1891phae.proj.1331.

KG
11366
v.327

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1891phae.proj.1331.

Oct. 17. 1891.

Circumpolar Variables

W. obs.

S Bootis

14 16

21 37

7 21

+54.6

N 2.5, S 1.50 in large tel.

7 46 Too faint for finder

Est. 12.4

Moon at the full. Observation difficult

R Draconis

16 26

21 46

5 20

+67.4

b 3.R, R 2.5 in large tel.

7 53 Too faint for finder

Est. 11.6

R Cygni

19 32

21 57

2 22

+49.9

E 3.5 R, R 1 f in large tel.

8 4 Too fr for finder

Est 13.0

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1891phae.proj.1331.

Oct. 17, 1891.

S Cygni

20	8	+57.1
22	2	
1	14	

S Cygni not seen owing to very bright moonlight. ~~St~~ Comp Star (S) not certainly seen S Cygni probably fainter than 14.1

8 15

S Cephei

21	37	+78.3
22	17	
1	40	

m 3 S, S 1 m in large tel.
Too faint for finder
Est 11.6

8 24

R Ursa Maj.

10	32	+69.2
22	24	
1	52	

S 3 R, R 1 ± in large tel.
Too faint for finder
Est 12.6

8 33

Observation difficult.

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Oct. 17, 1891.

Dm. Hedges Zone. Fr. to.

Cr. to A2.

+19°

18 39 +19.8

22 √5

4 16

9 3 3776 2.59

2.79

2.35 7.73

3.35

3778 3.02

3.02

3.10 9.14

3.96

3779 √.44

√.59

√.50 16.53

7.16

3782 2.48 A slightly fainter star follows

2.60 3 sec ~~T~~ south.

2.70 7.78

3.37

3789 2.91

3.10

3.29 9.20

3.98

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1891phae.proj.1331.

Oct 17, 1891

3790	4.62		
	4.75		
	4.59	13.96	
		6.04	
3792	3.20	Following of pair.	
	3.47		
	3.61	10.28	
		4.45	
~~3793~~ See note below.	3.09	Preceding of pair.	
	3.12		
	3.00	9.21	
		3.99	
3793	1.91		
	2.29		
	2.20	6.40	
		2.77	

It looks as if there were an error in the "Durch Musterung", and as if 3792 + 3793 might be the preceding and following of pair respectively. The following of pair follows preceding star 2.5 sec, slightly south. Both stars of pair should be in the "Durch Musterung". The star assumed however for 3793 ~~is a~~ both in this zone and in zone 20 conformably to the B.M. is a quite faint star, in same right ascension as following of pair and 6 min north of it. Mag. of following of pair 9.0, mag. of preceding of pair 9.2; mag. of faint star 10.8

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1891phae.proj.1331.

Oct. 17, 1891.

3801	3.10	
	3.20	
	3.50	9.80
		4.24
3804	2.59	
	2.80	
	2.90	8.29
		3.59
3806	3.19	
	3.47	
	3.39	10.05
		4.35
3810	3.05	
	3.30	
	3.45	9.80
		4.24
3825	2.60	
	2.59	
	2.50	7.69
		3.33
3831	2.40	
	2.48	
	2.45	7.33
		3.17
3838	2.70	
	3.11	
	3.02	8.83
		3.82

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1891phae.proj.1331.

Oct. 17, 1891.

3842	2.19		
	2.10		
	2.12	6.41	
		2.77	
3846	2.50		
	2.52		
	2.50	7.52	
		3.26	
3852	2.60	Preceding, northern and	
	2.41	slightly brighter of pair	
	2.50	7.51	
		3.25	

A slightly brighter star follows above star, 10sec, 5' south which is apparently not in D.M.

4002	2.79		
	2.81		
	2.80	8.40	
		3.64	
4008	3.17		
	3.20		
	3.47	9.84	
		4.26	
4009	5.89		
	5.74		
	6.19	17.82	
		7.72	

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1891phae.proj.1331.

Oct. 17, 1891.

4013	3.24		
	3.39		
	3.50	10.13	
		4.39	
4019	√.89		
	√.70		
	√.69	17.28	
		7.48	
4021	2.72		
	2.98		
	3.18	8.88	
		3.8√	
4023	3.66		
	3.88		
	3.97	11.51	
		4.98	
4027	4.00		
	4.13		
	4.39	12.52	
		5.42	
4028	√.22		
	√.20		
	√.√1	15.93	
		6.90	
4029	3.10		
	3.33		
	3.70	10.13	
		4.39	

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1891phae.proj.1331.

Oct. 17, 1891

4037	3.50		
	3.40		
	3.52	10.42	
		4.51	
4039	5.79		
	5.50		
	5.55	16.84	
		7.29	
4044	2.60		
	2.83		
	3.12	8.55	
		3.70	
4048	3.70		
	3.70		
	3.90	11.30	
		4.89	
4054	2.45		
	2.52		
	2.50	7.47	
		3.23	
4056	2.54		
	2.77		
	2.86	8.17	
		3.54	
4064	2.49		
	2.69		
	2.91	7.89	
		3.42	

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1891phae.proj.1331.

Oct. 17, 1891.

4067	4.35	
	4.10	
	4.04	12.49 5.41
4084	3.34	
	3.50	
	3.60	10.44 4.52
4087	2.30	
	2.40	
	2.33	7.03 3.04
4094	2.52	
	2.90	
	2.91	8.33 3.61
4096	~~2.78~~	Wrong
	3.20	
	3.43	
	3.40	10.03 4.34
	~~2.30~~	Following ~~and~~ brighter of
	~~2.12~~	three.
	2.29	
~~4103~~	~~3.30~~	
	~~3.58~~	
	3.20	

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1891phae.proj.1331.

Oct. 17, 1891.

~~4106~~ ~~2.99~~ 3.19 3.24

4103 2.07 Following and slightly
2.30 brighter of three.
2.25 6.62
2.87

4107 ~~2.60~~ Wrong.
3.00
3.12
3.10 9.22
4.30

There is no such star as 4106, at least it is not in position, ~~and this [illegible] the moment any confusion about, which was subsequently cancelled.~~ 4107 checks perfectly with 4113. 4113 checks with 4112.

4113 2.70
3.08
3.02 8.80
3.81

4121 2.71
3.20
3.39 9.30
4.03

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Oct. 17, 1891

10 ✓6 4/25

3.91
4.52
4.39 12.82
5.55

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1891phae.proj.1331.

Oct. 20, 1891.

Identification of Planetary Nebula. N. Gs.

Discovered by Prof. Pickering

20	8	+46.3
21	41	
1	33	

The right ascension of Dreyer no 6766 is in error by one hour ~~of~~. The right ascension should be 20 h. instead of 19. An exam. of the sky shows that its position with reference to D. M. stars +46° 2860 + 2864 is exactly as indicated in Book 106 p. 61. It has a faint but rather short continuous spectrum through centre, but is decidedly planetary.

S Bootis

14	16	+54.6
22	19	
8	3	

N 3 S, S 20 in large tel.
Too faint for finder
Est 12.8

8 23

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1891phae.proj.1331.

Oct. 20, 1891.

R Draconis

16 26 +67.4

22 35

6 9

8 29 R; R 2q in large tel.
Too faint for finder
Est. 11.5

R Cygni

19 32 +49.9

22 40

3 8

8 35 R 3 R, R 2.5 f in large tel
Too faint for finder
Est. 13.0

S Cygni

20 8 +57.1

22 45

2 37

8 51 S 2.5 S, S 2 t in large tel.
Too faint for finder
Est. 14.4

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1891phae.proj.1331.

Oct. 20, 1891.

S Cephei

21 37 +78.3

23 1

1 24

m 3 S, S 1.5 n in large tel.

8 58 Too faint for finder

Est. 11.5

R Ursae Maj.

10 32 +69.2

23 8

12 36

8 8 3.5 R R 1 t in large tel.

9 0 Too faint for finder

Est. 12.5

D.M. Nedge Zone W. obs

Series 83. +9°

21 12 +10.6

23 30

2 18

1891phae.proj.1331.

Oct. 20, 1891.

9	30	4763	2.22	A faint double follows √Sec.
			2.52	√1 ~~sec~~ north
			2.71	7.45
				3.23.
		4765	4.61	
			4.40	
			4.50	13.51
				5.85
		4777	2.85	Star rather faint Est. 9.3
			3.02	
			3.20	9.07
				3.93.
		4778	3.71	
			3.88	
			3.99	11.58
				5.01 √
		4780	3.69	
			3.92	
			3.89	11.50
				4.98 √
		4781	3.60	
			3.92	
			3.97	11.49
				4.98
		4782	~~4.71~~	Wrong.
			4.34	
			4.30	
			4.51	13.1 √
				5.69

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1891phae.proj.1331.

Oct. 20, 1891.

4794	2.51	
	2.99	
	3.02	8.52
		3.69
4795	3.79	
	3.80	
	3.62	11.21
		4.85
4831	2.30	A faint star precedes
	2.33	2 sec. 1' south
	2.40	7.03
		3.04
4835	2.40	Northern and brighter of
	2.82	pair
	2.65	7.87
		3.41
4838	3.90	
	3.82	
	4.19	11.91
		5.16
4843	2.30	
	2.60	
	2.78	7.68
		333
4861	3.89	A fainter star follows
	3.59	2 sec 1.5' north.
	3.89	11.37
		4.92

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1891phae.proj.1331.

Oct. 20, 1891.

4870	2.92	
	3.30	
	3.30	9.52 4.12
4872	5.10	
	4.97	
	4.97	15.04 6.51
4883	2.86	
	3.23	
	3.38	9.47 4.10
4885	2.38 Faint. Est. 9.5	
	2.67	
	2.52	7.57 3.28
4886	3.61	
	3.78	
	3.70	11.09 4.80
4889	2.70	
	2.89	
	2.81	8.40 3.64
4893		
	3.11	
	3.19	
	3.21	9.51 4.12

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1891phae.proj.1331.

Oct. 20, 1891.

4900	3.90		
	3.89		
	4.00	11.79	
		5.11	
4907	2.41		
	2.67		
	2.71	7.79	
		3.37	
4911	2.10		
	2.25		
	2.39	6.74	
		2.92	
4936	2.20		
	2.42		
	2.30	6.92	
		3.00	
4907	2.59		
	2.61		
	2.81	8.01	
		3.47	
~~4947~~			
4941	2.60		
	2.76		
	3.12	8.48	
		3.67	
4947	2.81		
	3.11		
	3.03	8.95	
		3.88	

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1891phae.proj.1331.

Oct. 20, 1891.

4948	4.90		
	4.63		
	4.79	14.32	
		6.20	
4954	2.79		
	2.47		
	2.79	8.05	
		3.50	
4956	~~3.80~~	Wrong.	
	3.31		
	3.21		
	3.40	9.92	
		4.30	
4958	2.89		
	2.92		
	3.17	8.98	
		3.89	
4961	2.10		
	2.25		
	2.20	6.55	
		2.84	
4965	2.60		
	2.80		
	2.71	8.11	
		3.51	
4966	2.87		
	2.90		
	3.07	8.84	
		3.83	

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1891phae.proj.1331.

Oct. 20, 1891.

4968	2,00		
	2.07		
	2.08	6.15	
		2.66	
4981	2.10		
	2.30		
	2.20	6.60	
		2.86	
4987	3.39		
	3.39		
10 VI	3.21	9.99	
		4.33	

At end of Zone, found that there was some dew on object glass, which ~~perhaps~~ probably accts. for some of the stars looking faint.

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1891phae.proj.1331.

Oct. 21. 1891.

Comet d 1891 (Barnard Oct. 27.) 8.obs.

20 $\sqrt{2}$ +3.7

21 2$\sqrt{}$

40 33

Comet not found, sky rather hazy and seeing rather bad. Moon not rising.

Identification of planetary nebula disc. by Prof. Pickering.

21 0 +43.3

2$\sqrt{}$ 31

1 31

12 00

10 29

Nebula found. Looks slightly oval. Faint continuous spectrum through centre. Two maxima of light in continuous spectrum on more refrangible side of nebula proper, one being quite close to nebula, the other more remote. The maximum of light close to nebula is rather the more strongly marked of the two although both are plainly seen.

This Nebula is Dm. +41° 4004 (A.C.

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1891phae.proj.1331.

Oct. 21, 1891.

DM. Wedge Zone. +9°

Series 84. +9°

21 12 +10.6

23 25

2 13

9 20 4763 2.97
2.97
2.99 8.93
3.87

4765 4.40
4.52
4.50 13.42
5.81

4777 3.40
3.52
3.60 10.52
4.56

4778 4.40
4.35
4.60 13.35
5.78

4780 ~~3.80~~ Wrong.
4.32
4.59
4.53 13.44
5.82

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harvardcfa.proj.1331

Oct. 21, 1891

4781	4.49		
	4.59		
	4.62	13.70	
		5.93	
4782	4.99		
	4.98		
	5.08	15.05	
		6.52	
4794	3.09		
	3.42		
	3.40	9.91	
		4.29	
4795	3.90		
	4.12		
	4.13	12.15	
		5.26	
4804	4.80		
	5.11		
	5.10	14.01	
		6.07	
4807	3.40	Est. 9.3	
	3.69		
	3.90	10.99	
		5.11	
4817	4.75		
	4.82		
	4.80	14.37	
		6.22	

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1891phae.proj.1331.

Oct, 21, 1891.

	4821	.01	
		4.98	
		.17	15.16
			6.56
	4831	2.69	A faint star precedes
		2.56	2 sec. 1' south
		2.50	7.75
			3.36
	4835	3.32	Northern and brighter of
		3.60	pair
		3.51	10.43
			4.52
	4838	.02	
		.01	
		4.79	14.82
			6.42
10	29 4843	~~2.30~~	Wrong, star partly behind bar
		2.60	
		2.71	
		2.97	8.28
			3.59

Clouds; possibly one or two of the last stars affected.

Zone stopped by clouds.

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1891phae.proj.1331.

Oct. 21. 1891.

S Cygni.

~~20~~ 8 +V7.1

24

Clouds.

B. + C. 11 h 2.

11 9 22.0

10 22.0

B. 394.

11 9 0.0

10 0.0

Resolv. Sat. I. Prob. Sr. rec. hoon rad, circ.
Comp. with Sat. pos. = Sat. II.
Seeing poor. Phot. R.

11 36 20

4 12

11 44 32

11 9 0

3 V 32

11 9 2~

11 44 V4. Mp. time ecl.

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1891phae.proj.1331.

Oct. 21. 1891.
Limit of Vco.

11	Kr	24.0		31.5	r24.3
		36.0	151.0 37.8	34.7	29.4
		K0.0	37.7	65.2	rr.9 73.6
		K7.0		32.6	90.6 294.6 73.6

11	KK	K3.r	Seen.
		K6.0	61.3
		r3.0	97.0
		r4.0	r7.2
	Kr	2.0	96.r
		6.0	r7.2
		11.0	94.9
		16.0	96.2 r3.3
		25.0	99.4
		31.0	K9.4
		J6.0	107.J
		KK.0	KK.4
		K4.0	10K.1
		r3.0	KJ.9
		r4.0	107.9
	46	4.0	K0.3
		12.0	109.4
		17.0	39.0
		23.0	113.3r
		29.0	37.0
		J7.r	116.0

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1891phae.proj.1331.

Oct. 21. 1891.

11	K6	K3.0		JK.4			
		V0.0		116.V			
		VV.0		35.6			
	K7	0.0		119.J			
		5.0		JK.0			
		10.0		12[illegible].0			
		15.V		31.6			
		21.0		120.7			
		24.0		30.4			
		J6.0		12J.0			
		K2.0		24.7			
		K4.0		114.0	→		
		V6.0	87.5 / 96.2 / 183.7 / 91.9	J2.9		87.5 / 96.2 / 183.7 / 91.8	
	K4	1.0		120.K			
		4.0 4.5 / 18.0 / 4.5		30.7 77.7 / 310.9 / 77.7			
		13.0		126.9			
		16.0	90.5 / 93.3 / 183.8 / 91.9	29.7		90.5 / 93.3 / 183.8 / 91.9	
		22.0		120.2			
		31.0 24.6 / 98.5 / 24.6		27.0 74.3 / 297.2 / 74.3			
		26V		120.3			
		K5.0	91.1 / 96.1 / 187.2 / 93.6	24.7		91.1 / 96.1 / 187.2 / 93.6	
		K9.0		119.4 73.4			
		VK.V 52.2 / 209.0 / 52.2		2K.6 293.8 / 73.4	3		
	K9	2.V		120.7			

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1891phae.proj.1331.

Oct. 21. 1891.

11	E9	25.0	96.9 92.8 189.7 94.9	27.0	123.9	E	96.9 102.8 199.7 99.8
		33.0		25.3		75.5	
		E1, V 37.1 148.5 37.1		(27.4	302.3 75.6		
		E9.0					
	V0	V7.0	93.7 94.4 188.1 93.6	25.1	120.4		93.7 94.4 188.1 94.0 ✓
		E.0		30.2 75.6			
		11, V 7.7 31.0 7.8		(24.6	302.7 75.6		
		18, V					
		26, V	92.2 91.8 184.0 92.0	30.0	122.2		92.2 91.8 184.0 82.0
		33.0		29.0 75.5			
		39, V 36.2 145.0 36.2		(20.2	302.0 75.5		
		E6.0					
	V1	V3 V	96.0 96.5 192.5 96.3	27.0	123.0		96.0 96.5 192.5 96.2
		V9, V		27.5 75.3			
		4.0 3.8 255.5 63.9		(24.0	301.5 75.4		✓
		1K V					
		24.0	97.2 98.3 195.5 97.8	26.6	123.4		97.2 98.3 195.5 97.7
		34.0		24 E 76.3			
		E2 V 39. 156.0 39.0		(26.7	305.5 76.4		✓
		V1, V					

B. & C. 1842.

12	1	20.7
	2	20.7

B. 394.

12	1	0.0
	2	0.0

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1891phae.proj.1331.

Oct. 23 - 1891

B. + C. 1142.			B. 394.		
5	59	56.0	6	0	0.0
6	0	56.0		1	0.0

Reas. Jup. I. Plotted P. obs. true,
Seems rather poor.
Compared with ~~Postp~~ Sat. 7th.

6	√	1
	4	1
6	13	24
6	0	0
	13	24.
√	√9	√6.
6	13	20. Aff. Cune Ed.

Limit of Vis.

6	10	29.0	142.1	13.6 / 11.3 / 24.9	13.6 / 11.3 / 24.9
		173.10 / 43.2 40.0	195.7	12.4	12.5
		43.2	143.3	188.9	
	10	√√.0	1946	755.7 / 188.9	

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1891phae.proj.1331.

Oct. 23. 1891.

6	13	5.0	Prob. suspected.
		4.0	" seen.
		14.0	185.0
		19.0	197.0
		25.0	174.0
		31.0	202.0
		37.0	175.2
		44.0	203.3
		47.0	172.2
		54.0	204.0
	14	4.0	172.6
		9.0	212.2
		15.0	165.4
		22.0	215.7
		24.0	162.6
		36.0	216.7
		45.5	156.5
		53.0	220.1
		59.0	155.4
	15	6.0	220.4
		12.5	155.0
		19.0	224.1
		26.0	152.0
		31.0	224.1

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1891phae.proj.1331.

Oct. 23. 1891.

6 | 37.0 | 227.7
2.0
1.0 | 1.2
4.0 | 225.7
16 | 1.0 | 1.6
13.0 | 226.4
26.0 | 1K7.7 | 82.2 78.5 160.7 80.4

Focus changed.

154.5 38.6 | 37.0 | 229.9
38.6 | 1K9.0 188.5 | 1
227.1
2.0
1K9.1 | 79.7 81.7 161.4 80.7
17 | 50.5 12.6 | 4.1
1K.0 12.6 | 229.2
1K7.K 188.8 | 80.7
25.0 | 755.2 188.8 | 2
32.1 | 229.1
1K9.2
181.5 45.4 | K1.0 | 224.3 | 79.1 78.6 157.7 78.8
1.0 45.3 | 1K9.0 188.5 | 78.9
4.0 | 754.1 188.5 | 3
1A | 6.0 | 227.6
1K4.0 | 80.0 82.2 162.2 81.1 | 80.0
1.0 | 224.0 | 82.2
83.0 20.8 | 2.0 20.7 | 1KK.6 186.8 | 81.1
37.0 | 747.4 186.8 | 4
226.4
K6.0 | 1K7.0 | 82.3 80.6 162.9 81.4 | 82.3
4.0 58.7 | 229.3 | 80.6
19 | 235.0 58.8 | 2. | 1K9.4 188.9 | 162.9
12. | 755.7 188.9 | 81.5
230.0

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1891phae.proj.1331.

Oct. 23, 1891.

6	19	23.0		1K36	89.7 / 86.7 / 176.4 / 88.2	89.7 / 86.7 / 176.4 / 88.2
		31.0		233.3	189.5	6
		146.5 / 46.6	K2.0 36.6	1K7.3	758.2 / 189.6	
			V0.V	23K.0		
			V9.V	1K6.K	86.8 / 83.1 / 169.9 / 85.0	86.8
	20		9.V	233.2	189.5	83.1 / 169.9 / 85.0
		53.5 / 13.4	K.0 13.3	1K7.7	758.1 / 189.5	
			26.V	230.K		
			3K.0	1KV.0	84.4 / 81.8 / 166.2 / 83.1	84.4 / 81.8 / 166.2 / 83.1
		187.0 / 46.8	K2.0 46.7	229.K	1649.2 / 1821.1 / 747.8 / 187.0	
			V1.0	1KV.K		
	21		60.0	227.6		
			4.V	1K7.K		84.7
		175.0 / 43.8	20.0 43.7	232.V	187.6	9 88.6
	22		4.V	1K0.9	750.7 / 187.7	87 3.3 / 86.7
			1K.0	229.V	84.7 / 88.6 / 173.3 / 86.6	

During obs. photometer slipped and turned, changing focus and pos. angles. Correcting readjustment as specified on preceding page.

B. + C. 1142.

6	20	V V.2	6	29	0.0
	29	V V.3		30	0.0

B. 394.

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1891phae.proj.1331.

Oct. 23, 1891.

S Boötis
14 16 +54.6
22 22
6 9

p 8
f 2 S, S 3 f in large tel.
Too faint for finder
Est. ~~11.9~~ 13.2

8 9

Comp. Stad ^ p looks to be one or two grades brighter than than comp. star o but alt. is rather low and seeing rather poor so that it is rather difficult to get at the absolute facts of the case.

R Draconis
16 26 +67.4
22 36
6 10

p 1 R, R 3 p in large tel.
Too faint for finder
Est. 11.5

8 20

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1891phae.proj.1331.

Oct. 23, 1891

R Cygni

19	32	+49.9
22	45	
3	13	

e 3 R, R 1 f in large tel.
Too faint for finder
Est. 12.9

8 28

S Cygni

20	8	+57.1
22	55	
2	47	

t R 1.5 S, S 2.5 r in large tel.
Too faint for finder
Est. 14.7

8 45

The estimates of the last one or two nights probably make S a little too bright as observations were ~~very~~ difficult on account of moonlight. Comp. ~~star~~ 't' is thought to be certainly a little ~~fainter~~ brighter than variable.

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1891phae.proj.1331.

Oct. 23, 1891.

S Cephei

21	37	+7.83
23	16	
1	29	

m 2.5 S, S 2.5 r in large tel.
Rather too faint for finder
Est. 11.7

8 57

R Ursae Maj

10	32	+69.2
23	20	
12	48	

s4 R, R, t in large tel
Too faint for finder
Est. 12.4

9 25

Tr. obs.

Selection of ft. comp. stars for Var.

R Delphini

20	10	+8.8
23	58	
0	48	

Clouds.

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1891phae.proj.1331.

Oct. 23, 1891.

S Aquarii

22	52	-20.9
24	00	
1	08	

Clouds everywhere

Still cloudy.

22	46	-20
24	31	
1	45	

Still cloudy.

22	46	
25	2	
2	16	

10 42 S thought to be seen for a moment but not long enough to fix an est. Still too cloudy for comp stars.

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1891phae.proj.1331.

Oct. 24, 1891

Comet d. 1891 (Barnard, Sept. 24) W. obs.

20 √7 +4.√
22 0
+1 3

Comet found. 22 6 1 = S.V.
0 √9 0 = R.a. +4.0 = Dec.
21 7 1

~~Comp. Star = D.M. +4° 4631 (7.6M)~~

Pos Zero 337.8
4√.0
Setting. 292.8

Comp Star = D.M +4° 4642 (8.4C)
" " = G. 41336.

23	√	√3.√	⊂
	6	18.7	⊂
	8	26.√	*
	8	38.√	*
	9	13.4	
	9	38.1	
	11	46.2	
	11	√8.√	

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1891phae.proj.1331.

Oct. 24, 1891.

23	12	33.5
	12	58.2
	15	6.5
	15	18.5
	15	54.0
	16	19.1
	18	26.5
	18	38.5
	19	23.1
	19	46.7
	21	55.1
	22	7.0
	23	26.0
	23	49.6
	25	58.0
	26	9.5
	27	30.2
	27	53.0
	30	1.0
	30	12.6

Order in preceding transits ○ ○ * *
Comet in northern half, inside square.
Star in southern half, outside square.

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1891phae.proj.1331.

Oct. 24, 1891.

Comet somewhat brighter than when last seen. Nucleus fairly well defined. Total Diam of coma 1.5' Nucleus seems a little eccentric with slight indications of tail on following side. Comet 12.5 mag.

B. 236.			B. 394.		
23	37	53.1	9	13	0.0
	34	53.2		14	0.0

∴ B 236 is 3m 19.5s slow.

Chronograph failed so transits were taken by eye and ear

S Böötis +54.6

14	16
23	49
9	33

p 2.5 S, S 39 in large tel.
Too faint for finder
Est. 13.5

9 28

R Draconis +67.4

16	26
23	55
7	29

p 1.5 R, R 39 in large tel.
Too faint for finder
Est 11.6

9 33

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1891phae.proj.1331.

Oct. 24, 1891.

R Cygni
19 32 +49.9
24 00
4 28
ε 3 R, R 2 f in large tel.
9 37 Too faint for finder
Est. 12.8

S Cygni
20 8 +57.1
24 57
3 57
t 2 S, S 3 u in large tel.
9 41 Too faint for finder
Est. 14.6

S Cephei
21 37 +78.3
24 10
2 33
m 3 S, S 1 n in large tel.
9 55 Rather too ft. for finder
Est. 11.4

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1891phae.proj.1331.

Oct. 24, 1891.

R Ursae Maj.

10 32 +69.2

24 ~~32~~

13 50

t, R, R 2 m in large tel.

10 2 Too ft. for finder

Est. 12.4

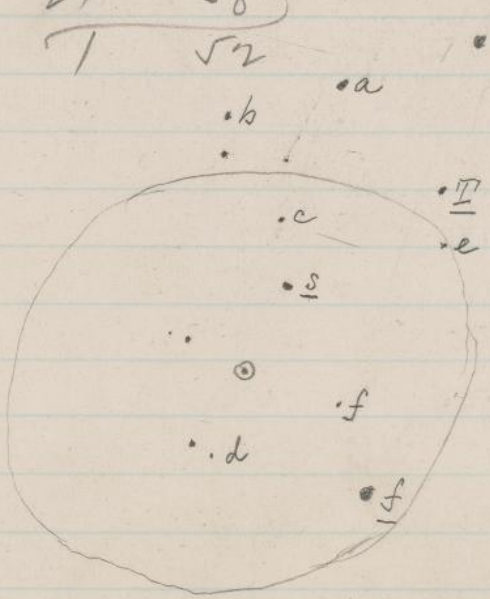
~~Sell~~ Selection of faint comp. ~~stars~~ for

S Aquarii

22 46 −20.0

24 38

1 52



N

E

over.

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1891phae.proj.1331.

Oct. 24, 1891.

$\underline{\iota}$ 35, S 2 $\underline{f}$ in large tel.
Too faint for finder.
Est. 13.1

f is the faintest star which can be seen ~~with certainty tonight or~~ with sufficiently well to use in a selection.
'S' although faint is identified with certainty by ~~Square~~ bar micrometer and S.D.

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1891phae.proj.1331.

Oct. 22. 1891.

Comet d 1891 (Barnard Sept. 27.) Ft. obs.

21	2	+ 4.2
22	0	
+0	√2	

22	√	√8
0	√7	✳
21	8	+√.3

22	16	
1	1	
21	.1√	+6.0

position Zero 7√√.3
+√.0
Setting 300.3

Comp. star = D M +√° √761 (9.√B)

22h	√0	21.0	✳
	√0	29.7	✳
	√1	32.0	⊏
	√2	17.7	⊏

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1891phae.proj.1331.

Oct. 28, 1894.

~~22~~	√2	~~49.1~~
	√2	√7.6
	√4	~~0.0~~
~~22~~		~~30.√~~
22	√6	8.7
	√6	17.√
	√7	20.√
	√8	7.4
	√8	33.2
	√8	42.0
	√9	44.√
23	0	31.√
	1	4.0
	1	12.9
	2	16.0
	3	2.3
	3	44.0
	3	√2.7
	4	√√.0
	√	42.√

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1891phae.proj.1331.

Oct. 28, 1891.

Order in preceding transits * * ○ ○
Star in northern half outside
Comet in southern half inside

Observations quite difficult. Comet faint and rather diffuse; nucleus rather poorly defined.

Circumpolar Variables W. obs.

S Bootis

14 16 +57.6

23 16

9 0

p 2.5 S, S 2.5 q in large telescope.

8 48 200 ft. for finder

Est. 13.5

Region low and V. faint

ζ Draconis

16 26 +67.4

23 27

7 1

0 4 R, R 1.5 p in large tel.

8 57 0 4 R, R 1.5 p in finder (but faint

Est 11.6

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1891phae.proj.1331.

Oct. 28, 1891.

R Cygni

19 32 +49.9

23 35

~~7~~ ~~6~~ 3

e 11.5 R. R 3.5 f in large tel

9. 4 Too ft. for finder

Est. 12.5

S Cygni

20 8 +57.1

23 41

3 33

t. 1 S 4 u in large tel.

9. 9 Too ft. for finder

Est. 14.4

S Cephei

21 37 +78.3

23 47

2 10

S = n in large tel.

9 15 S = n in finder

Est. 11.5

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1891phae.proj.1331.

Oct. 28, 1891.

K Ursae Maj.

10 32

23 V4

13 22

+69.2

9 22

t, R, R 2m in large tel.
Too faint for finder
Est. 12,7

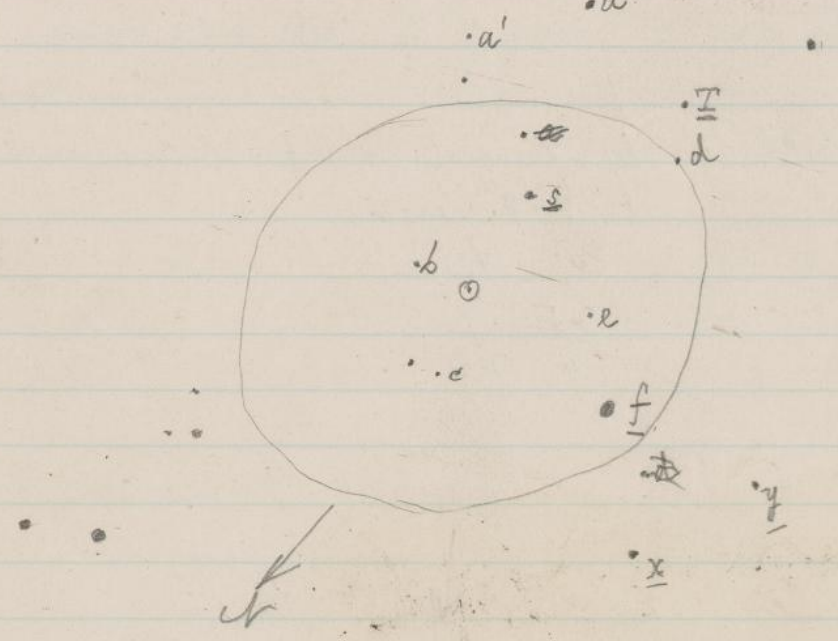
Remarks. of Comp. stars for
S Aquarii

22 46

24 24

1 38

−20.0



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1891phae.proj.1331.

Oct. 28, 1891.

This selection takes the place of the one made on Oct. 24 (See p. 41). As an exam. to-night shows that there was probably light cloud or haze on that date. The gradation of stars was right but the first faint stars were a little too bright.

d 3 S, S 2 E in large tel.

10 nl Too faint for finder

Est. 13.5

E and f which were used in est. on Oct. 24 become d and e.

Star 'e' is about as faint as can be seen tonight with advantage for selection of comp. stars as region is getting a little low.

~~This selection~~

Selection of faint comp. stars for

γ Cygni

20 43 +47.3

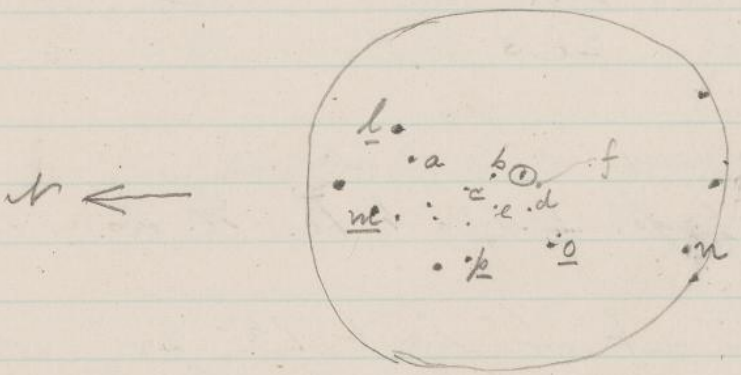
25 9

4 26

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1891phae.proj.1001.

Oct. 28, 1891.



l = V V = m in finder
V = l in large tel.
Est. 9.3

10 V6

The above est. on V. Cygni is in Mr. Reed's notation.

	B. 236.		B. 394.	
1	40	39.8	11	0 0.0
	41	40.0		1 0.0

∴ B. 236 is 3^m $36.\bar{9}$ slow.

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1891phae.proj.1331.

Oct. 24. 1891.

	B. & C. 1842.		B. 394.		
12	57	26.4	12	59	0.0
	54	26.3	13	0	0.0

Reap. Jup. I. Phot. R. Fr. obs. Powe rec.

Jupiter set at about 13h 2m which was ~~about~~ 1m before ~~theoretical~~ time of reappearance.

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1891phae.proj.1331.

Oct. 30. 1891.

	B. + C. 11h 2.		B. 394.	
7	32	43.0	3r	0.0
	33	43.0	36	0.0

This eclipse not to be used as it ~~was~~ was practically cloudy during the 3 minute limit.

h	0	49	
	h	12	
h	9	1	
7	3r	0	
	3h	1	
7	3m	43	
h	6	44.	Ap. time ecl.

Reg. Jup. I. Phot. R. W. obs. ~~Phot~~ recorder. Comp. with Sett. II.
Moore

4h 32m Somewhat cloudy.

7 58. Considerably cloudy; Jupiter rather dim Comp. Sat. almost invisible at full brightness

8 0 Jupiter quite dim in tel.

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1891phae.proj.1331.

Oct. 30, 1891.

8h	Limit of Visibility		
	0	45	164.0
	1	0	Clouds
		10	269.1
		37	Comp. Sat. Invis. full br.
	2	0	" " " "
8	26		
	4		
	8		
	9	5	
		39	167.8
	10	17	251.5
		47	157.0
	11	28	249.7
		45	163.2
		57	257.0
	12	10	163.0
		17	256.0
		26	166.5
		32	254.2
		39	166.0
		48	251.0
		55	165.2
	13	3	249.5
		10	166.7
		17	253.9
		28	168.0
		37	253.1

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1891phae.proj.1331.

Oct. 30, 1891.

#13	45	
	53	168.0
14	2	251.2
	9	166.1
	21	253.9
	31	167.4
	39	252.2
	50	164.9
15	1	252.0
	10	168.0
	18	251.0
	27	165.8
	36	251.9
	44	164.0
	57	254.2
16	5	162.8
	13	254.2
	22	163.5
	33	258.0
18	19	164.0
	36	254.0
	50	163.0
19	8	251.3
	20	165.2
	33	250.3
	46	165.8
20	1	251.1

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1891phae.proj.1331.

Oct. 30, 1891.

23	45	161.0
24	21	257.4

Lim. of Vis

25	12	183.0
	33	229.0
	51	189.4
26	8	224.5

Cloudy throughout. Especially so during the first critical 3 min. Then became somewhat clearer, so that constant was taken with considerable ease, and sats. pretty well seen. A little more cloudy when final lim. of Visibility was taken.

8 32 There is a peculiar black spot on Jup. It is quite dark, darker than the belts, and now appears quite round. It looks exactly like the transit of some body across Jup, and is vis. both with ordinary No. 1 eye piece and photom. R. It certainly must be some celestial body and cannot be one of Jup.'s sats, because two of them are on the right hand side and two on the left.

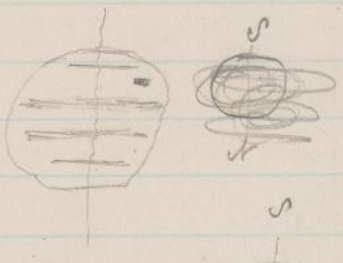
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1891phae.proj.1331.

Oct. 30. 1891.

It was first seen when photom. was put on preparatory to eclipse, at about 4.40. Its position has decidedly changed since then, and it appears to be passing in transit across Jup. It is a little south of the principal central belt and at present time is about midway from east to west.

Position at about 7h 40m



Position at 8h 42m



It looks as if it must be the transit of an asteroid across Jupiter. It ~~looks~~ seems to be too round and sharply marked for a comet.

9 2 Sky thickly cloudy

9 4 Rather faintly seen. Spot also seen. It is still further to the apparent left than at time of last preceding diagram

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1891phae.proj.1331.

Oct. 30, 1891.

9 10 Spot fairly well seen through clouds. It is decided to the left of a line running through center of planet perpendicular to the plane of the belts

Position at 9h 10m



9 29 Spot Jupiter with spot thereon seen at intervals through clouds. The spot is now about half way from middle line as drawn in the figures to left hand edge The spot seems to be perfectly round, and roundest when first seen.

9 36 Quite well Spot seen again. It seems perfectly round and from this fact and as well as its rate of motion it seems as if it must certainly be an asteroid

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1891phae.proj.1331.

Oct. 30, 1891.

9 40 Object appears to be ~~a little~~ more than half way from middle line to edge

~~9 50~~
9 57 Object appears to be about 2/3 way from middle line to edge on left.

Position at 9h 57m



Oct. 31. 1891.
The above spot was a transit of the shadow of Sat. III. as indicated by Naut. Almanac.

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1891phae.proj.1331.

Oct. 31, 1891.

Comet d. 1891. (Barnard Sept. 27) W. obs.

21 22 +6.6
22 N
√3

Clouds.

7 29 Too cloudy for any work.

21 22
2 √4
1 3 2

Sky too thick to see comet.

8 30 Sky still thickly cloudy with no prospect of clearing.

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1891phae.proj.1331.

Nov. 2. 1891.

B. & C. 1162.

7	22	15.2
	23	15.1

B. 394.

7	25	0.0
	26	0.0

7 4 2 47
8 12
50 59
7 2 45
7 ~~50~~ ~~59~~
48 14

7 50 59
25
25 59
22 15
7
Ap. time red. 7 48 14

Reap. Dup. II. Phot. R. W. abs. Polar. Re. Comp. with the more remote Bi two pairs on left of Dup. = Nat. I.

7 [49] 32.0 seen.
43 16.0
184.2
49 19 0.5
[~~49~~ ~~50~~] 00 15 7.6

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1891phae.proj.1331.

Jan 2, 1891

~~50~~ 49

[~~5~~ 1]

9 14	194.8
19	150.5
26	192.0
30	148.8
34	194 W
~~4~~ 3 8	149.2
43	201.4 ~~5~~
50	145
4 5	197.9
01	145.2
06	195.1
12	143.8
16	201.9
21	141.0
26	202.2
31	137.2
37	202.0
42	140.4
46	205.2
52	137.9
58	202.8
03	137.9
09	207.2
14	139.0
20	211.4
26	140.2
33	199.8
41	131.8
206 49	209.0
52	

[~~5~~ 0 1]

[~~5~~ 1 2]

~~5~~ 77.2
77.0
154.2
77.1

686.2
178.6
171.1

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1891phae.proj.1331.

Nov. 2, 1891

52 5-50 77.2 / 77.0 / 154.2 / 77.1 | 134.2

01 211,2

5 73.1 / 77.6 / 150.7 / 75.4 | 136.9 175.3

67 14 / 16.8 20 16.7 73.1 / 77.6 / 150.7 / 75.4 | 136,0 201.5 / 175.4

25 216,1

35 76.8 / 70.4 / 147.2 / 73.6 | 134.2

42 181 / 45.2 | 211,0 173.2

48 45.2 76.8 / 70.4 / 147.2 / 73.6 | 136.6 692.8 / 173.2

36 209.0

53 02 74.8 / 73.8 / 148.6 / 74.3 | 133.0

~~101~~ 10 / ~~25.2~~ 20 30.2 207,8 169.6

moved images a little in field.

678.6 / 169.6

49 74.8 / 73.8 / 148.6 / 74.3 | 132,0

5-X 08 205.5

09 75.5 / 70.5 / 146.0 / 73.0 | 133.5

192 / 23.0 16 23. 209,3 171.6

25 136,5 686.6 / 171.6

40 75.5 / 70.5 / 146.0 / 73.0 | 207,0

45 71.4 / 73.8 / 145.2 / 72.6 | 137,0

04 X 57.5 230 / 57.5 208.4

5-52 02 135.6 690.4 / 172.6

09 71.4 / 73.8 / 145.2 / 72.6 | 209,4

16 131.6

125 / 31.2 26 31.2 207,4 ~~207~~ 169.5

39 75.8 / 70.4 / 146.2 / 73.1 | 134,0 678.2 / 169.6

75.8 / 70.4 / 146.2 / 73.1

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1891phae.proj.1331.

Jun. 2, 1891

5 51	44		204.8		
	52	71.0 / 72.1 / 143.1	137.0		
57	08		208.1	173.2	
19 / 4.8	9	~~42.2~~ 42	71.6 / 71.0 / 72.1 / 143.1 / 71.6	137.9	692.9 / 173.2
	16		210.0		
	24	71.0 / 76.1	136.2		
144 / 36.0	32		147.1	207.2	172.3
	42	36. 73.6 / 71.0 / 76.1 / 147.1 / 73.6	135.0	172.3	689.5 / 172.4
	46		211.1		
	56	72.4 / 71.0	138.8		
57	02		143.4	211.2	174.3
23 / 5.8	8	5.7 71.7 / 72.4 / 71.0 / 143.4 / 71.7	138.1	174.3	697.2 / 174.3
	17		209.1		
	24	75.1	134.9		
	31	74.4 / 149.5	210.0	172.2	
138 / 34.5	36	34.5 74.8 / 75.1 / 74.4 / 149.5 / 74.8	134.9	172.2	689.1 / 172.3
	41		209.3		
	52				
58	03	76.8	132.0		
74 / 18.5	10	18.5 71.9 / 148.7	208.8		
	24	74.4	134.3	170.3	681.3 / 170.3
	34	76.8 / 71.9 / 148.7 / 74.4	206.2		

Limit of rio.

8	02	41	166.8		
263 / 5.8	5.4	176.7	~~176.7~~		
03	12	9.9	166.9	171.8	687.4 / 171.8
	36 5.7	10.1 / 20.0 / 10.0	177.0 / 9.9 / 10.1 / 20.0 / 10.0		

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1891phae.proj.1331.

Nov 2. 1891

Images rather poor from guiding drawn out quite a long distance, and observation somewhat difficult from rather close proximity of another star to the one used in the comp. Seems fairly good
The comp. star seems a little ~~brighter~~ fainter than the other one close to it and it is also a little higher up in the field.

See note at end.

B. + C. 1142.

♂	23	14.4
	24	14.5

⊙.

B. 396.

♂	26	0.0
	27	0.0

Chari gets trouble.

Comet 1891 d (Barnard Sept. 27) Ver. obs

21	26	+7.2
24	16	
+2	50	

2	56	+7.1
24	27	
21	29	

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1891phae.proj.1331.

Nov. 2. 1891.

Comp. star = DM + 7° 47 21 (8.2 K)

Pos. Zero 3 39.8

4V.0

Setting 294.8

0	~~4.0~~	~~44.6~~	
	~~41~~	~~21.0~~	
	43	V4.V	⋐
	44	31.0	⋐
	46	3.3	*
	46	46.V	*
	47	36.0	
	48	13.V	
	49	4V.V	
	V0	28.8	
	V1	18.2	
	V1	V4.0	
	V3	26.0	
	V4	9.4	
	VV	1.0	
	VV	36.V	
	V7	8.V	
	V7	V1.9	

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1891phae.proj.1331.

Nov. 2. 1891.

0	√8	√7.0
	√9	2√.5
1	0	√7.1
	1	41.0

Order in preceding transits comet comet star star. Comet in northern half. Stars in southern half.

Comet faint. Observations difficult Nucleus faint and rather poorly defined.

Circumpolar Variables.

S Bootis

18	16	+√6.6
2√	20	
11	4	

10 $2^{h}6^{m}$ p 2√ 8, 8 = 9 in large tel.
Too faint for finder
Est. 13.4

1891phae.proj.1331.

Nov. 2. 1891.

R. Draconis

16 26 +67.4
2v 20
9 2

10 40 ○ 3 R, R 2v ∅ in large tel.
200 ft. for finder.
Est 11v

R. Cygni

19 32 +49.9
2v 39
6 7

10 44 ◐ 1 R, R 4 ∅ in large tel.
200 ft. for finder.
Est. 12v

S. Cygni.

20 8 +v7.1
2v 43
v 3v

10 49 ◑ 1 S, S 2 ∅ in large tel.
200 ft. for finder.
Est. 140

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1891phae.proj.1331.

Nov. 2. 1891.

δ_1 Cephei

21	37	+78.8
2√	48	
4	11	

δ = m in large tel.
$\underline{\delta}$ = m in finder.
Est. 11.4

10 √2

R_2 Ursae Maj.

10	32	+69.2
2√	√1	
1√	19	

$\underline{\delta}$ 1 $\underline{R}$ $\underline{R}$ 2.√ m in large tel.
Low ft for finder
Est. 12.6

10 √√

	B. 236.		B. 394.		
2	1	3.√	11	0	0.0
	2	3.√		1	0.0

∴ B. 236 was 2m √6.0 slow.

In the Eclipse of tonight the electric light was used on photometer, a new battery being brought into the dome, and placed on the steps of the chair.

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1891phae.proj.1331.

Nov. 3, 1891

Comet d 1891 (Barnard Sept. 27.) N. Obs.

21	29	+7.2
22	34	
1	√	
22	37	
1	8	

Pos. Zero 292.8
Setting 4√.0
337.8

22	√2	24.0	≡
	√2	√8.0	≡
	√3	29.4	*
	√4	7.1	*
	√4	√5.3	
	√√	30.8	
	√6	0.9	
	√6	38.√	
	√7	43.0	
	√8	18.8	
	√8	49.0	
	√9	26.√	

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1891phae.proj.1331.

Nov. 3. 1891.

23	~~4~~	~~12.0~~
	~~5~~	~~34.0~~
	~~7~~	~~14.0~~
	8	~~38.0~~
	9	14.5
	9	43.5
	10	20.5
	~~12~~	~~7.0~~
	~~15~~	~~29.0~~
	~~20~~	~~16.2~~
	~~21~~	~~24.5~~
	22	14.5
	23	33.1
	23	9.0
	24	35.2

Order in preceding transits comet comet star star.
Comet in southern half.
Star in northern half.
Comet faint dia. of total nebulosity 1′ arc. Nucleus rather poorly defined this fact together with its faintness makes obs. difficult.
Comet at times seems almost to have a granulated structure but it is so very faint that one cannot be very certain of this.

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1891phae.proj.1331.

Nov. 3. 1891.

There seems to be a principle nucleus and at times something resembling a second nucleus suggests itself a little south following.
The same was suspected last night.
It was thought then that it might be a faint star but the same appearance to night + in about the same position renders it more doubtfull.
It is thought that the principle nucleus might be perhaps pretty well defined if it was not so faint.
Total light + impression 12.√ mag.
Comp. Star = D.M. +7° 472 √ (B.√K)

Circumpolar Var.

δ. Bootis.

14	16	+ √ 4/5.6
23	42	
9	26	
23	47	
9	31	
23	√0	
9	34	

7 √2

β = δ, δ = 9 in large tel.
Too ff. for finder.
Est. 13.√

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1891phae.proj.1331.

Nov. 3. 1891.

Obs. very difficult from low altitude. and slight amount of cloud

B. 236. B. 394.

0	♂	3v.0	9	4	0.0
	9	3v.1		5	0.0

∴ B. 236 was 3m. 2.1 slow.

R. Draconis

16 26 +67.4

24 15

7 49

9 15 ○ 2 R, R 3 p in large tel.
○ 2 R, R 3 p in finder
Est. 11.3

R. Cygni.

19 32 +49.9

24 19

4 47

9 21 e 1 R, R 3.v f in large tel
2 or fr for finder.
Est. 12.v

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1891phae.proj.1331.

Nov. 3. 1891.

δ. Cygni.

20 8 +√ 7.1

24 25

4 17

9 32 S 1.√ S. S 2.√ t in large tel.
1 ft. for finder
Est. 14.1

δ. Cephei.

21 37 +7£.3

2£ 37

+3 0

9 4√ m 2√ S. S 1.√ m in large tel.
Rather too ft for finder.
Est. ~~12.0~~ 11.8

R. Ursae Maj.

10 32 +69.2

24 √4

14 18

12

2 18

9 √3 S 4 R. R 1 t in large tel.
Too ft. for finder.
Est. 12.6

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1891phae.proj.1331.

Nov. 3. 1891.

Re examination of comp. stars for S. Aquarii W. Obs.

22	46	-20.0
2V.	00	
2	14	

A Re exam. of comp. stars for S. Aquarii seems to indicate that the selection is very good as indicated on page 47. as far as can be judged at this altitude.

Altitude a little low. Star e is the faintest star that can be seen well enough to use in a selection.

9 2V 3.5 h. 8 1 e in large tel
100 ft. for finder
Est. 13.6

Est. probably affected by altitude of star.

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1891phae.proj.1331.

Nov. 3. 1891,

Rerecam. of stars for
V. Cygni.

20	43	+47.3
2√	3√	
4	√2	

2√	40
4	√7

11 00 Est. 9.3

d 2.√ V, r. 2.√ m in large tel.
l 2.√ V, r 2.√ m in finder.

Selection of Comp stars seems to be very good.
There seems to be a star in the position indicated by ✝ on pg. 49 and this added

1891phae.proj.1331.

Nov. 4. 1891.

Comet d 1891. (Barnard Sept. 27.) H. obs.

21	29	+7.V
22	26	
+	V7	

21	31	+7.9
22	36	
1	V	

Comp. Star = B.M +7° 4727 (8.2 K)

Pos. 0 30.V
4V.0
Setting 346.5

23

~~+2 3.2~~
~~+2 2V.0~~

13	29.0 *
13	V0.3 *
14	30.0 ⊖
15	1.V ⊖
1V	41.0 *
16	3.0 *
16	44.5 ⊖
17	13.6 ⊖

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1891phae.proj.1331.

Nov. 4. 1891.

23	20	22.5 *
	20	44.2 *
	21	26.5 ☆
	21	55.5 ☆
	22	49.0
	23	10.7
	23	√3.6
	24	21.8
	28	22.8
	28	44.8
	29	28.0
	29	√6.0
	33	√2.5
	34	15.0
	34	59.5
	35	26.2

Order in preceding transits star star comet comet.
Star in southern half.
Comet in northern half.
Comet rather faint 12.0 to 12.5 mag.
Six sets taken, last two in √ set a little doubtful.
There seems to be possibly a second maximum of light slightly

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1891phae.proj.1331.

Nov. 4. 1891.

South following the principle one. as spoken of last night and possibly a slightly granulated structure to the nucleus but the comet is so faint that one cannot be absolutely certain of this second maximum.
Principle nucleus taken in transit.

Exam. of spectrum of DM −10° 5713 U. Obs.

2	28	− 10.1
24	10	
21	42	
0	10	
2	18	
0	15	
2	13	

Star seems to have a bright band in yellowish green also another bright band but somewhat fainter towards more refrangible end of spectrum probably in the blue.
At times a faint bright band suspected toward red end of spectrum
Star seems to be somewhat strongly marked by dark bands as

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1891phae.proj.1331.

Nov. 4 1891.

nearly as can be ascertained.
On looking a second time star seems to be quite strongly marked by dark bands one in the orange yellow and one or two of the strongest about in the green and others toward the more refrangible end.
Star slightly reddish in ordinary eye piece — reddish orange.

Circumpolar Variables. Fr. Obs.

δ. Bootis

14 16 +54.6
24 47
10 31

9 46 p 2 S. S 1.5 9 in large tel.
Too ft. for finder
Est. 13.4

R. Cygni

19 32 +49.9
24 VV
V 23

e = R in large tel
Rather too ft for finder.
Est. 12.5

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Nov. 4. 1891.

S. Cygni.

20 8 +√7.1
2√ 00
√2
4

9 √7 S = S. in large tel.
200 ft. for finder.
Est. 14.1

N. Geminorum Fr. ob.

7 44 + 27.7
2√ 23
17 39
12
√ 39

(Probably ℓ Gem. is intended)

10 √6 S = small t of chart in large tel.
Rather too low & faint for finder
Est. 10.6

Clouds coming up in East but
est. thought to be pretty good.

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Nov. 6. 1891.

Exam. of −10° ∨0∨−7.

19	1∧	−10.9
22	3∨	
+3	17	
22	48	
+3	30	

19	1∨
22	∨4
+3	3∨

19	30	−10.∨
22	∨2	
+3	22	

Clouds in this region. Light of star varying and at times practically extinguishing. When seen however it looks as if there might be bands and there is a bright spot about in the green and one or two others toward the more refrangible end of spectrum. but whether they are produced for contact & dark band cannot be decided with certainty.
Star shimmering but the certainly gives the impression of being banded

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Nov. 6. 1891.
Star very slightly ~~orange~~ orange
in ordinary eyepiece. Region
rather hazy.

Comet d 1891. (Barnard Sept. 27) Nr. ob.

21	30	+8.0
23	15	
+1	45	
23	18	
+1	48	

23	26	0	+9.0
1	48	0	
21	36	0	

Pos. zero. 11.2 #
45.0
56.2

23	41	24.4	=
	41	45.9	=
	42	20.2	*
	42	39.0	*

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Nov. 6. 1891.

23	43	21.0	○=
	43	53.0	○=
	44	16.0	*
	44	34.6	*
	~~45~~	~~29.8~~	
	46	33.2	
	47	V.2	
	47	28.5	
	47	46.6	
	49	17.8	
	49	47.5	
	V0	10.5	
	50	28.6	
	~~51~~	~~39.8~~	
	~~52~~	~~10.9~~	
	~~53~~	~~37.V~~	
	V4	41.4	
	55	12.0	
	55	34.0	
	VV	V1.8	

Order in preceding transits comet comet star star,
Comet in northern half inside square
Star in southern half outside square.

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Nov. 6. 1891

Comet faint and difficult. Nucleus fairly well defined but faint.
Total nebulosity 1' in diam.
Second ~~top~~ time in last set a little uncertain as comet is getting quite near a faint star possibly ~~at~~ time about a second & half late.
There seems to be at times a slight maxium of light a little south following principle one as indicated on three previous nights ~~last~~. It is not very strongly marked and is a little uncertain.

Comp. Star = 2 m. + 4° 47 34 (A1 K)

Circumpolar Variables. N. Obs.

δ. Bootis

14	16	+ √ 4.6
24	10	
+9	√4	

9 6

p 3 δ. S 2 9 in large tel.
200 ft for finder
Est. 13.4

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1891phae.proj.1331.

Nov. 6. 1891.
Star low & obs. very difficult.
Variable almost invisible.

R. Cygni

19 32 +49.9
24 21
+4 49

9 16 C 1.5 R, R 1.5 C in large tel.
200 ft. for finder.
Est. 12.4

S. Cygni

20 8 +57.1
24 34
+4 26

9 22 r 1.5 S, S 2.5 s in large tel.
200 ft for finder
Est. 13.8

R. Ursae Maj.

10 32 +69.2
24 38
14 6
12
+2 6

next page.

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1891phae.proj.1331.

Nov. 6. 1891.

9 30 S 4 R, R 1 t in large tel
~~3 F~~
~~2 ro~~ Ft. for finder.
Est. 12.5

B. + C. 1142.			B. 394.		
9	39	23.1	9	43	0.0
	40	23.1		44	0.0

9	6	27	
	2	12	
10	4	39.	
9	43	0	
	21	39.	
9	39	23.	
10	1	2.	Ap. time ecl.

Rec. Dy. I Phot. R. W. Obs.
Poute rec. comp. with 1 & II.

(over)

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1891phae.proj.1331.

Aug. 6, 1891.

h			
10	1	0	
		8	
	*	30	23.0
		~~43.~~	
		25 —	263.0
		29	228.8
		33 —	263.0
		41	225.7
		45 —	264.2
		57	218.8
		56	226.9
	[2]	9	272.0
		14	217.0
		18 —	273.0
		24	212.0
		28	276.2
		34	212.5
		40	277.0
		45 —	211.7
		51	278.0
		57	226.2
	[3]	3	279.0
		9	199.2
		15 —	286.9
		20	206.2
		26	290.3
		33	195.8
		~~40~~ 40	290.1 —
		46	196.9
		48	292.9 b

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1891phae.proj.1331.

Nov. 6, 1891

4 0 — 11 — 16 — 23 — 31 27. — 38 — 45 — 53 — 56.7 — 56.2 — 0 — [illegible] — 17 — 24 — 29.5 — 31 — 44 — 50 — 57 — 4 — 6 4 — 2 0.5 — 11 — 0.5 — 23 — 30 — 39.35 — 48 — 59 — 7 — 57 14.2 — 7 — 21 14.2 — 30 — 41 — 51 — 55.2 — 1 — 8 — 8

200.2
0
208.2
294.6
199.0
286.0 243.1
87.0 99.4 186.4 93.2 | 87.0 99.4 186.4 93.2 | 194.1 972.6 243.2
293.5
191.0 241.7
102.8 97.8 200.6 100.3 | 102.8 97.8 200.6 100.3 | 192.2 967.0 241.8
290.0
197.8
92.2 99.1 191.3 95.7 | 92.2 99.1 191.3 95.6 | 290.0 974.9 243.7
294.6 243.7
293.1
197.0
95.0 94.5 189.5 94.8 | 95.0 94.5 189.5 94.8 | 292.0 974.9 243.7
293.1 243.7
195.2
194.8
100.4 92.5 192.9 96.5 | 100.4 92.5 192.9 96.4 | 295.2 976.8 244.1
289.0
197.0 244.1
196.0 242.5
93.8 99.9 193.7 96.9 | 93.8 99.9 193.7 96.8 | 289.8 970.3 242.6
192.3
292.2
193.4
94.8 97.2 192.0 96.0 | 94.8 97.2 192.0 96.0 | 288.2 966.4 241.6
193.2
291.0 241.6

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1891phae.proj.1331.

Nov. 6. 1891.

10 8h

	19		99.9	192.3	
	26		96.3	292.2	
121		30.2	196.2		
30.2	34		98.1	194.8	242.6
			99.9		970.4
			96.3		242.6
			196.2	291.1	
			98.1		
	42				
	51		99.0	195.2	
			96.0	294.2	
	59		195.0		
12.			97.5		
3	6			198.0	245.3
			99.0		981.4
			96.0		245.4
			195.0		
			97.5	294.0	
9					
	16	3.			
	26		94.5	195.4	
			93.5	289.9	
	37		188.0		
167			94.0		
42	47	41.7		195.9	242.6
			94.5		970.6
			93.5		242.6
			188.0		
			94.0	289.4	
	57				
	8		100.2	191.0	
10					
	20		97.5	291.2	241.0
97					964.1
24	31	24.2	197.7	192.2	241.0
			98.9		
			100.2		
			97.5		
			197.7		
			98.8		
	38			289.7	

Sun S of mis.

16	29		17.3	293.2	
	45		18.0	295.5	
			35.3		
17			17.7	234.9	244.8
25.8					
4.5	10		17.3	252.0	979.5
			18.0		244.9
			35.3		
	54	4.5	17.6		

Slightly delayed at beginning
O eclipsed by Ly-I. reading
quite close to comp. rat., so
that comp. rat. had to be moved
in the field.

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1891phae.proj.1331.

Nov. 6. 1891.

B. + C. 1142.			B. 394.		
10	29	22.5	10	33	0.0
	30	22.4		34	0.0

ν. Geminorum. ν. Obs.

7 vv +22.2
26 12
18 17
12

+6 vv
26 18

18 23
12

+6 23

7 48 +21.8
26 22

18 34
12

+6 34

Became cloudy so that no est. could be obtained
No stars visible with telescope.

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1891phae.proj.1331.

Nov. 6. 1891.

B. 236.			B. 394.		
2	45	27.0	11	29	0.0
	46	27.0		30	0.0

∴ B.236 was 3m 23.5 slow.

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1891phae.proj.1331.

Nov. 13, 1891.

Circumpolar Variables. Fr. ob.

S. Bootis

14 16 +V 4.6
23 42
+ 9 26

8 10 p 2.V S, S 2.V q in large tel.
200 ft. for finder
Est. 13.V

R. Cygni.

19 32 +4 9.9
23 V 4
+ 4 2 2

8 30 a 2.V R, R 1.V S in large tel.
200 ft. for finder
Est. 12, 2
R looks slightly reddish.

S. Cygni

20 8 +V 7.1
24 12
+ 4 4

(over)

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1891phae.proj.1331.

Nov. 13. 1891.

8 34 q 2 8,8 2 r in large tel.
200 ff for finder
Est. 12.8

R. Ursae Maj.

10	32	+69,2
24	18	
13	46	
12		
+1	46	
24	24	
13	√2	
12		
+1	√2	

8 45 s 3 R, R 1.5 t in large tel.
200 ff for finder
Est. 12.6

Some light cloud in this region
at time of Est.
Clouds

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1891phae.proj.1331.

Nov. 13, 1891.

Sun. Trough Zone. Gr. obs.

Series ∠v. +9°

5 2 + 9.7
24 22
19 20
12
7 20

5 2
0 22
7 5 40

5 2
1 30
- 3 3.2

1 2
1 3 2
- 3 3 4

9 vv -

3.3 0
3.4 8
3.4 0

Not wanted

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1891phae.proj.1331.

Nov. 13. 1891.

9 ν 8

730	3.40	
	3.42	
	3.ν2	10.34 / 4.48
733	2.91	
	3.10	
	3.00	9.01 / 3.90
734	3.40	
	3.40	
	3.42	10.22 / 4.43
739	3.10	Fol. slightly brighter + northern of two 1.
	3.1ν	
	3.12	9.37 / 4.06
7ν4	2.80	
	2.82	
	2.8ν	8.47 / 3.67
763	4.61	
	4.69	
	4.80	14.10 / 6.11
779	3.13	
	3.30	
	3.47	9.90 / 4.29

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1891phae.proj.1331.

Nov. 13. 1891.

786	3.70	
	3.41	
	3.50	10.11
		4.38
792	4.30	
	4.52	
	4.70	13.52
		5.85
795	3.60	
	3.77	11.27
	3.90	4.88 Est. 9.4
796	4.79	
	5.00	
	4.81	14.60
		6.37
808	4.40	
	4.58	
	4.81	13.79
		5.97
823	5.15	
	5.20	
	5.30	15.65
		6.78
840	3.82	
	4.00	
	4.02	11.84
		5.13

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1891phae.proj.1331.

Nov. 13. 1891.

865
4.27
4.30
4.40 12.97
5.62

867
3.60
3.72 10.91
3.59 Rather ft. Est. 9.8

868
4.20
4.41
4.40 13.01
5.63

872
2.80
3.20 9.40
3.40 Double. Brighter component meas. 4.07

874
~~3.70~~ Seem to be wrong.
3.55
4.00
3.99 11.54
5.00

880
3.59
3.99
3.94 11.52
4.99

890
3.38
3.52 10.74
3.84 Ft. Northern & brightest of three. This 4.65
to the same star which was taken
in series 19. & called there fol. brighter of pair.

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1891phae.proj.1331.

Nov. 13. 1891.

894		3.19		
		3.31		
		3.69	10.19	
			4.41	
901		3.90		
		3.88		
		4.00	11.78	
			5.10	
908	Wrong star	~~3.74~~	2.43	
		~~3.62~~	2.99	
		~~3.69~~	~~3.00~~	8.42
				3.65
10 √6 917	Wrongstar	~~2.81~~	3.10	
		~~3.30~~	3.27	
		~~3.27~~	3.25	9.62
				4.17
923		2.55		
		2.78		
		2.78	8.11	
			3.51	
934		3.40		
		3.80		
		3.70	10.90	
			4.72	
939		4.98		
		5.12		
		4.92	15.02	
			6.50	

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1891phae.proj.1331.

Nov. 13. 1891.

11 00 941

3.81
4.27
4.46 12.54
5.43

B. + C. 11 A2.
11 2A 37.4
29 37.4

B. 39 K.
11 3K 0.0
35 0.0

11 S2 7
A 12
12 0 19
11 3K 0
26 19
11 2A 37
11 SK S6. Ap. time ecl.

Reap. Jy. I. Ht. obs. Powe rec.
phot. R. comp. with cat. next fol. (II)

11	5S	42	rem.
	56	1	232.5
		20	296.0
		35	231.9
		46	297.5
	57	2	226.0
		16	294.8

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1891phae.proj.1331.

Nov. 13. 1891.

11	5.7	30		229.0
		45 —		300.1
		5.8		224.0
	5.8	9		307.0
		27		216.5 —
		42 —		314.5 —
	5.9	21	91.9	220.9
		48 56	109.3 / 201.2	312.8 1
12	0	18	100.6	222.0
		25 —		331.3
		5.6	93.3 / 90.0 / 183.3	216.0
	1	23	91.7	309.5
		5.9 41.7		217.8
	2	29 —	93.3 / 90.0 / 183.3 / 91.6	307.8
	3	14		210.2
		56		321.3
	4	23		Sat. I. in-

visible.

	5	58	Sat. I. in-

visible

7	16	Sat I. in-

visible at thirteen full
beginning. Comp. Sat. very
faintly seen

8	3	190.5 —
9	10	Both Sats.

gone

Dyr. low, seeing very bad

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1891phae.proj.1331.

Nov. 13. 1891.

Spt. I. seeing and overlapping spectra settings made with extreme difficulty and considerable uncertainty. Spt. I nearly invisible during all the settings

B. & C. 11 & 2.			B. 39 K.		
12	20	36.5	12	26	0.0
	21	36.5		27	0.0

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1891phae.proj.1331.

Nov. 14. 1891.

8 10 Somewhat clearer.

8 15 More cloudy again.

Clear again

D.M. Wedge Zones.
Series 26. +9°

21 37 +9.2
~~18~~ 5
~~20 32~~
25 6
+3 29

9 27 DM. +9°

4861 3.30
3.40
3.49 10.19
4.41

4870 2.59
2.80
2.99 8.38
3.63

4872 4.59
4.60
4.75 13.94
6.04

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1891phae.proj.1331.

Nov. 14, 1891.

~~4883~~	~~2.99~~		
	~~3.18~~		
Hrong ster	~~3.28~~	~~3.40~~	
4883	3.40		
	3.30		
	3.37	10.07	
		4.36	
4885	2.30	Star faint	
	2.42		
	2.40	7.12	
		3.08	
4886	3.56		
	3.70		
	3.91	11.17	
		4.84	
4889	2.69		
	2.77		
	2.70	8.16	
		3.53	
4892	2.51		
	2.80		
	2.89	8.20	
		3.55	
clouds.			
4900	3.90		
	4.03		
	3.80	11.73	
		4.84	

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1891phae.proj.1331.

Nov. 14. 1891.

4907 1.91
1.81 5.57
1.85 Star 24 faint

Clouds again

So much light cloud now about that it is inadvisable to proceede
1032 forther with Zone.
Possibly last star affected

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1891phae.proj.1331.

Nov. 15. 1891.

B. & C. 1142.

5 51 5.8
52 5.8

B. 394.

5 57 0.0
58 0.0

Resp. Sup. I; Comp. with nearest sat. pre. Sup. Stat. R. Obs. Transit
Comp. with Sat. II.
Center of Sun.

6 21 18.0
32.0
152.5 38.1 44.0 38.1
38.1
74.5

26.4 249.2
20.1 27.6
46.5
23.3 246.1 259.2
26.4 1037.1
20.1 259.3
46.5
23.2 266.2

23 20.0
27.1
34.0
43.0
53.0
24 1.0
9.0

seen.
25.0
24.6
27 3.3
23 3.4
21 3.2
22 6.2

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1891phae.proj.1331.

6	24	14.5		287.6
		28.0		226.4
		34.0		290.1
		[illegible]		290.0
		56.5		291.5
	25	6.0		212.4
		12.5		293.6
		21.0		213.4
		25.5		295.2
		34.0		215.4
		46.0		299.9
		55.6		300.5
26		2.5		301.6
		14.5		211.1
		23.5		309.9 →
		33.0	96.5	216.3
	189.5	42.0	100.1	307.4
	47.4	53.0	47.3 97.1	257.7 207.3
			193.6	
27		6.5	96.8	304.4
		11.5	99.9	209.3
		20.5	97.5	309.2
	102.0	29.5	25.5 197.4	258.2 204.4
	25.5		98.7	
		40.5		305.9
		55.0	101.8	204.6
28		4.0	97.7	310.4 257.7 3
	51.0	19.0	12.7 199.5	207.2
	13	29.0	99.8	304.6

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1891phae.proj.1331.

Nov. 15, 1891.

6 28 40.0 97.6 204.4
49.0 100.7 306.0
198.3
29 99.2
9.0 24.0 204.
7.2 36.0 258.0 309.
46. 100.4 20.9
7.0 98.3 306.
198.7
30 7. 99.4 207.0 256.1
3.0
24.0 30.3
31.0 102.9 204.9
48. 204.1 316.4
207.0
11.0 103.5 20.5 258.9
31 5.0 309.6
16.0 100.8 20.3
92.2
27.0 193.0 310.1 258.1
96.5
36. 32.0 20.4
44. 30.6
94.3
42. 97.7 210.
6. 192.0 304. 256.6
96.0
16. 12.1 206.4
27.0 304.

Seeing fairly good.

Observations of Occultations during Total Eclipse of Moon.
Transits on chronograph with Fr. 1327.

(See next page.)

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1891phae.proj.1331.

Nov. 15. 1891.

				Sro
				96
				82
				80
				84a?
6	~~37~~	38	44.5	102
		39	0.0 lasbg 3 taps.	11 mag
7		2	37.5	108
		4	30	111
		6	33.5	110
		~~87~~	48.5 10.0 Em. Pro 1,300. Sro 89	
	Deduct 1 sec from Chron time			
		14	32.0 Em. Prob. 114.	
		16	4.0 Pro A. Mag. 102. 117	
		~~Pro~~ 21	18.0 1.5 Mg. Pro A 24.5. Em.	
			Sro time by Chronom. — 94	
	Reject lap followed by several short rattles. Probably lost.			9 9.5
7		29	52.0 Deduct 3 sec from Chronograph	96
		34	? 46.5 Em Pro 3.10 Mg 108	
	Deduct 4 sec. Not known			
			Pro. 60 108 Mg	
		42	24.0 45	
		43	23.5. Pro ~~45~~ Mg 108	
		47	53.5 Pro 27.5	102
		55	+38 Pro A 29.5. Em. Mg 10.2	
	Deduct 3 sec from Chronograph time			
8		2	17.5	108
		4	39.5	111

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1891phae.proj.1331.

Nov. 15. 1891.

8 8 30.5 Pos A 14°. Mag. 8.8 No. Number.
~~Dr~~ Moons limb bright. Obs. difficult.

20 18.5 Pos a. 115°. 2m. Mag. 8.5
~~20~~ ~~18.5~~ Time a little approximate
Moons limb very bright

B. & C. 1142.

δ	51	1.2	
	√2	1.3	

B. 394.

δ	57	0.0	
	56	0.0	

B. 236.

δ	√9	2√.5	
9	0	2√.6	

B. 394.

δ	√9	0.0	
9	6	0.0	

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1891phae.proj.1331.

Nov 18 1891.

Circumpolar Variables. W. Obs.

S. Bootis

14	16	+54.6
7	38	
+6.	38	
7	45	
+76	31	

Chronometer wrong.

14	16
23	49
+ 9	33

7 50

ρ = S. S = q in large tel.
Log fr. for finder.
Est 13.5

Obs. very difficult. Region last Moon three days past the full. Var. almost invisible. Obs. subject to a small uncertainty of error.

R. Cygni

19	32
23	59
+4	27

+49.9

(over)

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1891phae.proj.1331.

Nov. 18. 1891.

8 3 a 1 R, R 2.5 t in large tel.
Too ft. for finder
Est 12.1

δ. Cygni

20 8 +57.1
24 10
+ 4 2

8 12 q 1 δ. δ 2.5 n in large tel.
Too ft for finder
Est. 12.6

D M. Wedge Zone. U. Obs.
+90°

Series 87.

21 37 +9.2
24 45
+ 3 8

8 47 4911 2.97
2.90
2.95 8.82
3.82

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1891phae.proj.1331.

Nov. 18. 1891.

8	√√	4936	2.78	
			2.72	
			2.93	8.43 / 3.65
		4937	3.00	
			2.94	
			3.01	8.95 / 3.88
		4941	2.91	
			3.09	
			3.20	9.20 / 3.98
		4947	3.39	
			3.29	
			3.20	9.88 / 4.28
		4948	√.20	
			√.20	
			√.22	15.67 / 6.76
		4997	3.30	
			3.40	10.24 / 4.43
			3.54	~~Star rather bright.~~ Est 9.1
		4999	3.00	
			3.09	
			3.30	9.39 / 4.07

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1891phae.proj.1331.

Nov. 18. 1891.

√001	3.38	
	3.20	
	3.28	9.86 4.27
√007	3.81	
	4.10	
	4.11	12.02 5.20
√018	2.√0	
	2.89	
	3.07	8.46 3.66
√022	3.13	
	3.40	
	3.29	9.82 4.25
√024	4.03	
	4.28	
	4.27	12.58 5.45
√029	4.68	
	4.70	
	4.82	14.20 6.15
√033	4.11	
	4.43	
	4.53	13.07 5.66

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1891phae.proj.1331.

Nov. 18. 1891.

√036 2.99
3.37
3.70 10.06
4.36

√047 2.82
3.18.
3.31 9.31
4.03

√0√0 3.20
3.37
3.37 9.94
4.30

9 44 √055 4.88
√.04
√.10 15.07
6.√0

Now Series.
Now start to East of meridian.
Series ss. +9° Fr. obs.
+9.6

√ 13
~~2½~~ 4
− 3 9
2 8
− 3 √

10 7 8823 4.80
4.93
4.90 14.63
6.33

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1891phae.proj.1331.

Nov. 18. 1891

865 — 4.50
4.70
4.60 13.80
5.98

~~867~~ — ~~3.50~~ Reject. ~~dob.~~ Prob.
~~3.80~~ not A67. — A67 also
~~3.84~~ not needed.

~~868~~ A72 — ~~3.90~~ measured.
3.20 brighter & southern of components
3.25 Double. Preceding slightly
9.35
4.05

~~872~~ A74 — 3.40
3.70
3.88 10.98
4.75

~~874~~ A80 — 3.82
4.00
3.89 11.71
5.07

~~880~~ A90. — 3.32
3.71 Fol. brighter & northern of triangle.
3.82 Same star-totter as in series 19.
10.85
4.70

894 — 3.23
3.22
3.17 9.62
4.17

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1891phae.proj.1331.

Nov. 18. 1891.

901	3.42		
	3.50		
	3.60	10.52	4.66
908	2.51		
	2.75		
	2.87	8.13	3.52
917	3.32		
	3.50		
	3.43	10.25	4.44
923	2.90		
	3.19		
	3.20	9.29	4.02
934	3.21		
	3.37		
	3.60	10.18	4.41
939	4.81		
	4.62		
	4.69	14.12	6.11
941	4.32		
	4.51		
	4.58	13.41	5.81

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1891phae.proj.1331.

Nov. 18. 1891.

943	3.13	
	3.19	Same star taken as in previous
	3.19	series.
		9.51
		4.12
947	3.40	
	3.22	
	3.30	9.92
		4.30
~~952~~	4.09	
	3.80	Wrong star.
	~~3.92~~	
952	3.61	
	3.57	
	3.81	10.99
		4.76
960	2.89	
	3.13	
	3.16	9.18
		3.97
966	2.41	
	2.47	
	2.45	7.33
		3.17
967	2.60	
	2.98	
	3.12	8.70
		3.77

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1891phae.proj.1331.

Nov. 18. 1891.

969 2.15
2.37
2.37 6.89
2.98

970 4.21
4.15
4.36 12.72
5.51

11 00

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1891phae.proj.1331.

Nov. 19. 1891

Circumpolar Variables. 11.00

δ. Bootis

14 16 +54.6

23 18

~~+0~~ 42

+9

24. 0 V

~~+9~~ 49

Sky too cloudy in this region for Var.

R. Cygni

19 32 +49.9

24 10

~~+9~~ 38

8 10 a 1.5 R. R 2 V f in large tel.
Too ft for finder
Est. 12.1

δ. Cygni

20 8 +V7.1

24 20

+ 4 12

~~+15~~ ~~q 1.5 δ. δ 2 R in large tel.~~
~~Too ft for finder~~
~~Est. 12.1~~ (next page)

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1891phae.proj.1331.

Nov. 19. 1891.

8 30 $\angle$ 2 δ, δ 2.5 q in large tel.
Too ft. for finder.
Est. 12.7

In preceding Est. which was stricken out wrong star accidentaly used for q'
Est. through light cloud. Stars a little dim.

Sky becoming more cloudy.
A little clearer

R. Ursae Maj.

10	32	+6 9.2
2.5	3.5	
1.5	3	
12		
+3	3	

9 32 δ 2.5 R, R 3 t in large tel.
Too ft. for finder.
Est. 12.3

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1891phae.proj.1331.

19.

Nov. ~~18~~. 1891.

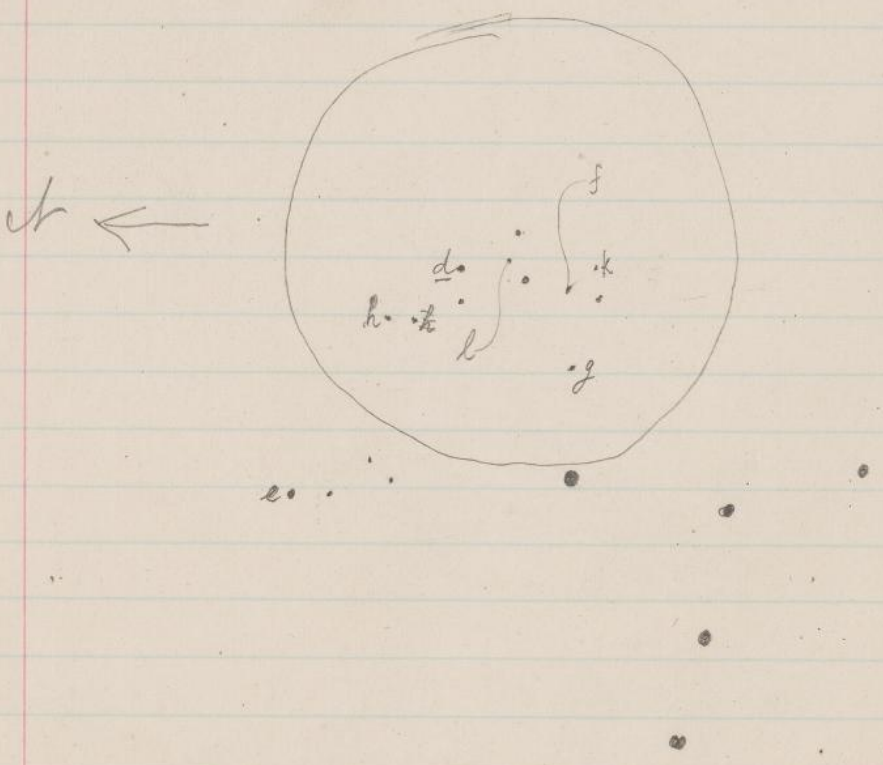
More cloudy again.

Some clearer again.

Selection of faint Comp. Stars for Var.

Lacerta.

22	21	+39.0
26	10	
+3	49	



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1891phae.proj.1331.

19.

Nov. ~~10~~ 1891,

10 50 Star 1 is the faintest star which can be seen with certainty to night. Troubled throughout evening by clouds.

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1891phae.proj.1331.

20.

Nov. ~~19~~ 1891.

δ Aquarii

22 46 −20.0

23 ✓0

+1 4

7 ✓6 d 2.5 δ, δ 2.5 e in large tel.
Too ft. for finder.
Est. 13.7

Sky pretty clear.
Asclumpolar Variables. W. Obs.

δ Bootis

14 16 +✓46

24 12

+9 ✓36

24 23

+10 7

8 16 p 2.5 δ, δ 2.9 in large tel
Too ft. for finder.
Est. 13.6

Region low. Obs. difficult

R. Cygni

19 32 +49.9

24 32

+✓ 00

8 24 a 2 R, R 3 F in large tel.
Too ft. for finder.
Est. 11.8

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Nov. 20. 1891.

S. Cygni

20 8 + √7.1

24 37

+4 29

8 35 ~~fe~~ 1.√ S. S 49 in large tel.
200 ~~ft~~ for finder
Est. 12.~~4~~ 5

R. Ursae Maj

10 32 +69.2

26 √0

14 18

12

+2 18

8 44 S 3 R, R 2√ t in large tel.
200 ft. for finder
Est. 12.2

~~Comet Wolf~~

~~4 31~~ ~~10.6~~

Abandoned.

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1891phae.proj.1331.

Nov. 20. 1891.

D.M. Wedge Zone. Series 89. +9°.

$\sqrt{27}$ + 9.9

1 27

$\sqrt{00}$

9 2$\sqrt{}$ 939 4.96

$\sqrt{.02}$

4.90 14.88

6.44

941 4.$\sqrt{2}$ Seem to be wrong.

4.$\sqrt{0}$

4.67 13.69

5.93

970 4.20

4.36

4.$\sqrt{0}$ 13.06

5.65

977 3.49

3.80

3.89 11.18

4.84

982 4.28

4.47

4.60 13.35

5.78

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1891phae.proj.1331.

Nov. 20. 1891.

999	3.39	
	3.30	
	3.59	10.28 / 4.45
1000	3.50	
	3.70	
	3.79	10.99 / 4.76
1011	3.41	
	3.63	
	3.92	10.96 / 4.75
1015	4.10	
	4.00	
	4.01	12.11 / 5.24
1023	4.31	
	4.48	
	4.58	13.37 / 5.79
1027	2.80 Has quite a Fr. Stor	
	2.92 slightly Fol. Same stor	
	3.0 Stor bright as in previous Series.	8.76 / 3.79
1048	3.88	
	3.90	
	3.94	11.72 / 5.07

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1891phae.proj.1331.

Nov. 20. 1891.

1056
4.20 This star is brighter
4.00 than 1048.
4.21 12.41
5.37

1059
3.60
3.60
3.88 11.08
4.80

1061
3.20
3.52
3.71 10.43
4.52

1086
3.56
3.51
3.76 10.83
4.69

1087
4.50
4.67
4.98 14.15
6.13

1095
3.16
3.10
3.30 9.56
4.14

1098
3.90
3.82
3.87 11.59
5.02

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1891phae.proj.1331.

Nov. 20. 1891.

1101	3.36		
	3.58		
	3.70	10.64	4.61
1111	2.73		
	2.88		
	2.79	8.40	3.64
1113	4.21		
	4.10		
	4.47	12.78	5.53
1123	2.68		
	3.00		
	3.11	8.79	3.81
1135	2.61		
	3.18		
	3.30	9.09	3.94
1137	2.48		
	2.80		
	2.99	8.27	3.58
1139	2.77		
	3.01		
	3.70	8.98	3.89

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1891phae.proj.1331.

Nov. 20. 1891.

1142 3.15
3.25
3.21 9.61
4.16

There is no star in the position of 1144 as given in the Dm. There is however a star which follows 1142 16 sec & is 2m north instead of south. It has a fainter star a little north preceding & another star nearly as bright as itself preceding it 3m north. This principle star with faint north preceding companion is assumed to be 1144 & taken below.

See note on next page.

1144 3.10
3.08
2.89 9.07
3.93

1159 2.80
2.90
2.86 8.56
3.71

1164 3.60
3.78
3.53 10.91
4.72

1167 3.90 Star bright. Est. 9.1.
4.13 Region thoroughly endentified
4.10 12.13
5.25

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1891phae.proj.1331.

Nov. 20. 1891

1173

6.70 Readings a little beyond
6.75 graduations on scale.
6.80 or that readings were obtained by Est.
20.25
8.77

10 v4

Nov. 25. 1891.

~~Error~~ An examination of a photograph of the region containing Dm. +9° 1144 (about which there is a note on preceding page), also shows that 1144 is 2' north instead of south of 1142, as indicated in note, so that there is an error of 4' in Dm.

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1891phae.proj.1331.

Nov. 24. 1891.

Circumpolar Variables. U. Obs.

S. Aquarii

22 46 +20.0

24 1

+1 1√

24 √

+1 19

8 43 d 2.√ d.d. 2.√e. in large tel.
200 ft. for finder
Est 13.1

S. Bootis.

14 16 +546

24 16

+10 00

8 √6 β 2 d, d 3 q in large tel.
200 ft. for finder
Est. 13.2

Obs. very difficult. Star low. Seeing poor. Var. & comp. stars almost invisible so that it is with much difficulty that an Est. can be made.

R. Leygni

19 3 +49.9

24 27

+7 4 √√

(over)

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1891phae.proj.1331.

Nov. 24. 1891.

8 10 $\underline{\underline{S}}$ $\frac{2.5}{3}$ R. R 2.5 a in. large tel.
Low fr. for finder.
Est. 11.5

R is somewhat reddish. s is in Mr. Reed's notation. a is in Mr. Wendell's notation.

S. Cygni

20	8	+57.1
24	41	
+0	33	

8 20 $\underline{\underline{P}}$ 2.5 S. S 3 q in large tel.
Low fr. ~~for finder~~
Est 12.5.

R. Monoc Maj.

10	32	+69.2
24	49	
14	17	
12		
+2	17	

8 25 $\underline{\underline{S}}$ 2.5 R. R 3 t in large tel.
Low fr. for finder
~~Est. 12.3~~

Somewhat cloudy at time of previous Est.
Re Est. 12.0

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1891phae.proj.1331.

Aug. 24. 1891.

S. Ursae Maj.

12 34 +61.7

~~24~~ 3

~~2~~ 29

+12

Abandoned.

S. Persei.

2 8 +V7.2

1 7

+1 1

Jan. easterly meridian telescope to be reversed. too near time for the eclipse

B. + C. 1142.

δ 43 20.0

44 20.0

B. 394.

δ 52 0.0

53 0.0

9 2V 56.

δ V2 0

33 56.

δ 43 20.

9 17 16. Ap. time eclipse.

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1891phae.proj.1331.

Nov. 24, 1891

Dis. gy. III. Comp with set I.
Phot. R. W. obs. Powers.

9	0	41		107.0	23.7
		49	56.0	100.9	130.7
				207.9	
				~~104.0~~	76.2
	1	3		104.0	24.6
		11			127.7
		27		101.5	28.5
		30		106.2	180.0
		Clouds		207.7	
				103.9	78.6
		40	35.5		251.0
		51			101.2
	2	1		102.1	251
		9		102.8	127.2
				204.9	77.2
		16	11.7	102.5	27.0
		21			129.8
		35		108.8	251.2
		43		104.1	134.0
				212.9	
		52	47.2	106.5	26.1 78.8
		59			130.2
	3	9		103.7	24.0
		17		104.8	127.7 76.2
				208.5	
		28	24.5	104.3	24.2
		44			129.0
		53		102.7	25.3
	4	3		110.0	131.0 78.4
				212.7	
		12	7.2	106.4	22.2
		21			132.2

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1891phae.proj.1331.

Nov. 24, 1891.

9	4	24			103.4	2578			
		37	43.2		117.6	129.2			
		48			221.0	16.X	77.3		
	5	0			110.5	1360			
		8				2418			
		19			107.7	13211			
		26	22.2		106.7	2570	78.3		
		36			214.1	1314			
		44			107.1	2810			
		51	54.7		109.2	1322			
		59			115.1	2011	77.6		
	6	1			224.3	1307			
		14			112.2	2570			
		21			110.2	1307			
		28	24.2		107.0	2417	79.1		
		34			217.2	1311			
		41			108.6	2417			
		48	58.2		106.6	1313	78.0		
	7	1			105.7	2575			
		17			212.3	1310			
		25			106.2	2417			
	8	12			105.3	1300			
		21	6.6		109.5	2317	77.8		
		26			214 8	1330			
		36			107.4	2570			
		44	50.2		106.3	1313	77.5		
		51			109.8	2210			
	9	4			216.1	1318			
					108.0				

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1891phae.proj.1331.

Nov 24, 1891

9	11		101.2	25.6
	17		102.6	127.0
	24	21.5	203.8	78.0
	32		101.9	26.4
				131.0
	38		108.7	25.3
	46	49.8	104.1	78.0
	54		212.8	104.0
			106.4	24.2
10	1			128.3
	8		102.7	26.2
	15		102.8	130.9
	21	18.5	102.8	30.3
	30			80.6
			(7, 133.1)	33.1
	47		99.6	31.1
	54	59.2	92.7	130.7
			192.3	80.6
			96.2	34.0
11	10			126.7
	17		92.0	33.0
	24	27.2	88.7	125.0
	31		180.7	78.8
			90.4	04.3
	37			123.0
	43		94.8	30.0
	50		88.9	124.8
	59	54.8	183.7	35, 278.5
			91.8	
12				124.1
	13		91.3	37.2
	20		87.4	128
	28	24.0	178.7	35.7
			89.4	81.1
	35			123.1
	48		77.9	40.1
	55	56.8	80.7	116.079.1
			158.6	
			79.3	

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1891phae.proj.1001.

Nov. 24. 1891

[12]
[13]

	5-9		38.8
	7		119.1
	14	78.0	38.0
	16	76.4	116.0 78.0
	20 21.8	154.4	
		77.2	40.8
	30		117.3
	35	70.6	41.1
	41	71.2	111.7 76.5
	47 43.8	141.8	
	52	70.9	41.0
			112.2
[14]	1	67.0	43.2
	4	70.6	110.2
	9 7.0	137.6	40.2 76.1
		68.8	
	14		110.8
	17	69.0	43.2
	22	66.2	112.2 78.3
	27.8	135.2	
	32	67.6	45.8
	36		112.0
		65.3	47.0
	43 58.5	51.6	112.3 79.3
	49	116.9	53.1
		58.4	
	~~Sol~~ Cl'ds		

Rob' invisible

[10]	44	104.7
	50	57.9
	56	104.2
[16]	2	53.3
		52.8
	13	57.0

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1891phae.proj.1331.

Nov. 24, 1891

9	[16]	18			95.6
		24			60.1
		29			93.5
		36			64.0
		41			89.7
		48			61.7
		55			91.7
		1			66.3
17		cl'ds			
18		18			87.2
		cl'ds			
19		21	sat. not very		
		Limit of vis.			
		48	19.9		67.8
20		01	20.3		
		21 20.0	40.2	77.7	87.7
			20.1		67.5
21		6			87.6
					310.2
					77.7

~~The last~~ ~~At time~~ When last reading was made upon limit of vis., sat. was thought ~~to be~~ suspected ~~and so~~ reading was taken. ~~At time of~~ reading before this one sat. ~~clear~~ about at limit of vis. Seeing in general pretty good save some interruptions from cl'ds.

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Nov. 24. 1891.

B. + C. 1142.

9	36	19.0	
	37	18.9	

B. 394.

9	45	0.0
	46	0.0

Rel. estimates on Comp. stars for V. Cygni.

26	44	+47.2
26	34	
+ √	√ 0	

Too much cloud about for relative estimates

Comet Wolf. (1884 III) W. Hs.

4	29	− 11.8
2	30	
−1	√1	

Pos. Zero 111.7

Setting 45.0

156.7

10 32 3

0	18.0	∈
1	3.√	∈
2	√.√	*
7	30.2	*
3	6.√	
3	√2.√	
4	√4.2	
√	1 7.√	

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Nov. 24, 1891

3	5	√1.5
	6	37.1
	7	39.5
	8	3.8
	8	45.0
	9	31.0
	10	33.2
	10	√7.4
	11	46.0
	12	32.2
	13	34.1
	13	√8.5

Comp Star = S.D. − 11° 907 (4.9 S.)

Obs in preceding transits comet comet star star. Both the northern hal(f) Nucleus pretty well defined. Nucleus about 10 mag. Some coma but rather faint slight traces of tail extending a little to north and slightly preceding Tail & short but visible for a distance of 3m of arc.

There seems to be a point of light about 6.6m of arc from nucleus in axis of tail. This point being 12 mag. & may possibly be a star.

At times the little spot of light seems to be possibly a part of the tail which is rather bright & near the nucleus. But one can hardly resist the impression that it

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1891phae.proj.1001.

Nov. 24. 1891.

is a discrete point & not due to the general light effect of the tail.

B. 236.			B. 394.		
3	3r	V.r	11	6	0.0
	36	5.7		7	0.0

∴ B. 236 was $1^m\ 39^s.5$ slow.

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1891phae.proj.1331.

Nov. 25. 1891.

Circumpolar Variables.. W. Obs.

S. Aquarii

22 46 -20.0

24 4

+1 18

7 38 ℓ 1 S, S 3 e in large tel.
200 fr. for finder
Est. 13.1

S. Bootis

14 16 +54.6

24 12

+9 56

7 48 ρ 2 S. S 29 in large tel.
200 fr. for finders.
Est. 13.1

Region low. Seeing poor. Obs. very difficult

R. Cygni

19 32 +49.9

24 23

+4 51

7 54 S 3 R, R 2 a in large tel.
200 fr. for finder
Est. 11.7

Diss in Mr Reed's notation.

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1891phae.proj.1221.

Nov. 2 V. 1891

δ. Cygni

20 8 +57.1

24 28

+4 20

24 V6

Clouds +4 48

f V δ, δ 3 q in large tel.

δ 25 200 ft. for finder

Est. 12.V

R. Ursae Maj.

10 32 +69.2

24 V9

14 27

12

+2 27

δ 30 S 2 R, R 4 t in large tel.

200 ft. for finder

Est. 12.2

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1891phae.proj.1331.

Nov. 25. 1891.

Examination and relative estimates of Comp. Stars for ~~U~~ E. Lyghi

20	48	+47.2
2√	1√	
+4.	32	

Clouds

2√	37
+4	√4

Clouds

26	18
+√	3√

a 5 b
b 4 c
c 6 d
d 4 e
e √ f
f 4 g
g 3 h
h 4 k
k 3,√ l
l 4 m
m 2,√ n

10 16

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1891phae.proj.1001.

Nov. 27. 1891.

Comet d ~~1889~~ 1891. (Barnard Sept. 27.) W. Obs.

23	16	+19.√
24	11	
+0	√√	

24	20	
1	6	
23	14	+19.1

Pos. Zero 1249
Setting 4√1.0
169.9

0	39	√48 =
	40	28.0 =
	41	54.0 *
	42	49.4 *
	44	8.7
	44	42.4
	46	6.√
	47	1.8
	48	.√8.5
	49	30.√
	√0	5√.0
	51	√0.0

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Nov. 27. 1891.

0	√3	38.4
	54	10.2
	√5	33.5
	56	28.5
	57	47.5
	√8	17.5
	59	40.5
1	0	35.0

~~7 26.0~~
~~4 7.9~~
~~5 15.9~~

Order in preceding transits comet, comet, star, star. Both in northern half.
Comp. star = D.M +19° √097 (8.3 R.)
Fourth set not considered quite as good as the others as it was taken through some cloud. Clearer at time of fifth set.
Comet faint about 13 mag. a little brighter than when last seen.

Nov. 29.$^{23^h}_{h}$ — Comparison of B. 236 accidentally omitted, but ~~it~~ error can be interpolated between the comps. on p. 140 of this book, made on Nov. 24, and that made on Nov. 29. in Book of Eph. No. 2, as B 236 has not been altered measurably.

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1891phae.proj.1331.

Nov. 27. 1891

Location of Comp. Stars for
R. Lyghi with square bar
micrometer.

20 43 +47.2
2V 18
+4 35

2V 36
+4 V3

Pos. Zero 124.7
45.0
Setting 169.7

2 19 8.V Var.
19 43.0 Star 0
20 V.0 Var.
20 24.8 Star 0
Both in southern half.

9. 4V 2 26 15.V Var.
26 V0.2 Star 0
27 19.V Var
27 39.3 Star 0
Both in southern half.

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1891phae.proj.1331.

Nov. 27. 1891.

2	29	0.7	h
	29	14.0	m
	29	29.0	h
	30	13.5	m

Both in southern half.

	59	7.0	Var.
	59	44.5	m
3	0	0.6	Var
	0	25.5	m

Var. in northern half. m in southern half

2	24.0	Var
3	27.7	h
3	37.5	Var.
4	2.0	h.

Both in northern half

14	25.9	h
14	40.0	a
15	15.0	h
15	26.5	a

Both in southern half.

17	1.2	h
17	28.1	h
18	9.6	h
18	27.5	h

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1891phae.proj.1231.

Nov. 27. 1891.

Star b in northern half. Star b in southern half. Star b is the faintest star that can be taken in transits to night. Stars a a + are in Mr Brandeis notation. The other stars are in Mrs Reed's notations

b 3 Var, Var 2 nn in large tube
b 2 Ver, Var 2 nn in finder
Est. 9.7

S. Cygni.

20 8 +07.1
27 31
+7 23

10 vv 0 2 8. 8 3 d in large tube.
2 nn fr. finder
Est. 12.2

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1891phae.proj.1331.

~~Harv.~~ Dec. 1. 1891.

Dm. +9° 4777 (Susp. Var.) Yr. obs.

21	11	+9.7
24	27	
+3	16	

Region of suspected Var. thoroughly identified

Star is faint to night. Mag. est. at about 10.0

Yr precedes Dm +9° 4778 by 12½ sec. dis about ⅓ of min. of arc. north of it.

Seems to be no doubt as to its variability. Star thought to be slightly reddish. Spectrum examined bands at times suspected but cannot be sure of it from faintness of star

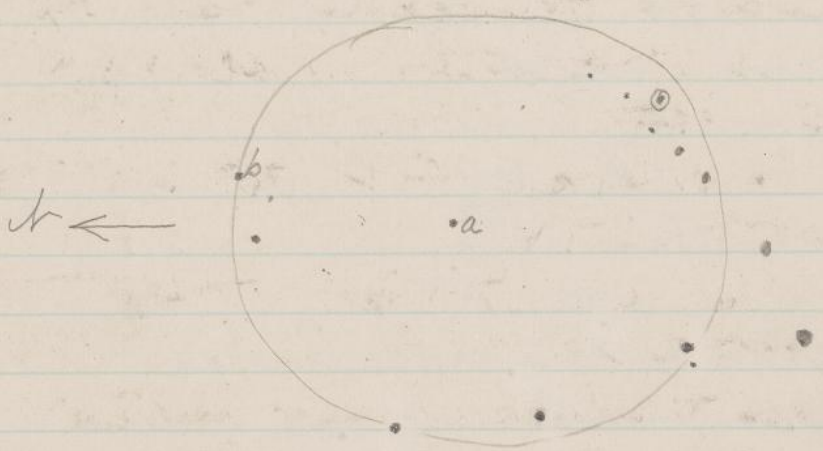
Yr follows Dm +10° 4517 by 7 sec and is 3" south of it.

See next page for diagram.

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1891phae.proj.1331.

Dec. 1, 1891.



γ 40 a 3 ~~8~~ V, ~~7~~ 2.5 ~~f~~ in large tel.
a 3.5 V, 7 2.5 f in finder
Est. 100
Var. is at least one mag. fainter than 4770. both in large tel & finder.

Identification of several stars ~~which~~ whose occultations were observed at time of Lunar Eclipse Nov. 15. 1891. Ft. Ob.

3 23 +17.4
2 4
+ 1 19
2 8
− 1 V
2 11
− 1 12

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1891phae.proj.1331.

Dec. 1. 1891.

Star 94 precedes 9 S by 9 sec + is about 3' north. Mag 9 9 S / 10.0. Mag. 94 10.5 S

A 10.7 mag. fol's. 9 S 2 sec + is 0.5' north of it. This is sto. 97.

A 10.6 mag. fol's 9 S 4.5 sec + is 2.5' north of it. This is sto. 98.

A 10.9 mag. precedes 94 3.5 sec + is 2.8' north of it.

A 10.8 mag precedes 94 3 sec + 4.7' north of it.

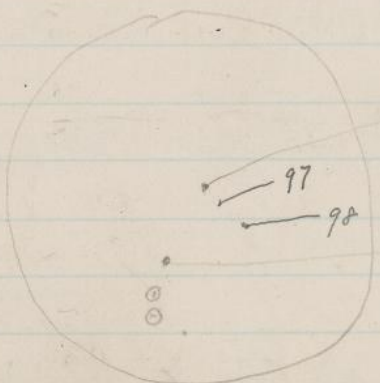
There is no star preceding 94 by 16 sec + about the same Dec.

A 12.8 mag. precedes 94 2 sec + 0.2' south of it.

A 12.5 mag. precedes 94 10 sec + 2' north of it.

A 12.8 mag. precedes 94 15 sec + 3.8' north of it.

A 12.6 mag. fol's 94 22 sec + 3' north of it



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1891phae.proj.1991.

Dec. 1. 1891.

The 10.8 mag. which disappeared at Pos. A 10° is possibly 131.
~~It is~~ The mag. is more correctly about 10.4 mag. & A is about 1.8' south of No 115
x A 10.8 mag. Fols No. 115 2.7 sec + is 3' north of it
A 10.8 mag Fols No. 115 38 sec. & may slightly north of it. (This is No. 125)
A 14.3 mag. Fols No. 131 8 sec. & 3.2' north of it.
A 11.3 mag. fols 131 15m 5sec + is 6' north of it.
~~A No 131 mag~~ 10.3 mag.
A 10.4 mag fols 131 1m 20 sec & about same Dec. 0.5 North
Any 11.2 mag. Fols No. 115 1m 5 sec + 7' north of it.

Any 11.3 fols No 125 24 sec. & is 1' south of it.

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Dec. 2. 1891.

Examination of No. 115 of Ralkowa list & adjacent stars with reference to c star observed in connection with the Lunar Eclipse of Nov. 15. 1891.

3	23	+17.4
0	32	
-2	51	

Clouds.

a 11.2 mag. precedes No 115 9sec + is 2.5m south of it.

an 11.0 precedes No 115 21sec + is 0.5' south of it.

an 11.3 precedes No 115 33sec + is 2' south of it.

an 11.4 precedes No 115 18sec + is 5' south of it.

an 10.5 foll's No 115 10sec. + is 7' south of it.

a 10.8 precedes No 115 33sec + is 9.5' South of it.

Star No. 115 is rather bright. Est. Mag. 8.8

a 8.9 mag. precedes 115 1m 1sec + is 8m. south

a 8.9 mag. precedes 115 1m 10sec +

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1891phae.proj.1031.

Dec. 2. 1891.

3m north.

a 9.9 precedes 115 1m d is 2.8' north

7a 10.0 precedes 115 2.9sec d 9' north of it

a 10.3 precedes 115 27sec d is 10.5' north of it.

a 10.8 precedes 115 55sec d is 9' north of it

Somewhat clearer.

a 12.2 precedes 115 10sec d is 3m north of it

a 11.7 precedes 115 7sec d is 12m north of it.

a 10.8 precedes 115 10sec d is 14' north of it.

a 12.2 precedes 115 1sec d is 1m north of it.

Circumpolar Var. N. Obs.

δ. Cygni.

20 8 +57.1

26 35

+ 6 27

9 48 Oz δ, δ 2p in large tel.

200 fr. for Andr.

Estr. 12.1

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1891phae.proj.1991.

Dec. 2. 1891.

Sky somewhat hazy.

R. Cygni

19	32	+49.9
26	50	
+7	18	

Sky to cloudy for Est.
Var Not seen.

Location of faint comp. stars for variables with square bar micrometer.

R. Cygni.

Sky becoming too cloudy, no faint stars can be seen

Circumpolar Variables. N. Obs.

R. Lyncis

6	49	+55.0
3	11	
-3	38	

1835 ± 2 C, C 2 t in Large tel.
Too fr. To find
Cor. 0.40 (Next page)

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1891phae.proj.1331.

Dec. 2, 1891.

The above Cor. was obtained after many attempts & is subject to a slight margin of error on account of the clouds through which it was taken.

Star still too cloudy for location of faint comparison stars with the micrometer as most of the selected stars are some little distance from the Zenith

R. Ursae Maj. +69.2

10	32
27	40
17	8
12	
+ √	8

10	32
3	42
=6	√0

10 √2 as R, R at in large to Log √ 2 for finder Esv. 11.9

Obs. made through light cloud

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1891phae.proj.1331.

Dec. 3. 1891.

Circumpolar Variables. W. Obs.

S. Bootis.

14	16	+54.6
24	33	
+10	17	

7 40 ρ 2 $\frac{S}{2}$ $\frac{Sr}{2}$ 9 in large tel.
200 ff. for finder
Est. 13.2

Region very low. ~~Hazy~~ Seeing poor. Vars & comp stars almost invisible. ~~Est.~~ On account of low altitude & bad atmospheric conditions est. can only be regarded as approximate.

R. Leonis.

19	32	+49.9
24	48	
+5	16	

7 57 2 4 R, R 1$\frac{1}{2}$ in large tel.
2 3.5 $\frac{R}{2}$, $\frac{R}{2}$ 1$\frac{1}{2}$ $\frac{1}{2}$ in finder, but faint
Est. 11.4

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1891phae.proj.1331.

Dec. 3. 1891.

Pos. Zero. 189.3
45.0
Setting 234.3

Location of Stars. Comparison Stars for 8 R. Cygni with square micrometer.

1	9	√4.0	Var.
	11	2.0	Var
	11	10.√	q.
	11	√0.√	q
Same again			
1	13	√0.5	Var.
	14	√8.√	Var.
	15	7.0	q
	15	46.√	q.

Var. in southern half; star q in northern half.

18	30.4	Var.
18	46.√	Var.
18	√7.√	n
19	49.0	n
Same again		
20	29.0	Var.
20	46.0	Var
20	√6.√	n
21	48.√	n

Both in southern half.

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1891phae.proj.1331.

Dec. 3. 1891

1	22	39.7	D
	23	9.0	Var.
	23	31.5	D
	23	41.0	Var.

Same again

24	29.5	D
24	49.5	Var.
25	21.0	D
25	30.5	Var

Stars D in Southern Lolf. Var. in northern Lolf.

1	50	14.8 Var.
	50	37.0 a
	50	52.0 Var
	51	45.0 a

Same again

	52	18.3 Var
	52	41.2 a
	52	56.0 Var.
	53	48.5 a

Var. in southern Lolf. Star a in northern Lolf.

	56	34.5 b
	56	53.5 Var.
	57	29.7 Var.
	57	46.0 b

Same again. See next page.

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1891phae.proj.1331.

Dec. 3. 1891.

1.	√8	39.5 b
	58	√8.8 Var.
	√9	34.7 Var.
	√9	√1.5 b.

Both in northern half.

2	8	18.0 a
	8	41.2 Var.
	9	24.5 Var
	9	29.5 c

Same again.

10	2.5 c
10	26.0 Var.
11	8.7 Var.
11	13.7 c

Both in northern half.

12	√6.5 d
13	13.0 Var.
13	55.5 Var
14	4.5 d

Same again.

14	45.5 d
15	2.1 Var.
15	44.2 Var
15	√3.2 d

Both in northern half.
Clouds too thick for any fainter stars

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1891phae.proj.1331.

Dec. 3. 1891.

S. Cygni.

$\begin{array}{rr} 2 & 0 \\ 2 & 6 \quad 28 \\ \hline +6 & 20 \end{array}$ $+\sqrt{7.1}$

9 32 0 3 S, S 1,V ⊄ in large tel,
200 ~~F~~ for finder.
Est. 12,V

R Lyncis.

$\begin{array}{rr} 6 & 49 \\ 3 & 0 \\ \hline -3 & 49 \end{array}$ $+\sqrt{V.0}$

10 13 2 3.5 R, R 1,V S in large tel
for ⊄ for finder.
Est. 140

R. Ursae Maj. $+69.2$

$\begin{array}{rr} 10 & 32 \\ 27 & 21 \\ \hline 16 & 49 \\ 12 & \\ \hline +4 & 49 \\ 2 & 7 \quad 2\sqrt{} \\ \hline 16 & \sqrt{3} \\ 12 & \\ \hline +4 & \sqrt{3} \end{array}$

(over)

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1891phae.proj.1331.

Dec. 3. 1891.

10 26 ○ 2.5 R, R 3.5 ☆ in large tel.
Too ☆ for finder
Est. 11.8

δ Ursae Maj. +62.0
12 37
27 34
14 ✓7
12
+2 ✓7

10 44 L 4 δ, δ 2.5 m in large tel.
Too ☆ for finder
Est. 10.6

Est. difficult + not ½ full value on account of cloudiness
Sky becoming too thick to proceed further.

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1891phae.proj.1331.

Dec. 5. 1891

D.M. + 9° 4777 (Susp. Var.) W. Obs.

21 11 +9.7
24 32
+3 21
+24 39
+3 28

7 40 a 3 ~~V~~, V 2 b in large tel.
a 3 V, V 2 b in finder.
Est. 10.0

S. Aquarii

22 46 -20.0
24 V8
+2 12

8 11 c 2.5 δ, δ 2 d in large tel.
Zn fr. for finder.
Est. 12.8

S. Bootis

14 16 +V4.6
25 23
+11 7

Abandoned.

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1891phae.proj.1331.

Dec. 5. 1891.

R. Cygni

19	32	+ 49.9
25	25	
+5	√3	

8 21 ~ 3 R, R ~ S in long tube.
~ 3 R, R ~ R in finder
Cot. 11.4

Location & balance of faint Comp. stars for R. Cygni with square bar micrometer.

Roo. 0	200.8	
	45-0	
Setting	√45.8	
1	49	√25 e
	49	35.0 Var
	√0	10.1 Var
	√0	39.5 e
Same again		
	√1	14√ e
	√1	18.0 Var.
	√1	√2.0 Var
	√2	22.√ e

Both in southern half

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Dec. √. 1891

	√3	29.√	Var
	√4	21.5	f.
	√4	71.5	Var. Wrong star.
	√4	43.0	f.

Same again.

~~√5 29.5 Var~~

~~1 1.0~~

1	√7	21.3	Var
	√7	√0.5	f.
	√8	25.5	Var. + 1 sec.
	√8	35.4	f.

Same again

	√9	26.0	Var.
	√9	√5.0	f.
2	10	31.0	Var
	0	40.2	f.

Both in Southern half.

	1	32.5	g
	1	44.5	Var
	2	12.0	Var
	2	43.1	g.

Same again

	4	42.5	g.
	4	√5.√	Var
	√	23.0	Var − 0.√
	√	√4.0	g.

Both in Southern half.

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1891phae.proj.1331.

Dec. 5. 1891.

2 | 15 | +[illegible] +1m
16 | 23.5 | +0.5
16 | 47.0 | +1m
F

2 | ~~18~~ 19 | 50.0h
20 | 12.5 h
21 | 30.5 h
20 | 52.0h +1m

Same again:

22 | 1.5 h
22 | 26.0 h
22 | 43.5 h
23 | 4.5 h

Both in southern half.
Star h although seen in transit is difficult as it is very faint & the region is getting rather low & seeing rather poor.
Star K is so faint that it will be better to take it the next night at a higher altitude and in better seeing.

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1891phae.proj.1331.

Dec. 5. 1891.

S. Cygni

20		
26	31	
+6	23	+57.1

9 25 0 2.5 S., S 1.5 P in long. tube.
Too ff. for finder
Est. 12.4

R. Cygni

19.	32	
26	58	
+7	26	+49.9

Relative Est. & Comp. Stars for R. Cygni. W. Obs.

9 51

a 4 b
b 6 a
c 5 d
d 3 e
e 3.5 f.
f 3 g
R seems fully as bright as g to night & perhaps 0.2 grade brighter than g
g 3 R
R 4 l
l 4 m
m 4 n

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1891phae.proj.1331.

Dec. 5, 1891.

n ~~3.5~~ = 0
0 4 R
p 6.5 q interval between p + q rather large.
q 3.5 r
r 3.5 s

16 42 Region getting a little low for first estimates on stars fainter than 8.

R. Lyncis

6	49	+ 55.0
8	52	
2	7	
3	7	
3	2	

10 2 Z 3.5 R, R = 8 in long tail, too fr. for finder
Est. 13.9

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1891phae.proj.1331.

Dec. 2. 1896

B. + C. 11 Eve.

6 2A 59,V
29 V9,6

B. 39 Eq.

6 30 0.0
31 0.0

Limit of Vis.

6 E2 16.0
E0,V
V3,V 44.5
E3 6.0

16.4 260.6
14.8 277.0
*31.2
15.6 2V9.6 267.9
27E,E

Resp. Jup. I. Sat. R. Comp. with print at fol. = Sat. II. P. obs. Fr. rec.

XE 7.0
12.0
17,V
2E.0
29,V
36,0
E2.0
E4,V
V3,0
V9,0
EV V,V
12.0
19.0
26,V
3E,V

Obsn.
7V,V
103.6
71.7
107.3
67,V
109.6
6.0.6
11E,2
V6.E
120.3
V3,E
130.0
V0,E
12E.0

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1891phae.proj.1331.

Dec. 4. 1891.

6	K7	K2,7		70,4
		71,7		128,7
	K6	1,7		K7,K
		11,0		131,2
		19,7		K8,0
		24,0		132,K
		39,0		K2,0
		K9,0		130,2
		79,0		K6,4
	K7	9,0		137,2 →
		14,0	92.7	K2,7
		27,0	98.1	135,2 90.1
		37,0 32.7	190.8	
		K9,0	95.4	K2,3 1
		76,7		1K0,K
				K1,8
	K4	6,0	94.2	137,7 88.5
		17,0 11.0	96.0	K0,K 2
		2K,7	190.2	136,K
		37,0	95.1	39,0
		K6,0	97.2	136,2 87.4
		76,0 50.8	97.2	34,6 3
	K9	K,7		137,4
		1K,0	96.3	36,K
		23,0	97.7	1K2,7 89.6
		33,0 28.0	194.0	K0,9 K
		K2,0	97.0	134,6

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Dec. 2. 1891.

6	0	27.0	90.9	E9		
		36.0	96.8	13.2	87.8	
		E6.0	41.6 187.7	93.9	37.0	0
		6.0			133.2	
	1	6.0	89.0	E2.2		
		19.0	96.2	13.2		
		3.E0	27.0 185.2	92.6	E2.E	88.6 6
		E4.0			138.6	
		4.0	94.6	E0.0		
	2	4.0	95.0	13E.6		
		12.0	13.8 189.6	94.8	E2.4	88.8 7
		31.0			137.4	
		E1.0	94.4	34.0		
		1.0	56.8 97.1		132.E	87.8 2
	3	2.0	191.5	95.8	E2.0	
		13.0			139.1	

	B. + C. 1882.		B. 99E.	
6	4	4.9	7 0	0.0
	9	9.0	1	0.0

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1891phae.proj.1331.

Dec. 8. 1891.

Some cloud.
Circumpolar Variables. N. Obs.
R. Lyncis + √√.0

6	49	
1	43	
− √	6	
1	47	
− √	2	

Clouds.

Sky now a little clearer.
8 45 ~~22~~ 3 R, R 15 Δ in large tel.
~~Too~~ Too Fr. for finders.
Est. 13.8

Sky slightly hazy as time of Obs.

R. Nrose May.

10	32	+ 69.2
26	14	
1 √	42	
12		
+ 3	42	

9 0 Δ 15 R, R. 4t in large tel
Rather too fr. for finders.
Est. 11.5
4

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Dec. 8. 1891.

δ. Aquarii

22	46	+20.0
26	2√	
+3	39	

Too low.

R. Cygni

19	32	+49.9
26	26	
+76	√4	

all cloudy again.

Some clearer again

26	37
+7	√

9 17 2 2√ R, R 2√ 2 in long tel.
2 2 R, R 2 2 in finder
Cat. 11,3

δ. Cygni.

20	8	+√7.1
26	43	
+6	3√	

9 2√ 0 2 δ, δ 2 f in long tel
2 2 for finder
Cat. 12√

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Dec. 8, 1891.

Clouds again.

Wolf's Comet.

4	20	−14.4
3	√	
−1	1√	

4	24
3	20
−1	4

3	2√
0	√0
4	1 √

Clouds.

Pts. Zero 88.9
4v.0
Setting 133.9

3	37	13.0	*
	37	49.√	*
	38	2√.√	⩽
	39	0.√	⩽

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1891phae.proj.1331.

Dec. 8, 1891.

3	39	49.3
	40	26.0
	41	2.5
	41	37.0
	43	√7.0
	44	28.0
	45	4.2
	45	38.6
	46	43.6
	47	.2a.√
	47	√6.8
	48	31.2
	49	9.2
	49	46.0
	√0	21.6
	√0	√6.√

Order in preceding transits Star, star, comet comet.

Star in northern Loop. Comet in southern loop.

~~√4 42.2~~
~~√11 49.4~~

In fifth set comet not quite as well seen as in other sets.

Comp Star = 8.√ mag. Dr Lus on 89 preceding 15 Dec same Dec.

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Dec. 8. 1891.

As 8.9 precedes Comp. Star 2m 1 sec + is 8 min North of it.

3 √7
−0 19
4 16 = 14.9

Comp. Star = √2. −14° 893 (A.2 K)

All cloudy

Comp. star is the star on Chart √2. or about 4h 17m 10sec Ra. −14° 20' Dec.

B. 236. B. 394.

4 1√ 34.√ 10 5 3 0.0
16 34.√ 5 4 0.0

∴ B 236 was 3m 19.9 slow.

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1891phae.proj.1331.

Dec. 10. 1891.

Circumpolar Tagiables. M. Obs.

S. Aquarii

22 46 +20.0
25. 00
+2 14

Region of S. Aquarii identified but moon too bright to see Var.

R. Cygni

19 32 +49.9
25 16
+5 44

7 57 ~ 2 R, R 3 S in large tel.
~ 2 R, R 2 S in finder.
Est. 11.2

S. Cygni

20 8 +57.1
25 30
+5 22

8 12 12.5 S S 2.5 f in large tel.
Too f for finder
Est. 12.3

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1891phae.proj.1331.

Dec. 10. 1891.

Location of Faint Comps. Stars ~~with~~
for Variables with Square Bar Micr. Stocks.

V Cygni.

20 3K +47.0
1 V0
+V 16

Abandoned Chart cannot be found

N. Cygni.

20 11 +47.2
26 6
+5 VV

Pos. Zero 304.7
4V.0
Setting 349.7

2 14 $300 0
1V 3V.1 0
1V VV.9 K
16 39.V K

Same again

17 18.V 0
18 22.0 0
18 42.V K
19 26.V K add +0.3

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1891phae.proj.1331.

Dec. 10. 1891

Star 1 in northern Lolf. Star K in Southern Lolf.

2 22 37.5 Var
23 1.5 f
23 30.0 Var – 0.4
23 49.2 f

Same again.

~~24 34.0~~
25 29.5 Var.
25 53.0 f
26 21.5 Var – 0.2
26 41.0 f

Both in Southern Lolf.

29 26.5 q.
29 50.1 Var
30 20.0 q.
30 55.5 Var

Same again

31 30.5 q.
31 44.4 Var
32 25.0 q.
32 59.5 Var – 0.2

Both in Southern Lolf.

34 21.5 r.
34 31.5 Var.
35 18.0 Var.
35 30.0 r

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1891phae.proj.1331.

Dec. 10. 1891.

Same again.

2	35	√3.0	∩
	36	2.5	Var
	36	49.5	Var
	37	0.6	∩.

Both in southern half.

38	30.0	∩
39	0.5	Var.
39	27.5	Var.
39	32.5	∩

Both in southern half.
Same stars again

40	3.0	∩
41	13.5	Var
42	10.0	∩
42	25.9	Var. −0.2

Star ∩ in northern half. Var. in southern.

9 21 g 2 N, N 2 h. in finder,
g 2 N, N 2 h in Borgetto.
Est. 8.8

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1891phae.proj.1331.

Dec. 10. 1891.

Location of faint Comps. stars for R. Pegasi with Bar. Mic. Fr. obs.

23	0	+ 10.
3	13	
+4	1.3	

23	3	+ 9.0
27	17	
4	14	

3	28	10.7 l
		30.5 l.
		48.5 m
	29	15.9 m

Same again

29	39.5 l
30	4.6 l
30	18.2 m
30	49.5 m

Both in southern half.

31	49.0 l
32	12.0 l
32	54.5 m
33	14.5 m

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Dec. 10. 1891.

Same again

3	33	36.0 l
	33	√9.5 l
	34	41.5 y
	35	1.4 y

Star l in southern half. Star y in northern half.

35	49.5 l
36	13.9 l
36	√5.5 t
37	7.5 t

Same again

37	30.0 l
37	√2.0 l
38	38.0 t
38	48.5 t

Star l in southern half. Star t in northern half.

~~39~~	√9.5 l
40	13.5 l
40	√5.5 W
41	28.4 W

Same again

41	√4.5 l
42	8.0 l
42	√2.0 W
43	23.5 W

Star l in southern outside square. Star

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1891phae.proj.1331.

Dec. 1, 01 1891,
W in northern Loop inside square.

3	48	1.5 l
	48	48.5 l
	49	23.5 x
	√0	1.5 x

Some again.

50	21.5 l
51	7.6 l
51	43.5 x
√2	20.5 x

Both in northern Loop.

√5.5	42.0 s
√5	√2.0 w
√6	0.5 s
√6	22.4 w
√6	46.5 s
√6	46.5 w
√7	√.2 s
√7	27.0 w

Star s in northern Loop. Star w in southern Loop. Var. not seen. No fainter stars can be seen to right. Region not getting rather low.

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1891phae.proj.1331.

Dec. 10, 1891.

Location 2 faint Comp. stars for S. Cet with Square bar. Mic. S. Cet.

0 12 −10.4

4 2

+3 50

Moon too bright & region too low to see faint Comp. stars.

R. Ursae Maj +6.2

10 32

28 10

+17 38

12

+5 38

10 47 S 1.5 R, R 4t in long tel.
Too Fr. for finder
Est. 11.3

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1891phae.proj.1331.

Dec. 11. 1891

D.M. +9° 4777 (Susp. var.) N. 66.

21	11	+9.7
2√	8	
+3	√7	
2√	12	
+4	1	

7 48 a 3 St, St 2 b in longitude.
Same for finder. but faint.
Est. 10.1

R. Lyncis

19	32	+4.9
2√	27	
+√	√√	

7√6 n √2 R, R 3 s in long tude.
Rather too ft. for finder
Est. 11.3

S. Lyncis

20	8	+5.7.1
2√	32	
+√	24	

8 2 0 2 S, S 2 p in longitude.
Too ft for finder
Est. 12.8

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1891phae.proj.1331.

Dec. 11. 1891.

Dm. Gedge Zone. Yr. obs.
+19°

Series 90.

22 17 +20.1
26 29

+4 12

8 √7 4928 3.50
3.49
3.51 10.50
4.55

4930 3.92
3.97
4.02 11.91
5.16

4943 2.20
2.41
2.59 7.20
3.12

4945 2.39
2.57
2.60 7.56
3.27

4952 2.32
2.40
2.38 7.10
3.07

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1891phae.proj.1331.

Dec. 11, 1891.

4959	2.77	
	2.79	
	2.80	8.36 / 3.62
4961	4.12	
	4.29	
	4.30	12.71 / 5.50
4963	2.58	
	2.55	
	2.56	7.69 / 3.33
4967	3.07	
	3.31	
	3.21	9.49 / 4.11
4969	2.85	
	3.04	
	2.99	8.88 / 3.84
4970	2.91	
	3.00	
	3.09	9.00 / 3.90

There is no star visible to night in place of 4971. For should Fol. 4970 about 14sec 2m ~~north~~ south. There is a very faint star which would not be measurable in wedge. Fol. 4970 24sec 1m north, a Reexamination however, discloses a very faint star Fol. 4970

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1891phae.proj.1331.

Dec. 11. 1891.

1.6 ec some v~m South. which is meas. below.

4971 (?)	1.49	
	1.55	
	1.50	4.54
		1.96
4973	2.37	
	2.59	
	2.31	7.27
		3.15
4979	2.29	
	2.50	
	2.62	7.41
		3.21
4986	3.25	
	3.17	
	3.40	9.82
		4.25
4987	2.90	
	3.29	
	3.30	9.49
		4.11
4996.	2.18	
	2.30	
	2.25	6.73
		2.91
5005	3.90	
	3.80	
	3.80	11.50
		4.98

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1891phae.proj.1331.

Dec. 11. 1891.

√007 2.71
2.90
2.99 8.60
3.72

√011 2.√0
2.59
2.80 7.89
3.42

9 ~~44 44~~ 8.30
~~2.42~~ Prob. wrong star
~~7.40~~

B. & C. 1142.

9 √3. 20.0
√4 20.0

B. 394.

9 √√ 0.0
√6 0.0

10 7 34
8 12

10 1√ √0
9 √√ 0
20 √0
9 √3 20
10 1~~4~~ 10 Ap. time ecl.

Reap. 2 Jup. II. Phot. R. No. obs.
Power rather comp. with second and
brighter ~~third~~ sat following Jup. = Sat. III.

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1891phae.proj.1331.

Dec. 11, 1891

Limit of rio.

18	9	56.0	28.6 / 26.3 / 54.9 / 27.5	132.2
	10	24	146,7	160.8
		39 28.0		133.8
		53		160.1
	14	40	nuquelich	
	15	9		127.8
		29		164.2
		37		128.5
		45		166.8
		56		124.8
	16	4		166.8
		13		123.8
		30		172.7
		38		178.8
		48		179.0
		57		118.2
	17	10		182.0
		19		109.7
		31		179.0
		39		111.2
		47		177.1
		55		109.2
	18	4		182.1
		14	110.8	70.1 / 67.8 / 137.9
	18m 31.2	26 31.2	146.5 180.9	69.0
		36		113.2
		49		181.0
		58		109.0

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1891phae.proj.1331.

Dec. 11, 1891.

10 19

9 74.0 72.9 146.9 73.5 183.0
26 17.0 110.2
35 183.1 146.3

20 46 73.1 108.0
56 75.1 148.2 74.1 181.1
7 108.0
18 1.8 183.1 145.0

21 41 74.8 109.2
50 57.0 75.9 150.7 75.4 184.0 145.9
3 107.2
14 183.1
26 80.1 72.5 152.6 76.3 107.1
40 46.8 184.2 146.8
54 110.3

22 7 182.8
19 76.5 77.0 153.5 107.5
33 184.0
44 37.5 76.8 109.0 146.6
54 186.0

23 6 78.5 80.6 159.1 79.6 108.4
18 186.9 147.3
33 24.8 106.7
42 187.3
54 82.8 89.2 172.0 86.0 102.9
11 185.7
56 36.3 102.0 145.5

24 191.2
40 81.7 73.1 154.8 77.4 106.8
52 188.5 147.7

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1891phae.proj.1331.

Dec. 11. 1891

10	26	7	0.3	1111
		22		1842

Electric lights go out immediately before first readings. Jupr. low, ~~rapid~~ bad, settings made with difficulty. The low altitude readily accounts for the rate appearing a little late. The last readings, ~~Dec 12~~ regular sets were more ~~doubtful~~ than the ~~earlier~~ ones on account of lower altitude of Jupr. and bad seeing.

B. & C. 11h2.			B. 394.		
10	46	19.2	10	48	0.0
	47	19.1		49	0.0

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1891phae.proj.1331.

Dec. 16. 1891.

Circumpolar Variables. Fr. obs.

S Aquarii.

22	46	−20.0
2v	1v	
+2	29	

7 30 Moon rather too bright to see variable.

R Cygni.

19	3r	+49.9
2v	40	
+6	4	

Clouds.

Some clearer.

19	3r	
2	v	
+6	33	

4 4 R 1 R, R 3 S is larger tel.
Moon too bright for finder.
Est. 11.3

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1891phae.proj.1331.

Dec. 16, 1891.

S Cygni.

20 A +V 7.1
26 1V
+6 7

0 1 S, S. 2.V.S in large tel.
A 2V. Too Fr. for finder.
Est. 12.2

Dm. +9° 4777 (S.V.)

21 11 +9.7
26 33
+V 22

a 2 S.V., S.V.S 26 in large tel.
A 44 Rather too faint for finder.
Est. 10.1

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1891phae.proj.1331.

Dec. 16. 1891.

Dkn. Tredyc Tone. Gr. obs.

+29°
Series 9t.

22 0. +29.6
3 1
+5 1

22 36 +29.5
27 4.
+4 28

Heavy clouds again.

Abandoned.

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1891phae.proj.1331.

Dec. 17. 1891.

Dm. +9° 4777 (S.V.) Sr. bk.

21 11 +9°.7
2v 2k
+4 13

2v 39
+4 2k

Z. 44 a 3 S.V., V.V. Sr. b in long tel.
Rather 6 ft. for finder.
Est. 10.2

R. Cygni

19,32 +49.9
25.55
+6 23

8 0 v/f = R in large Tel
v/f = R in Finder
Est. 11.0

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1891phae.proj.1331.

Dec 17, 1891.

S. Cygni

20	7	+57.1
26	21	
+6	14	

8 29 o S.S., S 2p
Too faint for Finder
Est. 12.2

R. Ursa Maj.

10	32	+69.2
26	35	
+16	3	

8 40 2 = R in Large Tel.
Too faint for Finder (moon bright).
Est. 11.1

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1891phae.proj.1331.

Dec. 17. 1891.

Dh. Hedges Zone. Yr. Obs.

+29°

Series 91.

23 37 +28.5

27 38

4 1

27 K1

+K K

9 58 - 4989 - 3.98

- 4.09

- 3.83

11.90 5.15

- 4996 - 3.60

- 3.64

- 3.90 11.14

4.82

- 5005 - 3.20

- 3.25

- 3.40 9.85

4.26

- 5011 - 2.50

- 2.66 7.83

3.39

- 2.67 A fainter star precedes 5 seconds and 1.5' ~~of~~ south dist

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1891phae.proj.1331..

Dec 17, 1891

- 5014	-	4.20	
	-	4.07	12.17
	-	3.90	5.27
- 5016	-	~~2.68~~ seem to be wrong	
	-	2.90	
	-	3.11	
		3.10	9.11
			3.94
5020		4.17	
		4.37	
		4.30	12.84
			5.56
5021		2.86	
		3.25	
		3.23	9.34
			4.04
5029		3.49	
		3.69	
		3.79	10.97
			4.75
5032		2.37	Southern and
		2.72	brighter of pair.
		2.80	7.89
			3.42
5038		3.42	
		3.30	
		3.50	10.22
			4.42

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1891phae.proj.1331.

Dec 17, 1891

5046	4.70		
	4.82		
	4.80	14.32	
		6.20	
5047	3.00		
	3.26		
	3.30	9.56	
		4.14	
5049	2.50		
	2.59		
	2.60	7.69	
		3.33	
5056	2.39		
	2.72		
	2.89	8.00	
		3.46	
7	2.39		
	2.57		
	2.50	7.46	
		3.23	
10 48 10	4.99		
	4.80		
	4.85	14.64	
		6.34	

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1891phae.proj.1331.

Dec. 18, 1891.

S. Aquarii N. obs.

22	46	-20.0
25	27	
+2	41	

~~Est~~ ~~Est~~ 2 S, S 3 b in large Tel too faint for finder

7.49 ~~Est 11 5~~ Est. 11,5

R. Cygni

19.	32	+49. 9
25	57	
+6	25	

p 4 R, R 1 q in large tel.
p 5 R, R 1 q in finder

8 4 Est ~~7.8~~ 10.5

~~S. Cygni~~

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1891phae.proj.1331.

Dec 18, 1891.

S. Cygni

20	7	+57.1
26	25	
+6	18	

o2 S, S2 p in large tel.
too faint for finder

8 28 Est. 12.3

R. Ursa. Maj.

10	32	+69.2
26	35	
+16	3	

e = R in large tel.
too faint for finder

8 35 Est. 11.0 Est. made through light cloud.

D. M. Wedge Zone W. obs.
+29°
Series 92.

0x	13x	+30.1°
~~26~~ 3	14	
~~26~~ 3	1	

9 16	~~498~~ 19	5.08	4.98
		5.19	5.08
		5.19	15.25
			6.60

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Dec. 18, 1891.

30	2.71	
	3.10	
	3.19	9.00
		3.89
44	3.30	
	3.59	
	3.51	10.40
		4.40
45	2.80	
	3.23	Same star taken as in
	3.10	series 36.
		9.13
		3.95
47	3.52	
	3.59	
	3.80	10.91
		4.72
49	2.70	
	3.02	
	3.19	8.91
		3.86
50	2.29	
	2.59	
	2.49	7.37
		3.19

The star assumed for D M no. 50 really precedes no. 49, 42. and about 6′ south of it. There are several stars in this region, but they are either so faint or so out of position that it seems as if the star assumed as 50 must be the right one. It also checks in

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1891phae.proj.1331.

Dec 18, 1891.
declinations with no. 54

54	2.95	
	2.99	
	3.21	9.15 / 3.96
58	3.51	
	3.55	
	3.70	10.76 / 4.66
60	3.89	
	3.83	
	3.88	11.60 / 5.02

There is a star which precedes no. 60, 8.5 secs., 3' south of it, magnitude 9.3 which does not seem to be in the D. M.

75	4.11	
	4.40	
	4.57	13.08 / 5.66
85	4.45	
	4.78	
	4.92	14.15 / 6.13
87	3.48	
	3.79	
	4.25	11.52 / 4.99

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1891phae.proj.1331.

Dec. 18, 1891

89	2.80	Same star taken as in
	2.91	series 34.
	2.90	8.61
		3.73
100	2.87	
	3.09	
	3.30	9.26
		4.01
103	~~5.89~~	Reject; seem to be wrong.
	4.30	
	4.29	
	~~4.40~~	12.99
		5.62
120	3.10	
	3.33	
	3.56	9.99
		4.33
122	3.70	
	3.90	
	4.10	11.70
		5.07
137	4.32	
	4.41	
	4.59	13.32
		5.77
138	3.60	
	4.00	
	4.10	11.70
		5.07

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1891phae.proj.1331.

Dec. 18, 1891.

150	5.40		
	5.18		
	5.31	15.89	
		6.88	
153	4.20		
	4.22		
	4.31	12.73	
		5.51	
161	3.55		
	3.69		
	3.79	11.03	
		4.78	
166	4.48		
	4.78		
	4.70	13.96	
		6.04	
169	~~2.71~~ seem to be wrong.		
	3.20		
	3.41		
	3.49	10.10	
		4.76	
10 56 171	3.58		
	3.70		
	4.00	11.28	
		4.88	

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1891phae.proj.1331.

Dec 19, 1891

S. Aquarii W. obs.

22	46	-20.0
25	23	
+2	37	
25	40	
+2	54	

a' 1.5 S, S 3b in large tel
too faint for finder

7 34 Est. 11.4

DM. +9° 4777 (S.O.)

21	11	+9°.7
25	54	
+4	43	

a 3 SV, SV 1b in large tel.
Rather too low + faint for finder

7 48 Est. 10.3

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1891phae.proj.1331.

Dec 19, 1891

R. Cygni

19	32	+49.9
26	7	
+6	35	

μ 4R, R 1q. in large tel.
μ 4R, R 1q in finder.
8 9 Est. 10.0

S. Cygni

20	7	+57.1
26	19	
+6	12	

26	30
+6	23

052, S 2μ in large tel.
Too faint for finder
Est. 12.4
8. 24 Sky hazy. Absolute Est. perhaps slightly affected.

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1891phae.proj.1331.

Dec. 19, 1891

R. Lyncis

6	49	+ 55.0
26	39	
+19	50	

R = 2 in large tel.
Too faint for finder

8 40 Est 14.1

R. Ursa Maj.

10	32	+69.2
26	51	
+16	19	

2 3.5 R, R 12 in large tel.
Too faint for finder

8 47 Est. 11.0

S. Bootis

Region too low and sky too hazy with moon, which is now rising, to see S.

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1891phae.proj.1331.

Dec 19, 1891

Location of faint comparison stars for R. Tauri

Fr. obs.

4	28	+9.9
27	32	
+23	4	

Sky considerably cloudy
Pos. zero.

	227.8
~~Setting~~	45.0
Setting	272.8

4	0	7.2 d
	0	43.0 d
	2	10.7 l
	2	55.2 l

Same again

	3	29.5 d
	4	5.8 d
	5	33.0 l
	6	18.2 l

Order inverse preceeding transits, ~~stars~~
Both in southern half of square.

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1891phae.proj.1331.

Dec 19, 1891

4	10	7.9 d
	10	28.5 d
	10	46.0 m
	11	8.0 m

Same again.

11	53.5 d
12	14.2 d
12	31.5 m
12	53.5 m

Both in northern half of square.

14	37.5 m d
15	50.1 m
15	3.5 d
15	23.5 m

Same again

16	14.0 d
16	26.5 m
16	40.0 d
16	59.6 m

Star d in southern half. Star m in northern half

20	51.0 d
21	36.0 d
21	47.4 o
22	13.0 o

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1891phae.proj.1331.

Dec. 19, 1891

Same again

4	22	38.0
	23	22.8

Same again

24	25.3 d
25	10.7 d
25	21.9 o
25	47.5 o

Star d in southern half.
Star o in northern half.

l 4R, R 1m in large tel.
Too faint for finder
10 27 Est. 11.7

~~Stay~~

Sky rather bad together with moon,
10 35 for anything farther.

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1891phae.proj.1331.

Dec. 24. 1891.

ζ Aquarii. H. obs.

2h	46	- 20.0
26	21	
+3	35	

Too low.

R. Cygni

19	32	+49.9
26	27	
+6	5	

m 3 R, R 1.5 ○ in finder.
○ 2 R, R 2 ○ in large tel,
Est 10.0

S. Cygni

20	7	+57.1
26	40	
+6	- 33	

m 1 S, S 2 m in large tel.
Too faint for finder
Est. 12.1

8 7

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1891phae.proj.1331.

Dec. 25, 1891

D.M. +9° 4777 (S.V.)

21 11 +9°.7

26 56

5 45

8 11 Too low

R. Lyncis.

6 49 +55.0

27 0

+20 - 11

2.5
R R 2t in large tel.
Too faint for finder.

8 25 Est. 14.1.

Comet 1884 III (Wolf) Ver. obs

4 14 -14.5

27 13

+22 59

27 36

+23 22

Poz. zero. = 102.2

45.0

Setting 147.2

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1891phae.proj.1331.

Dec. 28, 1891.

3	52	
	24	
4	16	-14.3

Comp. Star = S & D - 14° 875 (8.5K)

4	3	44.0	≡
	4	20.7	≡
	5	12.8	*
	5	40.5	*
	6	30.6	
	7	7.6	
	8.	0.0	
	8.	28.0	
	9	50.2	
	10	26.5	
	11	19.0	
	11	46.6	
	12	27.0	
	13	3.0	
	13	56.0	
	14	23.5	

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4	15	28.7
	16	4.6
	16	57.2
	17	25.0

Order in preceding transits. Comet, comet, star, star.

Both in northern half of square. Nucleus of comet about 10.5 magn. Diameter of total nebulosity 1.5'. Comet has a faint rather fan shaped tail which can be traced 3' or 4' from nucleus. Tail extends to north very slightly, and very slightly to preceding.

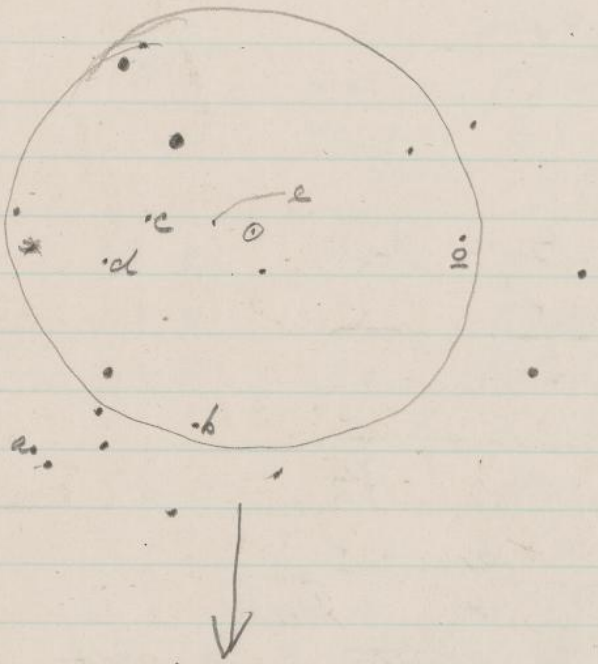
Selection of faint comparison stars for R. Tauri N. obs.

4	22	+10.0
4	30	
+0	*8	

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Star e is the faintest star that can be seen with certainty to night.

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1891phae.proj.1331.

Dec. 30. 1891.

1142.

√ 6 24√

7 24,6

√ 12 0,0

13 0,0

√ 31 24

4 12

√ 39 36

1 ~ 0

27 36

√ 6 24.

√ 34 4.

Dis. Sep. III Comp. with adjac. Sch. = Sch. I.

Phot. M. Robs. Princ.

√ 23 14.0

24,0

110.0 27.5 32,0 27.5

40,0

42,√

24 2,0

30 15.0 7.5

7.5 24√

37.0

227.5 56.9 69.0 56.9

24 6,√

17.0

160.0 29.0

45.0 40,0 45.0

101.8 & 730,2

103.2

205.0 232.0 1

102.5 101.8 181.5

103.2 730.3 726.0

205.0 181.5

102.5 233√

730.2

103.0 181.7

99.5 232.2 2

202.5 103.0 730.2 726.9

101.3 99.5 181.7

202.5 231.√

101.2

105.8 129.4 183.2

102.9 23√.2 3

208.7 732.7 732.9

104.4 105.8 183.2

102.9 23√.6

208.7 4

104.4 730.2 732.6

233.6 183.2

103.4 103.4

92.4 92.4

195.8 195.8

97.9 97.9

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1891phae.proj.1331

Dec. 30. 1891.

	102.5		99.3				99.3
	25.6		99.8		183.1		99.8
			199.1				199.1
			99.6		732.3		99.6
					183.1		
	261.5		99.2				99.2
	5.4		93.7		183.3		93.7
27			192.9				192.9
			96.5		6		96.4
					733.1		
					183.3		
	238.0		90.3				90.3
	59.5		90.2		182.1		90.2
			180.5				180.5
			90.3		7		90.2
					728.3		
					182.1		

Trouble with electric light. Lantern substituted.

30							
			72.4				72.4
			64.1		183.1		64.1
	178.0		136.5				136.5
	44.5		68.3		6		68.2
					732.3		
					183.1		
31							

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Dec. 30, 1891.

V 12	7.0	176
	17.0	209.4
	22.0	186.1
	30.0	203.9
	37.0	162.8
	46.V	202.7
	V6.0	161.6
13	V.0	199.4
	12.0	166.9
	14.0	194.7
	2V-0	166.8
	31.0	199.3
	34.0	166.7
	46.V	194.0
	VV.0	164.V

Limit of Vis.

V 14	40.0		25.0	170.6	25.0 23.6 48.6 24.3
216.5 54.1	V0.0	54.1	23.6 48.6 24.3	19V.6	
	V4.0			17V.V	183.2
1V	4.V			19V.1	132.8 183.2

Seeing at times exceedingly bad so as to render satellites almost invisible.

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Dec. 30. 1891.

B & C. 11 Am.

↓	↓2	27.4
	↓3	27.7

B. 39 K.

↓	↓8	0.0
	↓9	0.0

For balance of observations during latter part of this evening, see Book 61.

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1999phas.proj..434L

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