

KG
11365
200

H. 46

Equatorial.
1862 April 19th
To
1862 July 5th

Sold by THOMAS GROOM & Co., Stationers, India Building, 82 State Street, Boston.

KG 11365.200



KG 11365.200



ρ
*
 ρ
*
 ρ
*

(236
246

M

(73)

1862. Apr. 19

planet south from star of 9 mag.

H.P.T. obs
A.H. rec.Avg. Pos. Wires $17^{\circ} 5'$

Ad

(236)

The Star of Comp is No. 2469 Bower Street,
planet about 2' south of star.

p	10 ^h	16	34.1	- 45.4	- 35.70
*		17	9.8	21.1	

p		18	59.8	- 10.2	- 35.75
*			55.2	46.3	

(clouds)

p		29	18.6	- 29.6	- 36.05
*			54.6	5.7	

(clouds)

(236) Mean	10 ^h	21	43.1	Ad = - 35.83
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246 Jan

10 20 6.1

1 50 5.7

8 30 0.4

1 23.6

M. Time 8 28 37

Planet (73)

4th Apr 20th
Hob.

(Began about 10 PM)

Planet (arc. to HPS) 5.7 in so. fol. $+ 11' = \alpha$

Planet 12.13 [from memory next day, about 12th]

Position and Distance

Chro. 236.

11 59 46	14.2	Right
12 1 1	13.3	Left
2 58	10.7	L
11 29	12.2	R

Magnitude of wires
not good.

7 54	53.740	Below.	53.895	12 9 16	4.405 = 43".17
10 38	54.050	Above			
12 45	54.205	A.	54.428	12 13 43	4.272 = 41".87
14 41	53.823	B.			

19 20	6.5	L
20 40	6.3	R
21 46	6.4	R
23 14	6.2	L

27 29	54.38	A.	Angle 270°	12 32 3	3.996 = 39".16
30 27	62.174	A			
33.610	62.419	B.			

Zero of wires

58.30

Reduce to $12^h 14^m 32^s$ Chro. time

$\alpha = 2469 + 2^\circ$ $A \ 1855.0 \ 8.8 \ 11 \ 35 \ 31.3 \ +2 \ 51.3$ } Argelander
 $2473 + 2$ $B \ \text{---} \ 9.4 \ 11 \ 36 \ 44.1 \ +2 \ 51.7$ } Sternverzeichnis

Declination of α - α is north preceding A and B .

α	46.339	$\alpha - A$	+ 41.2
A	44.184		41.4
B	46.220		42.0
		Mean	+ 41.5

α	43.414	$\alpha - B$	+ 20.8
A	39.190		20.9
B	41.285		20.8
		Mean	+ 20.8

(73) now precedes α) 73. α Comp. with A, B , in AR.

73.	14	25	12.0	19.0	$\alpha - A$	- 1 5.95
α		25	13.4	20.7		- 1 5.80
A		26	19.4	26.6	Mean	- 1 5.88
B		27	31.4	38.7		

73.	14	28	—	12.0	$\alpha - B$	- 2 18.00
α		28	6.8	13.8		- 2 17.80
A		29	12.3	19.9	Mean	- 2 17.90
B		30	24.5	31.7		

Diff. of AR. and Dec. [73. α] 73 south preceding

AR	Chr.	14	38	3	73)	43.290	14	45	30	73)	47.287
		39	0	α		45.478			α		50.212
		39	58	73)		42.018	47	16	73)		47.360
		41	38	α		43.578			α		50.305
		42	38	73)		39.947	49	8	73)		47.210

46.40.13

41.718

44.60.4

47.297
50.258
2.957

Planet (73) npt.

1862 Apr. 20

Planet (73) compared with α ; Results

Chro. Time	$\Delta \alpha \cos \delta$ Planet - α	$\Delta \delta$ Planet - α	Alt.	$\frac{H}{P}$ for Par.	Par.
12 14 32	Spoc + 12".26 [1.582]	-39".98	2.	+0.067 + 5.44	+0.036 + 2.92
14 40 13	-27.89		1.	+0.303	+0.163 + 2.9
Reduce to Chro. 14 42 45	-26.88	-29".4			
14 47 18		-29.19	1.	+ 5".63	+2".81

Mer. Motion	$\Delta \alpha \cos \delta$ -16".49	$\Delta \delta$ -1".5
	$\Delta \delta$ +4.24	

Approximate Places

A 1862.0	11 35 52.9	+2 49.0		
B "	37 5.7	2 49.4	more accurate	
Mean α 1862.0	11. 34 47.8	+2° 49'.7	Meridian Circle approximate red. ut.	
Red. to app. (3 Virg)	+3.0	-0.3	A. app. to 24h	11 35 51.505 +2° 48' 53".4
Planet - Star	0.0	-0.6	-3 days (3 Virg)	+0.02 -0.1
Planet app. α . d.	11 34 50.8	+2° 48'.8	2-A.	-1 5.88 +41.5
			α app.	11 34 50.69 +2 49 34.8
			Planet - Star	+0.82 -40.0
Chro. 12 58			Chro. 12 14 32	11 34 51.51 +2 48 54.8
f. 1			fact. 1 39	Planet's place.
1 54			Chro. 12 12 53	
11 3			1 54 2	Chro. 14 42 45
			1 41	1 39
Chro. 11 1" M.T			M. Planet. 10 17 10	14 42 6
				1 54 2
				12 48 4
				2 6
				12 45 58

[Ephemeris 11 34 51 +2 48.8]

The above is a rather singular coincidence. See Ephemeris at end of book

Calypso.

1662 Apr. 20thComp. with R. 2979 at angle $357^{\circ} 8'$ Planet So. foll. A.R. Pos.Star
Planet

El.	13	7	15.6	21.5	
		7	45.4	57.3	+ 29.40

Star
Planet

8	6.3	12.1	
8	35.9	41.6	29.55
9	14.4	20.2	
9	44.0	49.8	29.60

10	22.5	28.4	
10	52.0	58.1	29.55

11	38.2	44.1	
12	8.0	13.7	29.70

12	57.0	62.7	
13	26.8	32.7	+ 29.85

El. [Subtracted 10⁵]

Choc. 236 13 23 44
 25 43
 27 32
 29 24
 31 47
 34 20

74° 10' Above. Right.
 74 40 Below. Left.
 74 0 " "
 74 5 Above. Right.
 74 2 " "
 74 13 Below. Left.

13	22	38		96° 45'	13 22 37
13	24	44			
	24	36			
	26	27			
13	28	28	97 4		13 27 22
	28	19			
	30	41			
13	33	4	97 0		13 31 54
	33	14			

1.1585

13	38	10.3	17.3	
		40.4	47.6	+ 30.10

39	21.5	28.6	
	57.9	58.8	30.30

40	23.5	30.0	
	53.4	60.2	30.15

41	20.9	27.9	
	57.6	58.3	+ 30.45

Star again
 Planet
 Star

Planet
 Star

Planet
 Star

Planet
 Star

Star-comparisons for Calypso

Star^3 of Apr. 20 = a a north pr. 8
 R. 2979 = b
 BZ [280] = c c.s. foll. 8

[28]

[28.10]

13 48 40.2 47.5
 49 51.7 58.9
 51 52.4 59.5

a

b

c

a.s.

short to.

13 52 43.5 50.7
 53 54.9 2.0
 55 55.5 2.5

a

67.928

a

b

27.613

+ 3.826

c

23.587

14.750

a

64.914

a

b

24.483

+ 3.751

c

20.731

37.78

a

b

c

Calypro

1862 Apr. 20thN.H. +1.45^s - 5.11

El			Reduced	Reduced	
13	7 48	+29.80	+0.40	+30.20	6.25
	8 39	29.55	0.38	29.93	0.06
	9 42	.60	0.35	29.95	"
	10 55	.55	0.33	29.88	0.69
	12 11	.70	0.29	29.99	0.16
	13 30	29.85	+0.26	30.11	2.56
					9.80
	38 49	30.10	-0.35	29.75	4.
	39 55	.30	0.38	29.92	1.09
	40 57	.15	0.40	29.75	4.
	41 55	+30.45	-0.42	+30.03	7.86

28.50

Reduced to El. 13^s 24^s 20^sPlanet - Star Δ + 29.95^s = 0.0351 Comp ± 0.112

El.		Δ comp.	log.	log 15 as d	log 5	Δ d	Reduced
13	23 37	+29.94	1.4763	1.1586	2.6349	9.0732 _w	-57.1 -57.2
	27 23	30.02	.4774		.6360	9.0972 _w	52.1 52.85
	31 54	30.13	1.6790		2.6376	9.0891 _w	53.3 52.65

Mean - 52.16

El 13 24 20 Planet - Star + 29.95^s in κ
 - 52.6 in δ

Calypso

1862 Apr. 20th

1862.0

$$\begin{array}{rcl}
 9^h 45^m 17.79 & +16^{\circ} 22' 39.9 & \\
 +4.493 & -35.99 & \\
 -0.005 & +0.60 &
 \end{array}$$

$$\begin{array}{rcl}
 2^{\circ} & 9.46 & 23.8 \\
 3^{\circ} & 16 & 17.01
 \end{array}$$

1862.0

$$\begin{array}{rcl}
 9^h 45^m 27.28 & +16^{\circ} 22' 4.5 & \text{[right]} \\
 +2 & 1.56 & -10 & 19.5
 \end{array}$$

$$\begin{array}{rcl}
 14^{\circ} & 9.46554 & \\
 15^{\circ} & 9.74078 &
 \end{array}$$

1862.0

$$\begin{array}{rcl}
 9^h 47^m 28.84 & +0.05 & 16^{\circ} 11' 45.0 + 0.9 \\
 -2 & 0.00 & +37.1
 \end{array}$$

$$\begin{array}{rcl}
 16^{\circ} & 1.67434 & \\
 17^{\circ} & 2.57043 & \\
 18^{\circ} & 9.92159 &
 \end{array}$$

R. 2979 from 1862.0
By R.

$$\begin{array}{rcl}
 9^h 45^m 23.29 & 16^{\circ} 12' 22.1 & 3? \\
 15 & 22.65 & 34.2
 \end{array}$$

$$\begin{array}{rcl}
 0.90066 & & \\
 7.955 & &
 \end{array}$$

Assumed that Rümker's dir. is right

1862.0

$$\begin{array}{rcl}
 9^h 45^m 23.85 & +16^{\circ} 12' 34.2 &
 \end{array}$$

Red. to app.

Planet - Star

$$\begin{array}{rcl}
 +2.57 & -12.2 & \\
 +29.95 & -52.6 &
 \end{array}$$

verified

$$\begin{array}{rcl}
 +0.932 & -4.20 & \\
 -0.408 & +2.41 & \\
 +2.045 & -10.45 & \\
 +0.001 & +0.04 & \\
 +2.57 & -12.20 &
 \end{array}$$

Planet - α - δ

$$\begin{array}{rcl}
 9^h 45^m 56.37 & +16^{\circ} 11' 29.4 &
 \end{array}$$

$$\begin{array}{rcl}
 El & 13 & 24 & 20 \\
 fast & & 35 &
 \end{array}$$

$$\begin{array}{rcl}
 13 & 23 & 45 \\
 1 & 54 & 2 \\
 \hline
 11 & 29 & 43 \\
 1 & 53 & \\
 \hline
 11 & 27 & 50
 \end{array}$$

Camber met

* Corrected. Bonn Observations IV. XIII

+ AR obs. H. Obs.; also R. 2979.

Eph.

$$\begin{array}{rcl}
 9 & 46 & 3 \\
 16 & 10.9 &
 \end{array}$$

Cor.

$$\begin{array}{rcl}
 -7.5 & +0.6 &
 \end{array}$$

& he also AR 1349 (Schödt) & H. Obs.

20
1
5
3
0

(73)

Apr. 20. 1862

H.P.T. obs.

Comp. Star in Bonner Stern.V. 2469

p. South. proc. Star

	EC.	h	AR.		AR.		AR.
p		9	54	44.0	-	54.3	- 62.60
*			55	46.7	-	56.8	
p			56	18.3	-	28.8	- 62.60
*			57	21.0	-	31.1	
p			57	54.0	-	64.2	- 62.40
*			58	56.5	-	66.5	
Mean	9		56	22.6			- 62.50

	Dec.		Dec.		Dec.
EC.	10	14	59.3	57.32	58.34
		19	58.9	57.41	58.32
		25	49.1	57.60	
Mean	10	20	15.8	57.443	
				58.330	
			Ad	- 0.887	- 8.69
					- 1.3

Reduce to

EC. = 9	56	22.6
		- 35.0
9	55	47.6
1	54	2.3
8	1	45.3
	1	18.9
M. Time	8	0 26

for Planet (73)

1862 Apr. 24
1145

8^h Cambr. 11 33 24 + 2^h 54.3
- 4 - 1.

8. Stars 8.9 11 30 40 + 2 56.7 } Apparent.
9.5 11 31 44 2 53.2 }

β Virg 11 43 33 + 2 33.

* γ folk. 1^m 9^s 40 0"

11 32 53 + 2 53.2 ✓

Planet? + z

γ + 26.5 + 2.4 at 11^h 10^m.

x 11 33 19.5 2 55.6

Cor. - 4.5 + 1.3

Planet ϵ compared with * γ . Planet m. f. Star.

Diff. MR. Angle 261° 0'

El.

Star	12	40	8.6	12.4	
Planet			33.5	37.3	+ 24.90
	41		23.0	26.9	
			48.1	51.9	+ 25.05
	42		31.3	35.0	
			56.1	59.8	+ 24.80
	43		19.3	23.3	
			44.3	47.9	+ 24.80

~~Sy 12. Angle $261^{\circ} 0'$ east.~~

Angles of Position

Cavo.

12 50 31
55 25
58 18
13 0 12

102 22 L
102 23 R
102 50 R
102 28 L

[Luthe 10³ from El]

20 - 10³
[12 49 30]
12 54 23
12 57 16
[12 59 2]

Angle $81^{\circ} 8'$ Clock put in

13 3 54
6 48
9 5

60.854 Planet
75.424 Star
60.543 Planet
75.420 Star
60.553 Planet

[13 2 52]
13 5 46
13 8 3

Angle $261^{\circ} 15'$

Reject 1st two sets: angle wrong

Star 13 16 31.8 35.1
Planet 51.3 59.7

[13 20 0.0 3.6
24.6 27.8]

17 25.2 28.4
59.7 52.8

18 15.2 18.5
39.7 43.0

19 19.3 22.8
44.0 47.3

Stars for Plant (73)

1862 Apr 24.

2115

Start of Apr 7. = x $a = W. XI 675$ $b = W. VI 815$

a	740	13 43	25.3	29.3	742
x	1 59.5	46	59.5	63.4	2 0.5

q	8 46	
x	3 6.5	ink failed

x	9 23	13 43	35.2	39.2	9 23
h	1 38	58	50.7	54.6	1 39

Planet (73)

Daily Declin

Apr 7 $15^h 11^m 42^s + 2^o 13.7$
 20 10.3 $34 52 + 2 48.9$
 24 9 $33 19 + 2 55.1$
 Predicted
 26 9 $32 39 + 2 57.4$

Apr 14.0 $-34.5 + 2.78$
 22.4 $-23.5 + 1.57$
 22.7 $-22.2 + 1.70$
 Aug $-20 + 1.4$
 25.4 $-17.2 + 1.34$
 25.9 $-19. + 1.06$

34.52 + 48.9

25.9 33.1 + 2.57.3

Maximum of Decl. about ~~Apr 29~~ May 3^d $-15 + 0.6$ May 3. $11^h 31^m 4^s + 3 0.5$

Minimum of AR about May 11

May 11. AR $11^h 29^m 7^s + 2^o 58.1$ inra

 $25.5 - 19 + 1.2$ $26.9 - 16.8 + 0.92$ $27.9 - 15.4 + 0.77$ $28.9 - 14.2 + 0.62$
 $26 11 32 42 + 2 57.5$ $28 11 32 11 + 2 59.0$ $30 11 31 44 + 3 0.2$ $2 11 31 22 + 3 0.6$

May

+96

Apr 25. 9^h α $11 33 1 + 2^o 56.3$ $-19.1 + 1.14$ $11 38 40 + 2 36.1$

+3.25

 $\frac{d\alpha}{dt}$ for Apr 19. $\frac{d\alpha}{dt}$ $+1.25$ -0.134

[Apr 19]

Decl Apr 26. 21^h $\frac{d\alpha}{dt}$ 25.2 $+1.8$

Planet (73)

862 Apr. 24

Alt in α -0.85 in $\delta + 2''.8$
 Reduct. Reduced Angle $+0''8'$ $\frac{1''}{20''}$ }
 -0.8 $20''$

12 40 36	-0.30	+24.60	64
41 50	0.29	24.76	64
42 58	0.27	24.53	215
43 46	0.26	24.54	196
13 16 58	+0.21	24.76	64
17 51	0.23	24.66	0
18 42	0.24	24.74	36
19 46	0.25	24.85	287
20 26	+0.26	24.66	4
12 52 58		+ 24.68	942
59 15			118

13 3 54 P. Err. 1 comp ± 0.5073
 6 48 result ± 0.024
 9 5

Reduce to El

Zero spread $261''8'$

13 2 00

$\log 1502 = 1.1756$

Declination	Circle	Angle of Pa.	Δ comp	$\log \Delta$ area	$\log \Delta$
El 12 51 56	102 22	68 46	+24.82	2.5704	2.1598
12 58 14	102 39	68 29	24.73	2.5688	2.1646

Declination	Circle	Δ	Reduct.	
El 12 51 56		Δ + 2' 24''.5	+0.5	+2 25.0
58 14		26.1	+0.2	26.3
13 2 52	14.564	22.7	0.0	22.7
5 46	14.279	25.8	-0.2	25.6
8 3	14.869	25.7	~~-0.3~~	25.4
		Δ		+ 2' 25''.0

P. Error 1 comp $\pm 0''.92$
 Alt ± 0.41

Planet (73)

1862 Apr. 24.

App. pl. of star [approximate]

-0.03

	11	32	53.97	-	+ 2	52	59.1	Preliminary reduction of Planet-Zone
Planet-Star			+ 24.68			+ 2	25.0	

Planet [approx] $11^{\text{h}} 33^{\text{m}} 18.65^{\text{s}}$ + $2^{\text{h}} 55' 24.1''$
 α. δ.

El fast

13	2	7
		46
13	1	14
2	9	49
10	54	25
		147
10	49	38

Ambr. m. l.

Cor. Eph. $\oplus - 3^s + 1'.0$

Chytr?

1/2 7th 17 APR.

	<u>171° 51'</u>				
x	15 21 7	87.382		$\Delta \alpha \cos \delta$	14.13
a	22 25	72.506	86.71	$16.25 = +2' 19.7''$	
x	24 16	85.863			14.29
a	25 22	70.923			
x	27 23	84.558			14.87
a	28 25	69.075			
~~x~~	~~24 53~~				

Sec.

	<u>261° 51'</u>	
x	39 54	54.272
a	41 26	79.303
x	43 5	54.332
a	44 21	79.387
x	46 4	54.206

APR.

	<u>171° 51'</u>				
x	51 36	79.396			
a	52 42	62.727	78.22	$16.09 = 2' 37.7''$	16.
x	55 37	77.303			

x follows a and is south.

Star a is WZ $11^h 47^m 17^s + 0^\circ 52' 42''$ (1862.0)

x was probably Chytr. It disappeared after the last observation.

The obs. was made by measuring with the movable wire while the clock was going.

for Planet (73)

62 Apr. 26th
M.B. Planet 11 32 43 + 2 57.3 corrected [at 7^h]

Star a) 11 30 41.5 + 2° 55' 58" — Determined on meridian Apr 24.25th
b) 11 32 54 2 53 0 }

Compared with A. Planet N.F. At angle 261° 8'

Star 11 4 38.0 43.9
Planet 10 39.8 45.5

+ 2 1.70

Star 11 11 19.9 23.6
Planet 13 21.3 25.0

2 1.40

Higher Power

Star 11 14 43.1 46.8
Planet 16 44.4 47.9

2 1.20

Star 11 17 7.8 11.5
Planet 19 9.2 12.8

2 1.35

Star 11 19 42.0 45.8
Planet 21 43.2 47.2

+ 2 1.30

Star
Planet E6 11 26 14 } 12.332 } not very good.
72.930 }

Star
Planet " 11 29 5 } 12.550
11 30 7 } 73.260

Star
Planet 11 33 35 } 59.233
69.714

Star
Planet 11 37 12 } 59.361 } not very good
69.945 }

Star
Planet [11 41 33] } 56.910
67.573

[Chr. + 1st 22]

Planet (23)

1862 Apr. 26th
245.

AR again - same angle

a	11 44	34.2	36.6	
Planet	46	35.3	37.6	+ 2 1.05

a	46	51.9	54.2	
Planet	48	—	55.1	2 0.90

a	49	9.5	11.6	
(Planet)	51	10.2	12.5	2 1.10

a	51	41.5	42.9	
Planet	53	41.2	43.5	+ 2 0.65

El. (approx) 0.7" + 2.5"
 Alt - ~~77~~ + 3."

	Reduction	Reduced Δx	Δd	Reduced
11 10 43	44 - 0.26	2 1.44	72	
13 23	34 0.23	1.17		
16 46	65 41 0.19	1.01	16	
19 11	43 0.16	1.19	3	
21 45	13 10 0.13	1.17		
26 14	13 26		+ 1' 43.86	+ 0.25 + 1 44.16 44.1
30 7	13 42		44.96	+ 0.08 45.06 45.0
33 35			42.71	- 0.06 42.65 42.7
37 12			42.72	- 0.25 42.47 42.5
41 33			44.50	- 0.38 44.12 44.1
46 36	+ 0.18	1.23	6	+ 1 43.88 + 43.9
48 55	0.20	1.10	5	
51 11	0.23	1.33	16	
53 42	0.26	+ 2 0.91	17	

Reduce to
 11 32 12 + 2 1.17 ± 0.036

Ref. temp. invisible

The focus was afterwards found out of order.

for Calypso.

1862 Apr. 26th
7145.

Liroth [9^h 31^m Cambri]

$$\begin{array}{r} 949.56 + 15.55.9 \\ - 7 \quad \quad \quad + 0.6 \\ \hline 949.49 \quad \quad 15.56.5 \end{array}$$

At length 251° 8'

Clyps.

1862 Apr. 26.

Planet 43 0
Star39.382 reject angle wrong.
62.372P Chro. Add 1.^m pr El
Star 12 46 4539.386
63.238

23.55

P 12 50 11
Star39.240
63.238

23.558

23.552
456P 12 52 33
Star.39.546
63.116

23.570

P 12 58 20
Star.40.685
64.280Adjusted form - Give 1/2 rt. to preceding obs
both AR and Star.

20.502

Planet 13 1 5
Star.45.280
68.690

El.

Planet 13 5 43.8 51.0 -53.85
Star 6 37.7 44.8Planet 7 26.7 30.6 -53.80
Star 8 20.5 24.4Planet 9 39.3 43.6 -53.50
Star 10 32.8 36.9

NA in 2 + 1.8 in 2 = 8.2

12 30 24	-54.72	2.5	70.69	3' 53.3 - 0.3	1.5	-54.03	+ 3 53.0
50 53				+ 3 50.3 + 1.0	2.		+ 3 57.3
13 00 42							
13 7 38	-53.72	3.	-0.43			-54.15	

Reduce to El 12 53 16

$$-54.104 + 3' 52.0$$

$\Delta \alpha$
Ref.
Temp.

Hant (73)

1862 Apr. 26.

Star app. place
Provisional reduction. Apr ²⁶/₂₅

$$11 \ 30 \ 41.37 + 2 \ 55 \ 58.6$$

$$-0.01 \quad +0.1$$

Apr 26.

$$11 \ 30 \ 41.36 + 2 \ 55 \ 58.7$$

Planet - Star

$$2 \ 1.17 + 1 \ 43.9$$

Planet. a. d.

$$11 \ 32 \ 42.53 + 2 \ 57 \ 40.6$$

This reduction has been
examined.

$$\begin{array}{r} \text{Cl} \ 11 \ 32 \ 12 \\ \text{fact} \quad 50 \\ \hline 11 \ 31 \ 22 \\ 2 \ 17 \ 42 \\ \hline 9 \ 13 \ 40 \\ \hline 1 \ 31 \\ \hline 9 \ 12 \ 9 \end{array}$$

$$4.63 \quad 11 \ 42 \ 7.4 \quad 2 \ 12.86$$

$$-34.05 + 2.71 \quad 14.03$$

$$20.43 \ 10 \ 17 \quad 11 \ 46 \ 51.5 + 2 \ 48.91$$

$$-23.08 + 1.62 \quad 22.44$$

$$26.45 \quad 37 \ 16.7 \quad 55.41$$

$$-18.76 + 1.17 \quad 25.41$$

$$26.38 \quad 37 \ 42.5 \quad 57.68$$

$$-14.54 + 0.73 \quad 28.38$$

$$20.46 \quad 21 \ 57.6 \quad 3 \ 0.05$$

$$30.77 \quad 1 \ 21.44 \quad 3 \ 0.60$$

$$\text{May 3.} \quad 11 \ 31 \ 20 + 3 \ 1.1$$

$$11 \ 33 \ 0.7 + 2 \ 46.53$$

$$-16.80 + 1.17$$

$$+ 1.438 - 0.15$$

not very accurate
approx.

Planet (73)

1862 Apr 30th
1875

Bright
Compared with star whose position is

α 11 30 41 δ + 2 56.0

used also Apr. 26th

Chro. Planet w/ star.

El (10^5 subtracted)

11 1 36 Star 45.968
Planet 74.523

11 2 38

+ 28.555

11 4 43 Star 40.216
Planet 68.656

11 5 47

28.442

11 7 26 Star 30.600
Planet 58.640

11 8 30

28.170

11 11 41 Star 35.325
Planet 63.484

11 12 44

(6³)

28.159

In A.P. at angle $35^\circ 8'$

Star
Planet
Star

11 15 33.6 37.0
Planet 16 36.7 40.0

Star 11 17 15.7 19.1
Planet 11 18 19.1 22.6

Star 11 18 53.8 56.9
Planet 11 19 56.7 60.2

Planet (73)

1862 Apr 30th cont.
MS.

Star	11	23	—	1.4
Planet		24	1.0	4.5

Star	11	24	26.7	30.0
Planet	11	25	29.7	33.1

Star	11	25	49.4	52.7
Planet	11	26	52.4	55.8

In Dec. again

Star	Chro.	11	31	36	58.868	11	31	39
Planet	)				79.336			28.468

Star	++	58.904	
Planet	~~++ 34 58~~	79.790	28.886

Star		416.832	
Planet	11 36 58	75.406	11 38 3 28.574

	AD		Reduct.	
El.	11 7 25	28.306 = 4' 37.40	4 comp.	+ 0."29
	11 34 51	28.643	3 "	- 0.34
				4' 37.59
				40.44
				+ 4' 39.64

The point may found to be wrong: so that these declinations are not very reliable.

	AD	Reduct.
El	11 16 34	- 0.03
	16 21	- 0.02
	19 54	0.00
	24 3	+ 0.03
	25 31	0.04
	26 44	0.06
	11 21 52	

Reduce to	11 20 32. El.	$\Delta \alpha$	+ 1' 3.75
-----------	---------------	-----------------	-----------

Planet (73)

1862 Apr. 30th
1145

+ Apr. 24	11 30 41.98	+ 2 55 56.6
	- 0.03	+ 0.2
+ Apr. 30	11 30 41.33	+ 2 55 56.8
Planet-Star	+ 1 3.15	+ 4 39.8
Planet & D	11 31 44.48	+ 3 0 35.8

This collection has been
revised.

El. 11 20 32
fact. 59

11 19 33

2 33 28

8 46 5

1 28

8 44 37 Cambridge mt.

Ephemeris II 11 31 43.3 3 0.9
Corr. + 1.2 - 0.1

for Cyte (73)

1862 Aug 6.

JNS

10 ^h 30 ^m Camb.	11 30 52 + 3	1.2
Cor. Elements	+ 6	- 0.6
Planet	11 30 58 + 3	0.6
Star	11 30 41 + 2	55.95

Chro 236.

Dif. AR (with clock) measured.

Planet n.p. 13	44.25	66.343
Star	45 47	80.433
Planet	46 54	65.064
Star	48 5	79.130
Planet	51 20	62.880

1ⁿ 0.544

Pl.	13 47 33	64.762
Star	46 56	79.782
Cor.		- 0.337

79.445

$$13 47 33 \quad 14^{\circ} 68' 30'' = 2' 23'' 9 - 9' 59'' +$$

Dif. Dir. (clock in)

P.	13 56 10	86.980
St.	57 26	67.513
P.	58 33	84.992
St.	59 36	67.642
P.	14 0 35	84.873

Pl.	84.948
Star	67.578
	17.370

P.	14 6 14	76.537
St.	7 44	90.908
P.	9 31	74.653
St.	11 16	89.010
P.	14 20	71.878

Pl.	14 10 2	74.356
Star	14 9 30	89.959
Cor.		- 0.270
	14 10 2	15.313

- 10.00

Position x n.f. a.

95° 30'

95 14

95 25

Mean 95 24.3

These observations are not very accurate. Clouds prevailed

It clouded up before I could obtain the AR of x. That given above is probably accurate within 1^s. x has probably been observed by W^F Hall.

Clytie 73)

1862 May 6.
J.H.S.

17^h 46^m - 0^s 38 in AR - 1" in Dec

13 47 33 - 9.59 + 2' 50".2
58 26
14 10 2 - 10.00

Reduction

- 0.06

- 0".0

+ 0.07

13 58 40 - 9.79 + 2' 50".2

Planet - x.

1862 May 8 angle 171° 8

Choo. 9

39.8 46.9

2

8.0

15.4

28.35

9

12

50.8

58.0

2

12

13

18.9

26.2

28.15

28.25

2 transits

28.38

5

transit pay

28.25

4

hr.

+ 28.34

Clytie - approximate place

11^h 30^m 59.5^s + 0^s 0'.35

x - a

Dynob. May 8 (the above and following pages)

x - a + 28.34 + 1' 49".0
to app. 11.4 11 30 41.38 + 2 55 58.6
Res. to May 6 - 1.07 + 1.5
2 May 6 11 31 9.62 + 2 57 45.5
Clytie 11 30 59.23 + 3 0.35.7
AR. Dec. 58.2

Position x - a

Circle 95° 24' 3

Angle 75° 43.7

(26.1 8.1)

log 28.34

1.4524

Res. D.

1.1755

only 75° 43.7

9.6056

2.00 (x - a)

2.0333

Choo 13 58 40

fast. 11

13 58 29

2 57 7

148

Cor. Eph. + 7.6 - 0.6

10 59 34 Comb. int.

Clytie?

1862 May 8.

Chr 236.

Object ^{= Planet} of comp. with star x of May 6th
 δ m. p. = $357^{\circ} 8'$

δ	12	18	28.5	
x			41.0	-12.5

δ	19	14.8	
x		27.2	-12.4

δ	20	2.8	
x		15.2	-12.4

δ	21	2.4	
x		14.6	-12.4

δ	21	41.4	
x		53.7	-12.3

Clock m - $261^{\circ} 4'$

Planet	12	32	0'	57.013
Star	34	32		41.348
P.	35	36.		57.398
St.	36	20		41.450
P.	37	43		57.423
St.	38	36		41.478
P.	40	10		57.528
St.	41	4		41.503
P.	42	22		57.604

Planet	12	37	34	57.393
Star	37	37		41.445
				9.948

Hold in $\delta - 0.17$ on $\delta + 1.9$

351° 8'

12 45	59.9	a	
	16.4	Pl.	-12.0
	28.4	x	

	5.6	a	
	21.8	Pl.	-12.4
47	34.2	x	

	13.4	a	
	29.3	Pl.	-12.3
48	41.6	x	

	8.9	a	
	24.5 ?	Pl.	-12.7
49	37.2	x	

[Whole second doubtful fraction right]

	4.3	a	
	20.4	Pl.	-12.2
50	32.6	x	

~~For~~

b-a	Planet - Star x	Reduction
+28.5		
28.6	12 20 6	-12.36 -0.02
28.2	37 34	+9.948.1375 +0.1
28.3	44 10	-12.32 +0.02
28.3		
28.38	Reduced to 35 17	-12.34 +1 32.6

See also preceding date

Cyrie

862 May 8.

Star α (approximate)

App. May 6 (see May 6)

11 31 9.64 2 57 48.5 1st.
- 0.11 + 0.1

" May 8

11 31 9.61 + 2 57 48.6
- 12.34 + 1 37.6

Cyrie 11 R. Dec.

for Par.

11 30 57.27 + 2 59 23.2
+ 1.17 + 5.43

Chro 12 35 17
fast (17)
Sid 12 35 0
3 5 0
1 33

Q 28 27 1st. Cont.

Cor. Ephemeris

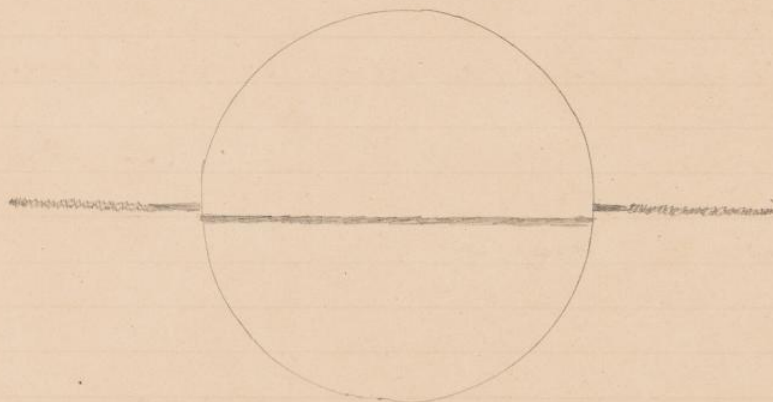
+ 11.5 - 0.82

Saturn

1862 May 6

H. P. T.

Seeing pretty good, power 141.



Zero of Position etc.

1862 May 12
2145

Observations were made to determine the Zero of Position for the movable wire.

In the first place, it was set at

$260^{\circ} 29'$ and the micrometer screw at various readings, each set being composed of two, one in which the star transited the wire soon after entering the field and another soon before leaving.

Thus from $63^{\circ}.625$ } a star was 43° in passing
to 62.932 }

from 63.942 } " " 43 "
to 62.864 }

from 63.665 } " " 46 "
" 62.952 }

from 63.460 } / " " 30 "
to 62.984 }

from 63.590 } " " 30 "
to 63.090 }

from 63.550 } " " 26.5 "
to 63.122 }

From these obs. we get Zero = $261^{\circ} 31.2$

Another set was now taken at the reading $261^{\circ} 45'$ and at this reading a star was 26.5 passing from

$63^{\circ}.263$
to 63.678

/over

Zero of Position

1861 May 12
175

again from 13.160 occupied 39"
to 13.946

from 13.200 " 30"
to 13.809

From these observations the Zero will be
261° 2'.1

And thus from the whole series giving the sets equal weights

Zero of Position 261° 2'.6

It is also evident that the focus is in good adjustment; as
the preceding numbers are in good agreement.

Clytie (73)

1864 May 14
JWS.Star x, Compared with star ⁸AP ^{h m s} 11 31 41 +2° 52' 9" (See Special Notes)

Star x = 12 F (Moonlight) S. P. star 6,

x	13	5	31.6	36.0	-22.95	Interval 3.4 by star.
6		5	54.6	57.9	*	
x		6	27.7	[51.1]	-23.2	
6			50.9	54.3		
x		7	24.0	27.4	-23.0	
6			47.0	50.4		
x		8	10.9	14.2	-23.05	
8			[50.9]	37.3		
x		8	55.0	58.6	-23.25	
8		9	18.3	21.8	-23.09	

Angles of Position difficult. The Pos. is noted, and 10^s after observation is the end of the break on the Chronograph.

Chro. time	El. - 10 ^s	Circ. Reading	} rather doubtful
13 16 24	13 16 24	86° 27' On wire	
18 41	18 41	86 54 "	
20 16	20 16	86 28 Below	
21 24	21 24	86 25 Above	
23 9	23 9	86 50 A.	
24 13	24 13	86 44 B.	
27 33	27 23	87 17 B.	
30 31	30 31	87 18 A.	

x is probably (73) very hard to observe.

over

Clytie (73)?

62 May 14
MS.

Star & Comp. with Star &

x	13	36	49.5	52.1	
6		37	12.5	14.8	-22.85
x		37	40.8	43.3	
6		38	3.9	6.2	-23.00
x		38	22.9	25.3	
6		38	45.8	46.3	-22.95
x		39	22.3	26.0	
6		39	45.0	48.5	-22.60
x		39	54.9	62.3	
6		40	22.7	26.2	-22.85
					-22.85

The following chronometric comparisons were also taken

Chor 236

x	13	1	7.5	13.2	
6			30.6	35.9	-22.90
x		2	26.2	31.8	
6			49.2	54.6	-22.90
x		3	0.8	4.0	
6			23.5	27.0	-22.85
x	13	41	0.3	4.1	
6			23.1	26.6	-22.65
x		42	4.4	7.8	
6			27.2	30.9	-22.75
x		43	15.3	18.8	
6			38.2	41.7	-22.90

There is a trace of motion in the galvanic transit
No appearance of motion in dir. a exaggerated and immediate.

Star for Chyfi (73)

1862phae
SMS

$$a = 19 \ 30 \ 41 + 2 \ 55.9$$

$$c = 11 \ 35 \ 52 + 2 \ 49.$$

Comp. between a, b, c in APP.

$$a. \quad 13 \ 44 \ 46.5 \ 50.1$$

$$b. \quad 45 \ 51.4 \ 54.1$$

$$c. \quad 50 \ 1.8 \ 57.5$$

$$b-a \quad +1 \ 3.95$$

$$b-c \quad -4 \ 11.40$$

$$a \quad 13 \ 51 \ 20.6 \ 24.2$$

$$b \quad 52 \ 24.7 \ 28.4$$

$$c \quad 56 \ 38.9 \ 39.7$$

$$+1 \ 4.15$$

$$\underline{\hspace{1cm}} \quad -4 \ 11.55$$

$$+1 \ 4.05 \quad -4 \ 11.32$$

See also Special Zones

$$\text{Chro. } 13 \ 22 \ x-2 \ -27.95 \quad -84.2$$

$$8 \quad 31 \ 31 \ 45.35 \ +2 \ 52 \ 58.9$$

$$-0.15 \quad +1.0$$

Apr. 24 all by comp. and spec. zones. Dec. by spec. zones, to May 14

$$11 \ 31 \ 26.75 \ +2 \ 52 \ 24.6$$

$$25.27 \quad 20.6$$

appr.

9^h 55^m

Uyji (73)

1862 May 14.

If the object observed is Uyji, we can have much confidence in the right-ascension, in account of the large number of transits taken. The same is not (relatively) true of the declinations. The planet was so faint owing to moonlight and haze that the light required to read off the position circle left the eye barely able to see it; ^{a similar} ~~the same~~ cause (thought in a less degree) affected the transits by chronometer.

$$M.U. \text{ is } + 0.35 \text{ is } S - 4.0$$

Time	El.		Reduct.		
13 20	-23.09	5 comp. El.	+0.09	-23.00	5
22 45		Sec.			
38 31	-22.85	5 comp. El.	-0.09	22.94	5
Chro. 13 230	-22.84	3 comp. Chro.	+0.12	22.76	3
42 4	-22.83	3 comp. Chro.	-0.12	-22.95	3
Chro. time = Time El. within 1."		Mean -22.93			

Mean for M.R. and Sec.

13 22 43.

for Sec.	by D.A. and S.	by D.S.
13 17 35	Dif. M.R. C. -22.90	2.5353 "
20 50	-22.92	5357 "
23 41	-22.94	5361 "
29 2	-22.97	2.5367 "
		263 25'
		263 40
		263 18
		263 47
		1 49 20
		-28.3

1862 May 17 (73) 11 31 53.6 +2" 49.0 9 "Lambert
Total 31 21.2 2 49.13

1.5255" - 33.5
5058" 32.0
5353" 34.3
1.5399" - 37.5
-34.3

El. 13 22 43

Planet - Star -22.93 -0' 34.3

fast. 31

13 22 12

3 28 40

9 58 32

1 32

Camb. mt. 9 51 55

Chapter 73.

Saturn (Disappearance of Ring)

1862 May 18 8^h 10^m m. s. t.

Found that the ring had 'disappeared' an exceedingly narrow thread of light remaining on either side of the ball.

It is remarkable that now, with the Sun 45° 1' above the ring there is a decided dark line - a shadow of the ring as it appears across the equator of the ball much more readily distinguished than the edge of the ring.



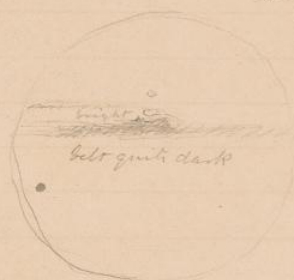
H. P. T. saw that the ring had disappeared
May 17th at - 8^h

Brighter
A few days later I could see that the ring-edge had become

About June 8th saw distinctly the edge with bright beads as in 1848.

Jupiter.

1862 May 18.

2 bright spots below a
large areaSpots in centre of disk
8^h 16^m on s. t.

Chitic (73)?

1862 May 24th

185. [2610 5"] Look star & compared with star $\alpha = 11 \ 32 \ 2.3 + 2 \ 30.6$ 8^m 9
 a 14 22 10.3 17.2 Chron. 236 [which has been obs. at Bonn]

x 23 34.0 41.3 - n. f.

a 25 0.2 6.9

x 26 24.2 30.9

a 27 6.4 13.3

x 28 30.5 37.4

a 29 15.7 22.4

x 30 39.6 46.3

a 32 59.0 65.8

x 34 23.4 30.0

a 49.296

x 39 25 39.306 not very good

a 49.200

x 45 32 38.718

a 49.065

x 48 37 38.920

a 53.433

x 51 22 42.792

a 53.315

x 50 53 43.283

[It was hard to obs. in dec. May.]

a 57 1.0 7.3

x 58 25.7

a 59 6.0 12.0

x 0 30.5 36.7

a 15 1 59.8 65.5

x 2 24.3 28.8

α 15 4 53.8 57.7
 κ 6 18.3 22.3

α 15 7 7.8 12.4
 κ 8 32.2 36.8



$\alpha - a$	H.M. assumed	$+0.5$	-7.5	Reduced
14 23 38	$+1' 23.90$	$+0.23$		$+1' 24.23$
26 28	24.00	0.29		.29
28 34	24.10	0.26		.36
30 43	23.90	0.22		.12
34 27	24.30	$+0.17$		<u>.47</u>
				$+1' 24.294 \quad 5)$
39 25	$+1' 37.9$			$\pm 0.8 \quad 1' 37.1$
45 32	42.7			0.0 42.7
46 37	39.2			$+0.4 \quad 39.6$
51 22	44.3			0.7 45.0
53 53	38.3			1.0 <u>39.3</u>
				$+1' 40.7$
14 58 26	$+1' 24.70$	-0.19		$1' 24.51$
15 0 24	24.60	0.22		.38
3 27	24.40	0.27		.13
6 20	24.55	0.31		.24
8 34	24.40	-0.34		<u>.06</u>
				$+1' 24.264 \quad 5)$

236 3.3. f. of $\epsilon\epsilon$
 $\epsilon\epsilon$ 55.4 f. of J.T.
 59

Reduced to $\epsilon\kappa$. 14 45 40
 -59

S.D.J. 14 44 41

Chyke

1862 May 24
11.5

P.M.T. 14 44 41
 4 8.
 1.
 C.M.T. 10 35

x - a	+ 1 ^m 24.28	+ 1' 40.7	not corr. for Refr. or Temp.
a 1862.0	11 32 23.9	+ 2 29.3	
Red trap.	+ 2.7	- 17.4	
x app.	11 33 50.9	+ 2 29.7	
Cor. Formula 2)	+ 48.3	- 2.9	

x is probably (73)

This determined in Book Special Zones

El. Time 14 44 41
 El. part. 54
 14 43 47
 4 8 5
 1 35
 W. hand. 10 34 7

for Office

Obs May 25th

Form.	11	33	41.7	+ 2	26.85
Cor.			32		- 3.1
Obs. 9 ^h 10 ^m 15 ^s	11	34	35	+ 2	23.7
		34	34	2	24.04
Star Area			+ 2.3		- 0.3
			21.4		- 0.3

Dist. Mod.	+ 21.5	- 3.10
Cor.	+ 2.2	- 0.1
Dist. Mod.	+ 23.8	- 3.2
Star Mod.	+ 0.99	- 0.0

a	8.3 K	11	33	20	+ 2	22.4	- 1.6
b	7.5		34	18	2	20.1	
c	8.0 K		38	3	+ 2	20.6	

for Zero of Position

1862 May 26
7HJ.Miles visible in twilight - β Virgin
 $60^{\circ} 28' 5''$ Rt. Vernier
 $260 \ 27.5$ Left "
 Telescope E. of pier

 $261^{\circ} 40'$ Rt.
 $261 \ 38.7$ Left
 E. of pier

 $12 \ 4 \ 24 \ 53.585$
 $4 \ 56 \ 53.141$
 $59. \ 53.484$
 $28.5 \ 54.002$
 $5 \ 54.5 \ 53.599$
 $6 \ 25. \ 53.150$
 $28.5 \ 53.500$
 $7 \ 16. \ 53.650$
 $7 \ 42 \ 53.190$
 $16.5 \ 53.500$
 $53 \ 54.050$
 $9 \ 29.5 \ 53.252$
 $10 \ 6.0 \ 53.202$
 $18 \ 23 \ 53.530$
 $58.5 \ 54.099$
 $10 \ 53 \ 53.780$
 $11 \ 28.5 \ 53.150$
 $34.5 \ 53.581$
 $6.5 \ 54.100$
 $12 \ 10.0 \ 53.850$
 $43.0 \ 53.300$
 $43.0 \ 53.649$
 $15.5 \ 54.180$

9.315			High			261 39.35		
9.642	9.662	7.947	30.4	260 58.4	22	9.683	9.496	8.028
9.652	9.667	7.923	33.1	261 1.1	4	9.740	555	7.993
9.663	9.678	8.063	39.8	7.8	22	9.755	570	8.020
9.740	9.555	7.993	33.8	1.8	2	9.715	530	8.024
9.724	9.539	7.989	33.5	1.5	3	9.725	540	8.028
9.740	9.555	8.036	37.4	5.4	5			
mean			261 2.7	day		261 3.5		

 $261^{\circ} \ 3.1 \pm 0.51$ [should be corrected for refraction]

1 Comp

 ± 1.70

for Clytie

562 May 26

α^0 = a of May 24	13	33	49.0	54.5	Scale approx 9.3
β = II 570 Wisp	34		63.5	48.8	2.8
δ = Arg. star 9.10 M.	35		41.4	47.0	2.8

using α^0 as used May 24th - β =

Clytie

$$\begin{array}{r} 11 \ 34 \ 19 \ +2 \ 21.5 \\ +16 \ \quad \quad +2.2 \end{array}$$

Clytie comp. with δ in AR

134

W.M. in AR +0.599

38 52.7 57.5

Chen

Reduction
14 6.40

39 — 12.9

13 39 13

+15.4

+0.45

15.25

54.4 59.7

9.6 14.7

13 40 12

15.1

0.43

53

6.8 0.4

42 47.6

43 3.3

13 43 3

15.7

0.39

16.09

5.1

20.5

13 44 20

15.4

0.07

15.77

56.8

45 12.3

13 45 12

15.5

0.35

85

49.6

5.2

13 46 5

15.6

0.34

94

46

44.0

59.8

13 47 0

15.8

+0.32

16.12

Cylin comp. with 7 in Dec.

261° 3' - Clock put in

11h - 7"7 Reduced to 14 9 40

Pl.	13 54 17	67.846	10.780	+ 2'15"0	- 2.0	13.0
Star	55 14	54.114				
Pl.	56 57	68.092	13.692	2 16.1	- 1.6	14.5
Star	58 15	54.264				
Pl.	59 40	68.122	13.869	2 15.9	- 1.3	14.6
Star	14 0 42	54.246				
Pl.	2 34	67.759	13.458	2 11.8	- 0.9	10.9
Star	3 46	54.354				
Pl.	4 12					

Pl.	12 12 7	67.956	13.263	2 11.0	+ 0.3	11.3
Star	13 12	54.647				
Pl.	15 40	68.623	13.936	2 16.6	+ 0.8	17.4
Star	17 5	54.714				
Pl.	19 38	68.504	13.662	2 13.9	+ 1.3	15.2
						2 16.44
						+ 0.38

in AR - Measures

Angle 171° 3' - Clock put in

Pl.	14 27 9	70.046	14 30 9	88.187	Pl.	
Star	28 26	64.733				
Plant	30 8	88.284				
Star	31 23	62.540				
Plant	33 11	86.123				
Star	14 36	49.6				
Pl.	37	5.8				
Star		32.2				
Pl.	37	48.5				
Star		25.9				
Pl.	38	42.4				

24.694 =	4' 2"0 - Down	+16.15
6.9	Radurhi	- 0.39
	13 43 37	7
	14 58	7
	940	6
		11.3 - 0.57
		16.5 - 0.53

Reduce to 14 16 30 Chro. J.

Star for Cybele

662 May 26

Avg 271" 3'

a	14	41	43.1	49.3
b		42	41.3	47.6
c		46	26.3	32.1

b-a

b-c

+ 58.25

- 3 44.75

a		47	48.0	53.3
b		48	46.6	51.8
c		52	31.0	36.4

+ 58.55

- 3 44.50

a		54	26.7	38.5
b		55	25.0	33.7
c		59	9.6	18.4

+ 58.25

- 3 44.65

V. Dear p.

+ 58.05

98.97

a	46.704
b [north of a]	47.775
c [south of a]	39.598

a	37.365
b	38.564
c	30.266

1.05

Reduction to app

Both Diff. Alt and Diff. Dec. had better be reckoned

	$\Delta \alpha$	$\Delta \delta$
b-a	+58.27	+11.12
b-c		

b-c	- 3 44.63	+ 1 20.75
Red. to mean	+ 0.02	- 0.02
Ref.	1.01	
Temp (55°)		+ 0.05

	a	b	c
Q	323		
L	173° 20' + 33.26	173 34.5	174 20' 33.36
H	201 46 9° 0.04	0.03	0.02
g	8.637 2° 5.60	8.637 5.60	8.634 5.97
alt (4)	8.758 Δ 39.00	8.725 39.07	8.517 39.37
g	1.1629		
alt (4)	9.9993	9.9994	9.9992
red.	0.0004 9° 14.53	0.0004 -14.53	0.0004 -14.54
alt (4)	9.9929 1' + 0.04	9.9493 -0.04	9.9725 + 0.03
L	130 47 2' - 3.34	- 3.34	- 3.34
alt (4)	9.9826	9.9821	9.9800
red.	8.637 -17.07	8.637 -17.07	8.634 -17.07

Cybie

16/12 May 25th

Planet - Star

Reduced to 14 6 40

Δt

Δd

By 7 transits before dec. $+15^s.88$

" 3 measures 15.76

" 3 transits 15.82

Mean of all $+15^s.438$

In Dec

Rev

Reduced
to 14 6 40

Planet 13 58 22 $67^s.955$ -54.214 $\times$ $+13.741$ 4 comp. $2'14".66$ $-1".10$ $+2$ 13.56 $\times$

Star 13 59 12 54.237

" 14 15.8 54.680

Planet 14 15 48 18.361 -54.698 13.663 3. 2 13.90 $+1.20$ $+2$ 15.10 3

Mean

Refr.

$+2'14".22$

Apr. $(+0.08)$

[Temp. 57° : no effect]

~~To correct for refraction is impossible, so far as regard the transits. For the measures made with clock in motion, the following formulae hold.~~

Refr. corr. for decl. about $+0".04$.

Chili

662 May 26.

N. II 570

Lalande 1800.0

3.0775 -19.904

Pape 1825.0

3.0773 19.911

Challis 1853.0

1897.5 19.916

			Per.			Per.	
11	30	7.26	+ 3.078	+2	42	24.5	-19.589
	+3	10.805			-20	34.05	2061
	31	24.54	3.078	2	34	6.6	19.90
	+1	53.86			-12	16.71	
				2	24	48.39	19.91
					-2	59.92	

II 656

~~11 34 5~~

Lalande 1800.0

3.0764 -19.952

Pape 1825.0

3.0761 19.955

Challis (Mural) 1849.0

3.0759 19.960

11	34	50.25	+ 3.077	+ 2	41	18.8	-19.939
	+ 3	10.74			-20	37.0	
	36	6.26	3.076	2	32	55.6	19.95
	+ 1	53.82			-12	14.3	
	37	21.22	3.076	2	26	57.76	19.957
		39.99			-4	19.48	

	<u>a</u>		<u>L</u>		<u>L.L</u>
1862.0	L	11 33	18.07 + 0.03	+ 2 21	50.4 - 2.6
	B	33	18.40 - 0.02	21	49.9 + 0.9
	Ch.			- 22 21	48.5 - 0.6

Ad. L. 131 Ch. 2 11 33 18.24 + 2 21 48.6

1862.0	L	11 38	0.99 + 0.03	+ 2 20	41.8 - 2.6
	B		0.66 - 0.02	37.3	+ 0.9
	Ch.		1.21 - 0.02	38.3	- 0.6
	Hawell		1.40		

Ad. L. 131 Ch. 2 11 38 0.95 + 2 20 38.2

1862.0	b-a	+ 58.27	+ 11.1
	b-c	- 3 44.61	+ 1 20.8

Adopted for b. 11 34 16.42 + 2 21 59.4
[It may be necessary to determine b for AR]

	<u>1862.0</u>
L	11 32 10.7
B	2 29.14
Ch.	11 36 52.0
	+ 2 24.94
b-a	8.6376
b-c	8.6341
Ch.	9.0831
	9.0830
Ch.	0.1265
	1.30224
Ch.	9.99680
	9.99778
Per. x	3.0774
	3.0762
b-a	-19.909
b-c	-19.954

Alpha

1662 July 26.

Star 1812.0	11	34	16.42	+ 2	21	59.4
Par to app.			+ 2.60			- 17.1
Planet - Star.			+ 15.84	+ 2		14.3

Planet α . S.	11	34	34.86	+ 2	23	51.6
for Par			259			5.53

Chro.	14	6	40
fact		1	3

14	5	37
4	15	58

	1	37
--	---	----

9	48	2	Cambr. m. t.
---	----	---	--------------

Cambr. 9 ^h	11	34	34.1	+ 2	24.05
Formula			33	41.9	2 16.85
			+ 59.2		- 2.80

Eclipse of Moon

1862 June 11/12

Clouded up soon after $\odot$ entered penum-
bra. Cloudy at 1^h 30^m & at other times during Eclipse. Clear
in New West River &c.

Chytie (not the planet)

1862. June 16.
A.U.

Compared a very faint object with Star H2. $11^{\circ} 47' 19'' + 0^{\circ} 52' 42''$
The object is north preceding star.

			AR	Sun	
236 =	15	37	0	9.51	58.20
		40	28	9.94	58.26
					58.23
					9.73
				42 -	48.50

			Sun	
16	6	0	53.08	
	7	30	53.23	58.23
				53.15
			48 +	5.08

Star for 1862.0

$$11 \ 47 \ 16.44 \quad + \ 0 \ 53 \ 22.0$$

The observation in AR above should be pretty good, that in Dec is very uncertain, the object being very faint.

Star of Perseus Clytia

1862phae.proj..200B

602 Jan 17

1. Stars not very good.

At 261" 29.5

After 2^h or 3^h search by Mr Hale June 16 & as many
by T.H.S. ~~with~~ 18th with 2^h or more by G.P.B. on 16 & 17 Clytia
was certainly recognized of 13-14 mag.

Ulysses

1862 Jan 17
JMS

For ^{original} notes see after Apr. 24th where they were placed by accident.

Copy.

α = "Ulysses" comp. with star α in AR. Clock put in: movable wire employed for both objects. α is south following α .

Obs. time (23h)		Corr. for motion of telescope	$\alpha - a$ $\Delta \alpha \cos \delta$	$\alpha - a$ $\Delta \delta$	Result for motion
α 15 21 17	87.382		+ 14.229 = 2' 19".4		+ 8".0
a 22 25	72.506	+ 0.647			27.4
α 24 18	85.663		14.330 2 20.4		6.6
a 25 22	70.923	+ 0.610			23.0
α 27 23	86.558		14.892 2 25.9		+ 5.2
a 28 25	69.075	+ 0.591			31.1

Change in $\cos \delta = 3".434$

Computed in Dec.

α 15 39 56	56.772			- 25.073 = -4' 5".7	+ 0.3
a 41 26	79.303				
α 43 5	54.332			- 25.013 = -4' 5".1	+ 1.0
a 44 21	79.387				
α 46 4	54.206			- 25.139 = -4' 6".4	+ 1.7
Mean for α	79.345				

Comp. in AR.

α 15 51 36	79.396		+ 16.040 2 37.2		- 6.0
a 52 42	62.727	+ 0.629			31.2
α 55 37	77.303	- 1.668	+ 16.244 2 39.2		- 7.8

Reduce to Chron. time $\Delta \cos \delta$ 15 38 40 $14h \alpha + \Delta \alpha \cos \delta = +27".7$ $\Delta \alpha \cos \delta + 2' 29".6 \Delta \delta - 4' 4".7$

Alfie

562 June 17th

Star place

1860.0 *Harvard Star*
Precession

11 47 16.44 + 0° 53' 22".0
+ 0.14 - 40.0

S.C

S.C

1862.

11 47 22.58 - 0° 01' 0 52 42.0 + 0".8

Red. to app.

+ 2.46 - 16.3

Planet - Star

+ 9.97 - 4 4.9

Planet & S.

11 47 35.00 + 0° 48' 21.6
+ 0.356 + 5.70

for parallax

Choo 15 36 40

fast. 2 7

to 2. 15 36 33

5 42 43

9 53 50

1 27

9 52 13 *Cambr. mt*

G	44 23
x	176 51
H	183 15
f	31.86
g	0.10
h	0.04
i	36.90
j	16.08
k	+ 0.31
l	- 0.50
m	
n	
o	
p	
q	
r	
s	
t	
u	
v	
w	
x	
y	
z	

Ref. + 2' 29".6 - 4' 4".7
- 0.1 - 0.2

Temp. 57° cov. invisible
+ 2 29.5 - 4 4.9

9 52 13

- 23 42

- 21 9

9 722 *Washington*
3801

(1862.0)
Reduct 176° 53'.01 + 0° 48'.69
+ 0.61 - 0.26
176 53.62

C. 11 47 34.5 + 0° 46' 26"
O. 47 35.1 24

Cor. of Eph. + 0.6 = 2"

86
10
4
0
08
31
50

for Ayrice

1862 June 19th
1875.

52.7 57.3

it

x	16 22 54	62.94
x	75 20	49.66
x	28 7	64.72
x	29 29	57.8
	30 51.	13.63

That only came up, and after they were through it was impossible to identify
 (73) with certainty.

Saturn

1862 June 19th

Saw Saturn well in evg twilight edges of rings
 very plainly visible with for evident inequalities of light just as in
 1848.

Not correctly drawn



Students

1862 June 19th

2nd fourth of Senior class came up to night

Wed 18th or if cloudy (as it proved to be) Thurs 19th were
opposed to this division on their representation that through
bad weather and a misunderstanding of the appointment they
lost their chance last year as Juniors.

For Clytie (73)

1862 July 1st

Clytie. From Ephemeris

11^h 59^m 48^s - 0° 35.7'G.P.B. obs.
A.H. rec.1865 11^h 57^m 52.2 - 0 42.8

+ 24 2.4

mag. 8.4 11 58 16.2 0 45.2

mag.	9.5	1862.0	11 56	1.7	- 0	53.2
	8.5		11 56	14.0	- 0	52.6

AR

Δα

p? (236) = 15⁻ 57 18.7 - 25.1
 * 57 39.7 - 46.6 - 21.25

p 59 1.8 - 8.9
 * 59 23.2 - 30.1 - 21.30

p 0 3.2 - 9.9
 * 0 24.6 - 31.1 - 21.30

p 4 37.8 - 44.6 - 21.05⁻
 * 4 58.9 - 65.6

(236) is far of Sid. Line (2nd 49.7)
at 17^h 20^m.

(236)	Δα
15 ⁻ 57 21.9	- 21.25 ⁻
59 5.3	21.30
60 6.5	21.30
64 41.2	21.05 ⁻
Mean 16 0 18.7	- 21.225 ⁻

planet north of star.

Dec.

16	10	7	29.52
	11	45	28.69
	13	20	28.84
	15	37	28.84
Mean 16	12	42.2	28.972
			58.357

Δδ + 29.385

Δδ + = 287.97 = + 4' 47.97

Mot. to 16 10 36

Temp.

Refr.

Δδ + 4' 48.9

Dens of rain

Ex. ther. 57°

58.41
58.37
58.32
58.33
58.357

(73) Continued.

July 1.

<i>AR</i>				
16	19	23.8	-	33.3
	19	44.6	-	53.8
				-20.65
20		10.7	-	20.6
20		31.6	-	41.0
				-20.65
21		28.0	-	37.1
21		48.2	-	57.6
				-20.35
22		12.6	-	21.7
22		32.6	-	42.1
				-20.20

(236) <i>Ad</i>				
16	19	28.5	-	20.65
	20	15.6	-	20.65
	21	32.5	-	20.35
	22	17.1	-	20.20
16	20	53.4	-	20.462
16	0	18.7	-	21.225
16	10	36.0	-	20.843 = <i>Ad</i>
	2	49.5	-	Ref. - 0.021
236 Jan	16	7	-	46.5
Sid. Time	6	37	-	54.4
	9	29	-	52.1
	1	33.4	-	
Camb. m. l.	9	28	-	18.7

A in *Bessel Star*, *Arg.* (10.58 8 - 0° 45')

Comp Star. of 12 mag.

Cir. at 261.3'

Scale "

<i>A</i>	16	24	11.4	-	20.6		2	26
Comp Star		25	53.0	-	62.6	41.80	6	50
		27	12.2	-	21.6		2	31
		28	59.0	-	63.6	41.90	6	50
		30	35.3	-	44.9		2	7
		32	17.5	-	27.0	42.15	6	28
						+ 1		41.95
						Ref. +		0.04
						<i>Ad</i>		1 41.99

Diff Dec. obs with Micr.

16	43	33	32.00
	46	27	31.34
	49	37	31.72
			31.687
			38.357

C.S.-*A*, + 26.670

+ 4' 21.37

Temp + 0.05

Refr. + 0.67

Ad + 4' 22.0

<i>p</i>	16	34	22.0	-	31.7
<i>*</i>		34	42.0	-	51.7

(73)

July 1.

Comparison Star.

W. XI. 992	11	58	21.00	-	0° 32' 18.1	
Proc to 1862.0	+ 1		53.60		- 12 22.0	
	11	58	14.60	-	0 44 40.1	
Red to aph			+ 2.39		- 15.9	
Star A	11	58	16.99	-	0 44 56.0	$\theta = 4^{\circ} 26'$
Comp Star - A	+ 1		41.99		+ 4 22.0	$\alpha = 179^{\circ} 34'$
Comp Star	15	59	58.98	-	0 40 34.0	$H = 170^{\circ} 50'$
$\Delta \alpha, \Delta \delta$			- 20.86		+ 4 48.9	
Planets α, δ etc.	15	59	38.12	-	0 35 45.1	$f = +39''.18$

Obs'd by G.P.B.

Rec'd by A.H.

The motion of planet clearly distinguished = 0.75 in R

No other objects near

Chytis is of $13^{\text{th}}-14^{\text{th}}$ mag.

δ	8.1137m	+39''.18
$\sin(\delta + \delta)$	8.8436m	+ 0.02
γ	1.2332	-3.60
$\sin(\delta + \delta)$	9.9984m	
$\delta \delta$		+35''.80
$\sin \delta$	0.0000	
$\sin(H + \delta)$	9.2221m	-17.05
h	1.3096	-0.26
$\sin(H + \delta)$	9.9939	+1.43
$\sin \delta$	8.1137m	
i	0.1553	
$\delta \delta$		-15''.88

Saturn

1862 July 1

Saw the ~~two~~ bright ~~mapes~~ ^{spots} on the edge of the ring
very plainly two on each side

The dark central band where ring crosses ball
is not so black as usual. I cannot satisfy myself

whether the plane of the bright part of ring is above or
below the ~~the~~ line of the dark band

Mr Hale saw the bright
places distinctly.



Search for Comet II 1861

1862 July 3rd

Winnecker Ephemeris in M. N. May 1862

Paths projected on Carrington's Chart

10^h m. & t. Comb.

Comets at	6 ^h 9 ^m	} Eq 7855.0
Dec	89° 00'	

Daily mo. in R	+ 40 ^m	(10' in arc)
Dec	0.	

Found Carrington's stars & knew precisely the place of Comet but
 could only suspect one or two objects near. There was a good
 deal of light mist in the air.

New Comet,

July 3, 1862.

Comet discovered by Prof. Bond (naked eye), at X_0^h

At about 11^h m.s.5 an object was seen with naked eye in Dec 79° R 21^h which was not recognized as a nebula or cluster & was called 'a Comet' though scarcely taken to be really one. - ^{as the sky was misty} Half an hour later put the Comet seeker on it & found it to be such. Motion very rapid & visible to eye like a balloon. $19^h 3^m$ R fol 60.3
 Comparison with small star 12th mag following one of group 25. of Bond 8
 At $18^h 55^m$ R $78 \pm$ beats = $38 \pm$
 8^m 98^3
 1^m 12

Comet moving north in declination.

Scale upside down & errors of 1' possible.

Comet north fol *

(236)

*	13	42.0	Time for Dec.	2' 03"
R	19 14	15.2	13 "	58.9 7 30

R	16	44.6	16	12.5	2	43
* X on	16	49.2			9	9

R	21	8.6	20	37.0	9	0
*	22	20.0	37.5		+0	41

R	25	19.1	25	00.0	10	10
*	27	33.5			0	2

Star of Comp is 10 mag perhaps 9, 10
 A star of 10 mag 29' from star of Comp and
 is 1.5' south of it.

See next page for another observation

N.B. Scale is upside down &
 the figures on it could not be made out.

In the second comparison it looks as
 though * and R should be interchanged.

Sid Time subtr. 360

Return to 336 $19^h 19^m 5^s$ = Comet $12^h 28^m$
 1^h - 909^s + 24' 7"

Cor

Return

19 14 15.2	+33.2	-1 11.9	-36.2	+2' 4" 0	+7' 31" 0
16 44.6	+4.6	-36.2	-36.2	+1 8.9	7 34.9
24 00.6	-1 11.4	+32.5	-36.9	-39.9	7 39.1
25 39.5	-2 14.0	+2 05.7	-36.7	-2 26.2	2 39.8
			-36.68		+7' 36.2

Cir. Reading Star.

Reduced to $19^h 19^m 0^s$

Star unknown

19	31	46.5			
236 for	2	5.4			
19	28	52.5	Dec + 76° 28'	20 58 14	East. R Star
1	29	22.	R 18	5.44	0 33
20	58	14	R 5 = +76	33.4	$\alpha = 20 58 47$

At $19^h 14^m 1^s$ of 236

Another setting

41	25.5
19	38
1	19
20	58

New Comet

July 3. 1862

Star x compared with star of 8 may, & in 9.10 may

			win	scale		
X	19	52	13.8	32.2	6	"
8 may.	59		41.1	59.7	7	32

Time of Dec.

			3 ^m	39 ^s	6	5 ⁻
			4	4	6	10
					6	35

Comet here compared with star of 8/9/10 may.

			Scale	scale		
	20	4	24.1	- 37.9		
X		14	6.2	- 23.7		

			Scale	scale		
	20	16	45.2	- 58.6		
*		29	44.0	- 61.5		
8 may		37	11.1	- 28.2		

9	425
4	315.31
11	167.14
5	0.6327
12	4.5087
8	127.62
2	4.5539
+	39.5
-	47.9
+	22.4
+	13.2
-	11.6
+	0.4

20	4	31.0	- 9	43.95	20
	16	52.9	13	0.85	
Mohr in 1 ^m	-	22.04			
Reid in 1 ^m	Chr	20	10	41.4	

Mohr	+ 155 ¹ / ₂	+ 21	5 ¹ / ₂
	+ 146.0	2	1.0
	- 121.44	2	8.6
	- 129.9	2	5.1
		+ 2	5.0

Arg. 21703 = 8 may

0	30	30	+ 76	54
20	36	40		
Cor to center of field	72			
20	35	28		
	2	54		
20	32	34		
21	3	4		

R 8 may	21	3	4	Inst.
	20	26		
R 8	20	42	38	

Dir + 76° 54'

2 48

76 56 44 at 236 = 20^m 16.7

Approximate Red.

21703, Arg. 1842.0	21	2	23.40	+ 76	49	45.5
Red. to 1842.0			- 18.85		4	46.4
1862.0	21	2	4.55	76	54	31.9
			+ 4.33			2.0
			+ 2.94			4.4
	21	2	7.46	76	54	36.3
			- 7	27.15	- 1	25.5
Star x app.	20	54	40.31	+ 76	53	10.8
R - *			- 11	22.40	+ 2	5.3
R x, 8	20	43	17.91	+ 76	55	16.1

at 236 = 20 10 41.4

- 2 55.8

20 7 45.6

6 45 47.49

18 21 58.11

2 21.39

Comb. m. l. 13 19 46.72

New Comet

July 3.

13 May

Comet Comp with 2 of 11 May, northernmost of a group of 4 or 5 of

~~50.39~~

N.B. The nucleus or bright point in nebulous mass
on side next sun appeared of exact obs $\pm 1''$ or $2''$
Angles of position were taken from stars near its path. The aim
Instrument Work of Per was always to get one
or more distant positions

~~50.39~~

Before & after times of nearest approach &
same at this epoch -

236 =	20	55	20.0	297° 48'
		56	16.0	289 44
		57	13.7	282 46
		58	19.0	276 28

21 2 31.4 Diff. den. 10' 48", and AR nearly the same at this time, Star 2 and Comet

21 5 7.2 Comet in same R with star of 12th dist 15" 9 paper 51 star
5 43.0 " Dec " 9 paper 51 star

Comet	Comp with Star	dist of 10 th mag		
21	12	39.5	281	20
	13	31.0	290	5
	14	35.3	309	44
	15	11.5	325	18
	16	13.2	351	10
	18	5.0	22	58
	21	19.0	42	59

Comet 5' north and per *

New Comet

July 3, 1862.

Kappa A.C. 7005

Comet Compared with Star of 4th mag.
Comet north fol. *

* 21	26	38.0			1	58"
	33	35.0?	32	53	2	25-

Instrument reversed to Telescope East of Pier.

Comet comp. with 7.8 or 8, mag

Comet is n. of star

* 21	52	29.2 -	17.0	5	58"	Time of day (236) =	22	30	20	This instrumental place probably belongs to the last star observed 8/9 mag			
	54	11.8 -	24.7	2	55"	53.11 35.0		2	55-				
							22	27	25-	+ 77	30		
* 55	59.9 -	18.0	5	32	H. West	2	19	40	18	0	03	44	
56	55.8 -	9.1	1	48	56.11 24.0	20	7	45-					
						At	0	51					
At 236 = 21.56.9 at 20 8 36 77 33 44													

Star of 11 mag

22	2	39.9 -	200°	15-180°
	3	22.0	265	50
	4	22.5-	260	45
	6	0.5-	248	50
	10	5.0	248	45-

Comet passed to the north of star

Star of 8.9 mag

22	14	12.5-	297	18
	15-	5.5-	308	10
	16	8.5-	323	20
	17	52.0	357	5
	20	28.0	27	37
	22	9.0	37	32

Bright twilight
Comet small but
good central point

New Comet

July 3 - Cont

Approximate

Time by	R.	Dec.
236		
19 ^h 14.1	20 58 47	+76° 33' 27"
20 16.7	20 42 38	+76 56 49
21 17.9	20 8 36	+77 33 44
20 10.7	20 43 15	76 55 12
21 33.6	20 20 25	77 22 12

Dij. E.

Dij. α

Hly mo

in R

in Dec

62.6 - 969^s +1402"
100.2 - 2042 +2215

-15.7^m + 22.4
-16.92^m + 22.4

15.7 1.960
16.92 20.4 1.3096
mean δ cor. 76° 45' 08" 9.3601
77 15 16 9.3437

Mean

Hly Motion in R reduced for cos δ - 1.01
Dec + 0.37

In arc of 0.90 = 3.60 0.5561
Great circle on 0.93 3.74 0.6533
2 quater

Hly motion in great circle $\sqrt{1.01^2 + 0.37^2} = 1.08$

Daily motion 25.9

If above places are correct [The last obs was incorrect]
it is approaching Earth
but the discrepancies are too large

Path is inclined by about 13° to circle of lat.

Approximate places of Comet

Hly. motion

	α 1862.0	δ 1862.0		
239 19 ^h 14.1	20 ^h 57 ^m 47 ^s	+76° 33' 27"	in α	in δ
20 10.4	20 43 15	76 55 12	236 = 19 42 ^m - 15.7 ^m	+ 22.8
20 16.7	20 41 38	76 56 49	20 51 - 16.65	+ 19.8
21 33.6	20 19 25	77 22 12	21 18 - 16.92	+ 18.3
22 17.6	20 6 45	77 33 44	21 55 - 17.29	+ 15.6

Comet moved just 24° of great circle between July 3rd & 4th

New Comet

July 4. 1862

(236) = 16	^h	^m	^s		
	8		11.0	289	15
	9		18.0	275	20
	10		19.7	229	20
	12		49.3	332	35
	13		39.0	327	20
	15		53.7	320	25

Star of comp is of 12th mag = a,
Comet moving South in Dec

Prof. Bond obs.
A. Hall rec

Comet passes to app. left of Star, Comet near
Meridian and above pole

N.B. Not being able to read the numbers
on the scale as it is upside down errors
of 1' are not improbable

Star of Comp of 11th mag = b,

16	18	55.5	186	10
	19	30.2	210	0
	21	57.2	255	5
	24	8.0	277	0

Comet passes to app. right of Star.

(236) At 16 25 11 Comet is 5' from Star and is 1' south

New Comet

July 4.

Scale Set at $35^{\circ} 2' 45''$
(Star is of 8 mag.)(236) = 16 35 3.4
37 14.0

 3 00 2' 43"
4 0 2 41

 Obs. 16 35 3.4 -0'17"
 37 14.0 1'19"
 36 47.1 -3 32.80 -4 41
 41 55.0 -5'14
 42 26.0 -5 21.15
 42 41.4

 16 36 41.8-52.4
 * 40 18.9-30.9

 Mean AR 16 39 44.25
 " for 39 7.60 (24.60)

 Motion in 1st AR -7.52
 (Lobry) for. -44'55"

 41 55.0
 42 26.0

 7 00(±1'?) 2 19
 7 30(±1'?) 2 16

 42-36.0-46.8
 47-36.8-68.3

There is no security whatever
about this conclusion
The most probable hypothesis is that the first
time (16 35 3.4) is ^{16 35} small.

 Obs. time 16 39 27
 2 58.2 Alt. -4 29.425 -2 52.85
 42.13 -6 75
 Liv. time 16 36 28.8
 8 49 46.05
 9 46 44.75
 1 36.13
 M. Lander. 9 45 8.6

Star Place

(236) = 16 49 54.0

2 58

16 46 56.0

H.W. + 1 0 10. Vernier 3.

 AR = 15 46 46 250° 47'
 + 70 47

15707 Deltek = 2700 Fath.

New Comet.

July 4.

star of Comp is of the 13 may = C.

17	6	31.5-	310°	50'
	8	10.0	309	57
	8	48.0	309	30
	11	25.5-	220	0
	11	51.4	148	00
	15	7.0	133	20

Comet ^{passes} to the app. left, dist 4" from star, when nearest.

To naked eye
(236) = 17 19 — Comet is on a line drawn through β to γ near min. distance $7/10(\beta-\gamma)$ from γ .

The light of the nebulosity is stronger in the south for direction, at an angle of 50° with the hour circle. There is a stellar nucleus of 14 ~~XX~~ may ~~X~~ not above 0.3.

to 267.

1842.0

Red to 1862.0

Red to app.

R - *

R's α , δ

Approx. Red.

15	37	14.70	+	69	47	36.0
			+	2.50		- 3 54.0
15	37	17.20	+	69	43	42.0
			+	2.95		+ 5.5
15	37	20.15	+	69	43	47.5
	- 2	49.39		+	6	26.2
15	34	30.76	+	69	50	13.7

Star of 5 may = β Arg (15584)

17	28	41.0	Venus 3.
1	48	30.	249 42
15	40	11	+ 69 42
-	2	57	
15	37	14	

at 236 = 17	58 22.5	2 a 46.3
	~~42 45.2~~	~~5 45.5~~
236 far	2 58.3	
Sid Time	17 49 46.9	
	6 49 44.05	
	5 50.15	
	11 0 2.85	
	1 48.13	
Comb mt	10 56 14.7	
	11 4 1.0	

New Comet

July 4. 1862

Comet comp with $\times \beta$

Transit of comet in Dec over scale Observed as well as in AR.

17 ^h 49 ^m 47.0	2' 0"	10° 39'
51 55.5	3 0	10 39

17	50	20.0 - 30.3
	52	53.1 - 4.8

54 ^h 25.5	2 0	7 14
55 44.0	3 0	7 13

17	55	2.8 - 12.2
	58	7.1 - 18.3

18 ^h 0 ^m 41.0	3 00	3 31
1 54.0	4 00	3 30

18	1	19.0 - 29.6
	5	51.7 - 16.9

18	7	4.0	6	00	1	33
----	---	-----	---	----	---	----

18	7	382. - 48.0
	12	5.6 - 16.7

Motion in 1st. - 6.360 - 45"5

motion

diff. AR	17 50 25.1	- 2 33.80	- 52.61	327.41	diff. Dec.	17 50 26.2	+ 8' 9" - 16.8"
	55 7.5	3 5.20	- 22.55	27.75		55 4.8	+ 4 42.5 - 23.5
	18 1 24.3	3 47.00	+ 18.90	18.10		18 1 17.5	- 0 4.52 - 5.1
	7 43.1	4 25.05	+ 60.57	32.48		7 4.0	- 4 57.0 - 6.7

17 58 40.0
 Return to 17 58 32.5 Chro. 73^m 27.168 + 2' 3.2

17 58 28.1
 Return to
 + 2' 0.2
 5.0
 5.6
 0.9

New Comet

July 4. 1862.

18	13	38.2	10 ^h 00 ^m	0	17
----	----	------	---------------------------------	---	----

M _B	18	14	36.3 - 47.0?
	19	19	49.9 - 61.4

(236) = 18 32 7.0 Comet passed 3" of star of 12 mag. Comet was in a line with two stars f and g. f is the fol of the two stars and the fainter. The comet passed 3" from it as mentioned before stars is nearly the same distance.

Was at its nearest dist^{3 3"} before above time.

(236) ~~18 44 24.0~~

New Comet

July 4. 1812

Star of Comps is of 13.14 mag. = g

Fair definition

Diam of light visible in telescope 40'. Carumbles

18 57 24.2

331° 45'

No tail.

Scale

19 0 11.0

343 33

[20"

19 3 13.2

45 55

19 4 48.0

90 59

19 8 108.5

117 50

Comet four minutes to the right and above the Star

away from Sun.

Star of 8.9 mag.

19 24 11.2 - 27.0 - 37.6

5 00 *
7 00 *

19 26 26.0 Comet & Star have same AR, Comet south 3' 40"

Motion

$$\begin{array}{r}
 19 \ 24 \ 11.2 \quad -2.0'' \\
 \quad \quad \quad 37.6 \quad +10.60 \quad -56.7'' \quad -4.68'' \\
 26 \ 26.0 \quad -3.40 \quad 0.00 \quad +46.6 \quad +5.98
 \end{array}$$

Motion in 1 m. -5.9 -46.0

Reduce to Chro

$$\begin{array}{r}
 19 \ 25 \ 25.2 \quad +5.95 \quad -2' 55.0'' \\
 \quad \quad \quad 2 \ 58.4
 \end{array}$$

S.T. 19 22 26.8

6 49 44.0

12 32 42.8

2 37.7

12 30 39.5

Place of Star (July 15-4117)

19 29 17.0

2 57

19 26 20.0

2 48 44'

4. 1 47

+68 44'

AR 15 24 33

Daily motion of Comet in arc of great circle 24° since 3rd

New Comet

July 4. 1862.

Star of Comp is of 13.14 mag = k

(234) = 20	6	47.0	161°	35'	
	8	44.2	244	10	Comet passed 40" to the left of Star,
	10	3.0	275	50	
	12	~~41.0~~	302	17	
	16	32.5	309	28	Comet is 6' app. above and to the right of the star.

Star of Comp is of 11th mag = l

20	25	49.0	124	32	Comet is 5' below and to the left of Star
	27	26.0	120	29	
	29	41.2	110	0	Comet passed to the Right of Star
	36	5.0	100	0	
	32	43.0	40	0	
	33	54.0	6	5	
	36	18.0	339	28	
	40	1.5	329	55	

Star of comp is of 11th mag = m.

21	15	17.5	15	45	
	16	27.0	339	32	
	17	59.0	328	29	Comet 15" to the right
	21	2.0	323	55	

New Comet

July 5, 1862.

Prof. Bond obs.

Star of 10.11 mag, has a little Coma on side opposite Comet.

(236)	16	21	25.0	133	50
		23	51.0	126	30
		26	22.5	110	0
		27	37.0	96	4
		29	54.0	46	10
		32	46.0	4	33
		35	35.0	351	48

Dist. from Star 1.5; Comet passed to the North.

Comet Compared with Star of 5th mag. = α Bootis

Comet. South prec. Star

(236)					
	17	18	1.8 = (Time of Dec.?)	α	6' 00"
α	17	18	9.9 - 16.3	*	4 24
*		22	6.7 - 13.5		
		28	19.0		
α	28	26.6	- 34.1	α	9 0
*	32	41.0	47.2	*	0 27

Approx. Red.

Motion

17 18 1.8	+1' 36"	-829.8
18 13.1	-358.00	-8.28
28 19.1	+833	+319.8
28 30.4	-413.25	+8.49
- 55.8	- 50.28	
13.3	0.26	

Reduce to thro.

17 23 18	
17 - 3 0.9	
17 20 17.1	
6 53 40.6	
10 28 36.5	
1 42.7	
10 24 53.8	WT Lamb.
Motion α 1 st - 1.63	-39"8

April 13) Star in Center of field

17	33	23.0		
	3	0		
17	30	23.0		
3	9	44	232	31
AR. 14	20	39	+52	31

New Comet

July 5

Comet compared with Star of 6th mag.

* 17	53	46.0 - 52.0	7'	29"	Time Dec.	} A north fol
A	57	58.2 - 64.2	6	30	57 46	

* 58	55.6	2.1	6	00	2	} A south fol.
A 3	0.2	6.7	8	20	2 47	

For Star

236 far at 18^h 32^m 3^s 1.1

18	4	19.0
	3	0

18	1	19.0
----	---	------

3	49	52	232 ⁰	2'
---	----	----	------------------	----

AR 14 11 27.0 + 52 2

236 far at 18 32
3 1.13177 Radcliffe
Red to 1862.0

Red to app.

Time for a 18 00 32.3 no 0.40
0 00 16.5A - *
A 2, 8,

AD Mod. - 1.58 - 39.4 no.

17 57 46 + 0' 59" - 98.9 17 58 1.2 - 3.56 + 4 12.20

18 2 47 - 2 20 - 98.9 18 3 3.5 + 4.60 4.60

- 39.9
41.1+ 4 8.64
9.20

Approx Red.

1 Bootis

14	10	40.58 + 52	5	2.4
		+ 36.44 -	4	47.0
14	11	17.02 + 52	0	15.4
		+ 2.52		+ 2.4
14	11	19.54 + 52	0	17.8
		+ 4 8.80 ²⁰	- 0	40.5-
14	15	27.54 + 51	59	37.3

at 236 = 18 0 16.5

- 3 1.0

17 57 15.5-

6 53 40.6

11 3 34.9

1 48.7

Camb. m. t. 11 1 46.2

Ephemeris of Cygnus (2)

12 ^h Watch Date.	α .	δ .	Δ
June 13	11 ^h 44 ^m 42 ^s	+1 ^d 9.9	0.3976
14	45 26	1 3.7	
15	46 10	0 58.5	
16	46 54	53.2	
17	47 40	47.8	0.4069
18	48 26	42.3	
19	49 14	36.7	
20	50 2	31.1	
21	50 51	25.3	0.4159
22	51 41	19.5	
23	52 31	13.6	
24	53 23	7.6	
25	54 15	+0 1.5	0.4248
26	55 8	-0 4.7	6.2
27	56 2	10.9	6.2
28	56 56	17.2	6.3
29	11 57 57	-0 23.6	0.4334
30	58 57 56	0 30 0	6.4

July 1 59 53 57 36.5 6.5 J.14.5
 2 12 00 50 0 43 0
 3 12 1 47 57

$\frac{21.4}{26.285} = 10' 10''$
 9.58

Hand for Comparison
 Reduced to 1862.0

Tab. 16."

Sub. 16."

Meraplan for 1855 + 24.0

- 21.6

Dec 1862.0 HZ

Jan. 4. H. Jones, 1862.0

9.3	11 47 3	+1° 4.2	+1° 6' 21"	10.71 11 44 23	+1° 5' 58"	-16"
9.3	11 45 12	+1° 2.2	2 30	10.71 11 44 40	+1° 5' 40"	
9.0	11 45 13	+1° 0.5	0 52			
9.2	11 50 22	+0 52.8	0 53 8			
9.5	11 49 48	+0 49.5	50 54			
9.4	11 45 37	+0 48.4	49 33			
9.1	11 44 37	+0 41.3	41 45			
9.5	11 50 38	+0 34.7	35 22	(11.12)	49 33	35 36 -16"
9.3	11 52 19	+0 35.0	36 17	(11.12)	52 53	29 8
8.5	11 54 25	+0 23.7	24 14	(12)	49 24	22 50 — ?
8.5	11 54 26	+0 22.7	23 19	(12)	52 49	18 46
9.5	11 49 50	+0 14.4	15 48	(12)	52 0	12 44
9.4	11 50 15	+0 10.2	10 39	7.5	54 31	5 18
8.7	11 53 23	+0 4.3	4 32			
9.4	11 53 54	+0 1.9	2 9			
9.2	11 56 36	-0 6.4				
9.5	11 56 14	-0 12.0				
8.6	11 57 45	-0 20.7				
9.1	11 57 33	-0 33.5				

-31.5
 $+14.5$ — 43

5/20"

7. 21.49
25

Reduction from 1825.0 to 1862.0

2.7645

$$\Delta x = 113.607 + [1.69434] \sin \alpha^{\circ} \cos \delta^{\circ}$$

$$[2.87043] \sin \alpha^{\circ}$$

11	33	1.4	2	32.77
		+18.86		-2.82
11	33	2.6	2	32.58
		+21.19		-2.95
				-0.122

Ephemeris No. 2 of (73)

Apr 24. 9^h Camb + 4 11^h 33^m 20.6 - 20.14 + 0.65 L²
 2° 55.27 + 1.32 L - 0.069 L²

Apr 28 11 32 10.4 + 2 59.4 ^{20.64}₁₉₈ Correction

30 31 43.2 3 0.71 + 1.5 - 0.1

May 2 31 21.1 1.42

4 31 4.2 1.62

6 11 30 52.6 + 3 1.77 7.4 - 11.6

8 20 46.2 3 9.23 11.1 - 0.8

14 11 31 0 + 2 56.2 2.72 - 1.6

12 11 32 15 + 1 57.5 2.42 - 1.6

24 32.4 21.7 - 2.4 48.3 - 2.07

The above agrees very closely with a similar computation by JMS

+ 2.3 - 0.13
 5.86
 + 0.34

10.62 L + 0.69 L²

6 - 0.4 - 19.28
 8 + 1.8 + 29.90
 14 3.3
 9.0
 17 11.2

9^h Camb. Not very accurate

May 24	11 33 58	+ 2 29.1	Sat.	May 24	Corr.	- 8.7 + 0.6			
26	34 46	22.7	Mon.			- 11.9 + 1.35			
28	35 40	15.7	Wed.			- 16. + 1.88			
30	36 40	2 8.1	Fri.						
June 1	37 45	1 59.9	Sun.						
3	38 57	1 57.1							

11^h 31^m 5^s + 2.7 (L - May 10) + 0.715 (L - May 10)²
 2° 57.68 - 1.02 (L - May 10) - 0.073 (L - May 10)²

Ephemeris of (73)
of Ceres

$$\frac{4 \text{ in } 0'}{11 \text{ } 13' + 729'}$$

32 56.1

535

$$\frac{72}{11 \text{ } 33 \text{ } 1.3} + 2 \text{ } 56.3$$

Cor. of Epa.

Cor. Epa

$$\text{Apr } 19 \quad 11 \text{ } 35 \text{ } 18 + 2 \text{ } 47.0$$

$$\text{Apr } 21 \quad 11 \text{ } 36 \text{ } 28 + 2 \text{ } 50.4$$

$$\text{Apr } 23 \quad 11 \text{ } 33 \text{ } 44 + 2 \text{ } 53.2$$

$$\text{Apr } 25 \quad 11 \text{ } 33 \text{ } 4 + 2 \text{ } 55.4$$

$$\text{Apr } 27 \quad [11 \text{ } 32 \text{ } 29 + 2 \text{ } 57.0] (-0.5)$$

$$\Delta \alpha \quad \Delta \delta$$

$$-2.5 \quad 0$$

$$-6$$

$$-12$$

$$-20$$

$$[-45] \text{ } 17$$

$$-45 + 11$$

Apr. 24th by obs.

This was computed Apr. 19th. The position for that date was deduced from a rough estimate of HPT⁵. The variation between Apr. 7 and Apr. 19 was computed, and $\frac{d\alpha}{dt}$ $\frac{d\delta}{dt}$ were obtained from an average of about 14 positions where I saw about March 20 in different years.

Corr of Ep. 1.54

$$\Delta \frac{d\alpha}{dt} \text{ t. Apr. 20} = 1.54$$

$$\Delta \frac{d\delta}{dt} \text{ t. Apr. 20} = 2.1$$

$$\begin{array}{r} 11 \text{ } 32 \text{ } 42.7 \quad 2 \text{ } 57.6'' \\ 38.467 \quad 56.19 \end{array}$$

t - Apr. 13

$$0.52 \text{ (t - Apr. 13)}$$

Correction of Epa.

$$-0.52 \text{ (t - Apr. 13) (t - Apr. 20) in } \alpha$$

$$0. \quad \text{in } \delta$$

Cor. of Epa.

$$\text{Apr } 24 \quad -3^s + 1'$$

$$25 \quad -3^s + 0.9'$$

$$26 \quad -3 \quad + 1.4'$$

$\frac{47}{48}$	2.8
$\frac{47}{48}$	3.15

Plumbeous
Apr 1979
3.1

24th by obs.

from

$\frac{4}{7}$	2.8
$\frac{4}{7}$	$\frac{3.15}{7}$

19

11^h 34^m 56^s
+ 20 49'

(for 1855)

~~46~~	2.8
47	3.15

