

KG
11365
318

N 35

Observations with E. Equatorial.

From Aug. 27, 1866 to Oct. 20 1866.

Volume 2.

(Copy)



K 6-11365. 318

KG 11365.316



Obs.
cr.

9w

MS

1866. Aug 27 Monday

1

Observer	No. of obs.	Object	Angle		Distance		Therm	Time (sidereal)	Remarks
			Reading	Position	Readings	Difference			
JW	1	70 ophiuchi	253 30						
	2		253 40						
	3		253 0						
			253 23	97 7				18 30	
	4				48.42	0.43			
	5				47 99				
					48 80	0.44			
JMS	6				48.36				
					48.57	0.44			
					48.13				
						0.44			
	1	Z 2173	203°	127 30				18 55	Very uncertain. Power no 4.
	1	τ Ophiuchi	283 28						Eyes put parallel to line joining the stars
	2		282 32						
	3		279 0						
	4		278 15						
	5		284 12						
	6		285 27						
	7		284 27						
			282 29	248 1					
					51.47	0.15			
					51.32				
					51.44	0.13			
					51.31				
					51.46	0.14			
					51.32				
						0.14			
			Chronometry sid. times of transit	$\Delta \alpha$					
		Celtz. 19871.2	19 59 46.5						
		19892.3	20 1 9.0						
		Comp. star (2)	20 4 49.5						

1866 Aug. 27 Monday

Object	No. of Obs.	Time	Position	Distance		Observer	Remarks
				Readings	Difference		
Thiabe (88)	1	by chronometer 20 5 22.5				S	Transits over one wire. observed by chronometer.
Comp. star (2)		5 39.5					Reading of position circle $170^{\circ}12'$
	2	20 6 15.2					
		6 32.0			$\Delta 8$		
Oeltz. 19871.2				30.45			
198923				-6.36	+36.81		Reading of position circle $260^{\circ}20'$
Oeltz. 19871.2				80.16			
Thiabe		21 31		75.87	+4.29		
(2)		21 31 15		81.05	-0.89		
Parthenope	1	by sid. clock. 22 41 25.2	$\Delta \alpha$				Transits over two wires.
W XXII 304		29.0					Observed on Chronograph.
" 313		41 39.6	-14.4				Reading of position circle $170^{\circ}20'$
		43.2	-14.2				
		42 14.9	-49.7				
		18.8	-49.8				
Parthenope	2	42 35.8					
		39.5					
		42 50.3	-14.5				
		54.2	-14.7				
		43 25.6	-49.8				
		29.4	-49.9				
Parthenope	1	by chronometer 22 50.7		44.45			
W XXII 313				34.65	+10.80		33.65?
" " 304				70.55	-26.10		Times by chronometer.
Parthenope	2	54.0		44.36	+10.67		
W XXII 313				33.69			Planet N of 313
Parthenope	3	57.0		44.42	+10.62		S of 304
W XXII 313				33.80			
Parthenope	4	59.2		44.46	-26.42		
W XXII 304				70.88			

1866 Aug. 27. Monday.

3

Object	No. of obs.	Time	Position	Distance		Observer	Remarks
				Readings	Difference		
Parthenope	3	by sid. clock.				S.	
		23 0 44.2					
		48.4					
		0 59.1	-14.9				
		1 3.5	-15.1				
	313	1 34.4	-50.2				
		38.8	-50.4				
	4	23 1 58.8					
		2 3.2					
		2 14.0	-15.2				
		18.5	-15.3				
		2 49.3	-50.5				
		53.8	-50.6				
Star for zero point	1		80 31				
	2		80 24				
	3		80 30				
	4		80 29				
			80 28				
Z 3057	1		233 15				Power no 3. Line joining eyes parallel to that joining stars. Mags. 7 & 11.
	2		233 24				
	3		234 40				
	4		233 15				
		0 ^h 30 ^m	233 38				
	5			58.15			
	6			16			
	7			15			
	8			18			
	9			20			
Coincidence of wires.	10			17			
				58.168	0.320		
				57.83			
				83			
				86			
				87			
				85			
				57.848			

1866 Aug 27 Monday.

Object	No of Obs	Time sidereal	Position	Distance		Observer	Remarks
				Readings	Difference		
η Cassiopeae	1		225 12			S	Line joining eyes as for last star.
	2		227 8				
	3		227 18				
	4		226 20				
			226 29				
	5	1 5		53.02			
	6			52.97			
	7			53.04			
	8			53.01			
Σ 3037	9			53.02			Eyes placed as before.
				53.012	0.686		
				53.69			
				66			
				71			
				71			
				69			
				53.692			
	1		141 58				
	2		139 40				
	3		140 15				
		1 30	140 38				
	4			53.88			
	5			89			
	6			88			
	7			85			
				53.875	0.24		
				53.62			
				64			
				64			
				64			
				53.635			

1866 Aug 28 Tuesday

5

Object	No. of Obs	Time	Position	Distance Readings	Difference	Observer	Remarks
		by clock (sid)					
Oeltz. 19871.2	20	4 12.8				S	Transits over two wires; recorded on chronograph.
		5 29.9					
19892.3	5	36.1					
	5	53.0					
Thiabe	1	8 50.0					
		9 7.1					
(2)	9	16.5	- 26.5				
	9	32.4	- 26.3				
Thiabe	2	9 59.2					
		10 16.2					
(2)	10	25.6	- 26.4				
	10	42.8	- 26.6				
				ΔS			
Thiabe	3	12 33		48.84	+7.16		Rattle on chronograph at times of comparisons in S.
(2)				41.68			
	4	13 43		48.95	+7.28		
				41.67			
	5	14 28		49.00	+7.23		
				41.77			
	6	15 25		48.92	+7.31		
				41.71			
	7	16 26		48.97	+7.15		
				41.82			
					+7.21		
Oeltz. 19871.2		18 50.1					
		19 7.2					
19892.3		20 13.4					
		20 30.6					
Thiabe	8	23 27.3					
		23 44.4					
(2)	23	53.9	- 26.6				
	24	11.0	- 26.6				
Oeltz. 19871.2				43.11			Micrometer wire placed successively on the stars in this order.
19892.3				79.91			
Thiabe				49.59			
(2)				42.21			

1866 Aug. 29 Wednesday

Position of a.	1	+0.025
Coincidence by	2	- .005
positive rotation	3	+ .013
of the screw.	4	.005
	5	.006
	6	.012
	7	.012
	8	.014
	9	.016
	10	.008
	11	.003
	12	+0.015
		+0.0103
Position of a.	1	+0.031
Coincidence by	2	.037
negative rotation	3	.035
of the screw	4	.025
	5	.036
	6	.043
	7	.036
	8	.035
	9	.032
	10	.031
	11	.041
	12	+0.032
		+0.0345
Position of a.	13	+0.006
Coincidence by	14	.017
positive rotation	15	.012
	16	.011
	17	.000
	18	+0.015
		+0.0102
Backlash		.0242
Position of b.	1	25.031
Coincidence by	2	.020
+ rotation	3	.012
	4	.038
	5	.028
	6	.035
		25.0273

JW Examination of micrometer screw. Power 316. Telescope pointed south, wires illuminated by daylight. Graduated head of micrometer screw to the right hand. The fixed threads denoted as follows a b c., a nearest the zero of the scale, c nearest the head of micrometer screw. A positive rotation of the screw is from left to right, or when the top of the screw moves from the observer in the position described. A negative rotation of the screw moves the stroke on the sliding scale from left to right or in the direction from 0 toward 100.

1866 Aug 29 Wednesday

7

Position of b	7	25.032
by + rotation	8	.019
	9	.015
	10	.019
	11	.022
	12	.017
		<u>25.0207</u>

	13	25.028
	14	.022
	15	.028
	16	.035
	17	.022
	18	.028
		<u>25.0272</u>
		<u>25.0251</u>

Mean of 18 obs.

Position of b	1	25.077
by - rotation	2	.085
	3	.088
	4	.095
	5	.080
	6	.082
		<u>25.0845</u>

	7	25.085
	8	.084
	9	.082
	10	.082
	11	.081
	12	.083
		<u>25.0828</u>

Mean of 12 obs.

Backlash		.0585
Distance ab by + rotation		25.0148
" " " - "		<u>25.0491</u>

Position of a	1	25.042
by + rotation	2	.063
	3	.049
	4	.038
	5	.028
	6	.035
		<u>25.0425</u>

Fixed wires moved.

1866 Aug 29 Wednesday

Position of α
by + rotation.7
8
9
10
11
1225.046
052
039
056
040
051

25.0473

-4 w

Position of α
by - rotation1
2
3
4
5
625.108
103
118
101
095
098

25.1038

Mean of 12 obs.

7
8
9
10
11
1225.118
100
094
118
097
115

25.1070

Mean of 12 obs.

Backlash

25.1054

.0605

Position of β
by + rotation1
2
3
4
5
650.058
062
080
074
058
078

50.06831
2
3
4
5
650.065
068
067
062
075
066

50.0672

Mean of 12 obs

50.0678

1866 Aug 29 Wednesday
and 30 Thursday

9

Position of θ
by - rotation

1
2
3
4
5
6

50.120
122
115
133
127
122
50.1232

JW

50.122
113
116
128
115
115
50.0182

Distance ab by + rotation
" " - "

50.1207
25.0229
25.0153

Mean of 12 obs.

JW Finder adjusted.
Searched for Thisbe, unsuccessfully.
Turned on δ Cygni, but could
not divide it. The seeing very
poor.

1866

Sept 1 Saturday

1866pina

Object	No. of obs.	Time	Position	Distance		Observer	Remarks
				Readings	Difference		
Thiabe	1	by sid. clock. 19 29 17.7 29 36.0 29 51.8				W	Transits over three wires observed on chronograph. Reading of pos. circle $170^{\circ} 30'$
(2)		30 22.3 30 39.3	-46.3 -47.5				In the first two transits
Thiabe	2	31 16.5 31 34.1 31 50.6					the first wire of the comparison star was lost.
(2)		32 19.7 32 37.1	[-45.6] -46.5				Seeing so poor that the stars could not always be followed up to the wire, and the tap had to be made by guess.
Thiabe	3	33 27.7 33 44.7 34 1.6					
(2)		34 15.5 34 32.3 34 49.2	-47.8 -47.6 -47.6				
Thiabe	4	35 58.2 36 15.6 36 32.3					
(2)		36 46.1 37 2.8 37 20.1	-47.9 -47.2 -47.8				
		by Chronometer		$\Delta 8$			
Thiabe	1	19 43.3		67.18			Wires will not bear much illumination. Stars seen with difficulty.
	2	46.5		39			
	3	48.0		29			
	4	49.5		30			
	5	50.0		14			
		19 47.5		67.26	+17.44		Planet N. of star.
(2)				49.82			Corr. to Chronometer = -40^s
				84			
				81			
				49.82			

1866 Sept 1. Saturday

11

Object	No. of Obs.	Time	Position	Distance Readings	Difference	Observer	Remarks
4 Aquarii	1	20 45	300			W	Thought to be separated.
	2		304				Images faint but steady
			<u>302</u>				Power 315.
37 Pegasi	1		74				Apparent elongation
	2		73				
	3		71 45			S	
	4		74			W	Power 401
	5		<u>76</u>			S	
			73 45				
							Distance < 0".5 (W)
							" about " (S)
μ Draconis	1		351 30			W	very carefully made
	2		351 45				
	3		<u>351 15</u>				
			351 30				
		mean time 11 ^h 5 ^m					
	4			42.07	0.27	W	
				41.80			
	5			46.75	0.28	S	
				47.03			
	6			41.78	0.29		
				<u>42.07</u>	<u>0.28</u>		
							toterably good.
							Further obsns. prevented by clouds.

1866 Sept 2 Sunday

Object	No of Obs.	Time	Position	Distance		Observer	Remarks.
				Readings	Difference		
Jupiter						JW	Beside the two principal belts always visible there is another one about as far above (apparently) the upper one as the upper is from the lower. Below the lower belt there are two narrow belts or lines; the upper line about half as far below the lower principal belt as that is from the one above it; the lower line about two thirds as far from the upper line as the lower belt is from the one above it. The above appearances also observed by Dr. Morrill Wyman. There is a dark spot on each of the principal belts. The upper belt of all has in a portion of it irregular edges and a mottled appearance, similar to those of the principal belts.

1866 Sept 2 Sunday

13

Object	No. of Obs.	Time	Position	Distance		Observer	Remarks
				Readings	Difference		
Thisbe	1	by sid. clock					
		19 42 23.3				W	Transits over three wires. Observed on chronograph. Reading of position circle $170^{\circ} 30'$
		42 40.2					
(2)		42 57.6					
		43 12.1					
		43 28.8					
Thisbe	2	43 46.0					
		44 18.8					
		44 36.0					
(2)		44 52.7					
		45 7.4					
		45 24.3					
Thisbe	3	45 41.1					
		46 19.8					
		46 36.8					
(2)		46 53.7					
		47 8.3					
		47 25.0					
Thisbe	4	47 42.0					
		48 26.9					
		48 44.0					
(2)		49 0.7					
		49 15.5					
		49 32.2					
Thisbe	1	by watch			ΔS		Reading of position circle $260^{\circ} 30'$
		9 ^h 8 ^m 5		66.90			Correction to watch -40^s
		2 9.7		67.03			Fixed wire put on the comparison star
(2)	3	12.5		66.83			by moving the telescope.
		by Frodsham pocket chronometer		67.06		S	Planet north of star.
		17		66.96	+20.60		
(2)				46.36			
				37			
				35			Correction to Frodsham $+6^s$
Thisbe	5	9 19		67.18	+20.74		
				46.44			

42

1866 Sept 2 Sunday
and 3 Monday.

Object	No of Obs.	Time	Position	Distance		Observer	Remarks
				Readings	Difference		
Thiabe	6	by Fordeham pocket chronometer		46.74	ΔS	S	Fixed wire set on the asteroid by moving the telescope.
	7			46.63			
	8			46.77			
	9			46.74			
				46.72	+20.76		
(2)				67.48			
				47			
				48			
				67.48			
Thiabe	1	by Lo's watch.		59.24		W	
	2			28			
	3			20			
	4			20			
	5			27			
				59.24	+23.88		
(2)				83.10			
				13			
				14			
				10			
				83.12			
Thiabe	1	by sid. clock					Transits over 3 wires Observed on Chronograph.
(2)				51 2.0			
				[51 19.6]			
				51 32.8			
				51 49.6			
				[52 10.0]			
Thiabe	2			52 50.2			
				53 7.2			
				53 24.3			
(2)				53 37.4			
				53 54.8			
				54 11.7			
Thiabe	3			56 6.1			
				56 22.8			
				56 40.2			
(2)	5						

1866 Sept. 3 Monday
and 6 Thursday

15

Object	No. of Obs.	Time	Position	Distance Readings	Difference	Observer	Remarks
		by sid. clock					
(2)		18 56 53.1					Note Nov. 5, 1880. There are other observations in the original record (book N5), of Jupiter, etc., but none of consequence.
		57 10.3					
		57 27.7					
Thisbe	4	57 45.3					
		58 2.2					
		58 19.3					
(2)		58 32.6					
		58 49.6					
		59 7.0					
Thisbe	5	19 0 37.5					
		0 54.5					
		1 11.7					
(2)		1 25.0					
		1 41.9					
		1 59.1					
Σ 2173						W	Turned on Σ 2173. Elongated but not measurable.
Σ 2234	1		151 30				Power no. 2.
	2		150 15				
	3		152 30				
	4		149 45				
	5		150 30				
	6		151 25				
			<u>150 59</u>				
		19 ^h 20 ^m					
	1			53.28			
	2			42			
	3			40			
	4			35			
	5			39			
	6			<u>41</u>			
				53.375	1.798		

1866 Sept. 6. Thursday

Object	No. of Obs.	Time	Position	Readings	Distance Difference	Observer	Remarks
2 2234				51.57 56 60 59 58 56 <u>51.577</u>			
τ Ophiuchi	1		283 36			L	
	2		279 44				
	3		281 28 <u>281 36</u>				
	4			54.62			
	5			65			
	6			67 <u>54.657</u>	0.154		
				52.51 48 49 <u>52.493</u>			
	7			53.92	0.22	w	Seeing very bad.
	8			53.70 53.76 53.57	0.19		
Star "c" of neb. h 2008. (h 2008 = G. B. 4403)						L	Looked for this star, but could not identify it.

1866 Sept 6 Thursday

17

Object	No. of Obs.	Time	Position	Readings	Distance Difference	Observer	Remarks.
Z 2303	1		132 15			W	
	2		132 30				
	3		132 34				
	4		131 45				
	5		131 15				
	6		132 15				
			132 6				
	7	20 25		52.50 .22	0.28		Note July 12, 1881. This agrees with the original, and there is no apparent reason for rejecting any observation; the result 0.28, depending on one setting, should obviously have $\frac{1}{3}$ the weight of the result 0.387; hence the general result for distance in revolutions is 0.360, and in seconds of arc 3.53.
	8			54.11			
	9			08			
	10			115			
				54.102	0.387		
				53.72 72 74 74 69 68 <u>53.715</u>			
W XIX 1273	1		194 31				Measured with great difficulty.
	2		195 30				
	3		193 30				
			194 30				
α^2 Capricorni							Examined but could not separate
4 Aquarii							" " " " "
Z 2847							Turned on this star, but took no measurements.

19

1866 Sept 6 Thursday

Object	No. of Obs	Time	Position	Distance Readings Difference	Observer	Remarks.
ζ Aquarii	1		12 45		W	
	2		13 15			
	3		12 35			
	4		12 15			
	5		12 20			
	6		11 30			
			<u>12 27</u>			
	7	22 13		45.63		
	8			65		
	9			66		
	10			69		
	11			68		
	12			64		
				<u>45.658</u>	0.351	
				45.25		
				33.5		
				33.5		
				<u>45.307</u>		

Search was made for Europa, and the positions of two stars ^{a & b} near W XXII 815 obtained

	a - W 815	b - W 815
$\Delta\alpha$	+9 ^s .5	+1 ^m 21 ^s .7
$-\Delta\delta$	-28 ^s .59	-53 ^s .00
	Approx. sid. t	0 ^h 10 ^m
At 0 ^h 33 ^m	$\Delta\delta$ a-b = -23 ^s .64	2 obs.
0 ^h 44 ^m	$\Delta\alpha$ " = -1 ^m 13 ^s .06	3 obs.

1866 Sept 3 Monday
(accidentally omitted in its proper place)

19

Object	No. of Obs	Time	Position	Distance Readings	Difference	Observer	Remarks
Jupiter Approximate Diameter of shadow of 1 st satellite in direction par- allel to equator				.28 .095	.185	L MAX	Endeavored to observe the transit of the first satellite, but the seeing was too poor.
Messier 72 = G.C. 4608							Not a bright object.
z 2847	1		45 29				
	2		42 22				
	3		41 16				
			43 2				
	5			53.18 53.28	0.10		
	6			53.41 53.28	0.13		
η Draconis	1		207 40			W	
	2		208 45				
	3		208 0				
	4		208 30				
		21 ^h 43 ^m	208 14				
	5			52.68 52.21	0.47		
δ Cygni	1		240				Approximate
ϵ Equulei						L	Saw the principal star neatly divided with power no. 3. but clouds prevented all further work at 11 ^h 40 ^m

1866 Sept. 8. Saturday

Object	No of Obs	Time	Position	Distance Readings	Difference	Observer	Remarks
Neb. h. 2008 = G.C. 4403						L	Turned on this object, but though the night was apparently clear, no trace of the nebula could be seen.
							Began to search for Daphne but clouds interrupted.
Σ 3057	1		232 30			S	Power no 1.
	2		234 25				Mags. 7 & 10.
	3		232 14				
	4		234 32				
			<u>233 25</u>				
	5			51.61	0.42		Power no 3.
				52.03			
	6			51.67	0.31		
				51.98			
	7			51.79	0.34		
				51.45			
	8			51.41	0.42		
				51.83			
Σ 3062	1		255 30				
	2		253 45				
	3		253 13				
	4		253 50				
		1 h 20 ^m	<u>254 4</u>				
	5			56.91	0.16		Distances not very trustworthy
				56.75			
	6			56.88	0.12		
				56.76			
	7			56.87	0.12		Fine auroral arch, specially at
				56.75			
	8			56.86	0.13		about 14 30 M.T.
				56.73			

1866 Sept 9 Sunday

21

Object	No of obs	Time	Position	Distance Readings	Difference	Observer	Remarks
Σ 2173	1	19 45	17 30			Moan Clark	
	2		2 45			W	
	3		1 45			S	
W XIX 1484	1			53.21	3.18	S	Search for Daphne
star a				56.39			
	2			53.22	3.27		
	3			56.49			
				53.21	3.39		b south of W XIX 1484
				56.60			
W XIX 1484		by Frodsham 10 ^h 37 ^m		31.95	ba-0.27		W XIX 1484 placed upon wire b;
star b				31.68 + ba			but coincidence made with
				32.08	ba-0.38		wire a.
				31.70 + ba			
		by chronometer					Transits of W 1484, a, & b over 1 wire
W XIX 1484	22	3 27.0					
a		5 10.3					
b		5 26.6					
W XIX 1484	22	6 15.5					" " " over 2 wires
		18.2					
a	7	59.4					
	8	1.8					
b	8	15.4					
		18.0					
star c					0.39		c north of W XIX 1484
W XIX 1484	22	23 52.7					
c		24 42.0					
star d							d precedes a 2.5
a				66.37	10.62 + ba		d south of a
				55.75 - ba			

1866 Sept 9 Sunday
and " 10 Monday.

Search for Beatrix and
Europa; the regions of
both charted.

Search for Daphne renewed

d 36.55 10.61+ab
a 47.16+ab

β Librae for
zero point

260 15

w

Transits of

1 15 21 6.6 16.4
23.0

s

Recorded on Chronograph
Therm. $70^{\circ}5$ at position
of observer

β Librae over
wires ab

2 22 2.2 16.5
18.7

3 22 31.3 16.5
47.8

4 22 59.7 16.6
16.3

5 23 29.2 16.5
45.7

6 24 25.0 16.5
41.5

7 24 54.3 16.7
11.0

8 25 23.7 16.5
40.2

9 25 53.1 16.6
9.7

10 26 22.5 16.5
39.0

mean

16.53

1866 Sept 10 Monday

23

Transits of β Librae over ba	1	15	31	37.2 53.8	16.6	5
	2		32	29.0 45.6	16.6	
	3		32	55.3 12.0	16.7	
	4		33	24.1 40.8	16.7	
	5		34	9.5 26.1	16.6	
	6		34	42.1 58.8	16.7	
	7		35	11.1 27.7	16.6	
	8		35	42.3 59.0	16.7	
	9		36	12.7 29.4	16.7	
	10		36	47.6 4.3	16.7	
	11		37	29.3 45.9	16.6	
mean					16.65	

Transits of β' Scorpii over cb	1	15	50	57.9 15.2	17.3
	2		51	29.2 46.6	17.4
	3		52	1.1 18.6	17.5
	4		52	34.5 52.0	17.5

Mean of ba reduced to equator
for β Librae = $16^{\circ}45'0$

Assuming ba = $25^{\circ}01'9$ (see p. 40)

$$1 \text{ rev.} = 9''863$$

Mean of cb reduced to equator
for β Librae = $16^{\circ}53'2$

Assuming cb = $25^{\circ}00'2$ (see p. 40)

$$1 \text{ rev.} = 9''798$$

Mean for β Librae $9''830$

Therm. at observer's place 70.7
" in alcove of dome 66.8

1866 Sept 10 Monday

Therm. at observer 69.5'

* Note April 21, 1880. Should be 17.36

1866 Sept 10 Monday

25

Transits of	5	16	9	41.3 58.8	17.5
β' Scorpii over					
ba	6		10	11.7 29.0	17.3
	7		10	46.1 3.6	17.5
	8		11	21.3 38.8	17.5
	9		11	51.9 9.3	17.4
	10		12	23.4 40.8	17.4
	11		12	55.2 12.7	17.5
mean of ba					17.40

τ Ophiuchi	1			105	0
	2			104	15
	3			104	45
	4			106	5
	5			105	50
		18	55	105	11
	6			17.71	0.24
				17.47	
	7			17.44	0.26
				17.18	
	8			17.445	0.205
				17.24	
	9			17.25	0.23
				17.02	

S

ba for β' Scorpii reduced to
equator = $16^s.409$

Assuming ba = $25^s.7019$ (see p. 40)

$$1 \text{ rev.} = 9''.838$$

cb for β' Scorpii reduced to
equator = $16^s.390$

Assuming cb = $25^s.002$ (see p. 40)

$$1 \text{ rev.} = 9''.833$$

Therm. at observer 69.5

In alcove of dome 66.8

W

Mean for β Librae $9''.830$

Mean for β' Scorpii $9''.836$

Mean of all $9''.833$

1866 Sept 10 Monday.
S.D. Observer.

Trifid Nebula.
G.C. 4355

References are
to drawings
of Aug. 2.

Seen or suspected. In absence of nebulosity in the part of the region x indicated by dotted lines. The whole nebula there is of the last degree of tenuity. There is no specific form or outline to be assigned with certainty. Yet it seems probable that the nebula only fades entirely away to the east of this break in its continuity. The entire region above (apparently) a is judged as before to be the brightest part of the nebula or nearly so.

North of the star "c" it is as certain that there is a uniform blackness separating the upper and lower divisions entirely as anything about the nebula.

The whole northern portion of the nebula as figured by Mason. The dark channel above a is inclined to line joining k and a nearly as shown in the annexed diagram instead of the length of the canal being parallel to line $k a$ as shown in sketch of Aug 2. I cannot feel sure that there is any nebulosity about a . The little patch of darkness above a pointing toward the region x , is larger every way than shown in old drawing, and less definite. (I mean the part north of the Trifid proper) has hardly any more separate existence as a nebula than any other equal portion of space in the vicinity which is all faintly nebulous.

The "northern" part of the nebula involving the conspicuously bright star not shown on chart of Aug. 2 is very faint, and very widely diffused. It is diffuse and formless even by comparison with the rest of the Trifid and the drawing by Mason bears no resemblance to what I see. The channel above " $a c d$ " is rather suspected than seen.

1866 Sept 10 Monday

27

S.P.L. & J.W. agree independently in concluding that the conspicuously bright star North has a dark channel above and below it with thicker nebulous matter on either side.

Σ 2838	1		167 12			S XX
	2		166 0			
	3		167 33			
	4		166 28			
			<u>166 48</u>			
	5			50.35		
	6			33		
	7			38		
	8			<u>38</u>		
				50.360	2.108	
				48.21		
				27		
				27		
				<u>26</u>		
				48.252		
	9			50.00	2.18	W
				47.82		
	10			50.33	2.29	
				48.04		

41 Aquarii	1	21	40	226 5		
	2			224 45		
	3			224 30		
	4			225 45		
	5			226 15		
	6			<u>224 15</u>		
				225 16		

1866 Sept 10 Monday

Object	No of Hrs	Time	Position	Distance		Observed	Remarks
				Readings	Difference		
41 Aquarii	7			46.17 45.65	0.52	W	
	8			45.98 45.49	0.49		
	9			45.77 45.215	0.555		
	10			45.65 45.085	0.565		
	11			45.52 45.06	0.46		
	12			45.57 45.06	0.51		
Z 2833	1		11 58				
	2		11 15				
	3		12 45				
	4		12 15				
	5		12 30				
	6		12 55				
			<u>12 16</u>				
	7	22 5		44.81			First measures of distance the best. Double weight given in combining.
	8			85			
	9			87			
	10			95			
	11			98			
	12			99			
				<u>44.887</u>	0.905		
				44.00			
				43.97			
				98			
				<u>98</u>			
				43.982			

1866 Sept 10 Monday

29

Object	No. of Obs	Time	Position	Distance		Observer	Remarks
				Readings	Difference		
37 Pegasi	1		41			S	Elongation pretty doubtful
	2		<u>34</u>				
			37 30				
P XXII 275	1		351 40			W	Not so well separated with
	2		355 15				a higher power. (W)
	3		<u>350 0</u>				
			352 18				Elongation doubtful (S)
53 Aquarii	1		226 15				
	2		226 45				
	3		227 30				
	4		<u>226 45</u>				
			226 49				
	5			46.54	0.78		
				45.76			
	6			46.56	0.89		
				45.67			
	7			46.44	0.84		
				45.60			
	8			46.25	0.81	S	
				45.44			
	9			46.33	0.90		
				45.43			
	10			46.19	0.87		
				45.32			
	11		49 0				
	12		48 58				
	13		47 20				
	14		47 48				

1866 Sept 10 Monday.

Object	No. of Obs.	Time	Position	Distance Readings	Difference	Observer	Remarks
98 Aquarii			0 30			JW	SMS could not perceive any elongation.
P XXIII 69	1		269 0				
	2		271 20				
	3		272 15				
	4		270 50				
	5		270 15				
	6		270 40				
			270 43				
	7			46.815	0.54		
				46.275			
	8			46.91			
	9			91			
	10			91.5			
				46.912	0.632		
				46.28			
Z 3062	1		255 15			L	
	2		254 17				
	3		253 4				Half weight
		0 ^h 30 ^m	254 26				
	4			50.21	0.14		Thought to be too large
	5			50.07			
				50.96	0.14		Considered better
				51.10			

1866 Sept 12 Wednesday

31

Object	No. of obs	Time	Position	Distance Readings	Difference	Observer	Remarks
Jupiter	1		270 40			JW	
direction of belts							
Polar diam.	1			44.91 40.56	4.35		
Apparent upper edge	1			44.812	4.407		
Middle of app. upper belts				42.75	2.345		
Lower belt				42.173	1.768		
Coincidence on lower edge				40.405			
Same meas. was repeated	2			44.65 42.70 42.12 <u>40.25</u>	4.40 2.45 1.87		
"	3			45.175 43.332 42.39 <u>40.635</u>	4.540 2.697 1.755		
"	4			45.235 43.39 42.54 <u>40.77</u>	4.465 2.62 1.77		
Preceding limb	1	20 ^h 37 ^m		42.71	2.66		
1 st bright spot				41.18	3.13		
Black spots				39.50	1.45		
Coinc. on foll. limb.				38.05			

1866 Sept 12 Wednesday

Object	No. of Obs.	Time	Position	Distance Readings	Difference	Observer	Remarks.
Jupiter						W	
preceding limb	2			42.88	4.76		
following "				38.12			
	3			43.015	4.815		
				38.20			
	4			42.88	4.70		
				38.18			
	5			42.80	4.64		
				38.16			
Hoan Clark's	1		328 28				Power 1200
new double	2		328 28				
star							
$\alpha = 20^h 35^m$	3		325 15				Very satisfactory measurement
$\delta = +40^\circ 6' 30''$	4		325 30				
	5		327 0				
			326 56				
	6		329 52			L	
	7		320 14				
	8		321 6				
			323 44				
	9			119	0.10	W	
				.09			
	10			55	0.09		
				.46			
	11			43.5	0.08		Perhaps involves backlash
				51.5			
	12			423	0.104	L	
				527			
	13			78	0.085		
				695			
	14		324 10				

1866 Sept 12 Wednesday
and 15 Saturday

33

Object	No. of obs	Time	Position	Distance Readings	Difference	Observer	Remarks
Neptune	1			58.643	0.268	g w	
Diameter for	2			375			
reading of	3			54	0.35		
position circle	4			19			
	5			475	0.275		
260°				20			
				47	0.26		
				21			
				49	0.35		Certainly large enough
				14			
δ Cygni			40°				Approximate
Mr Clarke's star							Not separable.
37 Pegasi							" "
P XXII 275							" "
P XVIII 226	1		254 20			w	
Z 2410	2		253 45				
	3		256 5				
			254 43				
	4		251 55			h	
	5		250 2				
	6		255 50				Double weight
			253 24				
	7		254 37			S	
	8		257 0				
	9		254 6				
	10		254 45				
			255 7				

1866 Sept 15 Saturday

Object	No of Obs.	Time	Position	Distance		Observer	Remarks.
				Readings	Difference		
P XVIII 226 Z 2410	11			58.000	0.135	W	
				57.865			
	12			57.613	0.111	L	
				57.724			
	13			57.669	0.146	S	
				57.523			
o Draconis	1		189 43			L	
	2		190 14				
	3		189 53				
		21 30	189 57				
	4		190 33			W	
	5			63.85	3.22	L	
				67.07			
	6	21 45		67.07	3.24		
				63.83			
	7			64.03	3.23		
				67.26			
Alvan Clark's new double star							Vernier III of dec. circle $220^{\circ} 10' 56''$
							Chronometer sid t. $21^h 59^m 47^s$
							Instrumental hour angle $+1^h 23^m 20^s$
			330 15			S	20 36 21

1866 Sept 16 Sunday

35

Object	No of Obs.	Time	Position	Distance Readings	Difference	Observer	Remarks
							Comparison of Chronometer
							Sidereal clock 19 29 30.0
							Chronometer 236 19 30 39.5
							Corr. to clock -28.5
							Corr. to Chronometer -1 38
Swan Clark's new star.							Unable to resolve it with any power.
61 Cygni	1		239 20			W	
	2		239 45				
			239 32				
	3	21 25	238 40			S	
	4		238 38				
	5		239 0				
	6		238 31				
			238 42				
	7			50.55			
	8			48			
	9			58			
10			49				
11			50				
			50.520	1.9 ⁴⁷			
			52.47				
			46				
			47				
			467				
			52.47				

1866 Sept 16 Sunday

Object	No of Obs	Time	Position	Distance		Observer	Remarks
				Readings	Difference		
8 Equulei AB	1		241 45'			W	Power of 1245
	2		241 45'				
	3		241 5'				
		22 0	241 32'				
	4			50.08	0.065'		
	5			50.015'			
				50.08	0.05'		
				50.03			
	6			49.93		S	
	7			93			
				49.93	0.11		
				49.82			
				82			
				49.82			Wires being set 0.06 apart the distance appeared certainly too small to 9 M S. Backlash avoided
	8			50.23	0.11		
				34			
	9			50.33	0.08	W	
				25'			
	10			50.352	0.072		
				280			
	11			50.368	0.078		
				29			
$\frac{A+B.C}{2}$	1		274 15'				
	2		274 15'				
	3		275 45'				
	4		273 50'				
	5		272 0				
	6		271 40				
	7		275 0				
	8		275 40				
			274 3				Made in a different part of the field from the others.

1866 Sept. 16 Sunday

37

Object	No of Obs	Time	Position	Distance Reading	Difference	Observer	Remarks
8 Equulei	9			48.44	1.18	W	Illurn. of wires poor
				47.26			
$\frac{A+B+C}{2}$	10			48.43	1.17		
				47.26			
	11			48.16	1.13		
				47.03			} " " better
4 Aquarii	1	23 0	261				Power of 401
	2		253				
			257				
Neptune	1			48.83	0.43		Power of 401. Measure considered large.
Diameter for reading of position circle	2			48.40			
				48.79	0.35		Power no 2. This measure also considered too large. Observer not satisfied with either measure.
				48.44			
Pomona	1	0 13	47.4				Observed on Chronograph.
W XXIII 418			52.8	-5.4			Reading of position circle $170^{\circ}20'$
	2	14	6.5				Transits over one wire.
			11.6	[-5.1]			
	3	14	37.9				First two transits not very good
			43.7	-5.8			
	4	14	55.7				
			1.1	-5.4			
	5	15	22.5				
			28.1	-5.6			
	6	15	45.5				
			51.3	-5.8			
	7	16	8.3				
			14.2	-5.9			

1866 Sept 16 Sunday

Object	No of Obs	Time by sid clock	Position	Distance		Observer	Remarks
				Readings	Difference ΔS		
Pomona	1	0 21 53		52.40			Rattle on Chronograph at times of comparisons. omitted for 3 ^d & 6 th .
	2	22 41		56			
	3	[23 15]		45			
	4	23 49		54			
	5	24 26		42			
	6	[25 0]		46			
	7	25 34		59			
	8	26 4		51			
	9	0 26 29		<u>52.55</u>			Planet south of star
				<u>52.50</u>	11.62		
Coincidence				40.83			
on W XXIII. 418				88			
				89			
				91			
				86			
				89			
				89			
				87			
				88			
				<u>40.91</u>			
				40.88			

1866 Sept 21 Friday.
Examination of screws

39.

Time mean.	rotation	Coincidence with						Observer	Remarks
		a		b		c			
		+	-	+	-	+	-		
3 ^h 30 ^m		0 ^{rev}	25 ^{rev}	50 ^{rev}					
		505	551	528	584	532	586	S	Conditions of observation same as those of Aug. 29 by J.W.
		514	550	530	580	540	570		
		515	564	530	593	522	562		
		508	547	521	579	532	576		Thermometer by Bond, in mahog. any case.
		499	548	522	593	530	580		in alcove of dome 65°9
		522	554	523	590	532	568		removed to observer's chair 67°4
		510	549	521	590	530	580		
		526	549	528	586	537	574		
		529	550	534	587	540	582		
		530	550		590	529	584		
	mean	516	551	526	587	532	576		
		5	30	55					Therm. at observer 69.0
		537	588	545	610	560	609		
		542	587	550	612	552	604		
		543	592	549	612	563	599		
		546	580	551	600	550	600		
		540	594	560	620	558	614		
		542	588	551	611	557	605		
		10	35	60					" 72.0
		508	565	529	583	527	579		
		521	562	504	582	525	582		
		494	570	517	582	539	576		
		510	569	517	580	534	572		
		510	576	506	588	522	580		
		509	568	515	583	529	578		
		15	40	65					" 72.7
		360	418	370	445	381	442		
		342	421	379	432	382	432		
		361	430	370	435	382	433		
		371	429	380	441	371	429		
		356	432	368	452	378	428		
		358	426	373	441	379	433		
		20	45	70					" 73.2
		369	439	377	449	395	429		
		368	423	374	448	390	432		
		369	421	364	439	395	442		
		369	432	375	446	387	441		
		376	422	378	451	396	439		
		370	427	374	447	393	437		" 73.2

1866 Sept 21 Friday
Examination of screw

Time mean solar	rotation	a		Coincidence with b		c		Observer
		+	-	+	-	+	-	
		25 ^{rev}		50 ^{rev}		75 ^{rev}		S
		476	537	480	540	512	537	
		480	530	490	534	498	519	
		469	541	500	537	505	550	
		482	531	492	548	511	532	
		472	546	498	557	510	530	
		476	537	492	543	507	534	
		30		55		80		
		481	543	495	560	512	540	
		470	550	506	560	508	540	
		470	550	500	550	520	549	
		485	558	498	563	518	542	
		490	538	502	566	520	533	
		479	548	500	560	516	541	
		35		60		85		
		258	331	271	337	290	313	
		261	322	272	322	290	330	
		258	330	288	341	291	327	
		260	340	279	331	290	334	
		258	338	285	338	297	322	
		259	332	279	334	292	325	
		40		65		90		
		302	367	319	376	341	350	
		310	367	310	368	330	360	
		295	363	318	370	330	361	
		290	370	315	360	345	368	
		293	371	312	365	340	365	
		298	368	315	368	337	361	
		45		70		95		
		422	478	450	478	440	468	
		410	490	439	484	442	480	
		410	480	439	480	451	464	
		403	490	433	472	461	461	
		401	472	440	474	450	461	
		409	482	440	478	449	467	
		50		75		100		
		486	547	516	548	544	541	
		483	536	515	545	548	541	
		480	536	515	548	521	551	
		493	540	530	538	530	530	
		491	553	530	550	526	550	
		497	542	521	546	538	543	

Therm. at observer
73°4

73°3

73°3

73°2

73°1

73°0

Mean results $ab = 25.019$ by + rotation $bc = 25.013$ by + rotation Therm. in Chronometer Bond 236, in
012 by - rotation 24.991 by - rotation alcove of dome 70°8

Mean $ab = 25.016$ $bc = 25.002$
Mean value of ab by 9w Aug 29 = 25.025; from which we may assume $ab = 25.019$

1866 Sept 22 Saturday

41

Object	No of Obs	Time	Position	Distance		Observer	Remarks
				Readings	Difference		
W XXIII 310	1	21 15	260 45			g w	Telescope reversed; circle follows.
for zero point	2		30				Vernier II reads .90-8 without
			260 38				correction, from observation on
		by sid. clock					W XXIII 320 & 327.
W XXIII 310	1	21 20 20.0					Transits over 2 wires. Reading
		20 36.3					of position circle $170^{\circ} 30'$
Pomona	1	21 21 10.0					Observed on Chronograph
		21 26.1					
	2	21 55.5					
		22 12.4					
	2	22 45.4					
		23 2.9					
W XXIII 310	3	24 7.3					Transits over 3 wires; micrometer
		24 15.8					wire between the former two.
		24 23.9					
Pomona		24 57.2					
		25 5.2					
		25 13.7					
	4	25 38.7					
		25 47.0					
		25 55.1					
		26 29.0					
		26 37.5					
		26 45.4					
	5	28 6.7					Result;
		28 14.9					Clock sid. t. $\Delta \alpha$ No. of comp.
		28 23.0					$21^h 25^m 27^s$ +47.98 13
		28 56.6					Chron. sid. t. ΔS
		29 4.7					$21^h 44^m 6$ +5.07 5
		29 12.6					
				ΔS			
	1	by chronometer		58.00	+5.24		Corr. to Chronometer = $-27^s 5$
		$21^h 39^m$		63.24			
	2	42		58.05	5.02		Planet N of star.
				63.07			
	3	44.5		58.17	5.23		Observations necessarily rather rough
				63.40			owing to faintness of planet.
	4	47.0		58.22	4.81		
				63.03			
	5	50.7		58.35	+5.07		
				63.42			

1866 Sept 22 Saturday

1866 Sept 23 Sunday.
& Sept 27 Thursday

43

Object	No of Obs.	Time	Position	Distance Readings	Difference	Observer	Remarks.
							Set on Jupiter, but found the seeing even worse than last night.
δ Equulei		by chronometer 20 35					Could not be sure of elongation of principal star. Jw & SMS Vernier II reads $199^{\circ} 31'$ when star is in centre of field
β Aquilae		20 43					Vernier II reads $196^{\circ} 7' 24''$
	1		334 12			W	
	2		336 10				
	3		333 7				
	4		330 50				
	5		334 45				
	6		329 53			S	
	7		331 0				
	8		333 15				best
	9		331 45				
	10		331 32				good
	11			53.44			
	12			48			
	13			44			
	14			51			
	15			55			
	16			51			
				53.488			
				Coincidence			
				52.34 31			
				34 29			
				31			
				52.318			
					1170		

1866 Sept 27 Thursday

H III 16	333 45				W	Seen several times distinctly
$\alpha = 20^h 24^m 8$	327 0					separated; but only at rare intervals.
$\delta = +10^\circ 49'$						
1867.0						
BC discovered	322				S	
by Dawes, see						
Ast. Soc. Not.	320					
Vol V. p. 61.						
No 32 of	268 35				W	observer thought he saw ~~the~~ a
Schjellerup's	267 28					faint star between the two; but
Catalogue	267 30					could not afterwards be sure of it
AN LXII 333	266 30					
	267 15					
	<u>266 35</u>					
		51.04	0.50			
		50.54				
		50.78	0.53			
		50.25				
22 20		50.64	0.575			
		50.065				
		50.58	0.52			
		50.06				
		49.83			S	
		80				
22 30		82				
		83				
		<u>49.820</u>	.610			
		50.44				
		44				
		40				
		45				
		42				
		<u>51.430</u>				

1866 Sept 27 Thursday

45

No 536 Otto					60° or 70°		W
Struve Ast. Soc.							
Notices Vol XX					61°		S
p. 12.							
Pomona &	1	23	51	24.5			S
				27.3			
W XXIII 248				33.8	- 9.3		
				36.5	9.2		
	2			51.4			
				54.2			
		52		0.7	.3		
				3.7	.5		
	3			20.7			
				23.6			
				30.0	.3		
				32.7	.1		
	4			49.0			
				52.0			
				58.5	.5		
		53		1.3	.3		
	5			16.3			
				19.2			
				25.7	.4		
				28.6	.4		
	6			44.3			
				47.3			
				53.6	.3		
				56.4	.1		
	7						
		54		11.4			
				14.4			
				21.0	.6		
				23.7	<u>3</u>		

Transits over 2 wires.
Observed on Chronograph.
Reading 170° 30'

1866 Sept 27 Thursday

Romona 2

W XXIII 248

by Frodsham
pocket chron.

11 32 30

34 10

35 0

35 55

36 25

24.70

75

74

60

69

78

76

24.717 +60.416

85.14

13

13

85.133

S

Planet North of star

Coincidences

by

negative rotation

W 0 884

1

by sid. clock

0 59 35.5

+53.0

52.0

53.3

Aubonia

1 0 28.5

45.3

2

1 1 33.2

52.8

41.0

53.0

50.0

52.8

2 26.0

34.0

42.8

3

3 7.4

52.7

15.3

52.7

23.9

53.1

4 0.1

8.0

17.0

Transit over two wires

Observed on chronograph

Transits over three wires

1866 Sept 27 Thursday

47

		by sid. clock				
W 0 884 &	0	47 33		42.17		Rattle on Chronograph at times
Ausonia		49 14		02		of comparisons.
		50 53		17		This should have been put before
		52 35		26		the comparisons in right asc.
mean				<u>42.155</u>	+ 33.712	Planet North of star.
				75.88		Coincidences by neg. rotation.
				87		
				85		
				<u>75.867</u>		
γ Andromedae			218 8			W Images seen distinctly by
BC						J W & G M S but not at
			243 13			S the time of measurement.
36 Andromedae	2	30	356 30			W Stars steady & observation
			359 30			satisfactory
			359 5			
			358 35			
			357 30			
			<u>357 15</u>			
			358 4			
			<u>352 26</u>			
				52.79	0.20	Wires not placed on stars
				<u>99</u>		
				85	0.13	S
				<u>98</u>		
				85	0.14	
				<u>99</u>		
				84	0.12	
				<u>96</u>		

1866 Sept 27 Thursday

ϵ Arietis	1	330 0			5	Separated easily, power 400 (No 4)
	2	328 48				
	3	332 0				
	4	330 40				
	5	328 34				
	6	329 13				
	2	50				
	7		54.20	0.07		
			27			
	8		18	.11		
			29			
	9		18	.07		
			25			
	10		17	.07		
			24			
				<u> </u>		
				.27		

1866 Sept 28 Friday

		by sid. clock.			
W 1 504?	1	19 36.5 44.4 52.9		S	Star α , about 12 th mag. ^{nearly the same S as W 1 540, or} some 3' north of star supposed to be W 1 504, which however at 0 ^h 15 ^m sid. time preceded it only 30 ^s 2, by two accordant observations by eye & ear.
1 540	21	34.2 42.1 50.5			
W 1 504?	22	12.1 20.0 28.6			
Star α		44.5 52.4			
	23	1.0			
W 1 540	24	10.0 17.8 26.4			

1866 Sept 30 Sunday

51

Search for
asteroid (89)Stars α & γ 20^h 42^m $\Delta \alpha \cos \delta$

S

99.72 6.92
+ ac92.80
- ac

Star α about 10th mag. follows
W XX 5'44 about 1^m 52^s on
nearly the same parallel

γ about 7' south of α } Order
" " 6' " " } in right asc.
" " 0' " " } $\alpha \gamma \gamma \gamma'$

 γ & α

20 48

89.82 26.49

63.33

Comparison of α & γ . α on wire a
y on mic. wire
coincidence with wire c.

 α & α'

61.33 24.19

37.14

Star 3

20 46

60.64

2

57.41

1

44.11

Star 1 12th mag. 3' north of α
2 13 " 0' " "
3 " " 0.5 " "

Coinc. on α

41.93

 α afterward proved to be (89)

The above estimates of dec. are
from memory and very rough.

8 Equulei

36 Andromeda

Showered a round and tolerably
steady disk with rings under
a power of 2000. (W & S.)
Not quite bright enough for
power of 2000 (owing to haze) though direction
could be measured even with
that.

1866 Sept 30 Sunday

36 Androm.

Beautifully ^{distinct} ~~bright~~ and steady
with a power of 1600. 2000
tried again.

With power of 400 a star
of one third the distance
could be elongated. (W & S)

Power of 400. Companion
elongated. Seeing not so good
as before. Stars less steady.

Components
of companion

1

251 30

W

2

251 0

3

247 45

Power of 1500

S could not measure the
direction, not being sure enough of it.

Σ 3062

1

23^h 5^m

256 45

2

257 50

3

256 50

4

254 10

S 1/2 wt.

5

253 30

6

252 10

1/2 wt.

7

251 26

1866 Sept 30 Sunday

53

 Σ 3062

8

258 55

9

251 10

10

49.59

11

59

12

58

49.587 0.097

49.49

49

49

49.490

13

49.63

0.13

W

50

14

49.585

0.107

49.48

485

47

mean 49.478

 Σ 3037

1

316 10

2

316 43

3

314 14

{ Companion only visible by
glimpses in obsns. 2 & 13.

Companion too faint to
measure its distance.

1866 Oct 1 Monday

	Time	Readings	Difference	
	by sid. Chronometer		$\Delta \cos \delta$	
Wetz. 20115	1 20 42	50.77		S
and Thiele	2	85		
	3	81		
	4	87		
	5	94		
	6	76		
	7 43 30	75		
	8	82		
		<u>50.82</u>	- 0.49	
		51.30		
		32		
		<u>31</u>		
		51.31		
			$\Delta \delta$	
	1 20 46	43.98		
	2	94		
	3 47	95		
	4 47 45	44.03		
	5 48 10	00		
	6 48 44	43.96		
		<u>43.98</u>	- 5.93	
		49.94		
		88		
		91		
		90		
		<u>90</u>		
		49.91		
	7 21 3 8	44.70		
	8 3 30	63		
	9 47	70		
	10 4 0	71		
	11 20	76		
	12 50	<u>70</u>	- 5.82	
		44.70		
		50.53		
		50		
		54		
		<u>49</u>		
		50.52		

Reading of pos. circle 170 30'

Planet precedes

Planet South

1866 Oct 1 Monday

55

					Readings	Difference	
					$\Delta \alpha$	$\omega s \delta$	
Oelta. 20115' and Thiebe	9	21	8	45	50.06		S
	10		9	25	49.99		
	11		9	50	50.02		
	12		10	17	01		
	13		10	54	03		
					50.02	+0.79	
					50.80		
					81		
					81		
					50.81		

Planet follows.

Planet (89) and α' of last night.	by sid. clock				$\Delta \alpha$	
	1	22	43	40.6	-45.4	
				49.4	.5	
				57.3	.4	
		44	26.0			
			34.9			
			42.7			
	2	44	58.5		.5	
		45	7.4		.5	
			15.4		.4	

(89) = α of last night.

Planet precedes

Comparison in δ were also made, but the observations for coincidence of wires neglected. Planet about 7' or 8' north of star.

		44.0				
		52.9				
	46	0.8				
				-45.45		
3	55	56.2		-45.3		
	56	5.0		.2		
		13.1		.0		
		41.5				
		50.2				
		58.1				
4	57	20.7		.2		
		29.5		.2		
		37.4		1		
	58	5.9				
		14.7				
		22.5				
				-45.27		

1866 Oct 1 Monday

W XX 544

23 53 41.6

 $\Delta \alpha$ from α'

-3 3.3

W

(89) & α'

50.5

58.5

-3 3.40

56 0.4

- 44.5

9.4

.5

17.7

.3

- 44.43

44.9

53.9

57 2.0

Otto Struve's

536 (see Sept 27)

36 Andromedae

Not certainly elongated.

High powers tried on both
objects, but seeing not good enough.

W 0 227 &

1

by chronometer

0 59 5

 $\Delta \delta$

51.88

Pancphaea

2

1 0 10

91

3

30

89

51.89

-13.55

Planet south of star

39.37

34

36

39.36

 $\Delta \alpha \cos \delta$

44.97

88

45.05

14

44.97

45.010

-5.66

 $\Delta \delta$

Coincidence unchanged.

Planet very faint.

" precedes

1

1 7 40

2

9 5

3

10 30

4

11 30

5

12 30

4

13 50

5

15 10

6

15 30

7

15 50

51.86

80

81

85

51.83

-12.49

coincidence unchanged

1866 Oct. 1 Monday

57

W 0 227 &

Panopaea

6	1	17	0
7		18	40
8		20	0
9		20	50
10		21	45
11		23	0
12		23	30
13		23	45
14		24	20

 $\Delta \alpha \cos \delta$

45.50

41

68

93

52

75

67

89

85

45.69

-6.35

39.32

34

32

33

33

33

39.33

W

Coincidence used as 39.34 through the whole series.

Search made for Nysa, but owing to a misprint of two minutes in the Berl. Jahrbuch ephemeris, the planet was not found till too late.

Region of W 1504 examined.
 Sept. 28
 The star observed there on Friday, no longer visible; it must therefore have been Nysa. There is no star greater than 13 mag. within 5' radius of the catalogue place.

1866 Oct 2 Tuesday

Arg. Durch. Zone +5° to 215° and Nysa	by chronometer			$\Delta \delta$	
	1	1	5 0	46.61	W Planet south
	2		40	66	
	3	6	10	55	
	4		35	61	
				46.62	
				ac - 8.76	
				55.41	
				38	
				36	
				39	
				55.38	

1	1	12	50
2		14	20
3		15	0
4		15	35
5		15	50
6		16	0

$\Delta \alpha \cos \delta$	
28.68	
67	
74	
63	
64	
70	
28.68	+ 1.60
30.27	
285	
29	
30.28	

$\frac{1}{2}$ weight. Asteroid very faint in this comp.
" distinct.

Planet on mic. wire.
Star on wire a -
Coincidence with wire c.

Planet follows

Star on wire b, with which
coincidence was made. Position
of fixed wires not changed.

36 Andromedae	1	1 ^h 37 ^m	3 43
	2		1 14
	3		2 13
	4		359 46
	5		3 51
	6		2 44
			2 15

56.87	
89	
87	
77	
56.88	0.109
56.74	
77	
77	
78	
78	
56.78	

S Power 400, seeing indifferent

good seeing and measure good.

} seeing good

1866 Oct 3 Wednesday

59

Thisbe and
Lat. 38104 = 0eltz.
20146

by sid. clock $\Delta \alpha$
21 26 12.0 - 39.2
21.2 38.5
29.5 38.7

51.2
59.7
27 8.2
28.5 - 38.9
37.5 38.5
45.4 38.8

28 7.4
16.0
24.2

44.5
53.0
29 1.5 - 38.5

lost
lost
40.0

56.3 - 38.7
30 5.2 38.6
13.9 38.5

35.0
43.8
52.4

31 15.2 - 39.2
24.4 38.6
32.3 39.0

54.4
32 3.0
11.2

Mean of 13 21 28 53 - 38.75

w Planet precedes

Comparisons of Chronometer 236

Clock	Chron.	Clock - Chron.
21 33 0.8	21 33 30	-29.2
5.7	35	.3
10.7	40	.3
15.8	45	.2
20.5	50	.3
25.5	55	.5
30.6	34 0	.4
		-29.31

Clock	Chron.	Clock - Chron.
0 52 0.2	0 52 30	-29.8
5.2	35	8
10.1	40	9
15.4	45	6
20.2	50	8
30.1	53 0	9
		-29.80

1866 Oct 3 Wednesday

		by chronometer	$\Delta\delta$		
This &	1	21 20 15	38.31	W	Planet south
	2	21 0	38		
Lal. 38104	3	22 0	37		(Should have been put before the
	4	22 30	46		comparison in α .)
	5	23 0	43		
		<u>21 21 45</u>	<u>38.39</u>		
			- 8.68		
			29.71		
			72		
			72		
			<u>.69</u>		
			29.71		
Planet (89) &	22	39 0	60.84	S	Planet south
		40 0	90		
		40 12	96		
		40 48	61.01		
		41 20	60.85		
		42 57	80		
		43 30	<u>.79</u>		
	22	41 7	60.88		-14.98
			45.91		
			.86		
			.92		
			<u>.89</u>		
			45.90		
			$\Delta\alpha \cos\delta$		
	22	47 30	0.00		
	22	55 30	45.66		
		55 50	.54		
		56 40	.58		
		57 5	.58		
		<u>57 29</u>	<u>.53</u>		
	22	56 31	45.58		+ 0.46
			45.14		
			.14		
			.10		
			<u>.11</u>		
			45.12		
					Planet follows

1866 Oct 3 Wednesday

61

Planet (89) &

by Chronometer

23	0	25
	0	50
	1	30
	2	10
	2	38
23	1	31

 $\Delta \delta$

59.47
29
46
44
41
59.41
-14.40
45.01
04
44.97
45.02
.02
45.01

S

No 32 of Schjell-
erup's catalogue

1

268 30

W

2

266 30

very poor; $\frac{1}{2}$ int.

3

268 45

4

267 40

5

268 45

Seeing too poor for distances.

268 10

Niobe & Arg.

0 4 25

 $\Delta \delta$

6.95

W

Planet north

9 50

97

S

Durch. + 26°

10 40

92

10 55

7.00

No 4672

11 25

7.00

0 9 27

6.97

+35.10

Star observed found next night not to be the planet. It is No 4669.

It is about 3' from the planet in the same direction.

17 40

46.96

19 0

47.08

19 25

47.10

19 47

47.08

20 16

47.11

0 19 14

47.07

-13.01

Planet precedes

1866 Oct 3 Wednesday

by sid. clock.

60.08
 07
 08
 60.08

w 1420 &

Nysa

0 33 41.1
 47.5
 57.3

34 23.2 +42.1
 29.5 .0
 39.5 .2

35 15.4
 21.6
 31.7

57.5 .1
 36 3.7 .1
 13.8 .1

39.9
 46.2
 56.1

37 22.0 .1
 28.3 .1
 38.5 +42.4

Mean of

9

0 36 2 +42.13

 ΔS

0 42 46
 44 5
 45 16
 46 30
 47 52
 0 45 18

29.81
 87
 86
 75
 .68

29.79 ac-1.66

28.14
 .13
 .11
 28.13

S Planet follows

Planet south.

Rattle on Chronograph at times.

Star on wire c.

Nysa " mic. wire.

Coinc. with wire a.

1866 Oct 4 Thursday

63

Lat. 38104 and
This be.

by Chronometer

20	49	30
	50	20
		35
	51	10
		50
	52	15
20	50	57

 $\Delta \alpha \cos \delta$

51.35
43
40
18
29
33
51.33

+16.87

34.45
43
48
46
34.46

W This be $\frac{1}{2}$ mag. brighter than
last night. Independent estimate
of W & S. Other stars the same.
Planet follows

 $\Delta \delta$

20	56	10
		30
	57	20
		40
		50
	58	15
20	57	18

31.30
28
15
33
29
31

31.28 + 3.14

34.44
40
41
34.42

Planet north

(89) and comp.
star of last night

21	31	20
	32	20
	33	10
	34	0
	34	40
21	33	6

 $\Delta \alpha \cos \delta$

42.58
41
58
51
58

42.53 bc+16.93

59.48
45
44
43
45
48
59.46

W Planet follows

Planet on wire c. Star on mic. wire.
Coincidence with wire b.

64.

1866 Oct 4 Thursday

(89) and comp.
star of last
night

by chronometer

21 39 45
40 15
41 25
42 30
43 0

21 41 23

 ΔS

81.25
25
23
05
29

81.21 + 22.09

59.06

13

14

13

59.12

Distance

Lat. 38387

1

23 15

73 30

2

71 55

3

70 40

4

73 0

5

72 25

72 18

6

57.67

7

66

8

58

9

75

10

73

11

72

57.685

1.28⁶⁷

58.96

59.00

58.91

- 94

58.952

12

23 26

56.57

S

13

56

14

50

15

56

16

54

546

56.58

1.374

57.94

.92

.90

.92

57.920

1866 Oct 4 Thursday

65

~~Nysa apd~~
~~Arg. Zone +2°~~
~~no 226~~

Panopaea

0 12 30
 +2 56
 13 42
 14 28
 15 8
 15 43
 0 14 18

 ΔS

91.64

S

60

54

53

49

91.56 $-(ac + 11.08)$

star d

17 0
 32
 58
 18 27
 52

82.35

48

28

47

46

82.41 $-(ac + 1.93)$

Coinc. on wire c

80.46

45

51

49

51

80.48

Panopaea

0 26 45
 28 50
 29 32
 30 12
 30 50
 0 29 14

 $\Delta \alpha \cos \delta$

46.13

31

16

00

02

46.12 -4.22

Both stars precede W 0 178.

star d

0 31 50
 32 29
 33 20
 33 58
 34 40
 0 33 15

26.05

31

09

29

21

26.19 -24.15

50.36

31

34

33

50.34

1866 Oct 4 Thursday.

by chronometer

 $\Delta \alpha \cos \delta$

Mysa &

0 48 10
5036.49
48

W

~~Comp. star. on wire c.~~

Arg. Zone

49 15
50 1551
49~~Planet on mic. wire~~

+2° no

40

69

~~Coincidence with wire b.~~

226

0 49 26

36.53 +13.81

Planet follows

50.33

Planet brighter than comp. star.

37

which is 9.5 according to Argelander

36

33

35

33

50.34

 $\Delta \delta$

0 57 0

43.55

Planet north, on mic. wire

58 15

50

Star on wire c.

45

68

59 10

35

Coincidence (unchanged) with wire b.

1 0 0

68

30

33

0 58 57

43.51 6c+6.83

1866 Oct 5 Friday

67

Object	Telescope E or W of pier	Time by chronometer	Reading of mic. screw	Readings of verniers in order I II III IIII				Observer	Remarks
Observations for inst. corr.								JW	Telescope pointed to stars near their meridian passage (by moving the telescope) and star put if possible upon wire b (the ~~new~~ reading of the clamp vernier of the position circle being $260^{\circ} 30'$) If the star could not conveniently be put on this wire, for which the reading of the screw was 51.75, it was put upon the micrometer wire was placed upon ~~the~~ the star, and the reading given, with a remark as to the star being north or south of wire b. When no reading is given, the star was upon wire b. The time was noted by G.M.S. with chronometer 236, and the verniers of the dec. circle read by him. The telescope was then reversed, and the same observation repeated in the other position of the instrument. Obsns. made by daylight.
α Scorpii	E	16 32 15		I 333°	54'	0"			
				II 243	56	28			
			verniers read without microscopes on this star.	III 153	56	40			
			microscopes used for the others.	IIII 63	56	12			
			mean reduced to	333	56	35.0			
	W	16 40 0		206	4	0			
				116	4	36			
26 4 20?				26	[5]	20			
				296	3	46			
				206	4	10.5			
κ Ophiuchi	W	16 48 0	51.38 star north of wire b	170	23	18			
				80	23	40			
350?				260	23	38			
260?				350	23	52			
				170	23	22.0			
	E	16 57 50	53.63 star north	9	37	45			
				279	37	12			
				189	37	20			
				99	37	0			
				9	37	19.2			
α Herculis	E	17 9 10		14	35	40			
				284	35	0			
				194	35	8			
				104	35	4			
				14	35	13.0			
	W	17 18 45		165	25	40			
				75	26	6			
				345	26	10			
				255	25	22			
				165	25	49.5			

68

1866 Oct 5 Friday

Star	Telescope E or W of pier	Time by sid. chronometer	Reading of mic. screw	Readings of verniers	Observer	Remarks.
β Draconis	W	17 27 0	49.25 star north of wire	I 127 35 38 II 37 36 10 III 307 36 8 IV 217 35 32 127 35 52.0	JW	
	E	17 35 30	51.18 star south	52 26 6 322 25 22 232 25 34 142 25 28 52 25 37.5		
ψ Draconis	E	17 48 0	54.78 star north	72 13 34 342 12 56 252 13 6 162 12 58 72 13 8.5		
	W	17 55 30	50.11 star north	107 47 24 17 47 46 287 47 56 197 47 4 107 47 32.5		
22 Camelopardalis	W	18 10 0	50.08 star south or (instrumentally) north	69 24 2 339 24 28 249 24 24 159 23 44 69 24 9.5		Instrumentally, since it was lower culmination.
	E	18 20 30	58.39 star south or (instrumentally) north	110 36 24 20 35 42 290 35 48 200 35 52 110 35 56.5		

Comparison of Chronometer 236

Chron. Clock. Clock-Chron

18 33 10	18 32 35.2	- 24.8
15	40.1	9
20	45.1	9
25	50.1	9
30	55.2	8
35	0.2	8
40	5.1	9
		- 34.86

Bar. at 18^h 40^m sid t 30.470

Att Therm 51

(Ext.) No 4. 47.4

1866 Oct. 5 Friday

67

Lat. 38104 &

This be

by Chronometer

21 2 30

 ΔS 32.79 + 17.87 W
50.66

4 45

32.68

6 0

52

8 0

30

9 50

08

11 40

20

13 20

45

Mean of 6

21 8 56

32.37 + 17.71

Planet north

50.10

08

10

06

08

05

50.08

Mean of 7

21 8 1

+ 17.73

by clock

21 23 37.5

46.0

55.1

24 42.8 +1 5.3

54.6 5.6

25 49.7

58.1

26 7.1

55.3

5.6

27 3.8

5.7

12.2

5.1

21 26 9 +1 5.46

Planet follows

70

1866 Oct 5 Friday

4 Aquarii

No power short of 1200 elongates it
This seems to separate it by glimpses
(f w)

49°

S By rough setting without illum.

55

w

50

Rough setting by illuminated wires
pretty good measure

47 30

Best measure yet. Star distinctly
separated.

2.75
18.67

50 15

Good measure

5 Equulei

w Cannot separate it with 1200
Not worth while to try a higher

37 Pegasi

70

Separated with a power of 600

68

54

S Seeing rather worse

54

5 Aquarii

w Seeing not nearly as good

S

1

18 4

2

14 19

3

15 2

4

14 58

5

15 5

15 30

1866 Oct 5 Friday

71

♄ Aquarii

59.16
20
19
21 337
59.196 0.3#

S

58.85
85
86
58.853

Planet (89)

by Chronometer

23 24 25

55

and star w

25 26

52

26 15

23 25 23

20 30

Δδ
50.86
90
91
89
94
50.90 -26.04

Planet south

76.92
96
94
96
76.94

Δα vs δ

23 30 0
38
31 27
58
32 32

23 31 19

60.68
71
65
74
72
60.70 +33.06

Planet follows

27.63
65
64
27.64

A rough comparison by Chronometer
and wires gave

Star w follows ^{w xx 572} ~~21.7000~~ 2^m 59^s
" " south of " " 35^m 47^s

72

1866 Oct 5 Friday

Panopaea
and star d
of last night

by Chronometer
0 0 10

ΔS
64.42 - 1.22
63.20

W Planet south

Panopaea
& W 0, 178

0 3 50
6 45
9 55
0 6 50

64.43 ac+3.12
61.31
64.31 ac+3.03
61.28
64.15 ac+3.09
61.06
-(ac+3.08)

Planet south

Comp. star on wire at

Planes beyond c.

Coincidence made with c.

by clock

0 18 9.3 - 59.0
17.8 4
25.6 .7

19 8.3
17.2
25.3

19 49.2 .8
58.2 59.3
7.0 58.8

20 49.0
57.5
21 5.8

21 35.2 60.0
44.3 59.4
52.8 - 59.2

22 35.2
43.7
52.0

0 20 0 - 59.40

Planet precedes.

Reading of pos. circle 170 25'

1866 Oct 5 Friday

73

Star for zero
of pos. circle1
2
3
4
580 30
30
26
31
36S No difference perceptible between
verniers.

Nyssa & Arg.

by Chronometer

0 53 4

54 14

40

55 4

223. 29

0 54 30

80 31

 $\Delta \delta$

17.15

13

15

19

17

17.16 - 5.17

22.35

32

35

31

34

22.33

S Planet estimated 9 mag.
being a little brighter than
comparison star.Seeing better than last night
Planet south. $\Delta \alpha \cos \delta$

1 0 50

2 0

2 35

3 5

3 30

4 40

5 15

5 43

1 3 27

-0.41

48

39

33

24

15

25

-0.13

-0.30

+18.39

Planet follows

18.11

10

05

10

10

18.09

Lat. 42240.1

42263

No companion visible (W & S)

A " " but too

faint to measure. (W & S)

74

1866 Oct 6 Saturday

Star	Telescope E or W of pier	Time by sid. clock	Verniers		
τ Hercules	E				
wire a		16 13 40.4	1	23	57 25
b		14 3.9			
c		14 27.4	11	11	57 28
Mean		16 14 3.90			
a	W	16 21 57.0	12	5	33
b		22 20.6			
c		22 44.7	0	5	35
		16 22 20.77			
ι Cephei	W				
a		16 38 44.7	5	53	35
b		39 23.6			
c		40 3.0	17	53	36
		16 39 23.77			
α Camelopard	W		12	19	16
b		17 0 55.1	0	19	15
b	E	17 10 10.0	0	28	37
			12	28	39
ϵ Urs. Min					
b	E	17 20 37.0	0	19	48
			12	19	47
b	W	17 28 21.8	12	27	10
			0	27	8

by interpolation for 17^h 0^m
 Bar. 30.364
 Alt 55
 Excl. (No 4) 56.

9 w Observations for inst. corr.

The position circle being set to a reading of 170 30 and the wire b to a position for coincidence with which the screw read ^{as yesterday} 51.75, the telescope was pointed on stars near the meridian, except ι Cephei near the 6 hr. circle; reversal being made on the meridian stars. The times of transit of the star were recorded on the chronograph, and the verniers ^{of the hour circle} read by G. M. S.

1866 Oct 6, Saturday

75

Planetary neb. * h 2075	21 15				g w	Not a brilliant object
Planetary neb. * h 2241					g w	Very bright; green, decidedly so under illumination; edges very well defined, about as much as those of Jupiter. Elliptical.
Major axis		293° 305°			GMS	Two other observers
		59.19 56.03	3.16	g w		made the color also green much deeper under illumination.
		59.60 56.87	2.73	GMS		than without. They thought there was a shadow
Minor axis		41.50 44.10	2.60	g w		or a darker shade of color on the north following side
		48.41 50.63	2.22	GMS		Lowest power used by both g w & GMS.
* Clus. h 2284						Seemed to W. to have enough regularity of structure to justify drawing it.
Double nebula * h 172 & 173		240° 252°			W S	

* Note June 7, 1880.

h 172 & 173 = G.C. 4418 & 4419.
 h 2075 = G.C. 4572.
 h 2241 = G.C. 4964.
 h 2284 = G.C. 5031.

1866 Oct. 7 Sunday

Planetary
nebula
h 2241
= G.C. 4964
Position of
major axis

1 21^h 0^m about 304
2 303
3 313
4 319

w without illumination

Lowest power

minor axis

48.13 2.58
45.55

S

small star 1

287 40

S

north following 2

288 45

the nebula 3

288 48

(wire tangent

288 24

to nebula for positions)

51.51

56

64

67

distance from 21^h 20^m

51.60

5.37

centre of
nebula.

56.99

96

96

56.97

S

with power of 400 w thought
he saw a darker portion in
it appears a little darker in the middle, than
the centre also two edges as
is slightly shaded. (w)
of a brighter nebula placed over
a dimmer one. Obsn. confirmed
by S.

The brighter and fainter
ellipse have not precisely the
direction of
same major axis; the brighter
would read on the position circle
10° or 15° less* than the fainter
according to w
20 or 30 according to a less
careful estimate of S.

Northern side appears brighter
to G.M.S.

Appearance to w that of
a hollow cylinder turned nearly
end to us.

The sky is not so free from clouds as on
last night but the seeing appears to be better.

Haze prevented further observation for some time

* Note Nov. 9, 1880. This will
be equivalent to a position
angle as much greater as the
position reading is less.

1866 Oct 7 Sunday

77

Longer axis			54.21 51.72	2.49	These measures are not so trustworthy as those of last night on account of variable haze.
shorter "			55.42 53.12	2.30	

P XXIII 100	1	$\frac{1}{2}$ wt.	299 50	
companion				
~~components~~ of	2		310 30	
7.5 mag. star.			306 57	
	3		308 30	
		mean of all	307 34	

W Companion south
better obsn. than first.

S

1866 Oct 11 Thursday

		by sid. clock		Verniers		
1 Aquarii (for collimation)	a	21	2 14.0	1	12 28 54	JW Telescope w. Wire b in coincidence at 51.75 Position circle 170° 30'
	b		30.2	11	0 28 55	
	c		46.4		28 54.5	
		21	2 30.2			
	c	11	7.2	1	0 37 52	Telescope E.
	b		23.5	11	12 37 51	
	a		40.0		37 51.5	
		21	11 23.6			
		by chronometer		Distance		
e Equulei components of large star	1	21	25	241	5	JW Seeing excellent by glimpses. Star distinctly separated, dark sky between. Power of 401
	2			242	40	
	3			243	5	
	4			243	5	
				242	29	Not so well seen with power of 1243.
δ Equulei components of large star			300			JW Cannot really be separated. GMS Neither observer confident of measure
			240			
ε Equulei components of large star				50.68	0.08	JW Good measure; wires placed on stars, ^{bright} ~~dark~~ elsewhere, but dark on stars.
				60		

1866 Oct 11 Thursday

79

ϵ Equulei
components of
large star

22 10

50.70
58

0.12 SP6

65
56

0.09

Intended to be small

745
58

0.165

" " " large

50.725
57

0.155 G.M.S

Observer thinks it a little small

50.656
566

0.09

232

Not a reliable measurement;
seeing does not warrant
further measures.

Planetary neb.

h 2241
= G.C. 4964
Position of major
axis

172

SP6 Elliptical; greenish color.

Rough setting without illum-
ination.

 ϵ Arietis

23 30

327 5

SP6 best

321 48

 $\frac{1}{2}$ wt. less careful than the others

327 58

next best

328 14

good

326 55

1866 Oct 11 Thursday and 15 Monday

 ϵ Arietis53.185
046

0.139

SP6

Stars quite still on the wires and
Measure satisfactory13
047

0.083

Thought to be small

283
02

0.263

" " " large

Only one
lamp
burning.
(illumination
only on one
side of
wires)485
162Haze prevented further
observations.

23 45

Micrometer removed and a new diaphragm substituted, as described
on the next page.

Oct 15 Monday

Neptune

0 30

W&S

Examined carefully with
the light thoroughly excluded
for some 15 or 20 minutes.

No satellite certainly visible
though both observers independ-
ently suspected a very faint
point occasionally appearing in
the north following quadrant; more
persistent than other similar
ones in different directions.

Powers 1 & 2 used.

1866 Oct 19 Friday

Observer G. M. S.

81

	Rotation	Time	Therm		Diff	at observer
			c	d		
Backlash	+	3 ^h 25 ^m mean solar	15.950	16.960	+0.010	64.0
	-		998	991	0.993	
			048	031		
				17.950		
			16.991	17.998	0.007	
				048		
			17.936	18.941	1.005	
			991	996	1.005	
			055	055		
			18.955	19.981	1.026	
			19.036	~~20.050~~	1.014	
				~~19.981~~		
			081	069		
			19.980	20.974	0.994	
			20.039	21.030	0.991	
			059	056		
			20.979	21.959	0.980	
			21.025	22.021	0.996	
			046	062		
			21.968	22.972	0.004	
			22.020	23.010	0.990	
			052	038		
			22.972	23.965	0.993	
			23.020	24.028	1.008	
			048	063		
			23.977	24.976	0.999	
			24.033	25.030	0.997	
			056	054		
			24.988	25.978	0.990	
			25.030	26.022	0.992	
			042	044		

Measures for value of screw revolution. Micrometer head to the right as before; telescope illuminated by daylight.

New diaphragm $\begin{array}{c} ab \\ | \\ cd \\ | \\ e \end{array}$

Approximate distances

ab 5 rev. cd 1 rev

bc 20" de 25"

e nearest to mic. head.

The diaphragm being moved as far to the left as possible the mic. wire was set on c.

After the first three sets, the method was as follows;

1. Coincidence with c by + rot.
- 2 " " c " - "
- 3 " " d " - "
- 4 " " d " + "

5 Diaphragm moved so as to bring c on the micrometer wire, and the mic. wire being then moved,

1 Coincidence with c by + rotation, as before. Of course the two readings on c should agree nearly with the preceding ones on d.

1866 Oct 19 Friday

Not					Therm at observer
+		c	d	diff	
-		25.984	26.981	0.997	
		26.036	27.032	0.996	
		052	051		
		26.988	27.988	1.000	
		27.057	28.047	0.990	
		069	059		
		27.996	28.992	0.996	64.0
		28.052	29.058	1.006	
		056	066		
		29.000	29.992	0.992	
		29.050	30.050	1.000	
		050	058		
		30.001	31.010	1.009	
		30.058	31.060	1.002	
		057	050		
		31.016	32.018	1.002	
		31.086	32.070	0.984	
		070	052		
		32.030	33.020	0.990	
		32.089	33.090	1.001	
		059	070		
		33.020	34.020	1.000	
		33.078	34.087	1.009	
		058	067		
		34.020	35.023	1.003	
		34.084	35.082	0.998	
		064	059		
		35.021	36.007	0.986	
		35.090	36.086	0.996	
		069	079		
		36.000	37.006	1.006	
		36.066	37.058	0.992	
		066	052		

Thermometer used is that
of Bond, in mahogany case,
same as Sept. 21

1866 Oct 19 Friday

83

Rot.	Time				Therm at observer
	mean solar	c	d	Diff	
+		37.011	38.016	+ 1.005	
-		37.071	38.075	1.004	
		060	059		
		38.016	39.013	0.997	
		38.086	39.089	1.003	
		070	076		
		39.000	39.998	0.998	64.0
		39.080	40.061	0.981	
		080	063		
	4 ^h 30 ^m	39.999	41.000	1.001	
		40.079	41.062	0.983	
		080	062		
	by sid. clock	Position			
		270 45'			
<i>8 Draconis</i> <i>for zero point</i> <i>Transits over</i> <i>cd</i>					
	19 15	40.4	1.6	19 21 53.4	1.6
		42.0		55.0	
	16	2.8	1.9	22 5.3	1.6
		4.7		6.9	
	16	15.9	1.9	22 14.5	1.7
		17.8		16.2	
	19	33.1	1.8	22 26.1	1.7
		34.9		27.8	
	19	45.0	1.9	22 40.2	1.8
		46.9		42.0	
	20	3.2	1.9	22 56.9	1.8
		5.1		58.7	
	20	15.9	1.9	23 8.0	1.8
		17.8		9.8	
	20	26.2	1.7	23 19.2	1.7
		28.9		20.9	
	20	37.4	1.6	23 33.8	1.9
		39.0		35.7	
	20	47.6	1.8	23 48.2	1.7
		49.4		49.9	
	20	56.4	1.7	24 3.9	1.8
		58.1		5.7	
	21	30.5	1.7	24 19.1	1.6
		32.2		20.7	
	21	42.3	1.8	24 28.7	1.7
		44.1		30.4	
	Mean of 13	1.78	Mean of 13	1.72	

Note Nov. 19, 1877. The distance cd from 49 measurements here recorded seems to be 0.9984 revolutions.

Circle set to 0° 45'

Transits recorded on Chronograph
Micrometer wire half way between
c & d reads 48.35 except for
1st three transits.

Observations poor.

Power no. 2. used in all the
observations of the afternoon.

1866 Oct 19 Friday. & 20 Saturday

19 24 44.2	1.8
46.0	
24 57.4	1.9
59.3	<u>min</u>
Mean of 28	1.76
Reduced to equator	0.6754

Comparison of Chronometer 236

Chron. Clock. Clock-Chron

19 27 30	19 26 16.7	-1	13.3
35	21.7		13.3
40	26.8		13.2
45	31.7		13.3
50	36.7		13.3
55	41.8		13.2
28 0	46.8		13.2

Clock - Chron -1 13.26

Corr. to Clock -43.9

Corr. to Chron -1 57.2

Oct 20 Saturday (before noon)

Zenith star
for zero point

270 38
47
31
40
<u>270 39</u>

S.M.S.

Obsns. of d	d	13 2	3.9	cd	1/2 rev.	52.00
			9.9			
aris. for	mic.	2	19.0		15.1	50.00
			23.3		13.4	
screw revolution c.		2	35.0	29.1		51.00
			35.8	25.9		
		Mean		27.50	14.25	

d at 47.00	13 4	17.5	
		24.5	
		34.3	16.8
		36.7	12.2
		47.8	38.3
		52.1	27.6
			<u>28.95</u> 14.50

Combined with obsn. of δ DraconisTherm. gives $270^{\circ} 40'$ 60.9 Circle set at $180^{\circ} 41'$

Mic. head to the right.

Coinc. with d 52.00 by + rotation

Mic. wire moved to 51.50 " " "

Transits over d, mic. wire & c.

Time of touching and of leaving
the wire noted.Therm. of Bond in mahogany case
as before. Power No 1.

1866 Oct 20 Saturday

85

d at 42.00

13	6	34.3	cd	$\frac{1}{2}$ row.
		38.8		
		47.9	13.6	
		52.8	14.0	
7		1.0	26.7	
		4.4	25.6	
			<u>26.15</u>	13.80

d at 37.00

8		45.7		
		52.5		
9		0.1	14.4	
		6.8	14.3	
		15.3	29.6	
		20.7	28.2	
			<u>28.90</u>	14.35

d at 32.00

10		58.1		
11		4.2		
		16.1	18.0	
		20.0	15.8	
		29.4	31.3	
		34.4	30.2	
			<u>30.75</u>	16.90

d at 27.00

13		14.1		
		18.8		
		27.8	13.7	
		32.8	14.0	
		42.0	27.9	
		47.0	28.2	
			<u>28.05</u>	13.85

d at 22.00

15		30.4		
		34.1		
		42.7	12.3	
		47.9	13.8	
		56.6	26.2	
16		0.4	26.3	
			<u>26.25</u>	13.05

d at 17.00

17		44.0		
		48.7		
		57.2	13.2	
18		2.8	14.1	
		10.3	26.3	
		15.2	26.5	
			<u>26.40</u>	13.65

Mean of all 27.87 14.29
 Red. to equator 0.6810 0.3492

1866 Oct 20 Saturday

Rot	d		Diff		Therm
	-	+	+	-	
-	82.039	81.028		1.011	
	81.988	81.001	0.987		
+	.051	.027			
	81.039	80.024	1.015		
	80.996	80.000	0.996		60.9
	.043	.024			
	80.011	79.020	0.991		
	79.981	78.986	0.995		
	.030	.034			
	78.986	77.986	1.000		
	78.940	77.959	0.981		
	.046	.027			
	78.050	77.027	1.013		
	77.990	76.979	1.011		
	.060	.058			
	77.040	76.047	0.993		
	76.989	75.999	0.990		
	.051	.048			
	76.030	75.017	1.013		
	75.978	74.988	0.990		
	.052	.029			
	75.029	74.030	0.999		
	75.000	73.990	1.010		
	.029	.040			
	74.024	73.036	0.988		
	73.980	72.989	0.991		
	.044	.047			
	73.039	72.040	0.999		
	72.989	71.988	1.001		
	.050	.052			

Measures for value of screw revolution, conducted in the same way as yesterday, except that they were begun at the other end of the screw and made in a reverse order. as follows

1. Coincidence with d by - rot.
- 2 " " " " + "
- 3 " " " " + "
- 4 " " " " - "

5 Diaphragm moved so as to bring d on mic. wire and (mic. wire being moved)
1 Coric. with d by - rotation as before.

Power no 1.

Observer GMS

Power no 4

1866 Oct 20 Saturday

87

72.026 71.984 042	71.029 70.979 050	0.997 1.005	
71.029 70.981 048	70.031 69.978 053	0.998 1.003	
70.018 69.975 043	69.020 68.968 052	0.998 1.007	
69.022 68.974 048	68.020 67.970 050	0.002 1.004	
68.020 67.965 055	67.020 66.969 051	1.000 0.996	62.1
67.015 66.970 045	66.022 65.960 062	0.993 1.010	
66.004 65.961 043	65.015 64.949 066	0.989 1.012	
65.000 64.953 047	64.010 63.951 059	0.990 1.002	
64.010 63.952 058	63.004 62.940 064	1.006 1.012	
63.000 62.949 051	62.014 61.950 064	0.986 0.999	62.1
62.003 61.961 042	61.013 60.954 059	0.990 1.007	
61.009 60.960 049	60.017 59.954 063	0.992 1.006	

188

1866 Oct 20 Saturday

Time
Mean solar

	60.013	59.017	0.996	
	59.956	58.950	1.006	
	057	067		
	59.011	58.015	0.996	
	58.955	57.948	1.007	
	056	067		
	58.010	57.022	0.988	
	57.955	56.951	1.004	
	055	071		
	57.036	56.038	0.998	
	56.966	55.970	0.996	
	070	068		
	56.039	55.046	0.993	
	55.986	54.981	1.005	
	053	065		
	55.031	54.037	0.994	
	54.964	53.961	1.003	
	067	076		
	54.021	53.030	0.991	
	53.963	52.964	0.999	
	058	066		
0 57	53.040	52.036	1.004	
	52.970	51.964	1.006	
	070	072		62.3

1866 Oct 20 Saturday

27

Oetz. 20362
and Thioe.

by sid. clock

22 23 55.1

24 2.9

8.8

22 24 19.4

20.1

27.0

32.8

36.3

22 25 4.2

5.0

12.0

17.8

21.3

22 25 28.3

36.2

42.0

45.4

22 26 15.0

15.8

22.5

28.4

32.0

22 26 39.0

39.9

46.9

52.8

56.3

+24.3

24.1

24.0

24.1

24.2

24.2

24.1

24.0

24.1

24.4

24.4

+ 24.3

Mean of 12

22 25 49

+ 24.18

22 30 19

31 59

34 1

35 55

22 33 4

62.32

33

27

28

62.30

+ 30.83

Mean of 4

31.47

49

46

31.47

FMS

Position circle $180^{\circ} 41'$

Planet follows

Position circle $90^{\circ} 41'$

Planet north.

90

1866 Oct 20 Saturday

Oct. 20362

& Thibe

by sid clock

22 42 57.6

9MS

7.5

11.2

14.6

22 42 22.8 + 25.2

23.6

32.8 25.3

36.3 25.1

39.8 25.2

22 43 55.8

56.6

44 5.8

9.3

12.8

22 44 21.0 25.2

30.9 25.1

34.7 25.4

22 44 53.4

45 3.4

7.1

10.5

22 45 18.6 25.2

19.4 25.2

28.8 25.4

32.3 25.2

35.7 + 25.2

Mean of 11 22 44 8 + 25.23

Position

91° 7'

15

22 (1/2 wt)

10 (1/2 wt)

91° 13'

Arg. Z. + 9°
5% off for
zero point

1866 Oct 20 Saturday

91

Ausonia 8	0 46 55.3	-7.9			GMS	Position circle 1° 13'
	56.1	-7.9				
Arg. Z. + 9°	59.4	-7.7				Planet precedes
No 6 1/8	47 3.2					
	4.0					
	7.1					
	21.3	-7.9				
	22.1	-7.7				
	25.2	-7.9				
	29.2					
	29.8					
	33.1					
	44.9	-7.9				
	45.7	-7.8				
	48.9	-7.8				
	52.8					
	53.5					
	0 47 56.7					
	0 48 8.7	-7.8				
	9.5	7.7				
	12.6	7.9				
	16.5					
	17.2					
	20.5					
Mean of 12	0 47 34	-7.82				
	0 50 28		55.59	+2.98		Position circle 91° 13'
			52.61			
	52 55		56.18	+2.92		Planet north
			53.26			
	54 10		56.25	+3.03		
			53.22			
	55 32		56.20	+2.86		
			53.34			
	56 55		56.23	+2.92		
			53.31			
Mean of 5	0 54 0			2.94		

1866 Oct 20 Saturday

Ausonia & 0 59 30.5 - 8.2
 31.8 8.3
 Arg. Z + 9° 32.4 8.4
 No 6 H. 8 38.7
 40.1
 40.8

4^s should be 54.1 - 8.1
 subtracted from 55.2 8.5
 56.0 8.5
 all these times, 1 0 2.2
 the sheet being 3.7
 4.5
 read wrong. 17.6 - 8.4
 19.0 8.3
 19.7 8.3
 26.0
 27.3
 28.0

Mean of 9 0 59 ~~56~~ - 8.33
 52

Arg. Z. + 1° 1 59 35.9
 37.1
 No 242 & 37.8
 Nysa 45.3 + 9.4
 46.5 9.4
 47.5 9.7
 2 0 2.7
 4.0
 4.7
 12.1 + 9.4
 13.4 9.4
 14.2 9.5
 26.2
 27.6
 28.1
 35.5 + 9.3
 36.8 9.2
 37.7 9.6
 Mean of 9 2 0 12 + 9.43

GMS Planet precedes
 Pos. circle 1° 13'

Comparison of Chronometer 236.

Chron.			Clock				
1	12	30	1	11	14.0	-1	16.0
		35			19.0		16.0
		40			24.0		16.0
		45			29.1		15.9
		50			34.1		15.9
		55			39.0		16.0
13	0				44.0		16.0

Mean -1 15.97

Pos. circle 1° 13'
 Planet follows

1866 Oct 20 Saturday

93

Mean of 7

by sid clock

2	2	51
	3	30
	4	4
	4	40 ²
	5	47 ²
	5	56
	6	35 ²

39.14
05
07
02
38.97
97
96

GMS Pos. circle $91^{\circ}13'$

Rattle omitted on three comparisons

Planet south.

2 4 42²

39.03 -24.49

63.52

52

52

63.52

2 10 28.9

28.9

29.6

36.9

+8.8

38.1

9.2

38.6

9.0

50.7

51.6

52.3

59.7

9.0

11 0.6

9.0

1.4

9.1

15.5

16.4

17.1

24.6

9.1

25.5

9.1

26.2

+9.1

Mean of 9

2 11 1

+9.04

Pos. circle $1^{\circ}13'$

Planet follows.

Double Stars Observed in this volume.

Name	Approx. place 1867			Dates, observers, & pages
η Cassiopeae	0	41.0	+57 6	Aug 27 S 4,
36 Andromedae	0	47.8	+22 54	Sept 27 W S 47, Sept 30 W S 51 52, Oct 2 S 58
γ Andromedae	1	55.8	+41 42	Sept 27 W S 47, Sept 30 W S 52
ϵ Arietis	2	51.6	+20 48	Sept 27 S 48, Oct 11 L 79 80
η Draconis	16	22.2	+61 49	Sept 3 W 19
μ Draconis	17	2.6	+54 39	Sept 1 W S 11
Σ 2173	17	23.5	-0 57	Aug 27 S 1, Sept. 6 W 15, Sept 9 Mr. Clark W S 21
Σ 2234	17	45.8	-7 52	Sept 6 W 15 16
τ Ophiuchi	17	55.9	-8 11	Aug 27 S 1, Sept 6 L W 16, Sept 10 W 25
70 Ophiuchi	17	58.8	+2 32	Aug 27 W 1,
Star "c" in neb. h 2008	18	12	-16 15	Sept 6 L 16
Σ 2303	18	12.9	-8 2	Sept 6 W 17
Σ 2410	18	45.0	+59 11	Sept 15 W L S 33 34
α Draconis	18	49.2	+59 14	Sept 15 L W 34
δ Cygni	19	40.8	+44 48	Aug 30 W 9, Sept 3 W 19, Sept 12 W 33.
β Aquilae	19	48.8	+6 5	Sept 27 W S 43
W XIX 1273	19	51.5	-2 36	Sept 6 W 17
Lal. 38337	19	56.8	+39 56	Oct 4 W ^S 64
α^2 Capricorni	20	10.7	-12 57	Sept 6 W 17
H ^{III} 16 = PXX 178	20	24.9	+10 49	Sept 27 W S 44
Schjellerup No 32	20	32.8	+10 29	Sept 27 W S 44, Oct 3 W 61
Mr. Clark's star	20	35	+40 6	Sept 12 W L 32 33, Sept 15 S 34, Sept 16 W 35
4 Aquarii	20	44.4	-6 8	Sept 1 W 11, Sept 6 W 17, Sept 16 W 37, Oct 5 W ^S 70
ϵ Equulei	20	52.5	+3 47	Sept 3 L 19, Sept 16 W S 36 37, Oct 11 W L S 78 79
61 Cygni	21	0.9	+38 6	Sept 16 W S 35
δ Equulei	21	8.0	+9 28	Sept 27 W S 43, Sept 30 W S 51, Oct 5 W 70, Oct 11 W S 78
Lal. 42240.1	21	33.3	+42 42	Oct 5 W S 73

Double Stars observed in this volume.

Name	Approx place 1867	Dates, observers, & pages
Lal. 42263	21 34.3 +42 41	Oct 5 w s 73
o Σ 2833	21 45.2 +8 25	Sept 10 w 28
o Σ 2838	21 47.5 -3 55	Sept 10 s w 27
o Σ 2847	21 51.3 -4 8	Sept 6 w 17, Sept 3 L 19
o 41 Aquarii	22 7.0 -21 44	Sept 10 w 27 28
53 Aquarii	22 19.4 -17 25	Sept 10 w s 29
o ζ Aquarii	22 22.0 -0 42	Sept 6 w 18, Oct 5 w s 70 71
o 37 Pegasi	22 23.3 +3 45	Sept 1 w s 11, Sept 10 s 29, Sept 12 w 33, Oct 5 w s 70
Pulkowa Cat. 536	22 51.8 +8 39	Sept 27 w s 45, Oct 1 w 56
o P XXII 275	22 54.0 +2 18	Sept 10 w 29, Sept 12 w 33
o 98 Aquarii = P XXIII 63	23 16.0 -20 50	Sept 10 w s 30
P XXIII 69	23 16.9 -9 11	Sept 10 w 30
P XXIII 100	23 23.7 +57 49	Oct 7 w s 77
Σ 3037	23 39.5 +59 44	Aug 27 s 4, Sept 30 w 53
Σ 3057	23 58.0 +57 48	Aug 27 s 3, Sept 8 s 20
Σ 3062	23 59.2 +57 42	Sept 8 s 20, Sept 10 L 30, Sept 30 s w 52 53

Asteroids observed

Thiabe	Aug 27 s 2, Aug 28 s 5, Sept 1 w 10, Sept 2 w s 13 14, Sept 3 w 14 15, Oct 1 s 54 55 Oct 3 w 59 60, Oct 4 w 63, Oct 5 w 69. Oct 20 s 89 90
Parthenope	Aug 27 s 2 3
Pomona	Sept 16 w 37 38, Sept 20 w 41, Sept 27 s 45 46
Panopaea	Sept 22 s 42 Oct 1 w 56 57, Oct 4 s 65, Oct 5 w 72
Ausonia	Sept 27 s 46 47, Sept 28 w 49, Oct 20 s 91 92
(89)	Sept 30 s 51, Oct 1 s w 55 56, Oct 3 s 60 61, Oct 4 w 63 64, Oct 5 s 71
Nysa	Oct 2 w 58, Oct 3 s 62, Oct 4 w 66, Oct 5 s 73, Oct 20 s 92 93
Search for Daphne	Sept 9 s 21
" " Europa	Sept 6 w 18, Sept 9 s 22
" " Beatrix	Sept 9 s 22
" " Nysa	Sept 28 s 50, Oct 1 s 57

Other objects observed

Name	Dates, observers, & pages
Jupiter	Sept 2 w 12, Sept 12 w 31, 32, Sept 23 w 43
" " 1 st Satellite	Sept 3 L 19
Neptune	Sept 12 w 33, Sept 16 w 37, Oct 15 w S 80
Nebula M 72	Sept 3 L 19
" h 2008	Sept 8 L 20
" (trifid)	Sept 10 L 26 27
" h 2075 (plan.)	Oct 6 w 75
" h 2241 (")	Oct 6 w S 75, Oct 7 w S 76 77, Oct 11 L 79
" h 172, 173 (double)	Oct 6 w S 75
Cluster h 2284	Oct 6 w 75
Occultation of α Tauri	Sept 28 w S 49
Zero point of pos. circ.	Sept 10 w 22 Aug 27 S 3, ⁸³ Sept 22 w 41, Oct 5 S 73, Oct 19 S ⁸³ 81, Oct 20 S ⁸⁴ 90
Examination of micrometer screw	Aug 29 w 6 7 8 9, Sept 21 S 39 40, Oct 19 S 81 82 83, Oct 20 S 86 87 88
Transits for value of screw revolution	Sept 10 S 22 23 24 25, Oct 19 S 83 84 85
Obsns. for instrumental correction	Oct 5 w 67 68 Oct 6 w 74 Oct 11 w 78

Determinations of zero point.

Date	Observer	No of obs.	Result.
Aug 24 ³ (in Vol 1)	S	3	80 20
Aug 27	S	4	260 28
Sept 10	w	1	260 15
22	w	2	260 38
Oct 5	S	4	80 31
Mean		17	260° 26'
Oct 19	S	5*	* 270 40
Oct 20	S	4*	* 270 39

350° 26' to be used to Oct 11 inclusive

to be used for the remainder of the volume. except on pp. 91, 92, 93. †

* Aug. 2, 1877. The above should apparently be

Oct 19	S	1	270° 45'
Oct. 19 (astronomical time) or 20 (civil time)	S	4	270 39
Mean			270 40

† Oct. 20 (2^d observation, see p. 90) 4 obs. 91 13

Note May 28, 1880. Same as note of this date in book N 34, 98.

