

KG
11366
v. 655

Chronograph Record
A 5
From Oct-6 1880 to Jan. 24, 1881

Oct. 6, 1880

No. 1 = 537

" 2 = 538

" 3 = 539

" 4 = 540

" 5 = 541

" 6 = 542

12 . 31

15 . 18

19 . 45

6 . 45

8 21

10 52

14 . 17

16 . 13

21 . 36

8 . 18

10 21

11 12

Oct. 7, 1880

No. 1 = 537

" 2 = 5

" 3 = 5

" 4 = 5

" 5 = 5

" 6 = 5

No. 1 =

" 2 =

" 3 =

" 4 =

12 31

14 17

16 13

21 30

8 18

10 21

11 12

13 36

22 6

8 3

10 21

Wilbur V. Bloom

Wilbur Wilt

7

Oct. 7, 1880

No. 1 = 537

" 2 = 5

" 3 = 5

" 4 = 5

" 5 = 5

" 6 = 5

12 31

14 17

16 13

1 30

8 18

0 21

1 12

725 Jan 3 1881

727-732 Jan 5.

No. 1 =

" 2 =

" 3 =

" 4 =

3 36

22 6

8 3

0 21

7
Oct. 7, 1880

~~No. 1 = 537~~
~~" 2 = 538~~
~~" 3 = 539~~
~~" 4 = 540~~
~~" 5 = 541~~
~~" 6 = 542~~

~~12 31~~
~~15 18~~
~~19 45~~
~~6 45~~
~~8 21~~
~~10 52~~

~~14 17~~
~~16 13~~
~~21 30~~
~~8 18~~
~~10 21~~
~~11 12~~

No. 1 = 543
 " 2 = 544
 " 3 = 545
 " 4 = 546

12 57
 20 29
 6 40
 8 7

13 36
 22 6
 8 3
 10 21

Oct. 8, 1880

No. 1 = 547

12 50

13 05

Oct. 9, 1880

No. 1 = 548	18	32	21	10
" 2 = 549	21	13	23	09
" 3 = 550	18	50	21	5
" 4 = 551	21	9	23	26

Oct. 10, 1880

No. 1 = 552

13 1

14

7

" 2 = 553

18 30

19

5—

Oct, 11, 1880

No. 1 = 554

" 2 = 555

" 3 = 556

" 4 = 557

12 4

19 32

1 5

22 6

13 48

20 52

2 0

23 29

Oct. 12, 1880

No. 1 = 558	13 58	14 41
" 2 = 559	19 34	21 29
" 3 = 560	21 35	22 34
" 4 = 561	22 37	23 39
" 5 = 562	7 49	9 29
" 6 = 563	10 59	11 27

At 19^h ~~30~~⁵³^m, sidereal time, Mr. Ballou of Waltham took apart the South Clock to clean it, & from that time, for the rest of the evening, the Chronograph was run with the sidereal Chronometer.

At 11^h 25^m, sidereal time, the minute hand of the South clock was set 2^m minutes ahead.

Oct. 13, 1880

No. 1 = 564	13	1	13	41
" 2 = 565	19	31	21	30
" 3 = 566	21	32	23	10
" 4 = 567	6	49	8	21
" 5 = 568	8	23	10	32
" 6 = 569	10	46	11	28

Oct. 14, 1880

No. 1 = 570	13	05	14	14
" 2 = 571	20	59	23	9
" 3 = 572	6	50	8	10
" 4 = 573	8	13	10	21

Oct. 16, 1880

No. 1 = 574

9 24

15 28

Oct. 17, 1880

No. 1 = 575

12 33

14 19

" 2 = 576

7 53

8 16

" 3 = 577

10 8

11 53

Oct 18, 1880

No. 1 = 578

" 2 = 579

" 3 = 580

" 4 = 581

12 8

20 57

23 14

10 53

13 51

23 8

23 53

13 4

Oct. 19, 1880

No. 1 = 582

13 7

14 16

" 2 = 583

10 45

11 52

Oct. 20, 1880.

No. 1 = 584

" 2 = 585

" 3 = 586

" 4 = 587

13 0

22 10

0 55

10 56

13 48

23 55

1 38

11 58

Oct. 21, 1880

No. 1 = 588

13 5

13 56

Oct. 22, 1880

No. 1 = 389

12 54

13 55

Oct. 23, 1880

No. 1 = 590

21 53

22 48

Oct. 24, 1880

No. 1 = 591	13 0	14 25
" 2 = 592	22 6	23 58
" 3 = 593	7 55	9 34
" 4 = 594	10 49	11 57

Oct. 25, 1880

No. 1 = 595	12	55	14 6
" 2 = 596	21	12	23 18
" 3 = 597	23	20	23 52
" 4 = 598	11	0	13 12
" 5 = 599	13	12	15 21

Oct. 26, 1880

No. 1 = 600

9 20

11 30

Oct. 28, 1880

No. 1 = 601

14

9

14

45

" 2 = 602

8

56

9

44

Oct. 31, 1880

$W. 1 = 603$ 20 26 28 6
 $" 2 = 604$ 9 2 1 2 9.59 "

Nov. 1, 1880

Nov. 1 = 603⁻ 9 6 11 13

Nov. 2, 1880

No. 1 = 606	13	0	14	58
" 2 = 607	21	20	23	56
" 3 = 608	23	59	1	19
" 4 = 609	9	6	11	12
" 5 = 610	11	16	13	21

At $12^h 20^m$ sidereal time, Adjusted North
Collimator for zero line of collimation.

At $12^h 40^m$, sidereal, adjusted Long
Collimator for line of zero collimation
nearly.

Nov. 3, 1880

Nov. 1 = 611	14	32	15	32
" 2 = 612	19	11	21	19
" 3 = 613	22	5	24	19
" 4 = 614	0	28	1	35
" 5 = 615	13	8	15	22

Nov. 6, 1880

No. 1 = 616

10 52

11 59

Nov. 7, 1880

No. 1 = 617	12	2	15 10
" 2 = 618	17	35	19 31
" 3 = 619	19	34	21 22
" 4 = 620	9	10	10 25

Nov. 8, 1880

No. 1 = 621	13	8	15	3
" 2 = 622	21	3	22	31
" 3 = 623	23	8	0	49
" 4 = 624	0	51	1	30

Nov. 9, 1880

No. 1 = 625 Minute not down — sun
" 2 = 626 13 0 13 57

Nov. 10, 1880

no. 1 = 627

15 02

15 16

Nov. 11, 1880

No. 1 = 628

" 2 = 629

" 3 = 630

" 4 = 631

22 13

0 13

⁰ Minute ¹⁶ not ¹ down ²⁵ ~~10^h~~

Minute not down ^{10^h} ~~Polaris~~

" " " Polaris

Reject 1st star on No. 1 as it was only a time star, observed by B.

At 22^h 2^m sidereal time found that the Microscope DE was not firmly clamped. The adjustment left until morning.

The trouble with the circuit was found to be in the clock. We, therefore, used the Chronometer on the Chronograph today from ~~12^h~~ 12^h 56^m

Nov. 11, 1880

At $13^h 58^m$, sidereal time, set
the sidereal Chrometer back
4 minutes.

Nov. 12, 1880

No. 1 = 632

minute not down - sun

Nov. 13, 1880

No. 1 = 633

10 2

12 11

" 2 = 634

12 24

14 37

Nov 14, 1880

No. 1 = 635	15	18	16	23
" 2 = 636	22	41	0	52
" 3 = 637	0	54	1	32

Took the No 8 level to Mr. Clark. After consultation it was decided to mount the hollow tree in the center of the bush.

Discovered that the interpolations for R.A. on the sheets containing P'-P have been incorrect mode for a few stars. The original interpolations ^{in good} having been made by R.G.S. The following are the stars ~~for~~ whose values of P'-P are incorrectly given. The values already used are given in one column and the correct values in the adjacent column.

R.A.	P'-P	P'-P	no.
	used	Correct value	
Persei 1872	+0.5	+0.3	(11)
" 73	+0.2	+0.3	
2 42	74 +0.2	+0.2	
(43)	75 +0.2	+0.2	
	76 +0.2	+0.2	
	77 +0.2	+0.2	
	78 +0.2	+0.2	

~~Nov 15~~

star-R.A.

c Persei

3h 0^m

(51)

P-P
undP-P
correct
value

No 1

1871	+06 ^s	+07 ^s
72	+06	+07
73	+06	+07
74	+06	+06
75	+06	+06
76	+06	+06
77	+06	+06

(12)

o Persei

3h 36^m

(58)

1871	+08	+08
72	+08	+08
73	+08	+08
74	+08	+08
75	+08	+08
76	+08	+08
77	+08	+08

(13)

Moon 750

3h 58^m

(68)

1871	+28	+25
72	+29	+25
73	+30	+26
74	+31	+26
75	+32	+27
76	+33	+27
77	+34	+27
78	+35	+28

(14)

9 Calmeop

4h 42^m

(76)

1871	+20	+22
72	+20	+22
73	+20	+22
74	+20	+22
75	+21	+22
76	+21	+23
77	+22	+23
78	+22	+23

(15)

Star - R.A.

P-P
usedP-P
correct-
value.In 906
sh 23^m
(92)

1871	-0.00 ^s	+0.0 ^s
72	-0	+0
73	-0	+0
74	-0	+0
75	-0.1	+0
76	-0.01	-0.01
77	-0.02	-0.01

(6)

57.76 Cephei
6 41^m
(111)

1871	-0.27	-0.23
72	-0.27	-0.24
73	-0.27	-0.25
74	-0.27	-0.26
75	-0.27	-0.27
76	-0.27	-0.28
77	-0.27	-0.29
78	-0.27	-0.29

(7)

In 1308
sh 18^m
(116)

1871	+0.07	+0.07
72	+0.07	+0.07
73	+0.08	+0.08
74	+0.08	+0.08
75	+0.09	+0.10
76	+0.09	+0.10
77	+0.09	+0.11

(8)

1.76 Draconis
9 19^m
(137)

1871	+0.30	+0.39
72	+0.30	+0.39
73	+0.31	+0.40
74	+0.31	+0.40
75	+0.32	+0.41
76	+0.33	+0.41
77	+0.34	+0.42

(9)

x Herculis
17 23
(481)

1871	+0.16	+0.10
72	+0.17	+0.10
73	+0.18	+0.10
74	+0.19	+0.10
75	+0.20	+0.10
76	+0.21	+0.10
77	+0.22	+0.10

(10)

δ Draconis
 $17^h 32^m$
 (482)

$P-P$
 und.

$P-P$
 correct value

1871	+15	+09
72	+16	+09
73	+17	+09
74	+18	+09
75	+19	+09
76	+19 ²⁰	+09
77	+20	+08

(11)

δ Cephei
 $22^h 4^m$
 (316)

1871	+09 ⁺¹⁵	+09
72	+09 ⁺¹⁵	+09
73	+08 ⁺¹⁶	+08
74	+08 ⁺¹⁷	+08
75	+07 ⁺¹⁸	+07
76	+07 ⁺¹⁸	+07
77	+07 ⁺¹⁹	+07

(12)

α Cass
 $23^h 48^m$
 (539)

1871	+16	+10
72	+17	+10
73	+18	+10
74	+19	+10
75	+20	+10
76	+21	+10
77	+22	+10

(13)

The changes required in nos. (11) (12) (13) (15)
 (16) (17) and (18) are so slight - that their omission
 will not effect - either n or $4T + m$ for any date
 $\times$ Hercules (10) ~~is~~ not found in the list of stars
 observed. The computations on the following

require the corrections indicated in

No.	(4)	¹⁸⁷¹ _S	¹⁸⁷² _S	¹⁸⁷³ _S	¹⁸⁷⁴ _S	¹⁸⁷⁵ _S	¹⁸⁷⁶ _S	¹⁸⁷⁷ _S
		+03	+04	+04	+05	+05	+06	+07
(9)		-09	-09	-09	-09	-09	-08	-08
(11)		+06	+07	+08	+09	+10	+10	+12
(12)		+06	+06	+08	+09	+11	+11	+12
(13)		+06	+07	+08	+09	+10	+11	+12

Nov. 15, 1880

Nov. 1 = 638

9

5

11 4

" 2 = 639

11

8

12 52

" 3 = 640

12

53

13 31

1877
5
07
1880phae.proj.1659R

-08

+12

+12

+12

Nov. 16, 1880

No. 1 = 641

" 2 = 642

" 3 = 643

" 4 = 644

15 22

21 4

23 5

0 56

16 48

23 3

0 55

1 56

Nov. 18, 1880

No. 1 = 6465

" 2 = 6476

" 3 = 6487

(?) " 4 = 648

22 42 0 13

0 14 1 33

9 47 11 52

12 34 13 38

Nov. 19, 1880

No. 1 = 648~~9~~

15- 37

15- 49

Nov. 20 1880

No. 1 = 64⁵⁰9

12 15 14 17

~~No. 2 = 651~~

~~10 15 12 32~~

Nov. 21, 1880

No 1 =	65 ⁵¹ ~~2~~	16 38	16 55
" 2 =	65 ~~1~~ ²	10 15	12 32
" 3 =	65 ~~2~~ ³	12 47	14 09

In order to connect the observations of ^{Polaris} W. & R. with those of W. & B., began on this date to make duplicate readings for each setting in declination. W. & B. reads first and W. & R. second.

Nov. 22, 1880

No. 1 = 65⁴ 15 44 16 1
 No. 2 = 65⁵ 0 45 2 11
 " 3 = 65⁶ 13 54 14 11

Received the lens from Mr. Clark with tree mounted with wax in center of bubble

Began series of observations for investigating its performance.

~~Microscope was found~~

Found difficulty in making the micrometer plate of microscope follow the spring. Took off microscope from tube and carried it down to Mr. Clark for repair. Waited till it was finished and brought it back same evening and remounted it before Paris.

~~Set microscope on~~

Adjusted microscope on the 5th division of the circle for pointing on the North Collimator (read)
 Clamped the tube of the microscope firmly

22
~~23~~
 Nov ~~15~~ 1880

700

Request from Professor Hall a request
 that the following stars be observed
 on the Meridian Circle

	2181	5181	Maj.
No. 5	2 ^h 10 ^m 3.3 ^s	+ 56 27 29	8.4
No. 12	2 11 33.5	+ 56 46 7	7.2

Nov. 23, 1880

Nov. 1 = 655⁷

15 46

16 15

" 2 = 658

12 56

14 12

Nov. 24, 1880

NO. 1 = 659

no minute down

W. B. B. goes on a vacation
for 2 weeks.

Nov 25/50

No. 2 = 661

12 44

14 21

No. 1 = 660

23 46

1 28

Measured distance from Center of Cube
to the focal point of Long Collimator

Series I Dist. = 215.26 ft -

II " = 215.37

Mean 215.31 ft.

Focal distance of object glass
= 215.31 - 9.24 = 206.07 in

Positions of nine stars to be observed
for

1845
7^h 46^m 24^s + 54⁰ 5¹ 90
7 46 41 + 50 52 84

Nov. 27, 1880

No. 1 = 662

23 26

1 26

1880phase proj. 1659R
Nov. 28, 1880

No. 1 = 663 No minute down

Nov. 29, 1880

Nov. 1 = 664 0 29 2 11

" 2 = 665 11 59 14 12

Nov. 30, 1880

No. 1 = 666 Sun - no minute down
" 2 = 667 22 44 1 29

Dec. 2, 1880

No. 1 = 668

16 26

17 10

Dec. 7, 1880

No. 1 = 669	16 52	17 35
" 2 = 670	0 5	2 7
" 3 = 671	11 49	13 57

Dec. 8, 1880

No. 1 = 672 12 6 14 13

Dec. 9, 1880

No. 1 = 673	17	5	17	17
" 2 = 674	22	41	0	36
" 3 = 675	0	39	2	27

Dec. 12, 1880

No 1 = 676

10 49

12 59

At about 12^h , sidereal time,
fixed the reflector so as to
throw the light squarely
on the glass plate.

Dec. 13, 1850

No. 1 = 677

10 41

12 50

" 2 = 678

12 54

14 54

Dec. 14, 1880

No. 1 = 679

" 2 = 680

" 3 = 681

17 25-

22 37

13 18

17 40

0 55

15 18

Dec 15, 1880

No. 1 = 682

17

25

17

42

" 2 = 683

11

38

13

39

Dec. 16, 1880

No. 1 = 684

" 2 = 685

" 3 = 686

" 4 = 687

" 5 = 688

18 26

12 56

2 6

11 38

13 16

18 07

2 5

3 1

13 13

15 14

Dec. 17, 1880

no. 1 = 689

17

38

17

51

Dec. 18, 1880

No. 1 = 690

22 46

0. 19

" 2 = 691

0 23

2 20

" 3 = 692

11 58 5

13 31

Dec. 19, 1880

No. 1 = 693

" 2 = 694

" 3 = 695

17 46

11 30

13 30

18 21

13 28

15 0

Dec. 20, 1880

no. 1 = 696

17

43

18 ~~11~~ 3

11

Dec. 21, 1880

No. 1 = 697

" 2 = 698

10 45

13 31

13 32

15 30

Dec. 22, 1880

NO 1 = 699

" 2 = 700

" 3 = 701

" 4 = 702

" 5 = 703

17 54

18 13

22 42 - 0 41.1

No minute down

11 50

18 31

13 45

15 20

Dec. 23, 1880

No. 1 = 704

" 2 = 705

" 3 = 706

18 3

18 20

22 53

0 - 38 "

0 41

11 2 - 42 "

Dec. 27, 1880

No 1 = 707

0 28

2 0

" 2 = 708

14 10

14 59

Dec. 28, 1880

No. 1 = 709

0 44

2 16

" 2 = 710

2 22

3 40

Star to be observed for Prof. Dawison

W I 1017 (6.7)

$1^h 58^m 40^s$
 $-12^{\circ} 26'$

Dec. 29, 1880

No. 1 = 711 12 37 13 29

Dec. 30, 1880

No. 1 = 712

18 35

18 48

No. 2 = 713

0 47

2 43

" 3 = 714

2 45

3 6

" 4 = 715

13 38

15 45

Dec. 31, 1880

No. 1 = 716

18 25-

19 07

///

Jan. 1, 1887

No. 1 = 717

0 44

2 16

" 2 = 718

2 22

3 26

~~" 3 = 719~~

Jan. 2, 1881

No. 1 = 720¹⁹

" 2 = 720

" 3 = 721

0 49 3 2

12 42 13 59

14 1 16 0 "

17 1 18 55

Jan. 3, 1881

No. 1 = 722	0	59	3	9
" 2 = 723	3	11	3	30
" 3 = 724	12	42	14	1
" 4 = 725	14	3	16	16

Jan. 4, 1881

No. 1 = 726

18 57

19 13

Jan 5, 1881

No. 1 = 727

18 45, 19 27

Jan. 6, 1881

No. 1 = 728

12 40

14 23

Jan. 7, 1881

No. 1 = 729

19 9

19 48

" 2 = 730

0 24

2 35

Jan. 8, 1881

No. 1 = 731

0 11 1 50

" 2 = 732

1 52 3 45

Jan. 9, 1887

No. 1 = 733 19 16 20, 30.

Jan. 10, 1881

no. 1 = 734	12	44	14	27
" 2 = 735	14	29	76	23
				"
			507	= N "

Jan. 11, 1881 — In the evening, at about 7^h M.S.T., Mr Ballou came + fixed the electric break in the sidereal clock.

Jan. 12, 1887

No. 1 = 734

" 2 = 735

" 3 = 736

" 4 = 737

19 24 20 25

0045 - 2 20

12 40 14 48

15 01 16 37

Jan. 13, 1881

No. 1 = 738

19 21

19 48

- 51

At about 7⁴ M.S.P.
Mr. Ballou took down the
sidereal clock & cleaned it

Jan. 15, 1881

W. 1 = 739

" 2 = 740

" 3 = 741

" 4 = 742

19 39

1 7

3 0 ?

14 19

19 58

3 2

3 52 ?

15 7

Jan. 16, 1887

No. 1 = 743

" 2 = 744

19 47 20 :48

No minute down

Jan. 17, 1881

No. 1 = 745-

0 48 1 52

At $7^h 44^m 12^s$ the sidereal clock stopped. Mr. Waldo started it the next morning; but when I attempted to observe, I found that the chronograph would not break. I then used the chronometer.

W.T.B.

Jan. 18, 1881

No. 1 = 746

0

43

1

53

Jan. 19, 1881

At 7^h M. S. T. Mr. Balbon took
~~down the sideros~~ stopped the side-
real clock & again fixed the break
but still the chronograph wouldn't
work. We finally found a cross
in the lines, & it then was fixed &
went all right.

W.V.B.

Jan. 20, 1881

No. 1 = 747 0 44 1 58

At 1^h ~~12^m~~^{3^m} 6^s the clock dropped 2^s
 " 1^h 21^m 3^s " " " 2^s

Jan. 21, 1881

at $19^h 31^m 18^s$ the sidereal clock
dropped 2^s

At $19^h 32^m 22^s$ " " "
dropped 6^s

At $19^h 34^m 8^s$ " " dropped 2^s

Jan. 22, 1881

At about 4^h sidereal time, the clock dropped 6^s

(Also during 2^h time, there were 8 breaks occurring out of time, & in addition to the regular breaks. These were afterwards found to be caused by a defect in the key.

Jan. 23, 1881

At about 23^h 8^m ^{sidereal time}, the clock 1327
again stopped. ~~Mr. Aston was sent~~
~~for~~

Jan. 24, 1881

No. 1 = 748

0 46

1 52

Mr. Aston came out & looked at 1327
& oiled the escapement. The clock
was then started & set.

