

KG
11365
422

Barometer.
Thermometer.
Rains.

Charles W. Sever, University Bookstore, Cambridge.

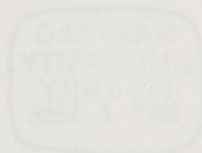
Collimation,
Pressure.

Bookstore, Cambridge.

KG 11365.422

1870phase.proj. 4238

K_{24} $\frac{moh}{\lambda/\mu}$



KG 11365.422



Resume of readings of Thermometer (No 4)

Barometer and attached Thermometer, Collimation and Circle Reading of the North Collimator (N.C.)
The times given are Sidereal. The values of No 4 in the second column are taken from the Meteorological record up to Feb. 1872. The times given for the value of No 4 in the first column are only approximate, the reading being taken after the conclusion of work for the night. Where apparent discrepancies occur the values in Column 2 are to be preferred. From Feb. 1872. No 4 was read twice and after Sept. 25. three times or more as seemed necessary. For the zone observations one reading seems to be sufficient. For the General Catalogue Observations a mistake was made in not reading No. 4 twice or more.

Circle Reading of
North Collimator
= F.C.

Date	Time	No. 4	Bar.	Alt.	Time	No. 4	Bar.	Alt.	h.	F	G	H	Collimation	Rev.
1870 Nov. 10	h m	0			h m	0								
		39.0				33.5	30.16	65.1					37.455	
13	1 0	36.8					29.87	67.6					37.445	
15	0 0	22.0			0 40	34.0	29.72	66.8					37.445	
16	1 10	23.8			0 44	35.0	29.90	61.2					37.454	
17	1 10	24.0			0 48	33.7	29.89	59.8					37.454	
19	4 10	30.1			0 54	30.1	29.95	64.6					37.454	
27	1 50	47.3			1 25	47.3	29.89	68.5					35.430	
Dec 10	4 50	29.4			2 16	29.4	30.16	65.1					35.449	
13	4 50	38.6			2 30	31.8	29.87	67.6					35.601	
18	3 50	22.7			2 50	22.7	29.88	61.0					35.552	
22	3 50	16.2			3 06	16.2	30.24	64.2					35.569	
26	3 30	25.3					30.12	63.5					35.550	
31	3 40	29.5			3 40	31.6	29.88	59.0					35.551	
1871 Jan 1	3 40	19.0			3 45	19.0	29.88	61.4					35.578	
7	7 20	9.5			4 10	13.1	30.20	61.9					35.574	
10	7 40	16.3			4 20	16.3	30.20	70.0					35.575	
17	7 20	28.5			4 47	29.1	30.15	67.0					35.588	
Feb 7	7 10	22.0			6 10	22.7	30.41	70.0					35.590	
11		15.0			6 25	16.8	30.47	67.0					35.546	
20	7 20	30.0			7 00	30.4	30.10	64.0					35.583	
21	8 30	15.0					30.21	65.0					35.583	
28	6 30	29.0			7 30	28.2	30.18	69.0					35.600	
Mar 1	10 30	27.0			7 40	40.5	30.15	67.0					35.611	
2	6 50				7 40	36.6							35.603	
5	10 30	37.5			7 50	37.4	30.97	62.8					35.600	
7	8 20	31.8			8 00	32.2	30.27	65.0					35.607	
9	8 30	46.5			8 10	48.4	30.13	66.0					35.610	
19		35.0			8 47	38.6	30.27	63.0						

Date	Time No. 4			Bar	Alt.	Time	No. 4			Bar	Alt.	E	F	G	H	Collimation
1871	h	m	s	°	'	h	m	s	°	'						Rev.
Mar 14						8	24	37.8	30.08	69.0						35.616
22						9	00	40.0	29.73	64.2						35.605
25	10	40		29.0												35.588
28	9	30		29.3					30.08	58.0						35.607
29				32.0					30.18	61.0						
Apr. 5	11	10		32.3		9	54	33.8	29.87	59.8						35.611
16	11	30		41.7		9	58	39.8	29.77	64.0						35.615
17	10	00		41.5					29.77	58.2						
18	10	00		41.0					30.07	59.0						35.607
24	12	10		54.50					30.27	54.4						35.608
23				44.0					30.20	66.0						
26	12	00		41.6					30.30	65.1						35.607
29	12	00		46.2					29.72	67.0						35.630
30				44.1					29.72	66.5						35.630
May 1	12	00		48.3					29.93	68.0						35.615
2	12	00		54.90					30.75	60.8						35.618
7	12	00		44.5					29.62	64.0						
9	12	00		46.8		12	10	47.8	29.79	73.5						
10	12	20		40.9		12	14	43.0	29.77	66.0						35.626
11	12	30		50.0		12	18	49.1	29.85	63.0						35.626
12				54.0		12	22	57.3	29.80	65.5						
13	13	00		42.8		12	26	44.2	29.83	61.0						
14	13	00		45.2		12	27	47.8	29.87	66.1						35.630
15				47.0		12	31	53.7	29.85	65.0						
16	12	10		53.6		12	35	55.2	29.74	67.5						35.632
18	14	10		51.8		12	43	55.0	30.14	60.8						35.615 Pen wires
20	14	00		55.2		12	51	57.2	30.10	66.5						
23	14	00		61.5		13	04	54.1	30.01	66.0						35.749

Date	Time	No. 4	Bar.	Alt.	W.	Time	No. 4	Bar.	Alt.	E.	F.	G.	H.	Collimation
May 24	14	50	51.8			13	08	54.4	30.31	63.0				
21			55.0			12	55	56.3	29.99	67.0				
25	14	40	62.8			13	15	62.6	30.06	69.2				35.052
26			65.2			13	15	67.1	29.95	71.0				35.066
27			58.8			13	19	52.1	30.27	64.0				
29	14	40	70.7			13	27	73.2	30.13	76.0				
June 1			60.0			13	35	56.3	30.13	67.5				
2			65.1			13	39	65.2	30.06	70.0				
3	15	10	75.9			13	46	75.1	29.92	78.5				43.590
5	15	10	56.8			13	55	57.9	29.97	64.5				43.594
4			67.9			13	50	68.5	29.83	71.1				
6	15	30	69.1						29.93	67.8				43.596
9			56.5			14	10	60.7	30.12	67.0				
12	15	30	57.7			14	22	58.5	29.59	63.5				42.351 uncorrected
14	16	10	58.4			14	30	58.5	28.99	65.2				42.340
17	16	10	56.0			14	42	59.9	30.17	62.8				42.340
19	16	30	63.8			14	50	57.2	29.88	62.1				39.966
21	16	30	54.4			14	58	54.2	30.10	64.4				44.896
25	16	50	60.9			15	15	61.9	30.10	65.9				44.104
26	16	50	67.3			15	17	69.6	29.97	72.3				44.145
27	17	50				15	22	65.1						44.132
29			60.0			15	29	63.7	29.93	71.0				
30	17	00	57.0			15	33	61.3	30.16	67.8				44.132
July 1	17	30	57.8			15	39	57.8	30.25	66.2				
3	17	50	68.9			15	45	70.0	30.04	73.1				
5	17	30	69.2			15	53	69.7	30.02	74.0				44.147 162 = 6
7			68.2			16	01	72.8	29.82	74.3				
9			85.0			16	09	79.6	29.74	87.9				44.103

Date	Time	No. 4	Bar.	Alt.	Time	No. 4	Bar.	Alt.	E	V	G	H	Collimation
1871													
July 10		0	0	0	16	12	68.6	29.86	73.2				
12	17 30	742			16	20	76.7	29.97	78.0				
13		71.0			16	25	72.2	30.07	77.0				
17		62.0			16	40	63.4	29.75	69.0				
20		59.3			16	52	64.1	29.88	66.2				
22		56.8			16	56	60.4	30.03	62.1				
23		60.8			17	04	59.7	30.14	63.4				
27		67.0			17	20	70.2	30.03	73.6				
Aug. 2	19 10	72.0						30.12	73.0				
3	19 10	77.4						29.97	80.0				
5	19 00	72.1						29.73	77.0				46.302
6													
9		64.5			18	11	68.6	29.57	72.2				
10		62.2			18	15	70.4	30.00	69.8				
13	19 00	64.3			18	26	65.1	30.13	68.8				
11		66.8			18	20	68.6	29.96	72.0				
17		63.4			18	42	67.0	30.08	70.2				
18	19 30	63.1			18	46	64.4	29.88	71.9				46.341
19	19 30	58.4						30.06	67.5				
22	19 50	58.5						30.44	63.0				46.371
28	19 50	62.8			19	25	63.5	30.12	68.0				361 = 24
29		72.0						29.95	72.0				
31	20 10	61.5			19	38	62.7	30.08	68.0				46.342
Sept. 1	20 10	56.8			19	42	57.1	30.25	66.0				
2	20 30	63.0			19	46	69.2	30.17	68.7				
3	20 30	64.2			19	50	63.8	30.25	71.3				46.330
6	19 30	68.5			20	01	68.0	29.93	74.4				46.343
7	20 30	55.9			20	05	56.4	30.04	64.3				

Date	Time	No. 4	Bar	Alt. H.	Time	No. 4	Bar	Alt. H.	E.	Z.	E.	H.	Collimation
Sept. 8		h m	0	0	0	h m	0	0	0				
			49.5			21 10	51.2	30.44	64.5				
9	20	00	50.5			20 14	53.5	30.27	62.0				
10			60.8				60.7	30.18	65.0				
14						20 00	Reversed Instrument.						
18	21	50	46.4			20 48	48.3	30.10	61.0				46.291
21	21	50	41.8			21 01	43.5	30.32	55.2				46.287
23	21	00	56.71			21 08	58.4	29.76	62.0				
22			42.8					30.20	56.0				
24			67.1			21 12	66.4	29.77	67.1				
25			52.0			21 16	55.0	29.96	64.0				
27			48.2			21 24	51.1	29.75	61.0				
28	22	30	46.1			21 38	48.6	29.92	59.8				
29						21 32	44.2						
30						21 36	43.7						
Oct. 3			57.6			21 50	57.6	29.85	60.0				
4			53.8			21 54	55.6	29.90	62.0				46.235
5			59.8			21 58	60.2	29.94	64.2				
8			48.5			22 07	49.4	30.37	58.5				
9	22	30	56.1			22 11	58.4	30.20	67.3				46.256
12						22 23	47.4						46.265
13													
14													
16	22	50	46.0			22 39	47.1	30.08	61.4				46.254
17	23	30	45.0			22 43	48.4	30.33	64.3				
21	22	10	46.6			22 59	44.8	30.20	63.9				46.240
22	23	40	58.1			23 02	58.4	29.77	67.0				
23	23	30	61.8			23 06	61.9	29.76	68.0				46.295
29						23 30	39.9	30.09	61.9				

Date	Time	h	m	s	Par	Alt	Time	h	m	s	Par	Alt	E	F	L	Ab.	Collimation
1871																	
Oct 30				43.0			23	34	44.0		30.34	69.5					
31				52.7			23	38	57.8		30.13	63.0					
Nov 2	24	00		38.3			23	46	38.8		29.93	64.0					46.285
5				26.0			23	58	26.3		29.97	63.0					
6	23	30		49.0			24	02	30.0		29.97	65.0					46.280
7	1	00		50.9			0	06	31.6		29.87	64.0					46.219
9	1	00		30.0			0	14	32.7		29.92	68.2					46.246
12				28.0			0	26	27.7		30.34	71.0					
13				31.8			0	30	31.8		30.34	68.9					
19	0	00		33.7			0	53	33.7		30.43	67.0					46.229
22	0	00		54.3			1	05	35.8		29.66	65.2					
23	1	00		25.6			1	09	25.8		30.30	64.3					46.250
25	1	00					1	16	34.1		30.24	64.0					
28				13.8			1	28	13.6		29.95	64.8					46.230
29				17.0			1	33	15.4		29.98	63.7					
Dec. 1	2	00		17.0			1	40	18.8		29.98	63.7					
2	2	10		16.6			1	44	19.1		30.27	66.8					
5				15.2			1	56	16.3		29.91	67.0					
6				15.7			2	00	16.0		29.95	66.2					
9	2	40		18.0			2	12	19.4		30.22	70.0					46.184
11				30.3			2	20	30.2		29.82	55.8					
12	2	40		20.4			2	24	23.5		30.16	70.0					46.198
14				33.0			2	43	33.1		30.22	65.9					
18				31.9			2	48	33.0		29.89	64.9					
20	3	00		6.8			4	30	14.0		29.60	62.0					46.185
24				34.5			3	11	34.0		30.26	64.3					46.209
27	3	00		21.6			3	24	23.3		30.07	63.0					46.186
28				16.9			3	27	15.2		30.50	69.9					46.144

Date	Time	h	m	s	Bar	Alt	h	m	s	Bar	Alt	E	F	G	H	Collimation
Jan 1				0	0	0	3	42	32.8	30.50	72.0					
2	4	50	19.5				3	46	20.0	30.57	62.9					46.154
5			31.6				3	58	32.6	29.80	71.2					
6			23.0				4	03	24.8	29.92	70.1					
8	4	50					4	10	19.6							46.142
10							4	18	31.7							46.181
12			35.5				4	26	36.1	29.85	71.0					
13			35.0				4	30	36.2	29.76	69.0					
14			11.2				4	34	9.9	30.07	64.8					
15			15.0				4	38	15.9	30.10	70.0					
21			35.0				5	01	30.4	29.83	71.0					
24	5	30	18.9				5	13	18.6	29.73	58.0					
30			5.2				5	37	16.0	(30.20)	66.0					41.653
31	3	15	14.9				5	25	10.7	30.10	63.0					
Feb. 1	3	05	18.0				5	40	12.1	30.33	68.2					
Feb. 2	7	05	10.5				7	14	^{+1.1} 17.0	30.55	67.0					
4	6	00	21.9				5	56	23.0	29.95	68.0					41.723
7	3	35	21.8				5	08	18.0	30.58	65.2					41.737
8	5	0	24.0				6	14	23.3	30.35	62.2					
12	6	50	38.0				6	28	37.9	30.07	72.0					41.767
14	3	30	22.2				6	36	17.7	29.47	63.8					
15	6	00	18.0				6	40	16.0	29.56	63.2					
16	7	00	26.8				8	54	^{+2.1} 26.8	29.72	65.0					41.750
17	5	15	25.0				7	55	25.0	29.73	72.0					
18			29.0							30.05	62.0					41.725
19			29.0							30.14	64.0					
20	6	40	30.0							29.73	68.0					
24			71.0				8	30	43.2 ^{+1.8}							
26	3	50	16.2				6	0	16.0	29.83	62.5					42.652
Mar 1			20.3				9	20	17.1	30.07	65.0					

Date	Time	No.	Bar.	Alt.	Time	No.	Bar.	Alt.	E.	S.	E.	S.	Collimation
Feb. 27	6 30	19.0			7 11	18.0	29.69	62.9					42.613
28	5 50	25.4			7 15	20.8	29.74	62.0					42.630
Mar 3	6 00	29.3			8 0	24.0	29.89	67.0					42.638
7					8 16	22.7	29.95	64.1					42.626
11	7 50	32.8			8 21	32.7	30.08	64.1					42.689
14	5 50	39.7			8 30	33.8	29.93	72.1					42.712
18	7 15	23.0			8 30	21.0	29.90	66.8					42.671
19	7 30	28.3			8 30	26.3	29.75	59.0					42.670
21	6 50	18.3			9 15	16.5	30.00	66.0					42.643
24		28.0			9 18	27.5	30.25	57.0					42.676
27	7 10	34.0			9 20	31.6	30.08	67.0					42.694
28	9 30	34.8			9 24	33.1	30.07	63.2					42.670
Apr 1	8 40	36.0			10 50	29.4	29.67	64.2					42.710
2	8 50	36.0			10 50	34.5	30.06	64.9					42.710
3	9 50	40.8			9 50	36.4	29.93	71.0					42.695
5	9 50	42.0			9 50	36.8	30.13	68.0					42.700
6	10 50	40.8			9 10	41.4	30.16	72.2					42.734
10	8 50	47.0			10 50	43.3	29.83	65.8					42.720
11	8 50	44.7			10 30	39.4	30.22	70.2					41.977
16	11 30	35.0			12 30	34.8	30.00	63.9					41.951
17	9 0	46.2			11 40	40.2	30.07	66.3					41.946
18	9 30	43.5			11 30	39.4	29.75	67.0					41.946
20	12 30	54.9			11 40	56.9	30.04	71.8					41.982
21	11 30	52.6			11 40	51.1	29.91	64.8					41.991
22	10 18	43.6			12 50	38.4	29.92	63.4					41.989
23	10 50	41.3			10 30	36.5	30.03	68.0					41.978
24	10 20	49.3			12 50	44.8	29.97	62.4					41.977
25	9 20	57.2			12 10	47.8	29.93	61.0					

Date	Time	h	m	s	Par.	M.L.	Time	h	m	s	Par.	M.L.	E.	P.	L.	H.	Collimation
Apr. 26	10	20	64.7				11	20	61.9	29.68	71.8						187.9
	27	11	50	53.0			11	25	51.8	29.99	64.0						
	29	11	20	46.5			9	50	43.0	30.24	69.0						41.983
	30	9	45	53.5			12	50	46.0	30.32	67.1						41.983
May 17							12	40	53.2	29.98	65.6						44.778
	20	13	30	58.2			12	50	59.5	29.61	67.0						44.778
	21	12	50	53.2			12	55	53.0	29.91	68.3						44.778
	22	30	07	60.4			13	00	56.7	30.07	67.5						44.767
	24						13	10	57.6	29.84	68.8						44.796
June 3	13	0	56.0				15	30	54.5	30.06	62.0						43.599
	6	14	0	53.5			14	02	53.4	29.82	64.4						43.650
	9	13	20	65.0			15	05	63.5	29.83	66.0						43.651
	11	13	00	72.5			15	45	67.3	29.87	70.1						43.669
	17	13	00	73.0			14	45	68.4	30.16	74.8						43.642
	18	13	00	73.5			14	50	68.6	30.18	76.0						
	19	13	20	72.6			16	20	68.2	30.17	70.9						43.651
	20						14	56	68.1	30.23	77.9						43.651
	27	14	40	66.0			16	20	64.2	30.07	67.0						43.660
	30	14	50	86.0			17	30	79.8	29.98	83.2						43.660
July 1	14	30	80.2				15	40	81.8	29.84	84.1						43.648
	2						15	45	70.4	29.93	80.6						43.660
	3	15	40	76.8			17	00	75.0	29.86	78.2						43.680
	6	14	50	76.6			17	10	69.8	30.07	75.2						43.680
	7	16	00	74.4			17	30	71.3	30.15	76.0						43.661
	9	15	00	76.0			17	15	71.1	30.17	76.5						43.661
	11	15	15	78.5			17	20	75.6	29.90	80.6						43.674
	14	15	00	78.0			17	10	74.0	30.00	78.0						43.673
	15	15	20	79.2			16	55	77.9	29.93	80.8						43.678

Date	Time	h	m	s	Bar.	M.H.	Time	h	m	s	Bar.	M.H.	E.	V.	L	H.	Collimation
1872																	
July 16	16	0			74.9		17	40			74.2	29.79	79.0				43.678
20	16	30			73.5		18	50			67.8	29.99	71.5				43.660
21							17	50			69.5	29.86	78.4				43.660
22	16	50			61.0		17	30			65.0	29.83	71.3				43.660
23	16	50			66.9		19	00			65.2	29.85	72.2				43.660
24	16	15			70.0		17	12			67.9	29.86	74.2				
25	16	15			69.7		17	45			66.5	30.13	72.1				
27	16	50			69.2		17	45			60.3	29.85	69.5				43.648
28	16	40			67.8		17	30			66.0	30.07	72.8				43.648
29	17	00			70.9		18	50			69.9	29.87	76.0				43.648
30	17	25			65.9		18	30			64.2	30.05	71.3				43.661
Aug 1	16	25			66.2		19	10			62.4	30.03	67.9				43.661
4	16	40			62.9		17	50			61.9	30.23	68.5				43.642
5	16	25			68.9		18	20			65.4	30.28	69.4				43.639
6	16	30			72.4		20	20			66.7	30.23	74.1				43.644
7	16	30			75.0		20	50			71.4	30.23	75.5				43.644
8	17	30			77.9		18	50			75.8	30.22	79.2				43.644
9	17	50			74.2		19	30			73.3	30.08	78.2				43.644
10																	43.644
14																	43.637
15																	43.652
Sept 9																	47.405
10																	47.405
12																	47.398
18																	47.407
19																	47.407
23																	47.407
25																	44.662

Personal Equation Observations.

Date	Time	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	Collimation
Sept. 28	19	0	59.5		22	35	53.8	30.11	65.0								44.662
	21	40	54.9														44.650
29																	44.666
30																	
Oct 2	18	45	54.0		22	30	46.1	29.85	60.9								44.585
	20	25	49.8														Adjusted
3	21	15	48.9		22	30	50.2	29.71	59.8								44.592
9	19	55	52.8		20	45	50.7										44.601
10																	44.592
11																	44.636
12	20	10	44.9		22	10	40.4	30.13	54.7								
	21	40	42.9														
14	19	15	49.2					29.63	63.0								44.609
	21	50	47.2														
16																	44.595
20	19	10	46.0		22	0	42.8	30.09	61.0								44.584
21	20	0	43.8					30.18	69.0								44.611
24																	44.600
28																	44.592
Nov 2																	43.924
																	new wire
4	20	50	36.2		23	10	33.8	30.38	61.8								43.908
13	1	55	38.3		2	38	35.5	30.14	64.0								
16	20	45	37.2		22	20	34.0	30.07	66.3								
					0	50	31.8										
17	21	20	33.6		0	0	29.8	30.32	64.0								43.913
	22	20	31.8		0	50	29.0										
19	20	30	36.3		23	15	33.0	29.97	60.2								43.945
20	23	50	31.8		0	55	29.8	30.00	69.8								
	0	0	30.3														
21	21	15	31.2		22	15	29.8	30.25	63.0								43.946
23	21	15	35.6		22	24	34.8	30.14	62.3								43.946
					1	12	32.3										
24	0	58	45.9		1	30	45.2	29.86	63.0								43.965
27																	43.938
Dec 2																	43.921
3	0	35	36.8														
	1	45	34.5														

Date	Time	h.	m.	s.	Par.	Alt.	Time	h.	m.	s.	Par.	Alt.	L.	F.	L.	H.	Collimation
1872																	
Dec. 4	23	55	28.7				0	10	28.0	30.22	63.8						
	7	21	50	28.5			23	15	26.3	(29.95	54.8)	63					
	10	0	20	16.1			0	0	25.8	29.97	62.8						43.924
17																	
17																	44.033
19																	44.001
21	22	50	26.8				1	45	20.4	30.15	73.2						
	30	5	23.8				2	30	16.6								
22	23	00	7.8														43.987
23	1	50	17.6				2	50	19.3	30.20	55.0						
							3	50	16.3								
24	22	58	6.4				23	30	5.7	30.42	56.0						43.974
							0	50	3.7								
26	23	06	+ 15				0	15	-0.2	30.43	55.0						
30	1	15	10.8				3	50	6.8	30.47	57.2						43.975
1873							3	45	6.1								
Jan 1	23	50	20.8				1	45	17.2	30.39	66.0						
	2	55	15.2				3	50	14.2								
	4	3	30	26.0			4	40	23.6	30.20	28.0						
6	0	0	29.2				2	15	25.7	30.27	61.3	5' 38.3"		12.57			43.992
	0	45	27.2				3	30	23.7								
							4	30	22.0								
7	2	30	16.8				4	30	12.8	30.40	63.8						
	3	50	14.0														
9	0	10	28.4				2	15	25.0	29.97	63.0	15.23		12.80			44.013
	1	20	26.8				4	50	21.8								
12	2	50	11.9				4	40	9.5	30.53	63.0	14.53		7.43			43.970
14	2	40	34.8				4	50	26.8	30.41	64.7	11.43		12.43			43.977
16	2	45	43.5														
19	2	45	19.3				4	55	18.2	29.97	58.2						
22	4	0	28.8				5	25	28.0	29.94	58.6	14.53		13.32			
28	3	15	21.6				4	54	21.8	29.87	54.8						
29	1	45	5.0				4	0	+ 1.3	30.23	56.8	14.53		10.56			43.957
	3	00	3.0				5	48	-0.2								

Date	Time	h	m	s	Bar.	Alt.	Time	h	m	s	Bar.	Alt.	E.	W.	Collimation
Feb. 2	1	50	11.6	0	0	0	3	52	7.8	30.22	53.2	14.77	70.3		43.959
	4	30	43.2				5	53	6.4						
	5	2	00	33.0			5	0	43.2	29.58	65.2	15.63	13.13		43.965
	2	45	31.6				4	9	29.1	30.23	67.9	14.63	15.41		43.989
	6	4	12	35.5			6	50	34.4	30.10	61.0				
	8	4	15	37.9			6	40	34.0	29.67	66.0				
	9	4	15	13.8								13.47	13.10		44.006
	10	4	40	9.5			6	40	9.0	30.11	57.0				
	11	5	11	23.8			7	10	21.8	29.80	63.8				
	13	4	30	16.8			6	30	15.4	30.20	59.5	13.20	5.97		43.959
	13											53 = 42.30	3.80		
	17	4	45	35.6			7	15	31.8	30.14	66.0	15.13	12.87		43.958
												55 = 42.45	12.00		
	18	4	45	28.8			6	15	28.2	30.37	65.4	15.40			
	19	5	20	37.8			8	20	36.9	29.92	63.0	15.40			
	20											16.37	14.23		43.978
	22	5	15	15.2			7	10	12.5	29.52	57.2	= 0 h m s.			
	23	4	40	7.2			5	50	4.9	29.34	57.0				
							6	25	3.9						
	24	5	20	9.5			7	32	8.9	29.59	55.5				43.944
	25	5	35	27.8			7	40	24.8	29.76	58.1	14.97	12.37		43.948
	26	5	40	27.8			7	32	24.9	30.07	67.2	= 5 h	8.14		
	26.8											14.22 m			
												= 7 h 45	8.10		
												15.33			
26	The pointing on the North Collimator has evidently changed.														
26.8	Reading at 10.4 ^h after new pointing											16.27	9.87		
27.1	Reading before new pointing											14.57	10.07		
27.1	Reading after new pointing											15.87	11.43		
27.9												14.33	9.90		
28	Before new pointing											14.70	9.60		
28	After new pointing											15.43	10.67		

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															A.C.	
Date	Time	h	m	s	Bar	Alt	Th	Time	h	m	s	Bar	Alt	Th	E	Collimation
Apr. 23	8	00	47.2									29.76	48.8	1570	2540	44.014
23	11	15	42.9									29.78	47.2			
26	9	30	44.2			10	55	42.3				29.67	46.8			
27	9	30	50.4			10	35	48.0				29.92	52.1			
May	1	9	45	62.1		11	30	46.2								
						11	05	58.2	30.07	60.2	13.53		34.07		44.044	
	4	10	00	52.8		12	05	58.2								
						11	15	47.9	29.97	43.0	14.43		30.30		44.015	
	5	10	15	53.8		12	20	47.2								
											13.43					
	6	10	55	51.0		11	40	48.3	30.30	57.4	13.43		33.80			
	7	10	30	48.8		11	20	47.2	30.36	54.2						
	8										12.80		31.70		44.042	
	12	10	15	58.2		12	20	53.8	29.74	57.4	13.60		31.93		44.032	
13	11	00	54.8			12	50	52.3								
13	11	00	54.8			11	55	52.8	29.62	58.7						
14	10	40	54.5			13	15	48.9								
14	10	40	54.5			11	20	52.3	29.65	56.8						
15	11	50	53.7			11	50	57.2	29.78	55.4	6' 32.23		46.67		44.830	
18	11	00	47.4			12	20	49.8								
									29.96	56.8						
19	11	20	51.4			11	50	50.6	30.04	59.2					44.779	
20	11	15	51.7			13	20	47.8								
20	11	15	51.7			11	50	50.7	30.27	57.8						
25	11	35	66.0								33.40		54.10		44.758	
27	12	00	63.5			13	15	59.0	29.90	65.0	30.80		54.73		44.778	
29	12	00	73.9			13	30	70.2	29.93	73.9	34.37		54.87		44.806	
31	12	30	54.2			13	30	51.0	30.32	59.9						
June	1	11	50	72.0		13	20	66.8	30.07	70.9	32.53		58.27		44.754	
	2	12	05	63.3		13	55	59.0	30.16	63.2					44.754	
	4										38.87		57.50		44.766	
	5	12	30	55.5		14	15	53.8	29.73	62.0						
						14	50	52.7								
	9	14	30	58.2		15	05	56.8	30.03	63.8	36.47		54.60		44.777	
	10	12	35	66.8		14	15	64.8	29.92	67.2						
						14	50	64.7								

A.C.

Date	Time	No. 4	Bar	Alt.	Time	No. 4	Bar	Alt.	L	H	L	H	Collimation
1873													
June 11	12 55	718			14 50	66.2	29.97	69.8					
	12 13 00	64.3			15 25	65.3			58.1				
					14 15	60.1	30.16	66.0	38.80		57.63		44.795
	15 13 15	71.2			14 00	68.8	29.85	71.2					
	16 13 30	74.5			14 45	67.3							
					14 30	72.0	29.77	77.4	38.13		63.23		44.817
	17 13 15	70.6			15 45	68.8	29.89	62.5	38.23		58.40		44.823
	25 15 10	65.3			16 00	62.8	30.40	67.9					
	26 14 15	73.4			15 55	68.4	30.23	73.0	41.10		62.37		44.800
	29 14 15	78.2			15 15	75.0	29.91	77.3	40.20		63.67		
	30 14 15	76.2			15 15	73.9	30.01	77.5					44.800
July 3	15 20	76.1											
	5 14 55	73.8											
	6 14 15	67.9			15 52	64.2	29.97	71.8	40.53		62.80		44.832
					16 25	62.8							
	7 14 35	63.8			15 30	61.8	30.05	70.5	41.27		65.03		44.809
					15 55	60.4							
	9 15 00	65.8			16 40	62.5	30.06	69.9					
	10 14 45	73.0			16 20	72.2	30.07	66.4					44.808
	12 15 15	68.5			16 00	65.8	30.23	70.8					
	13 14 45	71.9			16 03	72.6	30.24	67.1	40.47		62.40		44.795
	15 15 30	80.3			16 30	77.3	29.94	82.2					
	20 15 30	71.1			16 55	67.2	29.94	71.8	41.00		65.13		44.800
	21 15 30	71.8			16 45	68.3	30.05	73.8					
	22 15 30	74.6			16 30	72.7	30.17	74.2					
	23 16 00	76.8			16 55	75.3	30.03	78.4					
	24 16 00	77.1			17 00	74.9	29.94	79.8					
	26 16 45	77.8			17 10	77.2	30.09	79.9					
	30 16 11	81.3			17 30	78.5	30.06	84.5	40.43		64.83		44.802
Aug. 4	16 00	71.0			18 00	77.1	30.20	72.2	41.23		64.03		44.834
	5 16 30	66.2			18 20	62.1	30.27	71.8					
	9 16 45	71.1			18 15	72.0	30.08	65.5					

A. C.

Date	Time	No. 4	Bar. A.H.H.	Time	No. 4	Bar. A.H.H.	E. 4	E. 26	Collimation
Aug 10	16 45	67.4					41.73	64.00	44.810
11	16 45	65.2		18 00	70.6	30.19	70.6		
12	16 45	63.7		17 30	62.3	30.23	70.6		
28	18 00	63.7		19 30	61.9	30.32	68.8		
Sept 1	19 00	67.5		20 00	65.1	29.77	72.0	35.50	68.63
2	18 30	65.2		20 15	61.6	29.73	68.3		
3	18 15	66.0		20 00	62.8	30.07	67.9		
6	18 30	58.3							
7							37.04	56.40	44.777
8							37.07	57.00	44.781
9							37.03	56.17	
Oct 5	19 40	65.2		22 45	57.8	29.73	62.7	33.93	55.63
8	19 20	52.4		22 30	54.4	29.71	54.8	36.50	57.83
9	19 00	49.3		22 15	43.3	30.18	50.8		
13	19 30	45.5		21 15	43.0	30.11	53.4		
14	20 15	55.2		21 15	56.0	30.22	60.6		
15	20 15	48.8							
17							55.1		
20							27.35	42.83	41.542
21	19 210	54.1					23.28	38.98	
22	19 30	54.8					23.63	37.80	41.552
23	19 30	54.8		23 15	48.0	30.14	58.1	25.90	39.77
28	21 30	45.3		22 45	43.8	29.78	55.1	26.53	33.93
29	22 45	40.3		24 00	37.8	30.22	48.5	27.10	32.66
30							27.67	37.17	41.536
Nov 1	21 55	38.4		23 15	37.0	30.27	45.2		
2	23 15	44.6		22 00	43.5	30.10	47.2	28.80	34.77
3	22 15	40.2		22 55	38.8	30.10	38.6		
4	21 40	40.7		23 45	40.3	29.97	45.2		

See note under Runs

J.E.

Date	Time	No. 4	Par.	Alt.	Time	No. 4	Bar.	Alt.	E	Z	G	H	Collimation
1873													
Nov 5	23 00	32.5	0	0			30.19	42.2					
6	21 45	35.0			23 45	30.7	30.32	41.0					
9	21 59	41.5			23 30	40.9	29.75	46.8					
10	22 20	28.3			0 00	26.8	29.94	32.0					
18	23 00	27.5			0 00	27.5	28.94	32.7					
19	23 15	28.2			1 00	27.2	29.27	33.8	56"		"		41.512
22	22 30	30.4											
23									28.27		21.70		41.510
Dec 1	23 12	8.1			1 00	7.8	30.74	59.4	30.50		13.80		41.483
3	See note under head of Decs. re												
3	1 15	41.2					30.30	35.8					
6	22 50	29.7			1 25	28.3	30.37	33.8					
7	22 45	26.1			2 00	23.3	30.55	29.6	27.30		26.40		41.512
9	1 30	42.2					29.82	42.0					
10	0 15	30.0			2 15	27.8	30.23	33.8	26.17		27.62		41.512
10	Put on a nickel plated screw-head on E. Disturbed reading 2" or 3"												
15	0 00	29.3			2 10	28.3	30.38	63.1	28.83		31.01		41.539
16	0 01	38.3			0 30	35.7	30.17	40.2	28.63		29.07		41.518
17	3 00	34.0			1 30	31.8	30.04	39.0	27.83		25.27		41.518
18	0 1	36.4			3 00	34.1	29.77	39.4					
21	1 15	18.8					30.27	30.0	31.53		26.60		41.512
22	1 20	28.2			3 10	27.4	30.40	30.2	29.80		25.53		41.513
24									30.87		27.73		41.493
28									31.7		28.70		41.492
30	2 10	29.3			3 30	28.4	29.62	33.8					

Date	Time	h	m	s	Bar	H _g	H _h	Time	h	m	s	Bar	H _g	H _h	E	F	G	H	Collimation
Jan 15	4	08	11.2					5	00	10.3	29.57	25.3	50.0	0 22.0			22.42		46.386
17	2	45	16.1	30.37	24.7	5	15	11.3	30.38	33.0									
18	2	30	25.7	30.37	32.1	5	00	23.9	30.35	29.9	22.20						24.53		46.529
20	2	10	23.8	30.45	34.7	5	00	20.8	30.45	26.2	20.47						22.07		46.492
26													23.30				17.30		46.491
28	3	45	34.3	29.58	30.0														
Feb 1	3	45	48.3	30.32	19.3	4	30	3.2	30.32	19.3									
4	4	45	21.6			6	15	19.6	29.98	25.1									
5	3	45	9.3			4	30		30.24	22.6									
10	4	15	26.2	29.54	28.2	6	30	22.8	29.53	27.2									
11	4	15	23.8	29.70	27.7	6	30	20.3	29.74	26.1	22.20						18.70		46.473
12	4	28	24.1	30.15	30.5	6	45	21.8	30.15	28.3									
14	3	40	37.4	30.07	42.3	6	45	32.8	30.13	38.9									
15													24.77				24.93		
16	5	35	34.8	29.53	39.2	6	45	33.8											
17	5	00	24.2	29.83	33.0	7	00	21.3	29.87	29.5	21.17						22.57		46.532
18	5	00	26.3	30.27	32.9	7	00	23.6	30.27	30.7	22.10						23.57		46.505
23													20.90				26.07		46.527
24	5	30	26.4	30.43	36.8	7	30	24.6	30.42	32.9									
26	5	30	24.3	30.13	34.9	6	30	23.9	29.07	32.9	sure 52.07						53.70		46.505
Mar 1	6	15	37.6	29.95	40.1	8	00	36.3	29.92	40.1	22.83						27.90		46.499
4		30	40.7																
2	6	50	42.2	30.06	44.5	8	00	38.6	30.07	41.2									
3	5	45	49.3	29.91	45.7								20.37				31.23		46.492
4	5	45	51.2	29.54	48.3	7	45	41.7	29.62	48.1									
5	5	30	36.0			7	15	30.0	30.27	35.2	23.47						26.13		46.512
8	6	30	34.4	29.47	39.7	8	00	33.3	29.45	38.0	22.17						27.93		46.506
12	6	30	19.0	29.35	27.7	7	45	16.9	20.37	24.8									
16	7	00	34.2	30.34	38.8	8	15	32.6	30.34	38.9									

S.E.

Date	Time	No. 4.	Par.	Alt.	Time	No. 4.	Par.	Alt.	E.	G.	E.	G.	Collimation
1874 Mar 19									50.0 21.27		33.90		46.510
21	7	00	42.0	29.74	46.2	9	00	41.1	29.73	44.9			
22	6	30	37.5	29.67	42.9	9	00	34.2	29.90	39.3	22.07	29.67	46.512
23	7	00	25.3	29.85	33.8	9	00	22.2	29.90	30.9			
24	7	15	22.3	30.13	26.9	9	00	21.2	30.14	36.2	22.73	25.40	46.452
25	7	15	40.1	29.94	38.0	8	45	38.2	29.93	48.1	27.30	31.33	46.463
30	6	45	44.6	29.80	43.8	10	00	37.7	29.87	41.1	25.37	31.77	46.465
Apr 1	9	15	23.7	30.13	35.2						28.13	31.80	46.479
2	8	15	33.4	29.85	40.2	10	20	31.1	29.86	35.0	27.60	31.80	Set at 472 46.465
4	8	15	21.4	29.97	33.9	10	00	19.3	30.04	28.2			
6	8	00	39.3	30.00	43.2	10	00	37.2	30.03	41.3			
8	8	30	42.2	29.93	46.8						24.87	36.07	46.493
13													
13	10	00	35.2	30.32	40.5								46.533
15	11	25	54.8			12	30	53.6	29.71	53.3			
16	8	45	43.2	30.07	48.9	11	00	39.0	30.16	44.2			46.554
21	Set the micrometer head of G. so that when the telescope points on the north collimation, the reading of G. is about 25 less than E. In passing from N. to S. the reading of G. will always be greater than E. In the extreme south it will be about 18 greater.												
21	8	40	45.4			9	30		29.79	46.7	19.00	16.85	46.560
22	9	00	46.2	29.97	48.2	11	00	41.9	29.78	46.8	17.77	17.90	46.566
27	9	30	42.9	29.92	45.2	11	00	40.2	29.73	44.0	18.10	16.93	46.583
30	9	45	40.6	29.53	43.8	12	00	38.0	29.54	42.3			
May 5	10	30	43.7	29.64	51.9	12	00	41.7	29.63	48.8			
7	10	45	44.1	29.97	52.1	12	15	41.8	30.03	49.8			46.536
8											5.0 23 35 14.00	12.90	46.533
10	10	12	46.3	30.03	59.3	11	45	44.6	30.16	53.1			46.533 morning

N.C.

1870 phase

Date	Time	No 4	Bar	Alt	Time	No 4	Bar	Alt	E	E'	E''	Collimation
May 11	10 30	46.2	30.42	55.2	12 15	41.8	30.46	50.4	5° 25'			
	12 10 45	50.3	30.27	55.8	12 30	47.0	30.27	52.2				46.540
	13 12 00	68.2	30.02	66.1	13 00	65.5	30.00	65.2				
	14 12 30	62.8	30.13	67.0					13.77	29.07		46.568
	19 11 10	56.9	29.92	62.7	13 00	52.7	29.96	58.5	51° 3'	13.90	25.23	46.569
	19	Set G. back to 5° 3' 13.47										
	26 11 15	60.2	29.82	66.0	13 15	55.0	29.82	61.6	14.03	15.53		46.555
	24 11 30	63.8	30.02	63.9	13 30	59.3	30.04	62.2				
	27 11 30	62.1	30.02	67.3	13 45	57.5	30.04	62.2				
	28 11 45	65.4	30.06	67.8	13 45	61.8	30.07	66.8				
June 1	13 15	56.2	29.74	61.8	14 15	53.9						
	2 12 15	66.4	30.13	63.3	14 15	52.2	30.16	57.9	15.30	17.93		46.540
	8 12 45	73.2	29.75	76.0					12.97	26.73		46.580
	9 12 45	71.4	29.77	74.1	15 25	67.9						
	10 13 00	65.3	30.07	72.2	15 00	59.7	30.10	65.4	14.70	12.87		46.576
	15	See note in Chronograph Book.										
	15 13 45	73.3	30.23	73.3					16.44	19.12		46.576
	17 13 15	69.7	29.46	69.7								
	18 12 45	67.0	29.82	69.0	15 00	64.0	29.83	67.9	15.83	14.47		46.576
	21 13 30	62.2	30.07	63.1					15.43	12.47		
	22 13 12	78.8	29.97	74.1	15 00	73.8	29.97	73.6	16.73	19.20		46.571
	23	The trouble with microscope I. does not seem to be remedied.										
	Began a series of observations to see if it is possible to detect the cause of the error on the following plan. I The north collimator is to be read three times each day viz. in the morning, in the afternoon, and after finishing observations. II The above readings to be made first, without disturbing the screw head and frame, second, after every conceivable disturbance of them. P.M. June 23											
	23 15 15	71.8	29.75	76.0	16 40	71.2	29.73	74.0	14.45	14.27		

A.C.

in	Date	Line	No 4	Par.	Alt.	Time	No 4	Par.	Alt.	Q	Y	Z	Collimation
	1874	h	m	s	°	m	s	°	m	s	°	m	s
	June 23									50.31			
										14.63		15.17	
										I		II	
	24	9 A.M.								14.93		16.23	
										I		II	
	24	9 A.M.								14.93		17.50	
	24									15.12		18.03	
	24									15.03		14.10	
	24	It is obvious that Y can be moved about 4" by motion of the frame. On examination found that the clamps clamping the microscope tube to the frame did not press hard enough when screwed down as far as the screws would carry. Put paper under them (both). They now seem much firmer.											
	24	New Observations											
										I		II	
	24									15.27		13.27	
										I		II	
	24									15.27		14.80	
	24									15.43		14.47	
	24									15.43		14.13	
	24	13. 30	67.2	29.92	71.0	16	00	61.3	29.96	67.0	16.87	17.63	46.561
	24	10 A.M.								16.33		16.47	
	24	10 A.M.								16.33		17.53	
	25	6 P.M.								16.77		20.23	
	25	6 P.M.								16.77		20.50	
	25	13 45	72.4										46.556
	25	9 A.M.								15.50		16.30	
the	25	9 A.M.								15.00		16.27	
	28	13 35	83.6	29.72	80.6	16	20	75.5	29.73	78.9	17.37	23.77	46.560
ions	28									17.37		23.57	
and	28	15 55								16.27		20.10	
23	29	9 A.M.								15.50		21.03	46.616
	30	9 A.M.								14.53		19.53	

1870phae.p.p.

1874

Date	Time	No. 4	Bar.	14th	Time	No. 4	Bar.	Alt.	E.	F.	G.	H.	Collimation
June 30	14 09	73.2	29.93	79.2	16 55	66.3	29.97	73.4					
July 1	After adjustment. See Chronograph Book.												
1	14 25	74.3	30.07	78.4	16 15	69.2	30.07	73.8	3.23	4.27	3.37	2.27	46.602
2									2.23	7.67	4.20	2.73	46.602
6	14 40	63.3	30.13	67.1	16 45	60.8	30.14	65.0	2.23	10.13	2.93	3.87	46.562
7	14 30	73.8	29.93	75.9	16 45	68.9	29.90	72.3	1.80	9.97	4.47	3.77	46.570
8	15 05	74.5	29.81	80.0	16 10	77.0	29.83	78.4	2.30	9.40	4.30	3.43	46.601
13	15 50	71.7	30.07	74.1									
14	15 15	77.4	30.14	78.6	17 00	73.7	30.14	76.2					
15	15 10	81.7	29.95	83.3	16 40	77.5	29.83	79.8	2.53	9.43	2.80	1.63	46.593
18	15 55	72.2	30.22	77.0	17 20	69.8	30.23	74.1	2.00	6.53	7.53	1.70	46.593
19	15 30	73.5	30.23	78.2	17 00	69.9	30.23	74.4	1.33	5.80	8.40	1.93	46.599
21	15 40	70.8	30.20	75.9	17 15	66.7	30.20	71.9	1.87	6.13	5.53	1.37	46.565
22	16 45	71.2	30.08	76.1	17 55	65.3	30.07	70.7					
23	15 40	72.5	30.08	77.1	17 55	65.8	30.09	72.2	2.33	3.20	8.67	2.00	46.543
27	15 55	74.8	30.02	78.2	18 10	68.3	30.02	73.0	3.27	9.97	6.97	3.27	46.576
28	16 15	72.6	29.98	77.0	18 10	69.3	30.00	73.2	1.63	8.83	6.57	2.20	46.578
30	16 10	73.4	29.97	76.2	18 35	67.5	30.02	72.5	1.77	9.08	6.87	2.20	46.559
Aug. 2	16 05	66.0	29.76	73.6	18 30	62.4	29.77	68.1	2.93	10.13	6.97	3.20	46.566
3	16 15	64.5	30.00	69.9	18 05	58.8	30.02	64.8					
4	18 15	64.7	30.17	69.5	18 35	64.4	30.17	68.9					
5	16 30	64.9	30.13	72.4	18 10	60.4	30.11	67.2	2.83	11.63	9.87	2.90	46.536
5	J. F. M. is not certain whether he has been in the habit of reading microscope G. from 5' to 5° or from 55' to 5°. Probably read both ways.												
6	16 30	59.4	30.08	71.2	18 20	56.5	30.07	66.1					
10	17 00	72.6	29.93	77.0	18 45	70.2	29.95	75.1	1.00	8.83	7.87	3.17	46.593
19	17 00	71.2	30.17	74.3	18 30	67.4	30.17	72.0	0.18	8.10	6.40	0.63	46.569
20	18 00	77.5	29.96	78.1	19 20	76.3	29.97	78.0					

7.6

Date	Time	No. 4	Bar.	04 M	Time	No. 4	Bar.	04 M	E	F	G	H
1874	L	m	0	0	0	L	m	0	0	0		
Aug 22	17	20	63.1	30.20	71.7	19	15	58.8	30.32	65.9		
23	17	20	62.5	30.01	69.2	19	45	57.5	29.98	63.6	-0.47	+9.77
24	17	50	59.3	30.17	68.8	19	30	57.0	30.18	64.0		
25	19	15	55.8			20	10	54.8	30.23	61.8		
26	17	55	58.6	30.27	67.9	19	25	55.8	30.27	63.0	1.27	11.20
27	17	25	61.7	30.18	68.8	19	25	57.5	30.18	63.9	1.17	11.23
31	17	50	73.1	29.98	74.9	19	25	68.2	29.92	73.2	1.03	9.87
Sept 1	18	00	69.8	30.20	72.0	20	00	65.2	30.32	69.1	0.07	7.97
2	18	10	69.6	30.32	73.2	20	00	64.5	30.32	70.5	0.77	9.33
6	18	00	71.2	30.32	72.1	18	45	70.3	30.22	72.2		
7	18	00	64.4			20	00	61.2	30.32	68.0		
7	The reading for the runs is from 5' to 8'											
9	18	20	64.5	30.13	70.1	20	00	51.2	30.12	67.0		
10	18	45	77.0			19	00	75.8	29.93	74.2	1.60	9.43
10	After adjustment of Collimation Screws.											46.576
12	18	25	60.5	30.24	70.8	20	30	65.2	30.24	63.8		
13	18	17	61.3	30.33	68.3							
14	18	45	62.8	30.27	69.3	20	30	60.4	30.26	67.0		
Oct 3	17	48	53.6			21	45	48.2	30.15	56.0	0.50	9.80
4	20	25	47.2	30.27	56.8	22	10	44.2	30.26	51.8	1.17	9.03
5	19	00	50.6								0.27	1.07
6	20	40	52.8	30.26	57.0	22	40	48.8	30.27	54.8		
10	20	50	61.1	29.68	59.9	22	40	59.1	29.67	60.2		
11	Adjusted zero heads of microscopes so that they will all be positive.											
11	20	00	65.4	29.83	61.1	22	45	50.4	29.82	56.2	1.43	7.80
12	20	30	49.7	29.98	58.8	22	40	45.6	30.13	52.6		
15	20	45	49.2	30.16	54.8	22	50	46.9	30.16	51.7	4.17	10.87

A. E.

Date	Time	h	m	Sec	Bar	Alt.	Time	h	m	Sec	Bar	Alt.	E	W	L	W	Collimation
Oct 18	20	57	44.9	29.60	56.3	22	30	44.2	29.59	52.0							
19	21	20	39.7			23	20	38.2	29.86	44.2							
20	20	57	53.1	30.03	54.1	22	50	53.3	30.03	54.2	4.51	10.53	2.07	2.10			46.492
21	20	45	47.3	30.36	56.2	23	10	43.3	30.36	50.7							
22	20	35	54.6	30.27	59.0	23	00	48.3	30.28	54.3	1.03	12.93	8.73	7.00			46.508
26	20	45	58.4	30.15	63.0	23	20	52.1	30.12	58.0	3.47	11.00	8.87	6.27			46.544
27	22	05	58.4	29.86	59.9	23	15	56.5	29.87	59.3							
28	23	45	51.2			24	30	50.1			2.03	9.53	5.97	5.87			46.513
Nov 2	24	15	50.4	29.94	59.0												
	23	30	38.0			0	00	38.3	30.31	46.8							
3	0	20	41.8			1	00	41.8	30.36	47.0							
4	21	55	46.5	30.28	53.0	23	35	45.0	30.28	50.0	2.44	10.50	2.27	3.83			46.504
5	0	05	50.8			0	45	50.5	30.12	53.2	5.27	10.37	1.17	1.87			46.485
7	21	20	45.3	30.43	53.9	0	15	41.1	30.43	49.1							
8	21	35		30.22	54.6	23	45	47.6	30.19	51.9							
9	23	00	51.2			0	30	49.1	29.83	54.7							
10	21	19	51.9	29.89	51.2	0	05	50.9	29.86	53.8	6.00	13.53	8.33	8.37			46.524
11	22	45	43.5	29.81	51.0	0	40	42.3	29.83								
12	22	15		30.09	45.2												
16	23	00	37.2	20.52	42.2	0	50	33.9			6.57	12.97	2.70	3.53			46.492
18	22	00	46.2	30.13	54.3	0	45	39.5	30.15	46.9	5.33	11.33	3.23	4.83			46.495
19	22	20	28.7	30.15	36.2	0	15	26.7	30.13	33.8							
21	22	55	31.9	29.96	42.8	0	55	21.5	29.78	37.6							
22	23	00	26.1	30.17	48.6						7.23	12.27	-0.77	0.97			46.454
24	23	05	32.6	29.29	40.1	1	30	30.8	29.04	36.2	6.87	11.37	1.47	0.27			46.445
24	Adjusted the head of microscope G. to read as follows															6.33	
25											7.20	11.90	7.37	1.60			46.457
26	23	20	28.4	30.28	39.7	1	35	26.7	30.34	34.0							
29	1	20	31.9	29.77	42.2	2	00	31.6	29.73	39.3							

A.C.

Date	Time	No. 4	Bar.	M.H.	Time	No. 4	Bar.	M.H.	E	F	S	N	Collimation
	h m	°	°	°	h m	°	°	°					
1874 Nov 30	23 40	21.5	30.38	31.1	1 40	19.2			7.60	10.17	5.03	-0.30	46.459
Dec 2	23 15	34.8	30.16	42.8	1 45	32.9	30.14	39.1					
	3 23 15	44.4	29.84	44.9					9.00	11.33	8.17	1.30	46.462
	7 0 50	33.5	29.69	39.8									
	8 22 20	33.2	29.88	66.1					6.50	11.30	3.80	0.07	46.478
	9 0 40	39.8	29.90	39.6	2 25	36.9	29.92	38.9					
	10 23 57	30.1	30.29	38.9	1 40	27.9	30.26	34.7	9.60	11.60	5.33	0.87	46.471
	12 0 40	21.2	30.23	35.1	3 20	18.7	30.23	26.1					
	14 0 30	14.1	29.93	29.1	1 50	11.1	29.96	22.8	9.73	11.00	3.70	-1.43	46.461
	15 1 30	6.6	30.32	10.1	2 25	6.3	30.31	10.0					
	16 0 50	23.8	30.20	31.1	2 55	22.7	30.18	27.9	10.13	14.13	3.73	-2.23	46.374
	16												46.378
	21 1 00	18.1	30.11	31.8	3 25	16.9	30.08	23.8	9.60	12.73	3.10	-2.50	46.422
	23 0 00	33.4	30.33	40.0	3 25	31.7	29.98	36.9	8.53	11.97	1.90	-1.97	46.439
1875 Jan 27	1 30	35.3	30.13	40.1	2 20	34.8	30.13	39.9					
Jan 5	2 30	23.7	30.18	31.8	3 50	20.4	30.21	29.1	10.47	13.43	3.80	-1.17	46.445
	6								9.53	11.43	1.33	-4.00	46.404
	9 1 48	25.4	29.72	31.0									
	10 2 15	5.6	30.29	22.9		3.7	30.27	10.0	8.20	9.87	-2.23	-6.57	46.388
	11 2 30	11.8			4 45	10.4	30.30	31.8					
	12 2 13	15.8	30.43	26.8									
	14 2 28	20.5	29.91	31.0	5 7		29.90	22.8	10.40	11.23	0.23	4.73	46.343
	14												46.514
	14								39.90	45.43	44.27	44.20	46.788
	16 2 50	15.7	29.94	23.1	5 12	10.4	29.93	21.1					
	17 2 35	11.2	30.17	18.0	4 10	9.6	20.20	16.0	40.17	43.70	40.30	38.50	46.888
	17								0.83	10.60	8.97	6.90	46.867
	17								1.00		9.30		
17	Hereafter the wires will be read from 5' to 5' when the telescope points the north Collimation												

A.C.

Date		Time		h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	Collimation	
Jan 17		18	3	25	2.8	30.02	10.0	4	00	2.2	30.02	8.0								
		19	3	00	9.5	30.18	20.2	4	40	7.7	30.20	18.5	30.47	40.80	38.40	36.30	46.880			
		20	3	00	8.8	30.26	21.9	4	50	6.2	30.25	18.0	29.03	40.40	40.27	38.40	46.862			
		25	3	10	22.0	29.87	31.1	5	30	20.5	29.90	25.0	34.63	48.90	48.10	47.80	46.885			
		26	2	05	8.0	30.03	28.7	5	10	14.7	30.02	20.0	37.23	48.67	47.53	47.03	46.885			
		27	2	15	17.9	29.90	23.3	5	20	16.0	29.94	21.1								
		30	3	16	26.1	29.87	30.8	5	20	22.7	29.89	28.8								
Feb.	1	3	45	20.5	30.03	35.1	5	50	16.2	30.04	25.3	34.37	48.50	51.33	50.23	46.928				
	2	3	50	26.3	30.30	32.6	5	30	24.8	30.29	30.8									
	4	4	0	13.9	29.86	28.7	5	0	11.1	29.93	20.8						46.898			
	8	3	10	11.8	29.77	23.3						34.90	48.13	46.87	45.00	46.914				
	9	4	30	-4.0	29.95	8.0	5	20	-5.3	30.97	5.0	36.97	45.50	44.80	46.83	46.894				
	10	3	15	16.0	30.45	22.8						34.37	45.37	43.87	42.00	46.892				
	13	3	30	15.6	29.97	27.3	6	15	11.8	29.97	21.0									
	14	4	30	7.1	29.85	22.8	5	50	5.7	29.84	18.0	33.47	45.20	46.90	44.90	46.920				
	15	5	55	8.9	29.93	23.0	6	45	7.5	29.94	20.0	29.93	40.60	39.13	—	46.897				
	16	6	0	14.9	30.08	22.0	6	45	13.7	30.07	20.3	32.03	44.30	43.33	37.03	46.893				
	17	6	15	16.7	29.85	22.2	6	45	15.7	29.87	21.2									
	18	4	30	12.7	30.16	24.0	7	0	9.8	30.15	18.0	33.87	45.53	43.30	—	46.930				
	22	5	50	32.1	30.21	33.0	7	25	34.0	30.17	33.0									
	23											41.80	56.77	56.30	—	46.910				
	24	5	15	47.2	29.82	44.0	7	40	41.6	29.86	44.8	38.37	54.77	59.23	—	46.934				
	25											37.20	52.50	55.63	56.20	46.927				
	28	5	20	9.3	30.13	20.9	7	30	8.1	30.16	19.0	34.67	48.07	46.63	—	46.906				
March	2											36.67	49.67	40.13	48.33	46.912				
	4	6	30	19.8			7	40	18.8	30.32	25.2	40.07		50.70		46.922				
	8	6	0	29.7	29.95	37.0	8	50	26.7	30.03	32.5	40.73		53.30		46.919				

N. 6

Date	Time	N ^o . 4	Bar.	Alt. Th.	Time	N ^o . 4	Bar.	Alt. Th.	E	F	G	H	Collimation
1875 March 9									43.23		53.47		46.918
11	6 30	33.2	30.23	40.6	8 45	30.2	30.04	35.8					
17	6 15	23.1	29.62	31.0	8 30	20.6	29.65	28.8	38.60		55.50		46.944
18	6 10	19.8	29.87	28.8	8 30	17.7	29.92	23.0	40.00		49.43		46.932
22	7 20	18.2	30.04	29.9	9 0	15.8	30.07	24.6	42.07		55.50		46.893
23	7 0	20.5	30.32	31.7	9 25	16.2	30.32	24.1	40.80		51.80		46.891
25	7 15	31.6	29.97	33.9	9 15	30.2	30.02	33.0	38.93		52.10		46.896
27	7 15	41.8	29.87	45.2	9 30	40.0	29.89	43.8					
28	7 30	35.0	30.26	40.7	9 30	31.2	30.28	39.2					
29	6 45	38.4	30.33	44.1	9 45	33.8	30.32	41.2	40.07	s	56.50		46.906
30	7 45	38.5	30.33	46.2	10 0	34.2	30.34	38.9					
31	7 40	35.2	30.56	44.7	9 30	34.7	30.54	40.0	39.77		58.20		46.902
April 5	8 0	44.3	30.07	43.8	10 30	42.2	30.13	42.9					
6									38.23		57.77		46.920
7	8 30	33.3	30.37	42.8	9 30	31.2	30.38	40.0					
10	8 30	50.7	29.87	51.7	10 30	46.8	29.87	50.7					
11	9 5	41.9	30.00	51.2	9 45	40.8	29.97	49.0					
14	9 10	34.7	29.84	42.9	10 35	32.7	29.85	40.8	37.73		52.90		46.934
15	9 0	42.9	29.83	48.4	10 30	39.8	29.83	45.2	38.07		59.27		46.949
19	10 0	30.6	29.62	35.7									
20	9 10	31.1	29.54	36.1	11 0	28.5	29.57	34.0	41.30		55.7		46.923
21	9 25	31.1	29.78	36.0	11 0	28.7	29.82	33.9					
22	9 15	42.0	29.78	43.0	10 55	37.5	29.78	42.0	41.87		58.83		46.935
24	9 45	43.5	29.52	52.0	11 15	41.7	29.52	49.1					
25	9 40	48.8	29.87	53.7	11 15	45.2	29.93	49.2					
26	10 0	46.2	30.03	50.4	10 50		30.04	49.7	36.93		0.07		46.931
27	10 0	46.1	29.93	51.7	11 45	42.2	29.95	48.8					
May 3	10 0	50.2	29.72	52.1	11 45	46.2	29.76	51.4	36.20		1.40		46.946

N.C.

Date	Time	N ^o . 4	Bar.	Alt. Th.	Time	N ^o . 4	Bar.	Alt. Th.	E.	F.	G.	H.	Collimation	
1873														
May	4	10 20	42.0	29.65	48.2	11 15	40.5	29.66	46.1	"	"	"	"	ful
	5	10 0	57.3	29.92	57.2	11 55	51.8	29.94	55.1	38.40		2.10	46.934	
	10									37.87		6.93	46.977	
	12	12 35	55.6	29.78	58.9									
	13	11 15	58.2	30.20	61.8	13 0	54.8	30.22	60.1					
	17	10 50	55.2	30.22	58.2	13 0	49.7	30.24	54.7	39.33		6.73	46.972	
	22	11 30	73.0	29.84	69.0	12 15	69.1	29.85	69.9					
	23	11 30	64.2	29.98	67.9	13 20	59.7	30.00	66.1					Aug
	24									35.87		10.63	46.981	
	26	11 30	70.8	29.98	72.4	13 20	64.7	30.03	69.2					
	27	11 35	70.9	30.19	72.2	13 40	61.2	30.20	68.2	36.50		11.93	46.998	
	29	12 45	57.3	29.97	62.7	13 45	55.0	29.97	60.1					
June	1	12 10	52.4	30.24	62.7					35.50		10.63	46.961	
	8	12 40	63.2	30.22	67.4	14 30	58.2	30.24	63.7	36.37		11.43	46.981	
	10	14 40	61.1	30.12	64.1									
	14	13 15	61.8	29.93	65.4	14 45	67.0	29.95	63.7	34.80		9.20	46.954	
	15	13 30	65.4	29.87	67.0	14 30	62.8	29.89	67.0					
	16									35.40		11.80	46.957	
	20	13 25	70.7	30.12	69.8	15 15	60.5	30.10	68.7					
	21	14 0	72.4			15 15	69.7	30.07	70.2	33.40		10.53	46.991	
	22									34.37		12.43	46.989	
	24	13 45	81.9	29.92	80.0	15 10	77.9	29.88	78.9					
	27	13 30	80.4	29.77	80.0	15 35	78.4	29.77	80.6				47.042	Sep
	28	14 0	77.4	29.98	81.3	15 40	72.2	30.03	78.9					
	29									31.97		5.50	47.044	
	30	14 10	78.7	30.01	77.0									
July	1	14 50	67.2	30.06	72.9	15 55	65.8	30.07	71.0					

N. 6.

Date	Time	N ^o . 4	Bar.	Alt. Th.	Time	N ^o . 4	Bar.	Alt. Th.	E	S	G	H.	Collimation
1875 July 3	16	40	65.2	30.18	71.1								
7	14	45	67.4	30.23	74.7	17	0	64.9	30.23	69.2	29.20	2.57	47.036
8	15	30	68.4			16	45	66.9	30.29	73.1			
10	15	15	71.3	29.83	75.2	16	45	69.5	29.82	73.0			
11	15	0	74.1	29.84	78.3	17	0	69.7	29.87	75.0	29.10	5.20	47.036
12	15	15	68.3	29.90	73.6	16	0	64.7	29.89	70.7			
31	17	0	66.7	30.07	72.9	18	0	65.3	30.09	70.9			47.015
August 4	16	15	64.3	30.09	73.1					27.90		1.03	47.032
5													47.157
7	16	20	75.4	29.97	77.8	18	15	73.9	29.98	76.4			
8	16	15	72.7	30.02	76.3								
9	16	30	74.6	29.87	78.8	18	25	68.9	29.97	75.9	37.93	14.37	47.191
10	16	15	76.7	29.98	72.2	18	35	70.3	30.01	76.4			
12													47.446
14	16	45	77.3	29.97	82.3								
16													47.466
25	18	10	61.3	30.33	69.3	18	45	60.2	30.32	67.8			47.301
26	16	55	65.8	31.28	73.2	19	10	60.2	30.29	67.0	36.73	10.13	47.305
28	17	25	69.2	30.16	74.6	19	25	63.9	30.16	70.1			
29	17	15	76.9	29.99	77.1	19	25	69.9	29.98	74.8			
30	17	45	72.7	29.96	77.7	19	25	69.2	29.97	74.6	37.63	11.03	47.313
31	17	45	69.3	30.13	76.1	19	45	65.0	30.15	71.1			
Sept. 1	17	40	66.7	30.19	75.1	19	45	63.0	30.17	69.2	38.67	10.43	47.321
4	18	0	78.2	29.67	79.2	19	55	74.7	29.68	77.9			
5	17	45	78.1	29.88	76.1	19	55	66.5	29.89	72.8			
6										37.57		10.60	
7	17	55	66.8	30.02	73.0	20	0	61.2	30.04	68.5			
8	18	5	69.6	30.11	73.2	20	10	66.1	30.12	71.3	37.03	9.83	47.296

Date	Time	N ^o . 4	Bar.	Alt.	Th.	Time	N ^o . 4	Bar.	Alt.	Th.	E.	F.	G.	H.	Collimation	D.
Sept. 13	18 25	63.8	30.34	66.6		19 15	62.7	30.35	66.9							No
14	18 55	62.7	30.32	68.4		20 25	60.0	30.30	66.9	37.60		6.40		47.298		
25		59.4	29.93	63.2												
28	19 7	54.2	30.15	65.0		20 10	51.1	30.17	59.9					47.307		
Oct. 4	19 35	60.8	30.05	63.0		21 20	59.3	30.05	62.5							
5	19 55	62.4	30.10	68.8												
7	21 0	63.8	29.87	62.0						34.90		70.00		47.284		
12																
13	19 50	41.8	30.37	54.5		21 50	38.8	30.37	47.1					47.291		
14	20 0	45.7	30.23	56.0		22 15	42.2	30.19	49.6	33.83	10.57	10.57		47.304		
17	20 0	43.7	29.94	56.0		22 51	39.7	29.93	50.8							
18	20 55	51.0	29.97	57.7		22 45	48.9	29.99	55.0							
19	21 0	47.2	30.07	54.8		22 20	44.8	30.07	51.9	37.43		5.67		47.283		
20	20 25	53.1	29.87	57.0		21 55	50.7	29.84	55.8							
21	20 10	57.8	29.83	62.3												
25	20 30	63.2	29.80	62.1		22 45	57.9	29.87	60.8							
26										36.90		5.00		47.291		fa
27	20 35	44.2	29.73	56.8		22 30	42.5	29.73	49.1							
28	21 30	44.4	30.07	53.7										47.252		
Nov. 2	22 10	30.5	29.79	36.2		23 25	29.6	29.82	35.3	39.82		55.60		47.235		
3	22 45	33.2	29.83	40.8		0 0	31.9	29.83	38.3							
4	21 45	32.8	29.73	42.1		23 0	30.8	29.73	38.9							
6	21 15	37.2	30.12	44.0		23 20	34.2	30.12	40.1							
7	22 5	40.7	30.09	47.1												
8	22 55	35.3	30.18	45.1		23 0	33.8	30.18	42.0	40.47		58.83		47.242		
9	20 50	36.9	30.30	47.0		0 10	32.5	30.29	39.1	40.97		58.63		47.247		
11	22 0	37.9	29.78	46.0		0 5	36.8	29.80	43.0	39.27		59.37		47.266		
17	22 25	27.1	29.87	32.0		0 30	24.8	29.90	29.9	37.60		53.23		47.259		

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N.C.

Date	Time	N ^o . 4	Bar.	Alt. Th.	Time	N ^o . 4	Bar.	Alt. Th.	E	F	G	H	Collimation
Jan. 13	13 20	5.8	30.20	19.6	17 00	9.6	30.20	19.6	50.36	56.80	1.96	55.62	47.280
18	14 10	52.5	29.87	43.8					53.66	7.44	8.78	55.2	'
19													47.321
19	14 10	36.9	29.52	43.7	17 10	36.1	29.43	39.2					47.328
20	2 20	30.4	30.05	43.0	5 15	30.2	30.06	34.0	55.94	7.26	9.50	2.50	
20	14 20	27.9	30.06	34.1									
24									55.10	7.50	10.32	2.52	47.309
24	14 20	10.2	30.17	24.7	17 10	11.6							
25	14 30	23.1	29.82	30.00	17 50	16.4			57.12	4.44	6.18	0.36	47.298
26	3 0	18.1	30.18	28.8	5 30	16.2	30.21	22.7					
27	3 0	37.4	29.79	32.8	5 40	36.3	29.88	35.3					
27	14 10	30.8	30.04	33.1	17 30	33.0			53.64	3.62	7.64	1.62	
31	3 15	24.7	30.27	30.1	5 50	22.8	30.23	26.8					
Feb. 1													47.285
2	4 30	9.1			5 20	8.2	29.82	18.0					
3									50.40	58.10	51.80	1.36	47.462
7	4 10	39.6	30.20	40.2									
7	18 32	38.0	30.38	36.8									
8	4 15	36.2	30.33	41.1					56.62	9.54	12.54	6.20	47.349
15	16 20	31.3	29.45	38.9									
16	4 45	31.5	29.40	35.7					56.44	8.16	11.12	5.60	47.310
17	4 30	28.2	29.74	35.8	7 0	25.2	29.78	29.856 = 18.24	15.52	22.76	17.40		
17								N.C. = 13.26	22.24	25.10	11.54		47.263
19	17 8	31.7	29.93	34.8	18 32	32.7							
19									11.70	26.22	29.46	23.66	47.257
20	4 20	28.2	30.08	38.0	7 15	24.2	30.12	30.0					
20	17 00	19.0	30.22	33.9	18 30	20.2	30.22	23.8	11.48	20.78	25.58	19.78	47.248
21	5 5	27.6	30.12	32.9									
22													

Leon

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N.C.

Date	Time	N ^o . 4	Bar.	Alt. Th.	Time	N ^o . 4	Bar.	Alt. Th.	E.	F.	G.	H.	Collimation
1876													
March 19	5 30	20.6	30.15	26.7	8 55	16.4	30.20	22.9					
19	18 0	11.0	30.32	23.1	18 32	11.9	30.32	23.1					
21	7 35	38.7	29.32	39.7	9 5	35.2	29.37	38.4	N.C. 23.08	32.26	38.40	35.00	47.282
21									S.C. 23.70	23.48	31.62	37.28	
21	N.C. for upper wire of North collimator =								21.64	32.06	37.48	34.08	
21	S.C. for upper wire of North collimator =								24.70	23.76	31.58	37.98	
22	5 30	32.6	29.82	39.2					N.C. 23.44	32.52	37.46	33.72	47.267
22	17 44	24.0	30.03	31.0					S.C. 25.34	25.34	32.38	37.62	
22	18 30	24.4			19 48	27.0							
22	N.C. on upper wire of North collimator =								23.44	33.36	38.30	34.04	
22	S.C. on upper wire of								24.60	25.08	32.28	36.94	
27	6 10	39.7	29.78	49.0									47.256
27	18 0	30.0	29.88	39.3	20 37	34.1							
27	Upper of parallel wires N.C. =								22.44	31.28	39.80	34.90	
27	S.C. =								25.00	24.64	34.26	39.00	
29	8 55	40.8	29.42	48.1	10 1	38.4	29.43	45.3	N.C. 21.56	29.48	39.74	34.98	47.274
29	18 10	28.7	29.33	42.7	19 48	30.6			S.C. 23.20	21.20	34.14	38.68	
29	N.C. for upper wire of North collimator =								23.88	30.72	41.20	35.28	
29	S.C. for upper wire								24.74	22.48	35.08	38.66	
30	7 50	33.2	29.56	41.1	10 1	31.1	29.57	37.2					
30	19 48	33.0	29.70	38.7									
April 1	N.C. for upper wire of North collimator =								20.68	30.24	38.92	34.66	47.294
1	S.C. for upper wire								23.96	23.98	33.26	39.80	
									S.C. 23.48	23.68	33.04	39.32	
2	5 48	49.6			6 45	47.8							
2	7 40	43.8	30.24	46.8	10 1	37.8	30.24	43.8					
6	8 15	40.8	29.90	44.9	10 15	39.4	29.92	43.1	20.72	20.18	31.78	38.76	47.352
6	19 40	32.4	29.87	35.8									
9	8 0	37.2	29.87	41.1	10 5	34.9	29.88	39.2					47.309

Date	Time	No. 11 Bar.	Att. Th.	Time	No. 4 Bar.	Att. Th.	Collimation
1876							
April 10	7 30	43.4		8 15	41.8	29.97 43.6	47.326
10	10 20	37.9	29.98	43.0	18 30	34.2 29.97 39.1	
10	19 40	36.1	29.97	39.1			
11	7 30	37.7	30.00	49.1	9 0	47.6 30.01 49.1	47.369
11	10 20	45.4	30.02	48.8	19 40	36.3 29.97 43.8	
17	19 40	33.7	29.93	46.2	20 40	37.6 29.93 46.2	47.307
17	22 38	44.3	29.93	46.2			
20	8 30	50.2	30.07	53.1			
30							47.334
May 1	9 40	43.4	29.62	48.3	12 15	41.3 29.59 44.1	47.342
1	20 37	43.2	29.71	45.9			
3	20 37	35.7	30.07	46.9	1 12	48.8 30.12 57.2	
16	10 35	52.5	30.37	59.9	13 20	47.2 30.40 53.2	47.388
16	21 59	44.8	30.43	50.9	22 58	48.7	47.345
16	1 15	51.2 61.2					
17	11 40	49.8	30.34	55.1	12 40	48.2 30.35 53.2	
21	11 0	65.1	29.84	64.1	12 5	62.3	47.398
21	13 18	60.0	29.50	63.2	21 59	60.3 29.75 60.6	
21	22 30	65.0					
23	11 0	56.3	30.12	60.8	13 30	49.0 30.16 54.9	47.357
23	21 59	44.0	30.17	54.0	0 0	52.3	
24	10 35	67.0	30.06	63.9	13 25	56.9 30.05 62.0	
24	0 1	66.1	29.97	59.8			
25	11 0	65.5	29.97	68.0	13 45	55.2 30.03 61.1	47.395
25	22 58	46.0			0 1	57.0 30.16 54.9	
25	1 15	55.2					
29	22 30	48.3	29.99	61.2	0 1	51.3	47.408
29	1 12	55.2					
30	11 50	51.5	30.17	62.8	14 5	45.7 30.20 54.2	
30	22 58	45.7	30.29	53.2	1 18	61.0 30.30 63.3	

Date		Time		No.4	Bar	Alt. H.	Time		No.4	Bar	Alt. H.	Collimation	
May													
31	11	45	59.8	30.24	63.8	13	15	52.7	30.23	59.8		47.388	
31	21	59	42.0	30.15	54.5	22	58	46.8					
31	0	1	57.8			1	20	56.1 67.1					
June													
1	11	30	52.6	30.00	60.9	13	25	52.6	29.98	58.6			
5	18	20	57.6	29.87	63.2	0	1	59.4	29.88	60.0		47.389	
6	22	58	57.1	30.02	61.8	0	2	59.7					
7	12	30	66.8	30.11	68.8	14	25	60.5	30.13	66.0			
7	22	58	53.8	30.19	63.1	0	3	58.4					
13	12	55	71.7	30.23	71.2	14	45	66.8	30.25	69.9			
14	13	0	71.2	30.14	73.6	14	45	67.7	30.15	72.0			
15	13	25	74.4	30.20	86.1	14	15	72.4	30.22	70.5		47.402	
15	22	50	66.0			0	1	68.3	30.23	68.1			
15	1	12	73.9										
July													
10	1	13	74.2	30.03	77.7	4	28	83.5				47.431	
10	5	7	87.2										
12	14	40	81.3	29.98	85.7	16	20	78.5	29.98	82.7		47.440	
13	4	30	84.9	30.01	79.1	5	7	86.2					
13	13	18	92.0			14	9	91.4	29.97	88.1			
13	18	0	82.0										
17	13	18	87.4	30.15	83.7	14	57	82.1	30.16	88.3		47.423	
17	17	5	74.8	30.17	80.3								
18	5	5	85.2	30.04	81.2	5	55	86.8				47.448	
19	13	20	81.2	31.7	88.0	14	43	80.1					
19	16	40	76.2	29.97	82.0								
19	5	5	87.9	29.98	80.1								
22	16	0	65.1	30.07	74.0	17	30	64.4	30.07	69.3			
23												46.562	
24	15	0	72.2	29.90	74.8	17	30	63.2	29.91	70.2			

tion	Date	Time	No. 4	Bar.	Alt. H.	Time	No. 4	Bar.	Alt. H.	Collimation
	July 24	2 55	60.0							
	24	5 10	68.2			6 25	70.3	29.98	68.3	
	25	16 10	65.0	30.06	73.1	17 40	62.3			46.472
	25	5 50	63.7	30.12	67.2	17 40	62.3			46.468
	26	14 9	67.4	30.16	71.7	15 0	65.8	30.18	70.7	
	26	17 30	60.9	30.20	66.0					
	26	5 10	67.1	30.27	64.9					
	31	4 28	65.8	30.10	65.2	5 17	69.0			46.440
	31	6 40	71.2							
Aug.	1	15 40	67.1	30.22	72.9	17 30	64.2	30.23	69.1	
	1	2 55	60.1	30.20	67.8	5 7	69.4			
	1	6 40	73.4							
	2	16 20	68.6	30.35	75.1	17 30	65.8	30.30	73.2	46.442
	2	4 28	63.1	30.37	69.7	5 48	62.4			
	2	6 39	72.0							
	3	15 40	68.2	30.27	75.0	18 40	63.7	30.27	69.8	
	3	4 28	63.9	30.25	67.4	5 48	70.4			
	3	7 5	86.1							
	5	16 25	79.6	30.17	80.7	18 5	75.1	30.18	78.8	
	6	17 5	80.7	30.16	82.9	18 50	78.3	30.18	18.9	47.507
	6	5 7	80.1	30.10	77.2	5 48	82.4			47.554
	7	5 18	79.8	30.05	78.9					
	8	17 10	77.2	30.04	82.6	18 40	73.8	30.06	79.9	47.556
	8	5 17	72.1	30.17	75.0	5 48	73.8			
	8	6 40	77.3							
	9	17 8	72.2	30.17	79.1	18 40	69.6	30.18	77.2	
	9	5 8	70.2	30.23	73.1	6 40	75.2			
	10	17 0	73.3	30.24	80.2	18 40	69.4	30.23	75.8	
	10	4 28	67.9	30.27	72.8	5 7	70.5			
	12	17 0	74.5	30.24	82.0	18 50	72.3	30.26	77.9	

		Time			No.4	Bar.	At.H.	Time			No.4	Bar.	At.H.					Collimation	
Aug 1876																			
Aug	12	4	28	70.8	30.24	74.9		5	7	73.1									
	13	16	55	75.8	30.22	81.1		18	55	72.8	30.22	78.3							
	13	16	55	75.8	30.22	81.1													
	15	17	15	73.8	29.78	79.6		18	10	72.8	29.82	78.9							
	15	5	8	70.8	29.97	76.1													
	21	17	5	58.3	30.01	66.8		19	0	55.8	30.03	63.8					47535		
	21	5	8	56.2	29.98	61.8													
	22	17	30	64.9	29.97	71.1		18	30	65.0									
	22	7	25	65.9	30.13	66.6													
	23	17	8	60.7	30.17	70.4		19	5	57.2	30.18	65.0					47530		
	24	7	35	76.1	30.04	70.6													
	26	18	20	67.8	29.93	75.2		19	55	66.8	29.93	73.1							
	26	5	8	66.8	29.94	68.2		7	37	67.4									
	27	6	39	60.8	30.7	66.6		7	35	62.9							47520		
	28	17	10	67.8	30.04	73.2		19	45	61.7	30.06	68.4							
	28	5	8	55.3				7	26	64.9	30.05	63.9							
	29	17	30	67.8	30.03	72.7		19	15	62.1	30.04	69.1					47545		
	29	6	39	66.3	30.03	65.4		8	7	69.3									
	30	17	50	71.0	29.93	74.8		19	55	61.1	29.94	73.0							
	30	6	39	64.4	29.96	66.8		7	40	69.0									
	31	7	35	73.8	29.91	71.0													
Sept.	2	17	55	65.0	29.78	73.2		20	5	60.8	29.86	68.6					47528		
	2	20	40	60.2				6	39	60.0	29.98	63.6							
	2	7	37	61.8															
	2			62.0															
	3	13	18	73.5	29.97	72.5		15	37	72.4							47523		
	3	18	35	63.8	29.98	71.4		20	05	60.6	30.00	68.0							
	3	6	39	61.2	29.97	65.1		7	37	64.5									

Date	Time	Sec 4	Bar.	Alt. 4	Time	Sec 4	Bar.	Alt. 4	Collimation
Sept. 1876									
4	5	17	53.3	29.95	67.6	7	30	58.2	29.97 64.9
6	18	5	63.3	30.06	66.8	20	0	58.8	30.07 64.1
Oct. 2	19	20	53.3	29.86	61.1	21	55	47.9	29.90 56.1
3	6	40	39.0	29.59	52.1			40.3	29.88 57.0
3	18	30	52.9	29.79	57.4	21	30	52.3	29.83 57.1
3	6	58	50.9	29.82	56.7	7	37	52.7	
9	19	0	44.8	30.13	54.9	20	40	40.1	30.10 49.8
9	7	0	37.3	29.90	47.7	8	50	41.2	
10	19	15	56.2	29.63	56.8	21	55	52.8	29.63 55.8
10	7	0	39.5	29.74	50.9	7	40	38.8	
11	18	30	43.8	30.08	52.8	19	55	40.7	30.07 51.1
12	19	25	45.1	30.20	53.9	21	55	41.8	30.18 48.1
15	19	45	32.2			22	30	30.9	29.71 36.2
15	7	26	30.7	29.79	39.2	13	20	42.9	29.80 44.1
16	20	15	42.9	29.75	49.2	22	0	41.8	29.73 47.0
16	7	30	43.7	30.11	43.7				
17	20	0	40.3	29.82	48.0	22	30	37.9	29.85 43.1
17	10	0	38.4	30.00	45.8	11	45	42.2	
17	13	45	48.0						
18	20	5	46.4	30.03	53.0	22	5	42.8	30.04 49.6
19	20	10	46.2	30.14	53.1	22	30	42.8	31.5 31.9
24	21	25	54.7	29.57	61.0	23	35	50.1	29.58 57.9
24	10	00	47.6	29.57	52.9	13	05	56.7	
25	20	20	48.1	29.67	58.9	23	10	43.3	29.71 51.2
26	9	21	34.4	30.07	49.9	10	0	36.8	
28	21	30	39.6	30.03	49.9	10	0	27.9	30.03 40.9
28	13	13	58.1						
29	20	8	42.1	30.03	47.1	23	45	36.9	30.07 42.8
29	17	50	28.1	30.14	40.0	9	21	29.6	
29	11	40	35.4	30.19	38.2				

date	time	No.4	Bar.	Att.Sh.	time	No.4	Bar.	Att.Sh.	Collimation
Oct. 30	20 0	48.0	30.22	57.3	22 55	39.5	30.23	48.1	
31	22 0	48.0 ^{50.0}	30.03	52.0	23 30	37.0	30.02	57.8	47.391
31	10 0	44.8 ^{54.8}	30.07	49.9	13 30	55.9	30.07	52.3	
31	14 10	56.3							
Nov. 1	13 0	60.2	29.79	54.3					
2	20 10	54.8	29.73	60.4					
4	20 15	57.2	30.13	57.2	0 10	43.2	30.19	50.1	
5	19 45	46.4	30.33	54.1	23 15	37.6	30.33	45.3	47.454
5	10 0	28.7	30.40	58.9					
12	20 50	43.7	29.76	48.7	0 20	41.7	29.80	46.1	
12	11 42	40.6	29.83	45.0	14 10	46.9	29.84	46.1	
13	20 10	47.4	29.83	57.1	1 45	39.8			47.443
15	22 45	35.0	30.10	43.1					
Dec. 4	23 25	32.2	30.02	36.9	2 30	30.8			47.357
4	13 20	32.0	30.02	33.7					
5	21 45	36.8	29.96	41.3	2 0	29.3	29.97	34.9	47.347
5		23.2	29.94	31.6					
6	21 40	35.1	29.76	39.9	2 30	29.7	29.72	53.0	
6	14 42	26.2	29.63	34.6					
7	21 50	35.7	29.49	40.9	13 12	30.2	29.54	35.2	47.399
7	15 30	33.2	29.58	36.1					
9	13 20	4.0	29.88	20.2	10 29	7.9			47.323
10	21 50	9.8			1 20	3.8	30.15	17.0	
12	3 0	25.2	29.73	35.2	3 55	23.9	29.73	33.1	
13	20 30	41.0	29.66	38.3	3 0	38.7	29.74	39.8	47.350
14	1 30	36.9	29.75	39.0	2 15	36.5	29.74	39.1	47.327
14	13 20	36.7	29.66	38.3					

Date	Time	No. 4	Bar	Alt.	Time	No. 4	Bar	Alt.	Collimation
1876									
Dec. 18	14 9	4.9	29.82	19.8					
	19 0 0	16.1	29.92	26.0	3 10	16.1	30.02	20.1	47.310
	19 13 20	2.6	30.24	24.8	15 29	4.4			
	23 23 15	24.3	29.93	28.0	3 0	16.7	29.96	24.1	
	23 13 18	5.2	30.07	20.2	15 29	8.7			
	24 22 55	15.5	30.14	21.1	2 55	12.7	30.16	18.0	47.289
	24 14 9	6.8	30.21	18.0					
	25								
	26 15 30	27.2	29.92	30.3					
	27 22 50	27.6	29.93	33.7	3 15	20.2	29.97	26.1	47.333
	27 13 20	12.8	30.07	24.1					
1877									
Jan. 2	22 50	18.0	29.47	28.0	4 0	14.2	29.58	20.1	47.329
	2 13 20	8.3	29.74	18.0	14 9	10.1			
	3 13 30	3.3	29.75	18.0	15 30	4.3			
	4 23 45	12.8	29.77	21.3	4 0	8.7	29.75	17.0	47.330
	4 13 30	3.8	29.88	17.0					
	8								47.321
	10 13 30	13.2	30.07	24.1	15 30	13.7			47.294
	11 14 10	21.1	30.16	28.7	15 37	16.2			47.282
	13 0 45	11.5	29.75	26.9	4 30	8.0	29.78	18.0	47.250
	14 2 40	14.2	30.02	23.1	4 25	10.7	30.07	21.3	
	14 14 9	6.0	30.17	21.0					
	15								47.281
	20 3 0	40.6	29.41	37.2	5 15	37.1	29.57	39.6	
	21 2 58	22.1	30.23	31.0	5 10	21.4	30.26	29.1	47.291
	21								
	22								
	23 2 0	23.0	31.15	33.7	5 10	16.8	30.11	27.0	47.318
	23 14 0	7.3	29.84	25.0	15 30	5.2	29.80	22.0	47.280

Day	Time	No. 4	Bar.	Alt. H.	Time	No. 4	Bar.	Alt. H.	Collimation
Jan. 24	2 55	18.6	29.75	25.7	15 30	2.1	29.97	197	47.346
	25 14 9	7.7	30.19	18.7	15 29	6.8			
	29 18 30	28.4	30.34	30.8					47.316
	30 2 0	30.3	30.43	39.0	6 5	27.9	30.42	34.1	
	30 19 45	35.9	30.32	33.1					
Feb. 1	5 15	42.7			6 10	42.8	29.85	40.9	47.321
	3 2 30	41.3	30.07	46.3	6 15	34.6	30.08	40.8	
	4 3 10	35.8	30.15	42.0	6 5	31.9	30.22	38.0	
	5 3 55	33.9	29.91	40.6	6 50	31.3	29.86	36.1	47.346
	5 16 20	29.3	29.83	34.6	20 40	36.3	29.87	36.0	
	6 2 30	36.8	29.92	40.8	6 15	31.6	29.92	37.2	47.358
	6 15 30	26.2	29.82	34.1	18 30	29.7			
	7 15 30	32.3	29.86	38.0	17 0		30.06		
	8 3 20	29.8	29.97	39.7	6 45	25.3	28.99	33.0	47.318
	8 16 20	17.1	29.99	31.0		17.8			
	10 2 55	31.8	30.06	37.8					
	11 3 50	32.7	30.24	40.5	6 50	29.3	30.13	34.9	
	12 15 30	17.6	29.93	30.3	18 30	15.9			47.312
	12 19 40	17.4							
	13 3 30	15.6	30.12	28.1	4 30	15.6	30.13	24.0	
	14 4 5	28.2	30.32	33.1	6 50	24.4	30.23	30.2	
	15 4 45	35.2	30.17	38.3	6 45	33.4	30.15	36.1	
	15 32.9	30.04	34.0						47.324
	19 4 10	19.6	29.57	34.4					47.317
	19 17 30	14.4	29.69	20.8					
	20 4 0	25.7	29.73	30.2	7 0	23.0	29.71	29.7	47.288
	20 17 0	20.4	29.64	28.8	19 45	29.4	29.66	28.8	
	20 20 40	32.4							
	21 5 0	34.6	29.70	38.0	7 10	30.4	29.74	35.9	47.261
	21 17 0	24.7	29.72	32.7					

Date	Time	No. 4	Bar.	Alt. Th.	Time	No. 4	Bar.	Alt. Th.	Collimation
1877 Feb. 22	4 15	42.1	29.86	44.0	5 5	40.4	29.87	44.0	
26	17 0	26.8	30.17	35.2	18 30	27.3			47.339
26	19 40	31.2	30.23	33.9					
27	5 0	29.7	30.15	38.7	7 40	27.1	30.13	34.1	47.358
27	18 30	21.8	30.20	32.7	20 35	31.2			47.350
28	5 10	32.8	29.97	39.9	7 40	30.6	29.97	37.1	47.329
28	17 0	24.8	29.96	33.9					
March 1	4 55	37.9	30.13	42.0	7 40	32.8	30.13	39.6	47.329
4	5 35	37.3	29.78	43.1	7 40	32.0	29.85	39.1	
5	17 30	23.2	30.14	23.2					47.374
6	5 45	23.8	30.07	30.7	7 45	21.2	30.07	29.2	
7	6 10	31.7	30.17	39.0	7 30	29.9	30.13	37.0	47.342
11	6 15	30.1	30.35	38.0	8 25	26.7	33.35	34.0	47.334
15	6 30	27.1	29.62	35.8	8 30	24.4	29.65	33.0	47.375
15		23.6							
19									
20	6 50	26.9	30.19	34.2	8 50	23.5	30.18	30.6	47.311 47.304
24	7 0	43.3	30.17	44.3	9 35	38.4	30.24	42.7	
29									
31	8 50	41.3	30.27	45.1	9 50	36.8	30.18	43.1	47.347
Apr 3	8 55	32.8	30.17	44.2					
9	7 50	40.3	29.97	48.6	10 50	37.4	29.97	42.3	47.363
9	20 00	37.6	29.94	41.1	1 10	48.7	29.91	45.0	
10	1 15	50.7	29.82	46.9					47.353
12	8 25	36.3	30.06	45.8	10 40	34.6	30.11	40.2	
12	20 10	32.1	30.18	40.1	22 50	42.8			
12	1 10	47.8	30.20	43.4					
13									
15	8 20	48.9	29.99	50.1	10 35	42.3	30.02	48.0	47.332
15	19 40	36.8	30.02	48.8					
16	8 50	50.3	30.02	53.0	10 40	46.6	30.04	50.8	
22	9 15	46.2	30.20	49.0	11 5	43.2	30.22	47.4	47.386
22	1 10	64.0	30.17	48.6					

Date	Time	No. 4	Bar	Atm	Time	No. 4	Bar	Atm
Apr 23	9 15	54.6	30.12	56.3	11 5	50.3	30.10	55.1
24								
25	9 30	57.9	29.85	60.1	1 5	56.4	29.91	52.2
26	9 15	58.0	29.94	57.1	11 45	52.3	30.00	55.8
May 3	9 45	51.6	29.59	52.0	11 50	46.9	29.63	50.8
5	10 25	50.6	30.01	55.2	12 15	46.9	30.02	51.8
6	10 30	45.7	29.93	52.0	12 20	42.7	29.89	48.9
7	11 0	48.6	29.87	53.2	12 10	47.4	29.86	52.2
12	10 30	57.1	30.28	58.7	13 15	50.1	30.27	55.1
13	11 0	62.6	30.19	62.9	13 20	58.2	30.21	61.2
14	11 0	68.2	30.11	67.4	12 10	66.6	30.12	67.8
16	11 0	72.8	29.93	70.8	13 25	66.0	29.91	68.8
16	1 15	75.9	29.91	66.3				
17								
22	1 25	61.2	29.65	57.0				
28	11 30	68.2	30.19	67.3	14 15	60.6	30.23	64.3
28	13 20	71.8	30.25	62.9				
29	11 35	71.3	30.17	71.6	12 20	68.1		
29	13 50	64.8	30.17	68.9				
30	11 30	73.7	30.02	73.6	12 40	69.4		
30	14 10	66.3	29.99	70.2				
31	12 15	75.2	30.02	75.2	12 45	72.2		
31	13 30	70.7	30.03	74.2				
June 2	12 20	70.5	30.04	78.8	14 15	70.3	30.02	76.1
4	12 40	70.4	29.83	75.0	14 25	67.1	29.85	72.9
12								
14	14 0	69.6	30.12	74.6	15 40	68.3	30.13	70.2
17	13 0	72.5	30.05	74.1	15 50	64.2	30.07	69.9
18	13 25	70.8	30.04	74.1	14 42	65.8		
18	15 20	64.6	30.03	70.6	15 45	64.1	30.03	70.1
19	13 20	79.3	29.86	81.2	14 42	75.0		
19	15 20	73.2	29.95	77.3				
20	13 30	67.5	30.14	73.8	15 50	62.3	60.13	69.9
24	13 30	71.2	29.83	72.2	14 35	67.3		
24	15 50	65.3	29.84	68.9				

47.409
47.419

47.419
47.380

47.382

47.424

47.442
47.439

47.414

47.468

47.474

47.476
47.416
47.442

47.430

Date	Time	No. 4	Bar	Att. Sh.	Time	No. 4	Bar	Att. Sh.				
1872	25	13	25	82.3	29.77	78.7	15	0	74.6	29.84	78.1	47.420
June	27	13	35	63.8	30.06	71.9	13	40	59.7	30.07	68.8	
	27	15	20	59.4			15	45	58.3	30.07	66.2	
	28											47.437
July	4	14	0	70.2	29.97	75.1	15	20	66.1	29.98	73.0	47.429
	5											
	26	16	30	67.2	29.94	77.9	17	0	66.5	29.96	75.2	47.452
	2											46.678
	29	17	5	67.2	29.92	74.3	18	15	66.8	29.90	72.0	
	24	15	30	77.2	30.06	80.7	17	50	71.2	30.05	77.1	46.666
Aug.	1	15	35	66.4	30.29	73.7	17	30	63.7	30.30	70.2	
July	25	15	30	73.0	29.86	82.1	17	30	68.4	29.91	75.6	
July	25	15	30	73.0	29.86	82.1	17	30	68.4	29.91	75.6	
July	6	16	10	73.4	29.84	76.0	18	30	67.7	29.85	72.8	
July	26											
July	7	16	40	75.2	29.74	76.6	17	45	73.8	29.74	76.1	
July	31											46.650
	8	15	55	77.2	29.78	77.8	17	15	69.3			46.657
	8	18	20	69.2	29.79	78.7						
	10											46.628
	11	16	50	73.8	30.00	76.6	18	45	67.8	30.02	74.3	
	12	16	40	76.4	30.01	78.2	18	55	71.7	30.00	76.5	
	14	17	20	75.3	29.92	79.0	18	0	74.4	29.93	78.2	46.652
	16	16	20	77.3	29.82	78.8	17	30	73.6	29.83	78.1	
	16	20	30	70.4			23	45	67.7	29.83	72.7	
	21	17	30	69.3	30.10	74.5						
	22	17	30	71.5	30.07	78.3	20	0	68.2	30.07	76.4	46.645
	22	23	30	65.9	30.05	72.7						
	23	17	30	74.9	30.11	79.9	19	5	72.3			
	23	19	55	71.3	30.11	77.7						
	24											46.636
	27	18	25	69.0	30.21	78.0	20	40	67.8			
	26											46.670
	27	22	30	68.4	30.22	78.8						
	28	18	0	77.9	30.13	81.0	21	0	72.8			
	28	23	45	72.3	30.10	76.6						
	29											46.685
	30	17	45	70.4	30.04	77.1	20	35	63.5	30.07	71.4	
	30	23	35	59.7	30.08	67.1						
Sept.	11	18	10	69.2	30.16	72.7	20	40	64.0	30.18	69.5	46.640
	11	23	40	61.1	30.18	66.7						
	13	18	5	73.9	30.16	74.8	21	10	67.8			46.660
	12	23	40	65.1	30.13	69.9						

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 Date Time No.4 Bar. Alt. H. Time No.4 Bar. Alt. H.

Sept.	13	18	10	76.3	30.05	78.2	19	50	74.7										
	13	21	15	72.6	30.06	76.5													
	15	18	0	74.2	30.10	78.4	19	10	71.7										
	15	20	55	69.5			22	0	68.6	30.11	72.8								
	16	18	15	70.5	30.06	78.1	20	40	72.4	30.07	76.1							46.643	
	16	21	25	71.4			23	40	69.3	30.05	74.0								
	18	18	30	60.6	29.96	68.9	20	55	56.0	30.00	65.0								
	18	23	35	72.6 55.6	30.01	61.3													
	19	18	40	58.8	30.07	63.9	21	15	52.5	30.07	60.2							46.627	
	20	18	30	61.1	30.02	68.1	23	20	68.5	30.19	65.0								
	22	18	25	65.7	30.18	60.9	20	50	61.4	30.22	58.8							46.602	
	23	23	20	57.6 47.6	30.23	55.8													
	23	18	30	66.5	30.17	67.0	21	38	60.4	30.17	65.0								
	23	23	30	57.4	30.17	63.2	0	10	57.2	30.17	62.3								
	24	19	20	67.9	30.18	70.8	21	5	63.5	30.19	69.1								
	25	18	50	71.3	30.15	74.1	21	40	65.7	30.16	71.0							46.657	
	25	23	30	63.8	30.16	68.8													
	26	18	45	71.3	30.08	74.7	21 ³	15	68.1	30.09	72.0							46.655	
	27	19	35	57.8	30.27	65.3	21	45	56.5	30.27	62.8								
	29	19	35	65.0	30.15	65.0													
	30	19	35	59.7	30.22	66.1	21	35	56.7	30.22	63.6								
	30	23	20	55.0	30.21	61.1													
Oct.	1	19	45	64.7	30.14	69.2	19	35	62.3									46.684	
	1	23	20	59.8	30.13	65.0													
	4																		
	6	19	55	47.8	30.33	56.8	22	25	45.2	30.34	53.9							46.617	
	7	19	40	50.3	30.48	59.5	22	15	44.8	30.48	55.3							46.620	
	7	23	15	43.6	30.48	53.9													
	13	19	45	50.8	30.17	59.6	23	35	45.3	30.22	53.2								
	14	21	20	53.1	30.23	56.1	22	50	50.9	30.22	50.4								

Date	Time	No. 4	Bar.	Alt. Sh.	Time	No. 4	Bar.	Alt. Sh.			
Oct. 15	19	50	56.5	30.18	41.2						46.598
17	20	20	50.9	30.06	57.1	23	0	46.1	30.07	52.3	46.605
17	23	25	45.3	30.06	53.2						
18	19	35	56.1	30.03	60.2	23	45	48.3	30.03	53.7	
23	20	15	52.6	29.93	55.6	22	55	48.8	29.93	53.8	46.543
23	0	25	49.5	29.93	53.1						46.551
27	19	55	39.8	29.97	50.8	22	35	36.1			
27	0	35	33.9	29.99	41.6						
28	19	45	45.6	30.16	52.2	22	25	41.2			46.580
28	0	10	39.9	30.17	45.8						
29	21	35	57.6	29.89	57.2	23	20	60.4	29.93	58.8	46.600
30	19	40	50.8	29.97	56.2	22	05	46.8	29.98	54.0	
30	0	40	42.5	30.02	50.1	1	10	41.9	30.02	49.3	
31											46.584
Nov. 1	19	50	47.3	30.03	54.0	22	8	45.2			
3	1	20	42.0			2	50	40.7	29.93	46.1	
4	19	50	42.9	30.24	57.0	20	50	41.2			46.554
4	22	0	39.8			1	30	36.0	30.28	43.0	
6	22	0	31.8	30.23	41.3	1	20	30.3	30.22	38.7	
7	22	0	39.6	30.43	48.2	1	20	35.2	30.43	44.6	46.557
12											46.622
13	22	40	54.4	30.33	43.1	2	55	29.2	30.36	39.9	
14	22	45	45.8	30.28	47.8	1	30	45.1			46.558
14	2	35	45.0	30.27	47.6						
15	22	15	53.4	30.16	53.2	23	15	52.6	30.17	53.3	46.545
27											46.582
28	3	40	43.2	30.03	48.2	4	30	42.1	30.00	47.8	
Dec. 1	22	10	28.0	30.02	40.3	2	5	21.3			
1	3	50	19.4	30.12	29.1						
2	22	15	23.6	30.37	38.1	2	0	19.2	30.37	29.8	46.542

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Date	Time	No. 4	Bar.	Atm. Sh.	Time	No. 4	Bar.	Atm. Sh.			
Dec. 3	23	10	32.5	30.19	39.0	2	45	31.7	30.20	36.4	46.519
4											46.487
6											46.523
8	3	10	32.9	30.03	42.1	4	40	31.5	30.03	39.1	
9	23	10	29.3	30.22	39.9	2	55	26.8	30.24	33.7	46.553
11											46.523
12	23	0	37.1	30.20	43.0	2	40	31.8	30.22	37.8	46.521
13	0	25	44.5	29.55	44.0	2	35	41.7			
13	3	35	41.0	29.55	43.8						
15	23	30	44.8	29.88	43.3	1	55	42.8	29.84	43.8	
16	23	30	43.8	30.11	48.9 38.9	3	30	36.8	30.18	44.3	46.546
17	23	25	30.3	29.87	45.1	2	15	47.1			46.531
17	3	25	42.1	30.03	45.9						
18	23	30	27.0	30.62	43.2	1	20	26.0	30.60	36.2	
19											
20	0	0	39.6	30.37	48.6	3	25	32.0	30.45	39.0	
25	0	50	32.9	30.03	42.1	3	20	29.3	29.97	36.8	
26	0	20	35.3	29.90	42.8	3	55	30.3	29.89	37.0	46.513
27	0	15	37.2	29.97	45.1	3	50	31.7	29.98	41.1	
29	4	25	29.8	29.92	41.7	5	50	28.2	29.87	37.8	
30	10 A.M.										46.513
31	0	10	26.8	29.38	35.9	3	45	20.6	29.46	32.8	
31	4	55	23.6	29.67	33.1						
1878											
Jan. 1	0	15	28.1	29.67	36.1	2	15	25.5	29.67	34.1	46.516
3											
5	0	0	22.7	29.92	36.9	2	55	17.5	29.94	28.2	
5	4	55	15.2	29.94	25.1						46.488
6											46.472
7	1	5	5.1	30.36	21.2	2	45	3.1	30.41	18.1	
9	1	15	25.9 27.0	30.37	31.3						46.460
12	5	20	36.9 37.1	30.04	41.2	7	10	36.9	30.05	39.9	
13	1	40	36.8 37.7	30.12	43.8	3	30	34.1 35.3	30.07	41.6	46.494

Date	Time	No. 4	Bar.	Att. H.	Time	No. 4	Bar.	Att. H.	Reading S. Coll.	Coll.
1878.	L m	^{10.5}			L m	^{10.5}				
Jan. 14	3 15	34.7 35.2	29.46	41.0	6 50	35.8 35.4	29.47	39.9	88.48	
16	1 0	11.9 12.2	30.06	27.1	2 50	10.3 10.8				46.568 (1) } 46.501 (2) }
16	4 55	9.1 9.7	30.10	22.0						
17	1 10	20.0 20.7	30.19	31.8					9 38.27	46.503
(17.9)	1 0	40.8 40.0	30.07	39.8	3 30	37.8 37.5	30.08	39.3		
18										46.543
22	1 15	41.9 42.1	29.62	44.9	3 20	38.9 38.9	29.64	43.8		46.461
22	4 55	37.7 37.7	29.63	42.8						
23	2 30	4.2 5.3	29.76	27.0	5 30	2.7 2.8	29.85	18.0		
24	2 20	20.1 20.6	30.25	27.2	6 15	20.3 20.2	30.18	24.3		46.502
28	1 10	27.9 28.4	29.49	38.1	2 20	23.9 24.6	29.55	33.3		
28	5 30	14.8 14.9	29.65	36.8						46.583
29	2 15	18.1 18.7	30.06	28.2	5 30	15.6 16.8	30.09	24.8		46.551
30	2 40	16.9 16.3	30.42	28.6	6 15	11.8 12.7	30.42	23.9		46.573
Feb. 2	2 45	15.7 16.4	30.13	31.1	6 15	9.8 10.8	30.15	25.4		
3	2 50	25.9 25.6	30.09	33.2	6 15	19.8 19.2	30.05	30.0		46.539
4	3 0	26.8 28.2	29.78	35.2	6 15	18.9 20.4	29.77	31.7		46.541
5	2 50	29.9 30.6	29.92	38.8	6 15	24.8 23.9	29.92	33.4		46.555
6	3 30	34.3 33.3	30.06	40.1	6 40	31.8 30.9	30.05	38.1		
7	3 15	44.7 42.6	29.97	44.9	7 0	35.3 36.0	29.94	42.8		44.738
11	3 20	19.9 20.3	29.67	34.2	7 15	15.2 15.9	29.74	25.6		44.737
12										44.711
13	4 5	31.3 32.3	29.83	37.8	6 50	29.8 30.7				
13	7 55	26.8 27.6	29.93	33.2						
14	3 0	27.0 27.9	29.98	37.9	7 15	16.3 18.3	29.97	26.1		44.720
16	3 40	30.2 32.3	29.94	39.8	6 45	27.8 28.8	29.93	33.9		
18	3 35	19.3 20.0	29.92	35.2	7 55	12.0 12.8	(7.50) 29.96	(7.50) 26.1		44.715
19	4 0	21.9 21.8	30.14	33.3	7 55	17.1 17.1	30.14	25.9		
24	4 50	37.3 38.5	29.80	44.2	8 0	37.4 33.6	29.79	39.4		44.737
25										44.738
26	4 25	35.8 36.2	29.77	38.3	8 20	32.9 33.4	29.82	38.2		
27	4 55	42.2 43.4	29.83	45.6	8 50	37.9 37.8	29.87	42.8		44.730
28	5 0	44.6 44.6	29.88	46.6	8 45	38.9 39.4	29.92	44.3		

Date 1878.	Time h m	No. 4	No. 5	Bar.	Alt. Th.	collim.
Mar. 4	4 50	33.6	33.2	29.47 ⁱⁿ	43.2	
4	8 40	27.6		29.67	35.3	
5	5 0	36.1	34.7	30.18	41.8	114.676
5	9 0	30.3	29.3	30.24	36.8	
6	6 0	41.3	40.3	30.16	43.0	
6	8 30	40.6	40.8	30.13	42.8	
7 16	6 0	38.4	36.8	30.05	48.9	114.7117 I 114.7141 S II 114.777
16	9 0	34.5	32.9	30.03	41.7	
19	6 0	44.0	43.3	29.70	46.8	114.755
19	9 0	40.9	40.8	29.71	44.9	
20	6 10	34.5	34.1	29.76	41.8	
20	8 40	32.4	32.0	29.81	38.0	
21	6 10	30.4	29.5	30.04	37.6	
21 25	9 10	28.3	25.3	30.07	35.3	114.738
26	7 35	38.8	—	29.88	42.9	
26	9 35	35.7	34.5	29.90	42.2	
30	7 30	44.2	41.2	30.02	48.4	
30	11 15	39.9	39.1	29.97	44.2	
31	7 30	38.3	35.3	29.70	47.8	
31	11 10	36.2	33.2	29.66	41.3	
April 2	8 40	42.2	41.2	29.70	48.6	
2	11 0	41.2	—	29.72	46.8	
3	8 15	42.4	41.0	29.75	50.7	114.781
3	10 20	40.6	38.0	29.74	47.0	114.765
4	8 40	42.9	40.4	30.07	50.8	114.756
8	10 50	41.2	39.8	30.13	48.2	
13	9 30	49.3	48.6	29.61	53.3	
13	11 25	46.3	45.4	29.63	50.5	
14	9 15	48.4	48.0	29.77	51.0	
14	10 55	45.7	44.8	29.82	49.9	

Date	Time	No. 4	No. 5	Bar.	Att. Th.	collim.
1878.	15					
April	16	10 15	42.3	39.8	30.21	53.3
	16	10 55	41.8	39.8	30.21	51.0
	18	10 25	46.3	44.6	30.18	54.9
	18	12 15	43.7	40.9	30.13	50.4
May	22	12 30	46.8	44.2	29.93	54.4
	30	14 0	47.2	45.6	29.92	52.9
	2	10 30	59.9	57.3	29.88	65.3
	2	14 5	57.2	58.0	29.87	62.9
	4	10 45	59.9	62.3	29.83	67.5
	4	13 45	63.5	62.7	29.84	65.1
	5	12 10	55.7	59.7	29.64	63.9
	5	13 55	53.4	52.2	29.74	54.4
	6	10 45	58.8	57.7	29.88	64.9
	6	13 25	54.0	52.2	29.90	59.3
	7	11 30	55.8	52.3	29.89	63.7
	7	14 5	52.2	50.9	29.85	59.9
	8	10 55	54.2	50.8	29.87	63.4
	8	13 25	52.8	50.8	29.86	58.3
June	3	12 5	61.5	60.3	29.98	68.1
	3	14 25	59.4	58.2	29.97	64.8
	4	12 15	72.2	69.3	29.83	71.8
	4	15 45	64.3	62.4	29.83	69.4
	5	12 10	64.0	64.0	29.85	71.6
	5	13 15	60.3	—	—	—
	5	15 0	56.2	55.0	29.87	63.2
	6	12 25	59.3	58.4	29.92	63.3
	6	14 15	54.2	—	—	—
	6	15 20	51.1	48.2	29.95	57.8

Date.	Time.	No. 4	No. 5	Bar.	Att. Th.	collim.
1878.	^h _m			ⁱⁿ		
June 9	12 45	59.2	57.0	29.75	63.2	
9	14 30	55.6	—	—	—	
9	15 30	53.8	51.2	29.82	60.6	
13	13 25	61.3	61.2	30.11	65.0	
13	14 35	59.8	58.8	30.12	64.1	
19	13 25	68.3	65.8	29.89	72.9	44.592
19	14 45	64.2	—	—	—	
19	16 0	62.3	61.0	29.89	68.8	
20	13 25	71.2	68.9	29.84	73.6	
20	16 0	65.5	63.8	29.83	70.7	
23						44.584
24	13 50	68.1	65.1	29.78	73.0	
24	16 25	65.8	63.7	29.77	70.2	
25	13 50	69.7	68.2	29.78	73.4	
25	14 55	66.0	—	29.82	73.0	
25	16 30	62.8	61.8	29.84	68.9	
26	13 50	69.3	67.7	30.07	71.8	44.637
26	16 30	60.8	57.9	30.08	68.0	
July 1	15 0	79.6	76.2	30.07	84.0	
1	16 40	76.2	73.2	30.07	81.8	
2	16 0	81.0	—	30.07	84.2	44.599
2	17 10	78.4	76.3	30.07	83.8	
3	14 55	83.1	81.2	30.12	86.3	
3	15 35	81.1	—	—	—	
3	17 15	78.3	77.2	30.13	83.7	
7	15 10	74.1	71.8	29.97	78.3	44.598
7	17 15	70.8	69.0	29.99	76.5	
8	15 20	79.9	77.9	29.98	83.0	44.676
8	17 25	75.9	74.2	29.97	80.8	

Date.	Time	No. 4	No. 5	Bar.	Alt. H.	Collim.
1878.	h m			in		
July 9	16 25	73.8	71.1	29.98	80.8	44.661
9	17 30	72.9	71.0	29.98	78.7	
10	15 15	72.1	68.9	29.97	80.2	
10	17 40	71.1	68.8	30.00	76.7	
11						44.640
13	15 20	66.6	63.1	30.04	76.1	
13	17 50	63.0	60.2	30.03	70.9	
15	15 20	61.0	58.9	30.11	73.1	44.655
15	18 0	59.7	56.2	30.13	67.8	
16	¹⁵ 17 35	67.5	64.2	30.11	74.2	
16	18 0	64.1	61.3	30.10	70.3	
18						44.678
22	15 40	68.2	66.9	29.60	74.9	
22	17 55	65.2	64.0	29.64	70.7	
23	15 30	72.9	70.7	29.97	75.2	44.644
23	18 15	65.9	64.2	30.03	71.8	
24	16 30	72.9	71.8	30.02	78.0	
24	18 20	70.0	68.3	30.02	75.1	
25						44.641
28	16 15	73.3	70.9	30.15	78.7	
28	18 35	69.2	65.9	30.16	78.5	
29						44.666
31	16 50	59.9	58.0	30.04	68.1	
31	18 50	59.8	58.0	30.04	64.9	
Aug. 12	17 12	71.7	67.4	29.93	77.8	
12	19 5	67.3	64.0	29.94	74.1	
13	18 0	71.3	—	—	—	
13	19 0	69.1	—	30.01	75.8	
13	19 25	68.6	—	30.01	75.7	
14	17 5	72.8	69.8	30.06	^{79.1} 74.3	
14	19 45	66.9	63.2	30.07	74.3	
17	19 5	67.7	—	30.05	76.8	
18	17 8	70.1	69.2	29.83	78.2	44.645
18	19 55	64.8	63.0	29.82	72.3	

Date	Time	No. 4	No. 5	Bar.	Alt. Th.	Collim.
Aug. 20	^h 17 ^m 25	71.2	69.7	29.59	75.8	
20	20 00	68.2	67.3	29.64	72.8	
22	[17 36]	60.2	57.2	30.13	72.8	44.633
22	20 6	56.3	52.9	30.14	65.2	
25	17 35	63.2	62.0	29.75	69.8	
25	20 15	58.9	56.0	29.83	65.5	
26	17 50	63.7	61.7	29.94	72.8	44.616
26	20 15	59.4	60.4	29.96	69.2	
27	[17 30]	68.2	65.1	29.96	73.8	
27	19 58	63.0	61.8	29.97	69.1	
28	18 18	63.0	—	30.04	74.1	44.643
29	[17 54]	65.2	62.9	30.07	73.0	
29	20 25	62.2	61.0	30.07	68.8	
31	[19 25]	68.7	65.9	30.22	76.0	
31	20 19	67.8	65.2	30.21	74.6	
Sept. 1	17 50	77.8	75.7	30.00	79.3	
1	19 50	75.2	73.8	30.01	78.1	
2	18 50	73.2	71.1	29.97	78.3	44.635
2	20 40	72.6	71.0	29.97	77.7	
6	17 30	68.4	66.2	30.13	74.5	
6	19 10	64.5	61.6	30.15	70.8	
7	18 0	56.8	55.6	30.45	62.2	
7	19 5	56.0	54.2	30.47	61.7	
8	17 30	59.2	57.8	30.39	68.8	
8	19 0	57.2	55.3	30.39	65.4	
9	19 0	62.2	60.1	30.28	67.9	
9	21 30	60.2	57.2	30.27	65.8	
10	17 45	65.7	64.1	30.16	72.2	
10	21 0	65.3	64.0	30.18	68.8	

Date	Time	No. 4	No. 5	Bar.	Alt. Th.	Collins
Sept. 12	17 50	71.8	70.2	30.09	71.3	44.609
12	20 50	69.3	68.5	30.13	71.8	
14	18 20	63.8	63.2	29.96	72.3	
14	21 5	63.2 60.3	64.8	29.97	67.2	
15	17 45	60.2	58.6	30.14	68.2	
15	20 55	53.7	51.3	30.18	60.4	
16	18 25	57.0	54.8	30.33	67.9	44.601
16	21 0	52.8	50.2	30.30	61.7	
17	18 45	63.8	61.0	30.16	68.2	
17	20 55	60.0	58.8	30.14	65.6	
18	18 15	73.6	72.0	30.07	74.9	44.606
18	20 55	68.8	67.2	30.08	73.1	
19	19 0	63.7	61.7	30.13	70.2	
19	21 30	61.2	58.1	30.13	67.0	
22	19 0	55.5	—	30.26	65.1	
22	20 25	53.1	—	30.30	60.3	
23	18 55	51.8	50.2	30.48	65.3	44.618
23	21 30	47.3	45.7	30.47	56.9	
24	19 55	62.1	—	30.18	70.0	44.679
25	22 5	59.2	55.7	30.18	66.3	
28	19 0	51.3	51.0	30.38	63.2	
28	22 0	44.1	43.6	30.35	55.8	
29	19 50	57.2	—	30.21	65.5	44.615
30	22 0	54.5	—	30.20	60.8	
Oct. 1	20 20	61.0	58.7	30.08	67.1	44.617
1	22 40	58.3	56.2	30.07	64.7	
2	20 0	66.8	65.2	29.90	71.3	
2	22 25	64.1	63.0	29.90	68.4	
3	19 45	64.1	63.1	29.97	71.7	44.625
3	22 45	59.7	58.8	29.97	67.8	

Continued on Page 100.

Runs.

Date	A		B		A ₁	B ₁	Mean	Con.
1870 Nov. 10	div 59.78	div 60.98	div 55.74	div 56.76	301.20	301.02	301.11	-1.22
13	9.08	9.76	3.28	4.24	300.68	300.96	300.82	-16
15	Same as Nov. 13				300.68	300.96	300.82	-16
16	"	"	"	"	300.68	300.96	300.82	-16
17	35.36	35.26	35.36	36.98	299.70	301.59	300.64	-13
19	35.36	35.26	35.36	36.98	299.70	301.59	300.64	-13
27	45.56	45.94	41.04	41.58	300.38	300.57	300.46	-09
Dec 10	41.10	42.64	35.54	34.62	301.57	299.08	300.31	-06
13	55.68	57.00	56.25	57.46	301.32	301.21	301.26	-25
18	2.10	3.52	57.04	57.18	301.42	300.14	300.78	-16
22	2.10	3.52	57.04	57.18	301.42	300.14	300.78	-16
26	27.74	28.74	24.80	25.44	301.00	300.64	300.82	-16
31	35.04	35.52	33.44	35.34	300.48	301.60	301.04	-21
1871 Jan. 1	2.52	3.80	58.92	59.42	301.28	300.50	300.89	-18
7	39.78	41.78	47.76	48.10	302.00	300.34	301.17	-23
10	23.08	22.88	29.64	29.64	299.80	300.10	300.00	-00
17	7.44	9.74	13.54	14.88	302.30	301.34	301.82	-36
Feb 7	22.44	24.00	27.48	28.84	301.56	301.36	301.46	-29
11	13.42	13.92	18.18	19.00	300.50	300.82	300.66	-13
20	46.70	49.34	49.82	50.26	302.44	300.44	301.54	-31
28	17.30	16.98	21.42	23.86	299.68	301.94	300.81	-16
	39.00	41.20	42.44	42.34	302.20	299.80	301.00	-20
Mar 1	52.36	53.84	57.00	58.32	301.48	301.32	301.40	-28
5	35.32	36.90	38.30	39.37	301.58	301.07	301.62	-32
2	52.36	53.84	57.00	58.32	301.48	301.32	301.40	-28
7	35.32	36.90	38.30	39.37	301.58	301.07	301.32	-26
9	35.02	35.62	38.56	38.96	300.60	300.90	300.50	-10
19	37.06	38.78	41.98	42.70	301.72	300.52	301.21	-24
14	34.04	35.14	40.03	41.03	301.10	301.00	301.05	-21

1870pha

	Date	A	B	A ₂	B ₂	Mean				
1871 Mar.	22	-0.38	14.52	15.60	18.68	19.50	301.08	300.82	301.95	The values of Mean in blue are to be applied to the Circle readings. The values in red are to be applied to the declinations, with their proper signs.
	25	-0.42	8.90	11.02	13.18	15.32	302.12	302.14	302.13	
	28	-0.11	28.62	29.56	32.06	32.24	300.94	300.18	300.56	
	29	-0.32	9.20	10.70	12.90	14.60	301.50	301.70	301.60	
Apr.	5	-0.12	31.82	32.52	35.82	36.24	300.70	300.92	300.56	
	6	-0.32	21.40	23.10	26.30	27.80	301.70	301.50	301.60	
	17	-0.19	28.98	30.30	35.76	36.32	301.32	300.56	300.94	
	18	-0.23	13.98	15.32	18.98	19.98	301.34	301.00	301.17	
	23	-0.17	10.22	10.98	18.64	19.60	300.76	300.96	300.86	
	24	-0.19	22.92	23.90	29.94	30.82	300.98	300.88	300.93	
	26	-0.36	34.64	36.48	42.76	44.50	301.84	301.74	301.79	The values in red are to be applied to the declinations, with their proper signs.
	29	-0.24	18.94	20.18	26.42	27.54	301.24	301.12	301.18	
	30	-0.26	6.24	7.86	12.80	13.82	301.62	301.02	301.32	
May	1	-0.09	14.56	14.16	21.64	22.96	299.60	301.32	300.46	
	2	-0.26	21.74	22.76	29.82	31.11	301.02	301.29	301.15	
	7	-0.11	15.92	16.20	22.20	23.02	300.28	302.82	301.55	
	9	-0.17	8.20	8.62	13.52	14.86	300.42	301.34	300.88	
	10	-0.16	16.78	17.22	23.16	24.40	300.44	301.24	300.84	
	11	-0.09	11.38	11.56	16.12	16.86	300.18	300.74	300.46	
	12	-0.17	25.82	26.42	31.78	32.88	300.60	301.10	300.85	
	13	-0.20	30.42	31.58	38.96	39.80	301.08	300.84	300.96	The values in red are to be applied to the declinations, with their proper signs.
	14	-0.14	21.04	21.76	28.22	28.90	300.72	300.68	300.70	
	15	-0.14	Same as May 14				300.72	300.68	300.70	
	16	-0.14	"	"	"	"	300.72	300.68	300.70	
	18	-0.11	7.90	8.32	14.92	15.64	300.42	300.72	300.57	
	23	-0.22	20.80	21.34	33.24	34.94	300.54	301.70	301.12	
	24	-0.12	30.58	31.50	40.06	40.38	300.92	300.32	300.62	
	20	-0.21	7.52	8.18	15.88	17.29	300.66	301.41	301.03	

Date		A		L		A _r	L ₂	Mean
1871 May 21		21.40	21.62	28.98	29.70	300.22	301.72	300.98
-29	25	42.60	44.56	52.86	53.76	301.96	300.90	-0.16 301.43
-10	26	15.18	15.22	22.32	23.22	300.14	300.90	+0.16 300.52
-10	27	Same as May 26				302.14	302.90	300.52
-15	29	16.34	17.28	23.32	23.88	300.94	300.56	300.75
June 1		3.50	4.76	12.86	13.34	301.26	300.48	300.87
-17	2	Same as June 1				301.26	300.48	300.87
-30	3	27.50	28.34	35.22	37.36	300.84	302.14	301.49
-30	4	Same as June 3				300.84	302.14	-0.25 301.49
-17	5	19.80	20.96	27.54	30.22	301.16	300.48	+0.25 300.84
-32	6	44.58	46.22	57.12	58.70	301.64	301.58	301.61
-32	9	Same as June 6				301.64	301.58	301.61
-17	12	26.02	27.02	37.30	37.96	301.00	300.66	300.83
-20	14	30.86	31.96	42.20	43.58	301.10	301.38	301.24
-23	17	19.06	20.88	29.96	30.52	301.82	300.56	-0.15 301.19
-02	19	4.02	4.14	15.62	15.70	302.12	300.08	+0.15 300.10
-09	21	27.22	26.76	40.10	41.52	299.54	301.42	300.48
-26	25	25.78	27.40	36.72	37.68	301.62	300.96	301.29
-22	26	17.68	18.36	26.56	28.04	300.68	301.48	301.08
-22	27	4.46	5.56	14.36	15.60	301.10	301.24	301.18
-17	30	15.86	17.00	25.36	25.94	301.14	300.58	300.86
-20	July 1	15.26	16.34	25.92	28.34	301.08	301.42	-0.24 301.25
-29	3	7.14	8.92	15.14	16.80	301.78	301.66	+0.24 301.44
-22	5	30.52	31.16	38.82	40.42	300.64	301.60	301.12
-22	7	Same as July 5				300.64	301.60	301.12
-34	9	15.26	16.70	22.52	24.52	301.44	302.00	301.72
-15	10	7.66	8.24	14.52	15.44	300.58	300.92	300.75
-23	12	15.58	16.78	22.18	24.26	301.20	301.08	301.14

$$A_r = 300.69$$

$$L_2 = 300.93$$

$$A_r = 301.23$$

$$L_2 = 301.27$$

$$A_r = 300.71$$

$$L_2 = 300.82$$

$$A_r = 301.15$$

$$L_2 = 301.28$$

		Date	A	B	A _r	B _r	Mean
$A_r = 300.85$		1871 July 13		Same as July 12	301.20	301.08	$\frac{0.22}{301.14}$
$B_r = 301.87$		14	5.54	5.58	14.32	15.90	$\frac{+0.22}{300.51}$
		20	28.02	27.46	39.46	40.36	300.90
		22	5.74	7.98	18.44	19.64	301.24
		23	24.82	24.90	35.50	37.38	301.88
$A_r = 300.76$		24	4.46	5.52	59.40	1.30	301.06
$B_r = 301.33$		17 Aug. 2	24.22	25.22	33.80	34.58	301.00
		3	28.34	29.90	37.02	37.02	301.56
		5	27.22	28.04	35.82	37.16	300.82
		9	43.10	44.96	53.98	55.78	301.86
		13	17.92	18.44	26.82	27.16	300.52
$A_r = 301.30$		10	48.04	49.12	57.46	58.62	301.08
$B_r = 301.21$		11	43.34	45.34	52.04	52.64	302.00
		17	4.24	4.84	12.72	12.90	300.60
		18	23.60	24.34	32.98	34.42	300.74
		19	15.92	17.48	26.16	26.46	301.56
$A_r = 301.01$		22	1.42	2.24	7.00	8.80	300.82
$B_r = 300.94$		28	13.36	14.72	18.32	19.10	301.36
		29	0.62	0.76	5.96	7.36	300.14
		31	14.52	15.28	19.92	21.14	300.76
		Sept. 1	19.94	20.76	28.18	28.78	300.82
		2	5.46	6.22	18.94	20.96	300.76
		3	8.06	8.74	12.64	13.36	300.68
		6	33.84	34.74	39.10	39.48	300.90
		7	1.92	2.24	9.22	9.60	300.32
		8	23.88	25.22	31.50	32.56	301.34
$A_r = 300.50$		9	40.16	40.66	47.06	48.70	300.50
$B_r = 301.10$		10	14.46	14.00	19.20	20.84	299.54

The mean value of λ from Apr. 26, 1871 to Sept. 11 1871 = 300.82
 The " " " " " " " " = 301.10

Reversed
Sept 11 1871

Date	E	G	E ₂	G ₂	Mean				
1871 Sept. 18	30.80	28.44	43.92	43.40	299.64	299.48	299.56	+44	
+09	21	21.84	21.78	15.14	14.62	299.94	299.48	299.56	+44
+07	23	1.74	1.44	32.24	31.84	299.70	299.60	299.65	+35
+15	22	14.96	16.46	0.06	0.04	298.50	299.98	299.24	+76
+06	24	37.48	37.66	7.98	7.18	300.18	299.20	+0.13	+31
+10	25	42.98	42.14	15.28	15.08	299.16	299.80	-0.13	+52
+05	27	33.98	33.52	3.90	3.90	299.54	300.00	299.77	+23
-03	28	1.62	1.78	28.18	28.36	300.16	300.18	300.17	-17
-03	29	Same as Sept. 28				300.16	300.18	300.17	-17
-03	30	"	"	"	"	300.16	300.18	300.17	-17
+08	Oct- 3	Same as Oct. 4				299.60	299.58	299.59	+41
+06	4	16.02	15.62	22.86	22.44	299.60	299.58	+0.14	+41
+32	5	20.22	20.20	27.16	26.86	299.98	299.70	-0.17	+14
+02	8	18.02	18.08	20.70	20.68	300.06	299.78	299.92	+8
-02	9	15.34	15.56	20.02	19.96	300.22	299.94	300.08	-08
-02	12					300.22	299.94	300.08	-08
-02	13	Same as Oct-9				300.22	299.94	300.08	-08
-02	14					300.22	299.94	300.08	-08
-02	15					300.22	299.94	+0.16	-08
+15	16	33.14	32.44	37.82	37.02	299.30	299.20	-0.16	+77
+13	17	51.36	50.98	56.96	56.06	299.62	299.10	299.36	+64
-01	21	0.15	0.39	0.25	0.11	300.24	299.86	300.05	-05
-07	22	24.12	24.36	30.90	31.38	300.24	300.48	300.36	-36
-07	23	43.12	43.46	49.50	49.22	300.34	299.72	300.23	-33
-14	29	40.94	40.74	41.46	41.10	299.80	299.64	+0.17	-72
-14	30	Same as Oct-29				299.80	299.64	-0.17	-72
+0	31	9.50	9.30	11.16	10.90	300.30	299.74	300.02	-02
+4	Nov. 2	16.32	15.72	13.78	13.00	299.40	299.22	299.31	+69
Art		Mean of E ₂				299.80	299.75	299.77	+23

Date		\bar{L}		\bar{G}		\bar{L}_r	\bar{G}_2	Mean	
1871 Nov.	5	15.60	14.76	10.99	9.72	299.16	298.73	298.94	+1.06
+21	6	14.06	13.72	9.70	6.58	299.66	298.88	299.27	+1.23
+15	7	26.54	26.50	20.14	17.86	299.46	299.72	299.59	+1.41
+08	9	1.48	1.24	54.32	54.10	299.76	299.78	299.77	+1.23
+05	12	37.68	37.40	29.76	28.84	299.72	299.08	299.40	+0.08
+12	13	Same as Nov. 12				299.72	299.08	299.40	-0.08
+10	19	34.38	34.68	30.28	28.78	300.30	298.70	299.50	+1.50
+3	22	57.60	57.50	52.26	52.10	299.90	299.84	299.87	+1.13
+7	23	23.70	23.78	16.16	15.42	300.08	299.26	299.67	+1.06
+23	25	29.74	28.04	22.20	21.60	298.30	299.40	298.85	-0.06
+08	28	38.18	37.68	25.32	25.06	299.50	299.74	299.62	+0.06
+34	29	9.70	7.64	55.70	54.34	299.94	298.64	298.29	+1.29
+34	Dec. 1	9.70	7.64	55.70	54.34	299.94	298.64	298.29	+1.29
+34	2	36.56	35.62	24.62	23.02	299.06	298.40	298.73	+0.66
+09	5	29.14	26.70	14.22	13.72	299.56	299.50	299.53	+0.04
+09	6	19.98	19.46	4.72	4.18	299.48	299.46	299.47	-0.04
+00	9	36.10	36.14	23.22	23.22	300.04	300.00	300.02	+0.02
+09	11	49.60	48.78	39.16	39.04	299.18	299.88	299.53	+0.35
+06	12	43.02	43.14	30.42	29.72	300.12	299.30	299.71	+0.81
+08	17	50.36	49.62	37.70	37.70	299.16	300.00	299.58	+0.84
+02	18	12.20	12.10	0.86	0.80	299.90	299.94	299.92	-0.04
+08	20	57.92	58.68	42.24	42.12	299.16	299.88	299.52	+0.36
+19	24	24.06	24.64	16.50	16.16	300.38	299.66	299.07	+0.71
+12	27	40.92	40.34	27.38	26.56	299.42	299.18	299.30	+0.24
+13	28	10.80	10.42	54.78	54.08	299.62	299.22	299.42	+0.40
+06	29	30.30	30.32	16.44	15.78	300.02	299.34	299.68	+0.34
+13 1872 Jan	1	3.24	2.66	50.54	52.86	299.42	300.32	299.87	-0.90
+04	2	57.06	57.12	42.98	42.52	300.06	299.54	299.80	+0.26
+11		Mean of \bar{L}_r				299.50	299.89	299.69	+0.19

Date		E		G		E ₂		G ₂		Mean		
1872	Jan 5	24.56	24.44	10.20	9.20	299.88	299.00	299.44			299.69	+56
+13	6	28.20	28.24	19.06	16.56	300.04	299.50	299.77				+23
+09	8	31.52	31.38	14.94	14.46	299.86	299.72	299.79				+21
+12	12	16.74	15.98	6.42	6.18	299.04	299.96	+0.11				+60
+01	13	14.02	13.58	3.66	4.02	299.56	300.36	-0.11				+04
								299.96				
E ₂ = 299.59	+11	23.02	22.48	7.42	6.94	299.46	299.52	299.49				+51
G ₂ = 299.58	+14	11.08	10.42	55.68	54.92	299.34	299.24	299.29				+71
	+09	21	11.54	11.82	48.28	47.64	300.28	299.36	299.82			+18
	+04	24	Same as Jan 21				300.28	299.36	299.82			+18
	+08	30	27.68	26.78	58.30	58.36	299.10	300.06	+0.13			+42
								299.96				
E ₂ = 299.49	+11	31	57.88	51.24	22.98	22.56	299.36	299.58	-0.13			+53
G ₂ = 299.83	+07	Feb 1	20.90	19.36	51.24	52.06	298.46	300.82	299.64			+36
	+02	2	22.54	22.40	54.54	54.44	299.86	299.90	299.88			+12
	+19	4	18.62	18.16	52.14	51.24	299.54	299.10	299.32			+68
	+03	7	46.96	46.80	20.56	20.42	299.84	299.86	+0.13			+15
								299.96				
E ₂ = 299.70	+06	8	24.30	23.94	58.26	58.02	299.64	299.76	-0.13			+30
G ₂ = 299.67	+06	14	Same as Feb. 8				299.64	299.76	299.70			+30
	+06	15	"				299.64	299.76	299.70			+30
	+12	16	24.98	24.84	2.10	1.06	299.86	298.96	299.42			+58
	+17	17	20.98	20.88	57.22	55.58	299.90	298.36	299.13			+87
	+14	18	51.80	51.26	28.14	27.28	299.46	299.14	299.30			+50
	+13	19	13.20	12.90	52.10	51.10	299.70	299.00	+0.07			+65
								299.35				
E ₂ = 299.65	+13	20	Same as Feb. 19				299.70	299.00	-0.07			+65
G ₂ = 299.05	+16	26	1.62	0.90	34.62	33.78	299.28	299.16	299.22			+78
	+13	27	52.58	51.76	25.54	25.74	299.18	299.50	299.34			+66
	+22	28	4.96	6.72	41.30	41.32	298.76	299.02	298.89			+111
	+15	Mar 1	42.52	42.16	17.36	16.20	299.64	298.84	299.24			+76
Mean of E ₂						299.42	299.46					

1870phae-P	Date	E	G	Er	G ₂	Mean	F	26	(E+G) (Er+26)					
	1872 Mar. 3	40.32 +0.3	39.92	15.62	15.68	299.60	300.06	+0.10 299.83	+17					
	Er = 299.55	11	37.38-05	37.76	14.86	14.78	300.58	299.92	-0.10 300.25	-25				
	G ₂ = 299.46	14	54.82-07	55.28	33.26	33.48	300.46	300.22	300.34	-34				
		18	55.30+13	57.32	31.44	31.24	299.02	299.80	299.41	+35				
		19	4.36+05	3.86	39.50	39.48	299.50	299.98	+0.05 299.74	+26				
	G _r = 299.20	21	22.90+35	21.42	57.20	55.52	298.52	298.32	-0.05 298.42	+158				
	G ₂ = 299.33	24	Same as Mar 21		298.52	298.32	298.42		+158					
	✓	27.4	26.42+14	25.90	3.82	3.90	298.48	300.08	299.28	30.20 +72 29.38	12.28	9.58	-6.12	-4.58
		27.8	54.88-03	54.74	33.10	33.51	299.86	300.41	300.13	57.18 -13 58.00	41.24	38.04	-6.27	-3.90
		28	26.48+04	26.40	5.96	5.60	299.92	299.64	299.78	31.82 +22 31.36	13.12	11.88	-6.40	-5.62
	Apr. 1	51.76+04	51.64	28.78	29.30	299.88	300.52	300.20	55.36-20 55.06	57.60	21.30	-6.17	-4.19	
		2	47.24-04	47.36	24.76	25.04	300.12	300.28	+0.01 300.20	51.54-20 51.58	33.58	31.04	-6.56	-4.87
		3	14.08-01	14.24	53.74	53.70	300.16	299.96	-0.01 300.06	19.52-06 19.44	1.70	0.76	-6.11	-5.52
	G _r = 299.80	4	50.30+03	49.78	30.46	30.46	299.68	300.00	299.84	55.40+16 55.26	37.58	35.78	-6.11	-5.30
	G ₂ = 300.01	6	35.12-05	35.48	18.88	19.02	300.36	300.14	300.25	42.30-25 42.22	26.04	23.28	-7.39	-5.40
		10	26.04-01	26.10	12.22	12.26	300.06	300.04	300.05	32.62-05 32.34	18.04	14.96	-6.20	-4.44
		11	36.60-11	39.15	7.15	7.36	300.85	300.21	300.53	36.20-53 38.83	18.03	18.06	Ref	
		11	35.50-12	35.90	20.40	21.14	300.42	300.74	300.58	42.46-58 42.00	25.64	23.28	-5.10	-4.21
		16	22.98+03	22.78	4.83	4.64	299.80	299.81	299.81	28.44+19 28.12	8.90	7.30	-4.89	-4.00
		17	1.38+09	0.82	44.94	44.64	299.44	299.70	299.57	6.58+43 6.68	51.10	48.12	-6.13	-3.79
		18	19.80+00	20.04	23.84	23.58	300.24	299.74	299.99	44.88+11 44.92	29.54	26.80	-5.49	-4.03
		19	54.10+13	53.46	39.44	38.80	299.36	299.36	299.36	+84				
	G _r = 300.05	20	20.84-01	20.88	10.22	10.24	300.04	300.02	-0.01 300.03	26.72-03 26.87	15.90	14.30	-5.77	-5.02
	G ₂ = 300.00	21	50.84-06	51.06	39.94	40.36	300.22	300.42	+0.01 300.32	56.02-32 55.54	45.74	43.78	-5.49	-3.95
		22	59.94-06	60.42	48.82	49.00	300.48	300.18	300.33	5.68-33 5.28	53.88	51.08	-5.15	-3.77
		23	11.24-05	11.46	54.78	55.06	300.22	300.28	300.25	87.46-25 36.63	0.34	58.52	-4.46	3.37
		24	53.16-06	53.04	40.40	41.10	299.88	300.70	300.29	57.86-29 57.28	45.32	43.32	-4.81	-3.23
		25	46.30-12	48.74	35.74	36.46	300.44	300.72	300.58	52.42-58 52.12	41.52	38.50	-4.95	-2.91
		Mean of Er				299.86	299.98							

Date	E.	G.	E ₂	G ₂	mean	G	26.	(E+G) -(7+26)				
1872 Apr 26	11.82 -16 12.40	3.70	4.76	300.58	301.06	300.82	18.28	18.26	7.00	5.04	-4.88	-3.07
27	13.14+04 4.306	33.66	33.32	299.92	299.66	299.79	50.00	50.14	37.28	34.90	-4.73	-4.33
29	45.18+04 45.02	33.52	33.22	299.84	299.70	299.77						
30	11.82+03 11.76	59.26	59.00	299.94	299.74	-0.03 299.84	23.00	22.86	1.40	9.14	6.66	(17)
May 20	57.36-04 57.26	49.70	52.20	299.90	300.50	+0.03 300.70						
E = 300.03	21	46.66+01 46.24	39.68	40.00	299.58	300.32	299.95					
G = 300.29	22	Same as May 21			299.58	300.32	299.95					
	24	Mean of E ₂			299.90	300.18						
	25	701			299.58	300.32	299.95	#				
June 3	54.82-14 54.94	46.04	47.56	299.92	301.52	300.72						
9	13.14+01 13.10	8.62	8.60	299.96	299.98	299.97						
11	52.66-05 52.50	46.92	47.62	299.84	300.70	300.27						
E ₂ = 299.94	18	Same as June 11			299.84	300.70	-0.07 300.77	-0.05 = -0.02				
G ₂ = 300.79	19	9.88-12 10.04	6.14	7.20	300.16	301.06	-300.61	+0.12 =	Adopted value for declination.			
300.36	20	9.88-12 11.04	6.14	7.20	300.16	301.06	300.61					
27	14.62-09 14.86	11.74	12.44	300.24	300.70	300.47						
30	14.62-09 14.86	11.74	12.44	300.24	300.70	300.47						
July 1	16.28+06 15.52	14.38	15.54	299.24	300.16	-0.04 299.70	+0.05 = +0.09					
E ₂ = 299.82	2	16.28+06 15.52	14.38	15.54	299.24	300.16	299.70	+0.09				
G ₂ = 300.56	3	38.44-17 39.20	38.12	39.10	300.76	300.98	300.87					
300.19	6	57.92-14 58.44	56.62	57.50	300.52	300.88	300.70					
7	40.25-13 40.44	38.12	39.24	300.19	301.12	300.65						
E ₂ = 300.45	9	56.54-10 56.92	55.18	55.82	300.38	300.64	-0.13 300.51	+0.05 = -0.08				
G ₂ = 300.85	11	56.54-10 56.92	55.18	55.82	300.38	300.64	300.51	+0.18				
300.65	14	31.64-08 31.76	30.80	31.52	300.12	300.72	300.42					
15	46.38-13 46.88	45.94	46.74	300.50	300.80	300.65						
E ₂ = 300.52	16	13.10-16 13.84	12.62	13.70	300.74	301.08	0.15 300.91	+0.05 = -0.20				
G ₂ = 300.95	20	12.44-20 13.16	10.32	11.52	300.72	301.20	300.96	+0.20				
300.74												

Previous to this date the suns were measured on a selected 5' space which was found to be the mean of a large number of measurements. After this date the suns were measured on the 5' space preceding the 1450 eclipse points to the north horizon.

a selected 5' space which was
spaces. After this date the sun's
is, from 55' to 0' when the
telescope points to the north horizon.

	Date	ξ	η	ξ	η	ξ	η	Mean
	July 22	55.66	55.78	54.92	55.12	300.12	300.20	300.16
	24	50.22	50.24	49.06	49.78	300.02	300.72	300.37
	25	60.88	61.00	58.90	59.12	300.12	300.22	300.17
	27	2.76	2.98	0.64	0.46	300.22	299.82	300.02
	28	47.78	48.22	46.66	47.00	300.24	300.34	300.29
	29	57.28	58.50	55.28	56.28	301.22	301.50	301.11
$\xi = 300.33$	30	55.26	55.46	57.88	58.52	300.20	300.64	-0.07
$\eta = 300.36$	Aug. 1	9.88	10.40	7.06	7.03	300.52	299.97	300.24
300.34	4	3.22	3.34	1.22	1.08	301.12	299.86	-0.07
	5	1.08	0.80	57.44	58.54	299.72	301.10	200.41
	6	26.68	27.14	25.14	25.72	300.46	300.58	300.52
	7	10.72	11.22	8.52	10.40	300.30	301.88	301.09
	8	57.40	57.58	57.00	57.36	300.18	300.36	300.27
$\xi = 300.51$	9	60.50	61.40	59.28	59.78	300.90	300.50	-0.13
$\eta = 300.68$	10	60.50	61.40	59.28	59.78	300.90	300.50	300.70
300.67	Sept. 25							
	28	10.26	10.40	3.98	5.44	300.14	301.46	300.80
	29	10.26	10.40	3.98	5.44	300.14	301.46	300.80
	30							-0.12
$\xi = 300.11$	Oct 2	41.68	41.74	35.24	35.56	300.06	300.32	300.19
$\eta = 301.08$	3							
300.59	9							
	10							
	11							
	11							
$\xi = 300.46$	12	49.44	49.90	40.34	40.26	300.46	299.72	-0.02
$\eta = 299.72$	14							
300.09	20							

$$+0.02$$

$$+0.12$$

$$+0.08$$

$$+0.18$$

$$+0.07$$

$$+0.17$$

$$+0.03$$

$$+0.27$$

	Date	E		G		E_1	G_2	Mean	
	1872 Oct. 21								
	24								
	28								
	Nov. 2								
	4								
	-06	13	35.34	36.12	23.76	23.56	300.78	299.80	300.29
	-06	16	48.34	48.54	32.52	32.90	300.20	300.38	300.29
	-08	19	54.40	54.68	36.00	36.54	300.28	300.54	300.41
$E_0 = 300.44$	19								
$G_2 = 300.36$	-13	20	40.92	41.44	23.76	24.50	300.52	300.74	300.63
300.40	21								
	-01	23	15.66	15.48	58.68	58.92	299.82	300.24	300.03
	-03	25	2.82	3.04	49.38	48.94	300.72	299.56	300.14
	27								
$E_0 = 300.17$	Dec								
$G_2 = 300.11$	-05	3	35.40	35.38	18.46	19.00	299.98	300.54	300.26
300.14	+01	10	7.82	7.26	36.70	37.20	299.44	300.50	299.97
	14								
	-04	17							
	-04	21	41.78	41.86	29.30	29.60	300.08	300.30	300.19
	22								
$E_0 = 299.76$	24								
$G_2 = 300.40$	25	13.54	12.76	54.64	54.48	299.22	299.84	299.53	
300.08	30								
	-02 873 Jan 1	36.46	36.18	20.98	21.12	299.72	300.44	300.08	

$$-0.08 + 0.5 = -0.03$$

$$+0.03$$

$$+0.13$$

$$-0.03 + 0.5 = +0.02$$

$$-0.02$$

$$+0.08$$

$$-0.02 + 0.5 = +0.03$$

$$-0.03$$

$$+0.07$$

Different circle
for all the preceding.

	Date	E		G		Er	G ₂	mean 5
	1873 Jan. 4	22.04	22.60	6.18	6.70	300.56	300.52	
	6	32.32	32.42	16.32	17.16	300.10	300.84	
	7	36.62	37.38	19.08	19.84	300.76	300.76	
	Jan 9	Perhaps microscopes disturbed by J. F. M.						
$E_2 = 299.87$	9	2.72	2.22	46.60	49.10	299.50	300.50	-0.03 +0.01 = -0.02
$G_2 = 300.41$	12	23.94	23.16	3.80	4.80	299.22	301.00	+0.01 +0.01 = +0.02
300.14	14	10.06	9.80	56.26	56.28	299.74	300.02	+0.02 +0.04 = +0.06
$E_2 = 299.87$	19	9.36	8.90	52.86	52.68	299.54	299.82	-0.02 +0.06 = +0.04
$G_2 = 299.98$	22	59.56	59.70	46.70	46.82	300.34	300.12	
299.92 + .08	28	51.26	50.50	35.28	35.74	300.24	300.46	
	Feb. 2	32.96	32.06	12.90	13.30	299.10	300.40	+0.01 +0.04 = +0.05
$E_2 = 299.54$	4	"	"	"	"	299.10	300.40	-0.05 +0.03 = -0.02
$G_2 = 300.32$	5	"	"	"	"	299.10	300.40	
299.93 .07	6	18.84	19.00	7.94	7.90	300.16	299.96	
	8	43.90	43.70	35.46	35.76	299.80	300.30	
	9	"	"	"	"	299.80	300.30	
	10	"	"	"	"	299.80	300.30	
$E_2 = 299.64$	11	57.50	57.10	38.96	39.28	299.60	300.32	-0.03
$G_2 = 300.23$	13	39.14	38.34	21.22	21.14	299.20	299.92	+0.01 +0.04 = +0.05
299.93 .07	14	17.64	17.26	3.80	3.88	299.62	300.08	-0.05 +0.03 = -0.02
	18	56.14	55.36	44.52	44.72	299.22	299.90	
	20	"	"	"	"	299.22	299.90	
	22	23.45	23.24	5.54	6.18	299.79	300.64	
	23	"	"	"	"	299.79	300.64	
	24	22.38	22.48	3.18	2.88	300.10	299.70	
	25	31.82	31.74	14.94	14.96	299.92	300.02	
$E_2 = 299.73$	26	15.28	15.22	0.30	0.58	299.94	300.28	
$G_2 = 300.16$	27	"	"	"	"	299.94	300.28	+0.01 +0.04 = +0.05
299.94 .06								-0.05 +0.03 = -0.02

	Date	\bar{E}	\bar{G}	\bar{E}_r	\bar{G}_r	Mean	
	1873 Feb 28	15.28	15.22	0.30	0.58	299.94	300.28
	Mar 4	4.56	4.76	48.44	48.56	300.20	300.12
	5	12.68	12.54	58.22	58.34	299.86	300.12
	6	52.10	52.70	39.26	39.46	300.80	300.20
$\bar{E}_r = 300.14$	8	5.26	5.22	56.32	56.32	300.16	300.00
$\bar{G}_r = 300.09$	9	13.84	13.70	2.86	2.66	299.86	299.80
300.11	10	"	"	"	"	299.86	299.80
	12	"	"	"	"	299.86	299.80
	13	46.06	46.06	38.38	38.14	300.00	299.76
	16	4.98	5.08	0.36	0.30	300.10	299.94
	14 16	Loosed the center clamping screw of microscope G. The previous change of this microscope may be due to unequal strain of clamping screws.					
$\bar{E}_r = 299.98$	18	4.98	5.08	0.36	0.30	300.10	299.94
$\bar{G}_r = 299.85$	27	12.26	12.48	0.92	1.08	300.22	300.16
299.91 .09	30	28.32	28.54	18.44	19.18	300.22	300.74
	30 31	"	"	"	"	300.22	300.74
$\bar{E}_r = 300.21$	Apr 1	52.86	53.04	48.12	48.06	300.18	299.94
$\bar{G}_r = 300.39$	10	50.64	51.30	47.80	48.22	300.66	300.42
300.30	15	"	"	"	"	300.66	300.42
	86 16	2.78	3.44	58.96	58.74	300.66	299.78
$\bar{E}_r = 300.64$	17 21	38.62	39.06	34.00	34.24	300.44	300.24
$\bar{G}_r = 300.31$	23	52.26	52.06	48.74	49.44	300.80	300.70
300.47	26	2.642	2.660	23.56	24.04	300.18	300.48
	29 27	"	"	"	"	300.18	300.48
$\bar{E}_r = 300.16$	May 1	59.54	59.70	5.06	5.06	300.16	300.00
$\bar{G}_r = 300.34$	4	42.92	43.04	42.24	42.64	300.12	300.40
300.25							

	Date	ϵ	ζ	ϵ	ζ	ϵ	ζ	Mean
	1873 May 5	42.92	43.04	42.24	42.64	300.12	300.40	
	6	38.64	38.80	43.46	43.60	300.16	300.14	
	7	"	"	"	"	300.16	300.14	
	8	"	"	"	"	300.16	300.14	
	9	"	"	"	"	300.16	300.14	
	12	53.52	53.72	58.16	58.08	300.20	299.92	
$\epsilon_2 = 300.22$	13	52.02	52.26	57.22	57.38	300.24	300.16	-0.04 $\pm 0.4 = -0.00$
$\zeta_2 = 300.19$	14	9.26	9.78	14.46	14.86	300.52	300.40	
300.20	15	54.34	54.56	58.12	58.54	300.22	300.42	300 +0.08
	15					Took out diaphragm and cleaned.		
	17					Adjusted anew carefully.		
$\epsilon_2 = 300.33$	18	44.36	44.90	29.76	30.28	300.54	300.52	
$\zeta_2 = 300.27$	19	54.14	54.38	59.70	59.56	300.24	299.86	-0.06 $\pm 0.4 = -0.02$
300.30	29	45.14	45.84	57.64	58.36	300.40	300.72	+0.02 +0.10
	31	"	"	"	"	300.40	300.72	
	June 1	4.18	5.34	13.88	14.18	301.16	300.30	
	2	31.72	31.74	40.62	40.86	300.02	299.74	
	4	"	"	"	"	300.02	299.74	
	5	36.50	37.20	44.50	44.98	300.70	300.48	
$\epsilon_2 = 300.38$	9	"	"	"	"	300.70	300.48	
$\zeta_2 = 300.28$	10	43.46	43.14	57.22	57.30	299.68	300.08	-0.07 $\pm 0.4 = -0.03$
300.33	11	"	"	"	"	299.68	300.08	+0.03 +0.11
	12	48.76	48.68	56.34	56.44	299.92	300.10	
	15	50.52	50.68	0.70	0.26	300.16	299.56	
	18							
	16	49.40	49.76	0.26	0.68	300.36	300.42	
	17	22.68	23.08	32.32	32.82	300.40	300.50	
$\epsilon_2 = 300.15$	26	37.66	38.08	48.10	48.60	300.32	300.50	
$\zeta_2 = 300.21$	29	12.92	13.04	24.94	25.26	300.12	300.32	-0.04 $\pm 0.4 = -0.00$
300.18	30	12.16	12.50	24.96	25.22	300.34	300.26	300 +0.08

	Date	ξ		η		ξ_r	η_r	ξ_{mean}	
	1873 July	3	30.46	30.54	43.08	43.00	300.08	299.92	
		5	"	"	"	"	300.08	299.92	
		6	5.08	5.26	17.00	17.36	300.18	300.36	
		7	9.70	10.12	20.12	20.72	300.42	300.60	
		9	16.50	16.92	28.10	28.88	300.42	300.28	
$\xi_2 = 300.23$		10	"	"	"	"	300.42	300.28	
$\xi_2 = 300.32$		12	41.12	41.06	50.54	51.48	299.94	300.94	-0.05 $\pm 0.1 = -0.09$
300.27		13	"	"	"	"	299.94	300.94	+0.01 +0.09
		15	48.24	48.80	1.00	1.04	300.56	300.04	
		20	"	"	"	"	300.56	300.04	
		20	29.78	30.46	40.08	40.80	300.68	300.72	
		21	4.22	4.59	14.62	14.88	300.32	300.26	
$\xi_2 = 300.49$		22	1.28	2.08	12.04	12.50	300.80	300.46	
$\xi_2 = 300.40$		23	31.42	31.96	43.84	44.16	300.54	300.32	-0.09 $\pm 0.1 = -0.05$ -0.13
300.44		26	17.52	17.56	30.36	30.94	300.64	300.58	+0.05 +0.13
		30	33.42	33.80	45.84	46.90	300.08	301.06	
	Aug.	4	12.46	13.70	26.86	26.58	301.24	300.44	
		5	49.58	50.26	1.50	1.76	300.68	300.46	
		9	3.58	3.72	14.86	15.18	300.14	300.32	
		10	"	"	"	"	300.14	300.32	
$\xi_2 = 300.30$		11	0.46	0.52	11.08	11.68	300.06	300.50	
$\xi_2 = 300.49$		12	11.58	11.64	22.94	23.06	300.06	300.12	-0.08 $\pm 0.1 = -0.04$ -0.12
300.39		28	36.56	37.24	47.02	47.30	300.68	300.28	+0.09 +0.12
	Sept.	1	"	"	"	"	300.68	300.28	
		2	"	"	"	"	300.68	300.28	
		3	"	"	"	"	300.68	300.28	
$\xi_2 = 300.68$		6	"	"	"	"	300.68	300.28	-0.10 $\pm 0.1 = -0.06$ -0.14
$\xi_2 = 300.28$									+0.06 +0.14
300.48									

	Date	\bar{L}		\bar{G}		\bar{L}_2		\bar{G}_2	mean
	1873 Sept 7	36.56	37.24	47.02	47.30	300.68	300.28		
	8	"	"	"	"	300.68	300.28		
	9	"	"	"	"	300.68	300.28		
	Oct. 5	3.58	4.22	12.48	13.56	300.64	301.08		
	8	"	"	"	"	300.64	301.08		
$\bar{L}_2 = 300.58$	9	11.82	12.06	14.08	14.26	300.24	300.18		
$\bar{G}_2 = 300.46$	13	14.68	15.20	18.24	18.30	300.52	300.06	-0.10	$\times 0.4 = -0.06$
300.52	14	"	"	"	"	300.52	300.06		$+0.06$ $+0.14$
	16	"	"	"	"	300.52	300.06		
	17	Took out diaphragm. Adjusted anem.							
	20	Took out microscope. G and examined. Adjusted it to read about 14" greater? than G.							
	22	Found that microscope L Oct-20 was set 1" wrong.							
	22	59.90	58.56	58.96	57.62	298.66	298.66		
	28	13.20	13.74	9.58	9.98	300.54	300.40		
$\bar{L}_2 = 300.22$	29	"	"	"	"	300.54	300.40		
$\bar{G}_2 = 300.00$	30	"	"	"	"	300.54	300.40	-0.02	$\times 0.4 = -0.08$
300.11	Nov 1	49.76	50.42	41.68	42.42	300.66	300.74		-0.02 $+0.06$
	2	56.78	55.74	49.08	47.90	298.96	298.82		
	3	"	"	"	"	298.96	298.82		
	4	"	"	"	"	298.96	298.82	+11	-7.9
	5	"	"	"	"	298.96	298.82		
	6	"	"	"	"	298.96	298.82		
$\bar{L}_2 = 299.43$	10	53.30	53.42	36.86	37.06	300.12	300.20		
$\bar{G}_2 = 299.41$	18	55.94	55.80	36.52	36.74	299.86	300.22	+0.12	$\times 0.4 = +0.08$
299.42	19	"	"	"	"	299.86	300.22		-0.06 -0.08
$.58$	22	"	"	"	"	299.86	300.22		
	23	"	"	"	"	299.86	300.22	-0.01	$\times 0.4 = -0.04$
$\bar{L}_2 = 299.86$									-0.03 $+0.05$
$\bar{G}_2 = 300.22$									
300.04									

Date	E	G	E ₂	G ₂	Mean	
1873 Dec. 1	55.94	55.80	36.52	36.74	299.86	300.22
3	Microscope E. having moved nearly 30' from its position (and having also been set wrong 1°) it was set back to 5° the telescope pointing to the lower line of the North Collimator. Found that the general direction of the motion <u>up</u> on the wheel instead of <u>down</u> as might be expected. Set both microscopes so as to read nearly alike.					
6	52.56	53.14	39.66	39.58	300.58	299.92
7	"	"	"	"	300.58	299.92
9	40.22	40.86	31.54	31.22	300.64	300.68
10	Put a nickel plated screen head on Microscope E.					
10	Disturbed the reading 2" or 3"					
10	54.70	55.06	39.82	40.26	300.36	300.44
15	"	"	"	"	300.36	300.44
16	21.98	22.78	10.94	10.90	300.80	299.96 -0.07
17	"	"	"	"	300.80	299.96
18	"	"	"	"	300.80	299.96
21	"	"	"	"	300.80	299.96
23	22	"	"	"	300.80	299.96
24	"	"	"	"	300.80	299.96
28	"	"	"	"	300.80	299.96
29	"	"	"	"	300.80	299.96 -0.08

$$E_2 = 300.45$$

$$G_2 = 300.23$$

$$300.34$$

$$E_2 = 300.80$$

$$G_2 = 299.96$$

$$300.38$$

$$+0.03$$

$$+0.11$$

$$+0.04$$

$$+0.12$$

Date	Dr	Cr	Gr	Gr	$\frac{Gr + Gr}{5}$

Apr. 16. In this position of the circle, read from 5' to the division 50 of the circle.
Set the micrometer head of G. so that when the telescope points on the North
Collimator, the reading of G is about $2\frac{1}{2}$ less than C. In passing from A. to
the reading of G. will always be greater than C. In the extreme south
it will be about 18" greater.

E_0	E_2	Date	E	E	E_0	E_2	E_0	E_2
$E_0 = 300.42$								
$E_2 = \frac{299.48}{299.95}$		1874 June 10	12.94	13.36	25.72	25.20	300.42	299.48
		+01						10
		-04 +04	15	47.26	18.30	18.2	301.04	299.20
$E_0 = 300.89$								16
$E_2 = \frac{299.50}{300.19}$			18	6.58	7.32	18.26	18.56	300.74
		-04						299.80
		-09 +09	28	48.80	52.18	8.18	8.70	301.28
$E_0 = 300.53$			30	41.40	42.54	13.56	14.68	301.14
								301.12
$E_2 = \frac{301.14}{300.83}$		-17 July 1	54.00	53.18	5.26	7.04	299.18	301.78
		-22 +22	6	2.78	2.98	11.04	11.10	300.20
$E_0 = 300.60$			7	6.86	7.52	17.62	15.76	300.66
								298.14
$E_2 = \frac{298.76}{299.68}$		+06	8	52.88	51.82	4.72	2.56	300.94
		+01 +01	13	6.14	6.26	19.38	18.62	300.12
			18	52.18	53.26	8.24	6.74	301.08
			21	28.86	28.44	45.98	44.18	299.58
			27	55.00	55.00	9.82	9.32	300.00
$E_0 = 300.78$								299.50
$E_2 = \frac{299.01}{299.59}$		+05	28	1.30	2.26	18.36	17.68	300.96
		+00 +00	Aug. 3	3.26	4.12	19.34	19.32	300.86
$E_0 = 300.86$			5	J. F. M. is not certain whether he has				
$E_2 = \frac{299.98}{300.42}$				been in the habit of reading				
				microscope E from $5'$ to $5''$ or from				
				$55'$ to $5''$ Probably read both ways.				
$E_0 = 300.43$			5	59.56	59.98	16.36	15.18	300.42
			19	8.94	9.54	26.00	25.30	300.60
$E_2 = \frac{299.04}{299.73}$			22	1.86	2.26	19.40	18.46	300.40
		+05						299.06
		+00 +00	25	107.36	47.58	4.32	3.32	300.32
			27	51.54	52.14	8.62	7.18	300.60
			31	54.36	55.46	12.08	10.56	301.10
			Sept. 2	50.50	51.32	9.58	8.02	300.82
$E_0 = 300.81$			6	2.46	3.46	19.52	18.90	300.96
$E_2 = \frac{298.45}{299.63}$		+07	7	58.70	59.28	16.40	14.78	300.58
		+02 -02						298.38

June 23. The trouble with microscope E does not seem to be remedied. Began a series of observations to see if it is possible to detect the cause of the error on the following plan. I. The North Collimator is to be read three times each day once in the morning, in the afternoon, and after finishing observations. II. The above readings to be made first, without disturbing the screw-head and frames, and second after every conceivable disturbance of them. It is obvious that E can be moved about $4''$ by motion of the frame. An examination found that the clamps clamping

1870phae

		Date		E	G	G ₂	G ₂	G ₂ +G ₂	
E ₂ = 300.94		1874 Sept. 9		58.26	59.22	16.74	15.78	300.96 299.04	11
G ₂ = $\frac{298.60}{299.77}$		14		5.24	6.16	23.30	21.46	300.92 298.16	
	+105	100-Oct. 3		51.46	52.02	7.92	6.50	300.56 298.58	
		6		9.12	8.88	22.48	21.64	299.76 299.16	10
E ₂ = 300.39		11		6.80	7.04	22.50	21.06	300.24 298.56	
G ₂ = $\frac{298.77}{299.58}$		18		53.78	54.78	9.88	8.66	301.00 298.78	
	+108	19		58.92	58.62	10.36	9.52	299.70 299.16	
	+103-13	20		7.98	8.66	20.28	19.18	300.68 298.90	22
E ₂ = 300.19		26		2.82	3.02	18.82	17.82	300.20 299.00	
G ₂ = $\frac{299.02}{299.61}$		4		52.96	53.28	4.60	3.70	300.12 299.10	
	+108	7		54.02	54.48	11.70	10.74	300.46 299.04	
	+103-13	9		50.2	5.44	19.52	18.50	300.42 298.98	9
E ₂ = 300.06		11		3.14	3.18	16.90	16.38	300.04 299.18	
G ₂ = $\frac{299.14}{299.60}$		16		6.50	5.78	16.06	15.16	299.28 299.10	
	+108	19		2.10	1.92	10.10	8.28	299.82 298.18	
	+103-13	21		7.12	7.00	13.20	12.24	299.88 299.04	23
E ₂ = 299.76		24		4.62	4.44	19.26	18.52	299.82 299.26	
G ₂ = $\frac{298.65}{299.20}$		30		2.86	2.38	13.74	12.06	299.52 298.12	
	+16	9		58.70	58.74	10.72	8.84	300.04 298.12	12
E ₂ = 299.81		12		4.60	4.36	13.80	12.38	299.76 298.58	
G ₂ = $\frac{298.47}{299.14}$		15		3.22	2.86	8.26	6.98	299.64 298.72	
	+117	21		55.10	54.88	2.10	0.76	299.78 298.66	
	+112-12	27		56.90	56.76	9.62	7.90	300.06 298.28	28
E ₂ = 299.93		1875 Jan 5		7.22	7.18	15.36	14.02	299.96 298.66	
G ₂ = $\frac{298.53}{299.23}$		10		30.82	29.34	32.58	30.92	298.72 298.34	13
	+115	17		0.83	1.00	8.97	7.30	300.17 298.33	
E ₂ = 299.44		19		20.40	20.47	29.87	27.73	300.07 297.86	21
G ₂ = $\frac{298.33}{298.88}$		20		52.60	52.74	5.56	4.38	299.14 298.82	
E ₂ = 299.75									
G ₂ = $\frac{298.40}{299.07}$									

The microscope tube to the frames did not press hard enough when secured down as far as the screws would carry. Put paper under them (both). They now seem much firmer.

Date	E									E_0	G_2	mean
1875, Jan. 25	2.92	2.96								310.04	298.52	
26	16.30	16.48								310.18	298.24	+20 +16
Feb. 1	57.18	57.56								310.38	298.18	+11 -11
$E_0 = 300.11$ 4	54.03	53.80								299.77	298.57	
$G_2 = \frac{298.33}{299.22}$ 8	4.86	4.40								299.54	297.32	
9	6.12	6.34								300.22	298.00	
10	7.30	7.50								310.20	298.26	+32 +28
$E_0 = 299.79$ 14	2.52	1.62								299.10	297.54	+21 -21
$G_2 = \frac{297.63}{298.21}$ 15	26.16	28.06								299.90	297.34	
16	8.36	8.18								299.82	297.22	
18	37.20	36.96								299.76	297.22	
$E_0 = 299.93$ 23	10.46	10.72								300.26	297.38	+29 +23
$G_2 = \frac{297.77}{298.85}$ 24	32.50	32.38								299.88	299.08	+18 -18
25	12.90	12.76								299.86	297.46	
28	54.06	53.40								299.34	297.78	
March 2	52.54	52.02								299.48	297.96	+35 +28
$E_0 = 299.42$ 4	7.40	6.40								299.00	297.84	+23 -23
$G_2 = \frac{297.75}{298.58}$ 8	55.42	54.82								299.40	297.22	
9	5.54	4.76								299.22	298.38	+33 +26
$E_0 = 299.51$ 17	7.80	7.72								299.92	297.94	+21 -21
$G_2 = \frac{297.85}{298.68}$ 18	4.80	4.62								299.82	297.96	
22	17.10	16.82								299.72	297.66	
23	8.78	7.82								299.04	297.88	+32 +20
$E_0 = 299.61$ 25	13.90	13.78								299.88	297.62	+20 -20
$G_2 = \frac{297.85}{298.73}$ 29	10.98	10.56								299.58	298.14	
31	53.66	52.86								299.20	298.40	
April 6	59.80	60.14								300.34	298.38	+24 +19 -19
$E_0 = 299.82$ 14	53.88	53.80								299.92	298.04	+14 -14
$G_2 = \frac{298.27}{299.05}$												

1870 phase

Date	E	F	G	G ₁	G ₂	Mean		
1875 April 15	282	254	25.10	24.16	299.72	299.06		
E ₀ = 299.77	20	4.48	4.10	20.20	18.40	299.62	298.20	+25 +20
G ₂ = $\frac{298.19 + 22}{298.98}$	22	8.14	7.88	26.60	24.68	299.74	298.08	+15 -15
	26	15.00	15.02	40.22	37.64	300.02	297.42	
May 3	12.78	12.56	39.28	36.90	299.78	297.62		
E ₀ = 300.17	5	23.34	23.52	48.42	46.76	300.18	298.34	+19 +15 +10 -10
G ₂ = $\frac{298.30}{299.23}$	10	14.88	15.42	44.98	43.92	300.54	298.94	
	17	57.04	57.20	25.10	23.54	297.16 300.16	298.44	+18 +14
E ₀ = 300.15	24	17.68	18.04	53.70	52.04	300.36	298.34	
G ₂ = $\frac{298.45}{299.30}$	27	3.08	3.02	40.44	39.00	299.94	298.56	+09 -09
June 1	49.40	49.58	24.60	23.34	300.18	298.74		
E ₀ = 299.88	8	2.52	2.22	38.78	36.98	299.70	298.20	+23 +19
G ₂ = $\frac{298.27}{299.07}$	14	19.04 15.50	18.80 14.04	52.16 52.04	52.04 52.16	299.76 300.74	297.88 302.12	+14 -14
	16	57.08	57.10	33.92	32.10	300.02	298.18	
E ₀ = 299.65	21	12.74	12.80	51.28	49.32	300.06	298.04	+28 +23
G ₂ = $\frac{298.10}{298.87}$	22	6.94	6.10	45.86	44.10	299.16	298.24	+18 -18
	29	25.28	24.64	0.28	58.22	299.36	297.94	
July 7	30.18	30.20	5.62	3.34	299.82	297.72		+29 +23
E ₀ = 299.49	11	54.88	55.04	33.32	31.00	300.16	297.68	+18 -18
G ₂ = $\frac{297.70}{298.85}$								
August 4	68.76	61.68	33.24	31.90	300.92 299.92	298.66		+20 +16
E ₀ = 298.74	9	10.06	9.62	47.86	46.62	299.56	298.76	+11 -11
G ₂ = $\frac{298.71}{299.47}$	26	0.86	0.72	35.00	38.02	299.86	298.02	
	30	7.96	8.12	42.84	41.88	300.16	299.04	+20 +16
Sept. 1	4.72	4.32	37.72	36.48	299.60	298.76		+11 -11
E ₀ = 299.88	6	54.04	53.94	28.06	26.34	299.90	298.28	
G ₂ = $\frac{298.52}{299.20}$	8	27.36	27.30	0.84	58.86	299.94	298.02	
	14	13.70	13.52	45.06	43.10	299.82	298.04	+25 +20
Oct. 12	15.30	14.88	41.60	39.80	299.58	298.20		+15 -15
E ₀ = 299.86								
G ₂ = $\frac{298.15}{299.01}$								

Date	E	F	G	E ₁	E ₂	mean
1875 Oct. 14	3.60	3.72	40.76	39.08	30012	298.32
E ₁ = 299.92	19	5.80	35.36	33.26	29956	297.90
E ₂ = 298.20						
299.06	26	20.70	50.70	49.20	30028	298.50
Nov. 2	10.64	11.10	29.30	27.20	30046	297.90
8	39.08	39.10	1.04	50.02	30002	298.98
9	19.14	20.10	40.02	38.68	30096	298.66
E ₁ = 300.41	11	18.58	42.36	40.68	30030	298.32
E ₂ = 298.46						
299.43	17	21.12	38.50	36.76	30028	298.26
E ₁ = 300.29	22	1.76	16.56	14.80	30030	298.24
E ₂ = 298.25						
299.27	1	41.58	46.74	45.28	29938	298.54
Dec. 1						
E ₁ = 299.71	13	1.94	15.36	13.92	29990	298.56
E ₂ = 298.29						
299.00	15	13.14	21.70	19.48	29984	297.78
1876 Jan. 5	-3.68	-30.4	4.94	-9	4.76	30018
10	57.50	57.28	5.96	+00	5.32	29936
10	57.68	57.84	5.32	-06	4.80	29948
11	57.50	57.28	5.96	+00	5.32	29936
11	57.68	57.84	5.32	+06	4.80	29948
13	53.84	53.26	1.66	-03	1.46	29980
13	50.36	50.60	56.80	+11	56.08	29928
18	53.66	54.54	7.44	+14	7.70	30026
20	55.94	56.18	7.26	+03	6.88	29962
24	55.10	55.88	7.50	+03	6.88	29938
25	57.12	57.46	4.44	+06	3.76	29932
27	53.64	54.12	3.62	-01	4.06	30044
29	50.02	50.46	9.44		9.54	10.46
Feb. 3	50.40	51.52	58.10	+09	57.14	29904
5	37.48	37.30	42.00		41.38	45.16
8	56.62	57.00	9.54	+03	8.78	29924
12	23.90	23.94	28.86		28.50	33.02
16	56.44	56.66	8.16	+00	8.18	30002
19	11.70	12.26	26.22	+05	26.02	29980
17	13.26		22.24	+03		25.10

These corrections are laid off from the curve (for) already drawn. The new curve (in red) is to be used in the reduction of the normal observations in which on only 1 standard error used.

Red (1st 29.40)

300.50 300.41
 299.95
 299.50
 299.10
 299.50
 299.10
 299.42
 299.42
 299.61
 299.50
 299.50
 299.48
 299.85
 299.50
 299.70
 299.24
 299.42
 299.50
 299.46

Row 5

Red. $\frac{1}{2}(R+G+16)$
to $\frac{1}{2}(E+G)$

Date	C	F	G	H	
1876 Feb. 20	11.48	12.18	300.70	20.78 $+0.5$ 20.60	299.82 25.58 24.56 298.98 19.78 18.62
-26 $\left(\frac{2}{1}\right)$ 22	13.02	13.44	300.42	25.76 $+0.9$ 26.08	300.32 29.60 29.20 297.60 25.26 24.18
+40 March 2	22.76	22.76	299.30	31.00 -0.1 30.92	299.92 35.64 33.74 298.10 31.78 30.86
+25 4	22.02	21.44	299.42	30.26 -0.5 30.06	299.80 35.12 33.52 298.40 29.58 28.60
+66 6	21.10	19.98	298.88	31.78 -1.3 31.76	299.98 36.28 34.58 298.30 30.88 30.70
+50 6	21.00	19.58	298.58	33.22 -1.2 32.94	299.72 38.62 37.28 298.66 33.70 33.24
6	21.24			32.86	38.62 33.62
+38 7	24.04	22.80	298.76	32.30 -0.8 32.66	300.36 41.52 40.64 299.12 36.76 35.82
+46 13	25.36	24.66	299.30	31.96 -0.9 31.88	299.92 39.10 37.44 298.34 33.84 33.40
+42 $\left(\frac{1}{1}\right)$ 14	23.92	23.36	299.44	30.06 -1.0 29.28	299.22 36.64 33.94 297.30 32.28 31.48
+45 $\left(\frac{1}{1}\right)$ 15	23.36	22.74	299.38	30.14 -1.1 29.80	299.66 37.08 34.88 297.80 32.30 31.58
+04 18	23.66	23.26	299.60	30.72 -1.1 29.88	299.16 37.60 35.88 298.28 34.02 32.88
+35 21	23.08	22.38	299.30	32.26 -0.7 32.26	300.00 38.40 36.64 298.24 35.00 33.96
+53 22	23.44	22.48	299.04	32.52 -1.1 32.56	300.04 37.46 35.76 298.30 33.72 33.52
+51 29	21.56	20.74	299.18	29.48 -1.0 29.56	300.08 37.74 37.62 297.88 34.98 33.98
-06 April 1	9.46	8.80	299.34	19.00 $+1.1$ 18.26	299.26 27.40 26.44 299.04 23.68 22.54
+29 6	17.82	16.88	299.06	30.18 -0.6 29.96	299.78 39.80 38.24 298.94 35.58 34.44
+21 9	19.86	18.78	298.92	29.28 -0.4 29.66	298.38 39.68 37.50 297.82 35.48 34.66
+28 $\left(\frac{1}{1}\right)$ 10	22.66	21.90	299.24	32.16 -0.5 32.20	300.04 40.20 39.00 298.80 35.76 34.90
+14 $\left(\frac{1}{1}\right)$ 11	18.06	17.12	299.06	26.30 -0.3 26.00	299.70 35.84 34.66 298.82 31.82 30.56
+65 17	26.32	25.56	299.24	31.52 -1.3 32.22	300.70 44.00 41.72 297.72 40.08 39.00
+04 30	26.12	25.24	299.12	33.82 -1.1 33.58	299.76 47.38 45.92 298.54 43.36 41.42
+39 May 1	25.64	24.44	298.80	32.18 -1.0 32.44	300.26 45.46 43.92 298.96 42.06 40.60
+54 16	29.32	28.10	298.78	33.92 -1.1 34.16	300.24 54.42 52.84 298.92 50.42 49.54
21	37.34	36.96	299.62	37.62	37.36 299.74 0.90 37.6 0.26 -0.40
+51 21	38.28	36.98	298.70	36.92 -1.0 37.06	300.14 1.68 -0.60 297.72 1.44 -0.24
+47 23	37.30	36.06	298.76	38.22 -0.9 38.78	300.56 58.88 57.12 298.24 58.38 56.70
+47 25	38.48	37.12	298.64	39.28 -0.9 39.52	300.24 6.60 4.78 298.18 4.86 2.80

$$P. or V$$

$$Red (E + F + G + H) - (E + G)^2$$

Date	E	F	G	H	
1876, May 29	45.66	41.62	29896	42.54	42.84 30030 7.78 7.02 29824 8.28 6.40
31	46.88	45.84	29896	45.26	45.44 30016 9.12 7.64 29852 11.78 10.40
31	45.26			53.12	59.54 50.68
June 5	51.82	51.72	29990	55.40	55.62 30022 4.00 2.84 29884 54.08 50.08
July 10	3.47	3.74	30037	9.68	9.56 29888 17.24 16.38 29914 8.86 7.66
12	5.78	7.14	30136	10.28	9.72 29944 17.24 15.82 29858 10.48 9.46
18	8.76	8.58	29982	9.56	9.20 29964 22.68 21.46 29878 13.10 11.72
23					
25	23.24	23.22	29998	28.28	27.44 29916 31.36 30.16 29880 20.66 19.08
31	51.82	51.80	29998	56.28	56.24 29996 60.58 59.72 29914 49.92 49.12
August 2	39.50	39.70	30020	44.66	43.48 29882 47.38 46.04 29866 36.36 35.22
6	25.26	25.04	29978	27.46	27.20 29974 32.86 31.78 29892 21.34 19.78
8	25.90	25.92	30002	28.92	28.34 29942 32.84 31.98 29914 20.88 19.56
21	49.18	49.08	29990	54.40	53.82 29942 58.14 56.74 29860 45.78 44.38
27	45.54	45.16	29912	49.04	48.20 29916 52.26 50.78 29852 41.06 40.54
29	41.30	41.24	29994	45.56	44.96 29940 48.72 47.54 29882 37.78 35.96
Sept. 2	38.04	37.92	29988	42.46	41.88 29942 45.14 43.60 29846 33.56 32.12
3	43.76	43.66	29990	47.42	47.06 29964 50.62 49.08 29846 40.10 39.10
Oct. 2	8.84	7.70	29886	17.42	16.48 29906 21.68 20.94 29926 8.70 6.08
10	29.70	29.56	29986	40.80	38.70 29900 41.56 40.10 29854 26.84 25.16
17	28.32	27.58	29926	41.42	40.56 29918 40.80 39.60 29880 23.04 21.50
18	17.52	17.10	29958	30.96	28.88 29922 28.46 26.98 29852 10.44 8.72
25	18.96	18.72	29976	28.18	27.84 29946 32.32 30.74 29842 14.92 13.92
29	35.24	33.48	29824	44.12	43.74 29962 45.18 43.22 29804 25.88 23.82
Nov. 5	25.78	24.36	29858	34.82	34.04 29922 36.76 35.92 29916 18.06 16.14
13	31.64	30.82	29918	42.54	41.86 29932 46.08 45.22 29914 26.66 24.58
Dec. 7	2.46	1.18	29872	13.38	13.16 29978 10.56 9.14 29858 49.50 47.68
9	24.56	22.88	29832	35.16	34.20 29904 30.76 27.34 29658 8.18 6.02

$$\frac{R_{\text{ed}}(R + R + 646)}{(R + 9)}$$

Date	E	F	G	H
1876, Dec. 13	12.34	11.74	29940	24.80 + 4
19	36.92	35.50	28558	48.06 - 3 46.46
24	51.22	50.12	29890	1.96 + 2 1.12
1877, Jan. 2	48.28	46.52	28824	0.20 - 7 59.78
4	88.44	37.04	28860	49.24 - 6 48.16
11	15.78	15.46	29968	16.44 + 1 15.38
15	11.42	10.02	29560	9.32 - 8 8.64
21	7.10	6.80	29970	7.93 - 7 7.33
23	20.70	20.14	29944	17.20 + 3 16.84
29	8.02	8.46	30044	9.44 - 7 9.54
29				25 + - 4
Feb. 5	37.48	37.30	29982	42.00 + 9 41.38
5				
12	23.90	23.94	30004	28.86 + 7 28.50
12				
19	22.96	23.08	30012	27.94 - 13 27.42
20	10.80	9.82	29982	14.34 - 19 13.26
27	16.80	16.80	30000	26.40 + 7 25.78
27				17 + 1
March 5	35.50	35.56	30006	45.42 + 0 44.78
5				
11	14.02	13.62	29960	23.46 + 0 23.32
11				8 + 0
29	37.04	37.24	30020	45.22 - 1 45.06
29				
April 9	37.18	37.22	30004	45.98 - 7 46.22
22	31.74	31.82	30006	51.38 + 3 50.58
25	12.86	14.00	30114	22.90 - 5 22.38
				13 - 2

$$\text{Rad. of } (F + \frac{G+H}{4})$$

$$\text{to } (\frac{E+G}{2})$$

Date	E	F	G	H
1877 May 3	22.20	22.26	30.06	31.30
14	25.56	25.36	29.80	35.24
17	45.18	45.68	30.50	55.50
22	22.50	22.81	30.31	32.67
28	20.22	21.04	30.32	32.40
30	12.32	14.44	30.12	26.26
June 4	24.54	25.76	30.12	37.50
14	18.86	20.62	30.76	33.46
19	10.84	11.70	30.86	23.88
28	15.86	17.04	30.18	31.48
July 1	39.10	40.28	30.18	57.48
5	12.66	13.66	30.00	26.28
24	14.26	15.28	30.02	21.54
26	22.78	23.14	30.36	33.96
31	16.38	16.76	30.38	27.30
Aug. 10	14.66	15.22	30.56	24.58
14	19.88	20.54	30.66	29.12
21	15.56	16.06	30.50	26.74
24	6.46	7.22	30.76	14.72
31	13.32	13.60	30.28	23.68
Sept. 12	16.12	16.60	30.48	26.26
16	40.26	40.90	30.64	48.02
19	56.6	6.06	30.40	15.92
22	40.10	40.16	30.06	49.38
25	9.10	9.62	30.52	19.22
Oct. 1	17.16	17.54	30.38	31.44
4	25.38	25.52	30.14	37.36
15	24.30	24.92	30.62	39.30

1870phase

Date	E	F	G	H
1877 Oct. 23	12.68	13.20 300.52	27.50	27.30 299.80
+19 -4			13.56	11.20 297.64
+32 -6	28	17.34	17.16 299.82	29.94
-26 +5	31	18.60	19.18 300.58	31.76
+18 +3	Nov. 4	33.32	33.40 300.08	47.36
+28 +6	7	32.22	32.28 300.06	44.22
+40 -8	12	12.84	13.02 300.18	19.64
+44 -9	14	14.66	14.82 300.14	27.92
+35 -7	27	3.36	3.76 300.40	15.08
+62 Dec. 2	24.98	24.96 299.98	36.28	36.28 300.00
+74 -15	6	28.76	28.58 299.82	40.60
-5 +1	12	40.26	40.08 299.82	52.00
+57 -11	17	15.88	15.84 299.96	27.80
+65 -13	26	0.14	0.28 300.14	12.28
+68 -14	30	30.68	30.64 299.96	41.20
1878 Jan. 3	22.72	22.18 299.46	32.70	32.04 299.34
+68 -03	9	11.30	11.02 299.72	20.38
+53 -11	16.9	27.40	26.92 299.52	38.18
+88 -20	17	11.52	11.76 300.24	13.56
-4 +1	22	8.08	8.10 300.02	9.56
+64 -11	29	10.10	10.94 300.84	10.94
+42 -9	Feb. 5	22.44	22.38 299.94	23.92
+16 -3	12	18.64	18.06 299.42	18.94
+39 -8	18	34.60	33.58 298.98	35.66
+8 -2	27	7.26	6.58 299.32	9.78
+30 -6	Mar. 5	12.70	12.56 299.86	14.94
+11 -2	19	23.82	23.72 299.90	25.44
+3 +1	Apr. 4	11.22	11.38 300.16	11.36
+13 -3	15	10.72	10.96 300.24	14.48
-27 +5	18	14.94	15.18 300.24	19.52
+4 -1				

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Date	B	F	G	H
1879, Jan. 21	21.82	21.76	299.94	22.44
	21.64	299.20	20.68	18.34
	297.66	21.90	20.22	298.32
			298.78	
			+24	120
				<u>298.80</u>

Values of Constant for R_{upis},
interpolated from preceding curve.

1878			
Jan. 1	-.13	Feb. 27	-.20
5	.14	28	.20
7	.14	Mar. 4	.19
12	.14	5	.19
13	.14	6	.19
14	.14	16	.18
16	.13	19	.18
19	.12	20	.18
22	.11	21	.18
23	.11	26	.17
24	.11	30	.16
28	.11	31	.16
29	.11	Apr. 2	.16
30	.11	3	.15
Feb. 2	.12	8	.14
3	.12	13	.13
4	.12	14	.13
5	.13	16	.13
6	.14	18	.12
7	.15	May 1	.11
11	.19	2	.11
13	.20	4	.11
14	.21	5	.11
16	.22	6	.11
18	.22	7	.11
19	.22	8	.11
24	.22	June 3	.07
26	-.21	4	-.07
		June 5	-.07
		6	.07
		9	.06
		13	.06
		19	.07
		20	.07
		24	.07
		25	.07
		26	.07
		July 1	.05
		2	.05
		3	.05
		7	.04
		8	.05
		9	.05
		10	.05
		13	.07
		15	.08
		16	.09
		22	.10
		23	.10
		24	.10
		28	.08
		31	.07

Data for curve for runs. Microscopes E A G and N

1870 Jan. 3	+ .15	- .10	Sept. 2	+ .08	- .03
9	.16	.11	9	.18	.13
16.9	.15	.10	12	.15	.10
17	.13	.08	16	.14	.09
22	.11	.06	24	.16	.11
29	.14	.09	29	.16	.11
Feb. 5	.12	.07	Oct. 3	.08	.03
12	.20	.15	10	.12	.07
18	.25	.20	29	.14	.09
27	.18 . 17	.13	Nov. 2	.17	.12
Mar. 5	.16	.11	19	.19	.14
19	.22	.17	26	.17	.12
Apr. 4	.14	.09	Dec. 3	.14	.09
15	.18	.13	11	.12	.07
18	.12	.07	16	.19	.14
22	.13	.08	19	.19	.14
May 7	.12	.07	1879 Jan. 21	.24	.19
June 3	.14	.09			
4	.06	.01			
19	.08	.03			
23	.12	.07			
July 8	.05	.00			
11	.09	.04			
15	.12	.07			
23	.14	.09			
25	.11	.06			
29	.08	.03			
Aug. 18	.06	.01			
26	+ .11	- .06			

Data for curve for runs Microscope E A. G. and No

1878 Jan. 3	+ .15	-.10	Sept. 2	+ .08	-.03
9	.16	.11	9	.18	.13
16.9	.15	.10	17	.15	.10

Value of Constant of Run $\frac{2 + R + G + W}{4}$
Interpolated from curve 1878

Jan. 1 -10 Feb. 27 -15 June 5 -04 Aug. 22 -03

Curve for Constant of Run

For Preliminaries

Curve used for none observations

July 8 .15 .00
11 .09 .04
15 .12 .07
23 .14 .09
25 .11 .06
29 .08 .03
Aug. 18 .06 .01
26 + .11 -.06

7 .11 May 1 .08 22 .06 19 .10
11 .14 2 .08 23 .06 22 .10
13 .15 4 .08 24 .06 23 .10
14 .16 5 .08 28 .05 25 .10
16 .16 6 .08 31 .04 28 .09
18 .17 7 .08 Aug. 12 .03 30 .08
19 .17 8 .08 13 .03 Oct. 1 .08
24 .16 June 3 .05 14 .03 2 .08
26 -10 4 -05 18 -03 3 -08

Values of Constant of Runo - $2 + F_T \frac{G + V_0}{4}$
 Interpolated from curve 1878

Jan. 1	- .10	Feb. 27	- .15	June 5	- .04	Aug. 22	- .03
5	.10	28	.14	6	- .04	25	.04
7	.10	Mar. 4	.14	9	.04	26	.04
12	.10	5	.14	13	.04	27	.04
13	.10	6	.14	19	.04	29	.05
14	.10	16	.13	20	.05	31	.06
16	.09	19	.13	24	.05	Sept. 1	.06
19	.08	20	.13	25	.05	2	.06
22	.08	21	.13	26	.05	6	.08
23	.08	26	.13	July 1	.04	7	.08
24	.07	30	.13	2	.04	8	.09
28	.07	31	.13	3	.04	9	.09
29	.08	Apr. 2	.13	7	.04	10	.10
30	.08	3	.13	8	.04	12	.10
Feb. 2	.08	8	.12	9	.04	14	.10
3	.09	13	.11	10	.04	15	.10
4	.09	14	.11	13	.05	16	.10
5	.10	16	.10	15	.05	17	.10
6	.10	18	.09	16	.06	18	.10
7	.11	May 1	.08	22	.06	19	.10
11	.14	2	.08	23	.06	22	.10
13	.15	4	.08	24	.06	23	.10
14	.16	5	.08	28	.05	25	.10
16	.16	6	.08	31	.04	28	.09
18	.17	7	.08	Aug. 12	.03	30	.08
19	.17	8	.08	13	.03	Oct. 1	.08
24	.16	June 3	.05	14	.03	2	.08
26	- .15	4	- .05	18	- .03	3	- .08

Oct. 8 - .07

10 .07

14 .07

15 .07

16 .08

21 .08

22 .09

29 .10

Nov. 2 .11

3 .11

4 .11

5 .12

6 .12

10 .13

12 .13

13 .13

14 .13

23 .12

24 .12

26 .11

30 .10

Dec. 1 .10

6 .10

7 .10

8 .10

11 .10

12 .11

14 .11

16 .12

17 .12

Dec. 18 - .12

19 .12

23 .13

24 .13

25 .14

26 - .14

30 .15

31 - .15

¹⁸⁷⁹
Jan 5 - .16

6 - .17

20 - .22

22 - .23

23 - .23

25 - .24

26 - .25

Constant for Runs for 1876 and 1877.

Mean values			Reading for run-space		Corr.
E.	5	0.12	5	0.21	-.09
F.	4	59.77	4	59.62	+.15
G.	4	58.92	4	58.68	+.24
H.	4	59.52	4	59.34	+.18
Mean corr.					+.10"
Mean					+.02" Applied to S
					-.02 " " 2.D.

Constant for Runs for 1878

E.	5	0.56	5	0.51	+.05
F.	5	0.18	5	0.32	-.14
G.	4	58.95	4	58.55	+.40
H.	4	59.72	4	59.45	+.27
Mean corr.					+.15"
Mean					+.03" Applied to S
					-.03 " " 2.D.

Values adopted

	For S	For Zenith Dist.
1876	+.02"	-.02"
1877	+.03	-.03
1878	+.03	-.05

Corr. for Rund.

	Corr. to Circle Reading	Corr. + Constant	Corr. + Constant Corrected, to be applied
76 Jan 5	-08	-06	-10" +16
10	+14	+16	+12 -12
11	+14	+16	+12 -12
13	+12	+14	+10 -10
18	+08	+10	-06
20	+10	+12	
24	+10	+12	
25	+10	+12	+08 -08
27	+03	+05	
Feb. 3	+06	+08	
8	+15	+17	
16	+12	+14	
19	+10	+12	-08
20	+08	+10	
22	+04	+06	
Mar 2	+18	+20	
4	+17	+19	
6	+16	+18	
7	+14	+16	
13	+14	+16	
14	+24	+26	
15	+19	+21	
18	+20	+22	
21	+18	+20	
22	+14	+16	
29	+19	+21	
Apr. 1	+18	+20	
6	+19	+21	
9	+28	+30	
10	+14	+16	

Apr. 11 +18" +20"

17 +17 +19

30 +23 +25

May 1 +20 +22

16 +17 +19

21

23 +21 +23

25 +22 +24

29 +17 +19

31 +19 +21

June 5 +25 +27

July 10 +10 +12

12 +08 +10

18 +16 +18

25 +18 +20

31 +09 +11

Aug. 2 +17 +19

6 +16 +18

8 +14 +16

21 +17 +19

27 +16 +18

29 +18 +20

Sept. 2 +18 +20

3 +15 +17

Oct 2 +27 +29

10 +27 +29

17 +22 +24

18 +28 +30

25 +16 +18

29 +31 +33

Nov. 5 +25" +27"

13 +22 +24

Dec. 7 +24 +26

9 +41 +43

13 +27 +29

19 +36 +38

1877 24 +38 +40

Jan 2 +29 +31

4 +30 +32

11 +22 +24

Corrections for Runs

1877 Jan 2 +.29" +.32"

4 +.30 +.33

11 +.22 +.25

15 +.32 +.35

21 +.19 +.22

23 +.25 +.28

29 +.14 +.17

Feb. 5 +.31 +.34

12 +.18 +.21

19 -.01 +.02

20 +.09 +.12

27 +.19 +.22

Mar. 5

11 +.21 +.24

29 +.13 +.16

Apr. 9 +.09 +.12

22 +.14 +.17

25 +.03 +.06

May 3 +.14 +.17

14 +.14 +.17

17 +.12 +.15

22 +.09 +.12

28 +.02 +.05

30 +.09 +.12

June 4 +.10 +.13

14 +.10 +.13

19 +.07 +.10

28 +.03 +.06

July 1 +.09" +.12"

5 +.08 +.11

24 +.04 +.07

26 +.04 +.07

31 +.08 +.11

Aug 10 +.10 +.13

14 +.09 +.12

21 +.03 +.06

24 +.02 +.05

31 +.10 +.13

Sept. 12 +.02 +.05

16 +.09 +.12

19 +.09 +.12

22 +.16 +.19

25 +.09 +.12

Oct. 1 +.14 +.17

4 +.10 +.13

15 +.06 +.09

23 +.15 +.18

28 +.12 +.15

31 +.11 +.14

Nov. 4 +.11 +.14

7 +.21 +.24

12 +.14 +.17

14 +.12 +.15

27 +.05 +.08

Dec. 2 +.19 +.22

6 +.03 +.06

Dec 12 +.21" +.24"

17 +.07 +.10

26 +.09 +.12

1878 30 +.14 +.17

Jan 3 +.15 +.18

By mistake the constant of the Runs was taken with the positive sign in the formation of the value in the record column. The curves were constructed with these erroneous values as also were the tabular values given on p. 134 of the book with the title "Meridian Circle Constants - Reduction Tables, 1878". The Runs having been computed with the values here given they are corrected by applying +.04" x reading of microscopes for 1876, and by +.06" x reading of microscopes for 1877.

Continued from Page 59.

Date	Time	No. 4	No. 5	Bar.	Att. Tl.	Collim.
	^h ^m	[°]	[°]	ⁱⁿ	[°]	
Oct. 8	19 50	59.3	-	30.15	65.2	
8	20 40	58.0	-	30.14	64.3	
10	20 45	51.3	-	29.96	58.7	44.569
10	22 50	44.8	-	30.00	55.2	
14	20 15	52.5	-	30.18	61.2	
14	22 55	50.4	50.3	30.17	57.0	
15	21 0	60.8	60.2	30.07	63.1	44.583
15	23 5	58.6	58.1	30.08	61.8	
16	20 0	63.7	61.3	30.07	67.1	44.574
16	23 5	58.4	56.0	30.05	63.1	
21	19 30	63.3	63.8	30.10	64.2	
21	22 10	57.8	57.8	30.12	63.6	
22	19 35	52.6	50.5	30.15	63.5	
22	22 15	51.5	48.9	30.13	57.7	
29	20 20	44.8	43.0	30.22	55.8	44.563
29	20 28	-	-	30.22	55.8	
29	0 45	40.7	38.3	30.19	46.9	
Nov. 2	20 10	50.0	49.1	29.94	54.1	44.569
2	0 10	45.2	44.0	29.93	50.0	
3	20 0	39.2	37.8	30.18	51.0	
3	0 10	33.2	32.2	30.17	40.6	
4	20 15	33.7	32.8	29.97	44.8	44.5435
4	0 10	29.0	27.7	29.97	35.2	
5	20 0	35.1	34.1	30.00	41.9	
5	0 10	30.8	30.2	30.01	36.9	
6	20 15	34.2	33.0	29.77	42.5	
6	0 45	30.1	29.2	29.78	36.0	44.508
7						
10	18 32	43.2	-	29.81	43.3	44.488
10	22 0	38.1	-	-	-	
10	23 45	36.6	35.8	29.82	43.0	

Date	Time	No. 4	No. 5	Bar.	Alt. Th.	Collim.
Nov. 12	^h 22 ^m 37	50.3	48.6	29.53	52.3	44.513
12	0 10	47.3	46.9	29.58	51.1	
13	21 27	41.8	41.2	29.72	47.9	
13	1 35	38.1	37.2	29.84	43.0	
14	21 37	36.2	35.2	30.24	44.1	44.514
14	0 10	32.5	29.5	30.30	39.8	
23	0 15	41.0	40.7	29.26	45.8	
23	1 35	40.3	40.3	29.30	45.2	
24	23 0	42.5	41.6	29.86	46.8	44.528
24	1 50	38.3	38.0	29.92	44.1	
26	22 30	34.6	33.8	30.13	43.1	44.526
26	1 50	30.3	27.8	30.17	36.8	
29						44.537
30	22 15	40.2	39.1	30.27	47.0	
30	1 30	33.8	32.2	30.35	40.2	
Dec. 1	23 0	32.1	29.3	30.43	42.0	
1	1 30	29.3	27.4	30.40	36.1	
3	23 20	42.4	41.8	29.58	47.3	44.538
5						44.536
6	22 50	29.5	29.2	29.74	38.6	
6	0 15	28.2	27.4	29.75	35.3	
7	22 30	23.2	22.8	29.98	36.2	
7	2 40	20.3	18.9	30.03	25.8	
8	23 0	24.9	23.2	30.28	33.2	
8	2 35	20.8	17.8	30.28	26.7	
11	23 55	38.0	37.2	29.64	43.7	44.519
11	2 15	37.3	37.2	29.73	42.0	
12	22 35	34.2	33.3	30.07	40.7	
12	1 35	33.2	32.9	30.12	37.3	
14	22 45	30.2	27.8	30.06	39.6	
14	2 20	27.6	26.1	30.04	32.9	

Date.	Time	No. 4	No. 5	Bar.	Ht. Th.	Collim.
Dec. 16	^h 23 ^m 15	24.8	24.0	29.96	36.4	44.513
16	2 40	20.2	19.2	30.03	28.0	
17	22 50	26.1	23.8	30.02	36.3	
17	0 5	26.1	—	—	—	
18	23 0	30.2	28.8	29.92	36.2	44.477
18	3 0	28.2	27.8	29.94	31.9	
19	22 50	25.5	25.2	30.17	33.8	44.503
19	3 0	21.3	19.8	30.23	31.1	
23	0 0	22.2	20.9	29.73	33.2	44.528
23	5 0	17.8	16.7	29.78	27.0	
24	23 40	19.8	18.8	29.64	33.4	
25	23 40	25.2	—	29.62	32.9	
25	1 35	22.8	—	—	—	
25	4 56	20.4	—	—	—	
26	0 30	24.7	—	29.69	33.6	44.499
26	5 0	19.2	—	29.68	27.2	
30	1 30	25.0	—	29.98	33.1	
31	1 30	23.6	—	30.15	33.4	44.535
31	5 15	19.7	—	30.13	29.7	
1879 Jan. 5	0 50	24.1	—	29.61	32.8	
5	5 17	19.2	—	29.60	26.9	
6	0 50	15.9	—	29.85	30.3	44.500
7	1 32	20.6	—	30.16	29.8	
13	2 53	28.8	—	29.82	31.7	
14						44.480
19	14 50	21.4	—	29.70	34.2	44.140
20	3 0	11.9	—	29.69	27.3	
20	5 10	8.9	—	29.73	21.8	
21						44.469

Date	Time	No. 4	No. 5	Bar.	Att. Th. Collim.
1879	L m	o		in	o
Jan. 22	5 15	28.2		30.00	33.8
23	3 30	29.5		29.98	34.3
23	5 10	26.1		30.04	33.3
25	2 55	40.2		29.40	40.4
25	5 55	34.8		29.43	40.0
26	3 10	6.4		30.31	24.2
26	5 55	3.7		30.28	18.2
Feb. 7					46.785

Date	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	KL	JM	JN	JO	JP	JQ	JR	JS	JT	JU	JV	JW	JX	JY	JZ	KA	KB	KC	KD	KE	KF	KG	KH	KI	KJ	KK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LL	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TT	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	XG	XH	XI	XJ	XK	XL	XM	XN	XO	XP	XQ	XR	XS	XT	XU	XV	XW	XX	XY	XZ	YA	YB	YC	YD	YE	YF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ
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E

F

G

H

$\frac{E+G}{2}$

1884 Feb 15 39
 (18) 22 2
 Mar 3 1
 (12) 10 2
 24
 Apr 13
 (22) 30
 Aug 5

See if corr of 4 micros to
 2 micros Feb 11 1883 = .05

298.56

301.63

301.17

299.90

128

$300.315 = \frac{E+F+G+H}{4}$

$299.86 = \frac{E+G}{2}$

$+ .45 \frac{E+F+G+H}{4} - \frac{E+G}{2}$

$+ .09 =$ Corr to be applied to 4
 to reduce to 2 micros.
 (for 1')

was
 Dec 3 1888

-.05 applied to Cuthbert's Correction
 in Feb 106-107 K24 is not the
 reduction of 4 micros to 2
 or 2 to 4

Try also for Oct 14 with
 same conclusion.

K24 p 106

0	28.53	298.83	298.84	+20 +.15
22	13.18	299.96	299.12	298.98
80	53.18	300.38	297.88	+23 +.18
12	6.74	299.62	299.03	
72	18.58	299.86	298.77	298.84
16	8.56	299.40	298.51	+26 +.21
12	11.84	299.42	298.90	298.70
06	7.98	299.92	299.12	+18 +13 299.12

$\frac{E+F+G+H}{4}$

6	27.94	299.58	299.46	
0	18.34	300.04	299.44	+11 299.63
3	18.53	300.20	299.98	+07-05 +.02
12	33.70	299.88	299.86	Before adjustment
72	16.06	300.34	299.89	299.88
70	29.94	300.24	300.05	-01-06
72	26.34	299.62	299.60	+08+03
66	31.28	300.62	299.80	+04-01
26	0.46	300.20	299.54	+09+04

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Resume of Level Readings

Value of ^{me} division = .80" by level trier
 " " " = .88 " circle

Mean adopted = .84"

The values here given are for the most part, the mean of two readings for each reversal.

Thus either E. W or E. W
 E. W W E
 W E W E
 W E E. W

Date	E	W	Time	E	W	Time	E	W	Time	Mean indir	Mean in time +0.58
1871 Sept 14											
25	4854	57.91								+1.67	
29	5875	59.60								+0.42	
30	6042	60.17								-0.12	
Oct 3	57.82	58.52		50.78	54.90		51.90	53.05		+1.13	
4	57.82	57.98		52.24	57.32					-0.19	
4	53.08	50.30		51.88	52.12	^h 23 ^m 20				-.74	
5	46.68	48.58		46.68	49.98		46.62	48.10		+ .78	
5	49.96	49.38		49.48	50.20		48.52	50.05		+ .19	
8	57.00	54.75		56.55	54.75		56.50	54.45		-.93	
9	50.62	52.35		52.40	50.98					-.05	
9	52.82	52.00		51.30	51.10					-.75	
12	47.50	50.82		48.95	49.90		47.60	51.48		+1.02	
12	(52.80	58.40)?		56.65	53.55	23 43	Ref'			-0.65	
13	54.32	54.32		53.75	53.10					+ .45	
13	52.90	53.85		56.15	53.01						
14	52.18	54.48		53.12	53.30		52.15	53.38			
14	53.32	53.32	11 15								
15	45.35	42.89		42.50	44.95		43.18	44.00			
16	57.92	58.90		58.88	58.30						
16	56.95	58.05	Morning								
17	56.70	54.68		57.15	54.58						
22	52.97	53.48		57.72	52.87		50.75	50.45	^h 11 ^m 10		
Nov. 2	52.92	54.40									
8	58.90	58.60									
9	59.05	58.12		57.75	54.92		57.80	53.02			
Dec. 16	61.60	62.20		63.98	66.80		68.40	62.30			
17	59.96	66.88	^h 5 P.M. M.T.								

Date	L	N	Time	S. E	N	Time	E	N	Time	Mean in div.	Mean in time
1871 Dec. 20	5980	7100		63.87	7072						
24	5782	6482		57.82	64.78						
28	6298	7158	(4 ^h P.M.)	62.52	72.52	4 P.M.					
28	6845	7520	(" ")	68.18	75.80	11 "					
1872 Jan 8	6630	7007									
July 20	3250	4290	16 ^h 17 ^m	3450	4790	18 03	3537	4742	18 03		
21	2995	4601		3017	4605		3187	4460			
21	3082	4627									
22	3375	4617		3252	4800		3790	5275	17 25		
23	3128	4780	15 00	3342	4542	15 10					
24	3092	4500	14 15	3762	5005	17 30	3610	5142	17 30		
25	3862	4987	17 30								
27	3250	4758	16 15								
27	4195	5672	19 00								
28	3025	4852	15 50				3058	4818	15 50		
28	2635	5200	17 30	3670	5200	17 30					
29	3202	4797	16 45	3110	4925	16 45	3362	5038	18 00		
30	3532	4415	16 40	3423	4498	16 40	4112	4985	18 15		
Aug 1	3910	4200	14 30	3845	4340	14 30					
1	4425	4942	19 20	4432	4902	17 20					
2	4100	3910	15 50								
4	3982	4560	15 50	3930	4615						
4	4135	5070	17 05	4197	5077						
5	3448	4072		3615	4285						
6	3502	4348	(6 ^h M.T.)								
6	Investigation of Level.										
Telescope horizontal	3502	4348		3538	4305						
L = +30° north	3585	4240		3578	4298						
L = +60 "	3572	4320		3475	4352						

Date	E	N	Time	E	N	Time	E	N	Time	Mean in dir.	Mean in time	
1872 Aug 6	Adjusted level carefully.											
Telescope horizontal	33.15	41.85		32.95	41.80		32.85	41.15				
$\angle = +38^\circ$ north	33.20	40.80		32.65	41.10							
Left the level to settle 15 minutes												
$\angle = +16^\circ$	33.55	40.28		32.10	41.68							
Aug 6	39.58	49.05	19	25	40.45	47.45	19	25	40.08	47.85	19	35
6	35.80	43.20	16	30	(By J. F. M.)							
7	32.54	41.55	16	15	33.54	41.90	16	15	35.90	42.57	18	20
7	38.38	43.22	19	20	37.15	44.12	19	25				
8	31.70	40.25	18	15	32.30	39.85						
9	25.45	35.22	14	50	25.85	35.08	14	50				
9	33.55	44.15	18	15	36.30	41.40	18	15				
10	35.80	42.60			35.75	43.55	17	50	34.50	44.20		
14	34.15	43.25	23	50								
Sept 9	46.75	52.55	22	50	45.65	53.60	22	50	45.82	53.60	22	50
10	47.10	53.05	21	40	46.62	53.72	21	40	W. A. R.			
10	47.62	52.70	22	50	Wm. Barkness							
12	35.98	42.85	16	50	35.21	43.75	16	50	35.50	44.10	W. A. R.	
12	42.00	53.70	17	10	Wm. H.							
18	41.22	51.45			41.32	51.08						
19	44.98	56.15	23	45	45.95	56.10	23	45				
Oct 10	52.10	56.80			51.60	57.50			52.50	57.52		
14	56.75	62.25			53.35	62.95			54.70	64.50		
14	56.75	62.70			55.90	64.15			56.05	63.55		
15	55.75	66.55			54.55	66.58			54.98	66.60		
15	54.46	62.80										
16	52.60	64.35			54.52	62.60			54.05	63.00		

Date	E	H	Time	E	H	Time	E	H	Time	Mean in dir	Mean in time
1872 Oct. 19	55.88	64.50									
21	55.92	60.00									
28	55.28	62.00		57.83	65.90		59.80	68.50			
28	60.52	67.55									
29	59.42	74.47	0	25 59.50	74.92		60.30	72.70			
29	58.40	71.65		Part-level over register.							
29	53.05	66.80		54.55	65.95						
Nov. 2	53.87	66.35		53.23	65.14		52.40	66.47			
1873											
Mar 18	39.15	73.40		39.55	72.95						
May 28	35.30	45.40		34.20	46.40		32.35	42.00	Longitude Campaign with West Point		
May 28 Morning				41.45	50.35		40.95	50.55			
29	45.35	54.40		44.75	54.90		45.60	53.80			
31	42.60	49.30		40.65	50.40						
June 1	46.85	57.35		45.65	57.15		45.45	57.45			
2	49.85	56.05		52.25	55.20						

Level of Russian Transit during Longitude Campaign with West Point is to be found in the Coast Survey Record Books, which are in possession of Mr. Dean.

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