1868phae.proj.323w

KG
11365
323

N 40

Observations with E. Equatoreal.

Feb 3 1868 to June 28, 1868

Vol. 7.

(Copy.)

J. L. FAIRBANKS, Stationer, 136 Washington Street, Boston.

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KG-11365: 829

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1868 Feb 3 Monday

		clock time	true sid time	true mean time	
Immr.					
BAC 1526		3 16 49.8	3 18 27.2	6 24 48.0	CSP
				coinc.	
				49.902	} Apparently last contact.
				909	
				907	
				916	
				912	
				49.909	
				49.830	} Apparently first contact.
				831	
				829	
				819	
				823	
				49.826	
	mean			49.868	Result for coincidence.
				49.865	} Apparently coincidence.
				860	
				863	
				862	
				864	
	mean			49.863	2d result for coincidence.
Em.		4 17 47.2	4 19 24.6	7 25 35.4	Note Dec. 10, 1880. By book (19) clock slow 97.5 at this time.
BAC 1526					
I. Orionis	CD		228.8		2d Power.
			230.3		
			229.7		
			229.4		
			230.1		
			229.66		
	AB		219.1		
			219.0		
			218.8		
			220.1		
			217.1		
			218.82		
	AC		291.7		
			293.1		
			289.2		
			289.9		
			289.6		
			290.70		
	BD		318.7		
			317.8		
			317.7		
			318.5		
			318.3		
			318.20		

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2

1868 Feb 3 Monday

KG 11365.823

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δ Orionis CD

51·95
86
74
92
92
51·878

AB

51·27
22
23
19
25
51·232

Star near place of Oeb. 1191 (Chacornac.) Dist. measured Jan 31. should be 53·71 & 53·78; 54·71 certainly very much outside. GMS Seeing abominable.

W VI 1883 Distance of companion about 16″

W IX 416 & Melpomene

8	57·0		44·81		
9	0·7		84		
	1·5		90		
	2·5		93		
	3·1		64		
	4·1		60		
	5·6		58		
9	2·90		44·729	+30·269	Planet north
9 7	57·9	− 7·8	74·98		
8	14·4	7·7	45 02		
	18·2	7·7	00		
			00		
8	5·7		74·99		
	22·1		74·998		
	25·9				
8	57·3	− 7·9			
9	14·0	7·9			
9	17·5	7·9			
9	5·2				
	21·9				
	25·3				
9	37·1	− 7·9			
	53·9	7·9			
	57·2	8·0			
	45·0				
10	1·8				
	5·2				
9 9	7	−7·86			Planet prec.

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AZ + 29° no 1308 and Eurydice	9 51 22.0	− 8.7			Planet extremely faint.
	29.9	8.3			
	41.5	8.2			
	30.7				
	38.2				
	49.7				
	52 16.9	9.2			
	24.3	9.3			
	36.7	8.4			
	26.1				
	33.6				
	45.1				
	52 57.1	9.0			
	53 4.7	8.6			
	18.2	− 8.8			
	53 6.1				
	13.3				
	25.0				
	9 52 19	− 8.72			
	9 54.9		60.88		
	55.5		60.93		
	56.2		61.40		
	[57.0]		61.36		No rattle
	9 55.90		61.142	−11.268	Planet south
			coine		
			49.87		
			88		
			87		
			86		
			89		
			49.874		
AZ + 26 no 1658 and Ausonia	10 54.2		55.65		Planet north
	55.5		40		
	[57.0]		.29		
	10 55.57		55.447	+ 5.573	
	10 58 52.1				
	10 59 6.2				
	10.6				
	49.3	+ 57.2			
	11 0 4.0	.8			
	7.9	.3			
	0 30.0				
	44.2				
	48.3				
	1 27.0	.0			
	41.8	.6			
	45.4	.1			
	11 0 53	+ 57.33			

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1868 Feb 3 Monday

	11	2	5·3		
			19·3		
			23·8		
		3	2·3	+57·0	Almost worthless on account of faintness of planet through cloud
			17·0	57·7	~~haze~~; reject.
W₂ X 237 & Danae	11	54	0·1		
			13·1		
			17·0		
			46·0	+45·9	
			59·5	46·4	
		55	3·1	46·1	
		55	25·0		
			38·1		
			41·7		
		56	10·9	45·9	
			24·5	46·4	
			28·1	46·4	
		56	51·1		
		57	4·6		
			8·1		
			37·2	+46·1	
			50·8	46·2	
			54·9	46·8	
	11	56	25	+46·24	

12	2·8	38·74		
	5·0	38·84		
	6·4	39·01		
	7·7	38·82		
	9·1	38·90		
12	6·20	38·862	−36·138	Planet south
		conc		
		74·97		Power no 3
		97		
		75·03		
		02		
		00		
		01		
		75·000		

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Σ 489

151·3
152·2 (2wt)
153·1
153·0
152·36

50·18
20
19
20
20
50·194
23 } 1/4 wt.
24
30
50·257

mean 50·207

CSP Seeing bad; both stars the color of violet of spectrum.
3d Power
Stars foop. to eyes.

Seeing improved.

4th Power

Σ 521

15·8
14·7
16·6
15·7
14·9
15·54

50·08
06
07
03
09
05
06
10
07
05
50·066

ϑ Orionis AB

37·8
37·0
39·3
38·03

AC

108·7
108·1
108·2
108·33

AD

6·8
8·7
8·3
7·93

BC

73·2
73·1
73·7
73·33

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1868phae.proj..323w

1868 Feb 4 Tuesday

BD	137.7	
	137.9	
	137.9	
	137.83	
CD	50.1	
	50.3	
	49.0	
	49.80	
AB		51.18
		17
		21
		20
		21
		51.194
AC		51.31
		28
		26
		25
		28
		51.276
AD		51.57
		55
		55
		58
		55
		51.560
BC		52.09
		06
		12
		07
		14
		52.096
BD		50.77
		76
		76
		80
		76
		50.770
CD		51.84
		89
		77
		78
		78
		51.812

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1868phae.proj..323w

For personal equation

Σ 1043

	100·3	SWS	Brought up by + rotation (i.e so that the circle reading increases.)
	102·5		
	100·0		
	100·8		
	101·0		Stars parallel to eyes
	100·92		
	103·5		By − rotation
	104·0		
	102·8		
	103·7		
	102·0		
	103·20		
mean	102·06		
	50·13		
	14		
	13		
	50·133	0·263	
	49·64		
	63		
	63		
	49·633	0·237	
	99·9	CSP	Stars parallel to eyes.
	101·2		
	102·2		
	102·8		
	104·1		
	102·04		
	100·9		
	105·0		
	103·6		
	101·8		
	105·6		
	103·38		
	102·71		
	50·14		
	17		
	16		
	50·157	0·287	
	49·59		
	63		
	63		
	49·617	0·253	

coinc. probably changed here

Note June 2, 1880. The coincidence used for this page seems to be 49.870, which results (as far as the hundredths are concerned) from the measures of Feb. 3, pp. 1, 3.

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1868phae.proj..323w

1868 Feb 4 Tuesday

	coinc		
	49.91	CSP	
	91		
	91		
	91		
	91		
	91		
	91		
	91		
	91		
	91		
	49.910		
	49.94	GMS	
	93		
	91		
	92		
	91		
	92		
	91		
	92		
	91		
	91		
	49.918		
	49.944	CSP	Measured on moon, wires placed in contact alternately on one side and the other.
	931		
	943		
	943		
	943		
	49.945		
	865		
	864		
	872		
	873		
	872		
	49.869		
mean	49.907		
	49.931	GMS	
	940		
	933		
	931		
	931		
	49.933		
	895		
	873		
	880		
	870		
	873		
	49.878		
mean	49.906		

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1868phae.proj..823w

				49.901	GMS	Note June 2, 1880.
				902		49.910
				910		18
				907		07
				911		06
				901		04
				903		04
				903		49
				902		
				901		
				49.904		General mean 49.908 for coincidence with d.
				49.903	CSP	
				904		
				903		
				903		
				912		
				900		
				902		
				904		
				907		
				903		
				49.904		
AZ + 26° no 1658 and Ausonia	8	33	1.1		GMS	
			10.8			
			19.2			
			5.8	+ 4.7		
			15.3	4.5		
			24.0	4.8		
		33	32.9			
			42.8			
			57.1			
			37.3	4.4		
			47.1	4.3		
			55.8	4.7		
		34	5.3			
			15.1			
			23.9			
			10.0	4.7		
			19.8	4.7		
			28.2	4.3		
		34	40.2			
			50.1			
			58.6			
			44.9	4.7		
			54.7	4.6		
		35	3.1	+ 4.5		
	8	34	.4	+ 4.58		
	8	36.0			54.00	
		36.8			02	
		37.4			10	
		38.6			04	
		39.8			13	
		40.8			04	
		41.3			04	
	8	38.68			54.053	+ 4.143 Planet north conic. d.

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1868phae.proj..323w

40

1868 Feb 4 Tuesday

W_2 VII 429·30·31. and Julia

9	6·8			40·12		
	8·4			39·86		
	10·3			40·01		
	11·7			·12		
9	9·30			40·028	+9·882	Planet north
9	14 43·0	−1	23·7			
	15 1·6		·8			
	9·2		·6			
	16 6·7					
	25·4					
	32·8					
	16 54·4		·7			
	17 13·1		·9			
	20·6		·6			
	18 18·1					
	37·0					
	44·2					
9	16 7	−1	23·72			

W_2 X 237 & Danae & zero of pos.

10	18·0		79·1	46·21		
	19·0		0	45·96		
	19·8		·2	46·07		
	20·5		0	46·14		
	21·8		2	45·97		
	22·7			45·94		
10	20·30		79·10	46·048	−28·952	Planet south conc. e.
10	39 7·9		−2·9	75·01		
	17·2		3·0	00		
	24·7		3·1	74·99		
				99		
	10·8			75·00		
	20·2			01		
	27·8			75·000		
	39 37·3		3·0			
	47·1		3·0			
	54·1		3·2			
	40·3					
	50·1					
	57·3					
	40 5·7		3·0			
	15·1		3·1			
	22·3		3·0			
	8·7					
	18·2					
	25·3					
	41 7·0		2·9			
	16·2		3·2			
	23·8		−3·2			
	9·9					
	19·4					
	27·0					
10	40 9		−3·05			

Note June 2, 1880.
If this coincidence with d is 49.91 (see pp. 8, 9), and that with e 75.00 as opposite this interval de is 25.09, which seems to be the value used on p. 24. But the interval de found from the numerous measures of Oct. 22 and Nov. 2, 1866, was 24.99, differing from that found here by 0.1 revolutions or about 1". If thousandths of revolutions are taken, we have 75.000 − 49.908, or 25.092 for the present value of this interval de.

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1868 Feb 7 Friday

Σ 622
= P IV 258 — CSP — Cannot be separated. Seeing miserable.

Σ 583

24·8		
23·8		
24·3		
24·9		
25·1		
24·58	50·65	
	64	
	71	
	63	
	67	
	50·660	

Seeing so very bad that it is almost useless to try to make any measures. Power no 2. Stars perf. to eyes.

Σ 651

103·1		
105·2		
106·6		
106·4		
107·0		
108·1		
108·1		
106·1		
108·7		
107·7		
103·8		
106·44	51·58	
	56	
	46	
	54	
	30	
	51·476	

Seeing intolerable.
Give 1/8 wt. to this series.
½ their normal weight

ζ Orionis Cannot be separated though companion to the north 30″ is plain. Horrid seeing.

GMS

AZ +28° no 1363 & Julia	9	6·6		68·57	AZ no 1363 has a 10·5 companion
		8·0		51	
		9·5		49	
		11·0		52	
		13·1		35	
AZ 1363 has a 10·5 companion 340° n to f. dist. 15″	9	9·64		68·488	+18·572 Planet north; coinc. d.
	9	14 26·0			
		31·0			
		44·4			
		15 13·8	+47·8		
		18·8	47·8		
		32·5	48·1		
		15 50·2			
		55·2			
		16 9·0			
		38·1	47·9		
		43·1	47·9		
		56·8	47·8		

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42

1868 Feb 7 Friday

	9	17	22·0			
			27·0			
			46·7			
		18	9·7	+47·7		
			14·6	47·6		
			28·3	47·6		
	9	16	45	+47·80		Planet follows.
W₂ IX 1143 & Flora	9	38	4·3			
			12·2			
			21·8			
			42·5	+38·2		
			50·3	38·1		
		39	0·0	38·2		
		40	28·1			
			36·0			
			45·4			
		41	6·1	+38·0		
			14·2	+38·2		
			23·5	+38·1		
	9	40	2	+38·13		
	9	45·0			90·48	
		46·2			39	
		47·2			45	
		48·4			47	
		49·5			[74]	
		50·3			56	
	9	49·56			90·470	+40·554 Planet north.
					corrc	
					49·92	
					92	
					91	
					90	
					93	
					49·916	

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Venus

Diameter N & S.

48·80
37
48·585

EP Austin

CSP

51·19
27
28
16
51·225

Diameter E & F.

50·92
92
51·04
50·960

EPA

51·40
29

Cephei 49 H.
L.

CSP Cannot separate it. Any elongation doubtful.

α Urs. Min.

316·0
315·0
313·6
315·2
317·2
315·00

Companion to the right 3d Power.

Difficult to measure because so hard to move in R.A & also in Dec.

51·885
81
67
80
70
51·773

Star R.A.
17h
Dec 82° 18' } ε Urs. Min.

Star about 4th mag.
suspected to be double.

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1868 Feb 8 Saturday

Observed for personal equation.

Σ 1045

+ rotation
123·9
124·0
124·5
124·0
123·5
123·98

— rot.
123·3
125·8
125·5
126·2
125·2

125·20

+ rot
90+ 32·0 50·49
30·0 54
30·8 53
120·93 50·520

— rot.
32·2 49·25
30·5 26
33·5 26

1263
6317
126
617

122·07 49·257

+ rot
121·3
122·2
122·2
120·0
120·7
121·28

— rot
120·8
121·0
121·5
120·7
121·0

121·6 0/0

50·50
·49
·51
·55
·43

50·496

1244
622
12
610

49·17
34
30
22
23

49·252

9 M 3 Companion s. f.
Power no 3.
Parallel to eyes

C S 8

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Observed for personal equation.

Σ 982

2·4
3·5
3·0
5·0
4·5

3·68

50·52
55
57
61
58

50 5 66

CSP Stars perp. to eyes
Comp. south

178·1
179·0
179·1
179·4
179·6

179·04

GMS

50·54
49
52
48
55

50·516

Σ 1109

[153·8]
155·0
156·8
155·0
156·8
155·8

155·88

CSP Perp. to eyes.
Stars nearly equal.

50·27
26
26
22
27

50·256

come
49·88
88
87
875
875

49·876

49 86
86
87
88
88

49·870

GMS

50·21
19
24
23
24

50·222

Star very faint; obsns. uncertain.

150·8
149·4
152 1
152·8
153·1
152·0

151·70

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1868phae.proj..323w

1868 Feb 8 Saturday

Z + 28° no 1363 GMS
and Julia

8	58	56·2			
	59	4·2			
		14·9			
		59·9	+ 3·7		
	59	7·9	·7		
		18·5	·6		
		25·4			
		33·5			
		44·1			
		28·1	·7		
		37·1	6		
		47·6	·5		
9	0	1·5			
		9·6			
		20·2			
		5·1	·6		
		13·2	·6		
		23·8	·6		
8	59	39	+ 3·62		
9		2·3		63·78	
		3·0		61	
		3·8		57	
		4·8		56	
		[5·5]		66	
9		3·88		63·636	−13·763

Planet south

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1868phae.proj..323w

Σ 536 Insepardble, CSB
Gas frozen up.
Very red star of 7 mag.

Great neb. in Orion. Stars very bad; nebula not dim but very ill defined in all its parts.

Neb. 1227 There are three stars of about the same magnitude and within the same degree of Declination but quite remote in R.A. which have a very similar nebulosity about them.

Do not resolve it, but see in 1227 say 20 stars.

Neb 1373 I find a star say of 7 mag. with very large bright nebula all about it, similar to 1227
See also several double stars 5" to 10" but not other nebula.
But the seeing is so bad that a nebula might easily be mistaken for a star.

Σ 880? In the place I find a double star, which I measure though it hardly answers the description. Mags. 8.5 & 9. Companion s.p.

112·0
113·3
113·0
113·0
111·5

112·56

51·80
52·27
51·96
76
88

51·934

Companion only seen by momentary glimpses.

Note June 18, 1881. See note of this date on following page.

Δ Z +28° no 1361 8 56 50·3 −47·0 45·9 GMS
and Julia 57 3·2 47·2 46·0
9·0 47·1 45·9

No 1361 No 1362
57 37·3 57 46·2
57 50·4 57 59·2
57 56·1 58 4·9

9 2 5·2 47·5
18·2 47·3
23·9 47·3

2 52·7
3 5·5
11·2

5·9
7·0
(9·0)
11·1
12·9

51·16
50·69
51·35
47
28

9 9 11 51·190 +23·844 Planet north on e.

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1868phae.proj..323w

1868 Feb 10 Monday

9	17	37.4	−47.8	corne
		48.7	47.6	
		55.9	47.8	75.04
				03
	18	25.2		04
		36.3		03
		43.7		03
				75.034
	18	55.6	47.6	
	19	6.6	47.8	
		14.1	47.6	
		43.2		
		54.4		
	20	1.7		
9	9	0	−47.47	

Set for Melpomene & Flora, but haze and moonlight prevented finding them.

Nov to June 18, 1881. The wires d and e were the only ones remaining at this time; the coincidence above is apparently with e; the interval d-e is 24.990 according to the figures adopted for Vol. XIII of the Annals; 50.044 would then be the coincidence with d; this would make the measure of distance for Σ880, last page, 1.890 revolutions, equal to 18".52, inadmissible if the right star was observed. The coincidence found Feb. 8, p. 15, is 49.873, and that found Feb. 11, p. 19, is 49.906. To explain the observation of Σ880, we may suppose

I. That the right star was not found (see original record, where error in index of hour circle is noticed).

II. That the head of the micrometer screw was loose (C.S.P.'s remark on the printed proof-sheets is "micrometer screw plainly deranged").

III. That the scale of whole revolutions was read incorrectly, so that the result should be changed by 1 or 2 revolutions; but this would not give a sufficiently good result to make the supposition very probable.

IV. That the reticule was moved so that the true coincidence cannot be found.

The uncertainty of the coincidence is a sufficient reason for rejecting the measure of distance.

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1868phae.proj..323w

Triple star (magnitudes about 11.5 M S) preceding Σ 160 about a minute, on the same parallel, found by C S P.
Also a double star about on the same parallel, about 3ᵐ.5 preceding W I 894.

Star found near Σ 880 last night is Lal. 11564-5. Both obsns. by Lalande probably refer to the larger star.

	clock time	true sid. t.	true mean time.		
Immersion of 48 Virginis	7 24 37	7 26 33.3	10 0 46.1	C S P	Moon just risen and edge was all flowing. Gave 3 taps; middle one was probably a little early for I thought I saw the star afterwards. Star hard to see. Three taps 7 24 $\begin{cases} 30^s.8 \\ 35.8 \\ 46.5 \end{cases}$
Emersion	8 24 31.5	8 26 28.0	11 0 31.0		Beautiful.

Note Dec. 10, 1880. By book O 19, clock slow at immersion 11ˢ.4, at emersion 11ˢ.5

W IX 221 & Melpomene

8 55 6.1
17.2
22.7
39.7
51.0
56.3
8 55 49

+ 33.6
33.8
33.6
+ 33.67

9 1.8
3.1
5.3
9 3. 24

32.76
83
77
32.787 − 42.247

C S P

Comp. star on e.

W₂ IX 1073 & Flora

9 52.6
53.4
54.3
54.9
55.6
56.7
9 54 49

4.68
[50]
69
65
53
.61
4.632 +45.274
comc.
49.89
92
89
91
92
49.906

G M S

Planet north on d.

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1868phae.proj..323w

220

1868 Feb 11 Tuesday

10	1	12·5	− 3·2
		22·9	3·1
		29·9	3·2
		15·7	
		26·6	
		33·1	
		41·9	3·1
		52·0	3·1
		59·0	3·2
		45·0	
		55·1	
	2	2·2	
		15·5	3·2
		25·9	3·2
		32·9	3·2
		18·7	
		29·1	
		36·1	
		48·2	3·6
		58·7	3·3
	3	5·6	3·4
		51·8	
	3	2·0	
		9·0	
		22·1	3·2
		32·3	3·5
		39·3	− 3·6
		25·3	
		35·8	
		42·9	
10	2	26	− 3·27

Search for doubles. GMS

Oeltz. 11442. Found a faint companion (11 mag.) n. f.

Power no 3.
Perf. to eyes.

317·5
319·0
[313·2]
316·5
319·0
318·00 1·000

2 dist.
48·95
50·95

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1868phae.proj.323w

1868 Feb 12 Wednesday

32 Orionis Cannot be separated tonight. CSP

Nebula I Orionis Nebula about the middle one of the three stars, and streaming from it, now seen for the first time. The streams from all three now quite plain; much more so than other points (such as the transverse stripe from the great southern wisp) which I see almost every time.

Another thing seen for the first time is the black streak running off towards s.p. from the apex of great triangle to star. But this is more doubtful. The bright streak beyond the star, I still cannot see.

The wispy character of neb. on both sides of triangle, that on p. side having convexity s.f. and that on f side having convexity f or n.f. is marked. (Drawing in orig.)

I also notice very plainly what is not on Bond's drawing. There is a large black cave on the n.f. corner of triangle which is on all the drawings. There is also a bar across it. Now I notice first that this bar is broken or almost so in the middle. And second that from the inner cave thus formed the blackness extends (in a mitigated way) clear up through the triangle to the p. side of the most p. of those three stars. And third that a less marked blackness extends southward a little way on the f. side of the same bar. Fourth, These black bars also extend northerly so as to be continuous with the great n.p. wisp giving the whole nebula an entirely new aspect so much so that it seems to me that I have got a good idea of it. I certainly never saw it look so finely.

The trapezium has always appeared to me to have a sort of glittering look as though there were other minute stars there. It seems so now, and in particular the star A looks thus (drawing in orig.) as though it were composed of several.

The whole texture of the nebula seems different I fancy. It almost sparkles. It is all but resolvable I believe. It looks more like the elder Bond's drawing.

Σ 850 Cannot resolve it.

Σ 838 Barely resolvable; cannot measure it.

Clouds.

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1868phae.proj..323w

1868 Feb 14 Friday
16 Sunday

Note July 3, 1880. It seems likely from the original that the observation of the Orion nebula below belongs to Feb. 16, except the word "miserable".

θ Orionis Miserable. Continuation n. & s. of 2 dark bands very distinct and indubitable. 6th star very faint (CSP)

Monocerotis BC 66.2 CSP

A is considerably the largest B & C equal; A is perhaps itself double, but the seeing is very bad.

Star disappeared in cloud before more measures could be taken.

Feb 16 Sunday

80 Tauri

344.3
341.4
347.3
341.7
347.8
344.50

CSP Companion north. Seeing very fine. 4th power
Star perp. to eyes

49.99
50.00
03
02
03
50.014

71 Tauri found to be double by CSP. Much closer than 80 Tauri. 5th Power barely separates it. Suspected on Friday.

32 Orionis

67.0
63 8
63.2
62.9
63.2
64.02

Power 6.
Seeing not nearly as good as higher up.
Seem to me 3 stars. (?)
Can't measure distance.

Sirius

97.6 Good (2 wt)
94.3 Poor
95.8
94.9 Star less distinct
96.04

Star parallel to eyes.
Companion very distinct.

51.027
06
11
08
04
07
51.064
1'
00
065
51.032

EP Austin

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1868 Feb 16 Sunday

Sirius		96·0 99·0 98·2 99·0 99·0 98·24		GMS	Parallel to eyes.
Σ 1216	Cannot separate. Perhaps a little elongated				p. CSP & f. Clouds came on.
Neb 2008 Direction of elongation		304·0 305·6 306·7 304·5 303·2 304·80		GMS	A remarkable object. Parallel to eyes. Power no 1.
small star s. p.	90 +	73·7 72·8 71·8 71·4 162·42	41·66 83 41·745 58·34 ·30 58·320	8·192 8·383	Persp. to eyes.
		161·0 160·9 161·5 160·3 160·92			
	mean	161·67		8·288	
larger star more distant. s. p.		163·0 163·0 163·1			
			69·91 ·91 70·16 ·03 ·09		
	mean	163·03	70·020	20·083	
small star?	in the neb. n. f.	132·0 130·2			Power no 3.
		131·10	51·79 ·86 51·825 coinc. 49·96 92 94 94 93 91 95 94 94 94 49·937	1·888	

Note June 9, 1880. This seems to be G.C. 2008, and hence not the object looked for Sept. 8, 1866.

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24

1868 Feb 16 Sunday

Neb 547 & Neb 2170

chron 236

10 38 33.5
40 46.5 +2 13.0

10 41 24.7
43 37.5 +2 12.8

No nebula visible except this near the place of 2170.
This corresponds with the description of 2170.

Zero of pos.

zero.
79.4
4
.0
.0
.1
79.18

4496
45.24

Neb. south.
Note Sept. 27, 1880. Recomputation makes place of nebula for 1880 10 33 69, +9 34 52. This agrees better with Dreyer's Supplement to G.C., p. 392.
This gives for 1860.0

10 32 52.6 +9 54 50
catal. 32 34.7 +10 0 40

mean +2 12.9 45.10 −4.84

star of neb.

26°2
25.8
25.0

Perf. to eyes.

42.51
27
36
25.67 42.377

Neb 2184
= AZ +12° no 2249

B vm E mb M does not look specially resolvable.
No small star near enough to measure.

Note Sept. 27, 1880. The measures make G.C. 2184 & 2194 on opposite sides in δ from Dkl. +12° 2248; according to Dkl. Nos 2249 and 2253 are both north of 2248; perhaps the Dkl. declinations of Nos. 2248 and 2249 should be exchanged.

Neb 2194
= AZ +12° no 2253

Nucleus appears elongated in direction 350° n to f. the southern end being the brighter
General elongation of nebula in direction about 315°

chron 236 chron 236

AZ 2248 11 56 40.3
Neb 2184 57 8.8 +28.5
2194 59 53.5 +3 13.2

11 3 13.2
3 39.5 +26.3
6 27.5 +3 14.3

Note Sept. 27, 1880. The mean value for dc being 24.990 (as adopted in this present reductions) the place of e is 49.937 + 24.990 = 74.927; hence for 41.83 at foot of this page, read 41.73.

AZ 2248 33.19
Neb 2184 31.14 −2.05
2194 e +41.84

Note June 2, 1880. The place here assumed for e seems to be 75.03, which may be derived from the value 49.94 found at the foot of p. 23 for the place of d and the value 25.09 found as on p. 10 for the interval de.
If thousandths of revolutions are taken these numbers become 49.987 and 25.092, and their sum 75.079.

33.21
31.01 −2.20
e +41.82

Neb 2184 from AZ 2248 mean +27.4 −2.12
" 2194 " " +3 13.8 +41.83

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1868phae.proj.323w

1868 Feb 16 Sunday

Neb. 3147 Not visible. Region of course certain, being near 3148 & 3157.

3157 Elongated in direction n & s. Looks almost double or bis N. f. B.

3148
+8°no
& A Z. 2629.

79.5
77.4
79.4
79.5
78.7
78.90

Star following.

56.76
54
65
56
69
56.640 6.703

Chron. 236 2^s slow of sid. clock.

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1868phae.proj..323w

1868 Feb 18 Tuesday

Micrometer removed, and
Low power eye-piece put on. CSP

Neb ♂ Orionis My black bands very distinct.

Micrometer replaced.

Zero of pos.

78·2
78·2
78·2

78·20

Clouds.

Neb 1673
star s.

353·8
353·1
351·1
352·0
352·4

352·48

GMS
Perp. to eyes

distance lost; clouds.

star nf.

325·5
325·4
327·2
324·2
324·0

325·26

Perp. to eyes.

53·42
10
23
23

53·245 3·141

coinc

50·10
09
11
11
11

50·104

Neb 1904
9 mag. s. p.

113·6
113·4
112·0

113·00

Obsns. poor; cloudy.

46·15
45·89
45·85

45·963 4·141

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1868phae.proj.323w

Feb 18 Tuesday

Neb. 2310
& W X 1105

16·33
25
45
16·343

Δδ
−58·857

Note Sept. 28, 1880. See p. 28 for coincidence of e, 75.200.

Star on e; neb. south.

Δα = −12ˢ·5 by chron. beat.

Neb. does not appear v S or r.

This gives for 1860.0

	11ʰ	1ᵐ	19ˢ·4	+5°	35′ 20″
catal.	11	1	17·1	5	35 14

Neb 2626

Elongation of nucleus — 140°

Power no 3. Very doubtful. Direction seems to change from time to time.

Note Oct. 2, 1880. These are probably circle readings, to be subtracted from 348°.

Direction of knob on both sides — 115, 114

Power no 1. Also very doubtful.

No small star near enough to measure.

Neb. 2776

Nucleus very sharp

elongation of neb.

21·0
24·0
mean 22·50

9·5 mag. star n. f.
AZ +2° no 2520

125·0
125·0
125·0
124·3
124·82

61·93
61 88
62·05
61·953

11·849

Coinc. d. [50.104 as in p. 26].

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1868 Feb 18 Tuesday

1868phae.proj..323w

		chron 236		Δα from 17 Virg				
Nebulae	2844	11	56	26	−3	11	44·31	+26·21	F, small star close nf.
	2862?		56	50	−2	47	9·58	−8·52	pB
	5070		56	53	−2	44	e	+57·10	B
2865 =	2852		57	0	−2	37	32·15	+14·05	*B
2869 =	2857		57	26	−2	11	47·78	+29·68	vB
double star distance 10″, 11 mags			57	29	−2	8			
	2876		58	45	−0	52	46·64	+28·54	pB
larger component of 17 Virginis = Σ 1636			59	37			18·10		
		12	9	13	−3	12	43·65	+26·38	
			9	39	−2	46	8·77	−8·50	
			9	41	−2	44	e	+57·93	
			9	48	−2	37	30·75	+13·48	
			10	13	−2	12	46·41	+29·14	
			10	16	−2	9	13·38	−3·89	
			11	33	−0	52	45·15	+27·88	
			12	25			17·27		
	2892	follows 17 Virg			+0	33	by two comp.		B.
							28·44		
							28·97		
							28·705	−21·399	Conc. d. neb south.

Note June 2, 1880. The assumed place of e seems to be 75·20, apparently derived as follows:

Coincidence, d, p. 26, 50.104
Interval de, p. 10, 25.092
75.196

The measured coincidence for e on Feb. 19, p. 29, is 75·200; this is still much liked to be the authority for the reduction.

A new nebula, vF, follows 2852 +0 7 say 20″ south.

Hence for 1860

	α			δ			catal					
2844	12	12	13	+	6	9	24	12	12	13	+6	6	59
2862?		12	39			3	43	12	13	36	+6	5	59
5070		12	41			14	30	12	12	41	+6	13	18
2852		12	48			7	21	12	12	48	+6	6	58
								2865	12	13	46	+6	7	26
nova		12	55			7	1							
2857		13	13			9	54	12	13	12	+6	9	25
								2869	12	14	6	+6	10	3
double star		13	17			4	28							
2876		14	33			9	42	12	14	33	+6	9	37
2892		15	58			1	36	12	16	2	+6	1	18

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1868phae.proj..323w

(95) Arethusa		5	57	59·3	−1	14·7		GMS
& W₂III 1281-2.			58	7·6		14·5		Planet precedes.
			59	14·0				
				22·1				
		6	0	26·3		14·8		
				31·1		14·8		
			1	41·1				
				45·9				
						66·23		
		About 6	15			58 82	7·41	
						77·55		Another supposed planet just on e.
						69·99	7·56	
		About 6	35			77·80		
						70·11	7·69	Planet north.
						77·93		Juries of these obsns. & other
						70·28	7·65	transits lost, pen not marking
						77·74		
						69·97	7·77	
								Corr. to ephem. A. N. 1677
						coinc e		
		7 16	1·1	−1	11·9	75·22		+10ˢ +0′·7 from this obsn.
			3·9		11·8	18		
			20·8		12·2	19		
						20		
			13·0			21		
			15·7					
		7 17	33·0			75·200		
	mean	6	32	12	−1	13·53		
	mean	6	31				+ 7·616	
Sirius		8	30			100·0		Companion well seen, but star
						98·1		rather too much past meridian.
						96·9		
						98·8		
						97·1		
						98·18		
						73·67		
						6·2		
						62		
						73·637	1·125	
						76·00		
						75·90		
						76·04		
						75·980	1·218	
						coinc		
						74·78		
						78		
						76		
						74		
						75		
						76	74·762	

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1868phae.proj..323w

1868 Feb 19 Wednesday

Search for doubles.

Oeltz. 10163 very red. About as deep a colored star as I ever have seen. Marked red in notes to catalogue.

Oeltz. 10285 has a companion n. f. Mags. 8 & 10.

159
159

Distance about 14"
Perp. to eyes.

The right ascension of this star is apparently too small in the catalogue by 1^m. by comparison with 10290 & 10334.

A star about 30' north of Oeltz. 10543 is also double. Mags 8·5 & 9·5. Precedes 10567 50^s 14' north of it.

85
85

Parallel to eyes.

Distance about 9"
Companion preceding.

The right ascensions of 10567 & 10572 are 1^m too large apparently.

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1868phae.proj.323w

1868 Feb 20 Thursday

GMS

ω Leonis 9 45 Cannot separate or elongate, with powers 3 4 5 or 6. Seeing very fair through clouds

γ Leonis 10 15 58·2 Parallel to eyes. Power no 3.
59·0
59·0
54·2 ($\frac{1}{2}$ wt)
57·4

mean 58·27 0·355

50·46
49·76
50·48
49·72
50·47
49·80

50·470 0·356
49·760 0·354

conc
50·12
11
11
13
10

50·115

ι Leonis Clouds too thick to see the companion.

ξ Ursae Majoris 11 15 88·0 Parallel to eyes. Power no 3.
86·0 ($\frac{1}{2}$ wt) Companion following.
87·5
87·5
87·6 ($\frac{1}{2}$ wt)

mean 87·45 0·180

50·28
29
29

50·287 0·173

49·91
92
95

49·927 0·187

ι Leonis 92·7 Comp. foll. very faint (probably clouds)
95·1 Parallel to eyes.
94·5
94·0 ($\frac{1}{2}$ wt)

mean 94·09 0·300

49·79
50·39
50·42
49·82

49·805 0·309
50·405 0·291

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1868phae.proj..323w

1868 Feb 20 Thursday

Zero of position

78·2
78·1
78·3

mean 78·20

γ Virginis

184·4
184·5
183·9

Perp. to eyes.

90 + 92·0 49·63
94·2 50·56
95·5 49·61
96·0 50·58

186·0 ½ wt
183·0 ½ wt

90 + 49·620 0·494
50·570 0·456

184·32
90 + 94·42

mean 184·37 0·475

All the obsns. tonight with Power no 3.

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1868phae.proj - 323W

Arethusa
& W$_2$ III 1281-2

6	45·0		78·08	CSP	Planet north.
			77·70 bad ½ wt.		
	54·2		77·23 good 2 wt.		
			77·30		
6	49·60		77·487	+27 387	
6	59 55·1				
7	0 1·0				
	12·1				
	1 32·8	+1	37·7		
	38·7		·7		
	50·6		·9		
	2 10·5				
	15·9				
	27·2				
	3 47·7		[·2]		
	53·7		·8		
	4 4·9		·7		
	4 17·8				
	23 6				
	35·0				
	5 55·7		37·9		
	6 1·7		38·1		
	13·0		38·0		
7	3 52	+1	37·85		

Sirius Doubtful whether companion is seen at all. Certainly not fit to be measured. 2^d Power cannot be used; seeing will not bear it.

Σ 1104 no use to try for double stars of any sort tonight. Very large and blurred. Wind rising and external therm. falling. Temp. outside 5° inside 25° but too much wind to open windows.

W IX 22
and Melpomene

9	12 3·3		−50·0	GMS	Planet preceding
	9·1		49·9		
	20·3		49·9		
	53·3				
	59·0				
	13 10·2				
	13 29·2		50·1		
	35·1		49·9		
	46·2		49·9		
	14 19·3				
	25·0				
	36·1				
	14 56·3		49·9		
	15 1·9		50·0		
	13·2		50·2		
	46·2				
	51·9				
	16 3·4				
9	13 35		−49·98		

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1868phae.proj..323w

1868 Feb 22 Saturday

	9	17.8	50.65	24.53	Conic e	Planet north
			25.59	51 49		
			46	64 62	Conic. d.	
			31	79 77		
	9	23.0	35	75 73		
				628		
	9	20 24		+24.628		
			conic		3d Power	
			50.11			
			10			
			08			
			07			
			06			
			07			
			08			
			07			
			07			
			08			
			50.079			

Note June 2, 1880. Interval de by means of posits 75.184 − 50.079 = 25.105. The interval seems actually to have increased during the past year. See Jr. 10; aleph. 53, 62, 93.

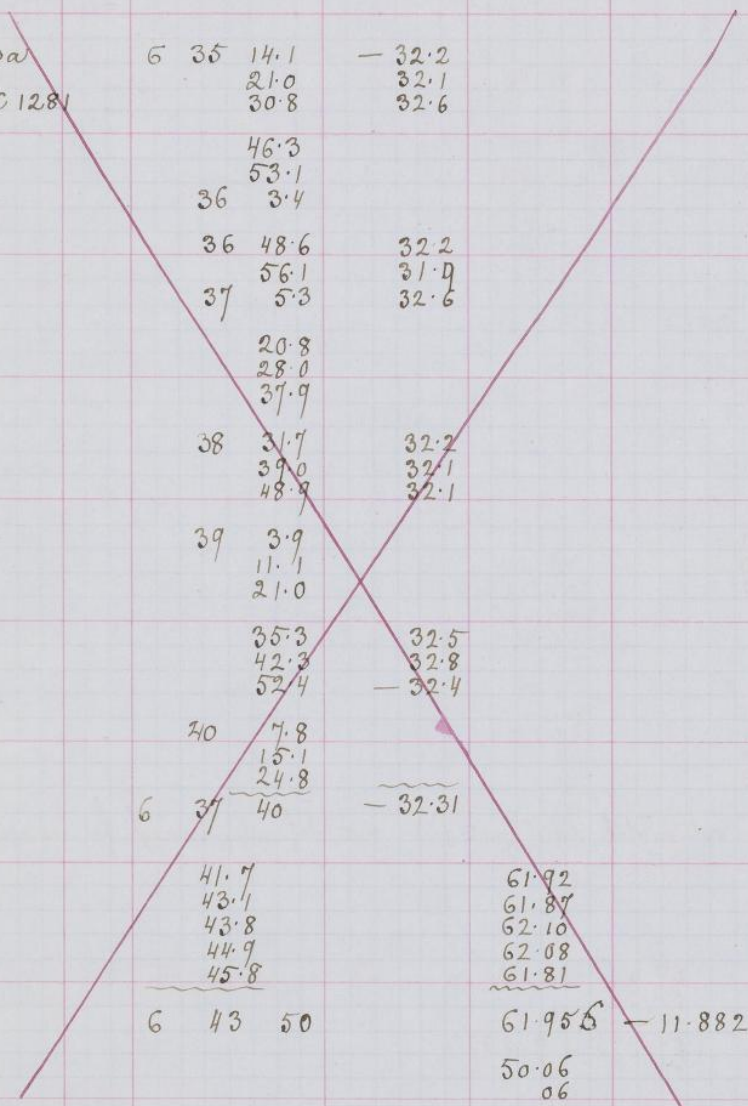
NZ +20° no 2377 and Flora	10	18 24	71.71	
			71	
			71 69	
			72.04	
			71.99	
			98	
		23 24	88	
	10	20 54	71.857	+21.778
			conic e.	
			75.19	
			18	
			19	
			18	
			18	
			75.184	

		51.	
	25	7.9	
		14.3	
	25	57.9	
	26	0.3	
		9.5	
	26	2.9	+11.0
		11.2	10.9
		20.0	10.5
	26	30.1	
		38.8	
		47.9	
		41.0	10.9
		49.3	10.5
		58.6	10.7
	27	9.2	
		17.7	
		26.7	
		20.0	10.8
		28.1	10.4
		37.4	10.7
	10	26 49	+10.71

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1868phae.proj - 323w

1868 Feb 23 Sunday



Arethusa and BAC 1281	6	35	14·1	− 32·2	GMS Planet precedes.
			21·0	32·1	
			30·8	32·6	
			46·3		
			53·1		
		36	3·4		A fixed star observed by mistake
		36	48·6	32·2	
			56·1	31·9	
		37	5·3	32·6	
			20·8		
			28·0		
			37·9		
		38	31·7	32·2	
			39·0	32·1	
			48·9	32·1	
		39	3·9		
			11·1		
			21·0		
			35·3	32·5	
			42·3	32·8	
			52·4	− 32·4	
		40	7·8		
			15·1		
			24·8		
	6	37	40	− 32·31	
			41·7	61·92	
			43·1	61·87	
			43·8	62·10	
			44·9	62·08	
			45·8	61·81	
	6	43	50	61·956 − 11·882	Planet south on d.
				50·06	
				06	
				10	
				08	
				07	
				50·074	
Melpomene and A Z + 14° no 2034	9		9·5	50·91	
			10·3	51·05	
			11·1	16	
			11·5	01	
			[12·0]	26	
			12·5	20	
			13·1	12	
	9	11	26	51·101 + 0·995	Planet north.
				50·06	
				12	
				13	
				12	
				10	
				50·106	

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1868phae.proj..323w

36

1868 Feb 23 Sunday

mean	9	16	55	+ 18·24	
	9	15	22·9		
			29·6		
			34·9		
			41·0	+ 18·1	
			47·6	·6	
			58·0	·1	
		16	7·2		
			13·7		
			24·2		
			25·6	·4	
			32·0	·3	
			42·3	·1	
			52·7		
			59·1		
		17	9·6		
			10·7	·0	
			17·1	·0	
			27·8	·2	
			44·0		
			50·2		
		18	1·0		
			2·4	·4	
			8·6	·4	
			19·3	·3	

Neb 2229 Direction of elongation estimated 140° (n to f.) not definite enough for measures.

An extremely faint star nearly north

	171·7		
	170·0		
90 +	83·2	59·52	
	82·0	59·23	
	171·72	59·375	9·285

Neb 2347 Elongation 87, 83

mean 85·0

very doubtful and changeable.

No small star near enough to measure.

Neb 2419 and a 10 mag. n f.

	58·92	
	93	Δδ
	65	
	67	
	58.792	+ 8.702
	66·30	
	08	Δα as δ
	22	
	66·200	+ 16·110

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1868phae.proj., 323w

1868 Feb 23 Sunday

Neb 2422
and a star n.f.

67·36
42
48

67·420 + 17·330 Δδ

57·12
56·92
57·08

57·040 + 6·950 Δα cosδ

Neb 2423
and a star n.p.

175·0
177·0
175·1

175·70

Persp. to eyes.

66·55
[65·40]
66·35
66·34

66·413 16·323

Nebula at least 1′ in diameter.

Note Sept. 29, 1880. This should be 16.319 if the coincidence is 50.094 as appears.

coinc
50·06
11
10
10
10

50·094

Neb. 2427 F, about 3/4′ in diam. R, not r.

Neb 2396
and a star n.f.

100·3
101·7
101·3

101·10

65·07
19
06

65·107 15·017

Note Sept. 29, 1880. This should be 15.013 if the coincidence is 50.094 as above.

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1868phae.proj..323w

38

1868 Feb 25 Tuesday

Σ 1104

Stars parallel to eyes
Companion preceding
Power no 3.

217.2
216.0
215.7
215.0
214.9
215.76

GMS Seeing fair occasionally
Generally pretty bad.
Multiple image

No use trying to measure
distance.

[32.7]
36.5
36.1
37.1
35.2
37.0
36.38

CSP Parallel to eyes
Seeing very bad.

ε Hydrae

Seeing also too bad on this
star for measures.

Nebula 1975 &
W. IX 1096

Chron 236
− 38.5.7
38.7
39.2
38.8
mean − 38.85

GMS This gives for 1860.0
9 50 38.4 +11° 1′ 32″
catalogue 9 50 39.1 +11 1 17
Nebula F. r.

86.51
40
27
86.393 −36.310

Nebula south on d.

Neb 2411 cL pB lbM. Direction of elongation about 5° n to f.

2499 pB L r fading away very gradually at edges. No small star near enough to measure.
(Elongation 45° n to f.?)

2626 Elongation estimated 50° n to f. Corresponds well otherwise with description
in catalogue.

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1868phae.proj.323w

Neb 2805 No star of 11 mag. in middle (perhaps 14 mag.); while nebula does not exceed a star of 11 mag. in light.
Elongation 350° n to f.

a 10·5 mag. n. f.

63·55
[90]
50
60 Δδ
57
62

63·568 +13·485

61·86
96
69 Δα cos δ
69
75

61·790 −11·707

Neb 28 29. f B b M N. is n f W XII 144
& W XII 144 s f

51·62
27 Δα cos δ
33

51·407 −1·324

This gives for 1860·0
12 10 17·3 +7 28 10
catal. 12 10 17·5 +7 27 9

82·11
82·48
81·78 Δδ
82·33

82·175 +32·092

Neb 2821 Elongation 45° n to f. decided. Note Oct. 4, 1880. The measure below gives 50°9; this 45° is an estimate.

a star n f.

151·0
151·1
149·5

150·53

61·63
27
11

61·137 11·054

elongation

116
121
115

117·3

come
50·09
08
10
07
07
07
10

50·083

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1868phae.proj..323w

1868 Feb 25 Tuesday

Two nebulae following 2821

I. 47^s foll. on same parallel I of F R = 2833? None exactly in the place of 2833 relatively to 2821.

II. 45^s following 2821 6′ north S F R bM.

Neb 2785 precedes 2821 $3^m\ 20^s$ (one comparison, chron 236) on same parallel. bMN S. pB R. sf. an 11 mag. star.

Neb. 2813 Appears bM as usual. Is 7′ north $6^s.5$ following ~~W XII~~ 130.

This gives for 1860.0

	12	9	25.4	+8	15
catal.	12	9	21.7	+8	14 21

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1868phae.proj.:323w

GMS

Sirius. Seeing not good enough for measures. Dome just opened

Σ 1045

118·7
117·7
116·4
118·7
117·8

Perp. to eyes. Power 3.

49·59
51
61

49·570 0·640

50 83
88
87

50·860 0·650

coinc
50·20
21
20

Oeltz 7033
= Lal 14810 of 4 mag. as in Oeltzen. or at any rate brighter than n' & n² Puppis combined, in finder.
Note Aug. 4, 1881. The Uranometria Argentina gives the combined magnitude of the two stars of n Puppis as 5.7.

n Puppis

61·8
60·5
60·8
60·5
60·5

60·82

Stars equal. Parallel to eyes.

Note Aug. 4, 1881. The B.A.C. gives Lacaille here for a pair sp dusky nf; but Smyth (p. 181) and Webb (p. 189) show that the pair is really np and sf as here measured.

51·18
23
20

51·203 0·993

49·30
27
30

49·290 0·920

Neb 1780 Apparent faint elongation 60° ± n to f. Has a star of 10 mag. 0'.5 south foll. 15ˢ

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1868phae.proj..323w

1868 Feb 29 Saturday

Neb. 1876 v. F S. resolvable follows Oeltz. 9854

8 Oeltz. 9854

chron 236

+ 33.s0
32·5
32·8

32·77

41·74
42·87
42·18

42·263 −7·947

This gives for 1860·0
9 28 32·7 −15 46 35
catal. 9 28 32·8 −15 46 48

Note Sept. 16, 1880. Present computation made this place for 1860
9 28 32.6 −15 46 34
Neb south.

a vF star s f

36·0
37·0
36·9

36°63

43·63
70
20

43·510

Neb 2008 B vm E

[Note June 9, 1880. See note of this date p. 23].

elongation

124·3
123·0
123·0

123·43

Parallel to eyes

a faint star south

160·5
160 0
161·0

160·50

41·98
41·67
41·63

41·760 8·450

58·32
31
60

58·410 8·200

mean 8.325

an 11 mag farther south

342·5
342·2
341·5
342·0

70·38
30
05
30
20

70·246 20·036

90 + 73·1
73·5
73·5

342·61

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1868phae.proj.323w

♅ XI 290 & Asia	11	37	16·7		Planet foll.
			26·8		
			32·9		
		37	18·1	+1·4	
			28·4	·6	
			34·7	·8	
			49·4		
			59·9		
		38	5·8		
			51·1	·7	
		38	1·3	·4	
			7·6	·8	
			16·5		
			26·6		
			32·8		
			18·0	5	
			28·1	5	
			34·2	4	
			45·9		
			56·0		
		39	2·1		
		38	47·5	6	
			57·7	7	
		39	3·8	·7	
	11	38	14	+1·59	
	11	43·3		73·26	
		44·3		61	
		45·0		61	
		45·7		50	
		46·8		61	
		48 6		80	
	11	45·60		73·565	+23·355 Planet north, conic. d.
AZ −1° no 2591 & Circe	12	2·2		52·95	
		3·7		52·83	
		5·6		53·14	
		7·5		52·93	
		10·3		53·28	
	12	5·86		53·024	+2·814 " "
	13	24·0			
		32·6			Planet foll.
		40·1			
	14	30·7	+1 6·7		
		39·1	6·5		
		47·2	7·1		
	15	4·4		conic.	
		13·0		50·21	
		20·8		23	
	16	11·1	6·7	21	
		19·9	6·9		
		27·7	6·9	50·210	= mean of 6. (1st 3 at beginning of obsns.) [p. 41].
	16	40·2			
		49·0			
		56·7			
	17	47·0	6·8		
		55·5	6·5		
	18	3·2	6·5		
	12	16 18	+1 6·73		

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1868phae.proj..323w

144

1868 Mar 4 Wednesday

	clock time	true sid. t	true mean time	GMS setting of pos. circle	
Imm. f. Geminorum	5 26 51.3	5 27 27.3	6 35 29.7	252°.1	Three taps; last the right one
Em. " "	5 31 21.9	5 31 57.9	6 39 59.5	259°.9	Perhaps a few seconds late

Companion of Sirius very distinct, seeing very fine

Note Dec. 10, 1880. The original record in book N 12 adds for the immersion ± 0.s2. The setting of the position circle was no doubt that in which the wire is tangent to the limb at the observed point, so as to differ 90° from the setting for position angle. The hour-time zero being 348°.24, and the star being occulted by the northern limb of the moon, as appears from the almanac, the position angles for immersion and emersion will be 6°.1 and 358°.3.
By book O19, the clock was slow 36.s2.

277.9
277.9
277.5
277.5
[276.5] poor
279.4
278.04

90 + 190.2

51.16
22
22
16
20
51.192 0.992

49.10
06
07
19
13
49.110 1.090 Seeing worse, star fainter.

mean 278.40 1.041

Σ 1074

205 Power 3
212 4

210 WMD " 3
215 4

Higher powers tried, did not work so well.

mean 210.5

Σ 1216

217 very doubtful (½ wt.) GMS Power no 4
180 pretty sure WMD " "

mean by weights 192

Both stars identified from Arg. Zones (Durchmusterung.)

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1868phae.proj.1323w

1868 Mar 4 Wednesday

ε Hydrae		135·0			Power no 4. Seeing poor
		132·0			Companion s. f.
		132·7			
	90 +	220·2	49·77	0·43	
		219·0	50·67	·47	
		222·1	50·66	·46	
		221·4	49·78	·42	
	mean	131·77		0·445	

Procyon — Two faint companions thought to be seen by GMS with power 4, one about 7″ north, the other about as far following. The first especially appeared to remain, though the star was shifted about in the field. But nothing was visible with power 3.

Σ 1178		200·5	coinc		Parallel to eyes. Stars equal.
		201·3			
		202·7	50·23		Power 4.
		202·5	27		
		203·0	27		
			25		
		202·00	50·255		50·200 adopted for tonight. See measures
					at end of obsns.
			49·72		
			68		
			77		
			49·723	0·487	
			[50·48 ?	·542	Enormous backlash of screw makes
			47 ?		obsns. very uncertain.
			38 ?]		
			80		
			80		
			85	·582	
			50·817	0·617	
		505	49·75	0·45	WMD
		595	49·66	0·54	
		515	50·77	0·57	
		538			
	mean			0·541	

Oeltz. 11008 has a very faint companion n. f.
102 rough setting without illumination. Distance about 4″.

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1868phae.proj..323w

46

1868 Mar 4 Wednesday

Asia & W XI 238

11	29·2		[63·48]	Planet north
	31·9		63·72	
	32·5		76	
	33·1		80	
	33·9		72	
	35·1		84	
11	33· 18		63·768	+13·568
37	37·0	−17·2		Planet precedes
	44·3	4		
	53·1	4		
	54·2			
38	1·7			
	10·5			
38	23·5	3		
	31·0	2		
	39·8	3		
	40·8			
	48·2			
	57·1			
39	1·1			
39	8·4	7		
	16·0	4		
	25·0	3		
	26·1			
	33·4			
	42·3			
	54·1	7		
40	1·6	5		
	10·8	3		
	11·8			
	19·1			
	28·1			
11	38 53	−17·39		

Circe & W XI 810

11	52 1·1	−4·6	Planet precedes
	8·7	·4	
	17·6	4	
	5·7		
	13·1		
	22·0		
	39·2	7	
	46·9	3	
	55·8	4	
	43·9		
	51·2		
53	0·2		

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1868phae.proj.:323w

1868 Mar 4 Wednesday

11	53	11·2	− 4·8		
		19·0	·2		
		27·9	4		
		16·0			
		23·2			
		32·3			
		42·6	5		
		49·9	8		
		58·9	·6		
		47·1			
		54·7			
	54	3·5			
11	53	1	−4·51		
		56·6		101·57	Planet south,
		57·0		61	
		57·6		42	
		[58·3]		54	
		59·0		34	
11	57	49		101·496 − 51·296	
				conc	
				50·20	
				18	
				17	
				19	
				18	
				50·184	[Additional observations p. 45].

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1868phae.proj..323w

1868 Mar 5 Thursday

GMS

Sirius 7h 0m Seeing magnificent. Companion brilliant and steady.

	l	40·95	Power no 3. Parallel to eyes
		91	
		94	
		[41·00]	
		93	
		94	
		40·934	1·164
		38·63	
		65	
		61	
		63	
		63	
		38·630	1·140
		Coïnc. (changed)	
		39·77	
		77	
		77	
		77	
		77	
		39·770	
	90+	190·8	
		188·8	
		188·2	
		277·0	
		276·5	
		279·0	
		278·4	
		281·0 } ½ wt each	
		282·0 }	
		280·8	
		278·0	
		280·0	
	mean	279·00	1·152

Procyon Same two companions as last night. Cannot be sure of them however. Power no 5.

71 Tauri 8 20 Cannot see any companion or elongation. Perhaps in direction (setting) 190°. south. Power no 4. Image very good.

Companion of 80 Tauri very dim, however. Bright moon and region rather low. Seeing very good.

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1868phae.proj.323w

1868 Mar 5 Thursday

Search for doubles.

Oeltz. 9667·8 has a 10 mag. companion nearly north.

	90+	75·8	40 37	0·46
		74·0	36	·45
		74·0	39·50	·41
		72·7	43	·48
	mean	164·12		0·450

New double of 7·8 mag. n.f. Oeltz 10411

		8·44	
		8·34	
		8·390	+56·663
	72·0		
	72·0		
	72·3		
	72·7		
	72·0		
		2 dist	
		65·22	0·17
		64·88	0·17
	72·20		0·170
		corrc e	
		65·05	
		07	
		04	
		65·053	

Double north on e.
Precedes Oeltz. 10411 $2^m\ 39^s\cdot5$
This gives for 1868·0
$10^h\ 0^m\ 44^s\cdot2$ $-24°\ 4'\ 9''$

Components equal.

Oeltz 11425-6 has a companion n.f. of 9th mag.

Perhaps also a close companion s.f. but I hardly think so.

Cape of G.H. Catal.
h_{A} 4456 = Oeltz 11513.
This also examined and found to agree with Herschel.

		88·7		
		90·0		
		89·9		
		89·5		
		90·5		
	mean	89·72		0·847
			65·89	
			90	
			84	
			65·877	0·824
			64·19	
			16	
Zero of pos	Power no 4	78·7	20	
		7		
		3	64·183	0·870
		2		
		1		
	no 2	78·1		
		3		
		0		
		8		
		3		
		1		
	mean	78·33		

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1868phae.proj..323w

1868 Mar 9 Monday

Sirius	$8^h\ 30^m$	97.9			MS	Power no 3.
		96.9				Perp. to eyes
		99.0				
		100.0				
		99.6				
		98.68				
	90+	6.8	63.89	1.10		Parallel to eyes.
		7.8	66.15	.16		
		8.2	63.86	.13		
		10.1	66.19	.20		
		98.22				
			conc			Coincidence with e. See pp. 48, 49
			64.98			
			98			
			00			
			00			
			98			
			64.988			
	mean		98.48			1.147
e Hydrae	companion unusually bright, must be variable; bright moonlight,					
						Perp. to eyes, power 3.
		307.4				
		308.1				Seeing not very good
		306.4				
		305.2				multiple image sometimes.
		306.0				
		306.62				
			64.61	.38		
			65.32	33		
			65.31	32		
			64.64	35		
			64.64	35		
			65.31	.32		
				0.342		
116 Hydrae	9 45	22.3				Parallel to eyes. Power 4,
		22.0				Stars equal.
		21.7				
		21.7				
		22.6				
		22.06				
			65.19	.18		
			65.18	17		
			64.85	16		
			83	18		
			84	17		
			65.16	.15		
				0.168		
	90+	108.7				
		110.3				
		108.7				
		109.6				
		111.0				
		19.66				
	mean	20.86				

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1868phae.proj.323w

Σ 1457

33·5
32·6
35·0
33·9
33·75

Comp. n fr.
Parallel to eyes, power no 4

65·10 ·09
08 ·07
64·89 ·12
91 ·10
0·095

Distance estimated, wires not on stars.

48,147

Anonyma
10 0 44
−24 4 9
found Mar 5

69·5
70·1
69·1

65·17 ·14
64·89 ·14
65·16 ·13
64·88 15

69·57 0·140

Parallel to eyes. Power no 4.

comc
65·02
03
03
04
03
65·030

Oeltz. 11425-6

87·2
87·1
87·9
88·4
87·0
87·52

64·17 ·86
65·82 ·79
65·84 ·81
64·16 ·87
0·832

Parallel to eyes. Power 2

Large star looks elongated & a little n, specially with this power.

Σ 1593 12h 15m

146·7
150·0
150·3
146·1
145·8
147·78

65·09 09
64·90 10
88 12
65·11 11
09 09
64·87 ·13
0·107

Power 4; too faint.
Perp. to eyes; stars equal
Power 3

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1868phae.proj..323w

52

1868 Mar 9 Monday

γ Virginis

		181·2		
		182·7		
		182·0		
		183·0		
		183·7		
	mean	182·52		0·461
			65·42	
			46	
			45	
			43	
			47	
			65·446	0·464
			64·50	
			52	
			53	
			54	
			53	
			64·524	0·458
			64·98	
			99	
			98	
			98	
			98	
			64·982	

Perp. to eyes. Power 3.

Very near moon.

Measured by moonlight without gas.

P·XIII 127

		105·0		
		106·5		
		104·8		
		105·0		
		105·5		
	mean	105·36		0·243
			65·28	
			28	
			26	
			65·273	0·235
			64·77	
			79	
			80	
			64·787	0·251
			65·04	
			[98]	
			02	
			06	
			04	
			03	
			65·038	

Parallel to eyes. Power 3.

Comp. foll.

Seeing fair, but multiple image frequently

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Σ 1819

134·0
133·5
133·5
135·0
134·8

134·16

65·08 08 — 08 08
64·90 90 — 10 10
·090
65·02 01 98 00 01
65·004

Parallel to eyes. Power 3. Comps. equal.

Distance estimated.
Note June 2, 1880. Wires probably not on stars, but interval between stars compared by estimate with that between wires. See p. 54, Σ 1037.

Note June 2, 1880.
Coincidences on this date with e.

65.053	1.419	3 settings
64.988	56	5
65.030	51	5
64.982	52	5
65.004	53	5
57		

65.011 mean without regard to number of settings

04
.080
.159
239

65.010 mean according to number of settings.

39.770 coincidence ford, p. 48.
25.240 interval de (still larger than on p. 10 and 34) -

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1868phae.proj..323w

1868 Mar 11 Wednesday ~~12 Thurs~~

Illrances

Chron 236

GMS

Power no 4. Seeing pretty good
Satellites tolerably bright.

3d Satellite s.f.	8	36	90 + 339·0	68·28	3·25	Parallel to eyes
		41	339·0	67·89	[2·86]	
		43	337·9	68·19	3·16	
		46	340·8	61·82	3·21	
		48	338·5	61·92	3·11	
		49	338·1	61·75	3·28	
	8	43·8	68·88		3·202	
4th satellite n.f.		56	90 + 57·5	69·22	4·19	Perp. to eyes.
		58	57·5	24	·21	
	9	1	58·9	60·68	35	Chron 236 1m 7s fast of clock.
		2	58·7	50	·53	Clock slow 52s by lock 019
	8	59·2	148·15		4·320	Chronometer fast 15s
≈ 1037	9	30	27·6	conc 65·03		Parallel to eyes Power 4
			25·5	04		Seeing not very good
			24·2	02		
			28·0	05		
			26·0	04		
				02		
			26·26	03		
				65·033		
				65·10	·07	Distance estimated, wires not
				64·91	·12	
				65·11	·08	on stars
				64·94	·09	
					0·090	
≈ 1177			357·4			Parallel to eyes. Comp. n.f.
			358·3			
			357·0			
			357·57			
			355·0			Perp. to eyes.
			356·1			
			355·0			
			355·37			
				64·62		
				65		
				67		
				64·647	0·386	
				65·40		
				40		
				40		
				65·400	0·367	
	mean		356·47		0·376	

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1868phae.proj..323w

1868 Mar 11 Wednesday

Σ 1186		300·8 306·2 304·5 306·7 302·5			Companion very faint, preceding. Perp. to eyes.
	mean	304·14		0·374	
			[65·50] 38 38 40		
			65·387	0·367	
			64·62 64 66		
			64·640	0·380	
σ⁴ Cancri = Σ 1298		30·0 30·8 31·8			Comp. s.f. parallel to eyes Seeing execrable.
		29·7 31·1			Power no 3 (no 4 hitherto used.) Little confidence in measures notwithstanding their accordance
			65·54 49 44 49 50		
			65·492	0·482	Seeing much better
			64·55 53 52 45 51		
			64·512	0·498	
	mean	30·68		0·490	
Σ 1333		Seeing too poor to measure it. Can just see that it is double.			

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1868phae.proj..323w

56

1868 Mar 11 Wednesday

14 Leonis.		64·0 63·0 64·0 63·2 62·5			Parallel to eyes, Power 3 comp. s. f.
	mean	63·34		0·669	
			65·67 67 68 68 66		
			65·672	0·690	
			64·31 33 35 38 30		
			64·334	0·648	
			done 64·99 98 99 97 98		
			64·982		
Zero of pos.		78·4 0 0 77·9 78·2			
		78·10			
Σ 1478		177·0 177·0 177·0 177·8 178·7			Comp. north.
	mean	177·50		0·937	
			65·92 89 96 93 95		
			65·930	0·948	
			64·04 10 08 05 01		
			64·056	0·926	

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1868phae.proj..323w

GMS

Σ 1074 Separated, but clouds came in region before a measure could be taken.

γ Leonis 10h 0m

57.0
54.8
56.6
54.5
54.3

55.44 0.334

64.74
72
75
73

64.735 0.343

[65.50]
43
40
39
39

65.402 0.324

conic
65.08
10
06
07
08

65.078

Comp. foll. Power 3. Seeing good
Parallel to eyes

54 Leonis 10 20

63.0
62.0
61.7

62.23

Comp. foll. very faint through clouds. Power 4.
Parallel to eyes
Disappeared in cloud.

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1868 Mar 18 Wednesday

Σ 1074 Not separated CSP

Σ 1104 Stars large; could not separate it.

Σ 1109 Stars very faint and ill defined. 4th Power. Stars perp. to eyes. Components equal

387.8
336.0
333.3
333.1
333.5

333.22

65.38
41

65.395

64.75
73

64.740

Σ 1216 Cannot resolve it with certainty.

ε Hydrae Comp. s. f. not seen very well. Power no 3. Stars perp. to eyes.

136.9
134.6
137.5
136.7
136.3

136.40 0.312

40.26
24

40.250 0.300

39.61
64

39.625 0.325

ω Leonis Cannot resolve it.

Σ 1281 3d Power, stars parallel to eyes. Fainter star n. f.

24.3
24.0
24.7
24.4
24.6

24.40

43.03
08
15
08

43.085 3.135

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1868phae.proj..323w

		coinc.		
		39.95		Power no 3.
		98		
		99		Note June 2, 1880. Coincidence with d.
		99		
		98		
		39.978		
		39.948		Power no 6.
		933		
		936		
		940		
		937		
		935		
		947		
		948		
		949		
		939		
		950		
		39.942		

116 Hydrae — Barely recognized as a double star. Cannot be measured tonight.

Σ 1457 — Inseparable.

134 Hydrae — 4th Power. Stars perp. to eyes. Companion s.f.

187.7			
188.2			
187.7			
186.8			
187.9			
	40.33		
	35		
	33		
	34		
	33		
187.66	40.336	0.386	

Σ 1404 — 4th Power. Stars parallel to eyes " equal.

53.6
55.3
56.0
53.3
54.2
54.48

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1868phae.proj..323W

60 1868 Mar 18 Wednesday

Neb 2301 see next page but one.

Neb 3021 & a star following	90+	167·8 169·4	59·82 60·06	5·26 ·02	GMS	v B L m b M not N Note Oct. 11, 1880. Distance measured from e (comp. 65.08) with movable wire first on one side and then the other.
		169·0 168·7	70·41 37	33 29		
		78·7 79·5 79·0 79·0				
		78·89		5·225		
New nebula? or one of Lord Rosse's? (See D'Arrest's last catal.)	8° prec. Perhaps	7' south of 3020. several		Elongated slightly 100° (n to f) ± v. F. stars but hardly seems so.		
Neb 3020	elong	0°				p.s. F elong 0° (pos. circle) not b M. No star good to compare with it.
Neb 3018 and a star			70·15 69·97 99 85 83	Δδ		S. H. R.
			69·958	−4·873		Neb south
			74·74 75 75 10 74·81 80	Δα cos δ		
			74·840	+9·755		Neb foll.
Neb 3040 and a star nf			66·82 58 47	Δα cos δ		F R bM
			66·623	−1·538		Note June 2, 1880. Coincidence used 65.085. See p. 62.
			69.00 68·88 69·15	Δδ		
			69.010	−3·925		
a star sf			72·92 83 71	Δα cos δ		
			72·820	−7·735		
			70·17 16 33	Δδ		
			70·220	+5·135		

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1868phae.proj.:323w

The two stars

70·93 Δα cos δ
77
83

70 84⅓ 5·758

74 62 Δδ
53
54

74·563 9·478

Neb ~~3060~~ 3032
and a star n p

73·95 Δδ
74·00
23

74·060 −8·975

74·48 Δα cos δ
09
04

74·203 +9·118

Neb elongated 0° ± (n to f)
p F' p 4 not 6 M
(which however is slightly red)
The "~~scarlet~~" star is W XI 378 ^
The nebula is 11' south of it,
and follows it 5ˢ, giving for
1860·0
12 23 18 +5 0·5'
12 23 17·7 +5 21· 17

Neb 3902
and 3904

357·0
356·3
355·4

356·23
Mr 236
+14ˢ·2
3
3

+14ˢ·27

3904
and a star prec.

Neb. fil. B R 6 M
This neb. looks perfectly simple.
no appearance of a companion
other than 3902.

62·07 Δδ
61·89 neb. south
61·76

61·907 −3·178

3902

74·85 Δδ
75·42 neb. north.
75·50

75·257 +10·172

Neb 0F S

corne

65·09
10
06

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1868phae.proj..323w

1868 Mar 18 Wednesday

This observation should come before that of Neb 3021

Neb 2301 &
W X 1065

chr 236
−40·8
5
·3
−40·53

38·14
37·91
37·84
38·25
38·00
38·028 + 27·057 Δδ

neb north on e.
This gives for 1860·0

	10	58	38·3	+0	43 9
catal	10	58	38·7	+0	43 2

elongation
0
3
3·5
2·17

conc
65·09
07
10
65·085 mean of all the conc.

[3 coincidences on p. 61].

Note June 2, 1880.
Coincidence with e, p. 62, 65.085
" " d, p. 59, 39.978
Interval de 25.107
See pp. 10, 34, 53.

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1868phae.proj.:323W

Experiments with spectroscope by J.W.

Σ 1457	38·2			CSP	4th power; stars parallel to eyes. Well separated.
	39·3				
	40·5				
	39·2				
	38·2				
	39·08				
		40·07			
		0 5			
		0 6			
		40·060	0·125		
		39·81			
		81			
		81			
		39·810	0·125		
		40·05	0·115		6th power; stars moderately
		39·82	0·115		steady and well defined.
	37·8			WMD	5th power.
	38·8				
	37·4				
	38·00				
mean of all	38·68		0·122		
ω Leonis.	153·5	approx.			6th Power. Perhaps elongated Has grown hazy and is still getting so. After long looking, felt pretty sure of its being seen double.
		coinc			
		39·937			
		935			
		937			
		932			
		39·935			

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1868phae.proj..323w

1868 Mar 19 Thursday

chr. 236

Neb 3009 &
W XII 380
= Σ 1648

−1 36·2
·2
−1 36·20

GMS β p.S R m b M N

42·41 Δδ
40,
15
42·320 +22·765

Neb north on e
This gives for 1860·0
12 21 50·0 +4 20 36
catal 12 21 50·2 +4 20 49

Σ 1648

130·0
128·1
129·5
130·1
129·1

Companion n. f.
Power no 1. Perf. to eyes.

mean 129·36 0·820

39·13
12,
15
39·133 0·802

40·80
77
75
40·773 0·838

Neb 3311

elong
42·5

Elongation decided
Neb. considered faint, but
clouds shortly afterward
came on.

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1868phae.proj..323W

CSH

Sirius Star large and tremulous, companion faint. 3d Power. Stars parallel to eyes.

97·8
99·1
93·8
95·1
96·45

Eyes tired by the glare so that I cannot go on with this stars. Seeing very bad, stars melting apart and dancing.

zero of pws
79·3
78·9
78·9
78·9
78·9

again nearer meridian
79·2 (2 wt.)
79·10

ε Hydrae

133·3
134·1
[133·5]
[137·5] as careful as the rest
132·9
134·1
133·58

Seeing bad, stars unsteady, 3d Power stars perp. to eyes.

40·30
30
29
31
30
40·300 0·340

coine
39·960
959
959
978
952
968
960
948
956
965
39·960

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1868phae.proj..323w

66

1868 Mar 22 Sunday

16 Hydrae

19.4
21.3
20.2
20.4
20.3

20.32 — 40.09, 08, 10 — 40.090 — 0.162

39.77, 76, 77 — 39.767 — 0.193

Σ 1404 — 54.3 — 40.69 — 0.73

W IX 1272

found to be double by CSP. Very close, within 1", nearly n. & s.

GMS

Double

Neb. D'Arrest's last catal.

11 25 12 +1° 35' (1861)

N.B. 78°.2 used as the zero in these comparisons; a correction is applied for this error.

Following component

& W XI 420

26.41, 40, 44 — 26.417 — Δα cos δ — +13.535 — corrected +14.018 — Neb. n. f.

9.33, 09, 08 — 9.167 — Δδ — +30.785 — corrected +30.573

The two nebulae

27.33, 27.79, 28.08, 09, 14 — 27.886 — Δα cos δ — +12.066 — corr. +11.990

35.06, 35.27, 34.92 — 35.083 — Δδ — −4.869 — corr −5.059

The following neb. is south. " is decidedly the brighter, and is rather bM. Preceding one has a more equable light.

This gives for 1860.0

Neb 1 11 25 2.6 +1 35 19

2 11 25 10.4 +1 34 31

coinc 39.97, 96, 93, 95, 95 — 39.952

Note Oct. 1, 1860. Neb 1 / 35 20 rather than 19

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1868phae.proj..323w

zero of pws
79·0
0
·2
·1
79·08

Neb. D'Arrest
11 24 36 + 4 15 (1861)
& W XI 442

19·44
·12
19·280 +45·792

chr 236
−1 38ˢ·2
·4
−1 38·30

Neb v F R pS bbM
This gives for 1860·0
11 24 29·8 + 4 15 36
Neb n.f. on wire e.
Note Sept. 29, 1880. Coincidence 65.072 on p. 68.

Neb 3045
and W XII 413

24ˢ·0
24, 5
23·8
−24ˢ·10

Neb n.f.
This gives for 1860·0
12 24 31·9 + 4 42 51
catal 12 24 29·8 + 4 42 12
Neb on d.

23·06
21·14
22·04
22·080 +17·872

Neb large and faint 90″ n to s
45″ p to f
ill defined but perhaps broader at northern end than at southern. Looks sometimes triangular. One or two small stars indistinctly seen in it, (one pretty certainly toward southern end with a brighter one s.f. just outside the neb.) but they hardly look like nuclei, having no condensation about them.

Neb 3125

elong
44·5
47·0
45·75

p 63.
Note Oct. 14, 1880. δ 1880 5 5 28.4
G.C. δ 5 5 19.5

8 W XII 502

chr 236
+36·2
·2

Neb. foll.
This gives for 1860·0
12 31 21·8 + 5 5 28
catal 12 31 18·5 + 5 5 20

51·03
50·60
51·56
51·20
+36·20 51·095 +11·135

Star south on d

Note Oct. 14, 1880. If this coincidence is 39.952 as opposite, this Δδ should be 11.143, with the mean 51.095; but the mean should arithmetically be 51.098 and Δδ 11.148: commensurable in result.

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1868phae.proj..323w

1868 Mar 22 Sunday

Neb 3311

elong
37.1
40.7
35.5
37.77

Brighter than 3125
Elongation very decided, more than 3125.
Neb. b M, lens shaped.

Neb D'Arrest
13 10 16 +6 47 (1861)

F. bM perhaps a little elongated; pos. about 70° n to f.

Neb 3456

Rather fainter than the D'Arrest nebula above. Looks R but I cannot be sure.

Neb 3615

Elongation estimated 140° n to f. Suddenly v m b M N; r?
Large, 3' by 1'.

New nebula s f. A Z +8° no 2822 about 4's 10° p from memory; clouds prevented a measure.
e E (through clouds?)

Note June 10, 1880.
Copied place of nebula 1860.0
14h 2m 43s +8° 43'

conc e
65.09
08
05
08
06
65.072

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1868phae.proj..323w

Observations with spectroscope by J.W.

Zero of pos.

77.8
77.7
77.8
77.77

CSP

coinc

39.993
988
003
000
998
39.996

W VIII 1221 found to be double by CSP

338.4
338.8
340.1
338.6
340.3

Star perp. to eyes. Color faint blue.

40.62
72
82 } bad (½ wt)
61
66
70
40.672 0.676

Oeltz. 10442 found to be double by CSP. Complete identification and measures prevented by clouds.

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1868phae.proj..323w

TO

1868 Mar 24 Tuesday

Observations with spectroscope by J.W.

α Orionis full of lines in every part.

Great nebula in Orion 3 or 4 lines; perhaps more; none in red.

δ Orionis (probably ζ) left of 3 in belt. No lines.

β Orionis. Lines in blue but not elsewhere.

α Tauri. Full of lines. Best yet. Sodium line double. Many bright lines.

Zodiacal light not very bright to the naked eye.

" " in spectroscope. Fancy can see light occasionally. That is all. Try again another night.

Little 4th mag. star in the foot of Auriga. Red. Plenty of lines. Sodium line very plain.

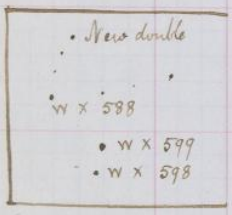
Procyon. Better than on previous evenings. No lines in the red.

Regulus. No lines. Pretty encouraging prospect in the blue.

α Hydrae. Sodium line conspicuous and plenty of others but not distinctly and steadily seen. Observer sees that there are plenty of lines in the star.

Search for doubles. by C S B.

10 mag. equal components. Position p & f. Dist. 5″
α = 10h 36m δ = −12° 41 Too faint to measure.



W X 598 is also double.

94.6
92.0
93.0
94.4
92.8
93.36

Stars parallel to eyes. Comp. p.

40.47
44
46
40.457 0.441

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1868phae.proj - 323w

1868 Mar 24 Tuesday
25 Wednesday

Note Oct. 2, 1880. Recomputation gives place of neb $11^h\ 56^m\ 39^s.3$ $+4°\ 19'.5$.

New neb. prec. Lal 22686 SMS

$\frac{1}{4}$ of field of power no 3 south

$\Delta\alpha$
$-53^s.5$
54
$-53^s.5$

Field of no 3 = $28^s.5$ by transit.

Neb. v F, p S, R?, b M.

$\Delta\delta$
$-1'.77$

This gives for 1860.0
$11^h\ 56^m\ 39^s.5$ $+4°\ 19'.5$

Neb 3009 n f Z 1648

B S R m b M N

Neb 3138 elongated 60° n to f ? agrees otherwise with Herschel's description.

Neb 3197 B p L elongated n & s. m b M.

Zero of pos.

zero
78.3
.5
.2
78.33

comic. power no 3

40.00
02
02
02
02
40.016

Mar 25 Wednesday.

α Orionis
α Tauri
α Hydrae
} Observed with spectroscope JW.

Planetary neb 2102 = Lal 20204 Line 1500 (micrometer reading probably.)

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1868 March 28. Saturday

1868phae.proj..323w

Venus, Disk of						P	
App. diam n & s					41.71 41.72		
App diam p & f					41.16 .27		
Shortest diam.				6.5 4.8 4.9	41.01 40.98 40.96		
Longest diam				281.5 276.8 276.2	41.45 .56 .78		

Occultations (time by eye & ear)

δ^1 Tauri	Imm.	9h	39m	38.0s	sid t.	P	Chron. Bond (236) 25.3s faster than sid clock.
δ^2 Tauri	Imm		51	11.2	"	"	
δ^2 Tauri	Em				"	"	Secr. Setting miscalculated.
δ^1 "	Em	10	35	32	"	"	
1391	Im	8	23	44	m. sola t.	Austin	Mlt comet seeker & Frodsham 3242)
"	"					P	Chronograph failed to mark)
1394	"			36?	sid. t.	P	" " " "
1210	Em	10	51	23		P	Bond 236.
1291	Em	10	31	58		P	Poor
1294	Em	10	33	23.5		P	
	Im	9	8	23.5		Austin	Mlt Equatorial & Frodsham 3242
	Im		12	57.5		"	" " " " "

Note Dec. 11, 1880. In order to determine the time of these occultations, observations were made with the East Transit Circle, (as appears from the chronograph record in book O 16), and the chronometers B. 236 and F. 3242 were also compared on the chronograph sheet with the clock. But if the chronograph sheet was ever read off, it was in the course of Miss Lane's work recorded in a book now boxed up along with the chronograph sheets. No reduction was made which is recorded in either of the books O 4, O 19, or O 20, so that to obtain it the boxes in the cellar must be searched, and probably the original chronograph sheet examined. Under these circumstances, Professor Pickering decides to reject the observations made with the chronometer F. 3242, and to obtain the error of the chronometer B. 236 from the data for the errors of the clock which are on record in book O 19 (March 25, 1868, $3^h\,30^m$ sid. time, clock slow 0.s26; March 31, $9^h\,9^m$ sid. time, clock slow 6.s89), combined with the note on this page (see also original record in book N 12) showing that B. 236 was 25.s5 fast of the clock. — On further examination, Professor Pickering decides to reject the whole. See note of this date in book N 12.

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1868phae.proj..323w

Spectra.
Moon

D		843		P	
		4			
		5			
		5			
		3	844		
b		1287		P	
		5			
		5			
		4			
		4	1285		
F		1570		P	
		1			
		0			
		0			
		0	1570		
E		1222		P	
		2			
		6			
		3			
		4	1223		
D		843		P	
		4			
		5			
		3			
		4	844		
Polaris				W	Few lines and ill-defined
"	Line	1571		P	Few lines
	Line	1217		P	
Kochab (β Ursae Min)				W	A good many lines
γ Ursae Min.				W	Very few lines
[Meteor]	10h 9m			W	Passed very near γ Ursae Minoris down towards about α Cassiopeiae. Much brighter than a star of the first magnitude.
Arcturus	2 lines	1310		W	Full of lines. A prime working-star
		852			
"		1294		P	Note that reddish working stars have many lines. Such are Betelgeux, Aldebaran, Cor Hydrae, little star at foot of Leonis, and Arcturus. Bright lines?
Mirach (β Bootis)				W	Promising. Several lines in red with lower power. Abundance in yr. & bl. with same power
				P	Lᵢ line?
Spica Virginis				W	Not sure of seeing any lines.

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1868phae.proj..323w

54

1868. March 30th. Monday.

Solar Spectrum

D	856.5		P
	860		
	855		
	857.5		
	857	857.2	
C	578		P
	580		
	579		
	580		
	579.5	579.3	
E	1229		P
	8		
	9		
	8		
	30	1228.8	
b	1290		P
	0		
	0		
	1		
	1	1290.4	
F	1577.5		P
	5		
	6		
	8		
	7	1576.7	
G	2284		P
	81		
	82		
	77		
	82	2281.2	
D	852		P
	4		
	5		
	4		
	5	854.0	
C	581		P
	0		
	1		
	0		
	0.5	580.5	
b	1290		P
	0		
	0		
	0		
	0	1290.0	
F	1576		P
	5		
	5		
	5		
	6	1575.4	
G	2290		P
	88		
	86		
	89		
	88	2288.2	

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1868phae.proj..323w

1868 March 30th (continued)

Solar Spectrum

D	8625		P
	3		
	4		
	5		
	6	854.1	
E	1227		P
	6		
	6		
	5		
	5	1225.8	
Line marked p in pencil on diagram in Schumacher's Atl	1785		P
	3		
	5		
	4		
	2	1783.8	
Line marked q.	2165		P
	7		
	8		
	4		
	8	2166.4	
H	2637		W.

1868 April 1st

Spectroscope mounted on Tripod not on Telescope.

Line between E & b	1234		P
	5		
	6		
	5		
	5	1235.0	
E	1200		P
	0		
	1199		
	9.5		
	9	1199.5	
b	1268.5		P
	8		
	8.5		
	8		
	8	1268.2	
D	824		P
F	1555		P
	6		
	5.5		
	6		
	4.5	1555.4	
Line between G & H	2733.5		P
H	2963		P
	.52		
	56	2957	

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1868phae.proj..323w

1868 April 18 continued.

Line beyond H	3042		P	
	33			
	41			
	36			
	44			
	40		P	
	52	3041.1		
B	459		P	
	57			
	60			
	59.5			
	57	458.5		
A	382		P	
	70			
	74			
	80			
	83	387.8		
C	558		P	
	8.5			
	9			
	9			
	8	558.5		
F	1554		P	
	3			
	2			
	1.5			
	3	1552.7		
G	2270		P	
	0.5			
	0			
	0			
	0.5	2270.2		
H	2963.5		P	
	53			
	65			
	58			
	60	2259.0		
Evening Observations				
Venus			P	Too dazzling and unsteady for measures
Sirius			P	Companion not visible.
Σ1133	60.7		P	3?P V. unsteady
	62.1			
	63.7			
	62.4			
	60.7			
mean	61.98			
	40.89		P	3½ P.
	90			
	84			
	80			
	74	40.816		
	.816			
	40.82		Horatio Greenough.	
	98			
	97			
	81			
	85	40.886		

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1868phae.proj..323w

1868 April 1st, continued.

Coincidence		40·30		P	3rd P
		·32			
		·29			
		25			
		28	40·294		
3 Double Stars found					Note June 23, 1881. h 1637 below signifies G.C. 1637.
	R.A. 8h 8m			P	In a nebula in Monoceros or rather a loose cluster = B.A.C. 2766 = h. 1637. There are three doubles in this nebula nearly in a line running n.p. & sf.
Middle star		41·23		P	After this, the fixed wires were moved.
	353·0			Norralw Greenwich Obs.	
	0·5				
	0·7				
	1·0				
	0·8				
	351·20				
Coincidence			36·83	P	3rd P
			3		
			3		
			0		
			4		
Southernmost star of 3.	322·6			P	
	1·1				
	3·6				
	3·0				
	5·5				
	323·32				
		37·52		P	
		·76			
		79			
		63			
		61			
		37·721			
Northermost of the three	340·3			P	
	41·1				
	39·7				
	39·8				
	41·0				
		37·70		P	
		·82			
		71			
Double Star found	843		10″	P	Found to be h 4303 R
Double star found RA 11h 25m Dec −23° 41′		37·64		P	
		35·94	·85		Double distances
		37·85			This star is Lalande 21940
		35·91	·97		Mags 7 and 10 (Confirmed Gy W)
	92·8			P	
	4·5				
	2·9				
	0·5				

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1868phae.proj..323w

78

1868 April 1st continued
5 Sunday 6 Monday and 13 Monday.

Double Star
h (Cuhe) 44456

47.7
9.2
8.3
9.2
9.7

P 8h ∝ 12h magd.

38.90
.87
39.12

P Comp. s. P.

Apr 5 Sunday

Castor

Double image. Too bad to measure.

294.8
5.8
4.8
6.1
5.5

295.40

CSP. Stars perf. to eyes.

37.48
40
40
40
49

37.434

Betelgeuse observed with spectroscope

Apr 6 Monday

48 Virginis

Invisible at immersion.

Apr 13 Monday

Brorsen's comet found by CSP at
9h sid. t.

Same R.A. as W III 393
Distant about 1° in declination.

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1868phae.proj.:323w

1868 Apr 17 Friday.

Object	Time	Position or Δα	Micrm.	Distance	Observer	Remarks
Brorsen's comet and Rumk. III 974		263·6 Zero of position			f w	
	9 42 38		57·20			
	44 0		56·26			
	45 2		56·17			
	9 43 53		56·543			
			coinc.			
	9 50 51·3	−21·9				Comet preceding
	51 0·3	21·9	56·53			
	7·9	23·1				
	51 13·2					Nucleus of comet distinct, but no certain tail. Perhaps could be seen without illumination.
	22·2					
	31·0					
	9 51 46·5	21·5				
	55·5	22·0				
	52 4·4	22·8				
	52 8·0					
	17·5					
	27·2					
mean	9 51 28	−22·20				
	9 57 58		60·50			Comet north.
	59 1		52			
	36		66			
	9 58 52		60·560			
	9 49 28·4	−22·6				
Transit omitted in its proper place.	38·3	22·1				
	46·7	22·1				
	51·0					
	50 0·4					
	8·8					
mean of all 9	9 50 51	−22·22				We thought he saw tail 15° N of f.
	10 1 51·3	−19·1				
	2 1·4	19·4				Notes in original regarding the identification of the comparison star, which proved to be Rumk. III 974.
	10·4					
	20·8					
	2 55·3	19·7				
	3 5·9	20·2				
	15·0					
	26·1					
	10 2 28	−19·60				

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1868phae.proj..323W

1868 Apr 17 Friday continued.
18 Saturday

γ Leonis

CSP. Seeing very bad. 3d Power
Cannot see it double.

JW Thought he saw it double at
first nearly N & S.

Not separated.

Pulkowa Catal. 201

Comparison of Chronometer Bond 236

chron.	12	36	
clock	12	34	28

Apr. 18 Saturday

Brorsen's comet and Arg. +24° 581.

	9	48·0	65·18	Δδ
		50·6	90	
		52·8	60	
		54·6	84	
		56·2	67·42	
		58·0	40	+10·086
	9	53·37	65·890	~~+9·890~~
			coinc. 56·00	
			changed 55·30	
			63	
				Δα cos δ
	10	5·0	57·87	
		6·1	58·38	
		7·6	58 98	
		8·4	59·16	
	10	6·77	58·597	+2·793
			coinc 56·05	
			04	
		mean of 5	55·804	
				Δδ
	10	15·7	72·18	
		16·2	46	
		16·5	55	
	10	16·13	72·397	+16·877
			coinc. 55·49	
			49	
			58	
			55·520	
		21·1	62·88	Δα cos δ
		22·8	63·80	
		23·4	63·60	
		23·8	63·80	
	10	22·77	63·520	+7·873

JW Comet n.f.

Coincidence changes whenever micrometer circle is turned.

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nrao.phee.proj.222w

coinc.
56·03
mean of 4 55·647

Comet has a tail following;
position circle reads 4° (+ 90)
Length of tail equal to field of
eye piece 10′ or 11′
Tail faint, but not much doubt.

CSP read the circle for the position of the tail 7°.5 and 13°. Extends 10′ to a star of 8·5° (mag?)

Notes in orig. as to identification of comp. star which proved to be Arg. + 24° 581.

JW Condensation in the middle; no distinct nucleus; tail shades off and spreads rapidly.
Head distinct from tail.
Outline irregular but nearly circular.

Diameter of head 61·31
56·10 5·21

Brorsen's comet and W² III 1293.

Apr 22 Wednesday

9 56·8 66·76
57·2 26
58·0 47
9 57·33 66·497 −14·407

Very faint
Comet s.f.

10 3 9
5 57·5 +2 48·5

10 11·1 62·43
13·1 63·06
15·2 61·82
10 13·13 62·437 −10·347

Error of Chronometer − 1ᵐ 51ˢ

coinc.
52·10
08
52·090

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1868phae.proj..323W

1868 Apr 23 Thursday

Brorsen's comet

and

Zero of pos
263°.6

	10	3·8 4·9 5·7 6·5	74·01 09 73·60 58	Δδ	Comet s. f.
	10	5·22	73·820	−21·735	Diagram of region for identification in original record.
	10	13 41			
		18 10·5 + 4 29·5			
	Chron. stopped.				
	10	31·5 32·1 32·8 34·0	68·45 68·35 67·75 67·94	Δδ	
	10	32·60	68·122	−16·037	
			conc 52·10 07 52·085		

Observations on spectrum of comet

J W	900 1000	both lines in these (limits?)
CSP	1090 1145 1162	broad line

Peters' asteroid

15	54·0 55·6 57·5	65·86 66·31 61 95 40	CSP	
16	1·8 3·0			
15	58·38	66·426		

3 Transits recorded on chronograph?

Comp. star precedes W XI 270 by 51ˢ.

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1868phae.proj.1323w

Apr 26 Sunday.
28 Tuesday

Zero of pos.
259°.7

Brorsen's comet.
and W² IV 563.

10 16 17.5
25.0
35.0

17 27.0

Comet precedes.

Remarks as to identification of region as previously.

26.0
28.6
32.8
33.4

10 31.60

[43.95]
45.15
45.35
45.49

45.330

Spectrum brilliant. Observations of previous night confirmed. Nearly over whole field black stripe. One pretty decided line faint at about 1900. The two bands extend from about 900 to about 1650. Hard edge of band 1362. All about 1b (see original) [looks like b in the original]
Aurora (not v. bright)

coinc.

52.00
51.98

51.990

Apr 28 Tuesday
Zero of pos.
261°.6

Brorsen's comet
and

10 29 22
31 0
32 38

10 31 0

44.76
60
74

44.700 +7.300
coinc
52.00

10 35 30.5
40.3
49.9

36 29.9
46.6
49.1

+59.4
.7
.2

Comet n. f.

37 4.7
14.9
24.6

38 25.0 +60.4

10 37 6 +59.67

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1868phae.proj..323w

1868 Apr 28 Tuesday (contin.)
30 Thursday

10	41	11	42.05	
	43	25	41.38	
	44	38	23	
				+10.447
10	43	5	41.553	

Spectrum (contd) Mean of broad lines 10.31 CSP

γ α β

γ = 1495 Violet line 1708 JW
β = 724 Another about 1100
" 672 better measure.

Line almost identical with right hand of two green ones of Mg spectrum. Said Mg. line is 940 and 935 (So.)
Other green line of Mg. 1085

(Moon) lo 955
Mg. line in violet 1621.

Apr. 30 Thursday

Attempts at spectrum.

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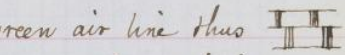
1868phae.proj.323w

1868 May 1 Friday
3 Sunday.

Spectroscope on Brorsen's comet JW

Principal band at 900
Another 641 Better measure 672
Broad dark space between them.
Very faint 1242 Some light doubtful
1465 Feeble line
Mg b 910 910
Air line 1058

y α′ α β
| | || |
See original

Space between α and β very black CSP
On the last evening of observation when the spark was in, two sharp well-defined lines appeared at α and α′ no other light of the comet was visible.
The slit was open to nearly its full width.
These lines were a little on the right side of b and the broad green air line thus 
(see original)

Hazy, moonlight.

May 3 Sunday

Brorsen's comet Faint.
Spectrum seen CSP sees αβγ. Finds and coincides with Mg. b and reads it 930.

JW Reads γ 1474 air 1545.

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1868phae.proj..323w

16

1868 May 4 Monday

Zero of pos.

Brorsen's Comet 265·1 CSP

		conc.		
		48·89		
		93		
		92		
		89		
		91		
		48·908		
11	47·0	54·64		Comet s/p.
	49·5	54,70	Δδ	
	50·6	53·34		
	52·6	53·65		
11	49·92	54·082	−5·174	
12	0·5	46·48		
	2·2	46·67		
	[4·2]	46·87		
	6·1	47·04		
12	3·25	46·765	2·143	

Δα or Chronograph (insert here)
Transits over 3 wires.

Following comp. star which is 9½ (mag.) is a star of 7½ twice as far from comp. star as comp. star is from comet. Same dec. as comet. Preceding the comet are two stars, south of it 8½ ~ two nearly together. Very wide double.
Value of revolution of finder
Dec. 17° 4′ = 3ˢ time.
[This perhaps means that the wide double preceding the comet was south of it 8½ revolutions of micrometer screw of finder; and that at 17°4′ from the equator 1 of these revolutions was equal to 3 seconds of time.]

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1868phae.proj.323w

Friday 1868 May 8.

Brorsen's comet

Zero of pos.
261°.5

49·23
24

Diameter

62·72

Rattles on chronograph at times.

78·75
78·77
79·22
44
69
79·174

2 Transits over 3 wires.
On chronograph.

JW

Nucleus or compressed centre is much nearer to the s.f. side than it is to the other. Irregular in outline. Pretty bright little star however on s.f. side which may kill light. That star is of 10th or 11th mag.

Comet n.p. star of comparison

Another star nearly as much further north of comet and further following. Almost exactly one field of 1st power north of comp. star 19s.5 following that star.

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1868phae.proj..323w

1868 May 8. Friday (contin.)

New double
α 12h 5m
δ −23° 9′
= h 4506

JW. Mags 8·5 and 12·5

Another not in
Herschel.
α 12h 15m
δ −23 28

t 1h 12m at 13h 27m
Both 9 mags. Distance
5″ to 6″.

11°

Pos sf and nf
Diagrams of region in original.

Another
α 12h 39m
−23° 40′

86·2 (pos?)

Companion of.
Vernier IV 66° 20′

New double
Star south of Spica
γ Hydrae

Fortasse Oblonga.

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1868phae.proj.323w

Brorsen's comet

zero of pos. 261°.5

56.97
56.35
55.54
56.287

Δδ

Comet s.f.

2 comparisons in α of two stars and comet over 3 wires, on chronograph

The preceding star of the two was ~~wires~~ was not used in the declination comparisons. It precedes the comparison star and is south of it. The reading of the micrometer wire on it is 51.53

A 7th mag. star follows the comp. star 42 to 44s and is north of comp. star 13′ or more. (Lal. 11377.2)

At 12 35 42 by 236 which is 4s fast of standard clock, the hour angle of comp. star is 6 40 57 by large circle.
Vernier reads 134° 5′ on dec. circle

53.39
52.75
52.27
52.803

Star on fixed wire

comc.
49.47

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

The times of the declination comparisons were denoted by a short rattle then a long break followed by a short rattle.

Some readings of R.A. comparisons are given in original.

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1868phae.proj..323w

90

1868 May 11 Monday

chron 236

Borrsen's comet and an 11th mag. star.

12	0·5	100·25		
	1·8	99·92	Δδ	CSP
	2·3	100·45		
	2·9	99·21		
	3·5	99·09		
12	2·20	99·784	−47·484	Comet south
		conc 52·30		After this the head of the screw was adjusted
	12·5	32·54		
	13·6	95		
	14·3	59		
	15·2	40		
12	13·90	32·620	−44·377	
		76·96		
		77·00		
		77·03		
		76·997		

2 Transits of comp. star and comet over 3 wires on chronograph

on chron
11 56

Transits of a 6 mag. star and comp. star over 3 wires

12 19

Comp. star foll.

These should follow the declination comparisons on next page.

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1868phae.proj.323w

42·23
41·91
42·25

42·130 −9·792

Comp. star. south.

comc.
51·92
92
95
90

51·922

2 Transits of comp. star and comet over 3 wires 12 22

Diameter of comet 70·19
56·06

The bright condensation
At $12^h\ 31^m\ 32^s$ (h=) $6^h\ 18^m\ 56^s$
Dec. 45° 42′

G.H.M. Comae Beren.

CSP Thought it had bright points.
JW Saw dark ⌒ place about nucleus.
Confirmed by CSP.
Examined

492 Bedford Catal.

h 2343
h 3606

W & P both thought it very spotty
No spirality seen.

Note Sept. 28, 1880. The time of year and the descriptions show that h 2343 and h 3606 are to be understood as Cy. Co. 2343 and Cy. Co. 3606.

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1868phae.proj..323w

82

1868 May 12 Tuesday

Brorsen's comet

Zero of pos
260.9

Comet a.p.

11	46.4		63.05	JW.
	46.7		08	
	47.4		12	
	47.8		00	
11	47.07		63.062	−11.152

11	53	43.5	− 32.5
		54.0	33.3
	54	7.0	32.0
		16.0	
		27.3	
		39.0	
	54	50.5	30.7
	55	3.0	31.25
		14.0	32.0
		21.2	
		34.25	
		46.0	
11	54	28	−32.96

11	57.2	61.64	
	57.6	50	
	58.2	33	
	58.6	00	
11	57.90	61.368	−9.458

conc
51.91

Breadth of comet

60.59 } ½ object glass
64.00 }
66.00 whole "

There is another star south of the comp. star distant 41ᵐ43 + diob. of fixed wires.
Δα = 40 to 40½ sec. comp. star follows.
35ˢ preceding comp. star is another brighter seen in finder. Dec = 46° 22'
Not more than ½ mag. brighter than comp. star.
Comp. star has a little one north of it, a mag. less. distant 20" and another same distance south of it.
Little circle on comp. star 46° 8'

At 12 10 10 h = 5 48 0
46° 9' = Dec. of star.

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May 12 Tuesday
14 Thursday

Spectrum of comet
Spectrum of Arcturus

Saw nothing new.
Good (Rutherford's spectroscope.)

May 14 Thursday

Brorsen's comet

zero of pos.
260°.9

Dec. of comet 47° 19'

Comet sp.

12	9	27		52.84	Δδ	JW.
	14	37		52.38		
12	12	2		52:610	−24.290	
				coinc		
				51.95 (other wire used.		

Note June 2, 1880.
Coincidence for e, below, 76.90
" " d, opposite, 51.95
Interval de 24.95
Only one getting for each coincidence.
See pp. 10, 341, 853, 62.

12	24	14.5	−3	33.9	
		27.0		32.5	
		39.5		32.5	
	27	48.4			
		59.5			
28		12.0			
	29	18.5		31.0	
		31.0		30.25	
		43.0		30.33	
	32	49.5			
	33	1.25			
		13.33			
12	27	4	−3	31.75	

Most condensed part decidedly nearer to S. side.

12	35	55	55.81	
	40	18	56.07	
12	38	6	55.940	−20.960

Diameter	65.04	
	coinc	
	76.90	
Centre of condensation	72.42	4.48
From S. edge		
Other edge	66.06	

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1868 May 14 Thursday continued.
22 Friday

chron 236
Comp. star at 12 54 20 h = 6 10 24 δ by large circle 47° 28' } For other identifications see original.
Correction of chron. — 30ˢ

The following nebulae were examined and judged good for the spectroscope.

h 3021, 3035, 3132 (measure the direction of elongation) 3636, 3453 (poor) 3572 (very curious. Deserves careful study with the ~~spectroscope~~ telescope.)

May 22 Friday

chron 236

Brorsen's comet

14 22·4
25·5
28·4
32·0
14 27·07

53·56
52·00
53·24
52·72
52·880 +24·250

Comet n.f.
pos. circle 82°

conic.
77·12
14
77·130

14 43 57·5 −2 55·3
44 13·0 56·0
23·0 55·5

45 52·8 −1 55·0
47 9·0 54·5
18·5 54·5

Zero of pos
81·7
81·4
81·7
81°60

45 52·5
46 7·5
46 17·5

46 52·8 53·7
47 9·0 53·2
47 18·5 54·0

48 46·5
49 2·2
49 12·5

14 45 41 −1 54·15

14 50·5
53·1
55·3
14 52·97

52·38
51·68
51·21
51·757 +25·373

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May 22 Friday cont.
28 Thursday 31 Sunday

At 15 2 29.25 hour circle 6 58 45 or 50^s

For other identifications, see original.

Zero error of large equatorial R.A. circle — 47^s

1868 May 28 Thursday

Linné Diameter

52.27
conc 52.07
0.200

Shadow on outside seen by JW. Power of 600

Small double crater found, each component about the size of Linné.

1868 May 31 Sunday

Brorsen's Comet and

zero of pos 258.8

JW. Dec 48° 46′ $\alpha = 9^h 30^m$

13	55.1			32.30	Comet very faint and without condensation toward the centre
	57.8			32.23	
	54.7			30.41	
13	57.53			31.647	−20.473 Comet very faint & broad.
14	4 33				Comet s.f.
	4 56				
	5 18	−1	4	52 13	Comp. star is small; 9th mag.
				11	
				52.120	
	6 22				
	7 9	−1	7.5		
	7 32		4.0		
	7 55		3.		
	8 16.5				
	8 36.0				
	8 58				
14	7 47	−1	4.62		
	11.0			29.57	
	13.0			28.30	
	14.5			29.07	
14	12.83			28.980	− 23.140

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1868 May 31 Sunday continued.
June 14 Sunday

A star of 9.10 mag. precedes comp. star $1^m 32^s.5$ and is about 2' north of it.

hour angle of comp. star at 14 27 28. = 4 52 48

δ = 48° 47'
48° 46' by small circle.

Chron. 236 $1^m 51^s.5$ fast at 15^h sidereal time.

June 14 Sunday

Nebula taken for Brorsen's comet.

First good night for a month.

coinc.

52.03 CSP
01
03
05
02

52.028

Bro
Comet pretty bright.

Chron. 3m fast

Setting 40° 9'

Comet s.f.

zero of pos
261°.9

57.71
58.44
58.02

58.057 − 6.029 JW

Diagram of region in original.

Coinc. changed

Coinc.
52.02

Now June 10, 1880. The nebulæ may possibly, by the imperfect indication of the α and δ in the original, have been G.C. 29211. At all events there is nothing to show that it was a new nebula. The relative places of the comparison star and nebula are not sufficiently indicated to permit any trustworthy identification. The star was probably either 1' or 7' north of the nebula. The Δα might be recovered from the chronograph records, perhaps. But the measure is probably not worth preserving.

24 Transits over 3 wires on chronograph.

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1868 June 14 Sunday (continued)
15 Monday
19 Friday

	16 44 44	58·26	
	43 45	57·45	
		57·855 − 5·827	
Brorsen's comet	17 43 10	45·14	Large nebulous faint
	44 56	45·89	Invisible with slight illumination.
	[45] 46	46·42	Comet n f.
	17 44 37	45·817	
		coinc	
		57·12 (52·12?)	
			Observations of R.A. impossible.

17 45 55 $\Delta\alpha \cos\delta$ = distance of fixed wires from one another

A bright star follows the comparison star 5^m, and north of it 2'
Approximate position of comp. star $11^h 26^m 21^s +40° 6'$

June 15 Monday

Brorsen's comet

J W. Comet very faint and broad, no central condensation
Haze thickened so that no obsn. could be made with filar micrometer.
Chron 236 $3^m 3^s$ fast

June 19 Friday

Brorsen's comet

Set chron. 18^s fast.
Small star in comet.

17 16		26·51	Comet n. f
22		36	Comp. star 8 mag. Dec 36° 10'
17 19	$\Delta\alpha$	26·435	Comet very faint; obsn difficult
17 29	35^s		Diagram of region in original.
32	32·5		
17 30·5	− 33·75		

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98

1868 June 20 Saturday
~~21 Sunday~~ 24

Oeltzen 12844 (7th mag)
found to be
double.

CSP

Chron 236 21s fast.
See orig. for identification.
Has a companion of 14th mag.
north. (The large star) α seems
to W and P to be double E & W
and components nearly equal, but
this is doubtful. Star trembling.

Nebula suspected (faint)
α 14h 7m at 15h 15m h = 1h 8m
δ −25 50

JW

Note June 10, 1880. The α
appears to be 14h 7m as
entered opposite. As the place
does not seem to be accurately taken,
the nebula may possibly be G.C. 3803.

Double star at 15 38 24 h = 0 26 0
15h 12m 15 40 27 0 28 0
−23° 40′

Companion nearly south.
Mags 7 & 9 JW
" 10 & 11? CSP

proved to be h 4756 on June 21

Comp. S a little p.

June ~~21 Sunday~~ 24

Note Oct, 19, 1880. See book
N 12, p. 38, for true date June 24.

Second double of June 20th found to be h 4756

CSP

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

Double star
15 13 at 16 33 27 h = 1 20 0
−7 41

CSP

Distance 10″ nearly p & f.
Mags. 9 and 9

Double star
15 11 at 16 51 18 h = 1h 40m
−7 45.5

JW.

Distance 5″ nearly n & s.
Mags 9 and 11.

Double star at 17 3 13 h = 1 44 20
15 19
−7 49

JW

Dist. 5″ nearly n & s.
Mags 12 & 15 (CSP)
11 & 12 JW

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June 21 Sunday 24 continued.
25 Thursday
28 Sunday

Double star at $17^h\ 13^m\ 8^s$ $h = 2^h\ 2^m$ Distance 3" nearly n & s. Comp. s/p.
$15^h\ 11^m$
$-6\ 39$

Another double precedes last 1^m. Dec: $-6\ 42.5$ is south of it 10'

β Librae observed without ill. for zero error of circle.
at 17 31 25 $h = 2\ 20\ 0$ true $\alpha = 15\ 9\ 56$

June 25 Thursday

Comp. star of June 19th examined. It has another equally bright s.p.

37.70
coinc.
$\Delta\alpha$ 18s — 77.12 — $\Delta\delta$ 39.42
39.42

Note June 10, 1880.
α apparently $12^h\ 21^m.3$
δ " +32°

Nebula taken for Brorsen's comet $h = 3\ 55\frac{1}{3}$ at $16\ 16\frac{2}{3}$. Setting 32° 3' Too bright for comet.
B; pL; g; psomb M.
Note June 11, 1880. Perhaps G.C. 2972.
See note of this date on original record, book N 13, p. 40.

June 28 Sunday Hazy; flying clouds.

Occultation of 94 Virginis observed by CSP.

Wide double at $16^h\ 12^m$ chron. time $h = 0^h\ 53^m$ Mags. 8 and 8. comp. s.
$15^h\ 19^m$ 3d Power
$-21\ 22.5$
= h 4769.

zero of pos. coinc.
79.8
52.02
03
03
02
02
52.024

338.0 — 52.99
85 — 99
9.1 — 53.01
8.8 — 52.99
8.3 — 97
338.54 — 52.990 — 0.966.

Other double stars observed June 28, for which see original.

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1868 J

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