

296
IV 13

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

KG 11365.296

 P = position angle T = zero of position i.e. when star runs along wire W = reading of micrometer on the side of Companion

$$P = 90 + T - W$$

34 35 40  Brorsen. 7-8-11.12-15-16-17-18-19-20-22-25-26-28-30-33

Pelle's asteroid 14

Moon - Linné 32

(100) - 50

 Encke 50-63-64-67-69-87-96

Ring Nebula drawn 56

C Lyrae 56

(101) 74 (102) 83

Occultations 80-86

Experiments with diaphragms 81

Nebulae 82-85-89

Pales (saturn) 87

Meteors 88

8
7
3
0
0
0

1868 Apr 1

Sinus	Σ 1133	Double	Coinc CSP
Penns	Pos. 62.7 H Greenough	Found	36.83
Too day -	62.0	by	3
zing	62.2 Doubtful	CSP	3
sun -	62.2		0
steady for	65.3		4
observation	62.80	RA. 8 ^h 8 ^m	826
		D - 5° 7'	
	60.7 CSP In nebula		Southern mark
	62.1 in Monocerotis		Pos. 322.6 P
	63.7 BAC 2766		1.1
	62.9 ~~2765~~ h 163p		3.6
	60.7 Shred in this		3.0
	61.9 loose cluster		5.5
	Dist 40.89 CSP called a neb.		323.32
	70 in B.A.C.		Dist 37.52 P
	84 They are nearly		1.76
	80 in a line run-		79
	74 ning n.p. & st.		63
	816		61
	40.82 49		42
	98		Northern mark
	99		Pos 340.3 P
	81		1.1
	85		39.7
	886		9.8
	Coinc. CSP		41.0
	40.30		Dist P
	32		37.70
	29		7.82
	20		7.71
	28		
	40.294		
		Pos. 353.0 Hg	
		350.5	
		350.7	
		351.0	
		350.8	

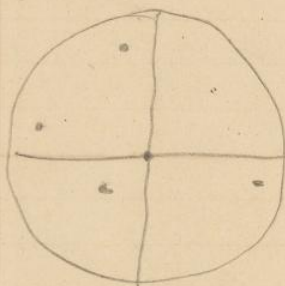
After this
fixed wire
moved

KG 11365.296



Wednesday April 1

Position RA $10^h 15^m$ Declination $-21^\circ 53'$, 5" magnitude $8\frac{1}{2} \times$ equal
about east & west Distance about $10''$
Sep, 3



Finder

Herschels'

4303

Position 81.6

81.6

81.6

Double Star found 92.4-

P. G. 11th 23rd

Decl. $-23^\circ 41'$

Distance 87.64

35.94 36.79

85 ~~735~~ 1.70

37.83 36.88

35.91 37.38

9.7 ~~11.7~~ 1.94

37.745
35.925
1.820
910
18
8.9

Comp. follows.

Position 92.8

94.3

92.9

90.5

This is

Lalande 29140

21940

Mags 7×10 (or α P)

Observed Herschels 4456

Star following this

6th. Dist about $20''$

Pos. 120° about. $8\frac{1}{2} \times 12\frac{1}{2}$ mags.

Herschels 4456.

Wednesday April 1

Pos.	Dist	Angle	Dir - South follow
47.7	38.90	36.83	
49.2	39.87		
48.3	39.12		
49.2			
49.7			

1868 Sunday Apr. 5

Castor. Betelgeuse
Double Image SpectrumToo bad to
measure.

Star + edge

 $\frac{1}{2} \text{ } \phi$

294.8

5.8

4.8

6.1

5.5

295.40

37.48

40

40

40

40

37.434

018

Monday April 6 1868

48 Virgo
Invisible
at Immers
ion.

1868 Monday Apr 13.

Comeh. Brown

Found
by C. L. P.

at 9^h ^{min}
sid. t.

Same R. A.

as

W. III. 393

Distant about

10 in Declina-

tion

Friday 1868 Apr 17

Comet
Broosen

Transit

~~Lev of Pos.~~
Set at

9 50 57.3

263.6

9 55 22.0

W. obs.

60.3

~~ΔS 59.60~~

Lev of Pos.

Comet 7.9

Is microm.
working
right?

263.6

Time

9 51 132

21.9

9^h 57^m 58.19 42^m 38.0

9 51 22.2

21.9

ΔS 60.50

31.0

23.1

Comet n of
star

ΔS 58.20

comet 9 51 46.5

9 44 0.4

55.5

9 59 1.0

ΔS 56.26

64.4

21.5

ΔS 60.52

9 45 2.2

Star

22.0

59 36.0

ΔS 56.17

9 52 8.0

22.8

ΔS 60.66

17.5

27.2

Coinc.

58.53

Comet

$$\begin{array}{r}
 57.20 \\
 56.26 \\
 \hline
 56.17 \\
 31.63 \\
 \hline
 56.54 \\
 56.53 \\
 \hline
 .01 \\
 .90
 \end{array}$$

$$\begin{array}{r}
 60.50 \\
 .52 \\
 .66 \\
 \hline
 .18
 \end{array}$$

Comet dist

nucleus

but no

tail sure

of.

Perhaps could
without light

22.6

60.66

56.53

4.13

4.14

2.07

9.815

0.9917

3160

1.3099

20.32

22.1

22.1

22.1

22.1

22.1

9 49 28.4

51.0 22.6

3 38.3

50 0.4 22.1

46.7

8.8 22.1

9 50 51.3

51 13.2 21.9

31 30.3

22.2 21.9

7.9

31.0 23.1

9 51 46.5

52 8.0 21.5

55.5

17.5 22.0

64.4

17.2 22.8

10 1 51.3

61.4

$$\begin{array}{r}
 920 \\
 1518.6 \\
 \hline
 9259.30 \\
 62.14
 \end{array}$$

Transits

10^h ~~10^h~~ 57.3 Comet
 61.4
 10.4
 20.8

19.1

19.4

Star

2 55.3
 3 5.9
 15.0
 26.1

19.7

20.2

Bright 10 32 11^vComp star 27 $\frac{1}{2}$ $\frac{3}{4}$ radius of finger

Comp star 18' - 20' S of Bright

Decl. 4^h $\times$ 5^h in row

M. thought he saw tail

15° N of $\star$.

Comp star is Pump III. 974.

10^h 1^m 51.3
 61.4
 2 10.4
 20.8
 19.1
 19.4
 19.25-
 2 55.3
 65.9
 18.70
 26.1
 19.7
 20.2
 19.95-

Friday 1867 Apr 17

Pule. Cat 201 $\Sigma 1478$

Not separated

Leonis

Seeing

v. Bad

312 Power

P.
Cannot see
it double.

W. Thought

he saw it

double at

first, nearly

N & S.

Bond 236

Clock

Corr. Clock

12 36

12 34 28

- 1^m 32^s

+ 6

- 1^m 26^s

51

25

- 1^m 31^s

$$\begin{array}{r}
 36 \\
 66 \\
 \hline
 2092 \\
 2092.92 \\
 9216.80 \\
 \hline
 6.36
 \end{array}$$

$$\begin{array}{r}
 2.89 \\
 2.66 \\
 \hline
 49.71 \\
 56.69 \\
 \hline
 6.92
 \end{array}$$

1868 Saturday Apr. 18

Polaris

W of

Comet

 $\Delta 8$
~~77.60~~

9^h 48^m 50.6 65.18 56.00
 50.6 65.90
 52.8 65.60
 54.6 65.84
 56.2 67.42
 58 67.40

10^h 15^m 72.18
 16.2 72.46
 16 32^s 72.55

Comet

55.49

55.49

55.58

Comet changed

Comet

55.30

55.63

10^h 21^m 7^s
 22 50 62.88
 23 22 63.80
 23 47 63.60
 23 47 63.80

 $\Delta 2 (\cos 8)$

62.88

63.80

63.60

63.80

TO S

 $\Delta 2 (\cos 8)$

Comet

56.03

10^h 5.0
 6.1
 7.6
 8.4

57.87

58.38

58.98

59.16

Comet

56.05

56.04

* follows 39 Plei.

44^s

43.5

* n of 39 Pleiadum

91.18

Comet 56.60

6) 34.5.8

5

Coincidence changes
 whenever micrometer
 circle is turned

Comet n.f. of *

* is a 9 to 10 mag.

Comet has tail following
 pos reading 4° (+ 90°)

Length of field of eye piece
 10' or 11' (afterward 12')

Tail fr. but not much doubt

C.I. read if 7^h 13^m Extends 10' to star of 8^h 12^m

1868 Apr 18

Comet Walsby

Condensation in middle

No det. nucleus

Tail shades off & spreads

rapidly

Distinct head; distinct
from tail.

Diameter of Head

61.31

$$\begin{array}{r} 56.10 \\ \hline 5.21 \end{array}$$
Outline irregular but
nearly circular

Fine Aurora

No vertical
lines.12^h vertical lines detached
from the bright cloud

1868 Apr 22.

Boorsen

Dec 56 50 (Gauss)
66.76 / Very faint
66.26 9^h 57^m 15^s
66.41 57 57

Comet follows S
of 5^h Mag
$$\begin{array}{r} 10^h \quad 3^m \quad 9^s \\ 27 \end{array}$$

$$\begin{array}{r} 5 \quad 54 \frac{1}{2} \\ \hline 2 \quad 48 \end{array}$$
Last transit to be preferred
because telescope was
brushed in first

62.43

63.06

61.82

$$\begin{array}{r} 10^h \quad 11^m \quad 5^s \\ 13 \quad 3 \\ 15 \quad 14 \end{array}$$

52.10

Coinc.

52.10

108

Hour angle

$$\left. \begin{array}{l} \text{star } 6^h \quad 15^m \\ \text{comet } 6^h \quad 14^m \\ \text{at } 10^h \quad 21^m \end{array} \right\}$$

$$\begin{array}{r} \text{at } 10^h \quad 21^m \quad 47^s \\ \text{Hour angle } 19 \quad 20^s \end{array}$$

28° 20'

Comparison W². III 1293
$$\begin{array}{r} 60 \overline{) 150} \\ 40 \end{array}$$
Error of
Chronometer
1^m 5^s

Thursday 1868 Apr 23

Comp star of last night

30^m S for 42 Jan 1868

6^h mag. Comp
 comes brighter
 Dec. 29° 20'

Hour angle 5^h 51^m
 at 10^h 00^m

Zero of No. 263.6

10^h 03^m 50^s
 $\Delta 8$ 74.01

10^h 4^m 57^s
 $\Delta 8$ 74.09

10^h 5^m 42^s
 $\Delta 8$ 73.60

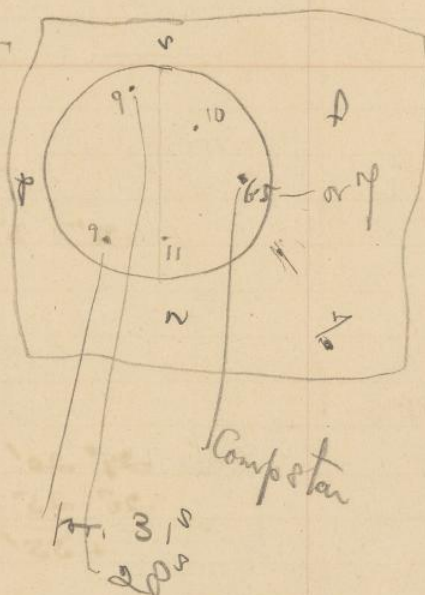
6 20^s
 $\Delta 8$ 73.58

Comet S. P. stars

10^h 13^m 41^s
 18 10 $\frac{1}{2}$

 4^h 39 $\frac{1}{2}$

18 45
 23 24 $\frac{1}{2}$



Chron. stopped
 10^h 31^m 5^s
 68.45

10^h 32^m 1^s
 68.35

10^h 32^m 8^s
 67.75

10^h 34^m 0^s
 67.94

Coinc.
~~52.25~~ bad
 52.10
 10^h

Circle setting 29° 20'

First star
 n. of comp
 star.

75.04

52.07

 24.00

4' north

Other
 5' south

W { 900 both lines
 1600 in these lines
 P { 1090 broad line
 1145
 1162



Spectrum of Comet
 C. S. P.

Peter's Asteroid

O P P Thursday

 $\Delta 8$

15 ^h 54 ^m 10 ^s	65.86
55.6	66.31
57.5	66.61
61.0	66.95
63.0	66.40

 $2^m 3^s$

3 transits
over three
zones

Comp star precedes

W XI. 290 by 5) S

4^h 9^m
4 9¹/₂
1¹/₂

10^h

29° 20'
28 25
+ 55'

29° 45'
28 45

24) 600
48
24

15
35
49
99
45.33
52.00
6.67

1868 Apr 26thLine of Pos.
259.7

Comet precedes

16 17.5
16 25.0
35.

17 27.0

Comet Solstar

	$\Delta 8$
10 ^h 26 ^m 02 ^s	43.95
10 20 37	45.15
32 45	45.35
33 25	45.49

Comp. star 6th star

6th mag followed
by another nearly same
mag. $\frac{3}{4}$ field finder
Same Dec.

Comet preceded by
star same dec precisely
 $\frac{7}{8}$ field of finder 5th mag.

~~355~~ Preceded by
another 6th mag 355

Bright one not same dec 7' north of Comet

6^h 20^m
10 48 58^s
49 4
49 12

Setting
32° 19'
32 19

single	9.8287	col	9.8684
line	9.7280	col	9.9269
		col +	9.9648
	9.5567		9.7601
	.3603		
	.5755		
	.9358		
	9.9712		

65° 20'

10 49	4 ^h 28 ^m	32	23
6 20		32	16
RA, 4 ^h 29 ^m	+3.7	+8.1	
Dec 32° 19'			
87 60	44	16	
57 41	67	148	

Spectrum brilliant. Obs of pre
night confirmed.

Nearly over whole field
Black stripe

On pretty ^{decided} bright line faint
at about 1900. The two bands
extend from about 900 to about
1650.

Hard edge of band 1302

All about $\frac{1}{2}$

Aurora (not v. bright)

Comp Star = W. IV. 563

Comet next morning
52.00
51.98 CIP.

1868 Apr 28

Boorsens

Lensed about
10h 15mSetting
34° 18'

Lensed

261.6

Lensed Pos.

261.6

 $\Delta 8$

10h 29m 22s

44.76

31 00

.60

32 38

94

Mean 31 00

44.70

Coinc —

52.00

Diff.

7.30

27.16

10 35

30.5

40.3

49.9

Star

36 29.9

40.0

49.1

Comet

59.4

59.7

59.2

60.4

37

4.7

14.9

24.6

Star

38

25.0

Comet n.f. Star

10 41 11

42.05

42 75

41.38

43 98

41.23

10 43 01

41.42

Spectrum

Mean of broad lines 10.31

 α β

Comet spectrum

 α

Mg at (b)

66

C. S. P. obs,

 $\gamma = 1495$ W obs.

Violet Mg line 1708

 $\beta = 724$

Another about 1100

~~Light at 1125~~ $\beta = 672$ (better measure)Line almost identical
with right hand of two
greenones of Mg spectr.Said Mg line is ~~2.11~~940 $\approx$ 935 (so)Other green line ^{of Mg} 1085

L. Moon

16955

Mg line in violet 1621

April 30th

Attempts at spectrum

34 16 $\frac{1}{2}$
89 60
55 43 $\frac{1}{2}$

May 1.

Spectroscope on
Bronsens 

Principal band
at 900.

Another 641

Broad dark space
between them.

672 better
measure

Very ¹²⁴² some light
doubtful

1465 Feble line

Mg b 910.910

As line 1050

Mo 15

Li 12
Ni 12
Na 12

γ α α' β

Space between α and β
very black.

On the last evening
of observation when
the spark was in
two sharp well
defined lines appeared
at α and α' no
other light of the comet
was visible.
The slit was open
to nearly its full width

These lines were
a little on the right
side of β and
the broad green air
line. Thus

Hazy moonlight.

May 3

Porosene

Faint.

Spectrum seen

c.s.p. sees α & β & γ Finds & coincides
with Mg b. and reads
it 930W. Reads γ 1474

Air 1545

May 4 Monday

Zero of Pos 265.1

Observer C. S. P

Brooks Comet

11^h 30^m Sid Time

Coincidence with fixed wire 48.89

Just after a change

48.93

48.92

48.89

48.91

Comet micules

No 236 Chan

 Δ 11^h

47.0

54.64

49.5

54.70

50.6

53.34

52.6

53.65

Comet South

Sd R. X on Chronograph

over these wires

ending 5.8.5

comparison star

not more than 9^h 2^m12^h 0.5

46.48

2.2

46.67

46.87

6.1

47.04

Look off micrometer

Following comp star which is 9^h 1/2 is star of 7^h 1/2
 twice as far from comp star as comp. star is from
 Comet, same Dec. as comet. Preceding comet as
 far as comp star are two stars south of it 8^h 1/2 &
 two nearly together, very nice double.

Value of revolution of finder Dec 17° 41' = 3^s time

Comet ~~Prosen~~ Friday 1868 May 8

4 20	82° 43'
5 39	41 47
1 19	9 4
4 29	34 18
5 48	43 22

11 35	32 19
5 47	

30 45
41 47
11 2
32 19
43 21

Setting
43° 22'

Alt. about
5h 48m

Diameter
Zero of Po 961.5

Coincidence 49.23
24

Nucleus or compressed.
center is much nearer to
the S.E. side than it is
to the other. Irregular
in outline. Pretty bright
little ~~*~~ however on S.E.
side, which may kill
light. That star is of

10^h or 11^h Mag.

Diameter 62.728

Comp star 8° South following
the comet. 2 transits over three wires

Δf

short
rattles of 78.75
times of 78.77 367
taking Δf 79.23
79.44
79.69

then long rattle 2 transits over
3 wires. Very long rattle.

Another star nearly as much
further north of comet & further
following. Almost exactly
one field of 1^h power north
of comp star 19^h 5 following that
star

Double by W

$$\alpha = 12^h 5^m$$

$$\delta = -23^\circ 9'$$

Mags 8.5 & 12.5

$$= 4506$$

$$= 5402$$

Another double

Dec Vernier M. 66.82

t 1h 12m

at 13 27.

Double Both 9 mag.

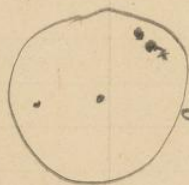
Dist 5" to 6", pos sparf

Pos. Circle 11°

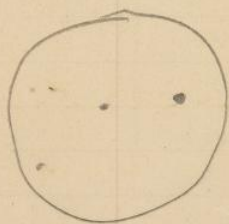
Not in Herschel.

~~2520~~

Dec (little circle) 23° 28'



Little finder.



Large Finder

Double

time 13^h 42^m 23^s

h 1 3 20

time 13 42 57

h 1 4 00

12 39

66° 20' Vernier IV

Circle 36° 2

261.5

225.3

315.

Comp. s. f.

Probably

$$h = 4551$$

No not that

for this was

found.

New Double

Star South of Spica

γ Andrae

Lortesse Oblonga

22
Saturday May 9th 1868

Bronsens Comet

Setting $\delta = 49^{\circ} 9'$ found this too much north
 $\alpha = 5^h 55^m$

Zero of Position Circle $261.5 + 90 = 351.5$

$\Delta\delta$ 56.97

56.35

55.54

& South following

By chronograph $\wedge$ R.A. comparisons

star on fine wire

53.39

52.75

52.27

Comet 49.47

~~2nd~~ 51.53

Transits of two stars and comet
over these wires, the preceding
star of the two was not used in
the declination comparisons.
It precedes the comet star and is
South of it. The reading of micrometer
wire at it is 51.53

7th mag. star follows comet star $42^{\circ} 44'$
and is ~~South~~ North of comet star $13'$ or more

Lalande 11377?

$12^h 35^m 42^s$ by 236

comp. x Hour Angle $6^h 40^m 57^s$
 $134^{\circ} 5'$
 44°

by large circle

by large circle Vernier 1111

by small circle

$\alpha = 5^h 54^m 41.59^s$

$\delta = 44^{\circ} 16' 17''$

226 4^s fast of Standard Clock

Comet much less bright than last night. The center
of condensation is much less distinct

The times of declination comparisons were denoted by
a short rattle, and then a long break followed by a
short rattle -

R.A. comparisons are as follows

	1 st *	2 nd *	δ		1 st *	2 nd *	δ
X +	0 57.8	1 30.2	2 46.7	}	4 0.7	4 33.3	5 56.8
	1 10.2	2 28	3 59.2	}	13.0	4 58.8	6 3.0
	1 10.2	3 14	3 9.2	}	23.1	5 6.0	13.6

As 32.73

32.77

Monday May 11 1868

Brooks's Comet

Compared with 8th mag star through small 11" x

In

$$\begin{array}{r} 11^h 6^m 8^s \\ 11^h 6^m 40.2 \end{array}$$

32.52

$$\begin{array}{r} 11^h 6^m 41.3 \\ 7^m 15.0 \\ \hline 33.7 \end{array}$$

21.4

6.9

45.5

Chm 236

Time

12^h 0.5

1.8

2.3

2.9

3.5

12.5

13.6

14.3

15.2

1st Comparison in Δ by Chronograph
over 3 wires about 11" 56 m
twice

105

100.25

99.92

100.45

99.21

99.09

32.54

32.95

32.59

32.40

come 52.30

6.5. P

after this the

head of the

screw was

adjusted

& south

76.96 come

77.00

77.03

5

51.92 come

51.92

51.95

51.96

6" north of comb x
and precedes it

6th star with comb star Δ

42 23

41 91

42 25

transits in Chronograph beginning about 12^h 19 the two stars
over three wires twice

transits of Comb star - Comet in Chronograph
about 12^h 22 m
two transits over three wires

Direction of comet 70° 19
5-6 06

the bright Condensation

$$\begin{array}{r} 12^h 31 32 \\ 6 18 56 \\ \hline 6 12 36 \end{array}$$
6^h 19^m Dec 45° 42'

24
Examined 64TH Comae Berenice (Bedford Cat 467)

P. thought it had bright points

W saw dark $\odot$ places about nucleus

Confirmed by P

Examined 492 Bedford Cat.

Examined Nebula L 2343. W & P both thought
it very spotty

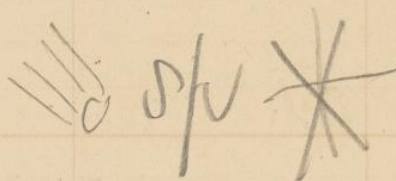
Examined Neb L 3606 No spirality seen.

Tuesday 1868 May 12

8 26 41.7
~~13 45.84~~
~~1 37.2836~~
 6 12 36
~~6 21 2~~

Loro = 260.9

h m s $\Delta 8$
 14 46 25 63.05
 44 63.08
 47 22 63.12
 50 63.00



h m s } Comet over wires
~~11 50 42.5~~
~~11 51 55.5~~
~~11 51 8.0~~

~~46.0~~
~~45.0~~

h m s } Star over wires
 11 51 29.0
 40.5

53 43.5) Comet
 54.0
 7.0

32.5
 33.3
 32.0

16.0) Star
 27.3
 11 54 39.0

11 54 50.5
 3.0
 14.0

21.2
 34.25
 11 35 46.0

30.7
 31.25
 32

h m $\Delta 8$
 11 57.2 61.64
 57.6 61.50
 58.2 61.33
 58.6 61.00
 Come 57.91

1868 May 12

41.43 + dist offered miles = dist of another
star (south of Comp star) from
the latter in Dec.

Dist in RA 40^s Comp star follows.

40 to $40\frac{1}{2}^s$

Readings of Comet $\left. \begin{array}{l} 60.59 \\ 64.00 \\ 66.00 \end{array} \right\} \begin{array}{l} \frac{1}{2} \text{ object glass} \\ \text{whole object glass} \end{array}$

Alt $12^h 10^m 10^s$
 $h^* \quad 5 \quad 40$
 $\quad \quad 3 \quad 22 \quad 10$

Comp. Star

$136^\circ 9' = \text{Dec} + 90^\circ \text{ of star.}$

35^s preceding Comp star is another brighter
 seen in finder.

Dec of this last $+ 90^\circ = 136^\circ 22'$

this star not more than $\frac{1}{2}$ mag brighter than
 comp star.

Comp star has little one north
 of it a mag less dist $20''$ & another
 same dist south of it little circle on
 comp star $46^\circ 08'$

Spectrum of 

Saw nothing new.

Spectrum of Archivas

Good
Rutherford's Spectra (see)

1868 May 14

W. obs

Protons



Zero 260.9

see

Comet = $47^{\circ}19'$ ~~Comp Star~~ sp. * $\Delta 8$

12 ^h 9 ^m 27 ^s	$\Delta 8$
14 30	52.84
19 21	52.30

Comet 51.95
other wire used

Transits 12 ^h 24 ^m 14 ^s	} Comet	12.5
27.0		12.5
39.5		33.9

12 ^h 27 ^m 48 ^s	} *	32.5
59.5		32.5
28 12.0		11.1

Transits
12^h 29^m 18.5
31.0
43.012.5
12.0

12 32	49.5	37.0
33	1.25	30.25
	13.33	30.33
		11.75
		12.08

12 ^h 35 ^m 55 ^s	$\Delta 8$
40 18	55.81
56.0	56.07

Diameter 65.04

Not condensed
part decidedly
nearer to north
~~condens~~ S sideComet. ~~77.50~~
76.90 - Better
this is the
wire usedCentre of condensation
Breadth 72.42Dist from centre
of condens. to S edge
Other edge 66.06

companion star

256 chron 12 54 20^s

Hour angle 6 10 ~~24~~

R.A. 6 43 56

Long Circle 137° 28'

$$\begin{array}{r} 42^{\circ} 22' \\ \underline{3^{\circ} 51'} \\ 38^{\circ} 31' = \text{Altitude} \\ 27^{\circ} 38' \\ \underline{3^{\circ} 51'} \\ 43^{\circ} 47' = \text{Altitude} \end{array}$$

$$\begin{array}{r} 4.4 \quad 3.7 \\ 13.2 \quad 11 \\ \underline{4.4} \quad \underline{3.7} \\ +57.8 \quad -48' \end{array} \quad \begin{array}{l} \text{following } 31^{\circ} \text{ S} \\ N \quad 20.6 \end{array}$$

$$\begin{array}{r} 3.7 \\ \underline{.7} \\ 329 \\ 51.29 \\ \underline{.28} \\ 47' 33\frac{1}{2} \\ 42 27 \end{array} \quad \begin{array}{r} 13 37 27 \\ \underline{6 53 36} \\ 6 43 51 \end{array} \quad \begin{array}{r} 6 53.42 \\ 6 \end{array}$$

companion star

Correction of Chron - 30^s

Observer $\alpha = 6^h 43^m 21^s$
 $\delta = 47^{\circ} 28'$

The following nebulae were examined & proved
 judged good for Spectroscopy
 h. 3021 - 3035 - 3132 (Note. Measure the direction of elongation) - 3636 - 3453 (Poor) - 3572 (Very curious. Deserves careful study with the telescope.)

Friday May 22

Obs. 236-

Boorsen's comet

Time	Δ	Comet
14 22 ^m 4	53.56	77.12
25.5	52.00	77.14
28.4	53.24	
32.0	52.72	Position 0

with sun visible
& m. preceding

Position Circle 82°

81.7

81.4

81.7

R.A.

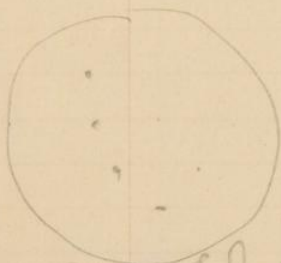
6 14 ^h 43	57.5	* 14 45	52.5
44	13.0	46	7.5
44	23.0	46	17.5
46	52.8	48	46.5
47	9.0	49	2.2
1 4 47	18.5	49	12.5

 Δ

14 50.5	52.38
53.1	51.68
55.3	51.21

15^h 2^m 29.25Hour Circle 6^h 58^m 45.5

6 59 50.5

Field of Telescope
these precede comet

15	19	54
19	59	
20	75	
20 ^m	20.7	

2725-50.2

270°

26 6°

15^h 35^m 11.5

7 50

7 45

in msa may

15 38^m 6°6^h 46^m 20.0

~~Err~~

$$\text{Clock} - \text{Chron} = -1^m 4^s$$

$$\text{Truetime} - \text{Clock} = +4$$

Zero error of large equatorial RA circle
= -47^s

1868 May 28

Linné

beam	52.27
Coincidence	.07
	1.26

Shadow on outside
seen by W. power
of 600.

small double spots found each component
about the size of Linné

1868 May 31 Sunday

Brown's Comet

Observer L. W.

Dec. $48^{\circ} 46'$
 $9^h 30^m$

Zero of position circle 258.8

$13^h 55.1$
 57.8
 59.9

$\Delta 5$
 32.30
 32.23
 30.41

Comet very faint and
 without condensation
 toward the center

Δ by chron. $14^h 4 33$ last
 $4 56$ 1
 Comp. is small
 9^{th} mag.

Comet very faint and broad

$7 9$ 8 16.5
 $7 3 2$ 8 36.0
 $7 5 5$ 8 58

11.0 29.57
 13.0 28.30
 14.5 29.07

Concordance to S. H.
 5213
 11

186 93

19 43
 $21 15.5$
 $1^m 32.5$
 1.3

Haze

Star 9.10 mag precedes comp. *
 and is about 2' north of it

Comp. is large 14^h $27.28.0$
 $52 48.0$
 $90 + 5$ $1380 47'$
 8 $48 46$ by small circle

Chron 236 $1^m 51.5$ just at 15^{th} sid. time.

June 14

First good sight for a month

Booser's found.

Pretty bright

$$h = \begin{array}{r} 3^h \quad 3^m \\ \text{at } 13 \quad 23 \text{ by chron} \\ \hline 12 \quad 22 \end{array}$$

Chr. 3 m. fast

Setting $40^\circ 9'$

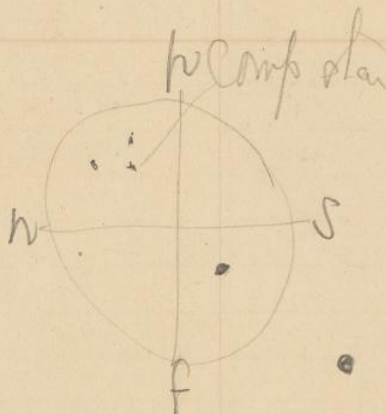
Coinc.	52.03
	52.01
	52.03
	52.05
	52.02

Zero 261.9

Comp * precedes W.	$\Delta 8$	(Y.W.)
	57.71	obs.
	58.44	
	58.02	

2 transits over
3 wires.Accidentally touched
field wire

Coinc 52.02



Note June 10, 1880.
The nebula may
possibly be G.C. 2924,
and the comparison star
Diff. $+40^\circ 25' 32''$ or
some small star south
of that.

$$\begin{array}{r} 58 \\ 52 \\ \hline 6 \end{array}$$

60.

 $\frac{1}{59''}$

If the star was
only $1'$ north of
the nebula, as
seems likely, it was
probably not a Diff. star

$16^h \quad 44^m \quad 44^s$	$\Delta 8$	58.26
$43 \quad 45$		59.45

This turned
out to be a
nebulaOne hour error
in hour-angle

Note Oct. 6, 1880. The comet by the
ephemeris (Astr. Nachrichten No. 1692)
should have been about $11^h 20^m$. Hence the
nebula observed was probably about
 $12^h 20^m$. It was probably G.C. 2924.

June 14

The comet found

Large nebulous faint

Comet was also with slight illumination.

 $17^h 43^m 10^s$
 $44 \quad 56$
 46
 $\Delta 8$
 45.14
 45.89
 46.145

Comet n of star & precede

Obs of RA impossible

Cone (observed wire) 57.12

Time

 $17^h 45^m 55^s$
 $\Delta \times \cos \delta =$

dist of fixed wires from one another

Pos. of Comp star

 $17^h 54^m 29.4^s$
 $17^h 55^m 40.9^s$
 $R 6 \quad 29 \quad 30$
RA $11^h 26^m 21^s$

of the star

 $40^\circ 6'$

Dec of star

Bright star follows comp star 5 m

 $6'$ south & north of it $2'$

June 15-

Brooks comet

Observer

L.W

M. J 10^h 45^m Comet found without difficulty - very faint and broad
no central condensation

Chron 236
16 37^m

hour angle
8^h 6^m 6^s

 $\delta = 39^{\circ} 26'$

Haze thickened so that no
observation could be made
with filar micrometer

closed up at 11^h 15^m

236 17^h 4^m 3^s

Standard clock 17 1^m

236 3^m 3^s fast

June 19. Friday
Set Chron. 236-

236 15 32 18^s

Standard

32 0

18^s 236 fast

Comet found at 10 P.M.

Comet found 10 12^m

10^h 13

= small star in comet

4^h 16^m $\Delta\delta$
26.57

17 22 26.36

17 29

17 32

$\Delta\alpha$

35^s

32.5-

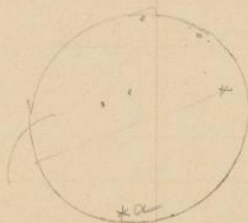
with. comb star 8^m

Sec of Comb +

36^o 10'

closed at 12^h

very faint
observation difficult



a comb star

June 20 1868

Chron 236 14 30^m 21
Standard 30

236 21^s fast

South star. Dec - 20° 15'
14 37^m 45^s
Hour angle 1 20^m 00^s
R.A. 13 17^m 45^s

G.S.P.

= Delzen 12547
7th = May.

Has a comp. of 14th mag. north
~~α~~ ~~per~~ seems to W. & P. to be double E & W but comp
nearly equal, but this is doubtful. Star trembling.

At 15^h 15^m
h = 1^h 8^m
Dec = -25° 50'

T.W.Obs
H. nebula suspected
Note June 10, 1880
α appears to be 14^h 7^m

Double star
At 15^h 38^m 24^s At 15 40 27 W. Obs
h = 0 26 00 0 28 00
Dec = -23° 40'

Comp. nearly S. Mags 7 & 9. W.
Comp S a little p. 10 & 11. ? P

Obs June 24

Second
~~third~~ double of α^h examined found
to be $L = 4756$ C.P.

Looked at star suspected to be triple
on the 20th. Doubt its being more than double
very greatly. P. & W. Evening not nearly so
good as before

$$L = \begin{array}{r} 1^h 20^m 00 \\ \text{at } 16 \quad 33 \quad 27 \\ \hline 15 \quad 13 \end{array}$$

$$\text{Dec} = -7^\circ 41'$$

Mags 9 and 9

Double
Dist 10^h
 15.04
 4.4

P. obs.
nearly P & T
 54.4
 2.0
 4.4

$$L = \begin{array}{r} 1^h 40^m \\ \text{at } 16 \quad 51 \quad 18 \\ \hline 15 \quad 11 \end{array}$$

$$\text{Dec} = -7^\circ 45\frac{1}{2}'$$

Mags 9 & 11

Double 32.4
 4
W obs. 129.6
 15.11

nearly 2 & 2
Dist = 8^h

$$L = \begin{array}{r} 1^h 44^m 20 \\ \text{at } 17 \quad 3 \quad 13 \\ \hline \end{array}$$

$$-7^\circ 49'$$

Mags 12 & 15 P
11 & 12 W

Double
W obs.

nearly 1 & 1
Dist = 5^h

$$\begin{array}{r}
 \text{at } \begin{array}{r} 2^h 2^m \\ 17 \quad 13 \quad 8 \\ \hline 1 \quad 11 \quad 8 \end{array} \\
 - 6^0 39'
 \end{array}$$

Double Wols
 Good star 3ⁿ
 n & s nearly
 Comp sp

Another double Precedes last 1^m 2)
 Dec - 6° 42' 5" is south of it 10'

B Librae observed (without ill) for geo error
 of circle

$$\begin{array}{r}
 \text{at } 17 \quad 31 \quad 25 \\
 L = 2 \quad 20 \\
 \hline
 \text{Obs } 15 \quad 11 \quad 25 \\
 \text{True R.A. } 15 \quad 9 \quad 56 \\
 \hline
 1 \quad 29
 \end{array}$$

1868 June 25

Comp star of 19th Examined
 It has another equally br. *
 sp.

$$\Delta S = 37.70$$

$$\text{Comp} = \frac{77.120}{39.42}$$

$$\Delta \alpha = 18^s$$

Boorsens Comet found

$$L = 3 \ 55 \frac{1}{3}$$

at 16 16 $\frac{2}{3}$

Setting $32^{\circ} 3'$ that is $\frac{1}{3}$ of a day behind Eph.

This is too bright for comet

BipL j g j p s m b M.

$$h = \begin{array}{r} 6^h \\ 18 \\ 12 \end{array} \begin{array}{r} 36 \\ 42 \\ 06 \end{array} \begin{array}{r} 40 \\ 20 \\ \end{array}$$

31°

11

58

Note June 11, 1880. The δ seems to have been better determined than the α , for there is no note on the $\Delta \alpha$ between ephemeris ($12^h 17^m$) and observing, while the $\Delta \delta$ is noticed. Possibly on this account the object may be G.C. 2916, or still more likely G.C. 2972, the δ of which needs a correction of $30'$ according to D'Arrest (p. 218 of his Catalogue for 1861). D'Arrest's place reduced to 1868 is $12^h 19^m 52^s + 31^{\circ} 57'$. The description on this page agrees well with that of G.C. 2972. The place of G.C. 2916 for 1868 is $12^h 17^m 04^s + 32^{\circ} 15'$.
 Note Oct. 6, 1880. See also Dreyer, p. 394, for corrected place of G.C. 2972.

1868 June 28

Coincidence
52.024

Hazy. Flying clouds

94 Virginis Deculted. observed

C1 Pobs

Began to survey Southern heavens for doubles
at 9:30 M.T.No Double found. At $16^h 12^m$ Chronometer timeL $0^m 53^s$
 $\underline{15^h 19^m}$ Dec — $21^{\circ} 22\frac{1}{2}'$ Star 1 eye May 8-9
J. B. Baker Comp. S.

Zero of Pos 79.8

Coinc 52.02

This
= $h 4769$

03

03

02

02

 $\underline{52.024}$

Antares

Comp p.

88.8

88.6

87.0

85.6

85.9

52.25

-20

265

30

81

 $\underline{52.281}$

338.0

338.5

339.1

338.8

338.3

 $\underline{338.54}$

52.90

~~52.94~~

52.99

53.01

53.09

53.17

End of 1027 copy

Seen very well but hard
to measure. out of prac-
tice. Star 1 eye J.B.

1868 June 28

Wide Double

At $16^h 56^m 16^s$ Chrom t. $h = 0 \ 27$ Dec = $-31^\circ 14'$ $9\frac{1}{2} \times 13^m = \text{Mags}$

New

324.5	53.58
322.1	53.72
320.4	53.43

Small Double

At $17^h 12^m$ $h = 23 \ 56$ RA $17 \ 16$ Dec = $-30^\circ 56'$ Mags $11 \times 13\frac{1}{2}$

New

31.1	52.54
26.1	56
32.3	58

Star of $9^m = \text{Mag.}$ Perhaps double Pos. 10° At $17^h 54^m$ $h = 0 \ 125$ RA $17 \ 41\frac{1}{2}$ Dec = $-20^\circ 43'$ Star $5^m = \text{Mag.}$ Double or triple positivelyPos. 99.0 52.16 99.5 $.15$ 103.2 $14\frac{1}{2}$ 102.8 13 101.4 13 $= \Sigma 2262?$

Hard to say how many components

At $18^h 21^m 5^s$ $h = 0 \ 24 \ 18$ $= \Sigma 2262$ Dec = $-80 \ 71$

1868 July 4
C S DCoincidence 52.23
 22
 23
Mean 52.227

Double

Setting $104 \ 04$
 $84 \ 46$ Dec $-19^{\circ} \ 18'$ Alt $16^{\circ} \ 30.5^m$ L $0 \ 56.2$ RA $15^h \ 34.3^m$ Obs 52.23
 22
 23

Not in L

H¹⁰ Power δ^h Mag α^h Mag
Star, tremulous $\perp$ eye.Pos. 147.6 145.5 148.0 145.4 146.3 32.8 146.56

52.44
 42
 45
 45
 44

Measures very difficult
 great tremulousness
 star & companion
 in the beam
 parallel & etc.
 stars & etc.

Suspected double

Alt $17^{\circ} \ 23.8^m$ L $1 \ 50.5$ RA $15 \ 33.3$ Nas with
another comp p.Setting $104^{\circ} \ 11$
 $84 \ 46$ Dec $-19^{\circ} \ 25'$

v Scorpis Component Double

 52.42
 52.23
 4.19
 $309.5?$ 309.0 $310.8?$ 310.1 310.5 310.18 52.43 $.42$ $.46$ $.44$ $.44$ $.44$ 52.434

1868 July 40(?) Friday

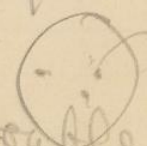
July 10th was Friday.

P. obs.

Vidcoptic was the star seen on the 4th

A Comet or nebula

$$\begin{array}{r}
 16 \ 38 \ 30 \\
 23 \ 24 \ 30 \\
 \hline
 17 \ 14 \ 30 = L \ 4293
 \end{array}$$

Examined suspected double of 4th July
 Dec - 19° 25' Config in fingers 
 P. & W. both feel confident it is double N & S
 Dist 1/2"

New Double

at 17^h 31^m10^h & 10^h

h = 23 44

Reading 102 08
84 46R.A. 17^h 47^mZero of pos 261.5
261.4

Dec = -17° 22'

Pos 139.1
 145.2
 144.5
 146.8
 150.7
 145.26

Too fh. to measure
 Clouds.

1868 July 10

Spectrum of v. Bright & remarkable
white Aurora = 1146 (wires & ~~by~~ line
seen at once by C.S.P.)

Time 10^h 10^m. v. rapid vibrations
towards zenith at intervals of $\frac{3}{4}$ second
[D reads 996]

Wreath Aurora about 1200

No other light seen by P or W.

Pretty faint at 10^h 30^m Had been visible
since dark.

Note Jan. 7, 1882. Times above evidently
sidereal. Wave-length of line observed about 5650
by observation of C.S.P., 5550 by that of J.W.
Vogel's Bothkamp observations give 5570.

16

1868 July 11

Saturday 11th (3)

Double

$$\begin{array}{r} \text{At } 16^h 11^m \\ h = 23 \ 53 \\ \hline 16 \ 18 \end{array}$$

$$\begin{array}{r} \text{Setting } 104^\circ 51' \\ 84 \ 46 \\ \hline -23^\circ \ 5' \end{array}$$

h calls this S.g. Ophiuchi

Double

$$\begin{array}{r} \text{At } 16 \ 51 \\ h \ 0 \ 1 \\ \hline 16 \ 50 \end{array}$$

$$\begin{array}{r} 104^\circ 03' \\ 84 \ 46 \\ \hline -19^\circ 17' \end{array}$$

$$\begin{array}{r} \text{At } 17 \ 02 \\ 0 \ 12 \\ \hline 16 \ 50 \end{array}$$

$$= \sigma 534.$$

h 4888 also found.

Double by W

$$\begin{array}{r} \text{At } 17 \ 30 \\ 0 \ 20 \\ \hline \text{By } 17 \ 10 \end{array}$$

$$\begin{array}{r} 108 \ 53 \\ 84 \ 46 \\ \hline -24^\circ \ 7' \end{array}$$

= Lacaille 7224

Obs. by h.

W. finds Double

36 Ophiuchi
Obs. by h.

$$\begin{array}{r} 111 \ 6 \\ 84 \ 46 \\ \hline -26 \ 20 \end{array}$$

1868 July 11.

$$\begin{array}{r} 232 \\ 8446 \\ \hline 10748 \end{array}$$
Double by W $9^h \times 13^h$ magPos = $315^\circ \pm$ Dist $4''$

$$\begin{array}{r} 17^h 53^m \\ 0 \quad 34 \\ \hline 17 \quad 19 \end{array} \quad \begin{array}{r} 110^\circ 50' \\ 84 \quad 46 \\ \hline 26^\circ 4' \end{array}$$

02023

Double by W

$$\begin{array}{r} 18 \quad 12\frac{1}{2} \\ 0 \quad 16 \\ \hline 17 \quad 56\frac{1}{2} \end{array} \quad \begin{array}{r} 108 \quad 55\frac{1}{2} \\ 84 \quad 45\frac{1}{2} \\ \hline 24^\circ 10' \end{array}$$

n.p. cluster L 4366

 $9^h \times 9\frac{1}{2}^h$ mag Dist $1\frac{1}{2}''$ Pos. $15^\circ \pm$

CSP Obs July 16th
Double

1868 July 16
Coincidence 52.113

$$\begin{array}{r} 46 \ 17^{\circ} 22 \frac{1}{2}' \\ + \ 0 \ 58 \\ \hline 16 \ 24 \frac{1}{2}' \end{array} \quad \begin{array}{r} 97^{\circ} 33' \\ 84 \ 46 \\ \hline -120^{\circ} 47' \end{array}$$

= $\Sigma 2050$

A little precedes
Nebula h 4231
is one of a wide double.

Double

$$\begin{array}{r} 46 \ 17^{\circ} 42'' \\ + \ 0 \ 42 \\ \hline 17 \ 00 \end{array} \quad \begin{array}{r} 98^{\circ} 30' \\ 84 \ 46 \\ \hline -130^{\circ} 44' \end{array}$$

Very pretty double
not in Struve's Catal.
Generalis.

4th Power Stars & Eyes

$$\begin{array}{r} \text{Pos. } 154.3 \\ 154.6 \\ 154.0 \\ 153.2 \\ 154.2 \\ \hline 154.06 \end{array}$$

Dist 52.27

$$\begin{array}{r} 30 \\ 29 \\ 29 \\ 30 \\ \hline 52.290 \end{array}$$

Dist. rough because seeing
is bad. Stars large.

Best perhaps

$$52.125$$

$$\begin{array}{r} 12 \\ 10 \\ 11 \\ 11 \\ \hline \end{array}$$

$$52.113$$

$$52.290$$

$$\begin{array}{r} 11 \\ 11 \\ \hline \end{array}$$

$$\text{Dist } 1.17$$

$$\begin{array}{r} \text{Lens of pos } 259.0 \\ 259.2 \end{array}$$

8th Mag.

Dec set at $-17^{\circ} 8'$

0 0 0
 22.5 6
 24.5 12
 25 23
 31
 41
 53
 181
 268

80 140
 140 200
 200 260

52 is only

At $19^h 14^m 14^s$

$h = 22 14$

$21^h 00^m 14^s$

Center

$-17^{\circ} 6'$

$= \text{alt } 21155$

61.5
 144
 47.5

75

0	32	-3	52
53	35	0	100
127	90	55	180
129	139	104	181
164	129		129
181	165	130	
179	144		
217	182		

$31\frac{1}{2}$

69

made 1011
 (250)

searching

33
 7
 23
 33

14.2
 $7'$
 99.4
 14.2
 241.4
 $4'$
 24
 $-17^{\circ} 10'$

56
 14
 18
 21
 59
 22
 21
 142

Sunday 1868 July 26th

After long searching found (100) at 13^h 15^m m.t

(100) Jno of pos. 79.7

3 Transits over 3 wires (100) precedes

1st transit poor

$\Delta 8$ 63.20

(100) South

63.08

63.07

3 Transits

$\Delta 8$ 63.13

Broke off to look for Enke

Pen seems to have failed partly

Searched for Enke from the earliest practicable hour till dawn, an excellent opportunity, I confess, but failed to find it. Fear that being tired I did not do the best that could be done

Wed Aug 7

 μ Hercules

3rd star not seen

Very damp - Cloudy - Fine seen
by glimpses - which were too short
to make sure of difficult object

$19^h 5^m 30^s$ hour angle 1^h
 $28^\circ 48'$

89	60
20	40
61	12

Supposed to be α Hercules BAC 6150

22
 26th August 9th Sunday

Coincidence
 51.738

Clear —

Antares

Pos. 81.0
 78.3
 75.8
 77.1
 74.5

 36.2
 77.34

Comp p. Com
 Comp on field w,
 51.98
 2.02
 5.97
 1.96
 2.02

~~16.980~~
 51.

Comp
 51. ~~77~~
 75
 74
 75
 75
 74
 72
 74
 72
 73
 74

51.7385

Zero of pos 79.0 Poor determination

New Double

Pos. 333.8
 6.1
 4.6
 4.0
 2.7

 334.24

52.23
 32
 30
 28
 29

Bestye

On meridian
 17^h 59^m
 -25° 25'

11th Mag each.

79.0
 334.24

 255.24
 165.5
 6

1868 Aug 10

Coincidence
51.686

Air clear & still - Floating clouds. Has been comfortable day

Double At 17^h 5^m $h = 23.54$ Dec = $-26^{\circ} 47'$ $17 \ 11$

Not in Struve's Catalog General.

h not at hand -

Both $6\frac{1}{2}$ mag same size same colour 5^{th} Power Star 1 eye

325.0	52.13	Conc 57.69	
5.7	15	60	
3.8	135	69.5	
4.0	13	68.5	
4.0	125	67	
<u>324.50</u>	<u>52.134</u>	<u>57.686</u>	
	51.686		

516
36
20

This is Oeltgen ^{44.8} ~~16563~~ 16624Followed 52^s by a star further northNote Aug. 6, 1881. Co. 16623-4 is followed, 7'n, by Co. 16641-2, 54^s; and 3'n, by Co. 16644-5, 55^s.

⁴⁶₅₂ ²¹₃₈ ¹²₁₃ These is another double which follows this
but it clouded up & could not observe it.

Note Aug. 6, 1881. ~~h 4944 f Co. 16623-4 129^s, 36's h 4944 -46's~~

1868 Aug 10. Monday

T. phinchi.

Position zero 79.1
79.1

Position	east	other side
102.0		
104.2	51.83	51.59
104.0	51.83	61
102.5	51.85	59
102.3	51.837	51.597
103.00	240	
	.120	

C. S. P. observer.

5th power, x parallel to eyes
on other side poor measures
~~on the side with no light~~
Combining first side with di-
rectly observed coincidence.
51.837
51.686
1.151

Same star

P. W. Obs.

Comp. precedes

100.0	51.84	51.56
98.5	835	.54
102.5	85	545
97.5	Mean 51.842	51.548
99.6		.294
99.62		.147
	19	.695
	38	
	89	

Less of position 79.3
79.0
79.15

Star of Aug 17, 1867, $19^h 6^m - 29^{\circ} 24'$

C. S. P. could not see comp
nor could P. W.

Too thick

1868 Aug. 10.

19^h 58^m Large blue meteor
through the two stars at back of Cassiopeia & then
nearly straight up.

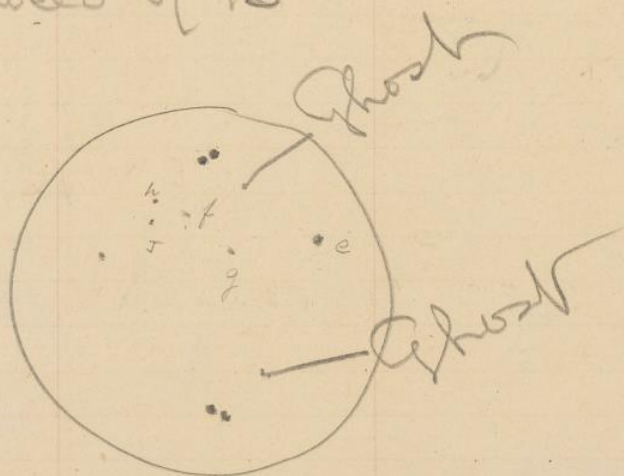
20^h 2^m From Mirach to a little over Algernib
& train visible nearly whole distance. Large

1868. 13th AugustClouds everywhere - occasional glimpses of clear sky
Stars rather largeComp to μ Herculis S^H Power

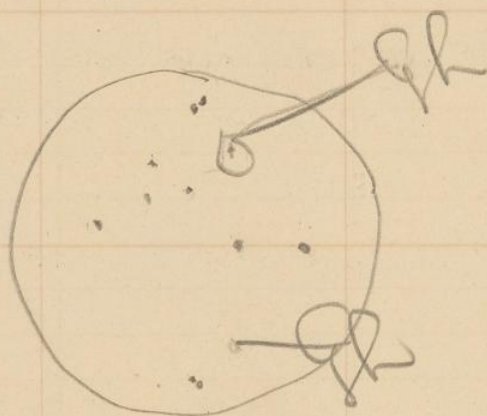
Plainly separated by T.W

Pos. $90^\circ + 343^\circ$ without illum. C S P could not separate it.Mis illum. 62.7 Ring Nebula
in LyraDrawn by C S P.
Pretty good

C Lyrae composed of 15

Not by Liv.
Sketch filled in by him
Sep. 10. 76.

1868 Aug. 13



§ Sagittarii

Seeing too bad for measures
but J.W. sees it double.

Double by J.W.

Oh 50^m
at 20 15

19^h 25^m
- 27° 5'

Comp st Dist 6" to 8"

7½ x 10

No in L

Another § Fabore

9x9 20" Dist comp NF

Supposed R 5133

1868 Aug 14

Began to sweep for doubles on Equator
at 17^h 30^m 20m before merid to
20m past

Double — at first sweep

$$\begin{array}{r} 17^h 41^m \\ 23 \ 47 \\ \hline 17 \ 54 \end{array}$$

+ 0° 6'

5^h P. Star 11 eyes 7 & 7 mag

$$\begin{array}{r} 75.1 \\ 74.4 \\ 75.6 \\ 75.8 \\ 76.0 \\ \hline 75.38 \end{array}$$

$$\begin{array}{r} 51.76 \\ 77 \\ 77 \\ 76 \\ 76 \\ \hline 51.764 \\ 718 \end{array}$$

$$\begin{array}{r} \text{Coinc} \\ 51.70 \\ 72 \\ 72 \\ 73 \\ 72 \\ \hline 51.718 \end{array}$$

$$\begin{array}{r} 75.38 \\ 165.38 \\ 79.15 \\ \hline 86.23 \end{array}$$

$$\Sigma = 2244$$

got telescope time⁴⁶ from 7 Serpenti's

Began to sweep again 3° S — 20m to + 20m
in hour angle

18^h 18^m telescope time

Seeing getting very bad for this
purpose. Double images

Ended at -5° 42' at 18° 55'

1868 Aug. 14.

Quadruple by J.W.

$$\begin{array}{r} 23 \ 29 \\ \text{at } 19 \ 20 \\ \hline 19 \ 51 \end{array}$$

$$-9^{\circ} 23'$$

$$= W \times IX \ 1255 \text{ and } 1258$$

Another double by J.W.

$$\begin{array}{r} 23 \ 28 \\ \text{at } 19 \ 29 \\ \hline 20 \ 1 \end{array}$$

$$\begin{array}{r} \text{at } 20 \ 24 \\ \hline 0 \ 4 \end{array}$$

$$-9^{\circ} 20' = \text{Salade } 38410 ?$$

Another double by J.W.

$$\begin{array}{r} 23 \ 16 \\ \text{at } 19 \ 46 \\ \hline 20 \ 30 \end{array}$$

$$-13^{\circ} 22' = W. \times X. 731$$

$$\begin{array}{r} 97 \\ 69 \\ \hline 28 \\ 11 \\ \hline 39 \end{array}$$

Another

$$\begin{array}{r} 0 \ 2 \\ \text{at } 20 \ 21 \\ \hline 20 \ 19 \end{array}$$

$$-8^{\circ} 41' = \Sigma 2678$$

Double by C.S.P.

$$\begin{array}{r} \text{at } 20 \ 41 \\ 23 \ 57 \\ \hline 20 \ 44 \end{array}$$

$$-6^{\circ} 56' \quad 10 \times 10 \text{ map}$$

Qu: -50 56? Very close

Note Aug. 20, 1881. Perhaps $\Sigma 2729$, but magn. differs.

1868 Aug. 14.

Double by CSP

$$\begin{array}{r} 23 \ 46 \\ \text{at } 20 \ 50 \\ \hline 21 \ 4 \end{array} - 5^{\circ} 52'$$

Another

$$\begin{array}{r} \text{at } 20 \ 57 \\ 23 \ 54\frac{1}{2} \\ \hline 21 \ 2\frac{1}{2} \end{array} - 4^{\circ} 58'$$

Another

$$\begin{array}{r} \text{at } 21 \ 02 \\ 23 \ 52 \\ \hline 21 \ 10 \end{array} - 4^{\circ} 41'$$

$$\begin{array}{r} \text{at } 21 \ 12\frac{1}{2} \\ 23 \ 44 \\ \hline 21 \ 24\frac{1}{2} \end{array} - 4^{\circ} 5' = W. XXI. 62$$

Bright star with ^{distinct} ~~comp~~ core n.p. - β IV

$$\begin{array}{r} 21 \ 19 \\ 23 \ 54 \\ \hline 21 \ 25 \end{array} - 6^{\circ} 6' \quad \beta \text{ Aquarii}$$

Sunday Aug 16 1868. Coincidence
51.70

2 Ophiuchi crossed wire at $17^h 30^m 20^s$

Circle reading $0 \quad 1 \quad 30$

trans Rt $17 \quad 28 \quad 50$
 $17 \quad 28 \quad 50$

Chronometer right exactly.

Began to sweep for doubles

at $17^h 37^m$ $-7^{\circ} 30'$ -20^m to $+20^m$
hour angle

Found Double $1\frac{1}{2}''$ $6''$ mag equal

South $8^{\circ} 6\frac{1}{2}'$

At $17^h 53\frac{1}{2}^m$

$23 \quad 57\frac{1}{2}$

 $17 \quad 56$

Calculation of Precession

$\frac{200}{40} \quad \frac{1.5}{40}$
 $\frac{11.6}{60}$
 $172817.85 \quad 8^{\circ} 5\frac{1}{2}'$

= 2 Ophiuchi = $\Sigma 2262$

$4'' = P_1$ Star II

Seeing too poor for such a star. Stars large & unsteady
Bright field illum.

101.5

101.7

101.8

100.5

99.8

57.85

80

80.5

83

83

83

Circ 51.70

This shows great change since Shure
who made dist 0.4

1868 Aug. 16.

Measuring γ Ophiuchi interrupted

Sweeping.

Began again at 18^h 20^m at $-8^{\circ} 5'$ $-23''$ to $+23''$
Hour angle

Another double

at 18^h 24^m 30^s

$$\begin{array}{r} 0 \ 11 \ 30 \\ \hline 18 \ 13 \ 00 \end{array}$$

$$-8^{\circ} 2' = \Sigma 2303$$

smaller star very blue

Left off at 18 40 Thickest of milky way.

Observations on doubles of last night

W IX 1255 $\times$ 1258 $8^{\circ} 10'$ Stars & eyes for pos
" " " for dist.

Note July 13, 1881.
W. XIX 1255
" 1258; see
p. 59, top.

W. XIX 1258 sf
W. XIX 1255, Δx
6.8, $\Delta \delta 59''$;
hence $p \approx 120.5''$
approximately. The
object measured may
have been either of the
stars; if we suppose
it to be the two, we
must read 42.808 for the
distance measure, but
this would only make 8 p.

55.9

56.5

55.6

58.2

55.5

56.3

55.96

55.96

55.96

55.96

55.96

55.96

55.96

55.96

55.96

55.96

55.96

55.96

52.82

82

98

83

79

404

52.808

51.70

1.128

Stars flaring badly.

Aspect preceding com-

mon to be double

mean
coincidence; see p. 61
distance 10".86

Salade 38410

Cannot get it. Seeing is so very

bad.

Stopped work on stars Seeing

too bad to continue

1868 Aug. 16.

L 2047 W says Surface of uniform
brightness & edges badly defined

Noted Sept. 24, 1880. This is L 2047 (not G.C. 2047), as appears by the time of year; hence G.C. 4510.

Set up to look for Encke's
[Must have searched on 5^{th} . We also looked on
another night previous to 26^{th} .]

Encke's comet found by L. S. P. about 2 AM

August 17

Arrived
Commuter Time marked in chronograph

24^h Δδ 70.42
24^h 1^m 69.73
2^m 69.15

24^h 5 Δα 66.61
24 5.8 66.46
6.7 66.46
7.6 67.45
9.1 64.13

Comet n. f. com

comet hard to see

When first seen appeared bright
without central condensation
edges not well defined
nearly round L. W

Comet seen with extreme difficulty when the wires are illuminated

11:5 Δδ 67.93
12:5 67.85
13:5 65.67

24^h 26^m 42^s
28^m 5^s 5^s

E horizon 5^h 4^m 8^s

Decl. Circle 158° 7'
248 05

Castor
H 0^h 38^m 34^s
h 5 12 40
7 25 54
Decl. 147° 50'
237 00
32 10

Monday Aug 17 1868.

Coincidence
51.706Twilight began about 12^h 25^m meant,Enke's Comet found by 7 Mar 23^h 53^m

Quite distinct

Measure of diam - 46.94

51.70

d b a d d

46.94

Comet 51.81

5

Pretty bright, bears illumination of the wires.

Merely round no tail or ellipticity noticed

0	4.7	$\delta\alpha =$	80.33	myet per	6 S.P	& n. f. quite distinct
	5.0		81.71			
	6.0		82.02			
	6.5		81.89			

46

8.5	77.25
9.5	77.75
10.0	78.01
12.6	77.33
17.5	77.16

on
only appears occasionally

20.0	$\delta\alpha$	87.67	Position circle
21.0		88.65	16.9.0
21.5		88.72	

Coinc. 51.75

27.0	75.76	(259)	71
29.0	75.79		68
			69
			70
			51.706

& bright Pollux

0.38
0.38.52 h = 5^h 3^m 44^s

240° 30'
2807 50

34^m 10^s

* declination
Hour angle

240° 30'
5^m 3^s 44^s

No coincidences here. See p. 75 for other observations of this date.
Coincidence p. 76, 51.446.

1868 Sept 5th Kern double. by C. S. P.

$h = 5^h$ 18 - 15 - 41.5

18^h - 16^m 41.5

Hour angle 0^h - 14^m

RA = 18^h 3^m

Star direct of S. camp N. Mag. about 6 @ 8^{1/2}
Seeing bad star large
Declination - 80° - 41'

Not in h

Position 174.5 174.1 173.9

Star perp to eye

Position { 174.1
173.8

2.
174
168.1
6

1st Power

Distance 51.82 (too close)

51.88
89
85
87
87

mean 51.872

Sept 5th Searched for double star discovered by
J. R. Seeing too bad.

C. S. P. began to sweep for doubles
at - 15° declination swept in hour angle from
- 15^m to + 10^m Seeing very bad
at 19^h 34^m found double

Brilliant aurora at 19^h 35^m

1868 Aug 21 Coincidence 79.676.

Began sweeping for doubles

20^h 25^m Dec = -8° 30' $\pm = -20^m$ to +20^m

Seeing bad - Clear, stars v. fr and large & v. unstable

Double comp s.p. mag doubtful pretty large dist 5".

$$\begin{array}{r} 41 \ 20^h \ 35^m \\ \hline 1 \ 01 \ 0 \\ \hline 20 \ 35 \end{array}$$

Dec - 9° 2'

not in Struve. Not in Weiss

Chron set on μ Aquarii

$$\begin{array}{r} 41 \ 20 \ 43 \\ \hline 23 \ 58 \\ \hline 20 \ 45 \\ \hline 20 \ 45 \frac{1}{2} \\ \hline \frac{1}{2} \end{array}$$

Began again at - 9° 30' time 20^h 50^m $\pm = -20^m$ to +20^m

Double (one of wide double) 5"

$$\begin{array}{r} 41 \ 21 \ 4\frac{1}{2} \\ \hline \frac{1}{2} \\ \hline 21 \ 5 \end{array}$$

Dec = - 10° 50'

$$\begin{array}{r} 41 \ 21 \ 5\frac{1}{2} \\ \hline 21 \ 8\frac{1}{2} \end{array}$$

= Σ 2776

1868 Aug. 21.

Looked for Encke's

2nd of Position
first wire

25-8.4

79.69, 68 - 67.65 - 69

Note Nov. 22, 1877. This seems to be a measure of convergence with wire C. The only one left is wire of broken according to right just below. The figures are probably 79.68 mean 79.676

Found 2^h 35^m m.t.

Obs. by J. W.

[Middle wire of chron. cleaned out to avoid

1^h 56^m 20^s

Δ8

1^h 3^m 0^s

1 5 45

86.35

Comet s p star

10 31

87.48

14 22

87.55

3 Transits over 2 wires

1^h 33^m 48^s

89.78

39 10

90.79

42 46

92.00

Comp. star is a loose double comp. p. Dist & directly in line with it at dist of 5' is a third preceding

Comet easily observed

Some central condensation but not rapid.

Comp

Star at 1 46 53.5

h = 5 41 0.

Reading 57 9¹/₂

84 46

+ 27° 36¹/₂

This 25 verid off centre

Pollux

1 54 57

56 32

6 18 26

84 46

28 14

58
Sunday Aug 23, 1868

Began to sweep for doubles $18^h 40^m$

Dec = $-12^{\circ} 0'$ to 0^h to -35^m

Double $7\frac{1}{2} \times 9\frac{1}{2}$ mag $2\frac{1}{2}''$

At $19^h 3^m$

$\begin{array}{r} 23 \ 33 \\ 19 \ 30 \end{array}$

Dec $-10^{\circ} 11'$

Double $6\frac{1}{2} \times 8$ $4''$

At $19^h 10^m$
 $\begin{array}{r} 23 \ 38\frac{1}{2} \ ? \\ 19 \ 32 \end{array}$

$-10^{\circ} 24'$

Zero of pos. on meridian = 258.6

To find error of chron-

Σ Aquarius At $21^h 7^m$

$\begin{array}{r} 47 \ 8 \ 27 \\ 23 \ 37 \ 48 \ 8 \ 46 \\ \hline 21 \ 29 \ 59 \\ 21 \ 30 \ 46 \\ \hline \text{Corr. Chron.} + 47^s \end{array}$

$\begin{array}{r} 26 \ 32 \\ 84 \ 46 \\ \hline 58 \ 14 \end{array}$

$\begin{array}{r} 2.2 \\ 2.5 \\ \hline 1.533 \end{array}$

1868 Aug 23

C. I. P. sat up to observe Encke's

Sounder does not work although chronograph seems to perfectly. Hence much unnecessary rattling beforehand.

Comet found at 15^h 35^m mean time

V long rattle as signal of beginning

Comet quite bright. Very plainly seen although twilight is quite advanced

Rattle

$\Delta 8$

23.15

Comet S p

Rattle

21.51 (Dir. near 21.0 screw head)

22.04 (Dir. 21.5) turned round

Comet star 17.5 mag
Certainly a cat. star
largest in vicinity

Long rattle

Transits over 2 wires

First 2 signals nothing

Rattle

Star over 1st W too late

Rattle

another

Rattle

another

Rattle

another

Rattle

another

Comet exceedingly faint, Bright twilight

Long rattle $\Delta 8$ 17.71

Comet no longer visible

Star at chron time 2^h 36^m 50^s
h = 18 15 32
8 21 18

Small Dec circ 58 2
84 46
26 44

Aug 27 1868.

Small micrometer on large telescope 15-inch
position circle 0 356°

Wire B reads 10 divisions 0 hundredths
Wire A " 30 " 0
Difference 20

54ⁱⁿ 49.5 21.5
64.5 36.0
15.0 14.5

Declination - 19° 46'

Small micrometer on small telescope 4.5-inch

Zero of position 284.7

Wires as before 2.5 35.5

65.5 96.5

Interval 10ⁱⁿ = 61.0

61.0

Declination 19° 46'

Secant 19° 46' = 1.065

10.63 14.75 61.0
5.31 6
15.94 88.50 366
147.5 610
236.0 976
9

One division Large Telescope = 235.1
Small telescope = 11.76 = 48.77

18 39
84 46
103 25

12 220
20

27

Aug. 27, 1868.

$$\begin{array}{r}
 3^m \ 51.5 \\
 9/183.5 \\
 \hline
 37.1 \\
 \hline
 25.7 \\
 24.7
 \end{array}$$

10 45.8

$$\begin{array}{r}
 43 \ 53.31 \\
 44 \ 54.80 \\
 45 \ 42.08
 \end{array}$$

61.49
47.28

$$\begin{array}{r}
 4^m \ 19.57 \\
 23 \ 50 \ 31 \\
 \hline
 23 \ 46 \ 11 \\
 \hline
 2 \ 15
 \end{array}$$

$$\begin{array}{r}
 5645.8 \\
 129.2 \\
 \hline
 7 \\
 904.4
 \end{array}$$

$$\begin{array}{r}
 - \ 0 \ 22 \ 33.5 \\
 \hline
 37 \ 18.8 \\
 \hline
 14 \ 42.3 \\
 \hline
 240 \ 2
 \end{array}$$

$$\begin{array}{r}
 23 \ 20.44 \\
 68 \\
 \hline
 43
 \end{array}$$

$$\begin{array}{r}
 15 \ 4.4 \\
 37 \ 38.9 \\
 \hline
 - \ 22 \ 134.5 \\
 14 \ 41.3 \\
 \hline
 - \ 37 \ 15.8
 \end{array}$$

$$\begin{array}{r}
 23 \ 43 \ 56 \\
 44 \ 54 \\
 \hline
 58.5
 \end{array}$$

$$\begin{array}{r}
 3.07 \\
 44 \\
 \hline
 120.28 \ 20.03 \\
 122.8 \ 41 \\
 \hline
 135.1 \ 80.12 \\
 12 \ 801.2 \\
 \hline
 2^m \ 15.16 \ 881.3 \\
 14 \ 41.3
 \end{array}$$

$$\begin{array}{r}
 23 \ 45 \\
 20 \ 20 \\
 \hline
 8 \ 25 \\
 8 \ 35
 \end{array}$$

52
53 61
44 51

$$\begin{array}{r}
 23 \ 45 \\
 21 \ 40 \\
 \hline
 2 \ 5
 \end{array}$$

$$\begin{array}{r}
 23 \ 45 \\
 23 \ 6 \\
 \hline
 39
 \end{array}$$



α Aquilae

$$\begin{array}{r}
 \text{Wh. 20} \ 57 \ 54.5 \\
 + \ 24 \ 14 \ 8 \\
 \hline
 20 \ 43 \ 46 \\
 \hline
 \text{RA} \ 19 \ 44 \ 23 \\
 \hline
 + \ 37.5
 \end{array}$$

1868 Aug 31

Coinc. of middle wire -

~~51.54~~~~52.5~~~~53~~~~54~~~~54~~~~51.535~~~~51.56~~~~51~~

51.51

~~51.57~~~~57~~

51.52

51

52

52

50

51.514

Ob. G. 4.4.

Zero of Pos.

258.1

258.2

258.1

51.50

500.

1868 Sept. 1. A new reticule of three wires had apparently been put in before this date and since Aug. 21; see p. 67. If we designate the new lines as f, g, h , the first being that farthest from the screw-head, the coincidences for this date are

f 26.338
 g 51.502
 h 76.554
 Intervals
 fg 25.164
 gh 25.052

Sept 1st

After the determination the fixed wires were moved. See p. 74.

Coincidence of mid. wire

(1st wire)

51.50

51.50

51.50

51.50

51.51

51.502

(2^d wire)

51.502

apparently

76.55

next screw-head

76.55

76.55

76.57

76.55

76.554

Fixed wire

76.554

Farthest from screw-head

26.306

26.31

26.31

26.31

26.34

26.34

26.34

26.338

Obs. C. S. P.

51.0

27.5
 51.4

341666

26.30

31

32

31

30

P. P. A

26.32 C S P

51.21

1868 Sept. 1.

Fixed wires moved

Middle wire coinc.

51.49
 .48
 .48
 .48
 .51

 51.488

Visitors

(101)

Obs by Prof. Watson

~~Comet~~ Planth follows Star
 + is north of it.
~~Transits over~~

Transits over 3 wires

39 31.5
 40 45.5
 1 14.6

Again at 20^h 43^m 52
 43 41.0 58
 45 9 25
 1 28 29

Again at 20^h 47^m 5
 46 50.3
 48 20.2
 1 30.0

(A rattle between stars)

* on wire I

Obs. constantly
 interrupted by
 clouds

Rattle

52 82.852

Rattle

833

Rattle

1 25.1 25.2

Transits of 3 wires

33 59.8 16.2
 35 24.9 41.4

16.4
 16.5

These transits worthless position wrong

Transit over 3 wires

37 49.3 5.5

Transits over 3 wires

1868 Sept. 1

$$\begin{array}{r} 40 \quad 20.4 \quad 53.5 \\ \underline{46.9} \quad \underline{21.9} \\ .5 \quad 28.4 \end{array}$$

Comp Star is W ~~XXIII~~ 783.

It is double. $2'' = \Sigma 3036$.

Cornic Ann I.

$$\begin{array}{r} 26.322 \\ 26.330 \\ 26.325 \\ 26.330 \\ 26.330 \\ \hline 26.327 \end{array}$$

Note June 2, 1880. Designating the wires of the new reticule as f, g, h, (see p. 73), the coincidence for f on this page is 26.327, and for g, on page 74, 51.488. This makes the interval fg 25.161, confirming the observations of C. S. P. on p. 73. These last coincidences, on pp. 74, 75, are probably by G. J. Alden. The values obtained at the top of p. 73 for the intervals fg, gh may be retained.

On Oct. 12 (book N14, pp. 7, 8), the interval fg appears to be 25.056, determined by 5 coincidences with each line by C. S. P.

On Jan. 22, 1869 (book N15, p. 21), the intervals, by 5 coincidences with each line by C. S. P., between f & h is 50.008; fg is 24.990, gh 25.018.

Taking the mean of the two complete series of observations Sept. 1, 1868, and Jan. 22, 1869, we have for fg $\frac{25.161 + 24.990}{2} = 25.077$, and for gh $\frac{25.052 + 25.018}{2} = 25.035$. These values may be adopted for any reduction depending on the intervals.

Note June 16, 1880. Mr. Wendell thinks that the reticule measured Sept. 1, 1868, was broken towards the end of the year, so that the measures of Jan. 22, 1869, relate to a new reticule. This suggestion is confirmed by the difference of the measurements, but depends mainly upon Mr. Wendell's recollection. On this supposition, the mean of the measures of Sept. 1, 1868, and Jan. 22, 1869, ought not to be taken as above.

1868 Sep 5th

Coincidence 51.446

For observations of this date
see after Aug 17 above

Double found at 19 34 by CSP

Observed by GEA

Position 214.3

216.8

216.8

214.1

213.0

8.0

214.66

4th Power Star Lays

(Mags 10 & 10 CSP)

Companion follows

158.1
214.6
78.5
146.5
18
326.5

52.57
52.64
52.77
52.75
52.53

Difficult to
ob. on account
of faintness

ε Equulei Observed
A & B Green CSP

1868 Sept. 5

$$376 \text{ P} \times \text{Eggenli} = \Sigma 2735$$

Stavill eyes

4th Power

Obs. 98 A

Comp. precedes

$$\text{Pos} = 61.0 \quad \text{Dist. } 51.75$$

$$64.5 \quad .67$$

$$66.0 \quad .73$$

$$65.9 \quad .63$$

$$64.8 \quad .60$$

$$\hline 272$$

$$64.440$$

$$2444 \text{ Obs. } 51.676$$

$$b, s, p.$$

$$\text{Pos. } 243.2$$

$$243.7$$

$$243.9$$

$$241.4$$

$$243.1$$

$$242.6$$

$$242.6$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$51.676$$

$$\text{Coincidence. } 51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$51.44$$

$$\begin{array}{r} 51.446 \\ 51.658 \\ \hline 212 \\ 51.234 \end{array}$$

These probably the best

$$51.658$$

$$\text{Pos. } 242.1 \quad \text{Obs. } 242.1 \quad \text{Prop. } 242.1$$

$$242$$

$$241.9$$

$$243.1$$

$$242.8$$

$$1211.9$$

$$242.38$$

$$\text{Dist. } 51.21$$

$$51.21$$

$$22.5$$

$$21.5$$

$$20.$$

$$24.$$

$$51.216$$

$$51.678$$

$$462$$

$$231$$

$$51.447$$

$$51.216$$

$$51.625$$

$$665$$

$$865$$

$$875$$

$$87$$

$$3890$$

$$51.678$$

1868 Sep 7th

W. Separated of Sagittarii

348.17

35.44

312.73

20 Pegasi

1866 July 15.7H. 317.3

" " G.H.S. 314.5

" July 26 S.P.L. 315.5

" " G.H.S. 314.9

1867 Mar 11 C.S.P. 315.0

- 1868 Sep 8 E.H. 312.7

1869 Oct 1 C.S.P. 313.8

" " E.P.A. 311.2

1871 Sep 28

1868 Sep 8th

Coincidence 51.502 for
Observation of G. S. A.; unknown in
observation of G. S. A.

Σ 2799 - Pegasus 20

Pos. 34.5
6.5
5.2
6.0
5.0

2.2
35.44

51.995
52.00
52.00
51.995
51.995

51.997

Obs G. S. A.
[should be G. S. A.]

4th power. Obs. G. S. P.
Star parallel to eye quite steady
seeing good

dist. 51.80
51.81
51.80
51.79
51.79

51.798
51.796

G. S. A.

~~51.79~~
~~51.79~~
~~51.79~~
~~51.79~~

Fixed wires
must have
been moved

Fixed wires moved

Coinc

36
68
22.
12.2 1.391
24.4 390
26.6 1.781
500

Sept 8th 1868

Pegasei 20

Coincidence of wires

51.51

51.56

49

51

52

257.51

51.502

Dist

51.64

62

62

62

62

51.622

502

.120

Occultations

Immersion 89 Lauri lost clouds -

Emergence 89 Lauri lost

Immersion Runk 1241 lost cloud (signal made
but star could not be seen)

Immersion Runk 1243 not seen (no signal)

Emergence Runk 1244 Signal made
but doubtful if seen - Clouds -

Sept 16th 1868Coincidence
53,610

Wire ill. 5th Power
Obs B-S-P
Coincidence

54.55
54.
54.
54.5
54.
288,05
53,61

1st Power star perpendicular to eye
seeing rather poor star rather large

Position	125.3	Distance	51.88
	125.3		84
	122.9		88
	123.6		87
	125.2		88
	822.0		85
	124.6		51.87

Tried 3 diaphragms on telescope

1st = Perforated paper

Appearance

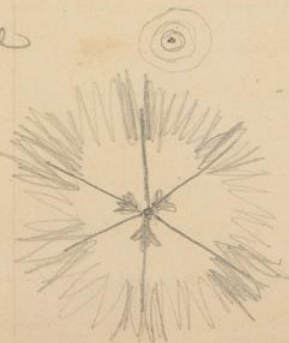


2nd = Large holes

Appearance



3rd = Triangular hole



Sept 16th 1888No coincidence, and
none required.

Obs. Prof. J. M. P.

Turned on a trippid nebula
could only see three stars or a tripple
star, rather faint star,

Dumbell nebula

In spectroscopic shows one bright
line which is in the field where
scale reads 1240. haven't yet means
to fix the position of the line to right

With lines better seen

scale reads 1350

Sept 17th

Obs. G. S. P.

Trippid Nebula

one of Mr Langley's stars seen
seeing had stars hazy,
stars moving violently & separating
occasionally. I seeing had

one of Mr Langley's stars seen
distinctly with first power; seen only
a moment. Mr Langley's star
occasionally seen exceedingly distinctly

Position between Mr Langley's and
one next to it measured without
ill. 754

Zero Position (approximate) 80.2
80.0

Sep 17th

Looked for (104) Not There

Sep 18th = 1868

J.W. examined Spectrum of Arcturus
after ward of Multiple Star in triplid
He found its spectrum to be continuous with
many ~~dark~~^{bright} lines and some bands -

Same thing seen (with some little doubt) by C.P.
Yet he was certain of seeing a bright place more while
field was illuminated

Spectrum extended to 27.00 (J.W) to 26.67 (C.P.)

Another nebula close to Large

cluster One bright line 16.92 (C.P.)
Note June 10, 1880. This is perhaps the spectrum of another part of the triplid nebula.

Dumb-bell. One v. bright line 16.77 (C.P.)

Ring-nebula in Lyra (L 4447) One bright
line. Same as other two looked at 16.69 (C.P.)

Measured Na line 10.42

Sept 18, 1868.

Planetary Nebula L 4628

3 lines - 2 on right of unequal brilliancy
a fine one to left J.W.

v. bright line (16.71 C.S.P.)

~~17.17~~	17.17	middle line	C.S.P.
	16.73	— brightest	
18.40		faintest	

J.W.

Finest nebula spectrum ever seen here.

h 4572 Not seen in Funder

h 4964 Planetary Neb

16.86 Brightest

17.10 Middle

= 17.84 Another fl. one

This is the finest yet

86.

Sept. 28th 1868.

Immersion of 64 Aquarii was lost in
a cloud —

Emergence of 64 Aquarii obtained —

~~Began sweeping for Doubles~~
~~Dec — 27th 30th~~
~~merid to 40^m East~~

Sep 29th 1868Coincidence
5-1.818.Looked for Encke's Ξ Too low down - At 6^h m.t.

Can't be seen for some time
 didn't actually get pointed till 6 $\frac{1}{2}$ but it would
 have been too low at 6.

Began to sweep for Doubles
 - 20° 1 R = 0^h 5.0^m 40^m

Began at 19.30^m

Stopped after a sweep or two
 to put on micrometer

Seeing wretched
~~Left~~

Asteroid Pales The supposed asteroid has
 a magnitude of less than 9 $\frac{1}{2}$ about 10

Transits over one wire
 Ast. precedes star 1^m 9^m

Readings of Dec. increase toward south

Open
 accidentally
 5.0
 5.18
 5.26
 5.46
 5.56

~~5.0
 5.18
 5.26
 5.46
 5.56~~

Over two wires

~~5.0~~
 5.18
 5.26
 5.46
 5.56

1868 Sept 29 cont.

Transits $\left\{ \begin{array}{cc} 6^{m} & 45^{m} \\ 7 & 50 \\ 5 & 0 \end{array} \right. \left\{ \begin{array}{cc} 8 & 45 \\ 7 & 50 \\ 4 & 59 \end{array} \right.$

The following of the two observed stars is Poles,
Measurement of disc of Jupiter at 9.51 : 5.1^m

~~The following of the two observed stars~~
~~is Poles, (on disc)~~

Zero position of micrometer $\left\{ \begin{array}{l} 260.0 \\ 259.9 \\ 260.1 \end{array} \right.$

Coincidence $\left\{ \begin{array}{l} 51.82 \\ 51.86 \\ 51.79 \\ 51.81 \\ 51.83 \\ 51.80 \\ \hline 51.818 \end{array} \right.$

Found Ircia but moonlight
too strong to observe it.

T.W. at 6^h 24^m P.M. by Frodsham watch
saw v. B meteor about $\frac{1}{2}^{\circ}$ N of Arcturus and
about 3° W of it moving a little to the south
of the vertical circle. It left no train but there
were some bright portions left behind, like a
rocket. It went down till it disappeared behind
the houses. Standing between Cambridge Arsenal
& Prof. Parsons' house,

Oct 3^d

1868

Coincidence
51.848

Neb.

h 4572 Spectrum

difficult to see

Moonlight (An: Whether seen)

One line diffused 16.09 (C.S.P.)

one line sufficiently sharp when the slit is reduced. (T.W.)

h 4670 $\oplus$ YB.Diffused but ^{mod.} bright light from 12.23 to 20.92
C.S.P.

Great Nebula in Andromeda

V. fh. light diffused — Positively nothing more (C.S.P.)
J.W.

h. 117 Diffused light

h. 4964

Brightest line —
C.S.P. (again)16.07
16.05
16.01
16.47
brightest
line
second line

Hg. line b. (single 11) 1583

Note Nov. 13, 1880. This is supposed to be 15.83 which agrees better than 15.83 with the other measures of λ , and with the observations of this nebula on this date.

Bright line of Nebula corresponds nearly with bright line belt toward violet from b except one rather fh. one near it. This is a little ~~more~~ ^{nearer} b than nebula line, ~~on the whole~~ on the whole C.S.P. thinks

Oct. 3, 1868.

They do coincide

W. thinks they coincide. Can see no difference between them.

micrometer
micrometer~~Σ 22.~~ G. E. & Obs.

Zero of Position.	257. ⁰ .4
	8.7
	8.2
	8.8
	8.2
	258.26

Field illum. Stars rather large, rather unsteady.

Coincidence -	54.89
	46.843
	46.839
	46.833
	46.833
	51.8476

Σ. 22. Star II eyes. 4th Power

Position	113.5	Distance	52.309
	113.2		52.312
	113.2		52.312
	113.4		52.325
	112.9		52.318
	113.24		

Oct. 3, 1868.

O. S. P. observer—

 Σ 22 Star II to eyes 4th power.

Distance. 52.29

52.30

52.25

52.29

52.25

52.28

$$\begin{array}{r}
 5 / 138 \quad (28) \\
 \underline{12} \\
 28
 \end{array}$$

Position

289.0
289.3
<u>288.8</u>

Obs B & P. Oct. 5

Examined 22 Capricorni but could not separate it.

T.W. thought he saw an elongation of comp. $\perp$ to line between
Comp. & principal *. C.S.P. could not.

Oct. 6

20^h 15^m
Left time
3 h. 15 m. heard
at obs

2

October 6th 1868

Double found by J.W.

$$\alpha = 20^{\circ} 33^m$$

$$\delta = -18^{\circ} 1.5$$

Coincidence	51.820	1.92
	.839	92
	.970	94
	.957	94

Mean of first two 51.830

" " second " 51.964

1st mean probably to be used before
Jupiter was examined by visitors,
2^d mean afterwards.Obs by C. I. P. 3rd Power Star + eyes

Position 163.7

168.3

Distance 50.42

5th Power

Coinc 51.82

822

819

828

812

51.8202

Field III

e Equal A & B * 11 eyes

Pos, 248.0

8.8

3.5

5.0

3.2

Distinctly separated

Dist 51.87

51.87

51.90

905

90

Field III

Wire III

Coinc 51.826

830

840

850

847

193

.839

E. P. A.

Position 271.6 $\frac{A+B}{2} \checkmark C$

A x B

Position 243.6
244.3
243.8

G S P

S P A

52.00 Wire Hl.
.98 Field Hl.

51.89 } Field Hl
CSP 51.89

37 Pegasi - CSP could not get any elongation
at all. J.W. Pos. 30° to 40°
Distance much less than α Equulei A x B

210° C S P

210 J.W.

Jupiter examined by visitors

42 left

C S P

Red Field Hl

Pos	187.5	x per. to y	5-2.09	4th p
	187.4	fourth Power Dist	.08	
	184.8		.05-	5th p
	187.0		.08	
	186.9		.08	

Best S P A obs. not separated
52.10
.09
.13
.15
.17
52.128

Mean 52.076
51.970
+.106

position
181.8
181.5
183.0
186.5
184.0
mean 183.33

96

Cep 9

1868

Coincidence

51.900

1.96

51.885

97

51.892

mean

1st observation probably by
G. J. Alden.Looked for Enke's  Too low. α_2 Capricornus — could not separate comp.C. S. P. notes that he has swept for
doubles largely but his notes have disap-
peared — except for a small areaC S P obs set at -5° Dec. and swept
south (commencing at $20^\circ 13^m$)between -15° and $+30^\circ$.

At $20^h 26^m$ 17.5 — H $23^h 46^m 15.5$ — $5^\circ 33'$ nearly
south of 6^m * ~~at~~ 0° Pr or far past 120°
T $20^h 47^m 10.5$ — $6^\circ 48'$ ✓
H $23^h 50^m 39$ — $7\frac{1}{2} - 8$ comp S

20	5.6	21
20	5.1	40
23	1.8	12
20	5.6	22
	5.7	

12 Aquarii = Σ 2745

 Aquarii
 G J & obs $3^m \approx R$

Star Eyes

Pos — 189.4

190.2

189.7

190.2

190.2

189.94

Dist 52.20

52.23

52.21

52.215

52.21

52.203

51.90

51.89

51.902

51.91

51.90

90.

Same star by C. S. P.

Pos. {
 190.8
 191.3
 191.7
 191.3
 192.6
 191.34

Dist {
 52.27
 22
 18
 23
 19
 52. 2.18

Coincidence {
 51.91
 88
 88
 88
 91.2.76
 88.5
 24.77
 191.64
 109
 144

Zero Pos. {
 258.5
 258.6
 258.2
 258.6
 258.8
 258.54

7	53.0	50	32.7
9	32.6	33	31.3
1	39.6	17	1.4
11	12.2	16	29.9
12	51.8		31.5

Note June 2, 1880. There is a copy of the observations in this book, as far as p. 40 inclusive, in book N 40. Subsequent pages have been examined for values of coincidence, and notes made at the top of the first pages of the separate dates of observations.

June 22, 1877. This book checked for observations
made after June 1868, except those of double stars.

22	34
5	2
17	35

Ephemeride des Encke'schen Cometen.

1868 0 ^h M.Berl. Zt.	AR.	Decl.	Log. Entfern.	Aberr.- Zeit	$\frac{a^2(a-1)^2}{r^2 \Delta^2}$
	^h ^m ^s ^m ^s	[°] ' "		^m ^s	
Juni 19	2 41 37,54 +2 37,33	+ 23 0 17,1 +14 8,5	0,34879	18 21,4	0,52
20	44 14,87 2 39,66	23 14 25,6 14 11,0	0,34498	18 11,7	
21	46 54,53 2 42,08	23 28 36,6 14 13,2	0,34114	18 2,0	
22	49 36,61 2 44,58	23 42 49,8 14 15,2	0,33726	17 52,3	
23	52 21,19 2 47,13	23 57 5,0 14 17,2	0,33335	17 42,6	0,60
24	55 8,32 2 49,80	24 11 22,2 14 18,9	0,32940	17 32,9	
25	2 57 58,12 2 52,52	24 25 41,1 14 20,2	0,32541	17 23,3	
26	3 0 50,64 2 55,37	24 40 1,3 14 21,3	0,32139	17 13,6	
27	3 46,01 2 58,29	24 54 22,6 14 22,1	0,31733	17 3,9	0,69
28	6 44,30 +3 1,33	25 8 44,7 +14 22,6	0,31323	16 54,3	
29	9 45,63 3 4,46	+ 25 23 7,3 14 22,5	0,30910	16 44,8	
30	12 50,09 3 7,71	25 37 29,8 14 22,2	0,30493	16 35,2	
Juli 1	15 57,80 3 11,07	25 51 52,0 14 21,4	0,30073	16 25,6	0,80
2	19 8,87 3 14,55	26 6 13,4 14 20,3	0,29650	16 16,1	
3	22 23,42 3 18,15	26 20 33,7 14 18,5	0,29223	16 6,6	
4	25 41,57 3 21,88	26 34 52,2 14 16,2	0,28793	15 57,0	
5	29 3,45 3 25,72	26 49 8,4 14 13,2	0,28359	15 47,5	0,93
6	32 29,17 3 29,71	27 3 21,6 14 9,6	0,27923	15 38,0	
7	35 58,88 3 33,81	27 17 31,2 14 5,1	0,27484	15 28,6	
8	39 32,69 +3 38,08	27 31 36,3 +14 0,0	0,27041	15 19,2	
9	43 10,77 3 42,47	+ 27 45 36,3 13 53,9	0,26596	15 9,9	1,09
10	46 53,24 3 47,01	27 59 30,2 13 46,9	0,26149	15 0,6	
11	50 40,25 3 51,70	28 13 17,1 13 38,8	0,25699	14 51,3	
12	54 31,95 3 56,55	28 26 55,9 13 29,7	0,25246	14 42,0	
13	3 58 28,50 4 1,53	28 40 25,6 13 19,3	0,24791	14 32,8	1,29
14	4 2 30,03 4 6,70	28 53 44,9 13 7,5	0,24333	14 23,7	
15	6 36,73 4 12,00	29 6 52,4 12 54,5	0,23874	14 14,6	
16	10 48,73 4 17,48	29 19 46,9 12 39,8	0,23414	14 5,6	
17	15 6,21 4 23,10	29 32 26,7 12 23,6	0,22952	13 56,6	1,54
18	19 29,31 +4 28,91	29 44 50,3 +12 5,3	0,22488	13 47,7	
19	23 58,22 4 34,86	+ 29 56 55,6 11 45,4	0,22024	13 38,9	
20	28 33,08 4 40,99	30 8 41,0 11 23,3	0,21559	13 30,2	
21	33 14,07 4 47,28	30 20 4,3 10 59,2	0,21094	13 21,5	1,84
22	38 1,35 4 53,72	30 31 3,5 10 32,6	0,20628	13 13,0	
23	42 55,07 5 0,34	30 41 36,1 10 3,5	0,20163	13 4,6	
24	47 55,41 5 7,10	30 51 39,6 9 31,8	0,19699	12 56,3	
25	53 2,51 5 14,00	31 1 11,4 8 57,3	0,19236	12 48,1	2,23
26	58 16,51	31 10 8,7	0,18775	12 39,9	

June 22, 1877. This book checked for observations made after June 1868, except those of double stars.

Ephemeride des Encke'schen Cometen.

1868 0 ^h M.Berl.Zt.	AR.	Decl.	Log. Entfern.	Aberr.- Zeit	$\frac{a^2(a-1)^2}{r^2 \Delta^2}$
	^h ^m ^s	[°] ['] ^{''}		^m ^s	
Juli 26	4 58 16,51	+ 31 10 8,7	0,18775	12 39,9	
27	5 3 37,56	+ 31 18 28,4	0,18315	12 31,9	
28	9 5,81	31 26 7,5	0,17858	12 24,0	
29	14 41,35	31 33 2,4	0,17404	12 16,2	2,71
30	20 24,32	31 39 10,1	0,16954	12 8,6	
31	26 14,80	31 44 26,3	0,16508	12 1,2	
Aug. 1	32 12,88	31 48 47,4	0,16067	11 53,9	
2	38 18,58	31 52 9,3	0,15631	11 46,8	3,33
3	44 31,96	31 54 28,1	0,15201	11 39,9	
4	50 53,00	31 55 39,1	0,14779	11 33,1	
	+ 6 28,74	- 0 1,1	0,14365	11 26,6	
5	5 57 21,74	+ 31 55 38,0	0,13959	11 20,2	4,11
6	6 3 58,11	31 54 20,0	0,13563	11 14,1	
7	10 42,07	31 51 40,6	0,13177	11 8,1	
8	17 33,46	31 47 34,9	0,12802	11 2,3	
9	24 32,17	31 41 58,1	0,12439	10 56,7	5,11
10	31 37,99	31 34 45,5	0,12089	10 51,5	
11	38 50,72	31 25 52,4	0,11754	10 46,5	
12	46 10,10	31 15 13,9	0,11433	10 41,7	
13	6 53 35,88	31 2 45,3	0,11128	10 37,2	6,40
14	7 1 7,71	30 48 22,2	0,10841	10 33,0	
	+ 7 37,55	- 16 22,1	0,10572	10 29,1	
15	8 45,26	+ 30 32 0,1	0,10322	10 25,5	
16	16 28,11	30 13 35,3	0,10092	10 22,2	
17	24 15,89	29 53 3,5	0,09884	10 19,2	8,07
18	32 8,15	29 30 21,6	0,09698	10 16,5	
19	40 4,50	29 5 26,0	0,09529	10 14,2	
20	48 4,44	28 38 14,3	0,09394	10 12,3	10,25
21	7 56 7,52	28 8 43,9	0,09279	10 10,7	
22	8 4 13,29	27 36 53,3	0,09190	10 9,5	
23	12 21,28	27 2 40,2	0,09126	10 8,6	
24	20 31,09	26 26 4,4	0,09087	10 8,0	13,12
	+ 8 11,18	- 38 59,7	0,09077	10 7,8	
25	28 42,27	+ 25 47 4,7	0,09093	10 8,0	
26	36 54,49	25 5 41,5	0,09135	10 8,6	
27	45 7,39	24 21 54,4	0,09203	10 9,5	16,98
28	8 53 20,68	23 35 44,4	0,09297	10 10,8	
29	9 1 34,04	22 47 12,3	0,09417	10 12,5	
30	9 47,33	21 56 19,6			
31	18 0,46	21 3 7,5			
Sept. 1	9 26 13,35	20 7 38,0			

Ephemeride des Encke'schen Cometen.

1868 0 ^h M.Berl.Zt.	AR.		Decl.		Log. Entfern.	Aberr.- Zeit	$\frac{a^2(a-1)^2}{r^2 \Delta^2}$
	^h ^m ^s	^m ^s	^o ['] ["]	['] ["]		^m ^s	
Sept. 29	13 10 47,87	+7 14,27	-12 27 8,7	-55 49,4	0,14365	11 26,5	14,80
30	18 2,14	7 10,08	13 22 58,1	53 48,5	0,14535	11 29,2	
Oct. 1	25 12,22	7 5,86	14 16 46,6	51 49,3	0,14720	11 32,1	
2	32 18,08	7 1,67	15 8 35,9	49 51,3	0,14918	11 35,3	
3	39 19,75	6 57,50	15 58 27,2	47 54,6	0,15131	11 38,7	10,88
4	46 17,25	6 53,30	16 46 21,8	45 59,8	0,15357	11 42,3	
5	53 10,55	6 49,10	17 32 21,6	44 6,4	0,15596	11 46,2	
6	13 59 59,65	6 44,90	18 16 28,0	42 15,1	0,15849	11 50,3	
7	14 6 44,55	6 40,71	18 58 43,1	40 25,5	0,16114	11 54,7	8,14
8	13 25,26	+6 36,50	19 39 8,6	-38 38,3	0,16392	11 59,3	
9	20 1,76	6 32,30	-20 17 46,9	36 53,0	0,16683	12 4,2	
10	26 34,06	6 28,00	20 54 39,9	35 10,3	0,16985	12 9,2	
11	33 2,06	6 23,62	21 29 50,2	33 29,6	0,17298	12 14,5	6,21
12	39 25,68	6 19,22	22 3 19,8	31 51,7	0,17621	12 19,9	
13	45 44,90	6 14,82	22 35 11,5	30 16,4	0,17953	12 25,6	
14	51 59,72	6 10,34	23 5 27,9	28 43,5	0,18295	12 31,4	4,82
15	14 58 10,06	6 5,81	23 34 11,4	27 13,4	0,18645	12 37,5	
16	15 4 15,87	6 1,26	24 1 24,8	25 46,1	0,19002	12 43,8	
17	10 17,13	5 56,68	24 27 10,9	24 21,2	0,19367	12 50,3	
18	16 13,81	+5 52,08	24 51 32,1	-22 59,2	0,19738	12 57,0	
19	22 5,89	5 47,43	-25 14 31,3	21 39,9	0,20116	13 3,8	3,80
20	27 53,32	5 42,79	25 36 11,2	20 23,4	0,20499	13 10,7	
21	33 36,11	5 38,14	25 56 34,6	19 9,5	0,20886	13 17,8	
22	39 14,25	5 33,48	26 15 44,1	17 58,3	0,21278	13 25,1	
23	44 47,73	5 28,83	26 33 42,4	16 49,7	0,21673	13 32,4	3,03
24	50 16,56	5 24,19	26 50 32,1	15 43,8	0,22072	13 39,8	
25	15 55 40,75	5 19,56	27 6 15,9	14 40,4	0,22473	13 47,4	
26	16 1 0,31	5 14,96	27 20 56,3	13 39,6	0,22877	13 55,1	
27	6 15,27	5 10,37	27 34 35,9	12 41,2	0,23282	14 2,9	2,45
28	11 25,64	+5 5,81	27 47 17,1	-11 45,2	0,23689	14 10,8	
29	16 31,45	5 1,29	-27 59 2,3	10 51,5	0,24097	14 18,9	
30	21 32,74	4 56,82	28 9 53,8	9 59,9	0,24506	14 27,1	
31	26 29,56	4 52,40	28 19 53,7	9 10,6	0,24916	14 35,4	2,00
Nov. 1	31 21,96	4 48,03	28 29 4,3	8 23,5	0,25325	14 43,7	
2	36 9,99	4 43,71	28 37 27,8	7 38,5	0,25735	14 52,0	
3	40 53,70	4 39,45	28 45 6,3	6 55,5	0,26144	15 0,4	
4	45 33,15	4 35,26	28 52 1,8	6 14,5	0,26553	15 8,8	1,65
5	50 8,41		28 58 16,3		0,26961	15 17,4	

Richfield Obs.^y of Hamilton College
Clinton, N.Y., 1868. June 15.

Dear Sir,

The planet Janthia (98) has become now so small, that it will be difficult to observe it to advantage except with the largest telescopes. I should be gladly obliged, therefore, if you would make an observation upon it yet this week, before the moon will interfere. According to a pretty good position obtained last night, the following elements will give you pretty accurately the place for about 10^h Cambridge Mean time:

1868 June 17.	$11^h 40^m 24^s$	$-7^{\circ} 37.9'$
18.	41 25	46.1
19.	42 26	-7 54.3
20.	43 28	-8 2.6
21.	44 30	11.0
22.	45 34	19.4
23.	46 38	-8 27.9

Magnitude about 13.5 or 14th.

Yours very truly
C. H. F. Peters

Professor Joseph Winlock
Director Obs.^y of Harvard College
Cambridge

Dear
The place
to observe is
gladly obliged,
week, before
obtained last
the place for
1868,

Magnitude

Professor

Ann Arbor 1868 Sept. 11

My dear Sir

The place of the new planet (103) communicated
to you in my letter of the 8th inst. is erroneous
as you will see by the following

Observations of (103).

Ann Arbor M. T.	(103) α	(103) δ	Comp	
1868 Sept. 7	15 ^h 31 ^m 46 ^s	0 ^h 22 ^m 13 ^s .18	-3° 49' 51".3	9
9	14 45 42	0 20 53.94	4 3 47.0	1
10	9 59 59	0 20 20.66	-4 9 24.5	7
Planet 10 th magnitude				

Please reduce and send me the observations of Helma (101)
which we made Sept. 1st or send me the data from
which I may obtain the place. I wish to use the
observations in computing elements.

Very Truly Yours

James C. Watson

Prof. Joseph Winlock
Cambridge
Mass.

Occultations Oct. 5

Phen.	Star	Mag.	m. b.	sid b	Angle N. point
Imm.	γ Tauri.	4°	9 ^h 10 ^m	22 ^h 10 ^m	294
Em.	γ Tauri		10 7	23 7	98
Imm.	70 Tauri	7	12 2	1 3	270
Em.	70 Tauri		13 12	2 12	127
	Runk 1203		13 47	2 48	302
Imm.	75 Tauri	6	13 56	2 57	312
Imm.	Runk 1210		14 5	3 6	261
	Approach θ Tauri	4½	14 18	3 41	199
Em.	Runk 1203		15 5	4 6	94
Em.	75 Tauri		15 10	4 11	82
Imm.	B.A.C. 1391	5	15 12	4 13	241
Em.	Runk 1210		15 20	4 21	133
Imm.	B.A.C. 1394	7	15 30	4 31	222
Em.	B.A.C. 1394		16 7	5 8	171
Em.	BAC 1391		16 14	5 15	148
Imm.	Runk 1232		16 28	5 29	312
Imm.	B.A.C. 1406	7	17 23	6 24	227
Imm.	Runk 1238	10	17 39	6 40	268
Em.	Runk 1232		17 48	6 49	82
Em.	B.A.C. 1406		17 53	6 55	145
Em.	Runk 1238		18 54	7 55	111
Rise	Moon		8 7		
Rise	Sun		18 3		

1868	α			δ	$\lg \Delta$	$\lg r$	1868	α			δ	$\lg \Delta$	$\lg r$	
May	31.	9 ^h	25 ^m	29 ^s	+ 48°	58.3		July	7.	12 ^h	57 ^m	34 ^s	+ 23°	50.5
June	1.		35	2	48	55.6	9.4653		8.	13	0	37	23	11.6
	2.		44	22	48	10.2			9.		3	37	22	33.2
	3.		53	28	47	42.3	9.9688	0.0194		10.	6	33	21	55.4
	4.	10	2	19	47	12.0			11.	9	24	21	18.2	
	5.		10	54	46	39.5			12.	12	12	20	44.5	
	6.		19	15	46	5.0			13.	14	58	20	5.4	
	7.		27	20	45	28.8	9.9786	0.0411		14.	17	40	19	29.8
	8.		35	9	44	50.9			15.	20	19	18	54.8	
	9.		42	43	44	11.5			16.	22	55	18	20.3	
	10.		50	2	43	30.9			17.	25	28	17	46.4	
	11.		57	5	42	49.2	9.9913	0.0647		18.	27	53	17	13.0
	12.	11	3	54	42	6.5			19.	30	26	16	40.1	
	13.		10	29	41	23.1			20.	32	57	16	7.8	
	14.		16	57	40	28.9			21.	35	14	15	36.0	
	15.		22	59	39	54.1	0.0064	0.0813		22.	37	35	15	4.6
	16.		28	54	39	8.8			23.	39	54	14	33.8	
	17.		34	37	38	23.2			24.	42	11	14	3.4	
	18.		40	8	37	37.3			25.	44	25	13	33.6	
	19.		45	27	36	57.4	0.0237	0.0999		26.	46	38	13	7.2
	20.		50	36	36	5.5			27.	48	49	12	35.3	
	21.		55	35	35	19.6			28.	50	58	12	6.9	
	22.	12	0	24	34	33.9			29.	53	6	11	39.0	
	23.		5	3	33	48.3	0.0424	0.1177		30.	55	12	11	11.4
	24.		9	34	33	2.9			31.	57	17	10	44.3	
	25.		13	56	32	17.9			August	1.	14	59	21	10
	26.		18	10	31	33.2				2.	1	23	9	51.5
	27.		22	47	30	48.8	0.0622	0.1346		3.	3	24	9	25.7
	28.		26	47	30	4.8				4.	5	25	9	0.2
	29.		30	9	29	21.4				5.	7	21	8	35.2
	30.		33	55	28	38.1				6.	9	19	8	10.6
July	1.		37	34	27	55.4	0.0829	0.1506		7.	11	15	7	46.4
	2.		41	7	27	13.2				8.	13	10	7	22.5
	3.		44	35	26	31.6				9.	15	4	6	59.0
	4.		47	37	25	50.5				10.	16	57	6	35.9
	5.		51	14	25	10.0	0.1040	0.1660		11.	18	49	6	13.1
	6.		54	26	+ 24	30.0				12.	20	40	5	50.7

Passage of the Perihelion
are 1868 April 17.4393 Berl. t.

The other elements are
not changed.

Ephemeris.		of Berlin mean Time.			
1868.	α	δ	$\lg \Delta$	$\lg r$	
May 15.	6 43 ^m 14 ^s	+ 47° 32.6			
16.	6 52 46	48 3.0			
17.	7 2 29	48 30.4			
18.	12 34	48 54.7	9.96432	9.9224	
19.	22 28	49 15.8			
20.	32 40	49 33.5			
21.	42 59	49 47.7			
22.	53 22	49 58.5	9.9600	9.9480	
23.	8 3 49	50 5.6			
24.	14 17	50 9.2			
25.	24 44	50 9.3			
26.	35 9	50 5.9	9.9593	9.9728	
27.	45 29	49 58.9			
28.	55 43	49 58.6			
29.	9 5 48	49 35.0			
30.	15 44	49 18.2	9.9623	9.9966	

1968phi000001_2000