

KG
11366
v.541

^{gone}
Chronograph Record
Circle Readings
From Oct. ~~12~~⁵ 1873 to Jan. 20, 1874

A. 12

C. W. Sever, University Bookseller, Cambridge.

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

Date.

1873 Oct. 13

First minute-break.

Oct. 14

c, set at.

N. Coll.

S. Coll.

Sum

Mean.

a.

δ.

Mag.

REMARKS.

20^h 17^m 40^s 25 52 00

7.8

~~7.8~~

Obs. W.A.R.

Rec. J.F.M.

18 43 8.3 57 36

8.1

8.5

Obs. W.A.R.

Rec. J.F.M.

19 51 9.4 57 42

21 22 9.0 57 59

9.0

9.0

22 46 8.7 57 06

9.2

23 52 8.6 50 33

8.8

9.1

24 49 9.4 57 33

lost

9.3

26 46 7.1 57 52

7.4

7.4

28 05 8.9 52 08

8.8

9.0

29 34 9.0 52 14

not seen

8.8

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

20 1 20.1 26.2

45 1 1.4 8.9

45 0 54.1 3.9

20 2 39.2 46.6

20 2 40.7 49.3

15 1 28.0 38.9

45 3 16.1 24.1

45 3 0.9 10.4

45 3 15.0 24.0

25 4 53.1 0.2

25 4 47.0 55.9

10 3 48.9 56.1

10 4 2.2 10.4

5 1 37.9 47.1

1873phae.pr01.1545R

Dec.

First minute-break.

c, set at.

Oct. 13, 1873
Oct. 14

Sum
Mean.

N. Coll.	S. Coll.

α .	δ .	Mag.	REMARKS.
20 30 52 84 51 36		9.3	
		9.4	
32 04 84 50 17		8.7	
		8.0	
33 05 89 50 17		9.0	
		9.1	
34 20 72 57 33		7.5	
		7.5	
35 21 85 50 57		9.0	
		8.8	
36 43 90 52 54		9.0	
		9.2	
37 05 90 52 39		9.0	very faint comp. suspected
		9.0	
38 16 91 52 58		9.0	
		9.0	9.3 folls.
39 17 90 51 53		7.1	
		8.8	9.6 folls
40 26 85 51 15		8.7	
		8.6	

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

45 0 51.7 59.5

45 0 39.1 49.0

0 4 51.9 0.4

0 4 49.4 58.9

0 4 12.5 20.9

0 4 12.5 21.5

45 2 8.4 16.7

45 2 6.3 5.1

30 0 0.3 8.0

30 0 54.6 59.0

25 2 13.0 19.9

25 1 53.1 1.0

40 1 58.5 5.0

40 1 57.0 59.3

20 3 6.7 12.1

20 3 5.8 14.4

30 1 42.8 49.9

25 2 50.9 59.7

5 0 47.1 55.0

5 0 43.0 52.3

1873bae.prj.1545R

Date.

First minute-break.

c, set at.

N. Coll.

S. Coll.

Sum

Mean.

α .

δ .

Mag.

REMARKS.

20 42 53 83 52 41

8.7

8.5

44 01 60 57 56

5.5

5.8

45 31 73 50 18

6.7

6.5

47 12 68 57 54

6.9

6.3

48 54 86 50 08

9.0

8.6

50 30 90 50 01

8.5

7.0

52 46 85 57 25

8.9

9.0

53 58 84 50 22

8.5

8.8

54 50 80 57 49

8.4

8.8

66 18 85 52 10

8.2

8.8

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

40 0 15.5 22.0

40 0 5.2 13.8

25 0 9.6 16.1

25 0 2.1 10.7

0 3 9.9 17.9

0 2 48.2 58.2

25 1 45.2 52.3

25 1 27.8 36.7

10 2 20.0 28.2

10 2 13.8 23.0

20 1 23.2 30.9

15 4 27.0 36.1

55 1 11.9 18.8

55 0 43.8 51.0

55 4 1.4 7.9

55 3 50.9 0.2

30 1 51.1 57.9

30 1 41.9 50.3

10 1 10.9 17.1

10 1 9.4 17.1

Date.

Oct. 13

First minute-break.

Oct. 14

c, set at.

Sum
Mean.

N. Coll.	S. Coll.

a. δ. Mag. REMARKS.

20	57 09	70 51 53	lost not seen
	58 18	8.0 50 54	9.0
			8.9
21	0 07	80 52 14	9.2
			9.1
1	32	8.0 51 57	9.3 lost 1. 2?
			9.2
2	44	8.4 51 28	8.2 2
			9.0
8	29	7.2 51 03	7.7 1 st #
			7.0
4	35	9.0 51 16	9.0 foll. #
			8.8
6	12	7.8 51 54	7.7
			8.0
7	35	8.4 51 30	8.0
			8.0
8	36	7.9 51 18	8.0
			8.0

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

25 1 44.5 52.0

25 1 41.5 51.1

5 1 52.8 58.9

5 1 38.1 46.1

25 4 36.8 48.8

25 4 29.9 38.4

50 2 4.7 11.9

50 2 1.9 11.1

15 2 11.7 18.0

15 2 14.7 23.6

5 1 36.2 43.9

5 1 36.8 46.0

25 2 5.9 12.0

25 2 1.4 10.9

50 1 39.9 47.1

50 1 32.0 41.7

0 3 27.1 34.2 seeing very bad.

0 3 25.3 33.9 seeing pretty good
but hazy

Date.

1873 Oct. 5

First minute-break.

Oct. 9

c, set at.

Sum
Mean.

N. Coll.

S. Coll.

α .

δ .

Mag.

REMARKS.

21 19 40 67 51 06

6.8

Obs. W. A. R.

Rec. J. F. M.

24 20 52 84 51 55

8.5

Obs. W. A. R.

Rec. J. F. M.

22 15 27 52 11

8.3

Obs. of 9.0 in A. R. pro.

7.0

23 47 67 52 34

9.2

2

8.9

24 43 82 51 31

8.4

22

8.5

25 31 90 51 17

9.2

lower #

26 56 68 51 37

6.4

2

7.0

27 42 75 51 19

6.5

6.8

28 58 76 53 01

7.0

7.9

30 02 64 51 07

6.3

false break after δ

5.5

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

15 0 4.0 10.7

25 2 13.8 25.9

25 4 32.7
~~40.9~~ 40.0

10 0 58.5 10.6

10 0 55.9 1.8

45 3 5.5 16.3

45 2 45.3 57.8

45 4 40.1 52.4

45 4 36.9 44.6

0 3 55.7 7.9

0

40 3 41.0 54.1

40 3 47.9 54.7

0 1 42.1 54.5

0 1 42.7 49.9

20 0 7.2 18.5

20 0 8.9 14.1

10 3 47.4 0.1

10 3 41.1 47.1

1873pae.proD.1545R

Date.

Oct. 5, 1873.

First minute-break.

Oct. 9

c, set at.

Sum
Mean.

N. Coll.

S. Coll.

α .

δ .

Mag.

REMARKS.

21 31 40 89 57 54 9.4

9.4 A.1, 2, 4

33 02 8.2 57 04 8.1

8.6

34 24 8.0 57 55 8.4

8.0

35 48 8.4 52 01 9.4

9.3 ref. A.1

37 36 7.1 57 41 6.5

6.1

38 48 7.7 57 45 7.7

7.0

40 11 8.0 57 12 9.0

9.0

41 52 8.1 57 14 9.0

9.1

43 05 8.7 57 19 8.9

8.9

44 18 8.6 57 53 8.8

8.9

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

25 1 28.1 41.0

25 1 39.1 45.1

15 1 33.2 45.9

15 1 36.2 42.9

25 0 41.8 53.9

25 0 33.1 39.0

15 4 33.0 44.9

15 4 21.1 27.0

35 4 6.9 19.1

35 3 5.1 11.0

30 2 8.5 —

30 2 5.5 10.3

5 3 26.0 39.0

5 3 24.9 31.3

5 2 10.9 23.0

5 2 8.2 13.9

0 1 37.7 50.0

0 1 38.9 40.0

25 3 22.7 34.8

25 3 20.1 26.8

Date.

First minute-break.

c, set at.

N. Coll.

S. Coll.

Sum

Mean.

a.

b.

Mag.

REMARKS.

21 45 30 67 (52 06) 6.0

5.8

47 27 88 (52 06) 8.7

8.9

49 05 89 51 24 9.3

9.3

50 48 86 (51 54) 7.5

7.4

51 50 83 (51 54) 8.5

—

53 05 90 51 06 8.9

9.2

54 26 87 51 46 8.8

9.1

55 23 94 51 16 9.5 X?

9.5

56 21 82 51 27 8.3

lost

57 55 91 51 52 9.1

9.2

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

15 0 28.6 40.7

15 0 25.0 30.4

15 0 1.7 13.9

15 0 0.0 5.0

55 2 14.6 26.9

55 2 4.2 10.2

25 1 15.0 26.9

25 1 7.9 13.1

25 1 15.0 26.9

25 1 7.9 13.1

10 4 27.9 40.3

10 4 27.1 34.1

30 4 21.2 33.2

30 4 15.2 21.1

0 3 30.8 42.5

0 3 14.7 20.1

50 2 52.1 4.1

25 3 4.0 15.3

25 3 2.2 7.2

1873bae.proj.1545R

Date.

Oct. 5

First minute-break.

Oct. 9

c, set at.

Sum
Mean.

N. Coll.

S. Coll.

a.

s.

Mag.

REMARKS.

21 59 35 9.0 51 52

not seen.

0 35 9.0 51 39

not seen

~~9.8~~
9.8

9.2

1 50 7.0 51 11

6.5

6.5

3 33 8.9 51 42

9.3

9.5

8.5 above

4 50 8.2 50 30

not seen

8.9

5 50 8.9 51 02

8.8

9.0

6 47 7.7 51 48

7.3

7.6

8 32 8.8 51 39

8.9

8.7

9 31 7.3 51 52

8.3

7.0

10 42 8.5 51 14

8.5

8.8

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

1

40 2 4.7 17.0

40 2 6.3 12.0

10 0 33.0 45.9

10 0 24.1 30.0

40 0 16.5 28.8

35 4 56.1 0.7

1

50 1 13.3 18.6

15 3 42.1 54.0

15 3 32.9 39.1

30 3 33.7 45.0

30 3 22.9 28.1

40 2 8.9 21.0

40 2 59.9 5.3

25 3 47.9 59.5

25 3 41.0 46.3

5 2 22.7 34.9 seeing not very good

5 2 27.8 33.8 seeing not very good

Date.

1873, Oct. 21

First minute-break.

Oct 22

c, set at.

Sum

Mean.

N. Coll.

S. Coll.

Oct. 22 in this column

a.

s.

Mag.

REMARKS.

21 24 24 8.3 50 33

8.1

8.3

Obs. W. A. R.

Rec. J. F. M.

25 51 8.8 50 37

9.0

9.0

Obs. W. A. R.

Rec. J. F. M.

27 06 9.0 50 04

8.8

9.0

28 14 8.4 50 40

8.4

8.7 lost. 1

29 24 8.8 50 11

(9.0)

(9.2)

mean + A. R. 1 stroke for each S
(9.1) 1 stroke each S. mean A. R.

30 23 9.0 50 49

8.8

8.8

31 42 7.3 50 07

7.0

7.5

32 43 9.0 50 15

(9.5)

(9.2)

9.3. foll # for Oct. 22

33 48 8.8 50 52

Oct. 22
8.4

36 12 8.9 50 55

Oct. 22
9.0

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

Oct. 21

45

2

14.9

19.9

45

2

15.3

19.0

Oct. 21

40

2

27.9

33.8

40

2

34.2

38.1

Oct. 21

15

3

34.9

41.1

15

3

43.2

48.0

Oct. 21

35

4

28.2

33.1

35

4

33.8

37.0

~~Oct. 21~~

Oct. 21

5

4

12.7

18.1

5

4

21.7

25.1

Oct. 21

30

1

36.9

41.8

30

1

38.4

40.9

Oct. 21

10

3

53.9

0.0

10

3

55.8

59.9

10

3

5

Oct. 21

0

4

15.1

20.1

0

4

28.1

32.1

Oct. 21

25

3

3.0

7.9

25

2

54.0

56.6

Oct 22

20

4

43.9

47.1

Date. 1873 Oct. 22.

First minute-break. Oct 28

c, set at.

Sum
Mean.

N. Coll.	S. Coll.

a.	s.	Mag.	REMARKS.
21 37 30	57 50 36	5.5	W.A.R Obs.
		5.8	f. M. rec.
38 89	80 50 25	8.5	
		8.7	ref. A-
39 49	89 50 30	8.8	
		8.8	
41 21	90 50 20	9.2	
		9.0	
42 26	93 50 46	9.2	2
		9.3	
43 21	76 51 01	7.4	22
		7.9	
44 02	86 51 00	8.2	suspected faint comp. falls.
		9.0	
45 51	72 50 23	7.9	
		7.7	
47 09	90 50 18	9.1	
		9.0	
48 44	88 50 48	8.8	22
		9.0	

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

40 3 49.9 53.9

40 3 50.0 50.4

55 0 13.7 16.3

55 0 15.8 15.0

50 1 19.5 22.8

50 1 18.3 18.9

0 1 12.7 16.7

0 1 13.8 13.9

30 3 39.5 43.1

30 3 47.2 47.1

15 3 7.9 11.4

15 3 20.1 20.2

15 4 22.5 26.0

15 4 19.0 19.1

55 1 8.3 12.1

55 1 11.3 11.9

0 2 54.9 59.1

0 2 56.1 57.0

30 2 40.0 43.1

30 2 41.3 41.0

Date. 1873 Oct. 22
 First minute-break. Oct. 28
 c, set at.

N. Coll.	S. Coll.
Sum	
Mean.	

a.	s.	Mag.	REMARKS.
49 2 2	86 51 02	8.6	
		8.8	
52 40	87 50 24	8.7	rej. 1 st stroke for 3
		8.8	
52 0 2	80 50 57	7.9	
		8.1	
53 0 3	86 50 14	8.7	both, reg. order
		8.6	
		8.6	reg. order for 8.
54 28	87 50 14	8.5	
		8.6	
55 34	85 50 59	8.6	
		8.8	
56 50	85 50 43	8.8	both. 2 nd . S. pr.
		8.7	
		8.6	S. for 2 nd # pr.
		8.7	lost 1 for 2 nd #.
57 57	88 50 10	8.9	
		9.0	
59 38	91 50 47	lost	current failed
		9.3	
0 38	85 50 31	9.0	
		9.2	

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

15 3 13.9 17.1

15 3 15.9 15.3

55 1 22.9 26.1

55 1 19.1 20.0

20 2 12.0 15.2

20 2 10.1 9.9

5 0 53.7 56.9

5 0 55.9 55.3

5 1 49.9 53.2

5 1 52.2 52.0

20 0 35.2 38.9

20 0 24.1 24.0

35 1 27.8 30.4

35 1 26.1 25.1

5 4 19.1 23.1

5 4 24.1 24.2

~~30 3 19.1~~

30 3 17.5 17.3

45 4 19.9 23.2

45 4 24.9 25.0

Date.

1873 Oct. 22

first minute-break.

Oct. 28

set at.

Sum

Mean.

N. Coll.

S. Coll.

a.

δ.

Mag.

REMARKS.

22 01 47 80 50 18 9.2

9.2 3.?

2 59 90 50 48 8.6

8.8

4 04 90 50 06 8.8

9.0 lower #

5 08 91 50 17 9.2 2 foll. #

9.0

6 10 60 50 11 8.0 2 A, R. only for 8.0 mag.

6.0

8.0

5.5

7 2 86 50 40 8.4 2

8.2

7 59 90 50 10 9.0

9.0

8 10 91 50 12 9.1

9.1

10 19 95 50 37 9.5

9.5

11 20 78 50 22 8.0

8.0

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

0 2 20.0 23.3

0 2 13.7 13.1

30 2 24.5 28.7

30 2 22.5 22.0

10 3 30.9 35.0

10 3 19.1 20.0

0 2 45.3 48.5

0 2 31.7 32.0

5 3 25.0
~~28.7~~ 28.7

5 3 36.8 36.1

35 4 31.8 35.0

35 4 34.1 34.1

5 4 42.1 45.1

5 4 50.0 49.8

5 2 52.9 56.0

5 2 43.9 43.1

40 2 20.3 23.9

40 2 20.7 20.5

55 3 7.7 10.3

55 3 5.9 5.1

Date. 1873 Oct. 22

First minute-break. Oct. 28

c, set at.

Sum
Mean.

N. Coll.

S. Coll.

a.

δ.

Mag.

REMARKS.

22 12 37 78 50 40

7.9

7.7

13 42 90 50 43

9.2

9.2

14 57 84 50 36

8.1

8.8

16 12 91 50 23

8.5

sure 8.8 folls.

9.1

8.8 in A.R.

17 21 88 50 50

8.9

8.8

18 27 77 50 58

7.6

8.0 lost 1

19 54 70 50 36

6.9

7.0

20 48 86 50 05

9.0

9.0

22 15 87 50 26

8.7

foll. #

8.7

23 15 77 50 39

7.7

8.0

Runs.

Sum

Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

35 4 33.0 35.1

35 4 30.8 30.9

35 1 26.0 28.9

35 1 22.8 22.2

40 3 44.9 48.6

40 3 45.1 45.0

50 4 14.9 17.9

55 1 57.9 57.0

25 4 49.9 52.9

25 4 24.3 23.2

20 2 1.9 5.0

20 1 30.9 29.9

40 3 48.2 51.8

40 3 54.3 54.4

15 0 58.0 -2.1

10 4 55.0 55.0

50 3 38.2 41.3

50 3 39.8 38.9

40 1 3.1 6.9 seeing very good

40 0 1.5 0.9 seeing pretty good

Date. 1873 Nov. 1
 First minute-break. Nov. 2
 c, set at.

N. Coll.	S. Coll.

Obs. W.A.R.
 Rec. J.F.M.

Sum
 Mean.

a.	a.	δ.	Mag.	REMARKS.
22 12 3	22 00 17	73 51 04	7.7	Obs. W.A.R.
			7.9	Rec. J.F.M.
13 4	2 30	90 50 20	9.0	both #2, 1 stroke for each 8
			8.8	
			9.1	
14 5	3 42	90 50 55	9.0	
			9.1	
16 12	4 50	92 50 30	9.0	2
			9.0	
17 21	5 35	84 50 10	7.9	2
			8.1	
18 27	6 24	80 50 41	8.0	
			8.4	
19 54	7 57	90 50 10	9.0	
			9.2	
20 48	9 11	80 50 48	7.8	
			8.0	
22 15	10 19	85 50 44	8.8	
			9.0	
23 15	11 18	83 50 27	8.3	
			8.3	

Runs.

Sum
Mean.

A.

C.

inter.

Stroke.

Rev.

A.

C.

REMARKS.

15 0 16.6 12.8

15 0 19.1 15.8

55 4 35.5 31.1

55 4 34.7 30.9

25 0 26.9 22.8

25 0 17.6 13.8

50 0 12.1 8.9

50 0 8.1 1.2

5 4 44.1 40.8

5 4 42.9 39.0

35 4 16.8 13.0

35 4 11.1 7.0

5 4 53.4 49.7

5 4 55.0 51.1

30 1 51.3 47.9

30 1 45.1 41.2

30 3 29.7 25.7

30 3 24.9 20.2

50 3 19.1 15.1

50 3 11.8 8.0

1873 photo. proc. 1545R

Date.

1873 Nov. 1

First minute-break.

Nov. 2

Set at.

Sum
Mean.

N. Coll.

S. Coll.

a.

δ.

Mag.

REMARKS.

22

12 16

8.2

50 10

8.3

wrong #

8.4

13 17

9.5

50 19

9.0

9.2 ref. 1st W.

14 23

9.0

50 57

9.2

9.3

15 33

6.5

50 20

6.7

2

6.9

16 29

8.4

50 46

8.0

2

8.5

17 23

8.7

50 35

9.0

8.7

18 29

7.2

50 33

7.0

7.5

20 12

9.4

50 05

9.7

2

9.9

21 05

8.7

50 38

8.7

8.7

22 34

7.3

50 50

8.0

7.2

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

40 0 3.7 4 0.9

5 4 52.1 48.6

0 0 60.0 56.9

0 0 60.0 55.8

25 3 47.2 42.8

25 3 43.0 39.0

55 4 57.6 53.7

0 0 57.3 53.5

30 1 24.1 20.4

30 1 21.1 17.4

45 0 10.3 6.9

45 0 12.1 7.9

45 2 15.9 11.9

45 2 18.0 13.5

10 4 36.1 33.1

10 3 43.8 40.9

40 0 0.4 57.0

40 1 7.8 4.8

25 4 48.1 43.5

25 4 49.7 45.1

N. Coll.

S. Coll.

Date.

1873 Nov. 1

First minute-break.

Nov. 2

Sum

Mean.

c, set at.

a.	δ.	Mag.	REMARKS.
22			
23 46	8.5 50 18	8.0	
		8.0	
24 47	8.8 50 42	9.0	
		9.0	
25 48	9.0 50 51	9.1	22
		9.1	
26 24	8.0 50 38	8.6	
		7.5	
27 43	9.0 50 33	9.0	
		9.1	upper #
29 35	8.6 50 20	8.8	
		8.7	
31 36	9.1 50 15	9.1	
		9.1	
33 09	8.8 50 24	8.8	
		8.8	
34 21	9.4 50 36	9.5	
		9.3	
35 30	9.1 50 43	9.0	
		9.0	

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

0 1 34.9 30.1

0 1 38.5 35.0

40 2 27.0 23.0

35 2 25.7 21.0

25 3 56.9 51.1

25 3 45.0 41.0

40 4 57.9 53.3

40 4 58.0 55.7

45 1 46.6 42.1

45 1 46.9 43.1

0 0 58.0 55.7

0 0 58.7 55.5

0 4 33.9 29.8

0 4 34.9 31.4

55 0 19.1 14.4

55 0 15.6 12.1

40 3 19.0 15.1

40 3 12.0 9.2

35 2 2.1 58.1

35 2 13.9 9.0

Date. 1873 Nov. 1
First minute-break. Nov. 2
e, set at.

Sum
Mean.

N. Coll.	S. Coll.

a.		d.		Mag.	REMARKS.
22	37 06	83	51 31	8.4	
				7.8	
38	45	55	50 26	9.5	
				9.7	
39	59	80	50 48	8.4	22
				8.0	
40	43	80	51 25	7.9	
				7.7	
42	19	92	50 29	9.0	
				9.0	
43	49	70	50 16	7.0	
				6.5	
44	44	88	50 35	9.2	2p
				9.0	
45	36	73	51 35	7.8	
				7.8	
46	34	90	50 34	9.1	
				9.0	
48	01	80	50 49	8.3	
				8.2	

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

45 3 47.6 43.0

45 3 42.9 39.2

50 3 35.9 31.2

50 3 42.9 38.2

30 1 14.0 7.1

30 1 14.5 10.0

50 3 11.1 6.8

50 4 12.0 7.1

30 0 3.8 0.2

50 0 6.7 2.4

0 1 51.9 48.1

0 1 51.1 47.7

40 3 3.4 0.2

40 3 3.0 59.1

40 4 39.9 35.1

40 4 40.0 36.0

45 0 44.9 41.4

45 0 37.1 33.0

25 4 10.9 6.1

25 4 9.7 5.1

Date.

1873 Nov. 1

First minute-break.

Nov. 2

c, set at.

Sum

Mean.

N. Coll.

S. Coll.

a.

δ.

Mag.

REMARKS.

224905 86 50 16 8.8 lower #
8.8

5114 91 50 57 9.3 2
9.3

5207 86 50 46 8.5
8.5

5309 85 50 19 8.5
8.6

55-05 82 50 19 8.0
9.7

5606 84 50 24 9.4
9.6

5721 87 57 04 8.7
8.8

5856 88 57 45 9.0
8.5

036 80 57 05 8.8
8.7

141 89 50 55 —
8.6

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

0 3 17.0 14.1

0 3 13.9 11.0

25 3 43.8 39.0

25 3 41.2 36.3

30 3 14.6 9.8

30 3 18.8 14.9

0 0 7.0 4.3

0 0 5.9 43.1

0 0 33.0 29.8

0 0 24.8 20.9

50 2 7.9 3.9

50 2 17.3 13.0

10 4 42.1 38.1

10 4 46.3 41.8

35 0 59.0 55.1

35 0 60.0 56.0

15 0 14.0 9.9

15 0 14.9 10.2

20 4 42.0 37.9 seeing pretty fair.

20 4 40.5 35.5 seeing very good

Date. 1873, Nov. 4.

first minute-break. Nov. 5

set at. Nov. 6

Sum
Mean.

N. Coll.

S. Coll.

Obs. W.A.R.
Rec. J.F.M.

mag's of Nov 6

a.

s.

Mag.

REMARKS.

22 32 08

8.5

50 53

5.8

Obs. W.A.R.

5.6

lost Rec. J.F.M.

33 49

8.8

50 29

9.1

false stroke after 1

9.2

9.0

34 46

8.5

50 55

8.4

8.5

8.8

36 00

8.3

50 15

8.3

8.3

8.3

37 23

8.8

50 22

8.8

8.8

8.7

38 54

7.5

50 46

7.5

7.2

7.8

40 11

7.8

50 38

8.0

7.8

7.9

41 44

8.1

51 27

8.7

9.0

9.0

43 24

9.2

50 14

9.2

9.2

9.1

44 35

8.6

51 00

8.5

8.5

8.4

Runs.

Sum
Mean.

A.

C.

W.A.R. obs.
J.H.M. rec. Nov. 6

		Pointer.	Stroke.	Rev.	A.	C.	Nov. 6		REMARKS.
16	Nov. 4	25	2	1.8	55.7	25	2	12.2	4.2
2	Nov. 4	50	0	32.8	26.4	50	0	29.0	20.8
	Nov 5	50	0	26.2	20.2				
5	4	20	4	11.9	6.4	20	4	12.9	4.9
	5	20	4	10.3	4.1				
13	4	0	4	37.9	31.8	0	4	38.6	30.8
	5	0	4	36.2	30.2				
8	4	55	2	50.9	45.0	55	2	50.5	42.2
	5	55	2	49.1	42.1				
2	4	30	3	46.2	40.2	30	3	51.9	43.8
	5	30	3	44.9	39.4				
8	4	40	1	15.0	9.4	40	1	12.1	4.8
	5	40	1	11.1	4.9				
0	4	50	2	59.0	53.0	50	3	2.5	53.2
	5	50	3	8.9	1.1				
2	4	5	0	53.0	47.2	5	0	52.6	44.1
	5	5	0	59.7	52.1				
	4	20	0	29.0	23.4	20	0	26.1	17.8
	5	20	0	31.1	24.1				

N. Coll.	S. Coll.

Date. Nov. 4

First minute-break. Nov. 5

c, set at.

Sum
Mean.

mag's Nov. 6

a.	s.	Mag.	REMARKS.	
22 46 20	80 52 21	7.7 6.9		6.8
48 05	82 51 57	9.3 9.3		9.2
49 22	50 18	8.8 8.6	upper & foll. #.	8.8
50 30	80 57 46	9.0 9.0		9.1
52 11	85 57 48		not seen too faint to obs. not seen	—
53 00	80 50 55	8.2 8.2		8.0
53 57	82 50 19		not seen not seen	—
55 03	89 57 42	8.8 8.8		8.8
56 14	80 50 39	8.9 8.8		8.8
57 22	80 50 35	9.0 8.8		8.8

Runs.

Sum
Mean.

A.

C.

Nov. 6

REMARKS.

Pointer.

Stroke.

Rev.

A.

C.

Nov. 4 55 4 22.0 15.4 55 4 19.0 10.2

5 55 4 22.8 15.2

4 20 2 52.0 45.0 20 2 47.2 38.1

5 20 2 51.5 43.9

4 0 1 31.0 25.1 0 1 31.7 23.8

5 0 1 39.0 30.7

4 30 3 50.7 43.9 30 3 48.9 39.7

5 30 3 57.4 49.9

4 20 4 56.9 50.2 not seen

5

4 20 4 56.9 50.2 20 4 51.9 42.3

5 20 4 56.1 48.2

4 5 3 35.9 29.9 not seen

5

4 5 3 35.9 29.9 5x 3 35.0 25.9

5 5 3 37.0 29.2

4 40 0 0.8 55.1 35 4 57.9 48.9

5 40 0 3.2 55.8

4 40 4 48.2 42.2 40 4 44.0 35.0

5 40 4 47.0 39.0 stopped on account
B bad seeing

18730ae.prj.1545R

Date. *Nov. 4*
First minute-break. *Nov. 6*
c, set at.

Sum
Mean.

N. Coll.

S. Coll.

α .

δ .

Mag.

REMARKS.

22 59 06 86 51 00 8.8
8.8

23 00 50 79 50 23 7.0
8.0

1 49 94 51 54 9.5
9.3 ref. 2, 3, & 4.

3 13 95 50 41 9.6
9.5

4 46 88 52 58 9.0
8.8

6 08 90 51 00 9.1
9.1

7 40 93 50 44

not seen

not seen

8 40 87 50 45 9.0

1 8.8

10 14 90 52 17 9.0

9.0

11 30 80 50 07 8.5

8.0

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

15 4 12.8 6.9

15 4 7.6 58.8

65 2 6.0 59.4

55 2 4.1 54.9

25 1 47.1 39.9

25 1 48.1 39.0

35 3 37.3 30.1

35 3 37.9 28.8

20 1 34.6 26.5

20 1 33.9 23.6

15 4 41.9 36.1

15 4 34.2 25.2

20 1 5.8 5.5

30 1 5.8 59.5

30 1 10.8 1.9

0 4 24.1 17.2

0 4 22.3 13.9

10 2 33.8 27.7

10 2 34.9 26.0

Date.

First minute-break.

set at.

X00.4

Nov. 6

Sum

Mean.

N. Coll.

S. Coll.

a.

δ.

Mag.

REMARKS.

23 12 51 80 50 40 9.1

9.0

13 45 80 50 58 9.0

9.0

14 38 80 50 47 9.2

8.9

15 44 80 50 34 8.7

8.6

16 57 79 50 20 7.0

7.9

18 34 92 52 42 9.4

9.0

19 39 92 51 58 9.4 2 lower #

9.4

20 36 90 52 44 8.8 1st in W.?

8.8

22 28 88 50 21 9.3

9.0

23 26 80 50 58 8.3

8.0

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

35 4 20.9 13.9

35 4 21.2 11.9

20 1 5.0 58.9

20 1 3.1 54.0

30 1 58.0 52.1

30 2 1.9 52.1

45 0 15.5 8.9

45 0 16.0 7.1

55 4 31.0 24.9

55 4 27.2 19.2

35 3 29.2 21.3

35 3 27.3 18.9

20 1 48.3 41.2

20 2 23.8 14.9

35 0 44.9 37.2

35 0 36.7 —

55 3 25.3 19.4

55 3 25.0 15.9

20 1 25.8 19.0

20 1 27.4 18.3

Date.

Nov. 4

first minute-break.

Nov. 6

Sum
Mean.

N. Coll.

S. Coll.

a.

δ.

Mag.

REMARKS.

23 24 30 90 50 19 9.2

~~9.3~~

25 30 90 50 22 9.3

9.3

26 42 84 51 10 9.0

~~8.7~~

27 51 90 50 52 9.3

8.9

9.1 pr. same 8

29 32 70 50 32 7.0

~~5.0~~

31 12 88 50 14 9.0

9.0

32 51 78 51 33 8.0

8.2

34 10 90 51 01 9.0

9.1

35 26 90 50 58 9.0

A.R. for an 8.0 ^{mag.} pr.

8.0

" " " " " "

36 35 73 50 42 8.0

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

55 3 40.8 34.3

0 0 24.9 16.5

55 1 55.1 48.1

554 59.8 51.4

5 4 37.9 30.8

5 4 31.7 22.7

25 2 34.0 28.0

25 2 31.6 22.8

45 1 57.0 57.5

45 1 58.9 50.0

5 0 59.3 53.1

5 4 1.2 52.1

45 2 2.0 56.0

45 1 59.3 49.5

15 3 47.9 41.3

15 3 41.0 32.1

20 0 53.5 47.6

20 0 42.0 33.1

35 2 4.0 57.3

Nov. 6
Seeing very bad
seeing very good till toward
the last when it became hazy
difficult to obs. faint stars.

Date. 1873, Nov. 10.
 First minute-break. Dec. 7
 Set at.

Sum
 Mean.

N. Coll.	S. Coll.

Obs. W. A. R.
 Rec. J. F. M.
 Obs. W. A. R.
 Rec. J. F. M.

a.	s.	Mag.	REMARKS.
22 45 11	83 50 26	8.5 8.8	
46 43	94 51 00	9.0 (sure) 9.1	
48 28	95 50 13	9.5 B 9.6	
49 22	88 50 18	8.8 8.6	md. + foll. W's
50 30	80 51 46	9.0 9.0??	
51 55	87 50 58	8.6 8.5	
53 22	80 50 43	8.3 B B 8.2	
54 57	82 50 19	8.0 ? 8.0	
55 35	88 52 49	9.0 8.8	
56 35	90 50 57	9.1 9.1	upper #

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

50 3 45.7 35.0

50 3 57.1 48.7

15- 4 40.1 30.1

15 4 44.8 36.9

5 2 4.5 54.8

5 2 15.0 6.3

0 1 25.7 15.9

0 1 22.2 15.0

30 3 48.3 38.8

30 3 54.1 46.3

20 1 25.0 15.1

20 1 30.9 22.2

35- 1 3.0 52.3

35 1 13.2 4.8

0 0 39.0 28.9

0 0 34.8 27.1

30 0 32.9 20.9

30 0 36.9 28.2

20 2 42.5 32.0

20 2 48.3 40.1

1873pae.pro.1545R

Date.

1873 Nov. 10

First minute-break.

Dec. 7

set at.

Sum

Mean.

N. Coll.

S. Coll.

a.

δ.

Mag.

REMARKS.

22 57 43

93

51 07

9.1

8.3

Wrong #

59 06

86

51 00

8.8

8.8

0 52

85

50 44

8.6

8.8

2 33

81

50 30

8.0

8.8

8 41

85

51 02

8.8

8.8

5 25

83

50 52

8.3

8.3

6 34

75

51 32

7.0

7.0

7 29

83

52 25

8.5

8.0

8 27

90

52 43

8.9

8.7

9 23

94

52 59

too faint to obs.

9.2

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

10 2 46.1 35.1

10 4 7.0 59.0

15 4 3.9 53.8

15 4 12.1 3.5

35 0 42.1 31.2

35 0 39.7 31.1

45 4 57.2 48.8

45 4 59.1 51.9

15 3 5.0 54.0

15 3 3.9 55.1

25 2 31.1 20.0

25 2 27.0 19.7

45 3 7.2 56.0

45 3 7.8 59.3

50 4 52.0 39.9

50 4 50.0 40.1

35 1 4.7 52.3

35 1 4.1 54.9

20 1 24.0 14.9

Date.

1873 Nov. 10

First minute-break.

Dec. 7

set at.

Sum
Mean.

N. Coll.

S. Coll.

a.	δ.	Mag.	REMARKS.
23 10 28	80 52 53	8.8 8.8	
11 49	92 50 08	9.1 9.1	
12 51	90 50 40	9.2 9.0	
13 45	90 50 58	9.0 8.8	
14 38	90 50 47	9.0 9.2	
15 59	94 52 26		not seen not seen
17 21	91 50 10	9.0 8.8	
19 02	90 50 17	9.2 8.9	
20 02	83 52 29	8.2 7.0 7.8 6.0	reg. order
22 37	88 50 16	9.1 9.2	202

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

25 2 37.1 24.3

25 2 43.2 33.6

10 1 41.9 31.2

10 1 44.9 37.4

35 4 18.1 6.3

35 4 16.9 7.8

20 1 5.7 53.2

20 1 11.0 2.1

30 2 9.4 57.2

30 2 7.8 0.1

5 4 13.7 2.8

5 4 20.1 11.0

0 2 36.1 24.7

0 2 41.5 33.2

50 1 52.0 38.5

50 1 49.5 39.7

0 8 20.2 8.9

0 3 15.1 8.3

Date.

1873 Nov. 10

First minute-break.

Dec. 7

Set at.

Sum

Mean.

N. Coll.

S. Coll.

a.

s.

Mag.

REMARKS.

23

23 15 80 50 30

not seen
lost 1st wire no. 8"24 41 80 50 24 9.1
9.025 51 85 51 49 8.7
8.724 16 87 50 07 8.9
9.028 12 8.3 50 53 7.8
9.0

foll #

29 39 90 50 47 9.1
9.030 45 81 51 34 7.5
9.2
8.6lost 4 of 1st #
1 stroke for each 8, 8 for 2nd #
comes 1st last wire of 2nd # 2.31 50 80 50 31 8.2
8.432 51 78 51 33 8.0
6.833 57 90 50 57 9.1
9.0

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

50	1		13.0	4.9	
55	0		40.0	27.7	
55	0		36.7	27.8	
30	0		36.9	24.5	
30	0		41.2	32.4	
10	2		23.3	12.2	
10	2		29.1	21.1	
25	0		45.8	33.1	
25	2		28.5	19.9	
30	3		52.0	40.0	
30	4		3.9	54.9	
45	0		41.8	29.9	
50	2		12.2	4.1	
45	2		40.0	27.9	
45	3		10.8	2.9	
45	2		4.9	52.9	
45	2		4.8	56.1	
25	4		19.9	7.5	
25	4		26.9	18.1	

1873pae.pr.05.1545R

Date.

1873 Nov. 10

First minute-break.

Dec. 7

set at.

Sum

Mean.

N. Coll.

S. Coll.

α.

δ.

Mag.

REMARKS.

23 34 59

80

50 58

7.5

faint comp. pr. suspected

7.8

35 53

81

51 02

9.2

9.0

37 22

80

50 33

9.0

9.0

38 57

88

50 08

8.9

22

8.8

39 07

80

50 33

9.3

9.3

40 36

79

50 31

7.0

7.5

41 39

86

51 07

8.8

2p

8.8

42 33

80

51 06

9.0

9.0

43 39

85

50 06

not seen

9.8

44 35

79

50 41

9.2

7.9

9.2

reg. order

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

20 1 40.9 28.9

20 1 41.4 33.1

15 2 17.4 4.9

15 2 32.6 23.9

45 1 48.8 35.9

45 1 58.0 50.1

10 1 12.3 1.1

5 3 1.0 52.1

45 1 23.2 11.0

45 1 25.9 18.0

45 3 58.6 46.6

45 4 10.0 2.0

10 2 28.3 16.2

10 2 47.2 39.3

10 3 17.8 6.1

10 3 25.4 16.4

10 3 38.9 31.1

35 3 33.9 21.5 seeing pretty bad

35 3 15.0 6.9 seeing very bad

Date.

First minute-break.

c, set at.

1873 Nov. 18

Nov. 19

Sum

Mean.

N. Coll.

S. Coll.

Obs. W. A. R.

Rec. J. F. M.

Obs. W. A. R.

Rec. J. F. M.

a.	s.	Mag.	REMARKS.
23 31 50	79 52 07	7.8 9.3 7.8 9.1	reg. order.
32 51	78 51 33		not seen not seen (2 wire)
33 56	79 51 17	8.8	not seen
35 08	86 53 02	8.5 8.8	
36 31	93 53 03	9.4 9.4	circuit broken.
37 23	90 52 16	9.4 9.0	circuit broken.
40 04	87 52 55	8.6 8.8	
41 12	91 52 31	8.9 9.1	reg. 2 nd wire
42 27	90 52 24	8.9 9.0	
43 28	93 52 10	9.1 8.9	

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

10 3 32.9 17.8

10 3 36.8 21.9

50 0 20.1 6.0

15 2 59.5 45.0

15 3 39.9 25.3

15 2 8.0 53.1

15 2 26.8 12.6

0 3 52.0 38.0

25 1 2.1 46.9

25 1 9.2 54.6

45 3 2.0 47.0

45 3 6.9 51.9

55 0 18.7 5.2

55 0 15.7 11.2

5 4 46.0 31.1

5 3 38.2 23.9

N. Coll.	S. Coll.

Date. 1873 Nov. 18
Nov. 19

First minute-break.

Sum
Mean.

c, set at.

a.		s.		Mag.	REMARKS.
2"	23 44 34	89	52 23	8.7	
					not seen
"	45 33	80	52 30		not seen
				9.0	
"	46 49	88	52 23	8.9	w
				8.8	pr. #
	48 22	85	52 47	7.8	
				8.3	
	49 48	87	52 29	8.5	2
				8.8	
"	50 39	88	53 02	8.4	2
				8.8	
"	51 33	75	52 41	7.7	
				7.7	
"	52 41	80	52 46	8.8	lost. 3 rd wire
				9.0	
"	54 23	80	52 34	8.9	
				9.0	
"	55 47	86	51 52	8.4	
				8.9	

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

55 2 18.7 4.0

51

50 0 25.7 10.3

55 2 22.5 8.2

55 2 25.4 10.9

30 3 2.3 47.0

30 3 13.2 58.0

50 1 48.9 33.0

50 1 48.7 33.0

~~35~~ 3 16.4 1.9

15 3 10.0 55.1

35 4 46.3 36.5

35 4 46.3 30.9

30 3 38.7 23.1

30 3 38.2 22.9

45 2 8.7 52.9

45 2 13.9 59.0

25 2 45.9 30.9

25 2 57.0 36.1

1873phase.pro: 1545R

Date.

1873 Nov. 18

First minute-break.

Nov. 19

Set at.

Sum
Mean.

N. Coll.

S. Coll.

a.

s.

Mag.

REMARKS.

23 5654 80 5236 8.6

8.2

58 53 95 5208 9.4 12.7

9.5

0 24 80 5227 9.0

9.0

1 50 78 5137 7.7

8.0

2 48 96 5118 7.5 ~~fol.~~ 8 for 2nd 11th pr.

8.9.1

7.2

3 49 82 5112 9.1 not seen

8.0

4 43 87 5122 9.1

not seen

6 06 84 5113 8.2 2

8.9

7 01 86 5157 8.3

8.8

8 19 51 56 7.8

8.0

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

40 4 11.9 67.2

40 4 14.9 59.9

10 2 22.6 7.3

10 1 53.8 38.7

50 3 25.5 9.9

50 3 25.5 10.1

40 2 54.1 39.8

40 2 57.3 43.1

0 0 27.8 13.0

0 0 36.3 22.1

5 2 38.7 24.1

55 3 16.9 1.7

5 1 42.1 27.9

5 1 50.8 36.0

20 3 22.9 7.6

20 3 27.0 12.0

20 4 37.8 22.6

20 4 38.0 22.8

Date.

1873 Nov. 18

First minute-break.

Nov. 19

set at.

Sum

Mean.

N. Coll.

S. Coll.

a.

δ.

Mag.

REMARKS.

0 10 11 9.0 57 53 8.7 22

8.8

10 56 87 57 14 8.7

8.7

12 06 78 57 28 6.8 aure

7.2

13 11 89 57 11 8.8

8.8

15 34 88 57 30 8.0 2

8.0

16 28 86 52 00 8.6

8.2

17 41 93 51 54 9.5 lower #

9.5

18 44 90 57 17 9.1

9.1

19 36 87 57 44 8.7

8.4

20 42 89 50 45 9.1

9.0 2P

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

25 2 26.8 11.5

25 2 20.1 5.1

5 0 57.8 42.6

5 0 49.0 34.7

5 2 33.1 17.8

5 2 30.0 15.3

5 4 25.3 11.2

5 4 25.7 11.1

45 4 41.9 26.3

45 4 44.8 30.1

20 0 11.5⁴ 56.9

20 8 13.9 59.9

25 0 57.7 41.9

25 0 44.4 29.3

0 2 25.0 11.0

0 2 7.5 53.7

35 1 5.9 50.4

35 0 54.1 39.0

35 0 58.1 43.1 seeing pretty fair

30 4 39.9 25.0 seeing not good

Date.

1873 Dec. 9

First minute-break.

Dec. 10

set at.

Sum

Mean.

N. Coll.

S. Coll.

Obs. W.A.R.

Rec. J.F.M.

Obs. W.A.R.

Rec. J.F.M.

a.

s.

Mag.

REMARKS.

0 31 16 7.7 50 34 7.5 L

7.8

31 59 88 50 45 9.0 not seen

9.1

33 07 92 50 07 9.1

9.1

34 08 89 51 07 9.0

9.8

9.0

(1 stroke for each s.
second s. comes first.)

35 07 85 57 44 8.2

8.5

37 10 94 50 14 9.3

9.4

9.5

double, reg. order

1 stroke for each s.

39 26 88 50 09 8.7

8.9

40 24 84 50 00 8.8

8.6

41 33 52 50 16 5.0

5.2

42 56 90 50 59 8.8

9.0

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

45 1 27.9 22.0

45 1 19.9 15.5

30 4 34.3 28.3

30 4 41.8 32.0

10 2 49.9 44.0

10 2 58.9 49.1

20 2 46.9 40.1

20 2 42.9 33.7

35 1 28.9 22.1

35 1 29.7 20.3

5 1 7.8 1.3

5 1 10.8 1.8

20 0 50.9 45.0

20 0 56.8 47.2

20 0 14.7 8.7

20 0 24.4 15.3

0 3 59.9 54.1

0 3 59.1 50.1

20 2 24.9 18.4

20 2 34.8 24.9

Date.

Fast minute-break.

c, set at.

N. Coll.

S. Coll.

Sum

Mean.

U. W. A. R.
Rec. f. 7 m.

a.

δ.

Mag.

REMARKS.

44 13 87 50 52 6.0
6.0

45 23 79 51 35 8.4
7.9

46 12 93 51 44 not seen
not seen

47 13 94 57 03 9.5
9.5 upper #

48 50 84 57 48 8.0
8.0

50 18 91 50 24 9.1
9.2

51 27 92 50 00 9.1
9.2

52 42 85 50 41 8.8
8.7

53 46 75 57 22 7.8
8.0

55 24 71 57 06 7.0
7.0

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

30 1 22.8 17.0

30 0 10.6 52.9

45 0 19.5 13.1

45 0 19.9 11.0

11

15 2 14.9 8.4

15 2 20.1 10.9

30 2 23.2 17.9

30 2 26.0 16.0

55 0 52.1 45.5

55 0 58.6 48.8

20 0 26.5 20.9

20 0 26.2 17.0

35 3 36.7 29.4

35 3 33.4 24.0

55 3 16.5 10.0

55 3 9.0 0.1

10 3 41.4 34.9

10 3 39.1 29.8

Date. *Dec. 9*
 First minute-break *0900*
 c, set at.

N. Coll.	S. Coll.
Sum	
Mean.	

a.	s.	Mag.	REMARKS.
<i>0</i>			
<i>56 57</i>	<i>83 50 32</i>	<i>8.8</i> <i>8.5</i>	
<i>58 17</i>	<i>88 50 38</i>	<i>8.9</i> <i>8.9.4</i>	
<i>59 26</i>	<i>93 49 58</i>	<i>9.5</i> <i>9.6</i>	
<i>1 40</i>	<i>86 51 55</i>	<i>8.8</i> <i>8.6</i>	<i>22</i>
<i>2 50</i>	<i>71 50 20</i>	<i>7.0</i> <i>7.5</i>	
<i>3 57</i>	<i>95 50 57</i>	<i>9.5</i> <i>9.6</i>	
<i>5 33</i>	<i>89 50 24</i>	<i>9.1</i> <i>9.1</i>	<i>Warm</i>
<i>18 09</i>	<i>86 57 43</i>	<i>8.9</i> <i>9.0</i>	
<i>19 46</i>	<i>78 57 08</i>	<i>8.5</i> <i>8.3</i>	<i>clouds</i>
<i>20 52</i>	<i>85 51 13</i>	<i>8.8</i>	

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

	45	3	12.5	7.3	
	45	3	4.4	55.7	
	40	1	40.7	34.3	
	40	1	41.0	32.7	
	20	4	25.0	18.9	
	20	4	42.3	32.7	
	20	4	53.2	46.8	
	20	4	57.0	48.1	
	0	0	22.9	16.7	
	0	0	17.5	7.7	
	25	4	6.2	1.1	
	25	4	13.2	4.0	
	55	0	25.1	19.0	
	55	0	24.3	14.2	
	35	1	49.0	43.0	
	35	1	55.1	44.1	
	10	1	37.8	31.1	blonded up but seeing very good.
	10	1	29.0	19.1	
	5	1	58.2	47.7	

1873

Dec. 10

Dec. 15

Date.

First minute-break.

c, set at.

Sum

Mean.

N. Coll.

S. Coll.

Obs. W. A. R.

Rec. J. H. M.

Dec. 16

a.

δ.

Mag.

REMARKS.

22 41 88 51 25 9.1

8.8

8.5

23 48 82 51 58 8.8

8.7

8.6

24 36 87 50 05

not seen

not seen

26 14 88 51 10

8.8 upper #

8.7

8.4

27 10 90 51 04

not seen

8.9

28 39 95 51 06

7.5

8.0

7.4

29 22 89 51 59

9.0 lost Lat 2 W. rej 1st stroke 9.1

9.6 obs. ??

0

30 37 90 51 52

9.2

9.0

not seen

31 54 91 51 44

9.0

9.5

8.9

33 07 92 50 07

not seen
not seen

Runs.

Sum
Mean.

A.

C.

Dec. 16

Pointer.	Stroke.	Rev.	A.	C.	REMARKS.
5	50	3	7.0	57.1	50 4 16.0 9.0
	50	4	18.1	10.5	
6	20	2	31.2	20.3	20 2 41.0 33.2
	20	2	31.8	23.8	
	5				not seen
	5	4	42.4	31.8	5 4 43.2 35.2
	5	4	33.0	24.2	5 not seen
	5	4	16.0	8.8	
4	10	4	33.9	24.0	10 3 27.8 20.1
	10	4	35.9	27.8	
1	20	1	15.0	51.1	20 1 39.5 31.9
	20	0	55.0	46.0	
0	25	2	3.8	53.0	25 3 23.0 15.0
9	35	3	40.9	31.0	35 3 40.5 32.2
	35	3	31.8	23.8	not seen

Date.

first minute-break.

set at.

Dec. 10
Dec. 15

Sum
Mean.

N. Coll.	S. Coll.

α. δ. Mag. REMARKS.

Dec. 16

1 34 05 9.4 52 17 9.0 9.0

8.9 foll. #

35 24 9.0 52 39 8.9 2 2 ft. Comp. pr. 9.4

8.8

(Dec. 16 boths)
2nd 8 pr.

8.8

36 12 8.5 52 33 7.9 8.0

8.9

37 29 8.9 52 27 8.9 8.6

not seen

38 59 8.8 52 14 8.5 8.7

not seen

40 06 8.8 52 36 8.0 (Dec. 16, 7, 8 mag. foll. in A.P.) 9.0

not seen

42 40 9.0 52 31 8.5 8.4

43 39 9.1 52 53 9.2 reg order 9.0

8.1

(Dec. 16 reg. order)

8.8

45 08 8.1 52 16 9.2 9.0

47 51 8.5 52 59 8.0

Runs.

Sum
Mean.

A.

C.

Dec. 16

Pointer.	Stroke.	Rev.	A.	C.	REMARKS.
0	10	3	35.8	24.8	0 3 38.8 30.1
	5	3	17.0	8.7	
4	40	1	24.3	11.0	40 1 37.4 28.9
8	40	1	35.3	26.4	
0	45	2	33.1	22.1	45 2 36.4 27.8
	45	2	34.2	25.8	clouded up, seeing very bad
6	50	3	39.1	28.7	50 3 37.6 29.0
7	5	1	40.7	30.1	5 1 44.9 36.1
0	40	3	45.9	35.0	40 2 4.2 56.0
7	45	4	15.0	4.0	45 4 20.2 10.9
	4				
	25	3	27.7	16.0	25 3 34.2 25.0
Dec. 18	9.2 25	3	53.1	44.4	
0	9.2 5	0	7.7	56.1	5 0 20.8 11.9
Dec. 18	9.2 5	0	17.9	7.7	
	20	1	27.8		20 1 32.3 23.1
Dec. 18	8.5 20	1	37.9	28.4	seeing very good

Date.

First minute-break.

set at.

1873 Dec. 16.

Dec. 17.

Dec. 18.

Sum

Mean.

N. Coll.

S. Coll.

Chas WAP
Reef Fm
Chas WAP
Reef Fm
Dec. 18

a.

s.

Mag.

REMARKS.

1 50 08 80 57 16 7.3

7.8

8.0

51 33 88 50 45 8.9

9.0

9.1

52 50 91 51 41 8.6

8.8

9.0

53 47 90 51 23 8.8

89.4

8.3

55 23 90 50 56 9.1

8.9

9.0

56 34 90 50 42 8.8

8.8

222 upper #

8.8

57 06 70 50 02 6.5

7.0

7.0

58 17 84 50 43 8.5

8.6

8.3

59 17 79 50 29 8.3

8.4

7.9

0 17 85 52 15 8.6

8.5

md. + foll. #

8.2

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

Pointer.	Stroke.	Rev.	A.	C.	REMARKS.
8	0	4	13.0	5.1	0 4 10.4 1.9
0	0	3	57.0	48.8	
1	40	0	11.4	3.9	40 0 48.2 10.8
	40	0	10.0	1.9	
20	35	3	7.2	58.8	35 3 10.0 1.8
	35	3	8.1	59.9	
3	55	2	5.0	57.7	55 1 58.1 50.1
	55	1	52.3	43.2	
0	20	3	40.5	31.9	20 3 34.9 25.9
	20	3	44.2	36.2	
8	35	2	40.1	32.8	35 2 45.2 37.9
	35	2	32.5	23.9	
0	15	3	19.1	12.0	15 2 54.1 46.2
	15	3	16.4	9.0	
9	35	2	34.0	26.1	35 2 21.0 13.0
	35	2	27.3	18.8	
9	50	1	9.0	59.9	50 1 8.1 58.9
	50	1	8.2	59.3	
2	5	0	42.9	34.9	5 0 25.9 16.3
	5	0	1.9	53.3	

Date.

First minute-break.

c, set at.

N. Coll.

S. Coll.

Sum

Mean.

1873 Dec. 16

Dec. 17

Dec. 18

a.

s.

Mag.

REMARKS.

Dec. 18

2 1 48 88 52 36

9.4
8.0

both, 2nd S, pr.

4.4 5 of 1st #? 2nd S pr.

9.4
7.7

3 01 88 52 40

9.0

lost A.1

9.0 #?

8.1

4 11 92 52 57

8.7

lost

9.0

lost

5 8 92 52 20

9.0

9.0

9.0 #?

6 52 68 51 57

6.8

7.0

6.7

8 15 91 57 14

8.4

(Dec. 18
2nd S of no S for 1st #?)

7.7
8.8

8.8
8.5

9 23 82 51 11

8.0

8.0

7.7

10 34 94 57 13

9.4

9.6

9.5

11 52 90 52 58

8.5

8.5

13 05 85 52 47

8.2

8.0

8.5 #?

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS

Dec. 18

40	3	57.9	57.0	40	3	59.5	50.3
----	---	------	------	----	---	------	------

40	0	6.5	57.4	35	0	5.2	56.9
----	---	-----	------	----	---	-----	------

40	0	40.8	30.9
----	---	------	------

25	3	52.2	43.5
----	---	------	------

25	3	1.0	51.9
----	---	-----	------

5	0	43.2	33.0	5	0	46.2	38.1
---	---	------	------	---	---	------	------

5	0	43.5	34.7
---	---	------	------

25	0	34.9	25.7	25	0	30.1	20.8
----	---	------	------	----	---	------	------

25	0	31.3	22.1
----	---	------	------

0	2	6.5	58.8	0	2	16.0	7.9
---	---	-----	------	---	---	------	-----

0	2	4.0	56.1
---	---	-----	------

5	4	7.0	59.0	5	3	5.0	57.7
---	---	-----	------	---	---	-----	------

5	3	54.9	45.8
---	---	------	------

5	1	34.1	26.0	5	1	27.0	18.5
---	---	------	------	---	---	------	------

5	1	31.1	22.1
---	---	------	------

5	2	36.9	28.9	20	1	58.0	49.4
---	---	------	------	----	---	------	------

20	2	6.2	56.8
----	---	-----	------

35	2	52.0	43.4	35	2	4.9	55.9
----	---	------	------	----	---	-----	------

35	2	1.0	52.8
----	---	-----	------

Date. Dec. 16
 First minute-break. Dec. 17
 Dec. 18

N. Coll.	S. Coll.

C, c, set at.

Sum
Mean.

a.		s.		Mag.	REMARKS.	Dec. 18
2	1503	85	51	96	8.2	8.9
				7.9		
16	12	70	51	18	9.2 reg. order, a 9.3 folls 8.8	9.1
				8.8		8.8
17	48	84	51	07	8.0 sure	8.0
				8.5		
19	14	80	51	58	7.5	7.0
				7.7		
20	41	85	50	50	8.9	8.9
				9.2		
21	51	88	49	59	8.5	8.8
				8.7		
22	57	94	51	45	8.8 reg. order	9.0
				9.2		9.6
24	27	65	51	44	6.5	6.0
				7.0	2nd 8 pr.	9.4
				9.3		
25	30	91	51	52	9.0	9.1
				9.2		
26	49	92	51	43	8.8 pr. II	8.9
				9.4	pr. II	9.3

Dec. 18
 (lost 1st w 2nd #)
 (stroke for 8 1/2 #)

Runs.

Sum
Mean.

A.

C.

18.	Pointer.	Stroke.	Rev.	A.	C.	REMARKS.
		30	2	47.0	38.1	30 4 23.0 14.9
		30	2	51.0	41.7	
9.1 reg. order.		0	1	32.1	23.2	0 1 27.8 19.7
8.8		0	1	25.0	16.4	
10		10	2	43.9	36.0	10 2 43.7 35.1
		10	2	44.1	36.1	in failed
20		20	1	57.0	48.0	20 1 56.1 46.9
		20	1	1.0	51.9	
25		25	4	5.9	37.0	25 4 7.9 59.4
		25	4	7.1	58.6	
20		20	0	36.9	29.0	20 0 32.9 23.9
		20	0	34.0	25.2	
0 reg. order.		35	0	43.9	35.4	35 0 0.9 52.1
6		35	0	53.9	45.7	
0 2nd 8 pr.		35	0	49.1	41.5	35 0 42.9 34.7
4		35	0	41.7	33.1	
25		25	4	22.3	14.0	25 4 10.9 1.9
		25	4	11.6	2.3	
35		35	1	55.9	47.7	35 1 53.0 44.1
8.9		35	1	22.0	12.5	35 1 15.0 6.1
9.3						

Date.

first minute-break.

c, set at.

N. Coll.

S. Coll.

Sum

Mean.

Dec. 26

Dec. 17

Dec. 18

a.

s.

Mag.

REMARKS.

Dec. 18

2 27 56 70 51 25 6.5 2 20

7.4

7.8

, 28 21 89 51 40 9.3

lost

9.1 last 3 wires

30 42 94 51 17

9.3

9.3

9.3

9.4

both reg. order, lost 1st wire of 1st #

32 16 90 50 57

9.1

8? for 2nd #

9.2

9.1

33 32 88 57 14

8.7

8.9

8.5

upper #

34 37 95 57 52

9.6

9.7

9.4

35 42 85 51 45

8.4

8.5

7.7

37 50 93 57 28

9.0

9.1

38 47 85 57 47

8.5

22

7.8

39 27 82 57 00

9.1

9.0

2nd " 8. pr.

9.2

9.0

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

55 1 14.4 6.9 55 0 42.0 32.4

~~55 1 7.1 59.8~~

35 3 22.9 14.9

~~40 0 27.0 19.1~~

0 3 40.2 31.9 0 3 31.9 23.3

~~0 3 32.1 23.5~~

20 2 40.9 32.0 20 2 44.0 34.9

~~20 2 33.9 25.9~~

5 0 13.0 5.1 5 0 13.5 4.9

~~5 0 8.9 5.9~~

25 3 25.9 17.1 25 3 24.9 15.0

~~25 3 16.8 7.1~~

30 4 38.3 29.3 30 4 42.1 33.7

~~30 4 38.8 30.3~~

50 1 47.8 40.0 50 1 46.8 38.0

30 3 23.8 15.1 30 3 23.4 15.8

15 4 39.5 32.0 15 4 30.0 21.8

Date.

Dec. 16

first minute-break.

set at.

Sum
Mean.

N. Coll.

S. Coll.

a.

δ.

Mag.

REMARKS.

Dec 15

40 24 90 57 26 9.1

9.0

41 30 91 51 18 9.0

9.0

42 58 83 51 41 8.5

8.0

44 20 81 50 30 9.0
8.8

reg. order

9.2
8.8

45 34 93 52 03 8.6

8.6

46 57 87 51 10 8.7

8.7

47 37 88 52 24 8.8
48 12 9.0 50 28

8.9

49 40 95 52 43 9.5

9.4

50 50 90 51 06 8.8

9.0

51 40 57 51 57

6.0
7.5

1 stroke for each 50
reg. order
reg. order 1 stroke for 7.9
each 8

Runs.

Sum
Mean.

A.

C.

Dec. 18

Pointer.	Stroke.	Rev.	A.	C.	REMARKS.
15	50	2	40.9	33.4	50 2 45.7 36.7
0	0	2	12.1	4.1	0 2 6.9 57.4
0	40	0	8.9	1.4	40 0 7.4 58.5
2	50	0	1.4	54.1	45 4 58.2 49.3
6	15	2	19.0	10.0	15 2 29.2 11.4
7	5	4	16.2	8.0	5 4 13.3 5.0
9	50	1	21.4	13.0	50 1 17.1 8.6
9	35	2	47.9	39.0	35 2 52.3 42.5
0	10	4	10.2	3.0	10 4 12.1 4.0
58	25	4	57.7	48.7	seeing very good indeed seeing very fine
79					25 4 1.3 52.1

Date.

1873 Dec. 29

First minute-break.

1874 Jan 20

c, set at.

Sum
Mean.

N. Coll.

S. Coll.

Obs. W. A. R.
Rec. J. F. M.

a.

s.

Mag.

REMARKS.

2 25 9 8.5 52 04 8.5

26 26 90 50 37 9.0

27 56 70 51 25 7.6
7.0

28 56 82 52 15 8.8
8.3

31 03 90 52 26 9.3
9.0

32 25 89 52 08 8.8
8.8

33 43 94 50 33 not seen.
not seen.

35 0.2 87 51 24 9.0
8.9 ref. A₊

36 06 89 50 11 9.0
8.2 #?

37 06 80 52 41 8.4
7.9

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

15

1

17.8

9.9

40

2

43.0

35.6

55

1

17.9

10.8

50

0

27.9

22.1

10

0

11.9

4.1

55

4

23.1

18.1

50

4

12.2

3.8

45

3

19.0

13.6

10

3

18.9

11.2

5

0

31.6

24.9

~~55~~~~0~~~~45.1~~~~36.9~~

55

0

45.1

36.9

45

4

26.5

20.9

5

4

20.7

18.3

0

3

31.2

25.2

40

3

10.1

0.9

30

2

57.3

52.0

Date. 1873 Dec. 29

First minute-break. 1874 Jan. 20

C. set at.

Sum
Mean.

N. Coll.	S. Coll.

α .	δ .	Mag.	REMARKS.
2 38 06.85	51 30	8.8 9.0	
39 21	52 57 00	8.3 7.5 9.4	2 nd 5 pr. 9.3 follo. 9.4
40 18	54 52 30	7.8 8.2	
41 27	52 52 04	9.1 9.3	
42 31	52 44	8.0 8.8	
43 27	52 52	7.7 8.1	
45 11	52 14	5.0 4.0	
46 17	52 51 44	9.0 9.2	
47 50	50 16	8.5 8.8	2 2
48 37	52 24	9.0 8.8	

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

40 3 42.4 35.0

35 2 53.0 47.0

15 4 28.3 20.2

10 3 3.0 58.0

50 0 47.1 38.1

40 4 55.5 49.0

15 1 33.1 25.4

10 0 36.1 30.0

35 2 57.9 49.1

30 1 58.3 52.1

25 4 36.0 28.0

20 3 44.9 38.8

5 1 13.1 5.4

0 0 7.0 1.4

35 0 48.6 40.3

25 4 45.0 38.9

0 3 51.0 44.0

55 2 49.0 43.5

55 2 23.9 14.9

50 1 34.0 27.5

1873phae.prodr.1545R

Date. 1873, Dec. 29,
1874 Jan. 20

First minute-break.

set at.

Sum
Mean.

N. Coll.	S. Coll.

α .	δ .	Mag.	REMARKS.
2 50 38 8.9	50 51	9.7	Fleecy clouds.
		9.0	
		8.9	
33 3	86 50 56	8.8	
		8.3	
54 3	86 52 15	8.8	
		8.8	
55 32	32 53 00	4.0	
		3.5	
56 37	80 52 14	8.6	
		8.5	
58 13	88 51 57	9.0	
		8.5	
59 51	90 51 36	9.2	lost
		9.0	
³ 0 59	89 52 26		
1 32	70 52 46	6.8	
B. 22	83 52 23	7.8	
4 32	75 57 18	7.7	

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

20 3 41.4 33.2

20 4 28.4 22.3

20 2 48.9 43.0

20 4 36.6 29.5

15 3 20.3 14.9

25 0 18.1 10.9

15 4 11.4 8.7

20 0 17.0 8.8

10 4 40.3 3.3

5 2 3.8 51.2

0 2 14.9 8.9

30 0 24.1 12.9

20 4 12.0 6.1

~~40 3 19.2 12.0~~

35 2 20.1 13.4

~~55 1 9.8 4.1~~

35 0 24.8 16.7

50 0 50.6 43.2

55 1 9.8 4.1

Date.

1874 Jan. 20

First minute-break.

set at.

Sum

Mean.

N. Coll.

S. Coll.

α .

δ .

Mag.

REMARKS.

5 30 86 51 06 8.3

6 58 95 52 39 9.8 #?

8 16 92 51 14 not seen sure
7 54 90 52 03 ~~22~~

8 37 83 52 39

9 37 87 52 33

10 48 86 51 36 8.6

11 55 88 52 02 8.9 ~~22~~

12 42 88 50 38 8.7

14 19 86 50 12 8.5 ~~22~~

15 00 90 50 02

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

55 3 10.1 4.3

40 1 40.2 33.3

35 3 24.1 17.9

10 1 57.0 49.5

35 1 12.5 6.9

0 2 9.9 2.8

Date.

First minute-break.

set at.

1873 Dec. 29

Jan 20

Sum
Mean.

N. Coll.

S. Coll.

3	α .	δ .	Mag.	REMARKS.
16	45	90 50 54	9.3	
17	53	90 50 25	9.7	Sp P
			9.3	
18	42	81 50 29		22
			8.2	
19	23	77 52 00	9.1	2 nd S, comes 1 st , 1 stroke for each S,
			8.5	
20	47	89 50 54	8.8	2
			9.0	
21	38	70 50 02	7.7	
			7.0	
22	28	80 50 00	8.0	lost 1. 2
			7.9	
23	53	95 51 27		
			9.1	
24	47	90 50 09	8.9	2
			9.0	
25	72	90 50 17	9.0	
			8.9	a very ft. Comp folia

Runs.

Sum
Mean.

A.

C.

Pointer.

Stroke.

Rev.

A.

C.

REMARKS.

Jan 20 ~~20 0 6.9 0.9~~ ⁴

~~20 0 6.9 0.9~~ ⁴

45 2 29.8 22.2

45 3 2.8 57.4

45 0 13.9 7.2

20 0 40.9 33.7

~~20~~

25 0 33.0 24.1

20 0 6.9 59.9

15 2 52.2 45.1

10 1 58.9 1.9+2.0

20 1 38.3 29.1

15 1 17.9 11.7

45 3 13.9 6.9

10 1 39.1 30.9

5 0 27.8 21.6

0 2 36.0 27.9

55 2 26.0 19.5

Seeing good except
for fleecy clouds.

Date.
First minute-break.
set at.

Sum
Mean.

N. Coll.	S. Coll.

~~115~~ 925 observations

$\frac{1.188}{1.022} = 1.162$
 $\frac{1.162}{1.022} = 1.137$
 $\frac{1.137}{1.022} = 1.113$
 $\frac{1.113}{1.022} = 1.090$
 $\frac{1.090}{1.022} = 1.067$
 $\frac{1.067}{1.022} = 1.044$
 $\frac{1.044}{1.022} = 1.021$
 $\frac{1.021}{1.022} = 1.000$

$\frac{1.188}{1.022} = 1.162$
 $\frac{1.162}{1.022} = 1.137$
 $\frac{1.137}{1.022} = 1.113$
 $\frac{1.113}{1.022} = 1.090$
 $\frac{1.090}{1.022} = 1.067$
 $\frac{1.067}{1.022} = 1.044$
 $\frac{1.044}{1.022} = 1.021$
 $\frac{1.021}{1.022} = 1.000$

$\frac{1.188}{1.022} = 1.162$
 $\frac{1.162}{1.022} = 1.137$
 $\frac{1.137}{1.022} = 1.113$
 $\frac{1.113}{1.022} = 1.090$
 $\frac{1.090}{1.022} = 1.067$
 $\frac{1.067}{1.022} = 1.044$
 $\frac{1.044}{1.022} = 1.021$
 $\frac{1.021}{1.022} = 1.000$

$\frac{1.188}{1.022} = 1.162$
 $\frac{1.162}{1.022} = 1.137$
 $\frac{1.137}{1.022} = 1.113$
 $\frac{1.113}{1.022} = 1.090$
 $\frac{1.090}{1.022} = 1.067$
 $\frac{1.067}{1.022} = 1.044$
 $\frac{1.044}{1.022} = 1.021$
 $\frac{1.021}{1.022} = 1.000$

1873ebae.proj.1545R

1879marc.proj.1545R