

KG
11365
410

Fundamental Stars for Jones
From March 17, 1873 to Dec. 1, 1873.
B 8

Charles W. Sever, University Bookstore, Cambridge.

KU 11365.476

Jim Star Bg



KG11365.416



Date

Observer

Mar 17 1923

Barom. =

log B =

n

Recorder

201 R.

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

Star.

Semi. α Can. Min β Sem. γ Mus. Min.

n = +25

T_s	7 12 28.6	7 32 36.1	7 37 29.0		8 40 0.2	$0 = +0.69 + 41 + 10 + 0.79$
T_m	31.0	38.2	31.4		2.3	$0.78 + 10 + 2 .80$
T_e	33.2	40.3	33.7	7 50 55.4	4.5	$0.67 + 54 + 13 .80$
T_f	35.4	42.3	36.1		6.6	$0.77 + 10 + 3 .80$
T_g	37.8	44.5	38.3		8.7	
T_h	33.24	40.28	33.70	7 50 55.4	4.46	$0 = +0.73 + .29$
Sum	23.22	40.26	23.68	56.2	4.44	$0 = +14.30 - 53.07$
Mean	32.53	38.48	33.01	41.9	3.67	$0 = -13.57 + 53.36$
Red. to T_m	+0.69	+0.78	+0.67	+14.0	+0.77	$n = +25$
Sum = s						
$\frac{1}{2}(T_m - T_s)$						$dT + m = +0.80$
T					$u = +3.8$	$m = +2.5$
RA					$m = +51 - 23 = +28$	$dT = +1.08$
RA - T						
- n tang δ						
$\Delta T + m$						

$T_m - T_s$	7 32 34.9	7 37 29.3	7 49 9.0			
A	31.1	31.5	50 83.9			$0 = -1.25 + 10 + 0.2 - 1.23$
C	31.1	33.7	51 0.3			$-1.36 + 54 + 10 - 1.26$
Sum	44.0	36.1	51 55.0			
Mean	42.2		52 48.2			$0 = -1.30 + .32$
Red. for runs	38.08	36.50	50 59.28			$0 = +8.27 - 53.07$
Red. to hor. wire	38.06	36.48	51 0.09			$0 = -9.57 + 53.39$
Red. to meridian	39.31	32.84	50 51.82			$n = +1.8$
Division error	-1.25	-1.36	+8.27			
Sum						$dT + m = +1.24$
Pointer						$m = +3.5$
App. z						$dT = +0.85$
log a'						$4dT = -.20$
A' log β						
λ log γ						
log tang z						
log r						
r						
z						
$\phi - z = \delta(O)$						
$\delta(O)$						
$\delta(O - O)$						

Date *Mar 30 1916*Observer *W. D. S.*

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ

Star.

*o hio Maj. & Hydrae d. Mus. Maj.**T_s 8 59 29 9 21 16.2 9 23 7.0**0 = -2.13 - .14 - .03 - 2.16**T_m 84 17.3 10.1**u**T_e 10.8 19.3 13.0**0 = -2.09 + 2.42 = +1.8**T_f 13.8 21.4 16.1**- 2.66 + 2.81 + 1.8**T_g 16.2 23.4 18.9**T_h 10.98 19.32 13.02**0 =**Sum 10.94 19.30 12.97**Mean 13.53 21.43 15.63**dT_m = +2.16**Red. to T_m -2.55 -2.13 -2.66**m = + 3.5*

Sum = s

dT = +1.81 $\frac{1}{2}(T_m - T_s)$ *ddT = +3.0*

T

RA

RA - T

- n tang δ $\Delta T + m$ *Mar 31* $T_m - T_s$ *o Hydrae.**8 39 56.8**A 58.8**C 11**0 = -2.46 + .07 + 0.1 - 2.45**Sum 33**Mean 53**Red. for runs 1.06**dT_m = +2.45**Red. to hor. wire 1.07**m = + 3.5**Red. to meridian 3.50**dT = 2.10**Division error 2.46**ddT = +3.0*

Sum

Pointer

App. z

log a'

A' log β λ' log γ

log tang z

log r

r

z

 $\phi - z = \delta(O)$ $\delta(C)$ $\delta(C - O)$

Date *Am. 1 1873*Observer *N. R. S.*

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ Star. *2 Mus. Min. & Hydrae a Leonis*

T_s	7 49 54	8 39 56	10 01 30
T_m	49 59	58	32
T_o	50 56	07	34
T_r	51 56	28	36
T_g	52 51	48	38
T_h	57 46	07	34
Sum	58 77	07	34
Mean	56 19	3.49	37.33
Red. to T_m	2.58	2.77	2.91
Sum = s			
$\frac{1}{2}(T_m - T_s)$			
T			
RA			
RA - T			
- n tang δ			
$\Delta T + m$			

$$0 = -2.77 + 12 + 01 - 2.76$$

$$2.91 + 2.22 + 2 \quad 2.89$$

$$0 = +2.58 - 53.07$$

$$0 = -2.54 + 1.7$$

$$0 = -5.42 + 53.24$$

$$n = +.11$$

$$dT + m = +2.82$$

$$m = +.35$$

$$dT = +2.47$$

*Am. 3 1873 Mus.**2 Hydrae.*

$T_m - T_s$	8 39 56
A	58
C	02
Sum	23
Mean	4.3
Red. for runs	0.15
Red. to hor. wire	0.16
Red. to meridian	3.46
Division error	8.30
Sum	
Pointer	
App. z	
log a'	
A' log β	
λ log γ	
log tang z	
log r	
r	
z	
$\phi - z = \delta(O)$	
$\delta(C)$	
$\delta(C - O)$	

$$0 = -3.30 + 12 + 01 - 3.29$$

$$dT + m = +3.29$$

$$m = +.35$$

$$dT = 2.94$$

Date *Apr. 10 1872*Observer *W. S. P.*

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ

Star.

 ϵ Hydrae a Lewis G. Drace. l. Lewis a Mrs. May

T_s	8	39	57.8	10	01	28.6	10	24	59	10	42	10	55	41.8	55	46.2
T_m			59.0			30.8			10.1				49.0			48.5
T_e			1.0			32.9			14.6				42.3, 40			46.2
T_f			3.0			34.9			18.8				48.5			52.8
T_g						37.0			23.1				52.1			55.0
T_h			58.96			32.84			14.50				31.40			46.34
Sum			58.59			32.22			14.49				31.38			46.21
Mean			3.32			37.24			19.14				35.78			55.01
Red. to T_m			-4.41			4.42			4.70				4.40			4.44
Sum = s																
$\frac{1}{2}(T_m - T_s)$																
T																
RA																
RA - T																
- n tang δ																
$\Delta T + m$																

n = +06

0 = -4.41 + 12 + 01 - 4.40

0 = -4.70 + 4.11

-4.42 + 22 + 01 41

-4.44 + 1.91

-4.40 + 20 + 01 39

n

4.41

0 = -2.9 + 3.93 = +0.9

0 = -4.41 + 1.8

0 = -0.3 + 1.73 + 0.2

+0.6

$T_m - T_s$																
A																
C																
Sum																
Mean																
Red. for runs																
Red. to hor. wire																
Red. to meridian																
Division error																
Sum																
Pointer																
App. z																

Apr. 15 1872 *ϵ Hydrae, i. Mrs. May, O. Mrs. May*

A	8	39	54.0	8	50	19.5	2	58	55.3
C			56.0			22.7			2.0
Sum			58.0			25.8			4.9
Mean			0.2			28.8			7.6
Red. for runs			2.3			82.0			10.3
Red. to hor. wire			58.10			25.76			4.82
Red. to meridian			58.08			25.72			4.79
Division error			3.29			30.90			13.00
Sum			5.21			6.18			5.21
Pointer									
App. z									

$\Delta T + m = +5.20$

m = +46

$\Delta T = +4.74$

$\Delta T = +1.6$

Date *Apr. 16 1873*Observer *N.R.*

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ Star. *o. Mus. May. B.eph. a Leo.*

T_s	8.59	2.0	9.26	4.72	14.01	27.6
T_m		4.4		50.2		29.6
T_e		7.1		53.2		31.8
T_f		9.7		56.2		33.9
T_g		12.6		58.3		36.0
T_h		7.16		53.22		31.78
Sum		7.12		53.27		31.76
Mean		13.05		18.51		37.17
Red. to T_m		-5.53		-5.24		-5.41
Sum = s						
$\frac{1}{2}(T_m - T_s)$						
T						
RA						
RA - T						
- n tang δ						
$\Delta T + m$						

$$u = +0.6$$

$$v = -5.41 + 0.01 - 5.40$$

$$v = -5.93 + 2.43$$

$$v = -5.24 - 2.75$$

$$v = -0.82 + 2.21 = n$$

$$v = -1.7 + 2.97 = +1.06$$

$$dT + m = +5.40$$

$$m = +4.6$$

$$dT = 4.84$$

$$4dT = +2.0$$

$T_m - T_s$	<i>Apr. 21 1873</i>				
A	<i>a Leonis & Draconis & Leonis a Mus. May.</i>				
A	10.01	26.7	10.24	3.2	10.25
C	28.8	7.5		5.8	4.63
Sum	30.9	11.8		2.0	4.83
Mean	33.0	16.1		4.0	5.06
Red. for runs	35.1	20.3		6.1	5.27
Red. to hor. wire	30.90	11.78		1.92	4.44
Red. to meridian	30.88	11.72		1.80	4.41
Division error	37.11	18.47		8.20	5.78
Sum	6.23	6.75		6.30	6.37
Pointer					
App. z					
log a'					
A' log β					
λ log γ					
log tang z					
log r					
r					
z					
$\phi - z = \delta(O)$					
$\delta(C)$					
$\delta(C - O)$					

$$n = +1.0$$

$$v = -6.23 + 2.2 + 0.2 = -6.21$$

$$-6.30 + 1.8 + 0.2 = -6.28$$

$$-6.37 + 1.92 = -6.24$$

$$v = -6.26 + 2.0$$

$$v = -6.75 + 4.12$$

$$v = -6.37 + 1.92$$

$$n$$

$$v = +4.8 - 3.92 = +1.3$$

$$v = +1.1 - 1.72 = -1.1$$

$$+1.0$$

$$dT + m = +6.24$$

$$m = +1.46$$

$$dT = +5.78$$

$$4dT = +1.1$$

Date *Apr. 23 1923* Observer *W. A. R.*

Barom. =

log B =

Att. Therm. =

log T =

log γ

n

Recorder

Ex. Therm. =

log β =

Star.

Arcturus, Arcturus, Arcturus

T_s	8 59 03	10 55 43.6	11 7 11.0
T_m	28	45.7	13.3
T_e	5.7	47.9	15.5
T_f	9.3	50.1	17.7
T_g	11.0	52.4	19.9
T_h	8 59 56.2	47.94	15.48
Sum	5.58	47.91	15.46
Mean	12.59	54.73	22.24
Red. to T_m	7.01	6.82	6.78
Sum = s			
$\frac{1}{2}(T_m - T_s)$			
T			
RA			
RA - T			
- n tang δ			
$\Delta T + m$			

$$0 = -6.78 + 39 + 02 = -6.76$$

$$0 = -7.01 + 2.43$$

$$-6.82 + 1.92$$

n

$$0 = +2.3 - 2.04 = +.10$$

$$0 = +4 - 1.03 = +3$$

+.06

$$dT + m = +6.76$$

$$m = +45$$

$$dT = 6.31$$

$$4dT = +2.6$$

 $T_m - T_s$

A

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a' $A' \log \beta$ $\lambda' \log \gamma$ log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$ *Apr. 27 1923*
Arcturus, Arcturus, Arcturus

$T_m - T_s$	10 42 24.3	10 55 43.2	11 7 10.8
A	26.5	45.3	12.9
C	28.6	47.7	15.4
Sum	30.8	49.8	17.3
Mean	32.9	51.9	19.6
Red. for runs	28.6	47.58	15.14
Red. to hor. wire	26.58	47.55	15.12
Red. to meridian	35.62	54.62	22.20
Division error	7.04	7.07	7.08
Sum			
Pointer			
App. z			

$$dT + m = +7.07$$

$$m = +45$$

$$dT = +6.62$$

Date May 1 1873

Observer

HAR.

Barom. =

Att. Therm. =

Ex. Therm. =

log B =

log T =

log β =log γ

n

Recorder

Star. α Leonis 9 Draco. 226 β Cephei. α Leonis w. Mercury

T_s	9 38 26.7	10 24 22	10 29 42.5	10 28 56.1	10 53 42.3
T_m	288	6.3	46.8	58.2	44.7
T_e	31.1	10.7	57.0	03	46.8
T_f	334	15.0	54.9	24	49.1
T_g	35.7	19.3	59.1	45	51.4
T_h	21.14	10.70	50.6	03.0	46.86
Sum	21.12	10.65	50.91	0.28	46.83
Mean	38.88	17.82	58.84	8.09	54.50
Red. to T_m	7.76	7.17	7.93	7.81	7.67
Sum = s					
$\frac{1}{s} (T_m - T_s)$					
T					
RA					
RA - T					
- n tang δ					
$\Delta T + m$					

$$\begin{aligned} 0 &= -7.76 + 45 - 0.2 - 7.78 \\ &= -7.81 + 17 - 0.1 - 7.82 \\ &= -7.67 + 18.2 - 0.8 - 7.75 \\ &= 7.78 + 3.1 \\ &= -7.17 + 4.12 \\ &= -7.93 - 3.89 \end{aligned}$$

$$\begin{aligned} 0 &= +.61 + 3.81 = + \\ &= +.15 + 4.20 = .04 \end{aligned}$$

$$\begin{aligned} \Delta T + m &= +7.78 \\ m &= +48 \\ dt &= +7.20 \\ ddt &= +17 \end{aligned}$$

$T_m - T_s$	May 4 1873		HAR.		β Leo. Polaris. S. P. w. Mercury	
A	10 55 42.4	11 33 47.0	11 42 24.0			11 46 53.8
C	44.6	58.7	26.1			59.8
Sum	46.8	56.8	28.3	11	8.3	2.8
Mean	48.9	1.0	30.4			6.6
Red. for runs	57.2	6.6	32.6			10.0
Red. to hor. wire	76.78	56.26	28.28	11	8.30	2.70
Red. to meridian	46.75	56.31	28.26	11	8.93	2.88
Division error	54.41	4.13	35.90		17.67	10.55
Sum	7.66	7.82	7.64		8.74	7.67
Pointer						
App. z						
log a'						
A' log β						
λ log γ						
log tang z						
log r						
r						
z						
$\phi - z = \delta (O)$						
$\delta (C)$						
$\delta (C - O)$						

$$\begin{aligned} 0 &= -7.66 + 19.2 - 0.5 - 7.71 \\ &= -7.64 + 27 - 0.1 - 6.5 \\ &= -7.67 + 14.0 - 0.4 - 7.1 \\ &= -7.66 + 12.3 - 7.69 \\ &= -7.82 + 4.33 \\ &= -8.74 - 4.19 \end{aligned}$$

$$\begin{aligned} 0 &= +.16 + 5.56 = .03 \\ &= +.08 + 4.31 = .03 \end{aligned}$$

$$\begin{aligned} \Delta T + m &= +7.69 \\ m &= +48 \\ dt &= +7.21 \end{aligned}$$

Date

May 5

Observer

W. R.

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ

Star.

a. m. maj. Pol. a. m. maj.

 $n = .03$

T_s	10 55 42.3	11 42 23.7	11 46 55.4
T_m	44.6	25.8	59.1
T_e	46.7	28.0	27
T_f	48.8	30.2	64
T_g	57.0	32.3	98
T_h	46.68	28.00	272
Sum	46.61	27.98	2.70
Mean	54.38	33.89	10.53
Red. to T_m	7.73	7.91	7.83
Sum = s			
$\frac{1}{2}(T_m - T_s)$			
T			
RA			
RA - T			
- n tang δ			
$\Delta T + m$			

$$\begin{aligned}
 0 &= -7.73 + 19.2 - 5 - 7.78 \\
 &= -7.91 + 24 - 1 - 92 \\
 &= -7.83 + 140 - 4 - 87 \\
 &= -7.86
 \end{aligned}$$

$$\begin{aligned}
 dT + m &= +7.86 \\
 m &= +48 \\
 dT &= +7.38 \\
 4dT &= +18.8
 \end{aligned}$$

May 6 1873
a. m. maj. Pol.

$T_m - T_s$	10 55 41.8	11 33 41.0
A	44.0	57.2
C	46.3	55.7
Sum	48.6	0.6
Mean	57.0	4.6
Red. for runs	46.34	55.62
Red. to hor. wire	54.35	4.30
Red. to meridian	8.01	8.68
Division error		
Sum		
Pointer		
App. z		
log a'		
A' log β		
λ log γ		
log tang z		
log r		
r		
z		
$\phi - z = \delta(O)$		
$\delta(C)$		
$\delta(C - O)$		

 $n = .03$

$$\begin{aligned}
 0 &= -8.01 + 19.2 - 28 - 98.6 \\
 &= -8.68 - 43.3
 \end{aligned}$$

$$\begin{aligned}
 +0.67 + 6.25 \\
 n &= -.10
 \end{aligned}$$

$$\begin{aligned}
 dT + m &= +7.86 \\
 m &= +48 \\
 dT &= 7.86?
 \end{aligned}$$

Date _____

May 7 1823

Observer

W. R.

Barom. = 30.00

Att. Therm. =

Ex. Therm. =

$$\log B =$$
$$\log T =$$
$$\log \beta =$$
 $\log \gamma$

n

Recorder

Star

Leonis Leonis & Leonis

$$a = -43$$

T_{δ}	10 42 22.9	11 7 9.1	1130 14.9
T_m	25.1	11.3	19.1
T_o	27.2	13.5	19.0
T_f	29.3	15.7	21.1
T_g	31.4	17.9	23.2
T_h	27.10	13.50	19.10
Sum	27.16	13.48	19.04
Mean	35.51	22.09	27.68
Red. to T_m	(8.35)	8.61	8.64
Sum = s			
$\frac{1}{b} (T_m - T_s)$			
T			
RA			
RA - T			
- n tang δ			
$\Delta T + m$	12.147	2	

$$\begin{array}{rcl} 2 & = & 861 + 39 - 01 & 862 \\ & & 864 + 02 - 00 & 864 \end{array}$$
$$\begin{aligned}dT + m &= +8.63 \\ m &= 4t \\ dT &= 8.15\end{aligned}$$

1 Leonis a his. May. 2 Virg. K Draco. 4 M Draco.

[illegible]
$$\begin{aligned} 0 &= -9.00 + 39.03 - 9.03 \\ &= -8.98 + 0.00 - 8.98 \\ &\quad \underline{0.00} \end{aligned}$$
$$v = -8.99 + 20$$
$$0 = -8.77 + 192 - 887 + 4.84$$
$$r = +.22 + 1.72 = -.13$$
$$0 = +12 + 4.64 = \underline{-0.3}$$

$$\quad \quad \quad -0.87$$
$$m = 4570 \text{ g} = +52$$

Pointer

App. z

 $\log a'$
$$A' \log \beta$$
 $\lambda' \log \gamma$ $\log \tan z$ $\log r$

r

 \mathbb{Z}
$$\phi - z = \delta(O)$$
 δ (C) $\delta(\text{C}-\text{O})$
$$\begin{aligned}dT + m &= + 9,00 \\ m &= .52 \\ dT &= 848\end{aligned}$$

Date

May 13/1872

Observer

W. L.

n

Recorder

Barom. =

Att. Therm. =

Ex. Therm. =

log B =

log T =

log β =log γ

Star.

Virginis Polaris

T_s	13	13	105	13	19	408
T_m			127		11	109
T_e			147			576
T_f			168			364
T_g			188			119
T_h			1970			8.94
Sum			1468			119.57
Mean			23.80			1123.15
Red. to T_m			9.12			13.58
Sum = s						
$\frac{1}{s} (T_m - T_s)$						
T						
RA						
RA - T						
- n tang δ						
$\Delta T + m$						

$$0 = -14.68 - 9.12 - 0.8 + 0.1 - 9.11$$

$$0 = -13.58 - 41.90$$

$$0 = +4.96 + 41.8$$

$$n = -11$$

$$\Delta T + m = +9.11$$

$$m = +61$$

$$\Delta T = -8.50$$

 $\Delta T + m$

May 14 1873 W. L.

$T_m - T_s$	10.55	408	11	7	86	11	42	226	11	46	543
A		432			108			247			579
C		452			130			268			15
Sum		475			153			290			48
Mean		488			175			312			85
Red. for runs		4670			1304			2686			140
Red. to hor. wire		4508			1302			2684			138
Red. to meridian		5408			2202			3582			1035
Division error		9.01			9.00			8.98			8.97
Sum											
Pointer											
App. z											

$$n = -40$$

$$0 = -9.01 + 19.2 + 0 + 9.01$$

$$-9.00 + 39 + 0 \quad 9.00$$

$$-8.98 + 27 + 0 \quad 8.28$$

$$-8.97 + 1.40 + 0 \quad 8.97$$

$$8.99$$

$$\Delta T + m = 8.99$$

$$m = 61$$

$$\Delta T = 8.38$$

log a'

A' log β X' log γ

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

Date

May 15 1873

Observer

N.A.R.

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Star.

 α Mus. Maj. Leo. γ Leo. T_s

10 55 37.2 11 7 48 11 30 107

 T_m

39.3 7.0 12.8

 T_e

41.7 9.2 14.9

 T_f

43.8 11.6 16.9

 T_g

46.0 13.7 19.0

 T_h

41.60 9.26 14.86

Sum

415.8 9.24 14.84

Mean

54.06 22.00 27.62

Red. to T_m

12.48 12.76 12.78

Sum = s

 $\frac{1}{2}(T_m - T_s)$

T

RA

RA - T

- n tang δ $\Delta T + m$ May 15 1873
 α Mus. Maj. Leo. γ Leo.

N.A.R.

 $T_m - T_s$

10 53 35.6 11 7 33 11 21 68

A

37.7 5.7 8.8

C

40.0 7.9 11.0

Sum

423 10.2 12.9

Mean

44.5 12.2 15.2

Red. for runs

40.02 7.86 10.94

Red. to hor. wire

40.00 7.84 10.92

Red. to meridian

53.96 21.97 28.12

Division error

13.96 14.13 14.20

Sum

Pointer

App. z

log a' $A' \log \beta$ $\lambda' \log \gamma$ log tang z

log r

r

z

 $\phi - z = \delta(O)$ $\delta(C)$ $\delta(C - O)$

n = -1.0

0 = -12.76 + 39 - 04 12.80

-12.78 + 0 - 00 12.78

0 = -12.48 + 192 - 19 12.68

 $dT + m = +12.79$

m = 61

 $dT = 12.18$

n = -1.0

0 = -14.13 + 39 - 04 - 14.17

14.20 + 05 - 00 20

13.96 + 192 - 19 15

14.17

 $dT + m = +14.17$

m = 62

 $dT = 13.55$

Date

May 19

Observer

H. R.

Barom. =

Att. Therm. =

Ex. Therm. =

log B =

log T =

log β =log γ

n

Recorder

Star.

1 Leo. 2 Leo. Polaris

n = -17

T_{δ}	11 21 6.8	11 46 49.3	11 30 9.9	8 57.3	9 39.0	0 = -14.17 + 0.5 - 1	-14.18
T_m	8.7	53.0	11.6	9 39.0	10 28.5	-13.71 + 1.40 - 21	13.92
T_e	11.0	56.7	13.6	10 28.5	11 3.7	-14.00 .00 - 0	14.00
T_f	13.1	0.1	15.7	11 3.7	11 47.2		14.03
T_g	15.2	3.6	17.7	11 47.2	12 24.6	0 = -23.48 - 41.90	
T_h	10.96	56.54	13.60	10 28.14	11 40.0	0 = -13.96 + 48	
Sum	10.94	56.52	13.58	10 28.77	11 46.3		
Mean	25.11	10.23	27.58	26.05	26.05	0 = +10.68 - 7.46	42.38
Red. to T_m	14.17	13.71	14.00	3.28	21.42	n = -17	
Sum = s							
$\frac{1}{2}(T_m - T_e)$							
T							
RA							
RA - T							
- n tang δ							
$\Delta T + m$							

$$\begin{aligned} \Delta T + m &= +14.03 \\ m &+ 68 \\ \Delta T &= +13.35 \end{aligned}$$

May 20 1873

1 Leo. 6. Leo.

$T_m - T_{\delta}$	11 21 6.8	11 30 9.9
A	8.9	11.5
C	10.9	13.6
Sum	13.0	15.7
Mean	15.2	17.8
Red. for runs	18.96	13.58
Red. to hor. wire	25.10	27.57
Red. to meridian	14.14	13.99

$$\begin{aligned} n &= -17 \\ 0 &= +14.14 + 0.5 - 0.1 \\ &- 13.99 + 0.0 - 0.0 \\ &13.99 \end{aligned}$$

$$\begin{aligned} \Delta T + m &= +14.06 \\ m &+ 68 \\ \Delta T &= +13.38 \end{aligned}$$

Division error

Sum

Pointer

App. z

log a'

A' log β X' log γ

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

Date

May 25/23

Observer

W.R.

Barom. =

Att. Therm. =

Ex. Therm. =

log B =

log T =

log β =log γ

n

Recorder

Star.

 β Leonis & β Uphi β Leo β Leo & β Leo

T_s	11 30	0.2	11 33	32.7	11 40	59.7	11 42	5.2	11 46	40.2
T_m		2.2		37.2		18		10.4		43.7
T_e		4.3		41.4		4.0		12.5		47.3
T_f		6.3		46.0				14.7		50.7
T_g		8.4		50.8				16.8		54.3
T_h		4.28		41.62				12.52		47.24
Sum		4.26		41.68				12.51		47.2
Mean		27.53		6.06				35.71		10.10
Red. to T_m		23.27		24.34				23.21		22.88
Sum = s										
$\frac{1}{2}(T_m - T_s)$										
T										
RA										
RA - T										
- n tang δ										
$\Delta T + m$										

$$\begin{aligned}
 0 &= -23.27 + .01 - .0 - 23.27 \\
 23.21 + 27 - 5 &= 26 \\
 22.88 + 14.0 - 34 &= .22 \\
 &= 23.25
 \end{aligned}$$

$$0 = 23.24 + .13$$

$$0 = 24.84 - 4.45$$

$$0 = +1.10 + 4.58$$

$$m = -.24$$

$$\begin{aligned}
 \text{Ref } 31 + 22 &= +53 & dT + m &= +23.25 \\
 m &= +.53 \\
 dT &= +22.72
 \end{aligned}$$

May 26.

 $T_m - T_s$

A

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a' $A' \log \beta$ $\lambda' \log \gamma$

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

$$\begin{aligned}
 dT &= +22.45 \text{ at } 12.35 \\
 &22.40 \text{ at } 15.30
 \end{aligned}$$

} From observations May 25-27

Date

May 26 1873

Observer

W.R.

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Wm. B. T. For Long. between N.C.O. and Port Lewis
 C.W. Star. 5 hrs. min & Bar. & Lib. min 48 bph. u. Bar. & Lib. min & Bar. & Lib. min

T_s	14 26 46.0	14 38 42.1	14 43 51	14 50 46	15 18 56.5	15 18 56.5	15 19 59.0	15 28 34.6
T_m	26 59.5	46.2	11.7	18.1	0.7	10.3	38.4	
T_o	27 14.7	50.2	15.4	31.3	5.4	21.8	42.4	
T_f	27 29.7	54.2	19.0	44.5	9.7	33.4	46.3	
T_g	27 45.5	58.2	22.6	57.5	14.5	45.4	50.2	
T_h	27 15.08	50.18	15.36	31.20	5.36	21.98	42.38	
Sum	27 15.01	50.16	15.54	31.15	5.34	21.92	42.36	
Mean	27 55.11	28.21	52.88	11.44	43.67	1.69	20.99	
Red. to T_m	π RA - 40.10	- 38.05	37.35	40.39	38.33	39.77	38.13	
Sum = s								
$\frac{1}{2}(T_m - T_s)$								
T								

RA	0 = - 38.05 + 5.2 + 1.14	+ 33 + 0	- 37.72	+ 47 + 33	+ 84	- 37.91
RA - T	37.35 - 28 + 1.04	- 18 + 0	.53	- 25 + 30	+ 55	27.90
- n tang δ	38.33 + 7.8 + 1.27	+ 50 + 0	.83	+ 70 + 38	+ 32	38.01
$\Delta T + m$	38.13 + 5.7 + 1.12	+ 33 + 0	.80	+ 46 + 34	+ 12	38.01

$T_m - T_s$						
A	0 = - 40.10 + 4.10 + 4.22					
C	40.29 + 2.64 + 3.77					
Sum	39.77 + 3.13 + 3.29					
Mean						

Red. for runs	0 = - 2.13 + 3.72 + 3.08	n = + 58				
Red. to hor. wire	- 2.32 + 3.26 + 2.63	n = + 69				
Red. to meridian	- 1.80 + 2.75 + 2.15	n = + 65				
Division error		+ .64				

Sum	Assume C = 0					
Pointer						
App. z	Assume C = .30					

log a'	0 = + 58 + n + .83C					
A' log β	= - .69 + n + .80					
A' log γ	= - .65 + n + .79					
log tang z	0 = - .58 + n + .25	n = + 83				
log r	- .69 + n + .24	n = 95				
r	- .65 + n + .24	n = 87				
z		n = + 90				

 $\phi - z = \delta(O)$ $\delta(C)$ $\delta(C - O)$ $dT + m = + 37.96$ $m = - 1.77$ $dT = 39.73$

Date

May 27/1873

Observer

H. R.

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Wm M. C.

Star.

1546 462 0 Virginis & 11 Draconis Virginis & 11 Polaris

T_s	11 46 403	11 58 183	12 5 467	12 12 584	13 2 367	13 9 232
T_m	440	204	576	07	589	10 124
T_e	476	225	568	28	09	10 053
T_f	510	246	20	48	30	11 375
T_g	546	266	67	68	50	12 213
T_h	4750	2248	5716	274	090	10 5394
Sum	4748	2246	55709	272	088	5487
Mean	998	4126	1789	2545	2372	3192
Red. to T_m	-2258	2280	-1980	-2273	-2284	-3735
Sum = s			$n = -35$			
$\frac{1}{2}(T_m - T_s)$	$0 = -2258 + 140 - 49$	(22.99)	$0 = -1980 + 4.83$			
T	$-2280 + 16 - 5$	85	$-3735 - 41.70$			11 58
RA	$-22.73 + 00 - 0$.73				12 13
RA - T	$-22.84 - .09 + 3$.81	$0 = -1.92 - 4.46$	$n = -.41$		13 03
- n tang δ			$- 14.63 - 42.16$	$n = -.35$		12 25
$\Delta T + m$	$0 = -22.72 + .37$			76 $- 38$		

$T_m - T_s$		$dT + m = +22.80$	$b = +417 \times 84 = +23$
A	$S, T = 12^h 25^m$	$m = +.68$	
C		$dT = +22.12$	$m = +31 + 32 = +63$
Sum			
Mean			$b = +.27$
Red. for runs			$m = +36 + 32 = +68$
Red. to hor. wire			
Red. to meridian			
Division error			
Sum			
Pointer			
App. z			
log a'			
A' log β			
A' log γ			
log tang z			
log r			
r			
z			
$\phi - z = \delta (O)$			
$\delta (C)$			
$\delta (C - O)$			

Date

Observer

Barom. =

log B =

Att. Therm. =

log T =

log γ

Ex. Therm. =

log β =

Recorder

n

Wm. H. C.

Star.

e Virginis 4 M Druce R. Biny K Druce 32 Canis 12 Canis & Biny.

T_{δ}	11 58 18.6	12 5 46.9	12 12 55.7	12 28 38.3	12 47 44.3	12 49 39.0	13 3 25.9
T_m	20.6	51.9	0.8	41.2	53.8	41.7	27.8
T_e	22.7	1.8	2.8	44.3	4.7	44.4	29.9
T_r	26.8	6.9	5.0	47.6	13.5	47.0	32.2
T_g	26.9		9.0	50.4	23.8	49.6	34.2
T_h	22.72	56.90	2.86	44.36	4.02	44.34	30.00
Sum	22.70	56.84	2.84	44.30	3.94	44.32	29.98
Mean	45.25	17.81	2.545	6.06	2.341	6.60	28.71
Red. to T_m	22.55	20.97	22.61	21.76	19.47	22.28	73

Sum = s

 $\frac{1}{2} (T_m - T_e)$

T

RA

RA - T

- n tang δ $\Delta T + m$

n = 33

n = 33

$$0 = -22.55 + 1.6 + 0.5 - 22.60$$

$$0 = -20.97 + 4.13$$

$$-22.61 + 0.0 - 0.0$$

$$61$$

$$21.76 + 2.81$$

$$-22.28 + 81 - 27$$

$$5.5$$

$$19.47 + 9.68$$

$$22.58$$

 $T_m - T_{\delta}$

$$0 = -22.48 + 3.2$$

$$0 = +1.49 + 4.51 n = 3.3$$

A

$$+0.72 + 2.49 n = 2.9$$

C

$$+3.00 + 9.36 n = 3.2$$

Sum

Mean

$$dT + m = +22.58 \quad n = 33$$

$$3.31$$

Red. for runs

$$.61$$

Red. to hor. wire

$$21.58$$

$$m = 31 + 30 = 61$$

Red. to meridian

Division error

Sum

Pointer

Level May 27 = 4.32 di

App. z

$$28 \quad 4.82$$

log a'

$$4.77$$

$$4.80 = 4.03 = +2.7$$

A' log β A' log γ

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

Date _____

May 28

Morning
Observer W. R.

Observer

Barom. —————

$$\log B =$$

Att. Therm. =

$$\log T =$$

D

Recorder

Ex. Therm. =

$$\log \beta =$$
 $\log \gamma$

Armi M. L.

Star. E. Daphn. Gr. 3241 & bryozoi uterum & bryz. P⁸ 61179 b. lyyg. & bryz. & bryph.

[illegible]

May 28
P. 69. P. 69. 11. 69.

$T_m - T_\delta$	21	26.278	21	37.310	24	39.296
A		33.9		33.2		35.8
C		39.9		35.2		42.2
Sum		43.8		37.3		48.2
Mean		32.0		39.4		54.6
Red. for runs		39.88		30.22		42.08
Red. to hor. wire		39.13		30.20		40.02
Red. to meridian		38.38		29.59		39.34
Division error		21.55		23.39		21.52

$0 - 22.23 + 37 - 13$	22.36
$22.05 + 99 - 34$	39
$22.57 - 17 + 06$	45
$22.08 + 86 - 79$	37
$22.14 + 78 - 27$	41
$22.28 + 57 - 19$	44
$22.37 + 16 + 05$	44

$$l = 127$$
$$m = 36 + 31 = 67$$

Sum

Pointer

App. z

 $\log a'$
$$A' \log \beta$$
 $\lambda' \log \gamma$ $\log \tan z$ $\log r$

r

Z

$$\phi - z = \delta(O)$$
 $\delta(C)$ $\delta(\text{C}-\text{O})$
$$0 = -21.24 + 3.10$$
$$dT + m = 22.41$$
 $2032 + 571$
$$m = 6$$
$$21.78 + 189$$

21.86

 $21.55 + 2.75$
$$21.52 + 4.86$$
$$0 = +101 + 2.59 \text{ u} = -39$$
$$1.93 + 6.20 = -3.7$$
$$0.217 + 1.38 = 1.597$$
$$0.70 + 2.24 = -31$$
$$0.73 + 2.35 = 3.08$$

Date

May 29/102

Observer

W. R. R. M. L.

Barom.

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ

Star.	β Leo.	Phospor. 0.0	416 Draco.	2.0	32 Camel	12 Can. den	
T_s	12 42 91	11 46 410	11 58 137	12 05 468	12 27 320	12 47 437	12 49 392
T_m	113	446	209	51.7	38.5	537	41.8
T_e	134	482	229	57.0	44.9	45	44.6
T_f	156	517	250	2.0	50.8	137	47.0
T_g	177	551	271	7.3	57.0	232	49.7
T_h	13.42	48.12	22.92	56.98	44.60	3.76	44.46
Sum	13.40	48.10	22.50	56.91	44.84	3.68	44.44
Mean	35.63	9.92	45.24	17.77	6.02	23.75	6.58
Red. to T_m	2223	2182	2234	20.86	21.48	19.07	22.19
Sum = s							
$\frac{1}{6} (T_m - T_s)$							
T							
RA							
RA - T							
- n tang δ							
$\Delta T + m$							

$T_m - T_s$	13 2 571	13 9 308	13 18 565	50	0 = -22.23 + 27 - 0.8	22.31
A	1.4	10 12.6	11.4	40	21.82 + 1.40 - 42	.32
C	3.4	—	0.8	90	22.34 + 17 - 5	.39
Sum	4.5	—	11.1	—	22.14 + 1.81 - 24	.38
Mean	—	—	13.3	—	22.33 - 0.8 + 2	.31
Red. for runs	1.40	13 10 571	9.08	—	22.39 - .19 + 6	.33
Red. to hor. wire	1.38	13 10 583	9.06	—		22.34
Red. to meridian	22.71	32.4	21.45	—	0 = -22.21 + 40	
Division error	22.33	37.1	22.39	—		
Sum	—	35.1	—	—	0 = -20.86 + 4.83	
Pointer	—	—	—	—	-21.48 + 2.82	
App. z	—	—	6 = +2.5	—	-19.07 + 9.68	
log a'	—	—	—	—	-35.10 - 41.77	
A' log β	—	—	—	—	—	
λ log γ	—	—	—	—	0 = +1.35 + 4.43	m = -3.0
log tang z	—	—	—	—	+0.23 + 2.42	= .30
log r	—	—	—	—	+3.49 + 9.28	= .21
r	—	—	—	—	+12.19 + 42.17	= .30
z	—	—	—	—		-41.34
$\phi - z = \delta (O)$	—	—	—	—		
$\delta (C)$	—	—	—	—		
$\delta (C - O)$	—	—	—	—		

Date

May 29 1873

Observer

W. R. W. W.

Barom. =

Att. Therm. =

Ex. Therm. =

log B =

log T =

log β =log γ

n

Recorder

C. W.

C = -20 for C. W. assumed.

Star. α Draconis 32 Camelopardalis. n. Mus. Mag. n. Boole's & Boole's

T_0	12 27 254	12 46 594	13 27 464	13 42 26	13 48 113	14 09 250	14 20 229
T_m	368	47 330	500	81	150	287	284
T_e	461	48 63	537	137	187	326	340
T_f	570	48 41	570	191	228	363	402
T_g	80	49 163	0.3	246	264	401	458
T_h	46.66	7.42	53.52	13.62	18.84	32.54	34.26
Sum	27 46.60	7.33	53.50	13.60	18.82	32.52	34.24
Mean	28 6.02	23.75	14.67	34.14	39.77	53.67	54.78
Red. to T_m	19.42	15.87	21.17	24.54	20.95	21.15	20.54
Sum = s							

 $\frac{1}{2}(T_m - T_0)$

T

RA

RA - T

- n tang δ $\Delta T + m$

May 29 C. W.

plus Min. & Boole's a₂ Lib.

$T_m - T_0$	14 27 170	14 38 582	14 43 236
A	27 327	21	270
C	27 478	060	308
Sum	27 30	100	344
Mean	28 2.0	13.9	37.7
Red. for runs	27.3250	6.04	30.70
Red. to hor. wire	32.43	6.02	30.68
Red. to meridian	55.08	28.20	52.50
Division error	22.65	22.18	22.22
Sum			

Pointer

App. z

log a'

A' log β λ log γ

log tang z

log r

r

z

 $\phi - z = \delta(O)$ $\delta(C)$ $\delta(C - O)$

C. W. n = 15 C = -20

$$\begin{aligned}
 0 &= -21.17 + 0.1 + 11.00 + 00 - 60 - 60 - 21.37 + 21.77 \\
 &20.54 + 1.19 + 1.55 + 18 - 93 - 1.11 + 55 + 65 \\
 &20.95 + 3.5 + 11.06 - 05 - 64 - 68 + 37 + 64 \\
 &21.15 + 3.6 + 1.06 - 05 - 61 - 66 + 51 + 81 \\
 &20.52 + 1.30 + 1.64 - 20 - 98 - 118 + 41 + 70 \\
 0 &= -20.87 + 0.84 + 1.46 - 21.39 + 21.72
 \end{aligned}$$

$$\begin{aligned}
 0 &= -19.42 + 2.83 + 30.0 \\
 &-15.42 + 9.61 + 9.57 \\
 0 &= +1.45 + 7.98 + 1.54 \\
 0 &= +8.45 + 8.67 + 8.11
 \end{aligned}$$

$$\begin{aligned}
 0 &= +7.8 + n + 6.6 \\
 0 &= +6.2 + n + 9.3 \\
 0 &= +7.3 - n + 40 \\
 0 &= +6.2 + n + 9.5
 \end{aligned}$$

$$\begin{aligned}
 0 &= -22.18 + 5.2 + 1.14 + 0.8 + 6.8 + 6.0 \\
 &22.22 + 2.8 + 1.04 + 0.4 + 6.2 + 6.6 \\
 0 &= -22.20 + 1.7 + 1.02 + 0.2 + 6.5 + 6.3
 \end{aligned}$$

$$\begin{aligned}
 0 &= -22.65 + 4.10 + 9.22 \\
 0 &= +4.5 - 3.93 - 3.13 \\
 0 &= +12 - n - 80
 \end{aligned}$$

$$\begin{aligned}
 0 &= +12 - n + 10n = +2.8 \\
 0 &= +12 - n + 10n = +2.8
 \end{aligned}$$

Date _____

May 29 1873

Observer

hsh.

Barom. =

$$\log B =$$

Att. Therm. =

$$\log T =$$
 $\log \gamma$

Ex. Therm. =

$$\log \beta =$$

n

Recorder

Star.

Recorder _____ Ex. Therm. = _____ log β = _____ log γ _____

C. & B. A. E. Mini R. P. New series after adjusting Sidereus focus.

star. Mini 48 kept a Bostis 2 Mrs. Mini, Cronman & Seipt.

[illegible]

Date *May 29* ¹⁸⁷³Observer *M.R.*

Barom. =

log B =

Att. Therm. = ?

log T =

n

Recorder

Ex. Therm. =

log β =log γ *C. R. W.**Wm. R. P. Perry*Star. *g. Mus. mi. Scorpi. B. Scorpi. h. 2320 Soph. r. Merc.*

T_s	1544	46.4	1552	21.0	1554	35.0	1604	24.0	16	138	16	15	257
T_m	48	38	25.0		388		332		17.3		30.0		
T_o	20.9		28.0		42.7		42.8		20.9		85.2		
T_f	38.4		32.9		46.4		52.4		24.4		40.5		
T_g	56.3		36.6		50.2		1.8		28.0		45.5		
T_h	21.16		28.86		42.62		42.82		20.88		35.26		
Sum	21.10		28.84		42.60		42.77		20.86		35.24		
Mean	41.47		29.88		50.06		24.5		43.23		57.78		
Red. to T_m	24.34		22.54		22.46		20.08		22.37		22.54		
Sum = s													

 $\frac{1}{s} (T_m - T_s)$ *0* *c = +.85* *n = -.24*

T

0 = -22.54 -45+10.8 +0.9 +.89 +.98 -21.56

RA

-22.46 -35+10.6 +.8 +.88 +.96 .50

RA - T

-22.37 -06+10.0 +1 +.85 +.86 .51- n tang δ *-22.54 +1.06 +1.45 -2.6 +1.23 +.98 .56* $\Delta T + m$ *0 = -22.48 +.06 +1.15 21.54* $T_m - T_s$ *0 = -24.39 +4.79 +4.89*

A

0 = +1.91 -4.73 +3.74

C

0 = +44 - n - .80

Sum

0 = +44 - n - .68 $\Delta T + m = +21.53$

Mean

n = -.24 $m = +.02$

Red. for runs

 $\Delta T = +21.51$

Red. to hor. wire

*Mean $\Delta T = +21.54$
21.56-*

Red. to meridian

Division error

Sum

Pointer

App. z

log a'

A' log β λ' log γ

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

Date

May 31/1883

Observer

W. S. B.

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ

Main M. 6.

Star.

2 Virginis K Draco 32 Camel & Virg. Pleiades & Virg.

T_s	12 12 59.6	12 27 32.4	12 47 22.0	13 2 57.8	13 09 36.3	13 18 5.6	
T_m	17	38.8	42.5	59.9	10 17.9	7.7	
T_o	38	44.7	21	19	11 2.8	9.7	
T_f	5.8	50.5	22.4	40	11 45.0	11.8	
T_g	7.9	57.0	43.2	61	12 30.0	13.9	
T_h	8.76	44.72	24.4	1.94	11 2.40	9.74	
Sum	3.74	44.66	2.35	1.52	11 3.03	9.72	
Mean	25.92	5.92	23.40	23.70	11 34.80	31.44	
Red. to T_m	21.68	21.26	21.06	21.78	31.77	31.72	$b = +2.4$
Sum = s							
$\frac{1}{2}(T_m - T_s)$			$n = -2.4$				
T		$0 = -21.58 + 8.0 + 0.0 - 21.68$		$0 = -21.26 + 8.82$			
RA		$-21.78 - 0.9 + 2$	76	$20.56 + 9.68$			
RA - T		$-21.72 - 1.7 + 3$	69	$31.77 - 41.77$			
- n tang δ		$0 = -21.73 - 1.0$	21.70				
$\Delta T + m$	May 31	J. R. M. Obs.		$dT + m = +21.70$		$m = 38 + 15 = 43$	
				43			
				$\Delta T = +21.25$			

$$\left(\begin{array}{l} 0 = +47 + 2.92 \quad n = -16 \\ +16.7 + 9.78 \quad = -12 \\ +10.04 + 41.67 \quad = -24 \\ -17 \end{array} \right) \text{ y m}$$

 $T_m - T_s$

A

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a'

A' log β λ log γ

log tang z

log r

r

z

 $\phi - z = \delta(O)$ $\delta(C)$ $\delta(C - O)$

Date May 31 1873

Observer J. R.

Barom. =

log B =

Att. Therm. =

log T =

log γ

n

Recorder Wm R. T.

Ex. Therm. =

log β =

Star. 32 Camel. & Proc. 2 hrs. May 31 1873 2100. 2 Booti. 1 Can. S.P. & Booti. 5 hrs. Min

T_{δ}	12 46 53.12	—	12 42	21 13 48	109	14 0	23.0	14 09 25.0	14 17 54.3	14 20	22.2	14 24 58
T_m	47 29.1	—	47	14.7	31.3			28.7	3.0		28.0	20.0
T_e	48 46	27	—	13.1	18.4	39.6		32.4	12.4		33.7	35.3
T_f	49 39.3	27	56.2	11.6	22.3	44.0		36.3	21.3		39.6	49.8
T_g	50 14.4		6.6	14.3	26.0	56.4		40.1	30.5		45.4	5.1
T_h	4.48	27	45.56	13.16	18.46	37.66		32.50	12.10		32.78	35.20
Sum	29.41	28	5.92	39.12	39.77	0.33		53.67	35.86		54.76	54.89
Mean	17.93		20.36	20.96	21.31	20.67		21.17	22.06		26.98	19.69
Red. to T_m	1.7		+ 5	+ 2	+ 2	+ 3		+ 2	+ 5		+ 2	+ 6
Sum = s	18.62		20.41	20.98	21.33	20.70		21.19	23.02		27.00	19.75
$\frac{1}{2}(T_m - T_{\delta})$												
T												
RA												
RA - T												
- n tang δ												
ΔT + m	E Booti	a Libani										
	14 38 58.0	14 43 21.9										
$T_m - T_{\delta}$	2.0	23.0										
A	6.0	31.6										
C	10.0	35.1										
Sum	14.1	39.0										
Mean	6.02	31.62										
Red. for runs	28.20	52.80										
Red. to hor. wire	21.18	21.28										
Red. to meridian	+ 2	+ 2										
Division error	21.20	21.30										
Sum												
Pointer												
App. z	Pa. CW	dT = +21.30										
	" CE	dT = 21.37										
log a'												
A' log β	Mean	+21.33										
λ' log γ												
log tang z		21.22										
log r												
r												
z												
φ - z = δ (O)												
δ (C)												
δ (C - O)												

Date *May 31 1913*Observer *R.R.*

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Wini R.P.

Star.

Phur. Min. 48 Sept. 1913. albonis albonis 2 Sept. 1913. Phur. Min. 2 Sept. 1913.

T_0	14 50 203	15 3 202	15 19 119	15 28 500	15 36 330	15 47 471	15 44 15	15 52 58	210
T_m	336	360	164	540	365	48 43	48	250	
T_e	470	574	209	581	379	48 213	84	135	288
T_f	0.3	80	255	20	436	48 385	119	21	328
T_g	137	242	299	57	472	48 561	154	25	366
T_h	46.98	57.76	20.92	58.00	40.04	48 21.46	840	2884	
Sum	46.92	58.03	20.90	57.98	40.02	21.40	8.30	2882	
Mean	11.34	11.78	43.67	20.51	2.50	48.43	30.18	51.40	
Red. to T_m	24.92	19.75	22.77	22.53	22.48	24.03	22.58	22.58	

Sum = s

 $\frac{1}{2} (T_m - T_0)$

T

RA

RA - T

- n tang δ $\Delta T + m$ $T_m - T_0$

A

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a'

A' log β λ log γ

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

$$n = +10.0 = +60$$

$$\begin{aligned}
 0 &= -22.77 + 78 + 127 + 8 + 76 + 84 + 21.93 \\
 &22.53 + 51 + 1.12 + 5 + 67 + 72 + 81 \\
 &22.48 + 11 + 1.01 + 1 + 60 + 61 + 87 \\
 &22.58 + 108 + 1.00 + 1 + 60 + 61 + 97 \\
 &22.58 + 41 + 1.08 + 4 + 65 + 61 + 97
 \end{aligned}$$

$$\begin{aligned}
 &22.50 - 35 + 1.06 \\
 &- 22.57 + 12 + 1.08
 \end{aligned}$$

$$\begin{aligned}
 0 &= -249.2 + 3.64 + 3.77 & dT + m &= +21.91 \\
 &19.75 - 4.45 - 4.16 & n &= +54 \\
 &24.03 + 4.79 + 4.19 & dT &= 21.37 \\
 &22.89
 \end{aligned}$$

$$\begin{aligned}
 0 &= -1.85 + 3.52 + 2.69 \\
 &- 2.82 + 5.56 + 5.64 \\
 &- 1.46 + 4.67 + 3.81
 \end{aligned}$$

$$\begin{aligned}
 0 &= .53 + n + .77 \\
 &-.51 + n + .91 \\
 &-.32 + n + .82
 \end{aligned}$$

$$h = +47$$

$$m = 63 - 9 = 54$$

$$\begin{aligned}
 0 &= -.53 + n + 46 - .07 \{ -.07 \\
 &-.51 + n + 55 + .04 \\
 &-.32 + n + 48 + 1.6 \} + 10
 \end{aligned}$$

$$dT + m = +22.03$$

$$m = 79$$

$$dT = +21.24 = C.W.$$

$$20.95 = C.E.$$

$$dT = +21.10 = \text{Mean}$$

Date _____

te *77 June 1 1913*

Observer

25 R.

n

Recorder

Barom. =

Att. Therm. =

Ex. Therm. =

$$\log B =$$
$$\log T =$$
$$\log \beta =$$
 $\log \gamma$

Wm M C.

Star. PL Geo. Thos. May o Virg. 4 N Drow. N Virg. K Drow. 32 Camel O Virg. Polaris S Virg.

T _s	11	92	100	11	46	41.5	11	58	19.5	12	5	57.4	12	12	55.8	12	27	32.9	12	47	24.0	13	2	55.0	13	9	34.9	13	18	57
T _m			12.1			45.3			21.8			47.2			19			35.0			54.0			(2.1		10	17.2			7.8
T _o			14.1			48.9			23.8			57.5			3.9			45.3			13.3			(4.2		11	1.0			9.8
T _r			16.3			2.5			25.9			4.4			5.9			51.1			33.0			(0.0		11	44.6			12.0
T _g			18.4			56.0			28.0			17.7			8.1			57.4			43.0			(6.3		12	27.2			14.0
T _h			14.15			48.50			23.78			57.44			3.92			45.14			13.46			(2.12		11	0.98			5.88
Sum			14.16			48.83			23.76			57.38			3.90			45.08			13.37			(2.10		11	1.61			2.16
Mean			35.60			9.85			45.21			17.47			25.41			5.88			23.74			(23.69		5	35.45			31.4
Red. to T _m			21.44			20.85			21.45			20.09			21.57			20.80			19.87			(21.59			33.84			21.57
Sum = s																														
$\frac{1}{5} (T_m - T_o)$																														
T																														
RA																														
RA - T																														
- n tang δ																														
ΔT + m																														
T _m - T _o																														
A																														
C																														
Sum																														
Mean																														
Red. for runs																														
Red. to hor. wire																														
Red. to meridian																														
Division error																														
Sum																														
Pointer																														
App. z																														
log a'																														
A' log β																														
λ' log γ																														
log tang z																														
log r																														
r																														
z																														
φ - z = δ (O)																														
δ (C)																														
δ (C - O)																														

Date Jan 1 1873

Observer W. R.

Barom. =

log B =

n

C. N.

Recorder Wm. R. R.

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

Star.

L. Dr. co. 32 Camel. 32 King. 32 Mrs. Maj. R. Boole & Draco Boole

T_s	12 27 - 12 46 58	12 25 46 3	13 42 27 13 48 150	114	14 00 23 8	14 09 25 2
T_m	-	326	501	83	188	322
T_e	-	70	536	187	227	405
T_f	570	423	571	193	263	487
T_g	74	170	07	24.8	-	574
T_h		7.52	53.56	1376	11.84	40.59
Sum		7.43	53.54	13.74	11.82	40.47
Mean		22.74	19.66	39.10	39.76	0.26
Red. to T_m		15.31	21.12	20.36	20.94	19.79
Sum = s						21.02

 $\frac{1}{2}(T_m - T_s)$

T

RA

RA - T

- n tang δ $\Delta T + m$

O Boole, 5 Mrs. Maj. & Boole

$T_m - T_s$	14 20 22.8	14 27 6.5	14 37 54.4		
A	286	219	35		
C	344	370	73		
Sum	463	65	114		
Mean	34.50	31.68	7.40		
Red. for runs	34.50	31.68	7.40		
Red. to hor. wire	20.25	18.14	20.53		
Red. to meridian	-20.36	+1.19	+1.55		
Division error	-20.94	+3.52	+1.06		
Sum	-21.02	+36	+1.06		
Pointer	-20.25	+1.30	+1.64		
App. z	-20.83	+52	+1.19		
log a'	-20.75	+62	+1.24		
A' log β					
λ log γ					
log tang z					
log r					
r					
z					
$\phi - z = \delta$ (O)					
δ (C)					
δ (C - O)					

$$O = +544 + 589 + 288$$

$$+ 96 + 1.52 + 1.83$$

$$+ 2.58 + 3.48 + 2.98$$

$$C = -36$$

$$O = +61 + n + 84$$

$$+ 13 + n + 74$$

$$+ 74 + n + 74$$

$$+ 74 + n + 74$$

$$+ 74 + n + 74$$

$$+ 74 + n + 74$$

$$+ 74 + n + 74$$

$$+ 74 + n + 74$$

$$+ 74 + n + 74$$

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$$+ 74 + n + 74$$

$$+ 74 + n + 74$$

$$+ 74 + n + 74$$

$$+ 74 + n + 74$$

$$+ 74 + n + 74$$

$$+ 74 + n + 74$$

Date June 1, 1973

Observer

J.R.R.

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

L.E. Wm R. P.

Star. γ Lib. β Mus Min. δ Lepus β Ursa Min. γ Ursa Min. Cor. δ Serp. Cor. γ Ursa Min

T_δ	1443 23.6	1450 44.3	15 3 14.3	15 19 13.1	15 20 17.5	15 21 50.8	15 37 33.6	15 44 20	15 48 51.3
T_m	271	55.0	322	176	293	548	373	57	80
T_e	30.8	110	4.7	22.0	40.8	5.9	40.7	9.2	25.7
T_f	34.6	4.7	5.4	26.7	52.5	2.9	114.8	12.0	42.4
T_g	38.4	5.7	21.6	31.0	4.1	6.8	47.9	16.3	0.2
T_h	30.52	30.14	49.04	210.8	40.92	58.84	40.76	9.16	25.52
Sum	30.80	11.87	49.12	220.6	40.87	58.82	40.74	9.14	25.45
Mean	52.90	11.23	11.84	43.67	1.58	20.57	2.53	30.88	45.07
Red. to T_m	22.00	20.40	22.72	21.61	20.71	21.69	21.79	21.74	19.92
Sum = s									

 $\frac{1}{n}(T_m - T_e)$

T

RA

RA - T

- n tang δ $\Delta T + m$ $\Delta T + m = +21.41$ C.E.

21.61 = C26

 $C = +25$ $m = -1.8$

21.51 = Mean

 $0 = -22.00 + 13 + 21 + 34$ 21.66 $\frac{58}{20.93} = \Delta T$

21.61 + 35 + 30 + 40.5 6.6

21.69 - 23 + 28 + 0.5 6.4

41.79 - 0.5 + 0.5 + 20 5.9

21.74 - 0.4 + 1.5 + 21 5.3

22.04 + 1.8 + 2.6 + 4.4 6.0

22.04 + 1.6 + 2.6 + 4.2 6.2

21.61

 δ Scorpi β Scorpi $T_m - T_\delta$ 15 52 21.7 15 57 35.6

A

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a'

A' log β λ log γ

log tang z

log r

r

z

 $\phi - z = \delta$ (O) δ (C) δ (C - O) $0 = +1.47 + 3.58 + 2.69$ $+0.55 + 4.51 + 5.64$ $+1.95 + 4.73 + 3.81$ $n = +3.6$ $0 = +.41 + n + .75$ $n = -.48 + .14$ $+1.9 + n + 1.25$ $+6.6$ $+4.11 + n + .81$ $-.71$ 21.5 $-.72$ $0 = +.39 + n + .94$ C 21.64 21.64 21.64 21.64 21.64 21.64 21.64 21.64 21.64 21.64 21.64 21.64 21.64 21.64 21.64 21.64 21.64 21.64 21.64 21.64

Date

June 21/73

Observer

W. L. R.

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Wm M. C.

Star.

P Leo. J. W. Major's Virg. 4 M. Draco 2 Argem. K. Draco. 32 Camel. O. Virg.

T_s	13 42 101	11 47 422	11 58 168	12 05 376	12 13 09	12 27 334	12 47 234	13 2 583
T_m	123	456	210	428	20	392	442	04
T_o	145	490	231	478	41	454	36	25
T_f	166	528	272	530	62	513	232	46
T_g	187	561	2	580	83	576	443	66
T_h	1494	4912	2404	24	412	4538	274	248
Sum	3559	4910	2402	75	410	4532	263	246
Mean	14.42	9.91	45.20	127	20.40	5.82	22.57	23.68
Red. to T_m	21.17	20.81	21.18	114	21.30	20.50	19.94	21.22
Sum = s				57.78				
$\frac{1}{s} (T_m - T_s)$				57.72				
T				17.39				
RA				17.67				

 $m = -34$

RA

$$0 = -21.17 + 27 - 09 - 21.26$$

RA - T

$$20.81 + 1.40 - 48 \quad 29$$

- n tang δ

$$21.18 + 17 - 6 \quad 24$$

 $\Delta T + m$

$$21.30 + 00 - 0 \quad 30$$

$$21.22 - 08 + 3 \quad 19$$

$$21.03 + 81 - 20 \quad 23$$

$$21.26 - 19 + 6 \quad 20$$

$$21.14 + 34 \quad 21.24$$

 $T_m - T_s$

Polaris S.P. x Virg. 12 Cam. Dra.

A

$$14 09 328 \quad 13 15 58 \quad 12 49 403$$

C

$$10 176 \quad 82 \quad 428$$

Sum

$$4 \quad 088 \quad 102 \quad 455$$

Mean

$$11 415 \quad 123 \quad 482$$

Red. for runs

$$12 243 \quad 144 \quad 508$$

Red. to hor. wire

$$10 5940 \quad 10.20 \quad 45.52$$

Red. to meridian

$$11 003 \quad 10.18 \quad 45.50$$

Division error

$$36.15 \quad 31.44 \quad 6.53$$

Sum

$$36.12 \quad 21.26 \quad 21.03$$

Pointer

App. z

$$b = +16$$

$$m = 21 + 31 = +52$$

$$dT + m = +21.24$$

$$m = +52$$

$$dT = +20.72$$

log a' $A' \log \beta$ $\lambda' \log \gamma$ log tang z log r r z $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

Date *June 2 1873* Observer *W. A. P.*

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

*C. W.**Wm. R. P.*Star. *Draco 32 Camel Virginis & Luc. May' & Boot. & Draco (B)*

T_s	12 27 26.8	12 47 4.0	13 27 46.1	13 42 8.3	13 48 11.4	13 59 38.7		
T_m	37.6	47 87.3	49.5	8.8	15.2	43.6		
T_e	41.3	48 11.3	50.4	14.2	18.8	57.6		
T_f	58.6	48 48.8	56.8	19.6	22.6	0.1		
T_g	9.1	49 22.2	0.9	25.2	26.3	8.8		
T_h	41.08	48 12.72	53.24	14.22	18.86	51.84		
Sum	41.02	48 12.63	53.22	14.20	18.84	51.82	51.80	
Mean	5.83	22.57	14.64	34.10	37.76	0.24	56.27	
Red. to T_m	17.81	9.84	21.42	19.90	20.92	18.17	42.07	
Sum = s	$0 = -2.142 + .00 + 1.00$			$0 = -17.81 + 2.23 + 3.00$			$0 = +32.7 + 20.2 + 1.50$	
$\frac{1}{2}(T_m - T_s)$	$-20.92 + 1.19 + 1.55$			$-9.94 + 9.51 + 2.57$			$+11.14 + 8.70 + 8.37$	
T	$-20.90 + 3.5 + 1.06$			$-15.17 + 2.14 + 2.37$			$+11.91 + 1.33 + 1.17$	
RA	$-21.05 + 5.1 + 12.0$							
RA - T								
- n tang δ								$0 = 1.45 + m + 9/c$
$\Delta T + mC$	C DE.							

	2 Drac(2) a Boobis	8 Boobis	5 Mus. Min.	2 Boobis	2 Lib. min.	3 Mus. Min.	8 B	6
$T_m - T_s$	14 01 14.0	14 09 24.4	14 20 22.1	14 27 5.7	14 38 58.4	14 43 23.5	14 47 45.2	14 49 5.0
A	21.0	28.3	27.8	20.6	2.4	27.0	47 58.4	x 50 52.1
C	30.1	31.9	33.7	35.6	6.5	30.6	48 10.7	51 1.7
Sum	38.6	35.6	39.6	50.4	10.7	34.6	25.6	17 15.8
Mean	46.9	39.2	45.4	5.4	14.6	38.0	18 38.3	50 34.7
Red. for runs	30.12	31.88	33.74	35.54	6.52	30.74	11.64	52.04
Red. to hor. wire	30.08	31.86	33.72	35.47	6.50	30.72	2 46.88	51.58 c-5.5
Red. to meridian	30.08	31.81	33.70	35.43	54.78	28.23	52.89	11.19
Division error	-50.27	20.23	21.84	21.01	19.31	21.73	22.17	18.21
Sum	(c = -47)							
Pointer	$DT + m = 21.92 C W$							
App. z	$0 = -2.184 + 2.44 + 2.37$							
	$-21.01 + 0.56 + 1.06$							
log a'	$-21.73 + .52 + 1.14$							
A' log β	$-22.17 - .28 + 1.04$							
λ log γ	$0 = -21.69 + .48 + 1.22$							
log tang z								
log r	$0 = -20.43 + 2.14 + 2.37$							
r	$-19.31 + 4.10 + 4.22$							
z	$-19.21 + 3.64 + 3.77$							
$\phi - z = \delta(O)$								
$\delta(C)$								
$\delta(C - O)$								

$DT + m = 21.92 C W$	$m = -49 C = -28$
$21.55 C E$	$0 = 21.42 - .00 - 4.9 - 4.9 20.8$
34.7	$20.92 - 1.18 - 7.7 - 1.5 .87$
$DT + m = 21.73$	$20.80 - 3.15 - 5.3 - 8.8 .78$
$m = 5.4$	20.82
$DT = 20.79$	

$0 = +1.26 + 1.98 + 1.22$	$0 = -21.84 + .36 + .53 + 1.7 21.67$
$0 = +2.38 + 3.62 + 3.00$	$21.01 - 1.27 + 8.1 + 5.4 .47$
$0 = +2.48 + 3.16 + 2.55$	$0 = +.80 + m - .81 C$
$0 = +.76 + m + .69$	$21.73 - 5.1 + 5.6 + 0.5 .68$
$0 = +.66 + m + .83$	$22.17 + 2.8 + 1.2 + 8.0 .37$
$0 = +.80 + m + .81$	$m = .109$
	21.55

Date June 21/73

Observer

H. R.

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

C. W.

Min. R. T.

Star.

3 Mus. Min. 48 Lep. SP. u. Bootis 2 Mus. Min. & Coronae & Sept. & Cor.

3 Mus. Min.

T_s	14	52	48	15	3	12	16	19	18	15	20	20	15	28	52	15	37	34	3	15	44	24	15	46	12	47	52
T_m		25				28		X 23	2		33			56			X 41				61			28		13	
T_o		15				48		27			44			0			44				9			46		40	
T_f		24				0		32			56			39			37				13			41		48	
T_g		42				16		14			7			8			48				16			21		56	
T_h		15				44		23			44			55			41				9			46		30	
Sum		15				44		23			44			59			41				9			46		30	
Mean		20				11		43			1			20			2				30			43		45	
Red. to T_m		- 16				- 27		20			17			20			21				21					14	
Sum = s																											

 $\frac{1}{2}(T_m - T_s)$

$$0 = -20.35 + 78 + 1.27$$

$$0 = -16.16 + 36.4 + 0.77$$

$$0 = +47.0 + 3.27 + 2.64$$

$$0 = +1.44 + n + .81$$

 T

$$-20.58 + 51 + 1.12$$

$$-27.17 - 445 - 4.56$$

$$+6.31 + 14.82 + 1.69$$

$$1.31 + n + 1.18$$

RA

$$-21.20 + 11 + 1.01$$

$$-17.21 + 3.13 + 3.29$$

$$+3.65 + 2.76 + 2.16$$

$$1.32 + n + .79$$

RA - T

$$-21.32 + 0.8 + 1.00$$

$$-14.90 + 4.79 + 4.89$$

$$+5.96 + 4.42 + 3.76$$

$$1.35 + n + .85$$

- n tang δ

$$-20.86 + 37 + 1.13$$

$$-14.90 + 4.79 + 4.89$$

$$+5.96 + 4.42 + 3.76$$

$$1.43 + n + .91$$

 $\Delta T + m$

6. C.

3 Mus. Min. 1 Scorp. & Scorp. 3 Dracon. 1 Dracon. 1 Ceph.

$$0 = -57$$

$$n = -91$$

 $T_m - T_s$

$$49$$

$$254$$

$$128$$

$$514$$

$$486$$

$$460$$

A

$$80$$

$$107$$

$$288$$

$$167$$

$$595$$

$$586$$

$$499$$

C

$$50$$

$$280$$

$$330$$

$$208$$

$$68$$

$$87$$

$$532$$

Sum

$$50$$

$$454$$

$$369$$

$$249$$

$$140$$

$$191$$

$$570$$

Mean

$$1092$$

$$2908$$

$$1078$$

$$5922$$

$$5876$$

$$4972$$

Red. for runs

$$10.86$$

$$29.06$$

$$16.76$$

$$59.18$$

$$58.71$$

$$49.70$$

Red. to hor. wire

$$-43.51$$

$$57.42$$

$$37.31$$

$$19.68$$

$$18.53$$

$$11.82$$

Red. to meridian

$$-37.50$$

$$22.36$$

$$22.53$$

$$20.50$$

$$19.82$$

$$22.12$$

Division error

$$27.05$$

$$43.36$$

Sum

$$-18.31$$

Pointer

App. z

$$0 = -22.36 - 41 + 1.08$$

$$0 = -15.81 + 4.79 + 4.89$$

$$-22.55 - 49 + 1.12$$

$$-19.82 + 1.87 + 2.12$$

log a'

$$-22.12 = 18 + 1.02$$

$$-20.50 + 2.61 + 2.79$$

A' log β λ log γ

$$0 = -22.34 - 36 + 1.07$$

$$0 = +40.3 + 5.25 + 3.82$$

$$0 = +77 + n + 73$$

log tang z

$$+7.52 + 2.23 + 1.05$$

$$+16.8 + n + 47$$

log r

$$+1.84 + 2.97 + 1.72$$

$$+1.62 + n + .68$$

r

$$0 = +69 + n + .59$$

z

$$0 = +1.40 + n + 91$$

 $\phi - z = \delta(O)$

$$150 = .74$$

 $\delta(C)$

$$0 = .49$$

 $\delta(C - O)$

$$n = .98$$

Date

Observer

Barom. =

log B =

n

Recorder

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

Star.

Russian Janis. Intervals.

 T_δ From B₁ to D₅ T_m

K Deco. gives 56.694

 T_e

22 Camul 56.803

 T_f

2 Deco. 56.710

 T_g

5 hrs. Min. 56.572

 T_h

3 hrs. Min. 56.664

Sum

48 obs. 56.680

Mean

5 hrs Min. 56.724

Red. to T_m

Mean

Sum = s

456.692 approximately = 16 intervals.

 $\frac{1}{2}(T_m - T_e)$

414.173

T

3.543 = one third interval.

RA

RA - T

From A₁ to C_m = +42.516- n tang δ B_m to C_m = +21.258 log = 1.32752 $\Delta T + m$ D_m to C_m = -21.258E_m to C_m = -42.516 $T_m - T_\delta$

A

n = -91 c = -57

C

v = -20.35 - 71 - 72 - 143 - 21.78

Sum

-20.58 - 46 - 69 - 110 68

Mean

-21.20 - 10 - 58 - 68 88

Red. for runs

-21.30 - 7 - 57 - 64 96

Red. to hor. wire

n = -98 c = -49 21.82

Red. to meridian

v = -20.35 - 76 + 63 - 138 - 21.74

Division error

-20.58 - 49 - 55 - 104 62

Sum

-21.20 - 11 - 50 - 61 81

Pointer

-21.30 - 8 - 50 - 58 88

App. z

21.76

log a'

c = -22.36 + 40 + 57 + 98 21.38

A' log β

22.55 + 49 + 55 + 104 51

A' log γ

22.12 + 18 + 51 + 69 43

log tang z

21.44

log r

21.76

r

b = +04

120

z

m = +05 + 89 = +94

 $\Delta T + m = +21.60$ $\phi - z = \delta(O)$

m = + 94

 $\delta(O)$ $\Delta T = +20.66$ $\delta(C - O)$

20.63

Date June 5 1873

Observer W. H. R.

Barom. =

log B =

Att. Therm. =

log T =

log γ

n

Recorder

Ex. Therm. =

log β =

Star.

Virginis Polaris Virginis

T_s	13 259.3	18 9 41.2	18 18 7.0
T_m	14	10 22.0	9.1
T_o	8.4	11 01.4	11.3
T_r	5.5	11 46.9	13.3
T_g	7.6	12 24.5	15.6
T_h	34.4	11 32.0	11.26
Sum	236.8	384.6	31.46
Mean	20.24	38.26	20.20
Red. to T_m			
Sum = s			
$\frac{1}{s}(T_m - T_s)$	$v = -20.24 - .88 + .03 - 20.21$		
T	$-20.20 - .19 + .06 - 20.14$		
RA	-20.18		
RA - T	$v = -35.26 - 41.79$		
-n tang δ	$v = -21.22 - 13$		
$\Delta T + m$	$v = -14.04 - 41.66 \quad m = -34$		

$$dT + m = +20.18$$

$$m = +52$$

$$dT = +19.66^s$$

$$dAT = -.36^s$$

 $T_m - T_s$

June 9 1873 W. H. R.

Librae Arcturus Min. 6 Bootis

A	14 43 18.8	14 50 45.8	14 56 48.2
C	21.0	50.2	50.9
Sum	23.1	53.5	53.6
Mean	25.3	54.6	56.3
Red. for runs	24.4	1.6	53.9
Red. to hor. wire	23.12	53.76	53.58
Red. to meridian	23.10	53.70	53.56
Division error	52.88	10.84	11.76
Sum	29.78	17.14	18.20

$$n = -38$$

$$v = -18.20 + 0.87 - 33 - 18.53$$

$$v = -17.14 + 3.66$$

$$v = -1.06 - 2.79$$

$$dT + m = +15.53^s$$

$$m = +52$$

$$dT = +15.01^s$$

$$dAT = -.48^s$$

Pointer

App. z

log a'

A' log β λ log γ

log tang z

log r

r

z

 $\phi - z = \delta(O)$ $\delta(C)$ $\delta(C - O)$

Date *June 10 1873* Observer *N.R.*
 Recorder *7*

Barom. =
 Att. Therm. =
 Ex. Therm. =

log B =
 log T =
 log β =
 log γ

Star. *δ Virginis Polaris α Virginis*

T_{δ}	13 03	14	13 9 45.0	13 18 60
T_m		3.6	10 29.6	14.2
T_e		5.7	11 11.4	13.4
T_f		7.7	11 53.8	15.4
T_g		9.8	12 35.6	17.6
T_h		5.64	11.08	13.32
Sum		5.62	11.71	13.30
Mean		23.64	43.00	31.42
Red. to T_m		18.02	31.29	18.12
Sum = s				
$\frac{1}{2}(T_m - T_e)$				
T				
RA				
RA - T				
- n tang δ				
$\Delta T + m$				

$$0 = -18.02 - .08 + .03 - 18.05 - 17.99$$

$$-18.12 - .19 + .06 \quad .48 \quad 18.04$$

$$-18.02 \quad 18.02$$

$$0 = -18.07 - .13$$

$$0 = -31.29 - 41.79$$

$$0 = +13.22 + 41.66$$

$$n = -3.2$$

$$dT + m = +18.02$$

$$m = +5.2$$

$$dT = +17.50$$

$$dT = -41$$

June 11 1873
 δ Virginis Polaris α Virginis

$T_m - T_{\delta}$	13 03	2.0	13 9 46.0	13 18 9.7
A		4.0	10 29.6	11.8
C		6.1	11 11.9	13.8
Sum		8.2	11 55.5	15.9
Mean		10.3	12 37.8	18.1
Red. for runs		6.12	12.16	13.86
Red. to hor. wire		6.10	12.79	13.84
Red. to meridian		23.64	43.86	31.42
Division error		17.54	81.07	17.58
Sum				
Pointer				
App. z				
log a'				
A' log β				
λ' log γ				
log tang z				
log r				
r				
z				
$\phi - z = \delta(0)$				
$\delta(C)$				
$\delta(C - 0)$				

$$0 = -17.54 - .08 + .03 - 17.51$$

$$-17.58 - .19 + .06 - 17.52$$

$$0 = -17.56 - .13$$

$$0 = -31.07 - 41.79$$

$$0 = +13.57 + 41.66$$

$$n = -3.3$$

$$dT + m = +17.52$$

$$dT = 17.00$$

$$dT = +50$$

Date 1873 June 12

Observer

H. R.

Barom. =

log B =

Att. Therm. =

log T =

log γ

n

Recorder

Ex. Therm. =

log β =

Star.

 α Virgin, Polaris & Virginis

T_s	13	0	23	13	9	43.2	13	18	10.0
T_m			4.4		10	27.0			12.2
T_e			6.6		11	12.7			14.3
T_f			8.7		11	53.8			16.3
T_g			10.7		12	34.0			18.1
T_h			25.4		11	10.14			14.24
Sum			6.52		11	10.77			14.22
Mean			23.60			44.68			31.35
Red. to T_m			17.08			33.91			17.13
Sum = s									
$\frac{1}{s}(T_m - T_s)$									
T									
RA									
RA - T									
- n tang δ									
$\Delta T + m$									

$$0 = -6.52$$

$$0 = -17.08 - 0.8 + 0.3 - 17.05$$

$$-17.13 - 1.9 + 0.8 - 0.5$$

$$0 = -17.11 - 1.3$$

$$0 = -33.91 - 41.79$$

$$0 = -16.80 - 41.66$$

$$m = -4.0$$

$$c/T + m = +17.05$$

$$m = +5.2$$

$$dT = +16.53$$

$$ddT = -4.7$$

 $T_m - T_s$

June 15 1873

A

Polaris & Virginis

C

3 09 53.8 13 14 11.3

Sum

10 34.0 13.4

Mean

11 10.7 15.6

Red. for runs

12 1.6 17.6

Red. to hor. wire

12 14.4 19.7

Red. to meridian

18.90 15.32

Division error

11 19.3 15.60

Sum

46.85 31.32

Pointer

27.44 15.82

App. z

log a' $A' \log \beta$ $\lambda' \log \gamma$

log tang z

log r

r

z

 $\phi - z = \delta(O)$ $\delta(C)$ $\delta(C - O)$

$$0 = -15.82 - 1.9 + 0.6 - 15.76$$

$$0 = -27.44 - 41.79$$

$$0 = +15.86 + 41.60$$

$$m = -2.9$$

$$dT + m = +15.76$$

$$m = +5.2$$

$$dT = +15.24$$

$$ddT = -4.6$$

Date June 16 1873

Observer

W. R.

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ Star. *2. In. Maj. 4. Boole*

1349

T_s	13 42 12.7	19 48 20.4
T_m	15.8	22.2
T_e	19.0	24.4
T_f	22.2	26.7
T_g	25.6	28.8
T_h	9.53	12.21
Sum	19.06	24.42
Mean	19.04	24.40
Red. to T_m	33.89	39.67
Sum = s	- 14.85	13.27
$\frac{1}{2} (T_m - T_s)$		
T		
RA		
RA - T		
- n tang δ		
$\Delta T + m$		

 $n = 40$

$$0 = -14.85 + 11.9 - 4.8 \quad 15.33$$

$$-15.27 + 3.5 - 14 \quad 15.41$$

$$\Delta T + m = 15.38$$

$$m = +52$$

$$\Delta T = +14.86$$

$$\Delta T = \bar{x} 40$$

 $T_m - T_s$

A

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a' $A' \log \beta$ $\lambda' \log \gamma$

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

Differences of Longitude between H. C. C. and P. T. Vermis

May 26 $14^m 15^s.51$ 27 $.60$ 28 $.66$ 29 $.57$ 31 $.70$ June 1 $.64$ 2 $.60$ 14 15.64

Date June 18/1873

Observer

Barom. = 29.89

log B = 1.7612 + 0044

Att. Therm. = 68.8

log T = -0.045 - 0014

n

Recorder

Ex. Therm. = 62.5

log β = 1.7597 + 0030 log γ = 0.115

Star.

Polaris & Argus & Arcturus & Boötis

T_{δ}	13 11	13 18 123	13 42 131	13 48 206		
T_m		144	164	227	$0 = -14.75 - 19 + 07$	-14.68
T_o	11 19.8	16.6	19.7	24.9	$-14.29 + 1.19 + 41$.70
T_r		17.7	22.7	27.0	$-14.76 + 35 - 12$	69
T_s		20.8	26.0	29.3		
T_h	11 19.8	16.56	19.58	24.90	$0 = 13.46 + 3.63$	-14.76
Sum	48.5	31.37	33.67	39.66	$0 = -14.53 + 45$	69
Mean	28.7	14.75	14.29	14.76	$0 = -28.70 - 41.79$	
Red. to T_m					$0 = -14.17 + 2.24$	
Sum = s	✓	✓	✓	✓	$n = -34$	
$\frac{1}{2}(T_m - T_o)$	10 57.5	18 00.4	41 49.8	48 4.5	$n = -34$	
T					$0 = -14.75 - 19 + 06 - 14.69$	$dT + m = +14.76$
RA					$-14.29 + 1.19 - 41$	$m = 52$
RA - T					$-14.75 + 35 - 12$ (87)	$dT = +14.76$
- n tang δ					$-14.43 + 87 - 30$	$4dT = 7.60$
$\Delta T + m$					14.71	

June 18/1873

Polaris & Arcturus & Boötis

$T_m - T_{\delta}$						
A	14 50	42.2	14 56	52.4	$0 = -13.86 + 87 - 34$	14.20
C		49.8	55.0		$-12.77 + 3.63$	
Sum		57.7	57.9		$0 = +1.09 + 2.86$	
Mean		5.5	0.7		$n = +39$	
Red. for runs		13.4	3.3			
Red. to hor. wire		57.72	57.86			
Red. to meridian		57.66	57.84			
Division error		10.43	11.70			
Sum		12.77	13.86		$dT + m = +14.20$	
Pointer					$m = 52$	
App. z					$dT = +13.68$	
					$4dT = -5.6$	
log a'						
A' log β						
λ log γ						
log tang z						
log r						
r						
z						
$\phi - z = \delta(0)$						
$\delta(C)$						
$\delta(C - 0)$						

Date *June 17 1973* Observer *W. R. P.*

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

*Comparison stars (112)**Comparison stars (112)*

Star.	<i>Alus</i>	<i>Mir</i>	<i>Arctis</i>	<i>B. Bortis</i>	<i>1533 40</i>	<i>1534 25</i>	<i>1535 25</i>	<i>1536 43</i>	<i>1538 18</i>	<i>15</i>										
T_s	14 50	59.3	41.8	13.48	119.4	56.5	15.33	1.3	10.1	33	57.6	65	35	29.99	36	14.7	27.7	37	50.0	59.0
T_m		18.9	49.5	14.0	54.6	3.6	12.6	1.9	11.0	3.2	12.1	2.0	8.3	2.0	8.3	52.2	1.4			
T_e		22.6	57.0	16.3	57.3	4.9	14.9	4.4	13.2	5.8	14.4	2.3	4.3	2.3	4.3	54.6	3.7			
T_f		38.9	4.9	33.6	0.4	23.9	17.1	22.2	17.8	2.3	16.7	4.1	3.1	4.1	3.1	12.5	6.0			
T_g		2.2	12.7	35.8	2.7	26.1	19.6	24.6	17.8	2.6	19.0	4.3	3.6	4.3	3.6	14.8	8.2			
T_h				38.0		28.6		26.8		28.9		40.9		17.2						
Sum		56.98	24.8	57.3		14.2	14.6	13.2	13.8	14.4	14.2	32.3	32.3	3.5	3.6					
Mean																				
Red. to T_m		5		5		32	59.0	33	54.3	35	0.3	36	14.2	37	40.7					
Sum = s						0.0	58.4	1.4	19.5	4.1										
$\frac{1}{2}(T_m - T_s)$						12	0.0	2.4	2.0	4.3										
T		48	4.6	56	33.1	33	0.1	58.6	35	14	36	19.5	37	41.9						
RA		56.92	24.91	57.28		33	14.77	34	13.21	35	14.39	36	32.31	38	30.8					
RA - T		10.48	38.66	11.71		+	1.5	+	1.5	+	1.5	+	1.5	+	1.5					
- n tang δ		13.46	14.78	14.43		+	14.66	+	14.66	+	14.66	+	14.66	+	14.66					
$\Delta T + m$						33	29.58	34	28.02	35	29.20	36	47.12	38	18.29					
$\log F - R$		9.52036	0.5202	9.55659		9.72130	9.72220	8.72330	9.72100	8.72150										
$T_m - T_s$		+4.03	+20.3	+24.2		1.16435	1.16435	1.16354	1.16721	1.33441										
A		40	1	52.3	15	4	33.9	25	3	23.9	14	32.8	13	19.8	11	24.8	19	24.0	38	58.8
C		2	4.1	43.8	36.0	40.4	27.9	32.0	32.1	39	64.2									
Sum		3	36.4	74.7	59.9	73.2	48.7	56.8	56.1	120.0										
Mean		41	58.20	19	38.5	28	29.95	14	36.60	18	23.85	11	28.40	19	28.05	39	00.00			
Red. for runs																				
Red. to hor. wire		-14.0	-25.2	-24.0		-26.8	-26.7	-15.60	-6.74	-42.1										
Red. to meridian						14	19.09	13	63.3	11	12.80	19	12.80	38	34.19					
Division error																				
Pointer																				
App. z																				
$\log a'$		1.7612	1.7612	1.7612	1.7581															
$A' \log \beta$		+0.30	+0.30	+0.30	-85															
$\lambda' \log \gamma$		-0.115	-0.115	-0.115	1.7496	1.7496	1.7496	1.7496	1.7496	1.7496										
$\log \tan z$		9.6009	9.6348	8.4132	35.86	35.76	35.62	35.89	36.58											
$\log r$		1.5536	1.3975	0.1659	2.1082	2.1072	2.1058	2.1085	2.1154											
r		-38.78	+24.88	+14.60	+2.83	+2.80	+12.76	12.84	12.104											
z		41	22.92	20	03.83	28	30.40	16	27.4	15	14.3	13	20.4	21	21.1	40	44.6			
$\phi - z = \delta(O)$		41	26.2	2	44.8	54	19.2	23	53.38	23	52.25	23	50.31	23	58.32	24	17.560			
$\delta(O)$		14	40	37.9	19	02.73	40	58.30	-1	3.5	1	3.5	1	3.5	1	3.5	1	3.5		
$\delta(O - O)$		-48.3	37.5	28.7	23	54.42	23	53.28	23	57.35	23	58.36	24	18.55						
		-14.0	25.2	24.0																

Date

Observer

Barom. =

log B =

Att. Therm. =

log T =

log γ

n

Recorder

Ex. Therm. =

log β =

Star.

 T_{δ} T_m T_e T_f T_g T_h

Sum

Mean

Red. to T_m

Sum = s

 $\frac{1}{6} (T_m - T_s)$

T

RA

RA - T

- n tang δ $\Delta T + m$ $T_m - T_{\delta}$

A

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a' $A' \log \beta$ $\lambda' \log \gamma$

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

Date June 25 1873

Observer

Barom. =

Att. Therm. =

Ex. Therm. =

log B =

log T =

log β =log γ =

n

Recorder

Star.	47338 990298		9.49353		10167		11129	
	i bars. Oort		5 lusmin		Librae		Stephanieli	
T_s	14 18 149	14 20 241	14 20 156	14 25 38.2	14 43 296	43 174	16 7 463.2	07 246
T_m	14 17 440	174	275	36.4 315	318		500 226	14.4
T_e		20.2	30.9	39.7 50.8	33.8		537 247	
T_f		22.6	37.6	43.1 500	350		170 188	
T_g		25.3	41.0	46.6 443	403		243 308	
T_h		27.9	44.4	50.2 488	424		329	
Sum		305	478	536 531	445		350	
Mean		23.0	57.0	57.0 57.5	466		371	
Red. to T_m		35.7	58.0	0.6 62.2	508		408	$dT+m=10.43$
Sum = s			1.2		530		433	$m=1.52$
$\frac{1}{2}(T_m - T_s)$			4.6		55.2		453	$dT=19.91$
T		2528	4437	4653 4407	4236		3289	$d dT = -54$
RA		28.33	44.35	44.87	4234		3287	
		86.54	54.33	53.34 44.00	5260		4332	
RA - T		11.21	9.98	64.7 9.34	1051		1045	
- n tang δ								
$\Delta T + m$								
$T_m - T_s$		413	287	81.6	25.0		185	
A	10 3 345	55 0 489	5 1 397	50 1 345	40 3 79			
C		52.2	57.2	50.7	44.1		16.8	
Sum		867	1011	904	786		297	
Mean	1 3 43.35	55 50.55	6 47.20	51 39.30	43 1235			
Red. for runs								
Red. to hor. wire								
Red. to meridian		+21.35 - 22.95	- 9.85	- 31.59	- 24.24			
Division error	14 470	85 2760	6 3535	51 3771	42 4811			
Sum								
Pointer								
App. z								
log a'	1.7613	1.7614	1.7611	1.7599	1.7608			
A' log β	+0101	- 37	- 37	0101	- 37			
λ log γ	-0138			-0139	0114			
log tang z	9.6574	9.2485	9.8271	9.2025				
log r	1.4224	1.0062	1.5845	1.9587	1.7615			
r	- 2645	- 1014	- 3841	+ 3094	+ 5869			
z	13 38.25	55 17.46	5 56.94	52 38.66	43 46.80			
$\phi - z = \delta(O)$	9 10.4	52 27 37.2	16 517	-15 39 50.0	20 58.2			
$\delta(C)$	66 49 86.0	52 26 26.7	76 10 46.7	-15 30 54.6	- 8 22 01.1			
$\delta(C - O)$	-24 26	-40 03	-33 53	57 54	45 45			
		-1 45	-1 50	-1 46	-1 28			

Date *June 25 1873* Observer *W.H.*

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β = *+0101*log γ = *.0138*n = *34*

Recorder

Comparison stars

Star.	<i>28 28 - 1709</i>	<i>15 33 40 - 23 58</i>	<i>15 34 21 - 28 55</i>	<i>15 35 25 - 28 51</i>
T_s	<i>15 28 6.6</i>	<i>28 19.3</i>	<i>15 33 21.0 29.8 33 12.2</i>	<i>15 34 38 12.7 34 21.2 15 35 5.2 13.9 35 12.7</i>
T_m	<i>8.8</i>	<i>21.6</i>	<i>23.1 32.1 13.2</i>	<i>6.0 17.1 22.5 7.6 16.3</i>
T_e	<i>11.0</i>	<i>23.2</i>	<i>25.3 34.4 14.4</i>	<i>8.5 17.4 24.0 9.6 11.6</i>
T_f	<i>13.0</i>	<i>28 21.4</i>	<i>43.4 36.6 33 13.3</i>	<i>26.5 19.7 34 22.6 27.7 20.8</i>
T_g	<i>15.2</i>		<i>45.7 39.0</i>	<i>28.7 21.9 29.8 23.0</i>
T_h			<i>48.0</i>	<i>30.9 32.1</i>
Sum	<i>10.82</i>		<i>34.42 34.38</i>	<i>17.40 17.38 18.67 18.52</i>
Mean	<i>10.80</i>		<i>34.38</i>	<i>17.37</i>
Red. to T_m	<i>10.80</i>		<i>34.38</i>	<i>17.37</i>
Sum = s	<i>15 28 21.45</i>	<i>15 33 44.83</i>	<i>34 27.92</i>	<i>35 29.12</i>
$\frac{1}{2}(T_m - T_s)$				
T				
RA				
RA - T				
- n tang δ				
$\Delta T + m$				
$T_m - T_s$	<i>08.471</i>	<i>08.805</i>	<i>07.888</i>	<i>07.905</i>
A	<i>28 47.8</i>	<i>19 19.1</i>	<i>12 53.9</i>	<i>11 14.5</i>
C	<i>53.5</i>	<i>28.0</i>	<i>6 2.8</i>	<i>22.6</i>
Sum	<i>103.4</i>	<i>47.1</i>	<i>11.67</i>	<i>37.1</i>
Mean	<i>28 51.70</i>	<i>19 23.55</i>	<i>12 58.35</i>	<i>11 18.55</i>
Red. for runs	<i>Red. - 11 + 13.18</i>	<i>- 26.44</i>	<i>+ 6.23</i>	<i>- 7.20</i>
Red. to hor. wire	<i>29 4.88</i>	<i>18 59.11</i>	<i>13 4.58</i>	<i>11 11.35</i>
Red. to meridian				
Division error				
Sum				
Pointer				
App. z				
log a'	<i>1.7596</i>	<i>1.7596</i>	<i>1.7581</i>	<i>1.7581</i>
A' log β	<i>- 37</i>			
λ log γ	<i>1.7559</i>	<i>1.7559</i>	<i>1.7544</i>	<i>1.7544</i>
log tang z	<i>22.72</i>	<i>23.22</i>	<i>23.86</i>	<i>23.86</i>
log r	<i>1.9831</i>	<i>1.9881</i>	<i>2.1130</i>	<i>2.1120</i>
r	<i>41 36.2</i>	<i>1 37.3</i>	<i>2 9.8</i>	<i>2 9.5</i>
z	<i>30 41.1</i>	<i>20 34.4</i>	<i>15 14.5</i>	<i>13 20.8</i>
$\phi - z = \delta(0)$	<i>- 17 07 52.5</i>	<i>16 58 45.8</i>	<i>23 52 26.9</i>	<i>50 32.2</i>
$\delta(0)$	<i>- 1 4.2</i>	<i>- 1 9.2</i>	<i>- 1 4.2</i>	<i>- 1 4.2</i>
$\delta(C - 0)$	<i>- 17 8 56.7</i>	<i>- 16 58 50.0</i>	<i>- 23 53 30.1</i>	<i>- 23 51 36.4</i>

Date *June 25*Observer *W.R.*

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

*07718*Star. *453643-2359**153418-2419**155100-2428*

T_s	<i>15 24 46 326 25193</i>	<i>542.33 37 441</i>	<i>50 35.9 449 50 26.0</i>
T_m	<i>36 23.0 343 36 12.4</i>	<i>56.57 494</i>	<i>841 473 272</i>
T_e	<i>25.2 366 232</i>	<i>58.78 526</i>	<i>404 496 288</i>
T_f	<i>40 276 15.3</i>	<i>169 100 37 494</i>	<i>586 878 51 158</i>
T_g	<i>13.0 388 36 138</i>	<i>191 123</i>	<i>08 140</i>
T_h	<i>45.6 410</i>	<i>815</i>	<i>30</i>
Sum	<i>36.3 3654</i>	<i>783 782</i>	<i>4947 4952</i>
Mean	<i>36.52</i>	<i>781</i>	<i>4948</i>
Red. to T_m	<i>+1.15</i>	<i>+1.15</i>	<i>+1.15</i>
Sum = s	<i>36 47.07</i>	<i>38 1836</i>	<i>15 51 0003</i>
$\frac{1}{2} (T_m - T_s)$			
T			
RA			
RA - T			
- n tang δ			
$\Delta T + m$			

$T_m - T_s$	<i>02827</i>	<i>07883</i>	<i>07718</i>
A	<i>1.35603</i>	<i>1.26482</i>	<i>1.34635</i>
C	<i>+22.7</i>	<i>+18.4</i>	<i>+22.2 - 26.3</i>
Sum	<i>19 33.9</i>	<i>38 578</i>	<i>45 249.1 1 58.2</i>
Mean	<i>43.0</i>	<i>60.7</i>	<i>58.0 61.3</i>
Red. for runs	<i>76.9</i>	<i>112.5</i>	<i>107.1 114.5</i>
Red. to hor. wire	<i>19 38.45</i>	<i>38 56.25</i>	<i>47 53.51 46 57.25</i>
Red. to meridian	<i>-2725</i>	<i>-2206</i>	<i>" - 26.52 + 31.41</i>
Division error	<i>19 1120</i>	<i>38 34.18</i>	
Sum			<i>47 27.03 47 28.66</i>
Pointer			
App. z			
log a'	<i>1.7581</i>	<i>1.7581</i>	<i>1.7579</i>
A' log β			
λ' log γ	<i>1.7544</i>	<i>1.7544</i>	<i>1.7542</i>
log tang z	<i>3.562</i>	<i>3.588</i>	<i>3.690</i>
log r	<i>2.1106</i>	<i>2.1133</i>	<i>2.1232</i>
r	<i>2 8.0</i>	<i>229.8</i>	<i>2 128</i>
z	<i>21 202</i>	<i>40 440</i>	<i>49 398</i>
$\phi - z = \delta (O)$	<i>58 31.6</i>	<i>17 58.4</i>	<i>26 51.2</i>
$\delta (C)$	<i>-1 42</i>	<i>-1 42</i>	<i>-1 42</i>
$\delta (C - O)$	<i>235.9 35.8</i>	<i>-2 418 58.6</i>	<i>-24 27 55.4</i>

Date June 26 1873 Observer W.A.H.

Barom. = 30.23

log B = 0.093

Att. Therm. = 73.0

log T = -0.015

Ex. Therm. = 68.4

log β = 0.078log γ = 0.164

Recorder

Star.

9.71338

9.90298

9.49353

10.167

Car. S.P.

2 Poles

5 Mus. Mini

2 Lib. Sue.

T_s	14 18 153	14 442	14 20 246 330 14 20 197	14 21 278	14 26 597	14 43 298 357	43 266
T_m	18.0		278 40	318	617	320 407	276
T_e	20.2		313 448	364	664	341 427	287
T_f	22.9		083 42	408		512 448	276
T_g	25.6		17 517	452	27 2.6	533 470	
T_h	28.2	$n=41$ $0 = -9.52 + 13.0 - 53 - 10.6$	570	493		506	
Sum	308	$-10.18 - 2.5 + 11.1007$		537			
Mean	33.5	$0 = -9.85 + .51$		581			
Red. to T_m	36.1		4478 4484	24		4267 4272	
Sum = s	-20.62	$0 = -10.88 - 2.33 = .38$	44.81	45.06		4267	
$\frac{1}{2} (T_m - T_e)$	25.67	$8.26 + 4.08 - 45$	4479	45.00		4267	
T	36.60		8431	53.26		5285	
RA	-112.5	$dT_m = +10.06$	-9.02	-826		-1018	
RA - T	10.93	$m = +5.2$					
-n tang δ		$dT = +9.54$					
$\Delta T + m$		$ddT = .40$					

$T_m - T_s$	+ 414	1.61701	+ 251	1.39967	+ 425	1.62889	+ 151	1.17896
A	10 03 32.0	9.71338 1.33038	55 0 40.5	9.90298 1.30265	5 1 419	9.49353 1.12192	50 1 240	10.167 1.28065
C	507		540		529		330	
Sum	827		1043		948		880	
Mean	10 3 41.35		55 0 47.2		5 1 47.40		50 1 28.50	
Red. for runs								
Red. to hor. wire								
Red. to meridian	+ 21.41		- 20.08		- 13.24		- 19.08	
Division error								
Sum	14 1994		55 27.19		6 34.16		51 9.42	
Pointer	13 1984							
App. z								
log a'	1.7707	1.7707	1.7614	1.7614	1.7611	1.7611	1.7598	1.7598
A' log β	1.7707	+ .0078	1.7614	+ .0078	1.7611	+ .0078	1.7598	+ .0078
λ log γ	-16.41	- .0164	-16.39	- .0164	-16.39	- .0164	-16.43	- .0164
log tang z	.03972	.03972	9.2494	9.2494	9.2494	9.2494	.2025	.2025
log r	1.6541	1.8018	.8547	1.0022	1.7790	1.5796	1.5258	1.5587
r	4408	-1 03.4	+ 716	+ - 10.0	+ 2705	+ - 380	+ 1 43.9	+ 1 29.9
z	82 12 56.4	12 16.5	65 27.1		5 56.2		53 38.3	
$\phi - z = \delta (0)$	49 49.2		52 27 21.5		16 52.4		-15 29 50.9	
$\delta (C)$	66 49 36.0		52 26 26.8		76 15 46.8		-15 30 57.6	
$\delta (C - O)$			-1 4.7		-1 5.6		-1 8.9	-1 4.7

Date June 26 1873

Observer W.R.

Barom. =

log B =

Att. Therm. =

log T =

log γ

n

Recorder

Ex. Therm. =

log β =

Comparison Star (112)

Star.

T_s	15 24 44.7	35 24 41.0	15 28 53.7	416.28595	15 33 21.2	30.2 33 17.8	15 35 54.5	415.34571
T_m	56.9	57	57.9	66	23.6	32.9	47.9	167 54.8
T_e	59.1	78	11	8.8	25.8	34.9	10.0	190 60.4
T_f	163	100	17.2	140	43.8	371	240	243 58.90
T_g	186	122	19.4	131	46.1	394	302	236
T_h	207		21.5		48.3		325	
Sum	7.78	9.84	8.83	8.81	34.80	34.86	18.98	19.02
Mean	7.81		8.82		34.83		19.00	
Red. to T_m	7.79		8.80		34.81		18.98	
Sum = s	45.5	+ 7.3	+ 1.3		7.18		+ 1.8	
$\frac{1}{2}(T_m - T_s)$	57	+ 10.04	+ 10.04		+ 10.04		+ 10.04	
T								
RA	15 28 18.6		15 29 18.97		33 45.03		15 35 29.20	
RA - T								
- n tang δ								
$\Delta T + m$	0.2821		0.2831		0.2888		0.2805	
	1.30794		0.96848		1.23045		1.33244	
	+ 22.8		+ 9.3		+ 17.0		+ 21.5	
$T_m - T_s$	19 33.4	3	36 42.9		19 14.3		11 35.1	
A	43.5		51.1		24.2		44.8	
C								
Sum	76.9		94.0		2.85		79.9	
Mean	19 38.4		36 47.0		19 14.25		11 39.95	
Red. for runs	- 28.62		- 11.66		- 20.39		- 25.70	
Red. to hor. wire	19 9.83		36 35.34		18 53.86		11 14.16	
Red. to meridian								
Division error								
Sum								
Pointer								
App. z								
log a'	1.7596		1.7596		1.7581		1.7581	
A' log β	- 86		- 86		- 86		- 86	
λ log γ	1.7810		1.7810		1.7495		1.7495	
log tang z	22.72		23.01		35.86		35.76	
log r	1.9782		1.9811		2.1081		2.1071	
r	1 35.1		1 35.8		2 8.3		2 8.0	
z	20 44.9		38 11.1		21 2.2		13 22.2	
$\phi - z = \delta(O)$	57 56.3		15 22.5		58 13.6		50 33.6	
$\delta(C)$	- 1 4.7		- 1 4.7		- 1 4.7		- 1 4.7	
$\delta(C - O)$	16 59 1.0		- 17 16 27.2		- 23 59 18.3		- 23 51 38.3	

Date

June 26 1873

Observer

W. A. R.

Barom. =

Att. Therm. =

Ex. Therm. =

log B =

log T =

log β =log γ

n

Recorder

Star.

	13 36	22.3	325	36 16.3	28 58.4	28 34	51.1	16 50	26.3	403	50	29.3
T_s		45.7	34.7	17.7	10.102		52.5		34.7	47.7		80.5
T_m		27.9	36.9	19.2	3.4	12.4	53.7		40.9	50.0		31.7
T_e		46.0	39.2	36 17.7	21.2	14.7	52.4		58.9	52.2		30.5
T_f		48.3	41.4		23.7	16.8			11	54.4		
T_g		50.5			2.9				3.5			
T_h		36.93	35.94		12.32	12.38			49.90	49.92		
Sum		2895			1235				49.91			
Mean		36.93			12.33				49.89			
Red. to T_m		+ .13			+ .13				+ .13			
Sum = s		710.09			710.09				710.04			
$\frac{1}{s} (T_m - T_s)$		15.36	47.10		15.38	22.50			15.51	00.06		
T												
RA												
RA - T												
- n tang δ												
$\Delta T + m$												

	67583		67768		67718
	1.25330		1.25865		1.25780
$T_m - T_s$	+19.2		+19.9		+19.4
A	19 33.0		29 36.0		47 49.0
C	42.2		45.0		57.6
Sum	75.2		81.0		106.6
Mean	19 37.60		29 40.50		47 53.30
Red. for runs	- 23.02		- 23.80		- 23.17
Red. to hor. wire	19 14.58		29 16.70		47 30.13
Red. to meridian					
Division error					
Sum					
Pointer					
App. z	1:				
log a'	1.7581		1.7581		1.7579
A' log β	- 86		- 86		- 86
λ log γ	1.7495		1.7495		1.7493
log tang z	3589		3658		3690
log r	2.1084		2.1153		2.1183
r	+2 8.4		+2 8.3		+2 11.3
z	21 23.0		31 26.0		49 41.4
$\phi - z = \delta (O)$	58 34.4		8 37.4		26 52.8
$\delta (C)$	- 1 4.7		- 1 4.7		- 1 4.7
$\delta (C - O)$	- 23 59 39.1		- 24 9 42.1		- 24 27 57.5

Date

June 29/1913

Observer

W.R.

n

Recorder

Barom. =

Att. Therm. =

Ex. Therm. =

log B =

log T =

log β =log γ

Star.

 α Bootis 2 L. Lane. 5th Mag. Mer.

T_{δ}	14 20 39.8	14 43 40.0	5 27 29.3
T_m	43.2	42.2	37.9
T_e	46.4	44.3	46.7
T_r	49.8	46.4	55.7
T_s	53.2	48.5	40
T_h	46.48	44.28	46.6
Sum	46.46	44.26	46.6
Mean	54.24	52.83	53.04
Red. to T_m	7.78	8.57	6.44
Sum = s			
$\frac{1}{2}(T_m - T_{\delta})$			
T			
RA			
RA - T			
- n tang δ			
$\Delta T + m$			

$$n = -4.9$$

$$0 = -7.78 + 13.0 - 6.4 - 8.42$$

$$- 8.57 - 2.8 + 14.43$$

$$0 = -8.17 + .51$$

$$0 = -6.44 + 4.08$$

$$0 = -1.73 - 3.57$$

$$n = -4.9$$

$$b = +30$$

$$m = +40 + 45 + 85$$

$$\text{Assume } m = +70$$

$$\Delta T + m = +8.42$$

$$+ .70$$

$$\Delta T = -7.72$$

$$\Delta \Delta T = -6.1$$

 $T_m - T_{\delta}$

A

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a' $A' \log \beta$ $\lambda' \log \gamma$

log tang z

log r

r

z

 $\phi - z = \delta(O)$ $\delta(C)$ $\delta(C - O)$

Date *June 30*Observer *W.R.*

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ

Star.

*Librae Mercurii & Bootis**T_δ 14 43 406 14 50 486 14 56 588**T_m 428 563 16**T_e 450 41 14**T_f 441 118 70**T_g 492 195 97**T_h 4494 406 430**Sum 4492 400 428**Mean 5248 566 11.54**Red. to T_m 7.87 566 7.26**Sum = s* *$\frac{1}{2}(T_m - T_e)$* *T**RA**RA - T**- n tang δ* *$\Delta T + m$*

$$0 = -7.57 - 2.8 + 16 - 7.71$$

$$-7.26 + 87 - 50 = 76$$

$$= -7.56 + 30$$

$$0 = -566 + 365$$

$$0 = -1.90 + 335$$

$$n = .57$$

$$dT/m = 1.13$$

$$m = 70$$

$$dT = 7.03$$

$$ddT = -.73$$

*T_m - T_δ**A**C**Sum**Mean**Red. for runs**Red. to hor. wire**Red. to meridian**Division error**Sum**Pointer**App. z**log a'**A' log β* *λ log γ* *log tang z**log r**r**z* *$\phi - z = \delta(O)$* *$\delta(C)$* *$\delta(C - O)$*

Date

July 2 1873

Observer

N. R.

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Star.

u' Bootis

2^h 2^m 30^s T_{δ}

15 19 22.4 44.1 32.8

15 20 42.6

 T_m

24.9 57.0 35.4

45.7

 T_e

27.6 38.0

49.3

 T_f

48.4 40.7

52.5

 T_g

51.0 43.3

56.0

 T_h

53.7

59.1

Sum

27

Mean

6.1

Red. to T_m

9.7

Sum = s

38.00 37.84

53.97

 $\frac{1}{2} (T_m - T_s)$

37.93

53.91

T

48.46

63.4

RA

5.51

4.43

RA - T

- n tang δ $\Delta T + m$

July 3 1873

u' Bootis & Serpens 3^h 2^m 30^s $T_m - T_{\delta}$

15 29 11.3 15 37 53.7 15 48 21.7

A

13.6 53.8

31.7

C

16.0 54.9

41.1

Sum

18.2 0.0

51.4

Mean

20.7 2.0

13

Red. for runs

15.76 57.87

41.44

Red. to hor. wire

15.50 57.86

41.38

Red. to meridian

20.42 2.53

43.58

Division error

4.46 4.67

2.20

Sum

Pointer

App. z

log a'

A' log β λ log γ

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

$$0 = -5.51 + 7.8 - 36 - 5.87$$

$$4.43 + 3.13$$

$$0 = -1.08 - 2.35$$

$$71 = -4.6$$

$$\Delta T + m = +5.87$$

$$m = +7.0$$

$$\Delta T = +5.17$$

$$\Delta \Delta T = +.93$$

$$0 = -4.46 + 5.7 - 2.7 - 4.73$$

$$-4.67 + 1.2 - 6 .73$$

$$0 = -4.56 + 3.1$$

$$0 = -2.20 + 4.78$$

$$0 = -2.36 - 4.47$$

$$n = -.53$$

$$\Delta T + m = +4.72$$

$$m = +7.0$$

$$\Delta T = +4.03$$

$$\Delta \Delta T = -1.1$$

Date *July 6 1873*Observer *W. S. R.*Barom. =
Att. Therm. =
Ex. Therm. =log B =
log T =
log β =
log γ

n

Recorder

Star.

2 Bootis 2 Librae Plus. Min. 2 Bootis

T_{δ}	14 20 46.4	14 43 46.7	14 50 54.3	14 57 49
T_m	49.8	49.0	21	77
T_e	53.1	51.1	98	103
T_f	56.4	53.1	17.3	13.0
T_g	59.8	55.2	25.5	15.7
T_h	53.10	51.02	9.80	10.32
Sum	53.03	51.00	9.74	10.30
Mean	54.07	52.79	9.30	11.47
Red. to T_m	0.99	1.79	+0.44	1.87
Sum = s				
$\frac{1}{s} (T_m - T_{\delta})$				
T				
RA				
RA - T				
- n tang δ				
$\Delta T + m$				

$$\begin{aligned}
 0 &= -0.99 + 1.30 - 75 = 1.74 \\
 &= -1.79 - 2.8 + 16 = .63 \\
 &= -1.17 + .87 - 50 = .67 \\
 &= 1.68 \\
 0 &= -1.32 + .63 \\
 0 &= +0.44 + 3.65 \\
 0 &= -1.76 - 3.02 \\
 n &= -.58
 \end{aligned}$$

$$\begin{aligned}
 \Delta T + m &= +1.68 \\
 m &= .72 \\
 \Delta T &= +0.96 \\
 4\Delta T &= -1.00
 \end{aligned}$$

*July 7 1873**2 Librae Plus. Min. 2 Bootis 2 Coronae.*

$T_m - T_{\delta}$	14 43 47.9	14 50 55.1	14 57 58	15 29 15.5
A				
C	50.1	3.3	86	180
Sum	52.2	10.6	113	20.3
Mean	54.3	18.6	141	22.5
Red. for runs	56.4	56.4	16.7	24.7
Red. to hor. wire	52.18	10.80	113.0	20.0
Red. to meridian	52.16	10.74	112.8	20.18
Division error	52.78	9.23	11.45	20.80
Sum	-0.62	+1.58	-0.17	+0.22
Pointer				
App. z				
log a'				
A' log β				
A' log γ				
log tang z				
log r				
r				
z				
$\phi - z = \delta (O)$				
$\delta (C)$				
$\delta (C - O)$				

$$\begin{aligned}
 0 &= -6.2 - 2.8 + 16 = -0.46 \\
 &= -1.7 + .87 - .57 = .68 \\
 &= -.22 + .47 - .30 = .82 \\
 0 &= -.34 + .37 \\
 0 &= +1.59 + 3.65 \\
 0 &= -1.83 - 3.28 \\
 n &= -.59
 \end{aligned}$$

$$\begin{aligned}
 \Delta T + m &= +0.55 \\
 m &= .72 \\
 \Delta T &= -0.17
 \end{aligned}$$

Date

July 9 1873

Observer

W.H.R.

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Star. α Mus. Min. & Coronae. & Deep. H. & Mus. Min.

T_δ	15 29 16.7	15 37 59.1	15 48 26.3
T_m	190	12	36.2
T_e	214	3.8	46.3
T_f	237	5.3	56.4
T_g	260	7.4	6.2
T_h	21.36	3.26	46.28
Sum	21.34	3.24	46.22
Mean	20.38	2.49	43.09
Red. to T_m	+ 0.96	+ 0.75	+ 3.13
Sum = s			
$\frac{1}{2} (T_m - T_s)$			
T			
RA			
RA - T			
- n tang δ			
$\Delta T + m$			

$$0 = +0.96 + 5.1 - 26 + 0.70$$

$$+ 0.75 + 12 - 06 + 0.69$$

$$0 = +.85 + 3.1$$

$$0 = +3.13 + 4.78$$

$$0 = +2.28 + 4.47$$

$$n = -.51$$

$$dT + m = -.040$$

$$m = +.7$$

$$dT = -1.40$$

$T_m - T_\delta$	July 10 1873			
A	14 43 49.8	14 51 56.9	14 57 7.7	15 29 17.3
C	57.8	4.2	10.3	19.6
Sum	54.0	11.8	12.9	21.9
Mean	56.0	19.7	15.7	24.2
Red. for runs	58.1	27.4	18.6	26.4
Red. to hor. wire	53.94	12.00	13.04	21.92
Red. to meridian	53.52	11.54	13.02	21.90
Division error	52.74	9.02	11.40	20.37
Sum	1.18	2.92	1.62	1.83
Pointer				
App. z				
log a'				
A' log β				
λ log γ				
log tang z				
log r				
r				
z				
$\phi - z = \delta (O)$				
$\delta (C)$				
$\delta (C - O)$				

$$0 = +1.18 - 28 + 13 + 1.31$$

$$+1.62 + 87 \pm 40 \quad 22$$

$$+1.53 + .57 \pm 23 \quad 30$$

$$1.28$$

$$0 = +1.44 + 3.7$$

$$0 = +2.92 + 3.65$$

$$0 = +1.48 + 3.28$$

$$n = -.46$$

$$dT + m = -1.28$$

$$m = +.72$$

$$dT = -2.00$$

$$d.d. = -.60$$

Date *July 12 1913* Observer *W. R.*
 Recorder

Barom. =
 Att. Therm. =
 Ex. Therm. =

log B =
 log T =
 log β =
 log γ

Star. *α Coronae α Serpentis 5 hrs. Min.*

T_δ	15 29 18.2	15 38 0.7	15 48 27.5
T_m	20.6	28	37.0
T_e	22.8	50	47.1
T_f	25.1	71	57.6
T_g	27.5	90	72
T_h	22.89	4.92	47.28
Sum	22.82	4.90	47.22
Mean	20.35	2.47	42.84
Red. to T_m	2.47	2.43	4.38
Sum = s			
$\frac{1}{2}(T_m - T_e)$			
T			
RA			
RA - T			
- n tang δ			
$\Delta T + m$			

$0 = +2.47 + 5.1 + 2.2$ 2.25
 $+2.43 + 1.2 + 0.5$.38
 2.31

$0 = +2.45 + .31$
 $0 = +4.38 + 4.78$
 $0 = +1.93 + 4.47$
 $n = +4.3$

$dT + m = -2.31$
 $m = +.72$
 $dT = -3.03$

July 13 1913

α Coronae α Serpentis 5 hrs. Min.

$T_m - T_\delta$	15 29 18.7	15 38 1.1	15 48 27.5
A	21.0	3.3	37.6
C	23.3	5.4	48.8
Sum	25.6	7.6	59.8
Mean	28.0	9.6	80
Red. for runs	23.32	5.40	47.74
Red. to hor. wire	22.30	5.38	47.68
Red. to meridian	20.34	2.46	42.73
Division error	2.96	2.92	4.95
Sum			
Pointer			
App. z			
log a'			
A' log β			
λ log γ			
log tang z			
log r			
r			
z			
$\phi - z = \delta(O)$			
$\delta(C)$			
$\delta(C - O)$			

$0 = +2.96 + 5.1 - 2.3$ 2.73
 $+2.92 + 1.2 - 0.5$.87
 2.80

$0 = 2.94 + 3.1$
 $0 = +4.95 + 4.78$
 $0 = +2.01 + 4.47$
 $n = -4.5$

$dT + m = -2.80$
 $m = -.72$
 $dT = -3.52$
 $ddT = -.49$

Date

July 15 1873

Observer

J. J. R.

n

Recorder

Barom. =

Att. Therm. =

Ex. Therm. =

log B =

log T =

log β =log γ Star. α Serpens Coronae Borealis

T_0	15 38 23	15 29 14.8	15 48 29.3
T_m	4.4	22.2	38.9
T_e	6.4	24.6	48.2
T_f	8.6	26.8	59.1
T_g	10.7	29.1	9.0
T_h	6.48	24.52	49.10
Sum	4.46	24.50	46.04
Mean	2.73	20.32	42.56
Red. to T_m	4.01	4.18	6.48
Sum = s			
$\frac{1}{2}(T_m - T_e)$			
T			
RA			
RA - T			
- n tang δ			
$\Delta T + m$			

$$v = +4.01 + 5.1 + 2.5$$

$$+ 4.18 + 12.406$$

$$3.95$$

$$3.83$$

$$3.94$$

$$v = +4.10 + 3.1$$

$$v = +6.48 + 4.78$$

$$v = +2.88 + 1.47$$

$$n = 5.0$$

$$dT + m = -3.94$$

$$m = +7.2$$

$$dT = -4.66$$

$$ddt = -5.5$$

July 20 1873

J. J. R. & Corcoran & Ophichus

$T_m - T_0$	15 48 31.2	15 52 24.4	16 7 46.4
A	4.11	26.7	48.6
C	5.4	29.0	50.7
Sum	15	31.4	52.8
Mean	11.7	33.8	54.7
Red. for runs	5.38	29.04	50.62
Red. to hor. wire	42.09	21.57	43.23
Red. to meridian	9.29	7.47	7.39
Division error			
Sum			
Pointer			
App. z			
log a'			
A' log β			
A' log γ			
log tang z			
log r			
r			
z			
$\phi - z = \delta(O)$			
$\delta(C)$			
$\delta(C - O)$			

$$v = +7.47 + 7.7 + 2.0 + 7.27$$

$$+ 7.39 - 0.6 - 2.37$$

$$v = +7.53 + 2.2$$

$$v = +9.29 + 4.78$$

$$v = +1.76 + 4.56$$

$$n = 3.9$$

$$7.32$$

$$dT + m = +7.32$$

$$m = -7.0$$

$$dT = 8.04$$

$$ddt = -6.8$$

Date *July 21 1883*Observer *N. S. R.*

Barom. =

log B =

Att. Therm. =

log T =

log γ

n

Recorder

Ex. Therm. =

log β =

Star.

Serpentis 3 hrs. 30 min. Neph.

T_s	15 38 6.2	15 48 31.6	16 6 49.1
T_m	8.3	41.6	51.1
T_e	10.4	51.8	53.3
T_f	12.4	18	
T_g	14.5	11.9	55.3
T_h	103.6	51.74	51.16
Sum	10.34	51.68	51.14
Mean	2.39	42.00	43.23
Red. to T_m	7.95	9.68	7.91
Sum = s			
$\frac{1}{2}(T_m - T_s)$			
T			
RA			
RA - T			
- n tang δ			
$\Delta T + m$			

$$0 = +7.95 + 12 - 04 + 7.91$$

$$+ 7.91 - 06 + 02 \quad 7.93$$

$$0 = +7.93 + 03$$

$$0 = +9.68 + 9.78$$

$$0 = +1.75 + 4.75$$

$$0 = -3.7$$

$$dT + m = -7.92$$

$$m = +7.2$$

$$dT = -8.64$$

$$ddT = -6.0$$

*July 22**Serpentis 3 hrs. 30 min. Neph.*

$T_m - T_s$	15 38 6.7	15 48 32.2	16 7 47.6
A	8.8	42.3	49.6
C	10.9	52.4	51.7
Sum	12.9	2.3	53.7
Mean	14.9	12.6	55.8
Red. for runs	10.4	52.36	51.68
Red. to hor. wire	10.82	52.29	51.66
Red. to meridian	2.38	41.88	43.22
Division error	8.64	10.41	8.44
Sum			
Pointer			
App. z			

$$0 = +8.44 + 12 - 05 = 8.39$$

$$0 = 8.44 - 06 + 02 = 4.6$$

$$0 = 10.41 + 4.75 = 8.42$$

$$0 = +8.44 + 03 = 5$$

$$0 = 1.88 + 4.72 = 8.42$$

$$0 = -4.2$$

$$dT + m = -8.42$$

$$m = +7.2$$

$$dT = -9.14$$

$$ddT = -5.0$$

log a' $A' \log \beta$ $\lambda' \log \gamma$ log tang z log r r z $\phi - z = \delta (0)$ $\delta (C)$ $\delta (C - 0)$

Date *July 23 1873* Observer *N. R.*

n

Recorder

Barom. =

Att. Therm. =

Ex. Therm. =

log B =

log T =

log β =log γ Star. *Soph. ceph. & 2 hrs min*

T_s	16 07 48.2	16 07 46.3	16 57 54.8
T_m	50.2	48.3	4.3
T_e	52.2	50.7	22.1
T_r	54.3	52.5	3.74
T_g	56.3	54.6	5.2.0
T_h	52.74	50.42	22.12
Sum	51.22	52.40	22.07
Mean	43.21	41.28	9.32
Red. to T_m	+9.01	9.12	+12.68
Sum = s			
$\frac{1}{2}(T_m - T_s)$			
T			
RA			
RA - T			
- n tang δ			
$\Delta T + m$			

$$\begin{aligned}
 0 &= +8.91 - 0.6 + 0.3 & 9.04 \\
 &+ 9.12 + 1.7 - 0.9 & 9.03 \\
 && \underline{8.98} \\
 && 9.04 \\
 0 &= +9.01 + 0.5 \\
 0 &= +12.68 + 1.32 \\
 0 &= +3.67 + 1.27 \\
 n &= -50
 \end{aligned}$$

$$\begin{aligned}
 dT + m &= -8.98 \\
 m &= +72 \\
 dT &= 9.76 \\
 ddt &= -62
 \end{aligned}$$

*July 24 1873**Soph. ceph. 2 hrs min*

$T_m - T_s$	16 7 48.8	16 57 47.0	16 58 52.2
A	50.8	49.2	4.6
C	52.8	51.2	22.6
Sum	54.9	52.3	37.2
Mean	57.0	55.4	53.4
Red. for runs	52.86	51.22	22.60
Red. to hor. wire	52.84	51.20	22.49
Red. to meridian	43.21	41.28	9.20
Division error	9.63	9.92	13.29
Sum			
Pointer			
App. z			
log a'			
A' log β			
A' log γ			
log tang z			
log r			
r			
z			
$\phi - z = \delta(O)$			
$\delta(O)$			
$\delta(O - O)$			

$$\begin{aligned}
 0 &= +9.63 - 0.6 + 0.3 & 9.66 \\
 &+ 9.92 + 1.7 - 0.8 & 84
 \end{aligned}$$

$$\begin{aligned}
 0 &= +9.78 + 0.5 \\
 0 &= +13.29 + 1.32 \\
 0 &= +3.51 + 1.29 \\
 n &= +48
 \end{aligned}$$

$$\begin{aligned}
 dT + m &= -9.66 \\
 m &= +72 \\
 dT &= -10.38 \\
 ddt &= -62
 \end{aligned}$$

Date

July 26 1873

Observer

W. A. R.

Barom. =

Att. Therm. =

Ex. Therm. =

log B =

log T =

log β =log γ

n

Recorder

Star.

3 Mercuri elus. Min. & Mercuri P. Dives

T_s	16 07	44.16	57	54.0	17 8	05	17 27	41.4	0 = +11.87 + 1 - 40	11.417
T_m		43.6		8.8		2.7		44.5	0 = +11.62 + 26 - 13	11.397
T_o		46.2		24.0		4.9		48.1	0 = +12.16 + 1.30 - 66	11.50
T_f		48.8		39.3		7.0		51.6	0 = +11.66 + .53	
T_g		51.5		17.6		9.2		54.8	0 = +11.03 + 7.32	
T_h		46.22		24.14		4.86		48.14	0 = +33.7 + 6.79	
Sum		46.2		24.03		4.64		46.12	$n = -4.9$	
Mean		34.38		9.00		53.32		35.76		
Red. to T_m		11.87		15.03		11.48		12.16		$dT+m = -11.40$
Sum = s						11.52				$m = -42$
$\frac{1}{s}(T_m - T_s)$										$dT = -12.12$
T										$ddT = -8.7$
RA										
RA - T										
- n tang δ										
$\Delta T + m$										

July 26 1873 W. A. R.

Seph. 222200

$T_m - T_s$	16 7	54.16	22	26.7				0 = +15.77 .06 + 04 + 15.81	
A		56.8		31.0				0 = +16.92 + 1.86	
C		59.0		35.6				0 = +1.15 + 1.92	
Sum		10		39.7				$m = -60$	
Mean		31		44.0					
Red. for runs		58.92		38.40				$dT+m = +15.81$	
Red. to hor. wire		58.90		35.37				$m = +42$	
Red. to meridian		43.13		18.45				$dT = -16.13$	
Division error		10.77		16.92				$ddT = -1.10$	
Sum									
Pointer									
App. z									
log a'									
A' log β									
λ log γ									
log tang z									
log r									
r									
z									
$\phi - z = \delta(O)$									
$\delta(C)$									
$\delta(C - O)$									

Date

July 31

Observer

WSE

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ Star. *h Draco*

T_{δ}	16 22 22.3
T_m	29.7
T_e	31.8
T_f	33.9
T_g	36.1
T_h	38.2
Sum	406
Mean	41.8
Red. to T_m	44.9
Sum = s	361.6
$\frac{1}{s}(T_m - T_{\delta})$	36.15
T	114.2
RA	17.73
RA - T	
- n tang δ	
$\Delta T + m$	

 $dT = -173.3$ $T_m - T_{\delta}$

Aug 4 1873

A

*h Draco**4 Draco**h Mercaris**h Mercaris*

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a' $A' \log \beta$ $\lambda' \log \gamma$

log tang z

log r

r

z

 $\phi - z = \delta(0)$ $\delta(C)$ $\delta(C - O)$

16 22 29.0

16 28 24.8

16 38 48.2

17 8 7.7

33.6

30.7

50.8

9.8

37.0

36.3

53.3

12.0

42.0

42.3

56.0

14.1

46.7

48.0

58.8

16.3

37.82

36.42

53.42

11.88

37.80

36.30

53.40

11.96

18.26

16.45

34.21

53.24

19.54

19.91

19.19

18.92

 $0 = +19.54 + 1.16 - 87$

18.67

 $+19.19 + 8.1 - 38$

.81

 $+18.72 + 2.6 - 12$

.60

20.8

18.69

 $0 = 18.95 + 5.3$ $0 = +19.91 + 2.60$ $0 = +.96 + 2.07$ $n = -4.7$ $dT + m = -176.9$ $m = +.72$ $dT = -194.1$ $ddT = -5.8$

Date Aug 5 1883

Observer

W. R.

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

Star.

P. Draconis w. Mercurii

T_s	17 27 48.4	17 41 41.8
T_m	52.0	44.1
T_e	55.3	50.5
T_f	58.7	52.8
T_g	2.1	55.0
T_h	55.30	50.44
Sum	58.28	50.42
Mean	35.79	31.22
Red. to T_m	19.49	19.20
Sum = s		
$\frac{1}{2}(T_m - T_e)$		
T		
RA		
RA - T		
- n tang δ		
$\Delta T + m$		

$$\begin{aligned}
 m &= -46 \\
 0 &= +19.49 + 130 - 60 & 18.89 \\
 &+ 19.20 + 53 - 24 & 18.96
 \end{aligned}$$

$$dT + m = 18.92$$

$$m = +72$$

$$dT = 19.64$$

$$ddT = -23$$

Aug 6 1883 W. R.

P. Draconis w. Mercurii

$T_m - T_s$	17 27 48.4	17 41 46.1
A	55.7	48.4
C	52.3	50.7
Sum	59.0	53.1
Mean	2.6	53.4
Red. for runs	55.72	50.74
Red. to hor. wire	55.70	50.72
Red. to meridian	35.71	31.21
Division error	19.99	19.54
Sum		
Pointer		
App. z		
log a'		
A' log β		
λ log γ		
log tang z		
log r		
r		
z		
$\phi - z = \delta(O)$		
$\delta(C)$		
$\delta(C - O)$		

$$\begin{aligned}
 m &= 46 \\
 0 &= +19.99 + 130 - 60 & 19.39 \\
 &+ 19.51 + 53 - 24 & .27
 \end{aligned}$$

$$dT + m = 19.33$$

$$m = +72$$

$$dT = 20.05$$

$$dTd = +4.1$$

Date

Aug 9 1873

Observer

W. R.

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Star. *n* *Herculis* & *Lyrac*

T_s	16.38	49.6	1831.558
T_m	52.3	58.5	
T_e	55.1	13	
T_f	0.4	39	
T_g	54.7	6.5	
T_h	55.02	1.20	
Sum	55.00	1.18	
Mean	34.14	40.36	
Red. to T_m	20.89	20.82	
Sum = s			
$\frac{1}{2}(T_m - T_s)$			
T			
RA			
RA - T			
- n tang δ			
$\Delta T + m$			

Aug 10 1873

n *Herculis*

$T_m - T_s$	17.2	10.0
A	12.1	
C	14.2	
Sum	16.4	
Mean	18.5	
Red. for runs	14.24	
Red. to hor. wire	14.22	
Red. to meridian	38.69	
Division error	2.05	
Sum		
Pointer		
App. z		
log a'		
$A' \log \beta$		
$\lambda' \log \gamma$		
log tang z		
log r		
r		
z		
$\phi - z = \delta(O)$		
$\delta(C)$		
$\delta(C - O)$		

$n = -50$
 $u = +20.89 + 0.1 - 40$ 20.49
 $+20.82 + .80 - 40$ 20.22

 $\Delta T + m = -20.45$ $m = +72$ $\Delta T = -21.47$ $\Delta \Delta T = -3f$ $u = +21.057, 26 - 13 = 20.72$ $\Delta T + m = 20.72$ $m = +72$ $\Delta T = -21.64$ $\Delta \Delta T = .45$

Date

Aug. 11 1873

Observer

W. R.

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Star.

5 Mus. Min. & Mercurii

 T_{δ}

16 59 86.58 17 09 104

 T_m

236.312 126

 T_e

391.466 147

 T_f

18 168

 T_g

3116 190

 T_h

31 14.70

Sum

31.05 14.68

Mean

6.53 53.15

Red. to T_m

245.2 2153

Sum = s

 $\frac{1}{2} (T_m - T_e)$

T

RA

RA - T

- n tang δ $\Delta T + m$

Aug 12 1873

5 Mus. Min. & Mercurii

 $T_m - T_{\delta}$

16 59 160 17 51 0.9

A

24.1 12.8

C

31.3 130

Sum

392 172

Mean

472 193

Red. for runs

599

Red. to hor. wire

3156 15.00

Red. to meridian

31.45 14.98

Division error

62.2 53.14

Sum

2523 2185

Pointer

App. z

log a'

A' log β λ log γ

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

$$0 = +21.53 + 26 - 11 + 21.42$$

$$0 = +24.52 + 7.32$$

$$0 = -2.99 - 7.06$$

$$n = 42$$

$$\Delta T + m = -21.42$$

$$m = + 72$$

$$\Delta T = -22.14$$

$$ddT = -50$$

$$0 = +21.85 + 26 - 12 + 21.73$$

$$0 = +25.23 + 7.32$$

$$0 = +33.8 + 7.06$$

$$n = 48$$

$$\Delta T + m = -21.73$$

$$m = + 72$$

$$\Delta T = -22.45$$

$$ddT = -31$$

Date *28 Aug 16*Observer *J. F. m.*

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Star.

 T_{δ} T_m T_e T_f T_g T_h

Sum

Mean

Red. to T_m

Sum = s

 $\frac{1}{6}(T_m - T_e)$

T

RA

RA - T

- n tang δ $\Delta T + m$

$$\Delta T = +22.51$$

 $T_m - T_{\delta}$

A

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a' $A' \log \beta$ $\lambda' \log \gamma$

log tang z

log r

r

z

 $\phi - z = \delta(O)$ $\delta(C)$ $\delta(C - O)$

Aug 28 1873 N. H. R.
Plus Min. 51 Cephe. a Lyrae, J. Aquila

$T_m - T_{\delta}$	18.13	19.6	18.18	39.44	18.33	23	19.19	30.8
A	36.0		40	12.1		4.9		30.0
C	33.2		40	33.7		7.6		37.1
Sum	11.8		40	54.6		10.1		37.1
Mean	28.4		41	14.4		12.8		38.2
Red. for runs	54.20			33.84		7.54		35.04
Red. to hor. wire	-23			.33				
Red. to meridian	53.97			34.17		7.52		35.02
Division error	20.17			12.43		40.04		7.82
Sum	+33.80			21.74		27.48		27.20

$$0 = +27.48 + 50 - 76 \quad 27.22$$

$$+27.20 + 0.5 - 0.2 \quad 27.18$$

$$0 = 27.34 + 42$$

$$0 = +33.80 + 16.88 \quad n = 39$$

$$+21.74 - 20.66 \quad 27$$

$$n = -.33$$

$$\Delta T + m = 27.20$$

$$m = +44 + 30$$

$$m = +.74$$

$$\Delta T = -27.54$$

$$\Delta \Delta T = -.44$$

Date

Sept. 1 1872

Observer

W. H. R.

Barom. =

Att. Therm. =

Ex. Therm. =

log B =

log T =

log β =log γ

n

Recorder

Star.

Sagittae, a Sagittae Mus. Min

T_0	19 18 32.6	19 44 22	49 26.2	
T_m	34.7	42	50 28.7	$0 = +28.96 + 0.5 + 0.2 + 28.94$
T_e	36.8	63	51 26.1	$+ 28.96 + 1.5 - 6 28.90$
T_f	38.8	84	52 19.6	
T_g	40.9	106	53 15.9	$0 = +57.33 + 53.30$
T_h	36.76	6.36	25.38	$0 = +28.96 + 1.0$
Sum	36.74	6.34	51 24.60	$0 = +22.37 + 53.20$
Mean	7.28	37.38	33.27	$n = -42$
Red. to T_m	28.96	28.96	51.33	

Sum = s

 $\frac{1}{2} (T_m - T_0)$

T

RA

RA - T

- n tang δ $\Delta T + m$

Sept. 1 1872 Comp. stars Feb 1891

$\log \sqrt{s} = .53$	20 42 46.2	42 55.6	20 44 15.6	44 25.0	20 58 20.8	58 30.5	20 58 49.2	21 00 58.3	17.7
$T_m - T_0$	48.6	57.9	179	27.2	234	33.0	48.4	73.1	20.0
A	51.0	0.3	20.1	29.6	26.0	35.0	48.4	4.5	22.6
C	9.6	2.6	33.7	32.0	44.2	37.1	20 58 58.8	31.6	25.0
Sum	11.9	5.0	41.1	34.2	46.3	39.7	2.1	34.2	27.3
Mean	14.2		43.3		48.8		4.5	36.5	
Red. for runs	0.25	0.28	29.45	29.60	34.92	35.06	2.13	22.39	20.52
Red. to hor. wire	0.23	0.26	29.43	29.58	34.90	35.04	13.53	22.37	22.40
Red. to meridian	20 43 0.25		20 44 29.50		20 58 34.97		21 00 13.51	21 0 22.43	
Division error	-28.84		-28.94		-28.84		-28.94	-28.94	
Sum	20 42 31.31		44 0.56		20 58 60.3		20 59 44.87	59 58.49	
Pointer	+ .21		+ .21		+ .21		+ .21	+ .21	
App. z	42 31.52		44 0.77		58 6.24		59 40.08	59 58.70	
	-2.58		-2.58		-3.03		-3.03	-3.03	
	42 28.54		43 58.55		58 03.21		59 42.05	59 50.67	
log a'									
A' log β	9 32 2.55		log 9 1.0362		1.0362		1.0362		
λ log γ	9 31 0.45		2. (6+a) 8.5058		9.12519		9.9991		
log tang z	9 31 0.45		log 9 2.7220		9.7220		9.7220		
log r	9 31 0.45		9 1 9.5600		9.5600		9.5600		
r	9 31 0.45		9 1 9.5600		9.5600		9.5600		
z	9 31 0.45		9 1 9.5600		9.5600		9.5600		
$\phi - z = \delta (0)$	9 31 0.45		9 1 9.5600		9.5600		9.5600		
$\delta (0)$	9 31 0.45		9 1 9.5600		9.5600		9.5600		
$\delta (0 - 0)$	9 31 0.45		9 1 9.5600		9.5600		9.5600		

Date

Sept. 3 1873

Observer

N. R.

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Star.

S. M. M. & L. gal.

 T_s

18 12 46.1 1838 6.0

 T_m

13 24.9 86

 T_e

13 56.3 113

 T_f

14 30.4 139

 T_g

15 58 166

 T_h

13 56.18 11.28

Sum

13 35.85 11.26

Mean

17.62 39.91

Red. to T_m

3823 31.35

Sum = s

 $\frac{1}{s} (T_m - T_s)$

T

RA

RA - T

- n tang δ $\Delta T + m$

$$0 = +31.35 + 0 - 34 + 31.01$$

$$0 = +31.23 + 1.88$$

$$0 = -6.88 - 16.08$$

$$n = -43$$

$$\Delta T_m = -31.01$$

$$m = -72$$

$$\Delta T = -31.73$$

 $T_m - T_s$

Sept. 9 morning N. R.

A

5 14 44.5 528 14.8

C

46.9 16.8

Sum

98.2 18.8

Mean

576 20.9

Red. for runs

50.9 23.0

Red. to hor. wire

5 17 49.22 1886

Red. to meridian

49.20 1889

Division error

7.43 17.40

Sum

41.77 41.44

Pointer

App. z

log a'

A' log β λ' log γ

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

$$n = 43$$

$$0 = +41.77 + 55 - 20 + 31.53$$

$$+ 91.44 - 02 + 01 + 31.45$$

$$\Delta T_m = 31.49$$

$$m = +52$$

$$\Delta T = -32.21$$

$$\Delta T = -84$$

Set S. L. back sheet - 80⁰ and
took 20 shots.

Date *Sept. 6 1873*Observer *N. R.*

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

win M. b.

Star.

 γ Draconis Mus. Min. γ Draconis

T_s	<i>17 53 34.0</i>	<i>18 12 13.4</i>	<i>17 44 9.8</i>	<i>0.8</i>
T_m	<i>38.3</i>	<i>49.5</i>	<i>7.8</i>	<i>7.8</i>
T_e	<i>41.6</i>	<i>25.0</i>	<i>13.2</i>	<i>14.2</i>
T_f	<i>44.9</i>	<i>6.7</i>	<i>19.8</i>	<i>20.9</i>
T_g	<i>48.3</i>	<i>34.2</i>	<i>26.7</i>	<i>27.7</i>
T_h	<i>41.42</i>	<i>24.56</i>	<i>14.28</i>	
Sum	<i>41.40</i>	<i>24.31</i>	<i>14.22</i>	
Mean	<i>40.75</i>	<i>16.62</i>	<i>12.59</i>	
Red. to T_m	<i>+ 6.65</i>	<i>+ 7.89</i>	<i>+ 1.63</i>	
Sum = s				
$\frac{1}{s} (T_m - T_s)$				
T				
RA				
RA - T				
- n tang δ				
$\Delta T + m$				

$$0 = +6.5 + 1.26 - 1.3 + 0.2$$

$$+ 1.63 + 3.11$$

$$+ 7.89 + 16.88$$

$$u = +47 - 53 = -5.0$$

$$dT + m = -0.2$$

$$m = +7.2$$

$$dT = -7.4$$

Sept 6 win R. P.

	<i>C.W.</i>	<i>Mus. Min</i>	<i>x Lyne</i>	<i>o Sagitt</i>	<i>Solguil.</i>	<i>de Sagittari</i>	<i>S. C.W.</i>	<i>C.W.</i>	<i>C.W.</i>	<i>C.W.</i>	<i>C.W.</i>
$T_m - T_s$	18 11 22.6	16 32 32.0	32.2	15 59 36.6	19 10 8.4	19 12 13.8	19 15 12.0	19 17 57.8	16 24.6	19 20	
A	12 23.4	35.7	36.8	34.2	12.3	25.1	23.7	49.9	36.5	13	
C	13 22.5	38.0	41.1	37.9	16.0	34.2	35.6	2.2	48.8	2	
Sum	14 24.4	41.1	45.9	41.7	20.0	43.6	47.8	14.6	0.7	3	
Mean	15 22.0	40.3		45.3	23.8	53.0	60.2	26.0	13.4	5	
Red. for runs	13 22.88	41.26		37.94	16.10	34.34	35.86	2.10	48.80	25	
Red. to hor. wire	13 22.70	41.24		37.92	16.08	34.29	35.80	2.04	48.74	25	
Red. to meridian	13 16.42	39.84		36.22	14.58	32.79	26.39	0.69		26	
Division error	+ 6.28	+ 1.90		1.70	+ 1.53	+ 1.50	2.72	1.35		27	
Sum		21 = +30	0 = 33							-1	
Pointer	0 = +1.48	+ 80 + 1.28	+ 24 - 4.3	- 19	+ 1.21						
App. z	+ 1.70	+ 24 + 1.03	+ 7 - 3.4	- 27	(.43)						
	+ 1.53	- 35 + 1.06	- 11 - 3.6	- 47	.06						
log a'	0 = +1.54	+ 23 + 1.12			+ 1.13						
A' log β											
$\lambda' \log \gamma$	0 = +1.50	+ 2.40 + 2.60									
log tang z	+ 1.35	+ 3.29 + 5.42									
log r	0 = -0.4	+ 2.17 + 1.48									
r	0 = -1.9	+ 3.06 + 2.30									
z	0 = -0.2	+ 7 + .68									
$\phi - z = \delta (O)$	0 = -0.6	+ 7 + .77									
$\delta (C)$											
$\delta (C - O)$											

Date *Sept. 6 1873*Observer *N. R. P.*

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

*W. R. P.*Star. *α Aquilae & Aquilae edraeo. & Ceph. edraeph. & Cygni 1776479*

T_s	<i>18 40.89</i>	<i>19 44 30.8</i>	<i>19 48 16.4</i>	<i>20 12 31.8</i>	<i>20 27 4.8</i>	<i>36 58.8</i>	<i>20 52 36.6</i>
T_m	<i>12.6</i>	<i>34.4</i>	<i>26.8</i>	<i>58.5</i>	<i>8.3</i>	<i>3.7</i>	<i>52 54.4</i>
T_e	<i>16.1</i>	<i>38.0</i>	<i>37.3</i>	<i>8.0</i>	<i>11.9</i>	<i>8.6</i>	<i>53 19.0</i>
T_f	<i>19.7</i>	<i>41.6</i>	<i>47.2</i>	<i>24.1</i>	<i>15.4</i>	<i>13.8</i>	<i>53 39.7</i>
T_g	<i>23.1</i>	<i>45.1</i>	<i>57.8</i>	<i>40.9</i>	<i>18.8</i>	<i>18.6</i>	<i>54 0.0</i>
T_h	<i>16.08</i>	<i>37.98</i>	<i>37.10</i>	<i>8.06</i>	<i>11.84</i>	<i>8.70</i>	<i>18.54</i>
Sum	<i>1606</i>	<i>37.96</i>	<i>37.05</i>	<i>8.00</i>	<i>11.82</i>	<i>8.68</i>	<i>18.46</i>
Mean	<i>19.40</i>	<i>37.33</i>	<i>37.408</i>	<i>9.86</i>	<i>10.96</i>	<i>8.25</i>	<i>20.17</i>
Red. to T_m	<i>+0.66</i>	<i>+0.63</i>	<i>-0.43</i>	<i>-1.86</i>	<i>+0.87</i>	<i>+0.44</i>	<i>-1.91</i>
Sum = s							
$\frac{1}{2}(T_m - T_s)$							
T		<i>n = +30</i>	<i>C = +33</i>				
RA		<i>0 = +66 + 18 + 10.2 + 0.5 + 34 + 39 + 10.5</i>	<i>0 = -12.8 + 32.8 + 30.2 + 8.8 + 1.19</i>	<i>2.13 + 0.85</i>			
RA - T		<i>+ 63 + 15 + 10.1 + 0.5 + 34 + 39 + 10.2</i>	<i>- 4.3 + 2.73 + 2.91 + 8.2 + 1.97</i>	<i>11.79 + 1.36</i>			
-n tang δ		<i>+ 8.9 + 1.9 + 1.02 + 0.6 + 34 + 40 + 12.7</i>	<i>- 1.86 + 18.44 + 9.15 + 13.34</i>	<i>15.2 + 2.85 + 0.95</i>			
$\Delta T + m$		<i>+ 44 + 1.00 + 1.41 + 30 - 4.7 + 7.7 + 1.21</i>	<i>- 1.71 + 5.70 + 5.82 + 17.2 + 1.94</i>	<i>13.66 + 1.95</i>			

CE

$$0 = +0.65 + 38 + 1.12$$

<i>1920.15</i>	$T_m - T_s$
<i>138</i>	A
<i>25.9</i>	C
<i>37.9</i>	Sum
<i>50.2</i>	Mean
<i>25.86</i>	Red. for runs
<i>23.80</i>	Red. to hor. wire
<i>26.39</i>	Red. to meridian
<i>59.41</i>	Division error
<i>+ 0.66</i>	
<i>- 1.28</i>	

Sum

Pointer

App. z

log a'

A' log β A' log γ

log tang z

log r

r

z

 $\phi - z = \delta(O)$ $\delta(C)$ $\delta(C - O)$

$$0 = -19.3 + 2.91 + 2.30 + 8.7 + 1.69 + 0.29$$

$$-1.09 + 2.35 + 1.79 + 0.66 + 1.36$$

$$-2.51 + 4.06 + 3.43 + 1.22 + 1.14 + 1.36$$

$$-2.36 + 5.33 + 4.70 + 1.61 + 1.57 + 3.18$$

$$-2.46$$

$$0 = -66 + n + 78$$

$$-47 + n + 76$$

$$-62 + n + 86$$

$$-45 + n + 88$$

$$0 = -55 + n + 77$$

$$0 = -06 + n - 77$$

$$0 = -61 + 2n$$

$$n = +30$$

$$0 = -55 + 30 + 77$$

$$0 = +33 \text{ for } C.E.$$

$$dT_m = -1.13 \text{ C. N.}$$

$$dT_m = -1.14 \text{ C. E.}$$

$$\text{Mean } dT_m = -1.14$$

$$m = -11$$

$$dT = -1.03$$

*Levels**+ 8.7 div**+ 1.00**+ 1.65**+ 1.04**+ 8.5**3.64**.91**1.3**2.73**1.18*

$$m = 16 - 27 = -11$$

Date *Sept. 8 1873*

Observer

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Star.

*3 bygni & borphi**Altum = -45*

T_s	<i>21.2</i>	<i>30.4</i>	<i>21.15</i>	<i>27.8</i>
T_m		<i>31.6</i>		<i>30.0</i>
T_e		<i>32.8</i>		<i>32.2</i>
T_f		<i>34.0</i>		<i>34.7</i>
T_g		<i>35.2</i>		<i>36.8</i>
T_h		<i>36.6</i>		<i>37.8</i>
Sum		<i>37.8</i>		<i>41.0</i>
Mean		<i>37.0</i>		<i>40.2</i>
Red. to T_m		<i>40.2</i>		<i>40.6</i>
Sum = s		<i>35.27</i>		<i>36.71</i>
$\frac{1}{2}(T_m - T_s)$		<i>35.27</i>		<i>36.64</i>
T		<i>34.10</i>		<i>35.20</i>
RA		<i>-1.13</i>		<i>+1.48</i>
RA - T				
- n tang δ				
$\Delta T + m$				

$$\begin{aligned}
 v &= +1.15 + .57 = 26 + .89 \\
 v &= +1.48 + 1.89 \\
 v &= .33 \quad 1.32
 \end{aligned}$$

$$\begin{aligned}
 dT + m &= .89 \\
 m &= .72 \\
 dT &= -1.61
 \end{aligned}$$

*Sept 9 1873 Mini M. C.**2 Draconis & Mercurii*

$T_m - T_s$	<i>15.3</i>	<i>35.2</i>	<i>17.40</i>	<i>27.0</i>
A		<i>38.3</i>		<i>29.2</i>
C		<i>41.7</i>		<i>31.6</i>
Sum		<i>45.0</i>		<i>33.8</i>
Mean		<i>41.4</i>		<i>36.1</i>
Red. for runs		<i>41.22</i>		<i>31.56</i>
Red. to hor. wire		<i>41.70</i>		<i>31.52</i>
Red. to meridian		<i>40.65</i>		<i>30.61</i>
Division error		<i>1.05</i>		<i>.93</i>
Sum				
Pointer				
App. z				
log a'				
A' log β				
λ log γ				
log tang z				
log r				
r				
z				
$\phi - z = \delta(O)$				
$\delta(C)$				
$\delta(C - O)$				

$$\begin{aligned}
 m &= -40 \\
 v &= +1.05 + 1.26 = 50 + 5.55 + 7.0 \\
 &+ 0.93 + 5.3 = 24 + 1.72 + 7.2
 \end{aligned}$$

$$\begin{aligned}
 dT + m &= +7.2 \\
 m &= +7.2 \\
 dT &= -1.44 \\
 ddT &= -2.0
 \end{aligned}$$

Date *Sept 9 with R.T.* Observer *N.H.*

Barom. =

log B =

Att. Therm. =

log T =

log γ

Ex. Therm. =

log β =

n

Recorder

Star. *C.N.* *b = -0.4* *-0.7*
Min Lyrae. γ Aquilae δ Sagittarii Draconis, γ Draconis, C.W. C.E.

T_s		18 82 32.6	18 59 30.7	19 10 8.7	19 12 16.6	19 17 12.2	19 16 25.3	17 35.5
T_m		37.0	34.4	12.6	25.4	24.7	20.2	59.7
T_e		41.6	37.8	16.1	34.6	36.7	2.1	12.2
T_f		46.2	41.6	20.0	44.0	45.5	19.3	24.2
T_g		50.7	45.0	23.6	53.4	0.7	37.8	55.6
T_h	<i>T</i>	41.62	37.84	16.20	34.80	15 36.56	16 49.94	58.66
Sum	<i>T - x</i>	41.60	37.82	16.18	29.75	26.56	49.88	58.50
Mean	<i>R.H.</i>	39.77	36.17	14.51	32.64	0.46	3.08	0.47
Red. to T_m	<i>T - R.H.</i>	+1.83	+1.65	+1.67	+2.11	2.89	2.67	-0.63
Sum = s								
$\frac{1}{2}(T_m - T_s)$		19 15 36.50	19 16 48.88					
T		19 19 12.88	19 12 98					
RA		4 49.53	2 23.10					
RA - T		2.46169	2.15564					
- n tang δ		4.46303	2.46303					
ΔT + m		1.52372	1.61667					

$T_m - T_s$		18 490 20.18	19 40 8.0	19 44 31.0	19 48 16.4	20 10 56.7	20 12 30.6	20 19 59.4	20 27 4.9	20 25.2.0
A		08 191	12.8	34.6	27.2	0.2	53.3	3.0	8.5	13.5 31 339
C		130 261	16.4	38.8	37.7	3.8	9.4	6.8	12.0	25.3 47.2
Sum		257 384	19.9	41.8	47.6	7.6	36.2	10.6	15.7	36.8 58.2
Mean		37.2 20.1	23.4	45.3	58.2	11.1	41.8	14.2	19.1	48.3 11.0
Red. for runs		13.04 26.09	16.28	38.20	37.42	3.88	9.66	6.84	12.04	
Red. to hor. wire		12.98 26.03	16.26	38.18	37.38	3.86	9.59	6.82	12.02	
Red. to meridian		13.20 26.37	15.37	37.30	37.33	2.90	9.72	5.63	10.92	
Division error		59.78 37.66	0.47	0.47	0.47	0.47	0.47	0.47	0.47	
Sum		-6.8 -0.81	+0.89	+1.88	+1.05	+1.96	-1.13	+1.19	+1.10	
Pointer										
App. z										
log a'										
A' log β										
N' log γ										
log tang z										
log r										
r										
z										
φ - z = δ (O)										
δ (C)										
δ (C - O)										

Date *Sept. 30 1873*Observer *W. R.*

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

*C. W.**with R. P.*

Star.

Aquila. w. Aquila. & Dracon. 3 Mus. Maja Cupricari. K'ephi & Drapini Gr. 3241

T_s	19 40	15.8	19 44	35.1	19 48	25.7	19 59	57.9	20 11	3.4	20 12	47.0	20 27	11.6	20 30	21.3
T_m		19.6		41.5		35.6		7.7		6.9		2.9		15.2		32.1
T_e		23.2		45.0		46.0		17.0		10.5		18.8		18.8		44.1
T_f		26.7		48.6		51.3		26.8		14.0		35.6		22.4		58.7
T_g		30.3		52.3		6.1		36.4		18.0		57.6		26.0		7.6
T_h		23.14		45.10		45.90		17.16		10.68		18.18		18.10		44.08
Sum		23.12		45.08		45.85		17.21		10.66		18.11		18.88		44.03
Mean		18.08		37.00		36.07		59.12		2.65		78.81		10.67		33.32
Red. to T_m		+ 8.07		+ 8.08		+ 9.78		+ 4.28		+ 8.01		+ 10.30		+ 8.11		+ 10.71
Sum = s																
$\frac{1}{2}(T_m - T_s)$																
T																
RA																
RA - T																
- n tang δ																
$\Delta T + m$																

*C. W.**abysmi n K'ephi J. 9. 6. 1873*

$T_m - T_s$	20 37 6.3	20 42 35.4	20 48 42.0	50 45.6	20 48 2.266	20 51 26.15
A	11.4	45.6	2.5	4.8	57 32.78	55 29.02
C	16.4	53.1	22.4	25.8	8 10.12	4 2.84
Sum	21.2	0.1	42.3	47.5	490.12	2 42.84
Mean	26.2	7.5	4.1	7.2	2. 690.30	2. 385.3 2
Red. for runs	16.30	52.94	22.66	26.18	9. 236.79	9. 236.79
Red. to hor. wire	16.29	52.90	22.58	26.05	1. 8270.9	1. 622.11
Red. to meridian	7.78	17.70	17.96	17.90	84.54	41.39
Division error	+ 8.48		1.13	1.41	85.03	42.52
Sum			11.27		99	
Pointer						
App. z						
log a'						
A' log β						
$\lambda' \log \gamma$						
log tang z						
log r						
r						
z						
$\phi - z = \delta(O)$						
$\delta(C)$						
$\delta(C - O)$						

$n = -36$	$C = -25$
-----------	-----------

$0 = +8.07 + 18 + 102 - 07 - 29 - 36 + 7.71$	$0 = +9.78 + 273 + 1.91$
$+8.08 + 15 + 1.01 + 06 - 28 - 34 7.74$	$+4.29 - 2.59 - 2.78$
$+8.01 - 23 + 102 + 09 - 29 - 20 7.81$	$+10.30 + 9.44 + 4.55$
$+8.11 + 19 + 102 - 07 - 29 - 36 7.75$	$+10.71 + 3.10 + 3.20$
$+8.49 + 10 + 1.41 - 38 - 39 - 74 7.78$	$+11.27 + 5.73 + 5.82$
$0 = +8.15 + 26 + 1.10$	$0 = +16.3 + 2.47 + 1.81$
	$+3.20 + 2.55 + 3.88$
	$+2.15 + 4.18 + 3.45$
	$+2.06 + 2.84 + 2.15$
	$+3.12 + 1.47 + 4.72$

Date *Sept. 30 1873*Observer *W. & R.*

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

*k.E. with R.P.*Star. *74609 24* *Orion Maj & bygnia alaphi 1 Dracon. 29 Orion Maj B. Lep. B.*

T_s	20 53.4	154 4.1	56 51.8	20 59.2	21 7 33.2	21 15 34.4	21 11 5.8	21 29 37	21 25 47
T_m	48	86	113	111	372	421	311	140	140
T_e	266	288	325	210	413	495	560	298	82
T_f	464	493	537	301	453	568	214	356	116
T_g		10.3	146	39.8	493		160	462	290
T_h	2607	2902	3278	2082	4126	4194	5606	2416	826
Sum	25.97	28.82	32.68	20.88	41.24	41.91	56.88	24.82	
Mean	17.80	17.80	17.80	12.88	33.88	34.52	41.80	13.95	
Red. to T_m	8.07	7.98	8.31	7.98	7.36	7.39	8.44	87	
Sum = s	7.06			7.98	7.36	7.39	8.44	87	
$\frac{1}{2}(T_m - T_s)$									
T									
RA									
RA - T									
- n tang δ									
$\Delta T + m$									

$T_m - T_s$	21 37 597	21 40 130	22 23 518	21 28 528	22 35 107
A	31	232	71	563	140
C	68	339	224	598	178
Sum	103	39.516	368	33	211
Mean	14.0	40 2.0	51.8	6.9	247
Red. for runs	6.78	12.74	21.98	5982	1766
Red. to hor. wire	6.76	1268	2192	5980	1764
Red. to meridian	59.24	5.32	14.02	5241	10.20
Division error	+7.52	+7.36	+7.90	+7.39	+7.44
Sum					
Pointer					
App. z					
log a'					
A' log β					
A' log γ					
log tang z					
log r					
r					
z					
$\phi - z = \delta(0)$					
$\delta(0)$					
$\delta(0 - 0)$					

Date Oct-1 1873

Observer W.R.

Barom. =

log B =

Att. Therm. =

log T =

log γ

n

Recorder

Ex. Therm. =

log β =

C.W.

Wm R. P.

Star.

3 Mus. maj. a. Cap. x Cep. x loop. x Drup. h. 3241 a. leg. ni. e. leg. ni.

T_s	19 59.58	20 11 3.6	20 12 46.5	20 20 6.9	20 27 12.1	20 30 20.9	20 34 6.8
T_m	7.7	7.2	3.1	10.0	15.6	32.0	11.7
T_e	18.2	10.8	18.6	13.9	19.2	43.7	16.7
T_f	27.7	14.7	35.0	17.5	22.9	55.0	21.7
T_g	37.5	18.3	51.4	21.1	26.3	7.0	26.7
T_h	17.58	10.94	18.2	13.78	19.22	43.72	16.72
Sum	18.02	10.92	18.86	13.76	19.20	43.65	16.70
Mean	11.22	2.83	7.72	5.36	10.65	33.25	7.76
Red. to T_m	+6.80	+8.35	+11.14	+8.40	+8.55	+10.40	+8.94
Sum = s							
$\frac{1}{2}(T_m - T_s)$							
T							
RA							
RA - T							
- n tang δ							
$\Delta T + m$							

$$n = -34 \quad c = -33$$

$$0 = +8.89 - 23 + 1.02 + .05 - 34 - 26 + 8.13$$

$$+ 8.40 - 34 + 1.06 + 0.5 - 36 - 28 \quad 8.12$$

$$+ 8.55 + 19 + 1.02 - .06 - 34 - 40 \quad 8.15$$

$$+ 8.94 + 1.00 + 1.41 - .33 - 47 - 80 \quad 8.14$$

$$0 = +8.57 + 1.5 + 1.13$$

$$8.13$$

$T_m - T_s$	20 48 42.0	50 46.0
A	2.6	6.5
C	22.1	25.7
Sum	43.7	46.1
Mean	3.9	7.1
Red. for runs	22.86	26.28
Red. to hor. wire	22.76	26.18
Red. to meridian	4 6.47	2 3.22
Division error	53 29.23	53 29.41
	17.68	17.68
	+11.53	+11.73
Sum	20 49 22.86	20 51 26.28
Pointer	57 32.08	55 28.84
App. z	8 9.22	4 2.66
	2.68 9.50	2.38 5.06
log a'	9.23 6.79	9.23 6.79
	1.9 26.28	1.62 17.9
A' log β	84.39	41.86
λ log γ	85.03	42.52
	.64	.66
log tang z	-32	-33
log r		
r		
z		
$\phi - z = \delta (O)$		
$\delta (C)$		
$\delta (C - O)$		

$$0 = +6.50 - 25.8 - 27.7$$

$$+ 11.14 + 9.44 + 9.55$$

$$+ 10.40 + 3.10 + 3.25$$

$$+ 11.64 + 5.73 + 0.82$$

$$0 = +1.77 + 2.73 + 3.90$$

$$3.57 + 4.29 + 3.42$$

$$1.83 + 2.95 + 2.12$$

$$3.07 + 5.58 + 4.69$$

$$c = -33$$

$$0 = +6.1 + n + 1.8$$

$$+ .83 + n + 1.0$$

$$+ .63 + n + 1.2$$

$$+ .57 + n + 1.4$$

$$0 = +6.1 + n - 4.8 \quad n = -13$$

$$+ .83 + n - 26 \quad - 57$$

$$+ .63 + n - 24 \quad - 39$$

$$+ .57 + n - 28 \quad - 27$$

$$- 34$$

Date Oct 1 1873

Observer N.R.

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ

L.E.

Star. 18761579

Z legyne a lophii 12 Dec. 24 Dec. Maj. Pterph. & Pegan

T_s	20 58 -	54 477	56 504	27 7337	22 15276	21 1863	21 23 03	21 26 504	21 37 597
T_m	—	98	121	378	351	321	111	110	39
T_e	25.0	290	320	420	426	567	214	111	70
T_f	454	494	520	458	500	214	324	212	104
T_g	6.7	98	121	50.0	578	471	434	516	143
T_h	25.00	2894	3208	4186	4261	5672	472	1106	702
Sum		2571	2561	4184	4258	5681	2138	1100	700
Mean		17.68	17.68	33.86	3452	4885	1401	267	5923
Red. to T_m		+7.93	+7.83	+7.98	+8.06	+7.96	+7.97	+8.33	+8.22
Sum = s									
$\frac{1}{2}(T_m - T_s)$									
T									
RA									
RA - T									
- n tang δ									
$\Delta T + m$									

$T_m - T_s$	29	291	153	226	113	571
A	143	330	268	258	180	510
C	291	364	414	298	246	40
Sum	349	400	520	330	313	108
Mean	1384	3282	2770	2606	1800	5790
Red. for runs	1378	3280	2764	2604	1795	5785
Red. to hor. wire	5.27	2991	1950	1413		
Red. to meridian	+8.51	+7.88	+8.14	+7.91		
Division error						
Sum	$n = -38 \quad c = +33$					
Pointer	$0 = +7.98 + 0.7 + 1.15 - 2.2 + 38 + 16 + 8.14$					
App. z	$+7.77 + 1.6 + 1.01 - 0.6 + 34 + 28 + .05$					
log a'	$+7.89 - 2.5 + 1.23 + .09 + 34 + 43 + 32$					
A' log β	$+7.91 - 0.2 + 1.00 + .01 + 33 + 34 + .25$					
$\lambda' \log \gamma$	$+8.19$					
log tang z	$+8.33 + 2.74 + 2.92$					
log r	$+8.51 + 2.15 + 3.25$					
r	$+8.14 + 3.29 + 3.44$					
z	$+2.5 + 3.17 + 2.39$					
$\phi - z = \delta(O)$	$C = +33$					
$\delta(C)$	$0 = -01 + n + 85$					
$\delta(C - O)$	$+10 + n + 61$					

Date Oct 7 1873

Observer N. R.

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Star.

Star.	β Cephei	ϵ	γ Draconis	η Aquarii	226 Persei	β Pegasi	i Cephei
T_s	22 7 5.0	7 44.8	22 23 50.3	22 28 57.3	22 30	22 35 11.7	22 45 15.5
T_m	11.7	57.4	52	08	36	15.2	14.1
T_e	18.6	58.1	21.1	43	14.1	18.8	22.1
T_f	25.0	46	35.8	8.0	30.6	22.4	30.7
T_g	81.8	114	57.0	54.0	40.3	26.0	88.3
T_h	184.2	580.8	20.68	0.88		188.2	22.34
Sum			10.75	0.86		18.10	22.30
Mean			14.08	52.40		10.19	12.47
Red. to T_m			+6.67	+8.46		+8.61	9.79
Sum = s							
$\frac{1}{2}(T_m - T_s)$			$n = .38$	$c = .33$			
T	$0 = +8.96 + 0.1 + 1.00$	$-0.0 - .33 - .33 = .813$	$0 = +6.67 - 4.12 - 4.20$				
RA	$+8.61 + 1.8 + 1.02$	$-.07 - .34 - .41$	$\frac{8.20}{+8.17}$	$+9.79 + 2.19 + 2.41$			
RA - T							
- n tang δ	$0 = +8.53 + 0.9 + 1.01$						
$\Delta T + m$				$0 = +1.86 + 4.21 + 5.23$			
				$0 = +1.26 + 2.10 + 1.40$			
$T_m - T_s$				$0 = .44 + n + 1.24$	$(0 = +4.4 - 4.1)$		
A				$0 = +6.0 + n + .67$	$+6.1 - 2.2$	$n = -.38$	
C							
Sum							
Mean	First Series	-8.14	$-.34$			$b = -.02$	
Red. for runs	Second Series	-8.19	$-.38$			$-.28$	
Red. to hor. wire	Third Series	-8.17	$-.39$			$-.02$	
Red. to meridian						$+.05$	
Division error	$dT + m = -8.17$	$-.37$				$-.25$	
Sum	$m = +31$					$-.30$	
Pointer	$dT = -8.48$					$-.50$	
App. z	$ddT = -.50$					$-.02$	
						$+1.18$	
						$-.12$	
						$b = -.12 \times .13 = -.02$	
						$m = -.02 + .33 = +.31$	
log a'							
A' log β							
λ log γ							
log tang z							
log r							
r							
z							
$\phi - z = \delta(O)$							
$\delta(C)$							
$\delta(C - O)$							

Date *Oct 2 1873* Observer *W. A. R.* Barom. =
 n Recorder *W. A. R.* Att. Therm. =
 Ex. Therm. =
 log B =
 log T =
 log β =
 log γ

Star. *6 W.*

	<i>Argem.</i>	<i>Argem.</i>	<i>Drac.</i>	<i>a. Cap.</i>	<i>κ Lep.</i>	<i>π Lep.</i>	<i>ε Dra.</i>	<i>α Argem.</i>	<i>79.1279</i>	<i>B</i>
T_s	<i>19 40 16.8</i>	<i>19 44 38.9</i>	<i>19 48 26.2</i>	<i>20 11 4.3</i>	<i>20 12 47.8</i>	<i>20 20 6.7</i>	<i>20 27 13.0</i>	<i>20 37 4.2</i>	<i>20 44 43.5</i>	<i>50 45.3</i>
T_m	<i>20.6</i>	<i>42.3</i>	<i>36.4</i>	<i>7.8</i>	<i>36</i>	<i>10.6</i>	<i>16.4</i>	<i>12.3</i>	<i>3.1</i>	<i>6.0</i>
T_e	<i>24.1</i>	<i>45.9</i>	<i>46.7</i>	<i>11.5</i>	<i>19.7</i>	<i>19.2</i>	<i>19.9</i>	<i>17.5</i>	<i>23.7</i>	<i>26.5</i>
T_f	<i>27.7</i>	<i>49.6</i>	<i>57.3</i>	<i>15.1</i>	<i>36.4</i>	<i>18.0</i>	<i>23.5</i>	<i>22.4</i>	<i>44.1</i>	<i>47.6</i>
T_g	<i>31.1</i>	<i>53.1</i>	<i>7.6</i>	<i>18.8</i>	<i>52.8</i>	<i>21.7</i>	<i>27.1</i>	<i>27.1</i>	<i>4.0</i>	<i>8.1</i>
T_h	<i>24.06</i>	<i>45.96</i>	<i>46.84</i>	<i>11.50</i>	<i>20.06</i>	<i>19.24</i>	<i>19.98</i>	<i>17.30</i>	<i>23.68</i>	<i>26.70</i>
Sum	<i>24.04</i>	<i>45.94</i>	<i>46.79</i>	<i>11.48</i>	<i>20.00</i>	<i>19.22</i>	<i>19.96</i>	<i>17.28</i>	<i>30.15</i>	<i>29.93</i>
Mean	<i>15.02</i>	<i>36.97</i>	<i>35.94</i>	<i>2.62</i>	<i>7.61</i>	<i>5.35</i>	<i>10.64</i>	<i>8.73</i>	<i>30.44</i>	<i>29.74</i>
Red. to T_m	<i>+9.02</i>	<i>+8.97</i>	<i>+10.85</i>	<i>+8.86</i>	<i>+12.39</i>	<i>+8.87</i>	<i>+9.32</i>	<i>+9.55</i>	<i>17.55</i>	<i>+12.38</i>
Sum = s										
$\frac{1}{2}(T_m - T_s)$				<i>0 = -30</i>	<i>n = -45</i>					
T	<i>0 = +9.02</i>	<i>+15.10</i>	<i>+10.2</i>	<i>-0.8</i>	<i>-30</i>	<i>-38</i>	<i>8.64</i>	<i>0 = +10.85</i>	<i>+2.73</i>	<i>+2.91</i>
RA	<i>+8.97</i>	<i>+15.10</i>	<i>+10.1</i>	<i>-0.7</i>	<i>-30</i>	<i>-37</i>	<i>.60</i>	<i>+12.39</i>	<i>+4.44</i>	<i>+4.55</i>
RA - T	<i>+8.86</i>	<i>-23</i>	<i>+1.02</i>	<i>+10</i>	<i>-31</i>	<i>-21</i>	<i>.65</i>	<i>+12.39</i>	<i>+5.73</i>	<i>+5.82</i>
- n tang δ	<i>+8.87</i>	<i>-34</i>	<i>+1.06</i>	<i>+15</i>	<i>-32</i>	<i>-17</i>	<i>.70</i>			
$\Delta T + m$	<i>+9.32</i>	<i>+14.102</i>	<i>-9</i>	<i>-32</i>	<i>-41</i>	<i>.80</i>		<i>n = -30</i>		
$T_m - T_s$	<i>+9.55</i>	<i>+10.1</i>	<i>+4.41</i>	<i>-45</i>	<i>-42</i>	<i>-87</i>	<i>.68</i>	<i>0 = +1.75</i>	<i>+2.57</i>	<i>+1.82</i>
A	<i>0 = +9.10</i>	<i>+16</i>	<i>+1.09</i>					<i>0 = +3.29</i>	<i>+4.28</i>	<i>+3.46</i>
C								<i>0 = +3.29</i>	<i>+5.57</i>	<i>+4.73</i>
Sum								<i>0 = +6.9</i>	<i>+n</i>	<i>+7.1</i>
Mean								<i>+7.7</i>	<i>+n</i>	<i>+8.1</i>
Red. for runs								<i>+6.0</i>	<i>+n</i>	<i>+8.5</i>
Red. to hor. wire										
Red. to meridian								<i>0 = +6.9</i>	<i>+n</i>	<i>-2.1</i>
Division error								<i>+7.7</i>	<i>+n</i>	<i>-2.4</i>
Sum								<i>+6.0</i>	<i>+n</i>	<i>-2.5</i>
Pointer										
App. z								<i>n = -45</i>		
log a'										
A' log β										
$\lambda' \log \gamma$										
log tang z										
log r										
r	<i>b = -0.3</i>									
z	<i>m = -0.4 + 38 = +34</i>									
$\phi - z = \delta(O)$										
$\delta(C)$										
$\delta(C - O)$										

8.63

Date *Oct 5 1873*Observer *M. R.*

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Star. *Antiquae & Musmi (Ceph. abyssini)*

T_s	<i>19 44 42.7</i>	<i>20 13 22.9</i>	<i>20 37 12.0</i>			$n = -23$
T_m	<i>44.8</i>	<i>27.7 13.3</i>	<i>15.0</i>		$0 = +9.95 + 10^-$	$-03 + 9.92$
T_o	<i>46.8 74.5 15.9</i>	<i>32.4 13.2</i>	<i>17.8</i>		$+10.16 + 1.41$	$-32 9.84$
T_f	<i>49.0</i>	<i>37.0 22.9</i>	<i>20.7</i>		$0 = 10.05 + 7.8$	
T_g	<i>51.0</i>	<i>44.0</i>	<i>23.7</i>			
T_h	<i>76.88</i>	<i>15.9</i>	<i>32.80 13.3</i>	<i>17.19</i>	$0 = 22.6 + 53.30$	
Sum	<i>46.86</i>	<i>51 15.3</i>	<i>32.74 13.06</i>	<i>17.52</i>	$10.46 + 4.44$	
Mean	<i>36.91</i>	<i>50 52.7</i>	<i>7.30 7.30</i>	<i>7.66</i>		
Red. to T_m	$+ 9.95$	$+ 22.6$	$25.44 10.76$	10.16	$0 = +11.55 + 51.89$	$n = -22$
Sum = s					$0 = + 71 + 3.03$	-24
$\frac{1}{2} (T_m - T_s)$						-23
T						
RA						$dT + m = 9.88$
RA - T						$m = + 85$
- n tang δ						$dT = -10.73$
$\Delta T + m$						$d\delta = -4.6$

$T_m - T_s$	<i>Oct 8 1873</i>				
A	<i>22 58 36.4</i>	<i>22 45 54.8</i>			
C	<i>38.6</i>	<i>19.7</i>		$0 = +12.00 + 2.6 - .05 + 11.95$	
Sum	<i>40.7</i>	<i>24.8</i>		$+ 12.40 + 21.87 - 7.41$	
Mean	<i>42.8</i>	<i>29.9</i>		$0 = + 40 + 1.83$	
Red. for runs	<i>44.8</i>	<i>34.8</i>		$n = -21$	
Red. to hor. wire	<i>40.66</i>	<i>24.80</i>			
Red. to meridian	<i>40.66</i>	<i>24.75</i>		$dT + m = -11.95$	
Division error	<i>25.64</i>	<i>12.80</i>		$m = + 85$	
Sum	<i>120.0</i>	<i>22.80</i>		$dT = -12.80$	
Pointer				$d\delta = -7.0$	
App. z					

 $n = -21$ log a'A' log β $n = -48$ λ log γ -31 log tang z -25 log r -57 r -49 z -43 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

Date

Oct 9 1873

Observer

W.A.R.

Barom. =

Att. Therm. =

Ex. Therm. =

log B =

log T =

log β =log γ

n

Recorder

Star.

Aquilae

Aquilae & Mars Min.

 T_s

17 40 51.503

19 44 45.1

 T_m

51.528

47.3

 T_e

55.6

49.3 19.51 6.9

 T_f

57.4

 $0 = +12.47 + 0.8 - 0.1 = 12.46$ T_g

53.5

 $+12.40 + 53.30$ T_h

49.32

 $0 = +59.3 + 53.22$

Sum

49.32 19.51 6.9

 $m = -11$

Mean

36.83

47.7

Red. to T_m

12.47

18.4

Sum = s

 $dT + m = -12.46$ $\frac{1}{2}(T_m - T_e)$ $m = -82$

T

 $dT = -13.28$

RA

 $ddT = -4.8$

RA - T

- n tang δ $\Delta T + m$

Oct 13 1873

Aquilae & Mars Min. & Bephei & Bephei

 $T_m - T_s$

19 44 47.0

21 15 40.3

21 27 5.3

 $n = -25$

A

49.1

44.6

11.0

 $0 = 14.44 + 1.5 - 0.2 = 14.40$

C

51.3 19.51 0.7

48.9

17.0

 $14.57 + 1.89 - 4.7 = 14.40$

Sum

53.3

52.4

23.7

Mean

53.4

58.0

29.2

Red. for runs

51.22 57 0.7

49.09

17.14

 $0 = 14.65 + 1.02$

Red. to hor. wire

51.22 50 59.8

49.01

17.08

Red. to meridian

56.76 41.97

39.14

2.01

 $0 = 17.83 + 53.30$

Division error

14.44

17.83

14.87

15.07

 $15.07 + 2.74$

Sum

Pointer

 $0 = 13.18 + 52.28 \quad n = -0.6$

App. z

 $+0.92 + 1.72 = 2.64$ log a' $A' \log \beta$ $\lambda \log \gamma$ log tang z log r r z $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$ $dT + m = -14.40$ $m = -82$ $dT = -15.22$ $ddT = -5.0$

Date

Oct-14

Observer

M.A.R.

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ

Star.

Polaris & Aquarii

T_δ	21 27	21 59 28.8
T_m	14.6	31.0
T_e	17.6	33.0
T_f	20.4	35.0
T_g		37.1
T_h	21 27 17.53	32.98
Sum	21 27 17.57 21 59 32.96	
Mean	1.80	18.01
Red. to T_m	18.67	14.95
Sum = s		
$\frac{1}{2} (T_m - T_e)$		
T		
RA		
RA - T		
- n tang δ		
$\Delta T + m$	Oct	

$$0 = +14.95 - 0.2 \text{ for } +14.95$$

$$0 = +15.67 + 2.74$$

$$0 = +0.82 + 2.74 \text{ } n = 26$$

$$m + dT = -14.95$$

$$m = .82$$

$$dT = -15.77$$

$$dT = -5.5$$

 $T_m - T_\delta$

A

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a'

A' log β λ log γ

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

Date Observer Barom. == log B ==
 n Recorder Att. Therm. == log T ==
 Ex. Therm. == log β == log γ

C. W.

Star. *B Cephei* *11 Cephei* *16 Pegasi* *α Aquarii*
Bass Rogers Bass Rogers Bass Rogers Bass Rogers

T_s	26 59.4		38 56.8	37 52.6	47 08.6	21 46 46	59 06.0	21 58 44.5
T_m	09.3		07.1	02.9		44.5	09.4	48.1
T_a	19.3		18.4	13.6		48.5	12.9	57.7
T_r	30.2		28.7	24.8		52.4	16.3	53.2
T_g	40.3		39.3	35.3	19.9	56.3	19.8	58.6
T_h	27 19.70	26 15.70						
Sum	01.4	29 45.0	40 00.1	42 09.2	27.7	14.6	27.0	09.7
Mean	11.9	34.7	11.5	20.6	31.8	18.5	30.5	12.9
Red. to T_m	21.5	24.5	22.4	30.7	35.6	23.0	{33.8}	16.4
Sum = s	33.1	12.4	33.1	40.7	39.7	26.6	37.7	20.1
$\frac{1}{2}(T_m - T_s)$	28 43.2	03.2	43.5	57.7	43.6	30.3	41.3	23.6
T	28 22.22	29 23.96			35.68			
RA	7 2.15	2 4.31	41 05.4		57.4		48.3	
RA - T	27. 20.07	17.41	15.3		55.0		52.0	
- n tang δ		20.97	26.4		59.4		58.6	
$\Delta T + m$			48.0		03.2		59.0	
					07.0		01.4	

$T_m - T_s$	26 17.73	27 19.65	40 22.15	40 22.21	25.24	35.58	34.12	34.09
A	27 19.83	19.59	22.09	22.15	85.66	85.56	34.10	84.07
C								
Sum								
Mean								
Red. for runs								
Red. to hor. wire								
Red. to meridian								
Division error								
Sum								
Pointer								
App. z								
log a'								
A' log β								
λ log γ								
log tang z								
log r								
r								
z								
$\phi - z = \delta(O)$								
$\delta(C)$								
$\delta(C - O)$								

Date

Observer

Barom. =

log B =

n

Recorder

Att. Therm. =

log T =

log γ

Ex. Therm. =

log β =

Star.

Feb 8, 1905
See H.C. Andrews XVI
to be T₁ *Andrews*

	ϵ Pegasi	π_2 Pegasi	24 Cephei	γ Aquarii
	Bar. Regen	Bar. Regen	Bar. Regen	Bar. Regen
T_δ	53.2	22 ⁰⁰ 43.6	22 ⁵ 05.6	56.2
T_m	57.2	45.6	09.8	59.9
T_o	01.0	57.6	14.0	03.3
T_r	05.0	41.6	18.4	06.6
T_g	09.0	45.2	22.5	10.4
T_h				
Sum	16.7	2 ^m 03.1	5 ^m 30.8	15 ^m 17.6
Mean	20.5	07.2	35.5	21.0
Red. to T_m	24.3	11.2	39.6	24.6
Sum = s	28.3	15.1	43.6	28.1
$\frac{1}{2}(T_m - T_o)$	32.0	19.1	47.7	31.6
T			33.98	33.60
RA	40.0	56.0	25.9	39.0
RA - T	43.9	00.4	37.7	42.4
- n tang δ	47.9	04.7	46.1	45.7
$\Delta T + m$	51.8	09.0	39.2	49.2
	24.42	24.33	24.45	24.56
$T_m - T_\delta$				
A	24.40	24.31	24.43	24.54
C				
Sum				
Mean				
Red. for runs				
Red. to hor. wire				
Red. to meridian				
Division error				
Sum				
Pointer				
App. z				
log a'				
A' log β				
λ log γ				
log tang z				
log r				
r				
z				
$\phi - z = \delta(O)$				
$\delta(C)$				
$\delta(C - O)$				

Date Observer Barom. = log B =
 Recorder Att. Therm. = log T =
 Ex. Therm. = log β = log γ

Star.	Pegasi		μ Pegasi		i Cephei		α Pegasi	
	Bas	Rogers	Bas	Rogers	Bas	Rogers	Bas	Rogers
T_{δ}	12.0	22 39 48.9			22	22	22 57 52.9	
T_m	15.7	52.8					56.6	
T_e	19.3	56.6					60.4	
T_f	23.6	60.2					63.9	
T_g	27.7	64.3					67.3	
T_h	31.5							
Sum	40 35.1	21.3	44 02.5	72 43 39.5	46 02.4	45 10.9	58 56.9	20.8
Mean	39.0	25.0	66.4	43.3	11.1	19.3	40.5	24.6
Red. to T_m	42.8	28.8	10.3	47.3	19.2	28.0	44.2	28.1
Sum = s	46.6	32.7	14.2	51.1	27.8	36.4	48.0	31.8
$\frac{1}{2}(T_m - T_s)$	50.7	36.5	18.2	54.9	36.4	44.6	57.3	35.4
T			47.06	18.32	47.22	28.07	19.38	41.30
RA	58.3		25.9		53.4		58.0	
RA - T	02.2		29.9		02.3		02.6	
- n tang δ	09.7		33.7		10.6		06.2	
$\Delta T + m$	13.9		47.14	37.5	28.07	19.3	07.8	
$T_m - T_{\delta}$	42.84	42.71	47.10	47.22	28.07	27.7	44.18	44.18
A	42.82	42.69	47.08	47.20	28.02	27.79	44.16	44.16
C								
Sum								
Mean								
Red. for runs								
Red. to hor. wire								
Red. to meridian								
Division error								
Sum								
Pointer								
App. z								
log a'								
A' log β								
λ log γ								
log tang z								
log r								
r								
z								
$\phi - z = \delta(O)$								
$\delta(C)$								
$\delta(C - O)$								

Date

Observer

Barom. =

log B =

Att. Therm. =

log T =

log γ

Ex. Therm. =

log β =

n

Recorder

Star.

π Cephei γ Piscium γ Pegasi γ Pegasi
 Bass Regen Ban Regen Ban Regen Bass Regen

T_δ	02 23.2 23 01 02.3	19.50 23 10 2.4	19 08.3 23 13 45.1	49.9 23 18 26.9
T_m	36.8 15.9	31.8 06.9	12.3 49.4	53.6 31.0
T_e	49.6 28.3	35.6 10.8	16.2 53.0	57.5 34.7
T_r	04.2 43.7	39.2 14.2	20.1 57.0	01.4 38.6
T_g	16.8 57.0	18.0 24.0	01.1 55.3	42.1
T_h				
Sum	3 ^m 44.1 6 ^m 28.8	10 ^m 46.3 28.7	14 ^m 31.6 17.7	19 ^m 13.1 59.2
Mean	57.7 38.0	49.9 32.3	35.6 21.7	17.1 03.2
Red. to T_m	11.2 51.7	53.2 35.4	39.6 25.5	21.1 07.1
Sum = s	24.3 05.7	57.1 39.4	43.2 29.3	24.9 10.8
$\frac{1}{2}(T_m - T_e)$	37.8 18.8	00.2 43.2	47.4 33.2	28.6 14.5
T	5 ^m 05.3			
RA	18.6	11 ^m 07.5	55.0	35.6
RA - T	32.4	11.1	58.8	40.0
- n tang δ	45.4	14.8	02.4	43.6
$\Delta T + m$	58.2	18.2	06.1	47.5
$T_m - T_\delta$	11.04 12.72	21.9	10.0	87.3
A	11.04 12.72	53.35 53.23	39.38 39.30	20.77 20.81
C				
Sum	10.99 12.67	53.33 53.21	39.36 39.28	20.75 20.79
Mean				
Red. for runs				
Red. to hor. wire				
Red. to meridian				
Division error				
Sum				
Pointer				
App. z				
log a'				
A' log β				
λ log γ				
log tang z				
log r				
r				
z				
$\phi - z = \delta(O)$				
$\delta(C)$				
$\delta(C - O)$				

Date _____ Observer _____ Barom. = _____ log B = _____
 n _____ Recorder _____ Att. Therm. = _____ log T = _____
 Ex. Therm. = _____ log β = _____ log γ _____

70 Pegasi γ Cephei
 Star. Bass Roger Bass Roger } Bass Roger Bass Roger

T_δ	33.5	22 ^m 11.9	23 32 24.1	23 30 50.9
T_m	37.2	15.3	40.3	05.4
T_e	40.6	18.9	53.5	21.1
T_r	44.3	22.6	10.8	37.1
T_s	47.7	26.0	26.0	53.0
T_h				
Sum	22 55.2	38.4	33 58.1	37 ^m 05.8
Mean	58.7	42.3	14.1	16 ^o 21.6
Red. to T_m	02.4	45.6	29.3	15 ² 87.0
Sum = s	05.9	49.5	45.1	15 ⁸ 53.2
$\frac{1}{2}(T_m - T_s)$	08.4	53.1	00.7	15 ⁶ 09.1
T				
RA	16.7		35 32.3	
RA - T	20.4		48.1	15 ⁸
- n tang δ	23.9		02.7	14 ⁶
$\Delta T + m$	27.6		17.1	15 ⁴
	31.3		33.0	15 ²
$T_m - T_\delta$				
A	2.32	2.36	29.14	29.42
C				
Sum	2.30	2.34	29.07	29.35
Mean				
Red. for runs				
Red. to hor. wire				
Red. to meridian				
Division error				
Sum				
Pointer				
App. z				
log a'				
A' log β				
λ log γ				
log tang z				
log r				
r				
z				
$\phi - z = \delta$ (O)				
δ (C)				
δ (C - O)				

Date *Oct-17 1873* Observer *A. F. M.*

Barom. =

log B =

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

n

Recorder

Star.

61 Cygni

T_{δ}	<i>21 124.9</i>	<i>145</i>
T_m	<i>27.8</i>	<i>170</i>
T_e	<i>30.3</i>	<i>195</i>
T_r	<i>82.8</i>	<i>410</i>
T_s	<i>38.6</i>	<i>438</i>
T_h	<i>30.28</i>	<i>46.3</i>
Sum		<i>30.33</i>
Mean		
Red. to T_m	<i>30.30</i>	
Sum = s	<i>30.28</i>	
$\frac{1}{2}(T_m - T_e)$	<i>14.16</i>	
T	<i>16.12</i>	
RA	<i>77</i>	
RA - T	<i>15.93</i>	
- n tang δ	<i>8.2</i>	
$\Delta T + m$	<i>16.75</i>	

$$\Delta T + m = -16.93$$

$$m = +.82$$

$$\Delta T = -16.85$$

$$\Delta \Delta T = -3.3$$

Oct-18 *N.M.**4 Pegasi & brychei*

$T_m - T_{\delta}$	<i>23.45</i>	<i>16.5</i>	<i>23.34</i>	<i>2.17</i>
A				
C	<i>18.7</i>		<i>23.8</i>	
Sum	<i>20.8</i>		<i>30.8</i>	
Mean	<i>23.0</i>		<i>33.4</i>	
Red. for runs	<i>23.7</i>		<i>35.9</i>	
Red. to hor. wire	<i>20.82</i>		<i>30.72</i>	
Red. to meridian	<i>20.50</i>		<i>30.06</i>	
Division error	<i>4.18</i>		<i>13.16</i>	
Sum	<i>14.62</i>		<i>17.50</i>	

$$u = +16.62 + 3.3 - 0.8 + 16.54$$

$$+ 17.50 + 4.09$$

$$u = +0.88 + 3.70$$

$$m = -2.4$$

$$b = +4.8$$

$$m = +6.4 + 2.2$$

$$\Delta T + m = -16.54$$

$$m = +.86$$

$$\Delta T = -17.40$$

Pointer

App. z

log a' $A' \log \beta$ $\lambda' \log \gamma$

log tang z

log r

r

z

 $\phi - z = \delta(O)$ $\delta(C)$ $\delta(C - O)$

Date Oct 28 1873

Observer W.R.

Barom. =

log B =

Att. Therm. =

log T =

log γ

n

Recorder

Ex. Therm. =

log β =Star. *i. loep. & Pegasi & Piscium*

T_δ	22 41-240	22 58-461	23 10 550
T_m	291	483	571
T_o	390	504	593
T_r	390	526	14
T_g	435	546	34
T_h	3342	5040	5924
Sum	33.87	52.38	59.22
Mean	1121	2849	
Red. to T_m	22.16	21.85	
Sum = s			
$\frac{1}{s} (T_m - T_o)$			
T			
RA			
RA - T			
- n tang δ			
$\Delta T + m$			

$$0 = +21.89 + 26 - 03 + 21.86$$

$$+ 22.16 + 21.19$$

$$0 = +0.27 + 1.93$$

$$n = -13$$

$$\Delta T + m = -21.86$$

$$m = +86$$

$$\Delta T = -22.72$$

$$ddT = -65$$

Oct. 29 1873

x Pegasi x loephei & Piscium & Regan.

$T_m - T_\delta$	22 58 23.8	23 34 16.7	23 52 8.3	22 58 46.6
A	293	349	124	508
C	52.0	44.7	144	529
Sum	34.8	53.4	164	550
Mean	29.28	34.02	123.6	50.80
Red. for runs	29.26	33.96	12.34	50.8
Red. to hor. wire	28.68	12.80	50.11	58.48
Red. to meridian	058	21.66	22.23	21.29
Division error				
Sum				
Pointer				
App. z				
log a'				
A' log β				
$\lambda' \log \gamma$				
log tang z				
log r				
r				
z				
$\phi - z = \delta (O)$				
$\delta (C)$				
$\delta (C - O)$				

$$0 = +21.29 + 2.6 - 02 \quad 21.27$$

$$+ 21.35 + 03 - 00 \quad 21.35$$

$$21.31$$

$$0 = 21.32 + 1.5$$

$$0 = +21.66 + 4.09$$

$$0 = +34 + 3.54$$

$$n = -09$$

$$\Delta T + m = -21.31$$

$$m = 86$$

$$\Delta T = -22.17$$

$$ddT = +5.5$$

Date *Oct 21 1872* Observer *W. S. L.*
 Recorder

Barom. =
 Att. Therm. =
 Ex. Therm. =

log B =
 log T =
 log β =
 log γ

Star.

 T_s T_m T_e T_f T_g T_h

Sum

Mean

Red. to T_m

Sum = s

 $\frac{1}{2} (T_m - T_s)$

T

RA

RA - T

- n tang δ $\Delta T + m$

$$\Delta T + m = -17.66$$

$$m = +.86$$

$$\Delta T = -18.52$$

Oct 22 1872

#550 m $\sqrt{\tan \delta} = -.63$

 $T_m - T_s$

A

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

$$\Delta T + m = -18.77$$

$$m = .86$$

$$\Delta T = -19.23$$

$$n = -.11$$

log a'

A' log β λ log γ

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$

Date *Oct. 23 1872* Observer *W. K.*

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ

Star.

 T_{δ} T_m T_e T_f T_g T_h

Sum

Mean

Red. to T_m

Sum = s

 $\frac{1}{6}(T_m - T_{\delta})$

T

RA

RA - T

- n tang δ $\Delta T + m$ *#5011 W. \checkmark n = -14**2056 87.21**+ .09**2056 87.31**10.95**2056 18.36* *$\Delta T + m = -18.865$* *m = +.86* *$\Delta T = -19.71$* *Oct. 26* $T_m - T_{\delta}$

A

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a' $A' \log \beta$ $\lambda' \log \gamma$

log tang z

log r

r

z

 $\phi - z = \delta(O)$ $\delta(C)$ $\delta(C - O)$ *$\Delta T + m = -20.54$* *m = .86* *$\Delta T = -21.40$*

Date *Nov 2 1873* Observer *W*

Barom. =
Att. Therm. =
Ex. Therm. =

log B =
log T =
log β =
log γ

n Recorder

Star. *Sigulae & Draconis Mus. mi & Lygni @ Piscin*

T_δ	<i>19 44 54.4</i>	<i>19 48 44.0</i>	<i>19 49 31.4</i>	<i>20 37 23.1</i>	<i>23 52 8.1</i>	
T_m	<i>56.5</i>	<i>50.0</i>	<i>50 32.2</i>	<i>26.2</i>	<i>10.1</i>	<i>n = +0.1</i>
T_e	<i>58.6</i>	<i>50.0</i>	<i>57 28.8</i>	<i>29.0</i>	<i>12.1</i>	<i>0 = +22.10 +15 +0.1 22.11</i>
T_f	<i>0.7</i>	<i>2.0</i>		<i>32.0</i>	<i>14.2</i>	<i>+22.09 +1.00 +0.4 13</i>
T_g	<i>2.7</i>	<i>7.9</i>		<i>34.9</i>	<i>16.2</i>	<i>+22.03 +0.6 +0.0 03</i>
T_h	<i>58.58</i>	<i>58.98</i>	<i>50 33.13</i>	<i>29.04</i>	<i>12.14</i>	<i>0 = +22.07 +.40 22.12</i>
Sum	<i>58.56</i>	<i>58.96</i>	<i>50 32.31</i>	<i>29.02</i>	<i>12.12</i>	
Mean	<i>56.46</i>	<i>33.86</i>	<i>19.57</i>	<i>6.83</i>	<i>50.08</i>	<i>0 = 22.10 +2.73</i>
Red. to T_m	<i>22.10</i>	<i>22.10</i>	<i>17.23</i>	<i>22.09</i>	<i>22.03</i>	<i>17.73 +53.30</i>
Sum = s						
$\frac{1}{2} (T_m - T_s)$						<i>0 = +0.3 + 2.33 n = -.01</i>
T						<i>0 = -4.39 +52.80 +.08</i>
RA						
RA - T						
- n tang δ						
$\Delta T + m$						

$$dT + m = +22.12$$

$$m = +.86$$

$$\Delta T = -22.98 \quad d\Delta T = +0.6$$

Nov 3 1873

$T_m - T_\delta$					
A	<i>22 40 44.4</i>	<i>22 58 40.7</i>	<i>22 45 23.4</i>		
C	<i>46.6</i>	<i>48.0</i>	<i>28.7</i>		
Sum	<i>48.8</i>	<i>50.2</i>	<i>33.5</i>		
Mean	<i>51.0</i>	<i>52.3</i>	<i>38.5</i>		<i>Let n = 0</i>
Red. for runs	<i>53.3</i>	<i>54.6</i>	<i>43.3</i>	<i>0 = +21.67 + 2.6</i>	
Red. to hor. wire	<i>48.82</i>	<i>50.6</i>	<i>23.48</i>	<i>+22.93 + 2.19</i>	
Red. to meridian	<i>48.80</i>	<i>50.4</i>	<i>33.43</i>	<i>0 = +.24 - 1.93</i>	
Division error		<i>28.47</i>	<i>11.50</i>	<i>n = -.13</i>	
Sum		<i>21.60</i>	<i>21.93</i>		
Pointer					
App. z					
log a'					
A' log β					
λ log γ					
log tang z					
log r					
r					
z					
$\phi - z = \delta (O)$					
$\delta (C)$					
$\delta (C - O)$					

$$dT + m = 21.67 - 21.67$$

$$m = .86 + .35$$

$$dT = 22.53 - 22.09$$

$$dT = 22.02$$

Date *Nov. 4/1913* Observer *W. R.*

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ

Star.

= Piscis aquarii B. Lep. 1.

T_δ	23 58 4.6	21 40 12.8	21 39 35.3	21 24 10.2
T_m	9.8	19.0	39.3	16.3
T_e	11.8	25.1	39.5	22.4
T_f	13.8	31.2	41.5	28.3
T_g	15.9	37.3	43.6	34.5
T_h	11.78	25.08	39.44	22.34
Sum	11.76	25.02	39.42	22.28
Mean	56.08	3.50	17.74	0.87
Red. to T_m	21.68	21.52	21.68	21.41
Sum = s				
$\frac{1}{6}(T_m - T_e)$				
T				
RA				
RA - T				
- n tang δ				
$\Delta T + m$	<i>Nov. 5-1873</i>			

$$0 = +21.68 + 0.6$$

$$0 = 21.41 + 2.74$$

$$0 = +21.7 - 2.68$$

$$n = +1.0$$

$$0 = +21.52 + 2.86$$

$$0 = 42 + 2.50$$

$$n = +1.5$$

$$b = +.33$$

$$m = +.44 - 0.8$$

$$m = +.47 - 0.5$$

$$dT + m = -21.94 \quad 21.68$$

$$m = + \quad 85 \quad 35$$

$$dT = -22.29 \quad 22.03$$

2 Aquarii

$T_m - T_\delta$	<i>24 89 35.1</i>
A	<i>37.2</i>
C	<i>39.3</i>
Sum	<i>41.3</i>
Mean	<i>43.9</i>
Red. for runs	<i>39.26</i>
Red. to hor. wire	<i>37.24</i>
Red. to meridian	<i>17.74</i>
Division error	<i>21.50</i>

$$dT + m = -21.50$$

$$m = \quad 35$$

$$dT = -21.85$$

Sum	
Pointer	
App. z	
log a'	
$A' \log \beta$	
$\lambda' \log \gamma$	
log tang z	
log r	
r	
z	
$\phi - z = \delta(O)$	
$\delta(C)$	
$\delta(C - O)$	

Date

Observer

Barom. =

log B =

n

Recorder

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

Nov. 8 1873

Star.

 T_s

i b e p h. ?

 T_m

22 45 22.7

 T_e

27.8

 T_f

32.7

 T_g

32.7

 T_h

42.6

Sum

45 32.70

Mean

45 32.65

Red. to T_m

11.30

Sum = s

21.35

 $\frac{1}{2} (T_m - T_s)$

T

RA

RA - T

- n tang δ $\Delta T + m$

Nov. 9 1873

 λ Pegasi γ Pegasi 226 Blep. $T_m - T_s$

22 37 21.3 40 43.7 22 30 73

A

23.8

45.8

15.3

C

24.0

48.2

23.7

Sum

28.5

80.5

32.0

Mean

30.9

02.7

40.1

Red. for runs

26.10

48.18

23.68

Red. to hor. wire

26.08

48.16

23.62

Red. to meridian

4.90

26.80

28.0

Division error

21.18

21.36

20.82

Sum

Pointer

App. z

log a' A' log β λ log γ

log tang z

log r

r

z

 $\phi - z = \delta (O)$ $\delta (C)$ $\delta (C - O)$ $n = +10$ $0 = +21.30 + 2.19 + 2.2 + 2.57$ $\Delta T + m = -21.57$ $m = +35$ $\Delta T = -21.92$ $n = +13$ $0 = +21.18 + 5.0 + 0.7 + 2.125$ $+21.36 + 4.2 + 0.5 + 2.141$ $0 = +21.27 + 1.50$

21.33

 $0 = +20.82 + 3.92$ $0 = -4.5 + 3.92$ $m = 44 - 11 = +33$ $n = +13$ $\Delta T + m = -21.33$ $m = +33$ $\Delta T = -21.66$ $\Delta \Delta T = +0.2$

Date Nov. 10 1873

Observer H. R.

Barom. =

log B =

Att. Therm. =

log T =

log γ

n

Recorder

Ex. Therm. =

log β =Star. α Pictoris & Andromeda & Draco. T_s 23 53 6.9 0 2 8.3 0 6 24.8 T_m 9.0 10.8 22.37 $0 = +20.97 + 0.6 + 0.0 20.97$ T_e 11.0 13.1 20.36 $20.91 + 0.4 + 0.3 20.84$ T_f 13.0 15.5 44.8 T_g 15.2 17.8 54.8 $0 = 20.99 + 3.0$ T_h 11.02 13.06 6 33.80 $0 = +20.86 - 4.83$

Sum 53 11.00 13.04 6 33.86

 $n = 0$

Mean 50.03 52.13 13.06

 $20.8 - n = +0.5$ Red. to T_m 20.97 20.91 20.86

Sum = s

 $\frac{1}{2}(T_m - T_s)$ $dT_m = -20.95$

T

 $m = +.40$

RA

 $dT = -21.35$

RA - T

 $1dT = +.29$ - n tang δ $\Delta T + m$

Nov. 13

 $dT = -20.70$ $T_m - T_s$

A

C

Nov. 14 1873

Sum

Mean

 $dT = -20.50$

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a' $A' \log \beta$ $\lambda' \log \gamma$

log tang z

log r

r

z

 $\phi - z = \delta(0)$ $\delta(C)$ $\delta(C - 0)$

Nov. 15 1873

 $dT = -20.20$

Date

Nov. 18

Observer

H. R.

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ Star. *a Cass. Polaris*T_s 0 33 337 1 10 140T_m 373 11 439T_e 410 13 86T_r 446 14 332T_g 483 16 08T_h 4088 13 810

Sum 40.86 13 7.47

Mean 21.75 12 56.89

Red. to T_m 19.21 10.88

Sum = s

 $\frac{1}{2}(T_m - T_s)$

T

RA

RA - T

- n tang δ $\Delta T + m$

Nov. 19 1473

*a Cass. & Piscium Polaris*T_m - T_s 0 33 336 0 56 293 1 10 156

A 37.2 41.3 46.6

C 41.0 43.4 7.7

Sum 24.6 45.6 28.7

Mean 48.3 47.6 2.0

Red. for runs 30.94 42.44 13 10.12

Red. to hor. wire 60.92 43.42 13 9.49

Red. to meridian 21.74 24.03 12 56.83

Division error 19.18 19.39 12.96

Sum

Pointer

App. z

log a'

A' log β λ log γ

log tang z

log r

r

z

 $\phi - z = \delta(O)$ $\delta(C)$ $\delta(C - O)$

n = +2.2

0 = +19.21 + 1.47 + 8.3 + 19.54

0 = +10.58 + 40.6

0 = +8.63 - 38.1

n = +2.2

m + ΔT = -19.64

m = +2.5

 ΔT = -19.88

m = +44 - 19 = 25

n = 1.6

0 = +18.98 + 1.47 + 2.4 + 19.42

19.39 + 1.3 + 0.2 19.41

0 = +19.28 + 5.0

0 = +12.96 + 41.6

0 = +6.32 - 40.8

n = +1.6

 Δm = +44 - 14 = +30 $\Delta T + m$ = -19.42

m = +3.0

 ΔT = -19.72Nov. 21.8 ΔT = -19.01

Date

Nov. 22

Observer

W.S.R.

Barom. =

log B =

Att. Therm. =

log T =

n

Recorder

Ex. Therm. =

log β =log γ

Star.

a Piceis. a Pegasi

n = 120

 T_s 2250 449 2255 919 $0 = +17.86 + 26 + 0.5 = 17.91$ T_m 448 441 $+17.86 - 58 - 11$ T_o 582 461 T_f 607 483 $dT + m = -17.91$ T_g ' 561 $m = 30$ T_h 5823 2309 $dT = -182.1$

Sum 6821 2307

 $ddT = +.50$

Mean 46.35 2821

Red. to T_m 1786 1786

Sum = s

 $\frac{1}{s}(T_m - T_s)$

T

RA

RA - T

- n tang δ $\Delta T + m$

Nov. 22 1873

J.V.M. Jr.

W. Resmin & Anderson.

 $T_m - T_s$ 2253 300 145

A 54 67

C 71 93

Sum 91 117

Mean 112 140

Red. for runs 7.36 524

Red. to hor. wire 7.34 822

Red. to meridian 49.52 131.59

Division error 17.42 17.23

Sum

Pointer

App. z

log a'

A' log β A' log γ

log tang z

log r

r

z

 $\phi - z = \delta(0)$ $\delta(C)$ $\delta(C - 0)$

n = 120

 $0 = +17.42 + 26 + 0.5 + 17.47$ $17.23 + 54 + 11 + 17.34$ 17.40 $dT + m = -17.40$ $m = 30$ $dT = -17.70$ $ddT = +.51$

Date

Observer

W.A.R.

Barom. =

log B =

n

Recorder

Att. Therm. =

log T =

Ex. Therm. =

log β =log γ

Nov. 25.8

Star.

T_s	<i>a Boötis</i>								
T_m	<i>620</i>	<i>5 m.</i>							
T_e	<i>14 9 56.0</i>	<i>4.9</i>			<i>n = +2.0</i>				
T_f	<i>58.3</i>	<i>7.0</i>			<i>0 = +16.33 + 26 + 0.7 + 16.40</i>				
T_g	<i>0.5</i>	<i>9.2</i>							
T_h	<i>17.9</i>	<i>11.3</i>			<i>dT + m = -16.40</i>				
Sum	<i>20.1</i>	<i>13.5</i>			<i>m = +3.0</i>				
Mean	<i>22.3</i>				<i>dT = -16.70</i>				
Red. to T_m	<i>4.19</i>	<i>9.18</i>			<i>ddT = +.40</i>				
Sum = s	<i>9.17</i>								
$\frac{1}{2}(T_m - T_s)$	<i>52.81</i>								
T	<i>163.3</i>								
RA									
RA - T									
- n tang δ									
$\Delta T + m$	<i>Nov. 29</i>	<i>A.L. Dec.</i>							

$T_m - T_s$	<i>e Deneb</i>								
A									
C									
Sum									
Mean									
Red. for runs									
Red. to hor. wire					<i>dT + m = -15.31</i>				
Red. to meridian					<i>m = +3.0</i>				
Division error					<i>dT = -15.61</i>				
Sum					<i>ddT = +.32</i>				
Pointer									
App. z									
log a'									
A' log β									
λ log γ									
log tang z									
log r									
r									
z									
$\phi - z = \delta(O)$									
$\delta(C)$									
$\delta(C - O)$									

Date *Dec 1 1873* Observer *H. R.*
 Recorder

Barom. =
 Att. Therm. =
 Ex. Therm. =

log B =
 log T =
 log β =
 log γ

Star. *x Audron. + Draco. h. v. bars. 2 Pixin*

T_{δ}	<i>2 08 06 96</i>	<i>033 276</i>	<i>0 56 33.6</i>
T_m	<i>3.2</i>	<i>198</i>	<i>31.2</i>
T_e	<i>5.5</i>	<i>302</i>	<i>348</i>
T_f	<i>29</i>	<i>399</i>	<i>385</i>
T_g	<i>103</i>	<i>504</i>	<i>321</i>
T_h	<i>5.54</i>	<i>2494</i>	<i>3484</i>
Sum	<i>5.52</i>	<i>31.00</i>	<i>3482</i>
Mean	<i>51.90</i>	<i>15.23</i>	<i>21.41</i>
Red. to T_m	<i>13.62</i>	<i>14.77</i>	<i>13.41</i>
Sum = s			
$\frac{1}{2}(T_m - T_s)$			
T	<i>Nov. 25.8</i>	<i>16.70</i>	
RA	<i>26.8</i>	<i>16.30</i>	
RA - T	<i>27.8</i>	<i>15.0</i>	
- n tang δ	<i>28.8</i>	<i>15.40</i>	
$\Delta T + m$	<i>29.8</i>	<i>14.90</i>	
	<i>30.8</i>	<i>14.80</i>	

n = +21
 $0 = +13.62 + 5.4 + .11$ *13.73*
 $13.91 + 1.47 + 30$ *71*
 $13.27 + .13 + .03$ *.80*
13.75
 $0 = +13.60 + .71$
 $0 = +14.77 + 4.83$
 $0 = -1.17 + 5.54$
n = +21

$dT + m = -13.75$
 $m = +3.0$
 $dT = -14.05$
 $ddT = +.40$

$T_m - T_{\delta}$

A

C

Sum

Mean

Red. for runs

Red. to hor. wire

Red. to meridian

Division error

Sum

Pointer

App. z

log a'

A' log β

λ log γ

log tang z

log r

r

z

$\phi - z = \delta (O)$

$\delta (C)$

$\delta (C - O)$

