

KG
11365
199

H.45

Equatorial.

1862 Jan. 1st

to 1862 April 18th

Sold by T. Groom & Co., Stationers, India Building, 82 State St., Boston.

KG 11365.199

20 Books : 48 leaves mixed
in each just like pattern

Observatory

46 21.5
21 + 14.4

+

47 + 0.8 }
19.0 }

8" N. of star

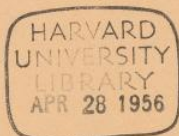
18.5
12.0 20. 48 24

Curia 48 10

1962phae-proj. 1968



KG 11365.199



Comet 1861 III (APT)

862 Jan 1.

Comet 13 25 34.8 - 8.90 + 0.03
+10 43.7

Comet 25 57.6 - 8.70 0.00
+10 6.3

Comet 26 26.4 - 8.50 - 0.03
+10. 35.2

Rev. to 13 16 0 Motion in $1 + 4^{\circ}38' + 6^{\circ}28'$

Comet n. of Star 33.65 at 13 29 20 33.90 + 2.4 - 20.9 18.5
31.32 31 40 + 25.3 - 35.6 10.3
- 14.4

Star a 13 34 6.3
" 2 35 —

Mer II
4.3 20.3
4 2 25.8

1 5.5 1

Star a 35 57.8
" 2 56.3

3 27 5.9
3 25 11.8

1 6.4 2

Star a 37 56.3
" 2 39 2.5

3 24 10.1
3 23 16.2

1 6.15 2
4 6.

Star a = W. 14.314.

Stars for Comet for Dec. 28th

PM 13
MTS

3 13 47 5.6
0 16.2

3 48 2.8
0 13.0

3 47 24.6
c. bright 34.4 9' 2" north.

C. in comp. + of Dec. 28.

3 = W. 14. 232
0 234

Ant 1861. III

For Jan 1.

Star a = Wisse 14.314.

In 1" below in the + 6" around

Reduce to 13 st. 0

Correct - x - 9.80 - 13.2

2 - a +1 6.04 - 1.3
+0 57.24 - 14.5

Mist 1864. III.

N. 14.314.

1825.0	^h 14 ^m 15 ^s 49.21	+ 3" 20'	5.6
	+ 1 52.03	- 10	13.4
1862.0	14 17 41.24	+ 3	9 51.8
Red. to app.	+ 0.54		- 6.7
Amel. - Mm	+ 0 58.24		- 14.5
Count. a. o.	14 18 39.02	+ 3	9 30.6
at	14 18 47.26	+ 3	9 50.9
	+ 0.54		- 8.7
	- 5.80		- 14.4

13 26 0 Chro. 226
part. 1 20

13 24 40

14 64 18

16 40 22

- 3 64

18 37 18 Lamb. m. f

	- 3.027	- 16.64
δ^0	2 12.98	
α^0	14 16 45.2	
	214 11.30	
γ^0	8.75419	
δ^0	9.74967	
	1.69224	0.19820
	2.87063	
	9.91761	
ϵ	358 9	
δ	214 25	
η	349 3	
γ^0	8.743	f + 16.42
δ^0	9.751	$g^0 - 0.21$
γ	0.854	$1^0 - 8.11$
δ^0	9.926	
δ^0	0.001	$g^1 - 6.03$
δ^0	9.500	$h^1 = 1.03$
δ	1.309	$i^1 - 1.68$
δ^0	9.963	
δ^0	8.74	

Or. and δ^0 from main

0.1825	+ 3.027	- 16.64
	+ 0.0014	+ 0.0014
	3.0284	- 16.643
	112.05	- 90 12.9

1861 Comet III

Jan 2 1862.

H.P. J. obs
H. sec.

Comet north fol. * of 8 mag

AR

236 = 11 12 24.0 - 31.8 + 1 15.11⁴²
 13 39.2 - 46.9

* 14 14.1 - 22.0 + 1 15.90
 15 30.1 - 37.8

* 16 0.7 - 8.5 + 1 16.30
 17 17.0 - 24.8

Mean 11 15 32.6 Mean $\Delta z + 1$ 15.78

Dec.

11 32 24.0 12.61 (wrong prob.) $\Delta z = + 1^m$
 34 39.0 13.83 (wrong) $\Delta \delta = +$
 47 41.0 14.50 (probably right)

* Sid 7. by 236
 11 37 19.2
 11 38 14.7

Mean 11 38 14.7 13.65^r
 Deriv 48.63 $\Delta z = + 1$ 16.84

AR

* 11 55 52.0 - 5.8 + 1 17.65⁴²
 57 9.7 - 23.4

* 57 39.9 - 53.6 + 1 17.55⁴²
 58 57.6 11.0

* 59 31.2 45.5 + 1 18.25⁴²
 0 49.3 3.8

Mean 11 59 5.8 $\Delta z = + 1$ 17.82

Comp * in center of field.

236 = 12 23 36 40 10 2 56 $\Delta \alpha + 5' 32''$

AR 14 19 16

236 = 11 38 14.7
 236 far 1 23.0

11 36 51.7
 18 48 14.9
 16 48 36.8
 2 45.2
 16 45 51.6

Comet

By scale at 12 6 (236)
 $\Delta \delta = + 8' 10''$

Assumed Hourly Motion (Eps) $+ 4^s.75 + 6'.8$

The observations on the preceding page are found somewhat discrepant. The angle of position was investigated and found to have been left at a wrong amount.

Mr. Hall thinks the first set were observed at the Zero of the Scale.

The declinations cannot be reconciled.

Comet III. 1861.

Jan 4. 1862

J.H.S. obs

Comet north fol. Star W. IV 401.

Ex. Ther + 1.5
Zero of Wire 201° 6'

236		AR		EL	
*	13	14	2.8 — 9.8	13	13 14.6 21.4
R		16	22.8 29.7	15	34.6 41.4
*		16	— — 59.2	16	4.0 10.9
R		19	13.1 20.2	18	26.9 31.9
*		20	56.6 — 63.5	20	8.3 14.9
R		22	16.4 23.8	22	29.1 35.4

Dec		AR		EL	
*	13	25	3 48.896	13	26 42.1 13.116
R		27	31 82.012		
*		28	53 49.285	30	34 36.411
R		31	22 85.696		

Twilight here interrupted the observations.

$$\text{Hk} + \frac{5.93}{1.500} + 8.19$$

Δx		$\Delta \alpha$		Reduction.	
13	15 38.0	+2	20.00	+0.75	2 20.71
	19 16.6		20.95	0.35	21.30
	22 20.1		20.65	0.05	20.71
	26 42	+5'	26.54	-31.1	+4 53.4
	30 34	5	56.23	-12.8	4.560
13-22 53				+2	20.92 + 4.537
					+0.1
				Rfr.	-0.4
				Temp. 1° S.	+2 20.92 + 4.534

Comet. 1861. III.

1862 Jan. 4.

W. XIV 401.

1862.0 14 22 20.5 + 11 39 47.6

1825.0 14^h 20^m 33.02 + 11 39 50.5
 + 1 47.65 - 10 5.2
 1800.0 14 19 20.08 + 11 56 40.4
 + 3 0.46 - 16 56.0
 1826.0 14 21 49.06 + 11 46 45.46
 1 15.645 - 7 4.88

H

L. 14 22 20.54 + 11 39 44.4
 D. 20.67 - 0.02 39 45.34
 R. (1862) 20.55 + 0.04 39 40.6

AD. 14 22 20.62 + 11 39 43.0
 Res. to app. + 0.56 - 12.6
 2 20.91 + 4 53.4

Comet's app. pt.

14^h 24^m 42.10 + 11^h 44^m 30.4^{24.8}

El. 13 22 ~~38~~
 part (38)
 to time 13 22 19
 18 56 7.5
 18 26 11.5
 3 1+

18 23 10 Lamb. mean time

C 216 10.3 11 42.5 }
 O 216 10.5 11 44.5 }

20 14 20 50.4 215 12 60
 210 + 11 48.20
 190.353 9.32009
 - 9989 9.76086
 1.91856
 3.89465
 9.91225
 20 14 21 26.7 215 21.68
 210 + 11 44.73 9.31789
 9.76268
 - 5.953 1.69434
 2.67043
 9.91144
 14 21 42.8 215 25.70
 + 11 43.26
 9.31696
 9.76319
 - 4.190 1.54110
 2.71719
 9.91108

Ans for sum of A. & B.

A. & B. - 18 + 3
 26 + 33 - 45
 20 + 1 - 16
 20 - 47 + 36
 8.7433 9.7349
 8.5981 9.2175
 0.4636 1.2123
 8.0546 9.7152
 + 0.268 - 2.65
 - 0.783 - 3.26
 + 1.067 - 5.98
 + 0.003 - 0.12
 + 0.055 - 1.00
 12.02

Orion.

1862 Jan 7

G.P.B. obj.
7.14.5 rec.

Obs for Scale values

12 m	- 9 21	5 58	20.5	24.4	$\frac{c+c''}{2} = 0$	α 10 24.5
13	+ 0 29	58	38.8	(42.8 bar)	Star. increase	10 34.5
13	0 38	59	14.8	19.1		γ 9 28.5
42.04. C'	10 35	6 0	1.7	5.6		
65 " C''	9 32.	0	18.2	22.2		
α 12 m	- 0 30	6 4	58.8	63.0	α 10 25	
β 13.	+ 0 21	5	17.3	21.4	β 9 34	
γ 13.	+ 0 25?		53.7	57.5	γ 9 30?	
C'	10 27	6	40.1	44.2		
C''	+ 9 23	6	56.6	60.6		
8 11.12	1 24	8	4	12.3		
α	9 26	13	59.4	63.5		
β	10 19	14	18.2	22.3		
γ	10 28	14.5		58.4		
Σ 10.m.	0 40	12	43.7	47.9	Assumed	Net. Zero. Wt.
α	9 27	18	31.4	35.5	α 10 24.8	2
β	0 37		36.2?	40.5	β 9 34.2	1
β	10 19		50.3	54.4	γ 9 28.5	0.67
β	0 2	18	59.	63.5-?	19 51.8	0.5
β	10 28	19	26.4	30.4		53.2 0.5
β	0 9	20	38.6	42.7		53.5 0.4
α	0 29	21	46.2	50.4		19 52.8 1.4
α	9 17	22	34.1	37.9		19 41.8 0.5
β	0 24		48.7?	52.7		42.5 0.4
β			52.7	56.7		19 42.7 0.9
γ			28.			
γ	10 17	23	28.8	32.9		
α	- 0 3	24	41.3	45.3		

Roni

1862 Pm 7

Σ 0 30
 19 41.8 5 < 9 17
 3 0 26
 43.2 5 10 9
 45.5 4 10 20
 19 43.4 0 -0 3

25 39.6 40.7
 26 27.3
 46.3
 27 21.8 25.9
 28 34.4 36.3

Σ 19 12.8 0.58 19 13.1 1.64
 δ 13.1 0.48 19 16.6 1.16
 η 12.4 0.58 19 50.8 0.58
 θ 19 45.1 1.64

Σ 10 11
 3 10 41
 η 9 29
 1 1 24
 K 1 07
 A (11) -0 12
 0 9 37

32 24.3 28.3
 33 17.6 21.7
 40.2 44.4
 34 15.8 19.7
 26.2
 35 13.6
 35 23.4

Zero

Σ 29 24.1 0.62
 δ 20.6 0.54
 η 14.8 0.39
 θ 28.1 0.62
 29 21.8

Σ 10 0
 3 9 52
 η 9 18
 1 4.4 11
 K 11 0 56
 A -0 24
 0 9 24
 10 0 8

37 24.3 28.2
 38 17.6 21.8
 38 40.3 44.1
 15.3
 25.9
 40 19.3 23.3
 41 11.3 15.3

13.1
 6.6
 8.8

11.1.10.1

9.1

Σ 10 9
 3 10 3
 η 9 27
 1 1 22
 K 1 0 6
 A -0 13
 0 9 34
 10 0 18

42 25.8 29.9
 43 19.5 23.4
 41.7 45.9
 21.0
 44.8
 45 21.3 25.3
 46 12.7 16.8

21.1
 19.6
 17.4

19.1

Orion

862 Jan 7.
 9.10.13 obs.
 7.14.5 m.

~~2.1' 37" parts of A Orion and getting 0.5~~

~~2.1'~~

Zero

1	14.0	6.58	56	—	9.	34.56.2	0.68	5'
14	"	6.40	56	—	15	54.2		7'
0' Orion		2.6	56	38.3	42.5			
1	9.00	8.21	57	3.2	7.3	54.6		11'
14	"	5.52	58	1.2	(5.11)	59.0	0.57	21'
1	12 (12.0)	0.5	7	1	58.2	—		14"-1
1	12	0.10	2	—	54.8			2"
1	1	10.10	3	25	23.3	38.9.2		
1	1	9.52	3	—	29.6	6.2		
0 Orion		5.12	3	52.4				
1		8.34	4	—	21.5	7.6		
0 11.0		0.9		26.3	—			9" 2" 11"
1		9.17	5	15.3	19.2	9.0		
11		-0.2	5		26.7			0" 0"
1	11.0	0.2	6	30.8	34.8			
1		0.10	7	23.7	26.2			
1		10.11		52.7		38.9.2		
1		9.54		59.1		6.2		
0 Orion		5.19		—	29.	10.6		
1		8.37	8	50.8				
0		0.11		59.8				
1		9.9	9	48.8	52.2	11.0		
11		-0.2		58.0	42.2			

Orion

1862 Jan 7

1 P.B. ob

2 H.S. ob.

ρ 10 7
 σ 10 3
 ϕ - 0 30
 ψ 10 31
 χ - 0 15-

7 42 - 17.3
 42 33.4 -
 44 ~~32~~ 32.7
 46 6.1 10.3

2 Orion ϕ 8 6
 3 6

48 42.4 46.2
 48 58.5

2 Orion ϕ 6 47
 1 48

2 Orion ϕ 6 51
 1 54
 χ 7 7

7 50 32.5 -
 53 8 5.4

2 Orion ϕ 5 19
 0 22
 6 54
 χ 5 32

54 7 -
 7 54 19.5 -
 58 - 19.7
 56 44.7 -

Ext. Dec. 16°

Orion

Orion

for Comets.

1861 Jan 16.

Comet 1861. II

Ephem. 6^h Lamb. 294° 51.7 + 52° 3.6
 19 15 27

Lat. 36568

vt

-0.005 +0.19

1862.00 19 13 49.28 + 51 53 1.8

Pro. hr. +1 30.09 + 6 47.8

Lat. Var. 12.6 -0.09 + 3.5

19 15 19.28 + 51 59 33.1 8 mag.

Mb. G. 1829 = R 7407 = L 36700

1862.00 19 18 15.50 + 52 6 58.7 7 mag.

Comet 1861. III.

15 46.0 + 66 22 + 15 45.1 + 66° 12'

Encke's Comet 6^h Lamb.

H. H.

22 8 40 + 0° 0' 50"

+ a 22 8 34 + 0° 18' Sim. mer. day -1 48.4 + 5' 32.3 South 8.1

-35 -8 30

9.5

+ b 11.12 22 8 38.5 + 0° 12' 15"

+ c 10 9 11.5 12 43.

Encke Comet.

1862 Jan. 16,

g. P. 13.40

T.H.S. rec.

Chr. 236. + 47 11.7

Orbit compared with mean star. of the 11. magnitude.

(Angle of zero 35.5)

Chr. 236	1	49	14.3	55.01	Distance
		50	32.	55.90	"
		51	26	55.90	"

52	41	Position	256° 32'	Comet
54	35.5	"	253 15	Comet s.f. nearly following
55	53.	"	251 37	
56	52	"	250 33	
57	34	"	249 28	

2	0	10	64.10	Distance	on the other side of Zero
	1	8	64.07	Mean	
	2	6	63.82		
	4	27	63.83		
	5	57			

Zero. of Meridian Scale

60.41
60.40
60.36
60.41

1	50	24	55.937	
	51	5.2		254.14
	56	57		250.20
2	0	56	64.058	
1	4	35	63.874	
			60.395	

12	0' 0"	14	59.3
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10	7 48	15	51.4
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12.45 f.	3. Ch.
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+ x (Comp.)	2 59	16	7.3
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12.	2 35	17	9.4
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9.40	1 11	18	23.7
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Tail. Angle of Position $19^{\circ} 20'$ from the Sun.

1' 10"

Star x = Zmes. 18.19 [OC] no 57. [alro 20.21]

Chen

1655.00	22	8	40.76	71	+ 0°	9'	46".3	3
Pr.			+ 30.63			+ 2	57.5	
1862.00	22	9	11.44		+ 0	12	43.8	
			39				4.3	

Reduce to 1 57 34

Assumed. $\text{Par.} = 4$ $111^{\circ} 37'$
 $\text{Dist.} = 2$ $38^{\circ} 5'$

$$d\epsilon = -0''875$$
$$dy = -0.883$$

Tr = 14.18

$$n = + 35.79$$

Encke's Comet.

1862 Feb 16.
g.p. 13

Star 1862.00 22 9 11.44 + 0° 12' 43" 8
 And to app. + 0.19 + 3.5
 Comet - Star + 2.34 - 14.0

Comet's apparent place 22 9 13.96 + 0° 12' 33.3

Chr. 1 57 34
 fuel 1 47
 1 55 47
 19 43 26
 6 12 21
 1 1

6 11 20 Cambridge mt.

6 11 20

5 38 6

11 49 26

- 6 10

11 43 16

9.6857 + 24.03 1.6131.5 - 21 11.0

9.0966 + 11.375 1.0521 - 2 7.8

22 9 22.25 + 19 25.1

+ 41.03 - 10 20.6

+ 1.41 + 16.0

C 22 10 1.47

8 42.63 + 0 9 20.5

G 358 1
 L 332 18
 H 325 15

top 7.55
 subtop 9.6948
 g 0.9117
 subg 9.9309

rad 0.0000
 subrad 9.9992
 h 1.3036
 subh 9.7849
 mid 7.55

f +18.73
 go -0.01
 lo -15.95

g' +7.09
 h' +0.04
 i' -3.66

Orion. Scale values

Jan 16. 1862

Prof. Bond obs.

Arc from C to ϵ Orionis measured by scale by intermediate stars

obs. 23.6

*(3) pre ϵ Orionis 0.1

*(2) pre " 25 beats

*(1) 5 20 5.1

10 13

1 4 40.8

(2)

6 31

2 4 58.0

(3)

7 52

3 6 19.7

2 Orionis

1 34

(1) 21 49.4

9 49

(2)

6 06

(3)

7 29

 ϵ Orionis 22 43.2

1 07

(1) 23 20.8

9 39

(2)

5 56

(3)

7 17

 ϵ Orionis 24 14.7

0 58

(5) 27 7.5?

10 28

Zero -5 3.2

5 15' 30" 9

(1) 27 45.2

3 38

(2) 28 27.0

-0 5-

(3) 28 39.2

1 16

(5) 29 39.0

10 19

Zero -5 11.5

(1) 30 16.8

3 29

(2) 31 58.4

-0 13

(3) 31 11.0

1 08

Orion (Continued.)

Jan 16, 1862

For Scale values

(6)	34	29.2 - 46.0	9'	00"	6	15 21.4
(3)		39.2 55.8	-0	01		

(6)			9	00		
(3)			-0	02		

(6)			8	38		
(3)			-0	24		

(7) 8 mag	37	4.7	10	15	(7) mag	7 21.7
8 (3)	37	25.6	9	10		

(6)	38	49.2	8	41	6 41	
(3)	38	59.6	-0	20		
7	39	26.7	10	19	16 51	
8	39	47.8	9	14	15 55	

(5) diff from (3)	41	58.6	?	8	13	
(1) diff from (3)	42	11.4		1	56	6 41.9
(6)		55.1		8	39	16 42.4
(3)	43	5.3		-0	22	6 41.7
(7)	43	32.5		10	26	16 50.0
(8)	43	53.8		9	12	15 51.0

(5)	46	31.2	8	29	11	14 31.8
(1)	47	9.2	1	38		

(5)	52	44.2	3	43		
(2) (3)	53	8.6	3	41		

Orion (Continued)

Jan 16. 1862

(5)	54	30.6		0	10	15 21.3
(9)	55	29.9	1"	8	52	
(6)	55	31.5		0	3	15 18.4
(7)	56	29.2		1	41	18.0
(8)	56	30.3		0	28-35?	

(7) and (8) are 8 mag.

(5)	59	44.0	5"	0	10	15 41.2
(9)	0	44.0	1"	8	31	
(6)	1	5.1	0"	0	17	34.4
(10) from (7)	4 ^s		2" 2"	10	29	26 4.6
(7)	1	42.8	5"	1	20	39.0
(8)	2	4.0	0"	0	15	39.6

(10) from 4 ^s				9	14	
(7)			5"	0	2	8.6

(10)				9	18	
(7)				0	9	8.1

(10)				9	24	
(7)				0	15	

A	5	20.5		6	23	
(10)	5	51.8	3" 3"	1	17	

A				7	00	
(10)				1	32	

A				6	33	
(10)				1	27	

Orion (Continued)

Jan. 16, 1862

(9)	6	8	53.0	K	0	28
8		9	16.0		7	34
(9)		9	49.5		2	24
8		10	10.2		9	30
(11)		11	37.0	K	10	37
8		11	48.0		0	31
(12)		12	8.0	R	10	39
			6?			
(11)		12	39.0	K	10	37
8		12	49.8		0	30
(12)		12	8.5	R	10	38
(13)		15	15.0	L	9	24
(11)		15	47.3		0	19
(14)			59.0	L	8	44
(12)		16	16.8		0	20
(13)		17	28.4		9	26
(11)			1.0		0	19
(14)		18	12.0		8	46
(17)		18	30.2		0	20
(13)		19	54.0		9	34
(11)			26.0		0	28
(14)		20	37.8		8	54
(12)		20	55.8		0	29

Orion (Continued)

Jan 16, 1862

(13)	23	41.2	0	35	59 54.0
(14)		25.2	-0	3	
(15)	24	37.8	9	41	
(16)	25	72	7	53	

c' orionis

(14)		57	8	00	
(15)	26	6	4	01	57.33.5
16	26	36	4	02.5	
			2	17	31.5

c'	27	37.5	8	48	
(15)	27	46.0	4	49	
(16)	28	16.0	3	6	

(13)	28	41.8	0	38	59 54.0
(14)			0	0	
(15)	29	42.0	9	41	
(16)			7	59	

c' orionis

(15)			7	00	
(16)			3	02	
			1	17	

Est. Th. 20°

		Rgr.	Temp.	
A - c	31 16.2	+1.0	-8.7	31 8.5
c - c	64 32.5	+2.2	-18.0	64 16.7
				+ 64 18.1

Recomputed by G.P.S.

Mudlin 1862.0	A - c'	33 5.89	31 16.2
	B - c	31 12.82	64 32.4

Tab. Dig Dec

64 18 71

Comet III 1861.

Jan 23 1862

Comet fil. Star

J.W.S. obs.
A.H. rec.

236

6	18	59.0
20	12.2	
21	9.1	

44.576	15.864
44.030	16.290
43.168	17.252

Comet & Star to the right

Dist "	155.3
	160.6
	169.0

23	13.5	61.0	Left
25	16.5	59.6	Right
26	11.1	60.6	Right
27	49.2	58.6	Left

109	59
111	23
110	23
112	23

31	39.5
36	0.4
37	54.8

34.620	25.80
31.820	28.38
30.180	30.24

angle = 150°

Angle of hor.

Corr.

2° 10'	+0.02
3 16	0.05
3 40	0.06

253.0
278.6
296.9

6 26 45.

Zero of Position near meridian

26° 59' : Corresponds to Pos. 90°

A flow $\frac{n}{f}$ reads
" 3.8. "280. } Like the Dorpat Refractor.
245 }

The evening was quite hazy, and observation difficult.

Ocltizon 264402

236 Star in field

6	41	54
---	----	----

far	2	1
6	39	53

40 8 7 19 Dec + 79° 30'

$$T = 90^\circ + I - W \quad T = 260^\circ 59'$$

$$= 270 + T - W'$$

$$dx = -4''00 \text{ dy} + 6''21$$

Reduce to Chro. 236 $6^h 26^m 45^s$

Assumed $\alpha = 212''$ East
~~212~~ 111.05 Pos

$$m = -77.7$$

$$n = +197.2$$

	-77.73	$-6''55$	$-5''60$	$-3''53$	$-1''48$	$-0''56$	$+1''07$	$+4''90$	$+9''25$	$+11''16$
$m + \delta m$	-46.6	-51.5	-55.3	-63.6	-71.8	-75.5	$+82.0$	$+97.3$	$+114.7$	$+122.3$
$n + \delta n$	$+149.2$	156.6	162.4	173.3	188.0	193.7	203.6	227.6	254.6	266.5
	166844	17118	17417	18035	18561	18779	19136	19881	20596	20874
	2.1738	2.1958	2.2106	2.2438	2.2742	2.2871	2.3088	2.3571	2.4058	2.4257
α'	$107''20.7$	$108''12.2$	$108''48'$	$109''55.5$	$110''52'$	$111''18$	$112''2$	$113''9$	$114''15$	$114''39$
$\delta \alpha'$	2.1940	2.2171	2.2264	2.2707	2.3038	2.3178	2.3417	2.3936	2.4457	2.4672
δ'	$156''3$	$164''9$	$171''6$	$-3'$	$-29'$	$+55'$	$-21'$	$267''6$	$279''2$	$293''2$
$C - O \text{ 12}$	$+1.0$	$+4.3$	$+2.6$	$+$	$+$	$+$	$+$	-5.4	$+0.6$	-3.7
$\delta \alpha'$				$-0''2$	$-1''7$	$+3''3$	$-1''3$			

$O = +1''0$	-0.30 dm	$+0.96 \text{ dn}$	$\alpha\alpha$	$\alpha\beta$	$\alpha\gamma$	$\alpha\delta$	$\alpha\epsilon$	$\alpha\zeta$	$\alpha\eta$
$+4.3$	-0.31	0.95							
$+2.6$	-0.32	0.95	$+4.21$	-0.66	$+5.75$	$+1.0$	-0.65	84	
					-0.10		$+0.15$		
-0.2	-0.94	-0.34			5.65		-0.55	0	
-1.7	-0.93	-0.36						0	
$+3.3$	-0.93	-0.36						64	
-1.3	-0.93	-0.37						10.5	
								5.24	
-5.4	-0.39	$+0.92$						± 2.18	
$+0.6$	-0.41	$+0.91$							
-3.7	-0.42	$+0.91$							
			$\delta \alpha'$	2.2950					
			$\delta \alpha'$	0.4388					
			$\delta \alpha'$	1.8562					
$dy = +0''06 \pm$									
$dx = -0.23 \pm$									

$$\Delta \alpha = \alpha = -77.93 \pm 1.07$$

$$\Delta \alpha \delta = \delta \alpha = +197.26 \pm 0.92$$

$$\Delta \alpha = +1''11.82$$

} Not yet corrected for Refr. and Temp.

Comet 1861. III

1862 Jan 23.

Argelanders (Allyn 24402) 9^m

$\frac{1862.00}{\text{rest to app.}}$
 22 31 2.82 +79° 21' 44".5
 +7.30 +6 11.3
 1862.00 22 31 10.12 +79 27 53.8 (+7.30)
 -5.82 +16.6
 Comet-Har +1 11.82 -1 17.9
 22 32 16.77 +79 26 54.5

Pm.

Chra 6 26 45
 fast. 2 1
 Liv. Time 6 26 44
 20 11 2
 10 18 52

1 41
 10 13 51 A.J. Lambidge

C 337° 48' +79° 27.5
 O.H. 338 5 79 27
 C-O -17' +0.5
 L.H.A. -31.1

337 48.60
 h m s
 22 31 6.4
 20 79° 26.84
 400 0.72841 -
 1000 9.57744 ✓
 1.42715
 2.60324
 9.96648 ✓
 -52.113

G 337 43 f +19.76
 u 337 48 20 -19.17
 H 328 26 10 -87.92

600 0.7306 g' +7.83
 1000 9.6174 u' +11.58
 9 0.9225 i' -0.83
 1000 9.9541
 1000 0.7380
 1000 9.9066
 K 1.2995
 4(1000) 9.7717
 1000 9.9926
 0.65612

Stars for Oct 1861. III.

Mr. 24 th	Alt. 25486	23 15 41	+77° 49'	about 9 m!	
25	25476	23 48 27	75 59	" 10 -	
	~~55~~	~~23 56~~	~~74 46~~	?	
26	263	0 14 +	74 18		G. 49
27	399	0 22 12	72 43	early - about 8 pm	
28	803	0 43 40	70 53	late : about 12.	
29	867	0 47 30	69 42	early : 6 pm	G.
30	1040	0 56 18	68 15	early : 6 pm	L.
31	1145 ₈₆	1 1	67 2	early : 6 pm. bright star.	L.

Encke's Comet.

1862. Jan. 27

Extract from a letter from Lewis Swift. Hunt's Corner, Cortland Co. N.Y. Jan 27. 1862.

"I last evening observed in strong twilight a comet with a tail something like 1° in length. I found it while searching for Encke's Comet which at first I supposed I had found; but a little later observing a tail. I immediately concluded it was not, but to me at least a new one."

The position of the Comet as described by Mr. Swift, leaves no doubt that the above was Encke's Comet, as he himself acknowledges in his letter of Feb. 6th

Encke's Comet

1862 Jan. 27

Observed the Comet in the twilight at an altitude of scarcely 5° . Sky quite clear

It was unexpectedly bright & in a more favourable position would have been visible to the naked eye.

The only light visible was concentrated within an area of $40''$ diameter - excepting a faint narrow but decided tail say $20''$ or $30''$ broad & $2'$ or $3'$ long in ang of pos $110^{\circ} 30'$ n. f. nucleus

Comet 1861 II

61 Jan 30.

1862
 The comet was seen about 14^h Sit. Time. The following observations were made.

Comet precedes Arg (Altz 19637)

 $I = 261^{\circ} 0'$

Obs	236.14	14	12	Angle from Circle	88.3	Right	Angle of Position	262.7
	16	43.5			89.3	Right		263.7
	20	16.			87.7	Left		263.2
	22	23			88.1	Right		263.9

Differences of A.R.

M.M. in $\alpha + 4.67$ in $\delta + 32.5$

Chr. Time

Comet?	14	27	—	42.0	14	27	27	Return to 14 31 9
Star	14	28		0.5				+0.27 -33.23

Comet	14	29	44.0	62.5	14	29	53	
Star			?	34.3				-31.8 +0.09 31.71

Comet	14	32	8.3	17.8				
Star			40.6	50.2	14	32	13	-32.35 -0.10 32.45

Comet	14	34	3.8	10.7				
Star			36.2	45.6	14	34	9	-32.15 -0.24 32.39

Comet	14	35	45.5	55.5				
Star			36	18.3	14	35	51	-32.30 -0.38 32.64

Comet	14	37	28.3	37.5				
Star			38	0.6	14	37	33	-32.50 -0.51 33.01

Comet	14	39	14.7	26.3				
Star			39	47.3	14	39	20	-32.45 -0.62 33.07

Angles again

Mean -32.65 ?

14	47	4.5	266.3	Angle of Pos.	264.7
19	40		266.6		264.4

See next page.

Comet 1861. II

1861 Jan 30.
11.5

At 14^h the comet was detected at once, when the telescope was set in its neighbor-
hood, so that I found the ^{surrounding} stars by the comet.

But at the close of the observation it grew quite hazy, so that I was not
certain whether the object was the comet, or a minute fixed star. In the latter
case, an occultation of the star by the comet, nearly central, must have taken place
while I was observing the first set of angles: i. e., about 14^h 18^m close time,
and the comet's observed place will hold good approximately for that time.
There was another small star north preceding the comet.

Computation of Difference of Declination.. by 15 m d = ^{55° 14' as. 9.7561}
0.9322

	Motion in <u>AR.</u>	Comet - Star $\Delta \alpha$ Computed	by $\Delta \alpha$ m d	Corr. π	$\Delta \delta$	Reduction	
14 14 12	- 1.31	- 33.96	2.4632	9.1076	- 37".2	+ 9.1	- 28.1
16 43	1.12	33.77	4607	.06103	31.7	7.6	24.1
20 16	0.83	33.48	4570	.0670	33.4	5.8	27.6
22 23	- 0.67	33.32	2 4549	9.0264	30.3	4.7	25.6
47 45	+ 1.31	31.34	2.4283	8.0674	- 24.8	- 8.9	33.7
49 40	1.45	- 31.20	2.4263	~~7.731~~ 9.914	- 26.2	- 10.1	- 36.1
							175.2
							? - 29.2

Comet 1861. II

1861 Jan 30.
M.S.

$$R_m = A(Alt\ 19637)$$

1862.0	19	42	52.48	+ 55°	11'	34.1"	4"	19 43 5.9	
			+ 26.74			+ 27	54.4	8"	55 13.92

1862.00	19	43	19.22	+ 55	14	28.5	4.5"	0.15828
Red to app.			- 1.66			- 3.2	in "	9.95449
Comet - Star			- 32.65			- 29.2		1.42715
								2.60324
	19	42	44.91	+ 55	13	56.1	4.5"	9.53832
								1.53992

Chro. Time

14	31	0
2	15	

14 28 45 Sidereal Time

20	38	38
----	----	----

17	50	7
----	----	---

2	55
---	----

17 47 12 Cambr m.t

This observation is doubtful on the grounds stated
previously

M.S.

G	357	21
d	295	50
st	321	0

4.5"	0.1587	+ 20.79
in Body	9.9636	- 12.00
g	0.9571	- 33.68
all in	9.5951	

dist	0.2440	+ 3.57
in (R+)	9.9886	- 3.69
t	1.2949	- 3.07
in (R+)	7.3545	
in d	9.9146	
i	0.7308	

Orion

1862 Jan. 31

For the first time for several weeks the vision is passably good.

I cannot see the β star nor make out ρ with certainty.

Notice that both ϵ^1 and ϵ^2 Orionis are decidedly nebulous i.e. have well marked aggregations of nebulosity about them. There are also two other stars within 4' or 5' of them having a similar character.

The spirality is most distinct in the region preceeding Trapezium and in same dec or near it. say 3' either side.

G.P.B.

Equatorial

Jan 32, 1862.

The Director changed the Zero of the Micrometer
Wires, and adjusted the reading of the head of
the Micrometer Screw

Sirius

1862 Feb 1

A. Clark jr. reports the discovery of a companion of Sirius last evg with the 18 1/2 in. object glass.
Following in R a 10" dist.

See Feb 7

Planet 1861. II ?

1861 Feb. 4

Comet n^o. 10.11

14	35	30	51.5	L
	37	50	50.9	L
	40	59	47.3	R
	42	26	46.7	R

46 48
48 52
50 24
53 23
55 2
56 16

58	43	48.6	R
15	1	18	52.1

52.46	Above	} 315°
52.70	Below	
52.75	—	
52.18	Above	
52.29	—	
52.92	Below	

6 20.2 327

Probably not the comet,

Sirius

Feb 7 1862

After scrutinising the neighbourhood of Sirius on every clear night of the past week since Feb 1st without obtaining a single opportunity of quiet definition a sight of the companion was obtained this evening during an interval of about 5^m when the vision was tolerably good.

For an hour before and after it was impossible to catch a glimpse of it

← .

By a hasty observation I find for the angles of Position

Scale reads	263 00
Zero	<u>261.55</u>
	1 05
	<u>40 00</u>
Ang of Pos	88° 55'

Distance of Comp 12" roughly estimated on scale

Vision rapidly deteriorating

Dist-	59.60
	<u>59.36</u>
Mean	59 48
Zero	<u>58.28</u> 32
	1-2.0 11.6
	<u>24 72.2</u>
By Micrometer	11" ~~72~~ 36
	wt = 1

A very difficult object when the vision is at all disturbed.

G. P. B.

Olympia (57)

Feb. 7

Copy Planet compared with double star - Comp^{7.10} 16" ^{2.4} 120°

Planet north following

I. Meris at 351° 0'

1 m Chr. 236.

Star	✓	22.	26.2	30.3	
Planet		22	37.8	41.6	+11.45

Star		23	40.0	13.9	
Pl.		23	21.3	28.3	11.35

Star		24	3.2	7.3	
Pl.		24	14.9	18.9	11.65

Star		25	2.7	6.7	
Pl.			14.2	18.3	11.55

Star		26	7.9	11.9	
Pl.			19.3	23.3	11.40

III. Meris 351° 0' again

Star	✓	36	17.2	19.3	11.2
Pl.			28.4	—	

Star		37	16.6	19.2	11.10
Pl.			27.7	30.3	

Star		38	25.7	28.4	11.2
Pl.			36.9	—	

Star		39	26.2	28.7	11.00
Pl.			37.2	39.7	

Star		40	25.0	28.4	11.05
Pl.			36.1	39.4	

Scale at 353° 48'

Star		4 29
Pl.	7 28 0	9 31

S.		3 29.5
P.	7 29 0	8 30

S.		1 54.5
P.	7 29 48	6 54

S.		1 23
P.	7 30 40	6 23

S.		2 51.5
P.	7 31 54	7 52

S.		5 24
P.	7 33 0	10 26

S.		4 53
P.	7 33 48	9 55

~~S.~~
~~P.~~

Star in center of field

Alt 7 42 26 (Chr. 236)

Hor. Az 11.12 0

Dist. +10 15

Star - Str. Cat. Gen. 1014

Arypin (59)

1862 Feb 7

An object $10^m.8$ was missed from the place it was in Feb. 5th and the planet's motion in the interval being added to that place the present object was found. Its mag. was estimated $11^m.2$ to night.

$$N.H. \approx -2.03 + 15^h.0$$

Reduced to Chri. 7 31 14

Reduced

7 22 40 +8.6	+0.29	+11.16	2
23 23 +7.8	0.27	11.08	5
24 17 +7.0	0.24	11.41	1
25 14 +6.0	0.20	11.31	
26 21 +4.9	-0.17	11.23	
36 28 -5.2	+0.18	11.38	1
37 29 -6.2	0.21	11.31	
38 38 -7.4	0.25	11.45	2
39 38 -6.4	0.28	11.33	
40 39 -9.4	+0.32	11.37	1
		+11.30	Virgo.

7 28 0 +3.2	+0.4	5 2.8	3.2
29 0 +2.2	0.6	1.1	
29 48 +1.4	0.3	4 59.8	1.5
30 40 +0.9	+0.2	5 0.2	0.7
31 54 -0.7	-0.2	0.3	0.5
33 0 -1.7	0.4	1.6	0.3
33 46 -2.5	0.6	1.4	0.2

$$+5 \quad 1.03 \pm 0^h.26 \quad \text{Virgo}$$

$$1 \text{ Comp} \pm 0^h.89$$

$$1 \text{ Comp} \pm 0.078$$

$$All \pm 0.025$$

Planet - Star

$$+ 11^h.30 \quad + 5' 11.03$$

Temp. 17°

$$-1.4$$

Ref.

$$+0.1$$

$$+ 11.30 \quad +4 59.7$$

8 28 24.5	10 23.4
8 28 35.8	10 26.4
8 28 49	10 27.3
- 13.	+ 1.1

Olympia (59)

362 Feb. 7

1800.0	8 25 2.49	+ 10 35 26.4	3.271 - 11.864	her bar	Precession for middle epoch
	+ 3 22.67	- 12 22.8			+ 3.2689 - 11.781
1830.0 [4 obs]	8 26 40.11	+ 10 29 24.7	3.2688 - 11.977		3.2677 - 12.037
1833.4	~~0.04~~	+ 0.4	196.128		
Corrected ult ^o	+ 1 44.57	- 6 25.2	11.96	0.007	0.371
5-2-81-21 1825.0 Waik.	8 26 23.95	10 30 23.7	3.269		3.2679 - 12.027
Using struts measured from comp.	24.25	24.4			
	+ 2 0.91	- 7 25.0			

L.	8 28 25.16	+ 10 23 3.6	✓
B.	25.01 ± 0.05	22 59.9	+ 0.9
Str.	24.68 ± 0.04	22 59.9	- 0.4
C. ult ^o	- 0.04	+ 0.4	

Strove has	
Best 10.28	} 1829.19
Best 114.10	
Δα cos δ	9.38
Δδ	- 4.20
Δα	+ 9.55

Giving lts. B1 star 2

H	8 28 24.78	+ 10 22 59.6	24.87	23 "0.0
Red. to app.	+ 2.85	- 10.7	+ 2.86	- 10.8
Plank - Star	+ 11.30	+ 4 59.7	11.30	4 59.7

Chro. 7 31 14	8 28 38.93	+ 10 27 48.6
fast 2 8	for. Par.	- 0.110
7 29 16	Par.	- 0.06
21 10 46		+ 4.56
10 18 26		+ 2.5
1 41		

Caulcut 10 17 15

G	356° 58'	+ 21.74	f
L	127° 6'	+ 1.44	g
H	313 25	+ 19.54	L
lg δ	9.263	- 5.30	g
sin(H+g)	9.918	+ 0.68	L
g	0.976	- 6.02	i
sin(G+g)	9.748		
sec δ	0.007		
sin(H+g)	9.994		
h	1.290		
sin(H+g)	9.217		
sin δ	9.256		

10 16 39
 5 38 6
 15 54 45
 - 15 18
 15 39 27 3 39.45

- 9.86

- 48.93 + 6 7.9

- 7.315
 - 14

C.	8 28 50.31	+ 10 27 13.1	13.1	13.1 for 1864.
O+Par.	38.87	51.1		
C-O	+ 11.544	- 38.4		

J
 This agrees precisely with Littrow's A.M. 12001 and fig.

Comparison Chart

1862 Feb x
7115

Chr. 9 21 43
 *x NA 6 1 15
 Sw. + 45 10

15 20 28
 - 2'
 15 18 28

Angle 352 48

a = Alt 15231 = Alt 419 15 25 27.54
 + 45 14 5.5

x	8 20	25 54.5	^I ~~24~~ 6.0.3	8 22	x-a	-7 13.40	+ 3 11.0
a	5 8	33 4.3	^{II} 13.3	5 12			

10 25.5 35 36.2 41.9

7 13.05 3 9.5

7 16 49.4 54.8 7 18

Wires and scale - 352 48

x	8.9 F	46	11.4	16.2	7 16	43.3	46 ^m	48.9	7 18
a	9 F	4.0	29.1	4 6	53	57.2	02.5	4 9	
y	8 F			9 30	55	40.5			

Three observations were made at the circle reading 352° 48' (zero for scale) on both
 wires and scale. Also following obs. if p. night

Comparison Stars.

62 Feb. 7

	10 ^h	5 ^m	At Angl 352° 48'	Scale	9 ^m	
Σ 9 ^h Mar	45.5	50.6	5 5"	16.4	21.9	5' 7"
8 10.2	51.4	56.3	2 59	2.4?	27.8?	3 0
2 7	56.4	1.4	8 23	26.8	32.2	

10 26 15
6 24
(changed)

29	11.1	16.5	9 23	29	47.0	52.3
32	6.2	12.1	7 10	32	43.1	48.3
35	12.2	17.6	5 4.5	—	—	54.2
46	17.4	23.0	10 26.5	—	—	52.2 58.6

51	18.7	24.2	4 18	—	—	55.7 1.3
56	24.3	29.9	2 9.8	—	—	—
5	9.6	35.1	7 34	—	—	6.0 11.3

$$\Sigma = 16 \quad 0 \quad 26.1 + 41 \quad 56.5$$

$$\eta = 16 \quad 3 \quad 36 + 41 \quad 54.4$$

$$3 - \text{Radcliffe } 3532 = \text{Lat } 29815 = \text{B.F. } 418 \quad 16 \quad 14.19 \quad 64$$

Comparison - Stars

Angle of Pos. of Wires $-1^{\circ}49'$

$$\Delta t = -[4.49729] \Delta D \quad \text{value in space}$$

$$= -[9.9946] \Delta D \quad \Delta t \text{ in seconds of time}$$

$$\Delta D \quad \text{in minutes of hour}$$

Comp. between α and a $15^{\circ}10'$

	Cor. for Wires	Wires	Scale	
$\alpha - a + 3' 9''.9$	$+0.56$	$-7 12.75$	$-7 13.38$	Mean
			$-7 13.39$	
			$-7 13.38$	
Place of Star α [approx]	1862.0	15 45 17.53	+45 10 56.5	Δt
		38.6	-3 57.5	
	1861.0	15 25 56.	45 6.59	$\checkmark$
with	α	15 18 43.	45 10 9	$\checkmark$

Comp. between ξ , η , and δ .

	Cor. for wires	Wires	Scale	
$\xi - \delta - 3' 16''.4$	9.743	$-14 10.87$	$-14 10.23$	$\delta 16 14 37 +41 59.7$
	$+0.55$	Wires corrected	$-14 10.32$	$\xi 16 0 37 41 56.4$
			$-14 10.28$	$\eta 16 3 33 41 56.3$
$\eta - \delta - 5' 23.7$	9.960	$-11 5.20$	$-11 4.40$	amp
	$+0.91$		$-11 4.29$	3
			$-11 4.32$	

Both wires and scale were employed, at the zero-reading for the scale. The zero-reading for the wires being $358^{\circ}0'$ while that for the scale was $352^{\circ}48'$, it is evident that the wire-transits were taken at an angle of position $358^{\circ}12'$, and therefore require the correction $+\frac{\Delta D}{\cos D} \sin 358^{\circ}12'$, or $-[9.9914] \Delta D$ where ΔD is to be expressed in minutes of hour and Δt in seconds of time.

Comparison - Stars

1862 Feb 7

p	11	9 ^m	36.3	41.8	9'31"	10 ^m	12.4	17.6
c	11	^{illegible} 52.9	55.8	3'44.5	12	26.9	32.2	
d	13	59.3	4.6	9'43.5	14	35.1	40.4	

10.5 p	11	15	56.3	61.4	9	32.5	16	31.8	37.1
c		18	9.4	15.2	3	45	18	46.1	51.4
8		20	18.6	24.2	9	42	20	54.4	59.8
8		23	18.7	24.2	7	53.5	23	54.8	60.3
c		25	32.2	37.7	2	6.	26	9.0	14.3
d	11	27	41.4	46.9	8	4	28	17.6	22.9

$$p = 16 \quad 8 \quad 33 \quad + 41 \quad 46.2$$

$$c \quad 16 \quad 10 \quad 27.85 + 41 \quad 45 \quad 44.3 = \text{Total } 297.15$$

$$d \quad 12 \quad 31.61 \quad 51 \quad 37.5 = \quad " \quad 297.65$$

Comparison - Stars

Comparison of p with c and d .

$$\Delta d \quad p-c + 5' 47.3 \quad \text{ly. } 7.889 \quad \text{Corr. for wires} \quad -0.77$$

$$p-d - 0 10.8 \quad +0.02$$

$$p-c \quad \text{Wires} - 2 13.82$$

$$\text{Corrected} - 2 14.59$$

$$\text{Scale} - 2 14.32$$

$$\text{Mean} - 2 14.45 \quad \Delta x + 5' 47.3$$

$$p-d \quad \text{Wires}^{\text{corr}} - 4 22.70$$

$$\text{Scale} - 4 22.70$$

$$\text{Mean} - 4 22.70 \quad \Delta d - 0 10.8$$

1861.0

$$c \quad 16 10 46 \quad 41 40.3$$

$$d \quad 16 12 55 \quad 41 46.2$$

$$p \quad 16 8 32 \quad 41 46.1$$

Sirius

1862 Feb. 10th

At 8^h saw the companion well
but before measures could be taken
it became difficult

Dist. $\ll$ 0.

57.42 Power 144

57.38

57.33

Mean 57.377

Zero 58.330

953

Zero

19

58.35

Dist. 9".34

32

wt = 1

58.32

Mean 58.33

At 9^h 30^m to 10^h vision much better & the following angles of position were obtained with certainty

Dist
57.25
57.27
Mean 57.26
Zero 58.33
1 07

Dist
59.39
59.37
59.38
58.33
1 05

Zero

86° 50' 1.6
82 00 3.2
85 40 0.4
89 30 4.2
86 00
81 15
4 45

21
10".49
wt = 2

21
10".29
2

Ang. Pos

85 15
± 1.1

Feb 7 11.36 wt = 1
10 9.36 1
" 10.49 2
" 10.29 2
Mean 10.37 6
± 0.2

for angle of unit
of wt ± 0.55 in distance
± 2.2 in position

Sirius

1862 Feb. 16

Saw the companion of Sirius under barely

tolerable definition

Distance

59.33

Pos

88° 15'

46

49

23

59.38

88 15

Zero

58.3391 1510.097 00

10.65

90 0020

Dist

10.3
9.85

4.06

83.00 1.84

wt =

1

wt.

1

Sirius. Clark 18½ Object glass

1862 Feb. 18

Saw Sirius with its Companion at about 8 P.M. perfectly distinct. was much impressed with the excellence of the definition of Sirius with the 18½ inch Object glass. It is difficult to suggest any particular in which improvement can be desired.

4 stars within 10'

When the eye piece is drawn out beyond focus the outer fringe of the image is a faint green

For bluish stars the color-correction seems very perfect. In general there is a slight excess of red but not at all offensive.

G. P. B.

Examined. Regel also

Orion Clark 18 1/2 in Object glass

1862 Feb. 18

Good definition - calm & clear. Temp about 32°

Obtained a very fine view of the Nebula with the great Object glass.

The cirrus-like filaments sweeping outward from the *Regio Hygeniana* perfectly distinct. far more so indeed than with our 15 in Object glass & entirely unquestionable as to their wisp like curves or spiral-ity in the sense attached to this term by Lord Rosse

The filaments were more numerous, distinct & cirrus like, than I have before seen them.

In the *R. Gentil.* *Dorham.* & *Picard.* This disposition was very strikingly evident.

The *R. Hyg.* was resolved into ^{a confused assemblage} ~~a convergent~~ of wispy masses verging on resolution.

The regions South of *R. Subnebulosa* towards of and following *Diina Gentil.* abounds with very small stars.

The nebulous light shooting southward from the bright stars in *R. Subneb.* ^{more} especially the *prec.* one very plain - also the neb-ularity of the neb. star S. of *R. Gentil.* has same tendency very plainly seen.

As the result of this view I was entirely confirmed in my previous impressions of the spiral structure of this nebula.

The variable κ star was not seen although looked for expressly.

C. P. B.

8^h 16 37 12 16
 * 8 17 14 12 10.5

Echo (60)

J.H. 1862 Sept. 1.

Compared with star ^a in Argelander Bonner Sternverzeichniss

-1 no 2592. 49 5.1 -1 28.8
 1855.0 11 ~~50 14.6~~ -1 32.4 9.5

Obs. 236. (α following a. north)

Wires - angle 341° 0'

Reduced to 10^h 39^m 7^s Chro.

11.4 in x -2.62 in δ -17".6

a 10 18 23.3 27.6
 x 18 59.0 63.2

+35.65 -0.68 +34.97

a 10 20 18.4 22.7
 x 20 54.1 58.4

35.70 -0.61 35.09

a 10 21 58.2 62.5
 x 22 33.4 38.0

35.35 -0.56 34.79

a 10 24 7.5 12.3
 x 24 42.4 47.4

35.00 -0.44 34.52

a 10 25 41.1 47.0
 x 26 16.7 22.4

35.50 -0.45 35.05

Mean of 5 +34.89

a ~~10 30 10~~

x 10 35 5

40.337

Zero 58.320

+2'56.2 +1.2 +2'57.4

a

x 10 39 6

40.235

2'57.2 0.0 2'57.2

a

x 10 41 22

40.160

2'58.0 -0.7 2'57.3

a

x 10 43 1

39.960

2'59.9 -1.2 2'58.7

a

x 10 44 31

39.953

+3 0.0 -1.6 2'58.4

Mean +2'57.8

Echo (60)

Star 1039
1862phae

a	10	50	27.2	34.6			
x	51	1.3	8.9	+34.20	+0.40	+34.60	
a	52	54.1	61.3				
x	52	28.0	35.9	34.25	+0.45	34.70	
a	53	23.0	30.2				
x	53	52.2	64.5	34.25	+0.50	34.75	
a	54	58.8	66.0				
x	55	32.8	40.1	34.05	+0.56	34.61	
a	56	11.4	19.0				
x	56	45.4	52.9	+33.95	+0.59	34.54	
					Mean 5	+34.64	

Cho.	10	39	7	Planet - Star	+ 34.76 ± 0.045	+ 2' 52.8" ± 0.22	These have been verified
fast.		2	26	Red loff.	+ 2.62	-1' 18.1	
	10	36	41	Refr.	+ 11 49 29.00	-1 30 26.0	
	22	36	54	Temperature	11 50 6.58	-1 27 46.2	
			1 58	Planet place			

11 57 49 Cambr. mean time

The star of comparison is Argelander (B. No.)

(1855.0)

9^h 5^m 11^s 49th 5.1 - 1° 28' 8"

and can be determined by comparison with two of Bessel's stars

1855.0						
8 ^h 7 ^m	11 47 30.0	-1° 34.7	} determined true 1863 Feb. 25 th			
9 ^h 0 ^m	54 22.1	-1 26.0				

Comparison = Stars for 1861.

1862 Nov. 5th
7.43

Star e Wires and Scale at 352° 48'

		Wires		Scale	n	6"	
Star e		41.8	51.0	1 52	39.5	49.3	1 54
" o q		4.5	14.5	10 18	10" L.		

Doubtful. Chord

Star e ^q ~~Wires alone for HR~~

	^q T ₂	56.0	65.3	1 49	53.0	62.7	1 51
o		9.7	28.9	10 10	—	24.9	10 14.5

e	19	12.2	21.2	1 25		19.4	1 27
o	22	35.7	44.8	9 48	0.8	41.7	9 50

e	26	48.7	57.4	1 45	46.3	56.1	1 47
o		12.8	21.6	10 6	8.3	17.7	—

e	33	33.9	42.8	1 46			
o		58.2	7.4				

e	40	18.6	27.8	1 46.5	15.8	25.9	1 49.5
o	43	42.7	51.8	10 6	38.0	47.7	10 8.5

3	23.65	22.20
	23.55	21.70
	24.15	21.85
	24.45	

Star e = Arg. [O.H.] N. 12183.84 11° 48' 15.24 66° 7' 22.3 2 obs. also in L. — 22487.
1842.0

Star o was used as a comparison = star for Comet 1861. II.

The observations above were taken on both wires and scale, at the zero for the scale.

At Wires	Scale	ΔS	Dec. 66° 4' 15"	0.7843	By Wires	3 21.92
+ 3 23.65	+ 3 22.2	+ 8 20.8	- 1° 48' 51"	8.4971	Scale	3 21.65
23.55	21.7	23.0		7.7128	about correct	
24.10	21.8	21.9	501.0	2.6999		
24.45	—	—	2.59	0.4127		
24.05	22.0	+ 8 19.2				

There is perhaps a little uncertainty about the angle between wires

Sirius

1862 March 11

Definition not very good.

2 x Dist

$$\begin{array}{r} 57^{\circ} 30' \\ 59.34 \\ \hline 2 \ 04 \\ 41 \\ \hline 19 \ 99 \end{array}$$
Dist. $9.995''$ $W=1$

$$\begin{array}{r} 59.23 \\ 57.34 \\ \hline 1 \ 89 \\ 38 \\ \hline 18 \ 52 \end{array}$$
Dist. = $9.26''$ $W=1$

Aug. Pos

 $82^{\circ} 47'$ $89 \ 5$ $90 \ 25$ $85 \ 50$ $34 \ 8 \ 07$ $87 \ 02$ Zero $81 \ 15$ $5 \ 47$ $90 \ 00$ $84 \ 13$ $W=2$

Stars of Comparison

2

1862 March 11.
1945

2 5 - 5'6

3 26 - 6.4

Chr. 236.

e 9 54 11.28 42.3 47.8

9.55.5

r 4 12 47.9 3.2

+2 5.50 - 5'42"

e 9 0.5 32 0.6 6.0

9 2.5

r 3 18 34 6.1 11.5

2 5.50 - 5 42.5

e 7 52.5 34 57.9 3.3

r 2 10

7.7 ?

miscount afterward 2 5.40 - 5 42.5
Assumed 3.7

e 7 51 38 33.8 39.3

r 2 8 40 39.2 44.7

2 5.40 - 5 43.0

e 10 5 42 11.4 16.7

r 4 23.5 44 16.9 22.3

2 5.55 - 5 41.5

mean.

diff.

Temp. (20°)

+2 5.47 - 5 42.3

0.00

- 0.2

+ 1.2

e 10 4 17^h 47^m 5.4 11.0

v 3 — 50 31.3 36.4

HR not very good. $\frac{1}{2}$ wt.
+ 3 25.65

e 9 19 11 53 29.3 34.6

v 2 49.5 56 54.8 0.3

-6' 29.5" + 3 25.60

e 10 24 11 57 57.9 57.4

v 3 54 — 22.8

-6 30 + 3 25.40

e 10 40.5 12 2 5.5 11.0

v 4 11.5 5 31.3 36.8

-6 29.0 + 3 25.80

C.R. 352° 50'

Mean - 6' 29.5" + 3 25.61
Ref. - 0.2 0.00
Disp. + 1.4

7/15

Comparison - Ray

1862 Nov. 17
745 Star for Comet

	1861	I ₁	5	
z	3 57	9	32 24.7	31.3
	7 20?	33	4.?	
γ	2 12	33	48.8	55.4 =
z	9 16	37	31.7	37.4
q	7 17.5	41	41.3	48.0
γ	2 7	45	33.4	39.8
z	9 20?	49	15.5	22.1
a				

Evening quite hazy; clouded up.

The star γ = Arg. (Oltz) N.S. 10748 9.10
 γ " " 10769.2 } 8.9
 20

z is probably a comp. star (May 2 1861) for Thatcher's comet. Magnitude estimated 10.7 or 10.11; observations bad.

Star α = Arg. (Oltz) N.S. 10882. 7."

The above are to be rejected.

Comparison: Star

1862 Nov. 19
JHS.Angle from ^{set at} "352°53'

1	x	8 ¹ 22.5 ¹¹	10 ¹ 28 ^m — 48.1 ^s
	y	2 44.5	32 15.8 19.8

221 20 - 6 28

Star x = Mupen VIII 113

y = Star for Comet 1861.I

1861.0 { 8^h 9^m 26^s 9^m nearly
- 6^m 33^s.0

2	x	10 14	10 34 55.4
	x''	11 26	36 17.8
	x'	8 23	36 43.8
	x'''	8 4.5	37 20.0
	y	4 35	38 26.4?
	y'	5 47	39 46.4
	y''	3 53	40 56.8

2^h 27^m 30^s - 6° 30'

3	x	9 2.5	10 44 27.6	31.7
	x''	10 12.	45 50.4	54.5
	y			
	y'	4 33	19.1	23.0

y-x

4	x''	7 34	10 53 1.0	4.9
	y'	1 52	56 29.4	33.4

10 32 + 3 31.4 - 5 36.0

34 ? 5 39.0

11 5 31.50 5 36.5

11 31.70 5 34.5

Mean - 10 52. + 3^m 31.4^s - 5^m 34.2^s

See also Merid. Obs. 1862 Jan 31.

x	6 22.5	11 1 22.8	26.7
x''	7 27	2 45.3	49.3
y	0 46	4 54.2	58.3
y'	1 56	6 13.7	17.6

x	8 20.5	11 7 26.6	30.4
x''	9 35	8 49.1	53.1
y	2 45	10 58.2	62.2
y'	3 55	12 17.6	21.5

3^h 0^m 0^s - 6° 28'

Comparison Stars

1862 Nov. 19
21.52889
PK₁ double pro. = A. $\Delta\mu = 382^{\circ} 53'$

A	6 20.5	11 23	22.2	26.3	lit. by
$\frac{1}{2}$	6 4.		50.0	54.1	

A	7 2	11 26	0.3	4.3
$\frac{1}{2}$	6 45	27	27.9	32.1

A	7 14	11 28	42.1	46.1
$\frac{1}{2}$	6 58	30	9.8	14.0

Corr. Carr

A	7 14	11 32	18.9	22.8	$3^h 2^m 26^s$
$\frac{1}{2}$	6 58	33	46.7	50.9	

- 1 25

B	2 55.5	11 43	1.0	4.9	3 18 32
η	8 54	45	39.2	43.2	

- 1 31

B	4 11	11 46	40.5	44.5
η	10 7.5	49	18.7	22.6

B	2 45	11 57	0.5	4.5	3 26 32 + 4° 37'
η	8 42	53	38.4	42.5	

 $\frac{1}{2}$ - A

11 25	+ 1 27.80	- 0 16.5
27	1 27.40	17.
30	1 27.80	16.
34	1 27.55	16.

+ 1 27.49
1861 by Chron. 1 27.96
Vise 1861 May 15 Count. 0.07

 η - B

11 46	+ 2 38.25	+ 5 50.5
49	38.15	56.5
54	37.95	57.0
	+ 2 38.12	+ 5 57.3

Vise Merid. Oct. 1862 Jan. 31.
B = Mags. VIII. 58x.

Orion

1862 March 19

First tolerably clear night for several weeks free from
Moonlight.

Compared places of stars on Engraved chart A. over
region indicated by red line - & got order of brightness

Clear but vision not good

Two stars missing - Four new stars.

Comparison-Start

1862 Dec 19 continued

5th May.

Σ	8 12	13 18 37.1	43.3
C	6 6	22 47.6	53.8

Σ	6 19	24 5.5	11.9
C	4 17	28 16.3	22.4

Σ	6 40	29 42.1	48.3
C	4 37.5	31 51.9	58.2

Add 0.5 probably: misprint

Σ	7 57.5	38 54.1	0.4
C	5 47	13 40 4.6	10.9

Star C = Arg. (Oltz) N 2 10802. Star Σ was employed 1861 May 2, for Comet 1861 I.

1862.0	10 20 28.45	+ 51 22 38.4
4 Apr.	2.77	1 11.63
		- 5 46.0

1861.0	10 21 37.1	+ 51 16.82
Σ - C	- 1 10.67	+ 2.06

10 17 26.5	+ 51 18.88
- 1 14.3	- 1.57

See 1861 May 2. Σ *

13^h 10^m Cambr.

1849 Berlin

10 16 12.2 + 51 17.37 1861.0

10 16 16.9 + 51 16.64 Interp. The star is 154 4.40 + 51 17.21

Berlin m.s.

May 2 9 31.6	10 22 40.2	+ 52 36.90
--------------	------------	------------

7 4.9

11 8.8

21 32.4 52 23.11 Altana

14 54.2

18 56.0 51 20.30 Washington

3 10 24.6

5 57.1 48 56.01 Altana

Computed

155.21.57 + 52 23.0

51 17.10

154 2.77 42 59.67

N.H. in A.R.

1.613 10^h 20^m - 42⁵⁰ - 8.61 14.58 - 41.15 - 8.67

3.783 13 1 - 41.6 - ? - 315.5 - 66.47

23.60 22 56 - 39.5 - 8.77

The star is the right one.

* A mistake of 0.5 in country was discovered immediately after writing down these numbers. The observed took up the beat between the transit of Σ and C.

Comparison - Stars

1862 July 19
W.S.

Results.

1 2 3 4 5 6

Orion

1862 March 26

Clear with tolerable definition

~~Comparison~~ Stars on Engraved Chart A in region marked in black

The two groups near Dec - 16' R. 0' and Dec + 19' 30" R. 0' gave a good deal of trouble

The former group strongly nebulous

Those numbered 1 and 2 are very bright and about equal to 2 & 3 of March 17.

Orion

1862 March 27

Good definition

No trace of δ star.

small of stars N.B. That nebulosity tends to aggregate about the groups

Compared stars on Engraved Chart A. green limits

Small star missing	Dec - 11' 30"	AR - 21'
" "	" + 20	" - 6
" "	" + 17	" - 3
Change of magnitude	" - 5	" - 29
" "	" - 5	" - 15
" "	" + 18	" - 26
New stars	- 12	- 22
"	- 5	- 29
"	+ 23	- ~~29~~ 29
"	+ 4	- 28
"	+ 15	- 27
"	+ 17	- 29
"	+ 19	- 28
"	+ 8	+ 2
"	+ 11	+ 5
"	+ 14	+ 7

N.B. That the smallest stars in the bright masses of nebulosity about the trapezium are easily seen in strong twilight & before others in darker regions come in sight although when the sky becomes dark the latter are much more easily seen.

This shows that the small stars near the trapezium are really much brighter than they appear to be - their light being commonly overpowered by that of the nebula.

This fact is important as evidence of a clustering of stars about the brighter nebulous regions - see also above

G.P.B.

4
5

Ab.
x
u

Orion

862 March 28

Clear but not good definition.

Concluded examination of Engraved Chart A.

the north following sixth Noticed corrections
as follows:-

Several new small stars indicated by x

Missing star in Dec + 19' AR + 12'

New stars some ten or twelve mostly small.

Star in + 20' Dec + 13' AR marked on chart as faint dot
is of 9-10th mag. also another similarly marked in Dec + 16'
AR + 20' is of 9th

Small stars most numerous in AR 0 to + 16'
Dec + 6' to + 20

Sirius

1862 March 29

Good definition.

Zero 81° 14'

Dist.

57.10

59.00

1.90

0.95

19

9.31

wt=2

59.20

57.04

216

1.08

22

10.58

wt=2

Pos

84° 35'

90 7

86 15

260 57

86 59

Zero 81 14'

5 45

90 00

84 15

Avg. Pos

wt=2

1862-~~the~~ Comet 1861 II14611229.
4. P. 1306.

	At	h	m	s
(Comet ?)	9	8	46.5	
star. north	9	9	0.5	
M.A.	11	34	42	
Dir.	+69° 19' 19"			

P Cephei	At	9	17	29
M.A.	11	49	6	
Dir.	+69° 58' 30"			

for Echo

1862 Dec 29
ZHSAt 9^h 30^m Camb.

$$\begin{array}{r}
 \text{Eph} \quad \begin{array}{r} h \quad m \quad s \quad \text{a} \quad \text{p} \\ 11 \quad 26 \quad 15 \quad + 2 \quad 7.4 \end{array} \\
 \text{Cor} \quad \begin{array}{r} + 9 \quad - 0.8 \\ \hline 11 \quad 26 \quad 24 \quad + 2 \quad 6.6 \end{array}
 \end{array}$$

$$\begin{array}{rcl}
 * a & 11 \quad 25 \quad 32 \quad + 2 \quad 6.6 & W. XI. 429 \\
 * b & 25 \quad 57 \quad 2 \quad 3.3 & " \quad " \quad 438 \\
 * c & 26 \quad 26 \quad 2 \quad 5.8 &
 \end{array}$$

x comp: with c. z n.p.

$$x = \underline{10.3^m}$$

$$\begin{array}{rcl}
 9^h \quad 54.20^m & 64.495 & \text{Dist L} \\
 57.5 & 64.836 & " R \\
 57.58 & 65.020 & " R \\
 59.8 & 65.000 & " L
 \end{array} \left. \vphantom{\begin{array}{rcl} 9^h \quad 54.20^m \\ 57.5 \\ 57.58 \\ 59.8 \end{array}} \right\} \text{Low Power} \quad \text{Cir. Read. } 325^{\circ} 20'$$

$$\begin{array}{rcl}
 10 \quad 4 \quad 25 & 231.2 & \text{above} \\
 6 \quad 5 & 233.1 & \text{below} \\
 7 \quad 32 & 233.2 & \text{below} \\
 9 \quad 57 & 232.1 & \text{above}
 \end{array}$$

$$\begin{array}{rcl}
 10 \quad 12 \quad 36 & 50.586 & \text{Dist L} \\
 14 \quad 0 & 50.500 & — R \\
 14 \quad 55 & 50.470 & — R \\
 16 \quad 36 & 50.524 & — L
 \end{array} \left. \vphantom{\begin{array}{rcl} 10 \quad 12 \quad 36 \\ 14 \quad 0 \\ 14 \quad 55 \\ 16 \quad 36 \end{array}} \right\} \text{Higher Power} \quad \text{C. Read. } 320 \quad 12$$

$$\begin{array}{rcl}
 10 \quad 19 \quad 43 & 232.6 & \text{below} \\
 21 \quad 20 & 232.8 & \text{above} \\
 23 \quad 2 & 232.1 & " \\
 24 \quad 12 & 232.3 & \text{below}
 \end{array}$$

$$10 \quad 28 \quad 57 \quad 49.612 \quad L$$

x = Echo.

for Echo

862 Jethy

a 10 39 7.5 13.5
c 40 1.8 7.9

a 40 44.6 50.7
c 41 38.9 45.0

a 42 13.9 20.1
c 43 8.2 14.2

a 43 50.1 54.5
c 44 44.6 49.0

Sp. Gov.

a 45 22.6 26.8
x 46 11.5 15.8
c 46 16.8 21.2

a 46 41.5 44.7
x 47 30.5 33.8
c 47 36.0 39.3

[x is evidently too small]

b 47 58.9 2.3
c 48 28.3 31.7

b 48 46.4 49.8
c 49 15.9 19.2

b 49 30.0 33.3
c 50 59.4 62.6

5-a + 54.35

.30

.20

.50

+ 54.534

E.C. 54.42

Mean + 54.38

5-b 29.40

29.45

29.35

+ 29.40

Sec. + 2.19

1.26

3.14

2.46

+ 2.26

+ 3' 20.40

21.08

20.68

+ 3' 20.71

a 51.835

c 51.614

10^h 58^m

a 51.643

c 51.514

a 51.790

c 51.470

a 51.766

a 51.396

c 51.145

11 8

b Zero wire

c 37.716

b Zero

c 37.650

b Zero wire

c 37.688

Echo.

1862 Aug 19

Zero of Pos. $261^{\circ}22'$ not very good.

Zero of Micr. wire 58.162
 58.159
 58.173

 58.165

L.H.S. 261 22

S.P.B. 261 14

261.18'

 $+15'$
 $+3'$ $-190'$

29.47

Echo comp: with c:

Pos.

Dist.
Pos.

Dist

Chro 236	9 55 12.5	6.501	~~299.15~~	63.71
	58 33.	6.845		67.08
	10 5 15		299.15	
	8 44.5		298.65	
	13 18	7.622		74.70
	15 45.5	7.768		76.13
	20 31.5		298.6	
	23 37.		299.1	

Chro.

Apex at 10 10 30 Pos 298.6 Dist 73.7 $m = +25.29$ $m = -64.70$ $\partial x = +0.289$ $\partial y = -0.449$

$m + \partial m$	$+30.87$	31.43	33.77	34.78	36.10	36.81	38.18	39.08
$m - \partial m$	-57.83	-59.33	-62.34	-63.91	-65.96	-67.06	-69.20	-70.60
	1.4896	1.5028	1.5285	1.5413	1.5575	1.5659	1.5819	1.5920
	1.7621	1.7733	1.7948	1.8056	1.8192	1.8265	1.8401	1.8488
Pos.	1		298 26.	298 35			298 53	298 58
Lu Dist	1.8166	1.8282	1.8504	1.8620	1.8761	1.8837	1.8978	1.9069
$\partial \zeta$	$+1.55$	$+0.25$			$+0.48$	$+0.37$		
$\zeta \partial v$			-0.88	-0.08			$+0.39$	-0.19
	Hera	$[C=0]$ $\partial \zeta = \text{and } \partial v$	$+0.74$	$\zeta = 72.96$		$m = -63.96$		
		∂v	-0.19	$v = 298^{\circ}45'$		$m = +35.10$		
		9.279	74.7					
						± 0.437 selling		

Echo.

March 29.

$$a = L. 21923 = BZ.$$

$$b = L. 21936 = BZ.$$

$$Ch. 1849 \quad 11 \ 24 \ 52.90 \quad + \ 2 \ 10 \ 29.61$$

$$1800.0 \quad 11 \ 22 \ 21.37 \quad + \ 2 \ 26 \ 46.2$$

$$+ \ 3 \ 10.87 \quad - \ 20 \ 28.2$$

$$1825.0 \quad 11 \ 23 \ 38.86 \quad 2 \ 18 \ 24.4$$

$$+ \ 1 \ 53.90 \quad - \ 12 \ 13.2$$

$$1849.0 \quad 11 \ 24 \ 52.90 \quad 2 \ 10 \ 29.61$$

$$+ \ 40.02 \quad - \ 4 \ 17.71$$

$$L \quad 11 \ 25 \ 32.76 + 0.02 + 2 \ 6 \ 18.0 = 2.7$$

$$b \quad 32.76 - 0.02 \quad 6 \ 11.2 + 0.9$$

$$Ch. \quad 32.92 - 0.02 \quad 6 \ 11.9 - 0.6$$

$$Ad. \quad 32.80 \quad 6 \ 11.6$$

$$1800.0 \quad 11 \ 22 \ 46.77 \quad + \ 2 \ 23 \ 26.0$$

$$+ \ 3 \ 10.85 \quad - \ 20 \ 28.5$$

$$1825.0 \quad 11 \ 24 \ 3.66 \quad 15 \ 8.2$$

$$+ \ 1 \ 53.89 \quad - \ 12 \ 13.4$$

$$L. \quad 11 \ 25 \ 57.62 + 0.03 + 2 \ 2 \ 57.5 - 2.7$$

$$b. \quad 57.57 - 0.02 \quad 2 \ 54.8 + 0.9$$

$$Ad. L. B. \quad 57.57 \quad + 2 \ 2 \ 58.3$$

$$C. - a \quad + 54.38 \quad + 2.3$$

$$C. - b \quad + 29.40 \quad + 3' \ 20.6$$

$$C. [1860.00] \quad 11 \ 26 \ 27.08 + 2 \ 6 \ 14.9$$

$$+ 2.78 \quad - 18.9$$

$$+ 2.02 \quad - 19.1$$

$$Planet - Star \quad - 4.26 \quad + 35.1$$

$$Planet \ H.R. \ Dec. \quad 11 \ 26 \ 25.24 + 2 \ 6 \ 31.1$$

$$Ch. \ 10 \ 10 \ 30 \quad p. \ Per \quad - 0.14.0 \quad + 5.53$$

$$f. \quad 10 \ 9 \ 53 \ h.R. \ C-0 \quad - 11.318 \quad + 53.41$$

$$0 \ 27 \ 18$$

$$9 \ 42 \ 15$$

$$1 \ 36$$

$$9 \ 40 \ 40 \ Carb. \ ref.$$

$$9 \ 40 \ 40$$

$$+ 5 \ 38 \ 0$$

$$15 \ 8 \ 13$$

$$15 \ 137$$

$$23 \ 07$$

$$1 \ 36 \ 4$$

$$24$$

$$1840.0$$

$$11 \ 24 \ 28.0 \quad 11 \ 24 \ 49.8$$

$$+ 2 \ 12 \ 46 \quad + 2 \ 10 \ 19$$

$$790 \quad 8.54932 \quad 8.54851$$

$$792 \quad 8.54932 \quad 8.54851$$

$$794 \quad 8.54932 \quad 8.54851$$

$$796 \quad 8.54932 \quad 8.54851$$

$$798 \quad 8.54932 \quad 8.54851$$

$$800 \quad 8.54932 \quad 8.54851$$

$$802 \quad 8.54932 \quad 8.54851$$

$$804 \quad 8.54932 \quad 8.54851$$

$$806 \quad 8.54932 \quad 8.54851$$

$$808 \quad 8.54932 \quad 8.54851$$

$$810 \quad 8.54932 \quad 8.54851$$

$$812 \quad 8.54932 \quad 8.54851$$

$$814 \quad 8.54932 \quad 8.54851$$

$$816 \quad 8.54932 \quad 8.54851$$

$$818 \quad 8.54932 \quad 8.54851$$

$$820 \quad 8.54932 \quad 8.54851$$

$$822 \quad 8.54932 \quad 8.54851$$

$$824 \quad 8.54932 \quad 8.54851$$

$$826 \quad 8.54932 \quad 8.54851$$

$$828 \quad 8.54932 \quad 8.54851$$

$$830 \quad 8.54932 \quad 8.54851$$

$$832 \quad 8.54932 \quad 8.54851$$

$$834 \quad 8.54932 \quad 8.54851$$

$$836 \quad 8.54932 \quad 8.54851$$

$$838 \quad 8.54932 \quad 8.54851$$

$$840 \quad 8.54932 \quad 8.54851$$

$$842 \quad 8.54932 \quad 8.54851$$

$$844 \quad 8.54932 \quad 8.54851$$

$$846 \quad 8.54932 \quad 8.54851$$

$$848 \quad 8.54932 \quad 8.54851$$

$$850 \quad 8.54932 \quad 8.54851$$

$$852 \quad 8.54932 \quad 8.54851$$

$$854 \quad 8.54932 \quad 8.54851$$

$$856 \quad 8.54932 \quad 8.54851$$

$$858 \quad 8.54932 \quad 8.54851$$

$$860 \quad 8.54932 \quad 8.54851$$

$$862 \quad 8.54932 \quad 8.54851$$

$$864 \quad 8.54932 \quad 8.54851$$

$$866 \quad 8.54932 \quad 8.54851$$

$$868 \quad 8.54932 \quad 8.54851$$

$$870 \quad 8.54932 \quad 8.54851$$

$$872 \quad 8.54932 \quad 8.54851$$

$$874 \quad 8.54932 \quad 8.54851$$

$$876 \quad 8.54932 \quad 8.54851$$

$$878 \quad 8.54932 \quad 8.54851$$

$$880 \quad 8.54932 \quad 8.54851$$

$$882 \quad 8.54932 \quad 8.54851$$

$$884 \quad 8.54932 \quad 8.54851$$

$$886 \quad 8.54932 \quad 8.54851$$

$$888 \quad 8.54932 \quad 8.54851$$

$$890 \quad 8.54932 \quad 8.54851$$

$$892 \quad 8.54932 \quad 8.54851$$

$$894 \quad 8.54932 \quad 8.54851$$

$$896 \quad 8.54932 \quad 8.54851$$

$$898 \quad 8.54932 \quad 8.54851$$

$$900 \quad 8.54932 \quad 8.54851$$

Orion Scale values

1862 April 3.

Observed stars in Orion Zone for comparison
with Pierri V. 163 & V. 167 - also with 2 & 4 Orionis
P.V. 167 is also in Armagh Catalogue

G.P.B.

8 20 1.8
8 18 - 22 20.0

(236)	Scale	Scale	From θ
8 ^h 26 42.5	a 2 32	2 40	+20' -11'
	b 0 32	0 44	+18.2 -4.2
	c 0 2	0 12	+17.7 -3.5
(x) 27 26.0	d	2 1	-0.1 -19.5
28 18	e 2 19	9/10 th 2 28	-19.5 -0.1
P.V. 167 29 44.5	f 10 13	10 22	

(2)	37 6	0 9
	37 59	0 37
	39 24	8 31

= P.V. 167

	from θ	Mag.		
P.V. 163	+59.5' -15' 17"	7.8	No. foll.	0'
V. 167	+2 19.9 +27 47	8.	No. foll.	0'
V. 175	+3 45.2 +12 27	8.	No. foll.	0'

Orion

C.P.B.

From θ'
 δ α

(m)			ϕ 20	2 26	(H ^{III})	-19.7 -10.4
(m) 8	47	42	1 38	3 44	(9 ^{III})	-18.4 -10.1
PV 153	49	23	5 42	6 48	(V ^{III})	-15.2 +14.9

m (H ^{III})	8 31	7 53
n (9 ^{III})	9 50	9 11
l	1 57	1 18
k	3 18	2 39

l & k are two
stars near α n of
Orion

m	6 32	7 06	(This is perhaps star (2) of Jan 16 th)
2 Orionis	1 36	2 3	l

n	7 20	9 18	(" star (3) of Jan 16)
2 Orionis	1 00	3 00	

j	8 19	8 10
P.V. 153	0 4	-0 5

(H^{II}) δ α
j -7.1 -5.2

j	1 2	0 41	0 56
θ	8 7	7 43	8 1

(236)
End 9^h 10^m

New Planet (by H.P.T.)

1862. Apr. 7

G.P.B. obs.

planet comp with star of 10. 11 mag, planet free, and in north of star

Planet difficult to observe on account of clouds.

29.83 original distance of wires
Zero of Wires 261.5 (assumed)

Reduced.

Comparison of 236

AR (on Spr. bar)

p	16	0	57.3	75.5	- 39.85	- 0.57
*			37.1	58.4		

236 = 16 46 00
236 = 16 47 6.8

p	16	4	12.5	22.8	- 39.95	- 0.18
*		4	52.5	62.7		

BDB

p	16	5	56.8	67.0	- 39.95	- 0.13
*		6	36.5	47.2		

Alt in $\times$ - 1.7 in δ + 9" assumed.

236 =	16	10	0	37.33	29.14	+ 1' 20.3 + 0.1
		12	50	37.95	29.55	+ 22.3 - 0.3

D.B.

AR

p	16	15	31.2	43.5	- 40.25	+ 0.14
*		16	11.5	22.7		

D B D

p	16	49.3	61.5	- 40.00	+ 0.17
*	17	29.2	41.6		

p
*

B.B.

p	19	20.0	32.2	- 40.10	+ 0.24
*	20	0.1	12.3		

Reduce to El. 16° 10' 47"

42.12
13
08
11
39.15
56

Planet - Star - 40.02 + 1' 21.2"

Star of Comparison

1862 Apr. 7th

K 13 30 14.5 19.0 9' 37"

K 31 23.9 28.4 7 28

33 30.4 34.8 2 25

Star to det 34 57.8 2.1 1 46

The star used on this day was observed Apr. 24th: Compared with Napier
$$\begin{array}{l} \text{XI. } 675 \text{ } 3 = a \\ \text{" } 815 \text{ } 7 = b \end{array}$$

1875.0	11 37	16.71	3.076 + 2	30. 44.8	19.96	0.030	20	1831.0	1843.5
	1	53.80		-12 18.7			50		11 38 13.6
1800.0	11 44	49.24	3.073 + 2	25 47.9	20.016	0.013	40		+2 24.58
	3	10.52		-20 41.4			100		3.62409
1825.0	46	6.01	3.073	2 17 26.6	20.02	0.	100		8.97208
	1	53.71		-12 20.8			100		7.69436
							100		2.87042
							100		9.998042

B (a) 11 39 10.51 - 0.02 + 2 18 26.1 + 0.9 Red to mean - 0.003 on ✓ 9.29551

L 47 59.78 + 0.03 2 5 6.5 - 2.6
 B 47 59.72 - 0.02 5 5.8 + 0.9
 M 47 59.74 + 2 5 5.8

Star of comp = x

$$x - a \text{ Apr } 24 \quad + 3 \text{ } 34.15 \quad - 5 \text{ } 40.5$$
Red to mean $[-0.01]$

a 1862.0 11 39 10.49 + 2 18 27.0

x - B - 5 18.45 + 7 44.5

Red to mean $[+ 0.02 \quad 0.0]$

b 1862.0 11 47 59.74 + 2 5 5.8

x 1862.0 (a) 11 42 44.63 + 2 12 46.5

(b) 44.31 50.3

1831.0	1843.5
20	11 46 34.7
50	+2 11.27
100	8.59192
100	8.71737
	1.91856
	3.69465
100	9.99925
0	9.27780
	9.01836

Planet (75)

1862 Apr 7

± 1862.0 $21^h 42^m 46.47^s$ $+ 2^{\circ} 12' 48''.4$
 Verified β Virg. Red. to app. $+ 2.99$ $- 19.3$
 Planet - Star $- 40.02$ $+ 1 21.2$

Planet app. + d $11^h 42^m 7.45^s$ $+ 2^{\circ} 13' 50''.3$

$+ 0.2990$ $+ 5.66$

EL 16 10 47
fast 5

16 10 42
 1 2 47
 15 7 55
 2 29

15 5 26 M.I. Cambridge

G	358 17	$f + 27.44$
K	175 41	$9^{\circ} + 0.05$
H	250 5	$h^{\circ} + 17.28$
log	8.558	$g' + 11.88$
ln(h)	9.022	$h' + 0.72$
g	1.0774	$i' - 7.72$
ln(hnd)	9.99762	
ln d	0.0003	
ln(hnd)	9.9599	
L	1.2774	
ln(hnd)	9.6157	
ln d	8.558	

Sirius

April 12? 1862

Observations of Companion of Sirius

	Dist.	wt.	Pos.	wt
Feb. 7 th	11".36	1	88° 55'	0.5
10	9.34	1	85 15	2
10	10.49	2		
10	10.29	2		
16	9.85	1	83 00	1
Mar 11	10.00	1		
11	9.26	1	84 13	2
29	9.31	2		
29	10.58	2	84 15	2
Apr 12	9.60	3		
12	10.39	2		
12	10.29	3	84 26	2

Mean by wts $\overline{10.07}$ wt = 21 || $\overline{84\ 37}$ 9.5Dist = $10''.07 \pm 0''.12$ $84^\circ 37' \pm 0''.23'$ ~~Prob. Error 1.07~~

Prob. Error of one of above results of unit of wt

In Dist. $\pm 0''.56$
 " Pos. $\pm 1''.18$

Power 144.

Dif = 2 x Dist.

57.20	59.08
57.8	59.12
57.14	59.10
59.10	
2) 198	
980	
980	
Dist 9.60	wt = 3

87° 40'	
85.58	
86 49	
81 15	
5 34	
90 00	
Aug. Pos 84 26	wt = 2

Power No. 3

59.30
57.18
2) 1212
106
21
Dist 10.39
wt = 2

57.13	58.25
57.16	58.25
57.15	58.25
58.25	
2 10	
10 51	
Dist. 10.29	wt = 3

Calypso.

1862 Apr. 12th
J.H.S.

for Calypso

Circle $17''$ $0'$ Star α comp. with a

α faint	2 ⁿ .9	48 ⁿ	36.2	41.6
a		49	2.0	8.4

α		50	0.7	7.1
a		50	26.9	33.4

α		51	13.3	19.8
a			39.7	46.2

α		52	26.7	33.1
a			52.9	59.6

α		53	42.6	49.0
a		54	8.8	15.6

apparent α $\leftarrow$ 12 [bright moonlight] and reads
 $8' 10''$ nearly - a reads $6' 15''$
 α $\leftarrow$ a
 $7' 17''$ - $5' 14''$

$\alpha - a$	
7 48 39	- 26.3
50 4	26.25
57 16	26.4
52 30	26.35
53 46	26.40
9 57 15	- 26.34

Star γ comp. with α .

γ	9	58	44.2	41.0
α			53.5	0.3

γ	9	59	46.6	52.4
α			6.0	11.6

γ	10	1	21.4	25.2
α			50.5	54.5

γ is less than i.n. of a and about the
 same magnitude as α .

$\gamma - \alpha$	
9 58 38	- 19.40
59 49	19.30
10 1 23	19.20
9 59 57	- 19.27

Calypso

26 Apr. 12

Circ. 236 at angle $171^{\circ} 1'$

x	11	1	52.1	56.0		
a	11	2	16.3	20.3	-24.25	11 1 54

x	11	2	58.8	2.7		
a		3	23.2	27.3	-24.50	11 3 1

x	11	4	6.0	10.3		
a		4	29.9	24.7	-24.25	11 4 8

20.8 23.3
~~6.2~~ ~~8.4~~ ?

~~28.4~~ 31.6

x	11	7	51.4	55.7		11 7 54
a		8	16.2	20.3	-24.70	

x	11	10	0.6	5.2		11 10 3
a			25.3	29.6	-24.55	
					-24.45	

Angle

x n.p.v	11	17	22	244.2	above	12	Cir. 162	241.10	Angle.
		19	23	243.7	below	11	18 22	243.95	287 13'
		21	0	243.8	below				
		22	24	244.0	above	11	21 42	243.90	287 16
		23	21	244.3	above				
		24	14	243.7	below	11	23 48	244.00	287 10

At angle $171^{\circ} 1'$

x	11	27	43.3	51.2		11 27 47
a		28	7.3	15.2	-24.09	

x	11	29	20.8	27.0		11 29 24
a			44.9	51.4	-24.25	

x	11	30	47.2	53.5	-24.30	11 30 50
a		31	11.5	17.8		

Calypso.

1862 Apr. 12

x	11	32	7.0	12.7	-24.20	11	32	10
a			31.2	36.9				
x	11	33	40.1	45.7	-24.10	11	33	43
a		34	4.1	9.9				

Zero $81^{\circ} 12'$ } not very good.
 $81^{\circ} 15'$ }
 $81^{\circ} 2'$ } The last pair ~~are~~ probably ~~have~~ opposite errors.
 mean $81^{\circ} 10'$

x is Calypso: we have

H.M. + 0^h 9^m 2^sComp. of $\Delta\delta = \Delta\alpha \sin \delta \cot \theta$

$$\alpha - a \quad 9^{\text{h}} 51^{\text{m}} 15^{\text{s}} \quad -26^{\circ} 34' + \sin 10' \cdot \frac{(\delta' - \delta)}{15} \quad + 2^{\circ} 34'$$

$$12^{\text{h}} 5^{\text{m}} 24^{\text{s}} \quad -24.45 + \sin 9' \cdot \frac{(\delta' - \delta)}{15} \quad + 0.23$$

$$12^{\text{h}} 30^{\text{m}} 42^{\text{s}} \quad -24.17 + \sin 9' \cdot \frac{(\delta' - \delta)}{15} \quad - 0.19$$

Red. to $12^{\text{h}} 19^{\text{m}} 11^{\text{s}}$ Chro. 236

$$a \text{ is a star } 9^{\text{h}} 5^{\text{m}} \quad 1855.0 \quad + \quad 9^{\text{h}} 41^{\text{m}} 57.4^{\text{s}} \\ \delta \quad + 16^{\circ} 23.9'$$

$\Delta\alpha \sin \delta \cot \theta$	$\Delta\delta$	
12 18 22	2.54374	+ 108.37
9.4912, $\cot \theta$		- 0.04 Red.
12 21 42	2.5428	+ 108.25
9.4916		+ 0.10 Red.
12 23 48	2.5423	+ 107.67
9.4898		+ 0.18 Red.
		108.33
		108.35
		107.85
		108.18

[These times should all be 12^h instead of 11^h]: the hour angle at beginning of this set was over 2^h.

There were visitors before, who went as late as 2 past 10, according to H.P.'s testimony. - this showing that the obs. must have been after 12^h sid.

At $9^{\text{h}} 49^{\text{m}}$ Camb. m.t.	Planet - Star	-24.53	+ 1.18
Star 1862.0	9 42 20.5	+16 22.0	
Red. to off.		+2.8	- 0.2
	9 41 59.0	+16 23.6	
Pirotti [Astr 1353]	42 3	23.1	
Correction		- 5.5	+ 0.5

Chro. 12 19 11 $\Delta\alpha$ -24.29 $\Delta\delta$ + 1' 46" 18
 Refr. ⁱⁿvisible + 0.0

Chro 12 19 11	
fact 12 17 53	
1 22 30	
10 55 23	
1 48	
10 53 35	

Calypso

1862 Apr 16
H.S.Calypso $\frac{11.12}{10}$ n.p. $\frac{5}{10}$ 11.14 in AR + 1.23 in Δ - 3.75Diff AR at $357^{\circ} 7'$

Chr. 236

Calypso	10	49	15.3	21.3
$\frac{5}{10}$			47.0	53.0

50	25.3	31.4
	56.9	2.8

51	38.3	44.1
	9.3	15.4

52	59.3	5.1
	30.5	36.6

54	11.2	17.0
	62.4	48.4

Angle of B.

56	44	57° 42'
11	0 57	57 43
	4 10	57 51
	8 5	57 42

21.

10 49 17 - 31.20

50 28 31.50

57 41 31.15

53 2 31.35

54 14 31.30

10 57 45 - 31.40

357° 9'?

Diff AR

Log 15000 = 1.1963

Log Δ 40

2.6538 2.2911 + 3 15.5

31.26 6533 2902 15.1

31.19 6523 2864 13.4

- 31.11 2.6512 2.2885 3 14.3

Calypso	13	21.1	28.7
$\frac{5}{10}$		52.3	59.3

14	31.2	38.1
15	1.9	8.4

15	43.3	50.3
	14.4	21.5

16	54.3	1.1
17	25.2	32.0

18	29.4	36.2
----	------	------

11	10	0.4	7.3
----	----	-----	-----

11	13	25	- 31.20	Sec. red. to 11 348	3' 15.2
	14	35	30.70		14.9
	15	47	31.15		13.6
	16	58	30.90		14.6

18	33	31.05
----	----	-------

11	15	52	- 31.00
----	----	----	---------

Chr. 236	10	3	48	- 31.20
Mean.				

 Δ + 3' 14.6

Plant - 5

Allyson.

1862 Apr. 16.

for 7 sea also Apr. 20th

Stan 3	6' 9"	21"	7.1	13.9
R. 29/79	248	(22)	18.3	25.2

S	718	(23)	49.4	56.0
R	354	25	0.5	7.3

between the stars

The above diff. SR were taken at $35^{\circ} \pm'$ with the wires, and are reliable: Do not

Le.

R2979 was obs. in AR, Apr. 19 ¹⁶		Q d "		146.10.25		
R2979	1836.0	Q 43	58.306	16 19	47.08	L ^o 9 44 41.0
		1	25.483	-7	13.14	d ^o +16" 16.18
	1462.0	Q 45	23.789 + 0.064	16 12	33.94 + 0.26	
Resto app.			+2.625		-12.44	192 ^o 9.46516
S-R		-1	11.22		+3 24.	1910 ^o 9.77563
Apron.	S app. 22.	Q ^h 44	15.26	+16"	15' 45.8	1.54110
						2.71719
	S 1862.0	Q 44	12.6	16 15	58.	as L ^o 9.91944

Planet app. x. d. 9 43 44.06 +16 19 0.4 ±

Chro.
fact

11	3	48
11	2	20
1	38	16
9	24	4

Camb. m. 9 $\frac{132}{22 \ 32}$

Comp. 9 43 52 + 16 18.3
Dev. (O-C) - 8.5 + 0.7

A. Mon a 0.5164 9.4154
 b 8.2077m 9.3635m
 c 8.7617m + 1.2248m
 d 8.5936 - 9.7462m
 + 0.968 - 4.36
 - 0.361 + 2.12
 + 2.015 - 10.30
 + 0.003 + 0.10

New Planet (73)

1862 April 18th

(73) is about $4'$ S of star of 10^{th} mag. at 11^{h} Sid
& precedes it say 15^{s}

Reduction from 1825.0 to 1862.0

 $2^{\circ} 2'$ for 1843.5

$$\Delta \alpha = 113.697 + [4.69434] \sin \alpha^{\circ} \text{ to } 0^{\circ}$$

$$\Delta \delta = [2.87043] \cos \alpha^{\circ}$$

J.M. 1800.0 to 1862.0

$$\Delta \alpha = 190.353 + [1.91856] \sin \alpha^{\circ} \text{ to } 0^{\circ}$$

 $2^{\circ} 0'$ for 1831.0

$$\Delta \delta = [3.09465] \cos \alpha^{\circ}$$

J.M. 1836.0 to 1862.0

$$\Delta \alpha = 79.835 + [1.54110] \sin \alpha^{\circ} \text{ to } 0^{\circ}$$

 $2^{\circ} 0'$ for 1849.0

$$[2.71719] \cos \alpha^{\circ}$$

J.M. 1842.00 to 1862.00

$$\Delta \alpha = 61.413 + [1.42715] \sin \alpha^{\circ} \text{ to } 0^{\circ}$$

 $2^{\circ} 2'$ for 1852.0

$$\Delta \delta = [2.60324] \cos \alpha^{\circ}$$

Zero of Position observed near the second star

Telescope

1862 Jan. 23. $\gamma = 260^{\circ} 59'$ 11.

Stars for 1862. II (N. Peters)

Schönfeld

$$9^{\circ} 14' 27'' 20 + 53' 14''$$

$$9.2 \quad 14 \quad 42 \quad 32 \quad 51 \quad 23.3$$

$$10 \quad 14 \quad 40 \quad 40 \quad 51 \quad 60$$

$$9.3 \quad 16 \quad 19 \quad 52 \quad 41 \quad 36.7$$

$$9 \quad 17 \quad 30 \quad 57 + 43 \quad 7$$

Star Comet 1861. I.

$$8 \quad 29 \quad 42 + 7 \quad 6.1 \quad \text{comp. with}$$

$$\text{B.H. } 2689 = 8 \quad 28 \quad 14 + 7 \quad 6.3 \quad \text{double [parallax]}$$

$$8 \quad 25 \quad 36 + 4 \quad 39.5$$

$$8 \quad 9 \quad 21 - 6 \quad 34$$

$$15 \quad 20$$

$$15 \quad 21 \quad 13 + 44 \quad 47 \quad 4 \quad 7.4$$

$$+ 25^s - 17' 8'' 76$$

$$16 \quad 5 \quad 30 + 60 \quad 55$$

Ecl. 1862 Sept. 26

$$5 \quad 30 \quad 6$$

$$- 14 \quad 33$$

$$9 \quad 40 \quad 40 \quad \frac{26}{11}$$

$$- 43.16$$

$$1.6353$$

$$\text{Oct. I. } 15 \quad 46 \quad 13$$

$$9.1163$$

$$\frac{20}{21} + 7 \quad 0.6 \quad 2.6239$$

$$C. \quad 11 \quad 26 \quad 14.53 + 2 \quad 7 \quad 28.4$$

$$0. \quad 25.94 \quad 26 \quad 30.9$$

$$\text{Oct. } -0.11 \quad + \quad 4.9$$

$$-11.20 \quad + \quad 53.1$$

$$-5.965$$

$$+ 59.0$$

Comet 1861. III

1861
Jan 23 ~~337~~ 40' + 79° 29' 7.727 0.97
 24 349 0 77 50 768
 25 356 48 76 4 768
 26 2 18 74 18 789
 27 6 21 72 35 809 0.62
 28 9 28 70 58 828
 29 11 57 69 37 847
 30 13 59 68 3 865
 31 15 38 + 66 45 9.883 0.40

Brightest of discovery = 1.

Cost of spec. Jan 23. $\Delta\alpha + 12' -$
 $\Delta\delta - 1'$

Z.H.1

1862phi6a.proj..1998