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u337













1886phar-proj.1341

SS



Aug 29, 1896



Aug. 29, 1896. (Saturday.)

B Lyrae:

Phot. V.

Cran obs

Index to left.

7	43.5	138.7	< B dis.	
		182.0	43.3 >	
		135.0	47.5 >	1.89 >
		182.5	90.8 >	

		135.2		
7	51.6	183.6	48.4 >	
		138.4	43.7 >	1.86 >
		182.1	92.1 >	1.88 >

Index to right and above

8	09.6	<del>223.4</del>	222.2	
		278.5	56.3 >	
		220.9	58.0 >	1.32 >
		278.9	114.3 >	

		222.2		
8	18.4	278.9	56.7 >	
8	00.8 >	221.8	57.5 >	1.32 >
		279.3	114.2 >	1.32 >
				1.88 >
				3.20 >
				<u>mean = 1.60 &gt;</u>

B othered same by spectrum of one of images.

Stopped in middle of above group to answer



Aug. 29, 1896.

Telephone call.

Same again. Cram also  
Index to right and above

8 45.4

222.2	< 3 dis.	
278.0	55.8 >	1.38 >
222.1	55.9 >	
278.0	111.7 >	

8 51.7

220.5		
279.1	< images adjusted	
221.7	58.6 >	
278.1	56.4 >	1.30 >
	115.0 >	1.34 >

Index to left and below.

9 06.6

317.8	317.5	318.2
361.5	< images adjusted	
320.5	43.3 >	
362.5	42.0 >	2.04 >
	85.3 >	

9 17.9  
9 00.4 >

319.0	43.1 >	2.03 >
362.1	42.5 >	2.04 >
318.5	85.6 >	1.34 >
361.0		3.38 >
	mean	= 1.69 >

Bothered a great deal by a circular banded  
light across field over images.



Aug. 29. 1896.

Same again: Circum. obs.  
Index to left and below.

319.6 < B dis.

363.5 < images adjusted

319.9 43.9 >

362.4 42.5 > 2.01 >  
86.4 >

318.4

361.2 42.8 > 2.00 >

318.2 44.2 > 2.00 >

362.4 87.0 >

Index to right and above

40.4

98.1 57.7 > 1.37 >

41.7 54.3 >

~~96.7~~ 96.0 112.0 >

39.7

100.4 60.7 > 1.28 >

42.2 57.2 > 1.32 >

97.4 115.9 2.00 >

mean = 1.66 >

Woven up and images a little fainter but observations much easier and considered much better as obs. is not now bothered by spectrum of images nor circular band of light across field as mentioned on p. 2. opp.

Aug. 29. 1896.

Same again. Cran: obs.  
Index to right and above

10	09.1	41.6	< 13 dis.		
		96.7	55.1	>	1.30 >
		41.7	60.1	>	
		101.8	115.2	>	

10	16.4	40.0			
		98.5	58.5	>	1.34 >
		43.4	54.7	>	1.32 >
		98.1	113.2	>	

Index to left and below.

10	21.1	314.8			
		362.7	47.9	>	1.90 >
		319.34	42.6	>	
		362.0	90.5	>	

10	26.6	318.4			
		362.6	44.2	>	1.98 >
10	18.3 >	318.1	43.3	>	1.94 >
		361.4	87.5	>	1.32 >
					3.286
					<u>mean = 1.643</u>

Images somewhat faint but observations considered good as obs. is not bothered by spectrum of magnesium.



Aug. 29. 1896.

Same again : trans. obs.  
Index to left and above

11 02.9

135.8 < B dis.

180.5

138.5

182.4

44.7 >

43.9 >

88.16 >

1.95 >

137.0

11 07.2

182.7

~~134.0~~

184.1

137.3

45.7 >

46.2 >

92.5 >

1.85 >

1.90 >

Index to right and below.

11 17.0

223.1

281.6

220.8

280.8

58.5 >

60.0 >

118.5 >

1.23 >

221.3

279.3

222.2

278.6

58.0 >

56.4 >

114.4 >

1.32 >

1.28 >

1.90 >

3.18 >

mean = 1.59 >

~~219.8~~

~~282.2~~

~~219.8~~

62.5

Reject

due on prism

Aug. 29, 1896.

Index to right and above.

12	03.5	220.9	< B dis.	
		279.4	58.5 >	1.22 >
		220.1	60.4 >	
		280.5	118.9 >	

~~Index~~

12	14.3	223.1		
		277.5	54.4 >	
		222.1	56.4 >	1.40 >
		278.5	110.8 >	1.31 >

Index to left and below

12	21.5	317.4		
		362.9	45.5 >	
		317.4	42.9 >	1.96 >
		360.3	88.4 >	

12	29.5	319.1	43.8 >	1.88 >
		362.9	47.4 >	1.92 >
12	17.2 >	317.4	91.2 >	1.31 >
		364.8		3.23 >
		<u>mean = 1.62 &gt;</u>		

Observations very difficult because of moon and faintness of images: observations slow on this account:

Because of dew collecting on prism, moon photo under roof prism to above group,



Aug. 29, 1896.

If possible, will try

Same again. Cran: obs.  
Index to left and below

13	17.8	317.9	< $\beta$ dis.	
		362.2	44.3 >	
		319.5	42.6 >	2.00 >
		362.1	86.9 >	

13	25.3	318.8		
		360.4	41.6 >	2.01 >
		317.7	44.7 >	2.00 >
		362.4	86.3 >	

Index to right and above.

13	37.8	42.5		
		99.2	56.7 >	
		40.7	57.2 >	1.33 >
		97.9	113.9 >	

13	42.9	41.4		
13	30.4 >	99.0	57.6 >	1.26 >
		41.5	59.4 >	1.30 >
		100.9	117.0 >	2.00 >
				3.30 >
			mean =	1.65 >

Observations extremely difficult and consequently slow because of faintness of images in moonlight.

Aug. 29. 1896.

Same again

I

14 02.3

100.9	59.9	
41.1	59.9	1.20
101.0	119.8	

14 09.5

40.6		
98.5	57.9	
40.0	66.5	1.22
100.5	118.4	1.22

14 17.0

138.0		
183.7	45.7	1.83
136.3	47.6	
183.9	93.3	

14 26.3

138.9		
183.7	44.8	1.97
138.2	43.2	1.90
[181.4]	88.0	1.22
		3.12
		1.56

Rept.

Observations the most difficult of any obs.  
has ever taken: images not seen but half  
the time at all: last reading by guesswork  
entirely: B Lyrae invisible to naked eye  
because of haze and moonlight.



Aug. 31. 1896.

~~Sept. 1. 1896.~~ (Monday)

7 0 cloudy  
 7 30 somewhat clearer  
 7 45 still clearer but a good deal of haze  
 B. Lyrae: Phot. N: same obs.

Index to left and below.

8 05.2 clouds.  $\begin{matrix} 324.8 \\ 354.8 \end{matrix}$   $\begin{matrix} < B. ds. \\ < \end{matrix}$   
 $\begin{matrix} 322.5 \\ 356.7 \end{matrix}$   $\begin{matrix} 30.0 > \\ 34.2 > \\ 64.2 > \end{matrix}$  2.717

clouds

8 27.9 clouds.  $\begin{matrix} 325.3 \\ 356.0 \end{matrix}$  324.6  $\begin{matrix} 31.4 > \\ 29.0 > \\ 60.4 > \end{matrix}$   $\begin{matrix} 2.847 \\ 2.787 \end{matrix}$   
 clouds.  $\begin{matrix} 326.3 \\ 354.6 \end{matrix}$  325.6  
 clouds.  $\begin{matrix} 326.3 \\ 354.6 \end{matrix}$   
 clouds  $\begin{matrix} 326.3 \\ 354.6 \end{matrix}$

Index to right and above.

8 59.8  $\begin{matrix} 51.8 \\ 90.1 \\ 50.0 \\ 91.9 \end{matrix}$   $\begin{matrix} 38.3 > \\ 41.9 > \\ 80.2 > \end{matrix}$  2.197

9 13.8 clouds  $\begin{matrix} 50.1 \\ 88.4 \end{matrix}$  92.2  $\begin{matrix} 42.1 > \\ 39.9 > \\ 82.0 > \end{matrix}$   $\begin{matrix} 2.147 \\ 2.167 \\ 4.947 \end{matrix}$   
 8 41.7  $\begin{matrix} 51.4 \\ 91.3 \end{matrix}$  mean = 2.477

Aug. 31, 1896.

~~Sept. 1, 1896.~~

Previous group taken thro' clear  
intervals in clouds and slow for this  
reason: images faint in haze and  
observations somewhat difficult.

hazy.

Same again.

Cham obs

Index to right and above

9 57.0  
34.2

50.6 &lt; B dis

91.2

52.5 50.0

89.5

40.6 &gt;

39.5 &gt;

80.1 &gt;

2.19 &gt;

10 07.5

hazy &gt; 50.6

hazy &gt; 90.9

49.0

91.6

40.3 &gt;

42.6 &gt;

82.9 &gt;

2.11 &gt;

2.15 &gt;

Index to left and below.

10 35.0

144.1

176.2

145.2

175.0

32.1 &gt;

29.8 &gt;

61.9 &gt;

2.79 &gt;

10 43.6

146.5

174.9

142.8

177.8

28.4 &gt;

35.0 &gt;

63.4 &gt;

mean =

2.73 &gt;

2.76 &gt;

2.15 &gt;

4.91 &gt;

2.46 &gt;

Seeing better than in previous group.



Aug. 31, 1896.

Same again.      Gram. abs.

Index below

11	10.7	images	344.6	< Bas.	
10	24.8	adjusted	354.1		29.5 >
			326.1		30.3 >
			356.4		59.8 >
					2.87 >

11	19.8		323.0		
10			355.4	324 >	2.76 >
			325.1	30.3 >	1.82 >
			356.4	62.7 >	

Index above.

11	27.6		50.8		
10			91.5	40.7 >	2.17 >
			51.6	40.1 >	
			91.7	80.8 >	

11	35.0		49.1		
10			92.0	42.9 >	2.13 >
11	23.3 >		50.3	39.2 >	2.15 >
			89.5	82.1 >	2.82 >
					4.97 >
					mean = 2.48 >

Observations slow and difficult because of very heavy fog + moonlight.

Dew wiped off prism after every reading until when phot. was removed, it was carried under shelter of roof.

Aug. 31, 1896

Same again.

trans. obs.

Index above

11

52.7

50.2

92.5

42.3 &gt;

50.9

38.7 &gt;

2.17 &gt;

89.6

81.0 &gt;

51.2

12

00.7

90.4

39.2 &gt;

2.17 &gt;

50.8

41.5 &gt;

2.17 &gt;

92.3

80.7 &gt;

Index below

12

08.6

144.2

32.0 &gt;

2.62 &gt;

176.2

~~142.4~~

143.0

34.5 &gt;

177.5

66.5 &gt;

143.5

12

20.1

33.1 &gt;

2.71 &gt;

176.6

2.66 &gt;

12

05.5 &gt;

30.9 &gt;

2.17 &gt;

145.1

64.0 &gt;

4.83 &gt;

176.0

mean = 2.42 &gt;

Observations most exceedingly difficult  
because of heavy fog and moonlight.



Aug. 31, 1896.

I impossible to get another set because  
of increasing fog, moonlight, and low  
altitude.

Sept. 1. 1896. (Tuesday)

B Lyrae: Phot. N: trans. obs.

Index to left

7 28

145.9

174.7

145.6

175.0

28.8 &gt;

30.4 &gt;

59.2 &gt;

2.89 &gt;

143.5

176.3

145.1

175.1

32.8 &gt;

30.0 &gt;

62.8 &gt;

2.76 &gt;

2.82 &gt;

Index to right

7 34

229.1

271.6

230.7

269.0

42.5 &gt;

38.3 &gt;

80.8 &gt;

2.17 &gt;

231.2

269.4

229.0

264.9

38.2

39.9 &gt;

78.1

2.25 &gt;

2.21 &gt;

2.82 &gt;

5.03 &gt;

mean = 2.52 >

7	37
7	31.0 >



Sept. 1, 1896.

S androm : Phot S : W. obs

$$\begin{array}{r}
 24 \\
 0 \\
 18 \\
 \hline
 -5 \\
 6
 \end{array}
 \begin{array}{r}
 14 \\
 50 \\
 24 \\
 36
 \end{array}
 +26.1$$

$$\begin{array}{r}
 19^m \quad 4^s \quad 41.8 \\
 \quad \quad 66.0 \\
 \quad \quad \hline
 \quad \quad 24.2 \\
 \\
 7^m \quad 04.7^s \\
 \quad \quad 55.9 \\
 \quad \quad \hline
 \quad \quad 51.2
 \end{array}
 \begin{array}{r}
 52.6^v \\
 16.2 \\
 \hline
 23.6^s \\
 \\
 18.4^s \\
 69.4 \\
 \hline
 51.0^s
 \end{array}$$

Index to left and above.

$$\begin{array}{r}
 127.0 \\
 152.6 \\
 125.9. \\
 152.0
 \end{array}
 \begin{array}{r}
 25.6 > \\
 26.1 > \\
 \hline
 51.7 >
 \end{array}
 3.20 >$$

Sept. 1, 1896.

9 9 42

126.2

153.1

126.6

152.2

26.9 &gt;

25.6 >

52.5 &gt;

3.16 &gt;

3.18 >

Index to right and below.

214.9

244.0

213.6

246.1

29.1 &gt;

32.5 >

61.6 &gt;

2.80 &gt;

212.8

245.0

214.7

244.8

32.2 &gt;

30.1 >

62.3 &gt;

2.77 &gt;

2.78 &gt;

3.18 >

5.96 &gt;

mean = 2.98 >

9	14	40
<u>4/44</u>		32
9	11	8

Wellis War: Phot 5: 2.98 &gt;

20

20

0

31

45

14

+17.7



Sept. 1, 1896.

Index to left and above.

10	3	83	9.2	< comp. Stan. dis.	
			93.4	84.2 >	
			7.5	89.5 >	0.12 >
			97.0	173.7 >	

10	5	52	8.0		
			93.9	85.9 >	
			4.1	89.1 >	0.09
			93.2	175.0 >	0.10

Index to right and below

10	8	24	96.0		
			184.5	88.5 >	
			100.8	78.3 >	0.25 >
			179.1	166.8 >	

10	9	55	101.3	78.3 >	
			179.6	81.9 >	0.38 >
			100.0		0.32 >
			181.9	160.2 >	mean = 0.21 >

10	6	56	4(2) 44	
			106.9	
			-26	
			80	

10 16 21

102.2		
179.3	97.1 >	0.51 >
104.0	76.2 >	
180.2	153.3 >	

Sept. 1, 1896.

10 20 54

103.0

177.9

99.8

183.8

74.9 &gt;

84.0 &gt;

158.9 &gt;

0.40 &gt;

0.46 &gt;

II

Index to left and above.

185.0

10 23 55

271.2

188.1

271.6

86.2 &gt;

83.5 &gt;

169.7 &gt;

0.20 &gt;

185.7

10 25 43

271.8

185.1

274.0

86.1 &gt;

88.9 &gt;

175.0 &gt;

0.09 &gt;

0.14 &gt;

mean = 0.30 &gt;

10 21.7 &gt;

4 86 53

10 21 43

-26

10 21 17

184.0

10 28 18

272.5

187.1

269.8

88.5 &gt;

82.7 &gt;

171.2 &gt;

0.17 &gt;

187.2

10 29 56

269.1

183.2

269.9

81.9 &gt;

86.7 &gt;

168.6 &gt;

0.22 &gt;

0.20



Sept 1, 1896.

III  
Index to right and below

10 32 8	277.1	85.5 >	
	362.6	81.3 >	0.25 >
	277.9	<u>81.3</u>	
	279.2	166.8 >	

10 33 27	279.1	81.2 >	
<u>10 31.0 &gt;</u>	360.3	82.7 >	0.30 >
4/123 49 <	277.6	<u>82.7</u>	0.28 >
10 30 572	360.3	163.9 >	mean = 0.24 >
-26			
10 30 31			

10 36 39	280.5	79.9 >	
	360.4	80.4 >	0.38 >
	279.8	<u>80.4</u>	
	360.2	160.3 >	

10 38 07	279.9	79.8 >	
	359.7	84.6 >	0.30 >
	275.4	<u>84.6</u>	0.34 >
	360.0	164.4 >	

IV  
Index to left and above

10 41 19	9.0	82.9 >	
	91.9	84.8 >	0.23 >
	7.6	<u>84.8</u>	
	92.4	167.7 >	

Sept. 1, 1896.

$$\begin{array}{r}
 10 \quad 42 \quad 50 \\
 \hline
 10 \quad 29.8 \rightarrow \\
 4 \overline{) 159} \quad 1 \\
 10 \quad 39 \quad 45 \\
 \hline
 \quad \quad -26 \\
 \hline
 10 \quad 39 \quad 19
 \end{array}$$

$$\begin{array}{r}
 10 \quad 44 \quad 24
 \end{array}$$

$$\begin{array}{r}
 10 \quad 45 \quad 40
 \end{array}$$

$$\begin{array}{r}
 10 \quad 50 \quad 20 \\
 \hline
 10 \quad 48.2 \rightarrow \\
 4 \overline{) 192} \quad 42 \\
 10 \quad 48 \quad 10 \\
 \hline
 \quad \quad -26 \\
 \hline
 10 \quad 47 \quad 44
 \end{array}$$

7.3

92.0

7.9

93.4

84.7 &gt;

85.5 &gt;

170.2 &gt;

mean = 0.28 >

0.19 &gt;

0.21 &gt;

10.2

91.1

9.1

92.2

80.9 &gt;

84.1 &gt;

165.0 &gt;

0.29 &gt;

9.2

93.9

8.1

92.5

84.7 &gt;

84.4 &gt;

169.1 &gt;

0.19 &gt;

0.24 &gt;

II

→ Index to right and below.

$$\begin{array}{r}
 10 \quad 50 \quad 20
 \end{array}$$

101.9

178.4

102.5

179.1

76.5 &gt;

76.6 &gt;

153.1 &gt;

0.51 &gt;

104.5

178.8

106.6

178.0

74.3 &gt;

71.4 &gt;

145.7 &gt;

0.66 &gt;

0.58 &gt;

mean = 0.41 >



Sept. 1, 1896.

10 55 22

104.1		
179.6	75.5 >	0.52 >
102.2	<u>77.2</u> >	
179.4	152.7 >	

10 56 49

104.5		
178.2	73.7 >	0.63 >
102.2	<u>73.6</u> >	0.58 >
176.8	147.2 >	

VI

Index to left and above.

10 59 31

190.4		
267.4	77.0 >	0.41 >
188.9	<u>81.6</u> >	
270.5	159.6 >	

11 1 15

10	58.2 >	
4	(23 2 5)	
10	5-8 14	
	-26	
10	57 48	

187.9	81.0 >	0.39 >
268.9	<u>78.6</u> >	0.410 >
188.9	159.6 >	mean = 0.49 >
267.5		

11 5 0

189.3		
269.0	79.7 >	0.37 >
187.3	<u>80.7</u> >	
268.0	160.4 >	

Sept 1, 1896.

187.9

271.0

185.0

271.5

83.1 &gt;

86.0 >

169.16 &gt;

0.207

0.287

Index tonight and before

281.4

356.1

279.9

357.9

74.7 &gt;

78.0 >

152.7 &gt;

0.52 &gt;

280.6

356.9

281.0

358.0

76.3 &gt;

77.0 >

153.3 &gt;

0.51 &gt;

0.52 &gt;

mean = 0.40 >

282.0

357.6

280.4

357.4

74.2 &gt;

77.0 >

151.2 &gt;

0.55 &gt;

281.7

357.8

280.4

357.0

76.1 &gt;

77.1 >

153.2 &gt;

0.51 &gt;

0.53 &gt;



Sept. 1, 1896.

VIII

Index to left and above.

" 15 24

5.4

92.5

9.7

92.7

87.1 &gt;

84.0 &gt;

1671.1 &gt;

0.17 &gt;

8.2

91.9

12.2

92.2

83.7 &gt;

80.0 &gt;

162.7 &gt;

$$\begin{array}{r} 0.317 \\ 0.247 \\ \hline \text{mean} = 0.387 \end{array}$$

" 17 22  
 11 14.8 >

4 19 6  
 11 14 46  
 -26

11 14 20

" 20 8

9.5

94.7

10.2

93.8

85.2 &gt;

83.5 &gt;

178.7 &gt;

0.21 &gt;

" 21 27

9.8

91.2

12.2

91.2

81.5 &gt;

79.1 &gt;

160.6 &gt;

$$\begin{array}{r} 0.377 \\ 0.297 \\ \hline \end{array}$$

IX

Index to right and below.

" 23 21

105.9

177.5

105.1

175.2

71.6 &gt;

70.2 &gt;

141.8 &gt;

0.74 &gt;

Sept 1, 1896.

11	24	42
<hr/>		
11	22.42	

11	22	24.8
<hr/>		
	4/9	39
		-26

11	21	59
<hr/>		

11	26	20
----	----	----

11	28	14
----	----	----

11	31	56
<hr/>		
11	29.12	

11	29	08
<hr/>		
	4/11	6
		33
		-26

11	28	42
----	----	----

104.9

174.7

103.3

176.9

104.1

176.0

105.1

173.4

104.9

176.6

104.3

177.9

189.8

270.4

190.4

267.9

191.1

267.5

190.0

267.5

69.8 &gt;

73.6 &gt;

142.4 &gt;

mean = 0.50 &gt;

0.71 &gt;

0.72 &gt;

71.9 &gt;

68.3 &gt;

140.2 &gt;

0.77 &gt;

71.7 &gt;

72.6 &gt;

145.3 &gt;

0.67 &gt;

0.72 &gt;

80.6 &gt;

77.5 &gt;

158.1 &gt;

0.42 &gt;

76.4 &gt;

77.5 &gt;

153.9 &gt;

mean = 0.59 &gt;

0.50 &gt;

0.46 &gt;

Index to left and above.



Sept. 1, 1896.

11 33 30

186.9

268.1

187.9

268.2

81.2 &gt; 0.35 &gt;

80.2 &gt;

161.5 >11 35 <sup>8</sup>

190.2

267.5

189.4

269.4

77.2 &gt;

80.0 >

157.2 &gt;

0.43 &gt;

0.39 &gt;

Index to right and below.

11 37 28

282.2

355.9

282.0

356.1

72.7 &gt;

74.1 >

146.8 &gt;

0.64 &gt;

280.6

358.3

282.9

354.2

77.7 &gt;

71.2 >

149.0 &gt;

0.59 &gt;

0.62 &gt;

mean = 0.50 >11 39 27  
11 36.4 >4 25 33  
11 36 23-26  
11 35 57

11 40 45

284.0

252.5

280.4

257.1

69.5 &gt;

76.7 >

146.2 &gt;

0.65 &gt;

Sept. 1, 1896.

40 40  
 " 43 45

281.3

356.9

282.0

255.0

75.6 &gt;

72.0 &gt;

148.6 &gt;

 $\frac{0.60}{0.62}$ 

<sup>XII</sup>  
 Index to left and above.

44 43

14.0

85.9

9.8

90.8

71.9 &gt;

81.0 &gt;

152.9 &gt;

0.52 &gt;

46 15

43.9

41 10 28

43 52

43 26

43 26

205

10.8

89.8

9.7

87.1

79.0 &gt;

77.4 &gt;

156.4 &gt;

0.45 &gt;

0.48 &gt;

mean = 0.55 &gt;

48 29

12.5

87.0

9.2

91.0

74.5 &gt;

81.8 &gt;

156.3 &gt;

0.45 &gt;

49 50

10.5

90.4

13.6

85.8

82.9 &gt;

72.2 &gt;

155.1 &gt;

0.48 &gt;

0.46 &gt;



Sept. 1, 1896.

~~XIII~~  
Index bright and blue.

11 52 8

285.0

353.0

68.0 &gt;

0.72 &gt;

281.3

74.7 &gt;

356.0

142.7 &gt;

284.6

359.2

284.5

351.9

74.8 &gt;

67.4 &gt;

142.2 &gt;

mean = 0.59 >

285.7

353.2

282.3

356.1

67.6 &gt;

73.8 &gt;

141.4 &gt;

0.75 &gt;

283.6

357.0

286.9

351.9

72.4 &gt;

65.0 &gt;

138.4 &gt;

0.81 &gt;

0.78 &gt;

~~XIV~~  
→ Index to left and above.10<sup>2</sup> .3 43

17.1

82.9

11.9

93.0

66.8 &gt;

81.1 &gt;

147.9 &gt;

0.62 &gt;

Sept. 1, 1896.

$$\begin{array}{r}
 12 \quad 5 \quad 17 \\
 \hline
 12 \quad 02.67 \\
 4 \overline{) 250} \quad 18 < \\
 12 \quad 2 \quad 34 < \\
 \hline
 \quad \quad -26 \\
 \hline
 12 \quad 2 \quad 08
 \end{array}$$

$$12 \quad 6 \quad 00$$

$$12 \quad 8 \quad 13$$

$$12 \quad 11 \quad 30$$

$$\begin{array}{r}
 12 \quad 12 \quad 57 \\
 \hline
 12 \quad 09.97 \\
 4 \overline{) 39} \quad 30 < \\
 12 \quad 9 \quad 52 < \\
 \hline
 \quad \quad -26 \\
 \hline
 12 \quad 9 \quad 26
 \end{array}$$

$$\begin{array}{r}
 9.7 \\
 88.9 \\
 16.3 \\
 82.5
 \end{array}$$

$$\begin{array}{r}
 79.27 \\
 66.27 \\
 \hline
 145.47 \\
 \hline
 \text{mean} = 0.717
 \end{array}$$

$$\begin{array}{r}
 18.2 \\
 83.3 \\
 10.6 \\
 92.7
 \end{array}$$

$$\begin{array}{r}
 65.17 \\
 82.17 \\
 \hline
 147.27 \\
 \hline
 0.637
 \end{array}$$

$$\begin{array}{r}
 11.1 \\
 89.9 \\
 15.0 \\
 85.3
 \end{array}$$

$$\begin{array}{r}
 78.87 \\
 70.37 \\
 \hline
 149.17 \\
 \hline
 \begin{array}{l} 0.597 \\ 0.617 \end{array}
 \end{array}$$

Index to right and below.

$$\begin{array}{r}
 110.0 \\
 170.4 \\
 104.4 \\
 177.3
 \end{array}$$

$$\begin{array}{r}
 60.47 \\
 72.97 \\
 \hline
 133.37 \\
 \hline
 0.917
 \end{array}$$

$$\begin{array}{r}
 105.0 \\
 170.3 \\
 111.6 \\
 167.5
 \end{array}$$

$$\begin{array}{r}
 68.37 \\
 55.97 \\
 \hline
 124.27 \\
 \hline
 \text{mean} = 0.807
 \end{array}$$



Sept. 1, 1896.

12 15 10

112.5

167.0

104.1

176.3

54.5 &gt;

72.2 &gt;

1.05 &gt;

126.7 &gt;

12 17 28

106.4

177.2

114.0

168.0

70.8 &gt;

54.0 &gt;

1.09 &gt;

1.07 &gt;

124.8 &gt;

XVI

Index to left and above

12 20 27

193.4

266.9

197.2

260.1

73.5 &gt;

0.85 &gt;

62.9 &gt;

126.4 &gt;

197.1

261.5

191.3

265.7

64.4 &gt;

0.80 &gt;

74.4 &gt;

0.82 &gt;

128.8 &gt;

mean = 0.95 &gt;

12 21 43

12 4(74 58 &lt; 178

12 18 44.5 &lt;

-26

12 18 18

12 23 15

191.1

268.0

197.0

264.1

46.9 &gt;

0.75 &gt;

64.1 &gt;

141.0 &gt;

23

15

Sept 1, 1896.

12 24 29

197.1

262.2

191.2

266.9

65.1 &gt;

75.7 &gt;

140.8 &gt;

 $\frac{0.76}{0.76}$  >

0.76 &gt;

~~Index~~ Index tonight and below.

12 26 27

283.9

355.2

289.0

349.6

71.2 &gt;

60.6 &gt;

131.9 &gt;

0.94 &gt;

12 28 14

x (22 35

12 28 39

-26

12 28 13

288.2

349.8

284.9

353.6

61.5 &gt;

68.7 &gt;

130.2 &gt;

 $\frac{0.97}{0.96}$  >

0.96 &gt;

mean = 0.86 &gt;

12 29 35

285.2

355.2

289.0

349.8

70.0 &gt;

60.8 &gt;

130.8 &gt;

0.96 &gt;

12 31 7

292.3

349.1

284.4

353.7

56.8 &gt;

69.3 &gt;

126.1 &gt;

 $\frac{1.06}{1.01}$  >

1.01 &gt;



Sept. 1, 1896.

XVII  
Index to left and above

12 [32] 58

9.9  
86.0  
19.0  
80.5

76.1 >  
61.5 >  
127.6 >

0.82 &gt;

20.3

79.9  
11.0  
88.5

59.6 >  
77.5 >  
127.1 >

0.83 &gt;

0.82 >mean = 0.92 >

34 15  
4 (12.7) 55 < 255  
12 31 59 <  
-26  
12 31 33

13.7  
89.6  
19.8  
81.1

75.9 >  
61.3 >  
127.2 >

0.83 &gt;

18.3

81.7  
11.4  
86.9

62.4 >  
75.5 >  
128.9 >

0.80 &gt;

0.82 &gt;

XIX  
Index to right and below.

106.0  
172.0  
114.8  
167.0

67.0 >  
52.2 >  
119.2 >

1.21 &gt;

Sept. 1, 1896.

$$\begin{array}{r}
 12 \quad 46 \quad 46 \\
 \hline
 4 \overline{) 14} \quad 6 \\
 12 \quad 43 \quad 32 \\
 \hline
 \quad \quad -26 \\
 \hline
 12 \quad 43 \quad 06
 \end{array}$$

112.4

165.5

107.0

173.0

$$529 > \quad \underline{1.227}$$

$$66.0 > \quad \underline{1.227}$$

$$111.9 > \\ \text{mean} = 1.027$$

12 118 24

107.4

171.1

112.6

166.0

$$63.7 > \quad 1.267$$

$$52.4 >$$

$$117.1 >$$

12 149 43

112.0

163.9

107.1

171.5

$$50.9 >$$

$$64.4 >$$

$$115.2 >$$

$$\underline{1.307}$$

$$1.287$$

IX  
Index to left and above.

12 52 42

192.0

261.7

199.6

257.7

$$69.17 >$$

$$58.17 >$$

$$127.8 >$$

$$1.037$$

$$\begin{array}{r}
 12 \quad 52 \quad 7 \\
 \hline
 4 \overline{) 204} \quad 6 \\
 12 \quad 51 \quad 032 \\
 \hline
 \quad \quad -26 \\
 \hline
 12 \quad 50 \quad 36
 \end{array}$$

199.9

257.2

194.2

259.2

$$57.4 > \quad 1.147$$

$$64.9 > \quad \underline{1.087}$$

$$122.3 > \\ \text{mean} = 1.187$$



Sept. 1, 1896.

13 2 23

197.5

259.7

202.4

257.8

622.7

55.47

117.167

1.257

13 3 27

199.7

256.9

195.4

260.6

57.27

65.27

122.47

1.147

1.207

Index to right and below.

12 5 20

288.0

351.2

292.6

346.9

62.27

54.37

117.57

1.257

13 6 30

4	17	40
13	4	25
		-26
13	3	59

291.0

344.2

288.5

350.2

53.27

61.77

114.97

1.317

1.287

mean = 1.247

13 7 40

287.3

350.0

290.1

343.2

62.77

50.17

112.87

1.357

7 40

Sept. 1, 1896.

13 8 49

293.7

340.9

287.5

352.3

50.2 > 1.30764.8 > 1.327

115.0 &gt;

Index to left and above.

13 <sup>[10]</sup>  
7 59

16.9

82.2

22.2

78.0

65.4 &gt; 1.17 &gt;

55.7 >

121.1 &gt;

13 12 17

13	9	40.2	22.5
		56.2	
		-26	
13	9	30	

20.7

76.0

12.4

82.9

52.3 &gt;

69.5 > 1.157121.8 > 1.167

mean = 1.247

13 13 49

17.6

80.2

21.2

78.2

62.6 &gt; 1.207

57.0 >

119.6 &gt;

13 14 55

22.9

77.9

18.8

82.0

54.0 > 1.23764.2 > 1.227

118.2 &gt;



S 42.1, 1896.

Index to right and below.

12 17  $\frac{100}{4}$ 

$$\begin{array}{r} 111.0 \\ 168.6 \\ \hline 112.2 \\ 116.5 \\ 165.2 \end{array}$$

$$\begin{array}{r} 57.6 > 1.50 > \\ 48.7 > \\ \hline 106.3 > \end{array}$$

$$\begin{array}{r} 12 \quad 18 \quad 44 \\ \hline 4(24 \quad 46) < \\ 13 \quad 16 \quad 12 < \\ \hline -26 \\ \hline 13 \quad 15 \quad 46 \end{array}$$

$$\begin{array}{r} 115.7 \\ 163.9 \\ 105.6 \\ 168.1 \end{array}$$

$$\begin{array}{r} 48.2 > 1.40 > \\ 62.5 > 1.45 > \\ \hline 110.7 > \\ \text{mean} = 1.34 > \end{array}$$

13 20 8

$$\begin{array}{r} 111.8 \\ 168.1 \\ 117.6 \\ 162.2 \end{array}$$

$$\begin{array}{r} 56.2 > \\ 44.6 > 1.63 > \\ \hline 100.9 > \end{array}$$

13 21 8

$$\begin{array}{r} 110.1 \\ 161.0 \\ 112.1 \\ 166.0 \end{array}$$

$$\begin{array}{r} 55.9 > 1.66 > \\ 53.9 > 1.64 > \\ \hline 109.8 > \end{array}$$

XXIV

Index to left and above.

13 22 2

$$\begin{array}{r} 197.1 \\ 258.6 \\ 205.2 \\ 204.9 \end{array}$$

$$\begin{array}{r} 61.5 > 1.39 > \\ 49.7 > \\ \hline 111.2 > \end{array}$$

Sept. 1, 1896.

$$\begin{array}{r}
 12 \quad 27 \quad 18 \\
 \hline
 4 \overline{) 8} \quad 18 \angle \\
 13 \quad 22 \quad 4 \angle \\
 \hline
 -26
 \end{array}$$

$$13 \quad 21 \quad 38$$

$$13 \quad 28 \quad 50$$

$$13 \quad 30 \quad 9$$

$$13 \quad 32 \quad 14$$

$$\begin{array}{r}
 12 \quad 33 \quad 46 \\
 \hline
 4 \overline{) 12} \quad 4 \quad 59 \angle \\
 13 \quad 31 \quad 15 \angle \\
 \hline
 -26 \\
 \hline
 13 \quad 30 \quad 49
 \end{array}$$

$$\begin{array}{r}
 204.4 \\
 255.8 \\
 199.9 \\
 258.7
 \end{array}$$

$$\begin{array}{r}
 51.4 > 1.41 > \\
 58.8 > 1.40 > \\
 \hline
 110.2 > \\
 \text{mean} = 1.52 >
 \end{array}$$

$$\begin{array}{r}
 200.6 \\
 258.4 \\
 204.4 \\
 255.1
 \end{array}$$

$$\begin{array}{r}
 57.8 > 1.45 > \\
 50.7 > \\
 \hline
 108.5 >
 \end{array}$$

$$\begin{array}{r}
 205.2 \\
 255.6 \\
 203.0 \\
 258.0
 \end{array}$$

$$\begin{array}{r}
 50.2 > 1.53 > \\
 55.0 > 1.49 > \\
 \hline
 105.2 >
 \end{array}$$

XXV

Index to right and below.

$$\begin{array}{r}
 289.9 \\
 345.8 \\
 295.5 \\
 342.1
 \end{array}$$

$$\begin{array}{r}
 55.9 > 1.60 > \\
 46.6 > \\
 \hline
 102.5 >
 \end{array}$$

$$\begin{array}{r}
 296.2 \\
 339.9 \\
 289.4 \\
 345.0
 \end{array}$$

$$\begin{array}{r}
 42.7 > 1.67 > \\
 55.6 > 1.64 > \\
 \hline
 99.3 > \\
 \text{mean} = 1.56 >
 \end{array}$$



Sept. 1, 1896.

13 38 52

292.4

348.3

297.1

344.2

55.9 &gt;

1.587

47.1 &gt;

102.0 &gt;

13 37 10

300.0

242.0

294.0

247.9

42.0 &gt;

53.9 &gt;

1.767

95.9 &gt;

1.687

~~XXVI~~

Index to left and above.

22.2

77.5

25.4

74.1

55.2 &gt;

1.56.

48.7 &gt;

104.0 &gt;

13 29 5

24.8

75.4

22.9

80.8

50.6 &gt;

1.457

57.9 &gt;

1.587

108.5 &gt;

1.607

mean  
mean = 1.587

13 40 28

4152 35

13 38 9

-26

13 37 43

12 42 26

22.1

78.5

26.4

75.6

55.4 &gt;

1.59.

47.2 &gt;

102.6 &gt;

42 30

Sept. 1, 1896.

13 42 32

27.3

72.3

22.6

78.2

46.0 &gt;

54.6 &gt;

100.6 &gt;

1.64 &gt;

1.62 &gt;

~~XXVII~~  
 Index to right and below:

112.1

164.0

118.2

157.8

52.4 &gt;

41.5 &gt;

93.9 &gt;

1.81 &gt;

122.2

160.7

116.3

164.6

121.3

29.4 &gt;

48.3 &gt;

87.7 &gt;

1.98 &gt;

1.90 &gt;

mean = 1.76 &gt;

13 46 30

$$\begin{array}{r} 4 \overline{) 18} \quad 13 \\ 13 \quad 44 \quad 33 \quad 2 \\ \underline{-26} \end{array}$$

13 44 33 2

13 44 07

13 48 11

115.1

165.0

120.3

158.5

49.9 &gt;

35.2 &gt;

85.1 &gt;

2.05 &gt;

13 49 30

120.7

159.9

115.4

163.9

39.2 &gt;

48.5 &gt;

87.7 &gt;

1.98 &gt;

2.02 &gt;



Sept. 1, 1896.

Index to left and above.

13 51 12

202.0

254.5

206.4

256.7

52.5 &gt;

50.2 &gt;

102.8 &gt;

1.59 &gt;

207.0

254.0

202.1

256.1

47.0 &gt;

54.0 &gt;

101.0 &gt;

1.60 &gt;

1.61 &gt;

mean = 1.82 &gt;

$$\begin{array}{r}
 13 \ 52 \ 9 \\
 \hline
 4 \overline{) 201} \quad 5 \\
 13 \quad 50 \quad 162 \\
 \hline
 13 \quad 49 \quad 50
 \end{array}$$

Arnold + Dent #958 : Band #394  
 $14^h \quad 10^m \quad 26.1^s = 14^h \quad 10^m \quad 0.0^s$

hence Arnold + Dent is  $26.1^s$  fast } com-  
 or is  $0.4^m$  fast }  
 pared with Band #394 : Band #394  
 is  $0.7^s$  fast : Arnold + Dent is then  
 $26.2^s$  sec fast =  $0.4^m$  fast

Sept 4. 1896 (Friday)

Comet inspected by W. E. Spina of Randolph Ohio: thorough sweep made throughout region, but comet not found: Wals

$$\begin{array}{r} 13 \\ 18 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 18 \\ 43 \\ \hline 25 \end{array}$$

55.7

$$\begin{array}{r} 13 \\ 18 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 18 \\ 57 \\ \hline 39 \end{array}$$

55.7

$$\begin{array}{r} 13 \\ 19 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 0 \\ 32 \\ \hline 32 \end{array}$$

55.9

$$\begin{array}{r} 13 \\ 19 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 16 \\ 49 \\ \hline 33 \end{array}$$

55.8



Sept. 4, 1896.

m. p 441 : Phot R : W. obs

$$\begin{array}{r}
 3 \\
 20 \\
 \hline
 -7 \\
 4
 \end{array}
 \quad
 \begin{array}{r}
 31 \\
 15 \\
 \hline
 16 \\
 44
 \end{array}
 \quad
 +62.8$$

var. is the brighter of the two

Index to right and above

$$\begin{array}{r}
 312.9 \\
 9.7 \\
 \hline
 312.7
 \end{array}
 \quad
 \begin{array}{l}
 < \text{var dis} \\
 312.1
 \end{array}$$

$$10.1$$

$$310.9$$

$$10.9$$

$$309.2$$

$$10.2$$

$$9.2$$

$$56.8 >$$

$$58.0 >$$

$$114.8 >$$

$$60.0 >$$

$$61.0 >$$

$$121.0 >$$

$$-1.31 >$$

$$-1.17 >$$

$$-1.24 >$$

Index to left and below.

$$40.7$$

$$100.2$$

$$41.1$$

$$100.4$$

$$59.5 >$$

$$59.3 >$$

$$118.8 >$$

$$-1.22 >$$

Sept. 4, 1896.

$$\begin{array}{r} 9 \quad 29 \\ \hline 9 \quad 20 \quad 0 \end{array}$$

$$\begin{array}{r} 41.1 \\ 101.0 \\ 40.8 \\ 98.7 \end{array}$$

$$\begin{array}{r} 59.9 > \\ 57.9 > - 1.24 > \\ 117.8 > - 1.23 > \\ \hline \text{mean} = -1.24 > \end{array}$$

var. is the brighter of the two.

R. C. arisop:

W: obs.

$$\begin{array}{r} 23 \\ 20 \\ \hline -3 \\ 9. \end{array}$$

$$\begin{array}{r} 52 \\ 52 \\ \hline 0 \\ 0 \end{array}$$

$$+9.7$$

$$0 \quad 4 \text{ var : var } 1.5 \quad 0$$

$$0 \quad 3.5 \text{ var : var } 2 \quad 0$$

W: obs.

former in large telescope.  
latter in finder.  
estimate = 10.1 magn.

S. C. arisop:

W: obs.

$$\begin{array}{r} 1 \\ 21 \\ \hline 22 \end{array}$$

$$\begin{array}{r} 10 \\ 5 \\ \hline 15 \end{array}$$

$$+72.1$$



Sept. 4. 1896.

$\begin{matrix} q & 2 & \text{var: var} & 3 & h \\ q & 1.5 & \text{var: var} & 3 & h \end{matrix}$  } in large  
 telescope and finder both W. obs.  
 estimate = 8.7 magn.

R. Draconis : W. obs.

$\begin{array}{r} 16 \\ 21 \\ \hline 4 \end{array}$ 
 $\begin{array}{r} 26 \\ 20 \\ \hline 54 \end{array}$ 
 + 67.4

var =  $\frac{1}{2}$  in large telescope &  
 in finder both  
 estimate = 8.6 magn. W. obs.

S Boötis : W. obs.

$\begin{array}{r} 14 \\ 21 \\ \hline 7 \end{array}$ 
 $\begin{array}{r} 16 \\ 25 \\ \hline 19 \end{array}$ 
 54.6

$\begin{matrix} e & 3 & \text{var: var} & 3 & f \\ e & 2 & \text{var: var} & 2 & f \end{matrix}$  } in large telescope  
 in finder.  
 estimate = 9.1 magn. W. obs.

Sept. 4, 1896.

S legygni: W: obs.

$$\begin{array}{r}
 20 \\
 21 \\
 \hline
 1
 \end{array}
 \quad
 \begin{array}{r}
 8 \\
 55 \\
 \hline
 47
 \end{array}
 \quad
 + 57.2$$

g 2.5 var: var 2 2 W: obs.  
 in large telescope: too faint for finder

11 0 estimate = 13.7 magn W: obs.

nova Aurigae: W: obs.

$$\begin{array}{r}
 5 \\
 22 \\
 \hline
 17 \\
 4
 \end{array}
 \quad
 \begin{array}{r}
 23 \\
 20 \\
 \hline
 03 \\
 57
 \end{array}
 \quad
 32.0$$

abandoned: too low.



Sept. 4, 1896,

Citi: Phot. R.

W. obs.

W. obs.

$$\begin{array}{r} 20 \\ 44 \\ 16 \end{array}$$

Index above.

$$\begin{array}{r} 119.4 \\ 201.9 \\ 121.1 \\ 199.4 \end{array} < \text{var dis.} = \text{preceding error of two}$$

$$\begin{array}{r} 82.57 \\ 78.37 \\ 160.87 \end{array}$$

$$0.377$$

$$\begin{array}{r} 120.8 \\ 199.6 \\ 117.8 \\ 203.6 \end{array}$$

$$\begin{array}{r} 78.87 \\ 86.37 \\ 165.17 \end{array}$$

$$\begin{array}{r} 0.287 \\ 0.327 \end{array}$$

Index below.

$$\begin{array}{r} 211.0 \\ 291.9 \\ 212.8 \\ 288.6 \end{array}$$

$$\begin{array}{r} 80.97 \\ 74.87 \\ 155.77 \end{array}$$

$$0.467$$

$$\begin{array}{r} 202.8 \\ 291.2 \\ 209.9 \\ 290.0 \end{array}$$

$$\begin{array}{r} 88.47 \\ 80.17 \\ 168.57 \end{array}$$

$$\begin{array}{r} 0.227 \\ 0.347 \\ 0.337 \end{array}$$

mean

$$\begin{array}{r} 25 \\ 2/44 \\ 220 \end{array}$$

Sept. 4. 1896.

B Lyrae : Phot V: trans obs

Index to left and below.

12	12.4	122.3	< B dis.	
		157.8	35.5 >	
		121.2	37.2 >	2.42 >
		158.4	72.7 >	

12	20.6	119.6		
		159.0	39.4 >	2.31 <sup>5</sup> >
		122.1	35.4 >	2.39 <sup>8</sup> >
		157.5	74.8 >	

Index to right and above.

12	37.2	208.7		
		252.0	43.3 >	2.01 >
		209.5	43.1 >	
		252.6	86.4 >	

12	50.5	209.2		
		252.3	43.1 >	2.01 >
		208.3	43.5 >	2.01 >
12	30.2 >	251.8	86.6 >	2.39 <sup>8</sup> >

4.39

mean = 2.20 >

observations slow and difficult because  
obs. had to read circle and record himself:  
bothered very much by spectrum of one of images.



Sept. 4, 1896.

Index to right and above.

208.8  $\leq \beta$  dis.

13 07.5

253.9

211.0

251.7

45.1 &gt;

2.03 &gt;

40.7 &gt;

8 5 '8 &gt;

207.7

252.6

205.7

~~255.8~~ 253.0

44.9 &gt;

1.86 &gt;

47.2 &gt;

1.94 &gt;

9 2.2 &gt;

13 25.0

Index to left and below.

300.0

338.0

301.3

340.9

38.0 &gt;

39.6 &gt;

7 7 '6 &gt;

2.27 &gt;

303.4

340.0

300.4

338.9

36.6 &gt;

38.5 &gt;

7 5 '1 &gt;

2.34 &gt;

2.30 &gt;

1.94 &gt;

4.24 &gt;

mean = 2.12 >13 38.2  
13 25.8 >Observations difficult and images very  
poor in both groups.

Sept 7. 1896 (Monday)

Comet Spessa

W. obs.

$$\begin{array}{r} 13 \quad \checkmark A \quad + \checkmark \checkmark \quad 37 \\ 19 \quad \checkmark \\ \hline +5 \quad 7 \end{array}$$

$$\begin{array}{r} 13 \quad 58 \\ 19 \quad 10 \\ \hline +5 \quad 12 \end{array}$$

Spessa comet found

- 10 It is rather close to an .8 mag. star. and this star is involved in the nebulosity. As near as can be determined the nucleus is somewhat shapp. and as faint as 11th or 12th mag. The nebulosity is rather faint and diffuse and probably somewhat circular. ~~Per~~ Total nebulosity approximately 1.5 min. of arc in diameter

Meas. of T. Androm. Plut J  
W. obs.

$$\begin{array}{r} 0.14 \\ 19.44 \\ \hline -4.38 \\ 7.30 \end{array} \quad + 26.1$$



Sept. 7, 1896

$$\begin{array}{r}
 0.14 \\
 19.50 \\
 \hline
 + 7.36 \\
 \hline
 \end{array}
 \quad + 26.1$$

19.55

$$\begin{array}{r}
 24.14 \\
 20.00 \\
 \hline
 - 4.14 \\
 \hline
 7.46
 \end{array}
 \quad + 26.1$$

Index L + above

8 40

$$\begin{array}{r}
 307.2 \\
 333.5 \\
 308.3 \\
 333.0
 \end{array}
 \begin{array}{l}
 < \text{Comp. star dis.} \\
 26.3 < \\
 24.7 < \\
 \hline
 51.0 <
 \end{array}
 \quad 3.23$$

8 42

$$\begin{array}{r}
 306.1 \\
 333.4 \\
 306.0 \\
 333.3
 \end{array}
 \begin{array}{l}
 27.3 < \\
 \\
 27.3 < \\
 \hline
 54.6 <
 \end{array}
 \quad (3.15) \quad 3.07$$

$R_1 + \text{above.}$

46

$$\begin{array}{r}
 35.9 \\
 63.8 \\
 35.5 \\
 65.3
 \end{array}
 \begin{array}{l}
 27.9 < \\
 \\
 29.8 < \\
 \hline
 57.7 <
 \end{array}
 \quad 2.95$$

Sept. 7. 1896.

$$\begin{array}{r} 48 \\ \hline 4(17) \\ 2 \quad 44 \quad 15- \end{array}$$

$$\begin{array}{r} 36.6 \\ 64.4 \\ 35.5 \\ 64.2 \end{array} \quad \begin{array}{r} 27.4 < \\ 24.7 < \\ \hline 56.5 < \end{array} \quad \begin{array}{l} (2.98) \\ 3.00 \\ M = (3.06) \end{array}$$

Steel's Qam.

Phot 5

$$\begin{array}{r} 20.31 \\ 20.25 \\ \hline - .06 \end{array} \quad + 17.7$$

$$\begin{array}{r} 20.31 \\ 20.27 \\ \hline - .04 \end{array}$$

9 12

$$\begin{array}{r} 12.8 \\ 93.0 \\ \hline \end{array}$$

Images do not reverse well

14

$$\begin{array}{r} 8.0 \\ 94.3 < \text{Comp. star dis.} \\ 3.5 \\ 97.4 \end{array} \quad \begin{array}{r} 86.3 < \\ 93.9 < \\ 48.0.2 < \\ \hline 179.8 \end{array} \quad \begin{array}{l} 0.00 \end{array}$$



Sept. 7. 1896.

9 18

~~4.1~~

5.5

(0.02)

~~96.6~~ 95.0

89.5

6.1

89.1

0.03

95.2

~~178.6~~

Index to R.

277.5

22

1.4

83.6

275.0

86.0

0.20

1.0

~~169.6~~

275.3

(0.24)

1.0

82.7

277.6

82.4

I 0.28

0.0

~~165.1~~

M = 0.13

~~Lower interferis (R'cat.)~~~~279.0 276.8~~

26

~~1.6~~~~276.0~~~~2.0~~

275.8

30

1.5

276.0

1.1

Sept. 7. 1896.

Index to L

~~359.0~~~~94.4~~

33

Reject above sets crossed out as  
done cuts off considerable of the  
obj. glass. Hells Variable again.

Index to L

4.6

93.3

5.6

94.1

88.7 &lt;

88.5 &lt;

177.2 &lt;

+ 0.00 &lt;

7.1

+(0.02) &lt;

96.4

5.8

96.9

89.3 &lt;

91.1 &lt;

180.4 &lt;

179.6

- 0.01 &lt;

Index to R.

102.6

181.0

98.6

183.0

78.4 &lt;

84.4 &lt;

162.8 &lt;

+ 0.33 &lt;

98.3

+(0.32) &lt;

182.5

102.1

182.0

84.2 &lt;

79.9 &lt;

164.1 &lt;

+ 0.30 &lt;

M = +0.17 &lt;

43

4/15 8

39 30

9



Sept. 7. 1896

Index to R.

9 46

100.9

181.1

98.0

183.1

80.2 &lt;

$$\frac{80.1 <}{165.3 <} + 0.28 <$$

+ (0.28) &lt;

99.4

48

182.8

102.0

183.2

83.4 &lt;

$$\frac{81.2 <}{164.6 <} + 0.29 <$$

Index to L.

182.5

51

276.1

184.6

275.3

93.6 &lt;

$$\frac{90.7 <}{184.3 <} - 0.08 <$$

175.7

- (0.07) &lt;

186.4

276.1

182.5

275.9

89.7 &lt;

93.4 &lt;

$$\frac{183.1 <}{176.9} - 0.06 <$$

9M = (+0.10) &lt;

54

4(199)

9 49 45

56

184.1

275.0

182.4

274.8

90.9 &lt;

92.4 &lt;

$$\frac{183.3 <}{176.7} - 0.06 <$$

56

Sept. 7. 1896

9 58

184.1

 $(-0.04)_{\angle}$ 

274.0

89.9 $\angle$ 

183.3

90.7 $\angle$  $-0.01_{\angle}$ 

274.0

180.6 $\angle$ 

Index to R.

179.4

276.0

3.1

87.1 $\angle$ 

10 4

276.0

88.4 $\angle$  $+0.16_{\angle}$ 

.4

178.5 $\angle$ 

277.8

 $+(0.18)_{\angle}$ 

.3

82.5 $\angle$ 

275.1

86.9 $\angle$  $+0.20_{\angle}$ 

2.0

169.4 $\angle$  $M = +0.07_{\angle}$ 

276.6

3.8

87.2 $\angle$ 

8

276.4

86.5 $\angle$  $+0.12_{\angle}$ 

2.9

173.7 $\angle$ 

276.8

 $+(0.13)_{\angle}$ 

2.0

85.2 $\angle$ 

9

275.4

87.5 $\angle$ 

2.9

172.7 $\angle$  $+0.14_{\angle}$



10 13

Sept. 7, 1896

Index to L.

5.5

96.9

7.0

96.4

91.4 &lt;

89.4 &lt;

180.8 &lt;

179.2

-0.02 &lt;

7.4

95.0

4.0

97.4

87.6 &lt;

93.4 &lt; V

181.0 &lt;

179.0

(-0.02) &lt;

-0.02 &lt;

(M = +0.06) &lt;

5.0

97.5

6.6

94.8

92.5 &lt;

88.2 &lt;

180.7 &lt;

179.3

-0.01 &lt;

6.8

94.7

4.5

97.8

87.9 &lt;

93.3 &lt;

181.2 &lt;

178.8

(-0.02) &lt;

-0.02 &lt;

Index to R<sub>10</sub>

102.1

183.8

98.8

181.5

81.7 &lt;

82.7 &lt;

164.4 &lt;

+0.30 &lt;

100.2

181.4

100.0

181.0

81.2 &lt;

81.0 &lt; VI

162.2 &lt;

+(0.32) &lt;

+0.34 &lt;

(M = +0.10) &lt;

15

4(45)

10 11 15

17

19

22

24

10 20 30

Sept. 7. 1896.

0 Cts.

W. St.

$$\begin{array}{r}
 2 \quad 4 \quad -2.5 \\
 22 \quad 0 \\
 \hline
 -4 \quad 4 \\
 7 \quad 56
 \end{array}$$

Index Below

10 47

$$\begin{array}{r}
 9.9 < \text{Comp Var. Dis.} \\
 91.0 \\
 8.1 \\
 \hline
 91.2
 \end{array}
 \begin{array}{r}
 81.1 < \\
 83.1 < \\
 \hline
 164.2 < -0.30 <
 \end{array}$$

49

$$\begin{array}{r}
 9.0 \\
 90.0 \\
 8.4 \\
 \hline
 89.3
 \end{array}
 \begin{array}{r}
 - (0.32) < \\
 81.0 < \\
 80.9 < \\
 \hline
 161.9 < -0.34 <
 \end{array}$$

Index Above

53

$$\begin{array}{r}
 100.9 \\
 180.0 \\
 97.8 \\
 \hline
 183.1
 \end{array}
 \begin{array}{r}
 79.1 < \\
 85.3 < \\
 \hline
 164.4 < -0.30 <
 \end{array}$$

55

$$\begin{array}{r}
 4 \overline{) 204} \\
 10 \quad 51 \quad 0
 \end{array}$$

$$\begin{array}{r}
 97.0 \\
 182.6 \\
 98.9 \\
 \hline
 180.9
 \end{array}
 \begin{array}{r}
 - (0.27) < \\
 85.6 < \\
 82.0 < \\
 \hline
 167.6 < -0.24 <
 \end{array}$$

$$M = -0.30$$



Sept. 7, 1896

0 Beti is ltr. than comp. star

Sept. 2, 1896.

7 0

Cloudy.

7 30

"

A 0

"

A 30

Still cloudy, and growing worse.



Sept. 10. 1896.

7 30

Cloudy.

7 45

Some clearing, will try for

$\Sigma$  2594 v 7. Aquilae Gr. obs.

$$\begin{array}{r} 19 \quad 28 \quad - 4.6 \\ 19 \quad 30 \\ \hline -0 \quad 14 \\ 11 \quad 42 \end{array}$$

Thickly cloudy again.

A little clearing.

$\Sigma$  51'

Gr. obs.

$$\begin{array}{r} 20 \quad 11 \quad - 12.9 \\ 20 \quad 10 \\ \hline -0 \quad 1 \end{array}$$

A 50

Thickly cloudy again,  
no chance for work.

Sept. 11. 1896. (Friday)

Yells Variable.  
Photo. T.

K. obs.

$$\begin{array}{r} 20 \quad 31 \quad +17.2 \\ 12 \quad \cancel{22} \\ \hline -1 \quad \cancel{23} \end{array}$$

Index 6-L

217<sup>w</sup>

250.0

216.3

244.6

3 2.5 <

28.3 <

6 0.8 <

2.83 <

216.7

247.0

217.0

247.5

30.3 <

30.5 <

60.8 <

2.83 <

(2.83)

Index 6-R

18.5

53.4

21.8

51.1

34.9 <

29.3 <

64.2 <

2.71 <



Sept 11

$$\begin{array}{r}
 7 \ 43 \ 55 \\
 \hline
 4 \ 145 \ 40 \\
 7 \ 36 \ 25 \\
 \hline
 12 \ 37 \ 0 \\
 +0 \ 18 \ 0 \\
 +0 \ 23 \ 0 \\
 \hline
 45 \ 26
 \end{array}$$

23.2

50.0

18.0

53.6

20.0

56.8

22.8

52.0

26.8 &lt;

35.6 &lt;

62.4 &lt;

(274)

2.77 &lt;

$$\begin{array}{r}
 M = 2.78 \\
 9.27 \\
 \hline
 12.05
 \end{array}$$

36.8 &lt;

29.2 &lt;

66.0 &lt;

2.64 &lt;

(272)

22.0

50.1

18.2

57.9

28.1 &lt;

33.5 &lt;

61.6 &lt;

2.80 &lt;

Index to L.

110.9

146.0

110.2

143.4

35.1 &lt;

33.2 &lt;

68.3 &lt;

2.56 &lt;

111.9

144.3

108.8

144.3

32.4 &lt;

35.5 &lt;

67.9 &lt;

(257)

2.58 &lt;

$$\begin{array}{r}
 M = 2.64 \\
 9.27 \\
 \hline
 11.91
 \end{array}$$

46 1

48 10

49 31

$$\begin{array}{r}
 4 \ 29 \ 8 \\
 7 \ 47 \ 17 \\
 \hline
 12 \ 47 \ 52 \\
 +0 \ 28 \ 52 \\
 +0 \ 34 \ 36
 \end{array}$$

Sept 11. '96

56 45

107.5

143.8

109.9

145.2

36.3 &lt;

35.3 &lt; 2.45 &lt;

71.6 &lt;

58 14

109.0

145.6

105.1

144.5

(2.38)

36.6 &lt;

39.4 &lt; 2.32 &lt;

76.0 &lt;

Index to R.

198.3

235.0

201.6

232.0

36.7 &lt;

30.4 &lt; 2.60 &lt;

67.1 &lt;

8 0 9

200.7

232.9

199.9

235.5

(2.59)

32.2 &lt;

35.6 &lt; 2.58 &lt;

67.8 &lt;

8 1 21

4(236 29 &lt;

7 59 07.2 &lt;

+35

12 59 42

+0 40 42

+0 46 26

-7 22

Watch 35" slow of Bond 394175

M = 248.

9.27

199.5

233.8

202.7

231.6

34.3 &lt;

28.9 &lt; 2.74 &lt;

63.2 &lt;



Sept. 11. 1896

8 8 26

200.0

230.6

198.3

233.5

30.6 &lt; (270)

 $\frac{35.2}{65.8} < 2.60 <$ 

Index Left

284.6

326.0

290.5

323.4

41.9 &lt;

 $\frac{32.9}{74.8} <$ 

2.35 &lt;

(2.24)

290.8

233.3

286.4

326.3

42.5 &lt;

 $\frac{39.9}{82.4} < \overline{M}$ 

2.12 &lt;

 $M = 2.47$  $\frac{9.27}{11.78}$ 

286.8

225.0

286.9

322.7

38.2 &lt;

 $\frac{35.8}{74.0} <$ 

2.38 &lt;

288.0

325.4

286.3

327.4

37.4 &lt;

 $\frac{41.1}{78.5} <$ 

2.24 &lt;

(2.31)

10 42

11 40

$$\begin{array}{r}
 4 \overline{) 38} \quad 10 < \\
 8 \quad 9 \quad 32 < \\
 \hline
 13 \quad 10 \quad 7 \\
 +0 \quad 51 \quad 2 \\
 +0 \quad 56 \quad 7 \\
 \hline
 15 \quad 50
 \end{array}$$

17 8

64 <sup>15</sup> <sup>50</sup>  
<sup>17</sup> <sup>8</sup>

Sept. 11, 1896

8 18 58

11.8

58.7

12.0

56.4

46.9 &lt;

44.4 &lt; 1.88 &lt;

91.3 &lt;

(2.04)

12.0

54.2

10.0

53.0

422 &lt;

358 &lt; 2.19 &lt;

80.2 &lt;

M = 2.18

9.27  
11.85

$$\begin{array}{r}
 20 \ 23 \\
 \hline
 4 \overline{) 72 \ 19} < \\
 8 \ 18 \ 04.8 < \\
 \hline
 13 \ 18 \ 40 \\
 +0 \ 59 \ 40 \\
 +1 \ 22 \ 53 \\
 \hline
 \end{array}$$

14.5

56.1

18.3

54.0

41.6 &lt;

35.7 &lt; 2.28 &lt;

77.3 &lt;

(2.24)

16.6

52.9

12.9

56.8

36.3 &lt;

43.9 &lt; 2.19 &lt;

80.2 &lt;

Index to L.

105.0

146.6

105.9

146.8

41.6 &lt;

40.9 &lt; 2.12 &lt;

82.0 &lt;

23 0

25 8

26 5

$$\begin{array}{r}
 26 \ 5 \\
 \hline
 4 \overline{) 17 \ 8} < \\
 8 \ 24 \ 17 < +1 \ 11 \ 36 \\
 \hline
 10 \ 24 \ 52 \\
 \hline
 \end{array}$$

107.1

144.5

104.9

146.0

37.4 &lt;

41.1 &lt;

78.85 &lt;

2.24 &lt;

11.85

M = 2.21

(2.18)



Sept. 11, 1896

9 0 33

270.2

320.7

275.9

320.0

50.5 &lt;

41.1 &lt;

91.6 &lt;

(1.8) &lt;

(1.81)

1 36

274.3

319.6

269.0

320.0

45.3 &lt;

51.0 &lt;

96.3 &lt;

1.75 &lt;

Index to R.

3 28

1.1

50.6

359.0

53.6

48.5 &lt;

54.6 &lt;

103.1 &lt;

1.58 &lt;

4 40

358.3

54.8

1.0

47.9

56.5 &lt; 111

46.9 &lt;

103.4 &lt;

1.57 &lt;

M = 1.70

9.27  
10.97

(1.0-8)

$$\begin{array}{r} 440 \\ 410 \quad 17 < \\ 9 \quad 2 \quad 34 < \\ \quad \quad + 35 \\ \hline 14 \quad 3 \quad 9 \\ + 1 \quad 44 \quad 9 \\ + 1 \quad 49 \quad 53 \\ \hline 5 \quad 48 \end{array}$$

5 48

46.2

355.6

53.1

44.7 &lt;

57.5 &lt;

102.2 &lt;

1.60 &lt;

v 48

Sept. 11. 1896

1.60

9 7 6

356.1

50.9

3.3

48.1

54.8 &lt;

44.8 &lt;

99.6 &lt;

(1.64)

1.67 &lt;

Index to L.

87.5

143.4

87.4

142.0

55.9 &lt;

54.6 &lt;

110.5 &lt;

1.41 &lt;

89.2

140.0

87.5

143.9

50.8 &lt; VIII

56.4

107.2

(1.44)

1.48

$$M = 1.5 - 4$$

$$\frac{9.27}{10.21}$$

$$\begin{array}{r}
 9 \ 32 \\
 \hline
 4 \overline{) 31} \quad 9 \ 2 \\
 9 \ 7 \ 472 \\
 \hline
 \text{+35} \\
 14 \ 8 \ 22 \\
 \hline
 +1 \ 49 \ 22 \\
 \hline
 +1 \ 10 \ 39 \ 16
 \end{array}$$

89.0

144.2

91.6

145.0

58.2 &lt;

53.4 &lt;

111.6 &lt;

1.38 &lt;

89.3

141.1

86.4

146.0

57.8 &lt;

59.6 &lt;

111.4 &lt;

(1.38)

1.39 &lt;

1214



Sept. 11, 1896

Index R

9148

179.8

235.0

182.4

225.8

55.2 &lt;

$$\frac{43.4 <}{98.6 <} \quad 1.69 <$$

183.7

229.5 - 45.8 &lt;

149.5

231.1

$$\frac{51.6 < \times 1}{97.4 <}$$

(1.70)

1.72 &lt;

$$M = 1.54$$

$$\frac{9.27}{10.81}$$

178.2

234.4

185.0

227.3

56.2 &lt;

$$\frac{42.3 <}{88.5 <} \quad 1.95 <$$

184.2

227.4

177.0

233.3

43.2 &lt;

$$\frac{56.3 <}{99.5 <} \quad 1.67 <$$

(1.81)

Index L.

268.4

323.8

264.9

320.0

55.4 &lt;

$$\frac{50.1 <}{110.5 <} \quad 1.41 <$$

1527

4/12 48 &lt;

9 13 12 &lt;

+35

14 13 47

+1 5-4 47

+2 17 56

1859

2033

Sept 11 1896

270.9

321.0

50.1 &lt;

(1.38)

261.4

62.7 &lt;

112.8 &lt;

1.35 &lt;

324.1

M = 1.60

9.27  
10.27

22 0  
 $\overline{479} \ 28 <$   
 9 19 52 <  
 +35

14 20 27  
 +2 1 27  
 +2 7 11

Reverse telescope to other  
 side of pin.

20 31  
 $\overline{21} \ 26$   
 1 55

+17.8

20 31  
 21 71

0 40

R + Below

179.6

235.1

179.5

231.0

55.5 &lt;

51.5 &lt;

107.0 &lt;

1.49 &lt;

9 35 44

37 12

~~180.5~~  
~~233.0~~

Reject (1.44)

178.2

234.2

178.5

234.0

56.0 &lt;

55.5 &lt;

111.5 &lt;

1.384

40 9



Sept. 11, 1896

L + Above

9 44 42

262.5

325.0

62.5 &lt;

262.1

63.3 &lt;

1.07 &lt;

325.4

125.8 &lt;

(1.04)

45.21

261.0

326.6

263.7

327.1

65.6 &lt;

63.4 &lt; 1.00 &lt;

129.0 &lt;

M = 1.24

9.27  
10.51

260.8

327.5

66.7 &lt;

265.4

63.6 &lt;

0.97 &lt;

329.0

130.3 &lt;

264.1

(1.02)

326.4

62.3 &lt;

263.0

63.6 &lt;

326.6

125.9 &lt;

1.07 &lt;

R + Below

355.1

54.9

59.8 &lt;

355.1

60.9 &lt;

1.18 &lt;

56.0

120.7 &lt;

30.59

48.16

4(165-56) &lt; 111

9 41 29 &lt;

+35

14 42 4

+2 23 4

+2 47.15





Sept. 11, 1896

10.4.15

7+ 81.0

152.2

79.9

151.0

71.2 &lt;

71.1 &lt;

142.3 &lt;

0.73 &lt;

10.5.50

79.9

151.7

80.0

154.0

71.8 &lt;

74.0 &lt;

145.8 &lt;

0.66 &lt;

(0.70)

Right and below

10.9.30

173.0

238.2

176.4

236.9

65.2 &lt;

60.5 &lt;

125.7 &lt;

1.07 &lt;

11.15

174.8

237.0

171.5

238.2

62.2 &lt;

66.7 &lt; XIV

128.9 &lt;

1.00 &lt;

M = 0.87

9.27

10.14

4(80.50) &lt;

10 42 &lt;

7 + 35 -

15 8 17

+ 2 49 17

+ 2 55 -

13.2

174.8

235.8

174.6

233.5

61.0 &lt;

58.9 &lt;

119.9 &lt;

1.19 &lt;

13 2

Sept. 11, 1896

1.19

10.14, 27

178.0

234.3

172.2

237.4

56.32

65.22

121.52

(1.18)

1.16

Left + above

260.0

320.1

259.2

321.0

70.12

71.82

141.92

0.742

13/15

13.15

(0.76)

259.2

321.4

258.8

330.1

68.22

71.32

139.52

0.782

M = 0.97  
9.27  
10.24

20.0

460 442

10 15 112

+35

10 10 46

+2 56 46

+3 2 30

Mr. Sawyer's watch used up to this point. His watch is now 35. secs. slow.

Mr. Murdoch's watch used from this point onwards.  
His watch is now 10 secs. fast.



Sept 11, 1896.

10 2530

257.3

329.0

258.0

329.0

71.7 &lt;

71.0 &lt;

142.7 <

0.72 &lt;

27.10

27.10

262.0

328.8

256.6

330.0

66.8 &lt;

70.4 &lt;

140.2 <

0.77 &lt;

(0.74)

Right and below

47.0

349.0

61.0

351.0

62.1

72.0 &lt;

71.1 &lt;

143.1 <

0.71 &lt;

350.6

59.8

349.6

60.5

69.2 &lt;

70.9 &lt;

140.1 <

0.77 &lt;

(0.74)

10,49.0

$$\begin{array}{r} 414830 < \\ 103708 < \\ \hline -10 \end{array}$$

$$\begin{array}{r} 153658 \\ + 231758 \\ + 352342 \\ \hline \end{array}$$

52.10

349.0

62.4

349.8

60.6

Clouds

73.4 &lt;

70.8 &lt;

144.2 <

0.69 &lt;

$$\begin{array}{r} M = 0.74 \\ 9.27 \\ \hline 10.01 \end{array}$$

52 10

Sept. 11, 1896

10.54, 10

348.8

587.5

348.0

62.4

Clouds,

68.7 &lt;

71

744.4 &lt;

0.94

143.1

4

350.4

58.9

350.3

54.8

67.5 &lt;

67.5 &lt;

135.0 &lt;

0.88 &lt;

(0.76)

~~(0.80)~~

51.0

Left &amp; above

77.3

150.0

77.5

154.5

72.7 &lt;

77.0 &lt;

149.7 &lt;

0.58 &lt;

77.5

157.5

78.8

154.1

80.0 &lt;

75.3 &lt; 11

105.3 &lt;

0.47 &lt;

(0.52)

111.2

$$\begin{array}{r} 4 \overline{) 225} \quad 19 < \\ 10 \quad 56 \quad 20 < \\ \hline 15 \quad 56 \quad 9 \\ +3 \quad 37 \quad 9 \\ +3 \quad 42 \quad 53 \end{array}$$

$$\begin{array}{r} 15 \quad 56 \quad 9 \\ +3 \quad 37 \quad 9 \\ +3 \quad 42 \quad 53 \end{array}$$

$$\begin{array}{r} 15 \quad 56 \quad 9 \\ +3 \quad 37 \quad 9 \\ +3 \quad 42 \quad 53 \end{array}$$

$$\begin{array}{r} 15 \quad 56 \quad 9 \\ +3 \quad 37 \quad 9 \\ +3 \quad 42 \quad 53 \end{array}$$

$$\begin{array}{r} 15 \quad 56 \quad 9 \\ +3 \quad 37 \quad 9 \\ +3 \quad 42 \quad 53 \end{array}$$

$$\begin{array}{r} 15 \quad 56 \quad 9 \\ +3 \quad 37 \quad 9 \\ +3 \quad 42 \quad 53 \end{array}$$

3.18

78.4

152.5

72.3

151.2

74.1 &lt;

78.9 &lt;

153.0 &lt;

0.52 &lt;

$$\begin{array}{r} 9M = 0.64 \\ 9.27 \\ 9.91 \end{array}$$



3 18

Sept 11, 1896

11. J730

75.0  
156.4  
79.8  
153.3

(0.50)

81.4 <  
73.5 <  
154.9 <

0.48 &lt;

Right and below

11.9.40

170.0  
2431.0  
170.5  
2411.2

73.0 <  
160.7 <  
143.7 <

0.70 &lt;

H.40

170.5

(0.68)

11.40

2431.2

72.7 &lt;

0.67 &lt;

430 8 &lt;

169.0

72.4 &lt;

11 7 32 &lt;

241.4

145.1 &lt; XVIII

-12

M = 0.59

16 7 20  
+3 48 20  
+3 54 4

9.27  
9.66

15.30

170.0

2421.5

72.5 &lt;

0.73 &lt;

172.0

69.5 &lt;

241.5

142.0 &lt;

18.40

170.2

(0.72)

241.7

71.5 &lt;

170.2

72.2 &lt;

0.70 &lt;

242.4

143.7 &lt;

15 20  
16 40

Sept. 11, 1896  
Left and above

11.20.20

~~11.20.40~~

$$\begin{array}{r}
 22.20 \\
 \hline
 4 \overline{) 74.40} \angle \\
 11 \quad 18 \quad 40 \angle \\
 \hline
 -12 \\
 \hline
 16 \quad 18 \quad 28 \\
 +3 \quad 59 \quad 28 \\
 +4 \quad 5 \quad 12
 \end{array}$$

11.33.50

27.58

264.0

329.0

68.0 <

254.0

81.0 <

0.59 <

335.0

149.0 <

252.7

(0.52)

337.2

84.5 <

258.3

71.3 <

329.6

155.8 <

0.46 <

$$\begin{array}{r}
 M = 0.62 \\
 9.27 \\
 \hline
 9.49
 \end{array}$$

260.2

331.0

70.8 <

257.2

86.8 <

0.43 <

338.0

107.6 <

251.2

(0.41)

337.3

86.1 <

258.0

73.2 <

0.39 <

331.2

159.3 <

Right and below

349.0

60.0

71.0 <

341.0

84.1 <

0.48 <

65.8

65.1 155.1 <



Sept. 11. 1896  
Right and below

347.0

62.2

340.5

68.8

75.4 <

88.3 <

163.7 <

(0.40)

0.31 <

$$M = 0.40$$

$$\frac{9.27}{9.67}$$

341.0

68.6

348.0

62.2

87.6 <

74.0 <

161.6 <

0.35 <

(0.34)

347.9

63.2

341.0

67.8

75.5 <

86.8 <

162.3 <

0.34 <

Left & above

67.5

161.0

72.4

153.0

93.5 <

80.6 <

174.1 <

0.11 <

75.5

157.0

68.1

161.4

91.5 <

93.3 <

174.8 <

0.10 <

$$M = 0.22$$

$$\frac{9.27}{9.49}$$

11. 42.10

4144 43 <

11 36 1082

-14

16 30 - 14

+4 16 57

+4 22 41

11. 47.0

48.20

82.15

54.5

8201 40 <

11 50 205 <

-15

16 50 10

+4 31 10

+4 36 54

September 11, 1896

12.4.20

$$\begin{array}{r}
 70.8 \\
 160.0 \\
 71.9 \\
 154.2
 \end{array}
 \begin{array}{r}
 89.2 < \\
 82.3 < \\
 \hline
 171.5 <
 \end{array}
 \begin{array}{r}
 0.16 <
 \end{array}$$

6.0

$$\begin{array}{r}
 77.9 \\
 154.9 \\
 70.0 \\
 161.2
 \end{array}
 \begin{array}{r}
 77.0 < \\
 91.2 < \\
 \hline
 168.2 <
 \end{array}
 \begin{array}{r}
 (0.19) \\
 0.22 <
 \end{array}$$

Right and below

8.0

$$\begin{array}{r}
 160.4 \\
 250.7 \\
 171.0 \\
 244.7
 \end{array}
 \begin{array}{r}
 246.0 \\
 85.6 < \\
 73.7 < \\
 \hline
 159.3 <
 \end{array}
 \begin{array}{r}
 0.39 <
 \end{array}$$

12.5

$$\begin{array}{r}
 4730 \quad 252 \\
 12 \quad 7 \quad 36 < \\
 \hline
 16
 \end{array}$$

$$\begin{array}{r}
 17 \quad 7 \quad 20 \\
 +4 \quad 48 \quad 20 \\
 +4 \quad 54 \quad 4
 \end{array}$$

16.20

$$\begin{array}{r}
 167.0 \\
 243.4 \\
 163.0 \\
 248.
 \end{array}
 \begin{array}{r}
 76.4 < \\
 85.0 < \\
 \hline
 161.4 <
 \end{array}
 \begin{array}{r}
 (0.37) \\
 0.35 <
 \end{array}$$

$$\begin{array}{r}
 M = 0.28 \\
 9.27 \\
 \hline
 9.55
 \end{array}$$

$$\begin{array}{r}
 162.0 \\
 250.0 \\
 167.8 \\
 239.8
 \end{array}
 \begin{array}{r}
 88.0 < \\
 76.2 < \\
 \hline
 164.2 <
 \end{array}
 \begin{array}{r}
 0.30 <
 \end{array}$$



Sept. 11, 1896

1219.0

167.0

243.5

163.6

250.5

Left + above

6

78.5 &lt;

86.9 &lt;

163.4 &lt;

(0.31)

0.32 &lt;

23.10

249.2

338.0

257.0

331.7

88.8 &lt;

74.7 &lt;

163.5 &lt;

0.31

9

(0.28)

26.5

257.8

334.5

250.9

339.9

76.7 &lt;

89.0 &lt;

165.7 &lt;

0.27 &lt;

M = 0.30

9.27  
9.57

484 35 &lt;

12 21 09 &lt;

-16

17 20 53

+5 1 53

+5 7 07

23.20

247.0

340.5

257.0

333.4

93.5 &lt;

76.4 &lt;

169.9 &lt;

0.19 &lt;

(0.20)

30.5

257.0

334.0

250.4

342.0

77.0 &lt;

91.6 &lt;

168.6 &lt;

0.22 &lt;

23 20  
30 5

Sept 11, 1896

Right and below

12.35.55  
~~12.35.55~~

340.0

72.0

345.0

64.8

9 2.0 <  
79.8 < 0.16 <  
171.8 <

345.2

(0.14)

66.5

339.3

71.2

81.3 <  
91.9 <  
173.2 <  
X 11.5 <

0.13  
~~0.51~~  
911 = 0.17  
9.27  
9.48

337.0

71.5

346.0

64.1

94.5 <  
78.1 < 0.14 <  
172.6 <

47.0

346.9

(0.17)

66.3

340.1

70.3

79.4 <  
90.2 < 0.20 <  
169.6 <

Left and above

68.7

162.0

75.8

156.8

93.3 <  
81.0 < 0.11 <  
174.3 <

50. 5



Sept. 11, 1886

$$\begin{array}{r}
 1252.2 \\
 \hline
 4 \overline{) 19427} \quad 147 \\
 12 \quad 48 \quad 37 \quad < \\
 \hline
 17 \quad 48 \quad 19 \\
 + 5 \quad 29 \quad 19 \\
 \hline
 22 \quad 77 \quad 38
 \end{array}$$

58.55

74.3

155.8

65.6

165.1

66.1

161.4

75.2

159.4

71.1

154.2

69.2

164.1

Right + below

162.0

251.0

164.8

241.8

165.0

243.5

167.7

252.6

+(0.04)

81.5-2

100.1-2

181.6-2

178.4

-0.03

M = 0.10

$$\begin{array}{r}
 9.27 \\
 \hline
 9.37
 \end{array}$$

95.3-2

84.2-2

179.5-2

0.01-2

(0.02)

83.1-2

94.9-2

178.0-2

0.04-2

1.00

$$\begin{array}{r}
 1.1.10 \\
 \hline
 4 \overline{) 23410} \quad 13. \\
 12 \quad 58 \quad 32 \quad < \\
 \hline
 17 \quad 58 \quad 13 \\
 + 5 \quad 39 \quad 13
 \end{array}$$

89.0-2

77.0-2

166.0-2

0.27-2

(0.24)

78.5-2

89.9-2

168.4-2

0.22-2

$$\begin{array}{r}
 M = 0.13 \\
 9.27 \\
 \hline
 9.40
 \end{array}$$

Sept 11. 1896.

1. 4.0

160.4

250.2

168.9

~~245.5~~

245.5

89.8 &lt;

26.6 < 0.26 <

166.4 &lt;

1. 7.

7.20

165.8

244.3

161.7

250.0

79.5 &lt;

88.3 &lt;

166.8 <

0.20 &lt;

(0.26)

Left and alive

10, 15

257.8

344.2

258.1

338.4

92.4 &lt;

80.3 &lt;

172.7 <

0.14 &lt;

252.5

336.8

246.1

341.2

84.3 &lt;

95.1 &lt;

179.4 < ✓ 11

0.01 &lt;

M = 0.17  
9.27  
9.42

250.8

337.8

254.1

336.2

87.0 &lt;

82.1 &lt;

169.1 <

0.20 &lt;

13.40

435-15 <

13 8 49 &lt;

-20

18 8 29

+5 49 29

+5 50-13

181.30

195



18 30

Sept. 11, 1896.

1.20.0

254.2		(0.14)
337.0	82.8 <	
246.0	<u>93.1 &lt;</u>	0.08 <
339.1	175.9 <	

Right &amp; below.

22

22.45

338.9	9	
69.2	80.3	1
343.8	80.0 <	0.08 <
63.8	<u>180.3</u>	
	7	

(0.20)

24.45

486	0 <
13 21	30 <
	-21

18	21	9
+6	2	9
+6	7	53

346.7		
66.7	80.0 <	
340.0	<u>88.9 &lt;</u> + VIII	0.21 <
68.9	168.9 <	
		M = 0.17
		<u>9.27</u>
		9.27

Images rather faint towards the end of settings.

Mr. Murdoch's watch was 21 sec. fast at end.

Sept. 15. 1896. (Tuesday)

Cloudy.

7 0

7 30

2 0

2 15

2 30

"

"

"

"

Somewhat clearer. Will try  
for Comp. Stars for X Cygni. H. obs.  
Plot. I.

19		
<del>16</del>	K1	+33.4
20	35	
+0	54	
	40	
+1	38	

24
15
40



Sept 15, 1896

Star ~~##~~<sup>K</sup> compared with Eighth  
 Magnitude star =  $\alpha = \text{Dec. } +32^\circ 35' 49'' (2.0)$

index Left and above

10.13.30

83.0		
92.0	9.0 <sup>✓</sup>	
81.4	11.1 <sup>✓</sup>	
92.5	20.1 <sup>✓</sup>	5.22 <sup>✓</sup>

80.7	11.4 <sup>✓</sup>	
92.1		
82.0	9.9 <sup>✓</sup>	
91.9	21.3 <sup>✓</sup>	5.15 <sup>✓</sup>
		.43

Right and below. 5.22

171.0		12.5 <sup>✓</sup>
<del>185.5</del>	183.5	
172.0		
184.2		12.2 <sup>✓</sup>
		24.7 <sup>✓</sup>
		K.23 <sup>✓</sup>

~~27~~  
 10. 92.20

172.1		10.5 <sup>✓</sup>
182.6		
172.2		11.4 <sup>✓</sup>
183.6		21.9 <sup>✓</sup>
		5.09 <sup>✓</sup>
		4.96
		mean = 5.09

Sept 15, 1896

Star 9.8<sup>c</sup> compared with 8th magnitude

10.2

10.27.10

171.0

185.3

169.8

186.0

14.3<sup>v</sup>

$$\frac{16.2^v}{30.5^v} \quad 4.37^v$$

169.3

189.4 185.8

171.5

184.7

16.5<sup>v</sup>

$$\frac{13.2^v}{29.7^v} \quad \frac{4.42}{4.40}$$

Left and above

10.26.40

260.0

273.1

260.0

272.8

~~272.8~~13.1<sup>v</sup>

$$\frac{12.4^v}{25.9^v} \quad 4.73$$

258.4

274.8

260.1

275.0

273.2

16.4<sup>v</sup>

$$\frac{13.1^v}{29.5^v} \quad \frac{4.44}{4.50}$$
mean = 4.49<sup>v</sup>



Sept. 15, 1896

Star ~~D~~<sup>8</sup> compared with 8th.  
magnitude.

11.15.10

$$\begin{array}{r}
 256.3 \\
 272.4 \\
 256.5 \\
 279.0 \\
 \hline
 44.6
 \end{array}
 \begin{array}{r}
 +6.7 \\
 22.1 \checkmark \\
 22.5 \checkmark \\
 44.6 \checkmark
 \end{array}
 \begin{array}{r}
 \\
 \\
 \\
 3.53 \checkmark
 \end{array}$$

$$\begin{array}{r}
 256.0 \\
 278.8 \\
 255.0 \\
 279.2 \\
 \hline
 47.0
 \end{array}
 \begin{array}{r}
 22.2 \checkmark \\
 24.2 \checkmark \\
 47.0 \checkmark
 \end{array}
 \begin{array}{r}
 \\
 \\
 3.41 \checkmark \\
 3.47 \checkmark
 \end{array}$$

Right &amp; below.

421

$$\begin{array}{r}
 348.0 \\
 7.3 \\
 345.0 \\
 10.5 \\
 \hline
 44.2
 \end{array}
 \begin{array}{r}
 19.3 \checkmark \\
 25.5 \checkmark \\
 44.2 \checkmark
 \end{array}
 \begin{array}{r}
 \\
 \\
 3.52 \checkmark
 \end{array}$$

$$\begin{array}{r}
 345.0 \\
 9.9 \\
 347.6 \\
 7.3 \\
 \hline
 44.6
 \end{array}
 \begin{array}{r}
 24.9 \checkmark \\
 19.7 \checkmark \\
 44.6 \checkmark
 \end{array}
 \begin{array}{r}
 \\
 \\
 3.53 \checkmark \\
 3.52 \checkmark
 \end{array}$$

10 ✓

h 2 Var., Var. 2 K. in lar. tel.  
Too ft. for further. mean = 3.50 ✓

September 15, 1896.

Troubled throughout by clouds.  
and equalization, consequently,  
a little uncertain.

Became too cloudy to finish series.

The preceding comp. stars for  $\gamma$  Cygni  
were first <sup>recorded</sup> in pencil in old notation  
as on right of p. 121. Book 3. Series 7.  
but have been changed into final nota-  
tion in red.



Sept. 16. 1896. (Tuesday)

7 0

Cloudy.

7 20

"

Quite cloudy still but will try  
for a double star.

$\Sigma$  3053. Alt. R. Gr. obs.

23	56	+65 <sup>0</sup> / <sub>4</sub>
19	25	
<hr/>	<hr/>	
<del>28</del>	31	

Thickly Clouded

$\Sigma$  28'  $\mu$  Bootis N. obs.

15 hours 20	+ 37.8
19	32
<hr/>	<hr/>
+ 4. 12	

Sept 16. 1896.

Sky a little clearer, will try again for double

$$\begin{array}{r}
 15.20 \\
 20.7 \\
 \hline
 + 4.47 \\
 \hline
 \end{array}
 + 37.8$$

8.15

Clouds thick.

8.30

Still all cloudy

8.45

Still all cloudy; No chance for work.



Sept. 14. 1896. (Friday)

7 0

Cloudy.

7 30

Cloudy, but will try for.

$\Sigma 3053$  Phot. R. Obs.

$$\begin{array}{r} 23 \quad 56 \quad +65.4 \\ 19 \quad 30 \\ \hline -4 \quad 26 \end{array}$$

Clouds too thick.

$\Sigma 321$   $\mu$  Bootis Obs.

$$\begin{array}{r} 15 \quad 20 \quad +37.2 \\ 19 \quad 45 \\ \hline +4 \quad 25 \end{array}$$

Double invisible. Clouds thick.

$\Sigma 2010$ . Obs.

$$\begin{array}{r} 16 \quad 2 \quad +17.4 \\ 20 \quad 5 \\ \hline +4 \quad 3 \end{array}$$

Clouds too thick.

Sept. 14, 1896.

A 15

Still thickly cloudy.

A 30

"

"

"

A little clearer, <sup>in north</sup> will try for

Σ 2010.

Gr. obs.

$$\begin{array}{r} 16 \quad 2 \quad +17.4 \\ \hline 20 \quad 45 \\ +4 \quad 43 \end{array}$$

A 47

All cloudy again. Clouds coming in very heavy masses.



Sept. 21. 1896. (Monday)

7 0

Thickly cloudy.

7 30

" "

A 0

" "

A 30

" "

Some clearer. Will try for double.  
stars.

$\Sigma$  2220.  $\mu$  Hercules'. G. obs.  
Phot. R.

$$\begin{array}{r} 17 \quad K2 \quad +27.A \\ 21 \quad 0 \\ \hline +3 \quad 1.A \end{array}$$

Pos. Aug.  $240^\circ$   
 $272^\circ$  Dist. 30". Magn. 9.0, 9.5

Index to right.  
136.1  $\angle$  btr. des.

144.7

138.0

144.0

9 5

Sept. 21. 1896.

Clouds thick again. Stars  
gone.

9 15

Sky thickly covered with clouds  
in heavy masses. No chance for work.



Sept. 23, 1896. (Wednesday)

$\Sigma$  2021, 49 Serpentes. W. St.  
Phot. F. R.

$$\begin{array}{r} 16 \quad A \quad + 13.8 \\ 19 \quad 25 \\ \hline + 3 \quad 37 \end{array}$$

This double by the book is 6.7 6.9  
The only double in this region which  
can be found seems rather fainter than  
6.7 but the distance of components is some  
3" as wanted. The companion must be  
as faint as 9.3 or 9.5  
Seeing not good enough to measure  
no close stars.

~~$\Sigma$  2022, 52 Ser~~

$\Sigma$  2096. 19 Ophiuchi W. St.

$$\begin{array}{r} 16 \quad 41 \quad + 2.3 \\ 20 \quad 6 \\ \hline + 3 \quad 25 \end{array}$$

Chronometer found to be wrong  
by setting on + Ophiuchi

Sept. 23. 1896.

+ Opbeuch for chr. error,  

$$\begin{array}{r} 20 \quad 21 \\ 2 \quad \sqrt{6} \\ \hline 17 \quad 25 \end{array} \quad +125$$

Chronom. set right.

$\Sigma$  2096 19 Opbeuchi Yr. obs.  
 Phot. R.

$$\begin{array}{r} 16 \quad K1 \quad +23 \\ 20 \quad 35 \\ \hline +3 \quad 5K \end{array}$$

Pos. Ang.  $45^\circ$  Dist. 25" Wap. 6.0, 9.4  
 Index right + above.

A 16

39.1  $\angle$  brtr. dis.  

$$\begin{array}{r} 62.9 \quad 23.8 \\ 34.3 \quad \underline{23.9} \quad 3.38 \\ 62.2 \quad 47.7 \end{array}$$

3.33

$$\begin{array}{r} 34.6 \\ 62.6 \quad 24.2 \\ 37.5 \quad \underline{25.7} \quad 3.28 \\ 63.2 \quad 49.9 \end{array}$$



Sept. 23. 1896.  
Index left & below.

129.5		
151.4	21.9	
129.0	25.9	3.37
154.9	47.8	

3.36

124.6		
153.2	24.6	
129.2	23.9	3.34
153.1	48.5	

Mean = - 3.34

Images faint from <sup>rather</sup> low altitude, moon  
light and faintness of companion.

□ 2190. P. XVII 163. W. ds.  
Phot. R.

17	31	+ 21.1
21	2	
+ 3	31	

Index left & above.

Pos. Aug. 20. Dist to <sup>6.4</sup> Wags. v. d. 9.4

131.2		
151.0	19.8	
126.0	28.9	3.33
154.9	48.7	

A v r

Sept. 23. 1896.

12 A.V

3.25

15 A.V

26.3

129.0

$$\begin{array}{r} 26.0 \\ \hline 52.3 \end{array}$$

3.17

145.0

Index right + below. Mean = 3.30

220.2

243.9

23.7

214.0

$$\begin{array}{r} 25.8 \\ \hline 49.5 \end{array}$$

3.29

243.4

3.35

219.0

243.3

24.3

219.3

$$\begin{array}{r} 22.7 \\ \hline 47.0 \end{array}$$

3.41

~~243.0~~

242.0

Images faint in moonlight.

Clock broke down. Stopped to repair it.

Σ 2447. η Lyrae. W. obs. Phot. R.

19

10.

+39.6

21

5A

+2

4A



Sept. 23. 1896.  
 Index right & below.  
 Pos. Ang.  $70^\circ$  Dist. 2 A. "wavy". 4.0, A.3

9 40

218.1	< intro. dis.	
241.2	23.1	
221.5	<u>19.3</u>	3.64
241.1	42.4	
		3.72

wavy	222.3	
	<del>242.0</del> 239.0	16.7
	220.5	<u>22.5</u>
	243.0	39.2
		3.81

Index left & above.

311.0		
330.1	19.1	
312.0	<u>17.3</u>	3.98
329.3	36.4	

4.04

9	49	
9	44	30

312.2		
324.5	16.3	
312.0	<u>18.1</u>	4.10
330.1	34.4	

Mean = 3.88

Sept. 23. 1896.

 $\Sigma$  45' 151 Aquilae B. W. obs.  
Phot. R.

$$\begin{array}{r} 19 \quad 36 \quad -4.6 \\ 22 \quad 27 \\ \hline +2 \quad 51 \end{array}$$

Pos. Aug. 140". Dist. 1.7 mag. 6.5, 6.9  
Index below.

$$\begin{array}{r} 10 \quad 10 \\ 2 \quad 23.2 \\ 3 \quad 52.5 \\ 2 \quad 20.1 \\ \hline 5.5 \end{array} \quad \begin{array}{r} 75.3 \\ 85.4 \\ \hline 160.7 \end{array} \quad \begin{array}{l} 0.37 \\ 0.30 \end{array}$$

$$\begin{array}{r} 2 \quad 77.9 \\ 6.5 \\ 2 \quad 20.9 \\ \hline 0.0 \end{array} \quad \begin{array}{r} 88.6 \\ 79.1 \\ \hline 167.7 \end{array} \quad \begin{array}{l} 0.23 \\ 0.40 \end{array}$$

$$\begin{array}{r} 13.0 \\ 89.2 \\ 9.0 \\ 92.0 \end{array} \quad \begin{array}{r} 76.2 \\ 83.0 \\ \hline 159.2 \end{array} \quad \begin{array}{l} 0.40 \\ 0.42 \end{array}$$

$$\begin{array}{r} 10.1 \\ 90.5 \\ 12.0 \\ 29.0 \end{array} \quad \begin{array}{r} 80.4 \\ 77.0 \\ \hline 157.4 \end{array} \quad \begin{array}{l} 0.43 \\ 0.36 \end{array}$$

$$\begin{array}{r} 10 \quad 12 \\ \hline 15.2 \text{ g.M.T.} \end{array}$$

Mean - - 0.36



Sept. 23. 1896.

0 Cete. Phot. R. Gr. obs.

$$\begin{array}{r}
 2 \quad 4 \quad -2.5 \\
 22 \quad 55 \\
 \hline
 -3 \quad 9 \\
 2 \quad 51
 \end{array}$$

Index above.

10 KK

$$\begin{array}{r}
 12.0 \\
 89.2 < \text{Var. dis.} \\
 10.0 \\
 93.2
 \end{array}
 \begin{array}{r}
 77.2 \\
 83.8 \\
 \hline
 161.0
 \end{array}
 \begin{array}{r}
 -0.36
 \end{array}$$

$$\begin{array}{r}
 11.5 \\
 91.2 \\
 12.2 \\
 90.2
 \end{array}
 \begin{array}{r}
 80.3 \\
 78.0 \\
 \hline
 158.3
 \end{array}
 \begin{array}{r}
 -0.41 \\
 \hline
 -0.38
 \end{array}$$

Index below.

$$\begin{array}{r}
 102.0 \\
 179.0 \\
 102.0 \\
 121.5
 \end{array}
 \begin{array}{r}
 77.0 \\
 79.5 \\
 \hline
 156.5
 \end{array}
 \begin{array}{r}
 -0.45
 \end{array}$$

Sept. 23, 1896.

10	5.8	102.0		
<hr/>		141.9	79.9	
10	5.1	102.2	77.0	0.44
		179.2	<hr/> 156.9	<hr/> -0.44
			M.	-0.41

Observations ~~are~~ somewhat difficult.  
 Moon at the full and not very  
 far distant. Sky bright and  
 images ~~are~~ rather faint when equalized.



Sept. 24. 1896. (Thursday)

7 0

Cloudy.

7 30

"

8 0

"

8 30

Cloudy with no prospect of clearing.

Posted to here.

Sept. 25. 1896. Friday.

7 0

Moon up.

$\Sigma$  1919. H. A. 62: Phot Q: W. obs.

$$\begin{array}{r} 15 \quad 7 \quad +19.4 \\ 20 \quad 4 \\ \hline +4 \quad 57 \end{array}$$

Position angle =  $0^\circ$  : Distance =  $22''$  ;  
magn = 6.0 and 6.8.

Index to right and below.

7

51

194.5 < brighter dis.

264.7

70.2 >

190.4

83.6 >

274.0

153.8 >

0.50 >

192.7

269.0

76.3 >

0.66 >

197.4

69.6 >

0.58 >

267.0

145.9 >

Index to left and above.

288.2

354.8

66.6 >

284.1

74.2 >

0.76 >

358.3

140.8 >



Sept. 25, 1896.

286.5

355.9

~~288.0~~

355.3

284.3

694.5

71.0

140.4

0.77

0.76

0.67

mean

Observations this some light clouds.  
obliged to stop and set both instruments.

Σ 1965 S Baranac: Phot. H: W. obs

15

35

+37.0

2045  
10~~Index to left and above.~~~~95.1~~~~158.6~~~~97.7~~~~157.6~~

Sept. 25, 1896.

~~98.3~~  
~~below~~  
~~159.2~~  
~~97.7~~

~~Index to right and below~~  
 Reject above: phot. not clamped

Index to left and above.

100.7  
 158.2 < brighten dis.

95.8      57.5 >  
 160.2      64.4 >      1.15 >  
             121.9 >

96.9  
 159.2      62.3 >      1.02 >  
 97.6      65.6 >      1.08 >  
 162.9      127.9 >

Index to left and below

187.2  
 249.9      62.7 >  
 184.2      68.3 >      0.96 >  
 252.5      131.0 >



Sept. 25, 1896.

187.2

251.8

185.3

249.9

64.6 &gt;

64.6 &gt;

129.2 &gt;

1.00 &gt;

0.98 &gt;

1.03 > =  
mean

Position angle = 290 distance = 6"  
 magn. = 4.2 and 5.0

Observations made this same day

8 Cephei

W. obs.

$$\begin{array}{r} 21 \\ 21 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 37 \\ 7 \\ \hline \end{array}$$

+78.3

clouds thick: no stars visible.

8 55 clouds still thick.

9 0 clouds pretty thick but obs. have  
 casual glimpses of 8 Cephei; and  
 thought he identified stars L and M  
 with some certainty; as near as obs.  
 could guess from momentary glimpses  
 the clouds, now would be about mid-

Sept. 25, 1896,

way between l and m.

Observation gives maximum and must not be used.

clouds thick again

$\Sigma$  1382:  $\epsilon$  Lyrae. Phot ~~2~~<sup>1</sup>: Wals

18

40

+39.6

$\frac{21}{2}$

$\frac{41}{2}$

9

25

all thick

clouds thick: can not do anything with it.

Stars invisible.

10

25

$\epsilon$  invisible.

no chance for  $\epsilon$  Lyrae



Sept. 25, 1896.

$\Sigma 2637: \theta$  Sagittae, Wolb

$$\begin{array}{r} 20 \\ 23 \\ \hline 3 \end{array} \quad \begin{array}{r} 4 \\ 14 \\ \hline 10 \end{array} \quad +20.5$$

clouds thick: no stars visible.

Well's Nav: Phot 5: Wolb

$$\begin{array}{r} 20 \\ 23 \\ \hline 2 \end{array} \quad \begin{array}{r} 21 \\ 17 \\ \hline 46 \end{array} \quad 17.7$$

clouds thick: no stars visible

10 40 in this region.

$\Sigma 48': \theta$  XIX 320, 321 Wolb

$$\begin{array}{r} 19 \\ 23 \\ \hline 3 \end{array} \quad \begin{array}{r} 48 \\ 28 \\ \hline 40 \end{array} \quad +20.0$$

11 0 clouds thick: no stars visible.

Sept. 25, 1896.

Wellis Nar again: Phot 5: Wobs  
 20 31 17.8  
 $\frac{23}{2}$   $\frac{46}{15}$

11 10 60 lands thick: no stars visible

Index above

293.6  
 clouds thicker  
 16.2 < comp star dis

11 40 0  
 301.8  
 11.0  
 $82.6 <$   
 $69.2 < + 0.54 <$   
 $151.8 <$

11 43 4  
 301.8  
 8.0  
 291.1  
 16.4  
 $66.2 <$   
 $85.3 < + 0.55 <$   
 $151.5 < + 0.54 <$

Index below I

11 45 44  
 18.8  
 109.1  
 29.9  
 102.0  
 $90.3 <$   
 $72.1 < + 0.33 <$   
 $162.4 <$

clouds thicker



Sept 25, 1896.

$$\begin{array}{r}
 11 \quad 49 \quad 40 \\
 \hline
 \cdot \quad 4 \quad 18 \quad 28 \\
 11 \quad 44 \quad 37 \\
 \hline
 \quad \quad - 76 \\
 11 \quad 44 \quad 31
 \end{array}$$

$$\begin{array}{r}
 27.0 \\
 100.2 \\
 22.1 \\
 107.7
 \end{array}$$

$$\begin{array}{r}
 73.2 < \\
 85.6 < \\
 \hline
 158.8 <
 \end{array}
 \begin{array}{r}
 + 0.40 < \\
 + 0.36 < \\
 \hline
 + 0.45 =
 \end{array}$$

mean

$$11 \quad 52 \quad 47$$

$$\begin{array}{r}
 21.0 \\
 107.7 \\
 22.0 \\
 103.3
 \end{array}$$

$$\begin{array}{r}
 86.7 < \\
 75.3 < \\
 \hline
 162.0 <
 \end{array}
 \begin{array}{r}
 + 0.34 <
 \end{array}$$

$$11 \quad 54 \quad 35$$

$$\begin{array}{r}
 28.1 \\
 101.0 \\
 22.5 \\
 105.8
 \end{array}$$

$$\begin{array}{r}
 72.9 < \\
 83.3 < \\
 \hline
 156.2 <
 \end{array}
 \begin{array}{r}
 + 0.45 < \\
 + 0.40 <
 \end{array}$$

Index above II  
blonds thick

$$12 \quad 47 \quad 45$$

$$\begin{array}{r}
 109.9 \\
 102.2 \\
 120.0 \\
 195.2
 \end{array}$$

$$\begin{array}{r}
 201.2 \\
 91.3 < \\
 75.2 < \\
 \hline
 166.5 <
 \end{array}
 \begin{array}{r}
 + 0.20 <
 \end{array}$$

$$\begin{array}{r}
 120.7 \\
 194.5 \\
 112.8 \\
 198.0
 \end{array}$$

$$\begin{array}{r}
 73.8 < \\
 84.2 < \\
 \hline
 158.0 <
 \end{array}
 \begin{array}{r}
 + 0.42 < \\
 + 0.38 < \\
 \hline
 + 0.38 =
 \end{array}$$

$$\begin{array}{r}
 6 \quad 10 \\
 \hline
 4238 \quad 14 \\
 11 \quad 59 \quad 34 \\
 \hline
 \quad \quad - 6 \\
 11 \quad 59 \quad 28
 \end{array}$$

Mean = 0.37 mean

Sept. 25, 1896.

12 7 50

114.5

197.5

119.5

191.9

820 &lt;

72.4 < + 0.47 <

155.14 &lt;

12 10 0

118.0

192.5

115.8

200.1

74.5 &lt;

+ 0.40 &lt;

84.3 <

+ 0.44 &lt;

158.18 &lt;

Index below III

12 11 57

206.2

227.7

210.9

284.4

81.5 &lt;

+ 0.54 &lt;

70.5 <

152.0 &lt;

13 27

210.7

283.5

209.4

286.4

72.8 &lt;

+ 0.58 &lt;

77.0 <

+ 0.56 &lt;

149.8 &lt;

+ 0.50 &lt;

4 (43 14

194

12 10 48

+ 6

12 10 42

Last setting somewhat doubtful:  
thick clouds.

Stopped by increasing clouds.



Sept 25, 1896.

Clouds growing thicker, heavy  
southern clouds also coming in.

no chance for anything further.

12.30 as Probably these sets should be repeated  
as they were made with some difficulty

Arnold + Dent #958

Band #394

$$\begin{array}{ccccccc} \text{h} & \text{m} & \text{s} & & \text{h} & \text{m} & \text{s} \\ 12 & 34 & 01.6 & = & 12 & 34 & 05.0 \end{array}$$

and Arnold + Dent #958 is 01.6<sup>s</sup> fast of  
Band #394: but Band #394 is  
04.3<sup>s</sup> fast: therefore Arnold and  
Dent #958 is 05.9<sup>s</sup> fast —

Sept. 26, 1896 (Saturday)

S Cephei

W: obs.

$$\begin{array}{r} 21 \\ 19 \\ -1 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 37 \\ 35 \\ -2 \\ \hline 42 \\ 18 \end{array}$$

$$+78.3$$

- 7 30 l 3 var: var 1 m: c W obs
- 7 35 l 2 var: var 3 m: c from obs
- 7 40 l 2.5 var: var 1.5 m: c W: obs again

now just up.

- 7 43 estimate = 10.2 W: obs.

all above in large telescope: rather too faint for finder

sky a little brighter and even a little fainter in W's second estimate



Sept. 26. 1896.

S. Androm : Phot. T: w: obs

$$\begin{array}{r}
 -4 \\
 20 \\
 \hline
 -3 \\
 8
 \end{array}
 \qquad
 \begin{array}{r}
 14 \\
 27 \\
 \hline
 47 \\
 137
 \end{array}
 \qquad
 +26.7$$

Index to left and above.

$$\begin{array}{r}
 57.1 \\
 75.0 \\
 56.5 \\
 74.9
 \end{array}
 \quad \leftarrow \text{comp. from dis.}$$

$$\begin{array}{r}
 17.9 \\
 18.4 \\
 \hline
 36.3
 \end{array}
 \quad 3.98$$

$$\begin{array}{r}
 57.0 \\
 74.7 \\
 57.0 \\
 75.4
 \end{array}
 \quad
 \begin{array}{r}
 17.7 \\
 18.4 \\
 \hline
 36.1
 \end{array}
 \quad
 \begin{array}{r}
 4.00 \\
 3.99
 \end{array}$$

Index to right and below.

$$\begin{array}{r}
 142.9 \\
 170.0 \\
 144.2 \\
 167.4
 \end{array}
 \quad
 \begin{array}{r}
 26.1 \\
 23.2 \\
 \hline
 49.3
 \end{array}
 \quad 3.30$$

$$\begin{array}{r}
 145.2 \\
 166.6 \\
 144.5 \\
 167.2
 \end{array}
 \quad
 \begin{array}{r}
 21.4 \\
 22.7 \\
 \hline
 44.1
 \end{array}
 \quad
 \begin{array}{r}
 3.55 \\
 3.42 \\
 \hline
 \end{array}$$

mean = 3.70

$$\begin{array}{r}
 8 \quad 64 \quad 8 \\
 \hline
 8 \quad 12 \quad 2 \quad 3 \\
 \hline
 8 \quad 1 \quad 0 \quad 1.5
 \end{array}$$

Sept. 26, 1896.

Androm is faint and bright  
 run up so that observations were  
 very difficult.

Same again.

Index to right and below.

8	12	11	146.1	< comp. var. dis.	
			166.2	20.1	
			147.0	<u>19.9</u>	3.77
			166.9	40.0	

			146.4		
			166.5	20.1	3.76
			147.0	<u>20.0</u>	3.76
			<del>144.6</del>		
			167.0	40.1	

Index to left and above

			56.0		
			76.0	20.0	
			57.0	<u>17.1</u>	3.93
			74.1	37.1	

8	18	18	56.1		
			74.9	18.8	3.91
			57.2	<u>18.7</u>	3.92
			75.9	37.5	
					mean = 3.84

8	18	18
	2(10	29
8	15	14.5



Sept. 26, 1896.

This last group considered rather more reliable, as, for some reason, T. Androm. was rather better seen.

M. P. 441

Phot. R: Wicks

$$\begin{array}{r} 3 \\ 21 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 31 \\ 18 \\ \hline 23 \\ 27 \end{array}$$

$$+62.8$$

Index to left and below.

9 2 <sup>12</sup>  
45

170.9

~~113.5~~

~~var dis.~~

~~113.5~~

~~171.8~~

~~57.4~~

~~58.3~~

~~115.7~~

112.9

171.9

112.8

170.0

59.0

Reject: phot. not dampened.

Sept. 26, 1896.

Index to left and below,

293.5 &lt; var. dis.

350.8

296.4

349.4

57.3

53.0

110.3

-1.41

293.2

349.2

294.1

349.9

56.0

55.8

111.8

-1.38

-1.40

Index to right and above.

23.8

81.3

21.9

82.0

57.5

60.1

117.6

1.25

21.5

82.7

22.8

80.0

61.2

56.2

117.4

1.25

1.25

mean = 1.32

9 16 20  
212.5 55  
 9 12 57.5



Sept. 26, 1896.

e Lyrae: Phot.  $\pm$ : W: obs $\Sigma 2382:$ 

$$\begin{array}{r} 18 \\ 22 \\ \hline 3 \end{array} \quad \begin{array}{r} 40 \\ 5 \\ \hline 25 \end{array} \quad + 39.6$$

Position angle = 20: distance = 3":  
 magn. = 4.7 and 6.4

Indices to left and above

281.0

337.1

278.2

344.7

276.3

345.4

280.6

328.4

&lt; brighter stars

56.1

66.5

122.6

69.1

57.8

126.9

1114

1.04

1.09

Indices to right and below.

113.2

66.7

4.3

74.8

52.5

70.5

124.0

1.11

Sept. 26, 1896.

9 39 34

5.0		
74.5	69.5	
<del>12.8</del>	<del>54.5</del>	
67.3	124.0	
	mean	= 1.10

Images do not quite go over each other when position circle is turned, altho' ordinary and extraordinary nearly transit over each other. ✓

Comp. of 5 Lyrae are a little closer so that they cannot be well measured with Phot. 54.

Eyes were pushed in farther so that obs. can now measure 5 Lyrae: abandoned as seeing is growing hazy.

$\Sigma 2424$ ; 11 Aquilae Phot. R. W. obs.

18	53	+ 13.5
22	35	
<u>3</u>	<u>42</u>	

Position angle =  $250^\circ$ ; distance =  $18''$ ;  
magn. = 5.8 and 9.4



Sept. 26, 1896.

Index tonight.

341.9 &lt; brighter dis.

356.5

340.9

356.5

14.6

15.6

30.2

4.39

339.2

357.0

341.1

355.9

~~356.6~~

17.8

14.8

32.6

4.38

4.22

Index to left. Mean =

70.9

86.5

68.5

88.3

15.6

19.8

35.4

-4.04

68.9

88.3

71.1

86.0

19.4

14.9

34.3

-4.08

-4.11

Mean = -4.19

Sept. 26. 1896.

Determination of position of new  
 photo. var. at about 21<sup>h</sup> 37<sup>m</sup>  
 +42° 55'

$$\begin{array}{r} 21 \\ \underline{23} \\ 1 \end{array} \quad \begin{array}{r} 24 \\ \underline{4} \\ 20 \end{array} \quad + 42.7$$

~~$$\begin{array}{r} 23^h \quad 36^m \quad 21.9^s \\ 45.8 - 0.4 \\ 38 \quad 24.8 \\ 47.2 \\ 39 \quad 13.7 \\ 37.4 \end{array}$$~~

Reject: wrong star.

$$\begin{array}{r} 23^h \quad 43^m \quad 4.7^s \quad \text{Var.} \\ 37.5 \quad \text{Var.} \\ 45 \quad 9.8 \quad \text{C.S.} \\ 35.2 \quad \text{C.S.} \end{array}$$

$$\begin{array}{r} 45 \quad 57.1 \\ 46 \quad 29.6 \\ 48 \quad 01.1 \\ 27.6 \end{array}$$



Sept. 26, 1896.

23<sup>h</sup> 48<sup>m</sup> 51.<sup>s</sup><sub>8</sub>  
 49 24.1  
 50 56.5 minus ~~0.5~~ 0.6  
 51 22.7

~~51 59.4~~  
~~52 31.5~~  
~~2.8~~ Reject.

~~54 25.0~~  
~~55.7~~  
~~56 29.1~~  
~~54.5~~ } Reject this set.

57 37.<sup>s</sup><sub>9</sub> minus 0.<sup>s</sup><sub>3</sub>  
 58 09.4 plus 0.<sup>s</sup><sub>2</sub>  
 59 41.6  
 60 08.8 minus 0.<sup>s</sup><sub>4</sub>

60 37.<sup>s</sup><sub>4</sub>  
 61 08.5  
 62 41.2  
 63 08.0

order in preceding transits: var.  
 var, comp. star, comp. star,

var. in northern half inside square

Sept. 26, 1896.

comp. star in Southern inside square

comp. star = D.M.  $+42^{\circ}$ : 4195  
(8.5 K). $\beta$  Lyrae. Phot.  $\beta^R$  mounted long  
optically on West Balcony = Phot.  $\beta^R$ 

Index to right

12	01.5	<del>190.8</del>	144.0	$\leq \beta$ dis.	
		<del>144.0</del>	190.8		
		146.8		46.8 >	
		189.6		42.8 >	1.92 >
				89.6 >	

12	08.5	147.5		43.7 >	1.99 >
		191.2		43.6 >	1.96 >
		147.2			
		190.8		47.3 >	

Index to left

12	13.4	65.3			
		92.3		27.0 >	2.98 >
		64.1		30.0 >	
		94.1		57.0 >	

12	19.1	63.1			2.89 >
	<del>17.9</del>	93.5		30.4 >	2.93 >
12	10.6 >	63.8		28.7 >	1.96 >
		92.5		59.1 >	4.89 >
				mean	= 2.44 >



Sept. 26, 1896.

Same again

Index to left.

12 28.4

244.5	
275.2	< B dis.
245.9	30.7 > 2.91 >
274.0	<u>28.1</u> >
	58.8 >

12 357.9

244.8	
274.4	29.6 > 2.80 >
244.0	<u>32.0</u> >
276.0	61.6 > 2.86 >

Index to right.

12 44.9

326.0	
11.7	<sup>4</sup> <u>55.7</u> > 2.00 >
329.9	<u>41.2</u> >
11.1	86.9 >

12 55.2

326.5	
11.0	44.5 > 1.96 >
327.2	<u>43.8</u> > 1.98 >
11.1	88.3 > 2.86 >
	<u>4.84</u> >
	mean = 2.42 >

12 41.1 >

These two groups were experimental on B Lyrae obs. not having observed for three weeks account of vacation: these were made with extreme difficulty at rather low altitude and in bright moonlight.

Sept. 28, 1896. (Monday)

7 0 cloudy.

7 30 cloudy.

8 0 cloudy.

8 15 Clearing.  
X bygni: Phot T. W. obs.

$$\begin{array}{r} 19 \\ 21 \\ \hline 2 \end{array} \quad \begin{array}{r} 41 \\ 46 \\ \hline 5 \end{array} \quad +33.4$$

Star K compared with comp. star.  
Index to left and above.

9 44 35-

$$\begin{array}{r} 331.0 \\ 340.7 \\ 330.7 \\ 340.3 \end{array} \quad \begin{array}{r} < \text{comp. star dis.} \\ 9.7 > \\ 9.6 > \\ \hline 19.3 > \end{array} \quad \begin{array}{r} 5.37 > \end{array}$$

$$\begin{array}{r} 330.9 \\ 339.8 \\ 330.2 \\ 339.4 \end{array} \quad \begin{array}{r} 8.9 > \\ 9.2 > \\ \hline 18.1 > \end{array} \quad \begin{array}{r} 5.51 > \\ 5.44 > \end{array}$$



Sept. 28, 1896.

Index to right and below

59.0

72.0

62.1

70.7

13.0 &gt;

8.6 >

21.6 &gt;

5.12 &gt;

61.4

71.4

59.5

71.8

10.0 &gt;

12.3 >

22.3 &gt;

5.05 &gt;

5.08 >mean = 5.26 >

9 51 31

Star I compared with comp star.

Index to right and below.

59.9 &lt; comp. star dis.

~~72.0~~

72.0

59.6

72.6

12.1 &gt;

13.0 >

25.1 &gt;

4.79 &gt;

59.4

73.2

60.1

70.7

12.8 &gt;

10.6 >

24.4 &gt;

4.86 &gt;

~~4.83 >~~

4.82 &gt;

9 45 25

Sept. 28, 1896.

Index to left and above.

148.4

164.7

149.7

162.1

16.3 &gt; 4.42 &gt;

13.4 >

29.7 &gt;

149.7

163.1

148.7

165.1

13.4 &gt; 4.42 &gt;

16.4 > 4.42 >29.8 >  
mean = 4.62 >Star B compared with comp. star.  
Index to left and above.

147.1

167.0

148.7

162.4

&lt; comp star dis.

19.9 &gt;

13.7 >

33.6 &gt;

4.15 &gt;

147.8

162.5

147.1

165.3

15.7 &gt;

18.2 >

33.9 &gt;

4.13 &gt;

4.14 >



Sept. 28, 1896

Index to right and below.

238.2

256.0

240.1

253.4

17.8 &gt;

13.2 >

21.1 &gt;

4.32 &gt;

239.9

252.5

237.5

254.7

12.6 &gt;

17.2 >

29.8 &gt;

4.42 >4.37 >min = 4.26 >Star compared with comp. star.  
Index to right and below

239.0

253.6

235.7

257.2

comp. star dis.

14.6 &gt;

24.5 >

36.1 &gt;

4.00 &gt;

237.3

254.5

239.6

254.1

11.2 &gt;

14.5 >32.3 >

31.7 &gt;

4.28 >4.14 >

Sept. 28, 1896.

Index to left and above

330.5

343.7

326.1

344.9

13.2 &gt;

18.8 >

32.0 &gt;

4.26 &gt;

327.6

344.5

328.7

343.0

16.9 &gt;

14.3 >

31.2 &gt;

mean = 4.22 >

4.32 &gt;

4.29 &gt;

Star S compared with comp. star.  
Index to left and above.

325.4

346.9

328.2

344.7

comp. star dis.

21.5 &gt;

16.5 >

38.0 &gt;

3.88 &gt;

328.2

345.4

325.7

347.3

17.2 &gt;

21.6 >

38.8 &gt;

3.84 &gt;

3.86 &gt;



Sept. 28, 1896.

Star  
Index to right and below.

52.7		
78.3	25.6 >	
56.4	<u>20.4</u> >	3.4-6 >
76.8	46.0 >	
55.9	19.1 >	
75.0	<u>22.6</u> >	3.68 >
53.9	41.7 >	<u>3.57</u> >
76.5	mean =	3.72 >

Same camp. star used in above  
measures as on previous night.

Moon rose shortly before begin-  
ning observations: made them a  
little more difficult.

Moon a little more than half  
full: some fog.

Sept. 28, 1896.

$\beta$  Lyrae : Phot. N : Cram also  
Index to right and above

11 22.7

147.8 <  $\beta$  dis.

191.5

43.7 >

1.98 >

146.3

44.0 >

190.3

87.7 >

11 22.5

148.1

43.3 >

1.96 >

191.4

45.1 >

1.97 >

146.9

88.4 >

192.0

Index to left and below.

11 42.2

242.1

32.9 >

275.0

32.9 >

2.66 >

242.2

65.6 >

Flagstaff interferes.

275.5

12 01.2

243.7

30.8 >

2.74 >

274.5

32.5 >

2.70 >

11 39.7 >

242.7

63.3 >

1.97 >

275.2

4.67 >

mean = 2.34 >



Sept. 28, 1896

Same again: trans. obs.  
Index to left and below

12	19.3	243.0	< B dis	32.2 >	2.69 >
		275.2		32.4 >	
		243.1		<u>64.6 &gt;</u>	
		275.5			

12	31.0	244.8		31.0 >	
		275.8		<u>30.5 &gt;</u>	2.80 >
		244.1		61.5 >	<u>2.76</u>
		274.6			2.74 >

Index to right and above

12	41.7	328.2		41.0 >	2.00 >
		9.2		<u>45.9 &gt;</u>	
		<del>324.3</del>	325.2	86.9 >	
		11.1			

12	54.1	327.2		44.3 >	2.00 >
		11.5		<u>42.4 &gt;</u>	2.00 >
12	36.5 >	329.1		86.7 >	<u>2.784</u>
		11.5			<u>2.37 &gt; = mean</u>

Observations most extremely difficult because of fog and moon-light: dew settled constantly on prism so that it had to be wiped off after every setting.

Posted to here.

Sept. 30, 1896. (Wednesday)

B Lyrae : Phot N : Grav. obs.

Index below

236.5

~~283.5~~ 289.0

240.5

280.4

b 39.0

Abn was an attempt to get  
B Lyrae at secondary before be-  
ginning on Well's Var.

Abandoned to start on Well's Var.



Sept. 30, 1896.

Willis Var: Phot. 5: W: obs

$$\begin{array}{r} 20 \\ 19 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 31 \\ 43 \\ \hline 48 \end{array}$$

$$+17.7$$

Index to right. a

$$23.6$$

&lt; comp. error dis.

$$107.6$$

$$84.0 >$$

$$32.8$$

$$68.1 >$$

$$0.53 >$$

$$100.9$$

$$152.1 >$$

$$27.4$$

$$100.1$$

$$72.7 >$$

$$0.66 >$$

$$29.6$$

$$73.1 >$$

$$0.60 >$$

$$102.7$$

$$145.8 >$$

Index to left. I

$$117.6$$

$$197.2$$

$$110.7$$

$$205.7$$

$$79.6 >$$

$$0.10 >$$

$$95.0 >$$

$$174.6 >$$

Sept. 30, 1896.

$$\begin{array}{r}
 7 \quad 1 \quad 13 \\
 \hline
 6 \quad 57 \quad 567 \\
 \quad \quad -13 \\
 \hline
 11 \quad 57 \quad 43
 \end{array}$$

$$\begin{array}{r}
 111.6 \\
 203.1 \\
 121.6 \\
 193.0 \\
 \hline
 91.5 > \\
 71.4 > \\
 162.9 > \\
 \hline
 \text{mean} = 0.40 >
 \end{array}$$

$$\begin{array}{r}
 7 \quad 4 \quad 23
 \end{array}$$

*Index left.*

$$\begin{array}{r}
 117.5 \\
 196.9 \\
 113.4 \\
 202.1 \\
 \hline
 79.4 > \\
 86.7 > \\
 166.1 > \\
 \hline
 0.26 >
 \end{array}$$

$$\begin{array}{r}
 7 \quad 6 \quad 15
 \end{array}$$

$$\begin{array}{r}
 113.9 \\
 203.6 \\
 121.2 \\
 198.0 \\
 \hline
 89.7 > \\
 76.8 > \\
 166.5 > \\
 \hline
 0.25 > \\
 0.25 >
 \end{array}$$

*Index to right.*

$$\begin{array}{r}
 7 \quad 8 \quad 23
 \end{array}$$

$$\begin{array}{r}
 213.4 \\
 282.7 \\
 206.5 \\
 291.2 \\
 \hline
 69.3 > \\
 84.7 > \\
 154.0 > \\
 \hline
 0.50 >
 \end{array}$$

$$\begin{array}{r}
 7 \quad 9 \quad 53 \\
 \hline
 7 \quad 07 \quad 137 \\
 \quad \quad -13 \\
 \hline
 12 \quad 7 \quad 0
 \end{array}$$

$$\begin{array}{r}
 207.2 \\
 291.3 \\
 212.9 \\
 284.8 \\
 \hline
 84.1 > \\
 71.9 > \\
 156.0 > \\
 \hline
 \text{mean} = 0.36 >
 \end{array}$$



Sept. 30, 1896.

Arnold + Dent #958 : Band #394

$$\begin{array}{ccccccc} 7^h & 14^m & 12.8 & = & 7^h & 14^m & 0.0 \\ \hline 7^h & 18^m & 12.6 & = & 7^h & 18^m & 0.0 \end{array}$$

A8D #958 12.6<sup>s</sup> fastbothered by beats from Fuchsheim in 1st comparison.  
Index right.

7 20 58

214.4

283.9

208.1

291.1

69.5 &gt;

83.0 &gt;

152.5 &gt;

0.53 &gt;

7 22 50

207.9

289.7

213.2

283.5

818 &gt;

70.3 &gt;

152.1 &gt;

0.53 &gt;

0.53 &gt;

Index to left.

III

7 26 30

304.2

11.5

295.4

16.3

67.3 &gt;

80.9 &gt;

148.2 &gt;

0.61 &gt;

298.0

19.4

302.4

12.9

81.4 &gt;

69.5 &gt;

150.9 &gt;

0.56 &gt;

0.58 &gt;

mean = 0.56 &gt;

$$\begin{array}{r} 7 \quad 28 \quad 38 \\ \hline 7 \quad 24 \quad 43 > \\ \hline \quad \quad -13 \\ \hline 12 \quad 24 \quad 30 \end{array}$$

Sept. 30, 1896.  
Index left.

7 31 30  
303.3  
10.2 66.9 > 0.63 >  
296.0 80.1 >  
16.1 147.0 >

7 33 20  
297.5  
14.3 76.8 > Down  
304.2 66.6 > cuts off  
10.8 143.4 > a little 0.71 >  
0.67 >

Index to right. IV

7 36 44  
31.5  
102.2 70.7 > 0.55 >  
25.0 80.4 >  
105.4 151.1 >

7 29 13  
7 35 127  
-13  
12 34 59  
25.4  
106.0 80.6 > 0.56 >  
31.2 70.3 > 0.56 >  
101.6 150.9 > mean = 0.62 >

Index right.

7 40 2  
29.0  
100.9 70.9 > 0.55 >  
25.1 79.3 >  
104.4 151.2 >



Sept. 20, 1896.

7 43 0

26.5  
105.2  
21.9  
99.678.7 >  
67.7 >  
146.4 > $\frac{0.65}{0.60} >$ 

Index to left. V

7 46 28

121.6  
196.0  
117.2  
198.474.4 >  
81.2 >  
155.6 >

0.47 &gt;

7	48	40
7	44	33 >
		-13
12	44	20

120.2  
197.4  
119.4  
195.177.2 >  
75.7 >  
152.9 > $\frac{0.52}{0.50} >$ 

mean = 0.55 &gt;

Index left.

7 58 23

119.4  
194.0  
116.5  
195.474.6 >  
78.9 >  
153.5 >

0.51 &gt;

8	1	9
---	---	---

120.2  
196.1  
121.3  
197.975.9 >  
76.6 >  
152.5 > $\frac{0.53}{0.52} >$

Sept 20, 1896  
Index to right.

8 2 10

215.2

282.9

212.2

285.0

VI

67.7 >

72.8 >

140.5 >

0.76 >

8 6 40  
8 02 327  
-13  
13 2 19

212.9

283.2

215.9

280.5

70.3 >

64.6 >

134.9 >

mean = 0.67 >

0.88 >

0.82 >

Index right, left,

302.9

11.7

304.6

11.4

68.8 >

66.8 >

135.6 >

0.86 >

8 18 23

8 19 52

301.9

9.2

304.6

9.2

67.3 >

64.7 >

132.0 >

0.94 >

0.90 >

Index to right VII

~~281.9~~

~~32.0~~

~~279.9~~

~~35.2~~

+++

Reject: wrong image dis.



Sept. 30, 1896.

~~Index left~~ ~~right~~ right.

8 33 25

216.1

283.5

67.4 &gt;

216.9

63.0 >

0.97 &gt;

279.9

120.4 &gt;

217.0

282.6

65.6 &gt;

0.96 >

216.4

65.3 >0.96 >

281.7

120.9 > mean = 0.937

---

Index right.

214.4

282.4

68.0 &gt;

217.8

62.5 >

0.97 &gt;

280.3

120.5 &gt;

215.7

279.7

64.0 &gt;

215.3

68.2 >0.93 >

283.5

132.2 >

0.95 &gt;

---

Index to ~~right~~ ~~left~~ left.

307.0

8.0

61.0 &gt;

1.08 &gt;

304.2

64.4 >

8.6

125.4 &gt;

$$\begin{array}{r}
 8 \quad 45 \quad 35 \\
 8 \quad 41 \quad 08 > \\
 \hline
 13 \quad 40 \quad 55
 \end{array}$$

$$8 \quad 48 \quad 22$$

$$7 \quad 50 \quad 29$$

$$8 \quad 56 \quad 20$$

$$\begin{array}{r}
 8 \quad 58 \quad 21 \\
 8 \quad 53 \quad 31 > \\
 \hline
 13 \quad 53 \quad 18
 \end{array}$$

Sept. 20, 1896.

$$305.0$$

$$8.6$$

$$305.1$$

$$8.3$$

$$63.6 >$$

$$63.2 >$$

$$126.8 >$$

$$\text{mean} = 1.00 >$$

$$1.05 >$$

$$1.06 >$$

Index left.

$$307.0$$

$$6.9$$

$$305.1$$

$$9.6$$

$$59.9 >$$

$$64.5 >$$

$$124.4 >$$

$$1.10 >$$

$$303.4$$

$$10.0$$

$$307.0$$

$$5.3 \quad 5.9$$

$$66.6 >$$

$$58.3 >$$

$$124.9 >$$

$$1.09 >$$

$$1.10 >$$

Index to right. IX

$$305.0$$

$$96.1$$

$$34.1$$

$$98.9$$

$$60.8 >$$

$$64.8 >$$

$$125.6 >$$

$$1.07 >$$

$$34.9$$

$$100.0$$

$$36.2$$

$$94.7$$

$$65.1 >$$

$$58.4 >$$

$$123.5 >$$

$$1.12 >$$

$$1.10 >$$

$$\text{mean} = 1.10 >$$



Sept. 30, 1896.

9 7 43

39.1

97.0

57.9 &gt;

36.9

58.0 >

1.28 &gt;

94.9

115.9 &gt;

9 9 23

37.2

95.0

57.8 &gt;

37.2

56.3 >

1.32 &gt;

93.5

114.1 &gt;

1.30 >

Index to left. and above

9 13 46

127.9

187.2

59.3 &gt;

123.0

66.4 >

1.07 &gt;

189.4

125.7 &gt;

126.0

190.4

64.4 &gt;

1.23 &gt;

131.9

53.7 >

1.15 &gt;

185.6

118.1 &gt;

mean = 1.22 >

9	15	18
9	11	32 >
		-13
14	11	19

9 17 53

128.6

187.9

59.3 &gt;

clouds

66.3 >

1.07 &gt;

120.6

125.6 &gt;

clouds

191.9

Sept. 30, 1896

126.0

189.5

~~128.9~~

129.2

187.4

63.5 &gt;

58.1 &gt;

121.6 &gt;

1.16 &gt;

1.12 &gt;

Index to right and below

219.8

275.0

219.3

278.4

55.2 &gt;

59.1 &gt;

114.3 &gt;

1.32 &gt;

220.8

276.0

221.0

273.5

55.2 &gt;

52.5 &gt;

107.7 &gt;

1.47 &gt;

1.40 &gt;

mean = 1.26 &gt;

a

222.1

272.0

223.0

275.6

50.9 &gt;

52.6 &gt;

103.5 &gt;

1.57 &gt;

222.4

274.7

222.9

272.0

52.3 &gt;

49.1 &gt;

101.4 &gt;

1.62 &gt;

1.59

1.60 &gt;



Sept. 30, 1896

Index to left ~~and~~ above, 4.

311.4

359.2

210.6

4.2

47.8 &gt;

53.6 &gt;

101.4 &gt;

1.62 &gt;

310.8

4.0

6.4

313.4

360.6

53.2 &gt;

50.6

47.2 &gt;

100.4 &gt;

1.65 &gt;

1.64 &gt;

mean = 1.62 &gt;

9 35 9

9 37 34 13 >

9 34 13 >

14 34 0

9 41 12

9 50

10 0

10 4 4

~~311.9~~

~~360.6~~

~~clouds~~

clouds.

clouds.

314.3

360.7

316.3

clouds

357.7

Rept.

~~46.4~~

~~47.4~~

~~87.8~~

Sept 20, 1896.

~~314.3~~~~357.4~~~~214.6~~~~359.6~~~~43.1~~~~45.0~~~~88.1~~

Reject.

~~318.9~~

belunds

10

15

10

30

belunds

b

320.0

354.6

320.8

356.6

34.6 &gt;

35.8 >

70.4 &gt;

2.49 &gt;

317.5

354.4

321.0

354.4

36.9 &gt;

35.4 >

70.3 &gt;

2.50 >

2.50 &gt;

Index tonight and below

47.4

84.1

48.6

83.7

36.7 &gt;

35.1 >

71.8 &gt;

2.45 &gt;



Sept 30 1896

$$\begin{array}{r}
 10 \quad 45 \quad 57 \\
 10 \quad 43 \quad 01 > \\
 \hline
 15 \quad 42 \quad 48
 \end{array}$$

47.4

83.4

45.9

86.6

36.0 &gt;

40.7 &gt;

76.7 &gt;

2.29 &gt;

2.27 &gt;

mean = 2.44 &gt;

a

10 48 15

47.6

85.1

50.4

81.2

37.5 &gt;

30.8 &gt;

68.3 &gt;

2.56 &gt;

10 50 24

49.0

82.0

45.6

85.7

23.0 &gt;

40.1 &gt;

73.1 &gt;

2.41 &gt;

2.48 &gt;

XIV

Index to left and above

135.6

180.5

141.0

176.0

44.9 &gt;

25.0 &gt;

79.9 &gt;

2.20 &gt;

2.38 &gt;

clouds

142.3

173.9

31.6

$$\begin{array}{r}
 10 \quad 52 \quad 40 \\
 10 \quad 51 \quad 19 > \\
 \hline
 10 \quad 51 \quad 6
 \end{array}$$

Balance of above group dropped by clouds.

Sept. 30, 1896.

11 23 12

128.9  
176.2  
139.8  
171.4

37.2 &gt; +

31.6 &gt; +

68.9 &gt; +

2.54 &gt; +

11 25 54

142.4  
172.0  
128.6  
177.0

29.6 &gt; +

38.4 &gt; +

68.0 &gt; +

2.57 &gt; +

2.56 &gt; +

Index to right and below a

11 29 0

232.1  
265.6  
233.9  
262.4

32.5 &gt; +

28.5 &gt; +

62.0 &gt; +

2.79 &gt; +

11 30 32

11 27 117

-13

16 26 58

234.6  
262.4  
231.7  
266.3

27.8 &gt; +

34.6 &gt; +

62.4 &gt; +

2.77 &gt; +

2.78 &gt; +

mean = 2.675

11 32 53

232.5  
263.1  
232.5  
261.6

20.6 &gt; +

29.1 &gt; +

59.7 &gt; +

2.87 &gt; +



Sept. 30, 1896.

11 35 8

234.8

259.6

230.8

264.9

24.8 &gt;

34.1 &gt;

58.9 &gt;

2.90 &gt;

2.542.70

2.88 &gt;

Index to left and above.

319.4

354.9

323.6

351.6

35.5 &gt;

28.0 &gt;

63.5 &gt;

2.73 &gt;

323.4

351.7

322.8

353.4

28.3 &gt;

30.6 &gt;

58.9 &gt;

2.90 &gt;

2.822.75

mean = 2.85 &gt;

11	39	49
11	36	30 >
		-13
16	36	17

Reject observations beyond this point.

See p. 155.

11 43 55

319.4

353.4

325.0

351.1

34.0 &gt;

26.1 &gt;

60.1 &gt;

2.86 &gt;

11 45 29

324.2

349.5

321.3

352.0

25.3 &gt;

11.7 &gt;

57.0 &gt;

2.98 &gt;

2.92 &gt;

Sept. 30, 1896.

Index to right and above a

11 47 47

49.9

85.7

~~47.9~~

82.0

35.8 &gt;

53.1 (28.9 &gt;

2.69 &gt;

64.7 &gt;

53.0

82.4

49.8

15.3

29.4 &gt;

35.5 &gt;

2.68 &gt;

64.9 &gt;

2.68 &gt;

mean = 2.80 &gt;

~~Reject observations beyond this point.~~a 82.6~~See p. 155.~~

11 52 9

82.6

48.0

83.1

31.4 &gt;

35.1 &gt;

2.62 &gt;

66.5 &gt;

11 53 56

49.3

83.4

51.9

81.9

34.6 &gt;

30.0 &gt;

2.71 &gt;

64.1 &gt;

2.66 &gt;

Index to left and above. b

11 57 22

140.0

172.1

132.1

176.4

32.1 &gt;

38.3 &gt;

2.49 &gt;

70.4 &gt;



Sept. 30, 1896.

$$\begin{array}{r}
 11 \quad 59 \quad 8 \\
 11 \quad 55 \quad 39 > \\
 \quad \quad -13 \\
 \hline
 16 \quad 55 \quad 26
 \end{array}$$

138.1  
172.9  
138.6  
172.4

$$\begin{array}{r}
 34.8 > \quad 2.52 > \\
 34.8 > \quad 2.50 > \\
 \hline
 69.16 > \\
 \text{mean} = 2.58 >
 \end{array}$$

12 9 29

140.2  
174.9  
140.0  
174.9

$$\begin{array}{r}
 34.7 > \\
 34.9 > \\
 \hline
 69.6 >
 \end{array}
 \quad 2.52 >$$

12 11 23

140.8  
175.6  
140.1  
175.0

$$\begin{array}{r}
 34.8 > \\
 34.9 > \\
 \hline
 69.7 >
 \end{array}
 \quad \begin{array}{r}
 2.52 > \\
 2.52 >
 \end{array}$$

~~XIX~~Index <sup>2</sup> for right and below

12 14 47

233.4  
261.6  
231.3  
265.9

$$\begin{array}{r}
 28.2 > \quad 2.76 > \\
 24.6 > \\
 \hline
 62.8 >
 \end{array}$$

229.6  
263.4  
228.1  
261.9

$$\begin{array}{r}
 33.8 > \quad 2.59 > \\
 33.8 > \quad 2.68 > \\
 \hline
 67.6 > \\
 \text{mean} = 2.60 >
 \end{array}$$

$$\begin{array}{r}
 12 \quad 16 \quad 24 \\
 12 \quad 13 \quad 06 > \\
 \quad \quad -13 \\
 \hline
 17 \quad 12 \quad 53
 \end{array}$$

Sept. 30, 1896.

a

12 21 42

233.3

264.0

230.1

262.7

30.7 &gt;

32.6 >

63.3 &gt;

2.74 &gt;

12 24 7

232.3

262.6

232.9

260.7

30.3 &gt;

27.8 >

58.1 &gt;

2.93 &gt;

2.84 >

Index to left and above.

12 27 1

323.6

350.7

320.2

351.5

27.1 &gt;

31.3 >

58.4 &gt;

2.92 &gt;

12	28	44
12	25	24 >
		-13
17	25	11

321.8

351.9

321.2

351.6

30.1 &gt;

30.4 >

60.5 &gt;

2.84 &gt;

2.88 >

mean = 2.86 &gt;

12 27 15

323.0

251.2

322.9

251.8

28.2 &gt;

28.9 >

57.1 &gt;

2.97 &gt;



Sept. 30, 1896

12 39 5

$$\begin{array}{r} 321.6 \\ 354.0 \\ 321.1 \\ 352.2 \end{array}$$

$$\begin{array}{r} 32.4 > \\ 31.1 > \\ \hline 63.5 > \end{array}$$

$$\begin{array}{r} 2.73 > \\ 2.85 > \end{array}$$

Index to right and below.

12 42 53

$$\begin{array}{r} 49.8 \\ 83.6 \\ 50.5 \\ 86.8 \end{array}$$

$$\begin{array}{r} 33.8 > \\ 36.3 > \\ \hline 70.1 > \end{array}$$

2.50 &gt;

$$\begin{array}{r} 12 \quad 44 \quad 53 \\ 12 \quad 41 \quad 02 > \\ \hline \quad \quad -13 \\ 17 \quad 40 \quad 49 \end{array}$$

$$\begin{array}{r} 52.5 \\ 81.8 \\ 49.7 \\ 82.5 \end{array}$$

$$\begin{array}{r} 29.3 > \\ 33.8 > \\ \hline 63.1 > \end{array}$$

2.74 &gt;

2.62 &gt;

mean = 2.74 &gt;

a

12 51 45

$$\begin{array}{r} 52.4 \\ 82.2 \\ 52.2 \\ 84.7 \end{array}$$

$$\begin{array}{r} 29.9 > \\ 32.5 > \\ \hline 62.4 > \end{array}$$

2.77 &gt;

12 54 21

$$\begin{array}{r} 50.2 \\ 82.2 \\ 50.2 \\ 83.6 \end{array}$$

$$\begin{array}{r} 32.0 > \\ 33.4 > \\ \hline 65.4 > \end{array}$$

2.66 &gt;

2.72 &gt;

Sept. 30, 1896.

Index to left and above, 6

138.7

39.4 &gt;

178.1

2.08 &gt;

137.5

44.4 >

181.9

83.8 &gt;

142.8

36.1 &gt;

178.9

35.6 &gt;

2.45 >

138.3

71.7 >

2.026 &gt;

173.9

mean = 2.49 >

12	2	2
12	56	49 >
		-13
17	56	36

137.4

41.6 &gt;

179.0

38.5 >

2.19 &gt;

140.1

80.1 &gt;

178.6

125.2

44.6 &gt;

179.9

47.2 >

1.87 &gt;

132.8

91.8 >

2.03 &gt;

180.0

Index to right and below, 2

229.0

265.0

36.0 &gt;

225.1

42.7 >

2.23 &gt;

267.8

78.7 &gt;

13	21	45
----	----	----



Sept. 30, 1896.

13	24	37
13	18	32
		-13
18	18	19

$$\frac{227.5}{257.5} = .88$$

$$266.5$$

$$229.6$$

$$267.8$$

$$39.0 > 2.28 >$$

$$38.2 > 2.26 >$$

$$77.2 \text{ mean} = 2.14 >$$

Observations during minimum very difficult: in the last two groups var. at limit of visibility, and seen with greatest difficulty; ~~possibly these two groups should not be used~~; probably these two groups should be rejected and possibly all the groups taken during minimum, because of the difficulty of observations.

$\beta$  Persei: Phot. N: crumols

$\beta$  Persei identified in Phot: search made in sunlight and haze for comp. stars but none found of sufficient magnitude except one supposed to be  $\omega$  Persei, it being distant about  $\frac{8}{9}$  the distance between the ordinary and extraordinary images of  $\beta$  Persei when prism is up against the objective.

Sept. 30, 1896.

Band W Perseus: Phot. No. Crumple  
Index to right and above

14 50 25

246.6

272.9

246.2

272.6

&lt; B dis.

26.3

27.4

53.7

3.11

14 58 0

248.3

272.0

247.2

271.5

23.7

24.2

47.9

3.37

3.24

Index to left and below.

15 6 8

147.9

189.8

148.7

190.9

41.9

42.2

84.1

2.08

15 12 48

~~150.5~~

189.6

146.5

190.0

149.8

39.8

43.5

83.3

2.10

2.09

2.66

15 20

cloudy  
Same again

16 0

cloudy



Sept. 20, 1896

Index

cloudy until daylight.

Oct. 1, 1896. (Thursday)

 $\beta$  Lyrae: Phot. N: Crum: obs.

cloudy.

"

Index below.

~~229.7~~ 243.7

277.4 &lt; 3 dis.

242.5

33.7 &gt;

274.6

32.1 &gt;

65.8 &gt;

2.65 &gt;

243.9

274.7

30.8 &gt;

240.4276 + ~~242.4~~

35.7 &gt;

2.62 &gt;

276.1

66.5 &gt;

2.64 &gt;

Index

145.3

46.5

191.8

Stopped by clouds and  
by East Eq. work.above was an attempt to get  $\beta$   
Lyrae between groups on East. eq.



Oct. 1, 1896.

W Herculis: Phot. T. W: obs  
 Measurements of faint comp. stars.

$$\begin{array}{r} 16 \\ 20 \\ \hline 4 \end{array} \quad \begin{array}{r} 28 \\ 28 \\ \hline 0 \end{array} \quad + 38.4$$

$d = \text{Comp. Star used.}$

7 20 cloudy.

Star  $\alpha$  comp. with star  $d$ .  
 Index to left and above.

8 11.3

$$\begin{array}{r} 132.5 \\ 181.6 \\ 139.6 \\ 175.2 \end{array} \quad \begin{array}{r} 49.1 > \\ 35.6 > \\ \hline 84.7 > \end{array} \quad \begin{array}{r} 2.06 > \end{array}$$

clouds

$$\begin{array}{r} 139.1 \\ 174.5 \\ 133.5 \\ 180.0 \end{array} \quad \begin{array}{r} 35.4 > \\ 46.5 > \\ \hline 81.9 > \end{array} \quad \begin{array}{r} 2.14 > \\ 2.10 > \end{array}$$

Index bright and below.

$$\begin{array}{r} 224.4 \\ 271.8 \\ 230.9 \\ 267.0 \end{array} \quad \begin{array}{r} 47.4 > \\ 36.1 > \\ \hline 83.5 > \end{array} \quad \begin{array}{r} 2.09 > \end{array}$$

Oct. 1, 1896.

8

19.3

230.4

266.6

225.3

271.9

36.2 &gt;

46.6 > 2.11 >82.8 > 2.10 >mean = 2.10 >

2.60

10.70 >Star 5 comp with star 2  
Index to left and above.

330.0

343.1

332.1

343.0

&lt; comp. star dis.

13.1 &gt;

10.9 >

24.0 &gt;

4.89 &gt;

8

24.2

330.1

342.9

330.3

342.7

12.8 &gt;

12.4 >

25.2 &gt;

4.79 &gt;

4.84 &gt;

Index to right and below.

59.8

73.7

60.9

73.4

13.9 &gt;

12.5 >

26.4 &gt;

4.68 &gt;



Oct. 1. 1896.

8	31.4	60.3	13.9 >	4.65 >
		74.2	12.9 >	
		60.8	26.8 >	4.66 >
		73.7		
			mean = 4.75 >	
			<u>2.60</u>	
			13.3 ✓	✓

Star B comp. with star d.

Index to right and below.

8	27.8	49.6 < comp. star d.	3 5.7 >	
		85.3	3 6.7 >	2.43 >
		49.3	7 2.4 >	
		blonds		
		83.1		
		86.0		

47.0	<del>46.0</del>	2 6.8 >	2.54 >
	83.8	3 2.3 >	2.48 >
	49.2	6 9.1 >	
	81.5		

Index to left and above.

135.3			
blonds			
<del>136.0</del>		41.4 >	
176.7		33.1 >	2.36 >
140.0		74.5 >	
173.1			

Oct. 1, 1896.

141.0	30.3 >	
171.3	43.4 >	2.39 >
134.3	<del>44.2</del>	2.38 >
<del>178.5</del>	<del>74.5</del>	2.48 >
177.7	73.7 >	
	mean =	2.43 >
		<del>2.60</del>
		11.03 >

Dome cuts off slightly in last set.

Troubled much by clouds: settings on last star made with much difficulty thro' clouds.

No chance for anything farther on these comp. stars.

$\Sigma$  45': 151 Aquilae b :

W. obs.

19 26 -8.6

Too cloudy.

$\Sigma$  43': B Cygni : Phot R : W. obs.

19 26 +27.7  
~~22~~ ~~32~~  
 2 6



20 Oct. 1, 1896.

Index to left and above.

9	38	147.4	< brighter dis.	
		195.0		47.6 >
		149.5		29.6 >
		189.1		87.2 >
				1.99 >

9	41	150.8		
		188.4		37.6 >
		147.1		47.6 >
		194.7		85.2 >
				2.05 >
				2.02 >

Index to right and below.  
clouds thick

9	43	237.1		
9	44	280.1		42.0 >
		233.9		51.1 >
		285.0		94.1 >
				1.81 >

9	45	234.8		
		283.7		48.9 >
		238.1		42.7 >
		2		91.6 >
				1.87 >
				1.84 >
				mean = 1.93 >
		clouds thick		
		278.9		
		280.8		

Position angle =  $20^\circ$ : distance =  $30''$ :  
mag. = 2.0 and 5.0.

Oct. 1, 1896.

observations made with difficulty  
thru clouds.

$\Sigma$  2521 : Phot. R: W:abs

$$\begin{array}{r} 19 \\ 22 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 21 \\ 50 \\ \hline 29 \end{array}$$

$$+19.7$$

9 55 clouds too thick.

10 0 clouds becoming too thick every-  
where.



Posted to here.Oct. 3, 1896. (Saturday)

B Lyrae : Phot N: Cam: obs

Index below.

6	52.5	242.5	← B dis.		
		274.7		3 2.2 >	
		243.2		2 9.5 >	2.80 >
		272.7		<u>6 1.7</u>	

7	0.9	245.4		
		272.5	28.1 >	2.93 >
		243.6	<u>30.2 &gt;</u>	2.86 >
		273.8	58.3 >	

Index above.

7	7.7	328.6	40.0 >	2.13 >
		368.6	<u>42.1 &gt;</u>	
		Stopped	82.1 >	
		329.4		

Stopped  
11.5

Stopped

7	56.5	327.2	44.7 >	2.00 >
		11.9	42.0 >	2.06 >
4	14.4 >	328.1	<u>86.7 &gt;</u>	2.46 > =
		10.1		<u>mean</u>

Oct. 3, 1896.

W Heculis: 6 hot. T. W. obs.  
 Measurement of faint comp. stars.

16	28	+ 38.4
<u>20</u>	<u>18</u>	
6	50	

Index to left and above.  
 Star 6 comp with star 2.

182.5	< comp. star dis.	
194.0	11.5 >	
182.0	<u>12.3</u> >	4.91 >
194.3	23.8 >	

181.9		
194.7	12.8 >	<u>4.83</u> >
182.2	<u>11.9</u> >	4.87 >
194.1	24.7 >	

Index to right and below

272.4		
286.4	14.0 >	4.48 >
271.3	<u>15.0</u> >	
286.3	29.0 >	

271.6		<u>4.65</u> >
285.6	14.0 >	<u>4.56</u> >
272.9	<u>12.8</u> >	4.72 > =
285.7	26.8 >	

K 72  
4.60 mean  
 6332



Oct 3, 1896.

Star B comp. with star d.  
Index to right and below.

7 42.0

264.0	← comp. star dis.	
295.7		21.7 >
260.3		35.9 >
<del>298.4</del>		67.6 >
296.2		

2.59 >

260.2	36.7 >	2.65 >
296.9	29.1 >	2.62 >
264.2	65.8 >	
293.3		

Index to left and above.

351.1	36.0 >	2.35 >
27.1	38.9 >	
349.0	74.9 >	
27.9		

7 49.5

350.4	28.2 >	2.44 >
28.6	33.9 >	2.40 >
352.1	72.1 >	2.51 > =
<del>25.7</del>		
26.0		

2.51  
4.60  
11.11 ✓

mean.

Oct. 3, 1896.

Star S comp. with star d.  
Index to right and above.~~359.2~~

258.1

19.0

358.6

20.0

&lt; comp star dis.

20.9 &gt;

21.4 &gt;

42.3 &gt;

3.64 &gt;

256.9

21.9

358.3

18.6

25.0 &gt;

20.3 &gt;

45.3 &gt;

34.9 &gt;

3.56 &gt;

Index to left and below.

90.1

108.0

88.1

108.3

17.9 &gt;

20.2 &gt;

38.1 &gt;

3.88 &gt;

87.9

108.9

88.5

107.8

21.0 &gt;

19.3 &gt;

40.3 &gt;

3.75 &gt;

3.82 &gt;

mean = 3.69 &gt;

2.60

12.29 &gt;

Heavy fog

20 clouds



Oct. 3, 1896.

~~Star comp. with star d.~~  
~~Index~~8 45 clouds thick: no chance for  
anything farther on this star.

clouds all over sky.

 $\Sigma$  2308 : 40 + 41 Draconis: P hot Q: w. obs

18 9 + 80.0

9 0 clouds thick: no stars visible.  
cloudy everywhere.9 15 Thickly cloudy with no prospect  
of clearing.

Oct. 6. 1896. (Tuesday)

7 0

Cloudy.

7 30

"

8 0

"

8 30

Still thickly cloudy with no prospect of clearing.



Oct. 11, 1896. (Wednesday)  
 B Lyrae: Phot. 2: Crum: obs

Index below

6	45.2	236.9	< B dis.		
		283.0			
		<del>234.3</del>	236.8	46.1 >	1.91 >
		280.9		<u>44.1</u> >	
				90.2 >	
6	56.7	238.5		42.2 >	
		280.7		<u>44.6</u> >	2.00 >
		236.5		86.8 >	1.96 >
		281.1			

Index above.

7	04.6	323.5		53.0 >	
		16.5		<u>53.5</u> >	1.50 >
		324.1		106.5 >	
		17.6			
7	12.2	321.8		56.0 >	1.44 >
		<del>322.2</del>	17.8	<u>53.0</u> >	1.47 >
		<del>320.9</del>	323.3	109.0 >	
		16.9			
6	59.7				
				<u>mean = 1.72</u>	

Oct. 7, 1896.

W. Herulis: Phot. 5: W. obs.  
 Measurement of faint comp. stars.

$$\begin{array}{r} 16 \\ 20 \\ \hline 4 \end{array} \quad \begin{array}{r} 28 \\ 38 \\ \hline 10 \end{array}$$

$$+38.4$$

Star 7 comp. with star d.  
 Index to left.

7 41.0

165.0 < comp. star dis.

185.9

165.8

185.3

20.9 &gt;

19.5 &gt;

40.4 &gt;

2.75 &gt;

163.4

183.0

164.2

186.7

19.6 &gt;

22.5 &gt;

42.1 &gt;

3.65 &gt;

3.70 &gt;

Index to right.

251.4

277.0

253.1

277.4

25.6 &gt;

24.3 &gt;

49.9 &gt;

3.28 &gt;

253.6

277.5

252.2

277.1

23.9 &gt;

24.9 &gt;

48.8 &gt;

3.33 &gt;

3.50 &gt;

mean = 3.50 &gt;

4.60



Oct. 7, 1896.

Star S comp. with star d.  
Index to right and below.

254.4

275.9

256.6

274.2

&lt; comp. star dis.

21.5 &gt;

17.6 >

39.1 &gt;

3.82 &gt;

256.5

274.8

253.0

275.9

18.3 &gt;

22.9 >

41.2 &gt;

3.70

3.69 >

3.76 &gt;

Index to left and above.

343.9

~~7.2~~

346.0

4.1

7.2

23.3 &gt;

18.1 >

41.4 &gt;

3.69 &gt;

345.5

4.9

344.2

7.0

19.4 &gt;

22.8 >

42.2 &gt;

3.65 &gt;

3.67 >

mean = 3.72 &gt;

3.60

12.32 &gt;

Oct. 7, 1896.

Stand comp. with stand.  
Index to left and above.

8 104

331.4 &lt; comp. star dis.

19.2

336.8

13.9

47.8 &gt;

37.1 >

84.9 &gt;

2.05 &gt;

336.4

15.2

331.1

18.7

38.8 &gt;

47.6 >

86.4 &gt;

2.01 &gt;

2.03 &gt;

Index to right and below

68.0 ~~to 5~~103.2 ~~to 6~~

67.7

104.7

35.2 &gt;

~~49.1~~37.0 >

72.2 &gt;

2.43 &gt;

8 207

66.4

105.2

65.4

~~104.5~~

102.9

38.8 &gt;

37.5 >

76.3 &gt;

mean = 2.20 &gt;

2.60

10.20 &gt;



Oct. 7, 1896.

Star <sup>δ</sup><sub>1</sub> comp. with star d.  
Index to left and above.

3 46.6 - comp. star dis.

3.8

3 46.8

3.3

17.2 &gt;

16.5 &gt;

2 3.7 &gt;

4.15

3 47.3

4.4

3 46.3

2.9

17.1 &gt;

16.6 &gt;

2 3.7 &gt;

4.15

4.15

Index to right and below.

77.2

94.0

77.5

92.0

16.8 &gt;

14.5 &gt;

2 1.3 &gt;

4.31

77.9

91.4

77.9

92.6

13.5 &gt;

15.7

29.2

4.46

4.38

4.26

2.60

12.66

Oct. 7. 1896.

Star  $\beta$  comp. with star  $\alpha$ .  
Index to right.

72.4 &lt; comp star dis.

97.8

71.4

99.5

25.4 &gt;

28.1 &gt;

53.5 &gt;

3.12 &gt;

71.1

101.1

73.3

97.6

30.0 &gt;

24.3 &gt;

54.3 &gt;

3.09 &gt;

3.10 &gt;

Index to left

164.6

180.3

162.3

188.3

21.7 &gt;

26.0 &gt;

47.7 &gt;

3.38 &gt;

161.4

188.5

164.2

186.7

27.1 &gt;

22.5 &gt;

49.6 &gt;

3.29 &gt;

3.34 &gt;

mean = 3.22 &gt;

4.68

11.22 ✓

$$\begin{array}{ccccccc} \beta & 4 & \beta & \beta & 5 & 4 & \beta \\ 5 & 5 & \beta & \beta & 4 & 5 & \beta \end{array} \quad \} \text{ W. obs}$$



Oct. 7, 1896.

It was found that the interval between comp. stars  $\beta$  and  $\gamma$  was too large so that  $\beta'$  was inserted between them and measured as on previous pages.

It was found that the interval between comp. stars  $\delta$  and  $\epsilon$  was too large, so that  $\delta'$  was inserted between them and measured as on previous pages.

All the comp. stars in preceding notation are as they now appear on Mr. Reed's chart.

Measurement of faint comp. <sup>star</sup> of  $\chi$  Cygni.  
 $\chi$  Cygni: Phot. T:  $\chi$  W. abs.

$$\begin{array}{r} 19 \\ 23 \\ \hline 3 \end{array} \quad \begin{array}{r} 41 \\ 3 \\ \hline 22 \end{array} \quad + 33.4$$

Star  $\eta$  comp. with star  $\delta$   
 Index to left and above

$$\begin{array}{r} 347.0 \\ 2.3 \end{array} < \text{comp. star dis}$$

$$\begin{array}{r} 346.7 \\ 4.2 \end{array} \quad \begin{array}{r} 15.3 > \\ 18.1 > \\ \hline 33.4 > \end{array} \quad 4.17$$

Oct. 7. 1896.

346.0		
4.4	18.4 >	4.13
346.5	<u>15.5 &gt;</u>	<u>4.15</u>
2.0	32.9 >	

Index bright and below.

78.0		
92.5	14.5 >	
76.4	<u>16.9 &gt;</u>	4.30
93.2	31.4 >	

10 265

76.7		
92.1	16.4 >	4.29
77.0	<u>15.2 &gt;</u>	<u>4.30</u>
92.2	31.6 >	
	mean =	4.22
		<u>4.10</u>
		12.32

Star  $\theta$  comp. with star  $\alpha$   
Index bright and below.

10 300

78.0		
91.7	< comp. star dis.	
76.6	13.7 >	
93.4	<u>16.8 &gt;</u>	4.37 >
	30.5 >	



Oct. 7, 1896.

78.7		
92.3	13.6 >	4.58 >
78.2	<u>14.1 &gt;</u>	
92.3	27.7 >	4.48

Index to left and abs.

169.2	13.3 >	
182.5	<u>14.2 &gt;</u>	4.59
168.7	27.5 >	
182.9		

10 35.9

168.9	14.4 >	
182.3	<u>12.0 &gt;</u>	4.68
169.7	<u>12.5 &gt;</u>	
<del>182.2</del>	26.9 >	4.64
181.7	26.4 >	
	mean =	4.56
		<u>4.10</u>
		12.66

Measurement of faint comp. stars.

α Delphinus. Phot T. W. W.

20	10	+ 8.8
<u>24</u>	<u>15</u>	
4	7	

Oct. 7, 1896.

+A° 4391 (9.3) ~~7.5 magn.~~  
 Comp. Star ~ comp. with star +A° 4393 (6.7)  
 Index to right and above.

49.2 165.1 < lat. ~~164.7~~  
 182.7 < dis. ~~184.0~~ 23.6 >  
 165.4 ~~163.2~~ 21.5 >  
 186.9 ~~187.0~~ 42.1 > 3.50 ✓

164.2  
 186.1 21.9 >  
 163.9 22.1 >  
 186.0 44.0 > 3.56 ✓  
 3.53 ✓

Index to left and below.

252.6  
 278.2 25.6 >  
 253.3 24.1 >  
 277.4 49.7 > 3.22 ✓

52.5 253.0  
 276.7 29.7 >  
 251.1 26.8 >  
 277.9 50.5 > 3.25 ✓  
 3.26 ✓  
 mean = 3.49 ✓

Star +A° 4391 (9.3) is to be the comparison star to be used with Phot. J. in measuring the faint comp. stars for R. Delphinus. There is no measured var. Phot. star rightly situated, so that 4391 was joined to 4393 in order to obtain photometric magn. of 4391.



Oct. 7, 1896.

B Lyrae.

Phot. N.

Craw. obs.

Index to right and above.

$$\begin{array}{r}
 \cancel{321.4} \\
 \cancel{15.9} \\
 \cancel{321.8} \\
 \hline
 \end{array}
 \leftarrow \text{B dis.}
 \begin{array}{r}
 \cancel{54.8} \\
 \hline
 \end{array}$$

~~11~~ 54.9

12 262

$$\begin{array}{r}
 \cancel{317.9} \\
 19.6 \\
 322.2 \\
 16.7
 \end{array}
 \begin{array}{l}
 320.4 \\
 = \text{B dis}
 \end{array}$$

$$\begin{array}{r}
 59.2 < \\
 54.5 < \\
 \hline
 113.7 <
 \end{array}
 \begin{array}{l}
 -1.33 <
 \end{array}$$

41.7

322.1

- (1.38)

~~13.0~~

15.7

53.6 &lt;

322.9

$$\begin{array}{r}
 56.1 < \\
 109.7 <
 \end{array}
 \begin{array}{l}
 -1.42 <
 \end{array}$$

19.0

53.5

56.7

100.3

43.6 &lt;

~~53.6~~

57.3

43.0 &lt;

-2.01 &lt;

100.3

86.6 &lt;

(-1.94)

57.3

102.1

44.8 &lt;

56.0

46.3 &lt;

-1.88 &lt;

102.3

91.1 &lt;

M = -1.66

52.8

41802

17

45.05

Oct. 7. 1896.

comp.

Star &amp; comp. with stars.

Indices left and above.

54.2

119.5

54.2

119.4

← comp. var dis.

65.3 &gt;

65.2 >

130.5 &gt;

0.97

54.4

118.3

56.5

119.1

62.9 &gt;

62.6 >

120.5 &gt;

1.05

Indices right and below.

320.6

35.1

319.1

32.0

74.5 &gt;

72.9 >

147.4 &gt;

0.63

321.7

28.3

317.6

31.0

66.6

73.4

140.0

0.77



Oct. 8, 1896. (Thursday)  
Measurement of faint comp. stars.

W. H. Curtis : Phot. T. W. obs.

$$\begin{array}{r} 16 \\ 20 \\ \hline 4 \end{array} \quad \begin{array}{r} 28 \\ 45 \\ \hline 17 \end{array} \quad + 38.4$$

Star  $\delta^1$  comp. with star d.

Index to left and above.

168.5  
182.4 < comp. star dis.

169.5

181.3

13.9  $\rightarrow$

11.8

25.7  $\rightarrow$

4.74  $\rightarrow$

169.4

180.9

169.2

182.7

11.5  $\rightarrow$

10.5

25.0  $\rightarrow$

4.80  $\rightarrow$

4.77  $\rightarrow$

Index to right and below.

257.8

272.6

258.2

272.0

14.8  $\rightarrow$

13.8

28.6  $\rightarrow$

4.51  $\rightarrow$

Oct. 8, 1896.

7

45.8

258.5

272.3

256.2

273.0

13.8 &gt;

16.8 &gt;

30.6 &gt;

mean = 4.60 &gt;

4.36 &gt;

4.44 &gt;

$$\begin{array}{r} 8.60 \\ \hline 13.20 \end{array}$$

Star y comp. with star d.  
Index to right and below

254.2

277.1

252.0

278.3

&lt; comp. star dis.

274.7

20.5 &gt;

26.3 &gt;

46.8 &gt;

3.42 &gt;

251.5

278.0

253.8

276.8

26.5 &gt;

23.0 &gt;

49.5 &gt;

3.29 &gt;

3.36 &gt;

Index to left and above.

342.1

6.9

341.6

6.5

24.8 &gt;

24.9 &gt;

49.7 &gt;

3.28 &gt;

7

56.7

340.8

7.5

340.9

7.3

26.7

26.4

54.1

3.14

3.14

3.14

3.14

mean = 3.14 &gt;

mean = 3.28 &gt;

8.60

11.88 &gt;



Oct. 8, 1896.

Star  $\beta'$  comp. with star  $\alpha$ .  
Index to left.

3 40.1 &lt; comp. star dis.

9.4

29.3 &gt;

3 40.2

28.8 &gt;

2.93 &gt;

9.0

58.1 &gt;

3 40.8

10.0

29.2 &gt;

3 40.8

29.6 &gt;

2.91 &gt;

10.4

58.8 &gt;

2.92 &gt;

Index to right.

73.2

24.9 &gt;

3.24 &gt;

98.1

25.8 &gt;

73.0

50.7 &gt;

98.8

71.7

27.3 &gt;

3.17 &gt;

99.0

25.1 &gt;

3.20 &gt;

72.9

52.4 &gt;

98.0

mean = 3.06 &gt;

8.60

11.66

Oct. 8, 1896.

25 noticed aurora arch at north  
of altitude about  $\frac{1}{5}$  that of Polaris

Star 5' comp. with star of again.

Index to right and below

257.4

&lt; comp star dis

271.0

257.3

271.4

13.6 &gt;

14.1 &gt;

27.7 &gt;

4.58 &gt;

257.1

272.1

258.3

271.7

15.0 &gt;

13.4 &gt;

28.4 &gt;

4.52 &gt;

4.55 &gt;

Index to left and above.

347.1

2.7

347.4

3.4

15.6 &gt;

16.0 &gt;

✓ 1.6 &gt;

4.29 &gt;

345.9

2.8

347.1

2.7

17.9 &gt;

15.6 &gt;

23.5 &gt;

4.16 &gt;

4.22 &gt;

mean = 4.38

8.60

12.40.98

as first measures of star 5' this ev



Oct. 8, 1896.

disagreed somewhat with those of the previous evs. it was remeasured as above.

29 center of arch of aurora <sup>each</sup> passes thro'  $\beta$  and  $\gamma$  lvs. mag. but does not extend to eastern horizon. alt. about  $\frac{1}{4}$  of Polaris.

9 0 Aurora entirely disappeared.

Measurement of faint comp. stars for  $\delta$  Aquarii. Phot. T. Wals

20	40	- 5.5
<u>22</u>	<u>10</u>	
1	30	

Comp. star is ~~in R. d. m.~~

Single comp. with star m.

Index to right and above.

347.7 ~~347.4~~ < comp. star dis.

2.2 2.2

346.0

3.2

14.57

17.27

31.77

4.28

Oct. 8. 1896.

346.1

4.1

346.6

2.7

18.0 &gt;

16.1 >

24.1 &gt;

4.12 &gt;

4.20 >

B othered in running phot.  
Index to left and below

77.3

92.9

76.7

93.0

15.6 &gt;

16.3 >

31.9 &gt;

4.27 &gt;

76.9

93.4

77.6

93.1

16.5 &gt;

15.5 >

32.0 &gt;

4.26 &gt;

4.26 >

4.23 &gt;

The interval between Mr. Reed's  $\alpha$   
 $\eta$  and  $\lambda$  is too large so that W.  
has inserted two stars  $\eta'$  and  $\eta''$   
comp star = Mr. Reed's  $m$

Star  $\lambda$  comp, with star  $m$ .  
Index to left and below.

74.1 < comp. star  $\lambda$ .

97.2

74.5

97.1

23.1 &gt;

22.6 >

45.7 &gt;

3.47 &gt;



Oct. 8, 1896.

75.0

95.9

75.0

95.4

20.9 &gt;

20.4 &gt;

41.3 &gt;

3.70 &gt;

3.58 &gt;

Index to right and above

343.1

6.4

342.2

5.0

23.3 &gt;

22.8 &gt;

46.1 &gt;

3.45 &gt;

340.8

6.1

343.4

5.2

25.3 &gt;

21.8 &gt;

47.1 &gt;

3.40 &gt;

3.42 &gt;

3.50 &gt;

Star m' comp. with star m.  
Index to right and above.

340.0

9.9

338.9

11.1

&lt; comp star dis.

29.9 &gt;

32.2 &gt;

62.1 &gt;

2.78 &gt;

See note on next page.

Oct. 8, 1896.

339.0

10.2

339.2

9.8

31.2 &gt;

30.6 &gt;

61.8 &gt;

2.79 &gt;

2.78 &gt;

Index to left and below.

69.1

99.0

71.7

98.8

29.9 &gt;

27.1 &gt;

57.0 &gt;

2.9 &gt;

10

23.2

71.9

100.2

71.1

101.1

28.3 &gt;

30.0 &gt;

58.3 &gt;

2.93 &gt;

2.96 &gt;

2.87 &gt;

Star  $\eta'$  not to be used in sequence.  
 A new  $\eta'$  selected.

Star  $\eta''$  comp. with star m.

Index to left and above.

74.9

96.9

74.6

95.6

&lt; comp. star dis.

22.0 &gt;

21.0 &gt;

43.0 &gt;

3.61 &gt;

Star  $\eta''$  not to be used in sequence.



Oct. 8, 1896.

74.0

95.5

73.7

96.8

21.5 &gt;

23.1 &gt;

44.6 &gt;

3.53 &gt;

3.57 &gt;

Index to right and below.

163.0

186.1

163.5

185.9

23.1 &gt;

22.4 &gt;

45.5 &gt;

3.48 &gt;

164.1

184.8

164.1

185.7

20.7 &gt;

21.6 &gt;

42.3 &gt;

3.64 &gt;

2.56 &gt;

3.56 &gt;

Star of comp. with star m.  
Index to right and below.

161.1

189.2

158.1

192.3

&lt; comp. star dis.

28.1 &gt;

34.2 &gt;

62.3 &gt;

2.77 &gt;

159.1

190.7

160.2

190.4

31.6 &gt;

30.2 &gt;

61.8 &gt;

2.79 &gt;

2.78 &gt;

Oct. 8, 1896.  
Index to left and above.

248.9

282.1

249.1

281.9

33.2 >

32.8 >

66.0 >

2.64 >

248.1

281.8

248.2

281.6

33.7 >

33.4 >

67.1 >

2.60 >

2.62 >

2.70 >

clouds.

2.5  
7  $\eta'$ :  $\eta'$  3.5  $\eta''$

$\eta''$  2.5  $\lambda$ :  $\lambda$  5  $\mu$

W. uls.

The above  $\eta'$  and  $\eta''$  not to be  
used in sequence.

R. Delphinus: Phot 5. Wob  
20 10 + 8.8  
24 37  
4 27



Oct. 8. 1896.

Star  $+L^{\circ} 4391 (9.3)$   
 comp with  $+L^{\circ} 4393 (6.7)$   
 Index to left and below

11 18.6

249.8  
 280.1 < brighter dis.

255.6

30.3 &gt;

276.2

20.6 &gt;

50.9 &gt; 3.2X

255.1

275.8

20.7 &gt;

251.2

29.0 &gt;

280.2

49.7 &gt;

3.2X  
 3.26

Index to right and above.

227.6

12.8

35.2 &gt;

345.5

21.1 &gt;

6.6

56.3 &gt;

3.00

343.6

6.7

23.1 &gt;

338.8

32.7 &gt;

11.5 12.5

55.8 &gt;

3.02  
 3.01

mean 3.14

Star  $+L^{\circ} 4391 (9.3)$  is to be the photometric  
 comp. star in measrs. of faint comp. stars for  
 R Delphinus. See bottom of p. 100 of this  
 book.

Oct. 9, 1896.

(Friday)

B Lyrae:

P hot. V:

Cram obs.

Index below.

b

49.9

~~65.4~~

63.1

93.5

&lt; B dis.

30.4 &gt;

2.79 &gt;

62.2

31.5 &gt;

93.7

61.9 &gt;

b

59.5

65.0

96.4

31.4 &gt;

2.72 &gt;

62.5

32.4 &gt;

94.9

63.8 &gt;

2.76 &gt;

Index above.

7

08.4

150.4

187.3

36.9 &gt;

2.41 &gt;

151.0

36.0 &gt;

~~186.5~~ 187.0

72.9 &gt;

7

16.6

151.4

188.2

36.8 &gt;

2.32 &gt;

149.0

38.9 &gt;

2.36 &gt;

7

03.6 &gt;

187.9

75.7 &gt;

mean = 2.56 >



Oct. 9, 1896.

I Aquarii : Phot. T: Cramohs

20

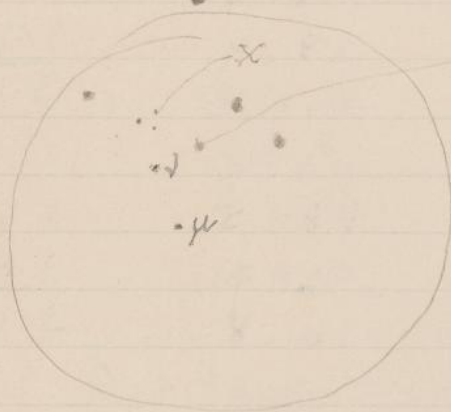
40

-5.5

$$\begin{array}{r} 20 \\ 0 \\ \hline 21 \end{array}$$

$$\begin{array}{r} 0 \\ 20 \\ \hline 20 \end{array}$$

Measurement of faint comp. stars



x on Red's chart.

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

Star x in above diagram is simply a provisional x and not included in the regular sequence of comp. stars.

It represents a very faint star a little above limit of visibility and is simply used to test limit of visibility criterion.

a star 2 grades fainter than x could probably be glimpsed at this altitude.

Oct. 9, 1896.

Star v camp. with star mv.

Index bright and above.

2.1 &lt; comp. star dis.

16.1	14.0 >	4.31 >
1.6	17.3 >	
18.9	<u>31.3 &gt;</u>	

1.6	16.9 >	4.33 >
18.5	14.1 >	
2.7	<u>31.0 &gt;</u>	4.32 >
16.8		

Index to left and below.

93.9	13.1 >	4.45 >
107.0	16.3 >	
91.6	<u>29.4 &gt;</u>	
107.9		

94.1	13.3 >	4.78 >
107.4	12.0 >	
94.2	<u>25.3 &gt;</u>	4.62 >
106.2		

mean = 4.47 >



Oct. 9, 1896.

Star M comp. with star m.  
Index to left and below.

8 30.7

93.9  
106.8 < comp. star dis.91.7  
107.3
$$\begin{array}{r} 12.9 > \\ 15.6 > \\ \hline 28.5 > \end{array} \quad 4.52 >$$

$$\begin{array}{r} 93.3 \\ 108.9 \\ 93.4 \\ 106.6 \end{array}$$

$$\begin{array}{r} 15.6 > \\ 13.2 > \\ \hline 28.8 > \end{array} \quad \begin{array}{r} 4.49 \\ 4.50 \end{array}$$

Index to right and above.

$$\begin{array}{r} 183.3 \\ 198.7 \\ 183.0 \\ 196.9 \end{array}$$

$$\begin{array}{r} 15.4 > \\ 13.9 > \\ \hline 29.3 > \end{array} \quad 4.45 >$$

8 42.4

$$\begin{array}{r} 182.2 \\ 197.8 \\ 182.9 \\ 199.2 \end{array}$$

$$\begin{array}{r} 15.6 > \\ 15.3 > \\ \hline 30.9 > \end{array} \quad \begin{array}{r} 4.34 \\ 4.40 \end{array}$$

mean = 4.45

Oct. 9. 1896.

Star h comp. with star m.  
Index to right and above.

8

52.6

180.1 &lt; comp. star dis.

201.5

181.1

200.3

21.4 &gt;

19.2 >

40.6 &gt;

3.74 &gt;

180.7

201.2

180.0

201.3

20.5 &gt;

21.3 >

41.8 &gt;

3.67 &gt;

3.70 &gt;

Index to left and below

266.2

291.2

266.4

291.3

24.4 &gt;

24.9 >

49.3 &gt;

3.30 &gt;

8

52.1

268.4

291.6

269.1

291.4

23.2 &gt;

24.3 >

47.5 &gt;

3.39 &gt;

3.34 &gt;

3.52 &gt;



Oct 9. 1896.

Star  $\lambda'$  comp. with star m.  
Index to left and below.

9	011	269.7	< comp. star dis.	
		290.1		
		240.0	20.4 >	
		290.6	20.6 >	3.71 =
			41.0 >	
		269.0		
		290.9	21.9 >	3.67 >
		269.1	20.0 >	
		289.1	41.9 >	3.69 >

Index to right and above.

	358.2	23.8 >	
	22.0		3.47
	358.0	22.0	
	20.0	45.8	
	359.6	20.6	3.57 >
	20.2	23.2	3.52 >
	357.6	43.8	3.60 >
	20.8		

zero of sprocket wheel = 5.0 :  
 and when star m is superimposed  
 upon  $\lambda'$ , sprocket wheel reads 6.2  
 when star m is a little to one side  
 for setting sprocket wheel reads  
 5.7

Oct. 9, 1896.

Star  $\eta'$  comp. with star m.  
Index to left and above265.7  
294.9 < comp. star dis.

267.2

29.2 &gt;

292.7

25.5 &gt;

3.07 &gt;

54.7 &gt;

266.8

293.5

26.7 &gt;

3.10 &gt;

266.3

27.3 &gt;

3.08 &gt;

293.6

54.0 &gt;

Index to right and below.

358.6

23.5

24.9 &gt;

3.11 &gt;

355.9

28.8

24.7

53.7

357.7

25.5

27.8

3.05 &gt;

355.9

27.4

3.08 &gt;

23.3

55.2

3.08 &gt;

The above star is not the  $\eta'$  of Oct. 2.  
That star was abandoned and the  
above  $\eta'$  selected, which now appears  
as  $\eta'$  on Mr. Reed's chart.



Oct. 9. 1896.

Starry camp. with gear m.  
Index to right and below.

9 302

351.3 &lt; camp star dis.

31.1

354.3

25.7

39.8 &gt;

31.4 &gt; 2.47 &gt;

71.2 &gt;

353.0

25.0

350.5

30.1

32.0 &gt;

39.6 &gt; 2.45 &gt;

71.6 &gt; 2.46 &gt;

Index to left and above.

81.7

116.4

83.0

119.2

34.7 &gt;

34.2 &gt; 2.54 &gt;

68.9

85.5

116.3

84.7

114.7

30.8 &gt;

30.0 &gt; 2.83 &gt;

60.8 &gt; 2.68 &gt;

2.57 &gt;

9 36.4

$$\begin{array}{r} \eta \quad 4 \quad \eta' \quad 5 \quad \lambda \\ \lambda \quad 3.5 \quad \lambda' \quad \lambda' \quad 3 \quad m \\ \underline{\quad} \quad 3.5 \quad \underline{\quad} \quad \underline{\quad} \end{array}$$

W abs.

Oct. 9, 1896.

R Delphini. Phot. 5: W: obs.

$$\begin{array}{r} 20 \\ 23 \\ \hline 21 \end{array}$$

$$\begin{array}{r} 10 \\ 34 \\ \hline 24 \end{array}$$

+8.8

10 15

Star 3 grades fainter than  
X could probably be seen.

X is merely a provisional star  
for limit of visibility criterion.

Star 5 comp. with D.M. +8°43'91 (9.3)  
Index to left and below.

10 41.2

$$\begin{array}{r} 82.9 \\ 116.9 \end{array} < \text{comp. star dis.}$$

83.2

34.0

116.3

33.1

$$\begin{array}{r} 34.0 \\ 33.1 \\ \hline 67.1 \end{array}$$

2.60

84.6

116.1

31.5

81.8

35.7

117.5

$$\begin{array}{r} 31.5 \\ 35.7 \\ \hline 67.2 \end{array}$$

2.60

2.60

A new star I selected on Oct. 10, 96.  
Reject this observation.



Oct. 9, 1896.

Index to right and above.

175.0

203.9

177.0

205.0

28.9 &gt;

28.0 >

56.9 &gt; 2.9 &lt;

175.2

206.0

175.3

205.0

30.8 &gt;

29.7 >

60.5 &gt; 2.2 &lt;

2.91

Mean = 2.76

Star  $\beta$  comp. with star D.M. + 8° 43' 11" 93

Index to right and above.

176.1

206.8 &lt; comp. star dis.

175.7

205.0

30.7 &gt;

29.3 >

60.0 &gt; 2.26

176.2

204.0

175.1

208.0

27.8 &gt;

32.9 >

60.7 &gt; 2.2 &lt;

2.21

Index to left and below

261.6

297.2

263.2

296.6

35.6 &gt;

33.4

69.0 2.5 &lt;

Oct. 9, 1896.

56.1

263.0

295.1

260.7

297.0

32.1 &gt;

36.3 &gt;

68.4 > 2.56

2.55

Mean = 2.70 ✓

Star  $\alpha$  comp with D. m + 8° 43' 91 (9.3)  
 Index to left and below.

256.4

303.1

257.0

300.1

&lt; comp. star dis.

46.7 &gt;

43.1 >

89.8 &gt; 1.92

257.3

303.0

254.4

303.3

45.7 &gt;

48.9 >94.6 > 1.79  
1.86 ✓

Index to right and above.

344.0

35.7

350.1

33.0

51.7 &gt;

42.9 >

94.6 &gt; 1.79

348.8

34.0

344.2

34.5

45.2

50.395.5 > 1.77  
1.82 ✓

02.5



Oct. 9, 1896.

Star γ comp. with D. M. +8°4391 (9.3)  
 Index to right and below.

11 0.47

$$\begin{array}{r}
 345.0 \\
 36.9 \\
 349.0 \\
 \hline
 29.1
 \end{array}
 < \text{comp. star dis.}
 \begin{array}{r}
 51.9 > \\
 44.2 > \\
 \hline
 96.1 > 1.7v
 \end{array}$$

$$\begin{array}{r}
 349.0 \\
 32.1 \\
 343.2 \\
 36.2
 \end{array}
 \begin{array}{r}
 43.1 > \\
 53.0 > \\
 \hline
 96.1 > 1.7v \\
 \hline
 1.7v
 \end{array}$$

Index to left and below.

$$\begin{array}{r}
 80.6 \\
 124.1 \\
 80.7 \\
 122.6
 \end{array}
 \begin{array}{r}
 43.5 > \\
 41.9 > \\
 \hline
 85.4 > 2.04
 \end{array}$$

11 10.6

$$\begin{array}{r}
 118.9 \\
 120.7 \\
 118.6 \\
 126.1
 \end{array}
 \begin{array}{r}
 41.8 > \\
 47.5 > \\
 \hline
 89.3 > 1.93 \\
 \hline
 1.96 \\
 \hline
 \text{mean} = 1.86v
 \end{array}$$

The above star γ was replaced by  
 another <sup>star</sup> on Oct. 10. '96.  
 Reject this observation.

Oct. 9, 1896.

Star d' comp. with D. M. +8° 4391 (93)  
Index to left and below.

11

13.0

70.6  
129.8 < comp. star dis.

71.5

59.2 &gt;

63.3 &gt;

~~125.6~~

134.8

122.5 &gt; 1.14

70.0

132.6

62.6 &gt;

73.9

56.1 &gt;

130.0

118.7 >  $\frac{1.22}{1.12}$ 

Index to right and above.

160.9

220.9

60.0 &gt;

162.9

54.6 &gt;

217.5

114.6 &gt; 1.31

11

18.3

164.9

217.4

52.2 &gt;

161.9 ~~188.4~~

58.8 &gt;

220.7 ~~222.4~~111.0 >  $\frac{1.39}{1.35}$ 

Mean = 1.26



Oct. 10, 1896. (Saturday)  
 B Lyrae : Phot. W. : Annals.

Index below.

7 03.0  
 242.3 < B dis.  
 244.2 31.9  
 245.4 27.6  
 243.0 59.5

Stopped to help on East Eq.

7 22.4  
 245.0  
 243.6 28.6  
 241.5

Stopped again

Below was an attempt to get B Lyrae  
 before beginning east eq. work.

7 30 Bright annular arch to west of meridian  
 more to east; only a few stars  
 summit of arch about  $\frac{1}{6}$  altitude of  
 Polaris.

Oct. 10. 1896. ~~Saturday~~Measurement of faint comp. stars.  
♄ Aquarii but ♄: W obs

$$\begin{array}{r} 20 \\ 20 \\ \hline 0 \end{array} \quad \begin{array}{r} 40 \\ 47 \\ \hline 7 \end{array} \quad -5.5$$

$$\begin{array}{r} \eta \\ \chi \\ \mu \end{array} \begin{array}{r} 4 \\ 3.5 \\ 3 \end{array} \quad \begin{array}{r} \eta' \\ \chi' \\ \mu' \end{array} \begin{array}{r} 4 \\ 3 \\ 3 \end{array} \quad \begin{array}{r} \chi \\ \chi' \\ \mu \end{array} \quad W: obs.$$

Star V comp. with star m.  
Index to right and above.

74.1 &lt; comp. star dis.

84.0

71.9

82.3

$$\begin{array}{r} 9.9 > \\ 10.4 > \\ \hline 20.3 > \end{array} \quad 5.26$$

70.1

83.4

72.9

84.1

$$\begin{array}{r} 13.3 > \\ 11.2 > \\ \hline 24.5 > \end{array} \quad \begin{array}{r} 4.85 \\ 5.06 \end{array}$$

Index to left and below.

160.8

172.1

160.7

178.3

$$\begin{array}{r} 11.8 > \\ 12.6 > \\ \hline 24.4 > \end{array} \quad 4.868$$



Oct. 10, 1896.

$\eta$  49.0  
 159.4  
 176.2  
 160.3  
 176.1  
 16.8 >  
 15.8 >  
 32.6 >  
 4.22 >  
 4.54 >  
mean = 4.80 >

$\eta$  so Aurora entirely disappeared.

Star  $\mu$  comp. with star  $m$ .  
 Index to left and below,  
 158.5 < comp. star. dis.

$\eta$  54.0  
 176.2  
 158.1  
 175.0  
 17.7 >  
 16.9 >  
 34.6 >  
 4.09 >

158.9  
 175.9  
 159.1  
 174.8  
 17.0 >  
 15.7 >  
 32.7 >  
 4.21 >  
 4.15 >

Index to right and above.

247.2  
 267.4  
 249.4  
 267.1  
 20.2 >  
 17.7 >  
 37.9 >  
 3.89 >

249.6  
 266.7  
 246.7  
 266.9  
 17.1 >  
 20.2 >  
 37.3 >  
 3.92 >  
 3.90 >  
 4.02 >  
mean

Oct. 10, 1896.

Star L comp. with star M.  
Index bright and above.

8 06.4

2 4 4.8 &lt; comp. star des.

2 7 1.4

2 4 6.0

2 7 1.4

2 6.6 &gt;

2 5.4 &gt; 3.18 &gt;

5 2.0 &gt;

2 4 5.8

2 6 9.2 ~~2 7 0.8~~

2 4 6.1

2 6 8.9

~~2 3.4 >~~

2 2.8 &gt; 3.45 &gt;

4 6.2 &gt; 3.32 &gt;

Index to left and below.

3 3 8.5

3 5 8.8

3 3 7.2

3 5 9.0

2 0.3 &gt;

2 1.8 &gt; 3.65 &gt;

4 2.1 &gt;

3 3 5.3

3 5 9.8

3 3 7.8

3 5 8.6

2 4.5 &gt;

2 0.8 &gt; 3.49 &gt;

4 5.3 &gt; 3.57 &gt;

mean = 3.44 >

8 16.9



Oct. 10, 1896.

Star 1' comp. with star m.

Index to left and below.

21.8

337.6 &lt; comp. star dis.

357.1

339.9

357.2

19.5 &gt;

17.3 &gt; 3.95

36.8 &gt;

338.4

356.6

339.1

356.9

18.2 &gt;

17.8 &gt; 7.00

36.0 &gt; 3.98

Index to right and above.

68.0

86.0

67.7

88.2

18.0 &gt;

20.6 &gt; 3.85

28.6 &gt;

67.4

87.4

68.1

~~86.6~~ ~~87.9~~

85.8

20.0 &gt;

19.7 &gt; 3.90

29.7 &gt; 2.88

27.7 &gt;

mean = 3.93

Oct. 10. 1896.

Troubled by shadows on above star especially when index is below.

When index is above, the field does not seem to be much in shadow and light is pretty uniformly distributed.

8 vary' comp. with star in  
Index to right and below.

65.1	< comp. star dis.
90.9	
65.2	25.8 >
90.1	24.9 > 3.247
	<u>50.7 &gt;</u>

65.6	
88.9	23.3 >
64.1	<u>26.1 &gt;</u> 3.307
90.2	49.4 > 3.277

Index to left and above.

152.9	
<del>182.8</del>	183.0
154.1	30.1 >
183.2	<u>29.1 &gt;</u> 2.897
	59.2 >

154.2	
181.1	26.9 >
152.0	<u>29.4 &gt;</u> 3.007
182.4	56.3 > 2.947
	<u>mean = 3.107</u>



Oct. 10, 1896.

Star  $\times$  thought to be seen at intervals but not steadily, and practically at limit of visibility.

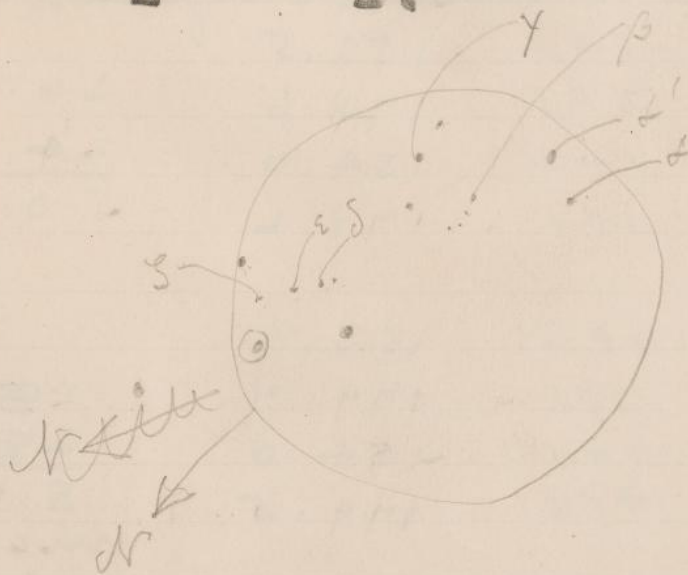
By a little haze  
 it is not quite as high as last night: for star  $\times$  in diagram on p. 195 of this book.

Measurements of faint comp stars.  
 R. Delphini: Phot 3: 25.0

$$\begin{array}{r} 20 \\ 22 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 10 \\ 38 \\ \hline 28 \end{array}$$

$$+ 8.8$$



$$\begin{array}{r} 10.5 \\ 10.5 \\ \hline 10.5 \end{array}$$

$$\begin{array}{r} 4.5 \\ 4.5 \\ \hline 3.5 \end{array}$$

$$\begin{array}{r} 8.1 \\ 8.1 \\ \hline 10.1 \end{array}$$

$$\begin{array}{r} 8.1 \\ 8.1 \\ \hline 10.1 \end{array}$$

$$\begin{array}{r} 4.0 \\ 4.0 \\ \hline 13.5 \end{array}$$

$$\begin{array}{r} 8.5 \\ 8.5 \\ \hline 13.5 \end{array}$$

W. obs.

Oct. 10, 1896.

Star & comp. with P.M. +8° 4391 19.3.  
Index to right and above

X 67.0 &lt; comp. star dis.

88.0		
64.3	21.0 >	
89.8	<u>25.5 &gt;</u>	3.43 >
	46.5 >	

66.4		
87.5	21.1 >	
66.6	<u>20.8 &gt;</u>	3.67 >
87.4	41.9 >	3.55 >

Index to left and below.

152.5		
178.6	26.1 >	3.26 >
154.0	<u>24.2 &gt;</u>	
178.2	50.3 >	

153.9		
179.4	25.8 >	3.22 >
154.0	<u>25.5 &gt;</u>	3.24 >
179.5	51.3 >	
	<u>mean =</u>	3.40 >



Oct. 10, 1896.

Star S comp. with D.M. +8°43'91.69  
Index to left and below

149.7	< comp. star dis:
180.7	31.0 >
153.5	27.2 > 2.93 >
180.7	58.2 >

152.9	28.9 >
181.2	25.2 > 3.10 >
154.1	54.1 = 3.02 >
179.3	

Index to right and above.

241.8	
275.7	32.9 >
242.0	29.7 > 2.73 >
271.7	62.6 >

242.0	
275.9	32.9 >
240.1	34.5 > 2.59 >
274.6	67.4 > 2.68 >
	mean = 2.84 >

Oct. 10, 1896.

Star  $\alpha^1$  comp with D.M. +8° 4391 (9.3)  
Index to right and above.

10

19.9

223.0	< comp. star dis.	
292.5		
230.0	69.5 >	1.06 >
286.7	<u>56.7</u> >	
	126.2 >	

223.6		
286.1	60.5 >	0.96 >
223.0	<u>70.4</u> >	1.01 >
293.4	<del>292.6</del> 130.9 >	

Index to left and below.

315.5		
22.2	66.7 >	1.15 >
321.1	<u>55.1</u> >	
16.2	121.8 >	

10

26.2

319.4		
17.7	58.3 >	1.18 >
317.0	<u>62.1</u> >	1.16 >
19.1	120.4 >	1.08 >



Oct. 10. 1896.

Star 2 comp. with D.M. + 8° 43' 9" 1923  
Index to left and below.

31.2

328.0	comp. star 2
10.9	
327.6	42.9 >
7.5	39.9 > 2.11 >
	82.8 >

326.0	41.9 > 2.16 >
7.9	39.4 > 2.14 >
329.6	81.2 >
9.0	

Index to right and above.

56.3	
44.9	98.6 42.3 >
56.7	38.5 >
95.2	2.17 > 80.8 >

57.0	40.8 >
97.8	2.06 > 43.9 >
53.9	2.12 > 44.9 >
97.8	

2.08  
mean = 2.13 >

Oct. 10, 1896.

Star γ comp. with D.M. +8° 4391 (9.3)  
Index to right and above.

10      39.7

55.7	< comp. star dis.	
96.4		
56.9	40.7 >	
99.1	42.2 >	2.11 >
	<u>82.9 &gt;</u>	

55.1		
98.4	42.3 >	2.21 >
59.0	<u>36.1 &gt;</u>	2.16 >
95.1	79.4 >	

Index to left and below.

144.1		
188.5	44.4 >	
140.6	<u>50.0 &gt;</u>	1.80 >
190.6	94.4 >	

10      44.5

142.8	45.4 >	1.82 >
188.2	<u>48.2 &gt;</u>	1.81 >
141.8	92.6 >	
190.0		
	<u>mean = 1.98 &gt;</u>	



Oct. 10, 1896.

Star  $\beta$  camp. with D.M.  $+8^\circ 43' 19.2$   
Index to left and below.

10	46.9	152.3	< camp. star dis.	
		185.9	33.6	>
		146.6	40.10	> 2.39
		186.6	<u>73.6</u>	>
		149.2	36.0	>
		185.2	24.9	> 2.48
		149.2	<u>70.9</u>	> 2.43
		184.1		2.44

Index to right and above.

10	53.7	241.9	31.6	> 2.49
		273.5	38.9	>
		238.0	<u>70.5</u>	>
		276.9		
		236.9	40.1	> 2.32
		277.0	35.6	> 2.40
		241.8	<u>75.7</u>	>
		277.4	mean =	2.42

11 07 a star  $1\frac{1}{2}$  grades fainter than  
 X could probably be seen. Star  
 X is the star on Mr. Reed's chart  
 of that letter.

All the measurements are above

Oct. 10, 1896.

camp. Stars for  $\alpha$  Delphini made with considerable difficulty from increasing haze; this was especially the case with fainter stars.

The last star measured (B.) was measured with great difficulty it was so faint that abs. lost the region in the series on this star and thought that some of the last settings may have been made on another star, altho' he is not sure.

















Posted to here.













1895ptae.jpg 1341