .02 \\
 \hline
 27.26 \\
 \hline
 27.24
 \end{array}$$

$$\begin{array}{r}
 .81 \\
 .79 \\
 .77 \\
 .72 \\
 .78 \\
 \hline
 2 02.77
 \end{array}$$

Average.



Jan 19.2

B. Anderson

J. P. Puri

Polaris

.18	5.6	6.0	1.6	9.4	1.0	0.4	03.4	36.5	39.9
.2							09.2	31.8	40.5
+ .04	8.0	3.3	.3	2.2	8.0	.3	17.0	18.6	35.6
+ .02							34.6	01.3	35.9
27.02	0.7	0.9	.6	5.5	4.8	.3	37.8	57.0	36.8
.08	3.0	8.3	.3	8.5	1.7	.2	47.8	49.6	37.4
							02.7	32.0	34.7
.24	5.7	5.9	.6	1.6	8.6	.2	11.3	25.0	36.3
.2							19.8	17.2	38.0
+ .05	0.7	0.9	.6	8.0	2.5	.5	36.0	00.5	36.5
+ .03							42.0	55.0	37.0
06.69	3.0	8.1	.2	0.9	9.4	.3	50.0	49.7	39.7
.77	5.7	5.7	.4	4.0	6.3	.3	03.8	29.7	33.6
	8.1	3.1	.2	7.0	2.1	.1	15.0	24.0	39.0
							19.9	18.3	38.2
							34.0	39.0	33.0
							43.2	50.0	33.2
.95			20.7			00.1	51.8	44.6	36.4
.6			13.5			2.6	06.0	28.5	34.5
- .59							13.0	24.0	37.0
+ .69	1	01	20.71	1	29	00.14	20.6	19.8	38.4
49.55			03 27.08			31 06.77	39.7	54.6	34.3
49.44							44.7	49.6	34.3
			- 2 06.37			- 2 06.63	50.2	43.8	34.0
			- .05			+ .05	09.2	27.8	37.0
			- .80			- .80	15.0	22.2	37.2
			2 07.22			2 07.38	21.5	11.0	32.5
							41.6	57.0	38.6
							45.7	52.0	40.7
							52.8	49.7	42.5
							09.0	26.0	35.0
							19.0	19.5	38.5
							24.2	12.0	36.2
							42.5	54.6	37.1
							47.1	48.8	38.9
							54.6	41.5	36.1
							12.6	23.8	35.9
									16.6

Average = 2<sup>m</sup> 07.<sup>s</sup>30

$$\tan 35^\circ 2' = 0.701$$

$$88^\circ 43' = 44.850$$

$$43.949$$

$$75 \overline{) 1374.9}$$

$$1 \quad 15 \quad 18.83$$

$$1 \quad 17 \quad 49.44$$

$$2 \quad 31.11$$

$$2 \quad 06.37$$

$$43.95 \overline{) 24.44}$$

$$n = .561$$

We will still  
use  $n = \frac{1}{2}$

Jan 29.4

 $\alpha$  Aurigae $\alpha$  Aurigae $\beta$  Tauri

.06

.11

.13

+.03

+.02

26.85

.90

.12

.4

+.05

+.02

14.18

.25

.09

.06

-.05

+.02

13.22

13.19

.08

.6

-.05

+.02

57.57

57.54

8.6 7.5 6.1

1.0 5.0 5.0

3.5 2.4 5.9

6.0 0.0 6.0

8.4 7.7 6.1

3.1 2.9 6.0

5.7 0.1 5.8

8.0 7.9 5.9

0.5 5.0 5.5

12.8

17.1

5 23 12.90

25 26.90

- 2 14.00

-.14

-.80

2 14.94

 $\gamma$  Tauri

1.7 5.9 7.6

4.0 3.5 7.5

6.1 5.2 7.3

8.1 7.0 8.1

0.4 5.0 7.4

5.0 2.8 7.8

7.2 0.3 7.5

9.7 7.9 7.6

1.7 5.2 6.9

43.6

14.3

5 28 43.75

30 57.54

2 13.79

-.27

-.80

2 14.86

8.3 1.9 0.2

1.5 8.9 0.4

4.2 5.7 9.9

7.7 2.3 0.0

1.0 9.0 0.0

7.3 3.0 0.3

0.7 9.7 0.4

3.9 6.6 0.5

6.9 3.1 0.0

00.0

1.7

5 35 00.09

37 14.25

- 2 14.16

+.13

-.80

2 14.83

6.1 2.7 8.8

8.2 0.2 8.4

0.7 8.0 8.7

3.0 5.6 8.6

5.5 3.3 8.8

0.0 8.8 8.8

2.3 6.5 8.8

5.0 4.0 9.0

7.0 1.7 8.4

59.3

6.9

5 16 59.37

19 13.17

2 13.82

-.19

-.80

2 14.81

2 14.94

.83

.81

.86

2 14.86

Average.



Jan 27.9 Collection

	N
<del>0.7</del> 04.2	2756.3
4.3	5.1
4.1	5.1
<u>4.2</u>	<u>55.1 <math>\frac{2}{3}</math></u>
	56.0
	2755.6

$$\begin{array}{r} 2820.7 \\ 2812.8 \\ \hline \end{array}$$

2817.2

Get at 2817.0

Found at 2820.6

	S	N
2861.7	82.9	56.3
1.0	2.7	6.0
1.7	2.0	5.7
<u>61.8 <math>\frac{2}{3}</math></u>	<u>82.5 <math>\frac{1}{3}</math></u>	<u>56.0</u>
	61.3 $\frac{2}{3}$	

$$\begin{array}{r} 2871.9 \frac{1}{3} \\ 755.6 \\ \hline 2813.8 \end{array}$$

$$\begin{array}{r} 2820.7 \\ 2813.8 \\ \hline 2817.2 \end{array}$$

## 78 (Near time of Lunar Eclipse)

Jan 28.2

$\delta$ Ymag			
2.9	2.7	5.6	
5.2	0.3	.5	
7.7	7.6	.3	
0.1	5.3	.4	
2.8	2.7	.5	
7.9	7.8	.7	
0.2	5.2	.4	
2.8	2.4	.2	
5.2	0.3	.5	
37.9			
14.0			
2 00	37.74		
02	52.34		

.22		- 2	14.60
.3			-.12
+ .07			-.80
+ .02		2	15.52

57.18

 $\delta$  Persei

2.2	2.9	5.1	
5.0	9.6	4.6	
8.0	6.7	.7	
1.0	3.7	.7	
4.1	0.7	.8	
0.2	4.7	.9	
3.1	1.7	.8	
6.1	8.6	.7	
9.2	5.3	.5	

42.2

7.0

3 32 42.37

34 57.27

- 2 14.90

+ .07

-.80

2 15.63

 $\delta$  Ymag  
 ~~$\delta$  Persei~~

9.7	9.0	8.7	
2.1	6.7	.8	
4.6	4.1	.7	
7.0	1.5	.5	
9.6	9.1	.7	
4.7	4.0	.7	
7.0	1.9	.9	
9.3	9.5	8.8	
2.0	7.0	9.0	

24.6

7.4

2 08 24.39

10 38.95

- 2 14.56

-.12

-.80

2 15.48

 $\delta$  Persei

7.0	9.1	6.1	
9.9	6.0	5.9	
3.0	3.2	6.3	
6.0	9.7	5.7	
9.2	6.8	6.0	
5.5	0.6	5.6	
9.0	7.0	6.0	
1.8	4.0	5.8	
4.9	1.0	5.9	

18.0

18.2

2 34 17.96

36 32.94

- 2 14.98

+ .11

-.80

2 15.67

2<sup>m</sup> 15<sup>s</sup> 58 = clock #1327 slow.

Placing this beside the figure in the companion book, it became evident that the mean time signals were within 0.<sup>s</sup>1 of the correct time, so that no correction of observed results is needed.



Reduction of J. R. E.'s observations.

Bond #236 - <sup>2027</sup> ~~Frankham~~ - 1<sup>m</sup> 31.<sup>s</sup>0

True Time - " + 2<sup>m</sup> 15.<sup>s</sup>6

" - Bond #236 + 3<sup>m</sup> 46.<sup>s</sup>6 i.e. "236 slow

Observed Time

Std. H. Dist. since  
Standard Meridian

From Table II

Star.	Bond #236	True Sidereal				
#264	3 09 24.2	3 <sup>h</sup> 13 <sup>m</sup> 11. <sup>s</sup> 1	6 <sup>h</sup> 28 <sup>m</sup> 06. <sup>s</sup> 3	1 <sup>m</sup> 03. <sup>s</sup> 56.7	6 <sup>h</sup> 27 <sup>m</sup> 02. <sup>s</sup> 7	
#247	3 43 24	3 47 10.6	7 02 05.8	1 <sup>m</sup> 09. <sup>s</sup> 13.5	7 <sup>h</sup> 00 <sup>m</sup> 56. <sup>s</sup> 9	

Let us check the above by a different process

The "companion" was 2<sup>h</sup> 29<sup>m</sup> 0<sup>s</sup> of P<sup>h</sup> 1327 = 2<sup>h</sup> 27<sup>m</sup> 29.<sup>s</sup>2 of the M. 3. signals

Bond #236 slower than #1327 = 1 31.

~~Bond #236 2 27 29. of #236 = "~~

~~Observed Observed~~ <sup>Std. H. Dist. since</sup> <sup>From</sup> <sup>M. 3. Dist. since</sup>  
~~Bond #236~~ ~~since the companion~~ ~~Table II~~ ~~the companion~~

3 09 24.2	0 41 <sup>m</sup> 55. <sup>s</sup> 2	06 <sup>h</sup> 27 <sup>m</sup> 17. <sup>s</sup> 3	41 <sup>m</sup> 48. <sup>s</sup> 6	17.8
3 43 24	1 16 55	12 <sup>h</sup> 45 <sup>m</sup> 13. <sup>s</sup> 3	1 <sup>h</sup> 16 <sup>m</sup> 42. <sup>s</sup> 4	

The "companion" was 2<sup>h</sup> 11<sup>m</sup> 0<sup>s</sup> of P<sup>h</sup> 1327 = 5<sup>h</sup> 27<sup>m</sup> 20<sup>s</sup> of M. 3. signals

Bond #236 slower than #1327 1 31

Observed Bond #236	Std. H. Dist. since	From	M. 3. Dist. since	Mean Time
3 09 24.2	59 <sup>m</sup> 52. <sup>s</sup> 5	07 <sup>h</sup> 56 <sup>m</sup> 14. <sup>s</sup> 3	59 <sup>m</sup> 42. <sup>s</sup> 7	6 27 02.7
3 43 24	1 <sup>h</sup> 33 52.0	15 <sup>h</sup> 23 <sup>m</sup> 14. <sup>s</sup> 3	1 <sup>h</sup> 33 36.6	7 00 56.6

Results. -

The beginning of the eclipse being unsatisfactory for occultations, the time was checked by having star travel with star. The star began valuable time was lost in adapting the instrument after it was by another observer for another purpose.

#269 Disappearance. Could not follow the star up to the limb.

264 6<sup>h</sup> 27<sup>m</sup> 02.<sup>s</sup>7 Disappearance

271 Disappearance. Could not follow the star up to the limb.

Interval during which instrument was surrendered for another purpose, since ability to get the occultation was doubtful.

236 After the following observation it was evident that this might have been taken

247 Reappearance. 7<sup>h</sup> 00<sup>m</sup> 56.<sup>s</sup>6

264 Lost by reason of untimely arrival of a visitor.

True note



1888  
80

	Clock 1327 Slow m s	Date 7 Comp.	Corr.	Clock Comp. m s	Stand. Clock s fast.
Jan 3.5	1 53.44	3.6	+0.9	1 52.71	-0.82
5.3	55.25	5.4	+0.7	54.62	-0.70
7.4	56.72	7.2	<del>-0.4</del>	56.52	-.06
8.3	57.18			57.37	+0.19
9.3	57.98	9.4	+0.7	58.53	+0.50
11.3	59.68			59.45	-.23
12.4	2 00.90			2 00.27	-.63
14.3	02.77			02.62	-.15
17.2	07.30	17.4	+1.8	07.42	-.06
27.4	14.86	27.8	+3.6	2 14.85	-.37
28.2	15.58			2 15.54	-.04
				11) 3.75	
					.341

	Stand. Clock s fast (+0.3)	
Jan 0.9	-.24	-.20
1.9	-.47	+.03
2.9	-.67	+.19
3.9	-.68	+.12
4.9	-.57	+.11
5.9	-.54	+.03
6.9	-.26	+.28
7.9	+.15	+.41
8.9	+.40	+.25
9.9	+.36	-.04
10.9	+.05	-.18
11.9	-.52	-.57
12.9	-.65	-.13
13.9	-.35	+.30
14.9	-.11	+.24
15.9	+.16	+.27
16.9	+.66	+.50
	6.84	4.33



17.9	0.00	-.66	+.66
18.9	0.00	0.00	-.02
19.9	-.02	-.02	-.01
20.9	-.05	-.03	+.11
21.9	+.03	+.08	+.05
22.9	+.16	+.13	-.04
23.9	+.25	+.09	-.27
24.9	+.07	-.18	-.19
25.9	-.30	-.37	+.29
26.9	-.38	-.08	+.07
27.9	-.39	-.01	+.58
28.9	+.18	+.57	-.45
29.9	+.30	+.12	-.10
30.9	+.32	+.02	-.17
Feb. 0.9	(+.17)	-.15	
	2.45		3.01
	6.84		4.33
31) 9.29			31) 7.34
.300			.284

82

Before making the sheet, the observer hereby makes record that he repeatedly noticed his tendency to make the tape a shade early, this evening. E. J. Jannicorum.

Feb. 1, 4

B Aurigae

$\begin{array}{r} 1.20 \\ 1.50 \\ 1.80 \\ 3.8 \end{array}$   
 $\begin{array}{r} .14 \\ .1 \\ \hline + .01 \\ + .02 \\ 19.52 \\ .53 \end{array}$

9.4 3.0 2.4  
2.2 0.0 .2

5.3 6.8 .1  
8.0 4.0 .0

01.0

0.7

5 49 01.08

51 19.53

- 2 18.45

+ .04

- .80

2 19.21

$\begin{array}{r} .09 \\ .1 \\ \hline - .01 \\ + .02 \\ 7.59 \\ 7.60 \end{array}$

$\begin{array}{r} .13 \\ .1 \\ \hline - .01 \\ + .02 \\ 17.25 \\ 17.26 \end{array}$

ψ Aurigae

7.1 0.0 7.1

0.0 7.1 7.1

3.1 4.0 7.1

6.3 0.8 7.1

9.8 7.7 7.5

6.0 1.1 7.1

9.0 8.0 7.0

2.3 5.0 7.3

5.3 1.9 7.2

58.8

11.2

6 13 58.54

16 17.26

- 2 18.72

+ .12

- .80

2 19.40

θ Aurigae

$\begin{array}{r} 3.3 \\ 0.6 \\ 6.9 8.0 4.9 \\ 9.2 5.6 4.8 \\ 2.0 3.0 5.0 \end{array}$

7.0 7.9 4.9

9.6 5.2 4.8

2.0 2.7 4.7

5.0 0.0 5.0

47.5

6.6

5 49 47.44

52 05.68

- 2 18.24

- .07

- .80

2 19.11

1.7

9.3

7.2

5.0

2.9

2.7

5.3

3.0 6.0 9.0

5.0 4.0 9.0

7.0 1.6 8.6

49.3

2.9

49.41

7.60

18.19

- .25

- .80

2 19.24

Average.



Feb 2.2

$$\begin{array}{r}
 .22 \\
 .22 \\
 \hline
 - .04 \\
 + .02 \\
 \hline
 52.74 \\
 \hline
 22
 \end{array}$$

 $\beta$  Persei

6.7	0.7	7.4
9.0	7.9	6.9
2.0	5.1	7.1
4.6	2.4	7.0
2.1	9.5	6.6
2.7	<sup>4.3</sup> <del>4.6</del>	7.0
5.4	<sup>6.9</sup> <del>6.9</del>	7.0
8.0	<sup>7.0</sup> <del>7.0</del>	7.0
0.9	6.1	<del>30.9</del>
		<u>33.6</u>
		9.6

$$\begin{array}{r}
 2 \quad 58 \quad 33.51 \\
 60 \quad 52.74 \\
 \hline
 - 2 \quad 19.33 \\
 \quad \quad - .03 \\
 \hline
 \quad \quad - .80 \\
 \hline
 2 \quad 20.06
 \end{array}$$

Feb 3.2

 $\delta$  Androm.
$$\begin{array}{r}
 .19 \\
 .3 \\
 \hline
 -.04 \\
 +.02 \\
 \hline
 19.34 \\
 .32
 \end{array}$$

$$\begin{array}{r}
 9.0 \\
 2.2 \quad 6.6 \quad 8.8 \\
 4.7 \quad 4.1 \quad .8 \\
 7.0 \quad 1.9 \quad .9
 \end{array}$$

$$\begin{array}{r}
 59.3 \\
 2.8 \\
 \hline
 59.40 \\
 0 \quad 33 \quad 19.32 \\
 \hline
 -2 \quad 19.92 \\
 \hline
 -17 \\
 \hline
 -.80 \\
 \hline
 2 \quad 20.89
 \end{array}$$



Feb 6.2  $\beta$  Persei

$\begin{array}{r} .22 \\ .4 \\ + .09 \\ + .02 \\ \hline 52.53 \\ .63 \end{array}$ 
 $\begin{array}{r} 8.7 \\ 1.3 \\ 4.0 \\ 6.8 \end{array}$ 
 $\begin{array}{r} 0.5 \\ 1.5 \\ 2.1 \\ 2.1 \end{array}$ 
 $\begin{array}{r} 9.2 \\ 9.0 \\ 9.0 \\ 26.89 \end{array}$

$\begin{array}{r} 29.7 \\ 4.8 \\ \hline 29.53 \end{array}$ 
 $\begin{array}{r} 3 \quad 00 \quad 52.63 \\ -2 \quad 23.10 \\ \hline \quad \quad -.03 \\ \quad \quad -.80 \\ \hline 2 \quad 23.93 \end{array}$

Feb. 8.4 O Geminor.

$$\begin{array}{r}
 .07 \\
 .2 \\
 \hline
 1.01 \\
 +.02 \\
 \hline
 25.10 \\
 .13 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 5.4 \quad 5.1 \quad 0.5 \\
 8.0 \quad 2.8 \quad .8 \\
 0.3 \quad 0.1 \quad .4 \\
 3.0 \quad 7.7 \quad .7 \\
 \hline
 5.4 \quad 5.3 \quad .7 \\
 0.4 \quad 0.3 \quad .7 \\
 3.0 \quad 7.9 \quad .9 \\
 5.3 \quad 5.3 \quad .6 \\
 8.0 \quad 2.9 \quad .9
 \end{array}$$

$$\begin{array}{r}
 00.4 \\
 6 \quad 43 \quad 106.6 \\
 \hline
 45 \quad 25.1
 \end{array}$$

$$\begin{array}{r}
 6 \quad 43 \quad 00.35 \\
 45 \quad 25.13 \\
 \hline
 -2 \quad 24.78 \\
 \quad \quad .11 \\
 \quad \quad - .80 \\
 \hline
 2 \quad 25.69
 \end{array}$$

$$\begin{array}{r}
 8.3 \quad 7.8 \quad 6.1 \\
 0.7 \quad 5.1 \quad 5.8 \\
 3.1 \quad 2.8 \quad 5.9 \\
 5.7 \quad 0.2 \quad 5.9 \\
 \hline
 8.0 \quad 7.9 \quad 5.9 \\
 3.1 \quad - \quad - \\
 5.7 \quad 0.5 \quad 6.2 \\
 8.1 \quad 8.0 \quad 6.1 \\
 0.5 \quad 5.6 \quad 6.1
 \end{array}$$

$$\begin{array}{r}
 53.0 \\
 \hline
 0.0
 \end{array}$$

$$\begin{array}{r}
 7 \quad 37 \quad 53.00 \\
 40 \quad 17.93 \\
 \hline
 -2 \quad 24.93 \\
 \quad \quad .12 \\
 \quad \quad - .80 \\
 \hline
 2 \quad 25.85
 \end{array}$$

$$\text{Average} = 2^m 25^s.77 \text{ at } 7.2$$

I am using  $m = \frac{1}{2}$ , and as a rule I get stars on each side of the zenith, or else nearer the zenith than on this occasion.



Feb. 9.3

J Geminorum, 5-1 Aurigan

8 Monoc.

$$\begin{array}{r}
 .05 \\
 - .09 \\
 + .04 \\
 + .02 \\
 \hline
 28.65 \\
 28.63
 \end{array}$$

$$\begin{array}{r}
 .04 \\
 .09 \\
 - .08 \\
 + .02 \\
 \hline
 54.61 \\
 54.53
 \end{array}$$

$$\begin{array}{r}
 .08 \\
 - .07 \\
 + .02 \\
 \hline
 50.60 \\
 50.55
 \end{array}$$

$$\begin{array}{r}
 .08 \\
 - .07 \\
 + .02 \\
 \hline
 11.67 \\
 11.62
 \end{array}$$

0.7	5.0	5.7	1.9	5.2	7.1	4.2	5.7	9.9
3.0	2.6	5.6	4.5	2.5	7.0	6.2	3.6	9.8
5.2	0.3	5.5	7.1	9.9	7.0	8.4	1.4	9.8
7.5	8.0	5.5	9.8	7.1	6.9	0.4	9.2	9.6
9.7	6.1	5.8	2.5	4.6	7.1	2.3	7.3	9.6
4.1	1.8	5.9	7.8	9.1	6.9	6.7	3.1	9.8
6.2	9.6	5.8	0.4	6.5	6.9	8.7	1.1	9.8
8.6	7.2	5.8	3.1	3.9	7.0	0.7	9.1	9.8
0.7	5.0	5.7	5.9	1.2	7.1	2.8	7.1	9.9

$$\begin{array}{r}
 02.9 \\
 \hline
 16.2
 \end{array}$$

$$\begin{array}{r}
 28.6 \\
 \hline
 9.6
 \end{array}$$

$$\begin{array}{r}
 24.9 \\
 \hline
 16.9
 \end{array}$$

$$6 \quad 55 \quad 02.85$$

$$6 \quad 28 \quad 28.50$$

$$6 \quad 15 \quad 24.89$$

$$6 \quad 57 \quad 28.63$$

$$6 \quad 30 \quad 54.53$$

$$6 \quad 17 \quad 50.55$$

$$- \quad 2 \quad 25.78$$

$$- \quad 2 \quad 26.05$$

$$- \quad 2 \quad 25.66$$

$$- \quad .26$$

$$- \quad .05$$

$$- \quad .41$$

$$- \quad .80$$

$$- \quad .80$$

$$- \quad .80$$

$$2 \quad 26.84$$

$$2 \quad 26.90$$

$$2 \quad 26.87$$

u Geminorum.

$$3.6 \quad 8.0 \quad 1.6$$

$$5.8 \quad 5.8 \quad 1.6$$

$$8.0 \quad 3.6 \quad 1.6$$

$$0.1 \quad 1.4 \quad 1.5$$

$$2.3 \quad 9.2 \quad 1.5$$

$$6.9 \quad 4.8 \quad 1.7$$

$$9.1 \quad 2.6 \quad 1.7$$

$$1.1 \quad 0.3 \quad 1.4$$

$$3.5 \quad 8.0 \quad 1.5$$

$$45.9$$

$$15.0$$

$$6 \quad 13 \quad 45.79$$

$$6 \quad 16 \quad 11.62$$

$$- \quad 2 \quad 25.83$$

$$\begin{array}{r}
 .84 \\
 .90 \\
 .87 \\
 .87 \\
 \hline
 26.87 \text{ average}
 \end{array}$$

Feb 12.3

L

ε Aurigae

ε Aurigae,

9.0 8.0 7.0

9.0 5.8 4.8

1.3 5.6 6.9

1.8 2.8 4.6

3.8 3.0 6.8

4.5 0.0 4.5

6.1 0.8 6.9

7.2 7.2 4.4

8.6 8.2 6.8

0.1 4.4 4.5

3.5 3.1 6.6

5.9 8.7 4.5

6.0 0.8 6.8

8.7 5.8 4.5

8.5 8.2 6.7

1.7 3.0 4.7

1.0 5.9 6.9

4.5 0.3 4.8

13.3

27.1

7.7

5.4

4 47 13.41

4 57 27.28

4 49 42.17

4 53 56.17

- 2 28.76

2 28.89

+ 1.13

+ 1.02

- 1.80

- 1.80

2 43.54

2 29.67

2 29.69

2 29.67

$$\begin{array}{r}
 .22 \\
 .2 \\
 - .04 \\
 + .02 \\
 \hline
 56.19 \\
 56.17 \\
 \hline
 42.17
 \end{array}$$

$$\begin{array}{r}
 .22 \\
 .2 \\
 - .04 \\
 + .02 \\
 \hline
 56.19 \\
 56.17 \\
 \hline
 42.17
 \end{array}$$



Feb. 13.3

 $\pi$  Gemmae. 19 Lepus's seg.

$$\begin{array}{r}
 .06 \\
 \underline{3} \\
 - .02 \\
 + .02 \\
 17.91 \\
 \underline{17.21}
 \end{array}$$

$$\begin{array}{r}
 -15 \\
 \underline{.3} \\
 - .04 \\
 + .02 \\
 44.72 \\
 \underline{44.70}
 \end{array}$$

$$\begin{array}{r}
 3.6 \quad 3.0 \quad 6.6 \quad 8.2 \quad 1.1 \quad 9.3
 \end{array}$$

$$\begin{array}{r}
 6.1 \quad 0.5 \quad 6.6 \quad 1.9 \quad 7.4 \quad 9.3
 \end{array}$$

$$\begin{array}{r}
 8.5 \quad 8.0 \quad 6.5 \quad 5.6 \quad 3.7 \quad 9.3
 \end{array}$$

$$\begin{array}{r}
 1.0 \quad 5.6 \quad 6.6 \quad 9.1 \quad 0.1 \quad 9.2
 \end{array}$$

$$\begin{array}{r}
 3.4 \quad 3.1 \quad 6.5 \quad 2.9 \quad 6.4 \quad 9.3
 \end{array}$$

$$\begin{array}{r}
 8.2 \quad 8.1 \quad 6.3 \quad 0.3 \quad 9.3 \quad 9.6
 \end{array}$$

$$\begin{array}{r}
 0.8 \quad 5.8 \quad 6.6 \quad 4.0 \quad 5.8 \quad 9.8
 \end{array}$$

$$\begin{array}{r}
 3.2 \quad 3.3 \quad 6.5 \quad 7.5 \quad 2.0 \quad 9.5
 \end{array}$$

$$\begin{array}{r}
 5.8 \quad 0.8 \quad 6.6 \quad 1.0 \quad 8.4 \quad 9.4
 \end{array}$$

$$\begin{array}{r}
 48.2 \\
 \underline{5.0}
 \end{array}$$

$$\begin{array}{r}
 14.7 \\
 \underline{13.4}
 \end{array}$$

$$\begin{array}{r}
 7 \quad 37 \quad 48.26 \\
 7 \quad 40 \quad 17.91 \\
 - 2 \quad 29.65
 \end{array}$$

$$\begin{array}{r}
 7 \quad 11 \quad 14.70 \\
 7 \quad 13 \quad 44.70 \\
 - 2 \quad 30.00
 \end{array}$$

$$\begin{array}{r}
 - \quad .12
 \end{array}$$

$$\begin{array}{r}
 + \quad .28
 \end{array}$$

$$\begin{array}{r}
 - \quad .80 \\
 \underline{.80}
 \end{array}$$

$$\begin{array}{r}
 - \quad .80 \\
 \underline{.80}
 \end{array}$$

$$\begin{array}{r}
 2 \quad 30.57
 \end{array}$$

$$\begin{array}{r}
 2 \quad 30.52
 \end{array}$$

Feb 14.3

$$\begin{array}{r}
 .19 \\
 \underline{4} \\
 - .08 \\
 + .02 \\
 42.19 \\
 \underline{42.13} \\
 .22 \\
 \underline{.4} \\
 - .09 \\
 + .02 \\
 56.19 \\
 \underline{56.12}
 \end{array}$$

1 Aurigae,  $\epsilon$  Aurigae.

7.1	6.4	3.5	7.1	4.2	1.3
9.8	3.9	3.7	0.0	1.3	1.3
2.3	1.3	3.6	2.9	8.6	1.5
4.8	9.0	3.8	5.7	5.7	1.4
7.0	6.5	3.5	8.6	2.8	1.4
2.1	1.8	3.9	4.1	7.1	1.2
4.3	9.1	3.4	7.1	4.1	1.2
6.9	6.9	3.8	0.0	1.4	1.4
9.5	4.2	3.7	2.8	8.7	1.5

11.825.815.713.04 47 11.834 51 25.684 49 42.134 53 56.12- 2 30.30- 2 30.44

- .13

+ .02

- .80

- .80

2 31.232 31.22



Sub 22.3 V Aurigae

19	0.9	3.9	4.8
<u>1.3</u>	3.4	1.1	.5
-.06	6.0	8.2	.2
+ .02	8.8	5.9	.7
43.82	1.1	3.0	.1
<u>.88</u>	6.9	8.0	.9
	9.2	-	
	2.0	2.6	.6
	4.6	0.0	.6

07.1

4.5

07.26

5 43 43.88  
- 2 36.62  
 -.05

- .80  
 2 37.47

92

7.6-28.3

$$\begin{array}{r}
 .21 \\
 .1 \\
 \hline
 +.02 \\
 +.02 \\
 40.35 \\
 \hline
 31
 \end{array}$$

 $\psi^5$  Auriga

1.4 8.2 9.6

4.2 5.0 .2

6.7 2.6 .3

9.6 9.7 .3

2.7 6.9 .6

8.6 1.1 .7

1.1 8.0 .1

4.0 5.4 .4

6.8 2.3 .1

59.5

12.8

$$\begin{array}{r}
 6 \quad 35 \quad \cancel{60.67} \\
 \quad 38 \quad 39.67 \\
 \hline
 \quad 2 \quad 40.30
 \end{array}$$

2 40.64

+.02

-.80

2 41.42



Mar 3.3  $\eta$  Gemin

.18	1.0		
.2	3.2	3.4	6.6
<u>-.04</u>	5.4	1.1	6.5
+ .02			
07.20	7.7		
<u>.18</u>	0.0		
	4.6		
.26	6.8		
.2			
<u>-.05</u>	9.0		
+ .02	1.0	5.6	6.6
16.70			23.3
<u>.67</u>			2.0
	6	05	23.29
		08	07.18
	- 2		43.89
			-.25
			<u>-.80</u>
	2		44.94

4 'Aurigen

0.8	4.1	4.9
4.0	1.0	5.0
7.0	7.6	4.6
0.0	4.5	4.5
3.5	1.2	4.7
<u>0.0</u>	5.0	5.0
3.0	2.0	5.0
6.0	8.8	4.8
9.2	5.3	4.5
		32.3
		<u>7.3</u>
6	13	32.38
	16	16.67
- 2		44.29
		+ .12
		<u>-.80</u>
2		44.97

94

Mar 7.4

 $\alpha$  Am. Mj

40 Lyrae

	2.4	3.1	5.5
.11	5.1	6.0	.1
14	8.1	7.0	.1
<u>+ .04</u>	1.1	4.1	.3
<u>+ .02</u>	4.1	1.0	5.1
<u>59.57</u>	1.0	4.9	5.9
.63	3.8	1.9	.7
	6.5	8.9	.4
.07	9.9	5.7	.6
<u>.4</u>			12.5
<u>+ .03</u>			13.1
<u>+ .02</u>	8	53	12.69
<u>14.68</u>		55	59.63
<u>.73</u>	- 2		46.94
			+ .08
			- .80
	2		<u>47.66</u>

	3.1	
	0.6	
	8.0	
	5.7	
<u>3.0</u>	<u>3.0</u>	6.0
8.0	8.0	6.0
0.4	5.4	5.8
3.0	3.0	6.0
5.6	0.4	6.0
		28.0
		<u>- .2</u>
9	11	27.98
	14	14.73
- 2		46.75
		- .11
		- .80
2		<u>47.66</u>



Mar. 9.5 21 Low Min.

$\begin{array}{r} 2.9 \\ 6.4 \\ 9.0 \\ 1.7 \end{array}$ 
 $\begin{array}{r} 1.5 \\ 3.9 \\ 6.4 \\ 9.0 \end{array}$ 
 $\begin{array}{r} 3.0 \\ 0.5 \\ 8.0 \\ 5.3 \end{array}$ 
 $\begin{array}{r} 4.5 \\ .4 \\ .4 \\ .3 \end{array}$

$\frac{1.7}{7.0} \frac{2.9}{2.7} = .6$

$\frac{7.0}{9.5} \frac{2.7}{5.1} = .7$

$\frac{9.5}{2.0} \frac{5.1}{2.5} = .6$

$\frac{2.0}{4.6} \frac{2.5}{9.9} = .5$

$\frac{4.6}{37.1}$

$\frac{4.6}{37.1}$

$\begin{array}{r} 10 \\ 18 \end{array}$ 
 $\begin{array}{r} 37.24 \\ 25.40 \end{array}$

$\begin{array}{r} 21 \\ -2 \end{array}$ 
 $\begin{array}{r} 25.40 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

$\begin{array}{r} -2 \\ -2 \end{array}$ 
 $\begin{array}{r} 48.16 \\ 48.16 \end{array}$

Mar. 10.4 19 Leon. Min.

3.9	9.0	2.9
6.5	6.0	.5
9.0	3.1	.1
2.0	0.7	.7
4.8	8.0	.8
0.4	2.4	.6
3.0	9.8	.8
6.0	6.9	.9
8.4	4.1	.5

01.4

6.2

01.33

9 50 50.46

- 2 49.13

- .01

- .80

2 49.94

10 Leon. Min.

8.0	9.2	7.2
0.7	6.6	7.3
2.9	4.0	6.9
5.6	1.5	7.1
8.1	9.0	7.1
3.1	3.8	6.9
5.8	1.2	7.0
8.3	8.8	7.1
1.0	6.1	7.1

33.7

10.4

9 24 33.55

9 27 22.62

- 2 49.07

- .08

- .80

2 49.95

40 Leon. Min.

0.8	1.0	1.8
3.0	8.3	1.3
5.6	6.0	1.6
8.0	3.5	1.5
0.6	0.8	1.4
5.6	5.7	1.3
8.1	3.2	1.3
0.7	1.0	1.7
3.1	8.2	1.3

25.6

13.8

9h 11m 25.73

9 14 14.71

- 2 48.98

- .11

- .80

- 2 49.89

.05  
9  
- .04  
+ .92  
22.64  
22.62

.07  
9  
- .06  
+ .02  
14.71  
14.71

Several stars  
for time and a  
polar star taken  
together.

Time on =  $\frac{1}{2}$  at  
polar. Given  
negative for stars  
of Gem.



Mar 15.3

 $\beta$  Gauri $\beta$  Aurigae

7.0	3.9	0.9
9.1	1.4	0.5
1.5	9.1	0.6
4.0	6.8	0.8
6.2	4.2	0.4
1.0	9.9	0.9
3.4	7.4	0.8
5.7	5.0	0.7
8.0	2.7	0.7

7.2	5.4	2.6
0.2	2.4	2.6
3.0	9.9	2.9
6.0	6.7	2.7
8.9	4.0	2.9
4.8	8.0	2.8
7.5	5.0	2.5
0.4	2.2	2.6
3.2	0.2	3.4

53.01  
2.1  
1.09  
1.07  
53.09 Aurigae

20.2

6.5

5 16 20.34

5 19 12.37

- 2 52.03

.18

- 0.80

- 2 53.01

26.1

6.1

5 48 26.32

5 51 34.62

- 3 08.30

5 51 18.638

- 2 52.308

+ .04

- .80

- 2 53.078

 $\gamma$  Orionis

7.1	9.9	7.0
9.2	7.8	7.0
1.4	5.7	7.1
3.7	3.5	7.2
5.8	1.3	7.1
0.0	7.1	7.1
2.2	5.1	7.3
4.4	3.0	7.4
6.5	0.9	7.4

18.6

11.2

5 58 18.59

6 01 10.538

- 2 51.948

13.25

.80

2 53.073

 $\psi$  Aurigae $\eta$  Gem.

2.1	5.4	7.5	2.6	7.2	9.8
5.2	2.1	7.3	4.9	5.0	9.9
8.7	9.1	7.8	7.0	2.8	9.8
1.8	5.9	7.7	9.5	0.7	0.2
4.9	2.9	7.8	1.4	3.3	9.7
1.1	6.5	7.6	6.1	3.9	0.0
4.2	3.2	7.4	8.1	1.6	9.7
7.6	0.1	7.7	0.4	9.1	9.5
0.7	7.1	7.8	2.8	7.1	9.9

23.8

15.4

6 13 23.81

6 16 16.35

- 2 52.54

+ .13

- .80

6 5 14.92

6 8 6.96

- 2 52.04

- .25

- .80

2 53.09

2.1  
4  
- .084  
12.44  
12.376  
12.3  
- .084  
+ .02  
12.44  
11.62

- .06  
+ .02  
34.60  
34.62  
2.6  
4  
- .104  
18.71  
17.69

18.726  
18.638

.28  
4  
- .112  
+ .02  
16.44  
16.35

1.9  
4  
+ .76  
- .08  
+ .02  
6.96

.18  
- .072  
+ .02  
10.538

Mar 16.4  $\beta$  Ursae May. $\psi$  Ursae May.

5.0 0.5 5.5

0.8 9.1 9.9

8.5 6.9 5.4

3.3 5.9 9.2

2.3 3.0 5.3

6.4 3.1 9.5

6.2 9.1 5.3

9.3 0.1 9.4

0.0 5.3 5.3

2.2 7.3 9.5

7.5 8.0 5.5

8.1 1.4 9.5

1.2 4.2 5.4

1.0 8.8 9.8

5.1 0.0 5.1

4.1 5.9 0.0

8.9 6.7 5.6

6.9 2.9 9.8

12.6

30.0

13.0

15.6

10 52 12.68

10 60 29.82

10 55 6.285-

11 3 23.14

- 2 53.605-

- 2 53.32

+ .313

+ .04

- .80

- .80

2 54.192

- 2 54.08



Mar 17.4 10 Leonis Min x Urs. Maj

83 Cancri

9.1	0.8	9.9	5.3	6.0	1.3
1.7	8.1	9.8	7.3	2.9	0.2
4.4	5.7	0.1	1.0	0.0	1.0
7.1	3.0	0.1	3.9	6.8	0.7
9.5	0.2	9.7	7.0	3.9	0.9
4.6	5.3	9.9	2.9	7.8	0.7
7.2	2.9	0.1	6.5	4.9	1.4
9.9	0.1	0.0	9.3	1.8	1.1
2.5	7.7	0.2	2.6	8.5	1.1

9.2	2.9	12.1
1.4	0.7	2.1
3.8	8.4	2.2
5.9	6.1	2.0
8.0	4.0	2.0
2.4	9.8	2.2
4.5	7.6	2.1
6.6	5.6	2.2
8.8	3.1	11.9

$$\begin{array}{r} .11 \\ .6 \\ - .07 \\ + .02 \\ 22.59 \\ \hline 22.54 \end{array}$$

$$\begin{array}{r} .16 \\ .6 \\ - .096 \\ .10 \\ + .02 \\ 59.57 \\ \hline 59.49 \end{array}$$

$$\begin{array}{r} .10 \\ .6 \\ - .060 \\ + .02 \\ 44.60 \\ \hline 44.56 \end{array}$$

$$\begin{array}{r} 45.1 \\ 18.9 \\ \hline 26.2 \\ 9 \quad 2.5 \quad 44.99 \quad 8 \quad 5.3 \quad 05.46 \\ 9 \quad 2.7 \quad 22.54 \quad 8 \quad 5.5 \quad 59.49 \\ - 3 \quad 37.55 \quad - 2 \quad 54.03 \\ - .28 \quad + .09 \\ \hline - .80 \\ \hline 38.43 \quad 2 \quad 54.74 \end{array}$$

$$\begin{array}{r} 51.0 \\ 0.8 \\ 9 \quad 0.9 \quad 51.04 \\ 9 \quad 1.2 \quad 44.56 \\ - 2 \quad 53.52 \\ \hline .29 \\ - \quad .80 \\ \hline 2 \quad 54.61 \end{array}$$

Wrong star?

10 Ursae May.

1.0	6.7	7.7
4.0	4.2	8.2
6.7	1.2	7.9
9.5	8.8	8.3
2.5	5.7	8.2
8.0	0.3	8.3
2.2	7.3	9.5
3.4	4.9	8.3
6.1	2.0	8.1

$$\begin{array}{r} 29.2 \\ 21.7 \\ 8 \quad 5.0 \quad 29.14 \\ 8 \quad 5.3 \quad 22.84 \\ \hline - 2 \quad 53.70 \\ \hline .00 \\ 8.0 \end{array}$$

2 54.50

54.50

.61

.74

54.22 Average

Mar. 18 *p* Geminorum

8.9 5.3 4.2  
0.1 3.1 3.2  
3.3 0.5 3.8  
5.8 8.2 4.0  
7.9 6.0 3.9  
2.9 1.1 4.0  
5.0 9.0 4.0  
7.2 6.9 4.1  
9.5 4.3 3.8

51.5

7 15 17.5  
7 18 51.92  
- 2 54.534  
- .19  
- .80  
2 55.524

*p* Geminorum

6.0 4.7 0.7  
8.5 2.1 0.6  
0.5 9.8 0.3  
3.1 7.1 0.2  
5.8 5.0 0.8  
0.7 0.0 0.7  
3.0 7.2 0.2  
5.1 5.1 0.2  
7.5 2.5 0.0

60.0

3.7

7 19 00.20  
7 21 54.667  
- 2 54.467  
- .144  
- .80  
2 55.411

24 *β* Cygni

7.0 7.0 4.0  
1.0 3.0 4.0  
5.0 8.9 3.9  
9.0 5.0 4.0  
3.0 1.0 4.0  
1.0 2.9 3.9  
5.0 9.0 4.0  
9.0 5.0 4.0  
3.0 0.9 3.9

37.0

18.7

7 30 36.98  
7 33 32.206  
- 2 55.226  
+ .37  
- .80  
2 55.656

*p* Geminorum

8.8 5.3 4.1  
1.1 3.1 4.2  
3.3 0.6 3.9  
5.8 8.3 4.1  
7.9 6.1 4.0  
2.9 1.1 4.0  
5.0 9.0 4.0  
7.3 7.0 4.3  
9.5 4.3 3.8

51.6

19.0

7 18 52.00  
7 21 54.524

63 *Antares*

6.0 8.4 4.4  
8.7 6.4 5.1  
1.1 3.3 4.4  
3.9 1.0 4.9  
6.7 8.9 8.6  
2.0 2.8 4.8  
4.7 0.8 4.5  
7.3 8.1 5.4  
0.0 4.8 4.8

2.4

7 1 9.3  
7 3 2.49  
7 3 57.27  
- 2 54.78  
- .04  
- .80  
2 55.62

.52  
.65  
.41  
.62  
55.57

*Antares*



Mar 22 8 Lynx

6.1	2.9	9.0
0.3	8.2	8.5-
4.8	4.0	8.8
9.3	9.9	9.2
3.5-	5.5-	9.0
2.0	6.8	8.8
6.3	2.3	8.6
0.5-	8.1	8.6
5.0	3.7	8.7

29.3

6	24	7.5-
		29.39
6	27	27.00
-	2	57.61
		.46
+		.80
-		
2		57.95-

St. Anne

9.9	3.0	2.9
2.5-	0.5-	3.0
5.3	7.9	3.2
7.9	5.0	2.9
0.6	2.3	2.9
5.3	7.3	2.6
8.8	4.4	3.2
1.0	1.9	2.9
3.9	9.1	3.0

56.5-

9.1

6	28	56.48
6	30	53.76
-	2	57.28
		.04
-		.80
-	2	58.12

Jan 23 '3

63 Aurigae

e Geminorum

8 Geminorum

$$\begin{array}{r}
 .23 \\
 .2 \\
 \hline
 -.05 \\
 +.02 \\
 \hline
 57.18 \\
 57.15 \\
 \hline
 .19 \\
 .2 \\
 \hline
 -.038 \\
 +.02 \\
 \hline
 46.38 \\
 46.362 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 .19 \\
 .2 \\
 \hline
 -.038 \\
 +.02 \\
 \hline
 26.17 \\
 26.15- \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 2.1 \ 5.8 \ 7.9 \\
 5.0 \ 3.0 \ 8.0 \\
 7.3 \ 0.3 \ 7.6 \\
 0.1 \ 7.6 \ 7.7 \\
 3.0 \ 5.0 \ 8.0 \\
 8.3 \ 9.7 \ 8.0 \\
 1.0 \ 7.0 \ 8.0 \\
 3.7 \ 4.4 \ 8.1 \\
 6.3 \ 1.8 \ 8.1
 \end{array}$$

$$\begin{array}{r}
 59.0 \\
 18.4 \\
 \hline
 7 \ 0 \ 58.97 \\
 7 \ 3 \ 57.15 \\
 - \ 2 \ 58.18 \\
 - \ .04 \\
 - \ .80 \\
 \hline
 2 \ 59.02
 \end{array}$$

$$\begin{array}{r}
 5.0 \ 1.6 \ 6.6 \\
 7.3 \ 9.1 \ 6.4 \\
 9.8 \ 7.0 \ 6.8 \\
 2.0 \ 4.5- \ 6.5- \\
 4.3 \ 2.4 \ 6.7 \\
 9.2 \ 7.8 \ 7.0 \\
 1.6 \ 3.4 \ 7.0 \\
 3.9 \ 3.1 \ 7.0 \\
 6.1 \ 0.9 \ 7.0
 \end{array}$$

$$\begin{array}{r}
 48.6 \\
 7.6 \\
 \hline
 7 \ 15- \ 48.40 \\
 7 \ 18 \ 46.36 \\
 - \ 2 \ 57.96 \\
 - \ .19 \\
 - \ .80 \\
 \hline
 2 \ 58.95-
 \end{array}$$

$$\begin{array}{r}
 6.0 \ 0.3 \ 6.3 \\
 8.1 \ 8.2 \ 6.3 \\
 0.2 \ 6.0 \ 6.2 \\
 2.8 \ 3.8 \ 6.6 \\
 5.0 \ 7.6 \ 6.6 \\
 9.2 \ 7.2 \ 6.4 \\
 1.6 \ 5.0 \ 6.6 \\
 4.0 \ 2.9 \ 6.9 \\
 6.1 \ 0.3 \ 6.4
 \end{array}$$

$$\begin{array}{r}
 28.2 \\
 4.5- \\
 \hline
 7 \ 10 \ 28.24 \\
 7 \ 13 \ 26.15- \\
 - \ 2 \ 57.91 \\
 - \ .25 \\
 - \ .80 \\
 \hline
 2 \ 58.96
 \end{array}$$



Mar. 24.3 u Cameri

u Ursa May.

4r 1450

$$\begin{array}{r}
 .16 \\
 .3 \\
 -10.48 \\
 +.02 \\
 \hline
 58.73 \\
 58.70
 \end{array}$$

$$\begin{array}{r}
 2.1 \\
 .3 \\
 -10.63 \\
 +.02 \\
 \hline
 33.01 \\
 32.97
 \end{array}$$

$$\begin{array}{r}
 .19 \\
 .3 \\
 -10.57 \\
 +.02 \\
 \hline
 38.53 \\
 38.49
 \end{array}$$

$$\begin{array}{r}
 .19 \\
 .3 \\
 -10.57 \\
 +.02 \\
 \hline
 38.53 \\
 38.49
 \end{array}$$

$$\begin{array}{r}
 .34 \\
 .3 \\
 -10.02 \\
 +.02 \\
 \hline
 58.05 \\
 57.97
 \end{array}$$

2.9	0.5	3.4
5.2	8.0	3.2
8.0	5.5	3.5
0.1	3.0	3.1
2.3	0.9	3.2
7.1	6.1	3.2
9.8	3.9	3.7
2.0	1.2	3.2
4.2	0.0	4.2

$$\begin{array}{r}
 56.9 \\
 13.6 \\
 8 \quad 30 \quad 56.72 \\
 8 \quad 39 \quad 58.70 \\
 - \quad 2 \quad 58.98 \\
 \quad \quad .18 \\
 \quad \quad .80 \\
 \hline
 2 \quad 59.96
 \end{array}$$

2.1	4.9	7.0
5.0	1.5	6.5
8.5	8.5	7.0
1.3	5.4	6.7
4.0	2.2	6.2
1.2	6.3	7.5
4.5	3.1	7.6
7.2	9.9	7.1
0.8	7.0	7.8

$$\begin{array}{r}
 33.9 \\
 10.3 \\
 8 \quad 48 \quad 33.84 \\
 8 \quad 51 \quad 32.97 \\
 - \quad 2 \quad 59.43 \\
 \quad \quad .11 \\
 \quad \quad .80 \\
 \hline
 3 \quad 00.12
 \end{array}$$

3.2	6.0	9.2
5.9	3.1	9.0
8.4	0.8	9.2
1.1	8.0	9.1
4.0	8.2	9.2
9.0	0.1	9.1
1.9	7.2	9.1
4.1	6.9	9.0
7.0	2.0	9.0
<del>9.5</del>	<del>4.9</del>	39.5

$$\begin{array}{r}
 42.0 \\
 10.4 \\
 8 \quad 22 \quad 39.55 \\
 8 \quad 25 \quad 38.49 \\
 - \quad 2 \quad 58.94 \\
 \quad \quad .06 \\
 \quad \quad .80 \\
 \hline
 2 \quad 59.80
 \end{array}$$

O Ursa May.

5.9	0.9	6.8
0.0	6.3	6.3
4.1	2.1	6.2
8.0	7.4	5.4
2.6	3.1	6.7
1.1	4.2	5.3
5.7	1.0	6.7
9.8	7.0	6.8
3.1	1.9	5.0

$$\begin{array}{r}
 58.1 \\
 19.3 \\
 8 \quad 17 \quad 58.02 \\
 8 \quad 20 \quad 57.97 \\
 - \quad 2 \quad 59.95 \\
 \quad \quad .44 \\
 \quad \quad .80 \\
 \hline
 - \quad 2 \quad 00.31
 \end{array}$$

Mar 28.3.

31 Lynein

6.8 9.2 6.0

9.3 6.5- 5.8

2.1 3.8 5.9

5.0 0.9 5.9

8.0

8.6

8 12 7.96

8 15 10.44

- 3 2.48

+ 1.02

- 1.80

3 3.26

O Ursa May.

2.6 7.9 0.5-

6.8 3.1 9.9

0.0 9.0 9.0

4.5- 4.5- 9.0

9.2 0.4 9.6

7.9 1.9 9.8

2.0 7.8 9.8

6.1 3.3 9.4

0.5- 9.2 9.7

55.1

15.8

8 17 54.83

8 20 57.83

- 3 3.00

+ .44

- 1.80

3 3.36

$$\begin{array}{r}
 .21 \\
 .7 \\
 - .147 \\
 + .02 \\
 \hline
 10.07 \\
 10.44
 \end{array}$$

$$\begin{array}{r}
 .34 \\
 .7 \\
 - .1238 \\
 + .02 \\
 \hline
 58.00- \\
 57.83
 \end{array}$$



Mar 29. 4

@ Leonis

A Draconis

$$\begin{array}{r}
 .01 \\
 + .008 \\
 + .02 \\
 \hline
 21.81 \\
 \hline
 21.84
 \end{array}$$

$$\begin{array}{r}
 11 \\
 \hline
 11 \\
 + .088 \\
 + .02 \\
 \hline
 47.44 \\
 \hline
 47.37
 \end{array}$$

7.9 0.5- 8.4

0.0 8.6 8.6

2.1 6.2 8.3

4.2 4.1 8.3

6.4 2.0 8.4

0.9 8.0 8.9

2.9 5.8 8.7

5.0 3.6 8.6

7.1 1.4 8.5-

19.3

11 40 5.0

11 43 21.26

11 43 21.84

- 3 2.5-8

- 3 2.32

- 3 1.80

3 3.70

3.4- 3.8 7.2

9.4 7.5- 6.9

5.1 1.9 7.0

1.2 5.8 7.0

9.7 9.9 9.6

9.8 8.0 7.8

5.8 1.7 7.5-

1.8 5.9 7.7

7.6 9.7 7.3

43.3

12.3

11 21 43.65-

11 24 47.37

- 3 03.72

+ 3 1.92

- 3 1.80

3 03.61

Mar 30.3 x Geminorum

27 bygnis

$$\begin{array}{r}
 18 \\
 9 \\
 -1162 \\
 +102 \\
 \hline
 41.40 \\
 41.26
 \end{array}$$

$$\begin{array}{r}
 127 \\
 9 \\
 -1243 \\
 +102 \\
 \hline
 2124 \\
 2102
 \end{array}$$

5.1 0.7 5.5

5.0 1.7 6.7

7.4 8.1 5.5

8.3 8.1 6.4

9.9 6.0 5.9

1.4 5.0 6.4

2.0 3.9 5.9

4.9 1.7 6.6

4.3 1.3 5.6

8.1 8.1 6.2

8.9 7.1 6.0

5.0 1.4 6.4

0.1 4.9 5.0

8.1 8.3 6.4

3.3 2.4 5.7

1.4 5.0 6.4

5.9 0.1 6.0

5.0 1.9 6.9

38.0

58.3

16.4

4.7

7 34 37.86

7 56. 58.25-

7 37 41.26

8 00 2.02

- 3 3.40

- 3 3.77

= 2.2

+ .18

= .80

- .80

3 04.42

3 04.39



Mar 31.3 31 Bygner

x. Uron May-

~~6.01~~~~6.53~~

10.36

102

10.38

59.12

102

59.23

7.2 41 1.3

0.0 1.3 1.3

2.9 8.3 1.2

6.0 5.8 1.8

8.8 2.9 1.7

4.8 7.3 2.1

7.4 4.9 2.3

0.1 1.9 2.0

3.0 8.7 1.7

4.0 5.1 9.1

6.9 2.0 8.9

0.1 0.0 0.1

3.1 5.9 9.0

6.3 2.9 9.2

2.6 6.9 9.5

5.3 3.9 9.2

8.5 0.8 9.3

1.5 7.8 9.3

5.9

16.3

8 12 5.86

8 15 10.38

- 3 4.52

+ 1.02

- 1.80

3 5.30

54.6

12.2

8 52 54.64

8 55 59.123

- 3 4.59

+ 1.09

- 1.80

3 5.30

Apr 2,

$$\begin{array}{r}
 .27 \\
 .2 \\
 - .054 \\
 + .02 \\
 \hline
 62.33 \\
 62.30
 \end{array}$$

$$\begin{array}{r}
 .51 \\
 .02 \\
 - .102 \\
 + .02 \\
 \hline
 23.10 \\
 23.10
 \end{array}$$

~~S. brown~~  
 8 Ursae May,

5.1 6.4 1.5-

9.1 2.0 1.1

3.1 8.2 1.3

7.9 4.3 2.2

1.9 0.2 2.1

9.6 2.1 1.7

3.8 8.1 1.9

7.9 4.1 2.0

2.0 0.1 2.1

$$\begin{array}{r}
 56.1 \\
 9 \ 3 \ 9 \ 17.0 \\
 5-0.91 \\
 \hline
 9 \ 4 \ 2 \ 62.30 \\
 - \ 3 \ 6.39 \\
 + \ .39 \\
 - \ .80 \\
 \hline
 3 \ 6.80
 \end{array}$$

Apr 15-86,

7.3 5.1 2.4

4.7 8.1 2.8

1.2 0.3 1.5-

8.9 3.1 2.0

$$\begin{array}{r}
 5.7 \\
 15.9 \\
 \hline
 9.6
 \end{array}$$

9 45- 16.07

9 48 23.10

- 3 7.03

+ 1.23

- .80

3 6.60



Apr 3 -

+ Ursa May.

 $\sigma^2$  Ursa May.

$$\begin{array}{r}
 23 \\
 \underline{13} \\
 -1069 \\
 +02 \\
 59.21 \\
 \hline
 59.16
 \end{array}$$

$$\begin{array}{r}
 44 \\
 \underline{13} \\
 -1132 \\
 +02 \\
 32.85 \\
 \hline
 32.74
 \end{array}$$

1.9 2.9 4.8

0.4 8.9 9.3

1.9 9.8 4.7

6.0 2.9 8.9

7.9 6.9 4.8

2.0 7.4 9.4

1.0 3.6 4.6

6.9 2.5 9.4

3.9 0.6 4.5-

2.1 7.0 9.1

0.1 4.4 4.5-

3.7 6.1 9.8

3.1 1.4 4.5-

8.9 1.3 10.2

6.2 8.3 4.5-

4.1 5.4 9.5-

9.1 5.3 4.4

9.1 0.0 9.1

$$\begin{array}{r}
 52.3 \\
 \underline{5.6} \\
 8 \quad 52 \quad 52.30 \\
 8 \quad 55- \quad 59.16 \\
 - \quad 3 \quad 6.86 \\
 + \quad \quad .09 \\
 \hline
 \quad \quad .80 \\
 \hline
 3 \quad 7.57
 \end{array}$$

$$\begin{array}{r}
 24.9 \\
 \underline{13.6} \\
 8 \quad 57 \quad 24.72 \\
 9 \quad 0 \quad 32.74 \\
 - \quad 3 \quad 8.02 \\
 + \quad \quad .76 \\
 \hline
 \quad \quad .80 \\
 \hline
 - \quad 3 \quad 8.08
 \end{array}$$

for 4.3

$$\begin{array}{r}
 .12 \\
 .4 \\
 -1044 \\
 +.02 \\
 18.43 \\
 \hline
 18.40
 \end{array}$$

$$\begin{array}{r}
 11 \\
 4 \\
 -1044 \\
 +.02 \\
 14.41 \\
 \hline
 14.39
 \end{array}$$

$$\begin{array}{r}
 11 \\
 4 \\
 -1044 \\
 +.02 \\
 25.17 \\
 \hline
 25.15
 \end{array}$$

 $\pi$  Leonis

3.1 0.0 3.1

5.1 7.9 3.0

7.3 5.8 3.1

9.7 3.4 3.1

$$\begin{array}{r}
 11.7 \\
 5.1 \\
 \hline
 9 \ 51 \ 11.57 \\
 9 \ 54 \ 18.40 \\
 \hline
 -3 \ 6.83 \\
 - \quad .38 \\
 - \quad .80 \\
 \hline
 -3 \ 8.01
 \end{array}$$

 $\mu$  Leonis

8.9 6.1 5.0

0.9 4.1 5.0

3.1 4.1 4.2

5.3 4.1 4.4

$$\begin{array}{r}
 7.3 \\
 2.9 \\
 \hline
 9 \ 58 \ 7.32 \\
 10 \ 1 \ 14.39 \\
 \hline
 -3 \ 7.07 \\
 - \quad .30 \\
 - \quad .80 \\
 \hline
 3 \ 8.17
 \end{array}$$

 $\alpha$  Leonis

4.0 0.9 4.9

6.1 8.4 4.5-

8.3 6.2 4.5-

0.2 4.1 4.3

$$\begin{array}{r}
 22.3 \\
 2.5- \\
 \hline
 9 \ 59 \ 22.28 \\
 10 \ 2 \ 25.15- \\
 \hline
 -3 \ 2.87 \\
 - \quad .34 \\
 - \quad .80 \\
 \hline
 -3 \ 4.01
 \end{array}$$



Apr. 6.

$$\begin{array}{r}
 .18 \\
 .16 \\
 \hline
 - .108 \\
 + .02 \\
 \hline
 41.22 \\
 41.13
 \end{array}$$

$$\begin{array}{r}
 .120 \\
 .16 \\
 \hline
 - .120 \\
 + .02 \\
 \hline
 17.20 \\
 17.10
 \end{array}$$

$$\begin{array}{r}
 .119 \\
 .16 \\
 \hline
 - .114 \\
 + .02 \\
 \hline
 38.52 \\
 38.43
 \end{array}$$

$$\begin{array}{r}
 .28 \\
 .16 \\
 \hline
 - .168 \\
 + .02 \\
 \hline
 1.97 \\
 1.82
 \end{array}$$

x Gemini.

9.9 5.1 5.0  
 2.0 3.0 5.0  
 4.2 0.8 4.8  
 6.7 8.2 4.9  
 4.9 6.1 5.0  
 3.3 1.4 4.7  
 5.7 9.3 5.0  
 8.0 7.1 5.1  
 0.3 4.9 5.2

$$\begin{array}{r}
 32.6 \\
 9.3 \\
 7 \quad 34 \quad 32.49 \\
 7 \quad 37 \quad 41.13 \\
 \hline
 - \quad 3 \quad 8.64 \\
 \hline
 \quad \quad .22 \\
 \quad \quad 1.80 \\
 \hline
 3 \quad 9.66
 \end{array}$$

27 Gemini

9.3 6.7 6.0  
 3.0 3.2 6.2  
 5.9 9.9 6.8  
 9.5 6.4 5.9  
 3.3 3.1 6.4  
 9.8 6.2 6.0  
 3.1 3.1 6.2  
 6.8 9.8 6.6  
 0.0 6.5 6.5

$$\begin{array}{r}
 53.5 \\
 2.1 \\
 7 \quad 56 \quad 53.11 \\
 8 \quad 0 \quad 1.82 \\
 \hline
 - \quad 3 \quad 8.71 \\
 \hline
 \quad \quad .17 \\
 \quad \quad 1.80 \\
 \hline
 3 \quad 9.34
 \end{array}$$

x Gemini.

3.7 3.0 6.7  
 6.0 0.8 6.8  
 8.7 8.0 6.7  
 1.0 5.7 6.7  
 3.3 3.0 6.3  
 8.5 8.1 6.6  
 0.9 5.8 6.7  
 3.8 3.3 7.1  
 6.0 0.9 6.9

$$\begin{array}{r}
 8.3 \\
 6.8 \\
 7 \quad 37 \quad 8.36 \\
 7 \quad 40 \quad 17.10 \\
 \hline
 - \quad 3 \quad 8.74 \\
 \hline
 \quad \quad .12 \\
 \quad \quad 1.80 \\
 \hline
 3 \quad 9.66
 \end{array}$$

x Gemini

6.3 3.1 9.4  
 8.6 0.9 9.5  
 1.0 8.4 9.4  
 3.3 6.1 9.4  
 5.9 3.9 9.8  
 0.3 9.2 9.5  
 2.9 7.0 9.9  
 5.0 4.4 9.4  
 7.6 2.1 9.7

$$\begin{array}{r}
 29.9 \\
 14.9 \\
 7 \quad 53 \quad 29.78 \\
 7 \quad 56 \quad 38.43 \\
 \hline
 - \quad 3 \quad 8.65 \\
 \hline
 \quad \quad .19 \\
 \quad \quad 1.80 \\
 \hline
 3 \quad 9.64
 \end{array}$$

Apr. 7. 3

X Luminor

β Cancri

5.6 2.4 8.0

6.5- 8.4 4.9

8.0 0.0 8.0

8.8 6.4 5.2

0.4 7.7 8.1

0.4 4.2 4.6

2.7 5.2 7.9

2.6 2.1 4.7

5.0 3.0 8.0

4.5- 0.0 4.5-

0.4 8.2 8.6

9.0 5.9 4.9

2.0 6.8 7.8

1.0 3.8 4.8

4.0 3.5- 7.5-

3.1 1.5- 4.6

6.9 1.3 8.2

5.4 9.7 5.1

29.0

17.6

0.1

7.9

7 53 29.01

8 7 17.42

7 56 38.41

8 10 26.65-

- 3 9.40

- 3 9.23

- 1.19

- 1.37

- 1.80

- 1.80

3 10.39

3 10.40



April 9.3 of Gemini

27 bynia

3.5- 0.5- 4.0

7.0 3.6 0.6

6.1 8.1 4.1

0.3 0.1 0.4

8.4 5.9 4.3

3.4 6.9 0.3

0.9 3.4 4.3

6.9 3.8 0.7

3.0 1.1 4.1

0.1 0.1 0.2

7.9 6.1 4.0

6.9 3.4 0.3

0.1 4.1 4.2

0.3 0.1 0.4

2.5- 1.8 4.3

3.7 6.9 0.6

4.9 9.6 4.5-

6.9 3.4 0.3

27.1

50.1

1.9

3.9

7 53 27.10

7 56 50.20

7 56 38.37

8 0 1.74

- 3 11.27

- 3 11.54

- 1.19

+ 1.18

- 1.80

- 1.80

3 12.26

3 12.26

$$\begin{array}{r} .19 \\ .19 \\ - .171 \\ \hline + .02 \end{array}$$

$$\begin{array}{r} 38.52 \\ 58.37 \\ \hline .28 \end{array}$$

$$\begin{array}{r} .19 \\ - .25-2 \\ \hline + .02 \end{array}$$

$$\begin{array}{r} 1.97 \\ - 1.74 \\ \hline \end{array}$$

Apr 12.3 r Urse May.

ψ Urse May

δ Leonis

8.1 8.0 6.1

0.0 8.4 8.4

4.4 8.8 3.2

0.9 5.4 6.3

3.0 5.5 8.5

6.7 6.3 3.0

3.3 3.0 6.3

5.9 2.5 8.4

8.9 4.1 3.0

5.8 0.6 6.4

8.9 9.7 8.6

1.1 2.0 3.1

8.1 8.0 6.1

1.8 6.8 8.6

3.3 9.9 3.2

3.3 3.1 6.4

7.8 1.1 8.9

7.8 5.4 3.2

5.9 0.8 6.7

0.3 8.0 8.3

9.9 3.1 3.0

8.2 8.0 6.2

3.7 5.1 8.8

2.1 0.9 3.0

0.5 5.4 5.9

6.4 2.3 8.7

4.2 8.9 3.1

13.0

9.2

56.6

2.4

5.4

10.4

11 9 13.13

11 .00 9.28

11 4 56.55

11 12 26.79

11 03 22.95

11 8 10.02

- 3 13.66

- 3 13.67

- 3 13.47

- .12

+ .04

- .26

- .80

- .80

- .80

3 14.58

3 14.43

3 14.53



Apr. 13.3

$$\begin{array}{r}
 124 \\
 13 \\
 \hline
 -1072 \\
 +102 \\
 \hline
 32.56 \\
 \hline
 32.51
 \end{array}$$

$$\begin{array}{r}
 22 \\
 13 \\
 \hline
 -1066 \\
 +102 \\
 \hline
 22.38 \\
 \hline
 22.53
 \end{array}$$

$$\begin{array}{r}
 24 \\
 100 \\
 \hline
 -1072 \\
 +102 \\
 \hline
 18.98 \\
 \hline
 18.93
 \end{array}$$

c Ursae Mag.

6.9 9.1- 6.0

0.1 0.0 6.1

3.3 3.0 6.3

6.2 0.0- 6.2

9.6 6.6 6.2

5.8 0.5- 6.3

8.8 7.3 6.1

1.9 4.3 6.2

5.1 1.3 6.4

18.3

2.1

8 48 18.11

8 51 32.51

- 3 14.40

+ .11

- .80

3 15.19

10 Ursae Mag.

0.1 5.9 6.0

3.1 3.0 6.1

5.9 0.1 6.0

8.5- 7.4 5.9

1.5- 4.7 6.2

6.4 9.0 5.4

9.7 6.4 6.1

2.2 3.7 5.9

5.1 0.9 6.0

8.0

18.6

8 50 7.98

8 53 22.33

- 3 14.35-

+ .00

- .80

3 15.15-

x Ursae Mag.

3.9 5.0 8.9

6.9 1.9 8.8

0.1 8.9 9.0

3.0 5.9 8.9

6.0 2.9 8.9

2.1 6.4 8.5-

5.1 3.8 8.9

8.2 0.4 8.6

1.5- 7.3 8.8

44.1

7.4

8 52 44.39

8 55- 18.93

- 3 14.5-4

+ .09

- .80

3 15.25-

Apr 16.3

Canari

x Ursae May.

40 Lepore

$$\begin{array}{r}
 .18 \\
 .16 \\
 \hline
 .108 \\
 + .02 \\
 \hline
 .128 \\
 \hline
 .140 \\
 \hline
 .140
 \end{array}$$

$$\begin{array}{r}
 .24 \\
 .16 \\
 \hline
 .144 \\
 + .02 \\
 \hline
 .164 \\
 \hline
 .180 \\
 \hline
 .180
 \end{array}$$

$$\begin{array}{r}
 .19 \\
 .16 \\
 \hline
 .114 \\
 + .02 \\
 \hline
 .142 \\
 \hline
 .146
 \end{array}$$

5.1 2.3 7.4

7.6 0.0 7.6

0.0 7.9 7.9

2.3 5.3 7.6

4.6 3.0 7.6

9.5- 8.1 7.6

1.7 5.9 7.6

4.1 3.5- 7.6

6.6 1.1 7.6

38.8

15.3

8 36 38.81

8 39 55.40

- 3 16.59

- .18

- .80

3 17.57

1.6 2.8 4.4

4.7 9.9 4.6

7.8 6.7 4.5-

0.9 3.7 4.6

4.0 0.3 4.3

0.1 4.4 4.5-

3.0 1.7 4.7

6.1 8.4 4.5-

9.1 5.3 4.4

42.2

4.7

8 52 42.25-

8 55 58.86

- 3 16.61

+ .08

- .80

3 17.32

2.7 2.9 5.6

5.0 0.1 5.1

7.5- 7.8 5.3

0.1 5.1 5.2

2.8 2.7 5.5-

7.9 7.8 5.7

0.2 5.2 5.4

2.7 2.7 5.4

5.1 0.1 5.2

7.8

57.8

13.2

9 10 57.69

9 14 14.16

- 3 16.47

- .11

- .80

3 17.37



Apr 17-3

31 Leon. min

in Ursa May.

2.0 3.7 5.7

4.8 0.7 5.5-

4.3- 1.0 5.3

7.8 7.7 5.5-

7.0 8.3 5.3

0.7 4.8 5.5-

9.4 5.9 5.3

2.9 2.1 5.0

2.4 3.3 5.4

6.0 9.3 5.3

7.5-8.1 5.6

1.7 3.9 5.6

0.1 5.5- 5.6

4.4 11.0 5.4

2.6 2.9 5.5-

7.1 8.2 5.3

5.1 0.3 5.4

0.05 8.7 5.7

7.8

5.5-22.8

13.9

13.6

10 18 7.73

10 12 22.72

10 21 25.03

10 15 40.00

- 3 17.30

- 3 17.28

- .08

- .01

- .80

- .80

3 18.18

3 18.09

Apr. 18.3 0 Urone May,

C. Caneri

U Urone May,

6.1 1.4 7.5-

3.9 1.0 4.9

3.1 5.3 8.4

0.2 7.1 7.3

6.1 8.8 4.9

6.1 2.3 8.4

4.8 3.0 7.8

8.4 6.1 4.5-

9.4 9.0 8.4

9.0 8.7 7.7

1.0 3.9 4.9

2.4 6.0 8.4

3.2 4.4 7.6

3.2 1.6 4.8

5.6 2.9 8.5-

1.8 5.7 7.5-

8.0 6.9 4.9

1.9 6.6 8.5-

6.0 1.6 7.6

2.6 2.0 4.6

5.0 3.7 8.7

0.3 7.5 7.8

5.0 9.9 4.9

8.0 0.5- 8.5-

4.7 3.1 7.8

37.4

1.1 7.5- 8.5-

39.0

7.5-

14.3

18.6

8 36 37.40

4.6

8 17 38.82

8 39 55.28

8 48 14.24

8 20 57.08

- 3 17.88

8 51 32.39

- 3 18.26

- .17

- 3 18.85-

+ .44

- .80

+ .11

+ .80

3 18.85-

+ .80

3 18.62

3 18.85-

3 18.84



Apr 21.3 u Urse May.

1 Urse May.

$$\begin{array}{r} .19 \\ - .019 \\ \hline + .02 \\ \hline 59.93 \\ - 39.93 \\ \hline .19 \\ - .019 \\ \hline + .02 \\ \hline 21.00 \\ - 21.00 \\ \hline \end{array}$$

2.1 7.8 9.9  
 5.0 4.9 9.9  
 7.9 2.0 9.9  
 0.4 9.4 9.8  
 3.3 6.9 0.2  
 8.9 1.1 0.1  
 1.7 8.5 0.2  
 4.4 5.7 0.1  
 7.1 2.8 9.9

$$\begin{array}{r} 19.9 \\ \hline 18.9 \\ 10 \quad 12 \quad 19.99 \\ 10 \quad 15 \quad 39.93 \\ \hline - 3 \quad 19.94 \\ \hline \quad \quad .01 \\ \quad \quad .80 \\ \hline 3 \quad 20.75 \end{array}$$

2.7 9.5 2.2  
 5.3 6.6 1.9  
 8.2 3.9 2.1  
 1.1 0.9 2.0  
 4.1 8.0 2.1  
 9.9 2.4 2.3  
 2.8 9.6 2.4  
 5.4 6.7 2.1  
 8.1 3.9 2.0

$$\begin{array}{r} 1.0 \\ \hline 1.1 \\ 10 \quad 7 \quad 1.06 \\ 10 \quad 10 \quad 21.00 \\ \hline - 3 \quad 19.94 \\ \hline \quad \quad .02 \\ \quad \quad .80 \\ \hline 3 \quad 20.72 \end{array}$$

Apr. 23.3.

e Leonis

6.5-1.8 8.3

8.5-9.3 7.8

1.0 7.1 8.1

3.0 5.0 8.0

3.5-2.4 7.9

0.2 8.1 8.3

2.1 6.0 8.1

4.5-3.5-8.0

6.9 1.1 8.0

9.0

0.5-

9 36 9.03

9 39 29.96

- 3 20.93

- 1.23

- 1.80

3 21.96

Or Ursa May.

9.5-1.2 0.7

3.8 7.0 0.8

7.7 2.9 0.6

1.9 8.9 0.8

6.0 4.9 0.9

4.1 6.4 0.5-

8.1 2.1 0.2

2.2 8.3 0.5-

6.6 4.4 1.2

40.4

6.6

9 39 40.35-

9 42 61.72

- 3 21.37

+ 39

- 1.80

3 21.78

$$\begin{array}{r}
 .10- \\
 .3 \\
 \hline
 .045- \\
 4.42 \\
 29.99 \\
 \hline
 29.96 \\
 .32 \\
 .3 \\
 \hline
 .064 \\
 4.02 \\
 61.76 \\
 \hline
 61.72
 \end{array}$$



Apr. 25.5 11 Bootis

d Bootis

λ Bootis

\* .00  
 .5  
 4.02  
 7.05  
 .10

\* .04  
 .5

.02  
 9.14  
 9.16

\* .05  
 .5  
 .02  
 24.76  
 .78

1.4 8.1 9.5  
 3.7 4.2  
 6.0 3.1 .1  
 8.3 1.1 .4  
 0.6 8.7 .3  
 5.3 4.0 .3  
 7.6 1.8 .4  
 0.2 9.4 .6  
 2.5 7.0 .5

45.0  
 12.1  
 13 52 44.71  
 56 07.10  
 -3 22.39  
 -1.19  
 +.80  
 3 23.38

θ Bootis

8.1 5.7 3.8  
 1.6 2.1 3.7  
 5.0 9.0 4.0  
 8.2 5.7 3.9  
 2.0 2.4 4.4  
 8.9 5.5 4.4  
 2.0 2.0 4.0  
 5.5 8.6 4.1  
 8.8 5.1 3.9

02.0  
 0.2  
 14 18 02.01  
 21 24.78  
 3 22.77  
 +1.19  
 +.80  
 3 23.38

6.9 6.6 3.5  
 0.0 3.6 .6  
 2.9 0.6 .5  
 5.8 7.8 .6  
 8.7 4.7 .4  
 4.7 8.8 .5  
 7.6 5.7 .3  
 0.6 2.9 .3  
 3.5 9.6 .1

46.5  
 13.3  
 14 18 46.70  
 12 09.16  
 -3 22.46  
 +1.07  
 +.80  
 3 23.19

.78  
 .19  
 .38  
 23.32 Average

\*Note. As Professor Searle has taken up the practice of allowing for the diurnal aberration instrumentally (in collimating) the term is omitted from "apparent place".

J. A. E.

May 6.5

B Bootis

$$\begin{array}{r}
 .06 \\
 4 \\
 \hline
 - .02 \\
 45.25 \\
 \hline
 23
 \end{array}$$

$$\begin{array}{r}
 7.8 \quad 2.3 \quad 0.1 \\
 6.6 \quad 9.5 \quad 0.1 \\
 3.2 \quad 6.7 \quad 9.9 \\
 5.9 \quad 4.0 \quad 9.9 \\
 8.7 \quad 1.1 \quad 9.8 \\
 4.2 \quad 5.7 \quad 9.9 \\
 6.8 \quad 3.1 \quad 9.9 \\
 9.5 \quad 0.4 \quad 9.9 \\
 2.4 \quad 7.9 \quad 0.3
 \end{array}$$

$$15.0$$

$$18.8$$

$$14 \quad 54 \quad 14.99$$

$$57 \quad 45.23$$

$$-3 \quad 30.24$$

$$- .01$$

$$- .80$$

$$3 \quad 31.05$$



May 7/88 Prof. Hinkle gets 5 stars. Mean =  $\frac{3 \ 30.63}{3 \ 31.43}$

May 16.3 20 bones 8 Can. Ym.

	9.6	3.8	3.4	3.4	8.8	2.2
.09	1.6	1.3	2.9	6.1	6.0	.1
.4	3.7	9.0	2.7	9.0	2.2	.2
-.04	6.0	7.0	3.0	1.7	0.4	.1
06.60	8.2	4.7	2.9	4.5	7.6	.1
54	2.9	0.5	3.4	0.0	2.1	.1
.13	5.0	6.0	3.0	3.0	9.4	.4
.4	7.0	6.0	3.0	5.7	7.0	.7
-.08	9.3	3.9	3.2	8.4	4.1	.5
26.70						
.25						
		31.4			51.0	
		9.9			2.4	
12	20	31.52		12	24	67.13
	24	06.54			28	26.25
	- 3	35.02			- 3	35.12
		~.26				-.01
		-.80				-.80
	3	36.08			3	35.93

124

Prof. Searle gets

May 25.3

2 Virgin

α Draconis

$$\begin{array}{r}
 .03 \\
 \underline{.5} \\
 - .02 \\
 58.11 \\
 \underline{.09}
 \end{array}$$

$$\begin{array}{r}
 .23 \\
 \underline{.5} \\
 - .02 \\
 27.56 \\
 \underline{.44}
 \end{array}$$

1.0 7.1 8.1

2.9 5.0 7.9

4.9 3.0 7.9

6.9 1.0 7.9

19.08.8

18.98

13 55 58.09

- 3 39.11

-.80

4.9 4.0 8.9

9.3 9.0 8.3

4.7 4.0 8.7

9.1 9.0 8.1

44.12.1

44.23

14 01 23.44

- 3 39.21

-.80



At June 6.4 4 Bootie

	6.6	8.7	5.3
.04	9.1	6.0	.1
.3	1.8	3.5	.3
<u>+.01</u>	4.3	0.9	.3
58.09	—	8.3	
.10	—	—	

.04	—	3.0	
.3	—	0.3	
<u>+.01</u>	7.6	7.9	.5
17.13	0.1	5.3	.4
.14			

	32.7
	<u>8.5</u>
	32.65
15	20 17.14
-3	44.49
	-.07
	<u>-.80</u>
3	45.86

V' Bootie

4.2	9.0	3.2
7.0	6.0	.0
9.7	3.4	.1
2.3	0.7	.0
<u>5.0</u>	<u>8.0</u>	<u>.0</u>
0.8	2.4	.2
3.4	9.8	.2
6.0	7.0	.0
8.9	4.3	.2

	11.6
	<u>10.8</u>
15	23 11.55
	26 56.10
-3	44.55
	-.01
	<u>-.80</u>
3	45.36

June 16. 3

 $\eta$  Del. Maj. $\eta$  Booti $\chi$  Booti

.16  
 .3  
 1.05  
 8.72  
 .77

9.2 1.0 0.2  
 2.2 8.0 .3  
 8.2 2.1 .3  
 1.2 9.1 .3  
 4.0 6.0 .0  
 7.0 2.0 .0

20.0

13/ 1.0

14 08 20.08

12 08.77

- 3 48.69  
 + .07

-1.00

3 49.72

The value  
 of base  $\varphi$   
 adopted  
 on page 128



June 18.3  $\alpha$  Bootis
$$\begin{array}{r} .11 \\ .1 \\ \hline +.01 \\ 35.74 \\ \hline .35 \end{array}$$
 $\gamma$  Bootis

33 Bootis

9.7	2.3	2.0
2.1	9.8	1.9
4.9	7.0	1.9
7.5	4.6	2.1
0.0	1.8	1.8
5.3	6.5	1.8
8.0	4.0	2.0
0.9	1.1	2.0
3.1	8.5	1.6

46.0

18.1

14 23 45.95

27 35.35

-3 49.40

.06

-1.10

3 50.56

Frodsham Lick clock 1327 put forward 5 minutes  
at 14<sup>th</sup> Lick time. J.R.E.

June 20.2 Level of Mer. line.

Original Record in the pocket <sup>-size</sup> comparison book.

Feb. 8	Seneca W.	05.6	14.8	20.4	-9.2	-9.8	
"	"	E.	10.4	10.0	20.4	-10.4	-9.35
"	N	W	09.2	11.4	20.6	-9.2	.11
"	"	E	08.6	12.0	20.6	-8.6	-8.9
							$\bar{b} = -1.03$
							$\sec \phi = 1.35$

From this we should get  $\bar{b} \sec \phi = -1.39$   
or say  $-1.40$

$$\begin{array}{r} 1.03 \\ 4.05 \\ 1.35 \\ \hline 1.39 \end{array}$$

Prof. Rogers' form may be found by consulting Apr. 7, 1885  
in his record book

Some work by J. R. D. may be seen in this set of books (book 138)  
at Apr. 22.9, 1887, but the above form seems to be the best;  
the constant .11 being half of that used by Prof. Rogers; but  
we apply it to a quantity twice as great.

As the levelling does not inspire much confidence we will  
take an average between the last and the previous  
figure. Left us until further notice  
~~use  $\bar{b} = -1.10$   $\bar{b} \sec \phi$~~

use  $\bar{b} \sec \phi = -1.10$

Remark: respectfully made by J. R. D.  
June 1, 1899

Has not Mr Edmunds accidentally  
introduced his bottle lengths on the  
above figures? The true final  
result seems to be  $\bar{b} = -1.396$



From 20.3 12 Can Ven. Leg. E Virgini

$$\begin{array}{r} .17 \\ .2 \\ \hline -.03 \\ 31.97 \\ .94 \end{array}$$

20 Can Ven

4.7	9.4	4.1
7.4	6.7	.1
0.1	4.0	.1
2.9	1.1	.0
5.6	8.6	.2
1.0	3.0	.0
4.0	0.3	.3
6.6	7.6	.2
9.4	5.0	.4

42.0

1.4

$$\begin{array}{r} 13 \quad 13 \quad 42.07 \\ 12 \quad 31.94 \\ + 2 - 49.87 \\ - .01 \end{array}$$

-1.10

50.98

3 Un. Maj. Pr.

June 21.3

γ Hercules.

ε Ophiuchi

$$\begin{array}{r}
 .09 \\
 \underline{.12} \\
 - .02 \\
 24.32 \\
 \underline{24.30} \\
 \\
 \begin{array}{r}
 110 \\
 \underline{12} \\
 - .02 \\
 25.39 \\
 \underline{25.37}
 \end{array}
 \end{array}$$

2.6	6.7	8.7	<del>4.2</del>	3.2	6.1	
5.2	<del>6.1</del>	8.4	<del>5.9</del>	4.9	3.9	
8.7	<del>8.2</del>	8.8	7.1	6.1	2.0	
1.2	<del>7.1</del>	8.3	8.5	7.5	9.8	
7.1	<del>7.1</del>	34.5	0.2	9.2	7.9	+
		2.7		7.1	3.6	0.7
16	17	34.30		9.1	1.4	0.5
16	16	24.30		1.2	9.4	0.6
	+2	-50.00		3.2	7.3	0.5
	+	.07				35.3
	-	1.10				2.6
		50.03		16	13	35.29
				16	12	25.37
				+2	-	50.08
				-		1.50
				-		1.10
						51.68



June 22.3

 $\beta$  Bootis. $\delta$  Bootis.

$$\begin{array}{r}
 .13 \\
 .3 \\
 \hline
 .039 \\
 - .04 \\
 \hline
 .102 \\
 45.09 \\
 \hline
 45.05
 \end{array}$$

$$\begin{array}{r}
 .09 \\
 .13 \\
 \hline
 .03 \\
 60.75 \\
 \hline
 60.72
 \end{array}$$

$$\begin{array}{rcl}
 7.5 & 2.0 & 9.5 \\
 0.0 & 9.0 & 9.0 \\
 2.9 & 6.2 & 9.1 \\
 5.5 & 3.9 & 9.4 \\
 8.2 & 1.0 & 9.2 \\
 3.9 & 5.6 & 9.5 \\
 6.5 & 2.8 & 9.3 \\
 9.1 & 0.1 & 9.2 \\
 2.0 & 7.2 & 9.2
 \end{array}$$

$$\begin{array}{r}
 54.8 \\
 \hline
 12.2
 \end{array}$$

$$\begin{array}{rcl}
 14 & 58 & 54.64 \\
 14 & 57 & 45.05 \\
 + 2 & - & 50.41 \\
 & - & .02 \\
 & - & 1.10 \\
 \hline
 \cancel{+ 2} & & 57.53
 \end{array}$$

$$\begin{array}{rcl}
 5.4 & 5.0 & 0.4 \\
 8.0 & 2.5 & 0.5 \\
 0.3 & 0.1 & 0.4 \\
 3.0 & 7.8 & 0.8 \\
 5.4 & 5.1 & 0.5 \\
 0.4 & 0.2 & 0.6 \\
 2.9 & 7.8 & 0.7 \\
 5.2 & 5.2 & 0.4 \\
 7.8 & 3.0 & 0.8
 \end{array}$$

$$\begin{array}{r}
 10.2 \\
 \hline
 5.3
 \end{array}$$

$$\begin{array}{rcl}
 15 & 12 & 10.28 \\
 15 & 10 & 60.72 \\
 + 2 & - & 50.44 \\
 & - & .12 \\
 & - & 1.10 \\
 \hline
 & & 55.66
 \end{array}$$

25.3

June 25.3

.21  
 .6  
1.26  
 -.13  
 8.63  
8.50  
 .09  
 .6  
-.054  
 34.30  
34.25

 $\eta$  Ursae Maj.  $\alpha$  Bootis.

5.9	9.9	5.8	1.8	5.3	7.1
9.0	6.6	5.6	3.8	3.1	6.9
2.0	3.3	5.5	5.9	1.0	6.9
5.2	0.2	5.4	8.1	8.8	6.9
8.4	7.0	5.4	0.3	6.5	6.8
5.0	0.5	5.5	4.8	2.1	6.9
8.1	7.2	5.3	6.9	0.0	6.9
1.4	4.0	5.4	9.0	7.9	6.9
4.6	1.0	5.6	1.2	5.7	6.9

17.9  
14.4

43.4  
8.6

13	44	17.746	14	11	43.45
13	43	8.50	14	10	34.25
+ 2 -		50.74	+ 2 -		50.80
+		.14	-		.27
-		1.10	-		1.10
		<u>50.70</u>			<u>52.17</u>

June 25, 1888.  
 $n$  small and not well  
 determined; appears to be  $-0.05$

The above is value of  $n$  as furnished by  
 Prof. Searle from his observations.



June 27.3

Dec 2° 5'

τ Virginis.

$$\begin{array}{r} .09 \\ .8 \\ - .072 \\ \hline 57.97 \\ 57.90 \end{array}$$

$$\begin{array}{r} .37 \\ .8 \\ - .30 \\ \hline 22.70 \\ 22.40 \end{array}$$

6.0	7.2	3.2	2.4
8.1	5.1	3.2	<del>7.4</del>
0.1	3.1	3.2	<del>2.1</del>
2.1	1.0	3.1	<del>7.1</del>
4.2	8.9	3.1	<del>2.0</del>
8.4	4.9	3.3	<del>1.7 7.3</del>
0.3	2.8	3.1	<del>3.2 5.7</del>
2.5	0.8	3.3	<del>5.0 4.0</del>
4.6	8.7	3.3	<del>6.6 2.4</del>
		06.5	<del>8.1 1.0</del>
		11.3	<del>9.8 9.1</del>
13	5.7	06.59	<del>1.3 7.7</del>
13	5.5	57.90	<del>3.0 6.1</del>
	+ 2	-51.31	<del>4.8 4.2</del>
		- 1.10	<del>6.3 2.9</del>
		52.41	<del>8.0 1.1</del>
		-51.31	<del>9.8 2.9</del>
		-51.26	<del>1.1</del>
		.05	

Dec 2° 5' L<sub>an</sub> 0.037  
 Dec 64° 54' L<sub>an</sub> 2.135  
2.098

n = .02

Dec 64° 54'

α Draconis

2.4	9.9	2.3
7.4	4.8	2.2
2.1	0.0	2.1
7.1	5.0	2.1
2.0	0.5	2.5
1.7	0.6	2.3
3.2	9.0	2.2
5.0	7.3	2.3
6.6	5.7	2.3
8.1	4.0	2.1
9.8	2.4	2.2
1.3	1.0	2.3
3.0	9.1	2.1
4.8	7.7	2.5
6.3	6.1	2.4
8.0	4.2	2.2
9.8	2.9	2.7
		31.1
		<u>4.9</u>

14 2 31.14  
 14 1 22.40  
 + 2 - 51.26

134

unc 27.3  
Continued

$$\begin{array}{r}
 .87 \\
 .6 \\
 \hline
 - .522 \\
 19.79 \\
 \hline
 19.27 \\
 \\
 .10 \\
 .6 \\
 \hline
 .06 \\
 57.42 \\
 \hline
 57.36
 \end{array}$$

Dec  $78^{\circ} 4'$   
4 hrs min.

7.9 8.1 6.0

8.1 8.1 6.2

1.1 5.0 6.1

4.8 1.4 6.2

8.0 8.1 6.1

1.5 4.9 6.4

4.5 1.8 6.3

8.0 8.1 6.1

1.5 4.8 6.3

5.0 1.3 6.3

28.0

2.0

14 10 28.10

14 9 19.27

+ 2 - 51.17

51.17

51.32

.15

lan  $78^{\circ} 4' = 4.745$ lan  $18^{\circ} 0' = \frac{0.325}{4.74}$   
4.420 $n = .03$ Dec  $18^{\circ} 0'$ 

7 Bootis

4.3 7.8 2.1

6.6 5.6 2.2

8.8 3.4 2.2

1.0 1.1 2.1

3.0 9.0 2.0

7.3 4.8 2.1

9.5 2.3 1.8

1.8 0.3 2.1

3.9 8.2 2.1

06.0

19.7

13 43 06.04

13 41 57.36

+ 2 - 51.32

- 1.10

52.42

Shall assume  $n = 0$  for present.



June 29.3

 $\beta$  Bootis. $\rho$  Bootis.

44.96

5.3 9.7 5.0

5.2 3.3 8.5

8.4 7.0 5.4

7.8 0.9 8.7

1.0 4.4 5.4

0.0 8.5 8.5

3.4 1.8 5.2

2.3 6.0 8.3

6.4 9.2 5.6

4.9 3.7 8.6

1.9 3.7 5.6

9.8 9.0 8.8

4.6 1.0 5.6

2.1 6.4 8.5

7.1 8.1 5.2

4.5 4.1 8.6

9.9 5.5 5.4

7.0 1.8 8.8

52.8

09.3

13.25.6

14 58 52.69

14 28 9.289

14 57 44.9614 26 61.44

+ 2 - 52.27

44

- 1.10

+ 2 - 52.13

53.371.10

53.23

June 30.3

J Bootis

 $\alpha$  Cor. bor. $\mu$  Bootis.

43.0 2.8 5.8

 $\overset{8}{2} \cdot 2 \overset{8}{9} \cdot 7$  0.9

8.2 0.3 8.5

5.6 0.3 5.9

 $\overset{6}{5} \cdot 5 \overset{6}{7} \cdot 2$  0.7

1.0 7.7 8.7

8.2 8.0 6.2

 $\overset{6}{7} \cdot 9 \overset{4}{5} \cdot 0$  0.9

3.5 5.3 8.8

0.8 5.4 6.2

 $\overset{9}{8} \cdot 3 \overset{1}{2} \cdot 8$  1.1

6.1 2.7 8.8

3.1 2.8 5.9

 $\overset{1}{2} \cdot 6 \overset{9}{8} \cdot 3$  0.9

8.9 0.0 8.9

8.1 8.0 6.1

 $\overset{5}{7} \cdot 1 \overset{4}{5} \cdot 8$  0.9

3.9 4.6 8.5

0.8 5.3 6.1

 $\overset{8}{7} \cdot 5 \overset{2}{5} \cdot 7$  1.2

6.5 2.1 8.6

3.2 2.9 6.1

 $\overset{7}{6} \cdot 9 \overset{0}{7} \cdot 0$  0.9

9.0 9.5 8.5

5.7 0.4 6.1

 $\overset{3}{4} \cdot 2 \overset{7}{8} \cdot 9$  1.1

1.8 7.0 8.8

08.0

05.6

24.3

19.4

9.2

6.4

15-12 08.02

15-31 05.48

15-21 24.34

15-10 60.65

15-29 58.24

15-20 16.95

+2 -52.63

+2 -52.76

+2 -52.61

- 1.10

- 1.10

- 1.10

53.73

53.86

53.71

53.73

53.86

53.71

$$\begin{array}{r} 3 \overline{) 161.30} \\ 53.77 \end{array}$$



July 2.3

3 hrs. Maj. d Bootis.

$$\begin{array}{r}
 .27 \\
 - .3 \\
 \hline
 -.081 \\
 25.42 \\
 \hline
 25.34
 \end{array}$$

$$\begin{array}{r}
 .12 \\
 .3 \\
 \hline
 -.036 \\
 18.49 \\
 \hline
 18.45
 \end{array}$$

$$5.3 \ 8.4 \ 3.7 \quad 2.1 \ 7.9 \quad 0.0$$

$$9.3 \ 4.7 \ 4.0 \quad 4.3 \ 5.7 \quad 0.0$$

$$2.8 \ 1.0 \ 3.8 \quad 6.7 \ 3.2 \quad 9.9$$

$$6.5 \ 7.4 \ 3.9 \quad 9.0 \ 0.9 \quad 9.9$$

$$0.0 \ 3.8 \ 3.8 \quad 1.2 \ 8.8 \quad 0.0$$

$$7.3 \ 6.4 \ 3.7 \quad 5.8 \ 4.2 \quad 0.0$$

$$1.2 \ 3.0 \ 4.2 \quad 8.7 \ 2.0 \quad 0.1$$

$$4.6 \ 9.2 \ 3.8 \quad 0.3 \ 9.7 \quad 0.0$$

$$8.3 \ 5.9 \ 4.2 \quad 2.7 \ 7.2 \quad 9.9$$

$$31.8$$

$$25.0$$

$$17.9$$

$$20.8$$

$$13 \ 20 \ 31.94$$

$$14 \overset{06}{\cancel{23}} \ 24.9.5$$

$$13 \ 19 \ 25.34$$

$$14 \ 05 \ 18.45$$

$$+ 2 - 53.40$$

$$+ 2 - 53.50$$

$$- 1.10$$

$$- 1.10$$

$$54.50$$

$$54.60$$

July 3.2

Observations with level.Telescope north. Screw W.  $W = 10.8$   $E = 4.4$ " " Screw E.  $W = 1.8$   $E = 13.5$ Telescope south. Screw E.  $W = 0.1$   $E = 14.7$ " " Screw W.  $W = 8.2$   $E = 6.3$ 

Level disturbed.

Telescope south. Screw E.  $W = 0.2$   $E = 15.0$ " " Screw W.  $W = 8.6$   $E = 6.5$ \* Telescope north. Screw W.  $W = 11.1$   $E = 4.0$ " " Screw E.  $W = 1.9$   $E = 13.2$ 

\* Dark lantern was used to light up scale.  
Bubble was seen to move while attempt was  
being made to read scale. Bubble was allowed  
to come to rest before final reading was made.

From above observations.

Tel N. Sc W.	$W = 10.8$	$E = 4.4$	dif = + 6.4	
" " E.	1.8	13.5	= - 11.7	- 2.7
Tel S. Sc. E.	0.1	14.7	= - 14.6	- 4.6
" " W.	8.2	6.3	= + 1.9	- 6.4
Tel S. Sc E W	$W = 0.2$	$E = 15.0$	= - 14.8	
	8.6	6.5	= + 2.1	- 6.4
	11.1	4.0	= + 7.1	- 4.2
	1.9	13.2	= - 11.3	- 2.1



July 3.3

$$\begin{array}{r}
 .22 \\
 .4 \\
 \hline
 -.09 \\
 8.42 \\
 \hline
 8.33
 \end{array}$$

$$\begin{array}{r}
 .12 \\
 .4 \\
 \hline
 -.05 \\
 18.49 \\
 \hline
 18.44
 \end{array}$$

η Ursa Maj.

$$2.3 \ 6.3 \quad 8.6$$

$$5.6 \ 3.1 \quad 8.7$$

$$8.8 \ 0.0 \quad 8.8$$

$$2.0 \ 6.8 \quad 8.8$$

$$5.1 \ 3.6 \quad 8.7$$

$$1.7 \ 7.1 \quad 8.8$$

$$4.9 \ 4.0 \quad 8.9$$

$$8.0 \ 0.9 \quad 8.9$$

$$1.3 \ 7.6 \quad 8.9$$

$$7.5 \quad 14.5$$

$$7.6 \quad 7.6$$

$$13 \ 44 \quad 14.40$$

$$13 \ 43 \quad 8.33$$

$$+2 - 53.93$$

$$- 1.10$$

$$55.03$$

δ Bootis

$$1.6 \ 7.3 \quad 8.9$$

$$4.0 \ 5.0 \quad 9.0$$

$$6.2 \ 2.8 \quad 9.0$$

$$8.6 \ 0.4 \quad 9.0$$

$$0.8 \ 8.1 \quad 8.9$$

$$5.3 \ 3.7 \quad 9.0$$

$$7.7 \ 1.3 \quad 9.0$$

$$0.0 \ 9.1 \quad 9.1$$

$$2.1 \ 6.9 \quad 9.0$$

$$24.4$$

$$9.3$$

$$14 \ 06 \quad 24.49$$

$$14 \ 05 \quad 18.44$$

$$+2 - 53.95$$

$$- 1.10$$

$$55.05$$

July 5.1

Observations with level.

	1 <sup>st</sup> readg.	2 <sup>d</sup> readg.
Tel N. Screw E.	W = 3.7 E = 12.9	W = 3.7 E = 12.9
" " " W.	W = 11.2 E = 5.2	W = 11.3 E = 5.1

Length of bubble accidentally disturbed. Bubble was readjusted.

			Diff.
Tel. S. Screw W.	W = 9.0	E = 7.2	+1.8
" " " E.	W = 1.1	E = 15.0	-13.9
Tel. N.	E.	W = 3.1	E = 13.1
" " " W.	W = 11.3	E = 5.0	+6.3
Tel S.	W.	W = 8.4	E = 7.9
" " " E.	W = 1.4	E = 14.8	-13.4
Tel N.	E.	W = 3.0	E = 13.3
" " " W.	W = 11.6	E = 4.7	+6.9
Tel S.	W.	W = 9.0	E = 7.0
" " " E.	W = 1.4	E = 14.6	-13.2
Tel N.	E.	W = 2.1	E = 13.8
" " " W.	W = 11.7	E = 4.3	+7.4
Tel S.	W.	W = 9.0	E = 7.0
" " " E.	W = 0.3	E = 15.4	-15.1
Tel N.	E.	W = 2.2	E = 13.8
" " " W.	W = 12.2	E = 3.9	+8.3

-4.6 } See P. 138.  
-4.2

4.08  
-11  
4.08  
4.08  
-3.7  $\delta = -0.4488$

-4.0  
6 | 24.5  
-4.08

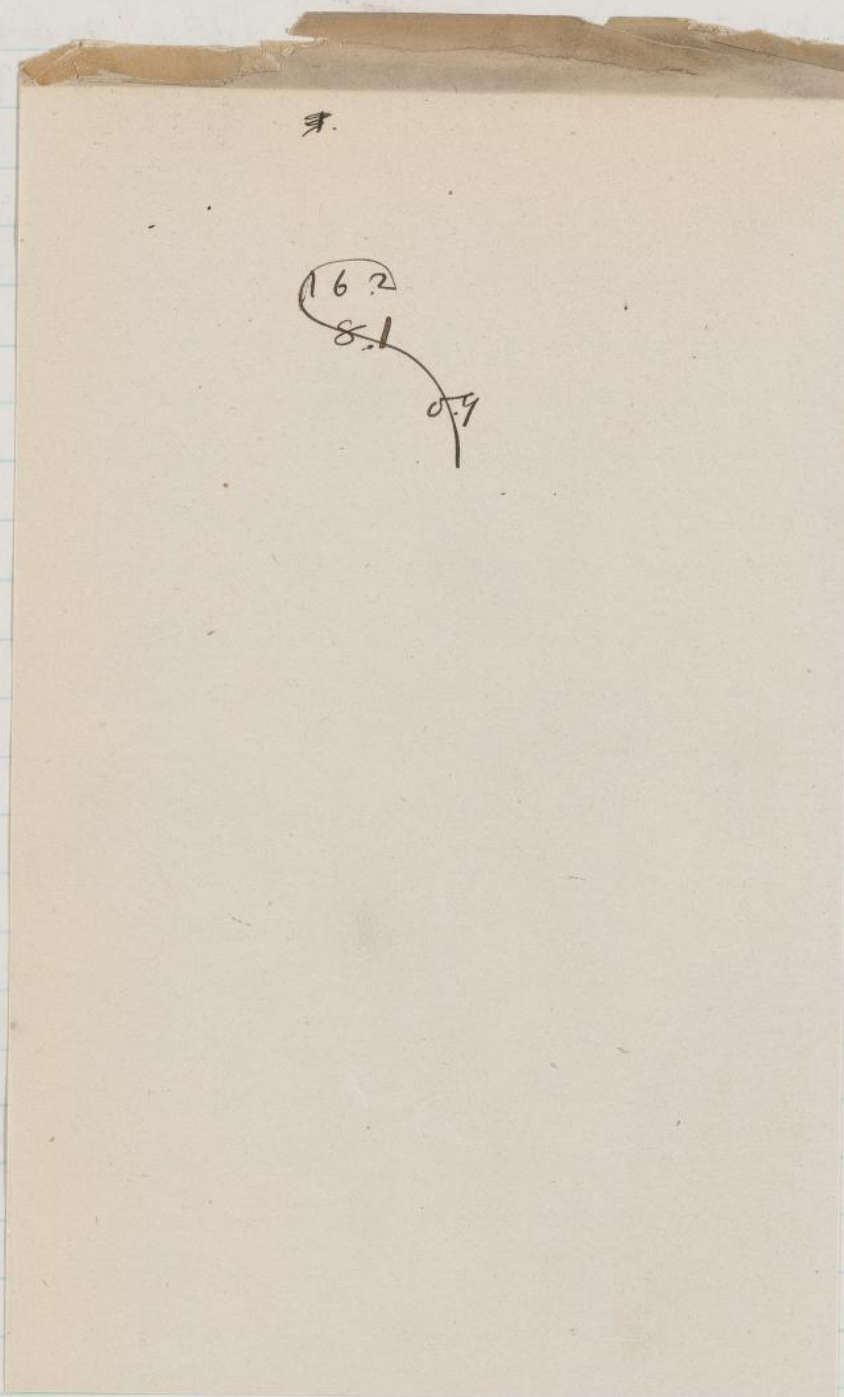
Sec  $\varphi = 1.354$

+0.449  
12186  
5416  
6416

-0.607946

$\delta \text{ sec } \varphi = -0.61$





uly 6.3

$$\begin{array}{r}
 .12 \\
 .7 \\
 \hline
 .08 \\
 18.49 \\
 \hline
 18.41 \\
 .14 \\
 .7 \\
 \hline
 .098 \\
 - .10 \\
 \hline
 61.33 \\
 \hline
 61.23
 \end{array}$$

$$\begin{array}{r}
 .12 \\
 .7 \\
 \hline
 .08 \\
 34.21 \\
 \hline
 34.13
 \end{array}$$

$$\begin{array}{r}
 .11 \\
 .7 \\
 \hline
 .08 \\
 28.97 \\
 \hline
 28.89
 \end{array}$$

d Bootis.

$$\begin{array}{r}
 0.2 \ 5.8 \ 6.0 \\
 2.3 \ 3.5 \ 5.8 \\
 4.7 \ 1.2 \ 5.9 \\
 7.0 \ 8.9 \ 5.9 \\
 9.2 \ 6.8 \ 6.0 \\
 3.9 \ 2.1 \ 6.0 \\
 6.1 \ 9.9 \ 6.0 \\
 8.4 \ 7.5 \ 5.9 \\
 0.6 \ 5.1 \ 5.7
 \end{array}$$

23.0

18.2

$$\begin{array}{r}
 14 \ 06 \ 22.96 \\
 14 \ 05 \ 18.41 \\
 +2 - 55.45 \\
 \hline
 .00 \\
 - 1.10 \\
 \hline
 56.55
 \end{array}$$

 $\pi$  Bootis pr.

$$\begin{array}{r}
 2.0 \ 5.2 \ 7.2 \\
 4.2 \ 2.9 \ 7.1 \\
 6.3 \ 0.7 \ 7.0 \\
 8.5 \ 8.6 \ 7.1 \\
 0.6 \ 6.5 \ 7.1 \\
 4.9 \ 2.2 \ 7.1 \\
 7.1 \ 0.0 \ 7.1 \\
 9.2 \ 7.8 \ 7.0 \\
 1.4 \ 5.7 \ 7.1
 \end{array}$$

33.5  
10.3

$$\begin{array}{r}
 14 \ 36 \ 33.54 \\
 14 \ 35 \ 28.89 \\
 +2 - 55.35 \\
 \hline
 - 1.10
 \end{array}$$

p Bootis.

$$\begin{array}{r}
 1.8 \ 9.8 \ 1.6 \\
 4.1 \ 7.5 \ 1.6 \\
 6.7 \ 5.0 \ 1.7 \\
 9.0 \ 2.7 \ 1.7 \\
 1.4 \ 0.2 \ 1.6 \\
 6.2 \ 5.3 \ 1.5 \\
 8.8 \ 3.0 \ 1.8 \\
 1.1 \ 0.7 \ 1.8 \\
 3.5 \ 8.2 \ 1.7
 \end{array}$$

05.8

15.8

$$\begin{array}{r}
 14 \ 28 \ 05.83 \\
 14 \ 26 \ 61.23 \\
 +2 - 55.40 \\
 \hline
 .00 \\
 - 1.10 \\
 \hline
 56.50
 \end{array}$$

$$\begin{array}{r}
 4 \ 2.07 \\
 .52 \\
 \hline
 = 56.52 = av.
 \end{array}$$

d Bootis.

$$\begin{array}{r}
 6.8 \ 0.6 \ 7.4 \\
 9.0 \ 8.5 \ 7.5 \\
 1.0 \ 6.2 \ 7.2 \\
 3.3 \ 4.0 \ 7.3 \\
 5.5 \ 1.7 \ 7.2 \\
 0.0 \ 7.3 \ 7.3 \\
 2.0 \ 5.2 \ 7.2 \\
 4.3 \ 3.0 \ 7.3 \\
 6.5 \ 0.9 \ 7.4
 \end{array}$$

38.7

15.5

$$\begin{array}{r}
 14 \ 11 \ 38.66 \\
 14 \ 10 \ 34.13 \\
 +2 - 55.42 \\
 \hline
 .00 \\
 - 1.10 \\
 \hline
 56.57
 \end{array}$$



July 7.3

$$\begin{array}{r}
 .16 \\
 .8 \\
 \hline
 .13 \\
 44.96 \\
 \hline
 44.83
 \end{array}$$

$$\begin{array}{r}
 .13 \\
 .8 \\
 \hline
 .10 \\
 60.66 \\
 \hline
 60.56
 \end{array}$$

$$\begin{array}{r}
 .13 \\
 .8 \\
 \hline
 .10 \\
 16.96 \\
 \hline
 16.86
 \end{array}$$

$$\begin{array}{r}
 .11 \\
 .8 \\
 \hline
 .09 \\
 14.15 \\
 \hline
 14.06
 \end{array}$$

$$\begin{array}{r}
 .15 \\
 .8 \\
 \hline
 .12 \\
 55.91 \\
 \hline
 55.79
 \end{array}$$

 $\beta$  Bootis.

1.8	6.2	8.0
4.3	3.5	7.8
7.2	0.9	8.1
0.1	8.1	8.2
2.8	5.4	8.2
8.0	9.9	7.9
1.0	7.2	8.2
3.7	4.4	8.1
6.2	1.9	8.1

49.0

19.6

$$14 \ 58 \ 49.03$$

$$14 \ 57 \ 44.83$$

$$+ 2 - 55.80$$

$$- 1.10$$

$$56.90$$

 $\delta$  Bootis

9.8	9.4	9.2
2.2	6.9	9.1
4.7	4.4	9.1
7.2	2.0	9.2
9.7	2.5	9.2
4.6	4.6	9.2
7.2	2.0	9.2
9.7	9.5	9.2
2.2	7.0	9.2

04.5

11.1

$$15 \ 12 \ 04.58$$

$$15 \ 11 \ 0.56$$

$$+ 2 - 55.98$$

$$- 1.10$$

$$57.08$$

{  $\mu$  Bootis }  
mid valley

0.6	1.3	1.9
3.0	8.9	1.9
5.8	6.2	2.0
8.4	3.7	2.1

21.0

8.9

$$15 \ 21 \ 20.99$$

$$15 \ 20 \ 16.86$$

$$+ 2 - 55.87$$

$$- 1.10$$

$$56.97$$

 $\beta$  Coron. bor.

4.5	1.8	6.3
6.8	9.2	6.0
9.0	7.0	6.0
1.4	4.6	6.0
3.8	2.3	6.1
8.5	7.5	6.0
0.9	5.2	6.1
3.2	2.7	5.9
5.7	0.3	6.0

18.0

19.4

$$15 \ 24 \ 18.02$$

$$15 \ 23 \ 14.06$$

$$+ 2 - 55.94$$

$$- 1.10$$

 $\nu^1$  Bootis

2.4	7.1	9.5
5.0	4.4	9.4
7.7	1.7	9.4
0.7	9.0	9.7
3.3	6.2	9.5
8.8	0.8	9.6
1.5	7.9	9.4
4.3	5.3	9.6
7.0	2.5	9.5

59.9

14.5

$$15 \ 27 \ 59.76$$

$$15 \ 26 \ 55.79$$

$$- 55.93$$

9.0

9.7

1.14

1.08

1.03

$$57.02 = \text{av.}$$

$$1.02 =$$

$$57.02 = \text{av.}$$



144

July 10.3

$$\begin{array}{r}
 .18 \\
 .1 \\
 - .02 \\
 \hline
 44.80 \\
 \hline
 44.78
 \end{array}$$

$$\begin{array}{r}
 .26 \\
 .1 \\
 - .03 \\
 \hline
 23.86 \\
 \hline
 23.83
 \end{array}$$

$$\begin{array}{r}
 .16 \\
 .1 \\
 - .02 \\
 \hline
 61.19 \\
 \hline
 61.17
 \end{array}$$

$$\begin{array}{r}
 .12 \\
 .1 \\
 - .01 \\
 \hline
 28.86 \\
 \hline
 28.85
 \end{array}$$

 $\beta$  Bootis

0.4 5.0 5.4  
 3.1 2.2 5.3  
 6.0 9.5 5.5  
 8.7 6.9 5.6  
 1.2 4.1 5.3  
 6.8 8.8 5.6  
 9.3 6.0 5.3  
 2.2 3.2 5.4  
 5.1 0.6 5.7

47.8

13.9

14 58 47.73

14 57 44.78

+ 2 - 57.05

- 1.10

58.65

 $\gamma$  Bootis

3.0 0.3 3.3  
 6.2 7.2 3.4  
 9.7 3.7 3.4  
 3.2 0.4 3.6  
 6.6 7.1 3.7  
 3.4 0.4 3.8  
 6.7 7.0 3.7  
 0.2 3.6 3.8  
 3.5 0.3 3.8

26.8

15.3

14 22 26.80

14 21 23.83

+ 2 - 57.03

- 1.10

58.13

 $\epsilon$  Bootis

0.1 8.0 8.1  
 2.5 5.8 8.3  
 4.9 3.4 8.3  
 7.3 0.9 8.2  
 9.8 8.6 8.4  
 4.6 3.7 8.3  
 7.0 1.3 8.3  
 9.3 9.0 8.3  
 1.7 6.5 8.2

04.1

2.5

14 28 04.13

14 27 1.17

+ 2 - 57.04

- 1.10

58.14

 $\pi$  Bootis pr.

0.2 3.5 3.7  
 2.5 1.2 3.7  
 4.7 9.0 3.7  
 6.8 6.8 3.6  
 9.0 4.8 3.8  
 3.1 0.4 3.5  
 5.4 8.2 3.6  
 7.6 6.0 3.6  
 9.5 4.0 3.5

31.8

15.5

14 36 31.80

14 35 28.85

+ 2 - 57.05

- 1.10

.15

.13

.14

.15

41.17

.042

.14 =

58.14 = av.



July 11.3  $\eta$  Urs. Maj.  $\eta$  Bootis.

$$\begin{array}{r}
 .24 \\
 \times 2 \\
 \hline
 .105 \\
 - .20 \\
 \hline
 .815
 \end{array}$$

$$\begin{array}{r}
 .13 \\
 \times 2 \\
 \hline
 .03 \\
 - .96 \\
 \hline
 21.96 \\
 \hline
 21.93
 \end{array}$$

8.7	2.9	1.6	2.5	6.1	8.6
2.0	9.6	1.6	4.9	4.0	8.9
5.1	6.3	1.4	7.0	1.9	8.9
8.3	3.1	1.4	9.2	9.8	9.0
1.5	9.8	1.3	1.3	7.5	8.8
8.0	3.5	1.5	5.8	3.1	8.9
1.1	0.2	1.3	7.9	1.0	8.9
4.3	7.0	1.3	0.0	8.9	8.9
7.4	3.9	1.3	2.2	6.8	9.0

$$\begin{array}{r}
 10.7 \\
 \hline
 13.4
 \end{array}$$

$$\begin{array}{r}
 24.4 \\
 \hline
 8.3
 \end{array}$$

$$\begin{array}{r}
 13 \quad 44 \quad 10.71 \\
 13 \quad 43 \quad 8.15 \\
 + 2 - 57.44 \\
 - 1.10 \\
 \hline
 58.54
 \end{array}$$

$$\begin{array}{r}
 13 \quad 50 \quad 24.44 \\
 13 \quad 49 \quad 21.93 \\
 + 2 - 57.49 \\
 - 1.10 \\
 \hline
 58.59
 \end{array}$$

$$\begin{array}{r}
 .13 \\
 \times 2 \\
 \hline
 .03 \\
 - .09 \\
 \hline
 34.09 \\
 \hline
 34.06
 \end{array}$$

 $\alpha$  Bootis

4.7	8.5	3.2
6.8	6.4	3.2
9.0	4.0	3.0
1.2	1.9	3.1
3.4	9.9	3.3
7.8	5.4	3.2
0.0	3.2	3.2
2.2	1.0	3.2
4.3	8.9	3.2

$$\begin{array}{r}
 36.6 \\
 \hline
 10.2
 \end{array}$$

$$\begin{array}{r}
 14 \quad 11 \quad 36.59 \\
 14 \quad 10 \quad 34.06 \\
 + 2 - 57.47 \\
 \hline
 10
 \end{array}$$

$$.54$$

$$.59$$

$$.57$$

$$\begin{array}{r}
 3 \overline{) .20} \\
 .57 = \text{av.}
 \end{array}$$

July 12.3

$\gamma$  Bootis.

$\pi$  Bootis. m.

$\delta$  Bootis

0.8	3.8	4.6	9.8	2.7	2.5	7.7	3.4	1.1
2.5	1.0	4.5	1.8	0.4	2.2	0.1	1.0	1.1
6.2	8.4	4.6	4.0	8.3	2.3	2.3	8.8	1.1
8.9	5.9	4.8	6.0	6.2	2.2	4.5	6.5	1.0
1.3	3.1	4.4	8.1	4.0	2.1	6.9	4.3	1.2
6.7	8.0	4.7	2.7	9.7	2.4	1.5	9.7	1.2
9.3	5.3	4.6	4.7	7.5	2.2	3.8	7.4	1.2
2.1	2.6	4.7	7.0	5.5	2.5	6.0	5.1	1.1
4.6	0.0	4.6	9.0	3.2	2.2	8.3	3.0	1.3

37.3

5.8

31.1

2.7

20.5

10.8

14	28	37.31	14	36	31.14	14	6	20.57
14	27	34.98	14	35	28.82	14	5	18.33
+ 2 - 57.67			+ 2 - 57.68			+ 2 - 57.76		
- 1.10			- 1.10			- 1.10		
58.77			58.78			58.86		

$\alpha$  Bootis

$\zeta$  Bootis

4.5	8.2	2.7	2.3	9.9	2.2	
6.6	6.0	2.6	5.7	6.4	2.1	.77
8.8	3.9	2.7	9.0	3.0	2.0	.78
1.0	1.7	2.7	2.5	9.8	2.3	.86
3.2	9.5	2.7	5.8	6.4	2.2	.85
7.5	5.0	2.5	2.5	9.6	2.1	.80
9.9	2.9	2.8	6.0	6.2	2.2	57.56
2.0	0.8	2.8	9.5	2.9	2.4	.11 =
4.2	8.5	2.7	2.7	9.4	2.1	.81 =

36.4

6.6

26.0

1.6

14	11	36.35	14	22	26.08
14	10	34.05	14	21	23.78
+ 2 - 57.75			+ 2 - 57.70		
1.10			1.10		



July 14.3

$$\begin{array}{r}
 .15 \\
 .5 \\
 \hline
 .08 \\
 60.53 \\
 \hline
 60.45 \\
 .16 \\
 .15 \\
 \hline
 .080 \\
 16.83 \\
 \hline
 16.75
 \end{array}$$

$$\begin{array}{r}
 .12 \\
 .5 \\
 \hline
 .06 \\
 58.15 \\
 \hline
 58.09
 \end{array}$$

$$\begin{array}{r}
 .12 \\
 .5 \\
 \hline
 .06 \\
 58.54 \\
 \hline
 58.48
 \end{array}$$

δ Bootis.

7.3 6.9 4.2  
 9.8 4.3 4.1  
 2.4 1.9 4.3  
 4.7 9.4 4.1  
 7.3 7.0 4.3  
 2.1 2.0 4.1  
 4.7 9.6 4.3  
 7.0 7.0 4.0  
 9.6 4.5 4.1

$$\begin{array}{r}
 02.0 \\
 \hline
 1.5
 \end{array}$$

$$\begin{array}{r}
 15 \quad 12 \quad 02.08 \\
 15 \quad 10 \quad 60.45 \\
 + 2 \quad - \quad 58.39 \\
 \hline
 \phantom{15 \quad 10 \quad } .61 \\
 \hline
 58.98
 \end{array}$$

ε Bootis.

6.8 3.0 9.8  
 9.2 0.8 0.0  
 1.5 8.6 0.1  
 3.9 6.3 0.2  
 6.0 3.9 9.9  
 0.8 9.1 9.9  
 3.0 7.0 0.0  
 5.3 4.6 9.9  
 7.6 2.2 9.8  
 59.9

$$\begin{array}{r}
 15 \quad 53 \quad 59.97 \\
 15 \quad 52 \quad 58.48 \\
 + 2 \quad - \quad 58.51 \\
 \hline
 \phantom{15 \quad 52 \quad } .61
 \end{array}$$

μ Bootis.

2.3 4.6 6.9  
 5.0 1.9 6.9  
 7.5 9.2 6.7  
 0.2 6.7 6.9  
 2.9 3.9 6.8  
 8.0 9.0 7.0  
 0.7 6.2 6.9  
 3.1 3.8 6.9  
 5.9 1.1 7.0

$$\begin{array}{r}
 18.5 \\
 \hline
 8.5
 \end{array}$$

$$\begin{array}{r}
 15 \quad 21 \quad 18.45 \\
 15 \quad 20 \quad 16.75 \\
 + 2 \quad - \quad 58.30 \\
 \hline
 \phantom{15 \quad 20 \quad } .61 \\
 \hline
 58.91
 \end{array}$$

α Coron. bor.

8.3  
 27  
 0.3 9.0 9.3  
 2.7 6.9 9.6  
 4.9 4.3 9.2  
 7.3 2.0 9.3

$$\begin{array}{r}
 59.7 \\
 \hline
 6.1
 \end{array}$$

$$\begin{array}{r}
 15 \quad 31 \quad 59.68 \\
 15 \quad 29 \quad 58.09 \\
 + 2 \quad - \quad 58.41 \\
 \hline
 \phantom{15 \quad 29 \quad } .61 \\
 \hline
 59.02
 \end{array}$$

$$\begin{array}{r}
 1.11 \\
 4 \overline{) 1.42} \\
 \hline
 .105 =
 \end{array}$$

$$1.00 =$$

$$59.00 = \text{av.}$$

Beginning tonight the new corr<sup>n</sup> for level  
 1-0.61<sup>2</sup> will be used till further notice. See P. 140



July 16.3

2 Bootis.

109 Virginis

2 Bootis

2.5	6.3	8.8	6.4	7.5	3.9	6.0	5.5	1.5
4.7	4.0	8.7	8.5	5.3	3.8	8.6	3.2	1.8
6.8	2.0	8.8	0.4	3.3	3.7	0.9	0.6	1.5
9.1	9.8	8.9	2.6	1.4	4.0	3.6	8.2	1.8
1.3	7.7	9.0	4.6	2.3	3.9	6.0	5.9	1.9
5.8	3.3	9.1	8.6	5.2	3.8	0.9	0.8	1.7
8.0	1.2	9.2	0.8	3.0	3.8	3.4	8.3	1.7
0.1	9.0	9.1	2.8	1.0	3.8	5.9	5.8	1.7
2.2	6.8	9.0	4.8	9.0	3.8	8.4	3.3	1.7

34.7

9.3

36.9

17.4

0.8

16.1

14	11	34.41	14	41	36.92	15	12	0.85
14	10	34.00	14	40	36.34	15	11	0.43
+2	-	59.59	+2	-	59.42	+2	-	59.58
-		.61			.61			.61
		60.20			60.03			60.19

2 Bootis

3 Bootis

1.2	3.5	4.7	0.9	8.0	8.9	
3.6	0.9	4.5	3.3	5.7	9.0	.20
6.5	8.1	4.6	5.7	3.3	9.0	.03
9.3	5.4	4.7	7.9	1.0	8.9	.19
1.8	2.8	4.6	0.3	8.6	8.9	.01
7.0	7.7	4.7	4.9	3.7	8.6	.12
9.5	5.0	4.5	7.4	1.4	8.8	5) 1.55
2.2	2.5	4.7	9.8	9.1	8.9	.11 =
4.7	9.9	4.6	2.1	6.7	8.8	60.11 = avg
		17.4			14.5	
		6.0			8.3	

15	21	17.32	15	24	14.44
15	20	16.72	15	23	13.95
+2	-	59.40	+2	-	59.51
		.61			.61
		60.12			60.12



July 17.3  $\alpha$  Bootis. $\rho$  Bootis $\pi$  Bootis

$$\begin{array}{r}
 .13 \\
 8 \\
 \hline
 .104 \\
 34.09 \\
 \hline
 33.99 \\
 .16 \\
 .8 \\
 \hline
 .13 \\
 61.19 \\
 \hline
 61.06
 \end{array}$$

$$\begin{array}{r}
 .12 \\
 .8 \\
 \hline
 .10 \\
 28.86 \\
 \hline
 28.76
 \end{array}$$

$$\begin{array}{r}
 .11 \\
 .8 \\
 \hline
 .09 \\
 36.42 \\
 \hline
 36.33
 \end{array}$$

$$\begin{array}{r}
 .11 \\
 .8 \\
 \hline
 .09 \\
 57.30 \\
 \hline
 57.21
 \end{array}$$

2.1	6.0	8.1
4.3	3.7	8.0
6.5	1.3	7.8
8.7	9.3	8.0
0.9	7.1	8.0
5.2	2.8	8.0
7.4	0.4	7.8
9.7	8.3	8.0
1.9	6.2	8.1

34.0

18.8

14	11	33.99
14	10	33.99
+1	-	0.00
		.61
		0.61

7.0	5.2	2.2
5.5	2.7	2.2
1.9	0.3	2.2
4.4	7.9	2.3
6.7	5.7	2.4
1.5	0.8	2.3
3.9	8.4	2.3
6.2	5.8	2.0
8.7	3.5	2.2

01.2

2.3

14	28	01.12
14	27	1.06
+2	-	59.94
		.61
		0.55

7.3	0.4	7.7
9.4	8.2	7.6
1.6	6.0	7.6
3.8	3.9	7.7
6.0	1.8	7.8
0.2	7.4	7.6
2.3	5.3	7.6
4.5	3.2	7.7
6.6	0.9	7.5

28.8

15.6

14	36	28.82
14	35	28.76
+2	-	59.94
		.61
		0.55

10.9 Virginis

P. XIX, 221

5.7	6.9	2.6
7.7	2.8	2.6
9.7	2.8	2.5
1.9	2.8	2.6
4.0	2.8	2.6
8.0	4.6	2.6
0.1	2.5	2.6
2.2	0.4	2.6
4.3	8.4	2.4

36.4

5.8

5.9	8.5	4.4
7.9	6.3	4.2
0.0	4.2	4.2
2.1	2.2	4.3
4.3	0.0	4.3
8.6	5.6	4.2
0.9	3.6	4.5
3.0	1.5	4.5
5.0	9.3	4.3

57.2

3.1

14	41	36.30
14	40	36.33
+1	-	0.03
		.61
		0.55

14	51	57.16
14	50	57.21
		10.05
		10.05

July 18.3

 $\beta$  Bootis. $\gamma$  Bootis $\mu$  Bootis

6.8	1.2	8.0	4.9	4.4	9.3	0.1	2.3	2.4
9.5	8.5	8.0	7.4	2.0	9.4	2.7	9.5	2.2
2.2	5.8	8.0	0.0	9.5	9.5	5.2	7.1	2.3
5.0	3.2	8.2	2.5	7.1	9.6	7.9	4.5	2.4
7.8	0.5	8.3	4.9	4.6	9.5	0.5	1.8	2.3
3.2	4.9	8.1	9.8	9.7	9.5	5.7	6.5	2.2
5.9	2.2	8.1	2.2	7.2	9.4	8.3	4.0	2.3
8.8	9.6	8.4	4.8	4.7	9.5	1.0	1.4	2.4
1.2	6.8	8.0	7.2	2.2	9.4	3.5	8.6	2.1

44.0

1.1

14 58 44.06

14 57 44.64

+ 1 - 0.58

- .61

- 01.19

59.7

13.8

15 11 59.73

15 11 0.39

+ 1 - 0.66

- .61

- 01.27

16.1

2.7

15 21 16.14

15 20 16.69

+ 1 - 0.55

- .61

- 01.16

 $\beta$  Coron. bor. $\gamma$  Bootis

9.7	7.0	6.7	7.6	2.2	9.8	
2.0	4.7	6.7	0.3	9.6	9.9	.19
4.3	2.3	6.8	3.0	6.9	9.9	.27
6.7	9.8	6.5	5.8	4.2	0.0	.16
9.1	2.4	6.5	8.5	1.3	9.8	.23
3.9	2.8	6.7	4.1	5.9	0.0	.25
6.1	0.4	6.4	6.8	3.2	0.0	57.1.0
8.5	8.1	6.7	9.5	0.5	0.0	.23 =
0.9	5.8	6.7	2.2	7.7	9.9	01.22 = Av.

13.3

5.8

15 24 13.30

15 23 13.92

+ 1 - 0.62

- .61

55.1

18.4

15 27 54.97

15 26 55.61

+ 1 - 0.64

- .61



July 23.3

 $\gamma^1$  Bootis $\mu$  Bootis $\beta$  Corv. bor.
$$\begin{array}{r} .20 \\ .14 \\ \hline .08 \end{array}$$

$$\begin{array}{r} 55.59 \\ 55.51 \\ \hline \end{array}$$

$$\begin{array}{r} .19 \\ .14 \\ \hline .08 \end{array}$$

$$\begin{array}{r} 16.67 \\ 16.59 \\ \hline \end{array}$$

$$\begin{array}{r} .16 \\ .14 \\ \hline .06 \end{array}$$

$$\begin{array}{r} 13.91 \\ 13.85 \\ \hline \end{array}$$

$$\begin{array}{r} .15 \\ .14 \\ \hline .06 \\ 58.03 \\ 57.97 \\ \hline \end{array}$$

$$\begin{array}{r} .11 \\ .11 \\ \hline .04 \\ 46.50 \\ 46.46 \\ \hline \end{array}$$

4.8 9.6 4.4 7.2 9.3 6.5

7.5 6.9 4.4 9.8 6.9 6.7

0.2 4.0 4.2 2.5 4.2 6.7

3.0 1.3 4.3 5.0 1.6 6.6

5.9 8.6 4.5 7.6 8.9 6.5

1.2 3.2 4.4 2.9 3.7 6.6

4.0 0.5 4.5 5.6 1.2 6.8

6.7 7.8 4.5 8.2 8.5 6.7

9.6 5.0 4.6 0.9 5.8 6.7

52.2

4.0

13.3

6.1

10.4

4.3

15 27 52.21

15 21 13.32

15 24 10.48

15 26 55.51

15 20 16.59

15 23 13.85

+ 1 - 03.30

+ 1 - 03.27

+ 1 - 03.37

- .61

- .61

- .61

03.91

03.88

03.98

 $\alpha$  Corv. bor. $\alpha$  Serpents

1.4 7.8 9.2 2.3 3.8 6.1

3.8 5.4 9.2 4.3 1.7 6.0

6.0 3.1 9.1 6.4 9.7 6.1

8.4 0.8 9.2 8.5 7.6 6.1

0.8 8.4 9.2 0.6 5.4 6.0

5.4 3.9 9.3 4.7 1.3 6.0

7.7 1.5 9.2 6.8 9.3 6.1

0.0 9.2 9.2 8.9 7.2 6.1

2.3 6.8 9.1 0.9 5.1 6.0

54.5

43.0

11.2

1.5

15 30 54.59

15 39 43.03

15 29 57.97

15 38 46.46

+ 1 - 03.38

+ 1 - 03.43

- .61

- .61

$$\begin{array}{r}
 .12 \\
 4 \\
 \hline
 -.05 \\
 62.46 \\
 \hline
 62.41
 \end{array}$$

*B. Serpenti*

7.6	0.3	7.9	
9.8	8.1	7.9	.91
2.0	6.0	8.0	.88
4.0	3.9	7.9	.98
6.0	1.9	7.9	.99
0.4	7.6	8.0	1.04
2.8	5.5	8.3	.99
4.8	3.4	8.2	6/.99
7.0	1.4	8.4	.165 =
		59.1	.96 =
		19.6	03.96 = av.

$$15 \quad 41 \quad 59.03$$

$$15 \quad 40 \quad 62.41$$

$$+ 1 \quad - \quad 03.88$$

$$- \quad .61$$

$$03.99$$



July 24.3

$$\begin{array}{r} .14 \\ .5 \\ \hline .07 \\ 33.96 \\ \hline 33 \end{array}$$

$$\begin{array}{r} .27 \\ .5 \\ \hline .14 \\ 23.60 \\ \hline 23 \end{array}$$

$$\begin{array}{r} .14 \\ .5 \\ \hline .10 \\ 34.83 \\ \hline 34.75 \end{array}$$

$$\begin{array}{r} .14 \\ .5 \\ \hline .17 \\ 28.74 \\ \hline 28.67 \end{array}$$

$$\begin{array}{r} .12 \\ .5 \\ \hline .06 \\ 36.31 \\ \hline 36.25 \end{array}$$
 $\alpha$  Bootis

8.1	1.9	0.0
0.3	9.8	0.1
2.4	7.6	0.0
4.7	5.3	0.0
6.9	3.0	9.9
1.3	8.8	0.1
3.5	6.5	0.0
5.7	4.4	0.1
7.9	2.1	0.0
		30.0
		19.2

14	11	30.01
14	10	33.89
		+1 - 03.88
		- .61
		04.49

 $\pi$  Bootis

3.2	6.3	9.5
5.4	4.3	9.7
7.5	2.0	9.5
9.8	0.0	9.8
2.0	2.7	9.7
6.2	3.5	9.7
8.4	1.2	9.6
0.5	9.2	9.7
2.7	7.0	9.7
		24.9
		15.8

14	36	24.83
14	35	28.67
		+1 - 03.84
		- .61
		04.45

 $\delta$  Bootis

6.0	3.5	9.5
9.3	0.1	9.4
2.8	6.8	9.6
6.2	3.4	9.6
9.5	0.1	9.6
6.2	3.3	9.5
9.6	9.9	9.5
3.0	6.5	9.5
6.3	3.0	9.3
		19.7
		14.2

14	22	19.75
14	21	23.46
		+1 - 03.71
		- .61
		04.32

109 Virginis

1.9	3.0	4.9
3.8	0.9	4.7
5.8	2.9	4.7
7.9	6.8	4.7
9.9	4.6	4.5
4.1	0.5	4.6
6.1	8.5	4.6
8.1	6.4	4.5
0.3	4.3	4.6
		32.3
		6.1

14	41	32.32
14	40	36.25
		+1 - 03.93
		- .61
		04.54

 $\gamma$  Bootis

4.4	7.3	1.7
7.2	4.7	1.9
9.8	2.0	1.8
2.4	9.4	1.8
5.0	6.9	1.9
0.3	1.5	1.8
2.9	8.8	1.7
5.6	6.2	1.8
8.3	3.4	1.7
		30.9
		17.0

14	28	30.89
14	27	34.75
		+1 - 03.86
		- .61
		04.47

5-1.77  
 .153  
 .453  
 04.45 = av.

July 25.3

$$\begin{array}{r}
 .21 \\
 .6 \\
 \hline
 .184 \\
 - .184 \\
 \hline
 44.62 \\
 \hline
 44.49 \\
 \\
 .17 \\
 .6 \\
 \hline
 .10 \\
 - .10 \\
 \hline
 60.38 \\
 \hline
 60.28
 \end{array}$$

B Bootis

3.0	7.4	0.4
5.6	4.7	0.3
8.3	1.9	0.2
1.0	9.0	0.0
<u>3.8</u>	<u>6.4</u>	<u>0.2</u>
9.1	0.9	0.0
2.0	8.3	0.3
4.7	5.5	0.2
7.5	2.9	0.4

40.1

2.1

14 5.8 40.11

14 5.7 44.49

+ 1 - 0.4.38

- .61

04.99

D Bootis

1.0	0.6	1.6
3.5	8.1	1.6
6.0	5.6	1.6
8.4	3.2	1.6
<u>0.9</u>	<u>0.7</u>	<u>1.6</u>
5.9	5.7	1.6
8.5	3.2	1.7
0.9	0.8	1.7
3.3	8.3	1.6

55.9

15.5

15 11 58.82

15 11 8.28

+ 1 - 04.46

- .61

05.07

.99

1.07

2 / 2.06

1.03 =

05.03 =  $\alpha_1$



July 26.3

R. Serpentes

0.6	2.0	2.6
2.6	9.9	2.5
4.7	7.9	2.6
6.7	5.7	2.4
8.9	3.7	2.6
3.0	9.6	2.6
5.0	7.4	2.4
7.2	5.5	2.7
9.3	3.4	2.7
		<u>41.4</u>

5.5

15	39	41.24
15	38	46.42
+ 1	-	05.18
	-	.61
		<u>05.79</u>

$\begin{array}{r} 11 \\ 17 \\ \hline 108 \\ - 108 \\ \hline 46.50 \\ 46.42 \end{array}$

July 27.3

B Bootis

1.5	6.0	7.5
4.1	3.2	7.3
6.9	0.4	7.3
9.6	7.7	7.3
2.4	5.2	7.6
<u>7.7</u>	<u>9.6</u>	<u>7.5</u>
0.6	7.0	7.6
3.3	4.1	7.4
6.0	1.4	7.4
		38.6

13.5

14 5.8 38.71

14 5.7 44.45

+ 1 - 05.74

.61  
 06.35

B Bootis

2.3	7.1	9.4
5.1	4.4	9.5
7.8	1.6	9.4
0.7	9.0	9.7
3.4	6.3	9.7
9.0	0.8	9.8
1.5	7.9	9.4
4.3	5.2	9.5
7.0	2.4	9.4

49.8

14.6

15 2.7 49.77

15 2.6 55.43

+ 1 - 05.66

.61

2

B Bootis

4.8	6.9	1.7
7.3	4.3	1.6
0.0	1.8	1.8
2.7	9.1	1.8
5.3	6.5	1.8
<u>0.5</u>	<u>1.3</u>	<u>1.8</u>
3.2	8.6	1.8
5.7	6.1	1.8
8.3	3.5	1.8

10.9

16.8

15 21 10.88

15 20 16.52

+ 1 - 05.64

.61  
 06.25

3

B Bootis

8.6	7.4	6.0
0.9	5.1	6.0
3.4	2.8	6.2
5.8	0.5	6.3
		8.1

0.6

15 24 8.03

15 23 13.78

+ 1 - 05.75

.61  
 06.36



July 30.3 0 Hercules

109 Hercules

1.2	9.1	9.3	7.9	2.0	9.9
3.3	8.8	9.1	9.8	0.0	9.8
6.0	3.2	9.2	2.2	7.6	9.8
9.2	1.0	9.2	4.4	5.2	9.6
0.8	9.9	9.7	6.5	3.1	9.6
5.3	4.0	9.3	0.9	8.7	9.6
7.8	1.8	9.6	3.2	6.8	9.7
9.0	9.3	9.3	5.5	4.2	9.7
2.4	7.1	9.5	7.7	2.0	9.7

04.9

50.0

13.1

16.4

18 04 04.69 18 19 44.86

18 03 12.37 18 18 57.52

+ 1 - 7.68 + 1 - 07.66

± 1.00

- .61

- .61

08.27

8 Lyrae

08.29

110 Hercules

6.8	9.4	6.2	2.9	6.7	9.6
9.3	6.8	6.1	2.8	4.8	9.6
2.0	4.2	6.2	7.2	2.3	9.5
4.8	1.6	6.4	9.4	0.1	9.5
7.3	2.0	6.3	1.7	8.1	9.8
2.6	4.0	6.6	6.2	3.9	0.1
5.3	1.7	6.4	8.4	1.5	9.9
7.9	8.4	6.3	0.4	9.1	9.5
0.3	5.9	6.2	2.6	7.0	9.6

3.1

44.9

2.8

16.0

18 34 3.15 18 41 44.84

18 33 10.95 18 40 52.55

+ 1 - 07.80 + 1 - 07.71

- .61

- .61

.29

.27

.41

.32

4) 129

.32 =

08.32 = av

Aug 14

109 Hercules

t Draconis

t Lyrae

6.5 0.5- 6.7

9.9 9.5- 9.4

5.2 8.4 3.6

8.5- 8.1 6.6

4.0 5.4 9.4

8.0 1.6 3.6

0.7 6.0 6.7

8.7 1.2 9.9

0.5- 2.9 3.4

2.9 3.9 6.8

1.8 7.4 9.2

3.4 0.4 3.8

4.9 1.6 6.5-

5.7 3.6 9.3

6.0 7.7 3.7

9.5- 7.1 6.6

3.9 5.6 9.1-

1.3 2.2 3.5-

1.8 5.0 6.8

7.9 1.5- 9.4

4.0 9.8 3.8

4.0 2.9 6.9

1.9 7.6 9.5-

6.5- 7.2 3.7

6.1 0.7 6.8

5.6 3.2 8.8

9.0 4.3 3.3

~~18~~ 18 48.3

9.8

1.6

18 19 48.35-

13.2

15.0

18 18 17.51

18 22 9.69

18 34 1.79

+ 1 - 9.16

18 22 18.93

18 33 10.93

+ - .61

+ 1 - 9.24

+ 1 - 9.14

+ - 9.77

- .61

16.1

110 Hercules

9

# 9.76-

1.5- 5.4 6.9

.16

3.6 3.1 6.7

.24

5.9 0.9 6.8

.14

8.0 8.7 6.7

.14

0.2 6.7 6.9

4 1.68

4.6 2.1 6.7

.17 =

6.8 8.9 6.7

09.17 =

9.1 8.9 7.0

.61

1.4 5.6 7.0

09.78 = av

48.3

7.7

18 41 43.40

18 40 52.54

+ 1 - 09.14

- .61

09.76-



Aug 3.3

*B. racinus*

*μ Herculis*

$$\begin{array}{r} 12 \\ - 15 \\ \hline - 060 \\ 34.15 \\ \hline 34.09 \end{array}$$

1.6	9.2	0.8
5.1	5.5	0.6
9.2	2.3	0.5
1.6	9.0	0.6
<u>5.0</u>	<u>5.6</u>	0.6
2.1	9.0	1.1
5.2	5.7	0.9
8.3	2.3	0.6
2.1	8.8	0.9

2.4	9.0	1.4
4.6	6.6	1.2
7.1	4.2	1.3
9.2	1.9	1.1
<u>1.8</u>	<u>9.7</u>	1.5
6.5	5.0	1.5
8.8	2.6	1.4
1.0	0.3	1.3
3.3	7.9	1.2

$$\begin{array}{r} 124 \\ \times 15 \\ \hline 620 \\ 1240 \\ \hline 1860 \end{array}$$
$$\begin{array}{r} .12 \\ 5 \\ \hline -.06 \\ 6.38 \\ \hline 6.32 \end{array}$$

$$\begin{array}{r} 23.0- \\ \hline 11.8 \\ \hline 17 \quad 10 \quad 23.62 \\ \\ 17 \quad 9 \quad 34.09 \\ \hline + 1 = 10.47 \\ \hline 0 \text{ Hercules} \quad 11.08 \end{array}$$

$$\begin{array}{r} 45.8- \\ \hline 7.1 \\ 17 \ 28 \ 45.87 \\ 17 \ 27 \ 55.96 \\ \hline + 1 \ 10 \ 59 \\ - \ 61 \\ \hline 11.20 \end{array}$$
$$\begin{array}{r} 55.8 \\ 12.7 \\ \hline 17 \quad 42 \quad 55.67 \\ 17 \quad 42 \quad 6.32 \\ \hline + 1 - 1065 \\ \quad 61 \\ \hline - 11.26 \end{array}$$
$$\begin{array}{r} 11 \\ 5 \\ \hline 12,36 \\ 12,36 \\ \hline 12,32 \\ 12 \end{array}$$

8.1	5.0	3.1
0.6	3.0	3.6
2.9	0.5	3.4
5.3	8.1	3.4
<u>7.8</u>	<u>5.9</u>	3.7
2.3	1.2	3.5
4.8	9.0	3.8
7.0	6.4	3.4
9.3	4.0	3.3
		1.8
		<hr/>
		14.0

109 Hercules		
41.8	9.1	3.9
70.0	6.9	3.9
8.9	41.5	3.4
11.2	2.3	3.5
<u>3.5</u>	<u>0.1</u>	3.6
8.1	5.8	3.9
0.3	3.5	3.8
2.6	1.2	3.8
4.6	9.0	3.6
		<u>46.9</u>
		15.3

$$\begin{array}{r} .08 \\ .20 \\ .26 \\ .25 \\ .29 \\ \hline 5 \overline{) 1.08} \\ \underline{216} \phantom{=} \\ 11.22 = \text{div} \end{array}$$
$$\begin{array}{r} 108 \\ - 5 \\ \hline 103 \\ - 53 \\ \hline 50 \\ - 49 \\ \hline 1 \end{array}$$
$$\begin{array}{r} 18 \quad 4 \quad 1.74 \\ 18 \quad 3 \quad 12.38 \\ \hline + 1 - 10.64 \\ - \quad .61 \\ \hline 11.25 \end{array}$$
$$\begin{array}{r} 18 \quad 19 \quad 46.81 \\ 18 \quad 18 \quad 57.49 \\ \hline +1 - 10.68 \\ \hline \quad \quad .61 \\ \hline 11.29 \end{array}$$

# Aug 4.3 E Hercules

6.6	4.7	1.3
8.9	2.3	1.2
1.3	9.9	1.2
3.8	7.4	1.2
6.3	5.0	1.3
1.1	0.2	1.3
3.4	8.0	1.4
6.0	5.4	1.4
8.1	3.2	1.3

50.6

12.2

16	576	50.64
16	55	61.78
		+1 -11.14
		- .61
		11.75-

# 3 Draconis

1.0	8.5-	9.5-
4.0	5.1	9.1
7.5-	1.6	9.1
1.1	8.3	9.4
4.3	4.8	9.1
1.2	8.2	9.4
4.6	4.8	9.4
8.0	1.4	9.4
1.3	8.1	9.4

44.5-

12.3

17	28	44.59
17	27	55.94
		+1 -11.35-
		- .61
		11.96

# L Hercules

9.1	8.3	7.4
1.9	5.3	7.2
5.0	2.4	7.4
7.9	9.5-	7.4
0.8	6.5-	7.3
6.8	0.6	7.4
9.9	7.6	7.5
2.7	4.7	7.4
5.7	1.8	7.5

8.7

13.2

17	37	8.69
17	36	20.06
		+1 -11.37
		- .61
		11.98

7.5-
9.6
9.8
3) 2.69
1897=
11.90 = av.

2.0
1.6
-1.0
20.16
20.06



Aug 9.3 Skyrme

S Aquilae

J Payne

$$\begin{array}{r} .16 \\ .016 \\ 10.85 \\ \hline 10.83 \end{array}$$

$$\begin{array}{r} .08 \\ .1 \\ .008 \\ 17.81 \\ \hline 17.80 \end{array}$$

$$\begin{array}{r} .12 \\ .1 \\ .012 \\ 31.02 \\ \hline 31.01 \end{array}$$

5.9 6.9 2.8

8.3 4.3 2.6

1.3 1.6 2.9

3.9 9.0 2.9

56.4

3.6

18 33 56.40

18 33 10.83

+1 -14.43

.61

15.04

2.2 4.4 6.6

4.1 2.3 6.4

6.3 0.1 6.4

8.4 8.2 6.6

0.5- 3.9 6.4

4.8 1.8 6.6

6.9 9.7 6.6

9.0 7.4 6.4

1.2 5.5- 6.7

3.3

19 0.5 5.0

19 0.0 17.80

+1 -14.54

.61

15.15-

0.5- 2.7 3.2

2.9 0.0 2.9

5.5- 7.3 2.8

8.1 4.8 2.9

0.7 2.2 2.9

6.2 7.0 3.2

8.6 4.3 2.9

1.1 0.5- 2.6

3.9 9.2 3.1

16.4

8.9

19 13 16.48

19 12 31.01

+1 -14.54

.61

+1 -15.15-

T Draconis

0.3 2.2 2.5

7.3 5.4 2.7

4.3 5.4 2.2

1.6 5.4 2.5

8.8 5.4 2.8

3.3 9.7 3.0

9.6 2.5 2.1

7.3 5.4 2.7

4.3 8.3 2.6

19 17 31.3

19 18 5.4

19 17 46.20

19 18 31.28

19 17 46.20

+1 -14.92

.61

15.53

$$\begin{array}{r} 4.8 \\ .1 \\ .05 \\ 46.25 \\ \hline 46.20 \end{array}$$

$$\begin{array}{r} .04 \\ .15 \\ .15 \\ 15.3 \\ \hline 41.87 \\ 15.22 = av. \end{array}$$

Aug 10

1.3 72 vphindri

 $\alpha$  Leyrae

110 Herculis

8.2 0.1 8.3

9.2 17 0.9 5.3 9.4 4.7

0.3 8.0 8.3

1.8 8.5 0.2 7.4 7.0 4.4

2.5-5.9 8.4

4.3 6.2 0.5 9.6 4.8 4.4

4.6 3.9 8.5

7.1 3.9 1.0 2.0 2.6 4.6

6.7 1.5 8.2

9.7 6.4 1.1 4.0 0.5 4.5

0.8 7.6 8.4

5.1 6.0 1.1 8.7 6.0 4.7

2.9 5.4 8.3

7.7 3.6 1.3 0.9 4.0 4.9

5.0 3.3 8.3

0.3 0.9 0.2 3.0 1.9 4.9

7.3 1.3 8.6

3.0 8.4 6.4 5.2 9.8 5.0

49.2

55.3 55.3

37.3

3.5

9.0

6.4

18 2 49.19

18 33 55.77 18.41 37.34

18 2 4.23

18 33 10.82 18.40 32.48

+1 -15.04

+1 -15.35

+1 -15.14

61

- 61

- 61

15.65

15.96

15.75

 $\beta$  Leyrae

8.8 8.2 7.0

.65

1.3 5.8 7.1

.96

3.8 3.2 7.0

1.75

6.2 0.9 7.1

.69

8.8 8.3 7.1

42 3005  
7.822

3.6 3.3 6.9

6.1 0.9 7.0

8.7 8.6 7.3

15.76 = Ar

1.2 6.0 7.2

43.7

10.4

18 46 43.55

18 45 58.63

+1 -15.08

- 61



Aug 13.3

$$\begin{array}{r}
 02 \\
 .5 \\
 \hline
 + 81 \\
 12.63 \\
 \hline
 12.63
 \end{array}$$

§ Cygni

1.4	8.7	0.1	5.0	6.9	1.9
3.6	6.2	9.8	7.3	4.8	2.1
6.4	4.0	0.4	9.2	2.6	1.5
8.4	1.7	0.1	1.4	0.5	1.9
0.8	9.2	0.0	3.6	8.7	2.3
5.7	4.7	0.4	7.7	4.3	2.0
8.0	2.3	0.3	9.9	2.2	2.1
0.4	9.9	0.3	1.9	0.1	2.0
2.6	7.4	0.0	3.9	8.2	2.1
		55.3			46.1
		20.7			19.3

~~§ Minchi~~

$$\begin{array}{r}
 21 \quad 8 \quad 55.09 \quad 18 \quad 2 \quad 46.02 \\
 21 \quad 8 \quad 12.63 \\
 \hline
 +1 - 17.54 \\
 - \quad .61 \\
 \hline
 18.15
 \end{array}$$

Aug 14.3

$$\begin{array}{r}
 .18 \\
 .6 \\
 \hline
 .11 \\
 26.48 \\
 \hline
 26.37
 \end{array}$$

$$\begin{array}{r}
 .11 \\
 .6 \\
 \hline
 .07 \\
 4.25 \\
 \hline
 4.18
 \end{array}$$

$$\begin{array}{r}
 .12 \\
 .6 \\
 \hline
 .07 \\
 57.45 \\
 \hline
 57.38 \\
 57
 \end{array}$$

$$\begin{array}{r}
 .30 \\
 .6 \\
 \hline
 .18 \\
 18.76 \\
 \hline
 18.58
 \end{array}$$

$$\begin{array}{r}
 .16 \\
 .6 \\
 \hline
 .10 \\
 10.85 \\
 \hline
 10.75
 \end{array}$$

D Herulis

2.4 4.1 6.5  
 5.0 1.9 6.9  
 7.6 8.9 6.5  
 0.0 6.3 6.3  
2.7 3.8 6.5  
 8.0 8.7 6.7  
 0.5 6.0 6.5  
 3.0 3.3 6.3  
 5.7 1.0 6.7

8.4  
5.3

17 53 8.28  
 17 52 26.37  
 + 1 - 18.09  
 - .61  
18.70

6 Draconis

0.2 9.7 9.9  
 4.3 6.0 0.3  
 8.3 1.8 0.1  
 2.3 7.9 0.2  
6.4 3.9 0.3  
 4.2 6.0 0.2  
 8.5 2.3 0.8  
 2.0 8.3 0.3  
 6.1 3.8 9.9

59.9  
20.9

18 22 60.10  
 18 22 18.58  
 + 1 - 18.58

72 Ophiuchi

5.0 6.9 1.9  
 7.3 4.8 2.1  
 9.2 2.6 1.8  
 1.4 0.5 1.9  
3.6 8.7 2.3  
 7.7 4.3 2.0  
 9.9 2.2 2.1  
 1.9 0.1 2.0  
 3.9 8.2 2.1

46.1  
14.3

18 2 46.02  
 18 2 4.18  
 + 1 - 18.16  
 - .61  
18.77

 $\alpha$  Lyrae

6.0 8.9 4.9  
 8.6 6.1 4.7  
 0.4 3.7 5.1  
 3.9 0.9 4.8  
6.8 8.3 5.1  
 0.8 3.0 4.8  
 4.8 0.4 5.2  
 7.3 7.8 5.1  
 0.0 5.2 5.2

52.7  
9.6

18 33 52.50  
 18 33 10.75  
 + 1 - 18.25  
 - .61

109 Herulis

6.8 1.1 7.9  
 9.2 9.0 8.2  
 1.3 6.9 8.2  
 3.6 4.6 8.2  
6.0 2.5 8.5  
 0.3 8.0 8.3  
 2.4 5.9 8.3  
 4.7 3.8 8.5  
 7.0 1.4 8.4

39.2  
21.7

18 19 39.14  
 18 18 57.38  
 + 1 - 18.24  
 - .61  
18.85

18.85 = Ave



Aug 16.3 to Draconis + Lyrae

$$\begin{array}{r}
 .30 \\
 .024 \\
 \hline
 18.76 \\
 18.74
 \end{array}$$

$$\begin{array}{r}
 .16 \\
 .8 \\
 \hline
 .128 \\
 10.81 \\
 \hline
 10.82
 \end{array}$$

9.1	8.4	7.5-	4.5-	7.6	2.1
3.0	4.4	7.4	7.2	5.0	2.2
7.0	0.6	7.6	8.0	2.0	2.0
1.1	6.9	8.0	2.7	9.6	2.3
4.9	2.8	7.7	5.4	6.9	2.3
3.0	4.8	7.8	4.6	1.7	2.3
6.9	0.7	7.6	3.1	9.1	2.2
1.1	6.9	8.0	6.0	6.3	2.3
5.0	2.5-	7.5-	8.7	4.0	2.7

$$\begin{array}{r}
 59.0 \\
 16.1 \\
 \hline
 18 \ 22 \ 58.85- \\
 18 \ 22 \ 18.74 \\
 \hline
 +1 \ -19.89 \\
 - \ 61 \\
 \hline
 20 \ 50
 \end{array}$$

$$\begin{array}{r}
 51.1 \\
 2.5- \\
 \hline
 18 \ 33 \ 51.13 \\
 18 \ 33 \ 10.82 \\
 \hline
 +1 \ -19.69 \\
 - \ 61 \\
 \hline
 20 \ 30
 \end{array}$$

20.40 = Av,

ang 19.2 x Aphelion

E Haul.

$$\begin{array}{r}
 .16 \\
 .1 \\
 - .016 \\
 \hline
 23.38 \\
 \hline
 23.36 \\
 \\
 .21 \\
 .1 \\
 - .021 \\
 \hline
 61.54 \\
 \hline
 61.52
 \end{array}$$

0.9 2.5 - 3.4

5.6 3.9 9.5-

2.9 0.4 3.3

8.0 1.4 9.4

4.8 8.3 3.2

0.3 9.0 9.3

7.0 6.3 3.3

3.0 6.5 - 9.1-

9.1 4.2 3.3

5.3 4.2 9.5-

3.2 0.0 3.2

0.1 9.2 9.3

5.3 7.9 3.2

2.5 - 7.0 9.1-

7.4 5.8 3.2

5.0 4.7 9.7

9.4 3.9 3.3

7.3 2.2 9.5-

$$\begin{array}{r}
 1.5- \\
 11.9 \\
 16 \text{ } 5.3 \text{ } 1.63 \\
 16 \text{ } 5.2 \text{ } 23.36 \\
 \hline
 + 1 - 21.73 \\
 \hline
 61 \\
 \hline
 22.34
 \end{array}$$

$$\begin{array}{r}
 9.7 \quad 39.7 \\
 2.2 \quad 13.9 \\
 16 \text{ } 5.6 \text{ } 39.73 \\
 16 \text{ } 5.5 - 61.52 \\
 \hline
 + 1 - 21.79 \\
 \hline
 61 \\
 \hline
 22.40
 \end{array}$$

f Draconis

6.8 7.5 - 4.3

1.7 2.3 4.0

6.8 7.4 4.2

1.9 2.5 - 4.4

7.2 8.5 - 5.7

7.2 7.7 4.9

2.3 2.4 4.7

7.1 7.3 4.6

2.3 2.2 4.5-

$$\begin{array}{r}
 7.4 \\
 \hline
 5.7
 \end{array}$$

17 9 7.3

17 8 28.92

+ 1 - 21.62

22.34

34

40

23

$$\begin{array}{r}
 3 \overline{) 97} \\
 \hline
 32 =
 \end{array}$$

22.35 = Ar.



Aug 20.41

C Cygni

T Draconis

$$\begin{array}{r}
 .2 \\
 \times 2 \\
 \hline
 .04 \\
 55.36 \\
 \hline
 55.36
 \end{array}$$

$$\begin{array}{r}
 109 \\
 \times 102 \\
 \hline
 218 \\
 1090 \\
 \hline
 11018
 \end{array}$$

$$\begin{array}{r}
 45.77 \\
 - 1.12 \\
 \hline
 44.65
 \end{array}$$

9.4	5.5	4.9	1.2	4.5	5.7
2.7	2.4	5.1	8.8	6.6	5.4
6.0	9.0	5.0	5.4	9.5	4.9
9.2	6.0	5.2	2.7	2.6	5.3
2.7	2.6	5.3	0.2	5.7	5.9
9.1	5.7	4.8	4.2	1.3	5.5
2.7	2.3	5.0	1.3	3.8	5.1
5.9	9.2	5.1	8.8	7.3	6.1
9.0	5.8	4.8	5.1	9.3	4.4
		32.7			22.7
		9.9			13.0

19	27	32.52	19	18	22.68
19	26	55.32	19	17	43.68
	+1	-22.80		+1	-22.97
		-161			-161
		23.41			23.55

C Cygni

$$\begin{array}{r}
 20 \\
 \times 14 \\
 \hline
 280 \\
 2800 \\
 \hline
 28000
 \end{array}$$

3.8	7.4	1.3
7.0	4.7	1.7
0.3	1.6	1.9
3.6	8.4	2.0
6.7	5.3	2.0
3.1	8.6	1.7
6.3	5.5	1.8
9.5	2.3	1.8
2.7	8.9	1.6

		5.9
		16.7
19	34	5.88
19	33	28.66
	+1	-22.78
		-161
		23.41

$$\begin{array}{r}
 141 \\
 \times 39 \\
 \hline
 1269 \\
 1410 \\
 \hline
 5509
 \end{array}$$

$14.0 = \frac{3}{13.8}$   
 $23.40 = \text{av. } 4.6$

168

Aug 22.3  $\xi$  Draconis

8.1 8.4 6.5-

1.9 4.5 6.4

5.7 0.9 6.6

9.5 7.0 6.5-

13.2

2.2

17 52 13.24

17 51 37.24

+1 -24.00- .61

24.61

.35-

.4

- .140

37.35

37.24



Aug. 23.4  $\pi$  Pegasi

3 Lacertae

24 Cephri

$$\begin{array}{r} 104 \\ .5 \\ + 1020 \\ \hline 63.41 \\ 63.43 \end{array}$$

$$\begin{array}{r} 104 \\ .5 \\ + 1020 \\ \hline 12.13 \\ 12.55- \end{array}$$

4.4 3.4 7.8

6.9 0.9 7.8

9.4 8.5 7.9

1.7 6.1 7.8

4.2 3.6 7.8

9.8 8.9 8.2

1.6 6.2 7.8

4.0 3.8 7.8

6.4 1.2 7.6

38.9

17.4

22 05- 38.92

22 04 63.43

+1 -24.5-1

61

25.12

$$\begin{array}{r} 104 \\ .5 \\ + 1020 \\ \hline 44.38 \\ 44.36 \end{array}$$

$$\begin{array}{r} 106 \\ .5 \\ + 103 \\ \hline 43.76 \\ 43.79 \end{array}$$

$$\begin{array}{r} 108 \\ .5 \\ + 104 \\ \hline 16.84 \\ 16.93 \end{array}$$

7 Lacertae

7.2 0.9 8.1

0.3 7.5 7.8

3.4 4.3 7.7

6.6 1.2 7.8

9.9 8.0 7.9

6.4 0.5 7.9

9.7 8.4 8.1

2.9 5.3 8.2

5.9 2.1 8.0

19.0

18.5

22 28 18.97

22 26 43.79

+1 -24.82

61

25.43

47.9

17.7

22 19 47.93

22 19 12.55-

+1 -24.62

101

25.22

10 Lacertae

6.0 8.5 4.5

8.8 5.9 4.7

0.1 3.3 4.4

3.7 0.6 4.3

6.5 8.2 4.7

1.6 2.8 4.4

4.6 0.2 4.8

7.2 7.5 4.7

9.6 5.0 4.6

52.2

5.3

22 34 52.28

22 34 16.93

+1 -24.65

61

25.26

22 8 19.30

22 7 44.36

+1 -25.06

61

25.67

57 170

34

170

Aug 24.3  $\alpha$  Cygni

$$\begin{array}{r}
 114 \\
 \underline{16} \\
 - .084 \\
 8.86 \\
 \underline{8.78} \\
 .07 \\
 \underline{.04} \\
 50.88 \\
 \underline{50.84}
 \end{array}$$

3.9	3.4	7.3
7.0	0.4	7.4
9.6	7.5	7.1
2.7	4.4	7.1
5.8	1.3	7.1
1.8	5.6	7.4
4.8	2.5	7.3
7.9	9.7	7.6
0.8	6.8	7.6

43.7

12.6

20 10 43.66

20 10 8.78

+1 -25.12

.61

25.73

 $\gamma$  Cygni

3.0	6.5	9.5
5.7	4.1	9.8
8.3	1.2	9.5
1.0	8.6	9.6
3.7	6.0	9.7
8.9	0.5	9.4
1.8	7.8	9.6
4.4	5.2	9.6
7.2	2.5	9.7

49.9

15.3

20 18 49.81

20 18 14.96

+1 -25.15

.61

25.76

 $\beta$  Aquilae

7.4	4.2	1.6
9.7	2.2	1.9
2.0	0.1	2.1
4.0	8.0	2.0

25.9

8.5

19 50 25.94

19 49 50.84

+1 -24.90

.61

25.51

.51

.73

.76

3 2.00

57

67 =

25.67 = Alt.

$$\begin{array}{r}
 110 \\
 \underline{16} \\
 - .06 \\
 15.02 \\
 \underline{14.96}
 \end{array}$$



Aug 25.3

$$\begin{array}{r}
 .16 \\
 .7 \\
 \hline
 .11 \\
 33.88 \\
 \hline
 33.77
 \end{array}$$

$$\begin{array}{r}
 .22 \\
 .7 \\
 \hline
 .154 \\
 10.10 \\
 \hline
 9.95
 \end{array}$$

$$\begin{array}{r}
 .16 \\
 .7 \\
 \hline
 .11 \\
 45.71 \\
 \hline
 45.61
 \end{array}$$

$$\begin{array}{r}
 .27 \\
 .7 \\
 \hline
 .16 \\
 19.73 \\
 \hline
 19.54
 \end{array}$$

 $\alpha$  Heranlis

$$\begin{array}{r}
 7.0 \ 9.5 \ 6.5 \\
 9.1 \ 7.3 \ 6.4 \\
 1.3 \ 5.2 \ 6.5 \\
 3.4 \ 3.0 \ 6.4 \\
 5.6 \ 0.9 \ 6.5 \\
 9.7 \ 6.8 \ 6.5 \\
 1.9 \ 4.7 \ 6.6 \\
 3.9 \ 2.5 \ 6.4 \\
 6.1 \ 0.4 \ 6.5
 \end{array}$$

$$\begin{array}{r}
 8.2 \\
 \hline
 4.5
 \end{array}$$

$$\begin{array}{r}
 17 \ 10 \ 8.24 \\
 17 \ 9 \ 33.77 \\
 + 1 - 25.53 \\
 \hline
 26.14
 \end{array}$$

 $\epsilon$  Heranlis

$$\begin{array}{r}
 4.0 \ 3.5 \ 7.5 \\
 6.9 \ 0.5 \ 7.4 \\
 0.0 \ 7.4 \ 7.4 \\
 3.0 \ 4.7 \ 7.7 \\
 6.0 \ 1.8 \ 7.8 \\
 1.7 \ 5.6 \ 7.3 \\
 4.9 \ 2.6 \ 7.5 \\
 7.9 \ 9.6 \ 7.5 \\
 0.8 \ 6.8 \ 7.6
 \end{array}$$

$$\begin{array}{r}
 53.8 \\
 \hline
 14.5
 \end{array}$$

$$\begin{array}{r}
 17 \ 36 \ 53.76 \\
 17 \ 36 \ 19.54 \\
 + 1 - 25.78 \\
 \hline
 26.14
 \end{array}$$

 $\pi$  Heranlis

$$\begin{array}{r}
 9.3 \ 0.2 \ 8.7 \\
 1.0 \ 7.5 \ 8.5 \\
 3.7 \ 5.0 \ 8.7 \\
 6.3 \ 2.4 \ 8.7 \\
 8.9 \ 9.9 \ 8.8 \\
 4.0 \ 4.7 \ 8.7 \\
 6.8 \ 2.1 \ 8.9 \\
 9.3 \ 9.5 \ 8.8 \\
 1.8 \ 6.9 \ 8.7
 \end{array}$$

$$\begin{array}{r}
 44.4 \\
 \hline
 6.9
 \end{array}$$

$$\begin{array}{r}
 17 \ 11 \ 44.36 \\
 17 \ 11 \ 9.95 \\
 + 1 - 25.58 \\
 \hline
 26.20
 \end{array}$$

 $\alpha$  Ophiuchi

$$\begin{array}{r}
 8.9 \ 1.1 \ 0.0 \\
 0.9 \ 9.0 \ 9.9 \\
 2.9 \ 6.9 \ 9.8 \\
 5.1 \ 4.8 \ 9.9 \\
 7.2 \ 2.6 \ 9.8 \\
 1.5 \ 8.5 \ 0.0 \\
 3.7 \ 6.4 \ 0.1 \\
 5.8 \ 4.2 \ 0.0 \\
 7.8 \ 2.1 \ 9.9
 \end{array}$$

$$\begin{array}{r}
 20.0 \\
 \hline
 18.4
 \end{array}$$

$$\begin{array}{r}
 17 \ 30 \ 19.97 \\
 17 \ 29 \ 45.61 \\
 + 1 - 25.64 \\
 \hline
 26.25
 \end{array}$$

$$\begin{array}{r}
 .14 \\
 .20 \\
 .25 \\
 .39 \\
 \hline
 4 \ 1.98 \\
 \hline
 .24 = \\
 26.24 = \text{av.}
 \end{array}$$

172

Aug 16. 3

O' Seq. Cygnus (?)

 $\delta$  Cygnus

2.9 2.9 5.8

1.4 5.5- 6.9

5.9 9.8 5.7

4.4 2.6 7.0

8.8 6.5- 5.3

7.0 9.8 6.8

1.8 3.7 5.5-

0.0 7.4 7.4

4.9 0.9 5.8

2.3- 4.7 7.0

0.9 4.7 5.6

7.8 9.3 7.1

3.7 1.8 5.5-

0.5- 6.7 7.2

6.9 8.6 5.5-

3.3 4.0 7.3

9.9 5.9 5.8

5.9 1.3 7.2

22.8

48.5-

15.3

10.4

20 10 22.8 14

20 18 48.5-5-

20 10 8.75-

20 18 14.94

+ 1 - 45.94

+ 1 - 26.39

.61

.61

46.35-

27.00

[Note: evidently the star observed for O' Seq. Cygnus was H.P. 3527 which preceded about 0.4<sup>m</sup> 4<sup>m</sup> north]



Aug 27.5' 7 Lacental # 10 Lacental

$$\begin{array}{r} .06 \\ 19 \\ + 1054 \\ \hline 43.76 \\ 43.81 \end{array}$$

$$\begin{array}{r} .08 \\ 9 \\ + .072 \\ 16.89 \\ \hline 16.96 \end{array}$$

4.8	8.6	3.4	3.4	6.2	9.6
7.8	5.6	3.4	6.0	3.3	9.3
1.0	2.0	3.0	8.7	0.8	9.5
4.2	8.9	3.1	1.4	8.0	9.4
7.4	5.8	3.2	4.0	5.5	9.5
3.8	9.3	3.1	9.0	0.4	9.4
6.9	6.2	3.1	1.8	7.7	9.5
0.4	3.0	3.4	4.5	5.0	9.5
3.4	9.8	3.2	7.0	2.5	9.5

$$\begin{array}{r} 16.5 \\ \hline 11.4 \\ \hline 22 \quad 27 \quad 16.60 \\ 22 \quad 26 \quad 43.81 \\ + 1 \quad -27.21 \\ \hline .61 \\ \hline 27.82 \end{array}$$

$$\begin{array}{r} 49.7 \\ \hline 13.9 \\ \hline 22 \quad 34 \quad 49.73 \\ 22 \quad 34 \quad 16.96 \\ + 1 \quad -27.23 \\ \hline .61 \\ \hline 27.84 \end{array}$$

Mean 27.83

Aug 28.3

♂ Aquilar			♂ Aquilar			♀ Aquilar		
2.5	4.5	7.0	9.4	1.3	0.7	44.9	2.4	7.3
4.8	2.4	7.2	1.6	9.2	0.8	8.2	9.1	7.3
7.0	0.3	7.3	3.7	7.2	0.9	9.9	5.5	7.4
8.9	8.3	7.2	6.0	5.1	1.1	5.3	2.1	7.4
0.9	5.9	6.8	7.9	3.0	0.9	8.2	9.0	7.5
5.1	2.0	7.1	2.1	8.9	1.0	5.3	1.5	6.8
7.3	9.8	7.1	4.2	6.9	1.1	8.7	8.3	7.0
9.6	7.6	7.2	6.1	4.9	1.0	2.0	5.2	7.2
1.6	5.7	7.3	8.3	2.4	0.7	5.2	2.0	7.2
		53.7	0.4		30.4			18.6
		10.9	2		8.6			11.7
19	45	53.57	19	41	30.45	19	53	18.62
19	45	21.44	19	40	58.17	19	52	46.45
	+1	-27.87		+1	-27.72		+1	-27.83
		.61			.61			.61
		28.48			28.33			28.44
					28.48			
					28.33			
					28.44			
			3		1.25			
					28.41			Mean



Aug. 29.4

57 Payari

0.7 9.4 0.1

2.9 7.0 9.9

5.5-4.7 0.2

8.0 2.3 0.3

0.3 9.8 0.1

5.4 4.9 0.3

7.9 2.5- 0.4

0.2 0.2 0.4

2.8 7.7 0.5

85.0

21.2

22 5 35.12

22 5 33.45-

+1 = 28.33

- .61

28.94

16 Payari

9.5- 5.0 4.5-

1.7 2.6 4.3

4.0 0.5- 4.5-

6.3 8.1 4.4

8.6 5.9 4.5-

3.2 1.4 4.6

5.4 9.2 4.6

7.6 7.0 4.6

0.0 4.5- 4.5-

32.0

4.5-

21 48 32.24

21 47 60.49

+1 -28.25-

.61

28.86

86

94

211.80

28.90 mean.

Aug 30.3

$$\begin{array}{r}
 .24 \\
 .12 \\
 \hline
 .05 \\
 - .05 \\
 \hline
 26.09 \\
 \hline
 26.04 \\
 \hline
 .16 \\
 .2 \\
 \hline
 .03 \\
 - .03 \\
 \hline
 3.85 \\
 \hline
 3.82
 \end{array}$$

*Acanthis*

1.5-3.2 4.7

4.0 0.7 4.7

6.6 8.1 4.7

9.2 5.4 4.6

1.9 2.9 4.8

7.0 7.7 4.7

9.5-5.1 4.6

2.3 2.6 4.9

4.7 0.0 4.7

57.4

6.8

17 5.2 57.36

17 5.2 26.04

+1-28.68

- .61

29.29

67 *Optunichi*

4.3 5.8 0.1

6.4 3.8 0.2

8.5-1.7 0.2

0.6 9.6 0.2

2.7 7.5- 0.2

6.9 3.3 0.2

8.8 1.3 0.1

1.0 9.3 0.3

3.1 7.1 0.2

35.1

1.8

17 5.5 35.09

17 5.5 3.82

+1-28.73

- .61

29.34

29.31 = mean



Sept 1.3 Sagittae

12	2.5	3.9	6.4
.4	4.7	1.8	6.3
- .048	6.6	9.6	6.2
53.11	8.8	7.5	6.3
53.06	0.9	5.4	6.3
15	5.0	14	6.4
.4	7.0	9.3	6.3
- .060	9.0	7.3	6.3
14.27	1.1	5.2	6.3
14.21		23.1	
		2.9	
19 20	23.115-		
19 19	53.06		
+ 1	-29.81		
	.61		
	-30.52		

 $\beta$  Cygni

1.0	7.4	8.4
3.2	5.0	8.2
5.7	2.9	8.6
8.0	0.3	8.3
0.3	8.1	8.4
5.0	3.7	8.7
7.2	7.2	8.4
9.5	9.0	8.5-
1.9	6.6	8.5-
4.2		
19 20	44.2	
19 19		
	44.2	
	4.2	
19 26	44.22	
19 26	14.21	
+ 1	-29.99	
	.61	
	-30.60	

178

Sept 3.3

 $\beta$  Draconis

$$\begin{array}{r}
 .34 \\
 .10 \\
 \hline
 .204 \\
 .1124 \\
 \hline
 .1124 \\
 .1124 \\
 \hline
 .1124
 \end{array}$$

$$\begin{array}{r}
 .120 \\
 .06 \\
 \hline
 .120 \\
 .1191 \\
 \hline
 .1191 \\
 .1191 \\
 \hline
 .1191
 \end{array}$$

0.1 7.4 7.5-

3.3 4.1 7.4

6.7 0.6 7.3

0.8 7.1 7.2

3.5- 3.9 7.4

0.3 7.1 7.4

3.6 3.9 7.5-

7.0 0.5- 7.5-

0.4 7.1 7.5-

23.8

13.5-

17 28 23.71

17 27 58.04

+1 - 31.33

.61

31.94

1.1 7.9 9.0

3.5- 5.4 8.9

5.9 3.0 8.9

8.2 0.7 8.9

0.6 8.2 8.8

5.2 3.7 8.9

7.5- 1.3 8.8

9.9 9.0 8.9

2.2 6.7 8.9

34.3

8.3

17 42 34.44

17 42 5.79

+1 - 31.35-

.61

31.96





6.3  
 Sep 5.3

.20  
 .9  
 - .180  
 58.48  
 58.30  
 .20  
 .9  
 - .180  
 30.74  
 30.56

.19  
 .9  
 - .171  
 47.05  
 46.88

$\beta$  Seyrae.

9.8 9.0 8.8  
 2.3 6.6 8.9  
 4.8 4.1 8.9  
 7.3 1.8 9.1  
 9.6 9.3 8.9  
 4.7 4.2 8.9  
 7.1 1.8 8.9  
 9.8 9.4 9.2  
 2.1 7.0 9.1

24.5  
 9.2

18 46 24.48  
 18 45 58.30  
 + 1 - 33.82  
 - .61  
 34.43

$\delta$  Seyrae.

0.5 2.9 3.2  
 3.1 0.2 3.3  
 5.7 7.7 3.4  
 8.5 5.0 3.5  
 1.0 2.7 3.7  
 6.0 7.1 3.1  
 9.0 4.4 3.4  
 1.3 2.0 3.3  
 4.0 9.3 3.3

56.7  
 12.9

19 12 56.68  
 19 12 30.56  
 + - 33.88  
 - .61  
 34.49

$\gamma$  Seyrae

8.6 7.5 6.1  
 0.8 5.2 6.0  
 3.5 3.0 6.5  
~~6.0~~ 0.2 6.2  
~~8.3~~ 7.8 6.1  
~~5.6~~ 2.9 6.0  
~~5.6~~ 0.4 6.0  
~~8.1~~ 8.0 6.1  
~~0.5~~ 5.6 6.1

13.0  
 1.2

18 55 13.06  
 18 54 46.88  
 + 1 - 33.82  
 - .61  
 34.43



Sep. 7.3  $\zeta$  Aquilae $\delta$  Lyræ. $\beta$  Cygni.
$$\begin{array}{r} .00 \\ 17.47 \\ \hline 17.47 \end{array}$$

$$\begin{array}{r} .00 \\ 30.54 \\ \hline 30.54 \end{array}$$

$$\begin{array}{r} .00 \\ 14.12 \\ \hline 14.12 \end{array}$$

$$\begin{array}{r} .00 \\ 28.26 \\ \hline 28.26 \end{array}$$

1.8 4.2 6.0

3.9 2.0 5.9

6.0 0.0 6.0

8.1 7.9 6.0

0.2 5.7 5.9

4.3 1.4 5.7

6.6 9.3 5.9

8.8 7.1 5.9

0.8 5.0 5.8

$$\begin{array}{r} 42.9 \\ \hline 18.0 \end{array}$$

19 0 42.94

19 0 17.47

+1 - 34.53

- .61

35.14

 $\delta$  Cygni.

0.5 4.9 5.4

4.0 1.8 5.8

7.2 8.5 5.7

0.3 5.0 5.3

3.8 2.0 5.8

0.0 5.5 5.5

3.1 2.2 5.3

6.2 9.1 5.3

9.7 6.0 5.7

23.0

14.8

19 33 22.78

19 33 28.26

548

wrong star?

9.7 1.9 1.6

2.3 9.3 1.6

4.9 6.6 1.5

7.4 4.0 1.4

0.1 1.6 1.7

5.1 6.1 1.2

8.1 3.6 1.7

0.8 1.0 1.8

3.1 8.3 1.4

$$\begin{array}{r} 55.6 \\ \hline 14.5 \end{array}$$

19 12 55.76

19 12 30.54

+1 - 34.78

$$\begin{array}{r} .61 \\ \hline 35.39 \end{array}$$

6.1 2.6 8.7

8.2 0.2 8.4

0.6 7.9 8.5

3.0 5.5 8.5

5.3 3.4 8.7

0.0 8.4 8.4

2.1 6.2 8.3

4.8 4.0 8.8

7.0 1.7 8.7

$$\begin{array}{r} 39.3 \\ \hline 5.3 \end{array}$$

19 26 39.28

19 26 14.12

+1 - 34.84

$$\begin{array}{r} .61 \\ \hline 35.45 \end{array}$$





4° 36'

Sept 12.3 Siderensis

B Draconis

B Opilichii.

5.1 0.6 5.7

2.0 9.5- 1.5-

8.1 9.4 7.5-

7.4 8.3 5.7

5.3 6.1 1.4

0.2 7.3 7.5-

9.9 6.0 5.9

8.6 2.8 1.4

2.3 5.2 7.5-

2.0 3.9 5.9

2.1 9.4 1.5-

4.3 3.1 7.4

4.2 1.7 5.9

5.5- 6.0 1.5-

6.4 1.1 7.5-

8.9 7.0 5.9

2.2 9.3 1.5-

0.5- 7.0 7.5-

1.1 4.8 5.9

5.7 5.9 1.6

2.7 5.0 7.7

3.3 2.4 5.7

9.0 2.7 1.7

4.8 3.0 7.8

5.7 0.1 5.8

2.4 9.2 1.6

6.9 0.9 7.8

47.9

15.8

18.9

17.3

14.5

15.1

17 10 47.91

17 28 15.76

17 38 18.79

17 10 26.78

17 27 14.72

17 37 57.65

+1-38.87

+1-38.96

+1-38.86

.61

.61

.61

39.48

39.57

39.47

L Draconis

8.5 8.7 7.3

Lam 65° 50' = 2.225

0.1 7.1 7.2

Lam 4° 36' = 0.0805

2.0 5.5 7.5

$$\begin{array}{r} -38.86 \\ -38.98 \\ \hline .12 \end{array} \quad \frac{.12}{2.1445} = 0.06 = n.$$

3.4 3.8 7.2

5.2 2.0 7.2

7.0 0.3 7.3

8.6 8.8 7.4

17 08 48.65

0.2 7.1 7.3

17 08 27.63

2.0 5.3 7.3

+1-38.98

3.7 3.8 7.5

5.2 2.0 7.2

7.0 0.2 7.2

48.7

16.3

17 08 48.65

Assume  $n = 0.08$   
 or correction =  
 Sign +  $n$  + - S. of  
 zenith.

Sept. 13.3

2. Pezrae.

110. Hercules.

$$\begin{array}{r}
 .25 \\
 .6 \\
 \hline
 .150 \\
 10.28 \\
 \hline
 10.13
 \end{array}$$

$$\begin{array}{r}
 .19 \\
 .6 \\
 \hline
 .114 \\
 52.09 \\
 \hline
 51.98
 \end{array}$$

4.0	6.5	0.5	0.1	4.2	4.3
6.6	4.0	0.6	2.2	2.0	4.2
9.1	1.3	0.4	4.7	9.8	4.5
1.7	8.6	0.3	6.9	7.6	4.5
4.3	6.1	0.4	9.0	5.5	4.5
9.7	0.9	0.6	3.5	1.0	4.5
2.3	8.2	0.5	5.8	9.0	4.8
5.1	5.8	0.9	8.0	6.7	4.7
7.8	3.0	0.8	0.0	4.5	4.5

30.3

12.1

5.3

4.6

18 33 30.28

18 41 12.24

18 33 10.13

18 40 57.98

+1 - 39.85

39.74

- .01

- .04

- .61

- .61

40.47

40.39

Average = 40.43



Sept 14, 2 a ohluchi  $\mu$  Heronilis

3.6	5.9	9.5-	1.8	8.2	0.0
5.8	3.8	9.6	4.0	6.0	0.0
7.9	1.7	9.6	6.4	3.6	0.0
0.0	9.5-	9.5-	8.7	1.3	0.0
2.1	7.3	9.4	1.0	9.0	0.0
6.3	3.2	9.5-	5.7	4.4	0.1
8.4	1.1	9.5-	8.1	2.0	0.1
0.5-	8.9	9.4	0.3	9.6	9.9
2.6	6.9	9.5-	2.7	7.2	9.9

$$\begin{array}{r} 119 \\ 17 \\ \hline 1133 \\ 4538 \\ \hline 4525- \end{array}$$

$$\begin{array}{r} 122 \\ 17 \\ \hline 1054 \\ 571 \\ \hline 5056 \end{array}$$

	4.9		25.0
	14.4		000
17	30	4.76	17 42 25.00
17	29	45.25-	17 42 5.56
	+1	-40.49	+1 -40.56
		-1.81	-1.81
		41.10	41.17
		41.15	41.20

Average = 41.15

Sept 15.3  $\beta$  Lyrae

110 Hercule,

 $\beta$  Lyrae

2.1 5.1 7.2

8.6 2.5- 1.1

2.0 1.4 3.4

4.9 2.3 7.2

0.7 0.1 0.8

4.4 8.8 3.2

7.1 9.8 7.0

3.0 8.1 1.1

7.0 6.3 3.3

0.1 7.1 7.2

5.2 5.9 1.1

9.5- 3.9 3.4

2.7 4.5- 7.2

7.3 3.8 1.1

2.0 1.5- 3.5-

8.1 9.0 7.1

2.0 9.3 1.3

6.9 6.5- 3.4

0.8 6.5- 7.3

4.0 7.2 1.2

9.2 4.1 3.3

3.5- 3.7 7.2

6.2 5.1 1.3

1.9 1.8 3.7

6.0 1.2 7.2

8.4 2.8 1.2

4.2 9.3 3.5-

28.610.616.9

11.2

10.8

13.6

18 33 28.5918 41 10.5718 46 16.7218 33 10.0818 40 51.9418 45 58.10

+1 - 41.49

+1 - 41.37

+1 - 41.38

- .01

- .04

- .02

- .61

- .61

- .61

42.1142.0242.01

Average = 42.05

$\begin{array}{r} .25- \\ .8 \\ - 1200 \\ 10.28 \\ \hline 10.08 \end{array}$   
 $\begin{array}{r} .19 \\ .8 \\ - 1152 \\ 52.09 \\ \hline 51.94 \end{array}$

$\begin{array}{r} .22 \\ .8 \\ - 1176 \\ 18.28 \\ \hline 58.10 \end{array}$



Sept 23.9 - 24.2 of Ursae Mag. & Ursa Mag. & Boatis

$\begin{array}{r} .09 \\ .004 \\ \hline 1.04 \end{array}$	$\begin{array}{r} 2.0 \\ 2.0 \\ \hline 2.0 \end{array}$		9.4	4.0	3.4	3.4	7.2	0.6
1.5.04	3.2	9.0	4.2	3.1	0.4	3.5	4.4	0.0
1.5.09	9.0	5.6	4.6	6.7	6.6	3.2	7.7	2.6
	2.7	2.0	4.7	0.4	2.9	3.3	9.9	0.4
$\begin{array}{r} .18 \\ .17 \\ .26 \\ \hline 2.04 \\ 2.19 \end{array}$	6.2	8.3	4.5	4.4	9.2	3.6	2.0	8.3
	3.0	1.3	4.3	1.8	2.0	3.8	6.6	4.0
	6.6	7.8	4.4	5.6	7.9	3.5	8.9	1.9
$\begin{array}{r} .09 \\ .1 \\ \hline 1.063 \\ 33.13 \\ \hline 33.07 \end{array}$	0.1	4.2	4.3	9.4	4.3	3.7	0.9	9.6
	3.8	0.8	4.6	3.0	0.8	3.8	3.1	7.4
	7.4	4.2						

$\begin{array}{r} .03 \\ .7 \\ \hline .021 \\ 4.55 \\ \hline 4.53 \end{array}$	$\begin{array}{r} 10.7 \\ 7.4 \\ \hline 4.0 \end{array}$	$\begin{array}{r} 16.8 \\ 14.7 \\ \hline 16.77 \end{array}$	$\begin{array}{r} 46.3 \\ 4.6 \\ \hline 46.24 \end{array}$
	11 48 7.23	12 49 16.77	14 10 46.24
	11 47 55.09	12 49 4.03	14 10 21.91
	+ 1 - 47.86	+ 1 - 47.76	6.67
	+ .04	+ .05	14 10 33.07
	- .61	- .61	+ 1 - 47.83
	48.43	48.32	- .04
			- .61
			48.48

43  
32  
45  
3/1.23  
Average 48.42

Sip 24.3

110 Herculis

 $\beta$  Lyrae. $\alpha$  Lyrae

$$\begin{array}{r}
 .20 \\
 .7 \\
 - .140 \\
 51.90 \\
 51.76
 \end{array}$$

$$\begin{array}{r}
 .24 \\
 .7 \\
 - .168 \\
 .17 \\
 58.06 \\
 57.89
 \end{array}$$

$$\begin{array}{r}
 .26 \\
 .7 \\
 0.182
 \end{array}$$

$$\begin{array}{r}
 10.03 \\
 10.21X
 \end{array}$$

$$\begin{array}{r}
 .07 \\
 .3 \\
 + .03 \\
 33.04 \\
 .07
 \end{array}$$

$$\begin{array}{r}
 .24 \\
 .3 \\
 + .07 \\
 57.59
 \end{array}$$

$$\begin{array}{r}
 1.8 \ 5.9 \ 7.7 \\
 4.0 \ 3.9 \ 7.9 \\
 6.1 \ 1.5 \ 7.6 \\
 8.4 \ 9.3 \ 7.7 \\
 0.5 \ 7.1 \ 7.6 \\
 5.1 \ 2.7 \ 7.8 \\
 7.1 \ 0.2 \ 7.3 \\
 9.5 \ 8.2 \ 7.7 \\
 1.5 \ 6.0 \ 7.5
 \end{array}$$

$$\begin{array}{r}
 03.9 \\
 15.7
 \end{array}$$

$$\begin{array}{r}
 18 \ 41 \ 03.83 \\
 18 \ 40 \ 57.76 \\
 +1 - 47.93
 \end{array}$$

$$\begin{array}{r}
 - .04 \\
 - .61 \\
 48.58
 \end{array}$$

$$\begin{array}{r}
 4.5 \ 4.0 \ 8.5 \\
 7.6 \ 1.7 \ 9.3 \\
 0.0 \ 9.0 \ 7.0 \\
 2.2 \ 7.0 \ 9.3 \\
 4.9 \ 4.2 \ 9.2 \\
 9.9 \ 9.6 \ 9.5 \\
 2.1 \ 7.2 \ 9.3 \\
 4.4 \ 5.0 \ 9.5 \\
 6.8 \ 2.2 \ 9.0
 \end{array}$$

$$\begin{array}{r}
 09.5 \\
 10.7 \ 19.7.65
 \end{array}$$

$$\begin{array}{r}
 18 \ 46 \ 09.56 \\
 18 \ 45 \ 57.89 \\
 +1 - 48.23
 \end{array}$$

$$\begin{array}{r}
 - .02 \\
 - .61 \\
 48.96 \\
 48.87
 \end{array}$$

$$\begin{array}{r}
 5.0 \ 8.0 \ 3.0 \\
 7.6 \ 5.1 \ 2.7 \\
 0.7 \ 2.5 \ 3.2 \\
 3.4 \ 0.1 \ 3.5 \\
 5.9 \ 7.2 \ 3.1 \\
 0.7 \ 2.1 \ 2.8 \\
 3.3 \ 9.4 \ 2.7 \\
 6.2 \ 6.3 \ 2.5 \\
 8.7 \ 4.0 \ 2.7
 \end{array}$$

$$\begin{array}{r}
 21.3 \\
 8.5
 \end{array}$$

$$\begin{array}{r}
 18 \ 32 \ 21.46 \\
 18 \ 33 \ 10.21 \\
 48.77
 \end{array}$$

 $\alpha$  Bootis

$$\begin{array}{r}
 3.5 \ 7.2 \ 0.7 \\
 5.5 \ 5.0 \ 0.5 \\
 7.7 \ 2.7 \ 0.4 \\
 9.9 \ 0.6 \ 0.5 \\
 2.0 \ 8.2 \ 0.2
 \end{array}$$

$$\begin{array}{r}
 6.7 \ 4.0 \ 0.7 \\
 8.9 \ 1.8 \ 0.7
 \end{array}$$

$$\begin{array}{r}
 0.9 \ 9.46 \ 0.5 \\
 5X.1 \ 7.3 \ 0.4
 \end{array}$$

$$\begin{array}{r}
 14 \ 10 \ 45.25 \\
 10 \ 33.04 \\
 +1 - 47.79
 \end{array}$$

 $\alpha$  Bootis $\alpha$  Lyrae

$$\begin{array}{r}
 110 Herc. \ 18.7 \ 48.58 \\
 \beta \ Lyrae \ 16.8 \ 48.87 \\
 Average \ 17.2 \ 48.63
 \end{array}$$

Misc Discrepancy



Sept. 26.2	109 Herc.	58 Dracon.	$\alpha$ Lyrae
5.2 9.8 5.8	7.8 7.3 5.1	4.0 7.0 1.0	
7.5 7.5 5.0	1.8 3.2 5.0	6.7 4.4 1.1	
9.8 5.3 5.1	5.8 9.3 5.1	9.2 1.6 0.8	
2.0 3.0 5.0	9.8 5.3 5.1	1.9 9.0 0.9	
4.2 0.8 5.0	3.8 1.3 5.1	4.8 6.2 1.0	
8.6 6.3 4.9	1.7 3.5 5.2	0.0 1.4 1.4	
0.9 4.2 5.1	3.0 2.1 5.1	2.7 8.6 1.3	
3.0 2.0 5.0	4.5 0.8 5.3	5.4 5.8 1.2	
5.2 9.8 5.0	5.7 9.5 5.2	8.0 3.1 1.1	
07.6	7.0 8.1 5.1	20.6	
9.8	8.3 6.8 5.1	10.4	
07.52	6.6 5.5 5.1	20.55	
18 18 56.62	8.3 4.2 5.2	18 33 09.77	
+1-49.10	6.6 3.0 5.0	+1-49.22	
-.05	2.2 1.7 5.3	00	
-.60	1.6 0.3 5.2	-.60	
49.75	3.6 8.8 5.2	+1-49.82	
	6.4 7.5 5.2		
	5.0 27.5		
	6.4		
	19.9		
	27.		
Amaze = +1 <sup>m</sup> -49 <sup>s</sup> .79			

190

Sp. 28.2

M  
x Merc

A Merc

V Dracen

.25  
 $\frac{.1}{25.02}$   
 25.34  
 $\frac{.32}{.25}$

1.4 7.8 9.2  
 3.7 5.6 9.3  
 5.8 3.2 9.0  
 8.2 0.9 9.1  
 0.2 8.5 8.7

.21  
 $\frac{.1}{.02}$   
 $\frac{05.27}{.25}$

5.2 4.0 9.2  
 7.6 1.5 9.1  
 0.0 9.2 9.2  
 2.2 6.9 9.1

14.7  
 $\frac{10.6}{14.56}$   
 $\frac{17 \ 42 \ 05.25}{50.69}$   
 $\frac{-.04}{-1.60}$   
 51.33

.35  
 $\frac{.1}{-.03}$

8.8 0.6 9.4 6.8<sup>9</sup> 3.0 9.9<sup>9</sup>  
 1.3 8.1 .3 0.0 9.7 9.7  
 4.0 5.5 .5 X<sup>3</sup>5 6.5 0.0  
 6.6 2.8 .4 6.7 3.0 9.7  
 9.1 0.3 .4 0.1 9.8 9.9  
 4.3 5.0 .3 6.7 3.1 9.8  
 7.0 2.5 .5 9.9 0.0 9.9  
 9.6 0.0 .6 3.2 6.6 9.8  
 2.0 7.3 .3 6.6 3.2 9.8

34.8  
 $\frac{13.6}{34.72}$   
 $\frac{17 \ 52 \ 25.32}{+1-50.60}$   
 $\frac{.00}{-.60}$   
 $\frac{+1-51.20}{.00}$

10.0  
 $\frac{17.5}{09.92}$   
 $\frac{17 \ 54 \ 00.63}{50.71}$   
 $\frac{+.03}{-.60}$   
 57.28

Average +1-51.27



Sept 29. ~~Sept 29~~

8.0 8.9 6.9

0.5 6.0 6.5

2.9 3.7 6.6

5.5 1.0 6.5

7.8 8.6 6.4

1.1 3.5 4.6

5.7 1.0 6.7

8.0 8.2 6.2

0.6 5.8 6.4

---

13.0

6.8

---

13.36

192

Oct. 2.5

B. Androm.

$$\begin{array}{r}
 .09 \\
 \underline{.5} \\
 -.04 \\
 30.92 \\
 \underline{30.88}
 \end{array}$$

2.5	2.6	5.1
4.6	0.0	4.8
7.1	7.4	4.5
9.9	5.0	4.9
2.3	2.6	4.9
7.4	7.6	5.0
9.9	5.0	4.9
2.4	2.6	5.0
5.0	0.0	5.0

$$\begin{array}{r}
 37.4 \\
 \underline{8.3}
 \end{array}$$

1 03 37.44

1 03 30.88

+1-53.44

-.02

$$\begin{array}{r}
 -.60 \\
 \underline{54.06}
 \end{array}$$



Oct-4.3

~~0~~  
~~862mi~~

- 4.3

- 0.7

- 7.7

- 4.6

- 1.5

9.4 5.0 4.4

2.7 1.6 4.3

5.9 8.6 4.5

9.0 5.3 4.3

32.1

1.6

19 33 32.18

33 27.45

+1-55.27

+ .02

- .60

55.87

+1-55.85







196

Oct 8.2 ~~Lyrae~~~~Lyrae~~~~Lyrae~~

$\begin{array}{r} .26 \\ .1 \\ \hline + .03 \\ 29.82 \\ .85 \\ \hline \end{array}$ 
 $\begin{array}{r} - 6.0 \\ - 3.5 \\ - 0.9 \\ - 8.1 \\ - 5.9 \\ \hline 0.5 \quad 0.7 \quad 2.2 \\ 3.0 \quad 8.1 \quad 1.1 \\ 5.6 \quad 5.8 \quad 1.4 \\ 8.0 \quad 3.1 \quad 1.1 \end{array}$

20.65.4

$\begin{array}{r} 19 \quad 03 \quad 20.60 \\ .03 \quad 19.33 \\ \hline + 1 \quad 58.73 \\ \hline \end{array}$

- .02

- .60

59.88

59.35

$\begin{array}{r} 3.0 \quad 1.8 \quad 4.8 \\ 5.5 \quad 9.4 \quad 4.9 \\ 7.9 \quad 7.0 \quad 4.9 \\ 0.4 \quad 4.6 \quad 5.0 \\ 2.8 \quad 2.1 \quad 4.9 \\ 7.7 \quad 7.2 \quad 4.9 \\ 0.5 \quad 4.7 \quad 5.2 \\ 2.6 \quad 2.3 \quad 4.9 \\ 5.0 \quad 5.0 \quad 0.0 \end{array}$

47.5

14.0

18 54 47.74

~~19 12 29.85~~ 54 46.21

+ 1 58.47

- .03

- .60

59.10

$\begin{array}{r} \text{Average} \\ \hline 59.2 \pm \end{array}$





Oct. 10.5 -  $\frac{1}{2}$  Liang. $\nabla$  Arcturus $\theta$  Persei

.20	7.2	6.8	4.0	7.6	2.0	9.6	4.7	8.0	2.7
.3	9.7	4.2	3.9	9.7	9.8	9.5	<del>7.5</del> 8.0	4.0	2.0
+ .06	2.0	1.7	3.7	2.2	7.5	9.7	1.0	1.0	2.0
36.71	4.6	9.8	4.4	4.2	5.2	9.4	4.1	7.9	2.0
.97	7.2	6.9	4.1	6.6	3.0	9.6	6.9	4.9	1.8
	2.1	2.0	4.1	0.8	9.0	9.8	3.7	8.7	2.4
.15	4.6	9.6	4.2	3.0	6.2	9.2	7.0	5.6	2.6
.3	7.0	7.0	4.0	5.5	4.0	9.6	0.0	2.5	2.5
+ .05	9.2	4.5	3.7	7.8	2.2	0.0	3.4	9.5	2.9
30.23			4.5	2.0		30.0			36.2
.28				0.8		15.3			3.1
.13	2	10	42.01	2	32	29.81	2	36	36.15
.5			51.43						36
-.07			10 42.59		32	30.28			36.97
42.66			- 0 00.58		- 0	00.47			- 0 00.81
.59			+ .02			+ .05			- .02
			-.60			-.60			-.60
			0 01.16		0	01.02			0 01.39

Mean = 1.19 slow



Oct 10.5

#103 Standard

15 27.67

13 18 35.02

13 ~~0.6~~ 06.1

2 9.120

~~13 49 37.81~~

26 42 31.81

2 ~~42~~ 30.5242 31.81

+ 0 1.29

Another reading gives + 0 1.27 at 2.41

Average + 0 1.28

#394 Normal

200

Oct 11.2

17 58 08.

103 standard

15 27.67

13 22 51.57

5 08 00.

$$\begin{array}{r} 0 \quad 40 \\ 17 \quad 54 \quad 52.67 \\ 18 \quad 33 \quad 07.54 \end{array}$$

$$\begin{array}{r} + \quad 0 \quad 14.85 \\ + \quad 0 \quad 14.99 \end{array}$$

#394 normal

15 27.67

13 22 51.57

4 54 00.

48.297

18 33 07.54



Oct 11<sup>10</sup>/<sub>10</sub>

$$\begin{array}{r}
 12 \ 54 \ 05.32 \\
 \hline
 54 \ 07.91 \\
 + \ 0 \ 2.59 \\
 \hline
 \end{array}$$

Another reading gives + 0 2.58 at 12 56

$$\begin{array}{r}
 12 \ 44 \ 50.38 \\
 \hline
 45 \ 06.43 \\
 + \ 0 \ 16.05 \\
 \hline
 \end{array}$$

Another reading gives + 0 16.06 at 12 46

#103 standard

$$\begin{array}{r}
 15 \ 27.67 \\
 13 \ 22 \ 51.57 \\
 23 \ 12 \ 00. \\
 \hline
 3 \ 48.670 \\
 + \ 36 \ 54 \ 07.91 \\
 \hline
 \end{array}$$

#394 normal

$$\begin{array}{r}
 15 \ 27.67 \\
 13 \ 22 \ 51.57 \\
 23 \ 03 \ 00. \\
 \hline
 3 \ 47.192 \\
 + \ 3 \ 6 \ 45 \ 06.43 \\
 \hline
 \end{array}$$

Oct. 12.2

$$\begin{array}{r}
 19(+) \\
 \hline
 18 \ 19 \ 58.48 \\
 18 \ 20 \ 01.29 \\
 + \ 0 \ 02.81 \\
 \hline
 \end{array}$$

Another reading gives + 0 02.79 at 18 14

Average + 0 12.80

#103 standard

$$\begin{array}{r}
 15 \ 27.67 \\
 13 \ 26 \ 48.12 \\
 4 \ 37 \ 00. \\
 \hline
 45.504 \\
 + \ 18 \ 20 \ 01.29 \\
 \hline
 \end{array}$$

#394 normal

$$\begin{array}{r}
 15 \ 27.67 \\
 13 \ 26 \ 48.12 \\
 4 \ 16 \ 00. \\
 \hline
 42.054 \\
 + \ 17 \ 58 \ 57.844 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 17 \ 58 \ 41.58 \\
 \hline
 58 \ 57.84 \\
 + \ 0 \ 36.26 \\
 \hline
 16.26 \\
 + \ 0 \ 16.27 \\
 \hline
 \end{array}$$

Another reading gives + 0 16.27 at 18 03

202

1327 Sidereal

#103 Standard

Oct. 14.9

$$\begin{array}{r}
 12 \ 18^{\circ} 43.65^{50} \\
 \underline{22 \ 10 \ 48.54} \\
 + \ 59 \ 04.88 \\
 + 0 \ 04.89 \\
 + 0 \ 05.04 \\
 + 0 \ 05.05 \text{ at } 12 \ 12
 \end{array}$$

Another reading gives

$$\begin{array}{r}
 11 \ 59 \ 27.35 \\
 12 \ 27.35 \\
 \underline{11 \ 59 \ 46.72} \\
 21 \ 59 \ 19.37 \\
 + 0 \ 19.37 \\
 + 0 \ 19.38 \text{ at } 12 \ 01
 \end{array}$$

Another reading gives

Oct. 12.9

$$\begin{array}{r}
 11 \ 53 \ 50.42 \\
 11 \ 53 \ 53.95 \\
 \underline{+ \ 03.53}
 \end{array}$$

Another reading gives + 03.51 at 22 07 00. Mean Time

Average + 03.52

$$\begin{array}{r}
 11 \ 44 \ 35.24 \\
 11 \ 44 \ 52.47 \\
 \underline{+ \ 0 \ 17.24}
 \end{array}$$

Another reading gives the same at 22 02 00. Mean Time

$$\begin{array}{r}
 15 \ 27.67 \\
 13 \ 34 \ 41.23 \\
 22 \ 17 \ 00. \\
 \underline{3 \ 39.635} \\
 36 \ 10 \ 48.54
 \end{array}$$

#394 Normal

$$\begin{array}{r}
 15 \ 27.67 \\
 13 \ 34 \ 41.23 \\
 22 \ 06 \ 00. \\
 \underline{3 \ 37.82} \\
 35 \ 59 \ 46.72
 \end{array}$$

#103 Standard

$$\begin{array}{r}
 15 \ 27.67 \\
 13 \ 26 \ 48.12 \\
 22 \ 08 \ 00. \\
 \underline{3 \ 38.157} \\
 35 \ 53 \ 53.95
 \end{array}$$

#394 Normal

$$\begin{array}{r}
 15 \ 27.67 \\
 13 \ 26 \ 48.12 \\
 21 \ 59 \ 00. \\
 \underline{3 \ 36.678} \\
 35 \ 44 \ 52.47
 \end{array}$$



Oct 15.9

#1327 Sidereal

12	43	44.33
	43	49.86
	+0	05.53

#103 Normal Standard M.S.

203

15	27.67
15	38 37.79
22	46 00.
	3 44.40
38	43 49.86

#1327 Sidereal

#394 Normal

11	58	22.60
11	58	42.47
12	7	43.94
	7	49.96

Another reading gives  
Average

Oct. 16.9

11	44	29.81
11	44	36.06
	+0	06.25

Another reading gives  
Average

+0	06.28
+0	06.27

15	27.67
13	38 37.79
22	40 00.
	3 32.007
	3 38.485
36	7 43.94
35	58 42.47

Mean Time

#103 Standard

15	27.67
13	42 34.34
21	43 00.
	3 34.05
	3 34.05

35	41.05
35	44.36.06

#394 Normal

15	27.67
13	42 34.34
21	34 00.
	3 32.57
35	35 34.58

11	35	14.25
11	35	34.58
	+0	20.33

Another reading gives the same at 21<sup>h</sup> 37<sup>m</sup> Mean Time



Oct. 16. 1 Delaying Apparatus (having been taken from the clock when it has been for several years) is made to register on chronograph. A sheet taken on which the signals of Bond <sup>(Mean Time)</sup> #394, undelayed and variously delayed, are "compared" with the sidereal clock Frodham #1327. The first <sup>pause</sup> minute of the sidereal clock is arbitrarily taken as 0<sup>h</sup> 0<sup>m</sup>. The <sup>end of the</sup> first five-minute <sup>pause</sup> of the mean-time clock is also arbitrarily taken as 0<sup>h</sup> 0<sup>m</sup>.

If  $M =$  <sup>(undelayed)</sup> ~~given~~ <sup>by #394</sup> mean time, and  $S$  the corresponding sidereal time on this sheet, we may say  $S = a + bM$  when  $a$  and  $b$  are such constants as shall satisfy the sheet; thus allowing at once for the special rates of the clocks as well as for the regular advance of sidereal over mean time. If the same formula be used for a delayed reading of mean time, the difference between the observed and calculated sidereal time will give the amount of the delay.

$M$	$S$	From this $b = 0.1636$ per minute, <del>of</del>
1 <sup>h</sup> 40 <sup>m</sup> 09 <sup>s</sup>	1 52 37.72	$\frac{1}{4} = 0.816$ " hour
0 <sup>h</sup> 00 <sup>m</sup> 09 <sup>s</sup>	0 <sup>h</sup> 12 <sup>m</sup> 21.36	$\frac{1}{4} = 10.0273$ " 10 seconds
100 <sup>m</sup>	100 <sup>m</sup> 16.36	

Then  $a = 12^m 21.36 - 12^m 33.5 = 12^m 31.16$

Test. If  $M = 1^h 40^m 09^s$  we have  $S = 1^h 12^m 31.16$

The sheet gives  $S = 1^h 12^m 30.19$  which is near enough.

The fraction of a second given under  $S$  was obtained from the sheet by a precise process of graphical averaging of ten breaks in pairs whose components are symmetrical with reference to the given second of  $M$ .

From 0<sup>h</sup> 7<sup>m</sup> 12<sup>s</sup> till 0<sup>h</sup> 28<sup>m</sup> 24<sup>s</sup> the signals were delayed by the "short delay", while from 0<sup>h</sup> 28<sup>m</sup> 28<sup>s</sup> till 0<sup>h</sup> 52<sup>m</sup> 14<sup>s</sup> the "long delay" was used, there being no alteration of adjustment of the apparatus meanwhile. The sheet shows very regular runs for these intervals of 21.2 and 23.8 respectively, with due observance of the minute and five-minute pauses.



Test of regularity of working of the short delay.

M	S(measured)	B.M.	S-B.M.
0 <sup>h</sup> 08 <sup>m</sup>	0 <sup>h</sup> 20 <sup>m</sup> 14.94	8 <sup>m</sup> 1.31	0 <sup>h</sup> 12 <sup>m</sup> 12.83 - 0.016
9	21 14.33	9 1.47	.86 + 0.014
10	22 14.50	10 1.64	.86 + 0.014
11	23 14.67	11 1.80	.87 + 0.024
12	24 14.82	1.96	.86 + 0.014
13	X	X	X
14	26 15.11	2.29	.82 - 0.026
15	27 15.30	2.45	.85 + 0.004
16	28 15.47	2.62	.85 + 0.004
17	29 15.62	2.78	.84 - 0.006
18	30 15.80	2.95	.85 + 0.004
19	X	X	X
20	X	X	X
21	33 16.26	3.44	.82 - 0.026
22	34 16.45	3.60	.85 + 0.004
23	35 16.61	3.76	.85 + 0.004
24	36 16.80	3.93	.87 + 0.024
25	X	X	X
26	X	X	X
27	39 17.26	4.42	.84 - 0.006
28	40 17.40	4.58	.82 - 0.026

Conclude that the <sup>vicinity</sup> approach of a coincidence interferes with measurement.

$$\begin{array}{r}
 19.74 \\
 12^m 12.846 \\
 \hline
 12^m 12.335 \\
 \hline
 .511
 \end{array}
 \begin{array}{r}
 + 15.216 \\
 0.013
 \end{array}$$

$$\text{Delay} = 0.51$$

Average deviation of single break = 0.014 This includes the error of measurement from the shut, as well as all irregularities of the clock both the clocks.

## 206 [Delaying Apparatus - continued.]

Test of regularity of the long delay

M	S	BM		
0 <sup>h</sup> 29 <sup>m</sup>	0 <sup>h</sup> 41 <sup>m</sup> 18.56	29 <sup>h</sup> 44 <sup>m</sup> 9 <sup>s</sup>	12 <sup>m</sup> 13.82	+0.025
30	42 18.69	30 4.91	.78	-0.015
31	43 18.90	31 5.07	.83	+0.035
<sup>x</sup> 33	<sup>x</sup> 45 19.15	<sup>x</sup> 5.40	<sup>x</sup> .75	-0.045
34	46 19.35	5.56	.79	-0.005
35	47 19.52	5.73	.79	-0.005
36	48 19.68	5.89	.79	-0.005
<sup>x</sup> 37	<sup>x</sup> 49 19.84	6.05	<sup>x</sup> .79	-0.005
39	51 20.16	6.38	.78	-0.015
40	52 20.34	6.54	.80	+0.005
41	53 20.51	6.71	.80	+0.005
42	54 20.67	6.87	.80	+0.005
43	55 20.85	7.04	.81	+0.015
44	56 20.00	7.20	.80	+0.005
45	57 21.16	7.36	.80	+0.005
46	58 21.31	7.53	.78	+0.015
47	<sup>x</sup> 59 21.50	7.69	.81	+0.015
48	1 00 21.65	7.85	.80	+0.005
49	01 21.81	8.02	<sup>x</sup> .79	-0.005
<sup>x</sup> 51	<sup>x</sup> 03 22.16	8.34	.82	+0.025
52	04 22.28	8.51	.77	24.260
			212.00	0.012
			12 <sup>m</sup> 13.795	
			12 12.335	

Delay = 1<sup>s</sup>.46Average deviation = 0<sup>s</sup>.012Continued from page 207] After again removing water we get Delay = 0<sup>s</sup>.906 at 2<sup>h</sup> 53<sup>m</sup>

We have now obtained the following amounts of delay: Ant of Delay With Short Delay With Long Delay

A delay greater than 1.65 was arranged later, but the

sheet did not properly hold out to record it:

0.22

0.91

0.32

1.28

0.50 ± .01

1.46

0.70

1.65



Test of accuracy of clock and the foregoing process by application to the undelayed signals.

M	S					
23 <sup>h</sup> 50 <sup>m</sup>	0 <sup>h</sup> 02 <sup>m</sup> 10 <sup>s</sup> .72	-10 <sup>m</sup> .64	12 <sup>m</sup> 12.36	+0.016	The conclusion is that either the long or the short-delay works so regularly that the apparent irregularities are attributable rather to our methods of measurement rather than to any irregularity introduced by the working of the apparatus.	
x 51	3 10.88	-09 1.40	.35	+0.006		
53	5 11.20	etc. 1.14	.34	-0.004		
54	6 11.37	0.98	.35	+0.006		
55	7 11.54	0.82	.36	+0.016		
x 56	8 11.71	0.65	.36	+0.016		
x 59	11 12.16	0.16	.32	-0.024		
0 00	12 12.32	-0 0.00	.32	-0.024		
1	13 12.51	<sup>+1</sup> 0.16	.35	+0.006		
3	14 12.68	0.33	.35	+0.006		
x 3	15 12.84	0.49	.35	+0.006		
5	17 13.14	0.82	.32	-0.024		
			12.53	12.154		
			12 12.344	0.013		
			12 12.335			
			0.009			

The undelayed clock was run from 0<sup>h</sup> 5<sup>m</sup> 2<sup>s</sup> <sup>18<sup>s</sup></sup> to 1<sup>h</sup> 04<sup>m</sup> 34<sup>s</sup> and from 1<sup>h</sup> 09<sup>m</sup> 20<sup>s</sup> to 1<sup>h</sup> 13<sup>m</sup> 30<sup>s</sup>. <sup>From</sup> During the last interval we get  $\delta = 1^h 25^m 25.29$  for  $M = 1^h 13^m$ . Retaining  $\underline{a}$  as per page 204, we have  $\underline{B}^M = 1^h 13^m 11.943$   ~~$\underline{B}^M =$~~  whence  $\underline{a}$  (redetermined) = 12<sup>m</sup> 12.347

The short delay, adjusted quite short, was then used.

We find  $\delta = 1^h 30^m 25.38$  for  $M = 1^h 18^m$ . Subtracting  $\underline{B}^M = 1^h 18^m 12.761$  we have 12<sup>m</sup> 12.569 and subtracting again  $\underline{a} = 12^m 12.347$  we have Delay = 0.222

Again, with another adjustment, we find Delay = 0.32 at 1<sup>h</sup> 23<sup>m</sup>

And again " etc " " " " " = 0.49 " 1<sup>h</sup> 26<sup>m</sup>

~~(The long delay was then used, and the adjustment changed.)~~  
 " " " " " " = 0.70 " 1<sup>h</sup> 33<sup>m</sup>

We find Delay = 1.65 at 1<sup>h</sup> 34<sup>m</sup> 09<sup>s</sup> probably with same adjustment as above.

The undelayed clock was then taken for a few minutes, giving material used on page 204. The long delay was then used <sup>after removal of water</sup> (probably constant re-adjustment) giving Delay = 1.28 at 1<sup>h</sup> 48<sup>m</sup>. ~~We may call this the~~ [Continue on page 206]



Oct. 17.5

3 Androm. V Picus

0.1 0.6 0.7 1.8 9.0

2.6 7.8 .4 5.4 6.6

4.9 5.3 .2 7.5 4.1

7.5 2.9 .4 9.8 2.0

0.0 0.1 .1 2.0 9.7

5.3 5.5 .8 6.7 5.1

7.7 2.7 .4 9.0 3.0

0.0 0.2 .2 1.5 0.9

2.8 7.8 .6 3.8 8.5

25.0

3.8

1 03 25.20

03 30.92

-0 05.77

-1.02

-1.60

0 06.39

Average = 06.40

1 13 15.91

13 21.68

-0 05.77

-1.04

-1.60

0 06.41

8 Cassiope.

7.1 8.8 5.9

1.5 4.7 6.2

5.2 0.3 5.5

9.2 6.3 5.5

3.3 2.2 6.2

11.7 6.3 4.5 6.0

3.0 1.4 1.7 6.2

4.5 7.1 0.2 6.0

3.8 4.5 9.0 6.0

7.0 3.0 8.4 6.4

8.6 1.7 4.9 6.2

9.9 0.2 4.9 5.9

1.0 0.2 3.4 5.9

2.5 7.8 1.6 5.6

4.0 6.3 0.3 5.6

5.3 4.9 9.0 5.5

6.5 3.4 7.7 27.9

7.9 1.6 30.3

9.0 1.6 33.0

1 18 27.94

18 34.30

0 06.44

Oct. 17.9

5x2  
11 5.9 26.36

5.2 33.27

+ 0 06.91

+ 0 06.93

+ 0 06.92

Another reading gives

Average

Oct. 17.5

1 01 26.36

1 01 46.65

20.29

#103 Standard 27.67

13 46 30.89

21 47 00.702

3 34.747

35 52 33.8247

#394 Normal

15.27.67

13 46 30.89

10 58 00.

1 48.093

25 0 46.65



Oct. 18.2

$$18 \ 55 \ 35.52$$

$$18 \ 55 \ 42.59$$

$$+ 07.07$$

$$+ 07.06$$

Another reading gives

$$15 \ 27.67$$

$$13 \ 50 \ 27.44$$

$$4 \ 4 \ 9 \ 00.$$

$$47.475$$

$$18 \ 55 \ 42.59$$

$$18 \ 43 \ 19.55$$

$$18 \ 43 \ 40.61$$

$$+ 0 \ 21.06$$

$$+ 0 \ 21.07$$

Another reading gives

Oct. 18.9

$$12(?)$$

$$2+ \ 20 \ 26.34$$

$$20 \ 33.76$$

$$+ 07.42$$

Another reading gives

$$+ 07.41 \text{ at } 2206 \text{ oo. Mean Time}$$

$$12 \ 06 \ 09.39$$

$$2+ \ 06 \ 03.09$$

$$06 \ 31.46$$

$$+ 0 \ 22.07$$

Another reading gives

$$+ 0 \ 22.09 \text{ at } 2203 \text{ oo. Mean Time.}$$

Average

$$+ 0 \ 22.08$$

# 394 normal standard

$$15 \ 27.67$$

$$13 \ 50 \ 27.44$$

$$4 \ 37 \ 00.$$

$$45.504$$

$$18 \ 43 \ 40.61$$

# 103 standard

$$15 \ 27.67$$

$$13 \ 50 \ 27.44$$

$$22 \ 11 \ 00.$$

$$3 \ 38.649$$

$$36 \ 20 \ 33.76$$

# 394 normal

$$15 \ 27.67$$

$$13 \ 50 \ 27.44$$

$$212+ \ 57 \ 00.$$

$$3 \ 36.350$$

$$36 \ 05 \ 31.46$$

210

Oct. 19.9

$$\begin{array}{r}
 12 \quad 20 \quad \overset{41}{\cancel{32.48}} \\
 \quad \quad 29.66 \\
 \hline
 \quad \quad 20 \quad \cancel{34.10} \\
 + 0 \quad 0 \quad \cancel{08.18} \\
 + 0 \quad 0 \quad 8.25 \\
 + 0 \quad 0 \quad 8.24 \\
 \hline
 + 0 \quad 0 \quad 8.25 \\
 + 0 \quad 0 \quad \cancel{8.25}
 \end{array}$$

Another reading gives

Average

$$\begin{array}{r}
 12 \quad \overset{7}{\cancel{07}} \quad 04.31 \\
 \quad \quad 07 \quad 27.53 \\
 \hline
 + 0 \quad 23.22 \\
 + 0 \quad 23.23 \\
 \hline
 \quad \quad \cancel{23.23}
 \end{array}$$

Another reading gives

Average

Oct. 21<sup>10</sup>/<sub>10</sub>

$$\begin{array}{r}
 13 \quad 20 \quad 21.48 \\
 \quad \quad 20 \quad 31.31 \\
 \hline
 + 0 \quad \cancel{19.83} \\
 \quad \quad 9.83 \\
 + 0 \quad 9.84 \\
 \hline
 + 0 \quad \cancel{9.84}
 \end{array}$$

Another reading gives

Average

$$\begin{array}{r}
 13 \quad 08 \quad 4.5 \overset{49}{\cancel{49}} \\
 \quad \quad 08 \quad 29.33 \\
 \hline
 + 0 \quad 24.8 \overset{4}{\cancel{4}} \\
 \quad \quad 22 \quad 41 \quad m
 \end{array}$$

Another reading

gives the same at 22<sup>41</sup>/<sub>41</sub> m

$$\begin{array}{r}
 \text{Another reading gives} + 0 \quad 24.69 \\
 \hline
 \text{Average} \quad \quad \quad \cancel{24.76}
 \end{array}$$

#1038 standard

$$\begin{array}{r}
 15 \quad 27.67 \\
 13 \quad 54 \quad 24.00 \\
 22 \quad \overset{07}{\cancel{34}} \quad 00. \\
 \quad \quad \overset{3}{\cancel{4}} \quad 37.992 \\
 \hline
 \quad \quad \quad \cancel{42.428} \\
 \hline
 36 \quad 20 \quad 34.10 \\
 \quad \quad 20 \quad 29.66
 \end{array}$$

#394 normal

$$\begin{array}{r}
 15 \quad 27.67 \\
 13 \quad 54 \quad 24.00 \\
 21 \quad 54 \quad 00. \\
 \hline
 8 \quad 3 \quad 35.857 \\
 \hline
 \cancel{36} \quad \cancel{05} \quad \cancel{17.20} \\
 36 \quad 07 \quad 27.53
 \end{array}$$

#103 standard.

$$\begin{array}{r}
 15 \quad 27.67 \\
 14 \quad 2 \quad 17.10 \\
 \quad \quad \overset{22}{\cancel{22}} \quad \overset{59}{\cancel{59}} \\
 \hline
 \quad \quad \quad \cancel{20} \quad 00. \\
 \hline
 \quad \quad 3 \quad 46.535 \\
 37 \quad 20 \quad 31.31
 \end{array}$$

#394 normal.

$$\begin{array}{r}
 15 \quad 27.67 \\
 14 \quad 2 \quad 17.10 \\
 22 \quad \overset{7}{\cancel{47}} \quad 00. \\
 \hline
 3 \quad 03 \quad 44.563 \\
 \hline
 37 \quad 08 \quad 29.33
 \end{array}$$



Delaying Apparatus. Mean-time clock signals with delays.  
The mean-time clock signals are shown at d<sub>1</sub> on the sheet.  
At d<sub>2</sub> the signal of the "short-delay" are added.  
At d<sub>3</sub> " " " " "Long-delay are substituted for the short.  
Throughout d the five-minute pause will be found, but  
not elsewhere on the sheet. The clock-signals shown at d<sub>1</sub>  
may be traced throughout <sup>run of</sup> the sheet; where both delays are given at once.  
a shows a run for purposes of adjustment. b shows an ad-  
justment so slow that the long-delay is only fairly over before  
the next clock signal. At c the long-delay practically  
coincides with the following clock-signal. The 56<sup>th</sup> and  
60<sup>th</sup> seconds of the clock furnish the best opportunity for  
studying the delay. At c the short-delay is <sup>slower</sup> larger,  
and the long-delay is <sup>faster</sup> shorter than at b or c. For e  
the adjustment was to obtain a <sup>relatively</sup> fast short-delay.  
For g, the greatest relative dissimilarity between the two  
delays was the object. This and all the preceding were taken  
with full water-jar and greatest length of stroke, <sup>the springs of the relay only being changed.</sup> g<sub>2</sub> <sup>is</sup> <sup>try</sup> in-  
clusions were taken with successive diminutions of water, without  
change of spring or stroke. For the remainder, the stroke  
was greatly reduced and various change of stroke water and  
spring made in rapid succession.



212

Oct. 22.9

$$\begin{array}{r}
 12 \quad 26 \quad 07.70 \\
 \hline
 26 \quad 18.33 \\
 + 0 \quad 10.63
 \end{array}$$

Another reading gives  $+ 0 \quad 10.62$  @ 21 3-9 00. Mean Time

$$\begin{array}{r}
 12 \quad 12 \quad 51.70 \\
 \hline
 13 \quad 16.19 \\
 + 0 \quad 24.49
 \end{array}$$

Another reading gives  $+ 0 \quad 24.30$  at 21<sup>h</sup> 46<sup>m</sup> Mean Time  
Average  $+ 0 \quad 24.40$

Oct 22.2

$$\begin{array}{r}
 \times \\
 19 \quad 10 \quad 18.60 \\
 19 \quad 10 \quad 28.63 \\
 \hline
 + 0 \quad 10.03
 \end{array}$$

Another reading gives  $+ 0 \quad 10.05$  at 4<sup>h</sup> 53<sup>m</sup> Mean Time  
Average  $+ 0 \quad 10.04$

$$\begin{array}{r}
 18 \quad 57 \quad 1.68 \\
 18 \quad 57 \quad 26.50 \\
 \hline
 + 0 \quad 24.82
 \end{array}$$

Another reading gives  $+ 0 \quad 24.79$  at 4<sup>h</sup> 39<sup>m</sup> Mean Time  
Average  $+ 0 \quad 24.81$

#103 Standard

$$\begin{array}{r}
 15 \quad 27.67 \\
 14 \quad 06 \quad 13.65 \\
 22 \quad 22 \quad 01.00 \\
 \hline
 3 \quad 37.007 \\
 36 \quad 26 \quad 18.33
 \end{array}$$

#394 Normal

$$\begin{array}{r}
 15 \quad 27.67 \\
 14 \quad 06 \quad 13.65 \\
 21 \quad 48 \quad 00. \\
 \hline
 3 \quad 34.871 \\
 36 \quad 13 \quad 16.19
 \end{array}$$

#103 Standard.

$$\begin{array}{r}
 15 \quad 27.67 \\
 14 \quad 06 \quad 13.65 \\
 4 \quad 48 \quad 00. \\
 \hline
 47.311 \\
 19 \quad 10 \quad 28.63
 \end{array}$$

#394 Normal.

$$\begin{array}{r}
 15 \quad 27.67 \\
 14 \quad 06 \quad 13.65 \\
 4 \quad 35 \quad 00. \\
 \hline
 45.176 \\
 18 \quad 57 \quad 26.50
 \end{array}$$



Oct 23.9

$$\begin{array}{r}
 12 \quad 35 \quad 4.46 \\
 35 \quad 15.71 \\
 \hline
 + \quad 0 \quad 11.25
 \end{array}$$

Another reading gives + 0 11.26 at 22<sup>h</sup> 08<sup>m</sup> Mean Time

$$\begin{array}{r}
 18 \quad 0.59 \\
 17 \quad 5 \\
 18 \quad 48 \\
 \hline
 18 \quad 24.95 \\
 + \quad 0 \quad 24.36
 \end{array}$$

Another reading gives + 0 24.40 at 21<sup>h</sup> 54<sup>m</sup> Mean Time

$$\begin{array}{r}
 + \quad 0 \quad 24.38
 \end{array}$$

# 113 Standard

$$\begin{array}{r}
 15 \quad 27.67 \\
 14 \quad 10 \quad 10.21 \\
 22 \quad 06 \quad 00. \\
 3 \quad 37.828 \\
 \hline
 3 \quad 6 \quad 35 \quad 15.71
 \end{array}$$

# 394 Normal.

$$\begin{array}{r}
 15 \quad 27.67 \\
 14 \quad 10 \quad 10.21 \\
 21 \quad 49 \quad 12 \\
 3 \quad 35.035 \\
 \hline
 37 \quad 18 \quad 12.923 \\
 36 \quad 18 \quad 22.94 \\
 36 \quad 18 \quad 24.95
 \end{array}$$

Oct 24.2

$$\begin{array}{r}
 .25 \\
 .13 \\
 + .08 \\
 \hline
 13.63 \\
 .71
 \end{array}$$

$$\begin{array}{r}
 129 \\
 .13 \\
 + .09 \\
 \hline
 07.20 \\
 .29
 \end{array}$$

$$\begin{array}{r}
 \cancel{X} \\
 \cancel{3} \\
 + \cancel{105} \\
 \hline
 4 \times 8 \\
 4 \times 85 \\
 .17 \\
 .3 \\
 + .05 \\
 \hline
 53.13 \\
 53.18
 \end{array}$$

o'up. 632m

8.0 5.5  
 0.7 7.5 (9.7)  
 3.7 4.0 5.2  
 6.7 1.5 5.1  
 9.7 8.4 5.2  
 5.5 5.4  
 8.7 6.5 5.2  
 1.6 3.5 5.1  
 4.6 6.6 5.2

$$\begin{array}{r}
 57.5 \\
 12 \overline{) 10.4} \\
 20 \quad 09 \quad 57.61 \\
 10 \quad 07.29 \\
 - 0 \quad 09.68 \\
 + .05 \\
 - .60 \\
 \hline
 0 \quad 10.23
 \end{array}$$

Average = 10.31

$$\begin{array}{r}
 15 \\
 20 \quad 16 \quad 06.3 \\
 15 \quad 30.42 \\
 + 0 \quad 24.12 \\
 + 0 \quad 24.14 \text{ at } 5^{\text{h}} 41^{\text{m}} \text{ Mean Time} \\
 + 0 \quad 24.13
 \end{array}$$

Another reading gives

Average  
Oct 24.9

$$\begin{array}{r}
 12 \quad 14 \quad 56.61 \\
 12 \quad 15 \quad 08.32 \\
 + 0 \quad 11.71
 \end{array}$$

Another reading gives

+ 0 11.75 at 22<sup>h</sup> 02<sup>m</sup> Mean Time

$$\begin{array}{r}
 + 0 \quad 11.73
 \end{array}$$

f 632m

7.0 1.0 8.0  
 9.9 8.2 8.1  
 2.3 5.5 7.8  
 5.1 2.8 7.9  
 7.9 0.0 7.9  
 8.1 5.0 8.1  
 6.0 2.1 8.1  
 8.7 9.4 8.1  
 1.1 6.6 7.7

$$\begin{array}{r}
 04.0 \\
 18.7 \\
 20 \quad 18 \quad 03.98 \\
 18 \quad 13.71 \\
 - 0 \quad 09.73 \\
 - .04 \\
 \hline
 - .60 \\
 10.37
 \end{array}$$

E Delphinus

2.9 4.7 7.6  
 4.9 2.5 7.4  
 7.0 0.5 7.5  
 9.0 8.4 7.4  
 1.2 6.1 7.3  
 5.4 2.0 7.4  
 7.6 0.0 7.6  
 9.6 8.0 7.6  
 1.6 5.9 7.5

$$\begin{array}{r}
 43.7 \\
 14.0 \\
 20 \quad 27 \quad 43.73 \\
 20 \quad 27 \quad 53.18 \\
 0 \quad 0 \quad 9.45 \\
 - .27 \\
 - .60 \\
 \hline
 10.32
 \end{array}$$

#394 Normal

$$\begin{array}{r}
 15 \quad 27.67 \\
 14 \quad 14 \quad 06.07 \\
 5 \quad 45 \quad 00.675 \\
 56.675 \\
 56.675
 \end{array}$$

$$\begin{array}{r}
 20 \quad 15 \quad 30.42 \\
 20 \quad 16 \quad 30.58 \\
 20 \quad 15 \quad 30.42
 \end{array}$$

#103 Standard

$$\begin{array}{r}
 15 \quad 27.67 \\
 14 \quad 14 \quad 06.76 \\
 21 \quad 42 \quad 00.886 \\
 3 \quad 33 \quad 29.430 \\
 35 \quad 48 \quad 03.880 \\
 36 \quad 15 \quad 08.32
 \end{array}$$



Oct 25.2

$$\begin{array}{r}
 19 \quad 03 \\
 \hline
 4 \quad 29 \quad 3.35 \\
 19 \quad 03 \quad 15.18 \\
 + \quad 0 \quad 11.83
 \end{array}$$

Another reading gives the same at  $4^h 31^m$  Mean Time

$$\begin{array}{r}
 18 \\
 \hline
 19 \quad 50 \quad 47.41 \\
 19 \quad 17 \\
 18 \quad 51 \quad 13.21 \\
 \hline
 285.80
 \end{array}$$

Another reading gives the same at  $4^h 23^m$  Mean TimeOct 25.  $\frac{10}{10}$ 

$$\begin{array}{r}
 13 \quad 49 \quad 7.48 \\
 13 \quad 49 \quad 19.66 \\
 + \quad 0 \quad 12.18 \\
 \hline
 + \quad 0 \quad 12.20
 \end{array}$$

Another reading gives

Average

$$+ \quad 0 \quad 12.19$$

$$\begin{array}{r}
 13 \quad 36 \quad 51.39 \\
 37 \quad 17.69 \\
 + \quad 0 \quad 27.30 \\
 \hline
 + \quad 0 \quad 27.32
 \end{array}$$

Another reading gives

Average

$$+ \quad 0 \quad 27.31$$

#103 Standard

$$\begin{array}{r}
 15 \quad 27.67 \\
 14 \quad 18 \quad 3.32 \\
 19 \quad 29 \quad 00. \\
 \hline
 44.190
 \end{array}$$

$$19 \quad 03 \quad 15.18$$

#394 Normal.

$$\begin{array}{r}
 15 \quad 27.67 \\
 14 \quad 18 \quad 3.32 \\
 4 \quad 17 \quad 00. \\
 \hline
 42 \quad 42.219
 \end{array}$$

$$18 \quad 51 \quad 13.21 \quad \times$$

#103 Standard.

$$15 \quad 27.67$$

$$\begin{array}{r}
 14 \quad 18 \quad 3.32 \\
 23 \quad 12 \quad 00. \\
 \hline
 8 \quad 27 \quad 00.
 \end{array}$$

$$\begin{array}{r}
 3 \quad 48.670 \\
 37 \quad 49 \quad 19.66
 \end{array}$$

#394 Normal

$$\begin{array}{r}
 15 \quad 27.67 \\
 14 \quad 18 \quad 3.32 \\
 23 \quad 00 \quad 00. \\
 \hline
 3 \quad 46.699
 \end{array}$$

$$\begin{array}{r}
 37 \quad 37 \quad 17.69 \quad \times
 \end{array}$$

216

Oct. 26.9

12 38 51.32

39 04.05

+ 0 12.63

+ 0 12.67

+ 0 13.77

+ 0 13.72

Another reading gives  
Averageat 22.03 mean time  
at 22.14 m

12 27 33.45

28 02.25

12.20

28.80

Another reading gives the same at 21.49.00 mean time

Oct 28.9

13 7 48.31

8 00.61

+ 0 13.30

+ 0 13.29

Another reading gives

Average + 0 13

12 55 28.38

55 58.64

+ 0 30.26

+ 0 30.30

Ear comp. gives

Average

+ 0 30.28

103 Standard

15 27.67

14 21 59.87

21 58 00.

3 363 3.6.514

3 6 3 49.04.05

#394 Normal

15 27.67

14 21 59.87

21 47 00.

3 34.707

3 6 28 02.25

#103 Standard

15 27.67

14 29 52.98

22 19 00.

3 39.964

3 7 08 00.61

#394 Normal

15 27.67

14 29 52.98

22 7 00.

3 37.992

3 6 55 58.642



Oct. 29.9

$$\begin{array}{r} 13 \quad 2 \quad 3 \quad 55.32 \\ 2 \quad 3 \quad 59.15 \\ \hline \end{array}$$

$$+ 0 \quad 13.83$$

Ear Amp. gives + 0 13.87 at 22 47. Mean Time

Average + 0 13.85

$$\begin{array}{r} 13 \quad 9 \quad 25.48 \\ 13 \quad 9 \quad 56.85 \\ \hline \end{array}$$

$$+ 0 \quad 31.37$$

Ear Amp. gives + 0 31.34 at 22 56 Mean Time

Average + 0 31.36

103 Standard

$$\begin{array}{r} 15 \quad 27.67 \\ 14 \quad 33 \quad 49.54 \\ 22 \quad 31 \quad 00. \\ \hline \end{array}$$

$$3 \quad 41.935$$

$$37 \quad 23 \quad 59.15$$

#394 Normal

$$\begin{array}{r} 15 \quad 27.67 \\ 14 \quad 33 \quad 49.54 \\ 22 \quad 17 \quad 00. \\ \hline \end{array}$$

$$3 \quad 39.635$$

$$37 \quad 09 \quad 56.85$$











1	19
2	38
3	57
4	76
5	95
6	114
7	133
8	152
9	171



