1881phae.proj.15238

KG
11366
v.524

Collimation — Ag Level.
Flexure — Runs — etc.
#6
From Sept. 21, 1881 to Jan 8, 1883

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1001phae.proj.15288

Jan. 2, 1853

for $\delta = 43° 0'$ the arc under
micro. 7 is $224° 15'$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1801phae.proj.1528B

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept 21, 1881

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.15288

Trans Venus Obs by SCC
Dec 14 1882

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 21, 1881

h m	No. 2 N	No. 2 S	No. 3 N	No. 3 S	Level E	Level W
12 16						
50 4 26.0	12.2	5.3	36.9	12.0		
40.3	14.0	3.7				
38.9	13.10	4.50				
35.9	4.50					
211	8.60					
35.28	+4.30					
−12.04						
23.24						

~~50~~

h m	N	S	N	S	Level E	Level W
12 20						
50 4 2.8	6.1	11.4	31.0	6.2	8.0	9.8
16.5	5.2	12.3			6.3	11.1
15.1	5.65	11.85			8.2	9.2
12.2		~~50~~ 6.20			6.2	11.2
66		−~~2.50~~ 3.10			28	41 2
11.65					7.18	10.30
+8.68						3 12
20.33						+1.56

357

21,78

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

2

Sept. 21 1881

2 25-

11	(2)		(3)		Level	
11.8	9.4	8.1	30.9	6.1	6.2	11.1
2.71	7.9	9.6			8.2	9.2
2.45-	9.0	8.4			6.3	11.8
2.26	8.3	9.1			7.8	9.4
8.60	34.6-	35.2			28.5-	41.2
21.50	8.65	8.80			7.12	10.30
.42		-.15				3.18
21.92						+1.59

23.24
20.33
21.92
5.49
21.83

At 10h or 11h (M.S.T.) this A.M., Mr. Rogers put stops on Level No. 2 so that it should always come to the same position.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 21, 1881

$16^h 45^m$	Long	Coll.	
	43.8	46.6	48.0
	45.0	16.6	16.3
	45.9	14.2	15.1
	44.0	57.2	58.0
	45.1	146	174
	38	3.65	4.85
	44.76	4.00	

$16^h 50^m$	N.C.	S.C
17	71.8	61.2
	72.1	61.8
	72.8	62.8
	71.8	62.0
	72.2	61.8
	7	46
	72.14	61.92
	61.92	
	13406	
17	67.03	

Set at 17 65.6

$16^h 55^m$		No. 2 N	No. 2 S	No. 3 N	No. 3 S	Level E	Level W
50	4 11.9	18.1	17.0	29.8 4.9		16.9	18.1
	26.4	15.9	19.2			14.0	21.1
	24.8	18.1	17.0			17.1	17.7
	21.9	15.9	19.1			14.0	21.0
	4.0	280	323			220	279
	21.00	17.00	18.08			1550	1948
	15		17.00				398
	+1.51		−1.08				+1.99
	22.51		−0.54				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 21. 1881.

~~6~~ 17h 15m Level repeated

E.	W.
7.9	14.1
10.8	11.2
8.2	13.8
10.7	13.3
376	124
9.40	13.10
	9.40
	3.70
	+ 1.85
	+ 1.99
	+ 1.92

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 22, 1881

12h 10m Long Coll.			12h 15m N C	S. C.
38.2	49.0	49.6	68.9	63.2
40.6	18.5	18.7	68.9	64.4
39.8	14.3	14.3	68.9	63.0
39.0	58.7	59.6	68.7	64.0
40.0	205	222	68.9	63.2
476	5.12	5.55	3	1.78
39.52	5.33		68.86	63.56
			63.56	
			13242	
			17 66.21	

Let at 17 65.6

12h 15m	(2) N	S	(3)		Level E	W
50 4 94	163	161	30.2	5.2	15.3	17.0
24.2	140	183			13.6	18.8
21.4	15.9	16.7			15.3	17.0
19.8	14.1	18.1			13.8	18.6
748	203	292			180	314
1870	15.08	17.30			14.50	17.85
3.11		222				3.35
21.81		- 1.11				+1.68

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 22, 1881

9h 30m	Long	Cl.	"	9h 35m	N. C.	S. C.
39.8	10 ~~40.3~~	47.8	48.7		71.8	63.2
41.6	~~47.8~~	17.0	17.2		71.8	62.8
39.8		13.6	14.2		71.8	61.8
39.7		58.8	58.9		73.0	61.2
36.5		172	190		72.6	62.0
4.74		4.30	4.75		110	110
39.48		4.52			72.20	62.20
					62.20	
					134.40	
				17	67.20	
					Set at 17	67.2

9h 50m	No. 2 N	No. 2 S	No. 3 N	No. 3 S	Level E	Level W
50 4 6.8	5.6	10.8	28.2	4.6	5.1	11.0
21.3	6.7	9.8			7.0	9.0
19.9	6.3	10.0			5.2	10.8
18.1	6.6	9.7			6.9	9.1
26.1	6.3	9.8			2	39
16.52	7.1	9.1			6.05	9.98
+4.82	26	52				-6.05
21.34	6.43	9.87				3.93
		6.43				+1.96
		3.44				
		-~~1.72~~ 34				
		72				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 22, 1881

		No. 2		No. 3	
$9^h 55^m$		N.	S.	N.	S.
50 4	22.0	14.1	4.0	35.0	11.2
	37.0	11.5	4.6		
	35.2	11.8	4.2		
	32.5	11.5	4.6		
	67	19	14		
	31.68	11.48	4.35		
	− 9.97	4.35			
	21.71	+7.13			
		+3.56			

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 23, 1881

	No. 2		No. 3		Level	
12^h W	N.	S.	N.	S.		
50 4 15.4	4.8	3.8	30.1	7.8	1,3	7,0
28.9	6.1	1.3			3,0	5-2
28.4	5.3	2.9			43	12 2
26.5	6.80	1.4			2,15	6,10
192	22	114				395
24.80	550	94				+1.97
496		236				
223		+127				
19.84		3,14				
		1,77				

12^h 35 W

15,9		67 1,3	12	7,0
29,8	6,8 2,2	53, 28	30	62
284	5,6 27	68 1,3	42	22
260	56 1,3	56, 22	210	610
1001	252	244 76		4,00
25.02	630 1,85	610 1,90		+2,00
2502	446	420		
−518	+223	2,10		
−588	620	2405		
19.84		3775		
19.14		1,85		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept 23

$12^h 50^-$

V	(2) S	(3)
5.6	2.2	30.2 8.2
6.4	1.5	
12.0	37	
6.02	1.85	
	4.15	
	2.07	

1
2502
5.82
1922

19.84
19.84
1914
19.22
204
19.51

Long Call

10 3 488
16.8
177
18
2651
6628
4 6.28

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 25, 1881

4h 25m. Flexure

	E	F	G	H	E	F	G	H
5h 4	14.4	42.3	41.4	23.7	19.7	33.0	33.8	30.2
	14.7	42.0	41.5	23.9	19.8	33.3	34.0	29.7
	14.8	42.1	41.8	23.7	19.9	33.3	33.9	30.2
	15.0	42.1	41.7	24.3	19.9	33.2	34.0	30.1
	15.0	42.1	41.9	23.7	20.2	33.0	34.0	30.2
	39	6	33	43	45	8	47	4
	14.78	42.12	41.66	23.86	19.90	33.16	33.94	30.08

42.12
41.66
23.86
242
30.60
29.27
1.33
+0.66

33.16
33.94
30.08
3708
29.27

6h 30m

N.C	S.C
81.8	55.8
81.3	55.9
82.3	56.2
82.3	56.1
81.6	56.1
43	1
81.86	56.02

56.02
137.88
68.94

Set at 17 67.1

9h 40m Long Col.

55.2	48.8	49.0
54.6	15.1	15.8
55.0	17.7	17.2
55.8	59.1	59.1
52.3	207	211
229	5.18	5.28
54.58	5.23	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 25, 1881

$9^h 45^m$	No. 2 N	No. 2 S	No. 3 N	No. 3 S	Level E	Level W
50 4 7.7	2.4	3.1	26.8	~~26.8~~ 6.2	1.2	4.0
20.2	1.0	4.6		+20.6	−0.2	5.6
22.2	1.70	3.85			1.3	4.0
18.0		1.70			−0.4	5.4
28 1		2.15			1.9	3 0
17.02		− 1.07			+0.48	4.75
~~29.9~~						0.48
+ 3.00						4.27
20.02						+ 2.14

$9^h 55^m$	No. 2 N	No. 2 S	No. 3 N	No. 3 S	Level E	Level W
50 4 15.4	5.2	0.3	30.9	10.4	1.0	4.3
28.0	~~28.0~~	~~?~~		+20.5	−1.0	6.0
30.5	3.9	1.6			0.00	5.65
25.4	4.55	0.95				+ 2.57
203	0.95					
25.08	#3.60					
− 5.04	+1.80					
20.04						

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 26, 1881

17h 20m Long Coll

66.8	49.7	48.7
63.5	18.9	18.8
63.4	23.0	22.8
65.0	2.6	2.4
66.6	342	327
25 3	~~3.55~~	
65.06	8.53	8.18
	8.36	

17h 25m N.C S.C

89.2	58.2
88.6	56.8
88.7	57.9
88.6	57.2
88.9	58.8
40	39
88.80	57.78
57.78	
146 58	
17 73.29	

Seeing very bad
Set at 17 67.1

Collimation repeated

17h 35m Long Coll.

	48.2	48.3
Declination	17.7	17.7
repeated	22.8	23.4
	1.7	1.76
	304	310
	7.60	7.75
	7.67	

17h 40m N.C. S.C

87.6	59.3
89.1	60.7
87.8	59.0
87.9	59.0
89.0	58.9
14	19
88.28	59.38
59.38	
147 66	
17 73.83	

Set at 17 67.1

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 26, 1881

		No. 2		No. 3		Level	
$17^h\ 45^m$		N.	S.	N.	S.	E	W
50	4	15.3	14.3	14.1	31.0	13.8	10.1	18.2
		29.0	16.8	11.6			13.1	15.2
		34.4	14.9	13.7			13.1	15.2
		29.7	16.8	11.6			10.1	18.1
		28 4	28	30			64	2867
		27.10	15.70	12.75			11.60	16.68
		+4.14	12.75					11.60
		22.96	2.95					5.08
			+1.48					+2.54

$17^h\ 50^m$		16.0	14.3	13.9
		29.5	16.8	11.5
		34.2	15.5	12.70
		28.1	12.70	
		27 8	2.85	
		26.95	+1.42	
		-3.98		
		22.97		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 26, 1881

9h 30m Long Coll. 9h 40m N.C S.C.

58.3	90	3 46.1	46.0	88.0	54.8
58.2		13.8	14.0	87.3	53.2
59.7		14.8	14.3	88.0	54.1
58.7		56.3	56.9	87.8	54.0
59.0		110	112	87.3	53.1
39		2.75	2.80	34	42
58.78		2.78		17 87.68	53.84
				53.84	
				1·41 52	
				17 70.76	

Seeing good

Set at 17 70.8

9h 35m

E	F	G	H	Flexure	E	F	G	H
50 4	13.1	41.8	41.4	24.5	23.7	17.8	33.7	34.1	35.0
	12.9	42.1	41.8	24.8	23.8	18.1	33.0	34.7	35.1
	12.8	41.7	41.8	24.3	23.3	17.8	33.0	34.8	35.8
	13.0	41.7	41.8	24	23.7	18.2	33.2	34.3	35.3
	12.6	41.3	41.8		23.5	18.5	33.3	34.6	35.9
	12.88	41.72	41.72		23.60	1808	3324	3450	35.42
	41.72					33.24			
	41.72					34.50			
	23.60					35.42			
	11992					12124			
	2998					3031			
	1499					1516			
						17			
						.08			

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 26, 1881

		No. 2		No. 3		Level	
9h 50m		N	S	N	S	E	W
50 4	4.0	2.1	4.4	~~26.3~~	~~5.5~~	-0.2	6.8
	17.8	0.2	6.4	25.9	5.0	2.2	4.2
	19.4	0.2	6.3			~~1.00~~	
	14.7	1.9	4.9			2.2	4.3
	15.9	4.4	2.0			-0.2	6.8
	13.98	1.10	5.50			4.0	21
	+ 6.16		1.10			1.00	5.52
	20.14		4.40				1.00
			- 2.20				4.52
							+ 2.26

		No. 2		No. 3		Level	
9h 55m		N	S	N	S	E	W
50 4	15.8	3.9	2.8	32.3	11.7		
	30.4	6.2	0.3		20.6		
	31.9	10.1	3.1				
	26.3	5.05	1.55				
	24.4	1.55					
	26.10	3.50					
	4.90	+ 1.75					
	21.20						

1358
2610
1212 (2.0)
1.90
1.22
11 85
270

385

20

134
2067

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 29. 1881

Flexure

$12^h 15^m$	E	F	G	H	E	F	G	H
60 4	13.2	44.0	42.5	25.0	17.1	33.8	34.7	30.2
	13.5	44.0	42.8	24.7	17.5	33.4	35.0	30.4
	13.3	44.0	42.8	25.1	17.4	33.5	34.9	30.5
	13.7	44.0	42.1	25.1	17.4	33.2	34.9	30.7
	14.0	44.0	42.1	24.9	16.9	33.8	34.6	30.4
	27	1	23	48	13	27	41	2
	13.54	44.00	42.46	24.96	17.26	33.54	34.82	30.44

44.00
42.46
24.96
12496
3124
2802
222
+1.11

33.54
34.82
30.44
11606
+2
29.02

$12^h 20^m$ V.C. S.C.

V.C.	S.C.
85.8	55.0
85.9	55.0
86.4	55.2
84.8	55.0
85.8	54.7
37	249
85.74	54.98

54.98
14042
70.8

$12^h 35^m$ Long Coll.

55.2	10 3	44.9
57.2		13.6
57.0		13.4
56.9		55.8
55.9		77
22		1.92
56.44		

Del-01-17 703

Seeing very bad

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 29, 1881

		to 2		to 3		Level	
$12^h 40^m$		N	S	N	S	E	W
50 4	0.0	2.0	7.2	26.6	4.7	0.2	9.1
	15.3	0.1	9.2			3.6	6.0
	16.5	0.2	9.2			3.7	5.8
	12.0	1.6	7.9			0.2	9.2
	38	39	15			7.7	30.1
	10.95	0.98	8.38			1.92	7.52
	+ 10.36		0.98				1.92
	21.31		7.40				5.60
			− 3.70				+ 2.80

		N	S	N	S
$12^h 45^m$					
50 4	14.7	5.3	4.1		
	30.0	8.0	1.6		
	31.5	13 3	57		
	26.5	6.65	2.85		
	227	2.85			
	25.68	3.80			
	− 5.37	+ 1.90			
	20.31				

−3.70
+1.90
5.60) 10.95 / 25.68 / 14.73 / 11.12 / 3.53 / 3.36 / 170 (2.63

21.31
W 31
70.81

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 3, 1881

Long Coll.

				N.C	S.C
$16^h 25^m$				$16^h 30^m$ 76.6	64.7
51.9	10	3	46.9 46.4	76.6	64.3
56.1			16.8 15.8	76.2	63.2
51.2			15.3 14.1	77.0	63.0
51.0			58.2 57.9	78.6	63.1
50.7			172 142	0	33
109			4.30 3.55	77.00	63.64
52.18			3.92	63.64	
				140 64	
				17 70.33	

Flexure. Set at 17 70.3

$16^h 35^m$

E	F	G	H	E	F	G	H
13.8	43.1	40.8	25.2	16.8	32.0	32.7	30.2
13.7	43.5	40.8	24.8	16.3	32.1	32.7	29.7
13.2	43.3	41.5	25.3	16.7	32.1	32.6	29.8
13.2	42.8	41.0	25.0	18	2	2	27
12.7	42.7	41.3	24.4	16.60	32.07	32.67	29.90
16	4	4	47	32.07			
13.32	43.08	41.08	24.94	32.67			
43.08				29.90			
41.08				3124			
24.94				27.81			
242							
30.60							
27.81							
2.79							
+ 1.40							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 3 1881

$16^h\ 45^m$		No. 2 N	No. 2 S	No. 3 N	No. 3 S	Level E	Level W
50	4 5.0	3.1	5.1	27.9	5.9	-0.8	8.7
	18.9	0.7	7.4			2.9	5.1
	19.0	0.8	7.3			3.1	4.8
	16.9	2.9	5.2			0.1	7.8
	19.8	7.5	1.0			5.3	26.4
	14.95	1.88	6.25			1.32	6.60
	+ 6.13		1.88				1.32
	21.08		4.37				5.28
			-2.19				+ 2.64

		No. 2 N	No. 2 S	No. 3 N	No. 3 S	Level E	Level W
50	4 18.3	~~6.7~~ ~~2.7~~ ~~4.5~~	~~1.3~~ ~~2.4~~ ~~2.4~~	32.4	10.6	2.2	5.2
	33.1	8.0	0.1			0.2	7.6
	32.7	8.1	-0.1			1.20	6.40
	29.9	6.9	1.1				~~1.20~~ 5.20
	340	17	24				+ 5.20 2.60
	28.50	~~7.42~~ 18	~~0.60~~				2
	- ~~8.40~~	~~0.60~~	1.17				
	~~18.95~~	~~6.82~~	6.01				
	~~2010~~	+3.41	3.00				

-219 +300 519 | 1485 2850 1365 1038 | 2.61

3170 3114 3160

2108 2010 118 2059

1881phae.proj.1528B

Oct. 3, 1881

$7^h 45^m$ Flexure

E	F	G	H
14.8	43.4	39.9	23.3
14.7	43.4	39.7	23.2
15.0	42.7	39.7	23.1
14.9	43.2	39.8	23.5
14.9	43.1	39.6	23.6
43	8	37	17
14.86	43.16	39.74	23.34

E	F	G	H
19.4	34.1	33.1	29.9
19.3	34.5	33.2	30.1
19.2	34.0	32.7	29.8
19.3	34.0	32.8	30.0
19.4	34.5	32.7	29.9
16	11	45	47
19.32	34.22	32.90	29.94

43.16
39.74
23.34
1 10
30.28
29.09
1.19
+ 0.60

34.22
32.90
29.94
3638
29.09

$7^h 50^m$

	N.C	S.C
17	77.8	64.0
	77.0	64.9
	77.8	64.6
	77.0	64.3
	77.1	64.9
	17	27
	77.34	64.54

64.54
1 41 88
17 70.94
Set at 17 70.3

$9^h 45^m$ Long Coll

1,3	"	"	"
5 ~~4.4~~	45.3	45.6	45.4
53.0	12.7	12.7	13.0
51.4	11.3	10.8	11.1
51.0	54.2	54.3	54.7
50.8	35	2434	42
25	0.88	0.85	1.05
51.50		0.93	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 3, 1881

$9^h.50^m$		No. 2		No. 3		Level	
		N	S	N	S	E	W
50 4	9.2	16.9	16.7	28.7	10.3	13.0	20.2
	23.6	15.8	17.7			16.0	17.2
	22.0	15.6	17.8			16.8	17.3
	19.2	16.7	16.7			13.2	19.8
	340	10	9			190	34 J-
	18.50	16.25	17.22			14.75	186 2
	+ 1.37		0.97				387
	19.87		-0.49				+1.93

, dio - 28.8
= 19
= .19

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 4. 1881

9^h30^m	N.C.	S.C	9^h35^m	N.C.	S.C
	50.8	62.6		52.8	63.7
	52.3	64.2		53.8	63.8
	55.7	65.3		53.8	62.6
	54.7	64.7		54.5	62.0
	54.0	64.2		54.0	61.5
	175	10		39	36
	53.50	64.20		53.78	62.72
	64.20			62.72	
	117.70			116.50	
17	58.85		17	58.25	

Repeated

Set 17 58.5

9^h40^m Long Coll.

seeing too bad for R.A.

δ	δ
"	"
50.7	50.3
14.3	13.9
3.7	3.7
50.9	51.2
396	391
59.90	59.78
59.84	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 4, 1881

$9^h 45^m$		No. 2		No. 3		Level	
		N	S	N	S	E	W
50	4 27.0	16.8	9.7	32.9 —		13.0	13.3
	38.5	15.8	10.8			11.8	14.3
	31.0	16.30	10.25			11.7	14.7
	28.8	6.05				13.4	12.8
	53	+ 3.02				99	31
	31.32					12.48	13.78
	− 8.46						1.30
	22.86						+ 0.65

$9^h 50^m$		N	S	N	S	E	W
50	3 59.4	8.0	18.2	26.8 —		13.1	13.2
	12.4	5.9	20.3			11.2	14.8
	3.2	13 9	38 5			11.0	15.0
	0.3	6.95	19.25			13.3	12.4
	153		12.30			86	154
	3.82		− 6.15			12.15	13.85
	+ 17.22						1.70
	21.04						+ 0.85
							.05

+302 3132
−6.15 13.22
9.17 19.10
2750 2.99
1830
9160

2286
21.04
390
21.95

1881phae.proj.1528B

Oct. 4, 1881

9h 55m

		N	S
50 4	6.9	10.4	15.7
	18.0	8.9	17.2
	10.5	15 3	12 9
	8.0	9.65	16.45
	43 4		6.80
	10.85		−3.45
	9.66		
	205		

20.57
21.04
21.82
4 41
21.4

10h 15m

Long Level

E	W
~~68.7~~	~~58.2~~
~~58.2~~	
52.2	72.1
55.8	88.3
56.0	87.8
54.1	69.8
181	380
54.52	79.50
	24.98
	12.49
	.05
	74.94
	62.45
	.69

b = +7.0

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 4, 1881

Runs

10h 20m	E		F		G		H	
5 0	19.2	17.8	44.8	43.4	33.2	30.6	19.2	17.5
	19.3	18.2	44.8	42.9	33.2	30.2	19.2	17.3
	19.9	18.2	44.2	42.0	32.9	31.4	19.8	17.6
	14	2	18	13	3	22	12	14
	19.47	18.07	44.60	42.77	33.10	30.73	19.40	17.49

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 6, 1881

	Long	Coll.		$17^h 25^m$ N.C.	S.C.
$17^h 15^m$	23.7	10 3	52.0	55.9	67.4
	23.2		18.2	55.0	68.8
	23.1		11.0	55.8	67.3
	22.5		57.4	55.9	68.6
	23.9		186	55.9	68.6
	14		4.65	35	7
	23.28		4.57	55.70	68.14
				68.14	
				12384	
				17 61.92	

$17^h 20^m$ Fleure Set at 17 59.8

	E	F	G	H	E	F	G	H
50	19.7	47.2	87.8	35.0	24.2	35.4	30.0	31.1
	19.8	47.8	38.1	25.1	24.0	35.3	30.2	31.3
	20.0	47.4	38.2	25.3	24.3	35.4	30.2	31.4
	25	14	1	4	5	11	4	8
	19.83	47.47	38.03	25.13	24.17	35.37	30.13	31.27
	47.47				35.37			
	38.03				30.13			
	25.13				31.27			
	~~270~~				R094			
	~~1.45~~							
	3023							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 6, 1881

$17^h\ 35^m$		No. 2 N	No. 2 S	No. 3 N	No. 3 S	Level. E	Level. W
50 4	26.3	13.8	5.0	37.2	8.9	9.1	9.6
	37.5	12.1	6.7			7.3	11.2
	32.5	12.95	5.85			16.4	20.8
	32.2	7.10				8.20	1040
	85	+ 3.55					220
	32.12						+ 1.10
	− 9.94						
	22.18						

$17^h\ 40^m$		N	S	N	S	E	W
50 4	4.1	3.1	15.5	26.2	—	6.3	12.2
	14.8	6.2	12.4			9.6	9.0
	9.0	93	79			15.9	21.2
	9.0	4.65	13.95			795	1060
	369		9.30				265
	9.22		− 4.65				+ 132
	+13.02						
	22.24						

+355 32.12
−4.65 8.22
8.20 2290 (279
164
650
574
76

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 6, 1881

		No. 2		No. 3		Level	
		N	S	N	S	E	W
50	4 13.1	9.0	9.7	30.0	—	9.0	9.6
	24.9	7.5	11.1			7.2	11.2
	18.7	16.5	20.8			16.2	20.8
	18.2	8.25	10.40			8.10	10.40
	34.9		2.15				2.30
	18.72		-1.07				1.15
	+3.00						
	21.72						

2218
2224
402
614
2205

9h30m Long Coll.

17	23.3	5°2.8	5°1.9	5°2.3
	21.7	17.0	16.4	16.7
	21.0	12.9	13.2	8.2
	22.8	55.9	55.3	55.3
	23.0	2586	2568	2525
		6465	6420	6312
			57	
			64.32	

	N.C.	S.C.
9h40m	52.3	52.4 68.3
	16.7	53.9 68.7
	8.2	52.8 68.8
	55.3	52.9 67.9
	53.6	69.9
	6	36
	53.12	68.72
	68.72	
	121.84	60.92

Set at 17 59.8

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 6, 1881

$9^h 35^m$

Flexure

	E	F	G	H	E	F	G	H
50 4	20.8	46.2	36.1	24.0	24.3	36.3	29.2	28.6
	20.7	46.0	36.3	24.7	24.7	36.9	29.4	29.1
	20.6	45.9	36.3	24.0	24.3	36.7	29.2	28.9
	21	1	7	7	13	19	10	26
	20.70	46.03	36.23	24.23	24.43	36.63	29.33	28.87

46.03
36.23
24.23
719
31.80
29.81
1.99
+ ✱1.00

36.63
29.33
28.87
3926
29.81

~~#~~ $9^h 5^m$

		No. 2 N	No. 2 S	No. 3 N	No. 3 S	Level E	Level W
50 4	2.8	4.3	11.1			7.7	2.8
	13.8	2.4	13.1			6.0	9.3
	6.5	6.7	42			137	171
	6.1	✱3.35	1210			6.85	855
	392		+~~1.25~~ 8.05				1.70
	9.80		+.62 4.38				+.85
	12.21						
	2201						

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 6. 1881

$10^h 0^m$		No. 2		Level	
		N	S	N	S
50 4	39.0	14.0	1.4	5.2	10.1
	50.3	16.2	-1.2	7.4	7.6
	43.7	15.10	+0.10	126	177
	42.7		1500	6.30	885
	43.98		7.50		255
	21.00				+1.27
	22.98				85
	22.01				212
					+1.06
	22.49				

004-7

~~To~~ The observations so far made on level No 3 show that it is not to be relied upon with its present form of mounting.

Remove the brass socket and mount the level like by fastening it directly to the tube of the telescope by means of a solid cement placed at the nearest point of the tube.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 7. 1881

$16^h 45^m$ No. 2

			N	S	#
50	4	24.9	7.0	4.6	45
		35.5	1.7	9.1	
		31.4	8.7	13.1	
		31.1	4.85	6.95	
		16.2		7.2	
		30.2		1.10	
		30.12			

No. 3

		N	S	Level E	Level W
0	15.1	56.0	80.1	2.0	8.7
	26.0	16.0	40.1	4.4	6.1
	22.3			6.4	14.8
	22.0		68.05 − 28.05	3.20	7.40
0	21.35				4.20
	+6.10				+2.10
	+8.25				
1	24.45				

$16^h 50^m$ No. 2

			N	S
50	4	25.1	14.7	6.0
		37.2	12.8	7.8
		33.1	7.5	13.8
		33.0	13.75	6.90
		28.4		6.85
		32.0		+3.42
		−9.58		
		22.52		

No. 3

		N	S	Level E	Level W
45	2 12.7	3.8	28.0	9.3	11.1
	23.8	5.22	5.21	7.3	12.9
	19.8	15.90		8.2	12.0
	19.2	+24.10		10.8	9.8
2	18.8			9.1	11.1
	39.5			7.6	12.6
	54.22			3.3	▽▽
	11.53			8.30	11.92
	10.43.0				3.5▽
	13.23				+1.78
	10.43.0				
	25.00				
	11				

(R 2.5

5-2.5

1 div = 2.25

1	39.83		
1	24.66		
1	24.45		
1	24.56		
45	22.52		
50	4	57.97	
	7		

Reading counted from the north towards the South.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 7. 1881

$6^h 55^m$ Zn. 2

			N	S
50	4	28.2	13.7	6.7
		42.4	16.1	3.1
		38.4	98	98
		36.5	1480	490
		145		10.0
		36.38		500
		14.00		
		22.38		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct 8 1881

Coll.

9 h 50 m

17 638 474
648 473
652 469
662 474
660 469
359
260 471.5
520

6580
4718
11298
5649

Sept 17 56.2

Long Coll.

17 406 478 476 476
411 153 148 147
420 113 103 96
413 56.2 56.0 55.3
413 106 85 2472
265 218 180
218
180
663
221

10 h 0 m

m2

m3 y s
58.9 83.7

451 116 2 142
249 271
236
209 207 453

120.25 38.2 38.4

2 142
27.8
25.8
23.7

2 23.85

Level

1.64

626.4 383 383
2434.8
2296.0
138.0

11

1dm = 1.64

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

~~Aug~~ Oct 8 1881

No. 8

	N	S.		
	41.2	40.6	64.7	5265
	55.7	58.9	83.7	1265
	53.6			
	57.5			

1	50.35	40.6	64.7
2	22.89	20.7	45.3
	32.54	19.9	19.4
			19.65

1 div = 1.65

	1 50.35		
	m 49		
1	50.35	1 29.86	
1	m 25	18.3	19.0
	30.1	18.65	

1 div = 1.62

Oct 1-9

13h 30m

	N	S	
50 4 11.9	4.8	5.0	
25.7	4.7	4.3	
23.5	4.9	4.2	
21.8	4.0	5.0	
82.9		18.5	
	17		
20.72	4.42	4.62	
+.56		-0.20	
21.28			

	E	W
	3.6	5.3
	3.6	5.4
	1.0	8.0
	0.9	8.0
	3.6	5.3
	9.0	7.5
	+.0	.78
	1.37	3.98
	2.29	6.63
		4.34
		+2.17

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct 9

No. 3

	N	S
45-2 30.7	1.2	25.0
44.7		
42.3		
39.9		
157.6		
45 2 39.40		

	N	S	
45 / 41	~~35.6~~	~~39.0~~	67.30
18.2	1.2	25.0	-27.30
16.0	54.4	54.0	
12.6			
57.9		54.20	
1 1298	1 1298		
2 39.40	-44.24		1 dw = 1.59
1 26420	28.74		

9h 5-5m

Flexure

	E	F	G	H	E	F	G	H
50 4	16.7	44.5	37.5	23.8	20.8	35.3	31.0	29.3
	16.9	44.1	37.4	23.8	20.7	35.0	30.9	29.4
	17.1	44.3	37.7	23.9	21.3	35.5	31.2	29.3
	27	9	16	26	28	8	1	10
	16.90	44.30	37.53	23.83	20.93	35.27	31.03	29.33
	44.30				35.27			
	37.53				31.03			
	23.83				29.33			
	256				36.56			
	30.64				29.14			
	29.14							
	1.50							
	+0.75							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 9, 1881

$10^h 0^m$	N.C.	S.C.
	64.6	69.3
	65.5	68.1
	64.8	69.2
	63.6	68.0
	64.8	68.2
	233	428
	64.66	68.56
	68.56	
	13322	
17	66.61	

Set at 17 66.6

$10^h 20^m$	Long		Coll.	
17	41.8	10 3	48.9	48.1
	43.1		15.8	15.3
	41.7		10.1	9.7
	42.2		55.1	56.1
	43.8		99	92
	126		2.48	2.30
	42.52		2.39	

$10^h 25^m$

	No. 2			No. 3			Level	
	circle	N	S	circle	N	S	E	W
50	4 16.3	8.8	7.7	45 2 28.9	0.0	27.1	7.2	9.1
	30.0	9.3	7.1	42.0		13.55	5.9	10.3
	26.2	9.8	6.7	38.9		+26.45	7.7	8.6
	24.2	8.9	7.7	37.7			5.8	10.6
	167	8	12	275			266	356
	24.18	9.20	7.30	2 36.88			6.65	9.65
	− 2.66		1.90	4285				300
	21.52		+0.95	1 54.03				+150

1 54.03
50.71
51.98
52.24

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 9. 1881

$10^h\ 35^m$ No. 3

	circle	N	S
45- 1	38.9	31.0	58.2
	52.0	0.0	27.1
	48.0	31.0	31.1
	47.3		31.05
	186 2		
1	46.55 - 46.55		
2	36.88 4.16		
	50.33 50.71		

1 div = 1.62

No. 3

	circle	N	S
45- 1	5.1	52.8	79.7
	19.0	0.0	27.1
	15.2	5.28	5.26
	13.9		5.27
	5.32		1.27
1	13.30	13.30	
2	36.88	20.32	
1	23.58	5.15.6	

1 div = 1.59

1.59
1.62
1.59
1.65
1.62
1.64
57
1.62

(I adopt for the present 1 div = 1.62)

$10^h 40^m$ No. 2

	N	S
3-0 4	11.0	6.8 10.0
	24.1	7.2 9.0
	20.9	13.4 19.0
	19.0	6.70 9.50
	7.5.0	2.00
	18.70	-1.40
	3.52	
	22.67	
	21.52	
	22.09	

Level

E	W
5.0	11.2
7.8	8.3
12.8	19.5
6.40	9.75
	3.30
	+1.65
	1.50
	+1.57

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 10, 1881

No. 2	N	S		No. 3	N	S	
5° 0 4	19.5	15.2	11.7	45 1	43.0	30.8	56.2
	32.8	16.0	10.8		55.9		43.50
	31.3	112 / 1560	25 / 11.25		53.5		−8.50
	29.4		+4.35		52.6		
	28.50		+2.17				
	6.5				57.25		
					+5.60		
					1 56.85		

No. 2	N	S		No. 3	N	S	
5° 0 4	16.1	14.7	12.1	45 1	49.1	26.8	52.1
	29.8		+2.6		2.2		39.40
	26.8		+1.30		59.4		+0.58
	24.5				58.4		
	24.30						
	−3.9			1	57.28		1 56.85
					0.89		1 56.39
					1 56.39		124
							1 56.62

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 10, 1881

10^h 20^m Seeing too bad for Long Coll.

10^h 25^m 57.8

	N.C.	S.C.
17	57.8	71.6
	52.7	72.4
	51.5	71.7
	52.3	73.2
	52.6	71.0
	9	99
	52.18	71.98
	71.98	
	124 16	
17	62.08	

10^h 20^m Flexure Set at 17 62.1

	E	F	G	H
40 4	21.6	46.6	35.3	22.8
	22.1	47.4	35.2	22.8
	21.8	47.5	35.6	22.8
	25	5	11	
	21.83	47.17	35.37	22.80

21.83
47.17
35.37
22.80
2717
31.79
29.12
2.67
+ 1.33

	E	F	G	H
	24.6	37.2	27.1	26.8
	24.5	37.3	28.3	26.8
	24.7	37.2	28.2	26.8
	18	7	26	
	24.60	37.23	27.87	26.80

24.60
37.23
27.87
26.80
3650
29.12

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 10. 1881

10h 30m

Runs

E		F *		G		H	
24.8	23.7	48.3	49.8	38.2	37.1	25.1	22.7
24.9	23.6	49.2	49.4	37.7	37.1	26.1	22.3
25.3	23.6	48.4	49.0	37.8	37.0	26.1	22.7
25.2	24.0	49.0	49.2	37.8	37.3	26.1	22.8
25.2	23.3	48.5	49.2	37.7	37.2	25.7	23.1
4	32	34	16	42	7	41	36
25.08	23.64	48.68	49.32	37.84	37.14	25.82	22.72

* transpose these readings.

10h 35m Four positions of the telescope

Z = 270°

	E	F	G	H
0	15.3	40.8	28.8	18.1
0	15.8	40.7	29.6	17.8
	16.3	41.3	29.7	18.0
	16.2	41.0	29.2	18.2
	16.7	40.5	29.7	17.8

Z = 0°

E	F	G	H
16.7	32.5	19.0	11.8
16.4	32.8	18.9	11.2
16.2	32.3	19.0	11.6
16.3	32.5	19.2	11.3
16.6	33.0	18.8	11.2

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 10, 1881

Z = 90°				Z = 180°			
E	F	S	H	E	F	S	H
18.9	30.1	21.2	20.9	26.8	53.1	52.8	43.4
18.8	30.0	21.2	21.3	26.2	53.6	52.8	43.6
18.8	29.8	20.9	20.7	26.3	53.6	52.8	43.3
18.0	29.7	20.9	20.8	26.2	54.3	52.7	43.2
18.0	29.6	20.9	20.7	26.3	54.1	52.7	42.8

10h 45m

No. 2			No. 3			Level	
Circle	N	S	circle	N	S	E	W
50 4 14.2	11.0	11.7	45 1 47.2	31.0	63.0	9.1	13.4
25.5	11.0	11.8	0.0	47.00		9.0	13.5
19.0	10.8	11.9	51.2	−7.00		11.0	11.3
17.0	11.0	11.7	49.8			10.4	12.1
75.7	10.95	11.78	1 52.05			10.3	12.0
18.92		−0.83	11.2			9.2	13.2
2.32			2 3.07			590	155
21.24						9.83	12.58
							2.75
							+1.38

~~45~~ ~~16.8 49.0~~

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 10, 1881

No. 2

circle	N	S
50 4 28.0	14.3	8.1
40.8	15.9	6.6
33.0	10.2	14.9
30.3	15.10	4.35
1821		9.95
33.02		3.87
−10.84		
22.18		
21.24		
54 2		
21.71		

No. 3

circle	N	S
45 1 58.0	16.8	59.0
10.4		57.90
2.5		+2.10
1.0		
2 2.98		
−3.36		
59.62		

1	5-9.6
2	3.7
2	1.65

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 11, 1881

$18^h 20^m$

Long Coll.

Seeing too bad for observation

$18^h 25^m$	N.e	S.e
	54.9	69.5
	53.8	69.0
	57.6	69.1
	54.7	70.1
	53.0	69.2
	260	369
17	55.20	67.38
	67.38	
	122.58	
	61.29	
Set at 17	62.1	

$18^h 30^m$ No. 2

	circle	N	S
50	4 17.8	9.6	9.7
	30.3	10.4	8.7
	24.5		
	24.1		

No. 3

	circle	N	S
45°	1 43.0	32.8	61.3
	55.2	47.05	
	49.2	−7.05	
	49.5		
	1969		
1	4922		
	11.28		
2	0.50		
		±	

No. 3

	circle	N	S
45°	2 1.2	19.1	47.8
	13.0		33.45
	7.8		+6.55
	9.3		
	29 0		
2	9.77		
	10.48		
1	59.29		
2	0.52		
	11979		
	15989		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 12, 1881

9^h30^m Long Coll.				9^h35^m	N.C	S.C.
17	32.2	16 3 52.1	50.8	51.7	53.4	73.1
	29.2	18.0	17.4	18.1	55.3	73.8
	28.3	10.1	8.8	9.9	53.8	74.2
	30.1	57.3	56.8	57.5	54.9	72.8
	31.2	175	138	172	53.4	73.6
	10	4.38	3.45	4.30	28	25
	30.20		4.04		54.56	73.50
					73.50	
					12806	
					64.03	

Set at 17 64.0

9^h45^m	E	F	G	H	Flexure	E	F	G	H
~~55~~ 50 4	19.7	46.1	37.2	24.6		23.3	36.1	30.4	30.4
	19.6	45.8	37.3	24.7		23.7	36.6	30.3	30.2
	19.4	46.0	37.1	24.1		23.0	36.1	30.5	30.3
	17	29	4	14		×10	8	12	9
	19.57	45.97	37.20	24.47		23.33	36.27	30.40	30.30
	45.97					36.27			
	37.20					30.40			
	24.47					30.30			
	721					030			
	31.80					30.08			
	30.08								
	1.72								
	+ 0.86								

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 12, 1881

$9^h 50^m$ No. 2

	N	S			N	S		Level E	Level W
5 0 4	30.1	14.5	3.7	5 0 4	13.1	7.0	10.1	6.3	11.3
	41.5	14.1	4.1		24.2	7.0	10.1	9.0	9.1
	36.2	14.30	390		19.2	7.00	10.10	8.7	9.2
	35.9		1040		18.9		310	7.0	11.0
	237		+5.20	35.92	18.85		−1.55	7.0	11.0
	35.92		−1.55	18.85	4.34			8.7	9.2
	14.56		6.75	1707 / 1350 (2.53				7.78	10,13
	2136			357	2319				235
				3385	2227				1,18
				1850					

$10^h 0^m$ No. 3

	N	S			N	S		
45 1	36.6	30.8	58.1	45 1	42.9	27.1	54.8	
	48.2	44.5	7.3		54.3	40.9	27.7	
	42.3	−44.5	3.6		47.9	−0.95	13.85	
	43.1	−.95			49.0			
		3.50						
	42.55	42.55			48.52			
	7.12	3.50) 597 (1.71			+1.52			
1	49.67	35		1	50.04			
		247						
		245						

1 4967
1 50.04
1 49.85

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 13, 1881
Long coll.

$18^h 20^m$ Seeing too bad for observation.

$18^h 25^m$

	No. 2 circle	N	S		No. 2 circle	N	S	Level E	Level W
50	4 10.3	15.7	17.0	50	4 7.2	13.8	18.8	13.3	18.9
	21.1	15.9	17.1		18.3	13.9	18.7	14.8	17.3
	22.1	15.90	17.05		18.2	13.85	18.75	14.3	17.6
	21.3		~~2.00~~		18.1		490	13.2	18.8
	348		−0.65		218		4.95	13.1	18.8
	18.70				15.45			14.6	17.5
	1.82				6.86			833	10 8.9
	~~490~~				2231			13.88	18.15
	20.52								18.88
									4.27
									+ 2.13
					21.83				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 13. 1881

$18^h\ 30^m$ No. 3

circle	N	S
45° 1	59.2	23.9	46.7
	10.4		35.3
	10.5		4.7
	10.9		
	10		
	~~10.25~~		
	~~7.82~~		
	~~52.73~~		
B	0.23		

No. 3

circle	N	S	
45° 1	46.0	~~55~~ 30.2	53.2	23.2
	56.4	41.70		− 11.6
	56.3	−1.70		
	56.8			
	55			
1	53.88			
	+ 2.72			
1	56.60			

No. 3

$18^h\ 50^m$

circle	N	S
45° 1	53.9	28.1	50.7
	3.9	39.40	
	4.4	+60	
	4.5		
	1,68		
	−.96		
B	0.72		

No. 3

circle	N	S	
45 1	53.0	28.0	50.3	~~45 1 39.5~~ 22.3
	3.7	39.1	
	2.3	0.8	
	3.0		
	0.52		
	1,36		
	59.14		

with 1 div = 1.6

~~A~~	~~1~~	~~2~~	~~0.23~~
2	2	1	56,60
	3	2	0,72
	4	1	59.14
	5	1	56.75
	6	1.	57.91
		1	~~59.72~~ 58.20

with 1 div = 1.2

1	55.92
	60.96
	59.48
	54.35
	18.27
	57,20

see Oct-13 Morning page 52

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

No. 3

circle		N	S
45	1 39.5	35.3	56.7
	50.3	46	
	48.7	−6	
	50.0		
	47.15		
	9.60		
	+59.60		
	1 56.75		

No. 3

circle		N	S
45	1 51.5	28.0	52.2
	2.5	3910	
	1.4	+090	
	2.0		
	59.35		
	−1,44		
	1 57.91		

47.15
59.35
6.9 1220 (197
65
530
483
470

10h20m Long Coll.

Seeing too bad for observation

10h20m	N.C	S.C
	60.2	69.0
	59.6	68.0
	60.6	69.1
	61.8	69.0
	60.0	68.2
	22	33
	60.44	68.64
	68.66	
	1 2910	
	64.55	
Set at	17	64.0

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 13, 1881

$10^h 25^m$ No. 2 Level

circle	N	S		N	S	E	W
50 4	14.4	9.4	10.3	~~50 4 11.7~~	~~8.8 11.0~~	8.8	11.0
	26.5	9.1	10.7			7.9	11.8
	22.5	9.25	10.50			7.8	11.9
	20.0		1.25			9.3	10.2
	34		-0.62			33.8	49
	20.85					84.8	112.2
	+1.74						2.34
	22.59						+1.17

No. 2				No. 3				No. 3			
circle	N	S		circle	N	S			N	S	
50 4	11.7	8.8	11.0	45 1	45.0	30.2	59.7	45 1	53.1	~~22.1~~	~~51.6~~
	23.8	8.3	11.2		57.3	~~29.5~~			5.0	~~21.8~~	~~51.2~~
	18.4	8.55	11.10		51.9	~~+10.5~~			59.4	~~21.0~~	~~50.6~~
	17.0		2.55		51.4	44.95			59.2	20.9	50.3
	30.9		1.27		56	-4.95			36.7	35.60	
	17.72				51.40				59.18	+4.40	
	3.56				+~~7.93~~ 16.80				-7.04	4.95	
	21.28			1	59.32			1	52.14	-9.35	
	22.59										
	21.93										

51.40
59.18
~~22~~ 78
95) 7480 . 83
300

1881phae.proj.1528B

Oct. 13, 1881

$10^h 45^m$ No. 3

		N	S	
45	1	26.1	45.2	~~74.8~~
		38.0		60.00
		32.9		−20.00
		32.8		
	1	82.45		
		32.00		
	2	4.45		

No. 3

		N	S	
45	2	19.4	1.7	31.21
		30.9		16.40
		25.9		23.60
		25.5		
	2	25.42		
		37.76		
	1	47.66		

No. 3

		N	S	
45	1	48.1	~~26.2~~	56.0
		59.3	26.7	56.2
		53.8		41.45
		54.0		−1.45
		54.05		
		+2.32		
	1	56.37		

3245 / 1405 / 1840 / 2160 / 1855 / 305 / 1855 / 1150 / 1.17

		N	S	
45	1	58.3	18.8	48.2
		8.2		33.50
		3.2		+6.50
		3.8		
		3.38		
		−10.40		
	1	52.98		

2542 / 8.38 / 2204 / 171 / 11.28 / 171 / 494 / 342 / 1520

The above were reduced with the value 1.6 = 1 div
These observations give 1.2 = 1 div.

Red. with the value 1 div = 1.2

1 = 1′ 57.34″
53.90
56.45
57.10
55.79
55.54
1 56.03

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 15, 1881

$20^h 45^m$

	N.C.	S.C.
17	72.8	93.7
	~~74.8~~ 72.8	95.1
	71.4	95.8
	71.8	94.2
	72.3	94.3
	1 1 1	2 3 1
	72.22	94.62
	94.62	
	166 84	
	83.42	

Set at 17 83.4

Oct 15 Evening

Cleaned the circle with charcoal, Ingenstrip Micrometer and lines are very much better.

Began to clean the telescope mounting & the nadir after observations in order to see whether this will affect the circle readings

1881phae.proj.1528B

~~Oct~~ 16 1881
13h 40m

Orb.

17.	812	928
	826	950
	798	947
	~~812~~	941
	819	948
		224
	4067	9448
	8134	
	9448	
	17582	
	8791	

bad
Sing

Sol-al 83.8

No. 2

	N	S	E	W
13 58				
50 o	102	15.5	141	19.6
	226	15.9	168	16.8
	215	15.70	109	164
	218	17.95	1545	18.20
	763	2.20		275
	19.08	- 1.10		+ 1.35
	+3.08			
	22.16			

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct 16

W.O.

Or S

320 56.9

383 899

49.2 44.95

47.4 4.95

46.7

1816

4540

5.94

51.34

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct 18 81

10h 30m Call.

17 6.50 17 96.8
66.8 96.8
67.5 96.4
67.3 96.3
67.4 96.6
313 29
17 67.46 96.524

17 67.46
96.524
16400
17 83.0

Sel-01-17 83.0

Long Call

17 50.1 10 40.8 59.4 59.8
49.2 25.6 25.3 26.7
48.7 16.6 15.7 15.7
47.6 3.6 2.8 8.4
49.5 466 3026 56
116.5 131.5
48.0
164.0

1h 45m N02

N S E W

50 42.6 16.3 9.0 10.2 15.0
25.8 15.2 10.2 11.8 13.1
29.6 14.8 10.3 2.0 8.1
29.3 15.4 9.7 11.0 14.05
123 215 352 3.05
1538 980 + 1.52
7.54 558
202.4 + 2.79
2274

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct-18

10h 40m

No 2

N	S	E	W
25.2	10.6	11.8	13.2
34.5	9.6	10.3	14.5
29.2	9.2	2.1	27
28.9	9.4	11.05	13.85
20.8	38		2.80
30.20	9.70		+1.40
7.87	5.62		
2233	+2.81		
	15.32		

No 3

45.1 41.8 28.2 59.0

53.9 57.2

45.2 43.60

43.5 -3.6

1844 1.2

4610 43.2

+ 4.32

46.042

2279

22.33

107

22.53

1881phae.proj.1528B

Oct 20 1881

Long Cove.

Seeing too bad for Obs.

$22^h\ 40^m$

17 69.6	17 96.2
69.1	95.6
65.2	96.8
71.1	96.2
70.6	97.4
3496	482
17 69.92	96.44
	65.52
	16636
	83.2

Del-A- 17 83.0

	N02 N	S	E	W
2.5	14.2	13.8		
33.1	14.6	13.3		
22.7	14.7	13.3		
25.0	15.0	13.2		
1023	185	16		
2558	14.62	13.40		
3.42		1.22		
2216				
23.86				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

OC-21

N S

45-1 48.9
5-58
501
513
2101
52.52
+1,14
53.66

25-3 56.6
F19
- 40.95
- 313
- 1565

45-1 32.8
44.2
33.7
35-6
26.3
3658
13.44
+066
30.02

N S

382 642
1028
5720
+0.9
11.2
-2.60
-1300
1565
2.65

129
124

2101
36.58
1265) 1557 1.23
1265
292
2530
3500

1881phae.proj.1528B

Oct 22 1881

12h 30m

Long Coll R R

17 598 10 4 18 08
606 27.4 26.7
613 18.6 17.4
627 6.6 6.0
628
3072 544 509
61.44 13.60 12.75
635
13.17

Coll

17 734 17964
751 95.7
748 96.4
757 96.2
750 95.8
234 29.6
7468 9592
7468
17060
85.3 Oct 01 = 17 85.3

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

OC1-22

13 h 30m

No. 2

N 8 E H

50 4 157 148 106 ++ 106
288 106 112 93 12.2
224 10.6 11.2 87 13.1
238 11.1 10.6 80 13.7
907 34 36 106 11.7
2268 1085 1090 360 107
+ .09 -.05 900 1268
2277 -03 368
+1.84

4 157 110 116 10.0 11.7
288 10.7 10.8 83 13.2
224 24 183 45
238 1120 9.15 1245
2268 -.85 330
0.47 .47 +1.65
+2.86
23.15

110 103
10.2 11.0
13
22.75 10.60 10.68
23.15 .05
22.75 -.02
865
2288

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 25 1881

Long Coll

19h 0m

No.	R	R
4 Zones	10 4 28	26
Obs.	288	28.2
	20.4	19.5
	9.0	9.0
	61.0	59.2
	15.25	14.80
		15.05

Oblique

No.	N.C.	S.C.
17	753	17 99.0
	72.7	1.0
	72.9	99.2
	74.3	99.0
	73.1	0.8
	16 3	499.0
	7386	179 9.80
		73.86
		173.16
		86.58

Sel. of 17 866

Mon

No.	N	S	N	S	Σ	M
5	4	16.3	15.7	10.9	12.4	
		28.3	28.8	12.3	13.0	
		20.7	21.2	12.5	12.8	
		22.4	22.5	12.3	13.0	
		86.7	88.2	90	11.2	
		21.68	22.05	12.25	12.80	
		22.05			−0.55	
		373			28	
		21.86			44.0	
		+0.597	22.63		11.0	
		22.457			15.4	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

001·25

No 2

N	S
121	13,1
12·5	12,7
6	
12,30	12,90
	0,40
	+,20

E	W
9,7	15
11,8	13,2
11,8	13,2
9,8	15,4
43 1	17 3
10.28	14,3.8
	3 5 0
	+1.75

21,86
— 56
21,30
22,63
3 5 3
21,86

No, 3

N	S
~~23,0~~	~~52,8~~

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 25 1881

11h 30m Long. Coll.

17 54.7 10 4 37 32
53.8 29.7 29.2
52.3 17.2 16.6
52.7 6.7 5.8
53.0 57.3 54.8
16 14.32 13.70
54.12 80.2
14.01

N.C. S.C.

17 [illegible] 18.6
69.8 1.1
[illegible] 1.5
68.8 1.8
[illegible] 0.1
[illegible] 5.1
[illegible] 1.28
65.54
[illegible]
[illegible] 17122
82.3 85.6

~~Aquatint Collp. Trace~~ Sel 21
17.866

No 2

12h 0m A W S E N

50 4 24.6 25.2 14.8 12.8 11.1 16.3
37.8 35.2 15.7 11.8 13.0 14.5
26.6 26.4 16.0 11.7 41 10.5
28.2 28.3 15.7 11.9 12.05 15.40
11.72 11.81 22.2 8.2 3.35
29.20 29.52 15.55 12.05 1.68
29.41 3.50
29.41 1.75
-4.50
24.51
15.6 11.9
16.0 11.6
15.80 11.75 2.01
8.5 4.05

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct 25 1881 No. 3

12h 20m

N	S		
30,6	628	45,1	45,7
	93,4		57,2
	46,70		47,8
	−6,7		48,8
			99,2
		1	49,80
			+ 8,04
		1	57,84

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct 26 1881

18h 30m

Mon

		N	S	E	W
50 4	28.2	9.0	6.4	4.9	10.4
36.2	36.1	7.7	7.7	7.6	7.8
26.2	26.6	4.6	4.7	2.5	18.2
27.5	27.2	6.4	6.0	6.25	9.10
331	333	33.7	27.8		28.5
28.28	28.32	8.42	6.95		+1.48
			1.47		
			.73		

28.30
2.05
26.25

6.0 & 6.5
8.0 7.2
17.0 13.7
8.50 6.85
1.65
.82

28.30
2.30
26.00

Tony Cobb

10	4	5.2	4.0
		30.0	29.1
		18.1	17.1
		7.7	6.5
		61.0	57.8
		15.25	14.45

9.70
1.485

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

OC1-26

11 30 long coll

					NC	SC
14 45.9	10 40.8	6.5	6.6		17 64.7	18.37
47.8	31.0	2.93	29.2		65.6	2.0
45.7	15.6	14.4	14.3		65.8	3.0
44.6	5.0	5.2	4.6		64.3	3.8
46.0			5.47		65.8	3.2
	5.84	5.57			4.62	1.60
	14.88	13.92	13.68		65.24	18 3.20
			12.45		3.20	
			14.15		16844	
					84.2	

Sel-21784.2

12 00 NO2

N		S		W		S	
26.1		12.3	11.1	25.8	12.9	10.2	
37.4		13.0	10.2	37.2	12.4	10.4	
23.9		5.3	21.3	23.8	1.3	6	
25.1		12.65	10.65	25.3	12.65	10.30	
112.5			2.00	32.1		2.35	
28.12			+1.00	28.02		1.17	
-2.80				3.28			
~~.092~~				24.74			
25.32							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 29 1881

18h 35m Long Col

17 551 528 528 508 522 137 5342

10 40 59 63 318 312 211 198 92 85 680 648 17.00 16.20 16.60

190 No. 2

W S W S

50 4 258 258 10,8 98 110 91 9,7 10,3
374 366 11.3 88 11,8 8.2 7.6 12.5
262 265 11.6 86 12.1 8.0 7.8 12.2
277 277 11.0 9.1 11.1 9.0 9.9 10.1
1171 368 47 358 60 343 350 51
29.28 29.20 11.48 89.5 11.50 8.56 8.75 11.28
223 2.92 2.53
29.24 1.11 1.46 +1.28
11
57
1.28

WW.3

45 2 02.0 13.3 2.0 4.0 21.3 5.32

W 17.8 S 47.8 656 328 −7.2

45 2 5.3 8.6 1 56.7

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct 27 1881

Long Coll.

17 52.2	10 40.8	63	
52.2	30.9	30.7	
51.7	16.6	16.1	
53.8	6.8	06	
51.3	1		
	599	599	
	14.98	14.98	

W.C. S.C.

69.0	08
67.1	1.1
68.7	0.2
66.6	0.2
68.0	0.2
394	3.5
67.88	.70
0.20	
1685-6	
84.3	

Sel-A-17 84.3

W.

R.O.

50 4	20.8	84	91	80	8.6
	33.2	8.2	9.3	8.1	10.3
	20.2	8.6	4	15.1	18.9
	22.8	8.30	9.20	7.55	9.45
	970		.90		1.90
	2420		.45		+0.95
	1.26				
	2651			8.5	9.1
				2.0	10.7
				15.5	19.8
				2.75	9.90
					2.15
					+1.07

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

70

Oct 27 1881

12 10

203

N	S
1.8	33.6
	34.8
	17.4
	−22.6
	15.2
	37.8

45 − 2 278
384
264
271
200

2 30.00
1 41.72
48.28

37.8) 48.28 (1.28
378
1048
756
2920

2 3000
2938
0.62

N	S
41.8	68.8
	1124 1104
	1620 5520
	+ 1629 1520
42.6	69.8
41.6	68.8
42.4	68.8
42.3	68.8
91	382
4228	6915
	11183
	5591

45 − 1393
582
393
401
1669

1 41.72

1 41.72
19.76
2 01.48

570
8.2
576.2
580
2394
5985
+ 1.04
20 0.89

N	S
247	569
	816
	40.80
	−.80

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov. 1 1881

Provisional values of Nfl. for Nov. 1880 to Nov. 1881

For Annual Report:-

1880 Nfl.		1881		1881	
Nov. 7	+1.04	Mar 23	+0.82	Sept. 6	+1.03
9	+0.43	24	+1.50 +0.85	7	+0.42
21	+1.55	27	+0.90	9	+0.32
28	+2.14	28	+0.34	12	+0.97
		31	+0.39	15	+1.23
Dec 8	+0.73			19	+0.45 +0.67
13	+1.81	Apr. 3	+1.37	20	+0.61
14	+0.99	10	+.54	25	+0.66
15	+0.59 +1.07	18	+1.55 +0.80	26	-0.08
19	+1.10	25	+0.27	29	+1.11
21	+1.45	May 2	---		
22	+0.78	3	+1.23	Oct. 3	+1.40
31	-----	22	+0.28 +0.75	3	+.60
1881		23	+1.26	6	+1.19
Jan. 3	+1.87	24	+0.24	6	+1.00 +1.02
5	+1.51	Aug 14	-0.90	9	+0.75
Feb 13	---- +1.25	19	+0.83	10	+1.33
17	+0.93	21	+1.81	12	+0.86
22	+1.57	21	+2.02 +0.60		
		22	+.51		
Mar. 14	+1.14	29	+84		
16	+0.65				
20	+0.84				
21	+0.76				
22	+0.64				

Nov. 1880	1.39 x 3 = 4.17		Mar. 1881	0.80 x 4 = 3.20	
Dec 1880	1.07 x 7 = 7.49		May 1881	0.75 x 4 = 3.00	
Jan 1881	1.25 x 4 = 5.00		Aug 1881	0.60 x 6 = 3.60	
Mar 1881	0.85 x 10 = 8.50		Sept. 1881	0.67 x 10 = 6.70	
	24 | 26.29			24 | 16.50	
	1.05			0.69	

* H. Le Sheahan: Jan

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Comparing the values for Dec 1880 and Jan 1881 with those for May and August 1881, we have

1.14" and 0.66"

with the difference 0.48"

Whole No. obs = 58

By referring to pag 115 Pl. Observ. Pulkowa 1881 to Feb 10 1881, the values of R will be found for the months of Jan. and Dec. from 1872 to 1878 by corrections for the years 1876 and 1877 which had not been computed at the time of the last report.

For convenience of reference the whole table is given below.

Parsin = 1.89

		Rg.	Mean
18			
1872	Jan	—	
1873	Dec	+1.80"	1.80"
1873	Dec.		

Parsin =

See next page

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Parallax = .050

		Ref.	Mean	July	Diff. Dec + Jan. − July. / 2
1872	Dec 31	+1.80"	+1.80"	+1.16	+0.64
1873	Jan	+1.50			
1873	Dec	+2.06	+1.78	+1.39	+0.39
1874	Jan	+2.40			
1874	Dec	+2.77	+2.58	+1.49	+1.09
1875	Jan	+2.47			
1875	Dec	+3.01	+2.73	+2.00	+0.73
1876	Jan.	+1.57			
1876	Dec	+1.65	+1.61	+1.47	+0.14
1877	Jan	+1.97			
1877	Dec	+1.67	+1.82	+1.10	+0.71
1878	Jan.	+1.45			
1878	Dec	+1.42	+1.43	+0.81	+0.62

+0.62

1872	July	+1.16
1873	July	+1.39
1874	July	+1.49
1875	July	+2.00
1876	July	+1.47
1877	July	+1.10
1878	July	+0.81

Jan

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

From proj 114

From Dec 1878 and Jan and Feb. 1879 $R_{ff} = +1.16''$
From Jan July and Aug 1879 $= +0.43$
$Diff\ +0.73$

From Dec 1879 and Mar 1880 $R_{ff} = +0.93$
June 1880 and July 1880 $= 0.37$
$Diff\ +0.56$

From Dec. 1880 and Jan 1881 $R_{ff} = +1.14''$
May 1881 and Aug 1881 $= .66$
$Diff\ +0.48$

Final Mean $= 0.59''$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept 7 1881

Began regular observations with level No. 2 (Clark) for Ab and Δ Req.

The observations made previous to this date have been tentative in their character.

In the following table are given the readings of the circle for the long coll. and for level No. 2

	No. 2	Means	Long Coll.		
Sept 7	24.05		5.19		
7	23.24	23.30	—		
7	22.60		—		
8	23.18	23.18	8.07		
9	22.16		—		
9	21.87	22.02	—		
12	20.91	20.91	5.79	6.96	
13	20.43		8.81		
13	20.82		—		
13	21.50	20.92	—		
14	20.08	20.08	5.30	5.35	
15	22.30	22.30	3.86		
15	—		5.01	4.59	
15	—		4.89		
17	21.07	20.89	7.16	7.16	
17	~~20.87~~ 20.87		—		
17	20.82		—		
19	21.34		3.50		
19	21.39		6.70	5.10	
19	21.22		4.27		
19	21.56	21.38	—		
20	22.21	22.21	5.37	4.55	
20	—		3.50		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

		"	Means		"	Means	
Sept.	21	21.88	22.17		4.08	4.00	
	21	22.51			—		
	22	21.81	21.62		5.33		
	22	21.34			4.52	4.92	
	22	21.71			—		
	23	19.51	19.51		6.28	6.28	5.69
	25	20.03	20.03		5.23	5.23	
	26	22.86		21.83	8.36		
	26	20.67	21.81		7.67	8.02	
Oct.	3	20.59			3.92	3.92	
	3	19.87	20.23		0.93		
	4	21.14	21.14		59.84	-0.16	
	5	21.45	21.45		3.31	3.31	
	6	22.05	22.27		4.57	4.44	2.46
	6	22.49		21.51	4.32		
	7	22.52	22.45		2.21	2.21	
	7	22.38			—		
	8	21.28	21.28		—		
	9	21.52	21.81		2.39	2.39	
	9	22.09			—		
	10	21.71	21.71		—	~~3.72~~	3.21
	12	22.27	22.27	21.79	4.04	4.04	
	13	21.83	21.88		—		
	13	21.93	21.93		—		
	16	22.16	22.16		12.40	12.40	
	18	22.53	22.53		—		
	20	23.86	23.86		—		
	22	22.88	22.88		13.17	13.17	
	25	21.86		22.70	15.05	14.53	13.39
	25	23.78	22.82		14.01		
	26	26.00	26.00		14.85	14.85	
	27	25.66	25.58	25.79	16.60	15.79	15.79
	27	25.51			14.98		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Comparing results are Lane.

Date	From level No. 2 seconds of Circle Reading	Greatest deviation from mean value	From Collimator	Greatest dev. from mean value
Sept 7 – Sept 13	22.06	1.24"	6.96	1.77"
Sept 13 – Sept 20	22.31	1.30	6.25	1.81
Sept 21 – Sept 26	21.03	1.52	5.69	
Oct 3 – Oct 13	21.79	1.28	13.21	
Oct 13 – Oct 25	22.70	0.51	13.??	
Oct 26 – Oct 27	25.79		15.79	

These values of course involve the actual changes in the position of the circle. Apparently

Comparing results are Lane.

Date	Circle Reading from level No. 2	Greatest deviation from mean	Seconds Circle reading from Collimator	Greatest dev. from mean
Sept 7 – Sept 13	22.06"	1.24"	6.96"	1.85"
Sept 13 – Sept 20	22.31	1.30	5.25	1.81
Sept 21 – Sept 26	21.03	1.52	5.69	2.33
Oct 3 – Oct 13	21.51	1.28	2.46	2.60
Oct 7 – Oct 13	21.79	0.51	13.21	1.06
Oct 13 – Oct 25	22.70	1.16	13.??	1.16
Oct 26 – Oct 27	25.79	0.21	15.79	0.94

These readings involve the actual changes which may have occured during this interval of Time. A definite opinion of the value of this method for the purpose of detecting changes in the eccentricity of the circle must be deferred till the value of this quantity has been derived from the Observations of Polaris but the present indications are it promises good results.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

78

Nov 5 1881

10h 30m

Tony Coll.

						NE		SE	
17	59.2	10	40	36.4	2.2	17	67.6	14	5.2
	59.5			29.3	29.7		67.2		4.3
	57.0			15.6	15.7		67.0		5.2
	58.5			5.7	6.1		67.6		5.4
	56.8			5.2	5.3		67.5		6.0
	140			130.5	134.2		19		26.1
	58.20				132.3		67.38		5.22
							5.22		
							17260		
							86.30		

Sol-alt = 17 16.3

13 30						NW							
						N		S		E		W	
50	4	14.0	14.3			9.3		12.2		7.8		13.7	
		24.2	25.3			9.1		12.3		9.8		11.7	
		16.4	17.2			9.1		12.3		9.8		11.6	
		17.5	17.8			9.2		12.2		9.3		13.0	
		72.1	74.6			37		10		35.7		100	
		18.02	18.65			9.18		12.25		8.92		12.50	
			18.83					9.18				3.58	
			3.04					3.07				+1.19	
			21.41					-1.53					

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

No. 5

14 0

4	22		No 2					
	12.1		N		S		N	S
	4.2		36		14.7	4 34.2	11.6	13
	5.1		5.6		15.7	41.2	16.9	4.3
	236		5.6		15.8	36.4	16.8	4.3
4	5.90		48		16.7	37.1	15.7	16
	+16.25		195		2129	329	250	19.5
	2215		4.88		21.9	3822	16.25	4.88
					1648	15.90		1137
					1160	2232		+1.68
					— 5.80			5.80
								11.48

2141
2215
22.32
588
2196

550
3822
11.48) 3232 (282
2296
9360
9184
1760

No 6 = 44,0

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 6 1881

19 30

Long. Coll.

2'5	1'5
2'0	2'7
2'1'5	2'0'2
8'0	5'2
6'1'0	5'6'6
15'2'5	14'1'5
	14'2'0

Seeing bad.

Nov 6
20h 0m

	N	S	E	W
50 4 ~~15.0~~ 15.1	10.1	10.8	7.8	13.2
159	9.0	11.8	9.7	11.2
2'7'0	9.0	12.0	9.8	11.2
2'5'4	9.7	11.2	7.9	13.0
21'2	37'8	58	35'2	86
7'45	9.45	11.45	88'0	12'15
18'65		2 00		33
280		-1.00		+1.68
21'45				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj:1528B

Slow HH

12h 10m

Long. Coll

567
558
543
523
530

50 4 64 71
286 293
149 149
41 50
540 563
1350 1408
13,79

N C SC

17 662 839
678 26
652 23
667 23
673 26
332 274
6664
274
16938
84.69

Set of 84

No 2

N S E W

50 4 190 50 10 66 23 53
296 32 43 13 62
166 33 42 36 115
182 12 63 180 575
824 87 214 395
2060 216 535 +1.99
462 317
2502 −1.58

1881phae.proj.1528B

Nov 84

h m

12 30

3.50	9.6	3.2
4.46	10.9	2.0
32.2	10.6	2.1
33.1	10.5	1.7
249	422	9.0
36.22	1055	2.25
11.62		8.30
24.60		4.15

9.6	7.7	10.2
20.6	2.4	10.2
8.2	2.55	10.20
9.D		D.65
12.02		-3.82
10.20		
22.22		

Nov = 749

25.02	
24.60	
22.22	
12.34	
24.11	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 19 1881 C =

O -

15 0 2

17 3

Jupiter limb in ♌

Last trace of the Cor pairs of Apparent limb and N limb of A,

and S ~~Cor pairs of A~~

~~All the~~ Last of all the pairs of Jupiter limb.

R

50.2 4.55

5.66

4.61

4.92

Seeing good

Seeing

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov. 8/9 1881

Being too bad for call.

Propose forwarding dew. on Obj'ct-glass

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Aug 29 1881

Long Coll

								N.e.		S C	
17	66.6	60	4	4.3	3.7	3.3	17	72.8	18	6.8	
	66.5			27.6	27.6	27.3		72.8		6.3	
	67.8			18.7	17.5	18.0		72.6		5.2	
	67.8			7.1	6.9	6.7		72.9		6.2	
	66.8					bad		73.0		5.2	
								14 1		29 7	
								73.5-2		5.4	
										35-2	
										18.46	
										89.73	

Set of 1789.7 Seems bad? Obs. very.

12h 31m Perseus.

	Σ	F	G	H	Σ	F	G	H
34	34.2	58.7	47.5	35.5	37.0	48.5	40.4	40.3
	34.6	58.4	47.8	35.7	36.7	48.1	40.3	40.7
	34.0	58.3	47.6	36.4	37.2	48.7	39.9	40.4

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Runs

5- 0	5-2.1	5-1.2	14.9	15.0	5.4	4.8	5-4.7	5-2.8
	5-1.8	5-1.3	15.4	14.8	5.3	4.8	5-4.6	5-3.1
	5-1.4	5-0.8	15.6	15.0	5.2	5.2	5-4.7	5-3.0
	5-2.3	5-1.3	15.4	15.3	5.2	5.2	5-4.9	5-2.7
	5-2.2	5-0.3	15.3	15.1	5.0	5.5	5-4.3	5-3.2
	48	49	16	2	11	5	32	48
	51.96	50.98	15.32	15.04	5.22	5.10	54.64	52 396

h 100.2

12 45

	N	S	E	W
50 4 11.6	7.1	11.8	9.0	9.8
23.9	7.0	11.9	7.3	11.2
14.9	7.05	11.85	7.1	11.6
16.0		4.80	9.2	9.5
16.60		-2.40	8.15-	10.5-
6.72				237
2332				+1.19

	N	S
58.9	3.0	16.0
9.7	1.4	17.3
1.4	1.7	17.1
21	3.0	17.0
3.02	2.28	16.85
20.38		14.57
23.40		-7.28

-7.28
+5.88
13.26

3 9 2
20.38
41.18
2080
3816
2652
11640
10608
1032

(2.88

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 1881

$12^h 50^m$

		N	S
4	36.7	16.2	2.7
	48.1	14.9	4.0
	39.6	15.0	3.8
	40.3	15.4	3.2
4	41.16	15,38	3.42
	16.34		11.96
	24.44		+5.98

23.32
23.40
24.44
216
23.72

Nov. 6 = 76.0

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov. 10 1881

12h 20m

Long Coll

17 51 9 50 4 21 6.4 79
55.2 26 8 27 3 29 4
52.5 15 6 14 0 15 6
52.4 4 7 3 2 4 2
52.6 5 9 2 5 0 9 5 7 1
14 8 1 4 8 0 1 2 7 2 1 4 2 8
17 52.94 13.93

W. C. S. C.

6.27 6.9 8.1
6.20 8.0 7.2
6.10 8.0 7.2
6.12 8.9 6.4
6.16 8.3 4.9
8.5 8.1 3 5 8
62.12 8.5 8.4
8.28 6.2 1 2
14.40 17 0 5
72.70 85.29

Let it 85.3

Dott reported

KW S C.

12h 30m

No 2

NE S E W

50 4 23.5 7.0 7.3 6.3 8.0
BB. 6.8 7.7 5.1 9.2
19.0 6.90 7.10 5.1 9.2
94.7 -.60 6.4 6.0
23.68 -.30 22.9 34.4
+.84 57.2 8.60
24.52 28.8
+1.41

1881phae.proj.1528B

Nov 10 1881

No 2

N S

40 0,7 13,7
130 -0,1 14,2
-0'8 +80 79
-0,7 13.95
17,0 1365
15 -6,82
15
3,88
19,10
22,98

22,58
24,52
26,55
24,82

No 2

N S

428 126 1,7
522 13,2 1,1
380 58 6
592 1290 1,40
1722 11,50
430 5 +5 75
16,10 6,02
26,95 12,57

3.88
4305
12,57) 39,17 (3,11
37 71
1460
1257
203 0

Apparent change in the velocity of No 2

Cold Clouds.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 11 1881

Long Cell-

19h 10m

17 56.5	50 40.9	63	66		17	62.6	18 10.1
56.6	30.8	29.7	29.1			61.3	9.3
58.0	17.4	16.3	15.8			61.3	9.5
54.8	6.7	5.2	5.3			60.8	9.9
55.2	1					61.2	11.1
	602.8	575	573			8.2	49.9
	1570	1436	1432			6164	9.98
		1440				9.28	
		1480				17162	
						85.8	

NC SC

Set at 55.3

NW. 2

	N	S	E	W
22.2	10.8	11.0	10.0	11.6
32.0	10.3	11.3	9.0	12.6
19.3	9.3	12.2	9.50	42
20.1	10.3	11.1		1210
9.36	407	56		260
2340	10.18	11.87		+130
2.35		1.69		
257.5		−.82		

5-38	2.2	20.2	25.75	25.75	10.11 2340
30	−0.1	2.19	23.12	24.43	5512
50.7	21	21	887	1018	9.16) 312.2 (34.6
53.0	1.05	21.05	24.43	2564	2748
220.5		20.00			424
5-5-12		− 1.00			3664
5-5-12 + 28.00					2560
33.12					

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 13 1881

Long Coll.

15h 30m

17 58.3	10 40.1	57.4	
59.5	29.9	30.2	
58.4	18.0	18.7	
57.0	8.2	8.2	
58.0			

N.C. S.C.

17 67.2	18 8.3
66.2	8.1
65.8	8.7
66.8	7.4
66.4	8.2
32.4	40.7
~~66.81~~	8.14
66.48	66.48
	174.62
	87.3

Sel. at 17 87.3

N.2

	N	S	E	W
50 4 20.4	8.5	9.0	7.9	9.7
30.4	8.0	9.5	6.2	11.2
20.3	8.25	9.25	6.2	11.2
2.25		1.00	8.4	8.0
9.36		.5.0	28.7	41.1
23.40			7.18	10.28
1.40				3.10
24.80				+1.55

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

No. 13 (18)

No. 2

50 4 08	N	S				S
108	18	158	368	14.3	31	
59.2	0.3	16.9	43.2	13.2	4.2	
2 1 29	0.6	16.8	35.9	13.6	3.5	
33 2.9	16	15.7	37.7	14.2	3.1	
~~6.28~~	4.5	2+2	39.40	15.8	14.3	
~~8.22~~	1.12	~~63~~	1.34	13.82	3.58	
21.25		1639	25.06		1024	
24.47		1518			+ 5.12	
		- 7.59			7.59	
					12.91	

24.47
24.80
25.06
14.33
24.74

No 4 =

3.22
39.40
1271) 3618 (2.85
2542
1076
1016
560

1881phae.proj.1528B

Nov 13 1881 C = 17 8 53

h m
12 48

Long. Coll

17 59 7 10 4 7 8 70
60.5 3 6 8 2 9 7
62.2 16 4 16 1
59.8 7.9 6.8
61.0

N C. S C.

17 69 2 168
69.7 57
68.7 59
68.8 9.8
69.1 7 2
4 15 46 5
6910 5.30
9.30
17 8 4 0
89.2

Sol - H 17 89.2

Flagstaff

50 4 37.0 +9 4 46.2 3 5.1
36.5 0.7 46.3 3 4.7
36.1 0.2 46.7 3 5.1
19 6 12 14 9

36 53 0.13 46.40 3 4 9 7
0.13
46.40
34.97
44.67
42.62
4 89
+0.98

40.7 3 8 7 +0.2 3 8.7 41.0
41.0 3 8.7 +0.2 3 8.7 40.8
41.0 3 8.3 +0.0 3 8.3 40.8
2 7 4 7 4 7 2 6

40.50 3 8 5 7 50.13 38.57 40.87
38.57
50.13
38.57
40.87
40.50
50.13
38.57
40.87
42.62

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 13 1881

13h 30m Nov

N	S	E	N
9.4	10.8	9.3	10.8
5.2	10.8	8.2	11.9
~6	10.	1.75	27
9.30	10.80	8.75	11.35
	1.50		2.60
	.75		+1.30

55 42 1.2
29.5
18.0
20.6
8.97
2242
2.10
24.52

N	S
2.0	19.1
2.7	17.3
3.0	17.1
1.3	18.4
9.0	3.19
2.25	17.98
	15.73
	−7.86

0.9
9.9
57.8
0.8
24.94
62.35
+22.01
24.36

N	S
16.9	3.1
17.3	2.3
14.2	1.59
17.10	2.20
	1.40
	+7.20
	7.86
	15.06

43.6
52.3
40.7
44.2
18.08
45.20
90.12
25.08

15.06) 42.85 | 2.84
30.12
12.73
12.048
6820

2436
24.52
25.08
13.96
24.65

2.35
45.20
42.85

Nov 6 = 7.50

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

1881 5 10

Long Coel.

							N.C.		S C	
17	58.6	52 4	11.1	11.2	11.4	17	65.3	18	11.0	
	55.3		31.7	32.8	32.2		64.8		10.7	
	56.7		14.9	15.6	16.0		64.3		10.8	
	57.8		6.3	6.3	6.7		64.4		10.3	
	57.4		643	659	663		66.3		11.1	
			16.08	16.48	16.58		25-1		49	
							65-02		109.8	
							10'58			
							17600			
							68.00			

Sel-al-89.2

2h 0m

Perseus

	E	F	G	H	E	F	G	H
50 4	41.3	2.3	46.3	34.4	43.2	53.1	37.8	39.2
	40.9	2.9	46.1	34.3	43.3	53.8	37.5	39.1
	41.0	2.9	45.9	34.8	43.7	53.7	37.4	39.0
	41.07	2.70	46.10	34.50	43.40	53.53	37.57	39.10
	2.70				53.53			
	46.10				37.57			
	34.50				55.10			
	48.09				43.40			
	43.40							
	2.69							
	+1.34							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov. 15, 1881.

E Runs S N

√ 0	32.2	32.8	√2.2	√2.8	36.9	36.9	27.8	25.1
	32.8	32.5	√2.3	√3.1	36.9	36.8	27.8	25.6
	32.8	32.4	√2.8	√2.8	36.9	36.4	28.2	25.8
	32.8	32.2	√2.8	√3.0	36.7	36.6	28.1	25.3
	32.7	32.2	√3.4	√3.4	36.9	36.6	27.8	25.8
	33	21	35	1	43	33	47	26
	32.66	32.42	52.70	53.02	36.86	36.66	27.94	25.52

h — No. 2

2 15

√0 4	24.3	9.0	9.9	9.1	9.8	
	33.3	9.8	9.2	8.0	10.8	
	18.6	9.1	9.8	7.9	10.9	
	19.9	8.8	10.1	9.2	9.4	
		9.14	9.75	34 2	9 ## 5	
	24.02		.57	855	0.22	
	+ 76		+ .28		~~+ .12~~	
	24.80				~~- .85~~	
				Lee	1.67	
				Next page	+ .83	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov. 15, 1881.

No 2

		N	S				
50 4	37	2.1	11.6	50	2.2	8.8	8.0
	11.7	1.1	12.6	51	3.3	9.3	4.3
	57.7	1.2	12.5		36.3	9.4	4.2
	59.7	2.1	11.5		38.2	10.3	3.2
		1.62	12.04			9.95	3.68
4/4	3.20		10.43				6.27
	14.59		5.7				3.18
	19.79				41.98		
	17.79				8.76		
	33.22				33.22		
	52.01						
	26.00						

Rij shown in the future field.

Clear change in the value of div

No 2 repeated

50 4	33.6	9.2	3.8		8.0	1.0	12.0
	42.0	9.0	4.0		15.8	1.2	11.7
	27.7	9.1	4.0		2.2	0.1	12.8
	29.7	9.0	4.0		3.6	0.4	12.3
	1330	3	15.8		7.40	0.68	12.20
	33.25	9.08	3.95		16.13		11.52
	7.22		5.13		23.53		5.76
	26.03		2.58				
	23.53						
	9.56						
	24.78						

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

No 16

Long Coil Jul 1943

1955

17 58.1 104 108 115 95 17 68.1 113

61.1 338 348 330 66.2 52

59.7 19.7 21.3 190 66.7 53

59.8 9.7 10.0 8.5 68.0 99

61.3 74.0 79.6 70.0 67.0 107

18.52 19.90 17.50 36.0 564

19.90 69.00 1008

17.50 10.08

25.9 17.50

1863 89.5

Sel-al-89.2

No. 2

N S N S Σ Σ

50 4 21.5 22.1 11.1 14.0 11.8 13.2 11.4 13.6

24.5 31.2 30.5 10.8 13.2 11.2 13.8 10.2 14.8

18.3 17.4 10.8 13.2 11.2 13.7 10.7 14.9

21.0 20.2 11.2 13.8 12.0 14.1 12.1 12.9

92.0 39 14.2 6.2 14.8 38 16.2

23.00 1099 13.55 11.55 13.70 10.95 14.05

3.58 2.87 21.5 3.10

26.58 1.28 1.07 +1.55

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 16 1881

Long Coll.

					N.C.	S.C.
17	60.0	~~50 4~~	11.2	10.3	17 68.0	12.8
	~~57.5~~		32.2	31.2	68.7	13.0
	60.1		16.3	16.6	67.3	13.2
	62.1		7.4	7.6	68.8	13.2
	62.2				68.7	12.8
			16.78	16.42	415	150
				16.60	6830	1300
					1300	
					8130	
					90.65	

Sel of 89.2

No 2

~~E F G H~~ E ~~F G H~~

	N	S	E	W
50 4 22.1	4.7	5.3	4.8	5.1
30.3	4.1	6.0	3.0	7.0
17.4	4.8	5.2	2.8	7.1
19.0	3.7	6.3	5.0	4.8
~~29.22~~	4.32	5.70	15 6	23 0
~~1.91~~		1.38	3.90	5.75
~~27.69~~		-.69		3.90
~~24.13~~				1.85
				+.92

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 16

13 45

	N	S
ν Ο 4 10.5	0.0	9.9
19.0	0.8	9.1
4.2	0.40	9.50
8.6		9.10
10.82		4.55
12.74		
23.56		
25.68		
9 24		
24.62		
24.13		
75		
24.38		

	N	S
ν Ο 4 35.9	9.1	0.8
44.1	8.0	2.0
30.3	8.55	140
32.4		015
35.68		357
−10.00		
25.68		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

No 19 Hyi

15-h 0m

Long. Col.

17	S-28	10	4	9.9	10.7	17	6.40	14	14.0
	S-28			30.8	31.4		64.5		16.0
	S-4.8			16.0	16.1		64.3		15.7
	S5.7			6.8	6.1		63.5		14.1
	S3.8			63.5	64.3		63.5		14.3
	19			15.88	16.08		205		241
	S8.58				15.98	17	6.5.12		14.82
							1.482		
							1.5554		
							89.97		

Sel-01 89.2

No 2

	N	S	E	W
10 42.5	10.1	10.9	9.2	11.7
31.7	10.0	11.0	8.9	12.1
18.2			8.1	3.5
20.0	10.05	10.95	9.05	11.90
9.34		.10		2.85
2.335		-.45		+.43
1.26				
24.61				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 19

N	S
2.2	18.6
1.3	19.4
35	180
1.75	1900
	1725
	−84.2
	~~11.43~~
	~~1005~~

N	S
470	18.1
561	18.3
422	4
441	18.20
1894	
4735	
−22.00	
+25.33	

N	S
2.8	
2.3	
11	
2.55	
15.65	
7.82	

592 580
8.2 588
547 447
563 468
2384
59.60
+24.94
24.54
25.33
987
24.93

−0.45
−8.62
8.17

23.35
59.60
~~3625~~
2375
1634
7410
~~6736~~
~~8740~~
7353
570

8.17) 2375 (291

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 20

20h 0m

Lining tin foil for Long Coll.

	NC	SC
14	66.8	15.6
	64.8	16.6
	65.3	14.0
	65.2	17.2
	65.9	17.3
	64.9	30.7
	32.9	~~18.42~~
	66.58	16.74
	16.64	# 1 type dark
	1833 2	
	91.66	81-01 ~~87.7~~
		85.2

			N 2.	8.	S	S
50 4	~~28.6~~		5.8	6.9	7.3	5.1
	23.8	29.6	5.3	7.1	7.2	5.3
	32.3	38.3	5.3	7.1	7.4	5.1
	19.6	24.9	6.2	6.3	7.6	5.0
	21.3	26.6	22.6	27.4	7.1	
	97.0	29.85	56.5	68.5	7.38	5.12
	24.25	3.16		1.20		2.26
	1.60	26.69		1.60		1.13
	25.93					
		26.31				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

No. 20

13h 45m

Long Coll.

						N.C.	S.C.
17	56.8	50 4	13.2	13.5	17	67.2	17.2
	56.4		33.1	33.2		66.8	16.2
	54.8		16.6	17.2		66.6	16.0
	57.3		10.0	9.1		66.2	16.6
	59.9		729	730		67.2	16.3
	352		182.2	18.25		340	323
	57.04		18.23			6680	16.46
						1646	
						18326	
						91.63	Sel a1 · 89.2

Filepine

50 4	41.3	2.4	45.6	37.3	44.7	53.3	38.2	41.5
	41.1	2.8	45.2	37.3	44.7	52.8	37.9	41.5
	41.2	3.0	45.6	36.8	44.8	52.7	38.3	41.4
	41.20	2.73	45.47	37.13	4493	52.93	38.13	41.47
	2.73				52.93			
	45.47				38.13			
	37.13				41.47			
	4663				44.31			
	44.31							
	232							
	+1.16							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 20 1881

13h 50m

	N	S	E	W
50 4 28.1	11.5	11.8	9.8	13.6
36.0	12.9	10.4	11.8	11.6
21.3	11.6	11.8	11.5	11.8
24.3	13.2	10.0	10.3	13.1
27.42	1230	11.00	10.85	125.2
1.90		+1.30		1.67
25.52		+.65		+.83

	N.	S		N.	S.
59.7	3.8	19.5	48.5	19.9	3.2
7.3	2.0	21.2	56.2	18.6	4.6
53.1	2.90	20.35	40.5	19.25	3.50
56.0		19.45	44.2		15.35
59.02	2.90	20.05	47.35		+7.67
24.44		−17.45	−21.48		−8.73
~~.458~~		−8.73	25.87		16.40
23.46					
25.87					
93.2					
24.67					

25.52
24.67
10.15
25.10

24.44
47.35
22.91
3.09

59.02
47.35
48.33 | 2.95
32.8
15.50
14.76
.740
16.40

1881phae.proj.1528B

Nov 21 1881

$13^h\ 31^m$

Long Coll. Seeing too bad for observation

	NC	SC
17	65.5	18 17.2
	63.7	17.1
	62.3	17.8
	67.0	16.7
6488	65.9	17.0
17.16	24.4	8.58
182.04	64.88	17.16
91.0		

~~50~~	4	40.0	1.7	1.7	45.3	34.7
		40.0	1.9	1.9	45.2	34.7
		40.6	2.3	2.3	45.7	34.6

Del M 892

~~44.0~~	53.3	37.7	~~41.3~~
43.7	53.2	38.2	41.0
~~44.3~~	53.6	38.7	~~41.3~~

Phœnicia

	E	F	G	H
50	4	40.0	1.7	45.3	34.7
		40.0	1.9	45.2	34.7
		40.6	2.3	45.7	34.6
		40.20	1.97	45.40	34.67
		1.97			
		45.40			
		34.67			
		14824			
		47.06			
		44.44			
		2.62			
		+1.31			

	E	F	G	H
	44.0	53.3	37.7	41.3
	43.7	53.2	38.2	41.0
	44.3	53.6	38.7	41.3
	44.00	53.37	38.20	41.20
	53.37			
	38.20			
	41.20			
	44.44			

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 21 1881

13h 40m

No 2

	N	S	E	W
No 4 24.0	13.1	14.9	12.1	15.9
32.8	14.2	13.7	14.3	13.7
19.3	14.0	14.0	12.3	15.7
20.4	13.3	14.7	14.0	14.1
24.12	13.65	14.32	13.18	14.85
+.92		0.67		1.67
25.04		−.33		+.83

N	S		N	S
15.3	9.9	18.1	35.2	18.0	10.0
22.7	10.5	17.3	43.8	17.8	10.2
9.0	10.20	17.70	29.6	17.90	10.10
11.4		.50	32.1		7.50
14.60		−3.75	35.18		+3.90
10.52			−10.92		21.52
25.10			24.26		7.65
24.26					
24.68					

25.04
24.68
24.86

1460
35.18
2058
15-30
5280
4590
6900

7.65) (2.69

1881phae.proj.1528B

NW 22

2, 6 5

50 4 219

298

15.4

17.0

21.02
4.05
25.07

N	S
6.0	7.2
4.9	8.2
5.1	8.0
4.8	8.2
20.8	31.6
5.20	7.90
	2.70
	−1.35

E	W
~~7.8~~	~~7.6~~
~~4.9~~	~~6.8~~
4.9	8.0
4.8	8.2
5.7	7.2
24	29
5.35	7.42
	2.07
	+1.03

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 22 1881 Copied from Fundamental Take book where it was recorded by mistake. Long Coll. Seeing too bad for observation

$13^h\ 20^m$	N. e.	S. e
	17 57.7	16.8
	57.2	17.8
	57.1	18.8
	56.8	17.3
	57.8	17.7
	366	384
	57.32	17.68
	17.68	
	17500	
	87.50	Set at 89.2

		N	S	E	W
50 4	31.6	15.3	14.9	9.1	11.0
	36.4	14.8	15.3	9.8	10.2
	19.2	9.9	10.3	9.8	10.2
	21.2	9.8	10.3	9.8	10.3
	27.10	12.50	12.70	9.62	10.42
	28		−.20		9.62
	27.38		.10		.80
					.40

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov. 22, 1881

	N	S		N	S
5.1	1.4	18.6	52.6	17.8	2.2
10.8	1.0	19.1	57.7	16.7	3.3
53.1	0.9	18.1	39.5	17.6	2.4
54.8	1.3	18.7	41.8	17.0	3.0
30.95	+1.40	18.65			
60.95		17.20	47.90	17.28	2.72
24.08		−8.60	−20.38		14.56
25.03			27.52		+7.28
					−8.60
					+1446
					15.88

25.03
27.52
1255
76.24

47.90
30.85
78.75
1588) 43.05 (2.71
3176
11290
11116
1740

	N	S		N	S
3.6	1.4	18.3	52.3	16.9	3.1
9.9	0.1	19.7	57.7	17.3	2.4
51.3	1.5	180	40.3	17.10	2.75
53.7	0.75	19.00	42.3		+14.35
59.62		18.25		14.48	+7.18
25.43		−9.12	48.15		9.12
25.05			−28.05		16.30
			27.78		
			25.05		
			26.91		

5962
48.15
483.3
326
1573
1467
1260
143) 48.33 (2.98

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 24 1881

Dry Coal

16h 20m

382	10 4	185	182
402		392	378
452		144	187
371		93	95
386		831	842
513		2078	2105
4026			

NC. S6.

17 620	18 200
611	180
590	201
603	184
597	190
3021	955
6042	1910
910	
19952	
89.76	Rel ad 89.2

No2

N S Σ W

16 10

50 4	313	187	182	130	139
	377	142	128	122	146
	206	143	124	122	146
	226	158	129	121	137
	1122	160	113	105	168
	2805	1400	1285	1262	1420
	216		115		158
	2589		−.77		+.79

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Mary

No 2

	V	5
26.5	11.4	15.2
33.6	12.7	14.1
16.3	12.9	13.8
19.0	12.6	14.2
95.6	96	173
2390	1240	1432
+2.56		1.90
2646		-.95
2589		
23.5		
26.18		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 4/5, 1881 B. Obs.

Found Collimation set at 17 90.0

N.C.	S.C.
17 63.9	18 17.4
63.7	18.0
64.3	16.8
64.5	17.1
64.8	16.9
12	32
17 64.24	17.64

18 17.64
181 88
17 90.94

23h 5m 5s Set at 17 90.9
m.s.T

0h 10m m.s.T.

Level E	Level W
7.7	5.2
~~9.4~~	~~3.7~~
8.7	4.1
8.6	4.2
7.8	5.0
8	25
8.20	4.62
3.58	
− 1.79	3.58
	1.20
	4.78
	− 1.59

0h 0m m.s.T

Level E	Level W
7.1	4.9
7.8	5.2
9	10 1
7.45	5.05
2.40	
− 1.20	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 8, 1881

17h 10m Long Coll.

50 4	17.7	18.0
	37.7	38.2
	20.3	20.3
	12.3	12.0
	80	85
	22.00	22.12
	22.06	

20.95
0.72
8.83) 34.77 (2.85
25.23
17.66
7.570
7.064
506 0

17 20 No. 2

	N	S
50 4	26.9	11.1 10.6
	35.7	10.8 11.0
	19.7	11.0 10.8
	21.5	10.5 11.2
	238	34 36
	25.95	10.85 10.90
	.56	−.05 −.02
	26.51	N S

50 4	2.2	1.5	20.1
	9.4	2.4	19.2
	54.3		
	57.0		
	29		

No. 2

	N	S
50 4	2.2	1.5 20.1
	9.4	2.4 19.2
	54.3	39 393
	57.0	1.95 19.65
	29	17.70
	0.72	−8.85
	24.78	
	25.50	

26.51
25.50
1.01
.26

50 4	45.8	18.4
	53.0	16.8
	38.0	14 2
	40.0	17.10
	168	12.60
	44.20	+6.30
	17.64	
	26.56	

Level

	E	W
50 4	10.1	11.8
	9.7	12.1
	9.6	12.2
	10.2	11.5
	39 6	36
	9.90	11.90
		2.00
		+1.00

	S	
7	4.2	
	4.8	
	1 0	
	4.50	

Took out level No. 2 & carried it to Mrs. Clark who cut out the brass cross-piece in the center.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 9. 1881

17 15m

Long Coll.

5

50 4	21.2	21.1
	41.0	41.2
	23.0	23.2
	13.8	14.7

17h20m R.C. S.C.

17	67.0	18 14.2
	67.4	14.2
	67.2	15.3
	67.8	14.1
	65.8	14.8
	2	26
17	67.04	14.5-2
18	14.5-2	
	181 56	
17	90.78	

Set at 17 90.9

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 15, 1881

Long Coll,

$16^h 10^m$

58.3	50 4	28.2	27.7
59.2		46.0	43.0
57.8		24.6	22.3
57.0		13.1	13.1
56.0		319	261
33		27.98	26.52
57.66		27.25	

Seeing very bad

$15^h 25^m$

N.C.		S.C.
17	52.8	18 18.3
	53.3	18.8
	52.5	16.6
	51.3	17.0
	54.6	17.3
	145	30
17	52.90	17.60
18	17.60	
	170.50	
17	85.25	

bad seeing

Set at 17 ~~85.3~~ 90.9

$15^h 20^m$

Flexure

	E	F	G	H
50 4	48.2	5.3	42.8	32.3
	48.0	5.6	43.3	31.8
	48.4	5.4	43.2	32.0
	6	13	3	1
	48.20	5.43	43.10	32.03

	E	F	G	H
50.0	55.0	34.8	36.0	
49.9	55.3	34.7	35.3	
50.0	54.4	34.9	35.4	
299	27	24	17	
49.97	54.90	34.80	35.57	

5.43
43.10
32.03
18876
47.19
43.81
3.38
+1.69

54.90
34.80
35.57
175 24
43.81

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 15, 1881

5h 15m

Runs

	E		H		G		H	
5-0	23.8	21.2	38.0	37.2	15.8	15.0	7.3	4.3
	23.0	21.2	38.2	37.0	15.7	14.5	6.3	4.0
	22.8	21.0	38.0	36.8	16.2	14.4	6.8	3.8
	23.3	21.1	37.4	37.0	16.1	14.2	6.3	4.0
	22.2	20.8	37.2	37.0	16.3	14.3	6.0	4.1
	1	3	38	0	1	24	27	2
	23.02	21.06	37.76	37.00	16.02	14.48	6.54	4.04
	29.04							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 16, 1881

$7^h 45^m$

N.C.	S.C
17 54.4	18 24.0
54.9	22.8
54.7	21.1
52.2	22.2
55.1	23.3
13	134
17 54.26	22.68
18 22.68	
176.94	adopt 17 88.5
17 88.47	

Let at 17 90.9

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 17. 1881

~~2~~ 0h 20m

Long Coll. "

~~5~~ 317	5 5.8	10	4 24.8	24.7
	5 2.0		43.6	43.2
	5 2.1		23.5	23.2
	5 3.0		15.1	15.0
	5 1.0		270	261
	139		26.75	26.52
	5 2.78		26.63	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

DEC 17 1881

Ti 18m

17h 30m

17	62.2	50.4
	62.6	48.1
	58.0	27.8
	55.2	20.9
	55.2	

Long Symbol

	N.C.	S.C.
17	59.5	16.8
	59.1	19.8
	62.0	19.7
	59.7	19.6
	59.8	18.9
	481	428
17	59.62	18.56
	18.56	
	17818	
	89.02	

Set at 17 89.0

Long Coll.

15h 30m

65.4	#10	4 24.8"	25.3"
63.1		42.0	42.3
62.8		23.8	24.4
65.0		13.7	15.0
65.6		243	270
		26.08	26.75
		26.41	

15h 40m

	N.C.	S.C.
17	59.6	18 21.0
	59.0	21.2
	57.8	20.3
	58.0	21.6
	58.8	21.7
	32	8
17	58.64	21.16
18	21.16	
17	179.80	
17	89.90	

Set at 17 89.0

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 18, 1881

5h 40m

Flexure

	E	F	G	H	E	F	G	H
50 4	46.4	5.2	46.1	36.3	48.0	54.9	37.5	39.5
	46.9	5.0	45.1	36.0	48.7	55.0	37.7	39.4
	47.0	5.8	45.6	35.9	48.8	54.9	37.3	39.6
	23	10	18	2	15	28	15	15
	46.77	5.33	45.60	36.07	48.50	54.93	37.50	39.50
	5.33				54.93			
	45.60				37.50			
	36.07				39.50			
	193 77				180.43			
	48.44				45.11			
	3.33							
	+1.66							

15h 35m

Runs

	E		F		G		H		
5 0	9.7	8.3	~~28~~.3	27.3	8.2	7.4	~~59~~.60.1	~~1.8~~	56.2
	10.0	8.2	27.8	27.2	8.7	7.2	58.~~0~~.2	~~1.8~~	56.6
	9.3	8.1	27.6	26.8	7.4	7.2	58.4~~0~~.7	~~1.3~~	56.8
	9.4	8.2	28.2	26.3	7.8	7.9	58.3~~0~~.2	~~1.8~~	57.2
	9.2	8.0	27.4	26.7	7.7	7.8	58.2~~0~~.6	~~1.3~~	56.7
	26	8	33	43	48	25	35		35
	9.52	8.16	27.66	26.86	7.96	7.50	58.70		56.70

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Investigation Four Quadrant Points

15-4 45m

E	F	G	H	E	F	G	H
0 0 37.3	43.3	21.7	17.8	33.2	40.0	22.7	25.3
37.2	43.5	21.3	17.7	33.2	39.5	22.8	25.1
37.2	43.7	21.7	17.8	33.1	39.6	22.8	25.1
37.0	43.3	21.7	17.7	33.1	39.7	22.7	25.0
37.1	44.0	21.9	17.8	33.6	40.4	22.7	24.8

E	F	G	H	E	F	G	H
30.0	42.2	31.4	25.0	11.8	29.5	10.3	2.8
29.9	42.4	31.2	25.3	11.2	29.7	10.3	2.3
30.0	42.3	31.1	25.1	11.4	30.0	10.2	2.0
29.4	42.6	31.0	25.5	10.5	30.0	10.4	1.9
29.7	42.3	31.4	25.1	12.0	30.5	10.6	1.7

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 18, 1881

$16^h\ 0^m$ Remounted the bulb tube of Level No. 2

16^h ~~21^m~~ 20^m

No. 2

		~~A~~	~~S~~	N	S	E	W
50	0	2.1	~~9.3 11.5~~	10.8	12.6	10.2	13.2
		7.7		10.8	12.7	10.7	12.9
		49.8		10.3	13.1	9	1
		54.0		10.3	13.0	10.45	13.05
		386		22	34		2.60
		58.40		10.55	12.85	+	1.30
		~~+ 32.20~~	~~5940 32.20~~		2.30		
		~~30.60~~	+3.45		- 1.15		
		+ 3.22	~~165~~ 1.85				
		1.62					

50' 2.0"

						~~187~~	185
						~~050~~	2.35
						~~255~~	1.87
						607	
						2.02	

			N	S			N	S
45	4	42.1	4.0	19.7	50	0	~~20~~.6	17.0 6.6
		49.1	4.1	19.4			27.6	17.0 6.7
		32.0	1	11			9.0	17.00 6.65
		33.2	4.05	19.55			12.3	+10.35
		364		15.50			295	+5.17
		39.10	39.10	- 7.75			~~17.38~~	1738
		+ 21.70	~~23.25~~ 2.35				~~14.49~~ ~~26.78~~	-15.51
		0.80					~~48.40~~	1.87
							2.89	
							0.50	
							3.69	
							1.84	

49 39.10
50 17.38
12.92) 38.28 (2.96
25.84
12440
11628
812 0

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj:1528B

Dec. 19, 1881.

18h 0m

No. 2

	N	S	E	W
50 0 3.9	12.8	13.6	11.9	14.6
9.9	12.9	13.4	11.8	14.8
52.0	12.85	13.50	11.85	14.70
56.7		0.65		2.85
25		−0.32		1.42
0.62	062			
+.90	.96			
1.52	1.58			

1.58
2.15
2.61
2.11
50

1 dio = 2.96
3.13
6.09
3.04

Adopt for the present
1 dio = 3.00

		N	S
45 4	46.9	6.8	19.6
	53.9	7.1	19.1
	36.0	1.9	7
	37.4	6.95	19.35
	34 2		−12.40
49	43.55	43.55	6.20
	+17.31	+18.60	
	23.27	2.15	
50	0.91		

		N	S
50 0	19.1	18.2	8.0
	26.4	18.2	8.0
	8.5	17.4	8.9
	12.5	16	9
	26.5	17.80	8.45
50	16.62	+9.35	+4.67
	−13.07	1662	
	3.55	−1401	
		261	
50	0.91	3.55	
	4.46	0.91	
	2.23	4.46	

49 4 3.55
50. 16.62
10.42) 26.93 (2.5
1044
1051
2089
6090

49 4 3.55
50. 16.62
1587) 32.17 (2.03
3174
7220
6348
8720
7935
7850

1087) 3307 (3.13
3261
1460
1087
3730

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 29. 1881

$5^h\ 33^m$ B. Obs.

	N.C	S.C
17	64.0	17.0
	64.5	15.9
	65.8	15.5
	65.1	16.8
	64.6	15.8
	40	10
17	64.80	16.20
18	16.20	
	181.00	
17	90.50	

Set at 17 89.0

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Jan. 3, 1882

15h 40m

Level B. Obs.

E	W
5.8	7.0
4.7	8.2
5.8	7.0
4.6	8.2
209	304
5.22	7.60
	2.38
	+ 1.19

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Jan. 4. 1882 Z

21h 30m Level B. Obs

E	W
9.2	10.0
7.1	12.0
9.2	10.0
7.5	11.6
3 30	486
8.25	10.90
	2.65
	+ 1.32

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Jan. 9, 1882

16h 0m B. Obs. 16h 15m

	N.C.		S.C.	N.C	S.C.
17.	46.3	18	20.3	46.4	21.8
	46.0		19.8	46.5	22.0
	47.4		20.2	46.9	22.2
	47.1		20.2	46.0	21.4
	47.3		20.3	47.3	21.8
	41		8	33	42
17	46.82		20.16	46.66	21.84
18	20.16			21.84	
	16698			168.50	
17	83.49			17 84.25	
				83.49	
				7.74	
Let at 17	83.9			83.87	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 3, 1882

$1^h 25^m$ Level up Level down

E	W	E	W
3.7	14.1	4.8	21.8
9.0	8.7	10.7	16.0
127	228	155	378
6.35	11.40	7.75	18.90
	6.35	5	7.75
	5.05		11.15
	+ 2.02		5.57
			2.02
			7.59 + 3.80
			72

up down

E	W	E	W
14.0	14.0	11.0	15.4
9.2	18.6	~~10~~ 5.1	21.3
232	326	161	367
11.60	16.30	8.05	18.35
	11.60		8.05
	4.70		10.30
	2.35		5.15
			2.35
			7.50 3.75
			~~3.75~~ 71

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 3, 1882

$1^h\ 35^m$

~~E~~ N	~~W~~ S		circle B
14.1	13.8	40 2	21.3
21.1	6.7		25.3
352	205		7.4
17.65	10.25		11.5
7.40			25.5
+3.70			16.38
			11.10
			5.28

3.70
6.50
10.20

~~17.65~~ 2 16.38
1 4360
~~2720~~ 3278 (3.21
10.20 306
218
204
140

~~N~~	S		circle
4.0	23.9	40 1	48.0
9.0	18.8		52.8
130	427		35.2
−6.50	21.35		38.4
	14.85		14.4
	7.42		43.60
			19.5
			+3.10

1 div = ~~3.24~~ 11

−6.50
+7.52
14.02

4360
2518
4458 (297
2804
1354
1268
86 20

N	S		
24.0	3.8	40 2	30.0
18.0	10.1		34.8
420	139		16.4
21.00	6.95		19.5
15.05			207
+7.52			25.18
			22.56
			2.62

1 div = ~~2.48~~ 11

5.28
3.10
2.62
1104
368

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 3, 1882

Level No. 2

Up		down	
E	W	E	W
14.0	14.0	10.0	12.7
9.3 ~~3~~	~~13.7~~ 18.7	3.0	20.0
233	327	100	327
11.65	16.35	6.50	16.35
	4.70		9.85
	2.35		4.92
			2.35
			727
			3.63

363
3.80
3.71
3.73

1 div = .20$

3.73 x 20$ = 74.75$ 72

1881phae.proj.1528B

Feb. 3. 1882
Old long level

E	W
46.8	84.1
72.0	57.1
70.0	60.1
~~42.0~~	~~89.1~~
42.2	88.0
231 0	289 3
57.75	72.32

+ 14.57
.056
5742
7285
.81

$f = +8^s.1$

.056
112

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 4, 1882

14 0m Level

up

4.3 12.2

8.0 8.0

too dark to redd further
& unable to open shutters - snowy -

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 5 or 6 (?)

1h 15m

Level

up		down	
E	W	E	W
1.3	11.3	2.9	9.5
5.6	7.0	−2.5	15.0
1.5	11.1	3.8	8.5
5.6	7.0	−2.9	15.7
140	364	13	487
3.50	9.10	0.32	12.18
	5.60		11.86
	+ 2.80		+ 5.93
			+ 2.80
			873
			+4.36

×.20 = +.87

1h 45m

up		down	
E	W	E	W
5.5	7.0	+3.9	8.4
1.5	11.0	−2.4	15.9
5.5	7.0	+3.8	8.5
1.5	11.1	−2.4	14.9
140	361	19	477
3.50	9.02	0.48	11.92
	5.52		11.44
	+2.76		+5.72
			2.76
			8 48
			4.24

×.20 = +.85

b = +.86

Mean b = .86

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Old long level

14 55m

E	W
81.4	43.9
31.7	93.0
31.0	93.5
83.8	40.9
2279	2713
56.987	67.82
	10.85
	.056
	6510
	5425
	.60760

$b = +.61$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 14, 1882

1h 30m

	N.c.	S.c.
17	51.0	23.0
	50.0	23.7
	51.0	24.7
	50.2	25.1
	51.0	24.6
	3 2	1 1
17	50.64	24.22
18	24.22	
	17486	
17	87.43	

Flexure 1h 35m

	E	F1	G	H	E	F1	G	H
50 4	45.0	6.7	49.1	38.7	~~10 4 27.6~~ 45.8	51.2	38.0	43.8
	44.7	6.7	48.8	38.4	~~27.7~~ 45.2	51.3	38.2	43.3
	44.8	~~7~~.2	48.8	38.7	~~28.0~~ 45.4	51.5	38.2	43.9
	44.8	7.0	49.0	38.2	~~2~~ 45.1	51.1	38.4	43.7
	44.8	7.0	49.0	39.0	45.3	51.2	38.7	44.2
	41	46	47	32	18	13	15	39
	44.82	6.92	48.94	38.64	45.36	51.26	38.30	43.78

6.92
48.94
38.64
19932
49.83
44.68
4.15
+ 2.07

51.26
38.30
43.78
17890
44.68

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 14, 1882

4h 40m Long Coll.

17	93.2	10	4	27.6	29.3	29.5
	93.7			49.7	50.0	50.0
	90.3			31.3	32.3	32.3
	93.0			22.8	23.8	23.0
	93.0			1314	1354	1348
	132			32.85	33.85	33.70
	92.64				33.47	

1h 45m

Equator pt. ~~Local + Reg.~~ correction

E/W	W/S			E/W	W/S		
4.1	17.2	40	1 59.9	21.1	0.6	2	24.2
12.2	9.1		5.6	13.3	8.2		30.0
16 3	26 3		52.5	344	88		16.0
8.15	13.15		56.2	17.20	4.40		19.8
	5.00		342	12.80			900
	− 2.50		58.55	+ 6.40	58.55		22.50
			+ .75	2.50	22.50		~~1.92~~
			~~59.30~~	8.50	2395 (2.69		~~20.58~~
			7.50		17.8		− 19.20
			6.05		615		3.30
					534		
					810		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 14. 1882

$14^h 50^m$

N	S			
7.9	13.6	40	2	8.8
14.6	6.9			15.5
22.5	20.5			0.6
11.25	10.25			4.3
1.00				29.2
+0.50				7.30
				−1.50
				5.80

6.05
3.30
5.80
15.15
5.05

$14^h 55^m$ No. 3 Level

Up		down		
E	W	E	S	W
4.7	17.8	10.0	5.2	
10.6	10.9	17.4	−1.7	
15.3	28.7	27.4	3.5	
7.65	+14.35	13.70	1.75	
	+6.70	−11.95		
	+3.35	+5.97		
		9.32		
		+4.66		

$b = +1.88$

No. 1 ~~Lat~~ Long level.

E	W
56.4	58.1
43.7	70.8
100.1	128.9
50.05	64.45
	13.90
	+6.95
	.056
	41.70
	34.75
	.3892 0

$b = +39$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 14. 1882

2h 0m

Long Level

E	W	E	W	
33.0	87.7	65.5	49.8	+.39
65.9	49.6	34.5	80.7	+.54
989	1373	1000	1305	+.43
49.45	68.65	50.00	6525	136
~~68.65~~	19.20		15.25	8
	+ 9.60		+ 7.62	b = +.44
	.056		.056	
	5760		4572	
	4800		3810	
	+.53760		+.426672	

2h 5m

Level No. ~~3~~ 2

up		down	
E	W	W	E
13.6	12.0	10.7	5.1
7.6	18.0	18.0	-2.2
212	300	287	29
10.60	15.00	14.35	1.45
	4.40	12.90	
	+ 2.20	+ 6.45	
		+ 2.20	
		865	
		4.32 × .2 =	.86 = b

For decision that the Clark level should be called "Level No. 2" see Aug. 29, 1881 No change has been made since then, & I will therefore continue to use that nomenclature. B

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 18, 1882

$0^{u}30^{m}$

~~Collimation screw was~~ set at 18
At last collimating record of setting
Collimation was forgotten. It was
today looked at and found to be 17 87.4

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 23, 1882

Long Coll.

14h40m

17	~~88.8~~ 78.8	10 4 36.8	36.7
	81.2	53.5	53.7
	80.0	31.2	30.0
	75.3	21.0	21.8
	74.0	142 5	1422
	393	35.62	35.55
	77.86	35.58	

14h45m

	N.C.	S.C
17	42.5	18 25.2
	41.7	26.2
	42.3	25.2
	42.5	26.0
	42.0	26.2
	10	38
	42.20	25.76
	25.76	
	16796	
17	83.98	

14h55m

Flexure

	E	F	G	H
50 4	48.5	6.5	42.7	33.7
	48.0	5.8	42.3	33.7
	48.4	6.2	42.5	33.3
	47.8	5.8	43.0	33.0
	48.0	5.7	42.5	32.7
	7	0	30	14
	48.14	6.00	42.60	33.28
	6.00			
	42.60			
	33.28			
	19002			
	47.50			
	44.84			
	2.66			
+	1.33			

	E	F	G	H
	51.2	54.9	34.8	38.9
	51.5	54.7	34.7	38.7
	51.3	55.0	34.7	38.3
	51.2	55.0	34.8	38.2
	51.3	54.9	34.8	38.0
	15	45	338	21
	51.30	54.90	34.76	38.42
	54.90			
	34.76			
	38.42			
	17938			
	44.84			

Sitgat 17 84.0

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 23, 1882

24 0m

NE	SW				N	S			
12.4	10.6	40	2	2.8	1.8	26.2	40	1	55.2
4.5	18.4			5.7	8.6	14.4			57.6
169	90			45.5	104	06			37.7
8.45	14.50			48.4	5.20	20.30			40.3
	6.05			224		15.10			308
	- 3.02			~~54.48~~		- 7.55			47.70
	9.06			55.60		22.65			+ 22.65
				+ 9.06					10.35
				4.66					

N	S			
14.9	8.1	40	2	35.4
23.1	0.2			39.7
38.0	83			19.1
19.00	4.15			22.2
14.85				364
+ 7.42				29.10
2226				- 22.26
				6.84

+742 2 29.10
-735 1 47.70
149 (2)

149) 4140 (27
298
1146
1043
98 10

466
6.84
10.35
2185
7.28

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 23, 1882

$2^h 10^m$

Level No. 2

up E	up W	down E	down W
6.1	17.0		
12.0	10.8	2.8	23.0
18.1	27.8	10.8	14.7
9.05	13.90	13.6	27.7
	4.85	6.80	18.85
	2.42		12.05
	6.02		6.02
	8.44		
	4.22		

$b = +^{s} .8$ ~~40~~

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 26, 1882

7h 45m Long Coll.

17	83.6	4 36.0	35.0
	85.7	52.1	52.8
	86.2	32.1	31.7
	84.0	21.9	22.8
	83.0	221	223
	225	35.52	35.58
	84.50	35.56	

7h 50m N. C. S. C.

17	44.8	18	~~19.8~~ 22.8
	44.6		21.8
	44.4		23.0
	44.1		22.5
	44.9		24.0
	28		133
17	44.56		22.66
18	22.66		
	16722		
17	83.61		

Set at 17 83.6

7h 55m

Flexure

	E	F	S	H
30	46.1	4.0	41.3	32.0
	45.3	3.7	41.2	31.9
	45.2	3.7	41.9	32.3
	45.6	3.5	41.9	32.2
	45.6	3.5	42.2	32.2
	28	34	35	6
	45.56	3.68	41.70	32.12
	3.68			
	41.70			
	32.12			
	2306			
	45.76			
	44.03			
	1.73			
	+0.87			
	~~2~~		+1.47	

	E	F	S	H
	49.0	53.8	34.1	37.8
	49.1	53.8	34.8	38.1
	49.7	54.2	34.9	38.8
	49.8	54.2	34.8	38.0
	49.3	53.9	34.3	38.2
	19	199	29	9
	49.38	53.98	34.58	38.18
	53.98			
	34.58			
	38.18			
	1612			
	44.03			

Add 0.″6 on account of wrong setting of collimator. This gives

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Feb. 26, 1882

$8^h\ 5^m$

Eq. Int. Corr.

N	S				N	S			
9.9	8.0	40	2	26.7	8.2	9.7	40	1	59.7
17.3	0.6			30.9	1.2	16.7			4.0
272	86			10.5	94	264			44.0
13.60	4.30			13.2	4.70	13.20			47.0
9.30				813		8.50			147
+ 4.65	20.32			20.32		- 4.25			53.68
-4.25	5368			- 13.95					+ 12.75
8.90	3336								6.43
~~1392~~	2664	(2.99		6.37					
89	178								
	884								
	801								
	830								

6.40

$8^h\ 10^m$ ~~Orbit~~ Adjusted horizontality of level tube to ~~reference~~ ~~fiducial~~ plate.

$8^h\ 15^m$

N	S				N	S			
9.0	8.7	40	2	13.6	- 1.9	+19.8	40	1	41.1
8.7	9.0			16.2	- 1.9	19.6			44.4
177	177			57.2	—	8			24.0
8.85	8.85			1.0	- 1.90	19.70			28.4
0.00				280		21.60			1379
				7.00		- 10.80			34.48
									+ 32.40
									6.88

7.00
6.88
5.30
6.39

22.80
1 34.48
108) 2832 (2.62
216
672
648
240

1881phae.proj.1528B

Feb. 26, 1882

N	S			
15.4	2.1	40	2	30.0
14.8	2.9			34.0
102	10			14.1
15.10	2.50			18.7
12.60	~~.40~~			968
+ 6.30				24.20
				− 18.90
				5.30

8h 20m

Level No. 2

up		down	
E	W	E	W
6.2	11.6	10.0	20.6
7.2	10.5	7.9	22.3
134	21	179	29
6.70	11.05	8.95	21.45
	4.35		12.50
	2.17		6.25
	6.25		
	8.42		

$+4.21 \times .2 = +0.8\overset{S}{\underset{82}{\cancel{84}}}$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Mon. Mar. 5. 1882

Long Coll.

$9^h 0^m$					$9^h 15^m$	NC		SC
	17	93.5	10 4	31.8 31.2		17 55.4	18	19.0
		92.4		30.3 49.7		54.3		19.1
		93.0		31.7 31.1		54.4		19.0
		94.1		22.3 22.5		55.1		20.0
		94.9		1361 1345		55.2		19.7
		29		34.02 33.62		44		18
		93.58		33.82		17 54.88		19.36
						19.36		
						17424		
						17 87.12		

$9^h 10^m$	E	F	G	H	Flexure	E	F	G	H
50 4	43.8	3.3	43.3	35.2		47.3	53.9	36.7	41.0
	44.1	3.0	43.2	35.0		47.4	53.7	37.0	41.0
	44.0	2.4	43.8	35.0		47.5	53.9	37.0	41.1
	43.7	3.3	43.6	34.4		48.0	54.1	37.1	41.1
	43.4	3.0	44.0	34.2		48.0	54.0	37.0	41.3
	40.	0	29	38		32	46	48	5
	43.80	3.00	43.58	34.76		47.64	53.92	36.96	41.10
	3.00					53.92			
	43 58					36.96			
	34.76					41.10			
	2514					1962			
	46.28					44.90			
	44.90								
	138								
	+ 0.69								

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

2nd half of Flexure repeated

E	F	G	H
47.8	54.2	36.9	40.8
48.0	53.8	36.4	40.3
48.0	53.9	36.8	40.4
47.5	53.8	36.9	40.8
47.8	53.7	36.4	40.2
38	44	34	25
47.76	53.88	36.68	40.50

53.88
36.68
40.50
17882
44.70
46.28
1.58
+ 0.79
+ 0.69
+0.74

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Mar. 5, 1882

Eq. pt. corr.

7h 25m

N	S			
13.8	13.8	40	2	1.1
9.8	17.8			7.5
11.80	15.80			50.0
	4.00			53.9
	− 2.00			325
	−6.95			58.12
				+ 6.00
				4.12

N	S			
4.4	23.2	40	1	50.0
9.2	18.2			56.3
136	14			38.2
6.80	20.70			42.1
	1390			266
	− 6.95			46.65
				+ 20.85
				7.50

+6.00 +58.12
~~−6.95~~ 46.65
~~12.95~~ 48.53

4.12
7.50
4.17
1579
5.26

N	S			
18.5	9.1	40	2	27.0
22.1	6.3			33.5
06	144			15.7
20.30	7.20			19.1
131.0				153
+ 6.55				23.82
				− 1965
				4.17

−6.95 4.665
+6.55 23.82
1360 3717 | 2.73
272
997
952
450

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Mar. 5, 1882

$9^h 30^m$ Level No. 2

up		down	
E	W	E	W
12.1	15.6	8.0	15.3
10.3	17.2	4.8	19.8
24	128	128	151
11.20	16.40	6.40	17.55
	5.20		11.15
	+ 2.60		+ 5.58
			2.60
			8 18
			+ 4.09

$b = +0.82$ (78)

$9^h 35^m$ Level No. 1

E	W
48.0	74.3
62.0	60.2
1100	1345
55.00	67.25
	55 00
	12.25
	+ 6.12

$b = +.34$

Level No. 1

E	W
56.1	55.0
53.0	68.8
91	38
54.55	61.90
	7.35
	3.68

$b = +.21$

~~48.0~~

E	W
61.0	61.0
48.2	73.8
1092	1348
54.60	67.40
	1280
	6.40

$b = +.36$ = 2nd
$+ .34$ 1st
$b = +.21$ 3rd

$b = +.30$ mean

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Mar. 5, 1882

9h40m Readjusted Level No. 1 & repeated reading.

Level No. 1

E	W
40.0	80.7
75.2	45.8
115 2	126 5
57.60	63.25
	5.65
	2.83

b = +.16

.36
.34
.21
.16
.39
.28
174
.29

9h45m Readjusted again

E	W
52.1	68.8
55.0	66.2
71	150
53.55	67.50
	13.95
	6.98

b = +0.39

E	W
54.2	66.6
56.7	64.5
109	111
55.45	65.55
	10.10
	5.05

b = +.28

39
28
67
b = +.33

Mean of all preceeding six values from Level No. 1 = +0.29

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Mar. 14. 1882

Eq. Pt. Cor. , B. Obs.

$12^h\ 5^m$				$12^h\ 10^m$			
N	S			N	S		
12.0	10.9	40 2	6.7	5.0	18.0	40 1	45.2
9.0	14.0		11.3	0.5	22.2		50.3
21.0	4.9		51.8				30.3
10.50	12.45		54.6				32.1
	1.95						
	0.97						

$12^h\ 15^m$			
N	S		
23.1	−0.2	40 2	41.3
20.2	2.5		46.7
			26.2
			28.7

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

$12^h 25^m$ Level No. 2 B. Obs.

ups		down	
E	W	E	W
10.3	12.3	3.3	19.0
8.5	14.2	7.5	14.9
188	65	108	139
9.40	13.25	5.40	16.95
	3.85		11.55
	1.92		5.77
	5.77		
	769		

$3.85 \times .2 = b = .77$ (S) $.13$

Collimation formd at 17 87.0

$2^h 30^m$ B. Obs.

	N.C.		S.C.
17	49.8	18	23.6
	49.1		21.2
	48.3		21.3
	50.2		22.0
	51.0		21.9
	484		100
17	49.68	18	22.00
		17	49.68
			171.68
		17	85.84

Set at 17 85.89

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Mar. 20, 1882

$0^h\ 15^m$ Seeing too bad for Long Collimator

Flexure

$0^h\ 20^m$	E	F	S	H	E	F	S	H
50 4	40.2	0.4	40.8	30.3	45.8	49.8	33.0	38.2
	40.2	0.2	41.0	30.5	45.8	49.4	33.1	38.3
	39.7	0.2	41.3	30.2	45.3	49.7	33.7	38.0
	39.7	0.0	41.2	30.2	45.7	49.0	33.7	38.7
	39.9	0.0	41.2	29.9	45.4	49.8	33.8	39.1
	47	8	6	11	30	27	23	23
	39.94	0.16	41.10	30.22	45.60	49.54	33.46	38.46
	0.16				49.54			
	41.10				33.46			
	30.22				38.46			
	171 42				16706			
	42.85				41.76			
	41.76							
	1.09	Flexure = + 0.55						

$0^h\ 25^m$	N.C.	S.C
17	57.2	18 17.0
	54.0	17.0
	54.9	16.4
	54.9	16.8
	55.0	16.0
	260	32
17	55.20	16.64
18	16.64	
	17184	
17	85.92	

Set at 17 85.9

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Mar. 20, 1882

5h 30m

N	S			
8.5	18.4	40	2	2.4
13.4	13.7			7.4
21.9	12.1			50.3
10.95	16.05			54.2
	5.10			343
	− 2.55			58.58
			+	7.65
				6.23

N	S			
3.7	23.6	40	1	43.8
6.5	20.7			48.2
10.2	43			31.0
5.10	22.15			35.0
	17.05			380
	− 8.52			39.50
	− 2.55		+	25.56
	5.97			5.06

39.50
5858
5.97) 1908 (320
1791
1170
1194

N	S			
24.3	2.3	40	2	41.9
21.9	4.8			47.8
6.2	7.1			30.0
23.10	3.55			33.5
+ 19.55				33.2
+ 9.78	38.30			38.30
− 8.52	39.50			− 29.34
1830	5880 (321			8.96
	+49			
	390			
	366			
	240			

6.23
8.52
8.96
2371
790

6.23
8.96
1519
760

−2.55
+9.78
12.33) 39.82 (3.22
38.58
38.30
96 59
2730
2466
2640

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1991phae.proj.1528B

Mar. 20, 1882

Level No. 1

$0^h 35^m$

1st reading		2nd reading		3rd reading		
						+.20
45.4	67.1	60.5	52.0	42.1	70.3	.27
59.2	53.1	42.1	70.2	61.0	51.2	.26
1056	1202	1026	1222	1031	1215	13
52.80	60.10	51.30	61.10	51.55	60.75	$b = +.24$
	7.30		9.80		9.20	
	3.65		4.90		4.60	
$b = +.20$		$b = +.27$		$b = +.26$		

$0^h 45^m$ Adjusted for parallelism of the level No. 1 tube with axis of telescope.

Level No. 1 repeated

1st reading		2nd reading		3rd reading		
E	W	E	W	E	W	
37.2	72.1	53.8	57.2	42.1	68.2	
53.9	56.8	42.1	68.0	54.9	55.0	+.53
911	1289	959	1252	970	1232	.41
45.55	64.45	47.95	62.60	48.50	61.60	.37
	18.90		14.65		13.10	131
	19.45		7.32		6.55	$b = +.44$
$b = +.53$		$b = +.41$		$b = +.37$		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Mar. 20, 1882

$0^h 55^m$ up down

E	W	E	W
12.0	13.8	9.1	15.9
9.8	15.9	4.4	20.8
21 8	97	135	367
10.90	14.85	6.75	18.35
	3.95		11.60
	1.98		5.80
			1.98
			778

$b = 3.89 \times .20 = \overset{s}{+}.\overset{s}{78}$ 74

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Apr. 3, 1882

$4^h 30^m$ ~~17 96.8~~ Seeing too bad for ~~Long~~ Collimator.

$4^h 35^m$	N.C.	S.C.
17	55.2	18 20.3
	55.8	21.8
	54.4	21.9
	53.7	21.2
	54.7	21.5
	238	17
	17 54.76	21.34
	18 21.34	
	176 10	
	17 88.05	

Set at 17 88.0

Flexure

$4^h 30^m$	E	F	G	H	E	F	G	H
50	4 43.8	3.9	46.2	35.0	45.1	49.8	35.7	40.3
	43.3	3.9	46.1	35.0	44.8	49.7	35.7	40.8
	42.8	3.7	46.5	35.1	44.7	49.7	35.3	40.4
	42.3	3.8	46.3	35.0	44.4	49.3	35.5	40.7
	42.9	4.0	46.3	35.4	44.5	49.5	35.3	40.4
	1	43	14	5	35	30	25	26
	43.02	3.86	46.28	35.10	44.70	49.60	35.50	40.52

3.86
46.28
35.10
1 8826
47.06
42.58
4.48
+ 2.24

44.70
49.60
35.50
40.52
17032
42.58

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Apr. 3. 1882

$4^h\,40^m$ Eq. Pt. Cor.

N	S			N	S		
17.2	7.6	40 2	33.8	0.0	24.6	40 1	37.1
23.1	1.6		38.1	−3.8	20.8		42.4
403	92		23.0	38	54		26.7
20.15	4.60		26.5	−1.90	22.70		31.0
15.55			14		24.60		1372
+7.77			30.35		−12.00		34.30
			−23 31				+3690
			7.04				11.20

$4^h\,45^m$ Adjusted horizontality of bulb

N	S			N	S		
12.2	12.3	40 2	8.6	4.0	20.7	40 ~~45.3~~ 1	45.3
11.9	12.9		13.2	3.8	20.6		50.7
41	12		56.8	78	13		34.7
12.05	12.60		1.6	3.90	206 5		38.5
	−55		202		16.75		1692
			5.05		−8.37		42.30
			+1.65				+25.11
			6.70				7.41

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.15288

Apr. 3, 1882

N	S			
23.2	1.4	40	2	41.6
23.4	1.2			47.3
6	6			31.1
23.30	1.30			35.4
22.00				354
+11.00	3885			38.85
−8.37	4230			33.00
17.37	8655	292		
	3874			5.85
	17810			
	14433			
	3770			

670
741
5.85
1996
665

4h 55m

Level. No. 2

Up. E.	Up. W.	down E	down W
10.2	14.2	5.8	15.8
9.0	15.7	4.3	17.2
9.1	15.6	4.9	16.9
10.8	13.8	5.9	15.8
391	193	9	257
9.77	14.82	5.22	16.42
	5.05		11.20
	+2.53		+5.60
			+2.53
			813
			+4.06

4.06 × .20 = +.81 (S) → 77

Level No. 1

E	W
27.8	86.8
71.2	44.5
1990	1313
49.50	65.65
42.85	16.15
21.42	8.07

b = +.45 (S)

E	W
48.0	68.0
52.1	63.2
1001	112
50.05	65.60
	15.55
	7.78

b = +.44 (S)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Apr. 13, 1882

α 10^m B. Obs.

	N.C.		S.C.
17	51.1	18	25.8
	50.6		26.9
	51.8		25.5
	53.0		26.2
	53.0		25.1
	95		45
17	51.90		25.90
18	25.90		
	17780		
17	88.90		

Set at 17 86.9

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Apr. 14. 1882

6^h 45^m Level B. Obs.

Level No. 2

Up		down	
E	W	E	W
5.8	11.7	1.3	15.4
6.6	11.0	4.0	13.0
6.3	11.3	4.0	13.1
5.7	11.9	2.0	15.2
4	19	113	167
6.10	11.47	2.82	14.18
	5.37		11 36
	+2.69		+5.68
	+5.68		~~2.69~~
	8 37		

$$b = +4.18 \times .20^{s} = 0.^{s}\underline{\underline{836}}$$
$$\underline{\underline{80}}$$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Apr. 18, 1882 B. Obs.

$5^h\ 5^m$ Seeing too bad for long coll.

N	S			N	S		
$5^h\ 20^m$ 9.4	8.3	40	2 5.0	23.0	-5.2	40	2 44.9
6.8	11.0		10.3	20.0	-2.1		50.4
16.2	19.3		0.1	30	73		39.8
8.10	9.65		0.9	21.50	-2.65		40.3
	155		163	24 15			154
	-0.77		4.08	+12.07			43.85
			+231				-36.21
			6.39				7.64

N	S			
-0.5	18.0	40	1	34.9
-4.0	21.5			40.5
4.5	39.5			29.4
-2.25	19.75			29.6
	2200			144
	-11.00			33.60
	3360			+33.00
+12.07	43.85			~~0.60~~
23.07	8025	(2.61		6.60
	4614			
	14110			
	13842			
	2680			

6.39
7.64
6.60
2063
6.88

+2.31 -0.77 ~~4.08~~
~~11.50~~ -11.00 3360
13.81 10.23 ~~3048~~ 3048 / 324
~~2668~~
2046
1002
9207
8130

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Apr. 24, 1882

$23^h\ 25^m$ Long Coll.

17	94.8	50 4	33.5	33.5
	94.3		30.8	30.0
	95.2		31.2	31.0
	96.0		23.8	22.1
	98.0		1393	1366
	283		3482	34.15
	97.08			

$23^h\ 30^m$

	N.C.		S.C.
17	60.0	18	16.9
	59.6		15.8
	60.6		16.8
	60.0		17.1
	59.3		17.2
	495		338
17	59.90		16.76
18	16.76		
	17666		
17	88.33	Set at 17 88.3	

$23^h\ 35^m$

E	F	G	H
43.8	0.2	41.7	32.3
43.0	0.4	41.8	32.5
43.4	0.6	42.0	32.6
12	12	25	14
43.40	0.40	41.83	32.47
0.40			
41.83			
32.47			
17810			
44.52			
42.50			
2.02			
+1.01			

E	F	G	H
47.0	50.7	34.2	38.5
46.7	50.7	34.0	38.0
47.0	50.8	34.1	38.3
207	22	3	8
46.90	50.73	34.10	38.27
50.73			
34.10			
38.27			
17000			
42.50			

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Apr. 24, 1882

$23^h 40^m$ Eq. Pt. Cor.

N	S			
~~5.3~~	5.2	40	2	16.2
9.1	11			21.0
9.3	9.2			3.8
13.1	5.1			7.0
224	143			480
11.20	7.15			12,00
	4.05			606
+	2.02			5.94

N	S			
14.3	4.3	40	2	29.8
16.3	22			34.8
10.6	6.5			17.2
15.30	3.25			21.3
1205				1031
+ 6.02				25.78
				− 1806
				7.72

2

678
5.94
7.72 2044
~~8.47~~ 681
~~2213~~
738

2.7	15.8	40	1	56.1
63	13.2			0.8
90	90			43.4
4.50	14.50			46.8
	10,00			2071
	− 5.00	5178		51.78
	+6.02	2578		+ 5.00
	11,02	3400 3306	301	6.78
		840		

Level No. 1

E	W
54.7	70.1
56.2	68.0
109	1381
55.45	69.05
	13.60
	+ 6.80

$b = +0^s.38$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Apas. 24.1882

23^{h} 5m Level No. 2

Up		down	
E	W	E	W
5.8	13.8	4.0	17.1
7.7	10.9	6.2	15.8
135	47	102	129
6.75	12.35	5.10	16.45
	5.60		11.35
	−2.80	11 35	5.67
	~~+6.02~~	~~2.78~~	2.80
	~~8.82~~		8 47

$b = 4.23 \times .20 = .85$ 81

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

May 1, 1882

23^h50^m	Long	Coll.		23^h55^m	N.C		S.C
18	11.9	30 4 28.7	29.9	17	67.0	18	13.2
	12.8	50.1	49.0		67.8		12.8
	12.3	34.0	34.2		68.2		13.0
	12.5	25.6	25.3		67.3		14.0
	14.4	1384	1384		68.1		13.8
	139	34.60	34.60		364		168
18	12.78	34.60		17	67.28		13.38
				18	13.38		
					18066		
				17	90.33		
				Set at 17	90.3		

~~24~~ 0^h0^m	E	F	G	H	E	F	G	H
50 4	37.4	57.2	42.5	32.7	42.0	48.9	35.3	39.9
	37.2	57.8	42.9	33.0	42.2	48.3	35.8	39.8
	37.2	58.2	42.6	33.3	42.3	48.2	35.2	40.0
	8	22	20	0	5	14	13	27
	37.27	57.73	42.67	33.00	42.17	48.47	35.43	39.90
	57.73				48.47			
	42.67				35.43			
	33.00				39.90			
	17067				597			
	42.67				41.49			
	41.49							
	1.18							
	+ 0.59							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

May 1, 1882

$0^h\ 10^m$ Eq. Pt. Corr.

N	S			N	S		
23.9	2.6	40	2 32.2	~~20~~ 12.3	14.0	40 2	11.3
20.1	6.1		39.0	15.8	10.4		17.6
40	87		26.5	81	44		4.8
22.00	4.35		28.4	14.05	12.20		6.6
17.65			61	1.85			03
+8.82	31.52		31.52	+0.92			10.08
-8.68	41.55		-26.46				-276
17.50	4997	2.85	5.06				7.32
	350						
	1497						
	1400						
	970						

$0^h\ 15^m$ Level No. 2

				up		down	
N	S			E	W	E	W
2.7	23.6	40	1 42.3	11.8	14.4	5.2	17.8
6.2	20.0		48.7	9.9	16.3	6.1	16.6
89	436		36.0	9.7	16.6	6.2	16.3
4.45	21.80		39.2	11.9	14.3	4.0	19.0
	17.35		62	33	216	215	297
13.78	-8.68		41.55	10.82	15.40	5.38	17.42
			+26.04		4.58		12.04
			7.59		+2.29		6.02
					6.02		
					831		

506
7.32
7.59
19.97
6.66

$b = 4.15 \times .20 = 0.8\,\cancel{3}\ 79$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

May 12, 1882 B Obs.

64 30m

	N. C.		S. C.
17	67.0	18	16.1
	67.3		16.7
	66.8		19.0
	68.7		17.8
	70.0		16.5
	398		361
17	67.96	18	17.22
18	17.22		
	185.18		
17	92.59		

Let at 17 92.6

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

May 15, 1882

$0^h 40^m$ Long Coll.

18	4.1	50 4	28.2	28.7
	4.3		47.8	48.1
	6.0		32.0	31.7
	4.8		22.0	23.0
	7.0		13.00	13.65
	26.2		32.50	32.38
18	6.55			

$0^h 50^m$ S.C. ~~N.C.~~ ~~S.C.~~

18	20.9	17	62.9
	20.1		63.9
	20.0		63.9
	19.1		63.1
	18.9		63.8
	490		26
18	19.80		63.52
17	63.52		
	1832		
17	91.66		

Set at 17. 91.7

Flexure

$0^h 45^m$	E	F	G	H	E	F	G	H
50 4	38.2	57.7	41.6	32.0	42.3	49.0	34.2	38.1
	38.2	57.9	41.8	31.8	42.3	48.4	34.3	38.0
	38.2	58.4	41.7	31.9	42.3	48.7	34.6	38.4
	—	0	21	27	—	21	11	5
	38.20	58.00	41.70	31.90	42.30	48.70	34.37	38.17

58.00
41.70
31.90
16980
42.45
40.88
1.57
+ 0.78

48.70
34.37
38.17
354
40.88

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

May 15, 1882

Reg –

$0^h 55^m$

N	S			N	S
12.6	14.0	40	2	12.9	
18.1	8.5			18.2	
10 7	22 5			4.0	
15.35	11.25			7.3	
4 10				424	
+ 2.05				10.60	
				– 6.15	
				4.45	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

May 15, 1882

$18^h\ 05^m$

Level No. 1

E	W
~~71.1~~ 50.8	71.1
62.2	59.2
62.3	59.1
45.7	75.8
21 0	25 2
55.25	66.30
	11.05
	5.52

$b = 0^s.31$

Level No. 2

Up E	Up W	Down E	Down W
~~9.7~~	~~13.1~~		
9.2	17.5	9.8	~~15~~ 20.3
12.1	14.1	9.8	~~20~~ 20.4
21 3	11 6		
10.65	15.80	9.80	20.35
	5.15		10.55
	2.57		5.28
	5.28		
	7.85		

$b = 3.93 \times .20 = 0^s.7\,\text{~~5~~}$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

May 29, 1882 B. Clks.

9h 10m Lohy Coll. N.C. S.C.

18	33.2	10 4	23.3	22.4	17 84.6	18 10.4	
	34.2		46.7	46.1	84.5	10.4	
	34.9		39.9	40.0	84.4	9.2	
	38.9		26.3	25.1	84.8	10.0	
	35.3		162	136	85.1	9.7	
	215		34.05	33.40	34	47	
	34.30		33.72		17 84.68	9.94	
					18 9.94		
					19462		
					17 97.31		

Seeing very bad.

Set at 17 ~~94.5~~ 95.0

Flexure

9h 15m	E	D	S	H	E	D	S	H
50 4	32.0	55.9	50.5	34.3	34.1	43.3	40.3	39.3
	32.0	55.9	49.9	33.9	34.8	44.1	40.6	39.3
	31.2	55.6	50.0	34.1	34.6	44.1	40.2	39.3
	22	24	4	3	15	25	11	
	31.73	55.80	50.13	34.10	34.50	43.83	40.37	39.30
	55.80				43.83			
	50.13				40.37			
	34.10				39.30			
	1176				3800			
	42.94				37.50			
	39.50							
	3.44							
	+ 1.72							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

14^{30m} Reg pt corr.

N	S			
22.1	-7.2	40	2	38.6
18.0	-3.2			47.9
18.7	-3.9			42.9
22.1	-7.3			42.5
09	216			119
20.45	-5.40			42.98
2585				-3876
+12.92	14298			4.22
-12.45	12852			
~~837~~				
~~1268~~	7446 | 2,93			
2537	5074			
	23720			
	22833			
	8870			

N	S			
9.6	5.0	40	2	0.5
6.1	8.5			10.2
157	135			5.1
7.85	6.75			5.0
110				208
+0.55				5.20
				-165
				3.55

$10^{41.0m}$ Level No. 2

N	S			
-3.5	18.1	40	1	24.0
-6.8	21.4			33.6
103	395			28.3
-5.15	19.75			28.2
	24.90			341
	-12.45			28.52
				+3735
				5.87

	Up		down	
E	W	E	W	
5.1	9.4	~~11.0~~ 5.3	10.3	
4.0	10.6	-1.8	14.0	
4.3	10.2	5.3	11.0	
5.5	9.0	-1.0	13.5	
29	32	78	88	
4.72	9.80	+1.95	12.20	
	508		10.25	
	+2,54		+5.12	
	+512			
	766			
$b =$	3.83	S ÷2 =	0.72	

4.22
3.55
5.87
1364
455

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

June 6. 1882 B. Obs.

7h 40m

	N.C.		S.C
17	86.8	18	6,3
	86,3		5.9
	87.0		5,0
	85.8		5.2
	86.8		4.9
	327		23
17	86.54	18	5.46
18	5,46		
	192.00		
17	96.00		

Set at 17 96.0

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

June 11, 1882

$14^h 20^m$	Long	Coll.	
18	37.2	4 22.6	22.6
	36.0	44.8	44.2
	36.6	36.7	36.8
	37.5	24.3	24.8
	36.0	84	84
	33	32.10	32.10
	36.66	32.10	

$14^h 45^m$	N.C	S.C
17	90.9	18 4.1
	90.9	4.0
	91.2	4.8
	90.7	4.5
	90.8	4.0
	45	14
17	90.90	4.28
18	4.28	
	19518	
17	97.59	

Set at 17 97.6

$14^h 50^m$ Flexure

	E	F	G	H
	32.8	55.0	47.1	35.6
	33.0	55.0	47.4	35.0
	33.1	55.3	47.6	35.3
	29		11	9
	32.97	55.10	47.37	35.30
	55.10			
	47.37			
	35.30			
	1074			
	42.63			
	41.68			
	0.95			
	+0.48			

	E	F	G	H
50 4	38.3	46.4	40.5	40.0
	38.8	46.1	40.6	42.1
	38.3	46.5	40.7	42.0
	14	10	18	41
	38.43	46.33	40.60	41.37
	46.33			
	40.60			
	41.37			
	673			
	41.68			

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

June 11, 1882

5h 0m Eq. Pt. Cors.

N		S		N		S		
14.2	9.7	40.2	4.1	4.9	19.0	40	1	37.9
11.4	12.3	~~41~~	12.3	2.0	21.7			46.4
56	220		6.4	69	07			41.0
12.80	11.00		6.6	3.45	20.35			41.1
1.80			294		16.90			64
+.90			7.35		−8.45	14160		41.60
			−2.70		+8.50	23310		+25.35
			4.65		17.95	5950		6.95
						3590	(28 18)	
						1560		
						~~1618~~		
						14360		
						1240		

N	S			15h 5m Level No. 1	
				E	W
23.2	0.6	40	2 29.5	~~66.0~~	~~33.8~~
19.6	4.2		38.4	33.8	66.0
28	8		32.4	63.0	36.4
21.40	21.40		32.1	63.2	36.1
19.00			124	29.7	69.4
+9.50			33.10	1897	2079
			−2850	47.42	51.98
			4.60		4.56
					+2.28
					b = 0.13

4.65
6.95
4.60
1620
540

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

June 11. 1882

15h 10m Level No 2

up		down	
E	W	E	W
9.7	14.2	11.0	14.1
9.9	15.0	6.1	19.2
16	12	171	133
9.80	14.60	8.55	16.65
	4.80		8.10
	+ 2.40		4.05
	4.05		
	6.45 × ~~.20~~ =		9
	3.22 × ~~.5~~ =		0.6

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

June 19, 1882

Long Coll.

5.18				
18	42.6	10 4 17.8	17.6	
	40.5	40.8	41.2	
	42.2	36.7	36.8	
	41.4	21.8	22.8	
	40.0	1171	1184	
	67	29.28	29.60	
	41.34	29.44		

3h 10m N.C. S.C.

17	96.1	97.2
	96.0	97.2
	96.8	0.8
	97.1	0.8
	97.2	0.4
	332	0.2
17	96.64	1.4
18	0.28	0.28
	196.92	
17	98.46	

3h 15m

Flexure

	E	F	G	H	E	F	G	H
50 4	29.9	53.8	49.2	32.8	34.0	43.8	40.9	39.5
	30.0	53.9	48.5	33.2	34.2	43.7	40.9	39.5
	29.7	54.4	48.5	33.7	34.2	44.1	41.0	39.3
	26	1	22	5	4	26	28	13
	29.87	54.03	48.73	33.17	34.13	43.87	40.93	39.43

54.03
48.73
33.17
16580
41.45
39.59
~~104~~
1.86
+ 0.93

43.87
40.93
39.43
3836
39.59

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

June 19, 1882

3h 20m Eq Pt.

N	S			
17.8	11.7	40	2	0.9
13.7	15.6			11.5
11 5	7.3			8.8
15.75	13.65			5.8
2.10				270
+ 1 05				6.75
				− 3 15
				3.60

N	S			
8.0	21.4	40	1	43.2
11.2	18.0			53.4
19 2	3 9 4			50.5
9.60	19.70			48.0
	10.10			35 1
	− 5.05			48.78
	+2.58	4878		
	8.03	12.85		+ 1515
		24 17 9 (301		3.93
		24 80		

Level No. 1

N	S			
19.4	9.7	40	2	7.1
15.7	13.5			18.0
15 1	23 2			14.6
17.55	11.60			12.1
5.95				118
+ 2.98				12.95
				− 894
				401

E	W
22.5	70.6
58.2	34.8
54.2	38.4
20.9	71.7
1558	2155
38.95	53.88
	14.93
	7.46

360
353
401
1154
3.85

7.46 × .056 = .42

1881phae.proj.1528B

$3^h 25^m$ Level Tw. 2

Up		down	
E	W	E	W
13.0	16.0	4.8	16.8
10.5	18.6	8.2	13.3
35	6	130	101
11.75	17.30	6.50	15.05
~~45~~	5.55		8.55
	+2.77		4.27
	427		
	704		
	3,52	$\times .19 = 0^s.66$	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

June 25, 1882

3h 30m Long Coll.

18	57.7	90 4	12".8	13".5
	58.0		39.0	38.7
	61.9		38.2	38.7
	59.5		22.9	22.7
	59.7		329	336
	468		28.22	28.40
	59.36	1.4	28.31	

3h 40m

	N.C.		N.C.		S.C.	
18	14.2	18	80.2	17	90.2	90
	13.8		81.5		88.2	
	13.2		79.9		89.1	
	13.0		80.2		90.0	
	12.7		81.6		89.2	
	.19		34		467	
18	13.38	17	80.68		89.34	
17	89.34		8934			
	272		17002			
18	1.36		85.01			

Set at 18 1.4

Flexure

3h 35m	E	F	G	H	E	F	G	H
50 4	29.6	55.9	54.5	38.2	32.0	44.5	44.2	41.8
	29.2	56.3	54.8	38.3	31.8	448	44.3	41.8
	29.3	56.3	54.2	38.3	32.1	44.4	44.1	41.7
	11	5	15	8	29	17	6	2
	29.37	56.17	54.50	38.27	31.97	44.57	44.20	41.77
	56.17				44.57			
	54.50	Rej. set on			44.20			
	38.27	outside wire			41.77			
	17831				251			
	44.58				40.63			
	40.63							
	395							
	1.97							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

June 25, 1882

$3^h 45^m$ Flexure repeated

E	F	G	H	E	F	G	H
25.2	53.5	51.2	35.0	32.8	44.7	44.7	42.0
26.7	53.9	51.8	35.2	32.2	44.8	44.8	42.8
26.4	53.6	51.8	35.7	32.1	44.0	44.2	42.3
3	20	18	9	11	15	17	11
26.10	53.67	51.60	35.30	32.37	44.50	44.57	42.37
53.67				44.50			
51.60				44.57			
35.30				42.37			
1667				381			
41.67				40.95			
40.95							
0.72							
0.36							

Level No. 2

$4^h 5^m$

	Up		down	
E	W		E	W
7.8	17.1		6.8	18.8
10.6	14.5		9.6	15.8
184	116		164	146
9.20	15.80		8.20	17.30
	6.60			9.10
	330			4.55
	4 55			
	785			
	3.92 × $\overset{s}{1.\cancel{2}\,\cancel{9}}$		=	$\overset{s}{0.\cancel{7}\,\cancel{8}}$
				74

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

$3^h 55^m$ June 25, 1882

N	S	Reg.			N	S			
12.8	12.2	40	2	3.6	6.5	18.4	40	1	34.1
16.0	9.0			15.3	2.0	22.8			47.1
88	12			15.3	85	12			46.7
14.20	10.60			12.4	4.25	20.60			44.2
3 60				6.6		16.35			121
+ 1.80				11.65		− 8.17			43.02
				− 5 40					+ 2451
				6.25					7.53

$4^h 0^m$

N	S				Level	No. 1
					E	W
24.1	0.7	40	2	22.8		
19.9	5.0			34.6	26.8	50.0
40	57			35.0	38.5	38.0
22.00	2.85			31.7	53	880
19.15				41	32.65	44.00
+ 9.57				31.02		11.35
				28 71		5.67
				2.31		5.67 × .056 = 0.32

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

July 3. 1882

	26m Long. coll.				6h 29m N.C.		S.C.	
18	35.1	10	4	14.7	15.8	17	93.1	17 99.8
	33.8			41.0	42.1		93.0	99.8
	34.3			35.2	36.8		92.9	99.2
	36.8			22.8	23.7		92.7	99.9
	36.1						92.7	99.9
							144	36
							9288	99.72
							99.72	
							1200	
							96.0	

Flexure

	E	F	G	H	E	F	G	H
6h 31m 31+ 50 4.	25.6	52.7	46.7	32.8	31.0	43.0	39.0	39.9
	26.2	52.7	46.8	33.0	31.4	43.1	39.1	40.3
	268	52.7	46.6	33.2	31.8	43.1	39.2	40.7
	~~26~~							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1001phae.proj.15288

Level No. 2

	E	S	Ray		N	S	Ray
6h 42m	14.3	10.0	4.0	2	11.3	10.3	13.8	4 v. l
	19.3	0.8			22.8	5.1	15.0	v 7.1
					18.7			v 2.3
					20.2			v 7.3

	Up E	Up W	Down E	Down W	Down E	Down W
6h 46m	10.1	14.3	-14	14.2	12.0	15.8
	8.4	15.8	~~20~~	~~8.0~~	8.2	19.2
	~~18.5~~	10.1	~~26~~	~~27.4~~		
	9.25	15.05	~~4.4~~	~~11.90~~	10.10	17.52
		5.80	38	8.7		7.40
		~~6.5~~		~~4.50~~		3.70
		~~2.90~~				
		~~2.3~~				
		2.90				
		3.90				
		9.30				

b = ~~1.06~~ 63

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

July 10. 1882

Long. Coll.

					N. C	S. C
18h 28m		10 4	12.2	12.6	18 2.8	99.9
18 38.4			38.3	39.2	1.3	99.3
37.2			37.3	38.0	1.2	99.9
34.7			22.5	22.6	2.3	99.7
35.3					1.9	99.1
					1.90	99.74
					~~4.28~~	1.50
					~~3.34~~	~~0.88~~

Flexure 18

	E	F	G	A	E	F	G	I
18h 34m	~~0.4~~	2.6	49.8	35.0	29.8	41.8	41.8	39.2
0 4	25.7	52.5	0.8	35.0	29.3	41.8	42.1	39.4
	25.9	2.3	0.3	34.8	29.8	42.0	42.1	39.7
	~~25.9~~							
	25.9							

Collimation repeated -

	N. C.	S. C.
18	1.7	98.0
	0.7	98.5
	1.1	96.3
	1.0	98.3
	0.0	98.0
	0.90	98.42
	~~98.42~~	
	0.66	
	1.32	
	98.16	

3.34
0.66
4.00
2.00

0.88
98.16
99.04
99.50

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1001phae.proj.15288

49m 40 2 19.1 N S
31.7 18.9 7.1
31.1 ~~7.1~~ 1.7
29.7 24.4

E W S
40 1 48.v 8.3 17.8
0.9 12.9 13.1
0.8
v9.1

Up Down
E W E W
vh v4m 8.0 18.0 13.0 24.0
11.0 15.0 16.2 20.8
9.v0 16.v0 14.60 22.40
7.00 7.80
3.5v 3.50
3.45
8.26 = .72

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

July 31, 1882

B. Obs.

12h 50m Long Coll.

				14m	N.C.	S.C.
9.1	10 4	3.0	2.7	18	3.3	18 5.0
10.7		33.3	33.3		4.1	5.0
10.1		35.1	34.2		3.5	5.2
8.3		17.3	17.4		4.0	6.9
12.0		887.	876		5.0	6.7
02		22.17	21.90		199	38
10.10		07			3.98	5.76
		22.04				3.98
						974
					18	4.87
					Set 18	4.9

Seeing very bad.

Flexure

1h 10m	E	F	G	H	E	F	G	H
50 4	21.1	53.4	52.2	35.5	50 4 24.1	42.0	43.8	40.8
	20.8	53.7	52.5	35.3	23.6	42.1	43.8	41.1
	21.2	53.4	52.9	35.7	24.2	41.4	44.0	40.9
	1	15	16	15	29	25	26	28
	21.03	53.50	52.53	35.50	23.97	41.83	43.87	40.93
	53.50				41.83			
	52.53				43.87			
	35.50				40.93			
	16256				3060			
	40.64				37.65			
	37.65							
	2.99							
	+ 1.50							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1001phae.proj:15288

July 31, 1882 B. Clo.

$1^h 30^m$ Reg-

				N		S			
6.4	12.4	40.	1 34.2	24.0	-5.2	40	2 27.9		
2.2	16.5		52.0	16.2	-1.5		45.0		
8.6	89		54.5	02	67		47.3		
4.30	14.45		60.8	20.10	-3.35		44.3		
	10.15		315	23.45			45		
	-5.08		47.88	~~+6.72~~			41.12		
			+15.24	11.72			~~20~~.16		
			3.12				35		
							5.96		

$1^h 40^m$

Level No. 2

b	N	S				Up		down	
	10.5	8.2	40	1 47.3	E	W	E	W	
	6.3	12.5		3.7	7.1	11.6	5.4	14.3	
	16.8	07		6.8	5.6	13.1	8.0	12.5	
	8.40	10 35		2.8	127	47	134	48	
		1.95		06	6.35	12.35	6.70	13.40	
		0.98		0.05		6.00		6.70	
				2.94		3.00		3.35	
				3.09				3.00	
								6.35	
								3.18	

$b = 3.18 \pm \frac{5}{19} = 0.\frac{6}{60}35$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Aug. 16, 1882 B. Alls.

$13^h\ 30^m$ $14^h\ 0^m$

Level No. 2

	N.C		S.C	E	W	E	W
						Up	down
17	97.5	18	7.3				
	96.8		8.2				
	97.4		9.1	E	W	E	W
	99.1		9.0	4.0	15.6	~~12.5~~ 7.0	~~7.0~~ 12.5
	99.8		8.1	8.2	11.5	5.0	14.8
	406		417	122	71	120	73
	98.12		8.34	6.10	13.55	6.00	13.65
	8.34				7.45		7.65
	6.46				3.72		3.82
18	3.23				382		

set at 18_h 3.2

$3.77 \times .2^{s}_{19} = 0.7^{s}_{71}$ ~~5.4~~

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1001phae.proj.13288

Aug. 18, 1882 B. Obs.

$14^{h}\ 5^{m}\ 5^{s}$ mg

Level No. 2

up		down	
E	W	E	W
9.5	13.9	9.0	14.0
7.0	16.2	7.4	15.8
16.5	10.1	16.4	9.8
8.25	15.05	8.20	14.90
	6.80		6.70
	+ 3.40		+ 3.35
			3.40
			3.375 + .2 = .675
			.19 .64

Adopted value of $b = 0.^{s}70$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Aug. 25, 1882 B. Obs.

14h 30m

	N.C		S.C
17	91.9	18	13.5
	92.2		14.2
	91.4		13.3
	92.1		13.0
	91.7		14.0
	93		180
17	91.86		13.60
	13.60		
	~~18~~ 5.46		
18	2.73		
Let at	18		3.0

14h 45m

Level No. 2

	Up		down	
	E	W	E	W
	8.1	11.1	6.7	12.2
	5.0	14.2	4.3	14.9
	4.3	15.0	4.3	14.8
	8.1	11.2	6.9	12.0
	255	115	222	139
	6.38	12.88	5.55	13.46
		6.50		7.93
		+3.25		3.96
		+3.96		
		121		

$b = +3.60 \times \frac{S}{19} = .68$

1881phae.proj.15200

Sept. 7, 1882

$11^h 10^m$

	Long		Coll.	
17	80.9	10 3	50.8	51.5
	75.0		19.8	21.5
	82.0		19.0	19.8
	78.0		3.0	3.4
	76.0		326	362
	419		8.15	9.05
	78.38			

$11^h 15^m$

	V.C.		S.C.
17	84.9	18	38.2
	83.6		38.8
	84.7		38.2
	83.1		39.1
	84.0		39.0
	203		33
17	84.06		3866
18	38.66		
	2272		
18	11.36		

Set at 18 11.4

Flexure omitted this week.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept 7, 1882

Reg

$11^h\ 20^m - 30^m$

N	S			N	S			
18.4	1.7	40	2 5.6	5.6	14.6	40	1	40.5
14.0	6.0		20.0	9.6	10.4			55.9
12.4	7.7		21.5	1.52	5.0			57.0
16.20	3.85		17.9	7.60	12.50			54.4
12.35			6.50		4.90			78
6.17			16.25		2.45			51.95
2.84			− 17.52					+ 7.96
			58.73					59.91

Value of the "Clark level" is adopted 2.84 till further notice

Level No. 2

Up		down	
E	W	E	W
5.5	14.7	6.0	16.0
8.6	11.6	8.1	14.0
141	6.3	141	0
7.05	13.15	7.05	15.00
	6.10		7.95
	3.05		3.97
	3.97		
	1.02		
	3.51 × .19 = S .66		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov 81.2
30.05
75.0

Sept 19 1882

Observations of

Circle

α Leo δ = 12 33 0 ′
+ 22

n = -170

δ wires R.A. wires

9	59	313	59	424	59	547
		33.7		44.5		56.0
		35.7		46.2		57.0
		37.1		48.3		1.0
		38.8		52.5		3.2
						5.4
				1.9		7.3
				18.1		9.3
				21.1		11.6
				22.3		
				24.0		

354	329	12 43 69	33.4
489			
450			
388			
1656			
39′	41.4″		

δ 45° 0′	8.94030	
log 15	1.17609	
	0.11639	
	9.98952	
	0.10591	
	1.44560	
	1.55151	
	+25.6	
39	41.4	
40	17.0	

3 = 29 51			
12	42	31.4	
		− 33.4	
12	41	58.0	

Obs. 12 41 58.0

δ 12° 32′ 22.3

− 9 35.7

39 41.4

3.27	3.17		
10	0	3.22	
		− .37	
10	0	2.85	
R.A. 10	2	7.22	
− 2	43	7	
		2.1	
		1.96	
2	1.96		

Obs α Leo

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.15288

Nov 81.2
30.05
75.0

Sept 19 1882

Observations

Circle

α Leo V = 1233
+.22

n = -170

δ wires

R.A. wires

9	59	313	59	424	547
		33.7		44.5	56.0
		35.7		46.2	58.0
		37.1		48.3	1.0
		38.8		52.5	3.2
					5.4
				1.9	7.3
				18.1	9.3
				24.1	11.6
				22.3	
				24.4	

354 329
489
450
388
1656

39 41.4

Obs 12 43 69
33.4

δ 55° 0' 8.94030
15 1.17609
0.11639
9.98952
0.10591
1.44560
1.55151

+27.90
+25.6
39 41.4
40 19.09

59 35.32

3 = 2951

12 42 31.4
− 33.4
12 41 58.0

Obs 12 41 58.0

12° 32' 22.3
− 9 35.7

39 41.4

3.27 3.17

10 0 3.22
− .37
10 0 2.85
R.A. 10 2 22.2
− 2 43.7
2 1.96

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 25, 1882

9h35m Long Coll.

17	62.3	10 3 57.0	56.8
	63.8	23.1	24.3
	63.7	16.2	16.0
	64.1	0.0	0.7
	63.0	3 6 3	3 7 8
	169	9.08	9.45
	63.38	9.26	

9h40m N.C. S.C.

17	72.3	18	25.2
	72.7		26.3
	72.9		27.0
	72.9		26.2
	73.1		26.3
	39		10
17	72.78		26.20
18	26.20		
	19898		
17	99.49		

Flexure Set at 17 99.5

9h45m	E	F	G	H	E	F	G	H
50 4	27.0	55.2	46.2	49.7	30.7	45.3	39.3	36.1
	27.6	54.3	46.8	49.8	31.3	45.6	39.2	36.3
	27.0	54.8	46.3	49.7	31.9	45.2	38.8	36.6
	6	23	13		9	11	3	10
	27.20	54.77	46.43	49.73	31.30	45.37	39.10	36.33

54.77
46.43
49.73 / 15813
X 8.13 39.53
414.57 3802
38.82 151
6.57 + .75
+ 3.25

45.37
39.10
36.33
3210
38.02

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept 25, 1882

~~N~~	S	9h 50m	N	S			
14.1	5.2	40 1 54.9	11.3	8.0	40	2	3.2
~~13.8~~ 8.8	10.7	8.5	16.3	3.0			16.3
229	159	2.8	76	110			10.5
11.45	7.95	69.6	1.380	5.50			7.8
3 50		58	8.30				378
+ 1.75		1.45	4.15				9.45
		~~- 3.32~~					~~- 7.88~~
		~~41 40~~ 58.13					~~42~~ ~~1.57~~
		-4.98					-11.79
		56.47					57.66

~~46.2~~ ~~50.6~~

32.0 64.1

~~46.2~~ ~~50.6~~

~~Seve~~ No. 2

Up down

~~4.4~~ ~~15.0~~

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 25, 1882

Level No. 1

E	W
46.2	50.6
32.0	64.1
32.0	64.6
~~51.8~~	~~44.8~~
45.0	51.2
1552	2305
38.80	57.62
	18.82
	9.41
	$+_s$
$b = +.53$	

Level No. 2

Up		down	
E	W	E	W
4.4	15.0	11.9	14.1
9.0	10.3	5.3	16.9
13.4	5.3	17.2	11.0
6.70	12.65	8.60	15.50
	5.95		6.90
	+ 2.98		3.45
	3.45		
	6.43		
	$3.22 \times \frac{19}{20} = 0^s.61$		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Sept. 2. 1882

13h 30m Long Coll.

17	63.2	903	58.8	58.7
	61.6		27.2	28.2
	62.6		20.2	19.8
	64.0		3.6	3.8
	63.0		498	505
	144		12.45	12.62
	62.88		14′	12″.53

13h 10m N.C. S.C.

17	70.0	18	29.5
	68.8		30.0
	69.1		29.9
	69.7		30.0
	68.7		31.0
	463		04
17	69.26		30.08
18	3008		
	19934		
17	99.67		

Set at 17 99.7

Flexure

13h 5m	E	F	S	H	E	F	S	H
50 4	25.2	54.8	46.8	30.4	29.1	46.4	39.8	37.1
	24.3	54.7	46.3	30.0	29.9	45.8	39.7	37.2
	24.5	54.6	46.5	29.0	29.9	44.8	39.6	37.3
	20	21.	16	24	19	20	21	°
	24.67	54.70	46.53	29.80	29.63	45.67	39.70	37.20
	54.70				45.67			
	46.53				39.70			
	29.80				37.20			
	15570				15220			
	3892				3805			
	3805							
	87							
	+ .43							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 2, 1882

13h 15m

N	S			N	S		
10.7	9.2	40	1 59.9	6.1	13.7	40. 1	31.0
16.2	3.8		14.8	0.4	19.3		44.9
69	130		9.6	65	130		40.2
1 3.45	6.50		7.0	3.25	16.50		37.7
6.95			313		13.25		338
+ 3.48			7.82		− 6.62		38.45
			− 9.88				+ 18.80
			57.94				57.25

13h 20m

Level No. 1

E	W
44.8	44.7
56.8	32.7
56.8	32.4
45.0	44.3
34	341
50.85	3852
12.32	
6.16	

b = +0.34

Level No. 2

Up		down	
E	W	E	W
8.3	11.4	12.3	14.3
4.8	15.0	5.1	17.0
131	64	174	113
6.55	132.0	8.70	15.65
	6.65		6.95
	+ 3.32		3.46
	3.48		
	80		

3.40 × .19 = 0.65

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1901phae.proj.1528B

Resumé of results of observations with the Clark lens for the time of the adjustments on Feb. 3 1901

Feb. 3	b =	+7.72	
5		+.81	
14		+.82	
23		+.80	
26		+.80	+.79
Mar 5		+.78	
14		+.73	
22		+.74	+.75
Mar. 3		+.77	
14		+.80	
24		+.81	+.79
May 1		+.79	
15		+.75	
29		+.72	+.75
June 11		+.61	
19		+.66	
25		+.75	+.67
July 3		+.63	
10		+.72	
31		+.61	+.65
Aug 16		+.71	
25		+.68	+.69
Sept 7		+.66	
25		+.61	+.64
Oct. 2		+.65	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 9, 1882

17h 40m Long Coll.

17	68.1	59.5	59.9
	67.0	27.9	27.6
	66.0	24.7	23.2
	67.2	6.6	5.7
	67.0	587	564
	3	14.67	14.10
17	67.06	14.	

17h 55m N.C. S.C.

17	66.2	18	33.0
	66.4		33.3
	67.5		32.2
	66.8		32.8
	66.8		33.1
	37		144
17	66.74		32.88
	32.88		
17.	1996.2		
17	99.81		

Set at 17 99.8

Flexure

17h 45m	E	F	G	H	E	F	G	H
50 4	26.2	56.1	51.3	38.1	29.8	43.2	41.8	38.1
	26.5	56.1	50.8	38.4	30.8	43.2	41.8	38.8
	26.5	56.0	50.4	38.0	30.2	43.3	41.8	38.8
	12	2	25	5	8	7		17
	26.40	56.07	50.83	38.17	30.27	43.23	41.80	38.57

56.07
50.83
38.17
16647
41.62
38.47
3.15
+1.58

30.27
43.23
41.80
38.57
33.87
38.47

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

18h 0m Oct. 9, 1882

E	N	S			N	S			
9.4	10.2		40	1 41.4	11.3	8.2	40	2 2.6	
4.0	15.6			54.0	16.3	3.2		14.8	
134	5.8			52.2	76	114		13.0	
6.70	12.90			49.7	1 3.80	5.70		10.2	
	6.20			373	8.10			06	
	−3.10			49.32	+4.05			10.15	
				+ 8.80				−11.50	
			41	58.12			47'	58.65	

18h 5m Level No. 2

	up		down	
	E	W	E	W
	4.2	15.3	4.1	15.1
	8.2	11.3	6.6	12.8
	124	66	107	79
	6.20	13.30	5.35	13.95
		7.10		8.60
		+ 3.35		4.30
		4.30		
		7.85		

b = 3.92 × .19 = 0.74

Level No. 2 repeated

	up		down	
	E	W	E	W
	6.9	19.1	6.5	12.8
	11.6	14.2	4.1	15.2
	185	133	106	80
	9.25	16.65	5.30	14.00
		7.40		8.70
		370		4.35
		435		
		805		

4.02 × .19 = 0.76

see over

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Oct. 9. 1882

$8^h 10^m$ Level No. 2 repeated

up		down	
E	W	E	W
11.9	14.1	5.7	11.6
7.7	18.5	3.9	14.0
196	126	96	56
9.80	16.30	4.80	12.80
	6.50		8.00
	+3.25		4.00
	4.00		
	7.25		

$3.62 \times .19 = {}^{s}.69$

.74

.76

9

$t = {}^{s}.713$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1001phae.proj.1528B

Oct. 30, 1882

19h 30m Level No. 2

Up		down	
E	W	E	W
7.2	12.0	6.3	12.8
4.8	14.4	3.9	15.1
4.9	14.3	3.7	15.2
8.0	11.0	5.4	13.6
24.9	11.7	19.3	16.7
6.22	12.92	4.82	14.18
	6.70		9.36
	+ 3.35		4.68
	+ 4.68		
	8.03		
	+ 4.01		

$\times .19^{s} = 0.76^{s}$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov. 6. 1882

$15^h\ 50^m$ Level No. 2 B. Wo.

up E	up W	down E	down W
13.2	14.5	4.0	15.5
8.8	18.8	4.7	14.5
8.8	18.8	5.1	14.0
13.1	14.4	3.8	15.4
439	265	16	194
10.98	16.62	4.04	14.85
	5.64		10.81
	+ 2.82		+ 5.40
	+ 5.40		
	8.22		
	$4.11 \times {}^{s}.19 = {}^{s}.78$		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov. 13, 1882

$3^h\ 25^m$

17	49.2	5".3	5".0
	49.8	30.8	29.4
	51.0	20.2	18.3
	51.0	6.7	5.7
	52.5	628	584
	35	15.70	14.60
17	50.70		

$13^h\ 30^m$

	N.C.	S.C.
17	34.9	18 ~~32.6~~ 48.2
	36.1	~~32.1~~ 48.7
	36.4	48.2
	34.7	48.2
	361	47.0
	282	3
17	35.64	48.06
18	4806	
	18370	
17	91.85	

Set at 17 91.8

$13^h\ 35^m$

Flexure

E	F	G	H	E	F	G	H
32.0	55.3	43.7	30.7	34.5	45.8	36.1	37.1
31.2	55.6	43.8	31.3	35.3	45.6	36.2	37.8
31.0	56.1	43.3	31.3	35.7	45.7	36.2	37.2
#12	20	18	3	5	21	5	11
31.40	55.67	43.60	31.10	35.17	45.70	36.17	37.37
55.67				45.70			
43.60				36.17			
31.10				37.37			
16177				15441			
40.44				38.60			
38.60							
1.84							
+ 0.92							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov. 13, 1882

12h 40m

N	S			N	S
8.2	9.3	40	50.8	~~10.0~~	~~12.8~~
6.2	16.2		0.9		
144	255		50.8		
7.20	12.75		52.2		
	5.55		147		
	− 2.78	41	53.68		
			+ 7.90		
		42	1.58		

13h 45m

Level No. 2

Up		down			
E	W	E	W	E	W
10.0	12.8	5.0	14.0	5.8	13.7
5.3	17.4	3.3	15.7	3.8	15.8
153	102	83	97	96	95
7.65	15.10	4.15	14.85	4.80	14.75
	7.45		10.70		9.95
	3.72		535		4.97
	~~5.35~~				
	~~907~~				
	~~4.53 × 19 = S 87~~				

3.72
4.97
8.69

b = 4.34 × 19 = S 83

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Nov. 23, 1882

$18^h\ 50^m$ Level No. 2 B. Obs.

Up		down	
E	W	E	W
5.6	16.1	4.0	17.0
9.8	12.0	5.8	15.4
15 4	81	98	124
7.70	14.05	4.90	16.20
	6.35		11.30
	3.18		5.65
	5.65		
	8.83		
$\sigma =$	4.41	$\times .19 =$	$^s.84$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 3, 1882

$20^h 45^m$	N.C.		S.C
17	7.4	18	63.3
	7.7		63.0
	8.0		62.3
	7.3		63.2
	7.7		63.0
	381		148
17	7.62		6296
18	6296		
15	0558		
17	85.29		

Set at 17. 85,3

$20^h 40^m$

	E	F	~~Flexure~~ E	F	G	H	G	H
50 4	43.7	2.3			39.7	27.8	36.2	33.5
	43.8	2.1	47.7	52.1	39.7	27.8	36.8	33.4
	43.8	2.4	47.8	52.0	39.2	27.3	36.8	33.6
		8	47.0	51.7	16	19	18	17
	43.77	2.27	15	28	39.53	27.63	36.60	33.57
	2.27		47.80	51.93				
	39.53		51.93					
	27.63		36.60					
	17320		33.57					
	43.30		16960					
	42.40		4240					
	0.90							
	+ 0.45							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 3, 1882

		N	S	Up E	Up W	down E	down W
40	2 12.3	9.0	1.2	4.0	5.1	0.2	12.2
	16.4	2.3	7.0	0.0	9.3	2.7	12.0
	56.4	11 3	62	−0.2	9.5	29	42
	57.8	5.65	4.10	4.1	5.1	1.45	12.10
	219	1.55	2.84	79	290		10.65
	5.48	+0.77		1.98	7.25		+ 5.32
	− 2.19				527		
	3.29				+ 2.63		
					5.32		
					795		
					3.98	× .19 =	S .76

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 6. 1882 $17^h\ 45^m$

	N.C.		S.C.
17	20.3	18	56.8
	20.3		56.8
	19.7		56.4
	20.1		55.0
	20.0		56.0
	4		31 0
17	20.08		56,20
18	5620		
	17628		
17	88.14		

Set at 17 88.1

Level $17^h\ 55^m$

(1)

Up E	Up W	down E	down W
5.8	16.1	8.8	16.0
9.8	11.9	5.8	19.1
156	80	146	151
7.80	14.00	7.30	17.55
	6.20		10.25
	+ 3.10		+ 5.12
	512		
	822		

$b = 4.11 \times .19 = .78$

(2)

Up E	Up W	down E	down W
9.4	12.2	6.1	18.7
5.8	16.0	8.9	15.7
152	82	150	144
7.60	14.10	7.50	17.20
	6,50		9.70
	+ 3,25		+ 4.85
	+ 4.85		
	8.10		

$b = 4.05 \times .19 = .77$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.15288

Dec – 14. 1882

Collimation found

at 17	89.1		
	W.C		S.C
15h 35s	17 5.4	18	63.3
	6.3		64.2
	6.0		64.8
	8.2		65.1
	6.1		66.0
	32.0		23.4
	17 6.40		64.68
	18 64.68		
	17 1.08		
	17 85.54		

Let at 17 85.5

Level B. Wls.

Up		down	
E	W	E	W
9.4	11.5	2.7	17.5
4.9	16.0	5.5	15.0
14.3	7.5	8.2	12.5
7.15	13.75	4.10	16.25
	6.60		12.15
	3.30		6.07
	6.07		
	9.37		

$b = 4.68 \times .19 = .89$

Long level

E	W
69.0	66.6
44.1	91.8
57.7	78.4
64.0	72.1
63.1	72.3
55.0	81.8
3529	4630
58.82	77.17
	18.35
	+ 9.17

$b = 9.17 \times .052 = 0.51$

Level W. A. R. Wls.

Up		down	
E	W	E	W
12.2	15.1	6.8	10.5
8.2	19.0	−1.0	13.2
8.2	19.0	−0.2	12.5
13.0	14.2	6.0	11.3
13.0	14.4	6.1	11.0
~~13.5~~ 8	18.9	−0.3	12.6
31	40.6	~~2.90~~ 7.4	11.1
10.52	16.77	2.90	11.85
	6.25		8.95
	3.12		4.48
	4.48		
	7.60		

$b = 3.80 \times .19 = .72$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Level repeated B. Obs.

Up		Down	
E	W	E	W
9.0	19.3	10.5	17.7
13.5	15.0	7.2	21.3
22.5	14.3	17.7	39.0
11.25	17.15	8.85	19.50
	5.90		10.65
	+ 2.95		5.32
	5.32		
	8.27		
	4.13		

× 19 = 5.79

7½

15

× 1

Venus South

Dec. 20 1882 S.C.C. Obs. diameter Venus,

π	20	00	40	45	2	2'	45	40	30	20
183		f			a		a			

Venus North

1	14	m	20	40	45	2	2'	45	40	30	20

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1001phae.proj.15288

Dec. 21, 1882

$18^{h}5^{m}$-5^{m}

	N. C.	S. C.
17	17.2	18 75.8
	11.7	75.2
	13.1	74.9
	12.3	76.7
	12.5	76.0
	168	286
17	13.36	7572
18	7572	
	18908	
17	94.54	

$19^{h}0^{m}$ Repeated

	N. C	S. C
17	11.1	18 75.9
	10.4	73.4
	11.0	74.0
	11.1	73.6
	11.2	74.0
	48	209
17	10.96	7418
18	74.18	
	18514	
17	92.57	
	94.54	
	711	
17	93.55	

Set at 1793.5

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 21, 1882

$2^h 50^m$ Level No. 2

	Up		down		Long level
E	W	E	W	E	W
9.7	11.1	5.8	17.4	60.2	73.2
5.8	15.0	6.8	16.3	53.1	81.1
5.8	15.1	6.7	16.3	57.7	75.6
9.6	11.2	5.0	18.2	241	310
5.5	15.3	5.2	18.0	56.02	77.75
9.1	16.7	7.2	16.0		21.73
455	244	367	422		10.86
7.58	14.07	6.12	17.03	$b = 10.86 \times .056 = 0.^s61$	
	6.49		10.91		
	+3.24		5.46		
	+5.46				
	870				
	$4.35 \times .19 = 0.^s83$				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1001phae.proj.15288

Dec. 25, 1882

Long	Coll.			N.C.	S.C.
		10 4		17 18.9	18 49.0
187	31.6	~~10 42 3.9~~	~~20.9~~	18.7	49.1
	33.0	~~23.8~~	41.0	18.6	51.1
	28.5	~~24.1~~	17.8	18.9	51.2
	31		9.0	18.3	49.2
	31.03		917	34	496
		10 4	22.92	17 18.68	49.92
				18 49.92	
				16860	
				17 84.30	
				Set at 17 84.3	

Flexure

		E	7	G	H	E	7	G	H
50	4	44.9	1.6	38.7	29.2	48.2	53.0	32.2	34.8
		45.0	2.3	37.8	29.1	48.3	53.8	32.2	34.8
5		47.7	2.8	38.3	28.8	48.3	53.7	32.2	34.8
		146	7	8	1	8	15		
		44.87	2.23	38.27	29.03	48.27	53.50	32.20	34.80
		2.23				53.50			
		38.27				32.20			
		29.03				34.80			
		174.40				4877			
		43.60				42.19			
		42.19							
		1.41							
		+ 0.70							

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 25, 1882

Reg.

N	S
6.1	6.0
12.3	0.1
8.3	3.9
2.3	10.0
106	139
5.30	6.95
	1.65
	−.82

40 2 7.2
12.4
40 51.9
55.0
65
1.62
+ 2,33

Long level

E	W
51.0	52.3
64.3	69.7
70.0	64.6
88.0	46.3
59.8	73.8
62.8	72.2

E	W
52.3	81.0
64.3	69.7
64.6	
70.0	64.6
46.3	88.0
59.8	73.8
62.8	72.2

Level No. 2

E	W
5.2	7.0
0.8	11.6
0.8	11.7
5.5	6.8
5.6	16.6
0.7	11.6
186	553
3.10	9.22
	6.12
	+ 3.06
	+ 5.83
	8 89

E	W
3.2	12.6
1.3	14.8
2.1	14.0
2.6	13.2
2.6	13.2
1.3	15.2
131	230
2.18	13.83
	11.65
	5.83

$b = 4.44 \times .19 = 0.85$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dec. 25, 1882

Long level

(1)		(2)	
52.3	81.0	70.0	64.6
64.3	69.7	46.3	88.0
1166	1507	1163	1526
58.30	75.35	58.15	76.30
	17.05		18.15
	8.52	1st	9.08
		2nd	8.52
		3rd	5.85
			23.45
			7.82 ×056 =

Readjusted (3)

59.8	73.8
62.8	72.2
1226	60
61.30	73.00
	11.70
	5.85

~~Dec. 26~~ 9 S.C.E. Obs diameter Venus Eq.

Venus Dorsi

10 20 30 45 2 2 45 30 20 10

Sat Venus North

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

1882 Dec. 31
~~1883 Jan~~ 1883 Jan. 1

5h 50m Long Coll

17.868 —
36.L104 41.8
37.5 24.3
37.3 9.6
35?

15h 55m N.C S.C.

17 18.9 18 52.8
19.7 50.8
19.3 49.8
18.6 50.8
19.0 50.5
5 47
17 19.10 50.94
5094
17004
17 85.02

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Long Coll.

N	S	—
12.3	8.2	40 2 12.7
5.8	14.9	53.1
		55.1

Long level

$16^h\ 15^m$

E	W
66.2	68.2
88.5	46.6
1547	1148
77.35	57.40
19.95	

$b = 9.978 \times .056 = 0.^s56$

adjusted

75.2	58.4
79.3	54.7
145	131
77.25	56.55
2070	

$b = 10.35 \times .052 = .^s58$

Level No. 2

Up E	Up W	down E	down W
8.8	11.0	4.4	14.1
4.3	16.2	3.0	15.7
4.3	16.2	3.1	15.6
9.9	10.7	4.3	14.3
+ 3.12 9.9	10.8	4.4	14.1
+ 5.60 4.7	16.0	2.8	15.8
872 10.0	10.9	3.1	15.4
4.36 4.9	15.7	4.7	13.8
$b = 4.36 \times 19$ 4.9	15.6	4.8	13.8
$= .^s83$ 9.8	10.9	2.3	16.3
715	340	369	489
7.15	13.40	3.69	14.89
	6.25		11.20
	+ 3.12		5.60

E	W
54.3	79.9
74.8	59.2
1291	1391
64.55	6955
	5.00
	2.25

adjusted

65.0	69.1
44.8	89.8
1098	1589
54.90	79.45
	24.55

$b = .^s056 \times 12.27 = .^s69$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Long level

E	W
45.3	88.6
68.2	65.6
1135	1542
56.75	77.10
	20.35

$b = 10.18 \times .056 = .57$

E	W
68.3	65.4
50.3	83.7
1186	1491
59.30	74.55
	1525

$b = 7.63 \times .056 = .43$

0.56
0.58
0.69
0.57
0.43
283

$b = 0.566$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Jan 1, 1883

After the ~~ad~~ observations on pp. 222-24
Mr Clark began the reduction of the minute
and the level of the M.C. by adopting
the zero mentioned therein.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

After correction and D Jan. 1, 1883

$23^h\ 55^m$	N. C		S. C
15	87.2	19	88.8
	88.2		89.2
	88.3		88.2
	27		22
15	87.90	19	88.73
19	88.73		
	1663		
17	88.32		

Set at 17 88.3

$23^h\ 50^m$ Level No. 2

Up		down	
E	W	E	W
8.0	0.0	9.6	9.8
3.8	3.9	9.6	9.8
11.8	3.9	9.60	9.80
5.90	1.95		20
3.95			+.10

-1.98
$+\ .10$
-1.88
$-0.94 \times .19 = -0^s.18$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1001phae.proj.1528B

Jan. 1, 1883
15h 30m Level No. 2

up		down		down repeated	
E	W	E	W	E	W
13.1	2.8	9.6	9.8	8.3	11.1
8.5	7.6	10.2	9.0	9.6	9.6
8.4	7.8	10.4	8.7	9.5	9.6
12.7	3.3	8.5	11.1	7.7	11.6
427	215	387	386	351	419
10.68	5.38	9.68	9.65	8.78	10.48
−5.30		−.03			1.70
−2.65		−.02			+0.85
−02					−2.65
267					180

~~$b = -1.33 \times 19 = 0.26$~~

$b = -0.90 \times 19 = 0.17$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Jan. 2, 1883

$15^h 58^m$ Level No. 2

E up	W	E down	W
15.1	6.0	14.7	15.6
11.2	10.1	14.2	13.8
11.3	10.0	14.1	13.8
14.9	6.1	13.0	15.8
125	322	140	190
13.12	8.05	13.50	14.75
5.07			1.25
− 2.53			+ 0.62
+ 0.62			
191			
− 0.96	×19 = −.18		

$16^h 7^m$

	N.C.		S.C.
15	85.3	19	97.0
	85.7		96.4
	85.0		97.3
	85.8		96.7
	85.0		96.7
	18		41
15	85.36	19	96.82
19	96.82		
	218		
17	91.09		
Set 17			91.1

After these observations Mr. Blaeks adjusted azimuth and level three times.
At the close of his work, the Blaeks level was found to read b = +.01s

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Jan. 3/4, 1883

Found ~~that~~ the stars observed last night (Jan. 3) were all taken with the collimation set at 15 88.5 when it should have been 17 91.1, see preceding page. The screw had been disturbed for the purposes of the adjustment by Mr. Clark.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Jan. 4. 1882

Level No. 2

up		down	
E	W	E	W

$19^h\ 35^m$

	N. C	S. C
17	88.8	17 83.4
	87.8	82.3
	87.7	82.3
	87.8	82.0
	87.8	82.4
	49	24
	87.98	8248
	8248	
	1046	
17	85.23	

set at 17 85.2

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

Dan 6-

Level Nov

up		down	
42	44	7.3	5-2
4.4	4.2	5.4	7.1
4.30	4.30	12.7	12.3
		6.35-	6.15-

+.00
-.10
-.05 b = -.05

1881phae.proj.1528B

Jan. 8, 1883 B. Obs.

24h 0m Level

Up		down	
E	W	E	W
5.3	7.0	6.2	5.5
6.6	5.8	6.0	5.9
11.9	12.8	2	14
5.95	6.40	6.16	5.70
	.45	.40	
	+.22	−.20	
	− 20		
	+ 2		

$b = +.01 \times .^{s}19 = 0.^{s}002$

23h 30m

	N. E	S. E
17	80.3	85.4
	81.7	86.0
	81.3	85.0
	82.5	87.1
	82.6	86.5
	84	300
	81.68	86.00
	86.00	
	768	
17	83.84	
	Set at 17	84.5

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

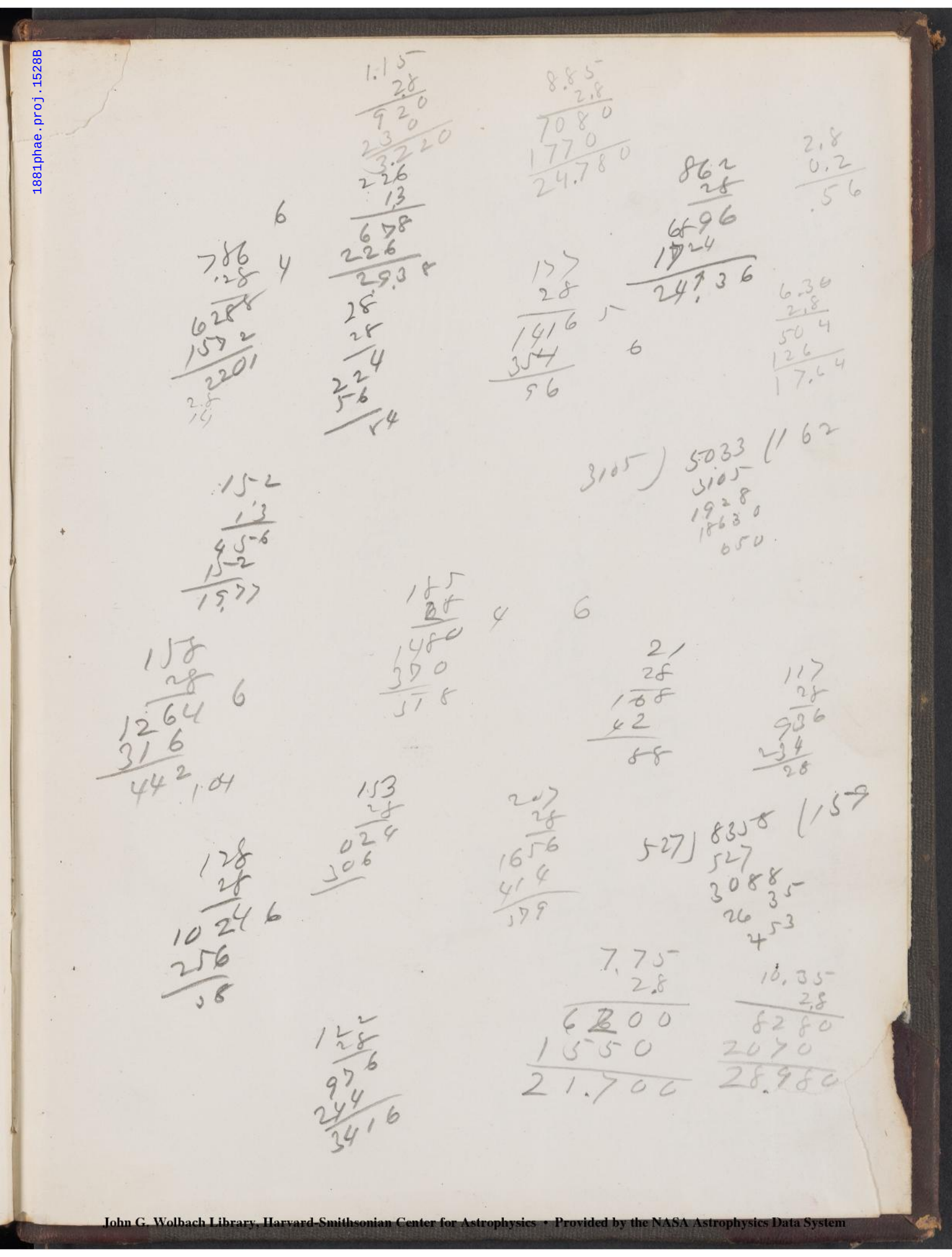
1881phae.proj.1528B

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

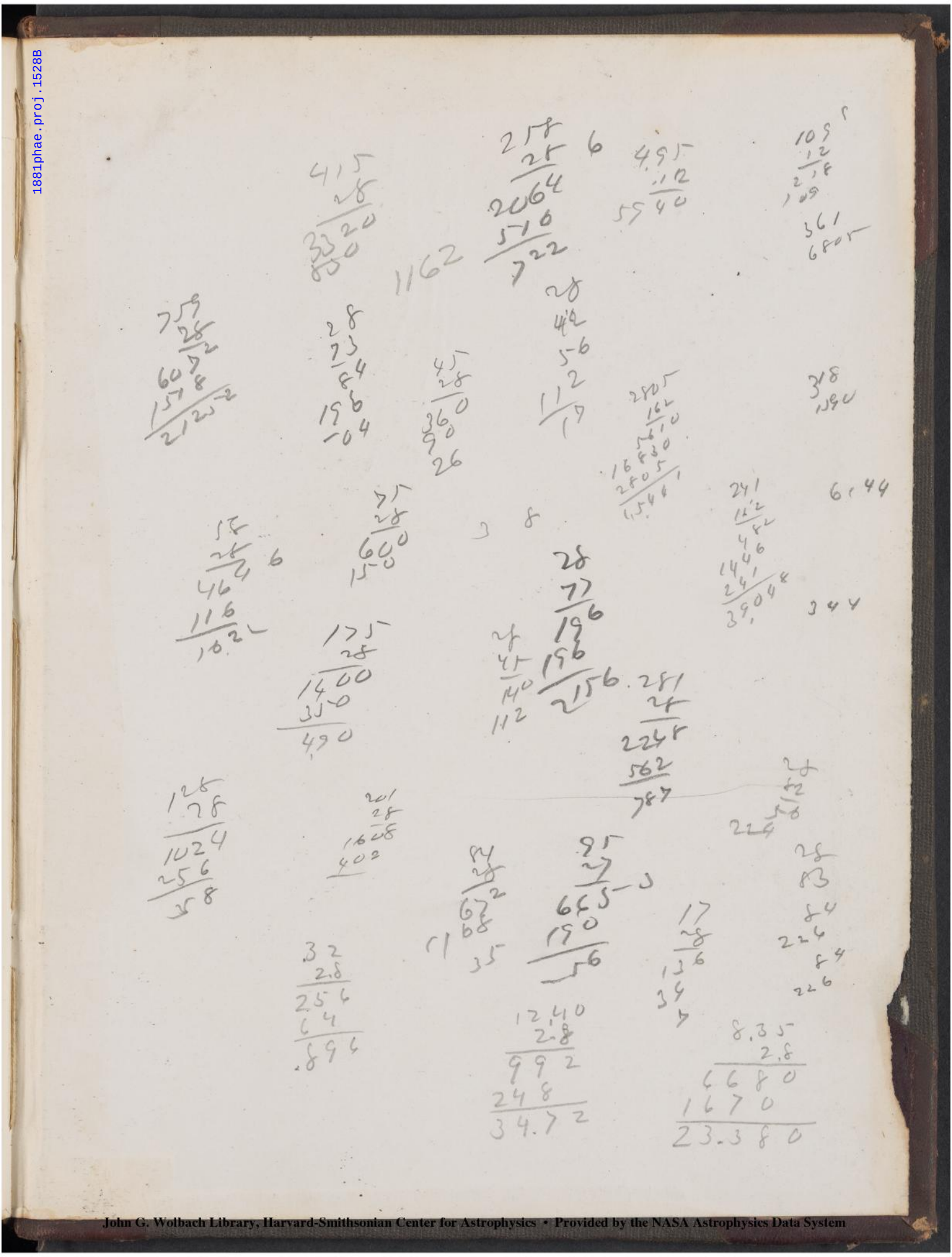


John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1881phae.proj.1528B



John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1991jhae.proj.15288

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System