KG
11365
293
N 10

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Observations with E. Equatorial.
(Original.)
Vol. 10.
1867 Apr. 25 to 1867 Oct 24

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1867 Apr 25 Thursday

Companion of Regulus. $10^h\ 45^m$ Power no 3

After long watching JW thought he saw steadily the faint star of Apr 19 at $90° + 343°$ } Rough setting without
S MS $90 + 355$ } illumination

$11^h\ 0^m$ JW $88°.2$ Illumination

49 Leonis $12°.8$ Power no 3.
12.3 Large star bluish white
~~Small " " "~~
11.6 Small " " "
9.5
11.7

50.215	49.67
265	71
21	73
215	70 best
27	71
22	

Σ 1496 JW $11^h\ 50^m$ Power no 1.

47.95	52.99	3°.2
84	95	3.3
48.01	52.00	3.0
47.95	51.94	4.2
94	89	

JW.	Σ 1593	S. M. S.		Stars perpendicular to eyes
334.6	153°.5	152.7	50.070	49.827
337.0	153 9		50.069	49.830
337.4	153.9		50.056	49.824
337.8	154.0		50.038	49 826
337.0	150.0	Castle's ⅄ right	50.050	49.817
	153.9		50.049	

$12^h\ 20^m$

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Σ 1595 Two stars in the ~~field~~ as before.
Neither of them separable. Power no 3.

γ Virginis $13^h\ 0^m$ J W

9.7	49.45	50.38	
7.0	46	40	better than any
7.5	435	425	previous set of
7.4	47	46	measures on this star by J W
8.5	49	44	both in dist. & angle.

η Coronae J. M. S

319.5		parallel to eyes	
316.3	50.071	19.840	
317.5	.040	.830	
320.4	.052	.841	
318.8	.051	.853	
	.045	.859	

γ Coronae GMS 335.5

J W [222.5] Double image of principal star
329.8

Power no 4
339.5

σ Coronae J W

339.6	parallel to eyes.	49.27	48.69
340.5		28	64
338.5		27	67
339.5		212	64
339.6		27	

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+26° No
T Coronae about = Arg Z. × 2761 JW (in finder)

> 2761 ● = mean of 2761 & 2763 G M S.

No peculiar appearance in large telescope.

ζ Herculis G M S Not separable. Seeing not very good.

167 Herculis 335·0 Numerous false images but real companion
334·0 occasionally seen well.

companion south Distance about 0″·5

Arg Z. +28° No 2627 not in sky. A star about 10·5 mag.
10 sec. preceding its place.

49 Serpentis. Too many images. Power no 3.

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1867 Apr 26 Friday

Power of 1561. Measures of interval cd of diaphragm. G M S.

Rot + — $3^h\ 0^m$ M.J.

d	c	c	d	d	c	c	d
				+		—	
24.994	24.005	049	030	25.708	713	748	746
998	009	038	030	700	701	750	745
994	001	037	034	700	707	745	751
990	23.996						
991	24.001						
25.100	24.091	132	131	798	795	837	834
100	102	127	131	794	798	839	838
093	109	134	130	791	795	833	842
209	213	255	240	899	910	930	935
208	213	248	237	899	901	938	934
203	205	250	237	900	903	938	939
310	304	340	340				
302	310	329	338	49.990	48.994	49.049	50.052
299	301	335	340	990	49.000	045	046
				990	006	050	043
400	409	441	430				
400	407	449	429	50.090	100	142	144
395	403	439	440	100	104	140	150
				099	101	147	144
489	502	543	540				
493	501	540	538	204	201	250	252
493	506	545	536	198	203	254	247
				205	209	249	259
605	606	640	645				
600	608	649	650	301	312	351	352
594	605	647	650	294	310	351	348
				300	310	346	346

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Obsns. ~~of~~ in the following order
Three measures on d by + rotation
" " " c " + "
" " " c " − "
" " " d " − "

Rot	+		−	
	d	c	c	d
50·390	49·391		433	426
	390	390	434	427
	393	395	433	430
	500	497	536	537
	493	505	539	533
	501	504	541	537
	600	600	642	646
	605	602	650	648
	608	600	643	641
	694	693	741	748
	699	707	743	745
	699	698	750	740
	810	811	853	851
	803	810	855	850
	804	811	852	850
	916	915	961	959
	919	908	957	959
	911	916	950	954
65·005	64·005		·040	032
	005	006	041	038
	007	63·995	040	035

Rot.	+		−	
	d	c	c	d
65·090		093	131	132
	088	090	124	128
	092	100	129	122
	201	208	247	243
	198	210	242	245
	210	210	242	244
	309	305	351	347
	306	308	339	340
	302	315	343	347
	399	400	434	438
	395	406	441	440
	393	408	441	434
	511	508	550	541
	511	518	540	540
	510	515	545	546
	600	600	640	643
	594	610	637	639
	603	602	640	635
	703	704	741	735
	708	704	739	733
	700	704	730	737
	800	810	841	840
	808	810	846	840
	810	809	838	838
	898	897	932	922
	898	895	928	930
	895	900	929	930

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1867 Apr 26 Friday

ω Leonis JW $10^h\ 20^m$ Power nio (50)

144·0 Companion north.
141·5
147·0 Elongation almost amounting to separation
150·0
147·0

140·5 GMS

141·5 JW Power of 861 ~~Power~~ Star entirely separated.

---

42 Comae JW

156·2 Power of 1243.
150·9 " "
G.M.S
149·2 best 161·8
156·0 159·6
Mean 153·1 145·0
143·2
139·6 not so good

Distance of neither of the above > the diameter of one of the webs. JW

---

35 Comae AB. JW.

	124·5	50·81	51·03
$11^h\ 30^m$	120·1	805	025
	125·0	785	025
	119·5	805	060
	118·2	790	035
	120·5		

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γ Coronae SMS

Could not separate it. Star faint through haze.

η Coronae Star too faint for measurement

$13^h\ 25^m$ P XIII 127 JW Power no 4

112·4			
115·0	50·69	51·20	no 3
116·6	725	·12	
120·0	72	18	
113·5	69	20	
112·5	72		
115·0			

Σ 1734 JW

13 55	163·1	50·78	51·05
	162·4	775	05
	163·0	80	06
	161·6	77	05
	163·6		

Chron 236 Saturn JW.

$14^h\ 24^m·3$	Titan	315·0	$31^m·9$	41·69	Satellite S. p.
24·7		315·5	32·2	75	
25·0		314·0	32·4	76	
25·5		315·0	33·0	72	
26·0		314·5	33·4	63	
35·7		315·2	come		
36·5		314·5		50·93	
37·0		314·5		94	
37·3		314·9		95	
				92	

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Another

	$\Delta\alpha\cos\delta$ sat. preceding		$\Delta\delta$ sat. south		
13h	40m.5	47.03	44m.8	49.74	Coinc. with c
	40.8	46.91	45.4	77	50.92
	41.5	46.95	46.3	70	94
	41.8	47.06	46.7	68	91
	42.3	46.93	47.1	80	95
			47.5	78	
	Coinc. with d		with c.		

G. M. S.	$\Delta\delta$	
14	46.5 +5m	48.07
	47.0	48.08
	47.2	.12
	47.4	.12
	48.0	48.13

Coinc. with c satellite south

Single wire across center of planet

Coinc with d micrometer head to the left

Sat. following

	$\Delta\alpha$
54.8	47.19
55.5	47.39
56.3	47.25
56.5	47.28
57.0	47.23
57.8	47.30

		$\Delta\alpha$
14h	58.8	50.44
15	0.5	50.54
	01.0	50.48
	1.2	46
	1.5	46

little one close with
Coinc with c
Sat. following

Time	$\Delta\delta$	
15 3m.5	49.31	Sat south
4.0	.11	faint Coinc with c
4.3	.17	15 5.8 49.14
4.6	.10	
4.9	.12	
5.1	.09	
5.5	.09	

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262° ♀ = Major axis	Minor axis of ring
263.0	49.06 Come with ♁
262.5	49.14
263.0	.07
262.7	.06
	.11
	.08

13m

Major axis of ring	
46.51	Come with ♁
.55	
.56	
53	
54	

Body of Planet	in direction of major axis of ring
48.97	
49 03	Come with ♁
49.06	50.93. 93.
48.97	
49.05	
49.00	

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1867 Apr 27 Saturday

Companion of Regulus. WMD. $12^h\ 25^m$ $90 + 355.8$ Rough setting without illum.
Companion follows. 358.4
Entirely independent measure; direction of companion
not hinted at. Power no 3.

Illumination.

$90 + 358.4$

Wires parallel to ~~—~~ stars. 259.2

Distance from memory ✓ 47.01 ~~—~~
coinc. 46.52 (changed)

9.1	γ Virginis	12 55	WMD
7.5	Seeing not very good.		
8.6	47.20	46.03	
7.7	16	45.99	
7.2	11	46.00	
	10	.03	
	10	.00	

WXT 755 & Calypso. WMD

chron 236	Δα	Planet precedes.	Δδ	Planet north
$13^h\ 34^m.8$	59.35	Comp. star on d.	13 43.0	67.80
36.6	59.32		Comp. 45.7	.63
37.5	58.97		star 48.0	68.01
38.7	59.20		on 48.9	67.76
39.5	59.16		d. 50.2	67.30
			51.2	67.25
$13\frac{1}{4}$ 1.8	60.94	"	52.2	67.71
3.9	60.80		coinc. 46.59	
4.8	60.62		51	
5.8	60.85		57	
6.2	60.56		56	

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Apr 28 Sunday

γ Virginis W M D $11^h 45^m$.

10·3		
11·9	Stars perp. to eyes.	
11·0		
12·2	45·01	46·03
11·4	·03	·07
9·8	·05	·05
14·1	·05	·07
13·6	·06	·06
10·3	·07	
11·9		

P XIII 127 W M D Stars parallel to eyes

112·1	90 + 30·3	45·91	45·25
114·5	26·0	45·92	·25
115·3	27·9	45·95	·26
114·3	26·2	45·90	·24
114·2	26·0	45·91	·26
115·3			

JW Σ 1734 Perp. to eyes

339·1	
342·8	Too unsteady to measure distance.
343·6	
341·2	
345·0	

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Nebula 64 M Comae Berenicis

JW

Nucleus shows appearance of a double star but not separable, perhaps not even stellar. Crescent shaped blackness below it. Longer diameter exceeds the field of low power. (No 1.)

Σ 1879

JW



Configuration in finder.

337.2
334.5
336.1

Power no 4.
Stars perpendicular to eyes.

Seeing becoming worse.

Σ 1819 G. M. S. Stars perpendicular to eyes.

321.0
322.8
321.2
319.8
319.0

Seeing poor. Power no. 4.

Distance		
	46.44	46.69
	46.44	.69
	.45	.67
	.45	.70
	.45	69

Seeing better.

Cluster 53 M Comae Ber.

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1867 May 1 Wednesday

Immersion of Mercury

	J W at Equatorial sid. clock			G M S with 3 inch. Chron 236		
First contact	19	11	24·3	19	12	35
Disappearance		11	36·7		12	49
Emersion	20	15	43	probably somewhat late.		

1867 May 2 Thursday

~~W IX 1296 J.W.~~

Star a little preceding γ Virginis, J W 12h 15m =Arg. Z 2599

Seen several times to be double, but the seeing seems to be variable. Tolerably good on γ Virginis, however.

Σ 1593	334.0	G M S	Perpendicular to γ's
	332.0		
	331.1		
	329.1		
	331.5		

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1867 May 3 Friday

W IX 1296 JW $11^h\ 55^m$

companion

82.5 Seeing not very good, but the air clear, as the ~~star~~ is
82.0 occasionally distinctly seen.
81.5

		coinc.
	47.02	46.56
	46.93	59
	99	60
		61
mean	46.98	

Arg Z - 0° No 2599 easily separated. JW. Power no 4.
Companion north.

34.0	45.44	45.73
38.0	40	72
35.8	47	72
33.5		
31.0	2 dist.	

Pulk. Cat. 256 JW Components equal.

	2 dist.	
117.0	46.675	46.45
113.5	70	47
111.8		
110.0		
112.0		

P. C. 247 JW. Identified from Arg. Z. Elongation uncertain.
" 248 GMS " No sign of elongation.

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275 — 76°.7 — Stars parallel to eyes Comp. precedes
75.0
76.1
75.1 — dist 46.15 — Coincc 45.60
76.8 — .17 — 60
.22 — 60
.16
16

273 — 61.9 — distance estimated — no difference of mag. Certain
60.1 — 0".8 — preceding perhaps a little fainter
59.3 — Stars parallel to eyes
61.5
60.9

279 — P XIV. 20 — Comp. precedes

102.1 — parallel to eyes
102.5
100.7
101.0 — dist 45°.77 — Coincc 45°.61
101.8 — 80

281 — Stars parl. to eyes Comp S

189.9
194.1 — Distance about 1".5

Seeing too poor to continue work.

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1867 May 4 Saturday

JW 11h 55m Arg. Z −0° 2599 Seeing too poor for measures.

~~45.04~~
~~46.63~~

Terpsichore and Deltz. 13487 JW

	Δα Planet follows	Comp. star on d.		Δδ Planet south on d
12h 59m.2	55.26			
13 0.0	.45			
0.7	.41			
1.5	.20			
2.1	.34			
2.4	24			
4.5	30			
	55.314	51.13	13 7.0	29.45
		.12	7.5	41
		.06	7.8	45
		.07	8.1	64
		.09	8.4	61
		.04	8.6	41
13 10.8	55.27			
11.9	54.89			
12.3	54 92			
12.7	55.02			
13.0	54.73			
13.4	.60			
13.7	83			
14.0	.45			
14.5	67			
	54 ~~78~~ 820			

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Saturn on mic. wire. Satellite precedes on d. JW.

		Δα			Δδ	Sat. south
13	29·5	55·34	13	34·6	51·79	+05
	30·2	37		34·9	73	−02
	31·0	30		35·1	68	−07
	31·4	27		35·8	83	+08
	31·8	30		36·4	60	−15
				36·7	85	+10

No 2 S. p. planet on e

	Δδ
39 53	48.00
40 25	47.90
40 40	47.80
41.37	47.95
42 4	47.98

	Δδ
44.0	52,23
44.35	52.28
45.10	52.25
45 35	.22
45 45	52 18

Planet on e

Titan Δδ n. p.

			Δδ
47 .10	45.29	+5m 47m 35	56.69
48 30	45.27	47 55	56.66
48 55	45.32	48 10	.65
49 25	34	48 25	.73
50 00	26	48 45	67
50 25	24		

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other one n. f

Δδ	
-54 2	-51.47
-54 4	-51.40
-54 6	.39
-54.8	.44
-55.1	.46

Δα	
-57.0	43.01
-57 5	42.90
-58.0	42.93
-58.2	42.93
-58.5	42.91

with e

Cone -50.04
05 —
05 —
05 —
05 —

n. f

Direction of axis of ring 83.2
82.8
83.8
84.0
83.3

Minor axis of ring —

48.18
48.25
48.24
24
25

e Coincidence wire

Major axis of ring
54.54
55 —
53
55
50

Seeing becomes bad at the 5th measure

Ball — in direction of major axis
52.01
51.98

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1867 May 5 Sunday

Occultation of Aldebaran obscured by clouds.

Clouds until Thursday May 9

Senior Class until ~~after one~~ ten o'clock

Searched per Comet II 1867 until 12

Telescope by G. M. S.

Time	Δα
36.7	29 21

Clouds.

1867 May 10 Friday

17h 45m Moon J W Edge of crater of Linné at least partially visible though not so distinct as that of ~~most of the small craters~~ neighboring ones. in Mare Serenitatis

Planet ☉ d.

14 Chron 236	Saturn J W Δα.	Satellite precedes.	14	Δδ	Satellite north
15 17.4	50.49		15 23.0	51.57	
18.8	44		23.8	.58	
19.7	44		25.3	.63	
20.5	48		25.7	.70	
21.0	41		26.6	.66	
21.7	51				
29.3	48.48	" precedes	35.0	52.49	north
30.0	43		36.0	50	
30.3	38		36.3	52	
30.7	38		36.5	47	
31.3	36		37.0	49	
31.7	43				

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15	32·3	50·11	Sat. precedes.	15	37·7	47·94	Sat south
	32·7	05			38·3	87	
	33·0	09			38·6	98	
	33·4	09			39·0	96	
	33·7	10			40·0	93	

		Titan foll.	40·3	44·40	Titan south
15	44·6	59·46	40·8	39	
	45·8	41	41·1	38	
	46·0	47	41·8	45	
	46·2	48	42·7	47	
	46·8	40			

Comc with c
50·34
34
35
34

Power no 2 used hitherto.

Power no 3. Direction of major axis of ring

81·4	~~Major axis~~	53·28
81·5	Ball in	·29
81·5	direction of	·32
82·5	major axis	·30
81·9		~~·31~~
		30

Comc
51·33

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λ Ophiuchi G. M. S. Stars preceding to get Comp. N

Time		dist	Comc
16h 10m	148.9	51.40	51.31
	146.8	51.44	32
	149.3	51.41	31
	149.7		
	148.6		

May 11 Saturday.

Moon 12h 30m Seeing unusually good.

Linné. J W and G M S. Power no 3. Central crater distinctly and constantly seen.

	Diameter	
J W	G M S	Comc.
51.415	51.39	51.30
	.38	29
		29
51.415	51.385	51.293
0.122	0.092	

May 12 Sunday.

12h Moon J W. Seeing poor. Crater in Linné not discernible.

12 30 γ Virginis Seeing two poor for measures.

May 12. Sunday.

Time 13h 15m.

G. M. S. ~~12h 0m 7s~~

Transits of δ Delta 13380 and Terpsichore over three wires.

Dif. of declination. comp. Star on wire d.

Planet South.

35.27
35.33
35.71
35.53

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Transits over three wires.

corrs. with b.

57.31
.30
.30

Saturn Seeing two poor for measures.

Micrometer removed for telescope cleaning.

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May 18 Saturday

Micrometer replaced.

$13^h\ 15^m$

Star found by GMS $13^h 11^m - 20° 45'$ = Oeltz. 12764-5.

Perp. to eyes. Comp. north Magnitudes 8&9. ⊙ Double
est. dist. wires not on stars.

		conjc.	
344.0	51.40	51.24	30'
343.0	41	27	
343.2		27	
341.8		25	
342.4		25	

Zero of pos. circle
264.8
264.8

Clouds.

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1867phae.proj..293S

1867 May 20 Monday

~~W XIV 421~~

Double, $14^h 25^m$ $-15^\circ 0'$ GMS. Mags 8 & 9.

259.9 Comp. follows. parallel to eyes
256.1
258.3
259.8
257.3

51.46 51.27
49 27
51
50
49

Saturn Disputes ? Precedes

		Δα	
14	5^m	29.93	Planet on wire & b
15	0	.88	
	2	30.04	
	2.5	30.01	
	2 9	30.01	

	Δδ	
5.0	14.18	satellite quite faint
6.0	14.39	very faint
10.6	14.14	

Titan	Δδ	
8.0	37.81	satellite ~~north~~
8.5	37.78	
8.9	37.78	
9.0	37.84	
9 6	37.80	

	Δα	follows		
13.0	36.95		14.5	56.94
13.6	36.88		15.0	36.87
14.0	36.88			

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another

	Δα	Satellite precedes
15	15m17s	23.09
	16.2	23.15
	16.6	23.08
	17.0	23.13
	17.7	23.25

	Δδ	satellite South
15	19.3	30.70
	19.9	30.78
	20.2	30.73
	20.5	30.75
	21.0	30.71

Another Sat South

Δδ	Circle with the b
21.5	29.34	31.28
22.0	29.24	31.30
22.3	29.27	31.28
22.7	29.26	31.27
23.3	29.24	31.27

Δα	following	Less, position circle
25.0	34.26	265.0
25.7	34.03	265.0
26.1	34.23	264.9
26.5	34.17	264.8 used on Saturn
27.0	34.23	

another following

Δα		Δδ satel. N.
27.4	35.38	30m.0 31.94
6	35.39	30.2 32.04
28.0	35.51	30.5 31.97 rather faint
28.3	35.50	
28.6	35.53	

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1867 May 24 Friday

13h 0m Star 12h 50m −28 31 = Oeltz 12501

143·2	Comp nf	Mayo 8 & 12
145·0		coinc
143·5	51·63	30
142·0	.62	33
143·2	60	30

Oeltz 13608 Mayo 7 & 9

G. M. L. Stars parallel to eyes. companion follows. Power no. 5

14h 25m

254.1	50·42	50.30
254.0	.41	.31
252.1		.32
252.6		.30
249.8		

W M D		coinc
254·8	51·48	51·28
251·2	45	28
252·8	46	28
254·5		
254·0		

Unsuccessful search for Comet 1867 II.

Saturn. G. M. L. another satellite. preceding. north

Satel. preceding south

	diff. R.A.		
15h 14m 15s	55 37	15h 19m 4s	54 79
14m 45s	55 25	20 13	54 91
15 4	55 31	21 53	54 95
15 26	55 36		

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Diff. in decl of first Sat.

15h 23m 15s		48 43
2	23 38	
	24 27	48 35
	24 56	48 28
	25 11	48 26
	25 29	48 35

Diff in dec. of second Satellite.

15h	26m 5s	52 49
	26 52	52 57
	27 20	52 51
	27 31	52 47
	28 0	52 52

ball of planet on mean of wires c+d

Planet on wire c.

Diff in dec. of third Sat. South. follows.

15h	29m 45s	49.75
	30 15	49.71
	30 40	497.6
	31 10	49 72
	31 32	49 78

Diff R.A.

15h	32m 57s	45 78
	33 40	45 70
	34 10	45 73
	34 28	45 75
	35 4	45 85
	35 37	45 81

coine with c

52.26
25
26
26
27

P XVI 60 for zero of pos. circle

265.0
264.9

P XVI 60 companion north.

2.8	51.96
3.3	51.94
3.2	52.00
3.0	52.01
3.0	52.03

coine.
51.27

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Zero of Position Circle.
26.0
26.9

1867 May 31 Friday
Ariadne and Lal. 30213

	Planet North	Comp. * on wire b	Transits on Chronograph. Rattle on chronograph at times of Δδ
Δδ	39.13		
	39.22	Coincidence with b	
	39.28	~~31.35~~ agree	
	39.12	31.29 - 30 - 29 - 29.	

Ariadne on d.

~~35.20~~	~~34.94~~	34.52
~~35.46~~	~~35.07~~	34.80
		7

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1867 June 11 Tuesday

chron 236

Comet 1867 II & W XV 96.

GMS.

. small star in coma observed for comet.	15 6.7	~~33.25~~	
	~~7.9~~	~~33.25~~	
	8.6	30	
		comc. d.	
	10.4	35.25	51.31 comet precedes.
	11.1	34.99	29 comp star on
	11.7	34.98	29 ~~comc with~~ d
	12.6	35.04	28
	14.1	35.08	28

15 19.5 $\Delta\delta = 0$

		comp star on
23.8	75.98	~~comc with~~ e
24.3	76.04	comet south

27.5	35.25	51.29
28.3	29	29
29.0	58	
29.9	65	
31.0	81	
31.8	66	

85.1 } 84.9 used in obsns.
85.0 }

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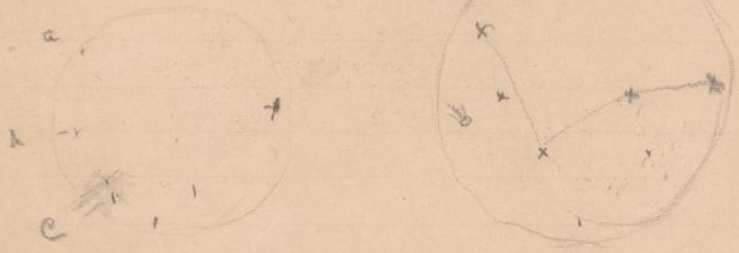
Monday July 1 1867

9h 5-9.5- position angle 21° Coma 48 5-2.5
10 2.0 19
10 3m dist 41.13
41.9
10 7.5- 41 6



position circle 21°
comet precedes north

letters



(3)

(3) precedes (4) ~~and is so~~ about
about a field and a half of the lowest power
and is north about half a field



(4)

dec by finding circle -14°
10h 39.5- hour angle 2h 10m west

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35·70 10h 5·4.0
35· 67
35· 76 10.55·

10 58.5· 10.6
11. 0.5· 4.2

11 2.2 65·69 Cenc 49.0
61 3.6 65 7 5·
11 4.5· 66.82

11h 6m 5· 4.0

23s.5· * 37s.5· * a
37.5·

47
75·

hour angle of mean star a
2h 5·4m 40s at 11h 23m Todstan
Dec — 13° 36'

Comp Star

* a

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JW

Wednesday 1867 July 10

Lunae a very distinct bipartite crater though there was no shadow in it

Stellar focus adjusted to Read 26.9

measures prevented by visitors.

Chron 236 GMS

17	16.3	49.16	Satellite precedes	17	22.5	51.67	Sat north
	18.0	49.12				51.710	

Saturn

19.3	48.09		24.0	50.73	
20.0	48.12		26.0	50.73	
17 31.8	46.41	} c follows	27.2	49.77	"
32.5	.42		28.2	49.711	
33.5	37		29.0	50.83	
			29.8	50.73	
35.0	44.03		39.8	49.45	} d
36.0	43.92		40.8	49.47	
			41.7	49.513	
37.3	45.02		42.0	49.42	
37.8	44.88				

coma

c	d
47.79	48.78
78	77
79	79

Zero of position

85.0
85.0

84.9 used in measures on Saturn.

Power no 3. Seeing not very good.

Star used for zero of pos. chronometric α $15^h\ 5^m$

δ $-15\ 32$

suspected to be double, but seeing too poor to be sure.

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1867phae.proj..293S

July 11 Thursday

Lunæ not well seen. J.W. Seeing rather poor $16^h\ 30^m$

70 Ophiuchi GMS $18^h\ 50^m$ GMS

75.0	parallel to eyes	47.32	48.39
76.4		47.28	43
78.1		47.36	40
78.0		28	37
76.4			

Distance measures unsatisfactory and almost impossible owing to unsteadiness of telescope from wind.

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1867phae.proj..293S

Delta. 21372

1867 July 13

Search for planet (92)

Chron 236

21373

21373 & (1) Δα cos δ (1) follows. JW.

19	46·8	62·48
	48·0	·59
	48·6	·32
	48·8	·58
	49·4	·51
	49·9	·35

(2) & (3) 52·7 55·79 (56?)
53·0 79

(3) & 21373	55m·0	57·56	(3) precedes
	55·4	·72	
	55·6	·50	
	56·2	·60	

conc.
48·91
·93
·90
·90

Δδ
71

20	2·8	50·28	(3) & (2)
	3·2	·95 a	
	3·4	·65	
	4·7	71·50 b	(3 & (1)
	5·0	52	
	5·7	72·43	(3) & 21373
		·31 x	
	6·5	35	

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		Δα	
20^h	35.5	55.61	✱
		.54	
		.69	
		.90	
		.95	
		80	
20	37.6	55.66	

fixed wire on ✱ ©

✱ ✱ just inside the wires d e

✱ (3) appears to be planet (92)

21372 & (92) J W.

		Δδ	
20^h	50·3	58·40	Planet north. Comp. star on wire b.
	51·0	·57	
	51·6	·53	
	52·0	40	
	52·3	61	
	52·8	48	

		Δα cos δ	
		~~58 35~~	Planet precedes Comp. star on wire d.
	59·5	58·66	
21	0·2	41	coinc. 48·88
	0·7	·56	
	1·0	54	
	1·4	51	

25 4″ 5

Δα cos δ with 21373

		Δδ			
	4·5	58·01	13	12·5	60·26
	5·0	·07		12·7	60·10
	6·0	57·82		13·0	60·25
	6·5	·75			
	7·0	·50			
	7·8	·66			
	8·2	·65			
	8·6	·71			

Chron. $0^m.5$ fast by subsequent comparison with clock.

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1867 July 14 Sunday

Transits of (92) and Oeltz. 21372 on Chronograph. J W.
3 wires. Planet precedes.

Chron 23b	$\Delta\delta$ Planet south	Comp. star on wire 5 (e)
19^h $25^m.6$	65.58	
27.0	65.43	
28.6	65.35	coinc. with e
29.3	65.33	73.83
30.0	65.30	.86
31.0	65.20	.88
32.0	65.22	.78 beat.
19 29.07	65.343	.84 just as good
		.84
		.84

Transits over 3 wires.

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1867 July 15 Monday
GMS

Saturn.

Chron 23h		Δδ	Satellite south
17	10·0	67·81	
	11·5	82	
	12·5	76	
	14·0	65·98	precedes
	16·0	66·09	
	18·0	65·94	
	19·8	78·49	follows
	20·8	78·36	
	21·5	78·40	
			stellar focus adjusted
	27·3	76·01	north
	28·0	76·06	
	29·5	76·05	

Seeing too poor for further work.

Planet (92) and Oeltz. 21372 GMS.
Transits over 3 wires. coinc. b.

½ wt	5h 48	78·26	Planet south on b	28·81
	49	·23		83
	49	·64	Rattle at times.	81
		·61		

½ wt to the second set of transits.

Star for zero of pos. circle 85°.0 which has been used in the obsns.

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1867 July 16 Tuesday

Star determined last night 8 (92) Transits over 3 wires

5 MS.

Planet precedes.

Rattle at times

Planet south on a.	comp on a
83·78	23·79
83·99	80
84·04	76
84·19	73
84·05	73
	76

Star for zero 85°.1

85°.0 used in obsns.

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1867phae.proj..293S

1867 July 17 Wednesday

Clouds till 10 P.M.

Search for Comet 1867 II. W & S.

τ Ophiuchi J W. $18^h\ 45^m$

Stars parallel to eyes.	104.9	50.088	49.60
	105.1	.05	.52
	104.3		
	103.7		
	106.5		
mean	105.06		

star too unsteady to measure distances.

70 Ophiuchi ~~J W~~ $19^h\ 0^m$ G. M. S.

Position			
75°.5	parallel	49.38	48.28
77.1		.36	.28
76.5		.37	.19
75.9		.38	.26
75.1		.28	.29
			22

Seeing not good

ε Bootis = dist other side

60°.7	49.37	48.30
62.2	.35	.28
62.7	.37	.22
62.3	.35	.32
60.6	3	

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July 23 Tuesday

Examination of approx. pos. circle. 9 M S about 1 P M

Approx circle	Clamp vernier of accurate circle.		Other vernier
0	179°	56	359° 56′
5		57	56
10		58	58
15		57	57
20		57	55
25		57	57
30		55	56
35		54	55
40		56	58
45		58	58
50		57	58
55		57	58
60		58	59
65		54	56
70		56	58
75		56	57
80		56	57
85		56	58
90		58	58
95		57	58
100		61	59
105		60	61
110		58	57
115		56	56
120		60	62
125		60	62
130		58	57
135		59	60
140		59	61
145		60	60
150		59	57
155		60	59
160		59	56
165		60	58
170		59	57
175		59	57

Approx circle	Clamp vernier of accurate circle		Other vernier
180	359	58	179 57
185		57	55
190		59	58
195		61	56
200		61	57
205		58	55
210		61	57
215		57	54
220		58	57
225		61	58
230		59	56
235		60	59
240		56	56
245		59	57
250		56	54
255		59	59
260		59	59
265		58	58
270		58	58
275		57	57
280		58	56
285		60	58
290		57	56
295		58	58
300		58	57
305		58	59
310		59	58
315		58	58
320		57	57
325		59	58
330		56	56
335		57	57
340		57	56
345		55	56
350		58	59
355		56	55

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July 23 Tuesday. GMS

Saturn

Japetus ?

Chron 236

16	53·5	72·71	Sat precedes conic. e.	Comc
	55·2	75		73·79
	56·0	75		78
	58·8	54·46	north	79
17	0·0	31		
	0·6	33		
	1·5	40		

Comet 1867 II.

Δδ +

17	44·3	56·66	Comet north conic. b	Comic
	48·2	1·21		28·89
	49·0	[2·83]		88
	51·0	1·65		
	52·5	2·00		
	54·5	3·10		
	55·5	3·05		

Δα cos δ −

18	0·5	16·79	Coinc d
	2·0	17·18	
	3·3	17·73	
	5·0	17·28	
	6·5	17·61	

Δδ +

18	9·5	2·85

. . .

Comp. star 9.10 mag. the preceding of 3, precedes Oeltz. 15 192·3
about 3^m 20^s about 120' south of it.

Rough estimate with finder.

(Approx pos. therefore about 15^h $54^m.0$ −18 30'
Comet 15 53·6 −18 25

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July 23

Planet 92 ? and Oeltz. 21256.7	Δ δ	Ratio at times
	80.93	Comp on ω.
Planet north.	81.09	
2. Transits over 4 wires.		Planet? follows
	81.00	"

Oeltz. 20429 & Alcmene

Planet south	21.60	comp. on e
	21.83	
Planet south	21.75	Star runs well on wires.

3 transits over 3 wires. Last tap on planet bad.

Planet follows. Planet very faint throughout.

Conc a	e
23.74	73.80
.72	82
.76	79

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July 24 Wednesday

Comet 1867 II & Oeltz. 15174.5 G M S

Transits Comet precedes. Very faint.

30·50	Comet on e.	Comc. e.
31·14		73·85
32·71	Rattle at times	83
31·32		84
31·48	Comet north.	

Transits

Comp. Star for zero of circle 85·0 which has been used in obsns.

μ Herculis (components of comparison 70.0 Power no 3.

18h 15m 67.0 4 not so good

Measures made with extreme difficulty from great altitude of star. 71·8 3
72·0 "
67·2 "

Stars parallel to eyes.

Alcmene and a star 8·5 mag. about 13's p 13s, Oeltz. 20429.

Chron 236	Δα cos δ	Planet follows.		Comp. on a.
19 19·3	68·66			
20·8	68·76			
21·5	68·66	19 27·0	59·07	Comp on c.
22·5	68·60	28·4	59·54	Planet north
24·0	68·35	30·0	59·62	
		31·7	59·55	
		33·5	59·58	

Haze

		Comc. c	a
41·5	67·81	47·83	2377
43·0	67·59	·85	77
		·83	77

Planet (92) looked for. but haze prevented mensures. Region seems to have been mistaken last night.

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1867 July 26 Friday

chron 236 Comet 1867 II & Oeltz. 15206·7·8·9.

17	45·5	52·87	Star on b comet follows
	47·5	·91	
	48·5	·91	G M S.
	49·8	68·04	Star on e comet south
	50·7	67·92	
	51·5	68·13	Comet generally well seen.
	52·4	67·76	
	53·4	67·60	

comic	b	e
	28·91	73·85
	88	85
	88	87

18	3·7	54·65	glimpse between clouds
	7·0	54·13	better.
	9·0	54·66	

better illum

82	86
83	82
83	85

10
) 1500"
15"

Comp. star for zero of pos. circle 85°.1
85·0 used in obsn

Set on μ Herculis but found the seeing too poor for measures.

Alcmene & Oeltz. 20384·5" G M S.

Δδ Planet north		Comp. on b.	Δδ
85·41	Rattle at times		85·61
·46		Transits 4 wires.	·73
·62		Planet follows.	·48
comic b.	Zero of pos. circle	84·7	
28·81		85·3	354°.8 used in transits.
·80		85·1	

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79.10
78.86
79.20

another following
74.48
69.52 } α

Long rattle about 1m after last comp.

Transit of comp. and three suspected over four wires.

Planet observed on last page second in order of α.

Another transit interrupted by clouds.

Planet (92) identified but persistent clouds in region prevented obsn.

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1867 July 28 Sunday GMS

Transit of β, Scorpii & Comet 1867 II over 4 wires.
Clock going perhaps driving the telescope a little.
Δδ Comp. on e Comet north

Clock stopped | 76·88 ½ wt
76·71
76·37

Rattle at times.

Telescope clamped in α to prevent disturbance by wind

2 Transits over 3 wires.

Δδ	comc
75·49	73·83
	82
	80

Region of Alcmene July 26 examined.
The preceding of the three stars was the planet.

Planet (92) and Oeltz. 21250·1

Chron 236

20	6·5	46·67	planet precedes. Comp on c.
	7·5	46·59	Δα cos δ
	8·5	46·61	
	9·5	46·42	
	10·8	38·77	Δδ " south " " e
	12·5	38·64	
	13·5	38·71	
	14·5	38·44	
	15·5	38·55	

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			coinc. c.
20	17.5	46.09	47.82
	18.8	46.10	81
	19.8	45.94	85
	20.7	45.83	83

Alcmene & Oeltz. 20384.5

Planet preceds. 2 Transits over 4 wires. Tel. clamped in α for 2d

Δδ Planet north ~~south~~ on e.

53.30
53.34
53.54
53.63
53.66

Comp. star for 0 point 84°.9 (85.0 has been used during work)

2 Transits 4 wires. Tel. clamped for 1st.

Chron 236

20	55	30
		35
		40
		45
		50

28.30
14.70
2 46 14.7
1 66

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1867 July 30 Tuesday

Identified Nebula found by J W in search for comet.

Precedes W XV 12 $1^m 8^s$ 1/10 of field of power no 2 north of it.
H. 405 I

Nebulae found July 1 by J W.

precedes W XV 91 about 30^s 3' south of it. H 4063

" " " 122 about 36^s 1' V north of it.
42/100 of field of no 1.

J W. Found to night one preceding W XV 37 about 25s nearly on the same parallel.

Set for μ Herculis but found the seeing too poor.
Wires a b c removed from micrometer today. (a broken out accidentally last night.)

Star for Zero of pos.		conic. d.
	82°.5	49.47
	82.6	45
		40
		50
		48

Alcmene and a star about 8 mag. J W. Planet s. f.

Chron 23b	20^h	$12^m.0$	16.46
		13.3	39
		14.5	45
		14.8	23
		15.2	24
		15.4	43

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		$\Delta\alpha \cos\delta$	
20	18·5	69·35	coinc.
	20·2	45	49·46
	20·6	49	50
	21·0	33	
	21·6	32	
	21·8	20	
	25·0	15·88	
	25·3	·95	
	25·8	·99	

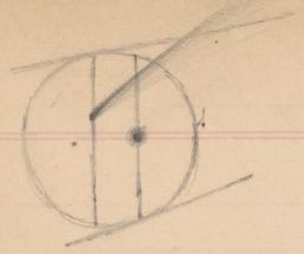
Planet (92) and a star 8·5 mag. JW.

		$\Delta\alpha \cos\delta$	Planet precedes.	Comp on d
20	39·8	33·25	48·1	32·06
	40·2	·42	48·6	32·95
	40·8	·49	49·2	·83
	41·4	·35	49·5	90
	41·8	·32	49·8	88
	42·0	·34		
	42·4	30		

		$\Delta\delta$	Planet north. (on e or d?)
20	43·5	29·35	
	44·0	36	
	44·7	55	
	45·5	57	59 20
	45·6	56	
	45·8	48	
	46·4	60	

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1867. July 31 Wednesday

Comet 1867 II & Oeltz. 15437 GMS

			Δa cos δ	
chron 23h	18	13·5	42·18	Comet precedes.
		14·5	42·11	
		15·5	42·26	star on d.
			coinc	
			49·38	
			·42	
			Δδ	
		19·0	33·71	Comet south
		20·8	33·89	
		21·5	33·61	star on e

J W.

		coinc - d.	e
25·8	33·98	49·41	74·59
27·0	34·02		·61
28·2	34·58		59
28·9	34·21		
29·8	34·15		

	Δα cos δ
33·2	44·34
34·0	43·71
35·0	43·95

which has also been noticed on previous nights.

Both observers remark the cluster-like or granular appearance of the comet. (A small star possibly also mixed up in the coma. GMS.)

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τ Ophiuchi. J W. ☉ $19^h\ 0^m$

279.5 Measures discontinued, the seeing becoming poor.

~~Trifid nebula $17^h\ 54^m$ $-23°\ 2'$ J W.~~

Measures and comp. star of last night J W.

	Planet precedes.	Transits. $\Delta\delta$	
Chron 23b			
20	28.0	27.43	Comp. on e. Planet south
	29.2	44	
	29.7	25	
	30.3	.10	
	30.7	.44	
	31.0	.20	
	31.2	.23	

Planet (92) and comp. star of last night.

	Planet precedes.	Transits. $\Delta\delta$	coinc.	Planet south.
20	51.8	59.27	~~XX~~ 55	74
	52.2	47	58	
	52.6	28		
	53.3	49		
	53.7	35		

Transit of Oltz. 21152 and comp. star over three wires G M S.
Comp. star follows exactly 25 rev. or de nuth.

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1867 Aug 2 Friday

Oeltz. 20281·2 and Alcmene 9 M.S.

Δδ	
62·30	Planet south; comp on e.
·26	Rattle at times.
	coinc 74·52
	·53

2 Transits over 3 wires.

Δδ
62·24

Comp. star for zero of pos. 82·5 coinc. 74·50
which has been used.

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1867 Aug 4 Sunday

$17^h\ 20^m$ (AB) ξ Librae I W. Principal star well separated. Seeing very fine.

Images round and distinct with a power of 861.

Power of 401 used in measures.

5.5
5.1
4.9
5.4

Power 861

	double dist.	
5.5	49.57	49.35
	55	34

Clouds prevented further measures.

Occultation of θ Virginis obscured by clouds.

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1867 Aug 5 Monday

ξ Librae 17h 30m GMS

			2 dist	
Power of 861	8·0	parallel to eyes	49.41	29
	7·8		39	31
	8·6		41	29
			403	·297
	6·7	perp. to eyes		·052
	5·0			
	8·2			

JW

49·28	49·21
26	·41

Antares. 17h 52m JW

88·0	comp. precedes	49·12	49·62
86·0		49·14	49·62
86·2		49·10	49·58
86·0			
85·2			

μ Herculis JW

74·5
81·3
~~81·8~~
83·2
79·5 best

GMS
81·7 very poor measure.

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167 Herculis JW 325·5 Rough without illum.
Comp. ~~north~~ south.

330·3
333·2
333·0
329·8
333·7
} 5 illum. Good measures.

Conc
49·45 49·375 large ~~XX~~ measure.

ζ Herculis inseparable ~~through~~ the seeing is good.
Most probable direction 305 comp. ~~north~~ south.

η Coronae JW. 19h 30

315·9
315·0
315·0
315·5
313·2

49·51 49·30
52 31

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1867 Aug 6 Tuesday

ζ Sagittarii found to be double by JW: Star well separated
distance estimated ~~about 0".75~~ (from 0".5 to 1".0)

	95.5			
	94.0			
18h 0m	94.3		49.44	49.25
	93.4	Power nw 5.	43	.27 best.
	97.5	Components about equal		
	94.6			
		Sky generally cloudy		
GMS				
86.5			49.42	49.32
			41	31

JW
91.0 smallest possible

Aug 7 Wednesday

			2 dist	
Antares	JW	80°.4	49.57	15
		74.5	57	14
		74.2	570	145
		80.3		
		82.0	dist 0.212	
	mean	78 28		

ζ Sagittarii beautifully divided.

Lunae well seen. Shadow in bottom not covering the whole, small shadow outside on following side. The preceding crater similar to Lunae well seen.

Measures of diameter of Lunae.

49.54	.49
.39	.38

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Aug 9 Friday

ζ Sagittarii G M S 18^h to $18^h\ 40^m$

Star separated, but seeing not good enough for measures.

μ Herculis companion $19^h\ 10^m$

72.2
77.9 } Power no H. Measures not very good.



Drawing of ζ Sagittarii by Mr. Alvan Clark Sen. at his observatory.

Aug 11 Sunday

ζ Sagittarii $80.^\circ 7$ G M S

Seeing too poor for more measures.

Small companion suspected 2" or 3" preceding.
Detected independently by E. Winslow.

Aristarchus

Streams entirely disappeared. Line on which they converged as distinct as ever, tangent to crater of Herodotus. Small black spot above the crater of Aristarchus.

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Aristarchus a more careful drawing $18^h\ 50^m$



The streams not visible nor the cones in the crater.

Planet (92) and Oeltz. 21103 Planet s p.

G M S.

Comp. star for zero of pos. Tel. ⊙ of stand. 82.7
Transits over 3 w. also a double star s f. the planet 82.7
observed.

mean of double star 36.75 on mic wire. south of planet

comp 73.05
72.83
73.43
73.14
73.25

} Rattle at times
Planet south on ~~fixed~~ wire.

h 3007.

Transits over 3 w.

conic.
49.43
34
39
37
37

Aug 12. J. W. examined Aristarchus
three Cones visible in Crater. the streams partially
visible but extremely faint.

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Aug 13 Tuesday

Saturn 1 satellite GMS.

Chron 236

17 35·0 $\Delta\alpha = 0$

Sat 2

36·5	51·64	foll.	
37·2	51·78		
38·6	51·52		
50·1	52·46	foll.	
50·8	52·53		
51·7	52·58		
52·3	60·41	foll.	
52·9	60·44		
54·0	60·51		

40·0	46·51	~~north~~ south
40·6	46·52	
41·5	42	
42·5	47·36	~~north~~ south
43·5	47·43	
44·0	47·44	
44·8	50·30	~~south~~ north
45·4	50·35	
46·0	50·29	

Titan

47·0	44·13	south
48·0	44·09	
48·5	44·09	

coma.
49·32
31
31

Antares $18^h\ 0^m$ Companion preceding, very conspicuous.

GMS

265·5			
263·0			
266·8			
			Comic
90+ 174·2	48·94	49·63	·31
174·3	94	·69	
175·9	96	68	
	947	·667	

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1867 Aug 17 Saturday

Search for Comet 1867 II. Rather too much moonlight.

Star 19 5 56 −29° 24′ 8 Mag
the s.p. of two. double about 1″ Pos appm 89°
faint comp. preceding.
about 10 mag G M S.

Comparison South ⊥ perpendicular to eyes

#					
h 5113	179°.8	90°+91.0	dist. 47.57	Coinc. 49.34	G M S.
	179.8		47.50	49.36	
	180.3		47.55	49.34	

Assm. tim 1940 m
Circle 0 20

---

19 58 −23° 17′ a 6 mag with a 13 about 25″ south of it.

Oeltz. 21004-5 and Undina (92) JW.

Transits over 3 wires. Planet follows.

Δδ Rattle at times. Planet north.

	coinc.
94.45	49.49
.42	41
.10	45
.53	42
.35	40
mean 94.370	49.434

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1867 Aug 18 Sunday

Comet 1867 II. G M S.

Transits ~~wire~~ of Oeltz. 15910·1·2 and two comp. stars over bar mic.

Transits of comet and the ~~southern~~ northern comp. (only the last two of any value. Comet south of diagonal. Star north.

Transit of Oeltz. & this comp. again.

Oeltz. over whole diagonal.

Same again.

Aug 19 Monday

Telar micrometer replaced.

Oeltz. 21004-5 and Undina (92) G M S

Comp. star for zero 263.°9

2 Transits over 3 wires. Planet follows.

Δδ Rattle at times	Planet south
63·28	74·37 (corrected)
31	37
33	34
26	39
37	37

2 Transits over 3 wires.

Comp. star for zero 263°9

Aristarchus. Streams perhaps as conspicuous as ever; seeing however poor.

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1867phae.proj..293S

Aug 20 Tuesday

ζ Sagittarii $19^h\ 10^m$ 9 MS

260.0
257.5
256.4 ½ wt

} Seeing not very good.

Faint companion preceding strongly suspected on first looking at the star; afterward not quite so plain.

Oeltz. 19003-4 double. comp precedes, 8.5 mag. calling princ. star 7.

		coinc
90 + 316.9		
317.9	75.24	74.40
318.8	75.19	40
319.0	75.24	38
		40
229.0		

Oeltz. 21004.5 8 (92)
9 MS

Transits over 3 wires.

Comp star for Zero 264.0

Rattle at times
8 lanes south

		coinc.
35.47		74.40
48		42
22	very faint through clouds.	43
81		44
		43

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Aug 21 Wednesday

Seeing too poor for ζ Sagittarii,

Oeltz. 21004-5 & 92

Planet precedes. 2 Transits over 3 wires.
Star for zero 264°0
Δδ Rattle at times. Planet south on fixed wire, Star on mic.

	coinc.
11·27	74·45
11·17	45
11·35	45
11·18	41
	45

Aug 25 Sunday

Planetary nebula h 2047 $19^h 36.^m5$ $-14° 28'$ JW.

$20^h 0^m$ Satellite following 288·6
~~284·5~~
288·5
288·5

Satellite preceding 241·1
240·2
228·2
238·6

" s. p. 143·8
140·5
141·0

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1867phae.proj..293S

Aug 26 Monday

~~70 Ophiuchi~~

ζ Sagittarii 18^h Preceding component perhaps somewhat the smaller. (W & S.) Faint companion preceding strongly suspected (W.) Seeing not good enough for measures.

70 Ophiuchi $18^h\ 40^m$ JW.

267.5	Parallel to eyes.	Comp. fol.	Power no 3.			
268.5						
269.6	49.42	51	.49			
266.4	48.50	56	55			
268.0						

τ Ophiuchi 18 50 Power no 4. JW.
Comp. Preceding, probably the smaller.

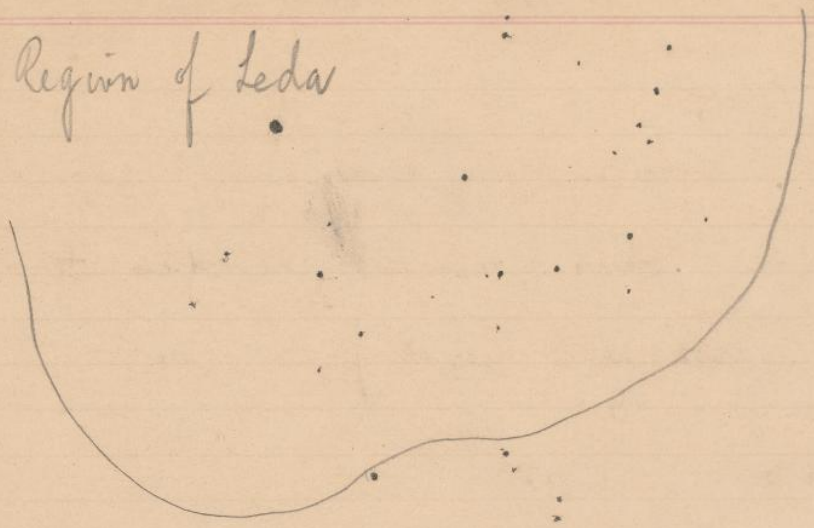
304.1						
306.2						
305.2	49.18	49.16	49.18		17	.16
304.6	48.82	48.81	48.86	.87	.84	85
305.2						

Neb. Auw. no 44. Diameter 1'.5; some stars about 20° preceding also somewhat nebulous. W. & S.

h 2037
Planetary Neb. ⅛ of field of lowest power faint disc well defined except on n.p. side appears fainter toward n.p. side.

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Planetary nebula. h 2047 and W XIX 925

Nebula n. p.

	Δ δ
	~~59.70~~
	~~.74~~
21h 30m	.85

Zero of position found to be wrong, the circle having slipped.

Circle brought up firmly, and zero determined

261.0

Δ δ		Δ α cos δ	
47.02	mic. on star.	93.56	mic on star
.19		.84	
.18		.70	
.11		.80	
.03		.72	
		.58	
coinc d.		coinc d	
~~49.49~~		~~74.53~~	
.42			
74.53		49.49	
		.42	

Satellite n preceding 222.2
222.2
222.2

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Aug 26 Monday

Oeltz. 20940.1 and (92) G.M.S.

			coinc
Zero	261.2	99.52	49.43
	261.0	.72	43
		.57	40
		.57	39
Planet n.f.		68	43

3. Transits

Aug 27 Tuesday G.M.S

Nebula 4407 = h. 3744 Neb precedes Oeltz. 18197.

	Δα	Δδ	Coinc
Nebulae north	41.54	59.18	49.07
	41.60	59.03	48.99 ?
	41.79	59.02	49.07
much brighter in middle almost stellar nucleus	41.85	59.09	49.09
	41.83	59.05	49.05
	41.78		49.08

Telescope unsteady in α owing to wind.

W XVIII 85 = planetary neb Σ 6

Greenish color G.W.

W. XVIII 92 Nebula South Neb precedes

Unsteady

Δδ	Δα	Coinc
45.66	27.33	same as above
45.68	27.25	
45.63	27.34	
45.70	27.25	
45.65		

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h 2075 Faint Unequally brighter Preceding side the fainter. JW.
Compressed with * by G.M.S

		Δα	Δδ	Come
Neb. follows	} of a small star 10 mag.	48ˢ.9	44.45	as before
" South		48.67	44.36	
		48.70	44.23	
			44.38	
			44.28	
			44.28	

Planetary nebula h 2098. Examined with powers 137 & 4 by
JW. Projection on each side in nearly an equatorial direction
the projections or rings are very light nebulous matter.
the ellipticity very decided. these features are much more
distinct with the high power.
To G.M.S. appearance of ~~elliptic~~ brighter elliptic globe with nebulous
Power no 4 matter placed upon it and a star inside, seen nearly
major axis of ellipse about = diameter of globe.
edgeways. direction of major axis of ellipse 277°.5 — rough without micrm.
A very faint satellite on ~~preceding~~ following side a little above the
ring.

Search for Leda. A very faint star of last night perhaps disappeared

Oeltz. 20940.1 & Uranus

				Planet north	Planet precedes		
21	17.3	79.27			21.6	60.66	49.10
Chron 236	18.2	25			22.5	60.71	08
	19.0	13			23.3	60.60	08
	19.7	11			24.0	60.81	09
	20.3	14			24.6	60.72	07

Zero 261.0 has been used.

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Aug 27 Tuesday

$22^h\ 6^m.2$ 76.55

Found a 12 mag. star about 1' south of the B.J. place of Leucothea and made the above comparison in α ~~Tau~~. It with a star s.p. (corrc 49.08) but clouds came up and prevented further measures.

Comp. of Chron 236	22	26	0.5
South Clock	22	23	0.[illegible]

Aug 28 Wednesday

ζ Sagittarii 262.0 Power no 4. 9 M S

Measure not repeated, seeing not being good enough

JW. π Capricorni double and probably triple. thus



Search for Leda. interrupted by clouds.

Aug 30 Friday

Transits of foll. Oeltz 20180 and Leda.

Δδ prec.	foll.	
	69.31	Transits of 1st hyp. planet & Comp. star. Planet follows. Another star preceding afterwards suspected.
68.80	69.37	
68.52	69.18	Planet north
68.59	69.20	
68.67	69.43	

Two transits of both.

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Two transits of a third. intermediate in α.

Δδ			comc.
73.62			49.09
73.68			07
73.30		261.3	05
73.25		261.4	04
73.51	Rattle at last.	261.1	.06

1 Transit of the two. first suspected.

Star of Aug 27 was Leucothea. Transit of W XXIII 566 & Comp. star of Aug 27 over 2 wires.

Planet 93 & W 0 23

Chron 236 (has been put back 1 and seconds altered.)

a	23	46.5	18.37	b	23	48.8	26.54
		49.7	17.96			53.0	25.95
	preceds	50.5	17.92		preceds	53.7	26.26
		51.3	17.95			54.2	26.42
		52.0	17.87			55.0	26.47

Comp. of Chron. with S. Clock.

0 24 18 Clock
0 24 15.5 Chron

a		57.2	44.25	b	0	0.5	39.52
	south	58.0	44.30			1.1	39.68
		58.7	44.06		south	1.7	39.48
		59.5	44.16			2.0	39.38
	0	0.1	44.14			2.6	39.52

							comc.
a		5.0	17.10	b		8.5	26.32	74.20
		5.8	17.10			9.0	26.38	19
		6.3	16.98			10.0	26.30	15
		7.0	17.13			10.5	26.39	22
		7.5	17.06			11.0	26.26	21
								.21

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Aug 31 Saturday.

Seeing not good enough to separate ζ Sagittarii.

π Capricorni JW. Principal companion very well seen.

Close companion also quite certainly seen.
Direction about 75° ∠ from that of other companion JW.
" 90 S M S from memory.
" " confirmed by inspection.

Principal companion

S M S.
19h 45m
Power no 5.

	200.4	comp. south.
	203.1	perp. to eyes.
	202.7	
	205.0	
	203.7	
90+	294.3	73.80
	296.6	82
	303.0	74.51 faint.
	295.9	47

too faint for more measures.

coinc.
74.14
.13

Principal compan. 10 or 10.5 mag.

71.29
71.40 Oeltz. 20180 & Leda.

21	9.5	93.80	follows	16.5m	68.67	north	25.3	93.39
	10.5	93.70		17.5	68.21		26.2	93.47
	11.4	93.85		19.0	68.61		27.0	93.16
	12.0	93.83		20.0	68.48		27.8	93.48
	13.0	93.79		21.0	68.72		28.5	93.66
				21.9	68.59			
				22.9	68.43			

Zero 261.1
49.02 04 02 05
06 06 03 03

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Sept 1 Sunday

Suddenly cleared at 20^h sid. t.

π Capricorni JW 20 30 Seeing indifferent.

Oltz. 20180 & Leda. GMS.

Chron 236			
21 40·0	55·27	foll.	
40·5	·34		
41·1	33		
42·2	33	coinc d	49·09
42·8	·46		06
			05
45·4	67·98	north	08
48·0	85	faint through clouds. ½ wt.	·05

Further measures prevented by clouds.

Leda − 43·5 + 3 15 of 20180 at 9½ Sept 3.
1 4 of 20175

Sept 12 Thursday

Occultation of λ Aquarii GMS.

		Chron 236	
Immersion	22	43	5·8 ± 0·3
Emersion	23	51	37·5 ± 1ˢ

Streams & bright points in crater of Aristarchus as ~~bright~~ Main as ever, through perhaps not as bright.

Sept 13 Friday. Too cloudy to observe eclipse. JW.

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Sept 14 Saturday

Immersion of 10 Leti lost through haze.
Emersion 20 16 55 ± 2^s Star very faint. } G M S.
Chron 236

Sept 15 Sunday

B A C 408 could not be followed up to immersion owing to faintness through haze.
Chron 236
Emersion 23 36 37 star first seen; may have come out sooner, the sky being somewhat hazy.

Sept 18 Wednesday

48 Tauri Immersion 4 2 24 ± 1^s Chron 236 G M S.
Emersion obscured by clouds.

Sept 19 Thursday

Zero of pos. 81.7
81.7

Leucothea & W XXIII 338
2 Transits over 3 wires. G M S.

		coinc
Planet south	59.10	48.96
on d.	58.99	96
	59.26	93
	59.08	93
		94

Planet greater,

2 Transits.

Zero 81.6

Mcd. removed

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Sepr 21 Saturday

Star observed in α and δ by mistake for (93); Transits of (93) afterward taken; Δδ prevented by clouds. Comp. star W XXIII 891

Zero. 81°.0
.0

Sepr 22 Sunday

80.6 Zero. Planet (93) and W XXIII 891
80.7

Planet pr,
2 Jr. over 3 w.
Planet south on d. Rattles.

	conc.
92.30	48.85
92.10	84
92.37	82
92.47	83

Zero 81.0
80.8

W XXIII 199 Δ Leucothea

Planet north

98.52	48.81
98.59	83
98.28 ½ wt.	84

Transits Planet follows

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Sept 23 Monday

Search for Proserpina. Region charted.

W XXIII 199 & Leucothea

2 Transits over 3 w.

82.02	48.84	Planet north. foll.
81.74	81	
81.64	83	
81.63	82	

Sept 24 Tuesday

Zero 81.0
80.8

W XXII 797 & Proserpina

56.54	Planet north.	48.84
.32		81
.47		80
.38		80
.28		79
.42		.78

3 Tr. over 3 w. Planet foll.

W XXIII 199 and Leucothea,
3 Tr. over 3 w. P. foll.

64.22	48.82	
.01	82	P. north.
.11	77	
63.95	84	
63.83	83	
63.94	84	

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W 0 726 & Themis. 2 Tr. over 3 w. Planet foll.

62·21	48·85
08	83
21	80
·09	84

Planet north

2 Tr. over 3 w

W 0 800 is a pretty double comp about 9° north. dist 9″ = Σ 71.

Zero of prs 80·7

Sept 25 Wednesday W XXII 197 & Proserpine

Chron 236	Δ δ	P. south			foll.	coinc.
23	51·7	42·99	0	0·0	53·93	48·85
	52·5	42·84		0·8	54·06	86
	53·1	42·86		1·5	53·90	88
	54·0	42·79		2·2	53·90	85
	54·7	42·78		2·9	53·84	85
	55·7	42·83		3·7	53·74	87

W XXIII 199 & Leucothea

0	12·2	82·51 foll	0	19·8	46·38 south	48·85
	13·6	82·47		20·7	38	82
	14·7	45		21·3	42	83
	15·5	13		22·2	48	84
	16·4	30		22·9	41	84
	17·4	10		23·4	47	83

W 0 726 & Themis

35·59	south
·66	
·58	
·63	

Zero of prs 80·8 81·0

3 Tr. over 3 w.

48·89
84
86
84
84
85

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Sept 27 Friday

Micrometer removed and replaced. Zero 78.8
79.0

~~Prosrpina and W XXII 797~~

Nebula noticed with comet seeker and place obtained with equatorial $22^h\ 22^m - 21°\ 30'$

Round, dark in the middle, brightest on northern limit. Quite faint. About 10′ in diameter. G.M.S.

Proserpina and ~~W XXII~~ 797.

Planet south on d.

78.00	2 Fr. over 3 w. Pl. fr.
77.73	
77.69	48.81
78.01	80
77.85	84
	81

~~W XXIII~~ 142 & Leucothea

3 Fr. over 3 w. Plan. foll.

79.14	" north
79.21	
79.13	
78.96	
79.15	

W I 827 and Daphne. I Fr. of W 827 and a b over 3 w
II "

a over last 2
b " all 3
c " last 2

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Zero 78.7

a	b	c all north	
67.02	72.30	64.39	Rattle about 20^s too late
07	.25		" " "
66.80	.28	64.90	
	.43		48.83
			87
			81
			84
			79

Transit of W 1827 & a b c over 3 wires.

Dumb-bell nebula 19^h 54^m + 22° 22'
examined with spectroscope by JW.
Spectrum found to consist of one faint broad line.

Sept 28 Saturday
Mic. removed and replaced
Capocci's nebula again examined. Precedes υ Aquarii 5^m.1 8' south of it.

Zero 78.5
78.2
78.5

Proserpina &	87.83	2 Jr over 3 w.	comic
W XXII 197	.69		49.00
Planet south	.52		4894
on d.	.62		96
			95
			91
			97

W ~~XXIII~~ 142 ~~199~~ and Leucothea

	64.33	
3 Jr over 3 w.	63.90	Planet north
Planet fell.	64.13	
	.00	
	.16	

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W 0 226 and Eugenia

chron 236 •

0	39·5	61·07	foll.	0	45·2	78·11	north	48·96
	41·0	61·12			46·1	19		98
	41·8	61·00			46·7	13		97
	42·5	60·98			47·4	13		99
	43·1	60·85			47·9	77·98		97
					48·7	78·12		
					49·4	19		
0	54·8	60·29			50·0	77·97		
	55·8	60·21			50·5	78·05		
	56·8	29			51·3	77·99		
	57·5	19						
	58·2	29						

Neither a b nor c of last night was Daphne.

Zero 78·6 (78·5 has been used)

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Sept 29 Sunday

Double found by J W 22h 2m −2° 41′

Pos. about 40° N to E. Dist. about 5″. J W.
Mags. about 9 & 10 "
9.5 & 10 G M S.

Zero of prs 78.0
78.4
78.2
78.1

Leucothea & W XXIII 142 G M S

22	29.4	35.74	prec.	22 38.0	49.62 north	48.96
	31.1	36.10.		39.5	.81	94
	32.5	35.94		40.5	.63	90
	33.5	36.06		41.8	.70	91
	34.7	36.10		43.8	.69	91

47.7	35.21	Planet faint through haze.
48.7	.23	
49.2	.13	
50.0	34.98	
50.8	35.09	

Eugenia and W 0 226.

3 Tr. over 3 w. Planet prec. ~~last occurs~~

57.60	Planet south on d.	48.94
57.48		93
.46		91
.56		91
.72		90

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Obsn. of Eugenia lost owing to chronograph stopping.
Tried again

Δδ	
58.75	
.16	3 Tr. over 3 w.
.10	
.22	1 Transit of a star north and a little following the planet.
.33	

Sepr 30 Monday

Zero 78.1
78.1

Leucothea ☌ ☿ XXIII 142

Planet south on d.	63.18	48.93	3 Tr. over 3 w.
	62.98	94	
	62.91	99	Planet extremely faint.
	63.35	97	
		97	

☿ o 226 ☌ Eugenia

2 Tr. over 3 w. 97.52
.48
.41

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• W I 827

Aglaia & W I 828
3 tr. over 3 w. Planet prec. 2 stars prec. the planet observed in 1st two transits

Δδ	34.04	
Planet north	.38	74.10
or e.	.42	04
		02
		04
		06
		05
		05

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Daphne & a 10 may star n. f.

2	~~0.0~~	~~46.11~~	2	6.4	29.00 south
	1.3	46.32		7.1	29.02
	2.0	46.19		7.8	12
	2.7	46.38		8.5	28.96
	3.5	46.10		9.0	29.08
	4.3	46.33		9.5	28.87
				10.5	28.82
				11.2	28.82
				11.8	28.82
				12.5	28.65

16.0	45.57
17.0	45.61
18.0	45.35
18.8	45.33
19.5	45.42

comp. star precedes W I 827 = ξ Piscium $1^m\ 36^s$ s 131.80

" I 803 $0^m\ 43^s$ n 121.37

giving for 1867 1 45 4 + 2° 10' 16"

W I 803 has α 10^s too small in zones & catalogue.

Zero 78.1

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1867phae.proj..293S

Oct 1 Tuesday

Zero 259.1 Tel. W. of pier.
259.3
254.3

W 0 477 & Massalia

a	b	both north coinc.
94.83	87.10	48.93
86	.25	98
.82	.17	94
		97
		98
		97
		.93

2 Tr over 3 w. a & b both fail.

Another transit afterward

a afterward found to be the planet.

Lutetia & W 0 954

3 Tr. over 3 w. plan. prec.

A small star prec. this planet also observed in the 2d & 3d.

Planet north on e.

38.14	74.04
.34	06
.32	06
.43	04

Daphne & W I 803

Planet north on e.

17.02	74.07
.01	09
.19	03
.28	04
	07
	.04

3 Tr. over 3 w. plan. prec.

Zero 259.2

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Oct 2 Wednesday

W 0 477 & Massalia

2 Jr. over 3 w.

53.60 north	48.93
.38	90
.64	91
.47	92
.23	.93
.46	

Daphne & W # 784

24.82 north on e.
25.12
24.57

4 Jr. over 3 w.

4[s] following 10" south of the planet is a pretty triple star pos. ~~80~~ ~~N~~

	dist	Mags	
118.5 N to S	2"	9.5	
200	12"	11	11.5

25.52
25.73
25.72

Zero 259.2

Comic.
74.02
05
03
00
02

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1867phae.proj..293S

Oct 6 Sunday

Mic. removed & replaced

Zero 258·1
·3
·1

W O 402 & Massalia.

60·46 north 48·97
58 96 3 tr. over 3 w. plan. foll.
·61 97
·34 96
·42

W O 832 & Lutetia

W O 818 probably = 832. not being visible.

3 tr. over 3 w. 85·93
plan foll. 86
3d tr. of comp. just precedes 98
1st tr. of planet. 69
·76

W II 305 & Leto

2 Tr. over 3 w. 3 stars a b c obsd. for planet.

a	b	c	all south	
49·59	40·14	45·16	comp. on c.	coinc. 74·14
52	39·98	20		13
64	40·03	32		14
				13
				10

2 Tr. over 3 w.

Zero 258·2

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Oct 7 Monday

Micrometer removed & replaced

Zero of pos. 257.8 } 9 M S
.9 }
.7 } W M D
7 }

W 0 397 & Massalia W M D
Chron 236

23	28.1	75.74	foll.
	29.3	76.17	
	30.0	75.98	
	30.9	75.86	
	31.7	75.86	
		75.922	

23	34.8	86.98	north
	35.8	87.03	
	36.4	87.26	
	37.0	86.95	
	34.7	86.84	
	38.5	86.98	
	38.9	86.98	
	39.7	87.02	
	40.7	86.84	
	41.7	86.85	

23	44.0	74.97	corrc.	74.16
	45.0	75.06		19
	45.8	75.11		16
	46.3	74.74		20
	47.3	74.72		.16
		74.920		74.174

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Lutetia & W 0 832 W M D

3 Jr. over 3 w. Planet prec.

Δδ Planet north		coinc.
47.07	} Rattle also on comp. star	48.94
.01		99
.05		99
.12		49.00
.00		.01
		.00

W I 680 & Daphne G M S.

2 Jr. over 3 w. plan. foll

40.32 south.
25 comp. on e.
24

2 Jr over 3 w

W II 305 & Leto

	45.98 south.	74.13
	46.13	11
Zero 257.8	.14	12
		15
		11
		17
		16

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1867phae.proj..293S

Oct 16 Wednesday

Immersion of Rumk. 1283 observed on chronograph
± 2ˢ star very faint

Zero of pos. 258·2
·0
·0

W I 556 and Daphne

100·60 Planet north.
100·32
100·14

3 Jr. over 3 w

99·61
99·72
99·57

Emersion of Rumk. 1283 probably 0ˢ·7 too late.

Oct 17 Thursday

Comc. for obsn. of Daphne last night.
48·87
86
81
82
84
84

Immersion of 130 Tauri by chronograph. G M S
± 2ˢ moon's limb very wavy
Zero of pos. W M D. 78·2

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1867phae..proj..293S

Oct 17 Thursday.

W I 556 and Daphne. W M D

57.04 Planet north.
56.96
56.82
56.96
56.80

1 Transits over 3 w. Planet foll.

~~[57.24]~~
56.99
56.63
56.70
56.25
56.47

coinc.
48.81
.78
.79
.86
.88

Emersion of 130 Tauri by chronograph G M S
Probably 0ˢ.5 too late.

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Oct 18 Friday

Telescope reversed ; E of pier.
Mic. removed & replaced.
Zero of pos. 79.7.8

Oeltz. 22773 Double found by G M S 23 15 −19 12
2 dist comic
68.0 comp prec. 48.30 49.50 48.91
69.5 29 49 91
68.6
67.1 Maps. 8 & 10
68.1

Oeltz 531 Star 0 52 — 19 44 suspicious p comp faint close
angle of pos 260° N to E. Large star also looks double
Seeing poor.

Oeltz 751 ? Star 1 12 − 23 23
Comp foll 2 dist.
106.9 49.95 47.81
106.9 Maps 9 & 10
109.3
110.0
109.4

Daphne & W 1 556
3 Jr. over 3 w. set at 349.2

87.80 Planet south on d
zero 79.7 .57 comic
80.0 .87 48.93
79.7 .88 .91
79.8 88.02 92
3 Jr over 3 w set right

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Oct 19 Saturday

W 0 664 and Lutetia GMS.

		prec.
25·72	Planet north on e	74·09
79		02
86		04
67	79·8	06
·80		06
		03
		05

W II 142 and Leto

28·76	Planet south foll.
·63	
·66	
·63	
52	

BAC 991 & Nemausa

27·44	Planet south foll.	
36		
52	coinc	
31	74·07	
26	04	
	·04	
Zero 79·7		

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Oct 22 Tuesday

Prisms of spectroscope adjusted to min. deviation. G.M.S

Telescope turned on sky ~~Upper~~ side of wires ^ apparently ~~toward~~ knob used for bisection. X 5925.0

line						Huggins
	D_1	9·22·5	9·23·5	9·24·0	9·23·3	1000
	D_2	9·26·8	9·26·1	9·27·2	9·26·7	1006
	mean	9·25·3	9·25·1	9·25·6	9·25·3	
					Mean	
	b_1	13·81·0	·819	820	13·816	1709
	b_2	13·901	912	910	·908	1722
	b_3	13·941	952	949	947	1731

~~Hg~~ 731 = 4·714 log coeff = 7·8095

131 = 845

E_1	13·150	130	150	13·143	1599
E_2	13·175	175	175	175	1600
C	6·446	450	462	6·453	590
0128					
2068	7 16·751	750	760	16·754	2200
8060	~~7~~				~~3~~
950^					
	G extremely faint	25·243	250	217	3597

Sky not bright enough to continue measures.

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Oct 23 Wednesday

Zero of pos. ~~259.8~~ 260.1 CSP
.3 } SM S
.1 }

CSP

W II 57 & Leto 1 34.41 Planet south coinc 48.82
33.98 .83
34.10 .81

2 Transits over 3 w. Planet follows.

Oct 24 Thursday $ Aquarii. Observer. E.S. Pierce

position 195.8
194.3 persp 282.8
194.2 " 283.6
4. 194.8

distance 49.29 Duty 19? (C.S.P)
48.51

double dist = .78

49.20
48.52
d.d. .68

49.14
48.47
d.d. .67

49.20
48.52
d.d. .68

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1867 October 24. Thursday.

δ Aquarii Observer Mr. Davis

Position Circle. ~~193°~~ 193° $22^h\ 57^m$
194°
193.5
193.8
192.8
193.4

Micrometer.
49.33
48.51
.82

49.29
48.49
.80

49.30
48.44
.86

49.29
48.50
.79

P. XXII. 219. C.S.P.

position circle
279.6
280.2
278.9
278.6
251.7
279.73

Micrometer
49.226
48.513
d.d. .713

Microm.
49.264
48.574
.690

49.224
48.523
.701

49.236
48.552
.684

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Oct 24

Σ 2964.

C.S.P.

position.

247.3
247.9
248.0
247.6
247.5
247.63

microm.

49.824
47.983
1.841

pow.

49.882
47.932
1.950

48.11
49.85
1.74

good.

49.84
48.23
1.61

49.90
48.06
1.84

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Oct 24. Thursday.

Σ 103 C.S.P.

position.	280.4		
	279.1		
	279.7		
	279.4		
	280.2		
	279.73		
microm.	49.52		
	48.35		
	49.42	1.07	
	48.30		
	49.40	1.12	
	48.58		(Bad. c. r.)
		.82	

W I 3668 Aglaia

3 Jr. over 3 w Plan. fell.

Planet north	53.10	48.94	W I 378 is double
	.09	95	
zero 260.0	.05	97	

W II 57 and Leto Planet south

28.12	48.96
.04	93
.24	98
.27	

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Comet 1867 II Aug 17 14h Berlin

16 40 26 −22 50

16 40 7 −24 18 6·7 May or 8

39 42 −23 45 8 my

39 50 −22 17 9

36 43 −22 50 9

37 7 −22 56 7 may

36 36 −22 45 8·9

Aug 18 16 42 30 −22 58

16 41 56 −23 14 8

16 41 12 −22 29 8·9

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