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April 1, 1890.

Measurements of DM+48°2942, suspected of variability and proper motion.

Position estimated in mm. and tenths; in regard to DM+48° 4941 and 4943.

Dec. 1, 18[illegible]

Plate B 1971

Oct. 1957	Mag. 8.9	DM+48°	2941	8,0	+220	−490		6.1	A	6.4
1957	7	W.S.	" 2942	7.1	+180	−015	475	7.1	M+	6.6
1957	8 1 7.8		" 2943	8,0	+155	+185	170	6,0	F	6.7
First star measured in DM			" 2938	9.2				7.4 7.6	A?	7.8

Plate I 907

Plate B 1947 Nov. 30, 18[illegible]7

DM+48°	2941	8,0	+240	−580		6,5	
W.S.	" 2942	7.1	+200	−105	475	7.5	
	" 2943	8,0	+170	+100	195	6,3	
First star measured in DM	" 2938	9.2				7.7 8,0	

April 8th 1890 Wrong star measured for DM+48°2942 which is a variable and extremely faint on B Plate 1947 and 1971. It appears quite bright on I Plate and the hydrogen lines G, h, are bright in its spectrum.

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April 3rd.

21 45

Plate 901 Taken Mar. 30/90.

r H
3.7 13.6 Bet. pr. 13h 33m -9° 0' = Uranus.

April 10, 1890.

Examination of D plates for
Dm +48° 2942. Prev. variable in Cygnus.

Plate 1494 D.

Dm +47° 2870 6.5 prem
" +49° 3125 7.3 "
+48° 2918 6.8 "
+48° 2942 7. Not prem. Vol.
+47 2943 7.6 prem
+47 2948 7.8 "

Plate 692 D.

Dm +47 2870 prem
+49 3125 not prem
+48° 2918 prem
+48° 2942 not prem
+47° 2943 prem
+47 2948 prem.

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June 30, 1890

DM +48° 2942? 4924

Plate 1261 taken June 2nd 1890

b	Dm +48°	2941	7.3	
	" "	2942	8.4	9.6
	" "	2943	6.3	
a		a	8.0	9.2
d		d	8.6	9.4
e		e	8.9	10.1

Plate 1330 taken June 25 1890

b	Dm +48°	2941	7.2	
	" "	2942	9.1	10.3
	" "	2943	6.4	
a		a	7.6	8.8
d		d	8.4	9.6
e		e	8.7	9.9

Plate 1340 taken June 26 1890.

b	Dm +48°	2941	6.6	
	" "	2942	9.0	10.6
a	" "	2943	5.8	
c	——	c	7.1	8.7
d	——	d	7.8	9.4
e	——	e	8.3	9.9

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July 8th 1890 (G.C. 4083)

Observations of variable stars in 5 M Librae.

B Plate 2451 taken March 7, 1888.

a ☆	6.0	9 8.7	var. preceding cluster
b	8.5	1 7.2	var. following cluster
1	6.0	9 8.7	
2	7.3	1 0.0	Dm +2° 2942 9.5
3	8.7	1 1.4	
	22.0		
	7.3		
	3 2.7		

For comparison stars see X 1482.

B Plate 2643 taken May 21 1888.

a	9.4	1 0.6
b	9.8	1 7.0
1	7.5	9 8.7
2	8.9	1 0.1
3	10.0	1 1.2
	26.4	
	8.8	
	2 1.2	

B Plate 2644 taken May 21, 1888

a	8.8	1 0.2
b	9.3	1 0.7
1	7.5	9 8.7
2	8.5	10 8.9
3	9.7	1 1.1
	25.7	
	8.6	
	2 1.4	

B Plate 2680 taken June 5, 1888.

a	8.0	10 8.7
b	7.6	9 8.3
1	7.2	9 8.9
2	8.4	10.1
3	9.4	1 1.1
	25.0	8.3

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July 8, 1890.

Observations of Variable Stars in 5 M Librae (Continued.

Plate 2725.

Useless.

Series B Plate 2759 taken July 16, 1888

a	7.5	9.9
b	8.8	11.2
1	7.6	10.0
2	8.4	10.8
3	9.8	12.2

25 8

8.6

2.4

Series I Plate 932 taken April 1, 1890

a	8.4	10.6
b	8.6	10.8
1	7.7	9.9
2	8.8	11.0
3	10.0	12.2

26 5

8.8

2.2

Series I Plate 934 taken April 1, 1890.

a	8.4	10.6
b	8.7	10.9
1	7.8	10.0
2	8.7	10.9
3	10.0	12.2

26 5

8.8

2.2

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1890phae.proj..802F

July 8, 1890.

Observations of Variable stars in 5 M Libræ (Continued).

Series X Plate 1482 taken May 25, 1889

a	6.5	10.0
b	7.8	10.3
1	6.3	9.8
2	7.5	11.0
3	8.8	12.3
	22 6	
	7.5	
	3.5	

Series X. Plate 1486. taken May 27, 1889

a	7.3	10.6
b	8.3	11.6
1	6.6	9.9
2	7.7	11.0
3	8.8	12.1
	23 1	
	7.7	
	3.3	

Series X. Plate 1530 taken June 1, 1889

a	7.4	10.7
b	7.8	11.1
1	6.6	9.9
2	7.5	10.8
3	9.0	12.3
	23 1	
	7.7	
	3.3	

Series X. Plate 1553 taken June 4, 1889

a	8.3	10.7
b	7.7	10.1
1	7.5	9.9
2	8.4	10.8
3	10.0	12.4
	25 9	8.6 12.4

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July 8 1890

Observations of Variable stars in 5 Minibrae Continent

Plate 1586 June 7, 1889.

a	8.0	11.1
b	7.4	10.5
1	6.7	9.8
2	7.8	10.9
3	9.2	12.3

237
7.9
3.1

Series X Plate 1690 taken June 20, 1889.

a	7.3	10.6
b	7.6	10.9
1	6.5	9.8
2	7.6	10.9
3	9.0	12.3

231
7.7
3.3

Series X. Plate 1728 June 24, 1889.

a	7.0	10.3
b	7.7	11.0
1	6.5	9.8
2	7.5	10.8
3	9.2	12.2

232
7.7
3.3

Series X. Plate 1749 June 27, 1889.

a	7.4	10.7
b	7.6	10.9
1	6.4	9.7
2	7.5	10.8
3	9.3	12.6

7.7 3.3

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July 14, 1890

Series X Plate 1941. Taken.

a	6.2	10.0
b	7.1	10.9
i	6.2	10.0
2	7.0	10.8
3	8.5	12.3
	21.7	
	7.2	
	3.8	

I Series Plate 1409. July 8, 1890.

a	8.0	9.7
b	7.9	9.6
1	8.0	9.7
2	9.1	10.8
3	10.2	11.9
	27.3	
	9.3	
	1.7	

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July 29, 1890.

Measurements of new Variable in Scorpius.
For comparison stars see Plate B 4068. No 1. is the brighter of two stars

Plate B 3529 taken

Images near edge of plate very poor.

a	~~6.8~~ 7.2	10.5
1	8.0	11.3
2	7.4	10.7
3	8.3	11.6
4	6.0	9.3
5	8.8	12.1
	38 5	
	7.7	
	3.3	

Plate B 3530 taken

a	7.4	10.9
1	8.0	11.5
2	6.7	10.2
3	8.2	11.7
4	6.0	9.5
5	8.5	12.0
	37 4	
	7.5	
	3.5	

Plate B 3625 taken.

a	7.0	~~11.8~~ 11.4
1	7.6	~~11.9~~ 12.0
2	5.0	~~9.3~~ 9.4
3	7.8	~~11.3~~ 12.2
4	4.3	~~8.1~~ 8.7
5	8.1	~~11.4~~ 12.5
	52 8	
	6.86	
	4.84	

Images near edge of plate very poor. Plate 4 compared with Scale

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July 29, 1890.

Measurements of New Variable in Scorpius

Plate B 3637 taken Spectrum N.S.

Plate 3804 taken

a	8.4	11.6
1	8.2	11.4
2	7.5	10.7
3	8.3	11.5
4	6.6	9.8
V	8.4	11.6

390
7.8
3.2

adopted April 23, 1903

Plate B 4068 taken (1900).

var.	a	8.2	~~13.0~~ 12.9	x 0.55	y 5.50		h. 16 48.4 - 44 57		
g = c =	1	6.9	11.6	0.75	4.80		16 48.3 - 44 57	c	
d = b =	2	5.6	10.3	3.00	4.85	22835	16 47.7 - 44 55 9	b	
h = d =	3	7.1	11.8	3.20	3.75		16 47.6 - 44 52	d	
b = a =	4	4.8	9.5	2.30	3.20	22838	16 47.9 - 44 50 8.2	a	
k = e =	V	7.3	12.0	2.60	6.80		16 47.8 - 45 1	e	

317
63
4.7

(spectrum) Plate B 4945

a 8.2 Hydrogen lines γ, h bright. h = 0.5 G.
None of the comparison stars appear on this plate

New sequence selected April 23, 1903. W.P.F. (B 13529)

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Red ink figures entered by M.C.S. Nov. 4, 1895

Sept. 11. 1890

Measurements of New Variable star in Sagittarius for position

B 3579 (1875 Positions)

	x	y	x²+y²	y×3							
7 Agc. 27709	-9.25	+11.40	2.89525	34.20	20 7 36 -39 52 42 7.6	52	29	34	9.5	18	98
6 Agc. 278	(4.65 / ~~5.05~~	+9.90)	1.89365	29.70	20 8 39 -39 47 17 8.6	47	1.9	30	10.5	17	
comp. 7 = d Agc. 27749	-4.25	+1.80	1.33025	5.40	20 8 51 -39 28 55 8.8	23	1.3	5	10.1	14	
5 Agc. 303	-2.05	+10.20	.64165	30.60	20 9 27 -39 47 44 9.4	47	.6	31	10.0	16	
var.	-2.05	+4.15	.64165	12.45	20 9.4		.6	12	(10.0 / 9.7)	(17)	
comp. 4 = d	-1.90	+4.05	.59470	12.15	20 9.5		.6	12	(9.9)	(17)	
Comp. 3 = c	-0.35	+2.45	.10955	7.35			0.1	7	(9.9)	(17)	
comp. 1 = a Agc. 27778	+0.05	+0.95	.01565	2.85	20 9 57 -39 30 13 10.0	20	0.0	3	~~10.6~~ 10.0	17	
									10.2	17	

	1875	1875	
var. 2	20ʰ 9.4	-39° 29′	20ʰ 11.1 -39° 25′ (1900)
4	9.5	29	Star 6 runs 5 h in decl. A recent revision of x gave 4.65, if so return reads 5.05 instead of 6.05, R.A. of comb. becomes 20ʰ 9ᵐ 25ˢ.8. Star 6 has been rejected.
3	9.9	24	

November 4, 1895 Mean Dec. = -39° 37′ 58″.2 = Lg. 0.11343 / 1.07700 / 1.19043

Diff. x	-7.20	~~-2.60~~ -2.65	-2.20	Infinity	+2.10	Diff. y	7.25	5.75	-2.35	6.05	-3.20
Log. " "	0.85733	0.60206	0.34242	0.00000	0.32222	x79	1297.75	1029.25	420.65	1082.95	572.80
	1.19043	1.19043	1.19043	1.19043	1.19043		21 37.75	17 9.25	7 0.65	18 2.95	9 32.80
	2.04776	~~1.79249~~ 1.80318	1.53285	~~1.19043~~ 0.06900	1.51265						
No. of Log.	111.6	~~62.01~~ 63.54	34.11	~~15.50~~ 8.00	32.56						
	1ʰ 51.6	~~+ 2.01~~ 40.31									

20ʰ 7ᵐ 35.5 -39° 51′ 42.2″	20ʰ 8ᵐ 39.3 -39° 47′ 17.2″	20ʰ 8ᵐ 50.8 -39° 22′ 55.1″	20ʰ 9ᵐ 26.7 -39° 47′ 44.1″	20ʰ 9ᵐ 56.8 -39° 20′ 12.6″
1 51.6 21 37.8	~~x~~ 41.4 / 40.3 17 9.2	34.1 7 0.6	~~+5.5~~ 18 3.0	32.6 9 32.8
20ʰ 9ᵐ 27.1 -39° 30′ 4.4	20ʰ 9ᵐ ~~41.3~~ 39.4 -39° 30′ 8.0	20ʰ 9ᵐ 24.9 -39° 29′ 55.7	20ʰ 9ᵐ ~~42.2~~ 26.7 -39° 29′ 41.1	20ʰ 9ᵐ 24.2 -39° 29′ 45.4

Mean Position of R.T Sagittarii. 20ʰ 9ᵐ ~~31.9~~ 24.5 -39° 29′ ~~11.~~ 7 (1875)

20ʰ 9ᵐ 25.3 -39° 29′ 44″ (1875) adopted from chart

Position identical with C.P.M. -39° 13822 9.7

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2	27749	20	8	51	-39	23	7¾
2	~~2777~~						Var.
1	27778	20	9	57	-39	20	8
4	27709	20	7	36	-39	52	8

								7.c. 224 20 7 36 -39 52 8½
1	27709	20	7	36	-39	52	8 =	7.c. 278 20 8 39 -39 47 9
2	27749	20	8	51	-39	23	7¾	
3							Var.	
								303 20 9 27 -39 47 9½
4	27778	20	9	57	-39	~~20~~	8 =	317 20 9 57 -39 20 8

	1	2	3	4	a		
3579	8.8	9.2	10.4	11.3	9.6	8.8	18.0
3614	~~9.3~~ 8.3	~~10.8~~ 9.8	7	7	~~10.9~~ 9.9	8.9	20.1
3629	8.3	9.4	10.2	11.8	9.5	8.5	17.7
3844	7.9	9.2	10.9	12.1	8.7	7.7	18.1
4357	[7.3]	9.6	11.1	11.9	11.7	10.1	16.9

8 7¾

	27.1	30′ 4″.4
	24.9	29 55.7
	26.7	29 41.1
	24.2	29 45.4
Mean Position adopted from	25.7	29′ 51″.6
4 stars — 20h 9m 25.7s	-39°	29′ 51″.6

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1890phae.proj..802F

November 6, 1895

14b)

Plate B 3579.

Computation to determine position of companion A

Mean Dec. = $-39° 37' 58''.2$ = Log. 0.11343 + 1.07706 = 1.19043

Diff. X	-7.35	+2.75	-2.35	-0.15	+1.95
Log. Diff. X	0.86629	0.43933	0.37107	9.17609	0.29003
	1.19043	1.19043	1.19043	1.19043	1.19043
	2.05672	1.62976	1.56150	10.36652	1.48046
	s.	s.	s.	s.	s.
No. of Log.	114.0	42.63	36.43	2.33	30.23
	1' 54.0				

Diff y.	7.35	5.85	-2.25	6.15	-3.10
			402.75	1100.85	554.90
			6' 42.75	18' 20.85	9' 14.90
× 179	1315.65				
	21' 55.65				

(7) $20^h\ 7^m\ 35^s.5$ $-39°\ 51'\ 42''.2$
$1\ 54.0$ $21\ 55.6$
$20^h\ 9^m\ 29^s.5$ $-39°\ 29'\ 46''.6$

~~(4) $20^h\ 8^m\ 39.3$ $-39°\ 47'\ 17''.2$~~

(6) $20^h\ 8^m\ 50^s.8$ $-39°\ 22'\ 55''.1$
36.4 $6'\ 42.8$
$20^h\ 9^m\ 27^s.2$ $-39°\ 29'\ 47''.9$

(5) $20^h\ 9^m\ 26^s.7$ $-39°\ 47'\ 14''.1$
2.3 $18'\ 20.8$
$20^h\ 9^m\ 29^s.0$ $-39°\ 29'\ 23''.3$

(a) $20^h\ 9^m\ 56^s.8$ $-39°\ 20'\ 12''.6$
30.2 $9'\ 14.9$
$20^h\ 9^m\ 26^s.6$ $-39°\ 29'\ 27''.5$

	h	m	s	°	'	"	
	20	9	29.5	-39	29	46.6	
	20	9	27.2	-39	29	47.9	
	20	9	29.0	-39	29	23.3	
	20	9	26.6	-39	29	27.5	
Mean	20	9	28.1	-39	29	36.3	(1875.0)
	20	9	27.7	-39	29	28	(1875 adopted)

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1890phae.proj..802F

September 11, 1890.

Measurements of new variable star in ~~Aquila~~ Sagittarius

Plate $\overset{B}{\wedge}$ 3579 (4). taken

6 mid	a	6.0	8.8
6	b	6.7	9.2
1	c	7.6	10.4
m	d	8.5	11.3
o	var.	6.8	9.6
		28.8	
		7.2	
		3.8	

Plate $\overset{B}{\wedge}$ 3614 (4). taken

1	a	5.3	9.3
d	b	6.8	10.8
m	c	7	
o	d	7	
	var.	6.4	
		121	
		60	
		4.0	

Plate $\overset{B}{\wedge}$ 3629 (4). Taken.

5	1	a	3.6 = 3.9	8.3
4	d	b	4.7 = 5.0	9.4
	m	c	6.2	10.2
	o	d	7.4	11.8
		var.	4.8 = 5.1	9.5
			26.5	
			5.6	
			4.4	

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Sept. 11, 1890

Measurements of New Variable in Sagittarius

Plate B 3844 (H) Taken

		b	a	
t	x	3.4	= 3.7	7.9
d	x	4.7	= 5.0	9.2
m	x		6.7	10.9
o	x		7.9	12.1
var.	x	4.2	= 4.5	8.7

23 3
5.8
42

Plate B 4354 (I) Taken
2d reading.

t	x	5.5	7.3	5.6
d	x	7.8	9.6	7.4
m	x	9.3	11.1	
o	x	10.1	11.9	
var	x	9.9	11.7	

32.7
82
1.8

An examination of Plate B4354 on November 25, 1896, confirms the magnitude of R T Sagittarii as derived on Sept. 11, 1890.

Plate B4354

c 5 v
v 1 d

H M Paul in the Astronomical Journal 16 p 84 says that the close companion must have been observed on the H.C.O. plate of Oct. 14, 1896. This photograph shows the variable and also the companion which is North & following. The variable is slightly brighter than the companion which is the comparison star "d". The date of Plate B4354 is in error. It should be October 7, 1889.

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Sept. 20, 1890.

W Hydrae (Sawyer 1888).

Measurements of New Variable in Hydra A.G.C.

Focus very poor. Plate B 5308 4 taken

var.	~~5.7~~ 7.0	9.1
a	V.V	8.9
b	6.0	9.4
c	6.4	9.8
d	8.6	12.0
	26.5	
	6.6	
	3.4	

Images near edge of Plate. Plate B 3791 I taken

var.	8.5	11.4
a	6.0	8.9
b	6.5	9.4
c	7.0	9.9
d	8.7	11.6
	28.5	
	7.1	
	2.9	

Near edge of plate. Plate B 3725 H Taken.

var.	7.2	10.5
a	6.0	9.3
b	6.2	9.5
c	6.8	10.1
d	7.8	11.1
	26.8	
	6.7	
	3.3	

Plate 3402 taken. On this plate the images are badly elongated and cannot be compared with the scale. The variable star is about 1 magnitude fainter than comparison star "c"

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1890phae.proj..802F

September 20, 1890

Measurements of New Variable Star in Hydra

Plate B 3545 Taken

var.	7.5	10.7
a	8.9	9.1
b	6.3	9.5
c	6.8	10.0
d	8.3	11.5

27 3
6.8
3.2

(Spectrum Plate B 5201 ~~Flat~~ I taken May 6, 1890

var.	7.5	9.4
a	8.0	9.9
b	8.2	10.1
c	n.s.	
d	n.s.	

16.2
8.1
1.9

Measurements for position of Companion star for A.G.C. 18770

A.G.C. 18770. 13 41 58.8 - 27 44 31.2

	x	y											
var	+0.65	+7.55	.146	22.65	A.G.C. 18770	13 41 58.79	-27 44 31.2	m 0.1	23'	41.9	67		
c	+1.10	+7.40	.249	22.20		42.2 ~~41.8~~	27 44 ~~22~~	0.2	22				
a	+4.00	+2.00	.898 .906	6.00		42.9 ~~41.1~~	27 44 25	0.9	6				
d	+4.30	+7.60	.966 .972	22.80		43.0 ~~41.0~~	27 44 7	1.0	23				
b	+8.30	+8.60	1.865 1.855	25.80	Z.C. 2662	13 43 41.61	-27 41 11.3	1.9	26	41.3	67		
—	+4.50	+10.20	1.017 1.015	30.60	Z.C. 2614	13 42 56.82	-27 33 39.9	1.0	31	41.9	65	41.7	66

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New Variable Star in Hydra. A.G.C. 18770 magn 7.0

		a	b	c	d	var	R.
Plate 3402 (L).	June 4 1889.						
3525 (L)	" 14 "	9.1	9.5	10.0	11.5	10.7	
3725 (H)	July 5 "	9.3	9.5	10.1	11.1	10.5	
3791 (L)	" 12 "	8.9	9.4	9.9	11.6	11.4	
5102	May 6 1890	9.9	10.1				9.4 (Spectrum)
5308	" 28 1890	8.9	9.4	9.8	12.0	9.1	

	Approx magn.	
8.1, 8.5, 9.0, 10.5 =	9.7	7
8.2 = 8.5, 9.1, 10.1 =	9.5	5
7.9 = 8.4, 8.9 = 10.6, 10.4		14
7.9 = 8.1 3 . . .	7.4	16
7.9 = 8.4, 8.8 = 11.0 5	8.1	9
8.05 $\frac{6}{5}=.12$	8.38 $\frac{5}{5}=10$	8.95 $\frac{4}{4}=10$ 10.55 $\frac{11}{4}=.28$ 9.02	$\frac{51}{5}=1.02$

12) 5344 (4453
48
54
48
64
60
40

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A.G.C. 22855

The star H.C. Hydra 358 magn. 7.0 equals A.G.C. 18770 proves to be variable. Can you give me the dates on which they were observed and the corresponding magnitudes also any observations later than those in the A.G.C. in printing the N.A.

later 8 7

A.G.C. 18770. June 25, 1875. 7
" 26. "
" 28 " 6¾
" 29 " 7
June 6¾ May 24 " 7

Lc. 5686 Magn 7 = April 13, 1852 (Resp. 297)
St. 7561 Magn 6 3 obs at 1878.36
Taylor 6413
Brisbane 4651 Magn 6.7 10 obs.
Yarnall 5786 Magn. 7.7 1862.4 2 obs.
O.A. 13157 Magn. 8 June 383,54 May 20, 1851 magn. 8

7.8 87
7 86
8 87

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1890phae.proj..802F

10

29
7.3

35 16
108 480

1h 40s +8'

6.4

28.3
1.7
266

b.	Dr +33° 458	7.5	I.	~~[illegible]~~ = var. on Pl 1841 [illegible] 1981
				faint.
				brighter
a	+33° 454	6.4	II.	~~[illegible]~~ than var. Pl. I 1981
				brighter than var.
c	+34° 472	9.0		Near a Pleiti 2192 ~~[illegible]~~
d	+33° 468	9.2	A?	= var. " "

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1890phae.proj..802F

13	42.0	41.9	−27°	45′	23′	68′			
	42.3		−27		22		−27°	45′	
	42.9				6		−28°	1′	
	43.0				23		−27	45	
	43.7	41.8	−27	41	26′	67′			
	42.9	41.9	−27	34	31′	65′			
		41.9				67′			

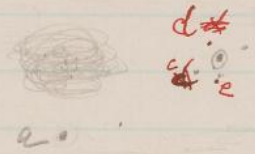
13	42.0		
13	42.1	−27°	44′
13	42.8	−28	1
13	42.9	−27	45
	43.8		
	42.9		

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1890phae.proj..802F

September 26, 1890.

Examination of Plates for Mr. D. Packers new Variable in the Andromedal Nebulae



Over.

Plate B 100 taken.

Much fainter than a and b the three stars c, d, and e were selected for comparison.

d 6 v	8.4	8.2		dc	ce
c 4 v	8.0	8.2		2	10
v 6 e	8.0	8.0		2	11
	8.1	8.1		3	3
				2	8

Plate I 90 Nov. 6, 1889

d 4 v	8.2	8.0
c 2 v	7.8	8.0
v 9 e	7.9	7.9
	8.0	8.0

Plate I 287 Dec. 11, 1889.

d 3 v	8.1	7.9
Image defective C o v ?	7.6	7.8
	8.3	8.3
	8.0	8.0
v 3 e		

Image defective. Always near edge of plate and very poor.

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1890phae.proj..802F

September 26, 1890

Androm. Continued.

Plate X 2148.

a	6.7	9.5	2.8	Pl 188	8.1	11.0	Nov. 3, 1885.
b	6.0	9.0	3.0	I 90	8.0	10.9	Nov. 6, 1889.
d	c 7.6			I 287	8.0	10.9	Dec. 11, 1889.
c	d 7.8			X 2148	8.2	11.1	Aug. 21, 1889.
	e 8.6			I 1910	8.1	11.0	Sept. 30, 1890
	var 8.2			I 1912	8.2	11.1	" " 1890

a = Dm. +40° 144 9.5 magn.
b = Dm. +40 154 9.0 magn.

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1890phae.proj..802F

October 3, 1890.

Mr. Packer's new variable in Andromeda (Continued)

Plate I 1910 taken Sept. 30, 1890.

var.	9.5	~~9.8~~	10.1	8.1		8.1
d	8.9	~~9.7~~	9.5	7.5	7.6	+1
c	9.4	~~9.7~~	10.0	8.0	7.8	-2
e	9.8	~~10.1~~	10.4	8.4	8.6	+2
	28.1					0
	~~9.7~~					
	~~0.8~~					

Plate I 1912 taken Sept. 30, 1890.

var	9.2	10.2			8.2
d	8.6	9.6	7.6	2.0	
c	9.0	10.0	7.8	2.2	
e	9.4	10.4	8.6	1.8	
	27.0			2.0	
	9.0				
	1.0				

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1890phae.proj..802F

October 3, 1890.

Measurement of lines in η Bootis D.C. 6602.
to find limit of spectrum.

ζ	60.00
H	69.10
K	69.65
M	72.80
	73.00
	73.25
	73.55
	74.75
	74.95
	75.80

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1890phae.proj..802F

October 10, 1890.

Measurement of hydrogen lines in β Orionis to determine wavelengths of ultra-violet lines.

Line	Means		Freqs	√.9 (λ−90)÷.6	
			λ	A	A+2
h	85.20				
H	91.30	1.65	397.0	.22	9.2
α	95.70	5.75	388.9	.95	398.4
β	98.80	8.80	383.6	1.47	8.3
γ	101.05	1.10	379.8	1.84	8.2
δ	102.80	2.70	377.1	2.13	8.4
ε	104.05	4.10	375.0	2.34	8.4
ζ	105.10	5.15	373.4	2.52	8.6
η	105.90	5.9	372.2	2.65	8.7
θ	106.55	6.55	371.2	2.76	8.8
ι	107.15	7.1	370.3..4	2.86	89
κ	107.00	7.5	369.6..8	2.93	89
λ	108.00	7.9	369.0..1	3.00	9.0
μ	108.30		368.5	3.05	9.0
ν	108.55		368.2	3.09	9.1
ο	108.90		367.7	3.15	9.2
π	109.10		367.4	3.18	9.2
ρ	109.30		367.0	3.22	9.2
	109.90		366.1	3.32	93

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1890phae.proj..802F

Oct 10, 1890.

Meas. of β & Orionis (Continued)

Line	Meas	Focus 5,3	
7	60°0		
g	75.20		
h	85.20	85.20	+20 ~~+0~~
H	91.25	91.30	(+ 5)
a	95.35	95.70	+ 15
β	98.60	98.80	+ 20
γ	101.05	101.05	+ 15
δ	102.50	102.80	+ 30
ε	103.90	104.05	+ 15
ζ	104.95	105.10	+ 15
η	105.70	105.90	+ 20
θ	106.35	106.55	+ 20
ι	106.90	107.15	+ 25
χ	107.30	107.60	+ 30
λ	107.70	108.00	+ 30
μ			
ν			225 / 12 = .212

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1890phae.proj..802F

October 10, 1890.

Measurement of Suspected variables.

DM + 48° 2942 7.1 See also page 6 for this star on plates 1261, 1330 & 1340.
" + 49° 2999 7.5
" + 51° 2734 7.3

Plate 983

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1890phae.proj..802F

Oct. 11, 1890.

Plate C 111 √ x Orionis

For additional lines not measured, and shown in Fig. 3 of frontispiece of D.C.

7	10.00	486.1		Adj.
1	32.70		465.8	~~466.~~ 465
2	44.35		456.0	~~456.~~ 455
3	66.25		~~448.1~~ 439.2	432.
9	73.20	434.1		
4	105.10		414.2	414.
h	112.70	410.2		
√	130.60		400.4	400.
H	138.55	397.0		
α	146.30	388.9		
	54.85		448.1	
			402.1	
	127.35		~~400.4~~	

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1890phae.proj..802F

October 13/14, 1890.

Measures of Suspected variables in Lyrae

$18^h\,57^m.1 + 28°\,44'$ DM+28° 3151 9.1 K = Weisse 1714, J 433, Aug. 18, 1828 magn. 9.

$18\,57.1 + 29\,37$ DM +29 3432 89

Plate 1566 taken

v_1	9.3	9.6
v_2	9.3	9.6
a	7.9	8.2
b	8.6	8.9
c	8.7	9.0
d	9.5	9.8
	347	
	8.7	
	0.3	

Plate 1737 taken

v_1	7.7	9.1
v_2	7.5	8.9
a	6.6	8.0
b	7.1	8.5
c	7.5	8.9
d	8.0	9.4
	292	
	7.6	
	1.4	

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1890phae.proj..802F

October 16, 1890.

Measures of Suspected Var. M.P. 4481. which equals Dunner II No 7.

S. var. DM +62° 596 magn. 6.6.

Comp. Star a = DM + 62° 602 " 9.5 — For comp. stars see Plate 432.

" " b = DM + 62° 589 " 9.5 For Chart see p 72.

" " c = faint star with preceding. not in DM.

Plate I 432 taken Jan 3, 1890

Images near edge of plate.

S. var.	9.4	~~10.4~~	9.4	~~10.9~~	11.0
a	8.8	~~9.8~~	8.8	~~10.3~~	10.4
b	9.0	~~10.0~~		~~10.5~~	10.6
10.99 c	9.3	~~10.3~~		~~10.8~~	10.9

~~27.1~~

9.0 8.9

1.85

Plate I 661 taken Feb. 13, 1890.

S. var.	8.8	~~10.9~~	11.1
a	8.2	10.3	10.5
b	8.3	10.4	10.6
10.99 c	8.7	~~10.8~~	11.0

~~25.2~~

~~8.4~~ 8.2

~~2.1~~ 2.3

Plate I 909 taken April 1, 1890

s. var	8.8	~~11.0~~	11.1
a	8.1	~~10.3~~	10.4
b	8.2	~~10.4~~	10.5
10.99 c	8.7	10.9	11.0

25.0

~~8.3~~ 8.2

~~2.2~~ 2.3

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1890phae.proj..802F

October 16 1890.

Meas. of M.P. 448 (continued).

Plate I 951 Taken April 5, 1890

S. var	8.8		10.9
a	8.3		10.4
b	8.4		10.5
11 10.5 09 c	8.6		10.7
	253		
	84	8.4	
	2.1	2.1	

Plate I 989 taken April 11, 1890.

S. var	9.0	~~11.0~~	11.1
a	8.4	~~10.4~~	10.5
b	8.4	~~10.4~~	10.5
10.99 c	8.9	~~10.9~~	11.0
	257		
10.5	~~8.5~~	8.4	
	~~2.0~~	2.1	

Plate I 1023 taken April 16, 1890.

S var	8.8	~~11.0~~	11.1
a	8.2	~~10.4~~	10.5
b	8.2	~~10.4~~	10.5
11.09 c	8.6	~~10.6~~	10.9
	250		
	~~8.3~~	8.2	
	~~2.2~~	2.3	

Plate I 1120 taken May 2, 1890

Useless. completely fogged.

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1890phae.proj..802F

October 16, 1890.

Meas. of M.P. 44d Combined.

	a	b	c	p.var.
Plate 432 taken	9.3	9.5	9.8	9.9
" 661 "	9.3	9.4	9.8	9.9
" 909 "	9.3	9.4	9.9	11.0
" 951 "	9.4	9.5	9.7	9.9
" 989 "	9.4	9.4	9.9	11.0
" 1023 "	9.4	9.4	9.8	11.0
" 2003 "				

See p. 93.

9.5 a 9.5 b c var 3.6 Corr mgn

Plate I432	taken	Jan. 3, 1890	10.3 a	10.5 b	10.8 c	10.9 var.	7.3
" 661	"	Feb. 13, 1890	10.3	10.4	10.8	10.9	7.3
" 909	"	April 1, 1890	10.3	10.4	10.8	11.0 10.9	7.4
" 951	"	April 5, 1890	10.4	10.5	10.7	10.9	7.3
" 989	"	April 11, 1890	10.4	10.4	10.9	11.0	7.4
" 1023	"	April 16, 1890	10.4	10.4	10.8	11.0	7.4
" 2003	"	Oct. 15, 1890	10.3	10.4	10.8	11.2 var.	<8
" 2006	"	Oct. 17, 1890	10.3	10.4	10.7	11.5	7.9
				10.4			
" 2295	"	Nov. 19, 1890	10.3	10.4	10.9	12.0	8.4
" 2345	"	Nov. 25, 1890	10.2	10.4	11.1	11.9	8.3
" 2426	"	Dec. 5, 1890	10.1	10.4	11.0	12.1	8.5
I 2857	"	Jan. 16, 1891	10.1	10.4	11.0	11.4	7.8

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1890phae.proj..802F

October 16, 1890.

Measurements of New Variable in Triangulum (or Perseus).

(B.obs. Jan. 7, 1858. 9.2) DM + 33° 470, mags 9.2 Plate 1981 Spectrum Md. Var.

				Type
Comp. Stars	a	+33° 454	6.4	II
	b	+33 458	7.5	I
	~~e~~	+34 472	9.0	
	f ~~d~~	+~~33~~ 3 468	9.2	
			32.1	
			8.0	

Plate B 1841 taken Nov. 7, 1877.

var = b. ~~7.37~~ 7.50 vars. show bright hydrogen lines.

~~e~~ f = v.r, S

f ~~d~~ = v.r, S.

Plate B 2192 taken Jan. 19, 1888. Unusually good plate.

c brighter than var.

f ~~d~~ = var. 9.12 bright hydrogen lines not seen in variable

~~8.17~~ ~~9.62~~ 9.12

Plate I 1981 taken Oct. 13, 1890

a br. than var.

~~7.37~~ 7.50 b 0.2 fnt. than var ~~7.17~~ 7.30

~~e~~ v.r, S.

f ~~d~~ v.r, S.

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1890phae.proj..802F

October 16, 1890.

Meas of. New Var. in Trian. (continued

Plate I 417 taken Dec. 31, 1889.

var.	5.9	7.6 ~~7.6~~	7.1
a	~~5.1~~ 5.0	7.4	6.9
b	6.0	7.7	7.2
e	7.3	9.0	8.5
f	8.1	9.8	9.3

8.0 ~~9.0~~

~~29.1~~ ~~7.3~~ 6.8 7.1

1.2

7.17 7.09 = 7.13 04 04

~~7.18 7.40 = 7.44 04 04~~

~~7.32 7.27 = 7.30 .02 .03~~

Plate I 1875 taken Sept. 25, 1890.

var.	5.2	7.8	6.8 Near edge of plate; image very poor
a	5.0	7.6	6.6 ~~7.4~~ very much elongated.
b	5.6	8.2	7.2
e	7.0	9.6	8.6
f	8.0	10.6	9.6

8.0

25 6

6.4

1.6 ~~2.6~~

7.17 6.79 = 6.98

~~7.48 7.10 = 7.29 .19 .19~~

~~7.32 6.97 = 7.14 .18 .17~~

			Approx. Magn.
Plate	B 1841	taken Nov. 7, 1887	7.5
"	" 2192	" Jan. 16, 1888	" 9.2
"	" I 417	" Dec. 31, 1889	" 7.1
"	" " 1875	" Sept. 25, 1890	" 6.8
"	" " 1981	" Oct. 13, 1890	" 7.3
"	" " 2000	" Oct. 15, 1890	" 7.2
"	" " 2005	" 17 "	" 7.1

See page 47.

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1890phae.proj..802F

October 17, 1890.

Meas. of M.P. 448. see p. 30.

Plate I 2003 ~~taken~~ Oct. 15, 1890

	var.	N.S.	7	fainter than 10.5	~~+2.3 fainter than 12.0~~ 1.24
a	8.5	~~9.5~~	10	9.3	10.4 ≷ 10.89
b	8.6	~~9.9~~	10	9.4	10.5
c	9.0	~~10.3~~	10	9.8	10.9
d					

10.5

~~8.7~~ 8.6

~~1.3~~

0.8 1.9

Measure of DM +33° 470 (see p. 32).

Plate I 2000.

a brighter than var.

~~1.50~~ ~~1.37~~ b 0.3 fainter than var. ~~1.07~~ 1.20

c ~~visible~~ seen.

d barely visible

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1890phae.proj..802F

October 21, 1890.

Meas. of DM. +33°470 (see p. 32)

Plate I 2005 taken

var	5.6	7.1			
a	5.3	6.8			
b	5.4	6.9	7.70 7.32	7.50 20 20	
c	7.3	8.8			
d	8.1	9.6		7.39 6.99 = 7.19	20 20
	26.1				
	6.5				
	1.5				

~~1.58 7.30 7.44 14 14~~
~~7.57 7.02 7.30 .27 .28~~
~~7.57 6.05 = 6.81 .76 .76~~

7.50 9.00 8.0

Meas of M.P. 441 (see p. 30).

Plate I 2006 taken

var	9.5	~~11.5~~	11.7
a	8.2	~~10.2~~	10.4
b	8.4	~~10.4~~	10.6
c	8.7	~~10.7~~	10.9
	25.3		
	8.5	8.3	
	2.0	2.2	

10.5 ~~11.69 9.52~~

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1890phae.proj.:802F

October 24, 1890.

New Objects of Interest for publication

Plate B 760. ν Ophiuchi H.P. 2758 =
A.G.C. 22280 R.A. (1900) $16^h\ 21.2^m$ − 18° 14′ magn. 4.6
Kr lines in Spectrum including 7 line. seen on
Plate 760 taken June 18, 1890.
Plate 3570 taken June 17, 1889. examined and
bright lines confirmed.
The spectrum of this star was also seen on
plates 796, 1391 and 1480 taken July 10 1886,
May 1, 1887 and 1480 but as these plates had
each
only an exposure of five minutes in this region
the spectrum is quite faint and does not show
the bright lines, although the lines 410 and 434 due
to hydrogen are narrow.

Plate B 5583, π. Cruis IV Type = A.G.C. 30526 1900 $22^h\ 16.6^m$ − 46° 27′ 6.7
taken

Plate 6438, δ Apodis III Type (M.) Spectrum of
(suspected variable. = A.G.C. 19014 (1900) $13^h\ 55.6^m$ − 76° 19′ mag. 5½ 6 6½.
taken

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1890phae.proj..802F

October 25, 1890.

Measurements of DM.-5°4858 $18^h 56.^m7 - 5° 54' 7.0$ in Aquila
= Durch II 39. Announced by Knott as Var. in 1891 "Provisional Catalogue of Var. stars"

Plate I 1341 taken

var.	8.7	9.2	
a	7.5	8.0	= DM-6°5020 18 55.5 -6° 2' 8.2 2. Orion.
b	8.4	8.9	star prec. & south. not in DM.
c	8.6	9.1	= DM-5°4859 18 56.7 -5 57 9.7
8.9 d	9.0	9.5	foll. & north. not in DM.
	33.5		
	8.4		
	+.5		

Plate I 1494 taken

var.	9.3	9.3
a	8.2	8.2
b	8.8	~~8.8~~
c	9.0	9.0
d	9.7	9.7
8.9	35.7	
	8.9	
	0	

Plate I 1659 taken

var.	9.5	9.4
a	8.5	8.4
b	9.1	9.0
c	9.3	9.2
8.9 d	10.0	9.9
	36.9	
	9.0	
	-1	

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1890phae.proj.:802F

October 25, 1890.

Meas. of Dm. -5° 4858. (continued)

Plate I 2044 taken

			x	y	
var.	8.4	8.5	1.35	1.30	Dm-5° 4858 18 56.7 -5 54
a	8.1	8.2	1.30	4.70	Dm-5° 5020 18 55.6 -6 2 8.2
b	8.8	8.9	1.15	2.25	— —
c	9.0	9.1	2.70	2.50	Dm-5° 4859 18 56.7 -5 57 9.7
d	9.4	9.5	0.55	1.10	— —

8.9

35 3

8.8

Weisse 1442
Dm-5 4858
Bonn II 89
Winnecke

				a	b	c	d	var	Gmel. mgn.
				8.2		9.7		7.8 / 7.0 / 7.3	
Plate	1341	taken	June 26, 1890	8.0	8.9	9.1	9.5	9.2	8.9
"	1494	"	July 20, 1890	8.2	8.8	9.0	9.7	9.3	9.0
"	1659	"	Aug. 20, 1890	8.4	9.0	9.2	9.9	9.4	9.1
"	2044	"	Oct. 22, 1890	8.2	8.9	9.1	9.5	8.5	8.2
"	2082	"	Oct. 28, 1890	8.3	8.8	9.1	9.6	8.4	8.1
"	2172	"	Nov. 4, 1890	8.3	8.6	8.9	9.7	8.5	8.2
	2272	"	Nov. 18, 1890	8.3	8.8	9.0	9.6	8.4	8.1
				8.24		9.06			

Does magn. & the corrected d. July 26, 1891.

3797 47 " "

Oct 6, 1893 I 2172 selected for enl. For ident see I. 1341 I 2272

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1890phae.proj..802F

October 28, 1890.

Meas. of New Variable in Perseus. follows DM +56° approx position for 1855. $1^h 52^m.0$ +56° 3' (No. 1).

Plate B 103 taken Nov. 3, 1885. Focus very poor. Hand 6

var.	N.S.		N.S.	
a	3.4	3.7	5.9	7.8
b	3.7	4.0	6.1	8.1
d = c	4.4	(4.7)	6.9	8.8
g d	9.8 = 9.0		11.5	13.4
f e	8.5 = 8.2		10.7	12.6
fe	8.4 = 8.1	8.4	10.6	12.5

fainter than 10.5 = 13.0 ~~13.3~~ compare images with Scale

DM +56° 418 1 54 48.4 +56 23.4 8.7 8.9

+56° 418 1 54 56.6 +56 18.7 8.8 9.0

dist in (DM +56° 403.1 51.26 +56 158.94) corrected for Scale

DM +56° 404 1 51 21.0 +56 4.8 (9.5) 10.5

not used in reduction 8.9 9.0 10.5 9.47

Plate B 1954 Nov. 30, 1887. Images elongated ⊥ near edge

var	57		7.1	
a	4.5	4.8	6.2	8.0
b	4.9	5.2	6.6	8.4
c	6.6		8.3	9.8
g d	9.8 = 9.5		11.2	13.0
f e	9.0 = 8.7		10.4	12.2
fe	8.8 = 8.5	8.8	10.2	12.0

9.3 9.0 = 9.15 of plate

d = g

e = f

c = 8 var.

1890phae.proj..802F

October 28, 1890.

Meas of New var. in Perseus (Continued).

Plate B 1977 taken 7 Dec. 1, 1887 Near edge of plate

9.7 9.9 = 9.80

var.	6.4		7.7	
a	5.0	5.0	6.1	8.0
b	5.5	5.5	6.6	8.5
c	7.6		8.6	10.6
g d	10.0		11.1	13.0
g e	9.2		10.3	12.2
~~f~~ c	9.0	9.0	10.1	12.0

9.5 6.0/3.0 ~~8.8~~

463 3|195 6.50

7.7

1.1

Plate B 1953 taken On edge of plate.

Images very much ~~badly~~ elongated. var. about .5 brighter than "c"

Plate I 1901 taken Sept. 29, 1890.

var.	N.S.			faint than 10.5 = 10.0	< 11.4
a	7.0	7.0	8	6.5	8.3
b	7.6	7.6	10	7.1	8.9
c	8.7		3	8.2	10.0
g d	N.S.				
g e	N.S.				
e ~~f~~	10.0	10.0	2	~~9.5~~	11.3

9.5 8.2/1.3 ~~8.8~~

33 3|246 8.2 ~~19~~ ~~48~~

8.3

.5

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1890phae.proj...802F

October 28, 1890. R 1954.

Meas of positions of Comparison stars for new variable in Perseus. (No. 1)

	x	y																	
a	8.45	11.35	.6042	34.05	4.086	2.35	DM +56° 417	1	54	48.4	+56	23.4	5.0	8.4	4.1	25	50.7	58
b	6.90	11.85	.2484	35.55	4.266	20.70	+56° 418	1	54	56.6	+56	18.7	2.5	8.6	4.3	21	50.6	58
c	2.65	3.45	.0954	10.35	1.242	7.95	~	−	1	51.9	+	56 7	1.0	10	1.2	8		
d	1.45	3.10	.522	9.30	1.116	4.35	~	−	1	51.8	+	56 3	0.5	9	1.1	4		
e	1.30	2.75	.568	8.25	.960	3.90	~	−	1	51.7	+	56 3	0.6	8	1.0	4		
f	1.80	1.80	.748	5.40	.648	5.40	+56° 404	1	51	21.0	+56	4.8	0.7	5	0.6	5	50.8	60
g	5.65	0.95	1.034	2.85	.342	16.96	+56° 403	1	51	2.6	+56	15.8	2.0	3	0.3	17	50.7	59
Ivan	1.00	4.00	.360	12.00	1.440	3.00		1	52.1	+	56	2	0.4	12	1.4	3		
																	50.7	59

Summary.

		a	b	c	d	e	f	var
Plate B 103 Ch. Nov. 3, 1885	Eache Tel.	5.9	6.1	6.9	11.5	10.7	10.6	N.S.
" B 1818 Sp. Nov. 3, 1887	~~Böhm 8in.~~	6.2	6.6	8.3	11.2	10.4	10.2	7.1
" " 1954 Ch. Nov. 30, 1887								
" " 1977 Ch. Dec. 1, 1887.	Draper 8in.	6.1	6.6	8.6	11.1	10.3	10.1	7.7
" I 1901 Ch. Sept. 29, 1890	" "	6.5	7.1	8.2	N.S.	N.S.	9.5	N.S.
Oct. 30. 1893 Eq. with 15 inch Equatorial. est. magn. 13.5								
Plate I 2101 Ch. Oct. 30, 1890	Draper 8in.	6.7	7.2	8.7	10.9	10.1	10.0	(11.3
I 2293 Ch.		7.2	7.6	8.7	10.4	9.4	9.4	N.S.
		6.43	6.87	v.v.v.			11.0	
I 2560 Ch.		7.1	7.5	8.6	10.4	9.8	9.7	11.4
I 2856 Ch.		7.0	7.4	8.7	10.3	9.8	9.7	11.0

Magnn. to be corrected July 16, 1891. By Eye-piece line

Pr. images

Ft. images

I 3186
I 3186.
I 3270
I 3308
I 3401
I 3541

See p 3 2 p 202.

Oct 4 1893 B 1977 Selected in cal. For identn see pl. B 1954

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1890phae.proj..802F

October 30, 1890.

Meas. of Dm. -5° 4858. Disp. var. in Aquila. (Continued from p. 37).

Plate I 2082 taken

var.	8.7	8.4
a	8.6	8.3
b	9.1	8.8
c	9.4	9.1
d	9.9	9.6
8.9	9.2	
	-0.3	

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1890phae.proj...802F

Monday. November 3, 1890

Weather later cold

10 15 Comparing scales of Draper Band and 5° prism, and Draper Hand with 5° prism on plate.

C 3036

f	60.00	.55	60.00
b	60.85		61.75
h	61.20	.35	62.85
H			

Meas. of new Var. in Perseus (cont from p 39.

Plate 4 2101 Taken Oct. 30, 1890

var.	fainter than 10.6		11.3 fainter	<12.1
a	6.0	6.0	6.7	8.2
b	6.5	6.5	7.2	8.7
c	8.0		8.7	10.0
d	10.2		10.9	12.4
e	9.4		10.1	11.6
f	9.3	9.3	10.0	11.5
g	7.4	12.18 7.2	8.1	9.6

9.5 1.3 2.2 8.8

6.6 8 8.1 0.7

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1890phae.proj..802F

Thursday Nov. 6, 1890

12 45 Position of sudden changes in intensity of third type used

F. Obs. P. rec.

F	60.00	5	145	486.1	11
	61.45	3		487.2	19
	(63.80	1)	135	48	
			55	489.1	
	64.40	3	160		13
	66.00	1	110	490.4	7
	67.10	2	140	491.1	9
	68.50	4	220	492.0	14
	70.70	2	40	493.4	4
	71.10	3	230	493.5	20
	73.90	4	—	495.8	
	13.70			9.7	

Plate 1118 D.C 3351.

H	60.00	397.0	
K	61.90	401.0	
~~F~~	64.00	424	
Ist Max.	64.60	432	
	68.20	474	
	68.50	478	
	69.00		
	69.30	495.8	
	69.90	495.8	
J	71.10		

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1890phae.proj...002F

January 7, 1892.

DM +53° 379 R.A. 1 35.9 (1855) Dec. +53 14 9.4 (1855) IV Type.

Obs Plate I 5288

This star has a spectrum which apparently is of the fourth type, although the plate is so faint that it may be of the fifth type, the bright lines showing but very indistinctly. Assuming it to be IV Type, it was suspected of variability as the spectra of IV Type stars of this magnitude are not readily photographed.

Chart-Plates B 1977, I 1901, 2293, 2560, 2855-6, 3186, 3270, 3308, and 4891 were therefore examined but as the star showed no distinct evidence of variation actual measures were not made.

DM +53 379 is IV Type as confirmed from Plate I 5403 Exp. 120m Taken Jan. 16, 1892.

Jan 21, 1892 Another plate I 5413 taken shows no evidence of variability as compared with I 2293.

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1890phae.proj..802F

Monday, Nov. 10, 1890.

11 30. Measures of fourth type stars.

F. Obs. S. rec.

Plate No.	S.	H.	Obs. Br.	No.	R.A.	Dec.	Magn. H.P.	Magn. D.M	Class
2392	18.7	13.5	6.8, 7.1.	D.II 21	7h 3.4m	-11° 46'	(M.P.7.6).		
	22.0	10.4	5.4 (5.6)	H.P.1366	7h 8.8m	-10° 6'	5.9	6.4	A
	11.6	9.4	5.2 (5.3)	H.P.1372	7 10.8	-15 23	5.2	6.0	A
	12.2	22.5	5.4 (5.6)	H.P.1291	6 43.5	-15 1	5.3	5.5	A
1853	15.0	19.5	7.7, 7.7, 7.9 (8.0)	E. 211	6 55.5	-3 6	(E.7.7)		
	19.3	22.8	5.3 (5.6)	H.P.1307	6 48.3	-0 58	5.2	6.4	A
	9.9	8.8	5.8 (6.1)	H.P.1390	7 16.5	-5 45	5.8	5.9	A. K=H
	4.1	8.9	6.0 (6.4)	H.P.1389	7 16.3	-8 45	6.2	6.6	A (near edge of plate)
2581	17.4	15.4	7.0, 7.2	D.II 26	10 38.1	+67 56	(M.P.6.4)		
	12.9	14.8	6.0 (5.8)	H.P. 1890	10 40.8	+65 46	6.3	6.5	A
	17.3	10.8	5.9 (6.1)	H.P. 1936	11 2.0	+67 52	6.0	6.5	A. K=H
	19.5	10.6	6.2 (6.3)	H.P. 1945	11 4.5	+68 54	6.6	6.2	A
2427	23.2	14.5	5.9, 6.8.	D.II 29	12 40.4	+45 59	—		
	14.2	16.9	5.8, (6.2)	H.P. 2149	12 33.0	+41 32	6.1	7.0	A.
	7.6	12.6	5.6. (5.8)	H.P. 2179	12 44.4	+38 11	59	6.0	A
	4.6	16.8	6.1, (6.4)	H.P. 2153	12 32.4	+36 38	6.3	6.0	A (near edge of plate)

* First type stars measured at 432+ and at 486−. The last measure being enclosed in parentheses.

11.50

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1890phae.proj...002F

Saturday Nov. 15, 1890.

Meas. of new var. in Triangulum (see p. 32).
Dm +33° 470.

Plate I 2235 taken

	var	6.3	7.9	
4	a	5.3	6.9	
4	b	5.7	7.5	~~8.00, 8.40 = 8.30 10 10~~
7.50	ex	6.9	8.5	779 809 = 794 15, 15
8.0	~~ex~~	7.6	9.2	~~7.97 8.11 = 8.04 .07 07 7.88~~
		25.5		
		6.4		
		1.6		

Summary.

				a	b	c	d	var
B 1841	Md	Nov. 7, 1887	Backe Ld.					7.5
B 2192	N.S.	Jan 19, 1888	" "					9.2
I 417		Dec. 31, 1889	Draper Em.	6.9	7.2	8.5	9.3	7.1
I 1875		Sept. 25, 1890	"	6.6	7.2	8.6	9.6	6.8
1981		Oct. 13, 1890	"					7.3
2000		Oct. 15, 1890	"					7.2
2005		Oct. 17, 1890	"	6.8	6.9	8.8	9.6	7.1
2235		Nov. 12, 1890	"	6.9	7.3	8.5	9.2	7.9
~~2345~~		~~Nov. 25, 1890~~	.					
2875				6.6	7.4	8.5	9.6	10.9
2931				6.6	7.5	8.4	9.5	10.6
3188				6.2	6.8	9.0	10.2	<11.7

Oct. 4, 1892 I 2005 selected for ent. For identif. see I 417

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1890phae.proj..802F

Monday, Nov. 10, 1890.

11.51 Measures of fourth type stars.

Plate.	S.	H.	Obs. Br.	No.	R.A. 1890 h m	Dec. 1890 ° ′	Magn. H.P.	Magn. 2 m.	
1988	7.2	16.6	7.5, 7.3	D.II 55	23 41.3	+2 56	—		
	19.3	19.9	5.9, (6.3)	H.P. 4179	23 33.7	+9 1	6.2	6.0	A
	21.9	13.7	5.4, (5.8)	H.P. 4218	23 46.5	+10 16	5.3	6.0	A
	14.2	12.4	5.6, (6.0)	H.P. 4227	23 49.0	+6 24	6.1	6.8	A

12.00

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1890phae.proj...002F

November 19, 1890

Meas of DM -5° 4858 New Var in Aquila (continued from p. 37)

Plate II 2172 taken Nov. 4, 1890

var.	8.5	8.5
a	8.3	8.3
b	8.6	8.6
c	8.9	8.9
8.9 d	9.7	9.7
	35.5	
	8.9	

DM + 78° 410. Suspected Var. (Prof. A. Searle).

Plate I 481 taken Jan. 13, 1890.

var			
a	v 4 a	DM + 78° 420	9.0
b	b 1.4 v	DM + 78° 421	7.3

Plate I 745 taken March 3, 1890

var	
a	v v a
b	a 1.3 v

Plate I 1102 taken April 29, 1890.

var	
a	v 4 a
b	a 1.6 v

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1890phae.proj..802F

Nov. 19, 1890

DM +72° 43. Suspected var.? (O. C. Wendell).

Plate I 426 taken Jan 3, 1890

var.

a r 5 a a = star immediately preceding and south of var.

b b V var. DM +72° 422 mag. 8.4

Plate 2098 Spect. taken

var

a n.s.

b b 3 var.

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1000phase.proj — 8025

November 21, 1889.

New Variable in Perseus (No. 2). DM +54° 431 1h 50.0m +54° 7' 9.0

Plate B 1073 taken Nov. 3, 1885 Images very poor.

var.	7.4	9.4					
a	5.0	7.0	DM. +53° 440	1 53.8	+53 60	7.9	7.9
b	5.6 ?	7.6	+54° 439	1 52.5	+54 2	9.1	9.5 / 8.7
c	7.5	9.5					
d	8.0	10.0	11.10	9.52	= 10.32	.78	.78
	26.1		10.1	9.52	9.76		
	6.5						
	2.0						

Plate B 1974 taken Nov. 30, 1887

var	8.7	10.2					
a	5.3	6.7					
b	6.0	7.4					
c	8.3	9.7					
d	8.7	10.1	10.02	9.92	= 9.97	.05	.05
	28.3						
	7.1						
	1.4						

Plate B 1977 taken Dec. 1, 1887

var	8.6	9.8					
a	5.4	6.6					
b	6.3	7.4					
c	8.6	9.8					
d	8.9	10.1	11.60	9.62	9.62 = 10.28	1.32	.66 .66
	29.2						
	7.3						
	1.2						

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1890phae.proj..802F

November 21, 1890.

Meas of New var in Perseus (No. 2) (Continued).

Plate I 1901 taken Sept. 29, 1890.

var	7.5	7.9					
a	6.6	7.0					
b	7.5	7.9					
c	8.9	9.3					
8.5 d	9.5	9.9	9.38	9.30	8.22 = 8.97	.41	.33 .75
	32.5						
	8.1						
	.4						

Plate I 2101 taken Oct. 30, 1890.

var	7.2	7.8					
a	6.4	7.0					
b	7.4	8.0					
c	8.7	9.3					
8.5 d	9.0	9.6	9.28	9.10	= 9.19	.09	.09
	31.5						
	7.9						
	.6						

Plate I 2291 (Sp) taken Nov. 19, 1890

var	6.3	8.2					
a	5.7	7.6					
b	6.6	8.5					
c	7.3	9.2					
8.5 d	7.7	9.6	9.08	9.00	= 9.04	.04	.04
	27.3						
	6.6						
	1.9						

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1890phae.proj..802F

November 21, 1890.

New Var. in Perseus (No. 2) Continued

Plate I 2293 taken Nov. 19, 1890.

var	7.0	7.8			
a	6.4	7.2			
b	7.3	8.1			
c	8.4	9.2			
85 d	8.6	9.4	9.08	9.00 = 9.04	.04 .04
	30.7				
	7.7				
	.8				

Summary.

Magnis 6 da erected July 19, 1891.

			a	b	c	d	var.	Corrected Magnis
			7.9	9.1			1.2	
Chart	Plate B 104	taken Nov. 3, 1888	7.2	7.6	9.5	10.0	9.4	10.6
"	B 1954	Nov. 30, 1887	6.7	7.4	9.7	10.1	10.2	11.4
"	B 1977	Dec. 1, 1887	6.6	7.4	9.8	10.1	9.8	11.0
"	I 1901	Sept. 29, 1890	7.0	7.9	9.3	9.9	7.9	9.1
"	I 2101	Oct. 30, 1890	7.0	8.0	9.3	9.6	7.8	9.0
Spectrum	I 2291	Nov. 19, 1890	(7.6	8.5	9.2	9.6	8.2	9.4
Chart	I 2293	Nov. 19, 1890	7.2	8.1	9.2	9.4	7.8	9.0
			6.84	7.74				
Chart	I 2560		6.8	8.0	9.5	9.8	8.4	
	I 2856		6.8	7.9	9.5	9.8	9.3	
Br. Images	I 3186							
Ft. Images	I 3186							
	I 3270							
	I 3308							
Useless.	I 3401		—	—	—	—	—	—
Useless.	I 3541		—	—	—	—	—	—

Oct. 4, 1893 I 9280 selected for enl. For ident see pl. B 1977

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1890phae.proj..802F

November 21, 1890.

New Var in Perseus (No. 1) See page 41

Plate 2293 taken

var	vr. S.		fainter than 10.5	11.2	<12.5
a	6.5	7.2	6.5	8.6	
b	6.9	7.6	6.9	9.0	
c	8.0	8.7		10.1	
d	9.7	10.4		11.8	
e	8.7	9.4		10.8	
f	8.7	9.4	8.7	10.8	
g	(7.9)	(8.6)		10.0	

9.5 / 2.4 / 21 / 8.8

3)22.1 / 7.37

4857 / 8.1 / .7

Measure of Dmer 39° Dm −5° 4858 (see p. 38)

Plate 2272 taken

var	8.4	8.4
a	8.3	8.3
b	8.8	8.8
c	9.0	9.0
d	9.6	9.6

8.9

35.7 / 89

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1890phae.proj..802F

Nov. 24, 1890.

~~Dm +5~~ New var in Perseus (No. 1) R.A. $1^h 55^m.1$ +56° 15' 1900.

Plate I 1818 Taken Sept. 18, 1890.

var.	r	o	Dm + 55° 476	9.2	9.2
Dm +55 465	8.4	2	r		9.1
Dm +56° 396	8.8	2	r		9.0
Dm +56° 389	9.2	2	var		9.4
					9.15

New var. in Perseus (No. 2). Dm +54° 431 $1^h 50^m.0$ +54° j 9.0

Meas. for position of Comparison Stars.

Plate B 103.

	x	y		Magn.
var.	+13.25	+1.10	Dm +54° 431	1 50.0 +54 7 9.0
a	2.20	4.10	Dm +53° 440	1 53.8 +53 6.0 7.9
b	6.10	3.25	Dm +54° 439	1 52.5 +54 2 9.1
c	11.45	2.80	—	—
d	12.65	1.55	—	—

Dec. 18, 1895

New obj. in Perseus (No. 1)

Plate I 1818

8.8 b 1 v 8.9

v = .3

c N.S.

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1890phae.proj..802F

November 25, 1890.

Measurement of stars in Pleiades
Scale ruled by Prof. Wm. A. Rogers used.
Plate E 1879.

	Meas.											2×36 6-1
No. 1	5980	+28°	6	19	3	58	4	+28	36.8	5.4 ?	397'	10.96	395	+2
2	8 330	+27°	6	33	3	57	44	+27	13.6	5.1 ?	314	861	309	+5
3	11 780	Dm+25°	6	24	3	41	35	+25	8.8	6.0	188	516	186	+2
4	14 200	23°	5	58	3	40	36	+23	41.6	6.2	102	274	99	+3
5	15 400	22°	5	63	3	39	47	+22	58.8	6.9	59	154	55	+4
6	16 940	22°	6	05	3	48	16	+22	3.1	6.0	3	0	0	+3
														+3

∴ 1 div. = 33' 100 div = 3300' = 625 mm 1 mm = 5.28'
3525
1750
1250
5000
528
1° = 11.4 mm
600 | 52.8
528 | 11.4
720
528
1920

Examination of Plate I 2233 for Class of spectrum of standard stars in Pleiades Vol XVIII p 153

Design	Class	K line
e	A	0
i	A	.3
j	A	0
k	V.S.	
l	V.S.	
m	V.S.	
n	just visible.	
o	N.S.	

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1890phae.proj..802F

November 25, 1890.

Examination of Spectra in Pleiades Continued.

Plate I 2273. Nov. 10, 1890.

		W No.	Sp.	
		208	F.	G5h bright edged.
-2	-1	235	K	
-5	+2	275	H	
-2	-1	338	A	K = .8 H
-3	0	358	A	K = .7 H
-4	+1	280	F	G5 K = .6
-3	0	110	A	K = .V-
-3	+1	111	A	K = .V-
		47	H	
		196	E? A?	
		143	A	K = .V-
		141	H	

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1890phae.proj..802F

November 26, 1890

Meas. of M.P. 441 [Draper II No. 7] Dm + 62° 796, (Sep 31).

Plate I 229 r taken Nov 19, 1890.

	r	10.2	~~12.0~~	12.1
	a	~~8.5~~	10.3	10.4
	b	8.6	~~10.4~~	10.5
10.5	c	9.1	10.9	11.0
11.99		~~26.2~~ ~~8.28~~		
		~~8.73~~ 8.6		
		~~.28~~ 1.9		

b . . c . . a

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1890phae.proj..802F

November 28, 1890.

Meas. of M.P. 441 (Dun. IV No. 7) DM +62° v 96 (Lee) p. 51.
Plate 2345 taken Nov. 25, 1890

var.	10.2	~~11.9~~	12,1
a	8.7	~~10.2~~	10,4
b	8.7	~~10.4~~	10,6
10.8 c	9.4	~~11.1~~	11,3
	26 6		
11.69	8.8	8,6	
	1.7	1.9	

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1890phae.proj..802F

December 1, 1890.

Meas. of faint star near Nebula in Lyrae. Pr. Professor Holden.

Plate I 2370 Taken Nov. 28, 1890. Ef. 20 m. Add. ef. of 20 m on pole.

	Br.				
*	9.5	Holdens. Star.			
310	9.6	= 543	13.5	13.4	+.2
337	9.6	= 506	13.1	13.0	−.2
380	9.8	= 489	13.5	13.2	0
				13.2	±.13

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1890phae.proj...802F

December 3, 1890.

~~Dec. 1890~~ Identification of stars in Pleiades having image in 4th exposure on Plate E 1875 distinctly visible.

E 1875 4th Ex.

Br.	No.	Dm. No.	R.A.	Decl.	Magn.
8.7	1	Dm +25° 624	3 41.6	+25 9	6.0
9.2	2	Dm +24° 529	3 32.1	+24 57	6.7
9.8	3	Dm +23° 473	3 25.9	+23 59	6.2
8.9	4	Dm +24° 546	3 36.5	+24 23	6.3
9.0	5	Dm +24° 553	3 37.3	+24 6	7.0
9.6	6	Dm +24° 556	3 37.4	+24 4	7.0
8.0	7	Dm +24° 547	3 36.6	+23 1	5.0
7.8	8	Dm +23° 576	3 37.2	+23 55	4.8 ✓
8.9	9	Dm +23° 505	3 36.2	+23 50	6.5 ✓
9.6	10	Dm +23 507	3 36.3	+23 39	4.7 ✓
9.8	11	Dm +23° 534	3 38.7	+23 41	8.0 ✓
~~7.8~~ 8.5	12	Dm +23 568	3 40.6	+23 42	6.2 ✓
7.5	13	Dm +23 567	3 40.6	+23 36	4.0 ✓
6.4	14	Dm +23° 541	3 38.9	+23 39	3.2 ✓
7.8	15	Dm +23° 521	3 37.7	+23 29	4.5 ✓
9.6	16	Dm +23° 563	3 41.1	+23 16	7.2
9.2	17	Dm +22 563	3 39.8	+22 59	6.9
~~10.4~~	18	Dm +22° 607	3 42.5	+22 46	7.0
9.8	19	Dm +21° 535	3 41.4	+21 48	6.5

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1890phae.proj..802F

December 15, 1890.

New Variable Star in Aquarius

Approx. 1855. 20h 38.7m − 4° 38′

Approximate Pos. for 1900. 20h 41.2m − 4° 26′

Plate 2243 taken Nov. 13, 1890.

		x	y									
var.	7.5	8.4	2.7	0.7	—	1855	20h 38.8m	− 4° 36′	1855			
a	7.0	7.9	0.8	0.2	DM. −4° 5257	20	39 9.5	−4 35	8.3	8.4 comp.	0.0	0.6	39.2	34
c	8.3	9.2	0.0	0.3	DM. −4° 5258	20	39 19.1	−4 35	9.3	9.9	0.0	0.9	39.3	34
b	7.5	8.4	1.7	3.4	DM. −4° 5254	20	39 0	−4 44	9.1	9.5	0.3	10.2	39.3	34
d	8.8	9.7	4.7	0.8	DM. −4° 5250	20	38 27	−4 37	9.8	0.9	2.4		39.3	35
e	9.2	10.1	2.2	4.5	—	20	38.9	− 4 48		0.4	13.5			39.3 34

9.1 — 39.3 34

40.8
8.2
0.9

Plate I 2468 taken Dec. 12, 1890

var	8.7	9.1
a	7.5	7.9
c	8.8	9.2
b	8.2	8.6
d	9.3	9.7
e	9.7	10.1

43.5
8.7
4

Plate B 3022 taken Oct. 18, 1888.

				a	r
var					
a	a	8	r	7.9	8.7
c	r	r	4c	9.2	8.7
b	r	c	o	8.5	8.5
d	r	8	d	9.7	8.9
e	r	//	e	10.1	9.0

43.8
8.76

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1890phae.proj...802F

Dec. 15, 1890.

New Var. in Aquarius (Continued).

Plate I 2224 (Spectrum) taken Nov. 8, 1890
Spectrum showing hydrogen lines G & h bright.

var.				
a	a & r	7.9	8.7	
c	k	ns.		
b	r / 16	8.5	8.4	
d	ns.			
e	ns.			
		8.55		

Summary of $20^h\ 38.7^m - 4^\circ\ 38'$ in Aquarius

	Plate	Date		a	c k	b r	d	e	var
	B 3022 (Ch.)	Oct. 18, 1886	Bache. 8 in						8.6
G & h bright.	I 2224 (Sp.)	Nov. 8, 1890	Draper " "						8.6
	I 2243 (Ch.)	Nov. 13, 1890	Draper " "	7.9	9.2	8.4	9.7	10.1	8.4
Magn. 6 to be corrected July 6, 1891.	I 2468 (Ch.)	Dec. 12, "	Draper " "	7.9	9.2	8.6	9.7	10.1	9.1
	I 2502 (Ch.)	Dec. 15, "		7.7	9.2	8.7	9.9	10.2	9.6

Oct. 6, 1893 I 2468 selected for cul. For ident see pl. I 2243

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1890phae.proj..802F

December 18th 1890.

Meas. of New Variables in Agrainis (See p. 63).

Plate 2502 taken Dec 15, 1890

var.	9.4	9.6
a	7.5	7.7
c	9.0	9.2
b	8.5	8.7
d	9.7	9.9
e	10.0	10.2
	44.7	
	8.9	

9.1

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1890phae.proj...802F

January 3, 1891.

Meas. of New Variable in Delphinus approx. 1855 20h 41m.4 +18° 50'

Approx Pos. for 1900. 20h 43m.1 +18° 58'

Found on I 2542:

e +18° 4617

Plate 2553+15 4622 d. var ⊙ f

c +18° 4618

a 9m +18° 4619

cor. D. 0.9466 Plate I 2553 taken Dec. 22, 1890.

			x	y				approx. 1855 h	m	°	'			
var.	8.3	8.7	6.60	+0.60	#	—	—	20	41.1	+18	48	— 1.5	1.80	426 50
a	7.5	7.9	10.15	+1.50	9m	+18°	4619	20	40.5	+18	46	8.9 9.1	2.1 4.00	426 50
b	8.4	8.8	10.40	+3.75		+18°	4617	20	40.4	+18	40	9.2 9.7	2.2 11.25	426 51
d	8.8	9.2	10.15	+2.35		+18°	4618	20	40.5	+18	43	9.0 9.3	2.1 6.75	426 50
c	8.5	8.9	0.0	+1.30		+18°	4622	20	42.4	+18	45	9.5 10.5	0.0 3.90	424 49
e	9.3	9.7	1.65	+4.20		—	—	20	42.3	+18	37	— 0.3	12.60	426 50
f	10.2	10.6	8.30	0.00		—	—	20	40.8	+18	50	— 1.8	0.00	426 50
												9.2 9.6		426 50

Plate 1257 Sep 68.

Plate I 1370 taken June 30, 1890.

var	fr. than	fr. 11.2
a	7.4	8.1
b	8.1	8.8
d	8.5	9.2
c	8.2	8.9
e	8.8	9.5
f	9.8	10.5

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1890phae.proj..802F

January 3, 1891

Meas. of New Var. in Delphinus (Contin).

Plate I 1530 taken July 29, 1890.

var.	ftr. than 10.5	ftr. than 10.0
a	8.8	8.2
b	9.6	9.1
c	10.0	9.5
d	9.8	9.3
e	10.5	10.0
f	N.S.	N.S.

8.7
9.7
-.5

Op. Plate I 1621 taken August 8, 1890

var.	ftr. than 8.5	< 9.3
a	7.3	8.1 .8
b	8.0	8.9 .9/8
c	N.S.	
d	N.S.	
e	N.S.	
f	N.S.	

Sp. Plate I 16 32/33 taken August 14, 1890.

var.	ftr. than 8.5	< 9.3
a	7.3	8.1 .8
b	8.0	8.9 .9/8
c	N.S.	
d	8.3	
e	N.S.	
f	N.S.	

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1890phae.proj...802F

Plate 1897 / 1868

January 3, 1891.

Meas. of new Var. in Delphinus (Continued).

Plate I 1642 taken August 15, 1890.

var. fr. then 10.5 fr. the 11.0

	a	7.7	8.2
	b	8.4	8.9
d	c	8.8	9.3
c	d	8.5	9.0
	e	9.2	9.7
	f	9.9	10.4

96 / 8.4 / 1.2 / 9.2

5.2 / 3 / 8.7 / +.5

Plate I 1869 taken Sept. 25, 1890.

var. fr. then 10.5 fr. the 10.4

	a	8.5	8.4
	b	9.2	9.1
d	c	9.7	9.6
c	d	9.2	9.1
	e	9.9	9.8
	f	N.S.	10.5

96 / 9.2 / .4 / 9.2

46.5 / 9.3 / -1

Plate I 1897 taken Sept. 29, 1890.

var. fr. then 10.5 fr. the 11.9

	a	6.5	7.9
	b	7.3	8.7
d	c	8.0	9.4
c	d	7.4	8.8
	e	8.3	9.7
	f	9.2	10.6

96 / 7.3 / 2.3 / 9.2

46.7 / 7.8 / 1.4

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1890phae.proj..802F

January 3, 1891

Meas. of new var. in Delphinus (Continued).

Sp. Plate I 1257 taken June 1, 1890.

var	~~7.~~ W.S. further	8.5	< 9.3	
a	7.3	8.1	.8	
b	8.1	8.9	.8	
d	e W.S.			
9.6 c	d W.S.			
	e W.S.			
	f W.S.			

Sp. Plate I 1827 taken Sept. 19, 1890.

var	~~8.0~~ W.S. further	8.5	< 8.8	
a	7.8	8.1	.3	
b	W.S.			
d	e W.S.			
c	d W.S.			
9.6	e W.S.			
	f W.S.			

Plate I 1969 taken Oct. 11, 1890.

var	further	10.5	for the 11.6	
a	7.0	8.1		
b	7.7	8.8		
d	c 8.2	9.3		
c	d 7.8	8.9		
9.6 7.1 1.9	e 8.4	9.5		
	f 9.5	10.6		
9.2	48.6			
	8.1			

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1990phae.proj.:.802F

January 3, 1891.

Meas. of New Var. in Delphinus (Continued).

Plate I 2084 taken Oct. 28, 1890.

var. fr. then 10.5 fr. the 11 2

	a	7.5	8.2
	b	8.2	8.9
d	c	8.6	9.3
c	d	8.3	9.0
	e	8.8	9.5
	f	9.8	10.5

9.6 8.2 .6 — 9.2 — 8.2 2 8.5 .7

Plate I 2350 taken Nov. 26, 1890.

var fr. then 8.5 < 9.7

	a	7.0	8.1 .11
	b	7.6	8.9 .13
d	c	N.S.	
9.6 c	d	N.S.	
	e	N.S.	
	f	N.S.	

Plate I 2371 taken Nov. 28, 1890.

var. 8.0 — 9.3

	a	6.8	8.1
	b	7.5	8.8
d	c	8.0	9.3
c	d	7.6	8.9
	e	8.1	9.4
	f	9.2	10.5

9.6 7.5 2.1 9.2 — 9.2 2 9.9 1.3

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1890phae.proj..802F

January 3, 1891.

Meas. of New Var in Delphinus (continued)

Plate I 2527 taken Dec. 19, 1890

nn.	7.3	8.6	
a	6.7	8.0	
b	7.5	8.8	
d c	8.1	9.4	
c d	7.5	8.8	
e	8.2	9.5	
f	9.3	10.6	

47 3

7.9

1.3

Sp. Plate F 2542 taken Dec. 20, 1890.

nn.	7.4		9.0
a	6.9	8.7	1.8
b	7.5	8.9	1.4
d	–		
c d	7.6	9.0	1.4
e	8.0	9.6	1.6
f	N.S.		1.6

Visible on A.C. 6657 Sept. 6, 1905 as very faint object. Not seen on A.C. 6694, Sept. 14, 1905, which shows faint adjacent stars. Very interesting and difficult object. Great care must be taken in identification of plates and in estimates when observations are made.

W. P. F. June 1, 1906.

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1890phae.proj...802F

January 3, 1891.

New Variable in Delphinus R.A. 19h 00m Dec. 19° 00'

Summary.

No. Plate	Class	Instrument	Date	a	b	d	c	e	ζ	var.
1257	I	Draper 8 inch								[<9.3]
1370	I	"	June 30 1890	8.1	8.8	9.2	8.9	9.5	10.5	<11.2
1539	I	"	July 29 "	8.2	9.1	9.5	9.3	10.0	N.S.	<10.0
1621	I	"								[<9.3]
1632	I	"								[<9.3]
1642	I	"	Aug 15	8.2	8.9	9.3	9.0	9.7	10.4	<11.0
1827	I	"								[<8.8]
1869	I	"	~~Sept 25~~	8.4	9.1	9.6	9.1	9.8	N.S.	<10.4
1897	I	"	" 29	7.9	8.7	9.4	8.8	9.7	10.6	<11.9
1969	I	"	Oct. 11	8.1	8.8	9.3	8.9	9.5	10.6	<11.6
2084	I	"	" 28	8.2	8.9	9.3	9.0	9.5	10.5	<11.2
2350	I	"	?							[<9.7]
2371	I	"	Nov. 28	8.1	8.8	9.3	8.9	9.4	10.5	9.3
2527	I	"	Dec. 19	8.0	8.8	9.4	8.8	9.5	10.6	8.6
2542	I	"								[9.0]
2553	I	"	Dec. 22	7.9	8.8	9.2	8.9	9.7	10.6	8.7
				8.1	8.9	9.4	9.0	9.6	10.5	

Magns. G & I corrected. July 16, 1891.

× 1869
× 1897
× 1969
× 2371
× 2527
× 2553

An examination of a large number of excellent plates showing very faint stars taken between Dec. 22, 1890 and ~~Dec~~ Nov. 14, 1903 failed to show any trace of this star except ~~I 1657~~ I 1657 2 on which it is fainter than when first visible. It is probably a new star, or such an inference might be drawn from this examination.

W. P. Fleming. May 31, 1906.

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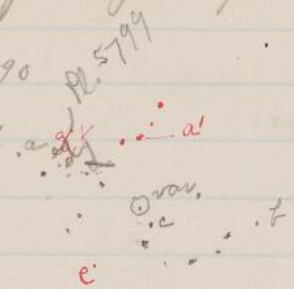
1890phae.proj..802F

January 7, 1891.

Mean of M.P. 441 (Dmer = II 7) Cont. from p. 29.

Plate I 2426 taken Dec. 5, 1890

var	9.5	12.1	12.4
a	7.5	10.1	10.4
b	7.8	10.4	10.7
10.5 g &	8.4	11.0	11.3
11.99 g	23.7		
	7.9	7.6	
	2.6	2.9	



A direct comparison of Plate I 2426 with I 432 shows a diminution of fully one magnitude in the light of M.P. 441. M.S.T.

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January 10, 1891.

Meas. of H Geminorum.

Plate I 2742 Taken Jan. 8, 1891

var	6.0	
a	7.9	= Dm +22° 1808 7 46.6 +12 3 8.2 ⊙.d b. .
b	7.0	+22° 1811 7 47.8 +22 13 9.3 a. .c
c	8.4	
d	9.0	

Plate I 2740 Taken Jan. 8, 1891

var.	7.0
a	7.2
b	8.0
c	8.8
d	9.2

Plate I 2744 Taken Jan 8, 1891.

Var.	6.7
a	7.0
b	7.9
c	8.7
d	9.0

Plate I 2748 Taken Jan 8, 1891

var	6.5
a	6.7
b	7.4
c	8.5
d	8.9

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1890phae.proj..802F

Jan. 10, 1891.

Meas. of N. Gemini (continued).

Plate I 2750 taken Jan 8, 1891.

rau 6.5
a 6.9
b 7.4
c 8.4
d 9.0

(Sp.) Plate I 2741 taken Jan 8, 1891

rau 6.7
a 6.4
b 7.5
c – N.S.
d N.S.

(Sp.) Plate I 2743 taken Jan. 8, 1891.

rau. 7.2
a 6.8
b 8.0
c N.S.
d N.S.

(Sp.) Plate I 2749 taken Jan 8, 1891.

rau 7.0
a 6.5
b 8.1
c N.S.
d N.S.

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1900theee.rpi..8025

Jan. 10, 1891

Meas. of η Geminii (continued)

Plate $\frac{I}{S}$ 887 March 26, 1890.

var.	7.0
a	6.5
b	7.4
c	8.5
d	9.2

Plate $\frac{I}{S}$ 913

var	N.S.
a	6.9
b	8.1
c	9.2
d	9.6

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1890phae.proj..802F

January 14, 1891.

Meas. of New Var. in Perseus, No. 1. (see p. 39).

Plate I 2560 taken Dec. 22, 1890

	var	fr. than 10.5		< 11.4	
	a	6.2	6.2	7.1	8.4
	b	6.6	6.6	7.5	8.8
	c	7.7		8.6	9.9
9.5	d	9.5		10.4	11.7
1.2 / 2	e	8.9		9.8	11.1
	f	8.7	8.7	9.7	10.9
8.8	g	7.8	21.5 / 7.17	[8.7]	10.0

47.0
7.9
.9

Meas. of New Var. in Perseus No. 2. (see p. 51)

	var.	7.0	8.4	Plate I 2560 taken Dec. 22, 1890.			
	a	5.4	6.8				
	b	6.6	8.0				
	c	8.1	9.5				
8.5	d	8.4	9.8	9.70	9.52 = 9.11	.59	.59

28.5
7.1
1.4

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1890phae.proj..802F

January 20, 1891.

Meas. of new var in Perseus. No. 1 (see p. 39).

Plate $\frac{I}{2856}$ taken Jan. 16, 1891.

	var.	fr. then	10.5 <	11.0	
	a	6.5	6.5	7.0	8.5
	b	6.9	6.9	7.4	8.9
	c	8.2		8.7	10.2
9.5 / 1.5 / 2.0	d	9.8		10.3	11.8
	e	9.3		9.8	11.3
	f	9.2	9.2	9.7	11.2
8.8	[g	8.7]	22.6 / 7.54		10.9
		49.9 / 8.3 / .5			

Plate $\frac{I}{2856}$ taken Jan. 16, 1891

Meas. of new var. in Perseus, No. 2 (see p. 57)

	var.	8.1	9.3			
	a	5.6	6.8			
	b	6.7	7.9			
	c	8.3	9.5			
8.5	d	8.6	9.8	10.70	9.42 = 10.06	.64 .64
		29.2 / 7.3 / 1.2				

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1890phae.proj..802F

January 20, 1891.

Meas. of M.P. 441. (See p. 31).

Plate I 2857 taken Jan. 16, 1891.

var.	9.6	11.4	11.7
a	8.3	10.1	10.4
b	8.6	10.4	10.7
c	9.2	11.0	11.3

10.5 11.29

26.1

8.7 9.4

1.8 2.1

~~Scale of~~ D.M. Mags. corrected in declination. Correction See p. 92.

Meas. of Espin's new var. DM +53° 2684 preceding and S. of them of a pair of stars. Plate B 2057 taken.

var.	7.0	8.3	10.2	4.65	1.40	01.57	4.20	DM +53° 2684	21	35	46	+53	40.0	86	1.6 4.2
comp. to var.	7.5	9.3	10.7	4.70	1.50	01.59	4.50		21	35	8	+53	39.4	–	1.6 4.5
a	6.4	8.7	9.6	0.30	3.85	00.10	11.55	+53° 2672	21	34	18	+53	46.8 47	9.2	5.7 33 32.35 34.2 33.9 1.7
b	7.4	9.2	10.6	3.60	0.45	01.21	1.35	+53° 2682	21	35	28	+53	37.0	9.5	10.5 34.3 36.2 1 / 10.1
c	7.9	9.7	11.1	5.70	2.50	01.91	7.50	–	–		21	36.1	+53 35	42.2	1.9 1.8
d	8.9	10.7	12.1	5.85	0.60	01.98	1.80	–	–		21	36.2	+53 35	37.2	2.0 1.8 / 34.2 34.5

10.1 / 9.4

306

7.6 6.9

1.8 3.2 2.5

35.3

35.6

35.4

Focus poor. Plate I 1759 taken Sept. 1, 1890

var.	8.0	9.2	10.7
comp. to var.	8.5	9.7	11.2
a	7.0	8.2	9.7
b	7.7	8.9	10.4
c	8.5	9.7	11.5
d	9.6	10.8	12.3

10.1 / 9.4

278

8.2 7.4

1.2 2.7

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1890phae.proj..802F

January 20, 1891.

Meas. of Eclipsis. near Var. DM +53° 2684 (continued).

Plate I 1895 Sept. 29, 1890.

var.	9.7	~~10.1~~	10.8
Comp. to var.	9.7	10.1	10.8
a	8.4	8.8	9.5
b	9.5	9.9	10.6
c	N.S.	N.S.	N.S.
10.1 9.4 d	N.S.	N.S.	N.S
	~~17.9~~ 9.0 1.4	9.0 1.1	

Plate I 2432 taken Dec. 7, 1890.

var.	7.5	8.7	10.4
Comp. to var.	8.0	9.7	10.9
a	6.7	~~7.9~~	9.6
b	7.7	8.9	10.6
c	8.4	9.6	11.3
10.1 9.4 d	9.8	11.0	12.7
	32.6 8.2 1.2	7.2 2.9	

Plate I 2820 taken Jan 15, 1891.

var.	7.5	~~8.4~~	10.0
comp. to var.	8.3	9.2	10.8
a	7.3	8.2	9.8
b	8.0	8.9	10.5
c	8.6	9.4	11.1
10.1 9.4 d	10.0	10.9	12.5
	33.9 8.5 .9	7.6 2.5	

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1890phae.proj..802F

Gsfmi. Nov. Var. DM. +53° 2684

Summary.

Plate	Date	Instrument	a	b	c	d	comp.	var.
Ch. B 2052		8 inch Bache	8.2	9.2	9.7	10.7	9.3	8.8
" I 1759		8 inch Draper	8.2	8.9	9.7	10.8	9.7	9.2
" " 1895		" " "	8.8	9.9	N.S.	N.S.	10.1	10.1
" " 2432		" " "	7.9	8.9	9.6	11.0	9.2	8.7
" " 2820		" " "	8.2	8.9	9.5	10.9	9.2	8.4
			a	b	c	d	comp.	var.
Ch. B 2052	Dec. 16, 1877	8 inch Bache	9.6	10.6	11.1	12.1	10.7	10.2
I 1759	Sept 1 1890	8 inch Draper.	9.7	10.4	11.5	12.3	11.2	10.7
" 1895	Sept 29 "		9.5	10.6 / 9.6	N.S.	N.S.	10.8	10.8
" 2432	Dec. 7. "		9.6	10.6	11.3	12.7	10.9	10.4
" 2820	Jany 15, 1891.		9.8	10.5	11.1	12.5	10.8	10.0

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1890phae.proj..802F

January 24, 1891.

Meas. of Comparison Stars for Victoria

Plate I 2082. Oct. 28, 1890.

	No.	Br.	Scale
	1	3.4	b
near edge,	2	4.1	b

Plate I 2092 Oct. 30, 1890

	1	3.6	b
close to near edge	2	3.9	b
	3	4.9	b
	4	9.4	a
	5	5.5	b
	6	7.5	a
	7	7.2	a
near edge	8	7.0	a
" "	11	6.2	a
" "	14	4.5	b
	15	5.5	a

Wrong Star Meas, no rec. of cor. of pos. given in cat.

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1890phae.proj..802F

January 26, 1891.

Meas. of Comparison Stars for Victoria.

Plate I 1582 taken Aug. 4, 1890.

No.	Br.	Scale	
Near edge of plate	5	6.5	a
" " " "	6	7.2	a
" " " "	7	7.0	a
	8	6.6	a
	9	7.1	a
	10	6.8	a
	11	6.4	a
	12	7.4	a
	13	7.0	a
	14	3.8	b
	15	5.6	a
	16	6.0	a
	17	5.5	a
	18	7.7	a
	19	5.5	a
	20	5.7	a
	21	6.2	a
	22	6.7	a
	23	3.9	b
	24	8.1	a
	25	7.4	a
Elongated Knot	26	7.3	a
" "	27	7.5	a
" "	28	7.0	a
" "	29	6.9	a
" "	30	6.6	a

See p. 81.

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January 26, 1891.

Meas. of Comparison stars for Victoria

Plate I 1882 (Continued). Aug. 4, 1890

No.	Br.	Scale
Elongated, March 31	7.9	a
" " 32	5.4	a
" " 33	—	—

Plate I 1751 taken Aug. 30, 1890.

Near Edge.	5	5.5	a
" "	6	6.1	a
" "	7	6.0	a
	8	5.6	a
	9	6.0	a
	10	5.7	a
	11	5.5	a
	12	6.6	a
	13	5.9	a
	14	3.1	a
	15	4.7	b
	16	5.4	a
	17	5.0	a
	18	7.0	a
	19	5.9	a
	20	5.6	a
	21	5.4	a
	22	6.0	a
	23	3.6	b
	24	7.4	a
	25	6.6	a

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January 26, 1891.

Meas. of Comparison stars in Victoria (Continued).

Plate I 1751 (Continued) Aug. 30, 1890.

	No	Br.	Scale
Elongated, Nearer edge	26	6.7	a
" " "	27	6.9	a
" " "	28	5.3	a
" " "	29	5.9	a
" " "	30	5.7	a
" " "	31	7.5	a
" " "	32	3.8	b
" " "	33	4.5	b

Plate I 1869 taken Aug. 3, 1890.

Elongated Nearer edge	25	7.4	a
" "	27	7.6	a
	28	6.4	a
	31	8.0	a
Elong. Nearer edge	32	5.4	a
	33	6.8	a
	35	6.9	a
	37	6.8	a
	38	6.4	a
	39	4.1	b
	40	5.7	a

Plate I 1879 taken Aug. 4, 1890.

	40	5.8	a
	41	5.5	a

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1890phae.proj..802F

January 27, 1891.

Examination of photographs of spectrum of R Scuti. for J. E. Keeler.

Plate I 1169 taken May 16, 1890. Focus bad. Image very poor; probably Mar 7

Plate C 398. Means. for Add. lines: Sc. 40 to 9 inch.

	line	Reading	Intensity							
14007	F	15 20 / 15 40	10	486.1	463.3			bd:3	2	
		22 √0	10	476 468	454.5	4633 ✓	417	439 n	454 i	
		34 10	2	463 451	447.1	454.5		415 n	442 i	
		44 √0	8		441.7	447.1 ✓		410 n	435 n	
		√200	2		438.6	441.7		409	426 i	
		56 10	3		435.3	438.6			420 i	
		6140	2			435.3			407 i	
	G	6310	10	434.6					397 n	
		7630	2		425.8					
		85 √20	2		419.9					
8940		89 490	4	89.90	417.3	✓				
		9400	3		414.9					
		9490	5 7		414.6	✓				
	h	10 2√0	10	410.2						
		10520	3		409.8					
		10400	7		409.4	✓				
		108√0	2		406.9					
		11710	8		402.6	✓				
		12040	1		401.1					
	H	12840	10	397.0						
		12940	2		396.7					

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1890phae.proj..802F

January 27, 1891

Plate C 398 (continued

Line	Meas.	Intens.		
	13562	2		393.8
α	14620	10	388.9	
β	15890	10	383.6	
	16250	6		382.3
γ	16810	10	379.8	

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January 28, 1891.

Examination of Photographs of Spectrum of R Scuti for T. C. Esplin. (Cont. from p. 85).

Plate I 1280 taken June 9, 1890
Spect. Kb.? or L. Apparently the G and h are faintly bright. I had formerly supposed that these bright lines were of shorter wavelength than the hydrogen lines and they may be so. It is almost impossible to say, owing to the small dispersion, the image examined being only 0,35 cm. in ~~extent~~ length. (limit – F to h).
This spectrum has not the breaks distinctive of stars of the III Type & therefore has not been called "ML".

Plate I 1419 taken. July 9, 1890
Spectrum L? G and h lines almost invisible still appear to be faintly bright. By "G & h" lines I mean the same lines as are referred to in Plate 1280.

Plate I 1650 taken, Aug. 16, 1890
Spectrum Kb. No trace of bright lines visible. Image comparatively faint. Plate not particularly good.

Examination of photographs of Spectrum of R Coronæ

Plate I 1040 taken April 17, 1890.
Spectrum G?. Very faint traces of bright lines appear to G & h.

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1890phae.proj..802F

January 28, 1891.

~~Area~~ Exam. of photos. of R Coronae (Continued,

Plate I 1075 taken April 25, 1890
Spectrum 2?. Strong bright lines visible
at wavelengths (approx). 409.5, 428, 462, ? 486 ?

Plate I 1117 taken April 30, 1890.
Spectrum 2?. Same bright lines faintly seen.

Plate I 1086 taken. April 28, 1890.
Spectrum 2?, Same bright lines faintly seen

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1890phae.proj...802F

January 28, 1891.

Meas of Comp. stars for Victoria (see p. 81.

Plate 1582

No	Second meas. Br.	Scale	First Meas.	Meas Third	Diff.	
19	6.0	a	5.5	6.0	5	Second meas adopted
20	6.3	a	5.7	6.4	6	" " "
28	7.2	a	7.0		2	first meas. adopted

Plate 1751

19	5.8		5.9		1	first meas. retained
20	5.8		5.6		2	" " "
28	6.5		5.3	6.2	11	second meas adopted.

Plate 1582

New No 5 8.0

Plate 1751

New No 5 7.3

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1890phae.proj..802F

0.30

February 2, 1891.

Enlargements.

Meas. of Typical bright line Spectra

In F. Aro. M.S. Reeds.

Plate D 2062. H.P. 1311 1st Division Br. Line Spectra

Line	Meas.	Intensity			Wavelength
F	40.00 } 41.10 }	1	40.55	486.1	486
	45.85 } 46.05 }	5 10	46.95		480 69
	49.05 } 50.85 }	2	49.95		462
	52.30 } 53.70 }	2	53.00		454
G	61.70 } 63.40 }	3	62.55	434.1	434
	69.60 } 71.30 }	3	70.45		420
h	75.95 } 77.90 }	4	76.92	410.2	410
	81.90 } 83.10 }	1	82.50		402
H	84.05 } 86.40 }	1	85.22		398

Plate D 2077. A.G.C. 22763 2nd Division Br. Line Spectra.

F	00.00 } 00.85 }	1	00.42		486
	06.80 } 07.40 }	5 10	07.10		469
	08.80 } 09.40 }	4	09.10		464
	12.60 } 13.30 }	21	12.95		455
	14.20 } 15.00 }	21	14.60		451
	15.70 } 16.65 }	21	16.18		447
G	22.40 } 23.30 }	3	22.85		434
	26.80 } 27.10 }	1	26.95		425+
	27.90 } 28.30 }	1	28.10		424
h	30.30 } 31.10 }	1	30.20		420
W	36.00 } 37.00 }	3	36.50		410
	39.15 } 39.95 }	2	39.65		406

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1890phae.proj..802F

February, 2, 1891.

Plate D. 2070 O.A. 17681. 3rd Division Br. Line Spectra.

Line.	Meas.	Intensity.		
	07.00	10	08.35	464
	09.70			
	12.80	1	13.05	455
	13.30			
	14.20	1	14.55	451
	14.90			
	16.90	2	17.75	443
	18.60			
G	22.00	2	22.55	434
	23.10			
	28.85	1	28.90	421
	28.95			
	34.49	1	35.64	412
h	36.80			
	37.40	1	38.70	407
	40.00			
	44.95	1	47.22	395
	49.50			

No F Line appears.

1.00

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1890phae.proj..802F

-1° to +80°

Magnitudes to be used for DM. Stars fainter than 7.0. in obtaining constant for reduction of measures of variable stars. Corrected magnitudes taken from results obtained from Table I Vol. ~~XIV~~ and Vol. XIII p 356.

Dm. Magn.		Cor. Magn.
7.0	=	7.0
7.8		7.9
8.0	=	8.1
8.3		8.4 8.5
8.5	=	8.7
8.8	=	9.0
8.9	=	9.1
9.0	=	9.3
9.1	=	9.5
9.2	=	9.7
9.3	=	9.9
9.4	=	10.2
9.5	=	10.5

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1890phae.proj..802F

February 3, 1891.

Meas. of M.P. 441. see p.

Plate I 2954 taken Feb. 1, 1891

	var.	8.7	11.4
	a	7.7	10.4
	b	8.0	10.7
10.8⁻	c	8.6	11.3
10.99			
		7.8	
		2.7	

Summary. (Copied from p. 31 & corrected).

Plate	Date		a	b	c	var.	.36
I 432	Jan. 3	1890	10.4	10.6	10.9	11.0	7.4 ~~4.6~~
661							
~~909~~	Feb 13	"	10.5	10.6	11.0	11.1	7.5 ~~4.7~~
909							
~~951~~	April 1	"	10.4	10.5	11.0	11.1	7.5 ~~4.7~~
951							
~~989~~	April 5	"	10.4	10.5	10.7	10.9	7.3 ~~3.5~~
989							
~~1023~~	April 11	"	10.5	10.5	11.0	11.1	7.5
1023							
~~2003~~	April 16	"	10.5	10.5	10.9	11.1	7.5
2003	Oct. 15	"	10.4	10.5	10.9	<12.3	<8.7
" 2006	Oct. 17	"	10.4	10.6	10.9	11.7	8.1
" 2295	Nov. 19	"	10.4	10.5	11.0	12.1	8.5
" 2345	Nov. 25	"	10.4	10.6	11.3	12.1	8.5
" 2426	Dec. 5	1890	10.4	10.7	11.3	12.4	8.8
" 2857	Jan. 16	1891	10.4	10.7	11.3	11.7	8.1
" 2954	Feb. 1	"	10.4	10.7	11.3	11.4	7.8
			10.42	10.58	11.11		
" 2972	Feb. 2	"	Wrong region				

Continued on p. 149.

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1890phae.proj.,802F

February 18, 1891.

Meas. of New Variable in Cygnus (No. 2). Oppy, 1885. 20h 46.9m +41° 57'

Plate I 84 taken

var.	8.5	10.4
a	6.3	8.2
b	6.8	8.7
c	7.6	9.6
d	8.7	10.6

8.8

~~294~~ 207
69
1.9

Dm +42° 3885 20 46.1 +42 6 8.5 8.7

Dm +41° 3915 20 47.1 +41 56 8.4 8.5

Dm. +41° 3910 20 46.0 +41 55 9.0 9.3 / 8.8

a
d
c. ⊙ b

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1890phae.proj..802F

February 18, 1891.

Discov. of Mr. Espin's new variable in Auriga. Pos. 1855 5h 32.6m +31° 5'

Plate I 613 taken Feb. 6, 1890.

			x	y								
var.	7.8	10.7	2.95	2.25	~~0069~~	~~4.75~~		5 32.7	31 58		~~07~~	7
a	6.0	8.9	1.05	1.20	~~0236~~	3.60	Dm+32°1062	5 31.2	+32 2	8.6 8.8	~~24~~	4 33.66
b	6.5	9.4	2.55	5.80	~~0060~~	17.40	Dm+31°1058	5 32.8	+31 48	8.9 9.1	~~06~~	17 33.45
c	7.2	10.1	0.40	3.40	0001	1030	Dm+31°1060	5 33.2	+31 54	9.5 10.5	0.0	10 33.24
d	7.9	10.8	2.70	1.85	~~0064~~	5.55		5 32.8	31 59	9.5	~~06~~	~~86~~
9.5 e	8.8	11.7	2.00	2.50	~~0047~~	7.50		5 32.9	31 57		~~05~~	8 33.45
	6.6											
	2.9											

Plate I 2405 taken Dec. 2, 1890.

Near edge of Plate	var.	9.5	11.8
	a	6.5	8.8
	b	7.0	9.3
	c	8.0	10.3
	d	8.9	11.2
9.5	e	9.4	11.7
		7.2	
		2.3	

Plate I 2578 taken Dec. 23, 1890

var.	10.2	10.7
a	8.4	8.9
b	9.0	9.5
c	9.6	10.1
d	10.4	10.9
9.5 e	N.S.	7.
	9.0	
	1.5	

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1890phae.proj..802F

February 18, 1891.

Meas. of Mr. Espin's new var. in Auriga (Continued).

Plate I 2892 Jan. 23, 1891

var.	7.6	9.5	
a	6.9	8.8	
b	7.5	9.4	
c	8.5	10.4	
d	9.3	11.2	
9.5 e	10.2	11.9	

7.6
1.9

Summary. Corrected magns.

Plate	Date	a	b	c	d	e	var.
I 613	Feb. 6, 1890	8.9	9.4	10.1	10.8	11.7	10.7
I 2405	Dec. 2 1890	8.8	9.3	10.3	11.2	11.7	11.8
I 2578	Dec. 23 1890	8.9	9.5	10.1	10.9	7	10.7
I 2892	Jan. 24 1891	8.8	9.4	10.4	11.2	11.9	9.5
2nd meas. I 2892		9.0	9.4	10.1	10.9	11.8	9.5
I 3392		8.8	9.2	10.2	11.7	12.1	12.0

On each plate 1 mm = 2.985 = 179.10
25.4
7164
8955
3582
454.914

24
214
192
229
216
131
120
114

45466
254
45491.4

1 in. | 24 / 189.35 = 1 hour CS. mean

379101 / 126.37 = 1 hour CS sidereal

log 1.10164

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1890phae.proj...8025

February 20, 1891

Determination of focal length of photographic doublets from pairs of Circumpolar polar stars.

Comparison of distances of circumpolar stars, with short scale. E.C.P. obs.

Dm No	R.A.	Dec.	Magn		Plate I 21" Draper 8"		Plate 36 Bache 8"		Plate E 1292 Voigt 4"	
					17.59	17.16				
1a	+86° 17 4	0 43.2 52.8	+86° 31.8 22.2	8.8 7.6	22.41 42.73	43	23.08	22.84	25.03	25.79
1b	+86° 184	12 45.5	+86 14.4	8.8	33.54	33.11 43	37.60	37.36	32.92	33.38
		2.3	7	13.8	15.95	15.95	14.52	14.52	7.89	7.87
2a	+86° 51	3 19.5	+86° 10.7	6.0	18.09	17.66	22.27	21.68	25.05	24.62
2b	+86° 222	15 18.8	+86 27.2	8.8 (4)	34.35	33.93	37.07	37.48	33.08	32.65
		0.7	7	21.2 21.9	16.26	16.27	14.80	14.80	8.03	8.03
3a	+86° 103	6 52.9	+86 39.2	8.2	19.38	19.04	21.78	21.02	25.26	25.06
3b	+86° 277	18 52.8	+86 5.5	8.8	35.39	35.04	36.36	35.59	32.70	32.51
		19 1.6 0.1	+8.6	7 15.3 31.2 6 49.8	16.01	16.00	14.58	14.57	7.44	7.45
4a	+86° 143	9 47.4	+86 32.0	8.6	19.98	19.59	21.06	20.19		
4b	+86 324	21 52.8	+86 20.2	8.2	35.72	35.32	35.37	34.50		
		5.4	7	7.8	15.74	15.73	14.31	14.31		

1' = a millimeters

Values a:	Draper 8"	Bache	Voigt 4
	.368	.335	.182
	.368	.335	.182
	.368	.335	.182
	.368	.334	—

1265 1152 626

Conclusion. With Draper 8" objective 1' equals 0.368 mm. Bache 8" 1'=0.335 mm. Voigt 5" 1' = 0.182 mm. Focal length Draper 8" = 1265.2 cm = 499.51 in., Bache 115.17 cm. = 45.34 in.

Bache 343.8

1/3 = 0.2 114.6

3438 | 626
3130 | 5.49
3080
2504
5760

626 | 17388
3130 | 3130
344.3
343.8

3438 | 3438
368 | 335
27504 | 17190
20628 | 10314
10314 | 10314
1265184 | 1152730

2717
10868

115.17 cm. 12652
3937
3737 | 88564
80619 | 37956
34551 | 113864
10365 | 37956
34551 | 495109 24
45.34 24 29

1 mm. on Bache plate = 2.985 = 3' or 179.2"
" " Draper 8" = 2.717 = 2.72 or 163" = 10.9

Sept. 1894 1.03023 1.07700 Was used with values.

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1890phae.proj..802F

February 26, 1891.

Meas. D position of var. stars in S M Librae. and other stars near cluster.

Plate X 1690.

	No.	y	x		
	m a	-18.00	+5.25	-12 43.2	— —
	H.C.O. b	-16.20	+4.25	-11 26.9	— —
S.	D.E. Porter b	-16.90	+1.30	-11 56.6	— —
N.		-16.80	+1.35	-11 52.3	— —
	Comp. st. 1	-41.75	+3.10	-29 30.1	Dm+2° 2942 15 11 7.3 + 2 17.7 9.5 167.2
	" " 2	-17.65	+12.35	-12 28.4	— —
	" " 3	-19.35	-1.80	-13 20.4	— —
	4	-12.60	-4.90	-9 54.2	Dm+2° 2946 15 13 13.3 + 2 37.9 9.5 167.8
	5	+4.70	-30.55	+3 19.3	Dm+2° 2945 15 12 44.3 + 2 50.0 9.5 166.7
	6	+15.30	+4.60	+10 38.7	Dm+2° 2941 15 9 5.7 + 2 58.0 9.5 167.4
	7	+30.10	-0.45	+21 16.2	Dm+3° 3008 15 11 14.7 + 3 8.4 9.5 167.1
	8	+38.50	-37.90	+27 12.4	Dm+3 3006 15 9 32.5 + 3 13.4 9.3 166.2
					167.1

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1890phae.proj..802F

March 13, 1891

Measures of plate 6126 Spectrum of Spica and standard light source. To identify measures of ultraviolet end.

	Int.			
H	0.7 d	396.8	279.3	278.6
K	5.1	393.4	283.7	278.6
	5.5 2			
	5.8 3			
	6.1 1			
	6.5 3			
	6.7 1			
	6.8 2			
	7.1 1			
	8.8 3 diff	390.50	287.4	278.6
	10.2 3			
	11.1 3			
	11.4 3			
	11.8 3			
	12.5 3			
	13.3 3 or 2 diff	387.20	291.9	278.6
	15.0 3 or 2 diff	346.00	293.6	
	17.7 end	384.15	.3	

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1890phae.proj..802F

March 30, 1891.

Meas. of Dm. -12° 1172. Planetary Nebula. New. Var?

Plate B 3007 taken. Oct. 17, 1888

Pl. neb.	6.5	8.6	Dm-12° 1172	5	20	46	-12	49	9.2
a	6.6	8.7	Dm-13° 1149	5	19	23	-13	2	7.8 7.8
b	7.0	9.1	Dm.-12° 1162	5	19	36	-12	60	9.5 10.5
c	7.6	9.7	Dm-12° 1174	5	21	48	-12	43	9.0 9.3

27.6
9.2

Boyd. Wright 9.2

21.2
7.1
2.1

Plate B 3007 (Faint Images. Oct. 17, 1888

Pl. neb	7.5	8.6
a	7.5	8.6
b	8.0	9.1
c	8.7	9.8

24.2
8.1
1.1

Plate B 3182 taken Nov. 13, 1888

Pl. neb.	9.4	9.5
a	8.4	8.5
b	8.9	9.0
c	9.8	9.9

27.1
9.0
0.1

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1890phae.proj..802F

March 30, 1891.

Meas. of DM. -12° 1172 (Continued).

Plate I 1950 taken Oct. 8, 1890.

Pl. neb	8.0	9.3
a	7.2	8.5
b	7.7	9.0
c	8.7	10.0
9.2	23.6	
	7.9	
	1.3	

Plate I 2626 taken Dec. 28, 1890.

Pl. neb.	8.3	9.3
a	7.5	8.5
b	8.0	9.0
c	8.7	9.7
	24.2	
	8.1	
	1.0	

Plate I 2648 taken Dec. 29, 1890.

Pl. neb.	6.9	9.0
a	6.3	8.4
b	6.8	8.9
c	7.8	9.9
	20.9	
	7.0	
	2.1	

(Sp) Plate I 3345 taken March 26, 1891.

Pl. neb.	7.4	9.4
a	6.4	8.4
b	7.0	9.0
c	8.0	10.0
	21.4	
	7.1	
	2.0	

Plate B 2187. Barely visible. Br. lines seen.

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1890phae.proj..802F

March 30, 1891.

Summary of DM. −12° 1172.

	Plate No.	Date	Const.	Ef.	a	b	c	Resid.
Bright Images	B 3007 ch.	Oct. 17, 1888	2.1		8.7	9.1	9.7	8.6
Faint "	B 3007 "	" "	1.1		8.6	9.1	9.8	8.6
	B 3182 "	Nov. 13 "	0.1		8.5	9.0	9.9	9.5
	I 1950 "	Oct. 8 1890	1.3		8.5	9.0	10.0	9.3
	I 2626 "	Dec. 28 1890	1.0		8.5	9.0	9.7	9.3
	I 2648 "	Dec. 29 1890	2.1		8.4	8.9	9.9	9.0
	I 3345 Sp.	March 26 1891.	2.0		8.4 ±.08	9.0 ±.04	10.0 ±.10	9.4 2.86
(Trail scale used).	C 3597	March 30, 1891	3.7		8.3	8.9	10.3	9.3
	C 3603	April 1, 1891	2.7		8.5	9.0	10.1	9.2
	I 3378	" " "	0.6		8.6	9.1	9.8	9.2
	I 3379	" " "	1.5		8.6	9.2	9.7	9.2
	I 3380	" " "	2.2		8.3	9.0	10.2	8.9

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1890phae.proj...802F

March 30, 1891.

Meas. of Espins suspected var (appm 1855.) 4 26 9 + 65 53,

Plate I 432 taken Jan 3, 1890.

			x	y	Plate 3118			
var,	7.6	9.2	4.95	8.40		h m s. ° 27.9		
a	7.5	9.1	0.75	0.50		Dm+65°419 4 24 33 +65 28	9.2	9.7
b	7.9	9.5	2.60	3.65		Dm+65°421 4 25 9 +65 38.19.0		9.3
c	8.6	10.2	1.25	11.00		Dm+65°418 4 24 12 +65 55.8 56	9.4	10.2
d	9.3	10.9	1.20	10.30		Dm+65°417 4 24 12 +65 53.395	10.5	9.9

9.9

33 3
8.3
1.6

9.28 9.30 = 9.29 .01 .01

Plate I 3118 taken Feb. 19, 1891

var.	9.1	10.6		
a	7.5	9.0		
b	8.0	9.5		
c	8.7	10.2		
d	9.4	10.9	10.55 10.45 = 10.50	.05 .05

33 6
8.4
1.5

Summary. Espm. 4 h 26 m 9 s + 65° 53'

Plate No.	Date	a	b	c	d	var.
I 432	Jan. 3, 1890	9.1	9.5	10.2	10.9	9.2
I 3118	Feb. 19, 1891	9.0	9.5	10.2	10.9	10.6

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1890phae.proj..802F

March 30, 1891.

Meas. of Espin's Inspected Var. Dm+68°368.

Plate I 800 taken March 8, 1890

Near edge of plate. Images elongated.	var.	7.7	9.9	1.80	5.00	Plate 3118
	a	6.0	8.5	1.30	1.65	
	b	7.8	10.3	3.00	1.25	
	c	8.6	11.1	1.65	9.00	
		13.4				
		6.9				
		2.5				

Dm+68°368 4 55 21 +68 28

Dm+68 369 4 55 36 +68 19 8.5 8.7

Dm+68° 371 4 56 26+68 18 9.4 10.2 18.9 9.4

Plate I 802 March 8, 1890

var.	7.7	9.9
a	6.4	8.6
b	7.9	10.1
c	8.5	10.7
	14.3	
	7.2	
	2.2	

Plate I 3118 Feb. 19, 1891

var.	7.6	9.7	7.6	9.8
a	7.2	8.8 Rej.	6.4	8.6
b	8.1	10.1	8.0	10.7
c	8.8	10.4	8.7	10.9
	15.7		14.4	
	7.8		7.2	
	1.6		2.2	

Images hazy.

Sommary Espin's Inspected var. Dm+68° 368.

Plate No.	Date	a	b	c	var.
I 800	March 8, 1890	8.5	10.3	11.1	9.9
I 802	March 8, 1890	8.6	10.1	10.7	9.9
I 3118	Feb. 19, 1891	8.6	10.2	10.9	9.8
		~~8.8~~	~~10.1~~	~~10.4~~	~~9.2~~
I 3393		8.9	9.8	10.1	9.5
I 3424		8.6	10.0	10.4	10.1
I 3530		8.7	10.1	10.9	9.8

Continued on p. 150

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1890phae.proj...802F

March. 30, 1891.

Meas. of Espin's suspected variable Dm. +68° 398.

W.O. Circular No. 30.

Plate I 800 taken March 8, 1890

var	9.4	11.3	3.65	2.20	Dm+68° 398	5 25 22 +68 43 9.3
a	6.1	8.4	10.50	4.75	Dm+68° 401	5 28 44 +68 47 8.4 8.5
b	7.3	9.6	10.25	6.80	Dm+68° 400	5 28 42 +68 53 9.1 9.5 / 9.0
c	7.8	10.1	0.60	0.75		
9.0 d	8.4	10.8	2.75	2.50		

13.4
6.7
2.3

For pos. of Comp. stars meas plate I 3686.

Plate I 803 taken March 8, 1890

var	9.8	11.9
a	6.4	8.5
b	7.4	9.5
c	8.5	10.6
d	9.2	11.3

Image blended.

13.8
6.9
2.1

Plate I 3118. taken Feb. 19, 1891.

var.	9.7	11.7
a	6.5	8.5
b	7.5	9.5
c	8.6	10.6
d	9.2	11.2

14.0
7.0
2.0

Summary Espins sus. var. Dm. +68° 398

Plate No.	Date	a	b	c	d	var.
I 800	March 8, 1890	8.4	9.6	10.1	10.8	11.7
I 803	March 8, 1890	8.5	9.5	10.6	11.3	11.9
I 3118	Feb. 19, 1891	8.5	9.5	10.6	11.2	11.7

Continued on p 151

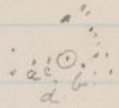
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1890phae.proj..802F

March 31, 1891.

Meas. of Espins ouspl. var. Dm +57° 258 1 10 49 +57 33 8.8

Plate I 1771 taken Sept. 1, 1890.



var.	7.0	10.8	3.00	2.50	Dm. +57° 258	1	10	49	+57 33 8.8
a	6.0	9.8	1.50	2.50	Dm +57 263	1	11	17	+57 33 9.3 9.9
b	6.2	10.0	3.80	2.25	Dm +57 253	1	10	31	+57 39 9.5 10.5
c	7.4	11.2	2.00	2.50	Dm +57 261	1	11	9	+57 33 9.5 10.5
10.3 d	8.5	12.3	2.25	1.60					10.3

19.6
6.5
3.8

Plate I 1793 taken Sept. 4, 1890.

var.	8.0	10.7
a	7.0	9.7
b	7.3	10.0
c	8.5	11.2
d	9.6	12.3

22.8
7.0
2.7

Plate I 2852 taken Jan. 16, 1891.

var.	8.2	10.6
a	7.5	9.9
b	7.8	10.7
c	8.5	10.9
d	9.3	11.7

23.8
7.9
2.4

Summary. Espins ouspl. var. Dm +57° 258.

Plate No.	Date	a	b	c	d	var.
I 1771	Sept. 1, 1890.	9.8	10.0	11.2	12.3	10.8
I 1793	Sept. 4, "	9.7	10.0	11.2	12.3	10.7
I 2852	Jan. 16, 1891	9.9	10.2	10.9	11.7	10.6

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April 1, 1891.

Meas. of Comparison star "C" used for Espin's suspected variable DM. +68° 368.

Plate 800 taken

c	8.1	11.0
d	8.4	10.9
e	9.0	11.5
f	9.3	11.8
	+6.	
	2.2	

Plate 802 taken

c	8.7	10.9
d	8.4	10.6
e	9.1	11.3
f	9.2	11.4

Plate 3118 taken

c	8.7	10.3	10.9
d	8.5	10.1	10.7
e	9.0	10.6	11.2
f	9.1	10.7	11.3
	1.6	2.2	

Summary of Meas of "C"

Plate No.	Date	c	d	e	f
800		11.0	10.9	11.5	11.8
802		10.9	10.6	11.3	11.4
3118		10.9	10.7	11.2	11.3
		+0.3	10.1	10.6	10.7

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April 2, 1891.

Meas. of DM -12° 1172. New Pl. Neb. suspected of Variability
Continued from p. 102.

Plate I 3378 taken April 1, 1891

Pl.neb.	8.6	9.2
a	8.0	8.6
b	8.5	9.1
c	9.2	9.8
9.2	25.7	
	8.6	
	0.6	

Plate I 3379 taken April 1, 1891

Pl.neb.	7.7	9.2
a	7.1	8.6
b	7.7	9.2
c	8.2	9.7
	23.0	
	7.7	
	1.5	

Plate I 3380 taken April 1, 1891

Pl.neb.	6.7	8.9
a	6.1	8.3
b	6.8	9.0
c	8.0	10.2
	20.9	
	7.0	
	2.2	

Plate C 3597 taken March 30, 1891. (Trail scale used).

Pl.neb	5.6	9.3
a	4.6	8.3
b	5.2	8.9
c	6.6	10.3
	16.4	
	5.5	
	3.7	

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April 2, 1891.

Meas. of DM. -12° 1172 (Continued).

Plate C 3603 taken April 1, 1891 (Scale 60 to the inch was used).

Pl. ref.	6.5	9.2
a	5.8	8.5
b	6.3	9.0
c	7.4	10.1
	19 5	
	6.5	
	2.7	

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April 24 1891

Stars used - determ. focal length of 15 cm reflector.

				Dm.				
1a	7h 3m	+89° 3	89° 13		7h 56.0	88° 55' 59"	64' 1"	
1b	21 10	89 35	36		19 84	89 39 59	20 1	
~~2a~~	~~13 5~~	~~89 30~~	~~21~~		~~12 42.4~~	~~89 13 35~~	~~84' X"2'~~	
2b	1 55	89 32	3		3 18.7	89 41 14	18 46	
2a	15 44	89 40	25		13 51.5	89 28 56	31 4	
							49' 50	

15.25
15.26
15.28

~~+5.26 mm = 84' 2"~~

84
5
5040

5.52 49' 50" = 2990" 1" = .01846m 1' = 1.108 mm

9.37 = 84 2 = 5042" 1" = .01858m 1' = 1.1152 mm

1.1115
2223

∴ 1' = 1.111 mm.

focal length = 382 cm

552 | 299 — 1.846 — 6 — 11076
299
2530
2392
1380
1196
1840

937 | 5042 — 1.8558 — 11148
5042
43240
40336
29440
25210
42300

3435
3435
3435
344
3819 62 | 254 — 150.4
254
1279
1270
960

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Plate Pots. F. Rec.

10.00	10.24	10.14	10.00	10.07	10.32
25.25 (15.25)	25.50 (15.26)	25.42 (15.28)	19.35 (9.36)	19.43 (9.36)	19.69 (9.38)
20.00	~~20.13~~ ~~21.02~~ (2006)	20.23			
25.57 (5.57)	25.58 (5.52)	25.75 (5.52)			

June 3, 1891 Pots. Rec. Focal length of 11 in. Proj. 24

Plate C 824.

1 a	15.00	~~24.54~~ (9.54)	15.13	15.40	9.55	9.55 cm. 18 = 504"
1 b	24.54		24.69 (9.56)	24.95		1.894
2 a	20.13		20.00	25.15		1.873
2 b	25.73 (5.60)		25.60 (5.60)	25.74	5.59	5.60 8

1" = .01884 mm

18

955 | 5042 → 1894

5042
45080
40336
47440
45374
20620

560 | 299 → 1.873

299
2610
2392
2140
2093
870

1884.60
1" = 1.1304 mm.
3437
11304
13748
10311
3437
3437
384.5184 8

3885 cm = 15.3 inches

3885 | 254 → 1529 5

254
1345
1270
750
504
2420
2286
1340

153

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April 28, 1891.

Meas. of position of Dm +33° 1911 R.A. 9h 43m 5.8s Dec. +33° 41' 6 9.5

Plate I 33 3/5 For J. W. Backhouse, Sunderland, England.

1	Dm+34° 2038	8/9	h 41	m 23.8	D +34°	17.0	7.8	0.85	18.70	11.149	50.864	m 41	s 12.6	33° 26.1
2	Dm+34° 2039	9	42	3.6	+34	11.3	9.5	4.00	16.90	52.467	45.968	41	11.1	33 25.3
3	Dm+33° 1910	9	42	32.7	+33	56.3	9.5	6.50	11.60	85.259	31.552	41	7.4	33 24.7
Var 4	Dm+33° 1911	9	43	5.8	+33	41.6	9.5	9.90	5.80	129.856	15.776	40	55.9	33 25.8
5	Dm+33° 1912	9	43	19.3	+33	26.6	9.0	15.30	1.15	200.686	3.128	40	58.6	33 23.5
6	Dm+33 1914	9	44	45.2	+33	44.0	9.1	17.25	7.25	226.264	19.720	40	58.9	33 24.3
7	Dm+33 1913	9	44	29.5	+33	59.0	8.5	15.30	12.15	200.686	35.768	41	8.8	33 23.2
8	Dm+34 2047	9	44	31.8	+34	3.8	8.8	15.35	~~15.15~~ 17.15	201.342	46.648	41	10.5	33 17.2
9								12.20	6.30	160.024	17.136			
10								14.15	6.65	185.602	18.088			

÷ .8310

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May 12, 1891.

Meas. of Spectra in Pleiades to compare with those in Memoir on Stellar Photography.

Plate I 489.

V H Class. Refr. Limit K line Intens. 7.

26.1
253
24.7
258
23.5
24.3
23.2
17.2

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May 12, 1891.

Meas. of Spectra in Pleiades for Comparison with Table in Mem. on Stellar Photography.

Plate I 489.

	V	H	Cl.	Rem.	Limit	K line	Intens.	F line	Bo. Table LXIV.	Dif. Reid.	
	11.9	15.0	A		α	?	2		6.6		3
	11.6	16.4	A		S	N	3	F	5.3		3
Cat. No. 62	12.1	14.5	A		α	K=.5V	2		6.4		3
	12.3	15.1	A		S	N	4	F	4.5	5.5 -10 +1	3
	12.7	15.5	Ho		He	N	1		6.8 7.2		3
	12.7	16.0	A		α	N	2		6.5		3
	12.7	17.5	A		α	K=.9 He	2		6.3		3
Cat. No. 77	12.8	15.6	A		α	K=.2 He	2	F	5.9	2nd 5.0	3
	12.9	14.6	A		S	N	3	F	5.0	6.1 -11 0	3
410.2; 434.2	12.9	15.7	F	R	K	K=He	2		5.7		3
Cat. No. 53	13.1	15.6	A		ε	N	3		5.6	6.7 -11 0	3
Cat. No. 81	13.2	14.5	A		S	N	3	F	5.5	6.7 -12 -1	3
410.4; 434.4	13.3	15.0	F	R	β	K=He	3	F	5.5	6.4	3
	13.3	14.8	A		α	K=.8 He	2		2nd 5.8 6.7		3
Cat. No. 52	13.4	15.6	A		ε	N	3		5.7	6.7 -10 +1	3
	13.4	16.2	A		S	N	5	F	B	4.2	3
Cat. No. 86	13.5	14.0	A		γ	N	3	F	5.5	6.6 -11 0	3
	13.7	14.9	A		γ?	?	5	F	B	3.8	3
Spectra superposed	13.8	14.9	A		S	N	4	?	B	5.1	3
410.5; 434.5	13.6	15.8	AF	R	α	K=He	1		6.6		3
	13.6	16.4	A		α	N	2		6.2		3
	13.6	16.6	A		β	N	2		6.2		3
	13.7	16.9	A		ε	N	5	F	B	3.8	3
Spectrum burned out.	13.7	15.6	A?	R					B	3.0	3
	13.8	15.7	A		γ	N	3	F	5.1		3
410.8; 434.8	14.0	16.2	A	R	α	K=He	2		6.1		3

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	D.M. No.	R. A.	Dec.	Mags.	D.M.	D.C.	1900 R.A.	1900 Dec.	Mag.	bl.	
h m		h m					h				
3 40.2 +22 50	+22° 565	3 40.2	+22 49	8.5	—		3 42.8	+22 58			
3 37.3 +22 45	+22° 545	" 37.3	+22 42	8.0		2134	3 39.9	+22 51	6.18	A	
3 41.2 +22 53	+22° 573	" 41.1	+22 54	8.4	✓	—	3 43.7	+23 3			148
3 39.8 +22 58	+22° 563	" 39.8	+22 59	6.9	✓	2169	3 42.5	+23 8	5.13	A	
3 39.0 +23 8	+23° 542	" 39.0	+23 9	8.2	✓	—	3 41.7	+23 18			
3 38.0 +23 9	+23° 524	" 38.0	+23 10	8.4	✓	—	3 40.6	+23 19			
3 35.0 +23 9	+23 496	" 35.1	+23 12	8.4		—	3 37.7	+23 21			1
3 38.9 +23 15	+23 539	" 38.9	+23 15	8.0	✓	—	3 41.6	+23 24			34
3 41.1 +23 15	+23 563	" 41.1	+23 16	7.2	✓	2187	3 43.8	+23 25	5.13	A	
3 38.8 +23 16	+23 535	" 38.7	+23 16	7.9	✓	—	3 41.4	+23 25			26
3 38.9 +23 20	+23 537	38.8	+23 21	7.5	✓	2158	3 41.5	+23 30	6.18	A	
3 41.5 +23 25	+23 569	" 41.4	+23 24	7.5	✓	2190	3 44.1	+23 33	5.86	A	
3 41.1 +23 15	+23 563	" 41.1	+23 16	7.2							
3 40.2 +23 30	+23 556	" 40.3	+23 25	7.0	✓	—	3 43.0	+23 34			41
3 40.8 +23 32	+23 559	" 40.6	+23 27	8.4	✓	—	3 43.3	+23 36			47
3 38.9 +23 28	+23 538	" 38.8	+23 28	7.5	✓	—	3 41.5	+23 37			
3 37.8 +23 30	+23 522	" 37.7	+23 29	4.3	✓	2144	3 40.4	+23 39	4.37	A	
3 42.0 +23 30	+23 570	" 42.3	+23 31	7.3	✓	2196	3 45.0	+23 40	6.13	A	
3 40.8 +23 35	+23 557	" 40.6	+23 36	4.0	✓	2178	3 43.3	+23 45	4.00	A	
3 40.9 +23 40	+23 558	" 40.6	+23 42	6.2	✓	—	3 43.3	+23 51			42
3 38.3 +23 30	+23 528	" 38.3	+23 33	8.3	✓	—	3 41.2	+23 42			25
3 37.2 +23 33	+23 517	" 37.2	+23 33	8.2	✓	—	3 39.9	+23 44			
3 36.9 +23 32	+23° 510	" 36.8	+23 35	8.2	✓	—	3 39.5	+23 44			
3 36.9 +23 38	+23 507	" 36.3	+23 39	4.7	✓	2125	3 39.0	+23 48	4.03	A	
3 39.0 +23 35	+23° 541	" 38.9	+23 39	3.2	✓	2160	3 41.6	+23 48	3	A	33
3 38.8 +23 36	+23 536	" 38.8	+23 39	8.0	✓	2155	3 41.5	+23 48	6.23	A	
3 37.9 +23 44	+23 520	" 37.7	+23 44	8.1	✓	—	3 40.4	+23 53			19

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May 12, 1891.

Plate I 489 Continued.

		V.	He.	bl.	Rem.	Limit	K Line	Int.	F Line	Obs Br.	Mag Diff XIV.	Diff Paired	
		√	14.1	14.5	A	α	H	1		6.8			3 4
Cat. No.		√	14.1	14.7	A	α	H	2		6.1			3 4
54	√	√	14.1	15.6	A	β	H	3		5.4	6.5	-11	0 3 3
37	√	√	14.1	16.1	A	β	H	2		5.7	7.0	-13	-2 3 3
		√	14.1	16.8	A	He	H	1		6.8			3
11	√	√	14.1	16.9	A	S	H	4	F	4.6	5.2	-6	+5 3
78	√	√	14.3	14.5	A	β	H	2	F	5.8	7.1	-13	-2 3
73	√	√	14.4	14.8	A	γ	H	3	F	5.2	6.3	-11	0 3
*		√	14.4	14.9	A	ζ	H	2	6.2	6.4			3
63	√	√	14.3	15.1	A	β	H	3	F	5.6	6.6	-10	+1 3
		√	14.3	15.2	A	He	H	1		6.7			3
		√	14.3	16.4	A	S	H	4	F	B	4.0		3 3
		√	14.3	16.5	A	β	H	3	F	5.7			3 3
		√	14.4	17.1	A	α	K=He √	2		6.5			3
		√	14.4	17.5	A	α	H	2		6.4	(7.5)	-11	3
		√	14.5	16.6	A	K	K=He √	1		6.9			3
		√	14.5	16.7	A	S	H	4	F	B	4.4		3 3
83	√	√	14.6	14.3	A	β	H	3	F	5.8	7.1	-13	-2 3
44	√	√	14.7	15.8	A	γ	H	3	F	5.3	6.6	-13	-2 3
31	√	√	14.7	16.3	A	ζ	H	3	F	5.1	6.3	-12	-1 3
29	√	√	14.7	16.4	A	ζ	H	3	F	4.9	5.7	-8	+3 3
		√	14.7	17.4	A	α	K=4 He √	2		6.3			3
410.6; 434.6			14.8	13.7	F?	R	K	1		6.9			3
50	√	√	14.8	15.7	A	α	H	2		6.0	7.3	-13	-2 3
		√	15.0	15.6	A	α	H	2		6.6			3
410.3; 434.3		√	15.0	14.4	F?	R	K	1		7.2			3
		√	15.3	15.9	A	α	K=He √	2		6.5			3
Cat. No. 14			15.3	16.8	A	S	H	4	F	4.7	5.6	-9	+2 3
			15.7	15.3	K	He	H	2		6.6			3
410.4; 434.4			15.9	16.5	F?	R	K	1		6.9			3

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Obs	Reg.			
6.4	5.7	−7	6.9	+5
7.5	6.0	−15	7.2	−3
9.0	7.3	−17	8.5	−5
9.2	8.1	−11	9.3	+1
321	271	12		±35
8.0	6.8	43	7.1	+7
		14	7.4	−1
			8.7	−3
			9.5	+3

Var in Luang. Approx Magn.

1841	7.5
2192	9.2
1981	7.3
417	7.1
1875	6.8
2000	7.2

						Mag		D.C.	R.a. Dec.	Magn.	Cl.	
3 41.5	+23 45					8.5	✓	—	3 44.0 +23 55			
3 41.0	+23 48					7.8	✓	2182	3 43.5 +23 57	6.44	A	
3 39.0	+23 52					7.0	✓	—	3 41.6 + ~~23 60~~ 24 0			
3 37.8	+23 45					[illegible]	✓	—	3 40.5 +23 57			
3 36.5	+23 50					~~8.5~~ 8.9		—	3 39.2 +23 57			
~~3 37.3~~	~~+23 55~~											
3 36.1	+23 50					6.5	✓	2123	3 38.9 +23 59	5.37	A	
~~3 37.2~~	~~+23 53~~											
3 41.2	+23 55					7.9	✓	2188	3 44.0 +24 3	6.39	A	
3 40.9	+23 56					~~7.0~~ 7.5	✓	2179	3 43.4 +24 5	5.97	A	
3 40.9	+23 56					8.0	✓		3 43.4 + ~~23 66~~ 24 6			
3 39.9	+23 55					7.8	✓	2170	3 42.6 +24 3	6.26	A	
3 39.6	+23 50					8.5	✓	—	3 42.3 + ~~23 61~~ 24 1			
3 37.3	+23 55					1.8	✓	2133	3 39.9 +24 4	4.17	A	
3 37.2	+23 53					8.1	✓	—	3 39.7 + ~~23 62~~ 24 2			
3 35.9	+23 56	[illegible]			+23 56	8.7		—	3 38.5 + ~~23 65~~ 24 5			4
3 35.2	+23 55	+23 49.5	3 35.1	+23	55	8.3	✓	—	3 37.8 + ~~23 64~~ 24 4			
3 37.0	+24 1	+24 55.0	3 36.9	+2~~3~~4	1	8.8		—	3 39.~~8~~6 + 2~~3~~4 10			12
3 36.7	+24 1	+24 54.7	3 36.6	+24	1	5.0	✓	2128	3 39.3 +24 10	4.72	A	
3 42.0	+24 3	+24 57.8	3 41.8	+24	3	7.7		2194	3 44.5 +24 12	6.39	A	
3 38.4	+24 5	+24 56.2	3 38.4	+24	4	7.5		2149	3 41.1 +24 13	6.34	A	
3 37.4	+24 5	+24 55.6	3 37.4	+24	4	7.0	✓	2138	3 40.1 +24 13	6.14	A	
3 37.3	+24 8	+24 55.3	3 37.3	+24	6	7.0	✓	2137	3 40.0 +24 15	5.74	A	
3 35.2	+24 6	+24 54.0	3 35.4	+24	6	8.0		—	3 38.1 +24 15			3
3 42.8	+24 5	+24 58.4	3 42.8	+24	5	8.9		—	3 45.5 +24 13			56
3 38.9	+24 8	+24 56.6	3 38.8	+24	8	8.0	✓	—	3 41.5 +24 17			
3 38.9	+24 10	+24 56.7	3 38.8	+24	12	8.6	✓	—	3 41.6 +24 21			
3 41.8	+24 12	+24 57.7	3 41.6	+24	13	9.0		—	3 44.3 +24 22			53
3 38.2	+24 20	+24 56.3	3 38.4	+24	22	8.4		—	3 41.1 +24 31			23
3 36.7	+24 20	+24 54.6	3 36.5	+24	23	6.3		2126	3 39.2 +24 32	5.38	A	
3 39.3	+24 30	+24 57.1	3 39.5	+24	32	7.0		—	3 42.2 +24 41			
3 36.6	+23 45	+23 50.9	3 36.5	+23	15	8.6			[illegible]			9

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Hm. Va.	h. m. R. A.	Dec.	Mag									
3 41.5 +23 45	+23° 56′	3 41.3	+23° 46′	8.5	✓	—	3 44.0+23 55					
3 41.0 +23 48	+23 56	3 40.8	+23 48	7.8	✓	2182	343.5	+23 57	6.44	A		
3 39.0 +23 52	+23 54	3 38.9	+23 51	7.0	✓	—	3 41.6	+23 60				
3 37.8 +23 45	+23 52	3 37.8	+23 48	8.0	✓	—	3 40.5	+23 57				
3 36.5 +23 50	+23 50	3 36.5	+23 48	8.3 8.9	—		3 39.2	+23 57				
~~3 37.3 +23 55~~	~~+23 51~~	~~3 37.2~~	~~+23 53~~	~~7.8~~								
3 36.1 +23 50	+23 50	3 36.2	+23 50	6.5	✓	2123	3 38.9	+23 59	5.37	A		
~~3 37.8 +23 53~~	~~+23 52~~	~~3 37.0~~	~~+23 53~~	~~8.1~~								
3 41.2 +23 55	+23 57	3 41.3	+23 54	7.9	✓	2188	3 44.0	+24 3	6.39	A		
3 40.9 +23 56	+23 56	3 40.7	+23 56	7.5	✓	2179	3 43.4	+24 5	5.97	A		
3 40.9 +23 56	+23 56	3 40.7	+23 56	7.5	✓		3 43.4	+24 6				
3 39.9 +23 55	+23 55	3 39.9	+23 54	7.8	✓	2170	3 42.6	+24 3	6.26	A		
3 39.6 +23 50	+23 54	3 39.6	+23 52	8.6	✓	—	3 42.3	+24 1				
3 37.3 +23 55	+23 51	3 37.2	+23 53	7.8	✓	2133	3 39.9	+24 4	4.17	A		
3 37.2 +23 53	+23 52	3 37.0	+23 53	8.1	✓	—	3 39.7	+24 2				
3 35.9 +23 56	+23 56	3 35.8	+23 56	8.7	—		3 38.5	+24 5				
3 35.2 +23 55	+23 49	3 35.1	+23 53	8.3	✓	—	3 37.8	+24 4				
3 37.0 +24 1	+24 55	3 36.9	+24 1	8.8	—		3 39.6	+24 10				
3 36.7 +24 1	+24 54	3 36.6	+24 1	8.0	✓	2128	3 39.3	+24 10	4.72	A		
3 42.0 +24 3	+24 57	3 41.8	+24 3	7.7		2194	3 44.5	+24 12	6.39	A		
3 38.4 +24 5	+24 56	3 38.4	+24 4	7.5		2149	3 41.1	+24 13	6.34	A		
3 37.4 +24 5	+24 55	3 37.4	+24 4	7.0	✓	2138	3 40.1	+24 13	6.14	A		
3 37.3 +24 8	+24 55	3 37.3	+24 6	7.0	✓	2137	3 40.0	+24 15	5.74	A		
3 35.2 +24 6	+24 54	3 35.4	+24 6	8.0	—		3 38.1	+24 15				
3 42.8 +24 5	+24 58	3 42.8	+24 5	8.9	—		3 45.5	+24 13				
3 38.9 +24 8	+24 56	3 38.8	+24 8	8.0	✓	—	3 41.5	+24 17				
3 38.9 +24 10	+24 56	3 38.8	+24 12	8.6	✓	—	3 41.6	+24 21				
3 41.8 +24 12	+24 57	3 41.6	+24 13	9.0	—		3 44.3	+24 22				
3 38.2 +24 20	+24 56	3 38.4	+24 22	8.4	—		3 41.1	+24 31				
3 36.7 +24 29	+24 54	3 36.5	+24 23	6.3		2126	3 39.2	+24 32	5.38	A		
3 39.3 +24 30	+24 57	3 39.0	+24 32	7.0	—		3 42.2	+24 41				
3 36.6		3 36.5		8.6			3 39.2	+24				

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1890phae.proj..802F

May 27, 1891

Measures of Brightness of DM. +33° 1911 for
T. W. Backhouse, Sunderland, England. (Rep. 112.).

Plate I 788 taken March 7, 1890

				Mags.	Cor. Mags.
1	6.5	8.1	DM. +34° 2038	7.8	7.8
2	8.1	9.7	DM +34° 2039	9.5	10.5
3	8.6	10.2	+33° 1910	9.5	10.5
4	9.4	11.0	+33° 1911	9.5	10.5
5	7.5	9.1	+33° 1912	9.0	9.3
6	7.7	9.3	+33° 1914	9.1	9.5
7	7.6	9.2	+33° 1913	8.5	8.7
8	8.0	9.6	+34° 2047	8.8	9.0
9	9.3	10.9			
10	9.4	11.0			

680 / 7 = 9.71

9.7 − 8.1 = 1.6

569 / 7 = 8.13

Plate I 3323 taken March 25, 1891.

Knowledge & Plate Images

1	6.4	8.1
2	7.6	9.3
3	8.4	10.1
4	9.3	11.0
5	7.4	9.1
6	7.6	9.3
7	7.4	9.1
8	8.0	9.7
9	9.2	10.9
10	9.3	11.0

9.7 − 8.0 = 1.7

557 / 7 = 7.96

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May 27, 1891.

Plate I 3510 taken April 28, 1891.

1	7.0	8.5
2	8.0	9.5
3	8.5	10.0
4	9.9	11.4
5	7.3	9.0
6	7.8	9.3
7	7.5	9.0
8	8.0	9.5
9	9.0	10.5
10	9.3	10.8

9.7
8.2
1.5

57.2/7 = 8.17 ~~= 8.18~~

Plate I 1315 taken June 18, 1890.

1	6.5	8.4
2	7.7	9.6
3	8.1	10.0
4	9.3	11.2
5	7.3	9.2
6	7.5	9.4
7	7.2	9.2
8	7.5	9.4
9	8.5	10.4
10	8.8	10.7

9.7
7.8
1.9

54.5/7 = 7.79

Summary

Plate	Date
788	March 7, 1890
3323	March 25, 1891
3510	
3515	

1	2	3	4*	5	6	7	8	9	10
8.1	9.7	10.2	11.0	9.1	9.3	9.2	9.6	10.9	11.0
8.1	9.3	10.1	11.0	9.1	9.3	9.1	9.7	10.9	11.0
8.5	9.5	10.0	11.4	9.0	9.3	9.0	9.5	10.5	10.8
8.4	9.6	10.0	11.2	9.2	9.4	9.2	9.6	10.4	10.7

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1890phae.proj...802F

15

June 3, 1891

Measures of New Variable in Sagittarius (No. 2.
(approx. 1900) R.A. 19h 52m.0 Dec. −42° 9'

Dec Plate 3579.

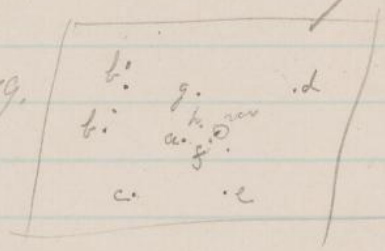


Plate B 3579 taken.

			x	y										
	var.	6.5	9.4	+10.30	+6.40	2794	19.24	—	19 51.8	− 42° 7'		2.8	19	54.6 48
	a	6.2	9.1	+8.60	+6.10	2.322	18.30	2083	19 50 37	− 42 10	9	2.3	18	54.6 48
9.2 6.3 2.9	b	6.3	9.2	+1.60	+6.85	0.482	20.55	2157	19 54.1 27	− 42 13	9	0.4	21	54.5 48
	b'	6.4	9.3	+2.05	+9.25	0.553	29.55	2152	19 54.0	− 42 22	9½	0.6	30	54.6 48
	c	6.4	9.3	+5.00	+1.20	1.349	3.60	(1900)	53.3	− 41 52	275 9.2	1.3	4	54.6 48
	d	6.9	9.8	+14.80	+10.35	3.996	31.05	"	50.6	− 42 19		4.0	31	54.6 48
	e	7.6	10.5	+12.40	+1.65	3.348	4.95	"	51.3	− 41 53		3.3	5	54.6 48
	f	8.0	10.9	+9.90	+6.20	2.673	18.60	"	51.9	− 42 07		2.7	19	54.6 48
	g	8.7	11.6	+8.85	+8.50	2.389	25.50	"	52.2	− 42 13		2.4	25	54.6 48
	h	9.3	12.2	+9.35	+6.50	2.524	19.50	"	52.1	− 42 8		2.5	20	54.6 48
														54.6 41 48

Plate B 3427 (Spectra) taken

	var.	7.3	9.1
9.2 1.4 1.8	a	7.5	9.3
	b	7.4	
	b'	7.5	9.2
	c	7.4	9.3
	d	N.S.	—
	e	N.S.	—
	f	N.S.	—
	g	N.S.	—
	h	N.S.	—

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1900phee.proj.0025

June 15, 1891.

Meas. of Neov Var. Sagittarius (No. 2) Continued.

Plate B 3629 taken

var.	5.2	9.3
a	5.0	9.1
b	5.1	9.2
b'	5.2	9.3
c	5.2	9.3
d	5.6	9.7
e	6.4	10.5
f	6.9	11.0
g	7.9	12.0
h	8.4	12.5

9.2
5.1
4.1

Plate B 3731 taken

var	5.3	10.0
a	5.4	9.1
b	5.4	9.1
b'	5.7	9.4
c	5.6	9.3
d	6.0	9.7
e	6.5	10.2
f	7.1	10.8
g	8.2	11.9
h	8.6	12.3

9.2
5.5
3.7

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1890phae.proj..802F

June 15 1891.

Meas. of Nova Sag. in Sagittarius (No. 2) Continued.

Plate B 4352 taken

	var.	N.S. Jr. than 10.5	< 12.6
9.2 / 7.1 / 2.1	a	7.0	9.1
	b	7.1	9.2
	b'	7.3	9.4
	c	7.2	9.3
	d	7.7	10.0
	e	8.3	10.4
	f	8.8	10.9
	g	9.8	11.9
	h	N.S.	N.S.

Plate B 5246 taken

	var.	N.S. Jr. th 10.5	< 13.3	Jupiter
9.2 / 6.4 / 2.8	a	6.2	9.0	
	b	6.4	9.2	
	b'	6.5	9.3	
	c	6.4	9.2	
	d	7.3	10.1	
	e	7.8	10.6	
	f	8.4	11.2	
	g	9.3	12.1	
	h	9.8	12.6	

near edge of plate
Images faint

Plate 5246

Var	10.3	13.1	adopt.

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1890phae.proj..802F

June 15th 1891.

Summary of New Var. in Sagittarius (No. 2).

1900 R.A. Dec.

Not in N.a., A.G.C. or F.C.

	Plate	Date	Bad Zl var.	a	b	b'	c	d	e	f	g	h
Spectrum	3427	June 6, 1889	" -	9.1	9.3	9.2	-	9.3	-	-	-	-	-
Chart	3579	June 17, 1889	" "	9.4	9.1	9.2	9.3	9.3	9.8	10.5	10.9	11.6	12.2
"	3629	June 21, 1889	" "	9.3	9.1	9.2	9.3	9.3	9.7	10.5	11.0	12.0	12.5
"	3731	July 5, 1889	" "	10.0	9.1	9.1	9.4	9.3	9.7	10.2	10.8	11.9	12.3
"	4352	Oct. 7, 1889	" "	<12.6	9.1	9.2	9.4	9.3	10.0	10.4	10.9	11.9	N.S.
"	5246	May 21, 1890	" "	~~13.3~~ 13.1	9.0	9.2	9.3	9.2	10.1	10.6	11.2	12.1	12.6
					9.18	9.2	9.3	9.3	9.9	10.44	10.96	11.9	12.40

Oct. 3, 1893 Pl. B 3629 selected for enl. For ident see pl. B 3579

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1890phae.proj..802F

June 15, 1891.

Meas. for position of new Br. line Spectrum.

(Approx for 1900. 13h 36.1m – 66° 56'. ~~24 hr. 0.96 p~~

Identified later as CPD -66 2299 13 35.9 – 66 54 (1900) Magn. 9.0

June 13

~~June~~ Found on Spectrum plate B 3397 taken.

Plate B 3419 taken

	x	y											
Br. line	+5.80	+12.05	29.42	36.15	(1900)	13h	36.3m	–	66°	55'		2.9	36
					(1900)		34.2						
a =	+9.90	+21.45	51.09	64.35	1942	13	32	16	-67	15 (23)	8½	5.1	64 39.3 ~~37.4~~ 19
b =	+13.85	+16.90	71.48	50.70	1813	13	30 (32.1)	9	-67	2 (10)	7½	7.1	51 39.2 19
c =	+2.30	+0.45	1.187	1.35	2144	13	35 (37.4?)	31	-66	11 (19)	8½	1.2	11
							38.0						39.2 66° 19'

Meas. for position of new br. line Spectrum. J.C. 934?

Found on Spectrum Plate B 3375 tak May 30, 1889

Plate B ~~3375~~ 3893 taken

	x	y												
Br. line	+9.45	+3.10	4.052 ~~4.266~~	9.30	934	(1900)	15h	15.8m	–	62°	19'	4.8	9	19.9 10
							15	13.7						
						(1900)		14.4			13			
assumed a =	+13.10	+1.05	5.617	3.15	828		15	12	12	–	62	7	10	5.6 3 19.9 10
to be b =	+6.35	+3.20	2.711	9.60	1020		15	15 (17.2)	2	–	62	14 (20)	9½	2.7 10 19.9 10
J.C. 934. c =	+3.15	+4.75	1.351	14.26	1109		15	16 (18.6)	23	–	62	19 (25)	8½	1.4 14 20.0 11
														19.9 10

Plate B 3893 taken

	x	y	J.C.						
Br. line	~~11.70~~ 6.75	~~3.96~~ 3.55	934?	15h	13m	43'	-62°	14'	9
a	14.85	1.55	828	15	12	12	– 62	7	10
b	8.15	3.55	1020	15	15	2	– 62	14	9½
c	4.90	5.20	1109	15	16	23	– 62	19	8½
d	8.75	2.00	1001	15	14	46	– 62	9	9
e	12.65	4.60	887	15	13	5	– 62	16	10
f	14.05	4.15	852	15	12	29	– 62	15	9

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1890phae.proj..8025

June 29, 1891

Meas. of lines in β Lyrae.

Plate C 3768.

7	40 00	486.2
g	69.15	2341 / 52.1
h	87.60	
H	99.85	
d	107.9 V	

7	4340	
g	72.8 V	
h	91.10	
H	103.20	
d	111.45	

	C 3777	C 3777	
Br. 7	13.79	13.73	6
	13.04	12.98	6
	11.69	11.62	8
	~~10.25~~	11.63	6
	~~11.2~~		
g	10.82	10.76	6

405.7 179 423.8 805 | 9 486.2

405.7 52.1 | 29.4 294 1.8 2270 2352

1 div = 1.8

10. = .01 = .018 .06 = .112 / 450 = 1/4000 = 75 Km

Copy. a meas = 500/Km = 30 cm. 400

150 300

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1890phae.proj..802F

July 14 1891.

Meas. of New Variable in Lacerta.

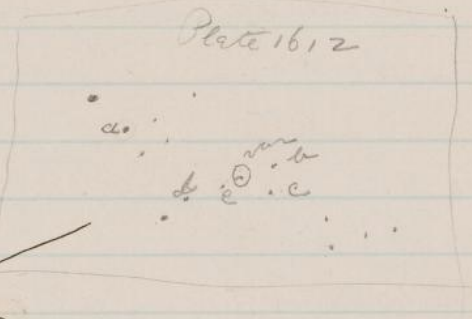
Dm. +39° 4851 Ra 22h 22m.7 + Dec. 39° 34' 8.8 K

Plate I 86 taken

var.	Fk, thn	10.5	<12.8
a	6.8	9.81	
b	7.5	9.8	
c	8.4	10.7	
d	9.5	11.8	
e	10.2	12.5	
	7.6		

Image on very edge of plate. Measures uncertain.

Plate 1612



New Seq. sel. by W.P.D. on I 15388 Aug 8, 1906

Plate I 1612. taken

var.	10,3	12.7	~~Fk 895~~ ~~0.25~~	~~N 5.00~~ ~~8.92~~	1 35.7	~~7.6~~ δ	13,60	Dm+39°4857	1900 22 24.7 + 39 48 22 22.7 +39 34 8.8 K	9.0	21.1	20
a	6,8	9.2	0.25	8.90	3.5		24.10	Dm+39 4842	22 21.1 +39 44 8.8	9.0	21.0	20
b	7.5	9.9	9.20	5.70	2 10.1		15,50	Dm+39°4853	22 23.2 +39 36 9.4	10.2	21.0	20
c	8.2	10.6	9.50	3.90	2 14.4		10,61	~~Dm+39°4854~~	~~22 23.5 + 39 28 9.5~~ 22 23.2 +39 31	~~10.5~~ 9.86		
d	9.2	11.6	3.60	3.50	50.9		9.52	—	— 22 21.8 + 39 30			
e	9.9	12.3	6.30	4.40	1 20.9		11.97	—	— 22 22.3 +39 32			

21.0 20

Sp. Plate I 3802 taken

var.	7.2	9.7
a	6.7	9.2
b	7.5	10.0
c	7.8	10.3
d	N.S.	N.S.
e	N.S.	N.S.

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1890phae.proj...802E

July 14, 1891.

Meas. of New Var. in Lacerta Continued.

Plate I 3810 taken

var.	8.8	9.4
a	8.5	9.1
b	9.3	10.0
c	10.1	10.8
d	N.S.	N.S.
e	N.S.	N.S.

9.9 9.3 / 6 = 9.6 8.9 / .1

Plate I 3840 taken

var.	10.5	9.9
a	9.8	9.1
b	10.5	9.9
c	N.S.	
d	N.S.	
e	N.S.	

9.6 10.2 / -.6

Summary of New Var. in Lacerta DM+39° 4851.

				a	b	c	d	e	var.
Ch.	Plate I 86	Nov. 6, 1889		9.2	9.8	10.5	11.8	12.5	< 12.8
Ch.	" I 1612	Aug 6, 1890		9.1	9.8	10.6	11.4	12.8	12.5
Sp.	" I 3802	July 6, 1891		9.2	10.0	10.3	N.S.	N.S.	9.7
Ch.	" I 3810	July 9, 1891		9.2	10.0	10.8	N.S.	N.S.	9.4
Ch.	" I 3840	July 13, 1891		9.1	9.9	N.S.	N.S.	N.S.	9.9

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1890phae.proj..802F

July 14, 1891.

New. Var. in Perseus No. 1.

br. images Plate I 3186 taken

var. ft. than 10.5 < 11.9

	a	6.8	6.8	8.5
	b	7.2	7.2	8.9
	c	8.5		10.2
9.5 1.8 / 1.1	d	10.8		12.0
	g	9.7		11.4
	f	9.3	9.3	11.0
9.0 7.0 / 2.0	g	8.6	233 / 7.77	10.3

ft. images Plate I 3186

var. ft. than 10.5 < 11.7

	a	7.0	7.0	8.5
	b	7.4	7.4	8.9
	c	8.8		10.3
9.5 8.0 / 1.5	d	10.5		12.0
	g	9.8		11.3
	f	9.5	9.5	11.0
9.0 7.2 / 1.8	g	8.7	239 / 7.97	10.2

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1890phae.proj...802F

July 14, 1891.

New var. in Perseus No. 1.

Plate I 3270 taken

		var. for the 10,5		2128
	a	7.2	7.2	8.7
	b	7.6	7.6	9.1
	c	8.5		10.0
9.5 8.0 1.5	g d	7.5		7
	f e	9.4		10.9
	e f	9.2	9.2	10.7
9.0 1.4 1.6	d g	8.5	240 8.0	10.0

Plate I 3308 taken

		var.		2117
	a	6.4	6.4	8.5
	b	6.8	6.8	8.9
	c	8.0		10.1
9.5 1.4 2.1	g d	9.8		11.9
	f c	9.0		11.1
	e f	8.7	8.7	10.8
9.0 6.6 2.4	d g	8.2	221 7.37	10.3

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1890phae.proj..802F

July 14, 1891.

Rev. Var. in Perseus No. 1.

Plate I 3401 taken

var. faintest 10.5 211.7

	a	6.2	6.2	8.5
	b	6.5	6.5	8.8
	c	8.5		10.8
9.5	d	10.5		12.8
2.3	e	9.4		11.7
	f	9.0	9.0	11.3
9.0	g	8.0	217	10.3
6.4			7.23	
2.6				

Plate I 3541 taken

var. fainter 10.5:

	a	7.5	7.5	8.3
	b	8.0	8.0	8.8
	c	9.4		10.2
9.5	d	lns.		7
8.7	e	10.5		11.3
0.8	f	10.5	10.5	11.3
			260	
9.0	g	9.4	8.73	10.2
7.8				
1.2				

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1890phae.proj...802F

July 14, 1891.

New Var. in Perseus No. 2.

Plate I 3186

Br. Images Var. 9.8

a 6.7
b 7.3
c 8.8
d 9.4

8.7
7.0
1.7

10.32

Plate I 3186

Faint Images Var. 9.9

a 6.9
b 7.7
c 8.9
d 9.4

8.7
7.3
1.4

10.42

Plate I 3270

Var 10.0

a 5.6
b 6.9
c 8.7
d 9.0

8.7
6.2
2.5

10.92

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1890phae.proj..802F

July 14, 1891.

New Var. in Perseus No. 2

Plate I 3308

Var 9.6

5

a 6.9

b 7.1

8.4

8.7 / 6.0 / 2.7

8.6

10.92

Plate I 3401 Too dark to measure. Fogged.

Plate I 3541 Too poor to measure.

DM + 33. 470 New Var. in Triangulum.

Plate I 3188

Var Fainter than 10.5 < 11.41

a 5.0 6.2

b 5.6 6.8

c 7.8 9.0

8.0 / 6.8 / 1.2

9.0 10.2

274

68

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1890phae.proj..802F

July 14, 1891.

Measures of M P 441.

Plate I 3086

Var	9.0	11.1				
a	8.4	10.5				
b	8.5	10.6				
	9.1	11.2	11.11	10.79 =	10.95	.16 .16

10.5
8.4
2.1

Plate I 3189 Badly fogged.

Plate I 3346

Var	8.7	10.9				
a	8.2	10.4				
b	8.4	10.6				
c	8.7	10.9	10.91	10.89 =	10.90	.01 .01

10.5
8.3
2.2

Plate I 3452

Var.	9.2	11.1				
a	8.5	10.4				
b	8.8	10.7	11.01	10.69 =	10.85	.16 .16
c	9.4	11.3				

10.5
8.6
1.9

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1890phae.proj..802F

July 14, 1891.

Measures in P 441.

Plate I 3537 Fogged Too dark to measure.

Plate I 3706 Fogged Too poor to measure.

.0.

Plate I 2718

Var	10.0	11.9	
a	8.5	10.4	
b	8.7	10.6	
c	9.1	11.0	11.79

10.5
8.6
1.9

Dm +33 470 New Var in Triangulum

Plate I 2875

Var.	9.8	10.9	
a	5.5	6.6	
b	6.3	7.4	
~~a~~	7.4	8.5	~~12.49~~ 11.21 ~~10.99~~
~~b~~	8.5	9.6	~~9.47~~

9.0
6.9
11

277
6.9

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1890phae.proj...802F

July 14, 1891.

DM +33 47 New Var in Triangulum

Plate I 2931

Var	9.3	10.6
a	5.3	6.6
b	6.2	7.5
c a	7.1	8.4
f d	8.2	9.5

8.0 / 6.7 / 1.3

11.01 ~~10.72~~

2 6 8 / 6.7

A.G. 6 18770 New Var in Hydra.

Plate B 5364

Var	5.3
a	5.1
b	5.5
c	5.8
d	7.0

Plate B 5413

Var	6.7 / 5.8
a	6.2
b	6.2
c	6.9
d	8.7

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1890phae.proj..802F

July 14, 1891.

A.G.C 18770 New Var. in Hydra.

Plate I 3595 Useless.

Plate I 3677 taken

Var	7.0
a	7.4
b	7.7
c	8.3
d	9.8

Plate I 3788 taken

Var	8.0
a	7.6
b	7.8
c	8.4
d	9.5

DM-5 48 5 8 New Var in Aquila.

Plate I 3794 taken

Var	8.7
a	7.5
b	8.3
c	8.5
d	9.3

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1890phae.proj...802F

July 15, 1891.

New variable in Cygnus DM +48° 2942.

Plate B 1947. Meas. for pos. of Comp Star.

			x	y							
	var		3.25	6.45	0.98	19.35	DM +48 2942	19	39.5 38	+48	26 75 ~~40.5~~ ~~39.~~ 38.5 7
c	x		3.00	7.50	0.90	22.50	— —	19	39.5	+48	29 —
d	x		4.00	7.00	1.20	21.00	— —	19	39.8	+48	28 —
e	x		3.60	6.50	1.09	19.00	— —	19	39.7	+48	26 —
a	x		3.10	9.50	0.93	28.00	DM+48° 2943	19	39.6 35	+ 48	35 80 8.1 ~~40.5~~ ~~39.~~ 38.7 7
8.1 b	x		3.0	2.70	0.92	7.40	DM. +48° 2941	19	39.4 ~~3~~	+ 48	13 80 8.1 40.3 ~~39.5~~ 38.5 6 — 38.6 ~~39.6~~ ~~40.4~~ 7

var. a c d

var. b

Plate I 1495 Taken

Var. fainter 10.5 < 12.4

c	a	7.4	9.3
d	b	8.3	10.2
e	a	8.8	10.7
a	d	6.8	7.7
8.1 6.2 / 1.9 b	c	6.6	8.5

Plate I 1649 taken

Var fainter 10.5 < 11.6

c	d	7.7	8.8
d	b	8.6	9.7
e	a	9.1	10.7
a	d	6.7	7.8
8.1 b	c	7.4	8.5

7.0 / 1.1

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1890phae.proj..802F

July 15 1891

Plate I 1968 taken

Var		6.3	8.3
c	a	7.0	9.0
d	b	8.0	10.0
e	c	8.5	10.5
a	d	5.8	7.8
b	e	6.3	8.3

8.1
6.1
2.0

Plate I 2065 taken

Var		7.3	8.2
c	a	7.7	8.6
d	b	8.6	9.5
e	c	9.1	10.0
a	d	7.0	7.9
b	e	7.4	8.3

8.1
7.2
.9

Plate I 2287 taken

Var.		7.0	8.3
c	a	7.3	8.4
d	b	8.1	9.4
e	c	8.5	9.8
a	d	6.6	7.9
b	e	7.0	8.3

8.1
6.8
1.3

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1890phae.proj..802F

July 15 1891.

Plate I 2415 taken Not cover region.

Var.

Espins New Var in Aurigae. Cir No. 29 W.O
RA 5·32 37 Dec + 31 57

Plate I 2892 taken

Var	7.5	9.5
a	7.0	9.0
b	7.4	9.4
c	8.1	10.1
d	8.9	10.9
e	9.8	11.8

9.5
7.5
2.0

Plate I 3392 taken

Var	8.8	12.0
a	5.6	8.8
b	6.0	9.2
c	7.2	10.2
d	8.5	11.7
e	8.9	12.1

9.5
6.3
3.2

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1890phae.proj..802F

July 15, 1891.

Meas. of Eros var. Dm+68° 398 (2m p 105).

Plate I 3424 taken

var.	9.8	10.7
a	6.0	8.2
b	7.6	9.8
c	8.3	10.5
d	9.3	11.5

9.0 / 6.8 / 2.2

Plate I 3531 taken

var.	9.5	11.4
a	6.5	8.3
b	8.0	9.8
c	8.7	10.5
d	9.5	11.3

9.0 / 7.2 / 1.8

Meas. pr. pos. of Comp. stars. Plate I 3686 taken

var.	9.5	11.3
a	6.4	8.2
b	8.0	9.8
c	8.6	10.4
d	9.7	11.5
e	9.5	11.3

9.0 / 7.2 / 1.8

Plate I 800 already measured

Dm+68°398 5 25 22 +68 43 9.3
Dm+68°401 5 28 44 +68 47 8.4
Dm+68°400 5 28 42 +68 53 9.1

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1890phae.proj...802F

July 15, 1891.

Meas of Espin's var. Dm. +68° 398 (Cont.)

Plate I 3393 taken

var	10.5	12.7
a	6.0	8.2
b	7.5	9.7
c	8.2	10.4
d	9.5	11.7
e	9.1	11.3

9.0
6.8
2.2

Plate I 3530 taken

var	10.5	11.8
a	7.0	8.3
b	8.4	9.7
c	9.0	10.3
d	10.4	11.7
e	9.8	11.1

9.0
7.7
1.3

Plate I 3698 taken

var	10.4	12.4
a	6.3	8.3
b	7.8	9.8
c	9.0	11.0
d	10.5	12.5
e	9.7	11.7

9.0
7.0
2.0

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1890phae.proj..802F

July 15, 1891.

Measures of Espins var ♀ 18 368

Plate I 3390 taken

var	7.5	9.5
a	6.9	8.9
b	7.8	9.8
c	8.1	10.1
d	8.4	10.4
e	8.7	10.7
f	9.0	10.8

9.4
7.4
2.0

Plate I 3424 taken

var	7.5	10.1
a	6.2	8.8
b	7.4	10.0
c	8.4	10.4
d	8.7	10.8
e	8.9	11.5
f	8.9	11.5

9.4
6.8
2.6

Plate I 3536 taken

var	7.4	9.8
a	6.3	8.7
b	7.7	10.1
c	8.5	10.9
d	8.9	11.3
e	9.4	11.8
f	9.4	11.8

9.4
7.0
2.4

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1000phee.proj...80ZF

July 15, 1891

Plate I 3331 taken

var	7.7	9.9
a	6.5	8.7
b	8.0	10.2
c	8.7	10.9
d	9.3	11.5
e	10.1	12.3
f	10.1	12.3

94
7.2
2.2

Plate I 3686 taken

var	7.8	9.6
a	6.8	8.6
b	8.4	10.2
c	9.1	10.9
d	9.6	11.4
e	10.5	12.3
f	10.5	12.3

94
7.6
1.8

Plate I 3698 taken

var	7.6	9.8
a	6.5	8.7
b	8.0	10.2
c	9.0	11.2
d	9.0	11.2
e	10.1	12.3
f	10.3	12.5

Plate badly fogged. Images poor.

94
1.2
2.2

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1890phae.proj..802F

July 15, 1891.

Espins Var. 4 26.2 +65° 54'

Plate I 3402 taken.

var 10.5
a 7.4
b 7.9
c 8.4
d 8.9 12.35

Plate I 3529 taken
var faintest 10.3
a 7.5
b 8.3
c 8.7
d 9.2 < 12.05

Plate I 3658 Fogged. Too poor to measure

July 16, 1891.

Meas fr. pos. of Comp. star for M.P. 441.

Plate I 432.

	x	y		
var	5.70	3.75	Dm +62° 596	3h 29m.4 +62° 10' 66
a	+0.60	+12.20	Dm +62° 602	3 32.0 +62 4 95
b	+0.15	+4.40.	Dm +62° 589	3 27.4 +62 12 95
c	+5.20	+4.40	—	—

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1890phae.proj..802E

July 15, 1891.

Summary of New Var. in Cygnus. DM +48° 2942.

Magnes. to be corrected before being entered.

	Plate	Date	Instrm.	c d e a b ~~a b c d e~~	var.
	B 1971		Bache Tel.		
×	B 1947		" "		
	I 1495		Draper 8in Tel.	9.3 10.2 10.7 7.7 8.5	< 12.4
	I 1649		" " "	8.8 9.7 10.2 7.8 8.5	< 11.6
	I 1968		" " "	9.0 10.0 10.5 7.8 8.3	8.3
	I 2065		" " "	8.6 9.5 10.0 7.9 8.3	8.2
	I 2287		" " "	8.4 9.4 9.8 7.9 8.3	8.3

Oct. 3, 1893 Pl. I 2065 selected for enl. For ident. see pl. I 1330.

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1890phae.proj..802F

July 16, 1891.

Summary of Nov. Var. in Scorpius. A.G.C. 22855. $16^h\,48^m.4 - 44°\,57'$ (1900)

Progress of the corrected ephs. being entered.

Plate	Date	Instrm	var.	1	2	3	4	5
B 3529	June 13, 1889	Bache Tel.						
B 3530	" "	"						
B 3625	June 21 "	"						
B 3637	June 24 "	"						
B 3804	July 13 "	"						
× B 4068	Aug. 22 "	"						

Oct. 3, 1893 Pl. B 3804 selected for enl. For ident. see pl B 3625

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1890phae.proj..802F

July 16, 1891.

Summary of Nov. Var. Star in Sagittarius (No. 1). $20^h\ 9.7^m - 39°\ 29'$ (1900)

	Plate	Date	Instrm.	Var.	1	2	3	4
Ch.	B 3579	June 17 1889	Bache Tel.					
"	B 3614	" 20 "	"	"				
"	B 3629	" 21 "	"	"				
"	B 3844	July 15 "	"	"				
"	B 4354	Oct. 7 "	"	"				
Br. Lines	Sp. B 5196	May 13 1890	"	"	8.5?			

Images to be corrected before being entered.

Oct. 3, 1893 Pl. B 3629 Selected for enl. For ident- see pl B 4068?.

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1890phae.proj..802F

July 16, 1891.

Summary of New Var. in Hydra. A.G.C. 18770 $13^{h}\,41^{m}\,59^{s} - 27^{\circ}\,45'$

Magno to be corrected before being entered.

Plate.	Date	Instru.	var.	a	b	c	d
B 3402	June 4 1889	Bache Tel.					
× B 3545	" 14 "	" "					
B 3725	July 5 "	" "					
B 3791	" 12 "	" "					
B ~~5102~~ 5201	May 6 1890	" "					
B 5308	" 28 "	" "					
5364							
5413							

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1890phae.proj..802F

July 16, 1891.

Summary of DM. +62° 596 : M. P. 441. (Continued from p. 93).

	Plate	Date	Instr.	Cor. & Var.	Corrected Magns. a	b	c	d	e
	I 2718			11.9 = 8.3	10.4	10.6	11.0		
	I 3086			11.1 = 7.5	10.5	10.6	11.2		
Uselessness	I 3189			—	—	—	—		
	I 3346			10.9 = 7.3	10.4	10.6	10.9		
	I 3452			11.1 = 7.5	10.4	10.7	11.3		
Uselessness	I 3537			Est. 10.85 .. ~~9.2~~ 7.3	—	—	—		
Uselessness	I 3706			Est. ~~10.6~~ 11.1 .. ~~7.2~~ 7.4	—	—	—		
	4549			~~< 10.6~~ 11.1 .. ~~< 9.9~~ 7.4					
	4550			< 11.8 .. ~~< 11.7~~ < 8.2					
	4798			< 10.4 .. < 6.8					
	4830			11.60 .. 8.0					
	4947			< 11.1 .. < 7.5					
	5144			11.70 .. 8.1					
	5323			11.65 .. 8.0					
	5397			< 11.1 .. < 7.5					
	5573			12.0 .. 8.4					
	5799			12.15 .. 8.6					
	6106			11.4 .. 7.48					
	6223			11.27 .. 7.6					
	7586			11.9 .. 8.3					
	7594			(11.6) .. (8.0)					
	7649			~~12.0~~ 12.10 .. ~~8.4~~ 8.5					
	7826			12.10 .. 8.5					
	7997			— —					
	8093			11.60 .. 8.0					
	8188			11.50 .. 7.9					
	8534			< 10.6 .. < 7.0					
Cont. in B. 3, p. 193	8563			< 11.1 .. < 7.5					

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1890phae.proj..802F

July 16, 1891.

Summary of Espin's Insp. Var. DM +68° 368.

(Continued from p. 104

Plate	Date	Instr.	var	a	b	c	d	e	f
I 3531		Dreyer 8 in Tel.	9.9	8.7	10.2	10.9	11.5	12.3	12.3
I 3686		" " "	9.6	8.6	10.2	10.9	11.4	12.3	12.3
I 3698		" " "	9.8	8.7	10.2	11.2	11.2	12.3	12.5

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1890phae.proj..802F

July 16, 1891.

Summary of Espin's Susp. Var. Dm. +68° 398.
(Continued from p 105).

Plate	Date	Instr.	var.	a	b	c	d	e
I 3424		Draper 8 in Tel	10.7	8.2	9.8	10.5	11.5	
I 3531		" " "	11.4	8.3	9.8	10.5	11.3	
I 3686		" " "	11.3	8.2	9.8	10.5	11.5	11.3
I 3393		" " "	12.7	8.2	9.7	10.4	11.7	11.3
I 3530		" " "	11.8	8.3	9.7	10.3	11.7	11.1
I 3698		" " "	12.4	8.3	9.8	11.0	12.5	11.7

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1890phae.proj..802F

July 17, 1891.

Summary of New Var. in Calcium $+37^m.1$ (1900) $-38° 26'$.

	Plate	Date	Instr.	var.	a	a'	b	c	d	e	f	g
H	B 4315		Bache Tel.	6.4	5.9	6.7	7.3	9.0	9.7	10.7	11.7	12.1
H	B 4345		"	"	7.7	7.5	8.3	8.9	9.5	10.1	10.9	12.2	N.S.
Sp.	B 4415		"	"	~~6.6~~	~~6.5~~	~~7.0~~	~~7.7~~	~~8.6~~	~~9.6~~	~~10.8~~	~~11.8~~	~~12.2~~
H	B 4493		"	"	6.6	6.5	7.0	7.7	8.6	9.6	10.8	11.8	12.2
H	B 4855		"	"									

Oct. 4, 1893. B 4315 selected for enl. For identif. see pl. B 4493

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1890phae.proj...002F

July 17, 1891.

1900.

Meas. of Rel. Var. in Coelum · RA. 4h 37m.1 Dec. -38° 26'
for Comp. stars see Plate 4493.

H Plate B4315 taken

var.	3,8	4.1	6.4
a	3,3	3.6	5.9
b	4.1	4.4	6.7
c	4.7	5.0	7.3
d	6,3	6,7	9.0
e	7.1	7.4	9.7
f		8.8	10.7
g		9.4	11.7
h		9.8	12.1

9.2 − 6.9 = 2.3

c=f · e=f · d=e · h=g · c=d · f=g · a. · b

7.36 7.16 = 7.26 .10 .10

I Plate B4345 taken

var	5.7	7.7
a	5.5	7.5
b	6.3	8.3
c	6.7	8.9
d	7.3	9.5
e	7.5	10.1
f	8.7	10.9
g	10.0	12.2
h	N.S.	N.S.

9.2 − 7.0 = 2.2

7.06 6.86 = 6.96 .10 .10

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1890phae.proj..802F

July 17, 1891.

Sp. Plate B 4415 taken

Hydrogen lines bright—

rav	8.0	
a	7.2	
b	7.9	
c	N.S.	
d	N.S.	
e	N.S.	
f	N.S.	
g	N.S.	
h	N.S.	7.56

Meas. for Comp. stars. H Plate B 4493 taken

rav	3.1	3.4	6.6	8,75	13,80	02.24	41.40		4 38.9 − 38 26		2			38.2	37 48
									4 38.0 − 38 29			41			
a	3.0	3.3	6.5	+1,90	+1,35	00.30	4.05	J.C. 1265	4 38.7 − 37 48		5				
									4 37.8 − 37 57	7		4		37.3	37 47
b	3.5	3.8	7.0	20,75	5.10	05.30	15.30	1077	4 32.9 − 38 2		5				
									4 32.0 − 38 5	7.5		15		37.3	37 50
c	4.2	4.5	7.7	2,25	20,25	00.30	60.75	1271	4 38.8 − 38 44		6				
									4 37.9 − 38 47	9		61		38.5	37 48
d	5.0	5.4	8.6	15.30	12.30	03.90	36.90	1155	4 35.4 − 38 22		3.9				
									4 34.5 − 38 25	9		37		38.4	37 48
e	6.1	6.4	9.6	11.80	15.10	03.01	45.30	1186	4 36.3 − 38 30		3.0				
									4 35.4 − 38 33	9.5		45		38.4	37 48
f	.	7.6	10.8	8.60	16.90	02.19	50.70	1210	4 37.1 − 38 36		2.2				
									4 36.2 − 38 39	9		51		38.4	37 48.
g	.	8.6	11.8	8.20	9.55	02.09	28.65	—	4 37.0 − 38 14		2.1			38.2	37 48
									4 36.1 − 38 17	—		29		38.2	37 48
h	.	9.0	12.7	5.05	14.80	01.28	44.40	—	4 37.8 − 38 29		1.3				
									4 36.9 − 38 32	—		44		38.2	37 48

9.2
6.0
3.2

9.2

6.96 7.06 = 7.01 .05 .05 M.C.S. recompute this star.

See B. 12. p144

Found Nov. 12. 1895 that J.C. 1159 should be J.C. 1157.

−6.85	−12.45
+12.50	−12.70
−6.50	+6.45
+6.55	−1.50
+3.05	+1.30
−0.15	+3.10
−0.55	−4.25
−3.70	+1.00

122
214
116
117
54
2
9
66

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1890phae.proj...002F

July 17, 1891.

H. Plate B 48 V V taken

var.	1	10.5	12.0
a	4.0	4.3	5.8
b b'	4.7	5.0	6.5
c b	5.5	5.9	7.4
d b	7.0	7.2	8.7
e b	.	8.4	9.9
f b	.	9.4	10.9
g f	.	10.2	11.7
h g	.	10.4	11.9

9.2
7.7
1.5

12.05
11.23

48
47
50
48
48
48
48
48
48
48

1226.15 2228.55
2148.00 2273.30
1163.50 1154.55
1172.45 268.50
545.95 232.70
26.85 554.90
98.45 760.75
662.30 179.00

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1890phae.proj..802F

Sept. 4, 1891.

8 Spins Inspected Variable DM +38° 2412
$13^h\ 8^m\ 1^s$ +37° v7.7 (1890.

Plates I 1446 taken July 14, 1890 and
I 3476 taken April 24 1891 show no
evidence of variation in this star therefore
no measures were made. The star is about
9th magnitude on both plates.

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1890phae.proj..802F

October 26, 1891.

Mr. W. M Reed's suspected variable Dm +14° 719
∴ missing

Chart plates, I 719, 2037, 2831 and 4218.
~~I 3963 4148, and 4195~~ examined and star not visible. These plates are poor plates and do not show the faintest Dm. stars, so nothing can be inferred from the stars absence on these plates.

Morehouse - March 18 1922 - has found that the above star is not in the sky - + has asked Dr. Shapley to have early plate examined - It is not on I 518 taken Jan. 20 1890 - This plate shows faint stars - D.W. March 18 1922

Mr. O. C. Wendell's suspected variable
Dm. + 19° 4106 19h 33.2m +19° 52' 9.3.

Chart plates I 3963, 4148 and 4195 examined and star not visible. These are poor plates and do not show the faintest Dm. stars so nothing can be inferred from it absence on these plates.

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1890phae.proj..802F

November 23, 1891.

Stars Not in DM. Astron Nach. Vol. p.

Plate I N-64.

DM +46° 2469 $18^h 18^m 18,5^s$ + 46° 55,6 9,0 A. Not seen on plate. Star in same Dec. Approx R.A. $18^h 17^m,5$ (1855) Can this be the star.

Plate I 4157.

DM. +47° 2795 $19^h 12^m 36,7$ +47° 56,4 8,9. Not seen on plate, a star of the 9th magn, not in DM. ~~follows~~ in same Dec. follows; Approx R.A. $19^h 13^m,3$ (1855) Can this be the star?. Plate I 984 confirms presence of this star.

DM. Wendells note on DM. +9° 1144.

"DM +9° 1144 fol. 1142, 16 secs and is 2' north of it instead of south."

DM +9° 1144 is certainly 2' north of DM +9° 1142 as seen on Plate I 245. This shows an error in the DM. of 4' in dec. which would carry 1144 into Zone +10°.

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January 7, 1892.

Record entered by mistake
on p. 45.

Dm +53° 379 IV Type. Susp. Var.

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1890phae.proj..802F

January. 14, 1892.

99 $0^h\ 25^m.2$ $+57°\ 49'\ 9.0$ (1855).

DM +57° ~~98[illegible] 26.8 Dec +57° 47' 7.1~~ appears on Plate B 2634 and the measure made was ~~4.6~~ 5.1. This would give the magnitude of this star as about 4.5. A plate No. B 2635 was taken about 10 minutes later and on it the star appears very faint in the second and third exposures. Consequently the following plates were examined without however showing any additional evidence of variability. B Series, 65, 71, 75?, 965, 1897, 1921, 2101, 2592, 2635, 2686, and 2690. I Series 232, 412, 424, 717, 846, 872, 908, 1094, 1187, 1208, 1241, 1275, 1290, 1306, 1557, 1805, 1807, 2091, 2532 and 2847.

On plate I 2532 the spectrum seems to be similar to that of the variable star π Geminorum

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1890phae.proj...802F

January 23. 1892.

Espin's Var's. Astron. Nach. Vol. 128, p 235.

a = Dm +36° 3852	20h 0m	23s	+36° 50'	0.5	8.7	}	Epoch 1890
b = Gs-Birm 6159a	20 12	11.5	+49	36.0			
1 Dm +40° 4191	20 23	03.3	+40	22.7	9.5		
2 +40° 4215	20 26	4.3	+40	56.1	9.5		
3 +44° 3543	20 36	48.0	+44	26.1	9.5		
4 +46° 3019	20 37	49.8	+46	30.1	9.2		
v- +40° 4307	20 40	14.8	+40	33.7	9.5		
6 +43° 3749	20 47	21.4	+43	44.5	9.5		
7 +42° 3891	20 47	30.5	+42	41.8	9.5		

In Comparison Plate I 4071 was used.

Plate I 84. No 1. Same Magn. on 4071
2 Same Magn on 4071
3 Reg. not cov. by 4071
5 Same magn on 4071
6 Not seen on 4071 or on this plate
7 Not seen on 4071 or on this plate

Plate I 1893. 3 Same magn on 4071

" I 4046 1 Same magn on 4071
2 Not seen

" I 4070 1 Same Magn. on 4071
2 Same Magn on 4071

over

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1890phae.proj..802F

January 23, 1892.

Espin's Var's (Continued).

Plate I 4072 No. 3 Same magn. on 4071
4 Same magn on 4071
6 Not seen on 4071 or on this plate which shows a large number of very faint stars

" I 4314 1 Same magn on 4071
2 Plate too poor to contain this star
5 Same magn. on 4071

" I 4317 1 Same magn on 4071
2 Plate too poor to contain this star.
5 Same magn on 4071

" I 4430 3 Same magn on 4071
4 Same magn on 4071
6 Not seen on 4071 or on this plate.

" I 4373 3 Plate too poor to contain this star
4 Same magn on 4071
6 Not seen on 4071 or on this plate
b Not seen.

As there seemed to be no evidence of variability in these stars measures were not made.
The plates have not yet been compared for stars "a" and "b" in the list. M. F.

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1890phae.proj...802F

January 29, 1892.

Suspected Variable (Oppert 1900) R.A. 23h 44m.0 Dec. -42° 54'

On Plate 6578 taken in Peru
the spectrum of this star appeared to be peculiar.
It was suspected of variability. Chart plates
3949 taken and 4327 taken
and no evidence of variability was detected.

Suspected Variable
On Plate 6571 taken in Peru Z.C. 615 22h 21m.6 (1900) -30° 45' 9
the spectrum of this star is apparently Md.
It was therefore suspected of Variability. Chart-Plates

3748 taken
3695 "
4083 "
4323 "
4366 "
5410 "

} shown no evidence of variability.

While plate 3695 taken shows a
slight change which is undoubtedly due to the
bad focus & poorness of the image.

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1890phae.proj..802F

February 3, 1892.

Nova Aurigae

Copeland's Nova. Announced by Cablegram Feb. 2, 1892. For chart of comp. stars see fr. 198.

A careful examination of the following plates has been made.

Comparison stars selected from I 5223.

Trail Chart. Plate B 117 taken Nov. 3, 1885
Nova not visible. Companion stars a, c, d, and e clearly shown. plate does not cover region of b.

Op. Plate B 298 taken Jan. 13, 1886
Nova not visible. a, b, c, d and e clearly shown.

Tr. Plate B 308 taken Jan. 14, 1886
Nova not visible. a, b, c, d, e, and f clearly shown

Ch. Plate B 1131 taken Feb. 25, 1887
Nova not visible, a, b, c, d, e, f, g, h and i, k clearly shown
j[l] and k[m] and b[n] visible

Op. Plate B 2133 taken Jan. 5, 1888
Nova not visible. a, b, c, d, e, f, g and h clearly shown.

Ch. I 613 taken Feb. 6, 1890
Nova not visible. a, b, c, d, e, f, g, h and i, k clearly shown
j[l] and k[m] seen, b[n] barely visible.

Ch. Plate I 2292 taken Nov. 19, 1890
Nova not visible. a, b, c, d, e, f, g, h and i, k clearly shown.
j[c] k[m] and b[n] seen

Op. Plate

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February 3, 1892.

~~Copeland's~~ Nova (Continued).

Sp. Plate I 2315 taken Nov. 20, 1890
Nova not visible. a, b, c, d, e, f, g, h and k clearly shown.
j[l] barely visible

Ch. Plate I 2366 taken Nov. 27, 1890
Nova not visible. a, b, c, d, e, f and g. clearly shown.

Ch. Plate I 2405 taken Dec. 2, 1890.
Nova not visible. a, b, c, d, e, f, g, h and i[k] clearly shown
j[l] k[m] seen and k[n] barely visible.

Ch. Plate I 2578 taken Dec. 23, 1890
Nova not visible. a, b, c, d, e, f, g, h and i[k] clearly shown.
j[l] k[m] barely visible

Ch. Plate I 2652 taken Dec. 29, 1890
Nova not visible. a, b, c, d, e, f, g, h, and i[k] clearly shown
j[l] and k[m] seen, k[n] barely visible

Ch. Plate I 2892 taken Jan. 23, 1891
Nova not visible. a, b, c, d, e, f, g, h, and i[k] clearly shown
j[l] and k[m] seen, k[n] barely visible

Ch. Plate I 2922 taken Jan. 26, 1891.
Nova not visible. a, b, c, e, f, g, h and i[k] clearly shown
plate does not cover region of d.
j[l] and k[m] seen.

Ch. Plate I 3064 taken Feb. 13, 1891
Nova not visible. a, b, c, d, e, f, g, h, and i[k] clearly shown.
j[l] and k[m] seen

Ch. Plate I 3392 taken April 8, 1891
Nova not visible. a, b, c, d, e, f, g, h, and i[k] clearly shown.
j[l] and k[m] seen; l[n] barely visible

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1890phae.proj..802F

February 3 1892.

Copeland's Nova (Continued).

Pp. Plate I 3403, taken April 9, 1891
Nova not visible. a, b, c, d, e, f, g and h clearly shown; i barely visible. The spectrum of a star (seen on all the plates) too faint to be contained in the DM, is visible on this plate. It follows the Nova about 5" south 1".

Pps Plate I 4679, taken Nov. 2, 1891
Nova not visible. a, b, c, d, e, f, g, and h clearly shown; i barely visible. K

Ch. Feb. 4 1892.
Plate I 5187 taken Dec. 16, 1891, R.a. Dec. Magn.

	Scale B	Scale A	m					
Nova	3.4	7.5		(Appr. 1855)	5 23	+30 20	4-5
a	3.2	7.1	4.95	DM+32° 1024	5 23 18.4	+32 4.8	4.8
b	4.4	8.5	5.94	DM+31 985 / +32 1027	5 15 18.7	+31 0.2	6.4
c	5.5 / 5.0	9.0	6.60	DM+32 1027 / 31 947	5 23 48.4	+32 11.3	7.5
d	Does not cover region		5.46	DM+30 963	5 29 19.6	+30 23.9	6.0
e	5.0	8.6	5.70	DM+30 898	5 17 51.4	+30 4.2	6.2
f	5.6	9.9	7.64	DM+31 991	5 22 6.9	+31 10	7.8
g	6.8		8.25	DM+30 944	5 26 4.2	+30 29.9	8.2
h		7.6	8.73	DM+30 913	5 20 48.6	+30 19.8	8.7
k i		9.4	—	DM+30 920	5 22 6.3	+30 35.1	9.5

b k
m R
m 8

seen
seen
seen

Images near edge of Plate 5187 and focus bad. Comparison with scale almost impossible.

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February 4, 1892.

Copeland's Nova (Continued).

Ch. Plate 5188 taken Dec. 16, 1891.

	B	A
Nova	3.8	8.0
a	4.2	8.2
b	5.2	8.5
c	4.7	9.0
d	Does not cover region	
e	4.5	8.7
f	5.7	9.5
g	6.8	.
h	.	7.6
k	.	9.5
l		
m		
n	not seen.	

Images near edge of Plate √188 and focus bad. Comparison with scale almost impossible.

Ch. Plate I √223 taken Dec. 17, 1891.

Nova	3.0	7.6
a	3.0	7.8
b	4.4	8.3
c	5.2	8.6
d	4.8	8.4
e	5.3	8.4
f	6.5	.
g	.	7.4
h	.	7.5
k	.	8.5
l		
m		
n	.	seen.

Images not comparable with scale

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February 4, 1892.

Copeland's Nova (Continued).

Ch. Plate I 5421 taken Jan. 20, 1892.

Nova	4.0	8.2
a	3.8	7.9
b	4.6	8.5
c	5.0	8.8
d	does not cover region.	
e	4.5	8.5
f	5.4	9.5
g	6.9*	
h		7.6
k		9.0
l		
m		
n	t not seen.	

Images not comparable with scale

Ch. Plate I 5479 taken Jan. 31, 1892.

Nova	3.8	8.0
a	3.4	7.5
b	3.7	8.0
c	4.5	8.6
d	does not cover region	
e	4.0	8.0
f	5.5	9.2
g	6.5	
h		7.3
k		9.0
l		
m	k	
n	t	barely visible

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February 4, 1892.

Copeland's Nova (Continued).

Sp. Plate I 5504 taken Feb. 3, 1892.
Spectrum contains bright lines and seems to be unlike any star heretofore photographed here. The plate is too poor to use for making an identification of the lines.

Nova	6.5
a	6.4
b	6.9 ~~7.4~~ 7.1
c	7.4
d	7.0
e	7.0
f	8.6

Ch. Plate I 5501 5

	B	A
Nova	5.6	10.0
a	5.7	9.8
b	6.6	
c	7.3	
d	6.4	
e	6.8	
f	8.4	
g	9.2	

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February 4, 1892.

Copeland's Nova (Continued).

Examination of Transit photometer Plates.

Plate M 215 taken Oct. 21, 1891

Swup 5h 10m Nova not visible. χ Aurigae clearly shown
Swup 5h 30m Nova not visible. χ Aurigae clearly shown

Plate M 223 taken Oct. 28, 1891

Swup 5h 10m Nova not visible. χ Aurigae clearly shown
Swup 5h 30 Nova not visible. χ Aurigae clearly shown.

Plate M 227 taken Oct 29, 1891

Swup 5h 10m Nova not visible. χ Aurigae barely visible
Swup 5h 30 Nova not visible. χ Aurigae clearly shown

Plate M 232 taken Nov. 3, 1891

Swup 5h 10m Nova not visible. χ Aurigae clearly shown
Swup 5h 30 Nova not visible. χ Aurigae clearly shown

Plate M 239 taken Nov. 6, 1891

Swup 5h 10m Nova not visible. χ Aurigae clearly shown
Swup 5h 30 Nova not visible. χ Aurigae clearly shown.

Plate M 241 taken Nov. 8, 1891

Swup 5h 10m Nova not visible. χ Aurigae clearly shown
Swup 5h 30 Nova not visible. χ Aurigae clearly shown

Plate M 246 taken Nov. 13, 1891

Swup 5h 10m Nova not visible. χ Aurigae clearly shown.
Swup 5h 30 Nova not visible. χ Aurigae clearly shown.

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February 4, 1892.

Copeland's Nova (Continued).

Plate M 249 taken Nov. 18, 1891.

Sweep 5h 10m Nova not visible. χ Aurigae clearly shown.
Sweep 5 30 Nova not visible. χ Aurigae clearly shown.

Plate M 252 taken Nov. 19, 1891

Sweep 4h 10m Nova not visible. χ Aurigae clearly shown
Sweep 4 30 Nova not visible. χ Aurigae clearly shown

Plate M 256 taken Nov. 20, 1891.

Sweep 4h 10m Nova not visible. χ Aurigae clearly shown
Sweep 30 Nova not visible. χ Aurigae clearly shown

Plate M 259 taken Nov. 24, 1891

Sweep 4h 10m Nova not visible. χ Aurigae clearly shown
Sweep 30 Nova not visible. χ Aurigae clearly shown.

Plate M 263 taken Nov. 30, 1891

Sweep 4h 10m Nova not visible. χ Aurigae not visible. Plate poor.

Plate M 263 taken Nov. 25, 1891

Sweep
Sweep 4h 10m Nova not visible. χ Aurigae clearly shown
Sweep 30 Nova not visible. χ Aurigae clearly shown. Defect near

Plate M 272 taken Dec. 1, 1891

Sweep 5h 10m Nova not visible. χ Aurigae clearly shown
Sweep 5 30 Nova not visible. χ Aurigae clearly shown

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February 4, 1892.

Copeland's Nova (Continued).

Plate M 287 taken Dec. 10, 1891

Sweep 5h 10m Nova visible; fainter than χ Aurigae

Sweep 5 50 Nova visible; fainter than χ Aurigae.

Plate M 290 taken Dec. 11, 1891

Sweep 5h 10m Nova visible; fainter than χ Aurigae

Sweep 5 30 Nova visible; fainter than χ Aurigae

Plate M 294 taken Dec. 13, 1891

Sweep 5h 10m Nova visible; fainter than χ Aurigae.

Plate M 295 taken Dec. 13, 1891

Sweep 5h 30m Nova visible; fainter than χ Aurigae

Plate M 300 taken Dec. 17, 1891.

Sweep 5h 10m Nova visible; ∴ brighter than χ Aurigae

Plate M 304 taken Dec. 18, 1891

Sweep 5h 10m Nova visible; brighter than χ Aurigae

Plate M 305? taken Dec. 18, 1891

Sweep 5h 30m Nova visible; brighter than χ Aurigae

Plate M 307 taken Dec. 19, 1891

Sweep 5h 10m Sweep too poor to contain either object.

Plate M 310 taken Dec. 25, 1891

Sweep 5h 10m Nova visible; brighter than χ Aurigae

Sweep 5 30 Nova visible; brighter than χ Aurigae

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1890phae.proj..802F

4.

February 4 1892.

Copeland's Nova (Continued).

Plate M 312 taken Dec. 30, 1891.

Swap 5h 10m Nova visible; brighter than χ Aurigae
Swap 5 30 Nova visible; brighter than χ Aurigae

Plate M 317 taken Jan. 4, 1892

Swap 5h 10m Nova visible; χ Aurigae not contained in plate
Swap 5 30 does not cover region for these objects

Plate M 319 taken Jan. 5, 1892

Swap 5h 10m Nova visible; brighter than χ Aurigae
Swap 5 30 Nova visible; brighter than χ Aurigae

Plate M 320 taken Jan. 8, 1892.

Swap 5h 10m Nova visible; slightly brighter than χ Aurigae
Swap 5 30 Nova visible; slightly brighter than χ Aurigae

Plate M 323 taken Jan. 9, 1892.

Swap 5 10 Nova visible; slightly brighter than χ Aurigae
Swap 5 50 Nova visible; slightly brighter than χ Aurigae

Plate M 325 taken Jan. 16, 1892,

Swap 5h 10m Nova visible; same magn. as χ Aurigae
Swap 5 50 Nova visible; same magn. as χ Aurigae

Plate M 327 taken Jan. 20 1892.

Swap 5h 30m Nova visible; fainter than χ Aurigae.

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1890phae.proj..802F

Observer M.F.T.
Recorder M.E.S.

Each time plates were read in inverted order

~~January~~ February 5, 1892.

Copelands Nova (Continued).

Comparison of Nova with χ Aurigæ on Harvard Photo. pl.

Plate No.						
M 327?	χ .3 Nova	χ .2 Nova	χ .2 Nova	−.23	1 0 0
· 323	Nova .3 χ	Nova .2 χ	Nova .4 χ	.30	0 1 1
"	" .4 χ	" .3 χ	" .4 χ	.37	0 1 0
· 319	Nova .5 χ	Nova .4 χ	Nova .3 χ	.40	1 0 1
"	Nova .5 χ	.5 χ	" .3 χ	.43	1 1 1
· 312	Nova .5 χ	Nova .3 χ	Nova .4 χ	.40	1 1 0
"	" .5 χ	" .3 χ	" .4 χ	.40	1 1 0
· 305?	Nova .7 χ	Nova .7 χ	Nova .7 χ	.70	0 0 0
· 325	Nova .05 χ	Nova .00 χ	Nova .05 χ	.03	0 0 0
"	" .05 χ	" .05 χ	" .05 χ	.05	0 0 0
· 300	Nova .3 χ	Nova .3 χ	Nova .4 χ	.33	0 0 1
· 310	Nova .4 χ	Nova .5 χ	Nova .5 χ	.47	1 0 0
	" .4 χ	" .4 χ	" .5 χ	.43	0 0 1
· 304	Nova .6 χ	Nova .6 χ	Nova .6 χ	.60	0 0 0
317	Nova visible χ not cent. in region				
307	—	—			
· 320	Nova .3 χ	Nova .3 χ	Nova .3 χ	.30	0 0 0
"	" .2 χ	" .3 χ	" .3 χ	.27	1 1 1
· 295	χ .3 Nova	χ .2 Nova	χ .2 Nova	−.23	1 0 0
· 300	Nova .4 χ	Nova .3 χ	Nova .3 χ	.33	1 0 0
· 294	χ .2 Nova	χ .2 Nova	χ .2 Nova	−.20	0 0 0
· 305?	Nova .6 χ	Nova .4 χ	Nova .3 χ	.43	2 0 1
· 287	χ .4 Nova	χ .3 Nova	χ .3 Nova	−.33	1 0 0
	χ .4 Nova	χ .4 Nova	χ .4 Nova	−.40	0 0 0
· 304	Nova .4 χ	Nova .5 χ	Nova .4 χ	.43	0 1 0
· 290	χ .3 Nova	χ .3 Nova	χ .3 Nova	−.30	0 0 0
	χ .4 Nova	χ .4 Nova	χ .3 Nova	−.37	0 0 1

GEO.

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Plate.								
287.	.37	0 1 1 0 0 0	5.4 5.3 5.3 5.4 5.4 5.4					
290	.33	0 0 0 1 1 0	5.3 5.3 5.3 5.4 5.4 5.3					
294 + 295	.22	0 0 0 1 0 0	5.2 5.2 5.2 5.3 5.2 5.2					
300	.33	0 0 1 1 0 0	4.7 4.7 4.6 4.6 4.7 4.7					
304 + 305	.54	1 1 1 1 0 1 2 2 2 1 1 2	4.4 4.4 4.4 4.6 4.5 4.6					
307			4.3 4.3 4.3 4.4 4.6 4.7					
310	.45	0 1 1 0 0 1	4.6 4.5 4.5 4.6 4.6 4.5					
312	.40	1 1 0 1 1 0	4.5	4.7	4.6	4.5	4.7	4.6	4.60	-1 1 0 -1 1 0
319	.42	1 0 1 1 1 1 ?	4.5	4.6	4.7	4.5	4.5	4.7	4.58	-1 0+1 -1 -1 +1
320	.28	0 0 0 1 0 0 ?	4.7	4.7	4.7	4.8	4.74	7	4.72	0 0 0 1 0 0
323	.33	0 1 1 1 0 1 ?	4.7	4.8	4.6	4.6	4.7	4.6	4.67	0 1 -1 -1 0 -1
325	.04	0 0 0 0 0 0								
327	.23	1 0 0								

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1890phae.proj..802F

February 23, 1891.

Copy from Plate Cover of C 4461.

11 Monocerotis. H.P. 1220.

C 4461 F line bright towards edge of shorter wavelength Feb. 18, 1892.

On plates C 2327, C 2435 and C 1587 F line bright towards edge of shorter wavelength.

March 1, 1892
C 4479 F line bright towards edge of shorter wavelength.

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1890phae.proj...802F

March 1, 1892.

M. 7 ns.

Nova Aurigae. Superficial examination of C Plates. Special ef. to be made later, probably by Miss Maury

2 Prism Plates.

Feb. 4, 1892. C 4403. Dark hydrogen lines slightly broader than in C 4405

Feb. 4, 1892. C 4405 – Dark hydrogen lines narrower than in C 4403

Feb. 4, 1892. C 4409 Image very poor. Dark hydrogen lines apparently slightly narrower than in C 4405 but owing to poorness of image this is uncertain.

Feb. 5, 1892. C 4413. Dark hydrogen lines apparently slightly narrower than in C. 4405.

Feb. 5, 1892. C 4416. Dark hydrogen lines apparently slightly narrower than in C 4413. Dark F of shorter wavelength seems fainter & narrower than in 4413.

Feb. 5, 1892. C 4418 Dark hydrogen lines apparently equal to or slightly ~~wider~~ broader than in 4416.

Feb. 6, 1892. C 4424 Dark hydrogen lines slightly broader than in C 4416. The line F shows a marked difference in width.

Feb. 9, 1892 C 4430. Dark hydrogen lines slightly broader than in C 4424. The image differs markedly from that of 4416 the dark F of greater wavelength being narrower while the other

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Nova Aurigæ

Feb. 9, 1892. C 4430 (Continued). lines show a similar reversion and the bright bands between F and G show a change also.

Feb. 9, 1892. C 4431 Confirms the change shown in C 4430.

Feb. 10, 1892. C 4439 Image very poor. Can scarcely be used for comparison, but F dark & F of greater wavelength seems to have gained in width.

Feb. 12, 1892. C 4441 Dark hydrogen lines apparently broader than in C 4430 G tripple? Two dark components of F almost equal.

1 Prism Plates.

Feb. 15, '92 C 4455 Image too poor to use for comparison

Feb. 13, 1892. C ~~4449~~ 4446 Agrees with C 4447.

Feb. 13, 1892. C 4447 Same as C 4446

Feb. 13, 1892. C 4449 Two components of dark hydrogen lines closer together than in C 4447; Thus the darks lines appear slightly narrower.

Feb. 15, 1892. C 4452 The dark hydrogen lines are apparently slightly broader than in 4447 although the separation of the two components is not so clearly seen and F appears as a single broad dark band.

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March 19 1892.

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C 4459 The dark hydrogen lines are broader than in 4452; this is due to the increased separation between the two components

C 4468 The separation between the two components of the dark hydrogen lines is slightly less than in 4459.

C 4477 Same as 4468.

C 4486 Dark hydrogen lines broader than in 4468. H line triple.

C 4489 Dark hydrogen lines broader than in ~~4486~~ 4468. Separation between two dark components of H and K better shown than in any of the preceding plates with 1 prism. H, K, and ε triple. Lines between K and ε differ the one next K being double in 4489 and single in ~~4486~~ 4468, while the line near ε is single in both photographs. In addition to the triple dark hydrogen lines, an additional narrow line is superposed on the edge of the bright lines K, H and h. This is probably the same as C 4430 taken with 2 prisms.

C 4492 Separation between components of dark hydrogen lines greater than in ~~4486~~ 4468. The lines thus appear broader.

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Nova Aurigae.

C 4498 Same as 4492. Image poor

C 4504 Components of dark hydrogen lines widely separated. The separation shows even better in this plate than in 4489 although the image is much poorer.

C 4511 Same as 4504 except for change in width of bright band between dark K and L.

C 45-23 Image very poor. Dark hydrogen lines apparently tripple?

C 4525 Erythrosin plate; Useless

C 4529 Two faint for Comparison.

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March 19, 1892.

Nova Aurigae.

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C 4525 Erythrosin plate; Useless

C 4529 Two faint for Comparison.

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March 19 1892. Nova Aurigae.

12 45 M

X = χ Aurigae. N = Nova Aurigae. Z = DM +7°1099. Differences

Sweep 1. Disp 2

Date	Plate No	X			N			3			4			5			6		
M	345	-	-	-	.5	.5	.6	.5	.6	.5	.5	.6	.5	.5	.5	.6	.7	.5	.5
	342	-	-	-	.4	.5	.5	.6	.5	.6	.6	.6	.5	.7	.7	.6	.7	.6	.6
	348	-	-	-	.3	.5	*.2	.7	.6	.6	.6	.5	.6	.6	.6	.7	.6	.4	.5
	344	-	-	-	-	-	-	.2	.4	.2	.3	.2	.4	.4	.4	.4	.4 ✓	.5	.4
	350	-	-	-	.5	.7	.6	.6	.7	6	-	-	-	-	-	-	-	-	-
	343	-	-	-	.5	.7	.6	.8	.9	.8	.8	.7	.7	.8	.7	.8	.7	.6	.7
	337	-	-	-	-1	-1	-1	-.3	-.3	-.3	-.4	-.4	-.3	-.2	-.2	.0	-.3	-.1	-.3
	339	.3	.3	.2	0	.0	.0	.1	.1	.1	.0	.0	.2	.3	.1	.2	.3	.3	.2
	336	.0	.0	.0	0	.4 Ov	.1	-	-	-	-	-	-	-	-	-	-	-	-
	341	.4	.3	.4	.2	.2	.2	* .2	.1	.1	.1	.1	.1	.4	.3	.2	.3	.2	.3
	338	-	-	-	*-1	-.1	.0	.0	-.1	-.1	-.2	-.1	-.2	-.1	.0	-.3 .3	.4 Ov	.1	.0
	355	-	-	-	(.4	.5	.4)	-	-	-	-	-	-	-	-	-	-	-	-
	340	.0	.1	.3	.2	.1 *	.2	.3	.4	.3	.4 Ov	.0	.2	.4 1 ✓	.2	.3	.1	.1	.1
	NZ																		
	345	-	-	-	-	-	-	.6	.5	.4 *	.4	.6	.4	.5	.5	.4	.6	.5	.5
	342	-	-	-	-	-	-	.6	.6	.5	.7	.5	.6	.4	.3	.3	.5	.5	.3
	348	-	-	-	-	-	-	.5	.3	.5	.5	.6	.6	.5	.6	.5	.5	.4	.6
	344	-	-	-	-	-	-	.7	.8	.7	.7	.8	.8	.8	.7	.7	.5	.6	.6
	~~350~~																		
	343	-	-	-	-	-	-	.3	.2	.4	.2	.2	.2	.3	.2	.3	.3	.2	.2
	~~337~~																		
	339	-	-	-	1.0	1.0	1.0	1.0	1.0	.9	.8	.9	.8	.8	.8	.6	.7	.8	.7
	~~336~~																		
	341	-	-	-	.9	.9	.9	.9	.9	.9	.7	1.0	.8	.6	.6	.9	.8	.7	.8
	~~338~~																		
	~~355~~																		
	340	-	-	-	.8	.8	.9	.8	.8	.8	.7	.9	.8	.5	.8	.7	.8	.8	.8

3 50

* The image of the Nova in this sweep appears to be defective

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Transit-Photometer Plates.

to be estimated in tenths.

7			8		
.7	.5	.7	–	–	–
.7	.6	.7	–	–	–
.6	.6	.8	.6	.6	.7
.3	.4	.5	.5	.4	.4
–	–	–	–	–	–
.8	.6	.8	.8	.8	.8
.2	–.1	.0	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–.1	.0	.0	0 .0	.0	0
–	–	–	–	–	– Nova not visible on this plate. Another object measured.
–	–	–	–	–	⊖
.5–	.5	.5	–	–	–
.4	.3	.4	–	–	–
.4	.4	.4	–	–	–
.5–	.6	.6	–	–	–
.4	.4	.2	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–

* The image measured on this sweep is probably a defect, and not Nova.

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March 22, 1892.

Meas. of spectra in Pleiades for comparison with Table in Mem. on Stellar Photography.

3.15

Plate I 5289.

	No.	δ	Hg.	Cl.	Rem.	Limit.	Kline	Intens.	Fline.	Obs. Br.	Vol. XIV. Table LXIV	
	1	12.3	11.8	H H		H K	N K=H	1 1	–	{7.0 7.0 / 7.4 7.4}		3
	2	12.1	12.1	a a		H H	N N	1 1	–	7.4 7.6		3
	3	12.3	12.6	K K		K K	K=H	K=H 1 1	–	7.6 7.8		3
	4	12.5	12.7	a		β	N	2	F	5.8		3
	5	12.3	13.0	H H		H H	N N	1 1	–	{7.5 7.3 / 7.9 7.7}		3
	6	12.3	13.2	a		α	N	2	F	6.0		3
	7	12.3	14.1	a K a		H K	N K=H	1 1	–	7.2 7.3		3
410,2; 434,2	8	12.0	14.2	F K a	R F	K K	K=H	K=H 1 1	–	6.8 6.8		3
	9	12.0	14.5	G K G		K K	K=H	K=H 1 2	F –	6.5 6.5		3
	10	12.0	14.7	a		β	N	3	F	5.2		3
	11	12.5	14.5	K K		K K	K=H	K=H 1 1	–	7.8 7.7		3
410,2; 434,1. 410,2,434,1	12	12.2	14.9	G F F		K K	K=H	K=H 1 2	–	6.4 6.3		3
	13	12.0	15.0	H H		H K	N K=H	1 1	–	{7.6 7.5 / 7.8 7.8}		3
	14	12.3	15.1	a a		K K	K=H	K=H 1 2	–	6.5 6.5		3
	15	12.2	15.6	a a		H H	N N	1 1	–	7.3 7.3		3
410,5; 434,5 410,5; 434,5.	16	12.8	12.0	F F	R	K K	K=H	K=H 1 2	–	6.8 6.8		3
410,2; 434,2 410,2; 434,2.	17	12.6	12.8	F F	R	K K	K=H	K=H 1 1	–	6.7 6.8		3
410,5; 434,5 410,2; 434,2.	18	12.6	13.0	F F	R	K K	K=H	K=H 1 1	–	6.9 6.9		3
Cat no 62	19	12.7	13.4	a		δ	N	4	F	4.2	5.5	-13 0 3
	20	13.0	13.7	H H		H K	N K=H	1 1	–	{6.8 6.8 / 7.1 7.2}		3
* 77	21	13.3	12.7	a		γ	N	4	F	4.6 4.0, 4.2	6.1	-15 -2 3
	22	13.1	13.8	H		K	K=H	2	–	{6.2 6.8}		3
	23	13.2	13.9	a		β	N	2	F	5.9		3
410,2; 434,2. dbl.	24	13.3	14.0	F	R	K	K=H	2	F	5.8		3
53	25	13.5	13.9	a		β	N	2	F	5.4	6.7	-13 0 3

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	DM. No.	R.A. 1855 h m	Dec. 1855 ° ′	Magn.	R.A. 1900 h m	Dec. 1900 ° ′	
3 43.2 +22.8	+22° 582	3 43.0	+22° 48	9.0	3 45.6	+22 56	√. 90
3 42.5 +22.7	+22° 578	3 42.3	+22 43	9.3	3 44.9	+22 52	√. 84
3 41.7 +22.8	+22° 574	3 41.4	+22 46	9.4	3 44.0	+22 55	√. 79
3 41.2 +22.9	+22° 573	3 41.1	+22° 54	8.4	3 43.8	+23 3	√. 75
3 40.7 +22.8	+22° 567	3 40.6	+22 49	9.0	3 43.2	+22 58	√. 68
3 40.2 +22.8	+22° 565	3 40.2	+22 49	8.5	3 42.8	+22 58	√. 65
	+22 553	3 38.3	+22 47	9.4			
3 38.5 +22.8	~~+22° 554~~	~~3 38.3~~	~~+22 46~~	~~9.4~~	3 40.9	+22 56	√. (42)
3 38.3 +22.7	+22° 551	3 38.1	+22 40	9.1	3 40.7	+22 49	√. (41
3 37.9 +22.7	+22° 549	3 37.7	+22 41	8.6	3 40.3	+22 50	√. 35
3 37.5 +22.7	+22° 545	3 37.3	+22 42	8.0	3 39.9	+22 51	√. (27
3 37.7 +22.9	+22° 548	3 37.6	+22 54	9.5	3 40.2	+23 3	√. 32
3 36.8 +22.8	+22° 541	3 36.8	+22 45	8.4	3 39.4	+22 54	√. (20
3 36.7 +22.7	+22° 540	3 36.7	+22 40	9.3	3 39.3	+22 49	√. (18
3 36.4 +22.8	+22° 537	3 36.3	+22 49	8.9	3 38.9	+22 58	√. (12
3 35.3 +22.8	+22° 536	3 35.3	+22 46	9.3	3 37.9	+22 55	√. (4
3 42.5 +22.9	+22° 579	3 42.4	+22 59	9.0	3 45.1	+23 8	√. 86
3 41.0 +22.9	+22° 570	3 41.0	+22 56	8.7	3 43.6	+23 5	√. 74
3 40.7 +22.9	+22° 568	3 40.6	+22 57	9.0	3 43.2	+23 6	√. 67
3 39.8 +22.9	+22° 563	3 39.8	+22 59	6.9	3 42.5	+23 8	√. 62
3 39.2 +23.1	+23° 544	3 39.1	+23 6	9.0	3 41.8	+23 15	√. 58
3 41.3 +23.3	+23 563	3 41.1	+23 16	7.2	3 43.8	+23 25	√. 76
3 39.0 +23.1	+23° 542	3 39.0	+23 9	8.2	3 41.7	+23 18	√. 57
3 38.9 +23.2	+23 539	3 38.9	+23 15	8.0	3 41.6	+23 24	√. 56
3 38.8 +23.3	+23 535	3 38.7	+23 16	7.9	3 41.4	+23 25	√. 48
3 38.9 +23.4	+23 537	3 38.8	+23 21	7.5	3 41.5	+23 30	√. 53

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Plate I 5289 (continued)

	No.	Y	H.	Cl.	Rem.	Lemt	K Line.	Intens.	F Lines	Obs. Br.	Vol XIV. Table LXIV		
	26	13.1	14.3	a		β	N	2	–	6.0			3
410,5; 434,5.	27	13.3	15.0	F	R	K	K=H	1	–	6.4			3
Cat No.	28	13.2	15.7	a		α	N	2	F'	5.9			3
86	29	13.9	12.2	a		γ	N	2	F'	5.3	6.6	-1.3 0	3
81	30	13.6	12.6	a		γ	N	3	F'	5.3	6.7	-1.4 -1	3
	31	13.7	13.0	a		α	K=.5H	2	–	6.2			3
410,7; 434,7.	32	13.6	13.1	F	R	β	K=H	2	F'	5.3	6.4	-1.1	3
	33	14.0	13.0	a		?	?	?	–	B	3.8		3
	"	"	"	a		δ	N	2	–	6.2			
* 52	34	13.8	13.9	a	a	β	N	2	–	5.7	5.0 (2nd 5.3 3rd)	6.7	-1.0 +3 3
	35	13.9	14.1	a	a	α	N	2	–	6.2			3
	36	13.7	14.5	a		?	?	?	–	B	4.2		3
	"	"	"	a		γ	N	2	–	6.5			
	37	14.0	14.7	a		β	N	2	F'	5.8			3
	38	14.0	14.9	a		β	N	2	F'	5.9			3
	39	13.7	15.5	F	F	K	K K=H K=H	1	–	7.7	7.4		3
	40	14.4	12.7	a		α	N	1	–	6.6			3
	41	14.5	12.9	a		α	K=.2H	2	F	6.0			3
410,5; 434,5 410,5; 434,5	42	14.3	13.3	F	F R	K	K K=H K=H	1	–	6.7	6.5		3
410,3; 434,3.	43	14.2	13.6	G	F	K	K K=H K=H	1	–	6.8	6.7		3
	44	14.1	13.9	a		?	?	?	–	B	3.0		3
	"	"	"	a		ε	N	2	–	5.7			
	45	14.2	14.0	a		β	N	3	F'	5.3			3
	46	14.2	14.1	a	a	H	H N N	1	–	6.8	6.7		3
54	47	14.5	13.9	a		δ	N	3	F	5.3	6.5	-1.2 +1	3
410,2; 434,2.	48	14.1	14.3	F	F	K	K K=H	1	–	6.8	6.8		3
37	49	14.4	14.4	a		β	N	2	F'	5.6	7.0	-1.4 -1	3
	50	14.3	14.4	a	a	α β	K=H K=H	2	F F	6.1	5.5		
	51	14.3	14.5	H	H H	K	K N K=H K=H	2	1 2	{6.5 7.0}	{6.5 6.9}		

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DM No.	1855 R.A.	1855 Dec.	Magn.	1900 R.A.	1900 Dec.	No.
	h. m.	° ′		h. m. s	° ′	
3 38.1 +23.2	+23°524	3 38.0	+23 10 8.4 ✓	3 40.7	+ 23 19 ✓.	(39
3 36.4 +23.2	+23°509	3 36.5	+23 15 8.6 ✓	3 39.2	+ 23 24 ✓.	(16
3 35.2 +23.2	+23°496	3 35.1	+23 12 8.4 ✓	3 37.8	+ 23 21 ✓.	1
3 42.4 +23.5	+23°570	3 42.3	+23 31 7.3 ✓	3 45.0	+ 23 40 ✓.	85
3 41.6 +23.4	+23°569	3 41.4	+23 24 7.5 ✓	3 44.1	+ 23 33 ✓.	80
3 40.7 +23.4	+23°559	3 40.6	+23 27 8.4 ✓	3 43.3	+ 23 36 ✓.	70
3 40.4 +23.4	+23°556	3 40.3	+23 25 7.0 ✓	3 43.0	+ 23 34 ✓.	66
3 40.7 +23.6	+23°557	3 40.6	+23 36 4.0 ✓	3 43.3	+ 23 45 ✓.	69
	Prismatic Companion				+	
3 39.0 +23.5	+23°538	3 38.8	+23 28 7.5 ✓	3 41.5	+ 23 37 ✓.	52
3 38.7 +23.6	+23°528	3 38.5	+23 33 8.5 ✓	3 41.2	+ 23 42 ✓.	46
3 37.9 +23.5	+23°522	3 37.7	+23 29 4.5 ✓	3 40.4	+ 23 39 ✓.	(36
	Prismatic Companion					
3 37.3 +23.6	+23°517	3 37.2	+23 35 8.2 ✓	3 39.9	+ 23 44 ✓.	(26
3 36.9 +23.6	+23°510	3 36.8	+23 35 8.2 ✓	3 39.5	+ 23 44 ✓.	(21
3 35.4 +23.4	+23°499	3 35.4	+23 25 9.3 ✓	3 38.1	+ 23 34 ✓.	6
3 41.3 +23.8	+23°565	3 41.3	+23 46 8.5 ✓	3 44.0	+ 23 55 ✓.	78
3 40.9 +23.8	+23°562	3 40.8	+23 48 7.8 ✓	3 43.5	+ 23 57 ✓.	73
3 39.9 +23.7	+23°554	3 40.0	+23 44 9.0 ✓	3 42.7	+ 23 53 ✓.	64
3 39.4 +23.6	+23°548	3 39.5	+23 41 9.2 ✓	3 42.2	+ 23 50 ✓.	60
3 39.0 +23.6	+23°541	3 38.9	+23 39 3.2* ✓	3 41.6	+ 23 48 ✓.	55
	Prismatic Companion				+	
3 38.8 +23.7	~~+23° 534~~ +23° 536	3 ~~38.7~~ 38.8	~~+23 41 8.0~~ +23 39 8.0 ✓	3 41.5	+ 23 48 ✓.	51
3 38.8 +23.7	+23°531	3 38.7	+23 40 8.5 ✓	3 41.4	+ 23 49 ✓.	(47
3 38.9 +23.8	+23°540	3 38.9	+23 51 7.0 ✓	3 41.6	+ 24 0 ✓.	54
3 38.3 +23.6	+23°526	3 38.0	+23 39 9.1 ✓	3 40.7	+ 23 48 ✓.	(40
3 38.0 +23.8	+23°523	3 37.8	+23 48 8.0 ✓	3 40.5	+ 23 57 ✓.	37
{ 3 37.6 +23.7	+23 519	3 37.6	+23 44 8.0 ✓	3 40.3 *	+ 23 53 ✓.	33
	520	37.7	44 8.1 ✓	40.4 *	23 53 ✓.	34

* Spectrum of DM +23°534 P.C. Dec. is probably superposed on that of the Prismatic Comp.

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March 22, 1892.

Plate I 5289 (continued)

L.	No.	R.	H	Cl.	Rem.	Limit	K Line	Intens.	F line	Br.	Obs.			
4.00											8h XIV. Table XIV			
	52	14.5	15.0	a		K	K=H	1	–	6.5				3
	53	14.1	15.1	a		?	?	?	–	B	3.8			3
	"	"	"	a		δ	N	2	–	6.2				
Cat. No. 111	54	14.5	15.2	a		γ	N	4	F	4.2	5.2	-10	+3	3
	55	14.2	15.4	a? a		HK	N K=H	1 1	–	6.7	6.9			3
781	56	14.7	12.7	a		γ	N	2	F	5.5	7.1	-16	-3	3
731	57	14.8	13.0	a		γ	N	2	F	5.1	6.3	-12	+1	3
*	58	14.8	13.0	a		β	N	2	F	5.7	2 5.6			3
631	59	14.7	13.4	a		γ	N	2	F	5.4	6.6	-12	+1	3
	60	14.6	13.5	a		β	K=H	2	–	6.2				3
410,5; 434,5.	61	14.6	14.1	F? b R		K	K K=H K=H	1 1	–	7.2	7.3			3
	62	14.7	14.7	a		?	?	?	–	B	4.0			3
	"	"	"	a		γ	N	2	–	6.4				
	63	14.6	14.9	a		γ	N	2	–	5.6				3
	64	14.9	14.9	a?		K	K=H	1	–	6.8				3
	65	14.4	15.0	a		?	?	?	–	B	4.4			3
	"	"	"	a		β	N	1	–	6.6				
	66	14.7	15.4	a		β	K=5H	2	F	5.9				3
	67	14.7	15.7	a		β	K=5H	2	F	5.9				3
410,6; 434,6.	68	15.1	11.9	F? R		K	K=H	1	–	6.5				3
831	69	15.0	12.4	a		γ	K=2H	2	F	5.5	7.1	-16	-3	3
410,6; 434,6	70	15.3	12.1	H F H		K K	K=H K=H	1 2	–	7.6 7.9	6.6			3
410,4; 434,4.	71	15.4	12.5	a F		α	N	1	–	6.8				3
	72	15.4	13.9	a		α	N	1	–	6.4				3
501	73	15.2	14.0	a		β	K=2H	2	F	5.8	7.3	-15	-2	3
441	74	15.0	14.2	a		γ	N	2	F	5.2	6.6	-14	-1	3
311	75	15.1	14.6	a		γ	N	3	F	5.1	6.3	-12	+1	3
291	76	15.1	14.7	a		γ	N	3	F	4.8	5.7	-9	+4	3

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DM. No.	R.A. 1855	Dec. 1855	Magn.	R.A. 1900	Dec. 1900	Obs. No.
3 36.5 +23.7	+23° 508	3 36.5	+23 48 8.9 ✓	3 39.2	+23 57 ✓	15
3 36.3 +23.7	+23° 507	3 36.3	+23 39 4.7 ✓	3 39.0	+23 48 ✓	13
	Prismatic Companion.				+	
3 36.2 +23.8	+23° 505	3 36.2	+23 50 6.5 ✓	3 38.9	+23 59 ✓	11
3 35.8 +23.7	+23° 503	3 35.8	+23 40 9.1 ✓	3 38.5	+23 49 ✓	9
3 41.3 +23.9	+23° 567	3 41.3	+23 54 7.9 ✓	3 44.0	+24 ~~3~~ 2 ✓	77
3 40.9 +23.9	+23° 561	3 40.7	+23 56 7.5 ✓	3 43.4	+24 5 ✓	72
	+23° 560	3 40.7	+23 57 8.0 ✓	3 43.4	+24 6 ✓	71
3 39.8 +23.9	+23° 553	3 39.9	+23 54 7.8 ✓	3 42.6	+24 3 ✓	63
3 39.5 +23.8	+23° 549	3 39.6	+23 52 8.5 ✓	3 42.3	+24 1 ✓	61
3 38.7 +23.8	+23° 529	3 38.5	+23 50 9.2 ✓	3 41.2	+23 59 ✓	45
3 37.3 +23.9	+23° 516	3 37.2	+23 55 4.8 ✓	3 39.9	+24 4 ✓	25
	Prismatic Companion				+	
3 37.2 +23.9	+23° 512	3 37.0	+23 53 8.1 ✓	3 39.7	+24 2 ✓	24
3 37.0 +24.0	+24° 550	3 36.9	+24 1 8.8 ✓	3 39.6	+24 10 ✓	22
3 36.8 +24.1	+24° 547	3 36.6	+~~23~~ 24 1 5.0 ✓	3 39.3	+24 10 ✓	17
	Prismatic Companion.					
3 35.9 +23.9	+23° 504	3 35.8	+23 56 8.7 ✓	3 38.5	+24 5 ✓	8
3 35.1 +23.9	+23° 495	3 35.1	+23 55 8.3 ✓	3 37.8	+24 4 ✓	3
3 42.9 +24.1	+24° 584	3 42.8	+24 5 8.9 ✓	3 45.5	+24 ~~1~~ 3 ✓	89
3 42.0 +24.1	+24° 578	3 41.8	+24 3 7.7 ✓	3 44.5	+24 12 ✓	82
3 42.8 +24.2	+24° 581	3 42.5	+24 9 9.2 ✓	3 45.2	+24 17 ✓	87
3 41.8 +24.2	+24° 577	3 41.6	+24 13 9.0 ✓	3 44.3	+24 22 ✓	81
3 38.9 +24.2	+24° 567	3 38.8	+24 12 8.6 ✓	3 41.5	+24 21 ✓	49
3 38.8 +24.1	+24° 566	3 38.8	+24 8 8.0 ✓	3 41.5	+24 17 ✓	50
3 38.6 +24.1	+24° 562	3 38.4	+24 4 7.5 ✓	3 41.1	+24 13 ✓	44
3 37.5 +24.1	+24° 556	3 37.4	+24 4 7.0 ✓	3 40.1	+24 13 ✓	31
3 37.4 +24.1	+24° 553	3 37.3	+24 6 7.0 ✓	3 40.0	+24 15 ✓	29

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March 22, 1892.

Plate I 5209 (continued)

4.20

No.	δ	H.	Cb.	Rem.	Limit.	K Line.	Intens.	F Line.	Glx. Br.	
77	15.1	15.6	a		β	K=.2 H?	2	F	5.9	3
78	15.7	12.4	a a		H H.	K K	1 1	–	7.8	7.7 3
79	15.7	14.1	a		α	K=.8 H?	2	F	5.9	3
80	15.9	14.9	F F	R	K K	K=H K=H	1 1	–	6.8	7.5 3
81	15.8	14.4	E E		H K	K K=H	1 1	–	7.9	7.5 3
82	15.9	14.8	E E		K K	K=H K=H	1 1	–	7.8	7.4 3
83	15.7	15.0	a		δ	K	4	F	4.4	3
84	15.7	15.2	E E		H K	K K=H	1 1	–	7.9	7.5 3
85	15.8	15.4	H H.		H K	K K=H	1 1	–	7.5 7.9	7.2 7.85 3
86	16.2	11.9	a a		H K	K K=H	1 2	–	6.7	6.6 3
87	16.1	13.6	K		K	K=H	2	–	6.5 6.5	3
88	16.1	14.6	E E		H K	K K=H	1 1	–	7.4	7.5 3
89	16.2	14.7	a a.		H H.	K K	1 1	–	7.0	7.2 3
90	16.2	15.8	a		β	K=.2 H	2	F	5.6	3
			a		β	K=.2 H	3	F	5.3	

4.30

14 ✓

410.5, 434.5
410.5; 434.5.

5.6 – K +1 = 23.2 / 18 = 1.29

2.43 / 19 = 7.28

65a 14.2 13.0 a: a: N E S N N 25 5 B. B.

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DM. No.	1855 R.A.	Dec.	Magn.	1900 R.A.	1900 Dec.	Cat. No.
3 35.5 +24.1	+24°540	3 35.4	+24° 6'	8.0 ✓	3 38.1	+24° 15 ✓.	5
3 42.0 +24.4	+24°579	3 41.9	+24 21	9.3 ✓	3 44.6	+24 30 ✓.	83
3 38.5 +24.4	+24°563	3 38.4	+24 22	8.4 ✓	3 41.1	+24 31 ✓.	43
3 36.8 +24.5	+24°548	3 36.7	+24 28	8.9 ✓	3 39.4	+24 37 ✓.	(19
3 38.0 +24.4	+24 560	3 37.9	+24 25	9.4 ✓	3 40.6	+24 34 ✓.	(38
3 37.2 +24.5	+24°551	3 37.0	+24 27	9.2 ✓	3 39.7	+24 36 ✓.	(23
3 36.6 +24.4	+24 546	3 36.5	+24 23	6.3 ✓	3 39.2	+24 32 ✓.	14
3 36.0 +24.4	+24°545	3 36.0	+24 22	9.4 ✓	3 38.7	+24 31 ✓.	10
3 35.7 +24.4	+24°543	3 35.7	+24 24	8.9 ✓	3 38.4	+24 33 ✓.	7
3 42.9 +24.5	+24° 582	3 42.7	+24 33	9.1 ✓	3 45.4	+24 41 ✓.	88
3 39.4 +24.5	+24°571	3 39.5	+24 32	7.0 ✓	3 42.2	+24 41 ✓.	59
3 37.4 +24.5	+24°558	3 37.4	+24 32	9.4 ✓	3 40.1	+24 41 ✓.	30
3 37.2 +24.6	+24°555	3 37.3	+24 35	9.3 ✓	3 40.0	+24 44 ✓.	(28
3 35.1 +24.6	+24 537	3 35.1	+24 36	7.3 ✓	3 37.8	+24 45 ✓.	2

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Comparison of Nova Aurigae with D.C. 3102.

March 25, 1892.

n = Nova Aurigae.
z = D.C. 3102

Plate No.	Sweeps.	n.		z.		
M 287	3	.2	.3	.2	.23	0 1 0
" 290	4	.1	.2	.3	.20	1 0 1
" 295	1	.5	.4	.5	.47	0 1 0
" 325	4	.8	.7	.8	.77	0 1 0
" 327	1	.7	.7	.6	.67	0 0 1
						.04 a.D.

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March 25 1892

Determination of Focus of 3½ inch doublet, used as Model for Bruce Telescope. 343.7.7

	Ra	Est	sec.	Dm.	Ra	Dec	Diff Ra	sec.	Diff Dec
a	18h 8m		+86.6	Dm +86°	18h 19m	7° +86° 36'	0	4.5	
b	18 11		+79.9	" +79	18 10 58	+79 59.4	8 0.7	6' 36.6	396.6
c	17 38		+84.7	" +84	17 37 3	+84 43.7	7.7		
d	17 30		+80.3	" +80	17 30 40	+80 15.4	6 2.3	4' 28.3	268.3

Plate E 2216

a	27.06	25.17	5.37	5.37 5.38	5.38	46.63
b	32.43	30.56 31.05				
c	28.64	25.77	3.62	3.62	3.62	46.38
d	32.26	29.39				

Plate E 2219

a	27.34	29.23	5.57	5.58 5.58	5.58	48.37
b	32.91	34.81 32.99				
c	25.24	25.89	5.57 3.77	3.77	3.77	48.30
d	29.01 30.84	29.66				

Plate E 2217

a	29.86	26.44	5.50	5.49 5.49	5.50	47.67
b	31.36	31.93 30.13				
c	25.37	26.79	3.69 3.70	3.70	3.70	47.41
d	29.06 30.86	30.49				

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March 25, 1892

Comparison of χ with Nova.

Plate	Sweep.	χ of Nova				II χ^h	I χ^n	$a\chi$	I a_n	
M 287	3	.7	.8	.7		.73	.40	.23	.63	.96
" 290	4	.9	.7	.7		~~.8~~ .77	.37	.20	.57	103
" 295	1	.5	.4	.4		~~.47~~ .43	.23	.47	.70	94
" 325	4	0	0	0		.00	.00	.77	.77	.77
" 327	1	.4	.4	.4	.4	.40	.23	.67	.90	1.07
									357	471
									.70	.95

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March 25, 1892.

Plate No		1st Sweep			2nd Sweep.			1st "	2nd "
M 287	1	.6	.8	.7	.8	.8	.8	.70 1̲10	.80 000
" 290	1	.6	.5	.6	.9	.8	.8	.57 01̲0	.83 100
" 294	1	.4	.3	.3	.	.	.	.33 100	
295	1	.4	.5	.5	.	.	.	.47 1̲00	
300	1	-.5	-.5	-.4	.	.	.	-.47 001	
304	1	-.4	-.5	-.5	.	.	.	-.47 100	
305	1	-.6	-.7	-.7	.	.	.	-.67 100	
310	1	~~-.7~~ -.6		-.6	-.4	-.4	-.4	-.63 1̲00	-.40 000
312	1	-.7	-.7	-.5	-.3	-.5	-.5	-.63 1̲1̲1	-.43 1̲1̲1
319	1	-.4	-.4	-.4	-.5	-.4	-.6	-.40 000	-.50 011̲
320	1	-.3	-.3	-.4	-.3	-.3	-.4	-.33 001̲	-.33 001̲
323	1	-.3	-.4	-.4	-.4	-.5	-.6	-.37 100	-.50 101̲
325	1	0	-.1	-.1	0	.1	0	-.07 100	.03 010
327	1	.4	.5	.4	.	.	.	.43 010	

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1890phae.proj..802F

Obs. M.S.F.
Rec. M.C.S

196

Red ink dots show second images measured.

L
3.00

Transit Photometer Plates

March 30, 1892

Additional Measures of the Nova in Aurigae

as 1st Meas.	Plate No.	1st Sweep	Plate reversed.	2nd Sweep.	Plate Reversed.
No. in L.C.	M320	.4 .4	.4 .4	.4 .5	.3 .4
" U.C.	" 305	.6 .7	.7 .6	. .	. .
" U.C.	" 287	.5 .7	.6 .6	.8 .9	.8 .8
" L.C.	" 312	.6 .8	.6 .5	.5 .4	.4 .5
" L.C.	" 295	.4 .5	.5 .4	. .	. .
" U.C.	" 327	.3 .4	.4 .4	. .	. .
" U.C.	" 319	.5 .5	.5 .5	.5 .7	.6 .5
" L.C.	" 294	.3 .4	.5 .4	. .	. .
" U.C.	" 323	.4 .4	.4 .3	.5 .5	.4 .4
" L.C.	" 310	.6 .6	.5 .5	.5 .4	.5 .5
" U.C.	" 300	.4 .4	.5 .6	. .	. .
" L.C.	" 290	.4 .6	.5 .5	.6 .9	.9 .8
" U.C.	" 325	.2 .1	.1 .2	0 0	0 0
" U.C.	" 304	.6 .7	.6 .7	. .	. .

	1st Sweep.	2nd Sweep.	Combined.
	-.40 0000	-.40 0110	-.40 00000110
	-.65 0110	"	" 0110 .....
	.60 1100	.82 0100	.71 2011 1211
	-.62 0201	-.45 1001	-.54 1310 0110
	.45 0110	"	" 0110 .....
	.38 1000	"	" 1000 .....
	-.50 0000	-.58 1101	-.54 00000210
	.40 1010	"	" 1010 .....
	-.38 0001	-.45 1100	-.41 00011100
	-.55 0011	-.48 0100	-.51 11000100
	-.48 1101	"	" 1101 .....
	.50 1100	.80 2110	.65 2011 0332
	-.15 0110	.00 0000	-.08 1001 1111
	-.65 0101	"	" 0101 .....

$\frac{20-19}{88} = .044$ A.D.

$\frac{27-30}{88} = -.065$ A.D.

4.25

$\frac{5-6}{44}$ $\frac{8-5}{56}$ $\frac{3-4}{32}$ $\frac{4-4}{32}$

-.02 +.06 -.03 .00

-.002 +.006 -.003 .00

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March 31 1892

10 20 Measures by Leahy of Comets of K & Ursae Majoris.

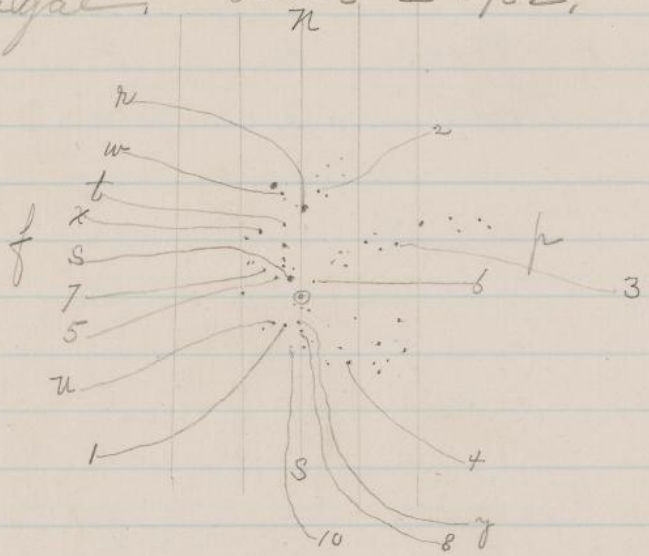
No.	Date,	Ham.,	Sep.
4543	March 16	9	0
4552	" 21	9	0+
4561	" 23	15	1
4566	" 24	10	1
4570	" 25	11	2
4573	" "	12	1
4574	" "	13	2
4575	" "	14	2
4576	" "	16	3
4578	" 26	9	3
4580	" "	10	3.5
4582	" "	~~11~~ 11	2
4583	" 28	12	0
4594	" 29	12	2
4606	" 30	10	5
~~4607~~ 4609	" "	12	4
~~4645~~ 4610	" "	14	4
4614	" 31	10	2
4616	" "	11	3
4619	" "	14	3
4623	April 1	10	0+
4625	" "	12	0+

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March 31, 1892.

Chart of faint stars in region of Nova Aurigae. Plate I 1982.



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1st Est. legible
23.40 ?

April 1, 1892

Estimate of the intensity of the bright lines of Nova Aurigae

Plate I 5557. Measured position of bright lines. Scale of hundredths of inch ruled by Mr. Gerrish, used.

1	239
2	247
3	253
F	259
G	300
3a	313
4	318
h	328
H	344
K	349
α	356
β	364
?	—
δ	377

2nd Est. legible at 1.00

Plate I 5557

1st Est.			2nd Est.		
H	1	G	H	2	G
G	1	h	G	0	h
h	2	F	h	1	K
F	0	K	K	0	F
K	5	4	F	4	4
4	2	α	4	1	3a
α	1	3a	3a	2	α
3a	2	3	α	1	3
3	4	2	3	3	2

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1890phae.proj..802F

✓ Plate I 5557 (cont.)

1st Est.	2nd Est.
3 o β	
1 n.S.	

✓ Plate I 5875.

	1st Est.	2nd Est.
Additional line appears between G and 3o. desig. v. 4 o v.	G 6 h	G 5 h
	h 1 F	h 1 F
	F 2 H	F 3 H
	H 2 3a	H 1 3a
	3a 2 K	3a 2 K
	K o 4	K o v
	4 2 3	v 1 4
	3 1 α	4 3 3
	α 3 2	3 3 2
	1 n.S.	3 o α

✓ Plate I 5605

1st Est.	2nd Est.
G 2 H	G 1 H
H 2 K	H 2 h
K o F	h o F
F 1 h	F 2 K
h 4 4	K 4 4
4 1 3a	4 1 3a
3a 3 3	3a 4 3
3 o α	3 1 2
3 o 2	2 3 1
1 n.S.	3a 1 α
v n.S.	

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1890phae.proj..802F

1st Est.	2nd Est. Plate I 5863
G 5 h	G 5 h
h 2 F	h 1 F
F 3 H	F 3 H
H 0 3a	H 1 3a
3a 1 r	3a 1 r
r 1 K	r 1 4
K 1 4	4 0 K
4 0 α	K 1 α
α 1 3	α 2 3
1 n. S.	
2 n. S	

✓ Plate I 5952.

Nova barely visible. Image very faint.
F? , G? F? , G?

✓ Plate I 5877

G 2 F	G 2 F
F 1 h	F 1 h
h 3 H	h 3 H
H 0 3a	H 1 3a
3a 2 K	3a 2 K
K 1 4	K 1 α
4 0 r	α 0 r
r 1 3	r 1 4
2 n. S.	4 0 3
1 n. S.	

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1890phae.proj..802F

Plate I 5904

1st Est.	2nd Est
G 4 h	G 4 h
h 0 F	h 1 F
F 2 3a	F 1 H
3a 1 r	H 1 K
r 3 H	F 0 r
H 1 K	r 2 3a
1 n. S.	
2 n. S.	
3 n. S.	
4 n. S.	

Plate I 5892

G 5 h	G 5 h
h 1 F	h 1 F
F 2 H	F 2 H
H ~~K~~ 1 3a	H 2 3a
3a 1 r	3a 1 r
r 2 4	r 1 K
4 2 ~~α~~ K	K 1 4
K 2 α	4 1 α
1 n. S.	
2 n. S.	
3 n. S.	

Plate I 5919

G 1 F	G 0 F
F 2 h	F 2 h
h 2 H	h 2 H

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✓ Plate I 5921

1st Est.	2nd Est.
G 2 L	G 1 F
L 1 F	F 1 h
F 1 H	h 1 H

✓ Plate I 5934

Image of Nova very faint. Image very poor.
F? = .3 Fl. Br? = .3

✓ Plate I 5942.

Image of Nova not seen. Image of Nova not seen.

✓ Plate I 5965

Nova barely visible. Nova barely visible

✓ Plate I 5507

H 1 F	F 1 H
F 1 K	H 1 K
K 3 h	K 3 h
h 2 G	h 1 G
G 2 4	G 1 4
4 1 3	4 3 3a
3 1 2	3a o α
2 1 3a	4 1 3
3a 3 γ	3 1 2
γ 3 1	
3a o α	
α 1 β	
β 1 δ	
∫ W. S?	

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Rt - 12.00.

✓ Plate I 5510

1st Est.	2nd Est.
H 1 F	H 1 F
F 1 K	F 1 K
K 1 h	K 0 h
h 0 G	h 1 G
G 4 4	G 4 4
4 1 3a	4 1 3a
3a 1 3	3a 0 3
3 2 2	3 1 2
2 3 v	2 2/4 v
v 2 1	v 2 1

✓ Plate I 5532

H 2 h	H 1 h
h 0 G	h 0 G
G 0 F	G 0 F
F 2 K	F 1 K
K 3 4	K 3 4
4 2 3a	4 1 3a
3a 3 2	3a 1 2
2 1 3	2 1 3
3 1 v	3 1 v
1 v. S.	

δ well-defined δ = v.

✓ Plate I 5638

G 1 H	G 0 F
H 1 F	F 1 H
F 1 h	H 1 h
h 1 K	h 2 K
K 4 4	K 3 α
4 0 3a	α 2 4
3a 2 2	4 1 3a

Dark band of shorter wave length than G is not visible

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✓ Plate I 5638 (cont.)

1st ⁼ Est.	2nd ⁼ Est.
2 1 3	3a 2 3
1 n.s.	3 1 2
8 n.s.	

✓ Plate I 5504

H 1 h	h 1 H
h 1 K	H 1 K
K 1 G	K 3 4
G 1 4	4 1 G
4 0 3a	

✓ Plate I 5619

G 2 F	G 2 h
F 1 h	h 1 H
h 1 H	H 0 F
H 2 K	F 2 K
K 1 4	K 2 4
4 1 3a	4 1 3a
3a 0 α	3a 1 α
α 2 3	α 2 3
3 3 2	3 3 2
2 1 1	
ν n.s?	

✓ Plate I 5608

H 1 G	H 1 h
G 0 h	h 0 G
h 1 K	G 1 K
K 0 F	K 1 F
F 3 4	F 3 4
4 1 3a	4 1 3a

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✓ Plate I 5608 (cont.)

1st Est.	2nd Est.
3a 1 3	3a 1 3
3 1 2	3 1 2
1 n. S.	
v n. S?	

✓ Plate I 5611

H 3 K	H 2 K
K 3 G	K 3 h
G o h	h o G
h 4 4	G 4 F
4 1 3a	F o 4
3a 1 F	4 1 3a
F 4 3	3a 3 3
3 2 2	3 2 2
1 n. S.	
v n. S	

✓ Plate I 5571.

G 3 F	G 3 h
F o h	h o F
h 2 H	F 2 H
H 2 K	H 2 4
K o 4	4 1 3a
4 1 3a	3a o K
3a 3 v	K 4 v
v 2 3	v 1 3
3 2 2	3 1 2
1 n. S.	

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1st " 0.25

✓ Plate I 5859

1st " Est.	2nd " Est.
G 2 H	G 2 H
H 2 F	H 2 h
F 0 h	h 1 F
h 3 K	F 2 K
K 3 α	K 1 α
α 2 4	α 3 4
4 1 3a	4 0 3a
3a 2 3	3a 3 3
3 2 f	3 2 2
f 0 2	2 0 f
2 1 v	
v n. S.	

✓ Plate I 5797

G 1 h	G 1 h
h 1 H	h 1 H
H 2 F	H 1 F
F 2 K	F 1 K
K 0 3a	K 0 4
3a 1 4	4 1 3a
4 3 3	3a 3 3
3 1 2	3 1 2
1 n. S.	
v n. S.	

✓ Plate I 5558

G 2 h	G 2 h
h 0 H	h 1 H
H 1 F	H 1 F
F 2 K	F 1 K
K 4 4	K 4 4

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✓ Plate I 5558 (cont.)

1st Est	2nd Est
4 1 3a	4 1 3a
3a 2 v	3a 3 v
v 1 3	v 0 3
3 1 2	3 1 2
1 vv. ss.	

✓ Plate I 5886

G 5 F	G 6 L
F 1 h	L 1 F
h 2 H	F 1 H
H 0 3a	H 1 4 3a
3a 2 4	3a 4 1 v
4 2 K	v 2 4
K 0 v	4 1 K
v 3 3	K 2 3
3 2 2	3 1 2
1 vv. ss	

✓ Plate I 5783 Plate fogged by moonlight.

G 2 L	G 2 L
h 1 H	L 0 H
	H ! F?

✓ Plate I 5542

H 2 K	H 1 F
K 1 F	F 1 K
F 1 G	K 0 G
G 0 h	G 0 L
h 5 4	h 5 4
4 0 3a	4 1 3a
3a 4 2	3a 2 3
2 1 3	3 0 2

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0.50

Plate I 5531

1st Est.	2nd Est.
H 2 K	H 1 K
K 0 F	K 1 F
F 1 G	F 1 G
G 0 h	G 0 L
h 4 4	L 5 4
4 1 3a	4 1 3a
3a 2 3	3a 3 3
3 0 2	3 2 2
1 m.s.	
v m.s.	

Plate I 5705

H h 1 K	H 1 K
K 0 G	K 1 L
G 0 L	L 0 G
L 1 F	G 1 F
F 4 4	F 5 4
4 1 3a	4 2 3a
3a 2 3	3a 1 3
3 0 2	3 1 2
2 4 1	2 4 1
v m.s.	

Plate I 5731

G 4 h	G 4 L
h 2 H	L 2 H
H 0 F	H 0 F
F 2 K	F 3 K
K 1 4	K 2 4
4 1 3a	4 2 3a
3a 2 v	3a 1 3
v 2 3	3 1 v
3 2 2	v 1 2

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✓ Plate I 5758

1st Est.	2nd Est.
G 4 h	G 4 h
h 2 F	h 1 F
F 1 H	F 2 H
H 1 K	H 1 K
K 2 4	K 1 4
4 2 3a	4 1 3a
3a 2 3	3a 3 3
3 3 2	3 3 2

✓ Plate I 5761

Dark band of shorter wave-length than G is plainly visible	G 2 H	G 1 H
	H 1 h	H 1 h
	h 1 K	h 1 F
	K 0 F	F 0 K
	F 4 4	K 5 4
	4 2 3	4 0 3
	3 2 2	3 3 2
	4 0 α	2 2 δ δ well defined.
	α 4 χ δ. δ χ well defined	

✓ Plate I 5819

Dark band of shorter wave-length than G visible.	G 4 h	G 4 L
	h 2 F	h 2 F
	F 2 H	F 3 H
	H 1 K	H 2 K
	K 1 4	K 1 4
	4 1 3	4 2 3

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√ Plate I 5670

1st Ext.			2nd Ext.		
G	2	H	G	2	H
H	0	F	H	1	F
F	1	K	F	0	h
K	1	h	h	1	K
h	4	4	K	4	4
4	2	3a	4	1	3a
3a	1	3	3a	1	3
3	1	2	3	2	2
2	4	1	2	2	ν?

√ Dark band of shorter wave-length than G has disappeared

√ Plate I 5763

G	3	L	G	3	h
h	2	H	L	1	H
H	1	F	H	1	F
F	3	K	F	4	K
K	2	α	K	2	4
α	0	4	4	0	α
4	1	β	α	1	β
β	1	3	β	0	3
3	1	2	3	3	2
2	1	δ	2	1	δ

√ Dark band of shorter wave-length than G is faintly seen

1st Ext. ended. W 0.53

2nd Ext. ended. h 2.10

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April 19. 1892

Measures of Plate X 276 to determine focus of 13 inch Boyden Telescope.

		Ra 1855 h m s	Dec. 1855	x	y
a	Dm +89° 38	17 21 38	+89 18.4	-1291	-2471
b	" +89° 38	19 45 0	+89 27.5	-21	-1746
~~b~~	~~" +89° 38~~	~~21 8 21~~	~~+89 31.7~~	~~+353~~	~~-1148~~
c	" +89° 17	10 26 21	+89 32.0	-2446	+649
d	" +89 9	4 49 39	+89 27.1	-324	+1884

				x	y				
a	1761	1747		1155"	3120"	13340	97344	110684	3327
c	2544 (783)	2530 (783)							
a	1705	1712		967	4355	93351	189660	199011	4461
d	2758 (1053)	2765 (1053)							
				~~2425~~	2395	58806	57360	116166	3408
b	1921	1942		~~2799~~	~~1797~~	~~98344~~	~~32892~~	~~130636~~	~~3614~~
c	2726 (805)	2747 (805)						132687	3642
				303	3630	91809	131769	~~223578~~	~~4725~~
~~b~~	~~1947~~	~~2004~~		~~677~~	~~3032~~	~~4583~~	~~91930~~	~~96573~~	~~3107~~
d	2811 (864)	2868 (864)							

Mult:	ac	ad	bc	~~bd~~		bc	bd
cm	1.89376	2.02243	1.90580	1.93651		3.53250	3.56134
sec"	3.52205	3.64943	~~3.53799~~	3.49234		1.90580	1.93651
	1.62829	1.62700	1.65219	1.55583	1.62737	1.62670	1.62483
	42.49	42.36	44.89	35.96	42.14	42.33	42.15
	5.31443						
	3.68614	3.68743			3.68706	3.68773	3.68960
	485.4	486.9			486.5 cm.	487.2 cm	489.20

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Results of measures of focal length of Bruce Refractor

	1 mm =	f = cm
a c	42.49	485.4
a d	42.36	486.9
b c	42.33	487.2
b d	42.15	489.3
	133	288
	42.34	486.7 cm
With P.	42.4	486.5 cm

Adopted 42.4 f = 486.5 cm

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August 30, 1892.

6 Spiri Suspected variable DM +55° 1870 9.2 16h 39m.8 +55° 12′

The following plates examined show very little evidence, if any, of variability.

Comp. stars used a DM +55° 1864 16 37.1 +55 23 8.7
b DM +55 1867 16 38.6 +55 33 9.5

Plate I. 6518 taken
a 1 v
v 4 b

Plate I 6563 taken
a 2 v
v 4 b

Plate I 6644 taken
a 2 v
v 4 b

Plate I 6693 taken
a 3 v
v 3 b

Plate I 6701 taken
a 3 v
v 3 b

Plate I 6734 taken
a 3 v
v 3 b

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August 30, 1892.

Gospis suspiciosa var. (Continued). Dm +55° 1870.

Plate I 6754 taken

Ra 3 r

r 3 b

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1999phae.proj...9024

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1890phae.proj..802F

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✓	12.2	−62° 7	a
	12.5	15	f
	13.1	16	e
✓	13.7	13	b
✓	15.0	14	b
	14.7	9	d

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1890phae.proj..002F

$x \times 2, \div \cos \delta$.

$y \times 3$.

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