

1901phae.proj..927K

KG  
11365  
926



KG11365.926

27

E. S. King

No 3

Sept 1901 — July 25 1902

128







## Index.

Measures used in No 2 of Vol XL I including measures of wedge & Horizontal Tel., & also of shade glasses	} 1-184 182, 8. 200-213.
Motion in line of sight when differences (in $\lambda$ ) between two Runov lines appear	{ 185, 6 189, 91
H.A. for Altitude of $+40^\circ$ & $+45^\circ$	192.
wedge 24305	193-199
Comparison of scale Pritchard wedge	214.
wedge 24306	215-220



Monday Sept 17<sup>6</sup> 1901

# Test of Yerkes wedge.

Same Apparatus as used Sept 14<sup>th</sup> except that a piece of photographic shade together with blue glass has been inserted in photometer to reduce the light. Similar piece of shade has been placed before artificial star.

The shades 1, 1, 1, 1, 1 are placed just in front of the Cooke lens.

## Measures Shades in.

10 07

36.3

34.6

29.9

35.8

36.0

322.6

Mean = 36 34.5

Again

36.0

34.9

36.0

35.7

33.8

264

Mean = 35.3



HG 11365.926

HARVARD  
UNIVERSITY  
LIBRARY  
JUL 17 1956

Monday Sept 16 1901

Shades removed

14.6

16.0

15.6

14.2

15.0

---

25.4

Mean 15.1

Again.

16.4

15.0

15.8

15.1

10 31 

---

16.8  
29.1

Mean 15.8

35.3

34.5

---

79.8

30.9

2 | 98.9

---

19.4 =

2.74

7.60

5.82

---

17.80

1.746

15.8

15.1

---

30.9

$$13.9 \cdot 139 = \frac{1}{25}''$$



Monday Sept 16 1901

Shade Glasses in

10 40

34.3

37.4

34.0

35.8

34.9

---

264

Mean 35.3

11 Removed.

31.0

26.4

29.3

30.0

28.3

---

450

Mean 29.0

6.3

11111 Removed.

20.0

19.5

21.5

19.9

20.8

---

51.7

Mean 20.3

8.7

111111 Removed.

16.5

14.5

16.3

15.6

16.4

---

293

Mean 15.9

---

19.4

4.4

11 03

Tuesday Sept 17 1901

Same Apparatus as last.

2 50 Shades in

37.5

37.8

36.9

36.8

35.5

34.5

36.9

11 Removed.

32.1

32.7

31.0

5.1

32.0

31.0

88

31.8

11111 Removed

24.4

23.8

22.9

7.7

24.3

25.1

20.5

24.1

111111 Removed

17.0

18.5

5.7

19.2

19.5

3 18

18.0

42.2

18.4

18.5



Tuesday Sept 17 1901

Shades in

3 26

~~34.6~~ 39.7~~36.6~~ 36.1~~32.5~~ 39.7

37.9

38.6

38.4

11 Removed.

33.2

33.1

35.0

30.2

5.8

31.7

13.2

32.6

1111 Removed.

23.3

22.4

24.8

8.9

24.0

24.2

18.7

23.7

11111 Removed

18.9

17.5

17.8

17.2

5.6

3 53

19.0

40.4

18.1

20.3

Tuesday Sept 17 1901

Same Apparatus.

Shades in

4

0

38.5

38.0

39.5

38.6

38.0

42.6

38.5

1.... Removed.

28.9

28.0

31.9

31.6

27.9

48.3

29.6

Repealed

30.0

28.7

30.9

26.7

31.0

47.3

29.5

9.0

" Removed.

23.2

25.0

23.0

24.3

25.0

20.5

24.1

5.4

1..... Removed

18.1

21.7

17.9

17.5

17.9

43.1

5.5

4 25

18.6

19.9



Tuesday Sept 17 1901

Same apparatus.

Shades in.

4  $\frac{40}{33}$

36.5

Repeated 37.5

39.1

38.1

42.0

38.2

42.0

37.6

38.1

40.0

477

39.5

41.4

38.3

" Removed.

38.9

31.3

33.4

32.3

6.5

32.3

32.5

32.4

118

1.... Removed.

26.0

23.5

2.7

23.0

25.8

25.2

24.7

23.5

1.... Removed.

19.1

18.8

5.9

19.5

18.5

18.3

18.8

5-07

442

20.1

Tuesday Sept 17 1901

Same Apparatus. Antifaint film reduced about 0.8 mag

Shades in.

43.0

44.4

43.2

42.8

41.9

---

153

43.1

Shades removed.

25.5

24.1

24.6

25.2

23.7

---

231

24.6  

---

18.5

Shades in.

40.9

~~49.0~~ Reject

40.7

44.0

46.0

48.1

---

19.7

43.9

Shades removed.

24.6

24.9

25.1

25.9

26.0

---

265

25.3

Diff = 18.6



Friday Sept 20 1901

22<sup>h</sup> + Same apparatus readjusted to make emergent pencils coincident. The fault previous was due to twisting of reflectors.

22 4<sup>h</sup> 8 Shades in

40.6

39.5

38.8

37.6

36.5

39.5

37.4

42.2

37.5

39.8

43.7

86.4

38.6

38.0

37.0

37.2

37.3

40.0

39.7

37.0

38.4

20.4

41.6

5.5

89.5

39.0

38.8

Friday Sept 20 1901

23 08

" Removed.

33.2

28.5

32.0

31.8

27.5

33.5

31.1

33.2

32.3

31.7

35.7

114.8

31.5

28.3

34.4

34.0

30.3

30.6

32.9

28.3

32.5

30.8

23 25

117.4

31.7

31.6



Friday Sept 20 1901

23 27 11111 Runway

23.0

24.8

24.1

24.8

23.7

24.0

25.2

25.1

22.0

23.4

23.2 40.1

24.0

25.0

23.1

24.9

27.2

25.0

25.0

25.2

24.8

23.3

23.8 46.7

24.7

23 44

24.4

Friday Sept 20 1901

Shade 10000 Removed

23 46

18.9

18.1

17.1

17.1

17.7

19.2

17.2

17.4

20.0

19.1

18.4

81.8

18.2

19.7

21.9

17.4

19.1

20.8

18.9

20.7

20.3

19.1

24,00

86.3

18.6

18.4



Saturday Sept 21 1901

Recapitulation of Results H 9-12

Shades in	38.8			Sum H 1475
" Removed	31.6	7.2		38.6
1000 "	24.4	7.2		30.8 7.8
1000 "	18.4	6.0		25.0 5.8
	<u>20.4</u>	<u>20.4</u>		<u>19.6</u> 5.4
				<u>19.0</u> 19.0

$$20.4 \overline{) 270} \quad \left( \begin{array}{l} \text{neg} \\ .132 = \frac{1}{25} \end{array} \right)$$

$$\begin{array}{r} 270 \\ - 204 \\ \hline 660 \\ - 612 \\ \hline 480 \end{array}$$

$$7.2 \overline{) 0.90} \quad \left( \begin{array}{l} \text{neg} \\ .125 = \frac{1}{20} \end{array} \right)$$

$$\begin{array}{r} 0.90 \\ - 0.72 \\ \hline 180 \\ - 144 \\ \hline 360 \end{array}$$

$$6.0 \overline{) 0.90} \quad \left( \begin{array}{l} \text{neg} \\ .15 = \frac{1}{20} \end{array} \right)$$

$$7.8 \overline{) 0.90} \quad \left( 0.115 \right)$$

$$\begin{array}{r} 0.90 \\ - 78 \\ \hline 120 \\ - 78 \\ \hline 420 \\ - 390 \\ \hline 30 \end{array}$$

$$5.4 \overline{) 0.90} \quad \left( 16 \right)$$

$$\begin{array}{r} 0.90 \\ - 54 \\ \hline 360 \end{array}$$

Saturday Sept 21 1901

7 32

Shades ~

37.3

38.5

38.9

40.3

37.1

40.0

38.2

37.1

40.6

38.3

86.3

38.6

7 41

" Removed

30.7

30.8

29.9

32.5

32.8

31.8

26.9

32.5

31.9

28.3

108.1

30.8



Saturday Sept 21 1907

11111 Run

7 48 25.7

25.0

26.4

23.3

24.5

24.1

24.8

25.5

25.8

24.4

49.5

25.0

11111 Run

7 58 19.5

18.5

20.0

20.9

19.7

18.3

18.8

18.9

19.7

8 06 21.4

95.7

19.6

~~38.6~~

Saturday Sept 21 1901

Made artificial star nearly a magnitude fainter by additional phot. shades

Shades -

9 28

47.9

47.0

47.4

46.4

45.7

46.0

44.0

45.5

44.5

9 40

43.0

45.7

57.4

" Removal

10 0<sup>6</sup><sub>8</sub>

37.5

-1

38.3 +.7

39.6 2.0

42.0 4.4

38.0 0.4

37.6

36.4 1.2

25.4 2.2

36.5 1.1

34.6 3.0

37.9 0.3  
76.2 7.8 7.6



Saturday Sept 21 1901

11111 Removed.

10 17 32.4 + 1.9

29.1 - 1.4

31.4 0.9

28.8 1.7

28.9 1.6

30.8 0.3

30.8<sup>4</sup>

31.6 0.9

30.8 0.3

27.3 3.2

32.4 1.9

103.5 6.2

7.9

7.4

7.5

10 26 11111 Removed

20.5

21.1

21.1

22.8

22.4

22.5

19.8

24.6

25.4

10 34

21.5

21.7

22.2

18

Saturday Sept 21 1907

10 38

48.0

42.8

42.3

46.3

42.0

43.3

43.0

41.9

43.5

10 46

40.8

43.9

43.4



Wednesday Sept 25 1900

2.5.

1034

1

Ready obs of buds on Moon.

Obs with 11" lens Mr. Chan at 6"

Obs with filter of 15". Mr. Chan at 11"

2 15

Not seen

17

"

"

3 1

"

"

1053 Monday Sept 30 1901

Apparatus for testing Goussier wedge. removed.  
A Warriner wide angle lens, <sup>same as from</sup> is now used. The two  
lights are made similar by blue glass & f.A.D.  
shades.

Shades near lens.

4 4<sup>8</sup>/<sub>5</sub>

Shades in

43.1

43.2

43.8

41.8

44.1

44.0

44.8

44.1

42.2

41.4

32.5 ✓

" Removed.

34.3

35.3

33.8

35.0

35.0

35.2

34.0

36.6

34.0

35.5

48.7 ✓

43.2 ✓

8.3

34.9 ✓



Monday Sept 30 1901

11111 Remond

26.0

23.8

23.8

26.3

26.4

26.0

25.1

25.0

26.3

26.1

54.8 ✓

9.4

25.5 ✓

5.4

11111 Remond

21.9

20.4

20.0

20.9

21.8

21.4

21.5

21.8

20.4

20.0

10.1

20.1 ✓

23.1

Monday Sept 20 1901

" Replaced.

26.2

25.0

24.5

26.3

27.0

24.9

25.4 ✓

26.2

25.9

24.5

23.1 ✓

54.0

542



10.5.1 Monday Sept 30 1901

8 47 Shades in

40.6	+6		
39.4		-6	
40.9	+9		
41.0	+10		
40.0	0		
39.4		-6	40.0
41.5	+1.5		
38.8		-1.2	
37.9		-2.1	
40.5	+0.5		
100.0	4.5	45	<del>10/9.0</del> $\pm 0.9$

11 Rem.

21 02	31.8	+	-1.0	
	32.0		-0.8	
	35.1	+2.3		
	33.7	+0.9		
	32.0		-0.8	32.8
	31.5		-1.3	
	33.5	+0.7		
	34.0	+1.2		
	31.5		-1.3	
	32.8		0	
	27.9	57	52	$\pm 1.0$

Monday Sept 30 1901

9 13

11111 Run.

25.3 - 2

26.1 + 6

24.7 - 8

24.5 - 10

25.9 + 4

25.7 + 2

25.5

25.5 0

26.3 + 0.8

24.9 - 6

26.2 + 8

55.2 28 26

 $\pm 0.5$ 

9 22

11111 Run

18.3 - 13

19.7 + 1

20.8 + 12

19.3 - 3

20.1 + 5

19.6

19.2 - 4

19.4 - 2

19.8 + 2

20.2 + 6

19.7 + 1

96.5 27 22

 $\pm 0.5$ 

9 29



Monday Sept 30 1901

9 33 Shaded in

41.5 +10

39.6 - 9

41.3 + 8

41.3 + 8

40.1 - 4

40.0 - 5

41.1 + 6

40.1 - 4

39.5 - 10.2 5.22

40.6 + 1

105.1	33	32
-------	----	----

 $\pm 0.6$ 

" Run

9 41 32.0 - 13

34.5 + 12

31.0 - 23

33.5 0

33.9 + 6

34.0 + 7

35.0 + 17

32.8 - 5

33.6 + 3

33.0 - 3

33.1	45	44
------	----	----

 $\pm 0.9$ 

33.3

Monday Sept 30 1907

9. 49

1111 Run

25.9 +10

25.0 +1

25.6 +7

23.9 -10

25.5 +6

23.7 -12

24.9

24.4 -5

25.0 +1

25.8 +9

24.1

48.9	34	-8	
	-38		$\pm 0.7$

9. 56

21.1 +18

20.0 +7

19.3 0

19.5 +2

19.3

19.3 0

19.8 +5

18.1 -12

19.2 -1

18.5 -8

10. 02

18.6 -7

93.4	+32	-28	$\pm 0.6$
------	-----	-----	-----------



Monday Sept 30 1901

22 18 Shade in

40.3

38.0

40.1

39.2

40.8

37.8

37.7

41.0

40.9

39.1

94.9

39.5 ✓

22 41 " Run

34.8

31.9

34.4

32.7

31.9

33.8

34.0

32.6

32.0

31.1

29.9

33.0 ✓

28

Monday Sept 30 1901

22  
1/0 58

1 min Run

24.0

25.3

23.6

24.2

23.6

23.1

23.3

24.6

22.8

22.3 ✓

38.8

23.9 ✓

20  
H 06

1 min Run

18.6

18.7

18.9

18.8

18.6

18.1

19.4

18.3

18.0

18.6 ✓

20 10

18.4 ✓  
5.8



Tuesday, ~~Sept~~ Oct 1, 1901

Lights have been left on since last measures.  
Position of comparison stars near to artificial star.

3 12 — Shades in west to artificial star.

40.4

39.7

40.4

40.8

39.8

39.9

39.8

40.2

40.0

40.0 ✓

---

 101.0

40.1 ✓

— " Run

3 24 30.7

31.3

30.4

28.3

29.0

30.5

31.3

33.2

30.7

30.6 ✓

---

 26.0

<sup>0</sup>  
 32.6 ✓

30

Tuesday Oct 1 1901

3 35

11111 Run

23.5

22.2

25.1

23.6

23.2

24.0

23.8 ✓

22.5

24.0

25.1

25.3

38.5 ✓

3 42

11111 Run

17.6

16.8

17.1

17.5

18.3

18.0

17.5 ✓

17.4

18.4

17.3

16.9

75.3 ✓

3 51



Tuesday Oct 1 1901

Shade is not to artificial sun

3 56

40.2

40.0

38.5

41.0

41.5

41.6

41.9

43.0

40.9

41.4

10.0

41.0 ✓

4 05

30.4

+7

33.7

+40

29.0

-7

29.8

+1

27.0

-27

29.8

+1

29.7

28.8

+1

-9

30.1

+4

30.3

+86

5

27.7

-20

96.7

+59

-84

+59

63

+59

122

± 1.2

Tuesday Oct 1 1901

4 14

24.3

23.1

23.1

25.5

23.4

23.2

23.2

21.5

23.2

23.3

33.8

23.4 ✓

4 20

17.1

16.8

17.8

17.9

17.5

17.8

17.6

18.4

18.1

17.3

76.3

17.6 ✓

4 26



10, 1 7, 1

Tuesday Oct 7 1901

Shades used near objection as before  
 They are oriented slightly different as some  
 of them appear fissured or not perfect plane

#7 45

39.4

37.5

40.5

38.3

39.4

37.6

42.8

40.4

37.6

39.8

93.3 ✓

" Run

31.5

33.0

34.8

34.3

35.8

32.0

31.9

33.1

35.0

32.1

33.5 ✓

39.3 ✓

5.9

33.4 ✓

7 58



8 06 24.5

24.3

25.3

22.8

24.0

24.2

23.1

24.4

24.4

24.2

41.3

9.3

24.1 ✓

5.9

8 12 16.3

18.5

18.0

17.9

20.3

18.8

18.3

17.7

17.4

18.5

81.5

18.2 ✓

21.1

8 19

Tuesday Oct 1, 1901

Measured individual shades near  $\Delta$   
lens.

9 54 Shades out *Agua*

17.3
17.5
18.5
17.0
16.7
17.3
18.7
19.6
17.7
19.3
<hr/> 79.6

18.0 ✓

10 02 " in *Agua*

25.5	10 31 23.0
24.6	24.4
24.3	24.3
25.8	23.3
23.9	23.1
25.5	23.8
24.7	25.0
25.7	24.9
25.0	23.0
25.1	23.9
<hr/> 50.1	<hr/> 23.9
	38.7

25.0 ✓

24.4 ✓

23.9 ✓

Tuesday Oct 1 1901

10 12 — 11111 in

26.3  
 24.8  
 23.3  
 25.7  
 24.3  
 24.7  
 24.4  
 23.5  
 23.2  
 23.4 ✓  
 43.6 ✓

10 40 — again

24.0  
 22.0  
 22.5  
 24.4  
 23.3  
 23.2  
 22.5  
 21.4

10 46 — 23.4 ✓  
 26.7 ✓

24.4 ✓

22.7 ✓  
 2147.1 ✓  
 2356 ✓

10 20 — 11111 in

10 20 — 21.5  
 24.5  
 25.5  
 23.5  
 24.6  
 23.9  
 24.6  
 24.1  
 23.8  
 24.5  
 40.5

24.0 ✓

at 11 48 disconnected  
 bottom.



Tuesday Oct 1 1901

23<sup>2</sup> +

Lights turned on.

Reading by Mr. Wendell. Recording.

Apparatus adjusted as to relative position of magnets  
+ orientation of shades.

Shades in.

39.8

Wednesday Oct 2 1901

M  
12 02

Shades in

39.8

40.0

40.7

39.4

38.9

40.0

39.9

39.1

39.9

12 07

39.3

98.0

11 Run

12 09

33.3

34.1

34.7

34.8

34.2

34.2

34.1

33.5

33.9

12 13

33.2 33.3

39.6

39.6 ✓

34.0 ✓

Wednesday Oct 21 1904

weight in

12 M 18

11111 Run

25.3

24.6

24.8

24.9

25.14

24.9

25.1

25.2

24.9

25.14

50.3 ✓

25.0 ✓

12 21

11111 Run

12 22

20.1

20.0

20.0

20.1

19.6

19.8

19.9

18.9

19.1

19.9

97.3 ✓

19.7 ✓

12 24



Wednesday Oct 2 1901

m  
 12 28    Shades in  
          39.4  
          38.1  
          39.0  
          40.5  
          40.1  
          40.0  
          ~~40~~  
          40.1  
          39.7  
          38.9  
 12 32    38.8 ✓  
          94.6 ✓

39.5 ✓

11 Run  
 37    33.3  
      33.8  
      34.2  
      34.4  
      33.7  
      34.4  
      34.6  
      35.1  
      35.3  
      35.0  
 37    35.0  
      35.3  
      44.5 ✓

34.4 ✓

Wednesday Oct 2 1901

12 39 Repeated.

34.2

34.6

34.5

34.2

33.6

33.7

33.9

33.9

34.0

34.3 ✓

40.9

34.1 ✓

12 42

12 45

1111 Run

24.4

25.3

25.8

25.1 ✓

26.0

26.0

26.0

26.0

25.9

26.0 ✓

57.6

25.8 ✓

12 49

Wednesday Oct 2 1901

11111 Run

12 50

19.9

19.8

~~19.1~~

19.0

19.0

19.1

~~19.4~~

20.0

19.5 ✓

19.9

19.9

19.1

52

19.1

~~4.8~~ ✓

54

Repeated

20.1

20.3

20.3

20.1

20.0

19.9

20.0 ✓

20.0

19.8

19.8

19.6

99





Wednesday Oct 2 1901  
Summary of results.

Page	20	23	25	27	29*	31*	34
Shades in	43.2	40.0	40.5	39.5	40.1	41.0	39.3
in Remond	34.9	32.8	33.3	33.0	30.6	29.7	33.4
1000 "	25.5	25.5	24.9	23.9	23.8	23.4	24.1
10000 "	20.1	19.6	19.3	18.6	17.5	17.6	18.2
	8.3	7.2	7.2	6.5	9.5	11.3	5.9
	9.4	7.3	8.4	9.1	6.8	6.3	9.3
	5.4	5.9	5.6	5.3	6.3	5.8	5.9
	23.1	20.4	21.2	20.9	22.6	23.4	21.1

Page.	39 <i>McDonald</i>	41 <i>McDonald</i>	46	<i>Surfaces</i>			
	49	52	54				
Shades in	39.8	39.5	—	42.1	36.7	37.2	39.4
1000 Rem	34.0	34.4 <sup>34.2</sup>	34.1	35.9	29.1	29.6	32.1
1000 "	25.0	25.8	27.2	22.3	21.8	24.3	
10000 "	19.7	19.5 <sup>19.8</sup>	20.0	22.0	17.2	15.9	18.3
"	5.6	5.3	6.2	7.6	7.6	7.3	
1000	9.0	8.4	8.7	6.8	7.8	7.8	
10000	5.3	6.0	5.2	5.1	5.9	6.0	
	19.9	19.7	20.1	19.5	21.3	21.1	
	20.0						

\* Shades  
not to  
artificial  
Bea

\* Shades  
not to  
artificial  
Bea

Wednesday Oct 2 1911

Instrument substantially the same  
as when left by Mr. Wendell except  
focus.

Readings by Bin

Recorded by McCulla

Shades in

4<sup>h</sup> 51.0

41.9

42.8

43.3

40.1

42.5

42.6

42.7

44.0

39.2

42.1 ✓

5:00

41.6

20.7 ✓



" R Wednesday Oct 2 1901

2.8

" Removed

33.8

34.0

36.2

35.7

36.3

36.0

36.7

36.3

37.1

37.8

58.9 ✓

35.9 ✓

9.8

" " " " Removed

11.5

25.3

27.2

27.9

28.2

~~26.8~~

26.9

26.1

27.8

26.9

27.3

28.0

71.6 ✓

27.2 ✓

25.8

Wednesday Oct 2 1901

1 " " " " removed

28.8

21.2

21.4

22.2

21.2

22.6

21.9

21.9

23.1

23.8

22.0 ✓

34.0

20.8 ✓  
20.1

There was great difficulty  
in comparing images. The focus  
would become very bad at  
times as the eye grew tired.

At Close became convinced that  
whole photograph had slipped with  
respect of artificial star.

Corrected & images appeared  
all right.

Disconnected batteries

Saturday Oct 5 1901

Apparatus changed so that surfaces are now to be measured. The distance of the artificial star has been increased.

The light source has in front of the pale blue glass, ground glass & an aperture. The aperture for artificial star is placed ~~some~~ about 8 mm in front of the ground glass to obscure roughness of surface. A shade has also been used to reduce the light in order to bring the readings at a particular part of the scale.

7 17

Shades in

36.0

37.7

37.4

37.8

35.9

36.2

38.7

36.0

35.4

36.3

67.4

36.7 ✓



Saturday Oct. 5, 1901

7.24 " Run

30.2

29.3

29.6

29.8

28.0

29.0

28.6

28.9

27.9

30.0 ✓

91.3

29.1 ✓

7.32

1111 Run

22.0

23.5

22.3

22.5

21.9

22.7

22.7

21.4

22.4

21.7 ✓

23.1

22.3 ✓

Saturday Oct 5 - 1901

11111 Run

7 39

17.5

16.9

16.5

17.5

17.0

17.8

17.3

16.9

16.9

7 45

17.2

71.5

17.2

$$\begin{array}{r} 17 \\ 22 \\ 24 \\ 23 \\ \hline \end{array}$$

Saturday Oct 5 1901

8 59

Shades in

37.1

36.3

35.8

36.7

37.4

37.4

38.7

37.3

37.4

38.0

---

72.5

37.2 ✓

9 07

" Rim

31.5

31.0

29.5

31.6

28.3

28.5

29.5

28.2

29.5

28.3

---

65.9

9

29.6 ✓



Saturday Oct 5 1901

9 15 11111 Run

21.6

21.7

20.6

21.7

20.5

21.5

21.4

22.7

21.4

21.4

17.5

21.8 ✓

11111 Run

9 20

17.4

15.9

16.2

15.7

15.7

16.5

16.3

15.0

13.6

15.9 ✓

9 26

17.1

59.4

Saturday, Oct 5 1901

Removed shade

Added a bit of photo. shade  
over artificial sun.

Shades in

10 02

39.0

39.6

39.8

38.6

39.0

~~39.7~~

38.0

41.1

40.0

38.8

93.6 ✓

39.4 ✓

10 12

" Removed

32.0

31.1

31.6

33.2

32.9

31.4

32.5

32.7

31.8

31.3

20.6 ✓

32.1 ✓

Saturday Oct 5 1901

10 18 11111 Run

24.5

24.9

25.0

25.0

24.7

23.6

24.0

24.1

22.7

24.5

43.0

24.3

10 24 11111 Run

17.9

18.7

18.2

17.5

17.0

18.6

18.8

19.5

17.1

19.5

82.9

18.3



Saturday Oct 5 1901

10 33

/ 1111 in

23.8

23.4

23.7

22.7

23.6

23.0

24.5

23.9

23.1

23.8

---

35.5 ✓

23.6 ✓

10 39

" in

23.0

23.6

24.1

24.0

24.4

24.9

24.3

25.1

24.0 ✓

10 42

23.3

10 44

23.0

---

39.7 ✓

Sunday Oct 6 1901

21<sup>h</sup> 30

Put arbitrary line on wedge.  
Took corresponding readings of scale

68.7

68.6

68.6

68.6

68.7

Monday Oct 7 1901

The line entered (see page 57) is 1.35 for  
 end of <sup>glass</sup> ~~to edge~~. "0" as in + 116 of Pth. Plot  
 No 1 is 1.60 for end of glass.

$$\begin{array}{r}
 1.60 \\
 1.35 \\
 \hline
 .04 \overline{) 2.21} \quad 5.2 \\
 \underline{20} \\
 10
 \end{array}$$

$$\begin{array}{r}
 68.6 \\
 5.2 \\
 \hline
 63.4
 \end{array}$$

Therefore "0" = <sup>Scale</sup> 63.4

1 = 53.4

4 = 43.4

5 = 38.4

6 = 33.4

8 = 23.4

9 = 18.4

10 = 13.4



Monday Oct 7 1901

Arrange apparatus to measure wedge  
by Pol. Phot. but using focus.

At extremity of bench in ent. Room  
set two pin holes <sup>about 0.5 mm.</sup> in focus in front of  
incandescent plate in front of heliostat  
Cooker lens brings point to focus with  
about 4 mm. reduction. The rays are  
as viewed through Pol. Phot. which has  
glass aperture removed.

For "

It is arranged so that different  
parts of wedge will come over one  
of the apertures.

The numbers "5" "6" "7" "8" "9" correspond  
to the graduations used in Pol. Phot. measure.

Measure on following pages.

Monday Oct 7 1901

7 22<sup>6</sup>

"9"

Left apertures. Lever right

11.3

rt dis

71.1

59.8

190.0

61.4

257.4

121.2

"9"

Left apertures

Lever left

~~354.6~~

358.5

left dis

80.9

82.4

173.3

102.9

276.2

Monday Oct 7 1901

"5" Lipo afutun Sun Lipo

Lipo dis  
334.1  
92.6 ~~5.5~~  
153.3 60.7  
295.5 38.6

"5" Lipo afutun Lipo up Lipo

at dis  
208.5  
233.6 35.1  
29.6 26.3  
55.9

> 45

L. R.

L. L.

> 50  
208.0  
235.4 27.4  
31.7 21.7  
53.4  
331.0  
108.6 50.1  
158.7 36.3  
295.0



Monday Oct 7 1901

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

Lycopodium. L. Right.

Sov

Di di

204.3

237.9

28.6

29.6

26.0

55.6

Readjusted instrument. Repeat Previous

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

Lycopodium L. R

8 22

210.7

237.1

26.4 ✓

30.5

25.3 ✓

55.8

51.7 ✓

3.20 ✓

L. I.

Di di

118.4

147.5

29.1 ✓

299.6

38.8 ✓

328.4

57.9 ✓

$$\begin{array}{r} 2.94 \checkmark \\ 2 \overline{) 6.14} \checkmark \\ 3.07 \checkmark \\ 1.31 \checkmark \\ \hline 20 \overline{) 7.76} \checkmark \\ 0.88 \checkmark \end{array}$$

Monday Oct 7 1901

	'9"	Lft apmtm	I. I.		
	<del>343.9</del>		343.4		
Lft Dis-	<del>99.9</del>	<del>65.8</del>	105.0	58.0 ✓	
	<del>165.7</del>	<del>50.5</del>	163.0	<u>60.1</u> ✓	1.23 ✓
	<del>283.4</del>		283.3	- 118.1 ✓	

<del>192.5</del>		194.3			
<del>251.8</del>	<del>59.3</del>	249.4	55.1 ✓		
<del>15.2</del>	<del>58.6</del>	15.8	<u>56.0</u> ✓	1.39 ✓	
<del>73.8</del>		71.8	<u>111.1</u> ✓	<u>2) 262</u> ✓	
				131 ✓	

Sunday Oct 7 1907

8 52

"9"

Left.

L. R.

13.6

14.3

1.29 ✓

71.7

58.1 ✓

69.6

55.3 ✓

1.37 ✓

195.0

57.7 ✓

195.0

56.8 ✓

2) 66 ✓

252.7

115.8 ✓

251.8

112.1 ✓

1.33 ✓

"9"

Left

L I.

wedge changed by  
mistake & restored.

~~103.6~~

~~105.9~~

~~104.8~~

~~164.1~~

~~164.3~~

~~163.3~~

~~287.1~~

~~283.0~~

~~283.6~~

~~341.6~~

~~343.5~~

~~347.6~~

103.8

106.0

1.22 ✓

164.0

60.2 ✓

165.3

59.3 ✓

1.17 ✓

284.7

58.7 ✓

282.7

61.8 ✓

2) 39 ✓

343.4

118.9 ✓

344.5

121.1 ✓

1.20 ✓

2.66  
2.39  
4) 5.05 ✓  
1.26



Monday OCT 7 1901

"8"

I. I.

109.6

111.3

155.0

45.4 ✓

156.5

45.2 ✓

1.85 ✓

291.0

45.7 ✓

293.3

42.1 ✓

1.95 ✓

336.7

91.1 ✓

335.4

87.3 ✓

3.87 ✓

1.94

I R.

198.5  
~~249.2~~ 66.5

204.2

1.85 ✓

246.8

48.3 ✓

246.3

42.1 ✓

3.93

23.4

43.0 ✓

22.0

43.0 ✓

2.05 ✓

66.4

91.3 ✓

65.0

85.1 ✓

2.93 ✓

2.57 ✓

4) 7.60 ✓

1.95 ✓

"7"

D L R.

206.9

207.8

241.6

34.7 ✓

241.6

33.8 ✓

2.65 ✓

29.1

31.1 ✓

26.7

32.4 ✓

2.64 ✓

60.2

65.8 ✓

59.1

66.2 ✓

I. I.

152.5

153.0

293.5

41.0

296.9

36.2 ✓

4.66

2.21 ✓

333.5

40.0 ✓

332.1

36.8 ✓

2.41 ✓

114.5

38.0 ✓

116.2

73.0 ✓

4) 7.95 ✓

78.0 ✓

2.49 ✓

Monday Oct 7 1901

"6 "

L. L.

116.9

148.2

298.6

330.0

31.3 ✓

$$\begin{array}{r} 31.4 \\ \hline 62.7 \end{array} \checkmark$$

118.9

150.5

298.4

329.3

31.6 ✓

$$\begin{array}{r} 30.9 \\ \hline 62.5 \end{array} \checkmark$$

2.76 ✓

2.77 ✓

L. R.

210.8

238.0

29.5

59.0

27.2 ✓

$$\begin{array}{r} 29.5 \\ \hline 56.7 \end{array} \checkmark$$

209.0

240.5

29.7

59.7

31.5 ✓

$$\begin{array}{r} 30.0 \\ \hline 61.5 \end{array} \checkmark$$

2.99 ✓

$$\begin{array}{r} 2.80 \\ \hline 4133.2 \\ \hline 2.83 \end{array} \checkmark$$

5

L. R.

211.2

235.5

31.1

55.1

24.3 ✓

$$\begin{array}{r} 24.0 \\ \hline 48.3 \end{array} \checkmark$$

211.7

238.0

31.8

56.2

26.3 ✓

$$\begin{array}{r} 24.4 \\ \hline 50.7 \end{array} \checkmark$$

3.35 ✓

3.24 ✓

L. L.

301.1

326.9

118.8

142.9

25.8 ✓

$$\begin{array}{r} 29.1 \\ \hline 54.9 \end{array} \checkmark$$

301.2

327.3

120.0

148.3

26.1 ✓

$$\begin{array}{r} 28.0 \\ \hline 54.4 \end{array} \checkmark$$

3.07 ✓

$$\begin{array}{r} 3.08 \\ \hline 4174 \\ \hline 3.18 \end{array} \checkmark$$

9 56

Monday Oct 7 1901

Pages 64-66

62, 3

"9"	1.26			1.31
8	1.95	0.69	.14	
7	2.49	0.54	.11	
6	2.83	0.34	.07	
5	3.18	0.35	.07	
	<u>20   1.92</u> ✓			<u>20   1.76</u> ✓
	0.96 ✓			0.85 ✓

157 123  
120  
3

9  
8  
7

L. R	2.1	L. R	L. I
<del>1.33</del>	<del>1.20</del> 9	1.33	1.20
<del>1.29</del>	<del>1.17</del> 8	1.96	1.94
1.95	<del>1.88</del> 7	2.64	2.33
	6	<del>2.90</del>	2.76
	5	3.30	3.08



Tuesday Oct 8 1901

Same aperture as under last  
experiment.

Photographic slide on one aperture  
wedge in flat. Tube covers other aperture  
Aperture viewed thru telescope from  
with Cooke lens & 2 in eyepiece  
wedge shifted, read & measured  
of the white.

With exception of 2 sets of  
comparisons were made between  
half & half advancing from top  
of frame to new version.

Tuesday Oct 8 1901

Shades in

41.2

34.1

37.8

30.1

30.8

These readings are means of four  
when placing brightness of faint

36.8+ 40.0+

39.1+ 38.7+

37.5+ 37.9

39.8 39.9

35.2 36.6

32.7 34.9

88.5 ✓

38.2 ✓

36.2 33.7

39.7 34.9

37.1 35.3

34.8 35.8

55.1 ✓

$$\begin{array}{r} 35.5 \\ 2 \overline{) 73.6} \\ 36.8 \end{array}$$

Shades out

15.9

16.0

15.7

15.3

15.0

27.9 ✓

31.3 ✓

59.2 ✓

17.2

17.2

15.2

16.1

15.6

31.8 ✓

15.9 ✓

Tuesday Oct 8 1901

16.7

14.6

15.1

15.2

$$\begin{array}{r} 14.1 \\ \hline 25.7 \end{array} \checkmark$$

$$\begin{array}{r} 22.1 \\ \hline 47.8 \end{array} \checkmark$$

15.2

15.0

14.7

14.4

$$\begin{array}{r} 12.8 \\ \hline 22.1 \end{array} \checkmark$$

14.8  $\checkmark$ 

38.2

35.5

$$\begin{array}{r} 35.5 \\ \hline 3.6 \end{array} \checkmark$$

30.9

$$\begin{array}{r} 2 \overline{) 42.89} \\ \hline 21.4 \end{array} \checkmark$$

$$\begin{array}{r} 21.4 \\ \hline 21.4 \end{array} \checkmark$$

$$\begin{array}{r} 27.0 \\ \hline 21.4 \end{array} \checkmark$$

$$\begin{array}{r} 560 \\ 428 \\ \hline 1320 \end{array}$$

15.9

14.4

$$\begin{array}{r} 14.4 \\ \hline 20.7 \end{array} \checkmark$$

$$\begin{array}{r} 12.6 \\ \hline 12.6 \end{array} \checkmark$$

$$\begin{array}{r} 36.5 \\ 15.4 \\ \hline 21.4 \end{array} \begin{array}{r} 27.0 \\ 21.4 \\ \hline 560 \\ 428 \\ \hline 1320 \\ 1288 \\ \hline 32 \end{array} \begin{array}{r} 126 \\ 126 \\ \hline 126 \end{array}$$



Thursday Oct 10 1901

Test of Jones' wedge.

Artificial stars as described on page 59  
 & viewed in same manner through Cooke lens.

Wedge in tube (to use graduated scale) is introduced  
 for our star. Danson's settings need to be made  
 & measured by P.C. P.H. but not same method  
 as used page 59.

4 00 "20" Index Up.

206.9	
258.8	57.9
26.7	57.4
84.1	

Reject 1

Index down.

207.9		205.6
258.6	50.7	259.9 54.3 ✓
28.6	52.8 ✓	27.9 52.0 ✓
81.4	103.5 ✓	79.9 106.3 ✓

20 Index down

118.5	
172.3	53.8
297.8	53.0
350.8	106.8

115.3		1.57
170.4	55.7	1.50
295.8	55.3 ✓	1.49
357.1	110.4 ✓	1.41
		41 19 9
		1.49 ✓

Thursday Oct 10 1941

Change position of Mot. slightly

Index down

$$\begin{array}{r}
 40' \\
 136.5 \\
 153.2 \\
 212.5 \\
 334.0 \\
 \hline
 \end{array}
 \begin{array}{r}
 26.7 \\
 21.5 \\
 \hline
 \text{Right}
 \end{array}
 \begin{array}{r}
 133.8 \\
 153.5 \\
 314.6 \\
 334.4 \\
 \hline
 \end{array}
 \begin{array}{r}
 19.7 \\
 19.8 \\
 39.5 \\
 \hline
 \end{array}
 \begin{array}{l}
 \\
 \\
 \checkmark \\
 \checkmark
 \end{array}$$

$$\begin{array}{r}
 134.2 \\
 154.1 \\
 314.2 \\
 332.6 \\
 \hline
 \end{array}
 \begin{array}{r}
 19.9 \\
 19.4 \\
 39.3 \\
 \hline
 \end{array}
 \begin{array}{l}
 \\
 \checkmark \\
 \\
 \checkmark
 \end{array}$$

$$\begin{array}{r}
 45.7 \\
 63.3 \\
 224.5 \\
 243.1 \\
 \hline
 \end{array}
 \begin{array}{r}
 17.6 \\
 18.6 \\
 36.2 \\
 \hline
 \end{array}
 \begin{array}{l}
 \\
 \checkmark \\
 \checkmark \\
 \checkmark
 \end{array}$$

$$\begin{array}{r}
 4570 \\
 64.0 \\
 224.5 \\
 243.7 \\
 \hline
 \end{array}
 \begin{array}{r}
 19.0 \\
 19.2 \\
 38.2 \\
 \hline
 \end{array}
 \begin{array}{l}
 \\
 \checkmark \\
 \checkmark \\
 \checkmark
 \end{array}$$

$$\begin{array}{r}
 3.79 \\
 3.81 \\
 3.99 \\
 3.89 \\
 \hline
 4134.86 \\
 3.86 \\
 1.49 \\
 292.37 \\
 \hline
 0.118
 \end{array}$$

Thursday Oct 10 1907

"20"

Index up.

$$\begin{array}{r}
 33.5 \\
 78.5 \\
 206.0 \\
 259.8 \\
 \hline
 45.0 \\
 53.8 \\
 98.8
 \end{array}
 \begin{array}{l}
 \\
 \checkmark \\
 \checkmark
 \end{array}$$

$$\begin{array}{r}
 30.5 \\
 79.3 \\
 209.6 \\
 260.5 \\
 \hline
 48.8 \\
 50.9 \\
 99.7
 \end{array}
 \begin{array}{l}
 \\
 \checkmark \\
 \checkmark \\
 \checkmark
 \end{array}$$

1.69  
1.66

$$\begin{array}{r}
 296.4 \\
 352.0 \\
 117.0 \\
 169.7 \\
 \hline
 53.6 \\
 52.7 \\
 106.3
 \end{array}
 \begin{array}{l}
 \\
 \checkmark \\
 \checkmark
 \end{array}$$

$$\begin{array}{r}
 295.7 \\
 351.3 \\
 115.8 \\
 173.0 \\
 \hline
 53.6 \\
 57.2 \\
 112.8
 \end{array}
 \begin{array}{l}
 \\
 \checkmark \\
 \checkmark \\
 \checkmark
 \end{array}$$

1.46

$$\begin{array}{r}
 1.35 \\
 4 \overline{) 216} \\
 \hline
 1.54
 \end{array}
 \checkmark$$

5 12

$$\begin{array}{r}
 3.86 \\
 1.54 \\
 2 \overline{) 2.32} \\
 \hline
 1.01 \\
 0.116
 \end{array}$$



Thursday Oct 10 1941

Measure with old <sup>Pb</sup> Phot.  
Adjustments otherwise the same

5	29	120	I.I.					
		285.6		283.8				
		341.3	55.7	341.1	57.3			
		104.1	58.5 ✓	106.7	52.9 ✓			
		162.6	114.2 ✓	159.6	110.2 ✓	132.2		
			I R			1.32		
		17.9		16.6		1.41		
		69.0	51.4	71.0	54.4	1.57		
		198.7	52.3 ✓	199.1	49.4 ✓	1.56		
		257.0	103.7 ✓	248.5	103.8 ✓	7118.6		
						1.46 ✓		

Thursday Oct 10 1901

"40"

2 R

33.7		33.4	
52.2	18.5	54.6	21.2
213.8	19.0 ✓	213.7	19.8 ✓
832.5	37.5 ✓	233.5	41.0 ✓

3 L L

3.91

3.71

123.3		123.4		
146.1	22.8	143.7	20.3	3.72
305.3	18.1 ✓	303.9	20.5 ✓	3.72
323.4	40.9 ✓	324.4	40.8 ✓	84306 ✓
				3.76
				1.46
				20 ) 2.30
				0.115

553

9 13

"20"  
40 L.L.

285.4

344.0 58.6

104.5 62.5 ✓167.0 121.1 ✓

287.0

347.0 60.0

104.0 58.0 ✓162.0 118.0 ✓

Reading about about 20.1 Set up

"20"

286.4

344.2 57.8

106.4 56.1 ✓162.5 113.9 ✓

282.3

342.7 60.4

107.2 57.1 ✓164.3 117.5 ✓

Set off accidentally Set back

20 I.R.

17.7

66.6 48.9

199.2 49.5 ✓2848.7 95.4 ✓

22.0

68.9 46.9

197.7 50.7 ✓248.4 97.6 ✓



'40"  
3575  
~~523~~  
52.3  
216.7

D L R.

Abandoned as images are very faint.

9 43

"35" I.R.

33.1

57.1

24.0

22.1

24.9 ✓

237.0

48.9 ✓

31.6

54.9

23.3

211.6

24.0 ✓

235.6

47.3 ✓

I.R.

119.5

147.2

27.7

301.3

25.7 ✓

327.0

53.4 ✓

120.6

148.0

27.4

301.7

26.6 ✓

328.3

54.0 ✓

3.32

3.40

3.12

3.10

$$\begin{array}{r} 4 \overline{) 94} \\ 8 \end{array}$$

$$\begin{array}{r} 3.24 \end{array} \checkmark$$

1.15<sup>2</sup> L.L.

93.9

177.5	83.6	✓
274.1	79.6	
353.7	<u>163.2</u>	✓

92.8

172.2	79.4	
275.9	75.4	✓
357.3	<u>154.8</u>	✓

0.32

0.48

0.59

0.73

7/2.12

0.53 ✓

L.R.

189.8

261.9	72.1	
4.2	77.3	✓
81.5	<u>149.4</u>	✓

10 04

188.3

260.9	72.6	
11.6	69.5	✓
81.1	<u>142.1</u>	✓

3.24

0.53

20	2.71
<hr/>	
	0.136



Dist from star to wedge increased  
by 23 cm.

10 19

"<sup>u</sup>  
35 L.L.

301.5	
327.3	25.8
122.3	24.4 ✓
146.7	<u>50.2</u> ✓

302.8 ✓

327.3	24.5
121.7	24.8 ✓
146.5	<u>49.3</u> ✓

L.R.

32.3	
56.0	23.7
213.6	21.8 ✓
235.4	<u>45.5</u> ✓

31.0	
55.0	24.0
212.0	<u>23.1</u> ✓
235.1	<u>47.1</u> ✓

3.276
3.30
3.4 ✓
3.40
<u>41.45</u> ✓
3.36

" 15" L. R.

$$\begin{array}{r}
 10.2 \\
 80.1 \\
 189.0 \\
 257.4 \\
 \hline
 66.9 \\
 68.4 \\
 138.3 \quad \checkmark
 \end{array}$$

$$\begin{array}{r}
 N. 2 \quad 10.4 \\
 70.9 \quad 81.2 \\
 180.5 - \\
 257.9 \\
 \hline
 70.8 \quad \checkmark \\
 67.4 \\
 138.2 \quad \checkmark
 \end{array}$$

I. J.

$$\begin{array}{r}
 98.0 \\
 168.9 \\
 278.9 \\
 1040 \quad 257.2 \\
 \hline
 70.9 \\
 72.3 \quad \checkmark \\
 143.2 \quad \checkmark
 \end{array}$$

$$\begin{array}{r}
 95.4 \\
 169.1 \\
 295.9 \\
 356.0 \\
 \hline
 73.7 \\
 80.1 \quad \checkmark \\
 153.8 \quad \checkmark
 \end{array}$$

$$\begin{array}{r}
 3.36 \\
 .71 \\
 \hline
 202.65 \\
 \hline
 0.132
 \end{array}$$

$$\begin{array}{r}
 0.81 \\
 0.81 \\
 0.71 \\
 0.50 \\
 \hline
 4) 223 \\
 \hline
 0.71 \quad \checkmark
 \end{array}$$

Friday Oct 11 1901

Apparatus as test used but with ~~new~~ except  
that tubes containing wedge & scale is as new shot  
as possible.

7 58

<sup>35</sup>  
"40" L.R.

215.0

213.6

235.0 214

30.9 24.3 ✓

55.2 45.7 ✓

211.5

236.5 250

32.4 22.6 ✓

55.0 47.6 ✓

"35" L.L.

301.7

326.0 24.3

121.1 24.7 ✓

145.8 49.0 ✓

301.1

326.4 25.3

119.1 29.2 ✓

148.3 54.5 ✓

3.47

3.38

3.32

3.08

41.25

3.31 ✓



Friday Oct 11 1901

"15" L.L.

275.1

353.0

98.0

170.8

779

728

150.7

✓

✓

273.0

355.0

93.3

169.0

820

757

157.7

✓

✓

15" L.R.

05.11

80.0

190.1

260.6

749

705

145.4

✓

✓

08.3

80.7

188.2

257.8

724

69.6

142.0

✓

✓

821

0.56

0.43

0.67

0.72

4) 239

0.60

✓

3.31

60

20) 2.71

0.136

Friday Oct 11 1901

Same arrangements last week but  
photo. shade is removed for night show.

8 30 '35 L.R

35.8  
52.4 16.6  
215.9 16.4 ✓  
232.3 23.0 ✓

35.3  
53.3 18.0  
214.2 18.0 ✓  
232.2 26.0 ✓

L.J.

123.2  
143.7 20.5  
304.7 18.9  
323.6 49.5 ✓

124.2  
143.5 19.3  
304.0 20.0 ✓  
324.0 39.3 ✓

419 4.00  
3.30  
749

419 3.30  
400 3.81  
3.30  
3.81  
4115.30  
382  
135  
247  
124

4.19  
3.75  
277.94  
3.97  
1.46  
2.51  
2.67  
215.18  
20 2.59  
0.130

4.19  
4.00  
1.819  
409 ✓

4.00 3.30  
3.81 3.81  
277.11  
3.90 3.55 ✓  
1.23  
2.67

Friday Oct 11 1901

"15 I I.

$$\begin{array}{r}
 105.3 \\
 162.0 \quad 56.7 \quad \checkmark \\
 285.8 \quad 57.9 \quad \checkmark \\
 \hline
 343.7 \quad 114.6 \quad \checkmark
 \end{array}$$

$$\begin{array}{r}
 103.1 \\
 163.7 \quad 60.6 \quad \checkmark \\
 281.3 \quad 62.5 \quad \checkmark \\
 \hline
 343.8 \quad 123.1 \quad \checkmark
 \end{array}$$

"15 I. R.

$$\begin{array}{r}
 201.1 \\
 251.3 \quad 50.2 \\
 16.0 \quad 51.6 \quad \checkmark \\
 \hline
 67.6 \quad 101.8 \quad \checkmark
 \end{array}$$

$$\begin{array}{r}
 193.0 \\
 253.4 \quad 60.4 \\
 18.0 \quad 52.8 \quad \checkmark \\
 \hline
 70.4 \quad 113.2 \quad \checkmark
 \end{array}$$

8 46

$$\begin{array}{r}
 1.31 \\
 1.61 \\
 \hline
 2 \overline{) 2.92} \\
 \hline
 1.46 \quad \checkmark \\
 1.23
 \end{array}$$

$$\begin{array}{r}
 1.13 \\
 1.34 \\
 \hline
 2 \overline{) 2.47} \\
 \hline
 1.23 \quad \checkmark
 \end{array}$$

$$\begin{array}{r}
 292 \\
 247 \\
 \hline
 4 \overline{) 539} \\
 \hline
 135
 \end{array}$$



Friday Oct 11 1901

Apparatus unchanged. Eve.  
wedge is removed from tube &  
placed directly over aperture.

9 08

"5"

I. R.

$$\begin{array}{r} 211.5 \\ 236.7 \\ 30.5 \\ \hline 56.2 \end{array} \quad \begin{array}{r} 25.2 \\ 25.7 \\ \hline 50.9 \end{array} \quad \begin{array}{l} \\ \\ \checkmark \\ \checkmark \end{array}$$

$$\begin{array}{r} 212.0 \\ 236.0 \\ 30.4 \\ \hline 56.4 \end{array} \quad \begin{array}{r} 24.0 \\ 26.0 \\ \hline 50.0 \end{array} \quad \begin{array}{l} \\ \\ \checkmark \\ \checkmark \end{array}$$

5

I I

$$\begin{array}{r} 301.3 \\ 328.0 \\ 120.4 \\ 147.4 \end{array} \quad \begin{array}{r} 26.7 \\ 27.0 \\ \hline 53.7 \end{array} \quad \begin{array}{l} \\ \checkmark \\ \checkmark \\ \checkmark \end{array}$$

$$\begin{array}{r} 299.0 \\ 329.1 \\ 119.0 \\ 148.2 \end{array} \quad \begin{array}{r} 30.1 \\ 29.2 \\ \hline 59.3 \end{array} \quad \begin{array}{l} \\ \checkmark \\ \checkmark \\ \checkmark \end{array}$$

$$\begin{array}{r} 3.24 \\ 3.11 \\ \hline 6.35 \\ 3.15 \\ \hline 1.23 \\ 1.98 \\ \hline 1.76 \\ 20371 \\ \hline 20186 \end{array}$$

$$\begin{array}{r} 3.27 \\ 2.89 \\ \hline 6.16 \\ 3.08 \\ \hline 1.32 \\ 1.76 \end{array}$$

$$\begin{array}{r} 3.24 \\ 3.27 \\ \hline 6.51 \end{array}$$

0.93

Friday Oct 11 1901

191

L. L.

282.2

343.7

104.1

164.5

61.5

604 ✓

121.9 ✓

283.1

344.4

105.0

162.5

61.3

57.5 ✓

118.8 ✓

L. R.

14.8

72.0

196.5

254.2

57.2

577 ✓

114.3 ✓

14.4

69.0

197.2

252.5

5

44.6

53.3 ✓

109.9 ✓

9 34

1.15

1.31

2) 2.46

1.23 ✓

1.22

1.42

2) 2.64 ✓

1.32

6.31

6.16

4) 12.51

3.13

1.25

2) 1.85

.92

264

246

4) 510

1.28

Friday Oct 11 1901

9 46

" 4

I R

33.5  
54.0  
214.0  
233.9

20.5  
19.9 ✓  
40.4 ✓

32.1  
53.2  
214.6  
233.9

21.1  
19.3 ✓  
40.4 ✓

" 4"

I. I

123.0  
146.7  
302.0  
325.1

23.7  
23.1 ✓  
46.8 ✓

122.2  
147.8  
302.9  
325.8

25.6  
22.9 ✓  
48.5 ✓

3.75  
3.7 ✓  
3.42  
3.34  
4) 22.86  
3.5 ✓  
1.88  
20) 1.69  
0.84



Friday Oct 11 1901

"8"

I I

108.2

156.3

292.2

338.5

48.1

46.3 ✓

94.4 ✓

112.2

157.1

289.5

337.5

4

34.9

48.0 ✓

92.9 ✓

"8"

I. R

201.0

247.0

22.5

67.2

46.0

44.7 ✓

90.7 ✓

202.1

245.9

22.9

65.9

43.8

43.0 ✓

86.8 ✓

1.79

1.84

1.90

2.00

71853

1.88 ✓

Saturday Oct 12 1901

Same apparatus as last.

Shades in next to apparatus.  
I R.

~~201.8~~

28.4  
58.3    29.9  
208.0    22.3 ✓  
240.3    62.2 ✓

29.7  
58.9    29.2  
209.3    28.4 ✓  
237.7    57.6 ✓

I. L.

2.78

2.95

2.75

2.69

4 | 31.7

2.79 ✓

119.2  
150.7    31.5  
298.4    31.5 ✓  
329.9    63.0 ✓

118.0  
150.8    32.8  
298.4    31.9 ✓  
330.3    64.7 ✓

Saturday Oct 12 1901

Shades <sup>||||| and |||||</sup> removed

L L

99.3		98.0	
169.0	69.7 ✓	171.2	73.2 ✓
277.8	<u>75.0</u>	274.2	<u>75.2</u>
362.8	144.7 ✓	349.4	145.4 ✓

L R.

191.2		187.8	
257.8	66.6 ✓	256.9	69.1 ✓
10.8	<u>63.2</u>	9.2	<u>68.0</u>
74.0	129.8 ✓	77.2	137.1 ✓

2.79  
78  

---

2.01

0.68  
0.61  
0.98  
0.83  

---

4/310  
0.78 ✓



Saturday Oct 12, 1901

Shade

Same as last about  
two inches from aperture

L R

180.0  
268.0  
4.1  
82.2

880  
78.1  
166.1 ✓

181.8  
266.7  
6.9  
88.4

84.9  
81.5  
166.4 ✓

L L

83.9  
182.8  
263.5  
359.6

98.9  
96.1 ✓  
195.0 ✓  
+ 57.4  
165.0

86.1  
184.8  
269.0  
364.0

99.7  
95.0 ✓  
194.7 ✓  
(165.3)

0.29<sup>6</sup>  
0.26  
0.52  
71 - 0.05  
- 0.01 ✓

Saturday OCT 12 1901

Three shades in same  
distance from aperture as last

L. L.

116.6

148.2

299.8

328.3

31.6 ✓

28.5

60.1 ✓

118.9

148.1

299.0

329.6

29.2

30.6 ✓

59.8 ✓

L. R.

208.8

237.8

29.6

58.9

29.0

29.2 ✓

58.2 ✓

209.5

238.9

29.0

59.0

29.4

30.0 ✓

59.4 ✓

$$\begin{array}{r} 142 \overline{) 1300} 94 \\ \underline{1238} \\ 620 \end{array}$$

$$\begin{array}{r} 2.86 \\ 2.87 \\ 2.93 \\ 2.88 \\ \hline 11.54 \\ \hline 2.86 \\ \hline 11.54 \\ \hline 28.4 \quad \checkmark \end{array}$$

$$\begin{array}{r} 201 \overline{) 2.87} (1.42 \\ \underline{201} \\ 860 \\ 804 \\ \hline 560 \end{array} \quad \begin{array}{r} 1.42 \\ \hline 0.4 \\ \hline 36 \end{array}$$

Saturday Oct 12 1901

Affairatus same as last,

Shades however are close to right aperture.

Shades in

L R

Mr. McCullen Recorder

298.9	
328.9	30.0
121.0	<u>28.2</u> ✓
149.2	58.2 ✓

298.8	
328.8	30.0 ✓
118.5	<u>29.7</u>
148.2	59.7

L. I

3<sup>h</sup> 20.0

30.0	
60.0	20.0 ✓
207.4	<u>30.0</u>
237.4	60.0 ✓

29.2	
61.5	32.3 ✓
207.8	<u>33.1</u>
240.9	65.4

2.93
2.87
2.86
2.66
<u>41 332</u>
2.83 ✓



Saturday Oct 12 1901

Shade 1/1111 + 1/1111 Run  
L I

12.9  
77.1  
191.2  
253.7

~~64.2~~  
62.5 ✓  
126.7 ✓

9.0  
75.0  
191.4  
257.8

~~68.0~~  
66.4 ✓  
132.4 ✓

L R

99.4  
166.1  
278.5  
348.9

66.7 ✓  
70.4  
137.1 ✓

28.4

2.83  
0.88  
1.95

97.0  
171.0  
280.2  
349.3

74.0  
69.1 ✓  
143.1

1.05  
.983  
.83  
.71  
4/3542  
0.88 ✓

Shade glasses about two  
inches in front of light aperture.

L. R.

33.0

100.4

166.8

276.0

347.9

66.4

78.9

135.3

98.0

169.6

282.0

348.6

71.6

66.6

138.2

L. L.

10.9

78.1

191.3

256.8

68.2

65.5

133.7

10.2

80.8

191.0

257.6

70.6

66.6

137.2

.81

.81

.82

.83

4 | 3289

0.84

Three shades in about the same position and aperture

L L.

40.5

205.2

237.0

261.2

62.6

31.8 ✓

26.4

68.2 ✓

204.6

240.5

31.0

60.2

25.9

29.2 ✓

65.1 ✓

L. R.

229.5

330.6

116.5

152.2

31.1

35.7 ✓

66.8 ✓

294.9

320.0

118.0

150.8

35.1

32.8 ✓

67.9 ✓

46.5

2.53  
2.61  
21344  
172

2.61  
84  
1.77

2.57  
2.67  
2.61  
2.58  
4) 245  
2.61 ✓



Shades about 2" in front of left aperture

4<sup>th</sup> 21.5

L R

212.2

237.0

28.5

57.6

24.8

29.1 ✓

53.9 ✓

210.5

237.2

28.4

56.9

26.7

28.5

55.2

L L

300.8

329.2

120.4

148.4

28.4 ✓

28.0

56.4 ✓

298.7

328.8

118.4

150.9

20.1

22.5 ✓

62.6 ✓

29.0

3.11

3.05

3.00

2.76

4 11.92 ✓

2.98

Shades about 2" if front of night aperture.

29.5 L L

209.1

239.2

31.8

59.6

30.1

27.8

57.9 ✓

208.8

237.7

31.0

58.1

28.9

27.1

56.0 ✓

2.94

3.02

2.71

2.49

41316

2.79 ✓

L. R.

301.8

331.8

117.7

34.0 151.8

30.0

34.1 ✓

64.1 ✓

296.8

331.5

115.9

151.6

34.7

35.7

70.4 ✓

279

2.98

279

2.88

2.781

2.9849

279

2.88

5260 ✓

Shade " about 2" ipr front of  
right aperture

L R.

35.0

278.8

348.0

98.7

166.0

69.2 ✓

67.3

136.5 ✓

284.0

346.6

101.9

167.9

62.6

66.0 ✓

128.6

0.84

1.01

1.00

1.087

4 | 3.942

0.98 ✓

L L.

16.0

76.0

190.2

258.9

60.0 ✓

68.7

128.7 ✓

12.5

76.5

194.7

256.3

62.0

61.6

123.6

40.0



"Shade" about 2" in front of left aperture

41.0 L.L.

284.1  
347.3  
103.9  
165.5

63.2  
61.6 ✓  
124.8 ✓

278.9

346.1 67.2  
2.1 67.2  
104.0 134.4  
169.2

L.R.

1.09

0.89

1.21

0.80

4) 3.99

0.0

1.00 ✓

12.6

72.6

194.7

254.1

60.0

59.4 ✓

119.4 ✓

12.1

81.4

194.0

253.4

69.3

69.4 ✓

138.7

46.0

Shades close to left aperture.

~~50~~  
49.0

L R

28.1  
55.9  
212.3  
237.8

27.8  
25.8 ✓  
53.3 ✓

30.2  
58.1  
209.2  
236.7

27.9  
27.5 ✓  
55.4 ✓

L L.

3.13  
3.04  
3.01  
3.02  
24220  
3.075  
(3.05) ✓

121.5  
148.2  
299.7  
329.1

26.7  
29.4 ✓  
56.1

121.1  
147.3  
300.3  
330.0

26.2  
29.7 ✓  
55.9

5600

Shades close to right aperture

56.5

L L.

$$\begin{array}{r} 31.9 \\ 56.7 \\ 207.1 \\ 240.0 \\ \hline 24.8 \checkmark \\ 32.9 \\ \hline 57.7 \end{array}$$

$$\begin{array}{r} 30.4 \\ 58.5 \\ 207.3 \\ 239.6 \\ \hline 28.1 \checkmark \\ 32.3 \checkmark \\ \hline 60.4 \checkmark \end{array}$$

2.989

2.84

2.82

2.81

L R

$$\begin{array}{r} 4 \overline{) 34.36} \\ \underline{28.6} \\ 5.76 \\ \underline{4.8} \\ 0.96 \\ \underline{0.8} \\ 0.16 \end{array} \quad \checkmark$$

2.86 1/2 (286 1/2)

5<sup>h</sup> 01.0

$$\begin{array}{r} 119.0 \\ 151.0 \\ 299.0 \\ 328.0 \\ \hline 32.0 \checkmark \\ 29.0 \checkmark \\ \hline 61.0 \checkmark \end{array}$$

$$\begin{array}{r} 118.4 \\ 149.0 \\ 298.9 \\ 329.5 \\ \hline 30.6 \checkmark \\ 30.6 \checkmark \\ \hline 61.2 \end{array}$$



1.0 Shade "in ngc aperture"

L.R.

102.6	
170.0	67.4
279.9	<u>71.0</u> ✓
350.9	138.4

98.7	
166.6	67.9
278.0	<u>68.7</u> ✓
346.7	136.6 ✓

L.L.

~~25~~

0.81
0.84
1.05
0.97
<u>453.67</u>
0.92 ✓

194.9	
257.6	62.7
13.8	<u>64.0</u> ✓
77.8	126.7 ✓

191.7	
250.3	63.6
11.8	<u>66.9</u> ✓
78.7	130.5 ✓

Shade " in left aperture

22.

$$\begin{array}{r}
 101.2 \\
 167.3 \\
 280.6 \\
 348.3 \\
 \hline
 66.1 \\
 67.7 \checkmark \\
 133.8 \checkmark
 \end{array}$$

$$\begin{array}{r}
 101.6 \\
 168.0 \\
 279.6 \\
 345.8 \\
 \hline
 66.4 \\
 66.2 \checkmark \\
 132.6 \checkmark
 \end{array}$$

$$\begin{array}{r}
 0.90 \\
 0.92 \\
 1.20 \\
 1.05 \\
 \hline
 4 \overline{) 4.07} \\
 1.02 \checkmark
 \end{array}$$

2R.

$$\begin{array}{r}
 195.5 \\
 252.5 \\
 13.5 \\
 76.3 \\
 11.0 \\
 \hline
 57.0 \checkmark \\
 62.8 \checkmark \\
 119.8 \checkmark
 \end{array}$$

$$\begin{array}{r}
 194.8 \\
 256.4 \\
 10.2 \\
 75.1 \\
 \hline
 61.6 \checkmark \\
 64.8 \checkmark \\
 126.5 \checkmark
 \end{array}$$

Monday Oct 14 1901

Same apparatus.

Darkest portion of  $\Sigma$  6632 placed at  
20 cm from left aperture.

Mr. McLellan Recorded.

L R

L L

<sup>4</sup>  
3 39.5

1.3  
90.9 89.6 ✓  
182.6 188.5 ✓  
271.1 278.1 ✓

93.7  
182.1 884 ✓  
267.3 93.2 ✓  
0.5 181.6 ✓

10 cm from left aperture

46.0 L R

L L

17.2  
70.2 53.0 ✓  
199.2 49.9 ✓  
249.1 102.9 ✓

284.0  
339.6 55.6 ✓  
106.9 53.5 ✓  
160.4 109.1 ✓  
11.59 ✓  
144.4 ✓  
3.03 ✓  
1.512 ✓



Shade found ~~cover~~ right aperture, at  
 "20" Readjusted & began again.

20 cm from left aperture.

4<sup>h</sup> 5.0

L R.

L L

24.8  
 62.0 37.2 ✓  
 206.3 37.7 ✓  
 244.0 74.9 ✓

115.5  
 155.5 40.0 ✓  
 294.1 41.5 ✓  
 335.6 81.5 ✓

4.0

2.13<sup>5</sup>  
 2.18<sup>5</sup>  
 4.50  
 2.2<sup>5</sup>

30 cm from left aperture

13.3

L L

L R

113.2  
 152.2 39.0 ✓  
 293.4 41.8 ✓  
 335.2 80.8 ✓

206.6  
 242.7 36.1 ✓  
 26.2 35.4 ✓  
 61.6 71.5 ✓

2.17 ✓  
 2.46 ✓  
 4.63 ✓  
 2.32 ✓

40<sup>cm</sup> from left aperture

LR

LL

21.7

203.8

292.1

245.2

41.4 ✓

336.0

43.9 ✓

25.9

36.0 ✓

112.0

43.0 ✓

26.0

61.9

77.4 ✓

155.0

86.9 ✓

2.27 ✓

2.00 ✓

4.27 ✓

2.14 ✓

Re-adjusted

LL

LR

30.3

295.1

23.8

334.1

39.0 ✓

65.0

41.2 ✓

111.9

42.3 ✓

205.7

37.6 ✓

154.2

81.3 ✓

243.3

78.8 ✓

2.16 ✓

2.23 ✓

4.39 ✓

2.16 ✓

35cm from left aperture

LR

LL

39.7

22.9  
63.0 40.1 ✓  
206.4 37.6 ✓  
244.0 77.7 ✓

112.2  
152.7 40.5 ✓  
293.9 40.0 ✓  
333.8 80.5 ✓

2.26 ✓  
2.18 ✓  
4.44 ✓  
2.22 ✓



boom from left aperture

5<sup>th</sup> 5.0

L.L.

L.R.

112.8

156.0

293.9

336.0

43.2 ✓

42.1 ✓

85.3 ✓

204.3

243.8

24.2

62.4

39.5 ✓

38.2 ✓

77.7 ✓

2.04 ✓

2.26 ✓

4.30 ✓

2.15 ✓

Et.  
7<sup>h</sup> 20<sup>m</sup>.

50 cm. from left aperture

Attempted to use  $f/11$  in Cooke lens but could not see both images on reversal of the prism of photometer. Returned to  $f/8$ . Determined by inspection through lens either direct or by reflected image by placing a mirror between lens & photometer, that photographic shade 26632 really covered one aperture & did not interfere with other.

Distances are from film of plate to aperture but were not made with the greatest precision.

50 cm for left aperture.

Mr. Freese Reader.

Et.  
8 28

L, R

26.3

63.9 37.6 ✓

206.2

244.0 37.8 ✓  
75.4 ✓

Lo. Lo.

112.1

154.9 42.8 ✓

291.6

337.4 45.8 ✓  
48.6 ✓

2.33 ✓

1.95 ✓

21428

2.14 ✓

45 cm from left aperture

Lo. Lo

~~335.2~~

116.4 81.2

155.2 38.8 ✓

296.9 38.3 ✓

335.2 77.1 ✓

Lo. R

24.9

64.0 39.1 ✓ 2.28 ✓

204.6

238.5 33.9 ✓ 241 ✓  
73.0 ✓ 469 ✓  
234 ✓

40 em.

L.R.

$$\begin{array}{r} 24.3 \\ 60.2 \\ \hline 35.9 \checkmark \end{array}$$

$$\begin{array}{r} 205.9 \\ 241.4 \\ \hline 35.5 \checkmark \\ 71.4 \checkmark \end{array}$$

$$\begin{array}{r} 246 \checkmark \\ 2.25 \checkmark \\ \hline 2471 \checkmark \\ 2.36 \checkmark \end{array}$$

L.L.

$$\begin{array}{r} 114.9 \\ 154.2 \\ \hline 39.3 \checkmark \end{array}$$

$$\begin{array}{r} 293.8 \\ 332.5 \\ \hline 38.7 \checkmark \\ 78.0 \checkmark \end{array}$$

35 em

L.L.

$$\begin{array}{r} 114.1 \\ 153.9 \\ \hline 39.8 \checkmark \end{array}$$

$$\begin{array}{r} 293.3 \\ 334.5 \\ \hline 41.2 \checkmark \\ 81.0 \checkmark \end{array}$$

$$\begin{array}{r} 217 \checkmark \\ 2.51 \checkmark \\ \hline 468 \checkmark \\ 2.34 \checkmark \end{array}$$

L.R.

$$\begin{array}{r} 207.4 \\ 242.2 \\ \hline 34.8 \checkmark \end{array}$$

$$\begin{array}{r} 26.0 \\ 61.2 \\ \hline 35.2 \checkmark \\ 70.0 \checkmark \end{array}$$

30 em.

L.R.

$$\begin{array}{r} 205.0 \\ 242.1 \\ \hline 37.1 \checkmark \end{array}$$

$$\begin{array}{r} 27.1 \\ 61.8 \\ \hline 34.7 \checkmark \\ 71.8 \checkmark \end{array}$$

$$\begin{array}{r} 2.45 \checkmark \\ 2.16 \checkmark \\ \hline 461 \checkmark \\ 2.30 \checkmark \end{array}$$

L.L.

$$\begin{array}{r} 294.7 \\ 335.0 \\ \hline 40.3 \checkmark \end{array}$$

$$\begin{array}{r} 114.1 \\ 155.1 \\ \hline 41.0 \checkmark \\ 81.3 \checkmark \end{array}$$

25 em.

L.L.

$$\begin{array}{r} 294.5 \\ 335.2 \\ \hline 40.7 \checkmark \end{array}$$

$$\begin{array}{r} 114.9 \\ 154.9 \\ \hline 40.0 \checkmark \\ 80.7 \checkmark \end{array}$$

$$\begin{array}{r} 217 \checkmark \\ 2.31 \checkmark \\ \hline 448 \checkmark \\ 2.24 \checkmark \end{array}$$

L.R.

$$\begin{array}{r} 26.0 \\ 62.6 \\ \hline 36.6 \checkmark \end{array}$$

$$\begin{array}{r} 205.5 \\ 245.0 \\ \hline 39.5 \checkmark \\ 76.1 \checkmark \end{array}$$



20 em.

Lb

25.5

61.5 36.0 ✓

207.0

239.9 32.9 ✓  
68.9 ✓
$$\begin{array}{r}
 2.54 \checkmark \\
 2.16 \checkmark \\
 \hline
 21470 \\
 235 \checkmark \\
 \hline
 \text{mean}
 \end{array}$$

Lb

111.1

153.1 42.0 ✓

294.5

333.8 39.3 ✓  
81.3 ✓

15 em.

Lb

113.2

154.2 41.0 ✓

292.6

334.0 41.4 ✓  
82.4 ✓
$$\begin{array}{r}
 2.12 \checkmark \\
 2.47 \checkmark \\
 \hline
 21459 \checkmark \\
 2.30 \checkmark
 \end{array}$$

Lb

205.1

240.6 35.5 ✓

25.9

61.5 35.6 ✓  
71.1 ✓

10 em.

Lb

205.1

240.8 35.7 ✓

24.4

62.8 38.4 ✓  
74.1 ✓
$$\begin{array}{r}
 2.37 \checkmark \\
 2.00 \checkmark \\
 \hline
 21437 \checkmark \\
 2.18 \checkmark
 \end{array}$$

Lb

292.2

336.9 44.7 ✓

113.4

155.5 42.1 ✓  
86.8 ✓

8 em

Lb

295.0

333.7 38.7 ✓

115.2

154.8 39.6 ✓  
78.3 ✓
$$\begin{array}{r}
 2.25 \checkmark \\
 2.25 \checkmark \\
 \hline
 21450 \\
 2.25 \checkmark
 \end{array}$$

Lb

24.1

64.0 39.9 ✓

206.1

244.2 38.1 ✓  
78.0 ✓

6 em.

L.R.

24.9

63.3

364 ✓

204.8

242.2

$$\begin{array}{r} 374 \\ \hline 73.8 \end{array} \checkmark$$

mean

L.R.

$$\begin{array}{r} 238 \\ 219 \\ \hline 2(457) \\ 228 \end{array} \checkmark$$

L.L.

113.0

152.8 39.8 ✓

293.0

$$\begin{array}{r} 333.2 \\ \hline 402 \\ \hline 80.0 \end{array} \checkmark$$

4 em.

L.L.

112.9

154.7 41.8 ✓

294.2

$$\begin{array}{r} 335.4 \\ \hline 412 \\ \hline 80.0 \end{array} \checkmark$$

$$\begin{array}{r} 211 \\ 237 \\ \hline 2(448) \\ 224 \end{array} \checkmark$$

L.R.

203.0

241.1 38.1 ✓

25.7

$$\begin{array}{r} 61.9 \\ \hline 362 \\ \hline 74.3 \end{array} \checkmark$$

2 em.

L.R.

203.8

243.1 39.3 ✓

23.5

$$\begin{array}{r} 64.2 \\ \hline 407 \\ \hline 80.0 \end{array} \checkmark$$

$$\begin{array}{r} 219 \\ 205 \\ \hline 2(424) \\ 212 \end{array} \checkmark$$

L.L.

293.0

336.1 43.1 ✓

113.9

$$\begin{array}{r} 155.8 \\ \hline 419 \\ \hline 85.0 \end{array} \checkmark$$

0 em.

L.L.

281.2

344.9 63.7 ✓

103.5

$$\begin{array}{r} 168.0 \\ \hline 64.5 \\ \hline 128.2 \end{array} \checkmark$$

$$\begin{array}{r} 1.02 \\ 1.34 \\ \hline 2.36 \\ 1.18 \end{array} \checkmark$$

L.R.

13.1

74.7 61.6 ✓

198.3

$$\begin{array}{r} 250.2 \\ \hline 51.9 \\ \hline 113.5 \end{array} \checkmark$$



1 cm.  
S.R.

23.9  
64.1 402 ✓  
203.5  
246.1 426 ✓  
82.8 ✓

2.11 ✓  
1.80 ✓  
2.391 ✓  
1.96 ✓

S.S.

107.2  
150.7 43.5 ✓  
292.5  
343.2 50.7 ✓  
94.2 ✓

1/2 cm  
S.S.

109.5  
161.6 52.1 ✓  
280.1  
2343.1 630 ✓  
115.1 ✓

1.30 ✓  
1.78 ✓  
3.08 ✓  
1.54 ✓

S.R.

203.2  
246.2 430 ✓  
16.9  
69.1 52.2 ✓  
95.2 ✓

Shade removed

S.R.

186.9  
268.3 814 ✓  
4.9  
84.5 79.6 ✓  
161.0 ✓

360  
181.8  
178.2

0.36 ✓  
-0.03  
21.33 ✓  
1.16 ✓

S.S.

~~268.0~~  
361.4 934 ✓  
87.1  
175.5 88.4 ✓  
268.0  
181.8 ✓

(same one repeated)

S.S.  
266.7  
362.9 962  
88.1  
176.6 88.5  
184.7 ✓

360  
184.7  
175.3

0.55  
-0.09  
21.46 ✓  
1.23  
1.16  
21.33  
20

S.R.

6.8  
82.1 75.3 ✓  
186.0  
262.0 76.0  
151.3 ✓



Tuesday Oct. 15, 1901

Results H 111-115

50	2.14
45	2.34
40	2.36
35	2.34
30	2.30
25	2.24
20	2.35
15	2.30
10	2.18
8	2.25
6	2.28
4	2.24
2	2.12
1	1.96
0.5	1.54
0.	1.18
Shade Removed,	0.20

Tuesday OCT 15 1901

Results pp. 94 -

	Right ascension	Sept. 21st		Means of 2
3 Shades (Close)	2.83	2.86	3.05	2.96
1 " "	0.88	0.92	1.02	0.97
<hr/>				
3 Shades (2" from)	2.61	2.60	2.98	2.79
1 " " "	0.84	0.98	1.00	0.99

Tuesday Oct 15 1901

Apparatus practically the same.  
Paper bearing ~~off~~ apertures is fastened to glass so that it does not spring away & change the dist of the apertures.

Source of light is screened & cut off surplus light. A strip of black paper has also been placed over porcelain plate so that no direct light will strike shade from right apertures.

Bunch readjusted for work.

50 cm

1. R

L.L.

21.7		111.2		2.53 ✓
58.2	36.5 ✓	157.9	46.7 ✓	1.79 ✓
207.6	32.9 ✓	290.0	48.2 ✓	2/432 ✓
240.5	69.4 ✓	338.2	94.9 ✓	2.16 ✓

Began again as <sup>left</sup> image (as seen) disappeared with movement of eye. Adjusting

50 cm

Reflected.

L.L.

202.4		291.2		2.11 ✓
245.1	42.7 ✓	337.8	46.6 ✓	1.75 ✓
22.9	40.1 ✓	109.5	49.5 ✓	2/3.86 ✓
63.0	82.8 ✓	159.0	96.1 ✓	1.93 ✓



45

I. I.

291.2

336.9

113.0

158.3

45.7 ✓

45.3 ✓

91.0 ✓

I R.

21.9

65.2

200.9

241.3

43.3 ✓

40.4 ✓

83.7 ✓

1.89 ✓

2.09 ✓

213.98 ✓

1.99 ✓

'40'

I. R.

20.7

66.2

202.0

245.4

45.3 ✓

43.4 ✓

88.9 ✓

I I.

111.8

159.6

289.9

336.2

43.8 ✓

46.3 ✓

94.1 ✓

1.94 ✓

1.81 ✓

212.75 ✓

1.88 ✓

35

I I.

110.0

158.6

290.3

338.7

48.6 ✓

48.4 ✓

97.0 ✓

I R.

202.2

244.0

23.0

65.1

41.8 ✓

42.1 ✓

83.9 ✓

1.73 ✓

2.08 ✓

213.81 ✓

1.90 ✓

8-00

9-38

stopped for outside work.

lighted lamps &amp; began again

'30'

I R.

201.8

245.3

20.0

65.7

43.5 ✓

45.7 ✓

89.2 ✓

I I.

289.3

339.9

111.0

157.9

50.6 ✓

46.9 ✓

96.5 ✓

1.94 ✓

1.72 ✓

213.66 ✓

1.83 ✓

25		I. R.		
L I				
287.1		23.8		
339.5	52.4 ✓	65.4	41.6 ✓	1.68 ✓
111.2	46.5 ✓	206.4	35.6 ✓	2.28 ✓
157.7	98.9 ✓	242.0	77.2 ✓	2/3.96 ✓
				1.98 ✓

20		I. I.		
I R				
22.7		108.7		2.05 ✓
65.4	42.7 ✓	160.5	51.8 ✓	1.57 ✓
205.0	42.3 ✓	289.2	51.8 ✓	2/3.62 ✓
247.3	88.0 ✓	341.0	102.6 ✓	1.81 ✓

15		L. R		
L I				
112.1		201.7		
156.1	44.0 ✓	247.1	45.4 ✓	1.81 ✓
291.1	50.0 ✓	23.3	42.9 ✓	1.96 ✓
341.1	94.0 ✓	66.2	88.3 ✓	2/3.77 ✓
				1.88 ✓

10		I. I		
I R				
201.3		288.7		1.86 ✓
246.0	44.7 ✓	339.6	50.9 ✓	1.74 ✓
19.5	47.2 ✓	110.5	45.8 ✓	2/3.60 ✓
66.7	91.9 ✓	156.3	96.7 ✓	1.80 ✓

8		L. R.		
L L				
286.9		21.5		1.74 ✓
337.9	57.0 ✓	65.6	44.1 ✓	2.00 ✓
110.0	45.8 ✓	202.1	42.6 ✓	21 374 ✓
155.8	96.8 ✓	244.7	86.7 ✓	1.87 ✓

6		L R		
L R				
19.8		109.6		1.80 ✓
67.0	47.2 ✓	158.1	48.5 ✓	1.72 ✓
199.7	47.1 ✓	288.5	49.1 ✓	213.52 ✓
246.8	94.3 ✓	337.6	97.6 ✓	1.76 ✓

4		L R		
L L				
110.0		21.1		1.79 ✓
156.2	46.2 ✓	65.6	44.5 ✓	1.93 ✓
289.2	48.5 ✓	202.0	45.0 ✓	21372 ✓
337.7	94.7 ✓	247.0	89.5 ✓	1.86 ✓

2		L L.		
L R				
21.5		106.5		1.81 ✓
67.8	46.3 ✓	162.0	55.5 ✓	1.429
199.6	47.7 ✓	290.5	51.3 ✓	212.25
247.3	94.0 ✓	341.8	108.8	1.62
				1.65 ✓



$$\begin{array}{rcl}
 & 1 & \\
 \begin{array}{r} 11 \\ 103.9 \\ 159.3 \\ 284.0 \\ 342.5 \end{array} & \begin{array}{r} \\ 58.4 \checkmark \\ 58.5 \checkmark \\ 113.9 \checkmark \end{array} & \begin{array}{r} 194.5 \\ 250.3 \\ 19.1 \\ 69.0 \end{array} \begin{array}{r} \\ 53.8 \checkmark \\ 49.9 \checkmark \\ 105.7 \checkmark \end{array} \\
 & & \begin{array}{r} 1.32 \checkmark \\ 1.52 \checkmark \\ \hline 2 \overline{) 2.84} \\ 1.42 \checkmark \end{array}
 \end{array}$$

$$\begin{array}{rcl}
 & 0.5 & \\
 \begin{array}{r} 12 \\ 192.3 \\ 250.3 \\ 14.0 \\ 69.6 \end{array} & \begin{array}{r} \\ 58.0 \checkmark \\ 55.6 \checkmark \\ 113.6 \checkmark \end{array} & \begin{array}{r} 283.8 \\ 347.2 \\ 105.8 \\ 163.5 \end{array} \begin{array}{r} \\ 63.4 \checkmark \\ 57.7 \checkmark \\ 121.1 \checkmark \end{array} \\
 & & \begin{array}{r} 1.34 \checkmark \\ 1.17 \checkmark \\ \hline 2 \overline{) 2.51} \\ 1.26 \checkmark \end{array}
 \end{array}$$

$$\begin{array}{rcl}
 & 0 & \\
 \begin{array}{r} 11 \\ 280.1 \\ 347.1 \\ 100.8 \\ 168.3 \end{array} & \begin{array}{r} \\ 67.0 \checkmark \\ 67.5 \checkmark \\ 134.5 \checkmark \end{array} & \begin{array}{r} 13.5 \\ 76.5 \\ 193.8 \\ 253.8 \end{array} \begin{array}{r} \\ 63.0 \checkmark \\ 60.0 \checkmark \\ 122.0 \checkmark \end{array} \\
 & & \begin{array}{r} 0.89 \checkmark \\ 1.13 \checkmark \\ \hline 2 \overline{) 2.02} \\ 1.01 \checkmark \end{array}
 \end{array}$$

Shade removed  
 $\frac{1}{2} R$   $\frac{1}{2} L$

150.3

265.2 84.9 ✓

03.4 81.9 ✓

857.3 166.5 ✓

$\frac{1}{2} R$

$\frac{1}{2} L$

0.2

290.3  
 336.5 — 46.2 ✓

841.0 83.7 ✓ 113.7 41.4 ✓

182.9 84.3 ✓ 155.1 87.6 ✓

267.2 168.0 ✓

0.23 ✓

1.98 ✓

2221 ✓

1.10 ✓

$\frac{1}{2} R$   
 $\frac{1}{2} L$

$\frac{1}{2} R$

358.8

113.2

<sup>44</sup>86.3 87.5 ✓ 155.5 — 42.3 ✓

152.0 81.7 ✓ 291.0 47.1 ✓

263.7 169.2 ✓ 338.1 89.4 ✓

0.20 ✓

1.93 ✓

21213 ✓

1.06 ✓

11 26

Wednesday Oct 16 1901

Comparison of aperture reported. See previous page

I R		I I		
178.6		264.2		- 0.180
269.2	981.6	358.2	94.0	0.08
00.7	88.8	86.7	981.5	2   0.26
89.5	170.4	178.2	175.5	0.13
	18		8	2   - 0.02
				- 0.01

360.5  
185.5  
174.5 (9)

2 20

03.8		87.7		
88.2	84.4 ✓	177.8	90.1 ✓	0.310
183.0	789.8	268.3	91.1 ✓	- 0.02
262.8	167.2	359.4	181.2 ✓	2   0.28
	4		178.8	0.184

2 24

182.6		266.4		
262.9	803 ✓	359.1	92.7 ✓	0.27 ✓
01.7	85.2 ✓	85.2	92.8 ✓	- 10 ✓
86.9	165.5 ✓	181.0	185.5 ✓	2   0.17 ✓
			174.5	0.08 ✓

2 32

359.1		90.0		
86.5	87.4 ✓	188.9	98.9 ✓	0.20 ✓
184.2	82.2 ✓	267.3	92.0 ✓	- 0.20 ✓
266.4	169.6 ✓	359.3	190.9 ✓	- 00 ✓
			169.1	

2 39



Wednesday Oct 16 1901

L R

L L

184.1

268.0

262.2

78.1 ✓

01.3

93.3 ✓

0.29 ✓

359.4

86.5 ✓

87.7

90.7 ✓

~~0.08~~ ✓

85.9

164.6 ✓

178.4

184.0 ✓

2) 0.21 ✓

(176.0)

0.10 ✓

2 46

Same shade as used last evening at  
20 cm from left aperture.

L R

L L

22.8

110.2

2.12 ✓

64.3

41.5 ✓

153.5

45.3 ✓

1.90 ✓

203.1

41.0 ✓

291.8

45.3 ✓

2) 4.02 ✓

244.1

82.5 ✓

337.1

90.6 ✓

2.01 ✓

2 54

204.0

290.7

242.8

388 ✓

339.0

48.3 ✓

2.05 ✓

221.1

46.2 ✓

110.8

47.2 ✓

1.77 ✓

67.3

85.0 ✓

158.0

95.5 ✓

2) 3.82 ✓

1.91 ✓

3 00

Light has been extinguished.

Lighted again & repeated last measurement  
20 cm.

2.01  
43.92  
1.96

3 20

20.6

109.0

1.865

67.6

47.0 ✓

159.2

50.2 ✓

1.66 ✓

199.7

45.3 ✓

259.1

49.6 ✓

2) 3.571

245.0

92.3 ✓

338.7

99.8 ✓

1.76 ✓

Wednesday OCT 16 1901

Reflected  
20 cm

3 32

203.5		107.5		
245.9	42.4 ✓	158.2	50.7 ✓	2.06 ✓
24.7	42.1 ✓	290.3	49.0 ✓	1.66 ✓
66.8	<u>84.5</u> ✓	339.3	<u>99.7</u> ✓	<u>2/3.72</u> ✓
				1.86 ✓

Removed paper screen over porcelain plate.  
 Moved light back from porcelain plate.  
 Other adjustments not changed.

20 cm				
I R		L L		
201.8		293.1		
244.7	42.9 ✓	337.2	44.1 ✓	2.03 ✓
23.0	43.0 ✓	107.9	47.2 ✓	1.88 ✓
66.0	<u>85.9</u> ✓	155.1	<u>91.3</u> ✓	<u>2/3.91</u> ✓
				1.96 ✓

3.47

Again

23.2		114.3		
64.8	41.6 ✓	157.6	43.3 ✓	2.05 ✓
201.3	43.3 ✓	290.7	47.4 ✓	1.90 ✓
244.6	<u>84.9</u> ✓	338.1	<u>90.7</u> ✓	<u>2/3.95</u> ✓
				1.98 ✓

Again

202.2		292.0		
244.5	42.3 ✓	339.6	47.6 ✓	2.03 ✓
23.5	43.5 ✓	110.2	45.8 ✓	1.82 ✓
67.0	<u>85.8</u> ✓	156.0	<u>93.4</u> ✓	<u>2/3.85</u> ✓
				1.92

4.04

Light extinguished



Wednesday Oct 76 1901

458 lighted lamp.  
 "20" Refractor.  
 1 R 1 L

24.6		110.5		2.02 ✓
66.6	420 ✓	156.0	43.5 ✓	1.83 ✓
201.3	44.1 ✓	289.0	47.0 ✓	2) 3.87 ✓
245.4	86.1 ✓	336.0	92.5 ✓	1.94 ✓

5-10

203.5		292.2		
243.2	39.7 ✓	337.3	45.1 ✓	2.11 ✓
22.2	43.1 ✓	112.2	45.1 ✓	1.91 ✓
65.3	82.8 ✓	157.3	90.2 ✓	2) 4.02 ✓
				2.01 ✓

5-16

23.4		113.7		
64.9	41.5 ✓	158.6	44.9 ✓	1.99 ✓
201.0	45.7 ✓	289.0	45.6 ✓	1.90 ✓
246.7	87.2 ✓	334.6	90.5 ✓	2) 3.89 ✓
				1.94 ✓

1.96  
 1.98  
 1.92  
 3) 16  
 1.95

1.94  
 2.01  
 1.94  
 3) 4.89  
 1.96



Wednesday Oct 16 1901

~~Repeats~~

Aftures.

7 21

I. R

I. I.

178.5		267.8	
265.1	86.6 ✓	1.3	93.5 ✓
1.8	83.2 ✓	91.3	84.3 ✓
84.5	169.8 ✓	175.6	177.8 ✓

$$\begin{array}{r}
 0.19 \checkmark \\
 0.04 \checkmark \\
 \hline
 70.23 \checkmark \\
 0.12 \checkmark
 \end{array}$$

7.3		89.6	
85.4	78.1 ✓	175.5	75.9 ✓
185.0	77.4 ✓	270.4	87.3 ✓
262.4	155.5 ✓	357.7	173.2 ✓

$$\begin{array}{r}
 0.4 \checkmark \\
 0.13 \checkmark \\
 \hline
 270.610 \\
 0.39 \checkmark
 \end{array}$$

183.7		267.0	
267.3	83.6 ✓	355.2	86.2 ✓
4.1	81.80 ✓ (?)	92.9	84.2 ✓
85.1	164.8 ✓	177.1	170.4 ✓

$$\begin{array}{r}
 0.29 \checkmark \\
 0.18 \checkmark \\
 \hline
 274.7 \checkmark \\
 24 \checkmark
 \end{array}$$

"0"		105.1	
16.5		166.2	61.7 ✓
73.4	56.9 ✓	284.1	62.6 ✓
194.1	58.1 ✓	346.7	123.7 ✓
252.2	115.0 ✓		

$$\begin{array}{r}
 1.30 \checkmark \\
 1.11 \checkmark \\
 \hline
 272.4 \checkmark \\
 1.20 \checkmark
 \end{array}$$

0.5		II. <i>houborn to mean</i>		
194.0		279.3		1.23 ✓
257.0	62.0 ✓	344.9	65.6 ✓	1.19 ✓
17.5	<u>55.2</u> ✓	106.3	<u>54.6</u> ✓	<u>2/242</u> ✓
72.7	118.2 ✓	160.9	120.2 ✓	<u>121</u> ✓

1.0				
18.5		109.0		
71.9	53.4 ✓	161.2	52.7 ✓	1.59 ✓
199.0	<u>49.2</u> ✓	284.1	<u>60.9</u> ✓	<u>1.23</u> ✓
248.2	102.6 ✓	345.0	113.1 ✓	<u>2/294</u> ✓
				1.47 ✓

0.5				
194.0		283.5		
251.2	57.2 ✓	344.2	60.7 ✓	1.34 ✓
17.6	<u>56.0</u> ✓	103.5	<u>59.0</u> ✓	1.20 ✓
73.6	112.2 ✓	162.5	119.2 ✓	<u>2/254</u> ✓
				1.27 ✓

P. 16

Thursday Oct. 17, 1901

Measurements on following pages for this evening are made with same apparatus but means of interference made before each aperture.

Measurements are made at different distances, which are given in cm.



## apertures:

	<u>L.R.</u>	<u>Lo, Lo.</u>	<u>Lo, Lo.</u>
Est.	188.2	266.0	
7.17	263.9 757 ✓	357.1 91.1 ✓	
	4.2	91.8	
Priming	77.9 737 ✓	171.8 89.0 ✓	
dis.	149.4 ✓	171.1 ✓	
	3.0	93.4	
	76.9 739 ✓	173.9 80.5 ✓	
	187.6	270.3	
7.26	259.1 71.5 ✓	356.0 85.7 ✓	
	145.4 ✓	166.2 ✓	

0 59  
0 17  
0 67  
0 26  
1 69  
42

## Photographic shade "0" left aperture

7.28	207.0	295.2	
	240.5 33.5 ✓	331.7 36.5 ✓	2.61 ✓
	28.0	114.6	2.41 ✓
7.32	61.3 33.5 ✓	151.2 36.6 ✓	1.42 ✓
	67.0	73.1 ✓	1.59 ✓

## "0" right aperture

7.33	341.0	249.0 249	418.03 ✓
	106.8 125.8 ✓	19.6 130.6 ✓	2.01 ✓
	54.3	69.6	50.0
	616.1 53.6		52.8
	285.4 124.3 ✓	196.2 126.6 ✓	102.8
	249.1	257.2 ✓	
7.38	250.1 ✓		

" 0.5" left

7:40

27.9

115.7

~~115.7~~

59.8 31.9 ✓

153.2 37.5 ✓

208.5

294.9

$$\begin{array}{r} 243.4 \ 34.9 \\ \hline 66.8 \end{array} \checkmark$$

$$\begin{array}{r} 334.1 \ 39.2 \\ \hline 76.7 \end{array} \checkmark$$

2.61 ✓

2.29 ✓

1.23 ✓

0.61

1.65 ✓

~~472.0~~

1.92

477.2 ✓

1.98 ✓

7:45

right

7:46

160.8

283.9 123.1

56.9

53.0

340.8

171.9

$$\begin{array}{r} 105.8 \ 125.0 \\ \hline 148.1 \end{array}$$

71.4

201.2 129.8

251.2

21.2

50.0

50.2

100.2

7:5~

" 1.0" left

7:53

211.4

299.2

235.9 24.5 ✓

330.0 30.8 ✓

32.1

118.6

7:59

$$\begin{array}{r} 56.4 \ 24.3 \\ \hline 44.8 \end{array} \checkmark$$

$$\begin{array}{r} 149.9 \ 31.3 \\ \hline 62.1 \end{array} \checkmark$$

8:12.4

341.5

202.2

112.9 43.0

247.4 45.2 ✓

155.9 52.7

25.3

288.8 75.7

66.3 41.0 ✓

$$\begin{array}{r} 86.2 \\ \hline \end{array} \checkmark$$

33.3 ✓

2.78 ✓

1.76 ✓

2.02 ✓

410.09

2.52

419.89

2.48 ✓

(2.47) ✓

8:19

$$\begin{array}{r} 333.6 \ 331.4 \\ 113.0 \ 40.0 \ 113.5 \\ 153.0 \ 25.1 \ 154.5 \\ 298.5 \ 292.9 \end{array} \begin{array}{r} 41.0 \\ 39.1 \\ 80.1 \end{array}$$

Reading made about 6:40



8122

"2.0"

33.8  
54.9 21.1 ✓  
214.0  
234.6 29.6 ✓  
41.7 ✓

~~right~~ left

121.7  
147.4 25.7 ✓  
303.2  
326.2 23.0 ✓  
48.7 ✓

8126

117.3  
151.9 34.6 ✓  
297.1  
330.9 33.8 ✓  
68.4 ✓

208.6  
239.9 31.3 ✓  
29.0  
41.3 32.3 ✓  
63.6 ✓

right

3.68 ✓  
3.33 ✓  
2.56 ✓  
2.73 ✓  
41230 ✓  
3.08 ✓

830

"4" left

852

213.9  
232.4 18.5 ✓  
34.1  
53.0 18.9 ✓  
37.4 ✓

304.7  
324.5 19.8 ✓  
123.7  
144.3 20.6 ✓  
40.4 ✓

right

858

120.6  
148.1 27.5 ✓  
200.5  
329.5 29.0 ✓  
56.5 ✓

212.0  
236.2 24.2 ✓  
34.0  
56.5 22.5 ✓  
46.7 ✓

3.92 ✓  
3.75 ✓  
3.00 ✓  
3.42 ✓  
41409 ✓  
3.52 ✓



134

"6.0" left

9 06

$$\begin{array}{r}
 214.2 \\
 232.8 - 18.6 \checkmark \\
 35.2 \\
 52.5 - 17.3 \checkmark \\
 \hline
 35.9 \checkmark
 \end{array}$$

$$\begin{array}{r}
 \cancel{214.2} \\
 124.6 \\
 143.4 - 18.8 \checkmark \\
 304.3 \\
 323.2 - 18.9 \checkmark \\
 \hline
 37.7 \checkmark
 \end{array}$$

9 15

$$\begin{array}{r}
 300.0 \\
 328.2 - 28.2 \checkmark \\
 119.9 \\
 147.6 - 27.7 \checkmark \\
 \hline
 55.9 \checkmark
 \end{array}$$

right

$$\begin{array}{r}
 32.8 \\
 56.2 - 23.4 \checkmark \\
 210.8 \\
 235.1 - 24.3 \checkmark \\
 \hline
 47.7 \checkmark
 \end{array}$$

$$\begin{array}{r}
 4.01 \checkmark \\
 3.90 \checkmark \\
 3.02 \checkmark \\
 3.38 \checkmark \\
 \hline
 4 \overline{) 14.31} \checkmark \\
 3.58 \checkmark
 \end{array}$$

"8.0" left

9 24

$$\begin{array}{r}
 35.0 \\
 53.9 - 18.9 \checkmark \\
 214.6 \\
 232.0 - 18.4 \checkmark \\
 \hline
 37.3 \checkmark
 \end{array}$$

$$\begin{array}{r}
 124.8 \\
 143.7 - 18.9 \checkmark \\
 304.6 \\
 323.9 - 19.3 \checkmark \\
 \hline
 38.2 \checkmark
 \end{array}$$

$$\begin{array}{r}
 3.92 \checkmark \\
 3.87 \checkmark \\
 3.14 \checkmark \\
 3.45 \checkmark
 \end{array}$$

9 30

$$\begin{array}{r}
 301.5 \\
 327.8 - 26.3 \checkmark \\
 120.1 \\
 146.7 - 26.6 \checkmark \\
 \hline
 52.9 \checkmark
 \end{array}$$

right

$$\begin{array}{r}
 33.5 \quad 33.5 \\
 55.5 - 22.0 \checkmark \\
 211.9 \\
 236.1 - 24.2 \checkmark \\
 \hline
 46.2 \checkmark
 \end{array}$$

$$\begin{array}{r}
 4 \overline{) 14.38} \\
 3.60 \checkmark
 \end{array}$$

"O"

left

~~9:38~~

9:41

25.6

63.8

38.2 ✓

206.6

240.1

335 ✓

71.7 ✓

113.3

154.0 407 ✓

294.3

334.5

40.2 ✓  
80.9 ✓245 ✓  
217 ✓  
164 ✓  
189 ✓9:48<sup>9</sup>

288.6

339.6

510 ✓

111.7

161.2

49.5

100.5 ✓

right

23.5

66.8

433 ✓

199.3

246.8

47.5 ✓  
90.8 ✓4 815 ✓  
2.04 ✓

9:57

Friday Oct 18 1901

Same apparatus. & shade

"0" left repeated

	207.4	21.1	50.3 ✓	45.7 ✓
2 <sup>h</sup> . 00.3	337.7	66.8	50.3 ✓	53.6 ✓
	109.0	197.4	100.6 ✓	99.3 ✓
14.5	159.3	251.0		

7 1.64 ✓  
1.67 ✓  
24.5 ✓  
2.21 ✓  
4 17.97 ✓  
1.99 ✓

11.5 "0" left repeated

15.5	203.3	293.1	36.8 ✓	41.8 ✓
	240.1	334.9	34.8 ✓	37.7 ✓
	27.3	115.1	71.6 ✓	79.5 ✓
20.0	62.1	152.8		

"8" left

23.5	35.0	123.2	3.94 ✓
	53.0 18.0 ✓	143.2 20.0 ✓	3.78 ✓
	215.0 19.0 ✓	304.2 19.8 ✓	3.17 ✓
23.5	234.0 37.0 ✓	324.0 39.8 ✓	3.34 ✓
			14.23
			3.56 ✓

"8" right

30.5	301.5	32.3	
	227.9 26.4 ✓	56.3 24.0 ✓	
	121.2 25.8 ✓	211.8 24.5 ✓	
	147.0 52.2 ✓	226.3 48.5 ✓	



Lighter shade # Jan 2 6631  
 "0" Left aperture

2h  
 347.7

51.0

15.2	101.5
73.6 58.4 ✓	164.6 63.1 ✓
194.2 57.8 ✓	282.5 63.5 ✓
252.0 116.2 ✓	346.0 126.6 ✓

"0" Right aperture

275.7	8.0
351.6 75.9 ✓	79.2 71.2 ✓
96.2 75.8 ✓	187.0 74.4 ✓
172.0 151.7 ✓	261.4 145.6 ✓

1.28 ✓  
 1.05 ✓  
 0.54 ✓  
 0.66 ✓  
 4) 4353 ✓  
 1.13 ✓  
 0.88 ✓

"0.5" Left aperture

2h  
 301.00

4.0

193.6	288.6
249.5 55.9 ✓	345.6 57.0 ✓
17.5 55.0 ✓	107.5 54.4 ✓
72.5 110.9 ✓	161.9 111.4 ✓

1.40 ✓  
 1.39 ✓  
 0.47 ✓  
 0.55 ✓  
 4) 381 ✓  
 0.95 ✓

"0.5" Right aperture

5.0

7.0

99.4	184.2
174.9 75.5 ✓	261.0 76.8 ✓
275.0 80.0 ✓	8.7 74.3 ✓
355.0 155.5 ✓	83.0 151.1 ✓

"1.0" Left

8.2

202.6

289.0

247.6 45.0 ✓ 341.8 52.8 ✓

21.4 46.9 ✓ 109.0 54.9 ✓

10.5

68.3 91.9 ✓ 163.9 107.7 ✓

1.86 ✓

"1.0" Right

1.47 ✓

0.64 ✓

11.2

101.0

190.6

170.2 69.2 ✓ 258.7 68.1 ✓

274.9 77.4 ✓ 9.9 72.1 ✓

0.77 ✓

414.74

1.18 ✓

14.0

352.3 146.6 ✓ 82.0 140.2 ✓

"2" Left

15.0

204.0

291.2

242.1 38.1 ✓ 336.9 45.7 ✓

24.8 41.0 ✓ 112.2 47.7 ✓

18.0

65.8 79.1 ✓ 159.9 93.4 ✓

2.22 ✓

1.82 ✓

1.16 ✓

1.24 ✓

416.44 ✓

1.61 ✓

"2" Right

18.6

104.1

195.8

163.8 59.7 ✓

253.9 58.1 ✓

283.6 61.6 ✓13.9 59.6 ✓

22.3

345.2 121.3 ✓73.5 117.7 ✓

"4" Left

22.7	201.0	294.0
	243.7 42.2 ✓	335.8 41.8 ✓
	25.6 38.9 ✓	113.5 41.8 ✓
27.0	64.5 81.6 ✓	155.3 83.6 ✓

2 "4" Right

			2.15 ✓
			2.09 ✓
			1.17 ✓
27.7	103.2	193.0	1.29 ✓
	160.9 57.7 ✓	250.6 57.6 ✓	7/6.70
	281.8 63.2 ✓	14.9 57.8 ✓	1.68 ✓
30.8	345.0 120.9 ✓	72.7 115.4 ✓	

"6" Left

31.6	25.0	113.2
	64.6 39.6 ✓	152.3 39.1 ✓
	204.3 37.7 ✓	292.1 42.5 ✓
34.8	242.0 77.3 ✓	334.6 81.6 ✓

2.28 ✓

2.15 ✓

1.30 ✓

1.32 ✓

"6" Right

35.0	286.0	15.2	7.05 ✓
	343.3 57.3 ✓	73.9 58.7 ✓	1.76 ✓
	106.0 57.8 ✓	195.2 55.6 ✓	
39.3	163.8 115.1 ✓	250.8 114.3 ✓	



"8" Left.

40.0

200.8

293.4

244.9 44.1 ✓ 333.8 40.4 ✓

23.6 39.6 ✓ 113.0 41.0 ✓

43.0

63.2 83.7 ✓ 154.0 81.4 ✓

2.09 ✓

"8" Right

2.15 ✓

1.23 ✓

43.6

105.0

197.6

1.52 ✓

162.7 57.7 ✓ 249.2 51.6 ✓

285.2 60.6 ✓ 18.6 54.0 ✓

345.8 118.3 ✓ 72.6 105.6 ✓

6.99 ✓

1.75 ✓

Light turned out

9 03

0

Left Repeated

16.5

101.1

74.1 57.6 ✓

168.1 67.0 ✓

1.33 ✓

195.3 56.2 ✓

282.7 65.0 ✓

0.94 ✓

257.5 113.8 ✓

347.7 132.0 ✓

0.49 ✓

0.72 ✓

0 Right Repeated

4/3.49 ✓

0.87 ✓

272.9 274.0

8.9

352.3 352.6 78.6 ✓ 79.1 70.2 ✓

96.8 75.6 ✓ 185.0 92.1 ✓

172.4 154.2 ✓ 257.1 142.3 ✓

9 11

Friday OCT 18 1901

"8" left Refractor

9 257

$$\begin{array}{r}
 251.3 \\
 61.9 \quad 36.6 \checkmark \\
 205.1 \quad \underline{36.6 \checkmark} \\
 241.7 \quad \underline{73.2 \checkmark}
 \end{array}
 \qquad
 \begin{array}{r}
 112.8 \\
 156.1 \quad 43.3 \checkmark \\
 291.8 \quad \underline{44.5 \checkmark} \\
 336.3 \quad \underline{87.8 \checkmark}
 \end{array}$$

$$2.40 \checkmark$$

$$1.97 \checkmark$$

$$0.97 \checkmark$$

$$1.55 \checkmark$$

$$4 \overline{) 6.89} \checkmark$$

$$1.72 \checkmark$$

"8" Right Refractor

247

$$\begin{array}{r}
 280.6 \\
 345.5 \quad 64.9 \checkmark \\
 102.5 \quad \underline{65.6 \checkmark} \\
 168.1 \quad \underline{130.5 \checkmark}
 \end{array}
 \qquad
 \begin{array}{r}
 19.7 \\
 72.5 \quad 52.8 \checkmark \\
 196.9 \quad \underline{51.6 \checkmark} \\
 248.5 \quad \underline{104.4 \checkmark}
 \end{array}$$

$$2.40$$

$$1.97$$

$$0.97$$

$$1.55$$

$$2.37$$

$$3.52$$

On examination I find that the lenses as  
now marked are about 2 mm short. i.e. 8.0 should be 7.8 cm

$$\begin{array}{r}
 2.40 \\
 1.97 \\
 \hline
 4.37
 \end{array}$$

$$0.97$$

$$\begin{array}{r}
 3.37 \\
 1.82 \\
 \hline
 1.55
 \end{array}$$

$$3.52$$

$$1.67$$

$$1.85$$

$$\begin{array}{r}
 1.33 \\
 0.94 \\
 \hline
 2.27
 \end{array}$$

$$0.49$$

$$\begin{array}{r}
 0.73 \\
 .6 \\
 \hline
 1.22
 \end{array}$$

$$\begin{array}{r}
 2.10
 \end{array}$$

$$1.30$$

$$\begin{array}{r}
 1.28 \\
 1.05 \\
 \hline
 2.33 \\
 2.04
 \end{array}$$

$$0.54$$

$$\begin{array}{r}
 0.66 \\
 1.20 \\
 \hline
 1.86
 \end{array}$$

$$\begin{array}{r}
 360 \\
 200 \\
 \hline
 160
 \end{array}$$

$$\begin{array}{r}
 1.75 \\
 .90 \\
 \hline
 .85
 \end{array}$$



Saturday Oct 19 1901

Same Apparatus. Shades " 100 T 1000

"0" Left

209.5		300.1	
237.2	27.7 ✓	328.1	28.0 ✓
31.0	26.2 ✓	119.2	30.6 ✓
57.2	53.9 ✓	149.8	58.6 ✓

2. 26.0

"0" Right

116.3		208.5	
152.9	36.6 ✓	237.2	28.7 ✓
297.8	34.4 ✓	29.9	30.9 ✓
332.2	71.0 ✓	60.8	59.6 ✓

3.11 ✓  
2.91 ✓  
2.47 ✓  
2.87 ✓  
11.36 ✓  
2.84 ✓

28.1

34.5

"2" Left

29.3		117.0	
61.0	31.7 ✓	149.6	32.6 ✓
209.8		297.7	34.9 ✓
239.0	29.2 ✓	332.6	67.5 ✓
	60.9 ✓		

2.83 ✓  
2.59 ✓  
2.56 ✓  
2.73 ✓  
10.71 ✓

40.7

46.5

"2" Right

298.6		28.6	
332.9	34.3 ✓	59.9	31.3 ✓
117.6	34.2 ✓	207.3	32.2 ✓
151.8	68.5 ✓	239.5	63.5 ✓

50.0

2.68 ✓



"8" Left

3<sup>h</sup> 00

30.0

117.9

3.02 ✓

58.2

28.2 ✓

150.2

32.3 ✓

2.64 ✓

210.2

27.8 ✓

298.0

33.9 ✓

2.68 ✓

3.5

238.0

56.0 ✓

331.9

36.2 ✓

2.59 ✓

8 Right

10.93 ✓

2.73 ✓

4.0

297.0

28.9

330.6

33.6 ✓

61.7

32.8 ✓

118.6

31.4 ✓

204.8

34.7 ✓

4.5

150.0

65.0 ✓

239.5

67.5 ✓

"1" Left

13.4

209.0

298.2

236.8

27.8 ✓

330.5

32.3 ✓

3.02 ✓

29.0

28.0 ✓

119.0

31.0 ✓

2.74 ✓

16.0

57.0

55.8 ✓

150.0

63.3 ✓

2.60 ✓

2.83 ✓

"1" Right

11.19 ✓

2.74

2.80 ✓

16.5

295.6

29.4

331.6

35.8 ✓

60.3

30.9 ✓

118.0

31.3 ✓

207.3

30.0 ✓

22.0

149.3

67.1 ✓

237.3

60.9 ✓

"0.5" Left.

24.7	28.2	118.8	2.92✓
	57.0 28.8✓	149.4 30.6✓	2.68✓
	208.4 29.6✓	296.6 34.3✓	2.80✓
28.0	238.0 58.4✓	330.9 64.9✓	2.94✓
			<hr/> 11.34
			2.84✓

"0.5" Right

28.5	298.7	30.2	
	328.4 29.7	61.1 30.9✓	
	117.3 31.9	210.0 27.0✓	
33.0	149.2 61.6✓	2.37.0 57.9✓	

"4" Left

33.4	208.8	296.8	
	237.0 28.2✓	330.3 33.5✓	2.99✓
	29.0 28.5✓	117.5 31.5✓	2.68✓
38.0	57.5 56.7✓	149.0 65.0✓	2.48✓
			2.93✓
			<hr/> 11.08✓
			2.77✓

"4" Right

38.9	115.5	207.6	
	149.0 33.5✓	237.6 30.0	
	294.0 37.3✓	30.3 28.1	
42.4	331.3 70.8✓	58.4 58.1✓	

Saturday Oct 19 1901  
 "b" Left

42.8	29.3	117.4	2.9.6 ✓
	58.4	29.1 ✓	150.6 33.2 ✓
	210.2	28.3 ✓	2.68 ✓
		298.5	31.5 ✓
47.5	238.5	57.4 ✓	2.51 ✓
		330.0	64.7 ✓
			2.93 ✓

"b" Right

47.8	297.0	31.7	11.09 ✓
	330.5	33.5 ✓	2.78
	114.0	36.5 ✓	2.77 ✓
	150.5	70.0 ✓	
		210.0	28.2 ✓
		238.2	58.2 ✓

0	2.84
0.5	2.84
1.0	2.80
2.0	2.68
4.0	2.77
6.0	2.77
8.0	2.73



Monday Oct 21 1901

1 28

	Dist 6.0	Left.
12.8		100.8
75.7	62.9 ✓	165.4 64.6 ✓
191.1	64.4 ✓	278.1 68.5 ✓
256.1	127.3 ✓	346.6 133.1 ✓

1.04

0.91

0.72

0.96

4/ 5.63  
- 0.81  
0.91

1..... Dist 6.0 Right

278.9		12.8
350.2	71.3 ✓	76.7 62.9 ✓
76.1	71.5 ✓	188.6 68.1 ✓
167.6	142.5 ✓	256.7 131.0 ✓

1 42

3 10 Shale 1 from Am. Tel. Left about 6.3

192.0		277.9
256.0	62.3 ✓	347.3 64.4
11.7	62.3 ✓	101.5 64.5
74.0	124.6 ✓	166.0 133.9 ✓

1.09

0.90

0.64

0.93

4/ 3.56  
- 0.89

Sum Right

97.3		191.6
167.2	69.9 ✓	255.6 64.0 ✓
276.4	76.7 ✓	9.8 68.2 ✓
353.1	146.6 ✓	78.0 132.2 ✓

3 27

3 2/1      1 Repeated at 60 about left

11.8		106.0	
74.7	62.9 ✓	168.0	62.0 ✓
192.3	58.7 ✓	229.5	68.2 ✓
251.0	121.6 ✓	347.9	130.2 ✓

Sum Right

101.5		185.7		1.16
168.1	66.6 ✓	257.4	71.7 ✓	0.97
278.0	<del>66</del>	11.6	87.1 ✓	0.51
349.6	71.6 ✓	27.7	138.8 ✓	0.50
	148.2 ✓			<u>41</u> 3.74
	13			0.94

95.7  
169.0      70.3 ✓  
229.2      69.8 ✓  
349.0      140.1 ✓

3-48

9

Repeated Left

3 50

13.0		103.9	
73.8	60.8 ✓	165.6	61.7 ✓
193.5	61.6 ✓	282.9	60.5 ✓
255.1	122.4 ✓	343.4	122.2 ✓

Sum Right

276.4		11.6	
350.2	73.8 ✓	78.4	66.8 ✓
96.1	74.4 ✓	188.9	69.4 ✓
170.5	148.2 ✓	258.3	136.2 ✓

1.14  
1.14  
0.61  
0.85  
41 3.74  
0.94

404

4 10

Repetitions 6.5 Lyr.

193.0		201.5	
252.2	59.2 ✓	345.4	63.9 ✓
14.6	59.7 ✓	102.0	64.1 ✓
72.3	116.9 ✓	166.1	128.0 ✓

1.26

1.02

0.68

0.92

$$\begin{array}{r} 4 \overline{) 3.88} \\ 0.97 \end{array}$$

98.8

191.1

168.3	69.5 ✓	257.5	66.4 ✓
295.7	75.1 ✓	12.8	66.6 ✓
350.8	144.6 ✓	79.4	133.0 ✓

4 24

.89

.94

.94

.97

$$\begin{array}{r} 4 \overline{) 3.74} \\ 0.94 \end{array}$$



5-26 Shade 1mm at 6 cm left

14.0		102.8	
71.4	57.4 ✓	164.8	62.0 ✓
193.5	<u>57.8</u> ✓	279.5	<u>6.64</u> ✓
257.3	115.2 ✓	345.9	128.4 ✓

1mm at 6 cm right

277.3		11.7	
349.6	72.3 ✓	78.2	66.6 ✓
101.1	<u>68.6</u> ✓	189.7	<u>66.9</u> ✓
169.7	140.9 ✓	256.6	123.4 ✓

1.30
1.01
0.76
0.91
<u>4) 2.98</u>
0.75
1.00

5-36

5-41 Again Shap's turn a new fast left.

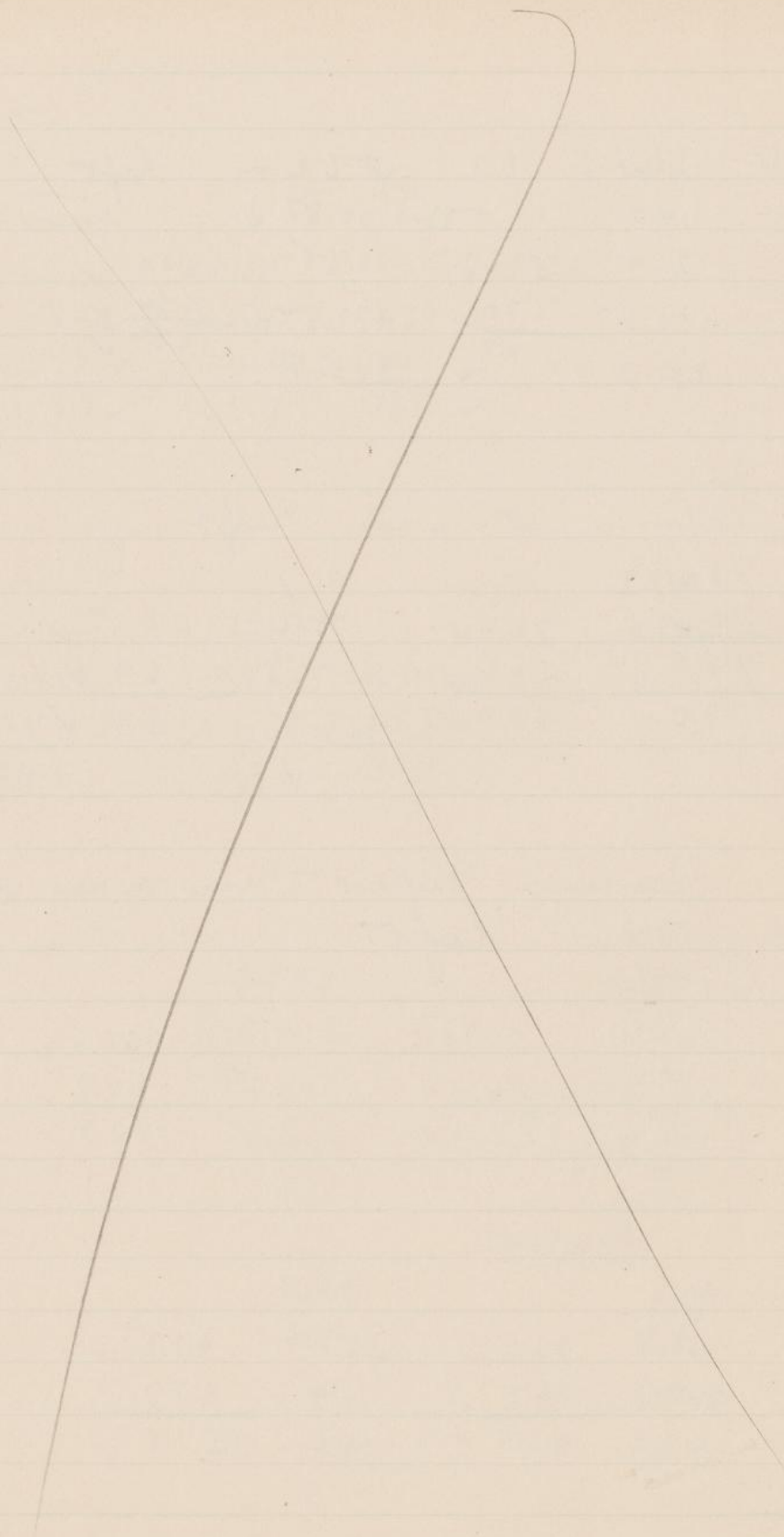
193.4		283.7	
250.8	57.4 ✓	345.3	61.6 ✓
151.2	<u>56.1</u> ✓	103.5	<u>62.3</u> ✓
71.3	113.5 ✓	165.8	123.9 ✓

Reps

97.1		192.3	
168.7	71.6 ✓	255.6	63.3 ✓
280.3	<u>69.6</u> ✓	11.9	<u>67.7</u> ✓
349.9	141.2 ✓	79.6	131.0 ✓

1.34
1.11
0.75
0.96
<u>4) 4.16</u>
1.04

5-52





.91  
1.02  
97  
2.90



7 16

Shade "		left	
13.1		102.1	
75.5	62.4 ✓	165.0	62.9 ✓
192.5	57.4 ✓	284.0	61.0 ✓
249.9	119.8 ✓	345.0	123.9 ✓

1.20

1.11

0.71

0.87

4) 3.89

0.97

Right

279.0		13.3	
351.5	72.5 ✓	77.4	64.1 ✓
98.7	70.6 ✓	188.5	71.2 ✓
169.3	143.1 ✓	259.7	135.3 ✓

7 29

Cleaned Shades thoroughly

8 13

" Repeater left

191.0		279.0	
255.6	64.6 ✓	348.0	69.0 ✓
10.5	63.5 ✓	99.6	64.4 ✓
74.0	128.1 ✓	164.0	132.4 ✓

1.02

0.91

0.75

1.00

4) 3.68

0.92

" right

100.1		190.6	
167.1	67.0 ✓	256.0	65.4 ✓
277.0	74.0 ✓	13.3	63.4 ✓
357.0	141.0 ✓	76.7	128.5 ✓

8 24

828      "      Repeated      left

14.7		103.0	
76.4	61.7 ✓	168.8	65.8 ✓
194.0	57.2 ✓	280.7	67.3 ✓
251.2	118.9 ✓	348.0	133.1 ✓

Right

276.1		10.0	
346.0	69.9 ✓	73.9	63.9 ✓
100.5	71.1 ✓	191.3	64.4 ✓
171.6	141.0 ✓	255.7	128.2 ✓

1.22  
0.91  
0.75  
1.01  

---

4/3.89  
0.97

844

858      "      Repeated      new fact.      left

192.4		277.4	
251.3	58.9 ✓	347.4	70.0 ✓
12.0	64.1 ✓	100.9	67.1 ✓
76.1	123.0 ✓	168.0	137.1 ✓

Right

97.2		188.0	
170.7	72.8 ✓	257.5	69.8 ✓
275.0	74.1 ✓	7.1	68.5 ✓
349.1	146.9 ✓	77.6	138.3 ✓

1.13  
0.83  
0.64  
0.81  

---

4/3.41  
0.85

909

9 20

Shade 1mm near edge left

248.2			
12.8		100.7	
72.6	59.8 ✓	166.7	66.0 ✓
192.0	56.2 ✓	280.0	66.8 ✓
248.2	116.0 ✓	346.8	132.8 ✓

Right

281.6		13.5	
342.7	68.1 ✓	76.5	63.0 ✓
101.4	65.9 ✓	185.0	66.2 ✓
167.3	134.0 ✓	254.2	128.2

1.25
0.92
0.90
1.00
4) 4.10
1.02

9 30

9 36

1mm Referred Mean Center left

192.6		280.0	
250.7	57.1 ✓	348.3	68.3 ✓
15.5	57.1 ✓	101.8	63.5 ✓
72.6	114.2 ✓	165.3	131.8 ✓

1.32

.94

.78

.82

4) 3.86
0.96

Right

275.8		12.0	
345.0	69.2 ✓	79.3	67.3 ✓
98.9	70.5 ✓	185.0	70.4 ✓
167.4	139.7 ✓	255.4	137.7 ✓

9 46



9 52

11111

left

190.6		287.2	
253.1	62.5 ✓	347.9	66.7 ✓
11.1	63.4 ✓	103.0	63.2 ✓
76.5	127.9 ✓	166.2	129.9 ✓

Right

<del>347.0</del>		192.7	
98.0			
167.3	69.3 ✓	256.6	62.9 ✓
297.3	69.7 ✓	12.4	66.1 ✓
347.0	139.0 ✓	78.5	129.0 ✓

1.02

0.98

0.79

1.00

413.79
0.95

10 00

11111	.91	.95	.96	.98	mean
11111	1.04	1.00	1.02	0.96	1.00
11	.97	.92	.97	.85	.93
+					2.86

1	.89	.94	.94	.97	.94
---	-----	-----	-----	-----	-----

10 37

10000 Rejected at 2.0

left

10.4		100.4	
75.0	646 ✓	164.2	62.8 ✓
190.8	<u>58.7</u> ✓	284.4	<u>62.5</u> ✓
249.5	123.3 ✓	346.9	126.3 ✓

Right

277.5		11.2	
348.6	70.5 ✓	78.6	68.4 ✓
99.1	<u>72.4</u> ✓	190.5	<u>67.5</u> ✓
171.5	143.2 ✓	258.0	125.9 ✓

1.12

1.06

0.79

0.86

$$4 \overline{) 3.82}$$

0.96

10 46

10000 Rejected at 4.0

left

191.0		166.6	67.8 ✓
254.0	63.0 ✓	278.0	14 66.0 ✓
13.5	<u>58.2</u> ✓	344.0	<u>133.8</u> ✓
71.7	121.2 ✓	<del>28.8</del>	

Right

100.1		193.6	
169.0	68.9 ✓	254.6	61.0 ✓
277.5	<u>69.3</u> ✓	11.1	<u>67.2</u> ✓
346.8	138.2 ✓	78.3	128.2 ✓

1.17

0.90

0.81

1.02

$$4 \overline{) 3.90}$$

0.98

10 58

Tuesday Oct 22 1901

Introduced a piece of ground glass  
but found that it spoiled the image  
except when very close to aperture.

Cleaned a piece of photo. plate for film.  
& measure in same manner as previous plate.

$\frac{2}{5} 18.5$

"0"

left.

185.3      9.6.0  
257.8 72.5 ✓    175.0 79.0 ✓  
8.3 73.6 ✓    271.8 82.0 ✓  
23.0    81.9 146.1 ✓    353.8 161.0 ✓

+ 0.65 ✓  
+ 0.36 ✓  
- 0.62 ✓  
- 0.11 ✓  
4/7 .28 ✓  
+ .007 ✓

"0"

Right aperture

24.0

257.0      0.0  
365.5 108.5 ✓    90.9    90.9 ✓  
81.2 103.9 ✓    177.6    94.7 ✓

30.0

185.1    212.4 ✓    272.3    185.6 ✓  
360. ✓    360.0 ✓  
- 137.6 ✓    174.4 ✓



"8" Left aperture

30.6

184.8

(352.2)

259.9 75.1 ✓ 95.0 78.0 ✓

11.7 69.1 ✓ 173.0 + 75.8 ✓

80.8 144.2 ✓ 276.4 + 153.8 ✓

+0.6 ✓

"8" Right aperture

35.3

259.0

355.0

6.7 74.3 95.0 8.0

81.0 - 166.0 176.8 81.8 ✓

18.3.0 - 150.3 ✓ 270.0 - 85.0 ✓

-166.8 ✓

+50.0 ✓  
 $\frac{1.19}{8.2} - 0.25$   
 $\frac{0.37}{0.09} \checkmark$   
 $\frac{8.2}{8.2} \checkmark$

"4" Left aperture

48.0

5.3

95.1

0.76 ✓

79.9 74.6 ✓ 176.0 80.9 ✓

190.0 66.0 ✓ 276.9 78.6 ✓

51.0

256.0 140.6 ✓ 354.5 159.5 ✓

0.39 ✓ 1.15 ✓  
 $-0.47 \checkmark$  6.1 ✓  
 $-1.14 \checkmark$  5.4 ✓

"4" Right aperture

52.5

261.0

93.6 1.0

91.0 ✓

4.0 82.7 ✓

92.0

96.3 ✓

86.7 - 72.8 ✓

174.1

187.3 ✓

56.0

188.2 - 155.5 ✓

270.4

-172.7

4) 5.14 ✓  
 $\frac{1}{1} \checkmark$

Shift a slightly

$$\begin{array}{r}
 80.9 \quad 4.9 \\
 182.0 \quad 101.3 \checkmark \quad 94.2 \quad 89.3 \checkmark \quad 48 \checkmark \\
 262.3 \quad 103.9 \checkmark \quad 73.1 \quad 92.9 \checkmark \quad 84 \checkmark \\
 \quad 6.2 \quad 205.2 \checkmark \quad 66.0 \quad 182.2 \checkmark \quad \hline
 \quad \quad -154.8 \checkmark \quad -177.8 \checkmark \quad .52 \checkmark
 \end{array}$$

Thursday Oct 24 1901

Results. Jp 131 & seq.

Distances	dark	light	
0	2.01	0.88	1.13
0.5	1.98	0.95	1.03
1	2.52	1.18	1.34
2	3.08	1.61	1.47
4	3.52	1.68	1.84
6	3.58	1.76	1.82
8	3.60	1.75	1.85

0 Repeated.	{ 2.04 } <sub>202</sub>	0.87	1.15
8 ..	{ 3.60 } <sub>358</sub>	1.72	1.86
0 ..	1.99		
8 ..	3.56		

~~2.01~~  
~~2.04~~  
~~1.99~~  
~~3.60~~  
~~2.04~~  
~~2.01~~

3.60  
 2.01  
 1.59

1.75  
 0.88  
 0.87



Thursday Oct 24 1901

Measuring Guker wedge by same  
apparatus at about 7 cm.  
scale of photometer used,

40

Left  
~~Right~~

4<sup>5</sup>  
44.0

217.2

306.8

229.8 12.6 ✓ 321.2

14.4 ✓

36.6 14.6 ✓ 127.6

~~6.4~~

54.3

51.2 27.4 ✓ 141.2

13.6 ✓  
28.0 ✓

~~4.70~~

4.62 ✓

4.55 ✓

3.68 ✓

4.02 ✓

416.87

4.21 ✓

4.22 ✓

"40" Right

55.0

302.8

36.1

324.2 21.4 ✓ 53.0 16.9 ✓

124.0 20.3 ✓ 213.8 18.8 ✓

144.3 41.7 ✓ 232.6 35.7 ✓

"35" Right

5<sup>h</sup> 00.5

121.9

212.3

145.8

23.9 ✓

234.121.8 ✓

302.0

25.0 ✓

35.221.0 ✓

2.0

327.0

48.9 ✓

56.2

42.8 ✓

3.32 ✓

3.62 ✓

4.30 ✓

4.11 ✓

4 15.35

3.84 ✓

~~2.0~~

"35" Left

3.0

36.3

125.0

52.1

15.8 ✓

142.0

17.0 ✓

216.0

15.7 ✓

305.8

17.3 ✓

7.5

231.7

31.5 ✓

323.1

34.3 ✓

"30" Left

9.0

33.5

122.4

54.1

20.6 ✓

145.2

22.8 ✓

213.2

20.7 ✓

303.1

21.7 ✓

12.0

233.9

41.3 ✓

324.8

44.5 ✓

3.70 ✓

3.53 ✓

2.88 ✓

3.02 ✓

4 13.13

3.28 ✓

"30" Right

12.5

120.2

210.6

149.0

28.8 ✓

237.6

27.0 ✓

298.2

30.6 ✓

30.2

28.8 ✓

15.5

328.8

59.4 ✓

59.0

55.8 ✓

"25" Right

16.4	293.4	27.2	2.22 ✓
	334.0	40.6 ✓	2.20 ✓
	114.6	38.6 ✓	3.09 ✓
	153.2	79.2 ✓	2.94 ✓
18.8		202.5	4   10.45
		41.2 ✓	2.61 ✓
		243.7	
		79.9 ✓	

"25" Left

19.7	207.9	300.2	
	236.2	28.3 ✓	328.2 ?
	31.0	25.9 ✓	28.0 ✓
23.0	56.9	54.2 ✓	30.0 ✓
		147.8	58.0 ✓

"20" Left

24.1	24.0	113.5	2.42 ✓
	61.5	37.5 ✓	2.06 ✓
	205.2	35.3 ✓	1.45 ✓
26.4	240.5	72.8 ✓	1.46 ✓
		336.3	4   7.39
		84.5 ✓	1.84 ✓
			5 ✓

"20" Right

27.9	284.2	15.7	
	339.3	55.1 ✓	72.2
	106.3	53.6 ✓	66.6 ✓
30.6	159.9	106.7 ✓	197.0
		248.8	51.8 ✓
		106.3 ✓	



"15" Right

31.9	100.0	184.8			0.65✓
	168.0	68.0✓	259.3	74.5✓	0.71✓
	274.9	78.1✓	7.0	68.8✓	1.80✓
34.4	353.0	<u>146.1✓</u>	75.8	<u>143.3✓</u>	<u>1.44</u>
					4 <u>4.60</u>
					111.5✓

"15" Left

35.4	20.3	108.1		
	67.0	46.7✓	159.5	51.4✓
	199.3	47.7✓	285.0	57.6✓
38.0	247.0	<u>94.4✓</u>	342.5	<u>108.9✓</u>

"10" Left

39.0	9.0	103.6		
	78.0	69.0✓	165.5	61.9✓
	194.0	58.1✓	280.0	69.7✓
41.5	252.1	<u>127.1✓</u>	349.7	<u>131.6✓</u>

1.04✓
0.95✓
0.00✓
<u>0.23</u>
4 <u>2.22</u>
0.58✓
6✓

"10" Right

42.4	265.3	180.2		
	0.3	89.8✓	267.5	87.3✓
	90.1	90.4✓	4.8	80.6✓
45.3	174.9	<u>180.2✓</u>	85.4	<u>167.9✓</u>

95.0
<u>84.8</u>
10.2

"5" Right

46.5

92.0

177.8

-0.13✓

179.8

263.0

85.2✓

0.19✓

262.0 82.2✓

0.5

84.8✓

0.92✓

1.0 -91.0✓

85.3

170.0✓

0.95✓

49.0

-173.2✓

2.08

4 2.17

0.55

0.51

"5" Left

20.6

13

71.93

0.48✓

50.0

7.0

277.5

76.0 69.0✓

346.0

68.5✓

192.8 63.9✓

101.5

63.0✓

52.4

256.7 132.9✓

164.5

131.5✓

40

4.21

35

3.84

.37

30

3.28

.47

93

25

2.61

.77

20

1.84

.69

15

1.15

.60

10

0.55

.04

5

0.51



Friday Munday OCT 24 1901

22<sup>+</sup>Substituted Grand glass for preliminary  
moved lamp back about 3".

Sam Yarker wedge

22  
to 33

30

Right. Left

209.6		298.7		226.5	
236.0	26.4 ✓	327.6	28.9 ✓	330.0	33.5 ✓
29.0	27.3 ✓	117.0	34.0 ✓	118.4	32.4 ✓
56.3	53.7 ✓	151.0	62.9 ✓	150.5	65.9 ✓

Right. Corrected setting 30

123.1		212.8	
145.3	22.2 ✓	235.3	22.5 ✓
302.5	22.2 ✓	34.5	19.9 ✓
324.7	44.4 ✓	54.4	42.4 ✓

3.11	3.11
27.5	26.5 ✓
3.84	3.54 ✓
3.04	3.64 ✓
4/13.04	12.98
3.26	3.24 ✓
4/12.94	3.24 ✓

22  
to 46

35 Right

305.4		36.3	
324.2	18.9 ✓	52.7	16.4 ✓
124.2	18.1 ✓	214.5	17.7 ✓
142.4	37.0 ✓	232.2	34.1 ✓
		33.2	

3.94 ✓
4.12 ✓
3.74 ✓
3.47
4/15.27
3.82 ✓

35 Left

213.6		302.6	
233.5	19.9 ✓	326.9	24.3 ✓
33.2	20.6 ✓	122.1	21.4 ✓
53.8	40.5 ✓	143.5	45.7 ✓



40 left

85.4		124.7	
52.6	17.2 ✓	142.0	17.3 ✓
213.9	<u>17.6</u> ✓	305.1	<u>19.4</u> ✓
231.5	34.8 ✓	324.5	26.7 ✓

4.05 ✓  
3.96 ✓  
4.48 ✓  
4.98 ✓

40 Right

306.0		39.6	
321.1	15.1 ✓	57.0	11.4 ✓
129.5	<u>13.9</u> ✓	217.2	<u>11.7</u> ✓
140.4	29.0 ✓	228.9	23.1 ✓

417.50  
4.38 ✓  
326  
112

2309

45 Right

128.2		218.3	
138.6	9.9 ✓	228.4	10.1 ✓
309.6	<u>10.4</u> ✓	39.5	<u>10.1</u> ✓
320.0	20.3 ✓	48.6	20.2 ✓

5.26 ✓  
5.27 ✓  
4.68 ✓  
4.47 ✓

45 left

36.3		126.0	
49.8	13.5 ✓	141.3	15.3 ✓
217.2	<u>12.9</u> ✓	307.4	<u>13.8</u> ✓
230.1	26.4 ✓	321.2	29.1 ✓

419.68  
4.92 ✓

2319

"50" left

218.7		308.2	
228.7	10.0 ✓	320.0	11.7 ✓
38.3	<u>10.4</u> ✓	128.1	<u>11.5</u> ✓
48.7	20.4 ✓	139.6	23.2 ✓

5.25 ✓

4.97 ✓

5.47 ✓

5.99 ✓

4/21.68

5.42 ✓

50 Right

130.1		220.2	
138.9	8.8 ✓	227.2	6.9 ✓
309.4	<u>9.6</u> ✓	41.0	<u>7.6</u> ✓
219.0	18.4 ✓	48.6	14.5 ✓

23 29

55 Right

310.1		41.3	
317.8	7.7 ✓	48.5	7.2 ✓
130.6	<u>7.4</u> ✓	220.3	<u>6.1</u> ✓
138.0	15.1 ✓	226.4	13.3 ✓

5.90 ✓

6.18 ✓

5.71 ✓

5.43 ✓

4/23.22 ✓

5.80 ✓

55 left

219.2		309.2	
227.4	8.6 ✓	318.7	9.4 ✓
40.1	<u>7.9</u> ✓	129.2	<u>9.4</u> ✓
48.0	16.5 ✓	138.6	18.8 ✓

23 38



60

lyt

40.3		129.1	
47.1	<sup>6</sup> 7.8 ✓	138.6	9.5 ✓
220.6	<u>6.6</u> ✓	309.8	<u>8.3</u> ✓
227.2	13.4 ✓	318.1	17.8 ✓

60

Ryht

131.4		220.8	
136.8	5.4 ✓	226.1	5.3 ✓
310.9	<u>6.1</u> ✓	42.3	<u>4.9</u> ✓
317.0	11.5 ✓	47.2	10.2 ✓

6.16 ✓

5.54 ✓

6.50 ✓

6.76

7/ 24.9 6

6.24 ✓

23 49

0.50 —

0.64

1.56<sup>32</sup>

2.09

2.88

3.31

3.92 4.02

4.46 4.64

4.97 5.15

(5.43)	(5.43)	5.58
(5.90)	(5.92)	6.05
(6.26)	(6.28)	6.41

5

10

15

20

25

30

35

40

45

50

55

60

0.5<sup>48</sup>0.55<sup>6</sup>1.15<sup>5</sup>

1.84

2.61

3.28

3.84

4.21<sup>2</sup>3.26<sup>4</sup>

3.82

4.38

4.92

5.42

5.80

6.24

.04

.60

.69

77

.67

.56

37

54

50

48

44



The following measures were of the light & dark  
 faces of H<sub>2</sub>O shade (exposure 160) the only change as I  
 remember that apertures were <sup>formed</sup> placed by pinholes in black  
 paper ~~as in direct contact~~ with porcelain plate.  
 Light face  
 slit "0"

Left aperture

2 <sup>h</sup> 00 <sup>m</sup> 00	12.7	99.5	1.0%
	74.1	61.4 ✓	165.8 66.3 ✓
	189.0	64.8 ✓	281.5 64.5 ✓
	253.8	126.2 ✓	346.0 130.8 ✓
			3.68
			.91 ✓

Right aperture

283.2	11.1
349.8	66.6 ✓
98.0	73.1 ✓
171.1	139.7 ✓
	255.8 134.1 ✓

" 8 am " Right

109.0	199.2
157.6	48.6 ✓
288.1	52.7 ✓
340.8	101.3 ✓
	15.0 52.8 ✓
	67.8 101.0 ✓

8 cm left.

21.0                      106.6  
 68.1   47.1 ✓            157.0   50.4 ✓  
 200.2   42.9 ✓            291.0   44.6 ✓  
 2.16    243.1   90.0 ✓      335.6   95.0 ✓

1.62 ✓  
 1.63 ✓  
 1.91 ✓  
 1.78 ✓  
 6.94 ✓  
 1.74 ✓

Dark film at 0 cm left

3 14    201.2                      292.3  
 242.2   41.0 ✓            335.6   42.3 ✓  
 22.7   41.9 ✓            113.1   42.5 ✓  
 64.6   82.9 ✓            155.6   85.8 ✓

2.11 ✓  
 2.03 ✓  
 1.73 ✓

0. cm

Right

110.4                      199.7  
 155.7   45.3 ✓            246.3   46.6 ✓  
 286.3   57.9 ✓            19.5   47.7 ✓  
 338.2   97.2 ✓            67.2   94.3 ✓

1.80  
 477.67  
 1.92 ✓

8 cm

Right

Put lamp nearer aperture. Mirror  
back of lamp.

120.4                      210.5  
 144.6   24.2 ✓            234.9   24.1 ✓  
 302.7   24.6 ✓            33.4   21.6 ✓  
 329.3   48.4 ✓            55.0   46.0 ✓



sem left

33.4		120.3	
53.8	20.4 ✓	145.5	25.2 ✓
214.2	19.9 ✓	302.2	24.7 ✓
254.1	40.3 ✓	327.0	49.9 ✓

3.33 ✓  
3.46 ✓  
3.75 ✓  
3.25 ✓

4) 182  
3.46 ✓

192  
154

Mean at sem made  
with other difficulty  
avg of function graphs.

3.60  
201  
159

3.46  
174  
172

192  
172  
100



Monday Oct 28 1901

Arranged apparatus for measuring  
the wedge of Am. Telescope. (Pitelund)

Two pinholes in black paper pasted on  
piece of ground glass, and back of which  
about  $1\frac{1}{2}$ " another piece of ground glass is  
glued are illuminated by a hot back  
burner. The wedge is placed vertically  
about 7.5 cm from pinholes so that  
one is covered. Cooke lens is placed  
about 16.5 cm from pinholes. The images  
formed by lens are viewed by the double  
image pin & hole pin of Pt. Potomac  
used in previous experiment.

The settings of wedge which will be taken  
from the graduations on edges, corrected  
(with the microscope) to font  $1.68^{32}$  diopters  
than recorded; i.e. if setting is 2.0  
the real font measure is opposite  $\frac{+68}{0.68}$ .

Wedge was found to be smeared with  
oil. It was cleaned before any measure  
were made.

Prominent wavy lines were noticed in  
darken part. They gave the impression  
that the surface was scratched but  
careful examination showed them to be  
in body of the glass.

Tuesday Oct 29 (1901)

Measurement of Am. tel. wedge with  
apparatus described on previous page.  
Recept that <sup>the 2nd piece of</sup> ground glass between aperture  
& light has been removed.

— 0.5 Left Aperture  
Photographing shades our eye - fire.

253.6		275.0	
<del>9.</del> 192.7	60.9 ✓	346.3	71.3 ✓
70.1	59.1 ✓	93.6	72.7 ✓
11.0	120.0 ✓	166.3	144.0 ✓

— 0.5 Right aperture

106.4		201.2		1.19 ✓
155.8	49.4 ✓	239.6	38.4 ✓	0.69 ✓
245.9	47.7 ✓	20.1	38.1 ✓	1.73 ✓
333.6	97.1 ✓	58.2	76.5 ✓	2.30 ✓
				4.59 ✓
				1.48 ✓

Shift a photometer  
eye - fire slightly to left



"0.0" Right aperture

110.9 201.5 2.19 ✓  
 150.8 39.9 ✓ 240.0 38.5 ✓ 2.23 ✓  
 292.0 40.1 ✓ 22.8 40.2 ✓ 1.92 ✓  
 11.58 332.1 80.0 ✓ 63.0 78.7 ✓ 1.88 ✓  
 8.22 ✓

reversal found not to be complete 2.06

"0.0" Left aperture

199.1 287.8  
 241.9 42.8 ✓ 335.8 48.0 ✓  
 18.0 46.8 ✓ 110.6 43.2 ✓ 106.5 51.7  
 64.8 89.6 ✓ 153.8 91.2 ✓ 158.2 48.9  
 287.9 54.6  
 336.8 100.6

"0.5" Left aperture

3.5 25.0 296.8  
 57.7 32.7 ✓ 330.1 33.3 ✓  
 205.8 32.5 ✓ 115.8 33.1 ✓  
 238.3 65.2 ✓ 148.9 66.4 ✓

"0.5" Right

8.0 116.6 210.5 2.67 ✓  
 146.0 29.4 ✓ 233.9 23.4 ✓ 2.63 ✓  
 296.0 30.0 ✓ 29.0 26.9 ✓ 2.88 ✓  
 11.5 326.0 59.4 ✓ 55.9 50.3 ✓ 3.26 ✓  
 4 | 1144 ✓  
 2.86 ✓



"1.0" Right

13.0

302.2

31.0

321.0

198.8 ✓

51.8

208.8 ✓

120.7

21.0 ✓

212.0

20.0 ✓

141.7

39.8 ✓

232.0

40.8 ✓

"1.0" Left

3.78 ✓

3.72 ✓

208.8

299.6

3.24 ✓

234.2

25.4 ✓

326.4

26.8 ✓

3.22 ✓

28.6

25.3 ✓

120.1

24.5 ✓

4) 13.96 ✓

22.0

53.9

50.7 ✓

144.6

51.3 ✓

3.49 ✓

"1.5" Left aperture

23.5

213.1

304.0  
~~302.0~~

232.2

19.1 ✓

322.1

18.1 ✓

3.98 ✓

33.0

17.2 ✓

122.7

19.3 ✓

3.92 ✓

50.2

36.3 ✓

142.0

37.4 ✓

4.53 ✓

4.59 ✓

"1.5" Right

17.02 ✓

~~4.25~~

4.26 ✓

124.8

216.0

139.0

14.2 ✓

230.0

14.0 ✓

304.9

14.1 ✓

35.6

13.6 ✓

33.6

319.0

28.3 ✓

49.2

27.6 ✓

Photographix eye-film not used  
"2.0" Riggs

35.0

307.2

37.0

316.9 9.7 ✓ 47.0 10.0 ✓

126.2 10.5 ✓ 217.0 9.9 ✓

136.7 20.2 ✓ 226.9 19.9 ✓

5.27 ✓

5.30 ✓

4.74 ✓

~~4.47 ✓~~~~5.27 ✓~~~~5.18~~

19.78

4.94

"2.0" Left.

215.8

305.0

228.3 12.5 ✓ 319.5 18.5 ✓

35.0 13.2 ✓ 125.4 14.6 ✓

42.0

48.2 25.7 ✓ 140.0 29.1 ✓

43.0

"2.5" Left

37.0

127.8

47.3 10.3 ✓ 137.5 9.7 ✓

218.0 10.5 ✓ 307.0 10.4 ✓

228.5 20.8 ✓ 317.4 20.1 ✓

5.20 ✓

5.28 ✓

5.83 ✓

5.76 ✓

4 22.07 ✓

5.52 ✓

"2.5" Riggs

308.5

38.5

316.4 7.9 ✓ 46.0 7.5 ✓

135.7 7.7 ✓ 218.0 8.6 ✓

51.5

135.7 15.6 ✓ 226.6 16.1 ✓

"3.0" Right

52.5

129.0

220.0

135.2

6.2 ✓

225.0

5.0 ✓

309.6

16.4? ✓

39.6

5.4 ✓

<sup>6.2</sup>  
315.0

7.6

45.0

10.4 ✓

12.6 ✓

~~7.40~~

"3.0" Left

~~6.71~~

37.8

128.3

45.0

7.2 ✓

136.5

8.2 ✓

218.8

8.1 ✓

308.8

7.6 ✓

226.9

15.3 ✓

316.4

15.8 ✓

"3.0" Right

6.30 ✓

6.71 ✓

5.87 ✓

5.80 ✓

309.7

315.3

5.6 ✓

129.2

6.0 ✓

135.2

11.6 ✓

41 24.628 ✓

6.17 ✓



"3.5" Right

398.0

310.0

40.8

314.0

4.0 ✓

44.1

3.3 ✓

130.1

4.1 ✓

220.2

3.9 ✓

7.26 ✓

134.2

8.1 ✓

224.1

7.2 ✓

7.61 ✓

6.76 ✓

6.61 ✓

4 | 28.14 ✓

7.04 ✓

"3.5" Left

220.5

130.0

225.7

5.2 ✓

135.3

5.3 ✓

39.5

5.0 ✓

309.7

5.6 ✓

16.0

44.5

10.2 ✓

315.3

10.9 ✓

"4.0" Left

17.0

221.2

310.3

225.2

4.0 ✓

314.3

4.0 ✓

7.34 ✓

40.2

3.8 ✓

130.3

4.5 ✓

7.15 ✓

44.0

7.8 ✓

134.8

8.5 ✓

7.98 ✓

8.02 ✓

"4.0" Right

4 | 30.49 ✓

7.62 ✓

131.3

221.0

134.1

2.8 ✓

223.5

2.5 ✓

311.0

3.0 ✓

40.8

3.2 ✓

314.0

5.8 ✓

44.0

5.7 ✓

"O.O" left aperture

Tuesday Oct 29<sup>th</sup> 1901

Wedge of H<sub>2</sub>SO<sub>4</sub> placed directly in front of aperture covering both so that the difference of brightness should be the same in all part of the wedge. The dist. of wedge from aperture was between 29.3 cm. The dist. of aperture apart about 24 mm.

Sub 187 These distances will be measured more exactly. The setting given is in all cases is that opposite which one of the apertures; the other aperture would be about 24 mm nearer the left hand part of wedge.

734 - 0.5 Left Photog. shade over eyepiece

R.

11.2

71.4 60.2 ✓

192.2

249.8 57.6 ✓  
117.8 ✓

99.0

162.1 63.1 ✓

278.9

343.8 64.9 ✓  
127.8

124 ✓

~~1.02~~  
~~1.04~~

1.49

1.85

Right

285.9

343.7 57.8 ✓

107.7

157.0 49.3 ✓  
107.1 ✓

18.6

65.5 46.9 ✓

199.2

244.8 45.6 ✓  
92.5 ✓

~~1.40~~

~~45.61~~  
1.40 ✓



0.0 Right (shade not used)

105.5	
161.8	56.3 ✓
285.5	
338.0	52.5 ✓
	<u>108.8</u> ✓

Left

9.8	
74.2	64.4 ✓
187.0	
254.2	67.2 ✓
	<u>131.6</u> ✓

97.2	
164.5	67.3 ✓
276.3	
344.9	68.6 ✓
	<u>135.9</u> ✓

145 ✓
182 ✓
0.95 ✓
0.86 ✓
<u>5.08</u> ✓
4 <u>1.27</u> ✓

+ 0.5  
Left

191.0	
253.3	62.3 ✓
11.5	
73.4	61.9 ✓
	<u>124.2</u> ✓

280.1	
344.3	64.2 ✓
100.1	
166.2	66.1 ✓
	<u>130.3</u> ✓

110 ✓
0.97 ✓
1482 ✓
1.77 ✓
<u>5.32</u> ✓
4 <u>1.33</u> ✓

Right

106.0	
161.3	55.3 ✓
285.3	
337.2	51.9 ✓
	<u>107.4</u> ✓

200.2	
246.2	46.0 ✓
18.2	
67.5	49.3 ✓
	<u>95.3</u> ✓

Right.

16.8  
 67.2 50.4 ✓  
 197.6  
 248.0 50.4 ✓  
 100.8 ✓

Left

191.5  
251.1 39.6 ✓  
10.1  
73.1 63.0 ✓  
122.6 ✓

$$\begin{array}{r} 280.0 \\ 346.5 \\ 100.0 \\ 162.2 \\ \hline 888.7 \end{array}$$

9.0  
15.0      64.0 ✓

$$\begin{array}{r} 191.3 \\ 255.3 - 64.0 \\ \hline 191.3 \end{array}$$

101.9  
165.9 64.0 ✓  
280.0  
348.3 68.3 ✓  
132.3 ✓

Right

286.9  
339.2 523 ✓  
104.0  
161.0 570 ✓  
109.3 ✓

$17.9$   
 $70.1 \quad 52.2 \checkmark$   
 $198.5$   
 $246.9 \quad .484 \checkmark$   
 $\underline{100.4} \checkmark$

$1.43 \checkmark$   
 $1.44 \checkmark$   
 $\underline{98} \checkmark$   
 $4 \overline{) 584}$   
 $\underline{98}$   
 $\underline{2.00}$   
 $1.25 \checkmark$

2.0 Right

105.5

154.9 49.4 ✓

285.0

338.1 53.1 ✓  
102.5 ✓

Left

10.2

73.7 63.5 ✓

191.9

252.5 60.6 ✓  
124.1 ✓

196.9

246.3 49.4 ✓

16.9

65.8 48.9 ✓  
98.3 ✓

1.60 ✓

1.70 ✓

1.10 ✓

0.84 ✓

96.9

166.2 69.3 ✓

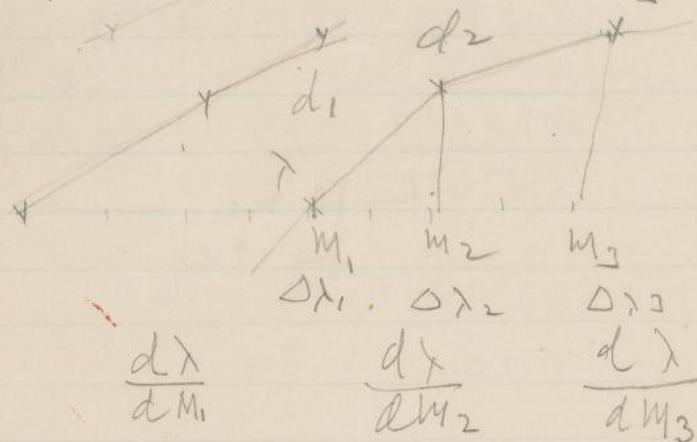
279.4

346.6 67.2 ✓  
136.5 ✓4 5.24 ✓  
1.31 ✓



Friday Nov 1 1901

Motion in line of sight when difference in distance (in  $\lambda$ ) between two known lines  $d_3$  are given



$$\Delta \lambda_1 \times \frac{69.07}{61.67} = \Delta \lambda_2 \times \frac{69.07}{73.10} = \Delta \lambda_3 \times \frac{73.10}{75.54}$$

$$(\Delta \lambda_1) 61.67 = (\Delta \lambda_1 + x) 69.07 = (x \lambda_1 + y) 73.10$$

$$\Delta \lambda_1 69.07 + 69.07 x$$

$$\Delta \lambda_1 61.67$$

$$\Delta \lambda_1 740 + 69.07 x = 0$$

$$\Delta \lambda_1 143 + 73.10 y = 0$$

$$\pm (xy) = 0$$

$$\Delta \lambda_1 = \frac{V}{61.67}$$

$$V = \left( \frac{V}{61.67} + x \right) 69.07$$

$$61.67 V = V 69.07 + x (61.67 \times 69.07)$$

$$0 = V 740 + x (61.67 \times 69.07)$$

$$\text{velocity} = V = \frac{-x (61.67 \times 69.07)}{7.40}$$

Friday Nov 1 1901

AB - AY

$$\begin{array}{r}
 \log 61.67 = 1.79007 \\
 \log 69.07 = 1.83929 \\
 \hline
 7.40 \quad 3.62936 \\
 \log 7.40 \quad 0.86923 \\
 \hline
 2.76013
 \end{array}$$

AB - AS

$$\begin{array}{r}
 \log 61.67 = 1.79007 \\
 \log 73.10 = 1.86392 \\
 \hline
 1143 \quad 3.65399 \\
 \log 11.43 = 1.05805 \\
 \hline
 2.59594
 \end{array}$$

575.6 Run for sec ——— 394.4  
for 1<sup>st</sup> diff.

$$\begin{array}{r}
 61.67 \times \\
 \hline
 7.40
 \end{array}$$

$$\begin{array}{r}
 69.07 \times \\
 \hline
 7.40
 \end{array}$$

44

$$\begin{array}{r}
 4800 \quad 62.46 \quad 1.7956 \\
 4100 \quad 73.13 \quad 1.8641 \\
 \hline
 10.67 \quad 3.6597 \\
 1.0252 \\
 \hline
 2.6315 \\
 428.1
 \end{array}$$

$$\begin{array}{r}
 4700 \quad 63.80 \quad 1.8048 \\
 4000 \quad 74.96 \quad 1.8748 \\
 \hline
 11.16 \quad 3.6796 \\
 1.0477 \\
 \hline
 2.6319 \\
 428.4
 \end{array}$$

AB - AY

$$\begin{array}{r}
 4861 \\
 4340 \\
 \hline
 521
 \end{array}
 \quad ) \quad \begin{array}{r}
 2500 \\
 2605
 \end{array}
 \quad \left( \begin{array}{l} 5 \\ \text{i.e. } 5 \text{ di} = 1 \lambda \end{array} \right.$$

$$\begin{array}{r}
 2554 \\
 2452 \\
 \hline
 101
 \end{array}$$

$$\begin{array}{r}
 575 \\
 20 \\
 \hline
 1150.0
 \end{array}$$

11500 Run  
9456 Run

$$\begin{array}{r}
 41861 \\
 4101 \\
 \hline
 760
 \end{array}
 \quad \begin{array}{r}
 4200 \\
 3500 \\
 \hline
 700
 \end{array}$$

$$\begin{array}{r}
 4234 \\
 4118 \\
 \hline
 116
 \end{array}
 \quad \begin{array}{r}
 24 \\
 24
 \end{array}$$

$$\begin{array}{r}
 394 \\
 24 \\
 \hline
 1576 \\
 728 \\
 \hline
 9456
 \end{array}$$

Saturday Nov 2 1901

Made measures on apparatus described.  
on page 181. Distance between apertures measured  
by glass plate D 6553 = 24.2<sup>mm</sup>.

Distance from aperture to wedge 2.0<sup>cm</sup> & 2.5<sup>cm</sup>.

Dist. from aperture to lens about 160<sup>cm</sup>

$$\begin{array}{r} 2 \overline{) 160} \\ \underline{80} \\ 80 \\ \underline{80} \\ 0 \end{array} \quad \begin{array}{r} 25 \overline{) 160} \quad (64 \\ \underline{125} \\ 35 \\ \underline{30} \\ 5 \end{array}$$

$$72 \overline{) 242} \quad 3$$



1.30

$$\begin{array}{r} 24.2 \\ \underline{20 \pm 2.5} \end{array} \quad 160 \quad \begin{array}{r} \text{cm} \\ 3.0 \end{array}$$

$$\begin{array}{r} 2 \overline{) 160} \\ \underline{80} \\ 80 \\ \underline{80} \\ 0 \end{array} \quad \begin{array}{r} 25 \overline{) 160} \quad (64 \\ \underline{125} \\ 35 \\ \underline{30} \\ 5 \end{array} \quad \begin{array}{r} 80 \overline{) 24.2} \\ \underline{3} \\ 23.9 \end{array} \quad \begin{array}{r} 64 \overline{) 24.2} \\ \underline{4} \\ 23.8 \end{array}$$

$$25 \overline{) 23.8} \quad \left( \right.$$



Nov 2, Saturday Nov 2 1901

Same App as last used for wedge  
experiments. However, incandescent plates  
placed between light & glass & heating  
apparatus.

Measure of shade glass placed  
directly over aperture

Shade 11111 left

4 09

17.0		105.7	
65.6	48.6 ✓	157.0	51.3 ✓
197.9	49.5 ✓	285.7	52.7 ✓
247.4	98.1 ✓	338.4	104.0 ✓

1.20

1.56

0.20

0.33

4/3.79  
0.95

11111 Right

270.2		4.7		0.13	
353.0	82.8 ✓	81.0	76.3	84.7	83.4 ✓
87.9	86.4 ✓	181.9	84.1	183.2	79.2 ✓
174.3	169.2 ✓	266.0	168.4	262.4	162.6 ✓

4 23

Wednesday Nov 20 1901

Motion in line of sight. Lightning.

C. Sm No 17 H 180-2

~~H<sub>B</sub> - H<sub>Y</sub>~~

	<sup>2400</sup> <del>4100</del> +	<del>H<sub>B</sub> - H<sub>Y</sub></del>	<sup>4100</sup> <del>2400</del> +	<del>H<sub>B</sub> - H<sub>8</sub></del>			
1		80	78	37	48	79	42
2		66	75	33	32	70	32
3		168	200	95	65	184	80
4		156	144	110	97	150	104
5		156	135	72	76	146	74
6		73	128	-08	15	100	04
7		119	84	27	12	101	20
8		103	-?	37	-?	103	37
9		-?	148	-?	72	148	72
10		65	66	11	-25	66	-07

1	13	49	2.7	2.5
2	4	39		
3	124	89		
4	84	111		
5	80	81		
6	34	11		
7	35	27		
8	37	44		
9	82	79		
10	0	0		

Wednesday Nov 20 1901

Book Sept 13 1901 page 212<sup>6</sup> 7C.

$$dx = \frac{bc}{(c+x)^2} \quad b = d.$$

$$x=0 \quad \text{th. } dx = \frac{bc}{c^2} = \frac{b}{c}$$

log b	<del>8.950665</del>	3.425828	3.453594	
log c	<del>3.366498</del>	4.025532	4.650755	
	<del>3.950665</del>			
	9.415833	9.400296	9.402839	
	<del>0.584167</del>	0.599704	0.597161	
B.	0.261	0.251	0.253	0.255
	<del>3.4</del>			

X = 2400

4100

C	<del>2.750</del> 8.926	13026	<del>2.400</del> 10.606	14706	<del>2.400</del> 11.240	15340
	11326	4.114811	13006	4.167455	13640	4.185825
	4.054077		4.114144		4.134814	
log bc	7.317163		7.451360		7.504349	
	<del>8.108154</del>		<del>8.228288</del>		<del>8.269628</del>	
	9.209009		9.223072		9.234721	
H y	0.162		0.167		.171	.167
	<del>7.317163</del>		<del>7.451360</del>		<del>7.504349</del>	
	<del>8.229622</del>		<del>8.334990</del>		<del>8.371650</del>	
	9.087541		9.116370		9.132699	
H s	0.122		0.131		0.136	.130



Wednesday Nov 20 1901

 $\Delta B \approx \Delta V$ 

$$\begin{array}{r}
 .255 \\
 167 \\
 \hline
 2) 422 \\
 0.211 \quad \left. \begin{array}{l} 1.00 \\ 844 \end{array} \right\} 1.47 \\
 \hline
 1560
 \end{array}$$

$$\begin{array}{r}
 .255 \\
 132 \\
 \hline
 7) 385 \\
 .192 \quad \left. \begin{array}{l} 1.000 \\ 860 \end{array} \right\} 1.52 \\
 \hline
 400
 \end{array}$$

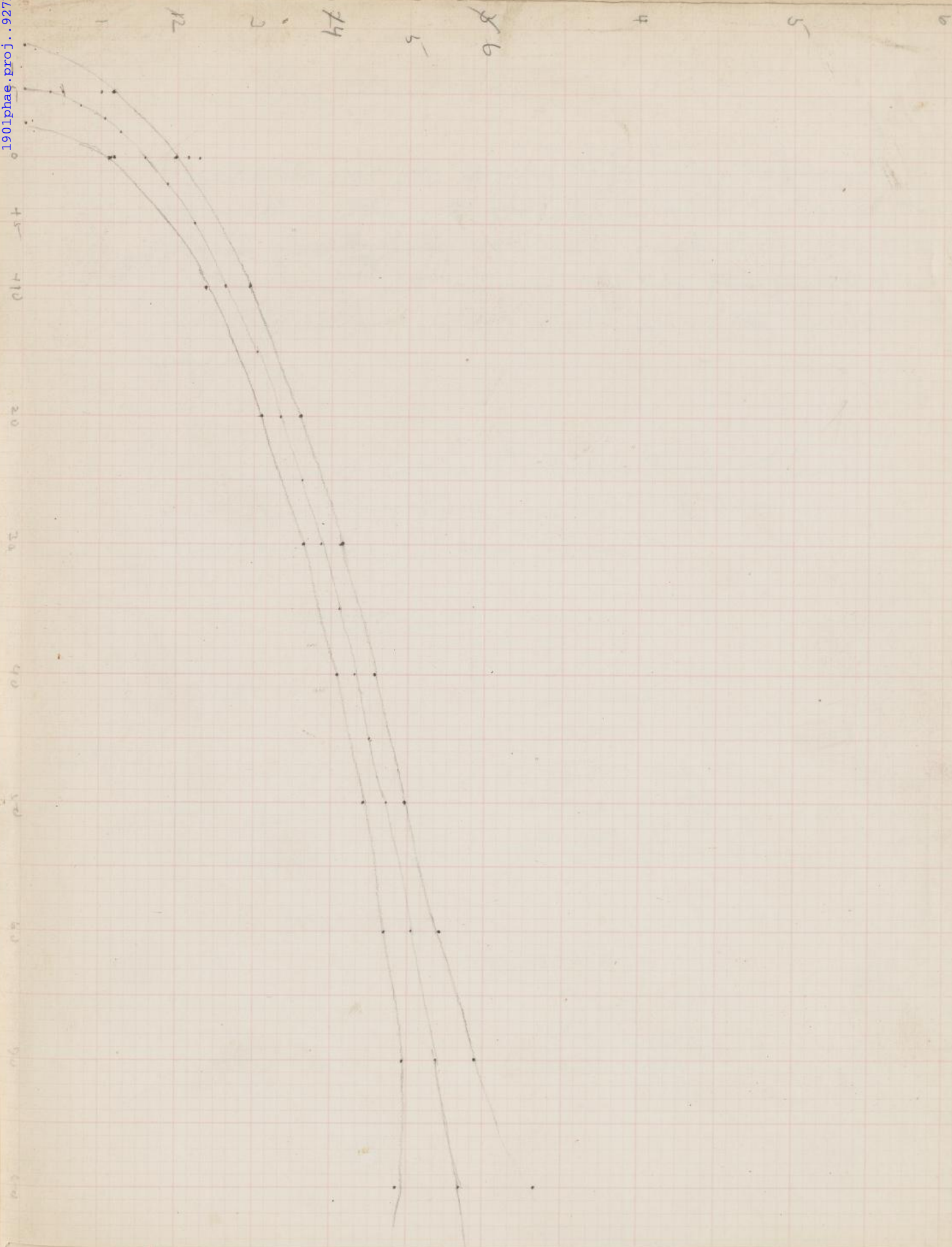
192

Friday Nov 22 1901

~~NA~~ for alt of  $+40^\circ$  &  $+45^\circ$

Dec.	NA $+40^\circ$	NA $+45^\circ$
-8.6	<sup>0</sup>	
-5.0	1 10	
0	1 58	1 06
+10	2 54	2 22
+20	3 34	3 06
+30	4 06	3 38
+40	4 32	4 04
+50	4 58	4 24
+60	5 24	4 40
+70	5 52	4 56
+80	6 40	4 50

	NA	alt
-16 <sup>0</sup>	0	31.6
-16 <sup>5</sup>	1 4	30.0
-16	1 15	29.0
	1 30	28.0







Thursday Jan 16 1902

Apparatus set up similar to preceding experiments of same character. 2 pinholes  $\approx$  about .15 mm in black paper lightly backed by blacked by miller. Cooke lens  $\frac{7}{8}$  in at about 165 cm for pinholes. Phot. "a" within glass plate under camera magn.

Measure of C4305 Filter turned lens.  
Dist from pinholes about 8 cm.  
Graduation 1 cm apart.

5-06

0. Right. Left

I. Rt

I. Left

Left dis. C  
323.1  
427.0  
67.0 93.9 ✓  
149.4 97.5 ✓  
191.4 ✓  
246.9 360.0 ✓  
168.6

57.9  
153.9 96.0 ✓  
238.0 96.8 ✓  
192.8 ✓  
334.8 360.0 ✓  
167.2

0.22 ✓

0.24 ✓

0.71 ✓

1.02 ✓

4/2.19 ✓

0.55 ✓

Left Right

52.8  
160.0 107.2 ✓  
233.4 109.7 ✓  
343.1 216.9 ✓  
360.0 ✓  
143.1 ✓

Right 319.0  
Pat dis 434.1 115.7 ✓  
138.3 117.0 ✓  
255.3 232.1 ✓  
360.0 ✓  
127.9 ✓

1 Left

Rt			Left	
69.4			159.0	
146.3	76.9 ✓		239.0	80.0 ✓
252.6	75.2 ✓		339.1	78.9 ✓
329.8	152.1 ✓		458.0	158.9 ✓

"1" Right

2357.1			75.7	
342.9			142.0	66.3 ✓
56.9	74.0 ✓		256.5	65.2 ✓
159.8	75.7 ✓		321.7	131.5 ✓
234.9	149.1 ✓			

0.53 ✓

0.40 ✓

0.59 ✓

0.95 ✓

4/247 ✓

0.62 ✓

2 Left

256.7			239	
328.2	71.6 ✓		345.0	
69.6	78.7 ✓		238.0	
148.2	150.3 ✓		158.1	77.0 ✓
			238.3	80.2 ✓
				157.2 ✓

57 ✓

43 ✓

74 ✓

89 ✓

4(2.63) ✓

.66 ✓

2 Right

164.6			254.8	
234.3	69.7 ✓		322.3	67.5 ✓
340.2	72.1 ✓		75.0	67.0 ✓
55.0	141.8 ✓		142.0	134.5 ✓



at  
8 of

" 0 " Left  
R. I. R

69.9  
147.9 78.0 ✓  
249.9  
329.2 79.3 ✓  
157.3 ✓

20. R  
342.3  
(4 55.3) 730 ✓  
161.2  
239.3 781 ✓  
151.1 ✓

I. I.

156.8  
237.9 81.1 ✓  
336.5  
57.1 800 ✓  
(417.1) 161.7 ✓

79.8  
140.1 60.3 ✓  
255.5 68.0 ✓  
323.5 128.3 ✓

0.43 ✓  
0.35 ✓  
0.55 ✓  
1.01 ✓  
4 12.34 ✓  
.58 ✓

" 1 " Left L. R.

255.5  
326.5 71.0 ✓  
72.2 706 ✓  
142.8 141.6 ✓

Right L. R.

165.0 912 ✓  
236.2  
346.7 668 ✓  
(4 53.5) 138.0 ✓

338.3  
62.2 839 ✓  
(422.2) 770 ✓  
159.3 160.9 ✓  
236.3

253.1  
322.1 690 ✓  
76.1 702 ✓  
146.3 139.2 ✓

0.74 ✓  
0.36 ✓  
0.81 ✓  
0.79 ✓  
4 270 ✓  
4  
.68 ✓

" 2 "

~~Left~~

L.R.

$$\begin{array}{r}
 70.7 \\
 148.3 \\
 251.9 \\
 327.9 \\
 \hline
 77.6 \checkmark \\
 76.0 \checkmark \\
 153.6 \checkmark
 \end{array}$$

L.R.

$$\begin{array}{r}
 346.0 \\
 (456.9) \\
 164.4 \\
 235.9 \\
 \hline
 70.9 \checkmark \\
 71.5 \checkmark \\
 142.4 \checkmark
 \end{array}$$

L.L.

$$\begin{array}{r}
 159.1 \\
 236.1 \\
 343.3 \\
 (459.7) \\
 \hline
 77.0 \checkmark \\
 76.4 \checkmark \\
 153.4 \checkmark
 \end{array}$$

$$\begin{array}{r}
 .50 \checkmark \\
 .51 \checkmark \\
 .73 \checkmark \\
 .75 \checkmark \\
 \hline
 41249 \checkmark \\
 .62 \checkmark
 \end{array}$$

$$\begin{array}{r}
 71.9 \\
 139.0 \\
 251.5 \\
 325.8 \\
 \hline
 67.1 \checkmark \\
 74.3 \checkmark \\
 141.4 \checkmark
 \end{array}$$

" 3 "

~~Right~~ <sup>Left</sup>

L.R.

$$\begin{array}{r}
 256.6 \\
 321.9 \\
 76.4 \\
 142.5 \\
 \hline
 65.3 \checkmark \\
 66.1 \checkmark \\
 131.4 \checkmark
 \end{array}$$

Right

$$\begin{array}{r}
 232.9 \\
 344.1 \\
 50.1 \\
 160.7 \\
 \hline
 111.2 \\
 110.6 \\
 221.8 \\
 362.0 \\
 \hline
 138.2 \checkmark
 \end{array}$$

$$\begin{array}{r}
 343.9 \\
 (455.3) \\
 161.3 \\
 232.5 \\
 \hline
 71.4 \checkmark \\
 71.2 \checkmark \\
 142.6 \checkmark
 \end{array}$$

$$\begin{array}{r}
 346.8 \\
 (454.2) \\
 159.9 \\
 234.5 \\
 \hline
 67.4 \\
 74.6 \\
 142.0
 \end{array}$$

(Reheated above)

$$\begin{array}{r}
 .95 \checkmark \\
 .72 \checkmark \\
 .73 \checkmark \\
 .81 \checkmark \\
 1.08 \checkmark \\
 \hline
 413.57 \checkmark \\
 .89 \checkmark
 \end{array}$$

$$\begin{array}{r}
 78.2 \\
 142.2 \\
 257.1 \\
 318.5 \\
 \hline
 64.0 \checkmark \\
 61.4 \checkmark \\
 125.4 \checkmark
 \end{array}$$



"4"

Left Lk.

263.9	
319.2	55.3 ✓
82.3	54.6 ✓
136.9	<u>109.9</u> ✓

348.5	
50.0	61.5 ✓
(410.5)	
166.4	60.2 ✓
226.6	<u>121.7</u> ✓

142 ✓
1.16 ✓
1.31 ✓
141 ✓
<u>415.30</u> ✓
1.32 ✓

Right

168.0	
225.5	57.5 ✓
351.9	57.4 ✓
49.3	
<del>49.3</del>	<u>114.9</u> ✓

259.9	
313.4	53.5 ✓
80.3	
137.1	56.8 ✓
	<u>110.3</u> ✓

"5"

Left af. Lk.

89.5	
128.9	39.4 ✓
271.5	<del>42.6</del>
311.0	39.5 ✓
	<u>78.9</u> ✓

174.8	
219.4	44.6 ✓
356.6	
37.5	4.9 ✓
(397.5)	<u>85.5</u> ✓

2.23 ✓
2.04 ✓
2.35 ✓
2.30 ✓

Right af. Lk.

2.0	
38.0	36.0 ✓
179.2	38.8 ✓
218.0	<u>74.8</u> ✓

90.0	
127.1	37.1 ✓
268.1	39.5 ✓
307.6	<u>76.6</u> ✓

<u>418.92</u> ✓
2.23 ✓



" 6"  
Left af. L.R.

277.0  
303.0 26.0 ✓  
97.2 24.9 ✓  
122.1 50.9 ✓

Right

186.3  
209.4 23.1 ✓  
7.9 24.3 ✓  
32.2 47.4 ✓

6.8  
31.8 25.0 ✓  
185.0 26.2 ✓  
211.2 51.2 ✓

3.24 ✓  
3.22 ✓  
3.39 ✓  
3.08 ✓

4/12.93 ✓  
3.23 ✓

" 7"

Left af. L.R.

100.2  
117.1 16.9 ✓  
282.8 16.4 ✓  
299.2 33.3 ✓

Right L.R.

12.4  
27.2 14.8 ✓  
192.1 14.2 ✓  
206.3 29.0 ✓

189.8  
206.2 16.4 ✓  
10.5 17.6 ✓  
28.1 34.0 ✓

4.17 ✓  
4.13 ✓  
4.48 ✓  
4.43 ✓

4/17.21 ✓  
4.30 ✓

101.5  
116.1 14.6 ✓  
280.2 15.0 ✓  
295.2 29.6 ✓

"8"

Left sp. L.R.

104.0	
115.0	11.0 ✓
284.5	11.6 ✓
296.1	<u>22.6</u> ✓

15.0	
25.4	10.4 ✓
193.9	10.9 ✓
204.8	<u>21.3</u> ✓

191.6	
205.0	13.4 ✓
13.2	
24.8	<u>11.6</u> ✓
	<u>25.0</u> ✓

103.5	
113.4	9.9 ✓
283.8	9.3 ✓
293.1	<u>19.2</u> ✓

5.02 ✓
4.80 ✓
5.15 ✓
5.38 ✓

4	<u>2035</u> ✓
	<u>5.09</u> ✓

"9"

~~Left sp. L.R.~~

0	0.55	0.58
1	0.62	0.68
2	0.66	0.62
3	—	0.89
4	—	1.32
5		2.23
6		3.23
7		4.30
8		5.09
9		
10		



Friday Jan 17 1902

Measured Yukon wedge by with apparatus similar to that used previously (ref 161)

wedge in photometer tubes so as to use graduations.

Dist from fiber about 8 cm.

9 0

~~5~~ 5 Left.

1 R

166.5  
228.0 61.5  
349.4 60.8  
41 50.2 122.3 ✓

262.0  
319.0 57.0  
78.9 60.5  
139.4 117.5 ✓

1.14 ✓ - 0.26 ✓  
1.25 ✓ 14  
2.39  
40  
7/1.99  
0.50 ✓

5 Right  
1 R

1 1

150.0  
248.6 98.6  
329.9 95.2  
42 65.1 193.8  
166.2 ✓

242.7  
334.2 91.5  
62.6 85.9  
158.5 187.4  
172.6 ✓



9 12

10 Right  
 1 R  
 left die > 333.0  
 71.1 98.1

$$\begin{array}{r} 150.5 \\ 244.3 \\ \hline 393.8 \\ 191.9 \\ \hline 168.1 \end{array}$$

$$\begin{array}{r} 11 \\ 67.1 \\ 152.0 \\ 244.0 \\ 333.8 \\ \hline 84.9 \\ 89.8 \\ 174.7 \end{array}$$

$$\begin{array}{r} - \\ 0.10 \\ 1.49 \\ \hline 1.18 \\ 2.77 \\ \hline 4/2.55 \\ 0.64 \end{array}$$

Repetitive

$$\begin{array}{r} 267.0 \\ 317.6506 \\ 82/124 \\ 102.0 \\ 134.5 \end{array}$$

$$\begin{array}{r} 10 Left \\ 1 R \\ 265.0 \\ 318.1 \\ 53.1 \\ 86.1 \\ 134.7 \\ \hline 58.6 \\ 3. \\ 106.7 \end{array}$$

$$\begin{array}{r} 11 \\ 348.6 \\ 49.0 \\ 168.5 \\ 228.6 \\ \hline 60.4 \\ 60.1 \\ 120.5 \end{array}$$

Amplitude 81.1

9 27

15 Left  
 1 R  
 89.1

$$\begin{array}{r} 128.7 \\ 271.3 \\ 312.1 \\ \hline 39.2 \\ 40.8 \\ 80.0 \end{array}$$

$$\begin{array}{r} 11 \\ 177.6 \\ 219.0 \\ 357.7 \\ 32.5 \\ \hline 41.4 \\ 40.8 \\ 82.2 \end{array}$$

$$\begin{array}{r} 2.19 \\ 2.13 \\ 0.30 \\ 6.64 \\ \hline 4/6.26 \\ 5.26 \\ 0.156 \end{array}$$

15 Right  
 1 R  
 left die 340.0  
 61.1 81.5  
 157.8 82.8  
 240.6 164.3

$$\begin{array}{r} 11 \\ 248.0 \\ 325.0 \\ 72.6 \\ 145.2 \\ \hline 770 \\ 72.6 \\ 149.6 \end{array}$$

Repetitive

$$\begin{array}{r} 252.1 \\ 326.1 \\ 74.7 \\ 147.3 \\ \hline 74.0 \\ 72.6 \\ 146.6 \end{array}$$

9 40

20 Right  
L R

169.0

231.0 62.0

$$\begin{array}{r} 357.7 \\ 40 \\ \hline 498.8 \end{array} \quad \begin{array}{r} 58.1 \\ \hline 120.1 \end{array} \checkmark$$

L I.

260.8

317.9 57.1

$$\begin{array}{r} 81.3 \\ \hline 140.7 \end{array} \quad \begin{array}{r} 59.4 \\ \hline 116.5 \end{array} \checkmark$$
1.19<sup>✓</sup>1.27<sup>✓</sup>3.05<sup>✓</sup>2.86<sup>✓</sup>

$$\begin{array}{r} 4 \overline{) 8.37} \\ \hline 2.09 \end{array} \checkmark$$

20 Left

L R.

95.6

123.6 28.0

$$\begin{array}{r} 276.9 \\ \hline 304.0 \end{array} \quad \begin{array}{r} 27.1 \\ \hline 55.1 \end{array} \checkmark$$

L I

183.3

212.7 29.4

$$\begin{array}{r} 05.1 \\ \hline 35.7 \end{array} \quad \begin{array}{r} 30.6 \\ \hline 60.0 \end{array} \checkmark$$

Checked over.

9 49

25 Left

280.5

301.1 20.6

$$\begin{array}{r} 100.2 \\ \hline 120.1 \end{array} \quad \begin{array}{r} 19.9 \\ \hline 41.5 \end{array} \checkmark$$

08.2

29.6 21.4

$$\begin{array}{r} 189.0 \\ \hline 208.1 \end{array} \quad \begin{array}{r} 19.1 \\ \hline 40.5 \end{array} \checkmark$$

74

3.69

3.74<sup>✓</sup>1.95<sup>✓</sup>2.14<sup>✓</sup>

$$\begin{array}{r} 4 \overline{) 11.52} \\ \hline 2.88 \end{array} \checkmark$$

25 R.

178.0

222.8 44.8

$$\begin{array}{r} 358.9 \\ 40 \\ \hline 42.7 \end{array} \quad \begin{array}{r} 43.8 \\ \hline 88.6 \end{array} \checkmark$$

269.7

309.1 39.4

$$\begin{array}{r} 88.3 \\ \hline 130.7 \end{array} \quad \begin{array}{r} 42.4 \\ \hline 81.8 \end{array} \checkmark$$

9 59



30 Right

05.0		94.0		
38.0	23.0	127.6	33.6	
182.5	<u>33.4</u>	273.9	<u>37.2</u>	2.63 ✓
215.9	66.4 ✓	305.1	64.8 ✓	2.68 ✓

30 Left

282.1		11.9		
298.9	16.8	30.5	18.6	
101.7	<u>17.5</u>	189.3	<u>20.3</u>	
119.2	34.3 ✓	209.6	38.9 ✓	

4.11 ✓  
 3.83 ✓  
4 | 13.25  
 3.31 ✓

10 07

35 Left

103.5		193.0		
116.5	12.7	206.6	13.6	
284.0	14.0	13.2	<u>13.9</u>	
298.0	26.7 ✓	27.1	27.5 ✓	

4.66 ✓  
 4.59 ✓  
 3.07 ✓  
 3.35 ✓

35 Right

06.2		98.6		
34.4	27.2	121.3	22.7	
186.2	<u>27.5</u>	277.0	<u>25.5</u>	
213.7	54.7 ✓	302.1	48.2 ✓	

4 | 15.67  
 3.92 ✓

10 15



40 Rt.

189.6

209.8

20.2

10.1

19.6

29.7

29.8 ✓

Ruffed 1/10 div.

281.0

295.8

17.8

101.1

17.9

119.0

35.7 ✓

40 Left

104.7

115.3

10.6

284.5

11.5

296.0

23.1 ✓

193.6

204.6

11.0

14.5

11.1

25.6

22.1 ✓

3.78 ✓

4.02 ✓

5.07 ✓

5.07 ✓

4 | 17.84

4.46

8 ✓

10 24

45 Left

286.2

295.0

8.8

106.0

8.1

114.1

16.7 ✓

9

15.0

25.0

10.0

194.3

9.8

204.1

19.8 ✓

5.68 ✓

5.31 ✓

45 Right

192. ✓

207.5

14.7

12.4

15.9

28.2

30.6 ✓

281.6

297.1

15.5

103.9

13.0

116.9

28.5 ✓

4.36 ✓

4.52 ✓

4 | 19.87

4.97 ✓

16 ✓

10 32

Adjustment made before layer.

45 Left.

285.1		13.9	
296.6	11.5	26.0	12.1
104.1	<u>12.0</u>	192.9	<u>11.2</u>
116.1	23.5 ✓	204.1	23.2 ✓

45 Right

194.0		285.0	
205.0	<sup>11</sup> 9.0	294.8	9.8
15.4	<u>10.4</u>	105.1	<u>9.9</u>
251.8	19.4	115.0	19.7 ✓
	21.4 ✓		

4.94 ✓
4.96 ✓
<del>4.94</del>
5.26 ✓
5.32 ✓
<u>4 20.58</u>
5.15
<u>97</u>
18
5.09 ✓

10 52

40 Right

14.1		104.2	
27.5	13.4	115.9	11.7
193.6	<u>13.3</u>	283.5	<u>12.0</u>
206.9	26.7 ✓	295.3	23.7 ✓

4.66 ✓
4.92 ✓
4.51 ✓
4.45 ✓

40 Left

282.9		13.2	
297.9	15.0	29.1	13.9
103.1	<u>13.6</u>	196.9	<u>15.1</u>
116.7	25.6 ✓	209.0	29.0 ✓

<u>4 18.57</u>
4.64 ✓
<u>18</u>
18

11 52



35 Left

100.4		188.7	
118.9	18.5	209.4	20.7
281.6	<u>18.4</u>	9.2	<u>19.3</u>
300.0	36.9 ✓	28.5	<u>40.0</u> ✓

31- Right

11.0		103.0	
30.3	19.3	117.0	14.0
190.7	<u>17.8</u>	281.4	<u>15.6</u>
208.1	37.1 ✓	297.0	<u>29.6</u> ✓

3.95 ✓
3.77 ✓
3.93 ✓
<u>4.43</u> ✓
4) 16.07
<u>4.02</u> ✓
3.92
<u>10</u>

11 12 50 Right

195.2		285.5	
204.1	8.9	293.9	8.4
15.9	<u>9.1</u>	105.0	<u>9.3</u>
25.0	18.0 ✓	114.3	<u>17.2</u> ✓

6.52 ✓
5.56 ✓
5.90 ✓
<u>5.32</u>

50 Left

106.1		173.7	
113.6	7.5	203.9	10.2
289.1	<u>7.6</u>	14.6	<u>9.5</u>
294.7	15.1 ✓	24.1	<u>19.7</u> ✓

4) 22.30
<u>5.58</u> ✓

11 27





Monday Jan 20 1902

Reduction of mean H 200-207

	5	.50	
-20	10	.64	
-15	15	1.32	
-10	20	2.09	
-5	25	2.88	
0	30	3.31	
+5	35	3.92	4.02
+10	40	4.46	4.64
+15	45	4.97	5.15
+20	50	5.47	5.58
+25	55	5.90	6.05
	60	6.26	6.41

11  
16  
13  
340  
13  
310  
18  
18  
346  
18

$$y + xm = n$$

$$y + \quad y - 4x = .64$$

$$-3 \quad y - 3x = 1.32$$

79.18  
22.60  
56.58  
65.56  
29.60  
35.96  
119.9

34.92  
24.97

$$10y + 5x = 34.92$$

$$10y + 170x = 120.78$$

$$165x = 95.86$$

$$x = .583$$

$$D = 0.116$$

-44	+16
-3	9
	4
	1
	0
	1
	4
	9
	16
	25

540  
64  
45  
326  
41  
76  
45  
310

13.58  
3.52  
8.92  
14.8  
21.72  
29.50  
78.97  
13.58  
65.39  
79.15  
13.54  
65.56

65.89  
29.50  
35.89  
11.9

$$10 - 55 = 0.116$$

$$10 - 50 = 0.119$$

$$10 - 45 = 0.124$$



Monday Jan 20 1902

-5  
-4  
-2-3  
-1-2  
0-1  
+1 0  
+2+1  
+3+2  
+4+3  
+5+4

$$y - 5x = .64$$

$$y - 4x = 1.32$$

$$-5y + 25x = -3.20$$

$$-4y + 16x = 5.28$$

$$+ 9 \quad 6.27$$

$$+ 4 \quad 5.76$$

$$+ 1 \quad 3.31$$

$$0 \quad 23.82$$

$$+ 1 \quad 4.46$$

$$+ 4 \quad 9.94$$

$$+ 9 \quad 16.29$$

$$+ 16 \quad 23.60$$

$$+ 25 \quad 34.92$$

$$+ 34.92 \quad 54.09$$

$$+ 54.09 \quad 23.82$$

$$+ 23.82 \quad 30.27$$

$$+ 30.27 \quad 30.47$$

$$+ 30.47 \quad 54.43$$

$$+ 54.43 \quad 23.84$$

$$+ 23.84 \quad 30.59$$

$$+ 30.59 \quad 34.92$$

$$+ 34.92 \quad 24.44$$

$$+ 24.44 \quad 34.92$$

$$+ 34.92 \quad 59.36$$

$$+ 59.36 \quad 34.92$$

$$+ 34.92 \quad 24.44$$

$$+ 24.44 \quad 34.92$$

$$+ 34.92 \quad 59.36$$

$$+ 59.36 \quad 34.92$$

$$+ 34.92 \quad 24.44$$

$$+ 24.44 \quad 34.92$$

$$10y - 5x = 34.92$$

$$-10y + 170x = 60.84$$

$$165x = 95.46$$

$$x = 0.116$$

$$D = 0.117$$

$$165y = 624.11$$

$$y = 3.78$$

$$10y - 5x = 34.92$$

$$-10y + 170x = 60.84$$

$$165x = 95.46$$

$$x = 0.116$$

$$D = 0.117$$

$$165y = 624.11$$

$$y = 3.78$$

$$10y - 5x = 34.92$$

$$-10y + 170x = 60.84$$

$$165x = 95.46$$

$$x = 0.116$$

$$D = 0.117$$

$$165y = 624.11$$



0.55 <sup>6</sup>	-4	-	2.20 <sup>4</sup>	-5	2.75
1.15 <sup>5</sup>	-3		3.45	-4	4.60
1.84 <sup>5</sup>	-2		3.68 <sup>20</sup>	-3	5.52
2.61	-1		2.61	-2	5.22
3.26	0		<u>11.94</u>	-1	<u>3.26</u>
			<u>12.00</u>		<u>21.35</u>
3.83	+1		3.83	0	
4.38	+2		8.76	+1	4.38
4.92	+3		14.76	+2	9.84
5.42	+4		21.68	+3	16.26
5.80	+5		29.00	+4	23.20
<u>33.76</u>			<u>78.03</u>		<u>53.68</u>
			<u>12.00</u>		<u>21.35</u>
			<u>11.94</u>		<u>32.33</u>
			<u>66.09</u>		
			<u>66.03</u>		

$$\begin{array}{r} 66.03 \\ 29.00 \\ \hline 37.03 \\ 123 \end{array}$$

$$\begin{array}{r} 66.09 \\ 29.00 \\ \hline 7.09 \\ 109 \\ \hline 37.09 \\ 1236 \end{array}$$

$$\begin{array}{r} 53.68 \\ 32.33 \\ \hline 2.75 \\ 36.08 \\ \hline 37.09 \\ 1236 \end{array}$$

$$\begin{array}{r} 10y + 5x = 33.76 \\ 10y + 170x = 64.66 \\ \hline 165x = 30.90 \\ 17 \quad 825 \quad \left. \begin{array}{r} 98.42 \\ 825 \\ \hline 1592 \\ 825 \\ \hline 7670 \end{array} \right\} 119 \\ \hline D = 0.119 \end{array}$$

$$\begin{array}{r} 10y - 5x = 33.76 \\ -10y + 170x = 64.66 \\ \hline 165x = 98.42 \\ 825 \quad \left. \begin{array}{r} 98.42 \\ 825 \\ \hline 1592 \\ 825 \\ \hline 7670 \end{array} \right\} 119 \end{array}$$

$$\begin{array}{r} 5y + 85x = 66.09 \\ 170y + 85x = 573.92 \\ \hline 165y = 507.83 \\ 495x \\ \hline 1283 \\ 1320 \end{array}$$

$$\begin{array}{r} 33.76 \\ 17 \\ \hline 23632 \\ 3376 \\ \hline 10-55 \quad .119 \checkmark \\ 10-50 \quad .124 \checkmark \\ 10-45 \quad .132 \end{array}$$

<sup>6</sup> 0.5 <del>8</del> - 4	-	<sup>4</sup> 2.2 <del>6</del>	16
1.15 <sup>5</sup> - 3		3.45 <sup>20</sup>	9
1.84 <sup>5</sup> - 2		3.68	4
2.61 - 1		2.61	1
3.26 0		<del>11.94</del>	0
		- 12.00	1
3.83 + 1		3.83	4
4.08 + 2		8.76	9
4.92 + 3		14.76	44
<u>22.53<sup>4</sup></u>		<u>28.35</u>	
		1194	
		16.41	

$$\begin{array}{r}
 16.41 \\
 220 \\
 14 \overline{) 18.60} \quad (133 \\
 \underline{14} \\
 46 \\
 \underline{42} \\
 40
 \end{array}$$

$$\begin{aligned}
 84 - 4x &= 22.54 \\
 -44 + 44x &= 16.41 \\
 \hline
 -84 + 88x &= 32.82 \\
 \hline
 84x &= 53.36 \quad (132 \\
 \underline{42} & \\
 133 & \\
 \underline{126} & \\
 70 &
 \end{aligned}$$



Monday Jan 20 1902

64	-4	-	2.56		
132	-3		3.96	9	
209	-2		4.18	4	
288	-1		<u>2.88</u>	<u>1</u>	
331	0		13.58	14	
392	+1		3.92	2	
446	+2		8.92	<u>28</u>	
499	+3		14.91	140	
<u>2359</u>			<u>27.75</u>		
			13.58		
			<u>14.17</u>		

					14.17
					2.56
					<u>14</u>
					14
					27
					<u>14</u>
					137

$$\begin{aligned}
 8y - 4x &= 23.59 \\
 -4y + 44x &= 14.17 \\
 -8y + 88x &= 28.34 \\
 \hline
 84x &= 51.93 \quad \left( \begin{array}{l} 123 \\ 124 \end{array} \right) \\
 42 & \quad \left. \begin{array}{r} 51.93 \\ 42 \\ \hline 99 \\ 84 \\ \hline 153 \\ 126 \\ \hline 270 \end{array} \right\}
 \end{aligned}$$



Monday Jan 20 1902

15	1.32	-3	49	-3.96
20	2.09	-2	4	4.18
25	2.89	-1	1	2.89
30	3.31	0	0	11.03
35	3.91	+1	1	
40	4.48	+2	4	
45	4.96	+3	9	

$$\begin{array}{r} 28 \\ 5 \\ \hline 140 \end{array}$$

$$\begin{array}{r} 3.91 \\ 8.96 \\ \hline 14.88 \\ 27.75 \\ \hline 11.03 \\ 14 \overline{) 146.72} \quad 119 \\ \underline{14} \phantom{00} \\ 27 \\ \underline{14} \\ 132 \\ \underline{122} \\ 10 \end{array}$$

$$\begin{array}{r} 4.96 \\ 1.32 \\ \hline 20 \overline{) 20.64} \\ 1.21 \end{array}$$

Saturday June 21 1902

Set <sup>various</sup> of Pritchard wedges at top of tracks  
for given comparison of scales

Wedges	Scales
0.0	11.60
2.0	14.77
1.0	13.20
- 3.0	6.82
- 0.2.0	8.43

- 0.2	8.43
0.0	11.60 3.17
+ 2.0	14.77 3.17

$$4 \overline{) 6.34} \\ 1.$$

$$\begin{array}{r} 1.39 \\ 4 \\ 6.34 \overline{) 5.560} \\ \underline{5072} \\ 4880 \\ \underline{4438} \\ 4420 \end{array}$$

$$\begin{array}{r} 1.877 \\ 109 \\ \hline 0.986 \end{array}$$

$$\begin{array}{r} 1.34 \\ 6.34 \overline{) 5.2} \\ \underline{5072} \\ 1280 \end{array}$$

$$\begin{array}{r} 1.37 \\ 4 \\ 6.34 \overline{) 5.480} \\ \underline{5072} \\ 4080 \\ \underline{3804} \\ 2760 \end{array}$$

Red

—  
—

—  
—

$$\begin{array}{r} 86 \\ 14 \\ \hline 86 \\ \hline 540 \end{array}$$

$$\begin{array}{r} 100 \\ 82 \\ \hline 2818 \end{array}$$

$$\begin{array}{r} 82 \\ 18 \\ \hline 164 \\ \hline 160 \end{array}$$



Thursday July 24 1902

Set up solarium apparatus for  
measuring wedge 24306.

Welsbach shines through 3 pieces of ground glass  
in contact with one another, the through space  
of about  $\frac{1}{2}$  inch; another piece of ground glass  
in which is black paper bearing two small  
pinholes about 7 mm apart. Wedge is set at  
10 cm from pinholes. Lens is Old Cooke  $f=11$   
set at 20 that first surface is about  
16.5 cm from pinholes. The images are visible  
without an eyepiece through a Nicol and  
a quartz double wedge prism.

The wedge is used in its regular frame.  
Care has been taken to have the first  
measured ~~to~~ correspond to the graduation  
of the scale ~~of~~ that used in measuring  
plates. It is also arranged in the  
frame symmetrically so that the dark first  
image be brought over either pinhole at  
pleasure by turning the frame upside down.  
The graduated side of first wedge is  
toward pinholes. The comparison is  
between the wedge & the adjacent Chen  
glass.

The position of the wedge was carefully  
det. by looking through Cooke lens with aid of plane  
mirror so as to ensure that each aperture was  
properly covered. Approximate obs were forwarded



Thursday July 24 1902

Σ 4306

0.5 Dark just over left aperture.

Edge down.

~~305.9~~

113.5

Rot dis

125.4 11.9

293.9 12.1

306.0 24.0

Same but ~~rotated~~ rotated tube containing double-magn  
furn slightly in positive direction

113.0

125.0 12.0

294.7 11.0

305.7 23.0

Same but tube rotated more in same direction

113.3

125.4 12.1

294.5 11.6

306.1 23.7

The conclusion is that no definite stop is  
required in reversing the furnace.

Thursday July 24 1902

wedge 24306

~~date~~

9 04 4.2 Left aperture 3 shades  
 Indis down Indis up.  
 79.8 352.4  
 Rt dis 160.8 81.0 70.7 78.3  
 260.8 77.5 170.4 81.3  
 338.2 158.5 251.7 159.6

Pulled off bit of paper to find a finding wedge  
 I do not think that it interferes

4.2 Right aperture. 0.41  
 164.5 256.2 0.39  
 Left dis 230.5 86.0 343.8 87.6 0.06  
 342.8 96.8 74.6 92.4 0.00  
 73.6 176.8 167.0 180.0 41.86  
 9 18 .22



Friday July 25 1902

Measures of E 4206

Adjustments tested before start.

2 30

4.2 Left aperture 3 shades

Index up. Index down.

RT dis.

349.1		257.8	
71.2	82.1	337.2	79.4
168.9	82.5	79.4	78.6
251.4	164.6	158.0	158.0

0.29

0.42

0.06

0.17

4 | 0.94

0.24

4.2 Right aperture 3 shades

Left dis.

74.5		166.9	
164.3	89.8	253.2	86.3
254.7	86.9	247.3	84.7
341.6	176.7	72.0	171.0

2 48

4.0 Right Left 3 shades

346.3		256.5	
67.5	81.2	338.9	82.4
170.4	80.2	78.4	82.5
250.6	161.4	160.9	164.9

4.0 Right 3 shades

77.0		165.4	
165.3	88.3	252.8	87.4
251.5	94.9	345.4	85.5
345.4	89.9	70.9	172.9
	178.2		

3 09

0.35

0.29

0.03

0.13

4 | 0.80

0.20



3.5 Right 2 Shades

260.7		168.7	
338.8	78.1	247.7	79.0
79.7	78.6	349.4	79.4
158.3	156.7	68.8	158.4

0.44

0.41

0.73

0.61

4/2.19

0.55

3.5 Left

63.3	72.5	80.0	
173.7	160.4	156.3	76.3
246.2	107.3	260.0	72.0
353.5	142.3	332.0	148.3

332

3.0 Left 2 Shades

180.2		89.3	
238.5	58.3	146.4	57.1
357.1	58.4	269.8	57.9
55.5	116.7	327.7	115.0

1.27

1.30

0.90

1.07

4/4.54

1.14

3.8 Right 2 Shades

262.0	67	357.1	
334.4	72.4	59.2	61.7
86.5	66.5	173.3	64.1
153.0	133.9	237.4	125.8

353

2.5 Right 1 Shade

276.7		180.7	183.3
322.3	45.6	235.0	54.3
93.2	47.3	5.0	46.3
140.5	92.9	57.3	100.6
			52.1
			98.8
			50.5
			3.8
			45.3

2.5 Left 1 Shade  
 2nd up 7.6 2nd down 97.2  
 47.2 39.6 138.9 41.7  
 188.4 40.3 277.0 42.4  
 421 225.7 79.7 319.4 84.1  
 1.84  
 1.69  
 2.20  
 2.08  
797.81  
 1.95

2.0 Left 1 Shade  
 193.0 101.3  
 223.2 30.2 133.1 31.8  
 11.3 21.9 282.0 23.0  
 43.2 62.1 315.0 64.8  
 2.78  
 2.68

2.0 Right 1 Shade  
 279.3 10.4  
 314.0 34.7 45.7 35.3  
 101.3 23.0 188.7 34.5  
 439 134.2 67.7 223.2 69.8  
 2.59  
 2.51  
410.56  
 2.64

1.5 Right No Shade  
~~105.6~~  
~~129.6~~ 17.5  
 130.2 24.6 41.2 23.7  
 285.6 24.4 194.0 27.6  
 310.0 49.0 221.6 51.3  
 3.32  
 3.22  
 3.79

1.5 Left No Shade  
 197.7 288.0  
 217.3 19.6 305.6 20.6  
 17.4 20.0 106.4 21.3  
 453 37.4 39.6 127.7 41.9  
 3.67  
412.00  
 3.50

1.0 Left

No Shade.















1901phae.proj..927K