KG
11365
792

1916phae.proj..793C

W Virginis I.

(1916)

C. A. Chant.

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1916phae.proj..793C

KG 11365.792

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1916phaeproj..793C

W Virginis

Max. & min. 1866-72 Schönfeld – Reduced by new curve (Mannheim M.T.?) A.N. 81, 165

" " 1872 Schmidt A.N. 80, 141

" " 1871, 1872 Schönfeld " 80. 151

" " 1866-1868 " " 73. 15

" " 1869, 1870, 1871 " " 78. 138

" " 1873-1875 Consec. to period Schönfeld A.N. 87. 20

" " 1889, 1890 Gr. M.T. Hagen A.J. 10. 179

" " 1890 - All the max. except April 23 by mean curve
" " min. and max for April 23 by single curve
Yendell A.N. 10, 85
A.J.

" " 1896 Gr. M.T. Hagen A.N. 143, 253

Max. 1889 May 24, July 24. Yendell A.J. 9. 83

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1916phaeproj 793C

W Virginis KG

Position for 1900, K. Graff - Bergedorf 1 - 79 $13^h\ 20^m\ 52^s.16$ $-2^\circ\ 51'\ 30''.7$

Note - 2nd Cat. p. 45. Schönfeld

Discussion of nature of light curve: position - Schmidt A.N. 80, 141

Discussion of the variation of light curve - Elements, Schönfeld A.N. 81, 161

New Elements, Schönfeld, A.N. 80, 154

Chart of neighborhood - J. Ashot P.A. I - 318

Period, Hagen A.J. 10 - 179

Var. announced. Position, Period. 1886 May 4 - Schönfeld A.N. 67, 29

Elements + period, Schönfeld A.N. 73, 14

Position, period, Schönfeld A.N. 68, 315

Elements, Schönfeld A.N. 78, 1387

Elements of: Tendell A.J. 9, 83

1906 - 1910 - K. Graff - A.N. 197, 250

1909 - 10 Max Mündler A.N. 189, 33

1899 - May 9 — 1899 Aug 8 O.C. Wendell H.A. 69 - 45

1888 Pickering H.A. 24, p. 256

1859, 1866 - Schönfeld A.N. 67, 29

1903, Feb. 16 Jost A.N. 163, 325

1889/90 Hagen Pub. Georgetown Coll. Obs. p. 122

1907 June 7.0 (8.9) Spera A.J. 26, 6

1907 May 18.6 9.0 Spera A.J. 26. 6

1907 July 10.7 8.9 Spera A.J. 26. 6

1895. May 17.0 8.7 G.M.T. Spera P.A. 3, 406

1895 June 1.7 8.9 Spera P.A. 3 - 406

1895 June 19.3 8.6 G.M.T. Spera P.A. 3 - 406

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1916phae.proj..793C

1891 -	May 25.89	Y		A.J. 12, 64	
1894 -	June 2.5 ?	Yendell	wt. 2/4	A.J. 14, 85	
1893	June 21.96	Yendell	wt 3/4	A.J. 13, 122	
1893	June 6.18	"	" 3/4	"	"
1893 -	May 2.08 E.S.T.	"	" "	"	"
1894	May 1.4 ?	"	" "	"	14, 85
1894	June 21.9 (8.5)	Spera		"	15, 110
1902	May 31.9	Yendell		A.J.	24.93
1900	March 31.5	"		"	" "
1896	April 9.2	Y	wt 4	A.J.	17.67
1892	Mar 31.7	"	" "	"	12-64
1891	June 28.78	"	" 1	"	12-64
1891	" 11.00	"	" 2	"	12-64
1896	May 13.6	"	" 4	"	17.67
1896	" 29.2	"	" 3	"	17, 67
1894	" 20.4 ?	"	" 3/4	"	14.85
1895	" 17.0 (8.7)	Spera		"	16.52
1895 -	June 1.7 (8.9)	"		"	16.52
1895	" 19.3 (8.6)	"		"	16.52
1892	Apr. 16.7	Y	wt. 4	"	12-64
1892	May 22.3	Y	" 3	"	"
1891	April 2.15	Y	" 2	"	"
1891	May 8.94	Y	" 3	"	"
1892	June 13.4	Y	" 4	"	12-64
1907	May 12 (10)	Spera		"	26.6

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K G 113 65 .92

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1916phae.proj..793C

May 9, 1916

W. Virginis

AM 4439
July 26, 1906

9.59 b 3 v. 11.18
v 2 k 10.34 — 10.52
b 1 v. 10.57
v 1 f — 10.46

[hm K = K' see p. 140

Ab. 6428 e
June 9, 1905

9.59 b 1 v. 10.34 — Images not sharp
v 1 b 9.30 — 9.96, 9.30 } 9.63
a 0 v. 9.97
v 1 b2 — 9.59 (step = 38) ? N.G.

Ab. 12953
Feb. 27, 1912

9.59 b 1 v. 10.57
v 2 f 9.30
a 1 v. 10.44
v 2 d — 9.92, 9.68 } 9.80

Ab 6390
May 23, 1905

9.30 a 1 v. 10.34
v 2 b' — 9.65
9.59 b 1 v. 10.57
v 3 f — 9.83 } 9.74

Ab 5912
Jan. 28, 1905
p.

10.34 b' 1 v. 11.03
v 2 c — 10.57 — Images trailed

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1916phae.proj..793C

Images trailed

A6 5941
Feb. 3, 1905

11.03 c 1 v.
v 2 g 11.94
10.57 f o v.
v 1 k 11.18 v

11.33 } 10.95 v
10.57 }
10.88 (step = 30) ? v

K line = K'

A6 6006
Feb. 14, 1905

9.30 a 2 v.
v 1 c 11.03
9.59 b 2 v.
v 2 f 10.57 v

10.45 }
} 10.26 v
10.08 }

A6 6107
A6 6128
Mar. 5, 1905

Wrong plate Dec. +30

b 10.34 b 2 v.
v 1 f 10.57
10.44 d o v.
v 2 k 11.18 v

10.49 } 10.46 v
10.44 }
11.02 (step=8) ? N. G. K'

A6 6137
Mar. 6, 1905

Images all double

A6 6196
Mar 17, 1905

Images too faint to measure

A6 6223
Mar 27, 1905

Plates rather faint

10.34 b 2 v.
v 1 f 10.57
10.44 d 1 v.
v 1 k 11.18

10.49 }
} 10.65 v
10.81 }

A6 6251
Apl-2, 1905

9.59 b 1 v.
v 1 d 10.44
9.30 a 2 v.
v 2 c 11.03 v

10.44
11.03

10.01 }
} 10.09 v
10.17 }

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1916phae.proj..793C

May 10, 1916

W Virginis

Ab 6313

Apl. 23, 1905

9.59 b 2 v.
v 2 d 10.44
9.59 b 2 v.
v 2 f 10.91
9.97 b² 2 v.
v 1 f 10.57

10 02 ✓
10.25 ✓
10 [illegible] 3
10.[illegible] 21

Good plate; many stars

ok.

Ab 6936

May 24, 1905

b

9.30 a 1 v.
v 1 d 10.44

987 ✓

Poor plate: some stars missing

Ab 12778

Dec 9, 1911

Too faint to measure - Exp 22m

(see p. 8)

Ab 12780

Dec 10, 1911

Invisible: only a few stars seen

(see p. 8)

Ab 12792

Dec. 13, 1911 -

Invisible; a, b, b'; b² + possibly d seen

(See p. 8)

Ab 13006

March 16, 1912

9.97 b² 1 v.
v 2 f 10.57
9.59 b 2 v.
v 2 f' 10.91

10 [illegible] 7 ✓
10.21
10 25 ✓

ok.

Ab 13110

April 25, 1912

10.34 b' 1 v.
v 1 d 10.44
9.59 b 2 v.
v 1 c 11.03

10 39 ✓
10.[illegible] 47
10 [illegible] 55

ok.

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1916phae.proj..793C

AG 13110 (cont.)

9.97
b 2 v.
v 1 f 10.57

10 37 ✓ Ok.

AG 13144
May 19, 1912

Invisible ; few stars to be seen
(see p. 9)

AG 13167
June 9 1912

9.59
b 1 v.
v 1 b' 10.34

9.30
a 2 v.
v 2 d 10.44

9 97 ✓
9 87 ✓ } 9.92 ✓

AG 13213
July 7, 1912

Invisible : few stars to be seen

AG 13790
Feb. 14, 1913

L deferred

AG 13886
March 2, 1913

10.44
d 1 v.
v 1 k 11.18

10.57
f 0 v.
v 1 c 11.33

10 81 ✓
10 57 ✓ } 10.69 ✓

K'

~~10 96~~ (step = 37) ??

AG 13874
Mch 11, 1913

9.30
a 1 v.
v 1 b 9.97

Plate not very good : fainter stars not seen

9 64 ✓

AG 13953
Apl 17, 1913

L' plate : deferred

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1916phae.proj..793C

May 10, 1916

W Virginis

AG 14010
May 7, 1913

9.59 b 2 V.
10.34 V.1 b
9.97 b² 2 V.
10.57 V 2 f

~~1016~~ 1009 ✓
1027 ✓
10.~~16~~ 10.18
O.K.

Exp. 30m : images faint

AG 14054
June 2, 1913

10.34 b' 2 V.
10.91 V 1 f'

10~~7~~2 ✓ O.K.

AM 4412
July 18, 1906

10.34 b' 1 V
10.44 V 2 d
9.59 b 2 V
10.57 V 2 f

1037 ✓
1008 ✓
10.22 ✓

AM 4426
July 21, 1906

10.57 f 2 V
11.03 V 0 c
10.44 d 1 V
11.66 V 1 e'

1103 ✓
1105 ✓
1p.04 ✓

N.G.

AG 12788
Dec. 9, 1911

Examined again; image invisible.

AG 12780
Dec 10, 1911

10.34 b' 1 N

< 10.34 ✓

AG 12792
Dec 13, 1911

~~b² 2 N~~
11.94 g 0 N
9.59 b 2 N

11.94 ✓

?

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1916phae.proj...793C

Ab 13144 · 9.30 a 2 N
May 19, 1912 ≪ 9.30 ✓

Ab 13213 · 9.59 b 1 N
July 7, 1912 < 9.59 ✓

Ab 10361 · 9.59 b 2 V
March 23, 1909 V 2 d 10.44 · 10.02 ✓ Composite – Pole + Virgo plate

Ab 10365 · 9.59 b 1 V
March 26, 1909 V 1 f 10.57 · 10 08 ✓
· 9.99 b 2 1 V
V 1 b' 10.34 · 10 16 ✓ } 10.12 ✓ Good plate

Ab 10383 · 11.03 c 1 V
March 31, 1909 V 1 g 11.94 · 11 49 ✓ 11 20 ~~11.12~~
· 10.57 f 1 V
V 0 f' 10.91 · ~~10 74~~ 1091 } V 1 f' ?

Ab 10414 · 9.59 b 0 V
April 9, 1909 9.59
V 1 f 10.57 · ~~1014~~ (step = 43) ?
· 9.30 a 2 V
V 2 c 11.03 · 1016 ✓

Ab 10468 · 9.59 b 1 V
Apl. 28, 1909 V 1 f 10.57 · 10 08 ✓
· 9.30 a 2 V
V 2 c 11.03 · 1016 ✓ } 10.12 ✓

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1916phae.proj..793C

May 11, 1916.

W Virginis

Ab 10501
May 12, 1909

9.30 a 1 v
v 1 b' 10.34
9.59 b 0 v
9.30 a 2 v
v 2 d 10.44

9.82 ✓
9.59 ✓
9.87 ✓
976

Ab 10507
May 15, 1909

Impossible; much motion in decl.; exp. 37m

Ab 10525
May 26, 1909

9.30 a 1 N

< 930 ✓

Images triple

Ab 10555
June 11, 1909

Nothing identifiable

Ab 10599
June 29, 1909

9.59 b 1 N

< 959 ✓

Image near edge; fogged.

Ab 11382
Feb. 13, 1910

9.59 b 1 V
v 1 b' 10.34
9.30 a 2 v
v 2 f 10.57

997 ✓
994 ✓
996 ✓

Beautiful plate

Ab 11440
March 5, 1910

9.59 b 0 v
9.30 a 1 v
v 2 f 10.57

959 ✓
972 ✓
966 ✓

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1916phae.proj..793C

AG 11499
Mar. 18, 1910

9.97 b² 1 v
v 2 f 10.57
9.30 a 1 v
v 2 d 10.44

1017 ✓
968 ✓
} 9.92 ✓

AG 11559
Apl 3, 910

10.57 f 1 v
v 1 d 10.44
9.59 b 2 v
v 2 k 11.18

1050 ✓
1039 ✓
} 10.44 ✓

[κ=κ' h.140

AG 11579
Apl 13, 1910

10.44 d 0 v
10.57 f 1 v
v 2 c 11.03

1044 ✓
1072 ✓
} 10.58 ✓

AG 11592
Apl 16 1910

10.44
d₂² v d 2 v
v 2 g 11.94
11.03 c 1 v
v 1 e' 11.66

1069 ✓
1135 ✓
} 11.02 ✓

AG 11655
May 14, 1910

9.59 b 2 v
v 2 d 10.44
9.97 b 1 v
v 1 f 10.57

10.02 ✓
10.27 ✓
} 10.14 ✓

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1916phae.proj..793C

12

May 11, 1916

W Virginis

AG 12768
Dec. 2, 1911

Not on plate R.A. 13 10 δ +6 0

AG 8189
Jan 23, 1907

9.59 b 2 v 1025
v 1 f 10.57 ~~1008~~ ~~9944~~
10.34 b 1 0 v 1034 ✓ } 10.14 10.23
9.30 a 2 v
v 2 f 10.91 1010 ✓

AG 8206
Jan. 30, 1907

4.30 a 2 N < 930 ✓

AG 8228
Feb 8, 1907

9.59 b 1 v 1001 ✓
v 1 d 10.44
9.97 b 2 v } 10.19 ✓
v 1 f 10.57 1037 ✓

AG 8250
Feb. 12, 1907

10.44 d 1 v
v 1 c 11.03 1074 ✓
9.59 b 2 v } 10.76 ✓
v 2 g 11.94 1077 ✓

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1916phae.proj..793C

A6 8266 Feb 18, 1907	10.44 d o v v 1 K 11.18	10444 ✓	Images elongated [K=K' p.140
A6 8340 Mar 9 1907	9.30 a o v	930 ✓	Poor plate; trails "—" in R.A. long
A6 8378 Mar 25, 1907	10.44 d 1 v v 1 K 11.18	1081 ✓	Trails "—"
A6 8400 April 5, 1907	9.30 a 2 N 10.34 D 1 N	≤ 1034 ✓	Erythrosin Plate
A6 8481 May 5, 1907	9.30 a 1 v v 1 f 10.57	994 ✓	Poor plate; irreg. trails

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1916phae.proj..793C

May 11, 1916

W Virginis

Ab 8538 — b 2 N — 9.59 — < 959 — Poor plate; fogged at edge
June 7, 1907

Ab 8570 — b 1 v — 9.97 — f (near limit); p.
June 27, 1907 — v 1 d — 10.44 — 1021 — 11.01
f 1 v — 10.57 — ~~1033~~ — step = 24 ?
v 0 g — 11.94 — 1194 — ?

Ab 8633 — b 1 v — 9.59 — Faint; rather p
July 27, 1907 — v 1 d — 10.44 — 1001

Ab 9293 — b 1 v — 9.59
Feb. 24, 1908 — v 1 d — 10.44 — 1001 — 10.34
b 2 v — 9.97
v 1 c — 11.03 — 1067

Ab 9448 — b' 1 v — 10.34
April 24, 1908 — v 1 K — 11.18 — 1076 — 10.66 — K = K' p. 140
v 0 f — 10.57 — 1057

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1916phae.proj..793C

AG 9469 · 10.44 d 1 v div
May 9, 1908 v 1 g 11.94 · 1119 v } 11.05 v
v 0 f 10.91 · 1091 v }

AG 9515 · 9.30 a 2 v Comparable - with pole Exp. 30m, 30m
June 5, 1908 v 1 d 10.44 · 1006 v Hard to identify

AG 9596 · 10.44 d 1 R < 10444 v p
July 1, 1908

AG 10200 · 9.30 a 2 v
Feb. 2, 1909 v 2 g 11.94 · 1062 v } 10.44 v
· 9.59 b 2 v
v 1 f 10.57 · 1025 v }

AG 10282 · 9.59 b 1 v
Mar. 5, 1909 v 1 d 10.44 · 1001 v } 10.14 v
· 9.97 b 2 v
v 1 f 10.57 · 1027 v }

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1916phae.proj..793C

16

May 11, 1916

W Virginis

AG 10339 · 9.97 b² 1 v
March 20, 1909 v 1 f 10.57 · 1027 ✓
With Pole on ; hard to identify

AM 4794
May 2, 1907
Plate too faint to identify anything
Clock Rate

AM 4799 · 9.59 b 1 v
May 3, 1907 v 1 f 10.57 · 1008 ✓
Irregular trails ; rather f.

AM 4802
May 7, 1907
Too faint ; Clock Rate

AM 4826 · 10.91 f' 1 v
May 11, 1907 v 1 g 11.94 · 1143 ✓ } 11.38 ✓
· 11.33 c' 0 v 1133 ✓ }

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1916phae.proj..793C

AM 4847 · 9.30 a 2 v
May 17, 1907 v 2 d 10.44 · 987 ✓
Rather faint plate: exp. 22m

AM 4934 · 9.30 a 2 v
June 21, 1907 v 2 f 10.57 · 994 ✓
Rather poor plate

AM 4950 · 10.44 d 1 v
July 1, 1907 v 1 k 11.18 · 1081 ✓
· 10.91 f 0 v 1091 ✓ } 10.86 ✓
K = K' p. 140

AM 4959 · 10.44 d 1 v
July 2, 1907 v 1 g 11.94 · 1119
v 0 f 10.91 · ~~1069~~ 1091 } ~~10.80~~ 11.05
9 Exposures: motion test
Images good
X

AM 4967 · 10.44 d 1 v
July 3, 1907 v 1 e' 11.66 · 1105 ✓
· 11.33 e' 0 v 1133 ✓ } 11.19 ✓

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May 11, 1916

W Virginis

AM 5348 — March 30, 1908

9.97 b 2 v
v 1 d 10.44
10.34 b' 0 v
v 1 f 10.57

1029 v
1034 v
} 10.32 v

~~1041 step = 16 ?~~ Usable?

AM 5382 — April 9, 1908

9.59 b 0 v
9.30 a 1 v
v 2 f 10.57

959 v
972 v
} 966 v

AM 5449 — May 8, 1908

11.33 c' 0 v
10.44 d 2 v
v 2 g 11.94

1133 v
1119 v
} 11.26 v

AM 5505 — May 29, 1908

10.57 f 0 v
10.34 b' 1 v
v 1 d 10.44

1057 v
1039 v
} 10.48 v

AM 5535 — June 6, 1908

9.59 b 2 v
v 2 f 10.57
9.30 a 2 v
v 2 f' 10.91

1008 v
1010 v
} 10.09 v

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1916phae.proj..793C

May 12, 1916

AM 5560 · 10.34 b' 1 v
June 16, 1908 v 1 f 10.57 · 1046 ✓
· 959 b 2 v } 10.38 ✓
v 2 c 1103 · 1031 ✓

AM 5579 · 959 b 0 v 959 ✓
June 19, 1908 · 930 a 1 v } 9.64 ✓
v 2 d 1044 · 968 ✓

AM 5659 · 1044 d 1 v ... ? Images hailed
July 15, 1908 v 0 c 11.03 · 1103 ✓

AM 5660 · 1044 d 0 v 1044 ✓
July 20, 1908 · 959 b 2 v } 10.60 ✓
v 2 g 1194 · 1077 ✓

AM 5937 · 10.34 b' 1 v ... ? Images with flares on them
Feb. 22, 1909 v 0 f 1057 · 1057 ✓

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1916phae.proj..793C

May 12, 1916

W Virginis

AM 5988
March 23, 1909

Too faint to identify stars

AM 6042
April 21, 1909

.1057
f 1 v
v 1 g 1194.
v 0 f 1091.

1125 ✓
1091 ✓ } 11.08 ✓

AM 6085
May 7, 1909

.1044
d 1 v
v 1 c 1133.
.1057
f 2 v
v 2 g 1194.

1088 ✓
1125 ✓ } 11.06 ✓

AM 6110
May 11, 1909

~~b v b~~
.959
b 1 v
v 1 b 10.34.
.930
a 2 v
v 2 d 1044.

997 ✓
987 ✓ } 9.92 ✓

AM 6139
May 16, 1909

.997
b 2 2 v
v 2 d 1044.

1021 ✓

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1916phae.proj..793C

AM 6196 — June 8, 1909

1091.
v 0 f' — 1091 ✓
.1044
d 1 v
v 1 e 1159. — 11.02
} 10.96

AM 6247 — June 19, 1909

.959
b 1 v
v 1 d 1044. — 1001 ✓

AM 6310 — July 6, 1909

.959
b 2 v
v 2 d 1044. — 1001 ✓
.997
b 2 v
v 2 e 1103. — 1050 ✓
} 10.26 ✓

AM 6377 — July 19, 1909

.959
b 2 v
v 2 d 1044. — 1001 ✓
.959
b 1 v
v 1 b' 1034. — 997 ✓
} 9.99 ✓

AM 6332 — July 10, 1909

.1034
b' 1 v
v 1 d 1044. — 1039 ✓

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1916phae.proj..793C

May 12, 1916

γ Virginis

AM 6392
July 22, 1909

.930
a 2 v
v 2 d 1044.
.959
b 1 v
v 2 K 1118.

987 ✓
1012 ✓
} 9.99.

K = K' f.140

AM 6878
April 13, 1910

v o d 1044.

1044 ✓

AM 6922
May 18, 1910

.1034
b' 2 v
v 1 f 1057.

1050 ✓

AM 6956
May 30, 1910

.959
b 1 v
v 1 d 1044. ✓
.930
a 2 v
v 2 f 1057.

1001 ✓
994 ✓
} 9.98

AM 69~~80~~
~~May 12, 1910~~
June 3, 1910

.1034
b' 1 v
v 1 d 1044.

1039 ✓

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1916phae.proj..793C

AM 7074 July 5, 1910

.959 b 1 v
v 2 f' 1091. 1003 ~~970~~ ×

AM 7081 July 6, 1910

.959 b 2 v
v 2 d 1044. 1001 ✓

AB 13790 Feb. 14, 1913

.1044 d 2 N < 1044 ✓ Yellow

AB 12972 Feb. 29, 1912

.959 b 1 v
v 2 d 1044. 987 ✓
.930 a 2 v
v 2 c 1103. 1016 ✓
} 10.02 ✓

AM 7099 July 9, 1910

.1044 d 0 v 1044 ✓
.1034 b' 2 v
v 1 f' 1091. 1072 ✓
} 10.58 ✓

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1916phae.proj..793C

May 12, 1916

W Virginis

AM 7118 . 1044 d 1 v
July 12, 1910 v 1 e 1159. 1102 ✓

AM ~~7145~~ 7145 . 1034 b' 1 v
July ~~25~~ 25, 1910 v 1 d 1044. 1039 ✓

AM 7421 ~~b~~
May 21, 1911 v 0 c' 1133. 1133 ✓ ~~poor~~ poor

AM 8109 . 930 a 1 N < 930 ✓ poor plate
April 23, 1912

AM 8149 . 959 b 1 v Images all discs ; out of focus?
May 7, 1912 v 1 d 1044. 1001 ✓

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1916phae.proj..793C

AM 8195 May 18, 1912	1044 d 0 v	1044	f	Images all discs
AM 8236 May 23, 1912	959 b 1 v v 1 d 1044	1001		Images all discs, but easy enough to measure
AM 8283 June 5, 1912	959 b 2 N	≤ 959		
AM 8284 June 5, 1912	1044 d 1 N	< 1044		
AM 8393 July 5, 1912	1044 d 1 N	< 1044		

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1916phae.proj..793C

May 12. 1916

W Virginis

AM 8429 — July 10, 1912

· 1057
f o v — 1057 — Images all double

AM 8439 — July 11, 1912

· 1034
b' 1 v
v 1 d · 1044 — 1039

AM 8529 — Aug 3, 1912

· 959
b 1 v
v 1 d · 1044 — 1001
· 1034
b' o v — 1034
} 10.18

AM 8586 — Sept. 2, 1912

· 930
a 1 N — < 930 — Exp. 31m "a" hardly visible

AM 8819 ~~8546~~ — ~~Sept 11, 1912~~ April 7, 1913

· 1034
b' 1 N — < 1034

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1916phae.proj..793C

·1034

AM 8866 b' o v 1034 Images doubled : p.

May 5, 1913

·1044

AM 8897 d o v 1044 Faint : images discs

May 10, 1913

·959

AM 8932 b i v p

May 23, 1913 v i d 1044. 1001

·959

AM 8941 b 2 v

May 24, 1913 v 2 a 930. ? a = d ? 1001

·997

b 2 i v

v i b' 1034. 1015

·959

AM 9017 b o v 959

June 6, 1913

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1916phae.proj..793C

May 12, 1916

W Virginis

AM 9026 — June 7, 1913 — L

.959
b i v
v i b' 1034.
997 ✓

AC 2591 — May 30, 1902 — L

.959
b o v
959 ✓
.930
a i v
v i b' 1034.
982 ✓
9.70 ✓

AC 2636 — June 20, 1902 — L

.959
b i v
v i d 1044.
1001 ✓

AC 2671 — July 8, 1902 — L

.959
b i v
v i d 1044.
1001 ✓
.1034
b' o v
1034 ✓
10.18 ✓

Pretty faint; fogged

AC 3189 — Jan 18, 1903 — L

.930
a i N
< 930 ✓

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1916phae.proj..793C

AG 3352
Feb. 23, 1903
L

1044
d 1 v
v 1 e 1159.
1057
f 1 v
v 1 c' 1133.

1102 ✓
1095 ✓
10.98 ✓

AG 3483
April 5, 1903
L

959
b 1 v
v 1 d 1044.
997.2
b 1 v
v 1 b' 1034.

1001 ✓
1015 ✓
10.08 ✓

AG 3549
April 25, 1903
L

930
a 2 v
v 2 d 1044.

987 ✓

AG 3628
May 13, 1903
L

930
a 1 v
v 1 d 1044.

987 ✓

AG 3692
May 27, 1903
L

997
b² 1 v
v 2 d 1044.

1013 ✓

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1916phae.proj..793C

May 12, 1916

W. Virginis

Ab 3699
May 30, 1903
L

.959
b 1 v
v 2 f 1091.

1003
~~1025~~

Ab 3710
June 1, 1903
L

.1034
b' 0 v

1034 f

Ab 4502
Jan. 5, 1904
L

.1044
d 1 N < 1044

Ab 4580
Jan. 27, 1904
L

.997
b² 1 v
v 1 b' 1034.

1015

Ab 4592
Feb. 1, 1904
L

.1034
b' 1 v
v 1 d 1044.

1039

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1916phae.proj..793C

Ab 4649 .959
Feb 16, 1903 b | v
v | L 1044. 1001 ✓
L

Ab 177 .1044
Jan. 25, 1899 d | v
v o f 1091. 1068 ✓
L

Ab 213 .959 ✓
Feb. 20, 1899 b | N < 959 Poor plate
qL

Ab 260 .1044 ✓
Mar. 24, 1899 d | N < 1044
L

Ab 272 .930 ✓ p 8 rr 9 images of ea. star
Apl. 6, 1899 a | N < 930
L
C

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1916phae.proj..793c

May 12, 1916

W Virginis

Ab ~~320~~ ~~315~~

May ~~5~~, 1899

11

L

·1044
d o v 1044 ✓
·1057
f i v
v i k 1118· 1087 ✓
} 1066 ✓

K = K' p. 140

Ab 745

March 10, 1900

L

·959
b i v
v 2 d 1044· 987 ✓
·997
b² o v 997 ✓
} 992 ✓

Ab 778

March 25, 1900

L

·959
b i v
v i d 1044· 1001 ✓
·1034
b' o v 1034 ✓
} 1018 ✓

Ab 792

April 3, 1900

L

·997
b² i v
v i k 1118· 1057 ✓
·1057
f o v 1057 ✓
} 1057

K = K' p. 140

Ab 845

May 5, 1900

L

·997
b² i v
v i d 1044· 1021 ✓
·959
b i v
v i f' 1091· 1025 ✓
} 1023 ✓

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1916phae.proj..793C

Ab 932
July 19, 1900
L

Faint "a" not visible

Ab 1116
Dec 31, 1900
L

· 930
a 1 v
v 2 d 1044.
968 ✓

Ab 1202
Feb. 2, 1901
L 1901

Not shown; few stars on plate

Ab 1305
Feb. 27, 1901
L

· 1044
d 1 v
v 1 k 1118.
1081 ✓
· 1034
b 1 2 v
v 2 g 1194.
1114 ✓
} 1098

k = k' p. 140

Ab 1349
March 17, 1901
L

· 1044
d 1 v
v 1 g 1194.
1119 ✓

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1916phae.proj..793C

May 12, 1916

W Virginis

Ab 1491
May 31, 1901
L

·9.30
a 1 N
<930 ✓
Plate fogged: few stars seen

Ab 1504
June 5, 1901
L

·959
b 1 v
v 2 d 1044·
·997
b² 0 v
987 ✓
997 ✓
} 9.92 ✓

Ab 1550
June 29, 1901
L

Plate fogged

Ab 1616
July 15, 1901
L

Plate fogged

Ab 2208
Jan 17, 1902
L

·1034
b' 0 v
·997₂
b² 2 v
v 2 d 1044·
103.4 ✓
1021 ✓
} 1028 ✓

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1916phae.proj..793C

Ab 2231 · 1034
Jan. 23, 1902 b' 1 N < 1034 ✓ Fogged
L

Ab 2278 · 959
Feb. 5, 1902 b 2 v
v 1 d 1044. 1015 ✓
L

Ab 2413 · 1091
Mar 14, 1902 f 1 o v 1091 ✓
· 1044
d 1 v
v 1 g 1194. 1119 ✓ } 11.05 ✓
L

Ab 2476 · 997
April 15 b² 1 v
1902 v 1 d 1044. 1021 ✓
L

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1916phae.proj..793C

May 13, 1916

W Virginis

AG 4591
May 6, 1904
L

·930
a 1 v
v 0 b' 1034·
1034 v

f ? n.g.

AG 4946
June 10, 1904
L

·997
b² 1 v
v 1 f 1057·
1027 v

AG 4990
June 19, 1904
L

·1034
b' 1 N
< 1034 v

AG 5036
July 21, 1904
L

R.A. = 14h 36m
Not on plate

AG 5853·
Jan 17, 1905

·959
b 2 v
< 959 v

f
Could detect nothing faint or

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1916phae.proj..793C

Ab 6464
June 28, 1916
L

.959
b | v
v | b' 1034.
997 ✓

Ab 6480
July 3, 1905
L

.997
b² | N
< 997 ✓

Ab 7033
Nov. 21, 1905
L

.1034
b' | N
< 1034 ✓

Ab 7250
Feb. 2, 1906
L

Fine plate

.1057
f | v
v 2 f' 1091'
1068 ✓
.1034
b' 2 v
v 2 c 1103.
1068 ✓
} 1068

Ab 7370
March 10, 1906
L

Fogged : poor

.1034
b | N
< 1034 ✓

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1916phae.proj..793C

May 13, 1916

W Virginis

AG 7448 · 1034
April 4, 1906
L
b' 0 v 1034 ✓
· 959
b 1 v
v 1 d 1044. 1001 ✓
} 10.18 ✓

AG 7526 · 1034
May 1, 1906
L
b' 1 v
v 1 f 1057. 1046 ✓

AG 7647 · 930
July 8, 1906
L
f
? N.G.
a 1 v
v 0 b' 1034. 1034 ✓

AM 455 · 1034
May 7, 1900
L
b' 1 v
v 1 d 1044. 1039 ✓

AM 479 · 1057.
May 26, 1900
b
Exp. 320m : Trails
f 0 v 1057 ✓
· 1034
b' 1 v
v 1 f' 1091. 1062 ✓
} 1060 ✓

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1916phae.proj..793C

.997

AM 521 b^2 2 v

July 16, 1900 v 1 d 1044. 1029 ✓

L

AM 777 .1044

May 10, 1901 d 1 v

v 1 K 1118. 1081 ✓ K' = K on p. 140

L

AM 794 .997

May 21, 1901 b^2 2 v

v 2 d 1044. 1021 ✓

L

AM 847 .997 Isochromatic plate

June 11, 1901 b^2 2 v

v 2 g 1194. 1095 ✓

L

AM 894 .959

July 5, 1901 b 2 v

v 1 d 1044. 1015 ✓

L

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1916phae.proj..793C

May 13, 1916

W Virginis

AM 895
July 5, 1901
L

.959
b 1 v
v 1 d 1044. 1001 ✓
.997
b' 1 v
v 1 f 1057. 1027 ✓
10.14 ✓

AM 905
July 9, 1901
L

.997
b' 1 v
v 1 b' 1034. 1015 ✓

AM 1248
May 15, 1902
L

.959
b 1 v
v 1 b' 1034. 997 ✓

AM 1268
May 19, 1902
L

.1044
d 1 v
v 1 c 1103. 1074 ✓
.1034
b' 2 v
v 2 g 1194. 1114 ✓
10.94 ✓

AM 1285
May 28, 1902
L

.1044
d 0 v 1044 ✓
.1034
b' 2 v ✓
v 2 c 1103. 1068 ✓
10.56 ✓

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1916phae.proj..793C

AM 1304 — Exp - 421m ; 14 images

June 5, 1907

.997
b2 1 v
v 1 b' 1034. 1015✓

L

AM 1412

July 2, 1902

.1034
b' 0 v 1034✓
.959
b 2 v
v 2 c 11.03. 1031
} 10.32✓

L

AM 1432

July 8, 1902

.959
b 1 v
v 2 d 1044. 987✓

L

AM 1477

July 15, 1902

.1044
d 1 v
v 1 g 1194. 1119✓

L

AM 1902

May 4, 1903

v 0 k 1118. 1118✓
.1044
d 2 v
v 2 g 1194. 1119✓
} 1118

K-K' 1.000

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1916phae.proj..793C

May 13, 1916

W Virginis

AM 1916
May 6, 1903
2

·1044
d 1 v
v 2 g 1194. 1094✓

AM 1935
May 14, 1903
L

·959
b 2 v
v 2 d 1044. 1001✓

AM 1977
May 30, 1903
b

Exp. 864m; 12 images

·959
b 1 v
v 2 d 1044. 987✓

AM 2107
July 12, 1903
L

·1044
d 1 v
v 1 g 1194. 1119✓
v o f' 1091. 1091✓ } 11.05

AM 2127
July 15, 1903
L

·1044
d 1 v
v 1 c 1103. 1074✓

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1916phae.proj..793C

AM 2251 · 1044
Sept 2, 1903 d o v 1044 ✓ f

L

AM 2491 · 1034
March 23, 1904 b o v 1034 ✓
· 959
b 1 v } 10.21 ✓
L v 1 f 1057. 1008 ✓

AM 2565 · 959
April 21, 1904 b o v 959 ✓
· 930
a 2 v } 9.80 ✓
L v 1 b' 1034. 1000 ✓

AM 2579 · 959
April 23, 1904 b 1 v
v 1 b' 1034. 997 ✓

L

AM 2596 · 1044
May 3, 1904 d 1 v
v 1 g 1194. 1119 ✓

L

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1916phae.proj..793C

May 13, 1916

W Virginis

AM 2651

May 13, 1904

.959
b 2 v
v 2 d 1044. 1001 ✓

L

AM 2710

June 4, 1904

.1044
d 2 v
v 2 g 1194. 1119 ✓

L

AM 2784

June 30, 1904

.959
b 1 v
v 2 d 1044. 987 ✓
.1034
b 1 o v 1034 ✓ } 10.11 ✓

L

AM 2793

July 1, 1904

.959
b 1 v
v 1 d 1044. 1001 ✓

L

AM 2913

Aug 4, 1904

.959
b 1 v
v 2 d 1044. 987 ✓
.1034
b 1 o v 1034 ✓ } 10.10 ✓

L

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1916phae.proj..793C

AM 3321

Jan. 12, 1905

L

1044.

v 0 d 1044 ✓

.959

b 2 v } 10.41 ✓

v 2 k 1118. 1039 ✓ K=K' p.140

AM 3389

March 17, 1905

L

.959

b 1 v

v 1 b' 1034. 997 ✓

AM 3398

March 27 1905

L

.1044

d 1 v

v 2 k 1118. 1069 ✓ K=K' p.140

AM 3460

April 21, 1905

L

.997

b^2 2 v

v 2 d 1044. 1021 ✓

.959

b 1 v 1007 } 1014 ×

v 2 c 1103. ~~974~~

AM 3493

May 2, 1905

L

.1044

d 1 v

v 2 k 1118. 1069 ✓ K=K' p.140

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1916phae.proj..793C

May 13, 1916

W Virginis

AM 3549
May 22, 1905
L

.959
b 1 v
v 2 d 1044. 987 ✓

AM 3665
June 24, 1905
L

.1044
d 1 v
v 2 K 1118. 1069 ✓

AM 3676
June 30, 1905
L

.959
b 1 v
v 2 d 1044. 987 ✓

AM 3685
July 5, 1905
L

.1044
d o v 1044 ✓
.1034
b' 2 v
v 1 f' 1091. 1072 ✓
} 10.58 ✓

AM 4078
Jan. 30, 1906

.1044
d 1 v
v 1 g 1194. 1119 ✓

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1916phae.proj..793C

AM 4122 · 959 Good plate
Feb. 21, 1906
b 2 v
v 1 d 1044. 1015 ✓
· 997 b² 1 v
v 1 f 1057. 1027 ✓ } 10.21 ✓

AM 4132 · 959
March 17, 1906
b 1 v
v 2 d 1044. 987. ✓
~~1015~~

AM 4201 (4201) · 959
May 4, 1906
b 1 v
v 2 d 1044. 987 ✓
L1
· 997 b² 2 v
v 1 b' 1034. 1021 ✓ } 10.04 ✓

AM 4316 · 1044
June 15, 1906
d 1 v
v 2 k 1118. 1069 ✓
L
k = k' μ.040

AM 4399 · 959
July 13, 1906
b 1 v
v 2 d 1044. 987 ✓
L
· 997 b² 2 v
v 1 b' 1034. 1021 ✓ } 10.04 ✓

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1916phae.proj..793C

Monday
May 15, 1916 W Virginis

A6 14838	.959		Images double
1914 Feb. 14	b 1 v		
	v 1 b'	1034. 997 ✓	
A6 14874	.1034		Screen I
1914 Feb. 12	b' 1 N	< 1034 ✓	
ac 14910	.997		Good plate
1914 Feb. 24	b² 1 v		
	v 1 d	1044. 1021 ✓	10.26 ✓
	.959		
	b 2 v		
	v 2 c	11.03. 1031 ✓	
ac 14996	.1044		
1914 March 19	d 1 v		
	v 1 g	1194. 1119 ✓	11.14 ✓
	v o K	1118. 1118 ✓	K = K' p. 140
A6 15037	.959		f
1914 Mar. 31	b o v	959 ✓	

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1916phae.proj..793C

AG 15055 · 1034 Eryth. Pl. Yellow Screen
1914 Apl 5 b' 1 N < 1034 ✓

AG 15081 · 959
1914 Apl 12 b 1 v
v 1 b' 1034 · 997 ✓

AG 15134 · 1044
1914 Apl. 24 d 1 v
v 1 g 1194 · 1119 ✓

AG 15149 · 959
1914 May 1 b 1 v
v 1 b' 1034 · 997 ✓

AC 15167 · 930 Plate fogged
1914 May 6 a 1 v
v 1 d 1044 · 987 ✓

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1916phae.proj..793C

May 15, 1916 W. Virginis

AC 15215
1914 May 29
.1044
d 1 v
v 1 g 1194. 1119

AC 15225
1914 June 1
.1044
d o v 1044
.1034 b' 1 v 60
v 1 K 1118. 1076 10.
K = K' h. 140

AC 15236
1914 June 5
Plate fogged
Eyth. Plate Serum I
.930
a 2 v
v 1 d 1044. 1006

AC 15276
1914 June 18
.1044
d o v 1044
.1034 b' 1 v 10.60
v 1 K 1118. 1076
K = K' h. 140

AC 15280
1914 June 20
.959
b 1 v
v 2 d 1044. 987

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1916phae..proj..793C

AC 15322 · 1034 f
1914 July 18 b' | v n.g.
v o k 1118. 1118 ✓ K = K' h. 140

AC 15349 · 959 Rather poor plate
1914 July 25 b o v 959 ✓

AC 16107 · 930 Yellow
1915 Feb. 13 a | N < 930 ✓

AC 16118
1915 Feb. 17 ~~b o b'~~
· 959 b | v
v | b' 1034 · 997 ✓
· 930 a | v } 982
v 2 d 1044 · 968 ✓

AC 16 ~~190~~ 384
1915 ~~Mch 9.~~ · 1044
Apl. 8 d o v 1044 ✓
· 1034 b' | v } 10.60 ✓
v | k 1118 · 1076 ✓ K = K' h. 140

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1916phae.proj..793C

May 15, 1916 W Virginis

AC 16403 .959
1915 April 16 b / v
v / d 1044 . 1001

AC 16417 .1034
1915 April 19 b' / N < 1034

AC 16482 Yellow : fogged
1915 May 19
R.A. 15

AC 16510 .959
1915 June 1 b / v
v / d 1044 . 1001

AC 16620 Fogged + streaked : Yellow
1915 Aug 7 Few images visible

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1916phae.proj..793C

ac 17281 · 959 Good plate
1916 Feb 3 b | v
v | d 1044 · 1001 ✓
· 997 b² | v
v | b' 1034 · 1015 ✓ } 10.08 ✓

am 9129 · 959
1913 June 28 b | v
v | b' 1034 · 997 ✓

am 9138 · 1034
1913 June 30 b' | v
v | f 1057 · 1046 ✓

am 9290 · 959
1913 Aug 1 b | v
v | d 1044 · 1001 ✓

am 9213 · 997
1913 July 14 b² | v
v | f 1057 · 1027 ✓

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1916phae.proj..793C

May 15, 1916 W Virginis

Am 9229 .1044 Perhaps visible; f
1913 July 23 d 1 N <1044 ✓

Am 9350 .959
1913 Aug 18 b 1 v
v 1 d 1044. 1001 ✓

Am 9840 Nothing to see
1914 June 9

Am 9859 .1034
1914 June 13 b' 1 N <1034 ✓

Am 9927 .959
1914 July 11 b 2 v
v 2 d 1044. 1001 ✓
.997 b² 0 v 997 ✓ } 9.99

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1916phae.proj..793C

am 9961 · 1044
1914 July 21 d 1 v
v 1 g 1194 · 1119 ✓

am 10340 · 1034
1915 Mar. 13 b' 1 v
v 1 d 1044 · 1039 ✓

am 10~~425~~ 542 · 997
1915 ~~April 14~~ May 4 b² 1 v
v 1 b' 1034 · 1015 ✓
· 959 b 2 v
b 2 c · 1103 · 1031 ✓ } 10.23 ✓

am 10560 · 1044
1915 May 7 d o v 1044 ✓ f

am 10735 · 1044
1915 July 1 d 1 v
v 1 K 1118 · 1081 ✓

K = K' p. 140

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1916phae.proj..793C

May 15, 1916

W Virginis

Am 10755 · 1034

1915 July 4 b' 0 v 1034 ✓ } 10.46

· 997 b² 2 v

v 2 K 1118 · 1057 ✓ }

k = k' 1.140

Am 10802 · 1057

1915 July 14 f 0 v 1057 ✓

Am 10879 · 930 poor plate Yellow

1915 July 25 a 1 N < 930 ✓

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1916phae.proj..793C

May 16, 1916 W Virginis

↓ α = 13
δ = -15

AM 8899 · 1044 f
1913 May 10 d o v ~~1111~~ 1044 v

AM 8927 · 959
1913 May 22 b i v
v i d 1044 · 1001 v

AM 8965 · 1044
1913 May 28 d i N < 1044 v

AM 8978 · 1044
1913 May 30 d i N < 1044 v

AM 8989 · 1044
1913 June 2 d i N < 1044 v

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1916phae.proj..792C

May 16, 1916 W Virginis

am 9046 · 997
1913 June 10 b² | v
v | d 1044 · 1021 ✓

am 9085 · 959
1913 June 23 b | v
v | b² 997 · 978 ✓

am 9120 · 959 poor plate
1913 June 27 b | v
v | d 1044 · 1001 ✓

am 9149 · 1044 f
1913 July 2 d | v
v | g 1194 · 1119 ✓

am 9158 · 1044
1913 July 3 d | N < 1044

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1916phae.proj..793C

AM 9254 · 1044 f
1913 July 26 d o v 1044 v

AM 9715 · 959 f. poor plate
1914 Apr. 16 b o v 959 v

AM 9945 · 1034
1914 May 15 b' o v 1034 v
· 997 b² | v
v | d 1044. 1021 v } 10.28 v

AM 9858 · 1044
June 13, 1914 d | N < 1044 v

AM 9876 · 997
1914 June 19 b² | v
v | d 1044. 1021 v

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1916phae.proj..793C

May 16, 1916

W Virginis

AM 9956

1914 July 20

v o K 1118. 1118v
.1044 } 11.22v
d 2 v
v 1 e' 1166. 1126v

K = K' h. 140

AM 9967

1914 July 22

.997
b2 1 v
v 1 f' 10.91. 1044v

AM 10037

1914 Aug. 9

.1044
d 1 v
g barely visible
v 1 g 1194. 1119v

AM 10345

1915 Mar 24

.959
b o v 959v
.930 } 9.64
a 1 v
v 1 b2 997. 968

x

AM 10370

1915 april 3

Nothing visible

α = 14

δ = −15

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1916phae.proj..793C

AM 10375
1915 April 4 · 1118
K | v
v | g 1194 · 1156
K = K' h. 140

α = 14
δ = -15

AM 10470
1915 April 22 · 1044
d | N < 1044

α = 14
δ = -15

AM 10554
1915 May 6 · 1044
d | v
v | f' 1091 · 1068

AM 10577
1915 May 10 · 1044
d | N < 1044

AM 6262 · 997
1909 June 21
b² | v
v | d 1044 · 1021

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1916phae.proj..793C

May 16, 1916

W Virginis

am 6303

1909 June 29

· 1044
d 1 v
v 1 g 1194 · 1119 ✓

am 6357

1909 July 15

· 1044
d 1 v
v 1 f' 1091 · 1068 ✓

am 6843

1910 March 2

· 959
b 1 v
v 2 d 1044 · 987 ✓
· 930
a 1 v
v 1 b' 1034 · 982 ✓
} 984 ✓

am 6859

1910 April 3

· 1044
d 1 N < 1044 ✓

am 6930

May 27, 1910

· 930
a 1 v
v 1 b² 997 · 964 ✓

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1916phae.proj..793C

AM 6979 · 1034
1910 June 3 b' 1 v
v 1 d 1044 · 1039 ✓

AM 7006 · 1044
1910 June 8 d 1 v N.G.
v 0 e 1103 · 1103 ✓

AM 7031 · 1091
1910 June 25 f' 1 v
v 1 g 1194 · 1143 ✓

AM 7454 · 959
1911 June 16 b 1 v
v 1 d 1044 · 1001 ✓

AM 7465 · 1034
1911 June 18 b' 0 v 1034 ✓
· 959 b 2 v
v 1 d 1044 · 1015 ✓ } 10.24 ✓

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1916phae.proj.793C

May 16, 1916

W Virginis

am 7503
1911 June 29

.959
b | v
v | b' 1034 . 997 ✓

am 7553
1911 July 16

.997
b² o v 997 ✓
.930
a | v 1034 .
v | b' 1034 982 ✓
} 9.90 ✓

am 7575
1911 July 19

.997
b² | v
v | d 1044 . 1021 ✓

am 7596
1911 July 22

.959
b | v
v | d 1044 . 1001 ✓

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1916phae.proj..793C

May 17, 1916

AM 8056 — p — b or a not visible
1912 April 13

AM 8063 — p
1912 April 16 — .930 a 1 N — < 930 ✓

AM 8096
1912 April 21 — .930 a 1 v
v 2 d 1044 . — 968 ✓

AM 8141 — .997
1912 May 4 — b^2 1 v
v 1 b' 1034 . — 1015 ✓

AM 8255
1912 May 25 — .959 b 1 v
v 1 b' 1034 . — 997 ✓

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1916phae.proj..793C

May 17, 1916

W Virginis

f

AM 8278

1912 June 4

· 1044
d 1 v <1044 ✓

AM 8291

1912 June 6

· 1044
d 1 v
v 1 g 1194 · 1119 ✓

AM 8318

1912 June 10

· 959
b 1 v
v 1 d 1044 · 1001 ✓

AM 8357

1912 June 17

· 1057
f 1 v
v 1 f' 1091 · 1074 ✓

AM 8387

1912 July 4

· 10.91
f' o v 1091 ✓
· 1044
d 1 v
v 1 g 1194 · 1119 ✓
} 11.05 ✓

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1916phae.proj..793C

AM 8411 · 1044
1912 July 7 d 1 N < 1044 ✓

AM 8428 · 1044
1912 July 10 d 1 v N.G.
v o K 1118 · 1118 ✓ K = K' μ 140

AM 8500 · 1044
1912 July 21 d 1 v
v 1 f' 1091 · 1068 ✓

AM 8818 · 959
1913 April 7 b 1 N < 959 ✓

AM 8850 · 959
1913 May 7 b 1 v
v 1 d 1044 · 1001 ✓

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1916phae.proj..793C

May 17, 1916

W Virginis

Ab 16250 .959
1915 March 17 b 1 v
v 1 d 1044 · 1001 ✓

ab 16275
1915 March 15 .930 a 1 N <930 ✓

ab 16304 .1044 Images winged
1915 March 20 d 1 v
v 1 ≡c' 1133 · 1088 ✓ } 10.81 ✓
.1057 f 1 v
v 1 f' 1091 · 1074 ✓

ab 16373 .1044
1915 April 7 d 1 v 1068 ✓
v 1 f' 1091 ·

Ab 16383 .1044
1915 April 8 d o v 1044 ✓ } 10.52 ✓
.997 b 2 v
v 1 f' 1091 · 1059 ✓

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1916phae.proj..793C

ac 16445 g barely visible

1915 May 10 v o f' 1091. 1091 ✓
. 1057
f i v
v i g 1194. 1125 ✓ } 11.08 ✓

AM 4140 . 1044
1906 March 24 d 2 v
v i g 1194. 1144 ✓

AM 4186 Good plate

1906 Apl 28 v o e' 1166. 1166 ✓
. 1044
d 2 v
v i g 1194. 1144 ✓ } 11.55 ✓

AM 4233

1906 May 14 v o f' 1091. 1091 ✓
. 1044
d i v
v i g 1194. 1119 ✓ } 11.05 ✓

AM 4288 . 959

1906 June 11 b i v
v 2 d 1044. 987 ✓

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1916phae.proj..793C

May 17, 1916

W Virginis

AM 4325 · 1044
1906 June 16 d 1 v
v 1 g 1194 · 1119 ✓

AM 4831 · 1044
1907 May 13 d 2 v
v 1 g 1194 · 1144 ✓

am 4876 · 1057
1907 May 31 f 1 v
v 2 g 1194 · 1103 ✓

am 4911 · 959
1907 June 8 b 1 v
v 1 d 1044 · 1001 ✓

am 4945 · 1034
1907 June 29 b' 1 v
v 1 d 1044 · 1039 ✓

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1916phae.proj..793C

~~1907~~ · 1034

AM 5003 b' 1 v

1907 July 16 v 1 d 1044 · 1039.

AM 5367 · 1044

1908 Apl 5 d 1 N < 1044 ✓

AM 5412 · 997

1908 Apl 25 b² 1 v

v 1 d 1044 · 1021 ✓

AM 5534 · 959

1908 June 6 b 1 v

v 1 d 1044 · 1001 ✓

AM 5573 · 959

1908 June 18 b 0 v 959 ✓

· 930 a 1 v } 9.6v ✓

v 1 b² 997 · 968 ✓

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1916phae.proj..793C

May 17, 1916

W Virginis

AM 5598 · 1034
1908 June 25 b' 1 v
v 1 d 1044 · 1039 v

AM 5950 · 959
1909 Feb. 1 b 1 v
v 1 d 1044 · 1001 v

AM 6022 · 959
1909 April 7 b 0 v 959 v

AM 6092 · 1044
1909 May 8 d 1 v
v 1 c 1103 · 1074 v

AM 6180 · 959
1909 May 29 b 1 v
v 2 b' 1034 · 984 v

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1916phae.proj..793C

AM 6211 · 1044
1909 June 10 d 1 v
v 1 g 1194. 1119 v

AM 6255 · 997
1909 June 20 b² 1 v
v 1 d 1044. 1021 v
exp. 65m

AM 6256 · 997
1909 June 20 b² 1 v
v 1 d 1044. 1021 v
exp. 122m

AC 11626 · 930
1910 May 5 a 1 N 930 v

12317 HC · 997
1911 Jan 28 b² 1 v
v 1 d 1044. 1021 v

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1916phae.proj..793C

May 17, 1916

W Virginis

Ab 12916
1912 Feb. 10
·959
b 1 v
v 1 d 1044· 1001 ✓

Ab 12940
1912 Feb. 20
1118·
v 0 K 1118 ✓
v 0 c' 1133· 1133 ✓ } 11.26 ✓
K = K' p. 140

ab 12952
1912 Feb. 27
·959
b 1 v.
v 1 d 1044· 1001 ✓

ab 12961
1912 Feb. 28
·997
b² 1 v
v 1 d 1044· 1021 ✓

ab 13005
1912 March 16
·997
b² 1 v
v 2 f 1057· 1017 ✓
·959
b 1 v
v 1 d 1044· 1001 ✓ } 10.09 ✓

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1916phae.proj..793C

AG 13020
1912 March 22
·1044
d 1 v
v 1 g 1194. 1119 ✓

AG 13088
1912 April 11
·1044
d 2 v
v 1 g 1194. 1144 ✓

AG 13104
1912 April 21
·959
b 0 v 959 ✓
Rather poor plate

AG 13108
1912 April 25
·1034
b' 1 v
v 1 c 1103. 1068 ✓

AG 13775
1913 Feb. 12
·930
a 1 v
v 1 d 1044. 987 ✓
Multiple (5) images

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1916phae.proj..793C

1916 May 17

W Virginis

ac 13824 .930 f
1913 Feb. 25 a 1 v
v 0 b' 1034. 982 v

ab 13835 .1044
1913 ~~Feb.~~ d 1 v
March 2 v 1 c 1103. 1074 v

ab 13847 .1044 f
1913 March 6 d 1 v
v 0 g 1194. 1119 v

ab 13902 .930 p
1913 March 19 a 1 N < 930 v

ab 13923 .959
1913 March 31 b 1 v
v 2 d 1044.
987 v } 9.9 v
.997 b² 0 v 997 v }

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1916phae.proj..793C

ab 13943 · 1044
1913 April 9 d 2 v
v 2 g 1194. 1119 ✓

ab 13951 f
· 930
1913 April 17 a 1 v N.G.
v 0 b' 997. 997 ✓

ab 13984 · 1044
1913 April 26 d 1 N < 1044 ✓

ab 14005 · 959
1913 May 4 b 1 v
v 1 b' 1034. 997 ✓

ae 14023. · 1044
1913 May 12 d 1 v N.G.
v 0 e 1103. 1103 ✓

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1916phae.proj..793C

May 17, 1916

W Virginis

AG 14795 · 997
1914 Jan. 21 b² | v
v | d 1044 · 1021 ✓

AG 14909 · 959
1914 Feb. 24 b | v
v | d 1044 · 1001 ✓

AG 14949 · 930
1914 March 10 a | v
v | b' 1034 · 982 ✓

Fogged : poor plate
Reddish plate, though not marked so.

AG 15004 · 1044
1914 March 20 d | v
v | g 1194 · 1119 ✓

AG 14995
1914 March 19 ~~v~~ d o c 1103 · 1103 ✓ f

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1916phae.proj..793C

AG 15054 · 959 Eryth pl: Yellow Screen
1914 Apl. 5 b 1 N < 959 ✓

AG 15044 · 997 f Eryth. Pl: Yellow screen I
1914 April 3 b^2 0 v 997 ✓

AG 15036 · 997 f, but not so f as 15044 –
1914 March 31 b^2 0 v 997 ✓

AG 15401 · 997
1914 April 17 b^2 1 v
v 1 d ^{1044} · 1021 ✓

AG 15140 · 959
1914 April 30 b 1 v 978 ✓
v 1 b $^{-997}$ · 979

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1916phae.proj..793C

Fred. May 17, 1916

W Virginis

AG 15224 · 1044 f
1914 June 1 d 1 v N.G.
v 0 f' 1091. 1091 ✓

AG 15229 · 1034 f Fogged
1914 June 2 b' 0 v 1034 ✓

AG 15921 · 1044
1914 Dec. 22 d 1 N < 1044 ✓

AG 16092 · 997 f Yellow
1915 Feb. 10 b² 1 d v Some stars very bright
v 1 d 1044. 1021 ✓

AG 16128 · 930
Feb. 18, 1915 a 1 v
v 1 b' 1034. 982 J

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1916phae.proj..793C

AG 16215 · 930
1915 March 8
a 1 v
v 2 d 1044 · 968.

AM 1372 · 997
1902 June 17
b² 1 v
v 1 b' 1034 · 1015 ✓ } 1001
· 959
b 1 v
v 2 d 1044 · ~~987~~ ~~998~~ } 10.0 b / ×

AM 1497 · 959
1902 Aug. 12
b 1 v
v 1 d 1044 · 1001 ✓

AM 1817 · 1044
1903 Feb. 5
d 2 v
v 1 k 1118 · 1094 ✓ K = K' p. 140

AM 1863 · 1044
1903 Apr. 17
d 2 v
v 1 g 1194 · 1144 ✓

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1916phae.proj..793C

May 17, 1916

W Virginis

am 1884 .959

1903 April 25 b | v

v | b' 1034. 997 ✓

am 1894 .997

1903 April 28 b^2 | v

v | b' 1034. 1015 ✓

am 2013

1903 June 12 .1044 d o v 1044 ✓

.997 b^2 | v } 10.50 ✓

v | K 1118. 1057 ✓

K = K' p. 140

am 2043 .959

1903 June 16 b | v

v 2 d. 1044. 987 ✓

.997 b^2 o v 997 ✓ } 9.9v ✓

am 2058 .1044

1903 June 22 d o v 1044 ✓

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1916phae.proj..793C

AM 2183 · 959
1903 Aug 11 b 1 v
v 1 d 1044. 1001 ✓

AM 2435 · 1044
1903 Dec 28 d 1 v
v 1 f 1057. 1050 ✓

AM 2475 · 1044
1904 Feb. 23 d 1 N 1044 ✓

AM 2505 · 959
1904 Apl. 7 b 1 v
v 1 d 1044. 1001 ✓

AM 2544 · 1044 ✓
1904 Apil 15 d 1 N < 1044

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1916phae.proj..793C

May 17, 1916

W Virginis

AM 2613

~~d 1 f~~ · 1044

1904 May 5 d 1 v

v 1 f · 1091 · 1068

AM 2687

· 1044

1904 May 31 d o v 1044

Poor plate : 4 images

AM 2685

· 1034

1904 June 1 ~~d~~ b' 1 v

v 1 d · 1044 · 1039

AM 2812

· 1034

1904 July 6 b' 1 v

v 1 f · 1057 · 1046

· 1044

d o ~~#~~ v 1044

} 1045

AM 2903

· 959

1904 Aug 2 b 1 v

v 1 d · 1044 · 1001

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1916phae..proj..793C

AM 3337
1905 Jan 14
· 1044
d | v
v | g 1194 ·
~~1069~~ 1119 1119

AM 3355
1905 Feb. 25
· 930
a | v
v | b' 1034 ·
982 ✓

AM 3412
1905 Mar 29
· 1044
d o v
· 1034
b' | v
v 2 f' 1091 ·
1044 ✓
3
~~1057~~ 1
} 10.47 8
8

AM 3440
1905 Apl. 5
~~1034~~ · 959
b | v
v | d 1044 ·
1001 ✓

AM 3487
1905 Apl 27
c
· 1044
d | v
v | g 1194 ·
~~1069~~ 1119
1119

Exp. 448m ! many images

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1916phae.proj..793C

May 17, 1916 W Reginus

AM 3512

1905 May 10

~~b v d~~

.959 b 1 v

v 1 d 1044. 1001 ✓

.997 b 2 1 v

v 1 b' 1034. 1015 ✓ } 10.08 ✓

AM 3521

~~.1054~~ .959

1905 May 11 b 1 v

v 2 c 1103. 1007 ✓

~~1054~~ } 10.21 ✓

.1034 b' 0 v 1034 ✓

AM 3582

~~.d 930~~ 1044

1905 June 3 d 1 v

v 1 g 1194. 1119 ✓

v 0 K 1118. 1118 ✓ } 11.18 ✓

K = K' p.140

AM 3636

.1044

1905 June 20 d 2 v

v 1 g 1194. 1144 ✓

AM 3696

.1044

1905 July 8 d 1 v

v 2 g 1194. 1094 ✓

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1916phae..proj..793C

AM 4084
1906 Jan 31 · 1044
v o K 1118 · 1118 ✓
d 1 N
v 1 g 1194 · 1119 ✓ } 11.18 ✓

AM 4113
1906 Feb. 16 · 1044
d 1 N < 1044 ✓

AG 9386
1908 Apr. 3 · 1103
C 1 N
v 1 g 1194 · 1149 ✓

AG 9402
1908 Apr. 9 · 959
b 1 N
v 1 d 1044 · 1001 ✓

AG 9428
1908 Apr. 19 · 1044
d 1 N
v 1 g 1194 · 1119 ✓

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1916phae.proj..793C

May 17, 1916

W Virginis

ac 9437 · 1044
1908 April 21
d 2 v
v 1 g 1194. 1144 ✓ } 11.18 ✓
v o f' 1091. 1091 ✓ }

ac 9457 · 997
1908 May 1
b² 1 v
v 1 b' 1034. 1015 ✓

ac 10192 · 959
1909 Jan 31
b 1 v
v 1 d 1044. 1001 ✓

ac 10256 · 1034
1909 Feb. 22
b' o v 1034 ✓

ac 10264 · 1044
1909 Feb. 25
d 2 v
v 1 g 1194. 1144 ✓

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1916phae.proj..7936

Ab 10 3~~44~~ 43 · 959
1909 March ~~27~~ 21 b 1 v
v 1 d 1044. 1001 ✓

Ab 10444 · 930 poor
1909 apl 22 a 1 N < 930 ✓

Ab 10448 · 1044
1909 Apr. 23 d o v 1044 ✓

ab 10454 · 959
1909 Apr. 24 b 1 v
v 2 d 1044. 987 ✓

ab 10493 · 959
1909 may 11 b 1 v
v 2 d 1044. 987 ✓

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1916phae.proj..793C

May 17, 1916 W Virginis

ac 10521	· 1044			
1909 May 25	d 1 v		?N.G.	
	v o c 1103 ·	1103	✓	
ac 10608			Fogged; poor	
1909 July 3	· 930 a o v	930	✓	
ac 11310	· 1034		Trails	
1910 Jan 15	b' o v	1034	✓	
ac 11397	· 930			
1910, Feb. 18	a 1 v			
	v 1 d 1044 ·	987	✓	
ac 11439	· 959			
1910 Mar 5	b 1 v			
	v 2 d 1044 ·	987	✓	

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1916phae.proj . 7936

AC 11472 · 1044
1910 Mar. 14 d i v N.G.
v o f' 1091 · 1091 ✓

AC 11498 · 959
1910 Mar 18 b i v
v 2 d 1044 · 987 ✓

AM 365 · 959
1900 Feb. 20 b o v 959 ✓
v 2 d 1044 · - N.G.

AM 410 · 1044
1900 April 4 d i v
· v i k 1118 · 1081 ✓ K=K' p. 140

AM 429 · 1044
1900 Apr. 9 d i v
v i g 1194 · 1119 ✓

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1916phae.proj..793C

AM 500

1900 June 19 · 1057 f o v 1057 ✓

AM 513

1900 June 27 · 1034 b' o v 1034 ✓
· 930 a 2 v
v 1 d · 1044 1006 ✓ } 1020 ✓

AM 963

1901 April 24 · 1057 f 1 v –
v o k · 1118 1118 ✓ N.G.
K = k' p. 140

AM 823

1901 June 5 · 959 b 1 v
v 1 b' · 1034 997 ✓

AM 867

1901 June 21 · 997 b² 1 v
v 1 b' · 1034 1015 ✓

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1916phae.proj..793C

AM 901 · 930 Poor plate
1901 July 6 d 1 N
v 1 b 2 997 · 964 ✓

AM 1178 · 1044
1902 Apr. 3 d 1 N 1044 ✓

AM 1181 · 1044 Rather poor plate
1902 Apr 5 d 1 N < 1044 ✓

AM 1331 · 1044
1902 June 11 d 1 v
v 1 g 1194 · 1119 ✓

AM 4547 · 1044
1904 Jan 18 d 1 v
v 1 g 1194 · 1119 ✓
· 1103 Co v 1103 ✓ } 1111

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1916phae.proj..793C

Ab 4617		f	Fogged
1904 Febr. 7	v 0 K 1118.	1118 ✓	K=K' p. 140
Ab 4674			Slightly fogged
1904 Feb. 22	1194 g 0 v	1194 ✓	
	1103 C 1 v	–	N.G.
AC 4724	1044.		
1904 Mar. 9	d 2 v	1	
	v 1 g 1194.	1144 ✓	
AC 4801	930.		
1904 Apl. 4	a 1 v		
	v 1 d 1044.	987 ✓	
AC 5030	997.		Slightly fogged
1904 July 2	b^2 1 v		
	v 1 d 1044.	1021 ✓	

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1916phae.proj..793C

AC 5922 · 1044
1905 Jan. 30 d 1 v 1091 1067 1067
v 1 f'

AC 5962 · 959
1905 Feb. 7 b 1 v
v 2 d 1044 · 987

AC 5975 · 959
1905 Feb. 10 b 1 v
v 1 d 1044 · 1001

AC 6096 · 997
1905 March 1 b² 1 v
v 1 d 1044 · 1021

AC 6160
1905 Mar 12

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1916phae.proj..793C

ac 6160
1905 March 12 · 1044 d 1 v
v 1 c 1103 · 1074 ✓

ac 6224 · 1044
1905 Mar. 27 d 1 v
v 2 g 1194 · 1094 ✓ } 10.98 ✓
· 1103 C o v 1103 ✓ }

ac 6319
1905 ~~Mar~~. · 1034 b' 1 v
April 25 v 1 d 1044 · 1039 ✓

ac 6330
1905 April 30 · 1044 d 1 v
v 1 K ~~1144~~ 1118 · 1081 ✓ K = K' p. 140

ac 6337
1905 May 1 · 1044 d 1 v
v 2 g 1194 · 1092 ✓

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1916phae.proj..793C

AC 7474 · 1044
1906 Feb. 2 d 1 v
v 1 f' 1091 · ~~1119~~ 1068 1068 ×

AC 7561 · 1044
1906 Mar. 6 d 1 v — N.G.
v 0 f' 1091 · 1091 ✓

AC 7394 · 1044
1906 ~~May 20~~ March 20 d 1 v
v 2 K 1118 · 1069 ✓ K = K' p. 140

AC 7482 · 997 Pow plate
1906 April 17 b² 1 v
v 1 d 1044 · 1021 ✓

AC 7501 · 1044 f Pow plate
1906 April 25 d or v 1044 ✓

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1916phae.proj..793C

AC 7525 · 1034 — Poor plate; images multiple
1906 May 1 — b' 1 v
v 1 d 1044 · 1039 ✓

AC ~~7563~~ 8173 — f
~~1906 May 19~~ · 959
1907 Jan 21 — b o v — 959 ✓

AC 8254 · 1044 — g invisible
1907 Feb. 14 — d 1 v — – N.G.
v o c 1103 · 1103 ✓

AC 8276 · 959
1907 Feb. 21 — b 1 v
v 2 d 1044 · 987 ✓

AC 8303 · 930 — Poor plate
1907 Feb. 25 — a 2 v
v 1 b' 1034 · 1000 ✓

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1916phae.proj..793C

AC 8367 · 1044 Rather poor
1907 Mar. 20 d 1 N < 1044 ✓

AC 8428 · 997
1907 Apl. 17 b² 1 v
v 1 b¹ 1034 · 1015 ✓

AC 8545 · 1044
1907 June 12 d 1 N < 1044 ✓

AC 9249 · 959
1908 Feb. 7 b 1 v
v 1 d 1044 · 1001 ✓

AC 9311 · 959
1908 Mar 3 b 2 v
v 1 d 1044. 1015 ✓

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1916phae.proj..793C

May 18, 1916

W Virginis

AC 9379 · 1044
1908 April 2
d 1 v
v l g 1194 · 1119 ✓

AC 294 · 1044 Somewhat fogged
1899 April 21
d o v 1044 ✓

AG 676 · 1044
1900 Jan 10
d 2 v
v l g 1194 · 1144 ✓
v o f' 1091 · 1091 ✓ } 1118

AG 714 · 930 Poor plate
1900 Feb. 6
a 1 v
v l d 1044 · 987 ✓

AG 786 · 997
1900 April 1
b² 1 v
v l d 1044 · 1021 ✓

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1916phae.proj..793C

AG 839 · 930
1900 April 30 a | N
v 2 d 1044 · 968 ✓

AG 883 · 1034 Poor plate
1900 June 13 b' | N < 1034 ✓

AG 1185 · 1044
1901 Jan. 29 d | N
v | K 1118 · 1081 ✓ K = K' p. 140

AG 1464 · 997
1901 May 14 b² | N
v | d 1044 · 1021 ✓

AG 2149 · 1044
1902 Jan. 3 d | N
v | c 1103 · 1074 ✓

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1916phae.proj..793C

AG 2268 · 997
1902 Feb. 4 b² | v
v | d 1044· 1021

AG 2347 somewhat fogged
· 959
1902 Feb 19 b | v
v 2 d 1044· 987

AG 2393 · 997
1902 March 6 b² | v
v | d 1044· 1021

AG 2479 · 1044
1902 April 15 d o v 1044
· 997 b² | v
v | b' 1034· 1015 } 10.30

AG 2533
1902 May 9 v o K 1118· 1118
· 1044 d | v
v | g 1194· 1119 } 1118
K = K' p. 140

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1916phae.proj..793C

AG 2544
1902 May 13
930
a 1 v
v 1 d 1044.
987 ✓

AG 2606
1902 June 5
997
b² 1 v
v 1 d 1044.
1021 ✓

AG 3134
1902 Dec. 31
Good plate
1044
d o v
959
b* 2 v
v 1 c 1103.
1044 ✓
1055
~~959~~
1035
~~1050~~
1050
X

AG 3143
1903 Jan 1
Good
1044
d 1 v
v 1 c 1103.
1088 ✓

AG 3167
1903 Jan 12
Poor plate
1034
b' o v
1034 ✓

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1916phae.proj..793C

May 18, 1916 W Virginis

AC 3331
1903 Feb. 20
.997
b² | v
v | d 1044 · 1021 ✓

AC 3342
1903 Feb. 22
·1044
d | v
v | K 1118 · 1081 ✓ } 10.9 ✓
·1103
c o v 1103 ✓ }
K=K' h.140 ✗

AC 3366
1903 Feb. 26
·1044
d | v
v | c' 1133 · 1088 ✓

AC 3401
1903 March 6
·997
b² | v
v | d 1044 · 1021 ✓

AC 3442
1903 Mar. 19
Poor plate: double images, discs
·997
b² | v
v | d 1044 · 1021 ✓

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1916phae.proj..793c

AC 3560 .959
1903 Apl. 28 b | v
v | d 1044. 1001

AG 3670 f
.1103
1903 May 23 c | v < 1103

May 19, 1916

AG 16265 Very fine plate
.1044
1915 March 14 d | v
v 2 f 1091.
1060
.1057 f o v 1057 } 10.58

AG 16430 Good plate
.1057
1915 May 6 f | v
v | c 1103. 1080

AG 7420 Yellow
.959
1900 Feb. 27 b | v
v | d 1044. 1001

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1916phae.proj..793C

May 19, 1916

AC 1266
1901 Feb. 19
959
b | v
v | d 1044 · 1001 ✓

AC ~~6030~~
~~1905 Feb. 18~~
10m exp - nothing
~~b' | v~~
~~v | f'~~

1911 Dec. 4
Faint
AC 12769
1034
b' | v
v | f' 1091 · 1062 ✓

AC 16054
1915 Jan. 29
1044
d | v
v | g 1194 · ~~1019~~ 1119 ✓

AC 16241
1915 March 11
Good plate
959
b | v
v | d 1044 · 1001 ✓

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1916phae.proj..793C

AC 16282 — Faint — Yellow

1915 March 16 — v a f' 1091 · 1091 ✓

AM 10451

1915 Apl 20 — 1091 ·
v o f' 1091 ✓
1044 ·
d i v
v i g 1194 · 1119 ✓ } 11.05 ✓

AM 10432

1915 April 15 — · 1044
d o v 1044 ✓
· 1034
b' i v } 56 ✓
v i c 1103 · 1068 ✓ } 10.

AM 10424

1915 April 17 — · 997
b² i v 4
v i d 1034 ⊙ 20 ~~1015~~ 1020 ✗

AC 16561

1915 July 6 — · 930
a i v
v 2 d 1044 · 968 ✓

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1916phae.proj..793C

May 19, 1916 W Virginia

am 10667
1915 June 12
.1044
d | v
v o f .1091
1091 ✓
N.G.

am 10636
1915 June 6
.997
b² | v
v | b' .1034
1015 ✓

am 10628
1915 June 5
.1034
b' o v
1034 ✓
.959
b | v
1001 ✓
10.18 ✓
v | d .1044
1001

am 10609
1915 June 3
~~b² v b'~~
.997
b² | v
v | b' .1034
1015 ✓
.959
b | v
v 2 d .1044
987 ✓
10.01 ✓

am 9961
1914 July 21
faint
.1044
d | v
v | K .1118
1081 ✓
K = K'

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1916phae.proj..793c

MD 3288

April 26, 1913 · 1044 d 1 v

v 2 e 1159 · 1082 v

Found difficulty in using this large-scale plate.

MD 3417

1913 May 19 · 959 b 1 v

v 1 d 1044 · 1001 v

As above

MD 3354

1913 May 7 · 959 b 1 v

v 1 b' 1034 · 997 v

As above

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1916phae.proj..793C

May 20, 1916 W Virginis

[PRACTICE]

Plate AM 10696
June 18, 1915

Scale N.

Kapteyn Area 105 (MC 2943)

K. No.	Scale Read:
1	4·8 B
2	6·4 B
3	7·0 B
4	6·7 B
5	7·2 B
6	7·8 B
7	8·7 C [9·(4) B]
8	8·9 C
9	9·2 C
10	9·5 C
11	10·[5] C

Kapteyn 104 (MC 2666)

	B	C
1	6·0	5·1
2	7·3	7·0
3	9·[1]	8·5
4	~~9·[6]~~ 9·[7]	8·5
5	8·9	8·7
6	9·(3)	8·7
7	[10]	9·4
8	–	9·5
9	–	9·7
10	–	10·0 f
11		

Sequence for W. Virginis — Scale Reading

	B	C
a	7·1	6·5
b	7·3	7·0
c	9·0	8·5
d	8·2	8·1
e	9 [·6]	9·1
f	8·2	8·0
f′	9·0	8·3
g	[10]	9·3
b′	8·1	7·8
b^2	7·8	7·2
e′	–	9·4
c′	9 [·2]	9·1
K′	9[3]	8·5

[ ] = extrapolated

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1916phae.proj..793C

Mon. May 22, 1916 W Virginis

Plate AM. 10696 $\begin{matrix}13\ 00\\ +\ 00\end{matrix}\}$

Scale N

(Con. – 4)

Carte [MC from MC 7828]

	B		C	
1	5.5	5.1	5.2	5.~~15~~
2	6.2	5.8	5.8	5.80
3	7.0	6.6	6.2	6.40
4	7.2	6.8	6.5	6.65
5	7.8	7.4	7.3	7.~~4~~[35]
6	7.6	7.2	7.1	7.~~2~~[15]
7	8.1	7.7	7.9	7.~~85~~ 80
8	8.7	8.3	8.5	8.40
9	8.8	8.4	8.5	8.45
10	9.0	8.6	8.5	8.~~6~~[55]
11	–		9.4	9.40
12	–		10?	10.
13	–		9.9	9.90

Kapteyn 104 [See MC 2666]

	B		C	
1	5.3	4.9	5.0	~~5.0~~ 4.95
2	7.2	6.8	7.0	6.90
3	9.0	8.6	8.4	8.50
4	9.2	8.8	8.8	8.80
5	9.4	9.0	8.6	8.80
6	9.3	8.9	8.8	8.85
7	9.6	9.2	9.1	9.~~15~~
8	9.6	9.2	9.3	9.25
9	–		~~10.0~~ 9.7	9.70
10	–		10.0	10.00

Kapteyn 105 [see MC 2943]

	B		C	
1	5.0	4.6	4.7	4.65
2	6.2	5.8	5.8	5.80
3	7.0	6.6	6.3	6.45
4	6.9	6.5	6.1	6.30
5	7.2	6.8	6.5	6.65
6	7.8	7.4	7.2	7.30
7	~~9.2~~ 8.6	8.8	8.5	8.65
8	9.2	8.8	8.8	8.80
9	9.5	9.1	9.3	9.20
10	9.9	9.5	9.6 f	9.~~6~~[55]

Sequence for W. Virginis AM 10696

	B		C	
a	7.3	6.9	6.7	6.80
b	7.1	6.7	7.0	6.85
b'	8.1	7.7	7.5	7.60
b²	7.7	7.3	7.3	7.30
c	9.0	8.6	8.5	8.~~6~~[55]
c'	9.2	8.8	8.9	8.85
d	8.1	7.7	8.0	7.85
e	9 [.3]	8.9	9.2	9.05
e'	9.[6]	9.2	9.2	9.20
f	8.4	8.0	8.2	8.10
f'	9.0	8.6	8.6	8.60
g	–		10.0	10.0
k'	9.[2]	8.8	9.1	8.95

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1916phae.proj..793C

May 22. 1916 W Virginis

Scale N. Plate AM 10896

(-4)

Carte [see MC 7828]

	B		C	Mean	Mean from p. 111	Mean of both pages
1	5.9	5.5	5.2	5.35	5.15	5.25
2	6.5	6.1	6.0	6.05	5.80	5.92
3	6.8	6.4	6.2	6.30	6.40	6.35
4	7.2	6.8	7.1	6.95	6.65	6.80
5	8.0	7.6	7.5	7.55	7.35	7.45
6	7.6	7.2	7.1	7.15	7.15	7.15
7	8.2	7.8	8.1	7.95	7.80	7.88
8	8.4	8.0	8.4	8.20	8.40	8.30
9	9.1	8.7	8.4	8.55	8.45	8.50
10	9.4	9.0	9.2	9.10	8.55	8.82
11	9.5	9.1	9.4	9.25	9.40	9.32
12	—		10.	10.		10.
13	~~9.8~~		9.8	9.8	9.9	9.85

Skapteyn 104 [see MC 2666]

	B		C	Mean of both pages	Mean from p. 111	B	C	Mean of B+C
1	5.00	5.4	~~5.1~~ 4.95			5.4	5.0	5.1	5.05
2	~~7.0~~ 6.92	5.4			6.1	6.90	7.3	6.9	7.0	~~7.0~~ 6.95
3	8.~~5~~ 38	7.0			6.2	8.50	8.4	8.0	8.5	8.25
4	8.72				8.80	9.1~~8~~7		8.6		8.65
5	8.60				8.80	8.7	8.~~3~~	8.5		8.40
6	8.85				8.85	9.3	8.9	8.8		8.85
7	8.~~95~~ 3				8.~~9~~15	9.4	9.0	8.5		8.~~8~~75
8	9.20				9.25	9.5	9.1	9.2		~~9.2~~ 9.15
9	9.~~5~~8				9.70	9.9	9.~~5~~	9.4		9.45
10	10.05				10.0	—		10.1		10.1

Skapteyn 105 [See MC 2943]

	B		C	Mean	Mean from p. 111	Mean of both pages
1	4.7	4.3	4.1	4.20	4.65	4.42
2	6.3	5.9	6.1	6.00	5.80	5.90
3	~~6.6~~ 7.1	6.7	6.3	6.50	6.45	6.48
4	6.8	6.4	6.2	6.30	6.30	6.30
5	7.1	6.7	6.2	6.45	6.65	6.55
6	8.0	7.6	7.3	7.45	7.30	7.~~2~~38
7	9.2	8.8	9.0	8.90	8.65	8.~~7~~78
8	9.2	8.8	8.7	8.80	8.80	8.80
9	9.4	9.0	9.0	9.00	9.20	9.10
10	9.8	9.4	9.2	9.30	9.~~6~~55	9.42

W. Virginis Sequence

	B	C	Mean	← from p. 114	Mean of both pages
a	7.1	6.7	6.7	6.70	6.80	6.~~8~~75	05 05
b	7.2	6.8	7.1	~~7.0~~ 6.95	6.85	6.90	05 05
b'	8.1	7.7	8.1	7.90	7.60	7.~~6~~75	15 15
b^2	7.7	7.3	7.5	7.40	7.30	7.~~4~~35	05 05
c	9.0	8.6	8.5	8.~~6~~55	8.~~4~~55	8.~~6~~55	00 00
c'	9.1	8.7	8.7	8.70	885	8.~~7~~78	08 07
d	8.1	7.7	8.0	~~7.~~8.85	7.85	7.85	00 00
e	9.3	8.~~7~~	8.8	8.85	9.05	8.95	10 10
f	8.2	7.8	7.8	7.80	~~7.~~8.10	~~7.~~8.00	15 15
f'	8.9	8.5	8.3	8.40	860	8.50	10 10
g	9.7	9.~~2~~3	9.4	9.~~3~~35	100	~~9.~~9.68	33 32
K'	9.2	8.8	8.5	8.65	~~9.0~~ 8.95	8.80	15 15
e'	[omitted]			—	9.20		230 24 ±.09%

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1916phae.proj..793C

Tuesday, May 23, 1916. W Virginis

Scale N - Plate AC 16265.

Correction to scale B −4

Correction to C

Carte

	B		C	mean of B+C
1	4.6	4.2	4.2	4.20
2	5.4	5.0	5.1	5.05
3	6.2	5.8	~~4.2~~ 5.2	5.50
4	6.2	5.8	5.5	5.65
5	7.0	6.6	6.2	6.40
6	6.9	6.5	~~6.7~~ 6.2	6.35
7	7.5	7.1	7.2	7.15
8	8.1	7.7	7.5	7.60
9	8.3	7.9	8.2	8.05
10	9.1	8.7	8.5	8.60
11	9.3	8.9	9.2	9.05
12	9.5	9.1	9.5	9.30
13	9.8	9.4	9.7	9.55

Kapteyn 104

	B		C	mean of B+C
1	5.1	4.7	5.0	4.85
2	7.1	6.7	6.5	6.60
3	7.5	7.1	7.2	7.15
4	8.7	8.3	8.2	8.25
5	8.5	8.1	8.3	8.20
6	8.0	7.6	7.8	7.70
7	9.0	8.6	8.3	8.45
8	9.1	8.7	8.6	8.65
9	9.4	9.0	9.2	9.10
10	9.5	9.1	9.3	9.20

Kapteyn 105 -

	B		C	mean of B+C
1	3.9	3.5	3.5	3.50
2	5.3	4.9	5.1	5.00
3	6.1	5.7	5.4	5.55
4	6.3	5.9	5.2	5.55
5	6.1	5.7	5.9	5.80
6	7.2	6.8	6.6	6.70
7	8.3	7.9	8.1	8.00
8	8.3	7.9	8.2	8.05
9	9.1	8.7	8.5	8.60
10	9.3	8.9	8.6	8.75
11	9.9	9.5	9.5	9.50

W Virginis Sequence

	B		C	← mean	← mean from p 112	← mean of both pages
a	6.0	5.6	5.4	5.50	5.55	5.52 02 03
b	6.4	6.0	6.0	6.00	6.00	6.00 00 00
b′	7.2	6.8	6.6	6.70	6.90	6.80 10 10
b²	7.1	6.7	6.1	6.40	6.50	6.45 05 05
c	8.0	7.6	7.6	7.60	~~8.0~~ 7.95	7.78 18 17
c′	8.4	8.0	8.2	8.10	8.05	8.08 02 03
d	7.4	7.0	7.1	7.05	7.15	7.10 05 05
e	9.1	8.7	8.3	8.50	8.50	8.50 00 00
e′	8.8	8.4	8.6	8.50	~~8.35~~	8.42 08 07
f	7.5	7.1	7.5	7.30	7.30	7.30 00 00
f′	7.8	7.4	7.7	~~7.55~~ 7.60	~~7.55~~ 7.50	7.55 00 00
g	8.9	8.5	8.9	8.70	8.40	8.55 15 15
k′	8.6	7.6	7.8	7.70	7.80	7.75 05 05

130
26
±.050

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1916phae.proj..793C

May 23, 1916 W Virginis

Plate aC 16265
Scale N.

W Virginis Sequence

	B		C	mean
a	6.0 / 6.1	5.6	5.5	5.55
b	6.5 / 6.2	6.0	6.0	6.00
b'	7.2 / 6.8	6.8	7.0	6.90
b²	6.9 / 7.1	6.6	6.4	6.50
c	8.3	7.9	8.0	7.95
c'	8.3	7.9	8.2	8.05
d	7.5	7.1	7.2	7.15
e	9.0	8.6	8.4	8.50
e'	8.8	8.4	8.3	8.35
f	7.7	7.3	7.3	7.30
f'	8.0	7.6	7.5	7.55
g	8.8	8.4	8.4	8.40
k'	8.2	7.8	7.8	7.80

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1916phae.proj..793C

May 24, 1916 Virginis

Carte du Ciel $13^h, -2°.5$

Des.	Mag.	Scale Read^g AM 10696	Diff.	Scale Read^g AC 16265	Diff
1.	7.68	5.25	2.43	4.20	3.48
2.	8.53	5.92	2.61	5.05	3.48
3.	8.81	6.35	2.46	5.50	3.31
4.	9.28	6.80	2.48	5.65	3.63
5.	9.84	7.45	2.39	6.40	3.44
6	9.88	7.15	2.73	6.35	3.53
7	10.35	7.88	2.47	7.15	3.20
8	10.88	8.30	2.58	7.60	3.28
9	11.06	8.50	2.56	8.05	3.01
10	11.84	8.82	3.02	8.60	3.24
11	12.26	9.40 (32)	2.86 (94)	9.05	3.21
12	12.37	10.	2.37	9.30	3.07
13	12.56	9.85	2.71	9.55	3.01
	13.10				

104 K

Des.	Mag.	Scale Read^g AM 10696	Diff.	Scale Read^g AC 16265	Diff.
1	8.29	5.00	3.29	4.85	3.44
2	9.78	6.92	2.86	6.60	3.18
3	10.28	8.38	1.90	7.15	3.13
4	10.95	8.72	2.23	8.25	2.70
5	11.25	8.60	2.65	8.20	3.05
6	11.10	8.85	2.25	7.70	3.40
7	11.49	8.95	2.54	8.45	3.04
8	11.91	9.20	2.71	8.65	3.26
9	12.12	9.58	2.54	9.10	3.02
10	12.56	10.05	2.51	9.20	3.36
	13.41				

105 K.

Des.	Mag	Scale Reading ~~4442~~ AM 10696	Diff	Scale Read AC 16265	Diff
1	7.32	~~5.90~~ 4.42	2.90	3.50	3.82
2	8.86	~~6.48~~ 5.90	2.96	5.00	3.86
3	9.35	~~6.30~~ 6.48	2.87	5.55	3.80
4	9.33	~~6.58~~ (5) 6.30	3.03	5.55	3.78
5	9.59	~~7.38~~ 6.55	3.04	5.80	3.79
6	10.44	~~8.78~~ 7.38	3.06	6.70	3.74
7	11.18	8.78	2.40	8.00	3.18
8	11.46	8.80	2.66	8.05	3.41
9	11.69	9.10	2.59	8.60	3.09
10	11.88	9.42	2.46	8.75	3.13
11	12.63			9.50	3.13
12	12.84				
13	13.04				

Mean Values of near-by Tables.

Des.	CARTE MEAN OF AM 10696 AC 16265	Diff	104 K. MEAN OF AM 10696 AC 16265	Diff.	105 K. MEAN of AM 10696 AC 16265	Diff.
1	4.72	2.96	4.92	3.36	3.96	3.36
2	5.48	3.04	6.76	3.02	5.45	3.41
3	5.92	2.88	7.76	2.51	6.02	3.34
4	6.22	3.06	8.48	2.46	5.92	3.40
5	6.92	2.92	8.40	2.85	6.18	3.42
6	6.75	3.13	8.28	2.82	7.04	3.40
7	7.52	2.84	8.70	2.79	8.39	2.79
8	7.85	293	8.92	2.98	8.42	3.04
9	8.28	278	9.34	2.78	8.85	2.84
10	8.71	313	9.62	2.94	9.08	2.80
11	9.18	36(8)				
12	965	2.72				
13	970	2.86				

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1916phae.proj..793C

May 25, 1916. W Virginis

Carte du Ciel

Deduction of Mags. of sequence for W Vig.

Plate AM 10696

	Carte 13h, −2°.5		104 K		105 K		
	Diff. from Curve II	Mag	Diff. from Curve III	Mag	from Curve III	Mag	
a	2.49	9.24	2.82	9.57	300	9.75	a
b	2.49	9.39	2.76	9.66	299	9.89	b
b′	2.49	10.24	2.52	10.27	281	10.56	b′
b²	2.50	9.85	2.62	9.97	290	10.25	b²
c	2.62	11.17	2.39	10.94	262	11.17	c
c′	2.78	11.56	2.40	11.18	2.80	11.58	c′
d	2.50	10.35	2.48	10.33	2.77	10.62	d
e	2.84	11.79	2.40	11.35	2 55	11.50	e
e′	2.86	12.06	2.42	11.62	2.50	11.70	e′
f	2.50	10.45	2.47	10.42	2.76	10.71	f
f′	2.57	11.07	2.40	10.90	2.63	11.13	f′
g	2.74	12.42	2.50	12.18	2.43	12.11	g
K′	2.80	11.60	2.40	11.20	2.57	11.37	K

Plate AG 16265

	Carte 13h, −2°.5		104 K		105 K		
	Diff. from Curve IV	Mag.	Diff. from Curve V	Mag.	Diff. from Curve VI	Mag	
a	354	9.06	3.33	8.85	3.80	9.32	a
b	352	9.52	3.26	9.26	3.78	9.78	b
b′	378	10.58	3.14	9.94	3.68	10.48	b′
b²	346	9.91	3.20	9.65	3.73	10.18	b²
c	316	10.94	3.05	10.83	3.37	11.15	c
c′	311	11.19	3.05	11.13	3.27	11.35	c′
d	333	10.43	3.12	10.22	3.60	10.70	d
e	3.18	11.68	3.09	11.59	3.13	11.63	e
e′	3.08	11.50	3.08	11.50	3.15	11.57	e′
f	3.32	10.62	3.09	10.39	3.55	10.85	f
f′	3.22	10.77	3.06	10.61	3.44	10.99	f′
g	308	11.63	3.10	11.65	3.12	11.67	g
K′	316	10.91	3.12	10.87	3.37	11.12	K

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1916phae.proj..793C

Thurs. May 25, 1916. W Virginis

Magnitudes of sequence for W Virginis

Plates AM 10696 & AC 16265

Adopted July, 1916

Mean of all

	Mean of the two values from Cate	Mean of two vals. from 104 K	Mean of two vals from 105 K	Mean of two vals by 105K.	Mean of all
a	9.15	9.21	9.30	9.54	
b	9.46	9.46	9.59	9.84	
b'	10.41	10.10	10.34	10.52	
b^2	9.88	9.81	9.97	10.22	
c	11.06	10.88	11.03	11.16	
c'	11.38	11.16	11.33	11.46	
d	10.39	10.28	10.44	10.66	
e	11.74	11.47	11.59	11.56	
e'	11.78	11.56	11.66	11.64	
f	10.54	10.40	10.57	10.78	
f'	10.92	10.76	10.91	11.06	
g	12.02	11.92	11.94	11.89	
k'	11.26	11.024	11.18	11.24	

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1916phae.proj..793C

Fri. May 26, 1916. W Virginis —

Residuals of mags. of sequence

	Carte du Ciel 13h, −2°.5		104 K		105 K	
a	+6	+24	−27	+45	−45	−2
b	+20	+7	−7	+33	−30	−19
b′	+10	−24	+7	+40	−22	−14
b^2	+12	+6	0	+32	−28	−21
c	−14	+9	+9	+20	−14	−12
c′	−23	+14	+15	+20	−25	−2
d	+9	+1	+11	+22	−18	−26
e	−20	−9	+24	0	+9	−4
e′	−40	+16	+4	+16	−4	+9
f	+12	−5	+15	+18	−14	−28
f′	−16	+14	+1	+30	−22	−8
g	−48	+31	−24	+29	−17	+27
k	−42	+27	−2	+31	−19	+6
	+69	+149	+80	+336	+9	+42	} +691
	−203	−38	−60	−0	−258	−136	} −695

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1916phae.proj..793C

B = 8 inch Bache Doublet
Taken in Arequipa
10° 24. covered -
1° = 4/5 inch = .8 inch
15m R.A. = 2 inches

B 19835
1897 July 16
Exp. 10m

.930
a | v
v | b' 1034.

982 ✓

Sat. May 27, 1916

981 ✓

B 19835
1897 July 16
Exp. 10m

.959
b | v
v | b' 1034.

997 ✓

.930
a | v
v | b2 997.

964 ✓

B 9503
1893 May 31
Exp. 10m

~~v~~ o f' 1091.

1091 ✓

Plate somewhat fogged

.1044
d | v
v 2 g 1194.

1094 ✓

B 10 858
No date
1894 u.9

Near edge: Images not good

.959
b | v
v | d 1044.

1001 ✓

B 18780
1897 April 9
Exp 13m

.959
b | v
v | b' 1034.

997 ✓

.997
b2 | v
v | d 1044.

1021 ✓

10.09

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1916phae.proj..793C

Sat. May 29. 1916

B 18488
1897 Feb. 2
Exp. 12m

.930
a 2 v
v 1 f' 1091 .
1038 ✓

Poor images, mostly diamond shaped

B 18656
1897 Mch 13
Exp. 11m

.1044
d 1 v
v 1 f' 1091 .
1068 ✓

Images trails

B 18677
1897 Mar. 24
Exp. 10m

.1034
b' 0 v
1034 ✓

.997
b2 1 v
v 1 d 1044 ⊙
1044 ✓
1045

28
21
1025

B 16933
1896 July 20
Exp. 12m

.959
b 1 v
v 2 d 1044 .
987 ✓

B 18286
1897, Jan. 5
Exp. 12m

.1034
b' 0 v
1034 ✓

.930
a 1 v
v 1 d 1044 .
987 ✓

1010 ✓

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1910phae.proj..793C

B 18349

1897
Jan. 21
10m

1044
d 1 v
v 1 f 1091 · 1068 ✓

B 1857 1

1897
Feb. 3
12m

1091 ·
v 0 f 1091 ✓
1044 ·
d 1 f v 1092 ✓
v 2 g 1194 · 1094 ✓

B 1857 8

1897
March 3
10m

1034 ·
b' 0 v 1034 ✓
997 ·
b² 1 v 1026 ✓
v 2 f 1057 · 1017 ✓

B 1887 5

1897
April 21
10m

930 ·
a 1 v
v 1 d 1044 · 987 ✓

B 16048

1896 June 1
10m

997 ·
b² 0 v 997 ✓
930 ·
a 2 v 1003
v 1 d 1044 · 1006 ✓

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1916phae.proj..793C

Sat. May 29, 1916

B 16412
1896 June 17
10m

.959 b | v
v | d 1044.
.997 b² 0 v

1001 ✓
997 ✓
} 999 ✓

B 15850
1896 May 13
10m

.997 b² | v
v | b' 1034.
.930 a | v
v 2 d 1044.

1015 ✓
968 ✓
} 992 ✓

B 16601
1896 July 2
15m

.997 b² 0 v
.930 a | v
v | b' 1034.

997 ✓
982 ✓
} 990 ✓

B 19712
1897 July 2
13m

.997 b² 0 v
.930 a | v
v | b' 1034.

997 ✓
982 ✓
} 990 ✓

B 19426
1897 June 8
13m

v 0 f' 1091.
.1044 d | v
v 2 g 1194.

1091 ✓
1094 ✓
} 1092 ✓

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1916phae.proj..793C

B Plates rather difficult to estimate - So great scale.

B 25154
1900 April 19
10m

.1034 b' 0 v — 1034 ✓
.930 a 2 v — 1033 ✓
v 2 c' 1133. — 1032

Monday, May 29, 1916 -

B 27104
1901 April 10
10m

.997 b² 1 v
v 2 d 1044. — 1013 ✓
.1034 b' 0 v — 1034 ✓ — 1024 ✓

B 23010
1899 June 6
11m

.997 b² 1 v
v 1 b' 1034. — 1015 ✓

B 25589
1900 June 22
60m

.930 a 0 v — 930 ✓

Images elongated and very stringy
b looks brighter than a but
b is near edge of plate

B 25684
1900 July 3
11m

.1118 K 1 v — ✓
v 1 g 1194. — 1156

K = K' p.140

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1916phae.proj..793C

Mon - May 29, 1916

B 27958
1901 July 24
Exp 18m

930 a 0 v 930 ✓

Seems quite equal to a

B 19135
1897 May 19
Exp - 15m

1091 f' 0 v 1091 ✓
1044 d 2 v
v 1 g 1194. 1144 ✓
} 1118 ✓

B 36444 e Hoppe
B 40032 e

B 36423
1905 July 12
11m

Poor images

1034 b' 0 v 1034 ✓

B 36283
1905 June 24
10m

Poor images e

1044 d 0 v 1044 ✓

B 35601 e

B 37451
1907 May 22
10m

997 b² 0 v 997 ✓
930 a 1 v
v 2 d 1044. 968 ✓
} 984

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1916phae.proj..793C

e = Near edge

B 37487
1907 May 24
16m

1044 d 2 v
v 2 g 1194 · 1119 ✓

B 36157
1905 June 9
16m

959 b 0 v 959 ✓

B 33793
1904 May 23
12m

1034 b' 0 v 1034 ✓
959 b 1 v } 10.18 ✓
v 1 d 1044 · 1001 ✓

B 34233
1904 July 1
10m

1034 b' 0 v 1034 ✓
959 b 1 v } 10.10 ✓
v 2 d 1044 · 987 ✓

B 34468 e
33433 e
33136 e

B 32164
1903 July 13
11m

v 0 f 1091 · 1091 ✓
1044 d 1 v } 11.05 ✓
v 1 g 1194 · 1119 ✓

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1916phae.proj..793C

Monday May 29, 1916
W Virginia

B 31899
1903 June 2
10m

.959
b 2 v
v 1 d 1044 .
1015 ✓

Poor images

B 30432
1902 July 17
10m

.1091
f 1 v
v 2 g 1194 .
1125 ✓

B 29507
1902 April 29
10m

.1034
b 1 v
1034 ✓
.997
b 2 1 v
v 1 f 1057 .
1025 ~~7~~
} 10.30

B 29237
1902 April 1
10m

v — o f 1091 .
1091 ✓
.1057
f 1 v
v 1 g 1194 .
1125
~~1095~~
} 1109 ~~1083~~

X

B 29109 e
29717 e
30383 e
31666 e

B 15437
1895 March 6
14m

Rather near edge

.1103
c o v
1103 ✓

1896
in ledger

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1916phae..proj..793C

May 29, 1916

B 13327

1895 May 13
10m

.1034
b' o v
.959
b 1 v
v 2 d 1044.

1034 ✓
987 ✓
} 1010

B 16595

1896 July 2
12m

.930
a 1 v
v 1 b2 997.

964 ✓

B 16672

1896 July 6
15m

.930
a o v

930 ✓

Rather near edge

B 15638

1896 Apr. 23
10m

.1034
b' o v
.930
a 1 v
v 3 d 1044.

1034 ✓
958 ✓
} 996 ✓

B 15681

1896 May 4
10m

.1044
d 1 v
v 2 g 1194.
v o K 1118.

1094 ✓
1118 ✓
} 1106 ✓

K = K' p 140

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1916phae.proj..793C

Wed. May 31, 1916 W Virginis

B 15725
1896 May 9
10m

.930
a | v
v 2 d 1044.
968 ✓

B 15883
1896 May 14
10m

.997
b² | v
v | b' 1034.
1015 ✓

B 15965
1896 May 28
10m

.930
a | v
v | b' 1034.
982 ✓

B 13929
1895 July 3
11m

Rather near edge

.930
a | v
v | b' 1034.
982 ✓

B 17136
1896 Aug 14
11m

v 0 f 1091.
1091 ✓
1044
d | v
1092
v 2 g 1194.
1094 ✓

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1916phae.proj..7936

I plate same size as B
= 8-inch Draper

B 17311 · 1091
1896 Sept 1 f' | g v
6m v | g 1194 · 1143 ✓ } 1138 ✓
· 1133 c' o v 1133 ✓ }

I 8537 Rather near edge
1893, May 14 · 1044 d | v
22m v | c 1103 · 1074 ✓

I 6333 Images poor and near edge
1892 May 27 · 1044 d | v
11m v | c' 1133 · 1089 ✓

I 3473 Plate fogged ; images poor
1891 Apr. 24 · 930 a | v
v | d 1044 · 987 ✓

I 1150 (v not on plate)

I 11006
1894 April 26 · 997 b2 | v
20m v | f 1057 · 1027 ✓

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1916phae.proj.793C

May 31, 1916

I 11176 — Fogged : rather near edge
1894 June 13
14m
· 1044
d i v
v i e 1103 · 1074

I 11 246 — Poor plate ; e
1894 July 9
10m
· 930
a o v 930

I 12 599 — Poor images : elongated thazz
1895 April 5
11m
v o f' 1091 · 1091
· 1044
d i v
v 2 g 1194 · 1094
} 1092

I 12 874
1895 May 10
8m
v o e 1103 · 1103
· 1044
d i v
v i f' 1091 · 1068
} 1086

I 14 357 — Fogged ; very poor images
1896 Jan. 28
10m
· 930
a o v 930

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1916phae.proj..7936

May 31, 1916 w Virginis

I 14504

1896 Feb. 24
14m

1057
f o v
1044
d i v
v i g 1194

1057 ✓
1119 ✓
} 1088 ✓

Somewhat fogged, but round images

I 10820

1894 Mar 16
19m

v o c 1103
1044
d i v
v i f 1091

1103 ✓
1068 ✓
} 1086 ✓

I 11019

1894 May 1
10m

930
a i v
v i b 997

968 ✓

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1916phae.proj.793C

Friday, June 2, 1916
W Virginia

Plates for 1915 to be remeasured S being at top –

AM 10542
1915 May 4
60m

1034
b' 0 v 1034 ✓
959
b 1 v
v 1 d 1044 · 1001 ✓
} 1018 ✓

p 55

AM 10340
1915 March 13
97m

1034
b' 0 v 1034 ✓

Rather near e.; images not very good

AM 10560
1915 May 7
60m

1044
d 0 v 1044 ✓

f; of little value

AM 10735
1915 July 1
59m 7s

1091
f' 0 v 1091 ✓
1044
d 2 v
v 1 c' 1133 · 1104 ✓
} 10.98 ✓

AM 10755
1915 July 4
62m

1034
b' 0 v 1034 ✓
997
b² 2 v
v 1 d 1044 · 1029 ✓
} 10.32 ✓

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1916phae.proj..7936

Plates reversed

AM 10802 f

1915 July 14 .1044 d 1 v

60m v 1 f' 1091. 1068✓

AM 10879 Yellow

1915 July 25 Just visible: with difficulty

60m

L'

AG 16107 Yellow Little seen on plate

1915 Feb. 13 .959 b 1 n < 959✓

60m

L'

AC 16384

1915 April 8 .1044 d 0 v 1044✓ } 10.53✓

60m .1034 b 1 v

v 1 f' 1091. 1062✓ }

AG 16403 Images rather faint

1915 April 16 .997 b2 1 v

60m v 1 b' 1034. 1015✓

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1916phae.proj..7936

Friday June 2 1916

Plates reversed

AC 16417
1915 April 19
62m

· 1044
d 1 N < 1044 ✓

AC16482 fogged

AC16 ~~518~~ 510

p. 52

· 959
b 1 v
v 1 b' — 997 · 979

AC 16620 fogged

AC 17281
1916 Feb. 3
58m

· 959
b 1 v
v 1 b' 1034 · 997 ✓
· 997
b² 1 v
v 2 d 1044 · 1013 ✓
} 10.05 ✓

AC 16241
1915 March 11
60m

· 959
b 1 v
v 1 b' 1034 · 997 ✓

AC 16054
1915 Jan. 29
62m

Yellow

· 1044
d 1 v
v 1 f 1057 · 1050 ✓

L

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1916phae.proj..793C

Plates reversed

AC 16282

1915 March 16

60m

L'

f

AM 10451

1915 April 20

60m

1057 f | v

v | g 1194 · 1125 ~~1075~~

1103 g

C | v 11.30 ~~11.05~~

v | e' 1166 · 1135

AM 10432

1915 April 18

30m

1057 f o v 1057 ✓

1034 b' | v 10.60 ✓

v | f' 1091 · 1062 ✓

AM 10424

1915 April 17

64m

1034 b' o v 1034 ✓

997 b2 | v 10.28 ✓

v | d 1044 · 1021 ✓

AC 16561

1915 July 6

31m

959 b o v 959 ✓

930 a | v 9.62 ✓

v | b~997 · 964 ✓

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1916phae.proj..793C

Friday June 2, 1916

Plates reversed

AM 10667
1915 June 12
60m.
see p. 108

Poor images

v o f' 1091. 1091 ✓

AM 10636
1915
June 6
123m

.1034 b' o v 1034 ✓
.959 b | v
v | f 1057. 1008 ✓
} 10.21 ✓

AM 10628
1915
June 5
60m

.997 b² o v 997 ✓
.959 b | v
v | b' 1034. 997 ✓
} 9.97 ✓

AM 10609
1915
June 3
60m

.959 b | v
v | b' 1034. 997 ✓

AM 10345
1915 Mar. 24
83m

Images elongated

.959 b | v
v | b² 997. 998 ✓

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1910phae.proj.7936

Saturday June 3 1916

W Virginis (Plates reversed)

AM 10375 · 1133 C 1
1915 April 4 ~~C~~ 1 v
v 1 g 1194 · 1163 ✓
60m

Images discs : rather near edge

AM 10470
· 1044
1915 April 22 d 1 N < 1044 ✓
60m

AM 10554
· 1057
1915 May 6 f 1 v
v 1 ~~E~~ c' 1133 · 1095 ✓
65m

AM 10577
· 1044
1915 May 10 d 1 N < 1044 ✓
60m
7×9"v

AM 10696 · 959 ~~1034~~
1915 June 18 b 1 v
60m v 1 b2 997 · 978 ✓

Not meas. before - Ref. stars marked out

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1916phae.proj..793C

Sat. June 3, 1916

Plates reversed

AC 16265

1915 March 14 · 1044 d o v 1044 ✓
65 · 1034 b' 1 v
v 1 f' 1091 · 1062 ✓ } 10.53 ✓

Good plate: used in comparison of ref. stars.

AC 16092

1915 Feb. 10 · 1034 b' o v 1034 ✓
60m
L'

Yellow: variable f

AC 16128

1915 Feb. 18 · 930 a 1 v
v 1 d 1044 · 987 ✓ } 9.92 ✓
60m · 997 b2 o v 997 ✓

AC 16215

1915 Mar. 8 · 930 a 1 v
v 1 d 1044 · 987 ✓ } 9.92 ✓
60m · 997 b2 o v 997 ✓

AC 16275

Mon. Jones

1915 Mar 15 · 930 a 1 N < 930 ✓
60m
L'

Yellow: poor

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1916phae.proj.793C

Mon. June 5, 1916

Plates reversed

ae 16304 — Images winged : e

1915 Mar 20 · 1044 d 1 v

v 1 f' 1091 · 1068 ✓

65m · 1057 f 1 v

v 2 g 1194 · 1069 ✓ } 1068 ✓

ae 16373 — Images winged : e

Apl. 7, 1915 ~~d 0 b~~

63m · 1044 d 1 v

v 1 c' 1133 · 1089 ✓

ae 16383

1915 April 8 · 1044 d 0 v ~~1~~ 1044 ✓

60m

ae 16445 — Pretty faint : winged

1915 May 10 · 1091 f 0 v 1091 ✓

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1916phae.proj..793C

Monday June 5, 1916

W Virginis –

Measurement of 2 pole plates & a W Vrig. plate taken between them –

On examining the sequence of stars for W Virginis I find I have made a mistake in the identification of K. That one taken for K is a little E of true K and is somewhat brighter than true K. The confusion arose from the faintness of K on AM 4439 which I used as a comparison star plate – Change all previous K's into K'

Polar Sequence

Plate MC 10773 Scale M Diffracted Companions

~~Prismatic~~

Des.	B	C
5	5.8	5.6
6	6.2	6.1
8	–	7.4
9	–	8.3
10	–	8.4
11	–	8.6
12	–	8.7
13	–	9.1
14	–	9.3
15	–	9.6

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Tuesday, June 6, 1916
W Virginia

Further measures of 1915 plates reversed —

AG 16412
1915 April 19
62m.
·1044 d 1 N < 1044 ✓

AG 16430
1915 May 6
69m
·1044 d 2 v
v 1 f 1091. 1076 ✓
·1057 f 1 v } 10.86 ✓
v 1 c 1133. 1095 ✓

AG 16510
1915 June 1
60m
·959 ~~1054~~ b 1 v
v 1 b² 997. 978 ✓

AG 16620 Nothing (yellow) fogged & streaked

AG 16282
1915 Mar 16
65m
L'
·930 a 1 N < 930 ✓ Yellow
Image of v extremely faint if visible at all

AG 16054
1915 Jan 29
62m
·1057 f 0 v 1057 ✓ } 10.76 ~~10.54~~
·997 b² 1 v
v 1 g 1194. 1096 ~~1046~~ }
Yellow
×

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1916phae.proj..793C

June 6, 1916

1915 Plates Reversed

AC 16241
1915 Mar. 11
60m
page 106, 134

.959 b, v
~~997~~ v, d 1044. 1001 ✓
.997 b² o v 997 } 9.99 ✓

AM 10432
1915 April 18
30m
pp. 107, 135

.1044 d, v
v, f 1057. 1050 ✓ Almost equal to d or f

AM 10451
1915 April 20
60m
pp 107, 135

Good plate

.1044 d, v
v, g 1194. 1119 ✓
.1103 a, v 11.27 ✓
v, e' 1166. 1135 ✓

AM 10424
1915 April 17
64m
pp. 107, 135

.997 b², v
v, d 1044. 1021 ✓
.959 b, v 10.14 ✓
v, f 1057. 1008 ✓

AC 16561
1915 July 6
31m

Not very good images

.930 a, v
v, d 1044. 987 ✓

AM 10370 Yellow; nothing visible

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1916phae.proj..793C

June 6, 1916 W Virginis

May 26, 1916

Polar Plate MC 10773 - Scale M

Diffuse Companions

Des.	B	C		MC 10778 P. 145	meau.		
10	4.0 42	4.2	4.20 00	3.7	3.95	25	25
11	4.7 49	4.9	4.90 00	4.50	4.70	20	20
12	5.1 53	5.1	5.20 11	4.95	5.08	12	13
13	5.7 59	5.8	5.85 10	5.55	5.70	15	15
14	6.1 63	6.1	6.20 11	6.05	6.12	08	07
15	6.5 6.7	6.6	6.65 10	6.35	6.50	15	15
16	6.8 70	7.0	7.00 00	6.75	6.88	12	13
17	—	7.5		7.15	7.32	18	17
18	—	7.8		7.5	7.65	21	
19	—	8.2	8.20 00, 8.2	78	8.00	20	20
20	—	~~8.1~~	, 8.4	8.5	8.45	01	
23		8.8		86	8.70	11	
25	—	9.1		90	9.05	10	

	B	C		P. 145 MC 10778	Diff.	meau
5	5.6 5.8	5.5	5.75 6 21	5.75	+0.84	5.45 20 20
6	6.1 6.3	5.9	6.10 22	6.00	1.01	6.05 05 05
7	6.2 6.4	5.9	6.15 23	6.05		6.10 05 05
8	~~7.3~~	7.3		7.5	0.93	7.40 11
9	—	7.6		7.9	1.23	7.75 21
10	—	8.1		84	0.92	8.25 12
11	—	8.5		8.8	1.05	8.65 12
12	—	8.7		8.8	1.16	8.75 10
13	—	9.2		89	1.10	9.05 21
14	—	9.3		9.4	1.35	9.35 10
15	—	9.7		10.0	1.38	9.85 12

hard to estimate

Diff (Polar seq. – mean scale reading)

10	~~+5.18~~	+507
11	498	4.85
12	5.15	4.78
13	488	4.60
14	4.78	4.53
15	490	4.58
16	4.77	4.52
17	466	4.31
18	4.83	4.41
19	4.55	4.42
20		4.28
23		4.64
25		4.82

Diff.

5	+1.04
6	1.06
7	1.21 ~~0.83~~
8	0.83
9	1.08
10	0.77
11	0.90
12	1.11
13	1.25
14	1.30
15	1.23

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1916phae.proj..793C

June 6 W Virginis

Sequence of Stars Plate MC 10776 10m

Scale M

Copied Bk 9: 136 1916 May 26

Diffracted Companion

	B	C		curve rdg.	C	curve reading	magn.
					Alt. +.03		
a	3.2 3.4	—		•	8.5	+0.98	9.49
b	3.5 3.7	—		5.12	8.5	+0.99	9.49
b'	4.6 4.8	4.2	4.40 3.3	4.91	9.1	1.17	10.27
b^2	3.9 4.1	—	4.1 a	5.01	9.1	1.17	10.27
c	5.1 5.3	5.2	5.25 10	4.71			
c'	6.0 6.2	6.1	6.15 01	4.50			
d	5.1 5.3	5.1	5.20 11	4.73	9.3	1.24	10.54
e	6.0 6.2	6.1	6.15 01	4.50			
e'	6.5 6.7	7.0	6.85 10	4.40			
f	5.2 5.4	5.2	5.30 11	4.70			
f'	5.8 6.0	5.6	5.80 22	4.58			
g	6.8 7.0	7.0	7.00 00	4.39			
K	~~7.6~~	7.6	7.6 a	4.36			
K'	5.8 6.0	5.6	5.80 22	4.58			

magno.

a •
b 8.82
b' 9.41
b^2 9.11
c 9.96
c' 10.65
d 9.93
e 10.65
e' 11.25
f 10.00
f' 10.38
g 11.39
k 11.96
k' 10.38

true K as marked on reference plate

star used for K in error Sep 140

Marked K' on MC 3268

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1916phae.proj.:793C

June 6 W Virginis

Scale M Polar Plate MC 10778 - May 26, 1916

Des.	B	C		curve reading	Diffracted Companions	B	C		curve
10	3.5 3.7	–	3.7 a.	5.13	5	5.1 5.3	5.2	5.25	10
11	4.5 4.7	4.3	4.50 2	4.91	6	6.0 6.2	5.8	6.00	2
12	4.8 5.0	4.9	4.95 0	4.78	7	6.0 6.2	5.9	6.05	2
13	5.5 5.7	5.4	5.55 1	4.64	8	~~7.5~~	7.5		
14	5.9 6.1	5.8	6.05 1	4.52	9	–	7.9		
15	6.3 6.5	6.2	6.35 1	4.41	10	–	8.4		
16	6.6 6.8	6.7	6.75 0	4.41	11	–	8.8		
17	7.0 7.2	7.1	7.15 0	4.37	12	–	8.8		
18	~~7.5~~	7.5	7.5 a	4.36	13	–	8.9	}	Hard to estimate
19	–	7.8		4.39	14	–	9.4	}	
20	–	8.5		4.56	15	–	10.0		
23	–	8.6		4.60					
25	–	9.0		4.78					

	magn. (sc. dg + curve dg)
10	8.83
11	9.41
12	9.73
13	10.19
14	10.57
15	10.82
16	11.16
17	11.52
18	11.86
19	
20	
23	
25	

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1916phae.proj..793c

June 7, 1916

1st of Series of his

Polar Plate MC 10806, June 1, 1916 Exp. 10m

Scale M

Des.	B		C		Diff. (North Polar Seq. — scale value)		Diffraction Companions B		C			Diff
10	3.5	3.7	—	3.7 a.	+5.32	5	5.4	5.6	5.3	5.45	2	+1.04
11	4.1	4.3	4.1	4.20	5.35	6	6.2	6.4	6.1	6.25	2	0.86
12	4.2	4.4	4.2	4.30	5.56	7	6.3	6.5	6.1	6.30	2	1.01
13	5.1	5.3	5.0	5.15	5.15	8	~~7.5~~		7.5			0.73
14	6.0	6.2	5.7	5.95	4.70	9	—		8.0			0.83
15	6.3	6.5	6.2	6.35	4.73	10	—		8.2			0.82
16	6.7	6.9	6.7	6.80	4.60	11	—		8.8			0.75
17	6.8	7.0	7.0	7.00	4.63	12	—		9.1			0.76
18	~~7.5~~		7.5		4.56	13	—		9.4			0.90
19	—		7.8		4.62	14	—		9.5			1.15
20	—		8.1		4.63	15	—		9.8			1.28
23	—		8.8		4.54							
25	—		9.2		4.67							

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1916phae.proj.793c

2nd of Series of Two June 7, 1916

Scale M Sequence for W Virginis MC 16805 June 1, 1916, Exp. 10m
Alt corr. +.03

	B	C	curve reading	magn.	C	Diffraction Companions curve rdg	magn.
a	3.7 3.9	–	5.48	9.38	7.9	+0.74	8.64
b	4.1 4.3	4.20 1	5.38	9.58	8.5	+0.74	9.24
b'	5.2 5.4	5.30 1 5.2	5.00	10.30	9.0	0.82	9.82
b²	4.2 4.4	4.35 0 1 4.3	5.32	9.61	8.7	0.76	9.46
c	5.2 5.4	5.35 0 1 5.3	4.98	10.33	9.5	1.05	10.55
c'	6.2 6.4	6.45 01 6.5	4.69	11.14			
d	5.3 5.5	5.40 1 1 5.3	4.91	10.37			
e	6.2 6.4	6.35 0 1 6.3	4.70	11.05			
e'	6.8 7.0	7.00 00 7.0	4.63	11.63			
f	5.2 5.4	5.40 00 4 5.4	4.91	10.37			
f'	6.0 6.2	6.10 1 1 6.0	4.74	10.84			
g	7.0 7.2	7.15 0 1 7.1	4.62	11.77			
K	~~7~~	7.5 · a 7.5	4.61	12.11			
K'	~~5~~ 5.8	6.0 5.90 1 1 5.8	4.81	10.71			

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1916phae.proj..793C

Wed. June 7, 1916 — W Virginis

Re-examination of plates in which k' is a companion star

AM 3493

1905 May 2
65m

.1057
f o v 1057 ✓
.1044
d i v
v i c 1103. 1074 ✓ } 10.66 ✓

AM 3665

1905 June 24

.1044
d i v
v i c 1103. 1074 ✓ } 10.74 ✓
.1057
f i v
v i f' 1091. 1074 ✓

Friday June 9, 1916 (Hum. at Plymouth)

AM 4316

1906 June 5
60m
p.47 June 15

.1044
d i v
v i f 1057. 1050 ✓ } 10.56 ~~10.61~~
.1034
b 2 v
v i f' 1091. 1072 (6) }

AC 8378

1907 Mar 25
82m

Somewhat fogged: images trails
Rather f

.1044
d i v
v i f' 1091. 1068 ✓

AC 15322

1914 July 18
60m

.1041
d i N.
.1057 f i N < 1057

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1916phae.proj..7926

Frid. June 9, 1916 W Virginis

Re-exam^n of plates involving 1c'

AM 9961 f

1914 July 21 .1103 c o v 1103 ✓

59^m

p. 108, 55

AM 410

1900 April 4 .1044 d i v

60^m v i c' 1133. 1089 ✓ } 11.18 ✓

.1103 c i v

v i f' 1091. 1147 ✓ }

AM 763 ?

1901 April 24 .1103 c i v

65^m v i f' 1091. 1097 ✓ } 11.15 ✓

.1133 c' o v 1133 ✓ }

AM 1817

1903 Feb. 5 .1044 d i v

66^m v i c' 1133. 1089 ✓ }

.1057 f i v 10.82 ✓

v i f' 1091. 1074 ✓ }

AC 4617 Fogged : images poor

1904 Feb. 7 .1057 f i v

112^m v i c' 1133. 1095 ✓

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1916phae.proj..793C

Mid. June 9, 1916 W Virginis

Re-exam - of plates involving K'

ac 6330
1905 April 30
97m

.1057
f : v
v : c' 1133.
1095 v
.1103
c : v
v : e' 1166.
1135 v
} 11.15 v

.1044
d : v
v : g 1194.
1119 v
?. 1133
c' : v
v : e' 1166.
1150 v
} 11.34 v

Image of v rather longer than c' but not so dense.

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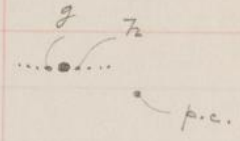
1916phae.proj..793C

Frid. June 9, 1916 W Virginis

Polar Plate MC 10806, 1916 June 1 Scale M.

Diffraction + Prismatic Images –

Des.	g	h	p.c.
5	5.2	5.0	5.4
6	5.6	5.8	6.0
7	5.8	5.8	6.3
8	7.5	7.0	7.7
9	8.0	7.7	8.1
10	8.2	8.0	8.4
11	8.5	8.6	8.9
12	9.1	9.1	8.9
13	9.3	9.0	9.5
14	9.4	9.5	9.5 (faint)
15	9.8	9.9	10.0 (")



Larger + fainter than scale

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1910phae.proj..793c

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1916phae.proj..793C

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1916phae.proj..793C

Visual Observations of W Virginis

A.N. Vol 67, p. 29 (No. 1586). E. Schönfeld, Mannheim, 1866 May 4

"I can also announce to you a new vble; it is a star which I used as a comp.n star for r Virginis (Wien. Beob. 42, p. 223) .... Position 1855 $\alpha = 13^h\ 18^m\ 33^s$; $\delta = -\ 2^\circ\ 37'.6$. I was surprised on Apl 7 to find the star somewhat fainter than I should have from my 1857 comparisons & as I had seen the star Apl 1. On this ev.g it had a brightness on my "a.a.O Scale" almost 13 or 14 - Apl 13, 20; the same on Apl 15 & 18; again Apl 23 it was 11 & Apl. 25.3 a min. at 6. May 2 again as bright as I ever saw it, about 23. The period, if it is regular, is very short: first seems certain that betw. Apl 1 & 13 there was a min. The light variations amount to more than 1½ mags. 8.9 to 10 mag. The color is reddish."

A.N. Vol. 68, p. 315 (No. 1628) E. Schönfeld, Mannheim, 1867 Jan 15

He refers to fact that the use of W had caused doubt in determ.n of V Vrg. Observations from 1866 Apl. 5 to July 11 gave period 17^d, and nearly increase and decrease of the same amt. show, however, that the extremes of brightness were apparently diff.t in diff.t periods

A.N. vol. 73, p. 14 (No. 1724) E. Schönfeld. Mannh. Oct. 1868

Observations include times 1866 Apl 7 to July 11, 1867 Jan 12 to July 28, 1868 Feb. 16 to June 18 - Few well determined max. & min. on account of unfavorable weather. The foll.g values were det.d by aid of curves drawn. Brightness thus det.d use as comparison stars

a	$13^h\ 20^m\ 54^s$	$-2^\circ\ 43'$ (1855.0)	= 15.1
h	23 34	− 2 3.9 "	= 31.7

The min. of 1866 Apl 6 & the max. foll.g it are taken as zero epochs -

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1916phae.proj..793C

		Minima	Brightness	wt.	
Epoch 1	1866	Apl. 25.3	16.1	2	None of the numbers are
3		May 29.6	18.5	1	here suppressed, altho later
4		June 15.9	18.0	2	improved values were deduced
23	1867	May 11.0	16.4	2	by means of the light curve,
24		26.8	16.6	1	since many of them will
26		July 1.2	16.5	1	appear as indep^t of the
41	1868	Mar. 16.6	17.0	2	hypothesis of a symmetrical
42		Apl 4.0	17.3	2	light variation, although than
43		19.0	19.3	2	the values introduced
44		May 7.1	16.0	2	later.
45		24.4	17.0	2	$17.^d3$ was given as

		Maxima	Brightness	wt.	first approx. to period. This
Epoch 2	1866	May 21.4	28.9	2	is warranted by these obs^{ns}.
3		June 7.5	28.5	2	More accurate elements
24	1867	June 4.3	29.2	1	are:
41	1868	Mar 24.1	28.6	2	Chief epoch Minima 1867 July 18.5
43		Apl. 27.8	27.2	1	Max " 26.6
44		May 15.1	28.0	2	Period $17^d.26$

Schönfeld then from the entire set of certain observations, 115 in all, using these elements, obt^d these 29 normal places for a mean light curve.

d		C−O
0.48	18.02	−0.4
0.94	18.30	−0.2
1.68	18.68	+0.2
2.12	20.04	−0.3
2.78	20.70	+0.5
3.10	21.54	+0.5
3.72	23.44	+0.1
4.43	24.92	+0.1
5.78	27.70	−0.9
6.84	27.28	+.3
7.54	27.28	+.6
8.03	27.70	0.0
9.39	27.98	−0.4
9.89	27.10	+0.2
10.60	27.08	−0.2
11.75	25.68	0.0
12.37	24.42	+0.5
13.04	24.08	−0.3
13.74	22.58	.0
14.61	20.56	+0.2
15.65	19.04	−0.2
16.29	17.42	+0.5
17.21	17.36	+0.1

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The curve itself, however, gives the foll.g values for the brightness of the var.e

d		d											
0.0	17.5	2.5	20.6	5.0	25.95	7.5	27.7	10.0	27.3	12.5	24.7	15.0	20.0
0.5	17.6	3.0	21.9	5.5	26.6	8.0	27.75	10.5	27.0	13.0	23.9	15.5	19.1
1.0	18.1	3.5	23.05	6.0	27.05	8.5	27.7	11.0	26.6	13.5	23.0	16.0	18.35
1.5	18.8	4.0	24.2	6.5	27.64	9.0	27.65	11.5	26.0	14.0	22.05	16.5	17.75
2.0	19.6	4.5	25.15	7.0	27.6	9.5	27.55	12.0	25.4	14.5	21.0	17.0	17.5
												17.5	17.6

"The max. in this curve appears notably less decided than the min. In order to determine it more certainly, I have drawn the Pogson cutting curve, and agreeably with the above elements the interval toward the preceding min. = 8.1d, and thus a control for the correctness of the drawing was obtained.

Now a second approx. to the determn. of the times of the individual max. & min. was undertaken with the assistance of the light curve. The method applied was that given by Argelander in his essay on β Lyrae. Thus a few more epochs were determined in the case of those to wh. the indep.t material did not extend. Thus was obt.d the foll.g definitive vals. whose weights, accord.g to the completeness of the concurring observations & the degree of their agreement are {considered / indicated}.

		MAXIMA	p.	R−O Calculated as
Epoch 1	1866	Apl. 25.37	2	−0.04 d
3		May 29.78	2	+0.10
4		June 15.86	1	+0.29
19	1867	Mch 2.26	2	−0.01
23		May 10.85	3	−0.50
24		26.70	2	+0.92
26		July 1.32	2	−0.15
27		18.47	1	−0.03
41	1868	Mar 16.41	3	−0.14
42		Apl 3.62	2	−1.08

	Max.		p	R−O.
Epoch 43	1868	Apl 19.04	1	+0.78
44		May 6.95	3	+0.14
45		" 24.41	3	−0.05

	MINIMA		p	d
Epoch 2	1866	May 21.37	2	−0.67
3		June 7.01	2	−0.03
22	1867	May 1.02	2	+0.15
24		June 3.72	2	+1.00
41	1868	Mch 24.51	3	−0.14
43		Apl 27.41	2	+0.51
44		May 15.28	3	−0.09

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1916phae.proj..793C

These give for the minima: —

Correction to epoch = $-0^d.0229 \pm 0.09193$ (w.?) = p.e.

" " period = $+0.01793 \pm 0.000590$

For Maxima -0.1507 ± 0.13745

and $+0.00501 \pm 0.028266$

P.E.

w.? of a min. $p = 2 \pm 0.3367$

" Max. ± 0.3763

In this method however the corr. to the epoch of the max. not indep.tly det.d of that of the min., but the interval betw. the two = $8^d.1$ is as correctly taken by hypothesis. The two corrections to the epoch must be united into a mean accord.g to the ratio of their wts., as those of the period, when in conclusion the foll.g elements are obtained:

Min. — Epoch $E = 1867$ July $18.44 + 17^d.2735\,(E-27)$

$\pm 0.076 \quad \pm 0.00485$ (w.?)

and therewith the represent.n of the obs.d epochs wh. are added in the last table.

A further check on the correctness of the elements is the following. On 1859 June 6.50 by the occasion of the Bonn observations of V Virginis (Wien. Sitz. Vol 42, p. 223; W = c there) the star had brightness 26.0 and on June 24.43 it was 26.7. These brightnesses are slightly uncertain as they are deduced from the sums of the steps of V towards W + a weaker star. In no case, however, can the star W have been in the neighborhood of a min. In fact now the -145^{th} + -144^{th} min. epochs by calculation on 1859 May 30.40 and June 16.68 + from the light curve the br. = 27.6 + 27.7. The elements satisfy these obs.ns, indeed much more closely than was expected.

From the comparison of the normal (Normalzahlen) numbers with the curve the sum of the sqq. of the deviations = 2.92, + thence, since the curve drawn without bending in, as this' 3 indepd. constants is to be considered, the p.e. of a normal no. = ±0.259 or of a single obs. = 0.576 steps.

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the smallness of this no. is striking, for it includes, in addition to the true obs.ⁿ error, also the prob. devⁿ of the actual brightness from that of the phases concerned. That, however, the latter alone already more than ½ step can amt. to, the obsⁿˢ suffice to show (among others, those from the single curves of the following variable brightnesses in the minimum). It appears, thus, as the real variations from the mean brightnesses in the normal nos had, notwithstanding the comp.ly small no. of observations, eliminated the greatest parts - Always the near junction causes a good prejudice for the exactness of the same.

A.N. Vol. 78, p. 137 (No. 1857) E. Schönfeld Aug. 1871

By means of the light curve (A.N. 1729) I was able, from the observations since 1869, to determine the following phases, whose weights are assumed similar to the earlier ones. The comparison refers to the last same given elements and the interval 8.ᵈ1 from Min. to the foll.ᵍ Max:-

Min.		p	C−O R−O d
Epoch 64	1869 Apl. 17.86	3	−0.30
67	June 8.54	1	−0.16
68	" 25.21	3	+0.44
69	July 12.88	2	+0.05
83	1870 Mar 11.84	1	−0.08
86	May 1.88	1	+0.70
87	" 19.64	3	+0.21
89	June 23.56	2	−0.16
103	1871 Feb. 19.98	2	+0.25
134	Mar. 9.34	3	+0.16

Maxima		p	C−O d (calculated from same)
Epoch 63	1869 Apl 8.82	3	−0.43
83	1870 Mar 19.55	2	+0.31
85	Apl. 22.79	2	+0.61
97	May 28.37	2	−0.42

From comparisons of V Virg. with W and other comp.ᵃʳⁱˢᵒⁿ stars, this which Prof. Auwers, about the same as I was convinced of the wobbly of W, I have been able to deduce a further yet foll.ᵍ max:-

Ep. 0 1866 Apl. 16.ᵈ6 33, p = 1, O−B = −0.ᵈ17

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A few older estimations, wh Auwers also had the kindness to give me, confirm approx. my elements for 1859 June, 1860 Mar., & 1862 Dec., without yet their weight essentially being raised. Also the new determinations would give at most then a small corr. to the elements, if the continuation extension of the observations in the current years should confirm the outweighing of the positive errors. The earlier (ones) do not make such a one necessary, as the following deviations of the Jahresmitteln mean years show: —

Ep. 2	C−O	$= -0^d.116$	$p = 10$
23		$+0.164$	14
43		-0.060	20
66		-0.078	12
86		$+0.148$	13

These Jahresmittel mean years are from the both phases constructed, under the assumption of equal Gewichtseinheit units of weight, and the epochs of the maximum wh. falls between two mienia n & $n+1$ is calculated $= n + \frac{1}{2}$. For the first time, also, Auwers Ep. O is drawn in. From this comparison follow: —

Corr. to Ep. 53 $= -0^d.02$

Corr. Period -0.0007

both values being within the p. e.

A.N. Vol. 80 p. 142 (No. 1905) J. F. J. Schmidt, Athens.

In order to learn more closely the nature of the tt. curve of W. Vir obsns were undertaken at end of June 1872 wh. were continued, with interruptions of every 1 or 2 dys, up to Sept. 8. The cometseeker he had was much too weak while the refractor had a small field. The obsns are therefore none too sharp. Color not striking; 3 on scale = yellow-white. Prelim. observations, in conjunction with Schönfeld's values obt.d in 1867 led precisely to this period. The star forms a side-piece to η Aquilae, in the case of both. Argelander (Bonn) Einbuchtung = one bay a single depression, the protraction of the decrease, a phenomenon wh.

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I have demonstrated in case of η Aquilae & of several other stars. W Vrg. showed in all the four ~~minima~~ periods a gut anomaly in the time of the max. It gives a secondary minimum. Results of curve for 1872, Athens time, are: —

	Principal minimum	I Max	secondary min.	II Max.
1872	July 4.15	July 11.65	July 14.25	July 16.35
	" 21.75	" 28.85	Aug 1.85	Aug 4.05
	Aug 9.40	Aug 15.75	" 19.80	" 21.60
	" 24.95	Sept 1.50		

The nearer period from the better among these = 17^d.275, or in zufolge consequence of a only one-sided Anschluss connexion in 1867 = 17^d.2607. If the latter is used for reduction, I find the foll^g (Athens time)

Chief ~~max~~ min.	1872	221^d.1927	including ans?	4 Aug.
I Max.		228.3178	"	4 "
Secondary min.	?	214.6333	"	3 "
II Max.	?	216.6667	"	3 "

I assume Schönfeld's statements in A.N. 1729 hold for Mannh. time & that his max. = I Max., & so 107 periods in interval give

P = 17.26832 from Min^a
17.25958 " Max^a

Mean. = 17^d.26396

The light curve by using only one comp. star gives foll^g values, wh. I put down here in order to show nature of curve

0^d	−7.1	4^d	−4.7	8^d	−4.1	12^d	−4.1	16^d	−6.7
1	−6.5	5	−4.1	9	−4.6	13	−4.3	17	−7.1
2	−5.9	6	−3.7	10	−4.4	14	−5.1		
3	−~~6.7~~ 6.3	7	−3.8	11	−4.3	15	−5.9		

Argelander from Mer. Circle gives comp. γ W with Weiss N^o 294
∴ W is 1872 α = 13^h 19^m 25^s.75
δ − 2° 42′ 37″.6

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A.N. vol 80, p. 154 Nº 1906 E. Schönfeld Sept 17, 1872

Continuation of obsns in 1729 & 1857 - Observed epochs 1871, 1872. Deduced by means of light-curve of 1729 & compared with elements there given:

Epoch	Minima	p	C−O d
103	1871 Feb. 19.98	2	+0.25
104	Mar. 9.34	3	+0.14
108	May 17.64	3	−0.05
125	1872 Mar. 6.10	2	+0.14
126	" 22.62	1	+0.90
127	Apl 9.74	2	+0.05
128	27.22	2	−0.16
132	July 5.44	3	−0.28

Epoch	Maxima	p	C−O
105	1871 Apr. 3.64	3	+0.23
107	May 8.46	2	−0.04
108	25.81	3	−0.12
109	June 12.68	1	−0.71
124	1872 Feb. 25.32	1	+0.75

If one brings in the obsns of the Jahresmitteln mean yrs we obtain as extension of the nos. in No 1857: Epoch 106 C−O = +0.022 p = 17

128 +0.079 11

Since 1870 the +ve deviations of the elements outweigh, i.e. the period found earlier $17^d.2735$ A.N. 1729 is somewhat too gt. The solution of the 7 yearly equations give Corr − Ep. 65 = $-0^d.0224 \pm 0^d.0402$ (w.f.)

Corr − Period -0.000747 ± 0.001015

or the new elements: —

Min − Ep. 65 = 1869 May 4.81 M.T. Marmh.

Period $17^d.2728 = 17^d\ 6^h\ 32^m\ 46^s$

with the representation of the Jahresmittel mean years

Ep.	C−O d	p	Ep	C−O	p	Ep.	C−O	p
2	−0.091	10	43	−0.066	20	86	+0.110	13
23	+0.173	14	66	−0.101	12	106	−0.031	17
						128	+0.009	11

The p.e. of single eqnt = $0^d.3958$, deduced from the comparison of the single determinations with the latter elements, in wh. the period was taken as $17^d.273$ for shortness. In same way the other p.e.'s calc?

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The rounding off (Abrundung, gerechtfertigt) is justified not only through the magnitude of the uncertainty still remaining but also thro' this, that the assumption (hypothesis) of equal exactness of the min.a & maxa in the case of the mean years (Jahresmittel), thro' the fresh calculation, has shown itself not quite legitimate; the latter are somewhat too small. For the following time I have therefore both phases separated & they now take the following form: —

MINIMA			p
Ep. 2	1866	May 12.523	5
23	1867	" 10.349	10
43	1868	Apr. 19.943	12
67	1869	June 8.340	9
87	1870	May 19.719	7
105	1871	Mch 26.669	8
128	1872	Apr. 27.051	10

MAXIMA			p
Ep. 2	1866	May 21.018	5
23	1867	" 17.870	4
43	1868	Apr. 27.876	8
63	1869	Apr. 8.820	3
85	1870	" 23.237	6
107	1871	May 8.469	9
134	1872	Feb. 25.320	1

In regard to the lt.-curve these researches have led to the result that an improvement of the nos. in No. 1729 is yet quite unnecessary.

I have considered the elements sufficiently certain in order to be able to compare the negative datum wh. thro' the omission of the obsn in Bessels Z. 70, 1822 Apl 16 is afforded..... The new elements give the min. Ep. — 932 on 1822 Apl. 15, 1822 & the lustre of W = 18½, mag. 9.6, in good agreement with calcn

A.N. Vol 81 p. 160 No. 1931 E. Schönfeld Mannh. Dec. 1872 (Discussion of Schmidt's res.)

He undertook investigation to see if Schmidt's conclusions were correct — i.e. the secondary min. Schönfeld's regular obsns began shortly before discovery yet ran in April 1866 - At time of writing he had made 252 obs. He gives a list of the comp. stars a, b, c, d, g, k. and brightness thus: —

a	13h 20m.9	−2° 43′	Brtness	15.8
b	21.4	53		18.5
c	23.0	28		19.2
d	22.1	18		20.0
g	21.8	12		27.9
k	23.6	4		36.8

In addition V Virg. was used - He found from diffnt. periods for Minima

Ep. E = 1869 May 4.81 M.T. Mannh.
+ 17d.273 (E − 65)

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from wh. Ep. zero = 1866 Apl 8. Schönfeld gives a table wh. contains his normal brightnesses & also Schmidt's after reducing the latter to same scale.

zero ^{d}	Schön.	St-Curve	Schmidt
0.00	17.31	−0.2	17.6
0.47	18.21	+0.6	18.6
0.93	18.16	+0.1	19.5
1.30	19.14	+0.6	20.2
1.88	19.27	−0.1	21.4
2.27	20.86	+0.8	22.1
2.80	20.37	−1.0	23.2
3.21	20.46	+1.0	24.0
3.78	23.24	−0.5	25.2
4.13	24.72	+0.3	25.9
4.95	26.10	+0.2	27.5
5.69	27.36	+0.5	28.5
6.06	27.22	+0.1	28.9
6.53	27.23	−0.2	28.7
7.23	27.21	−0.4	28.4
7.75	27.67	−0.1	27.9
8.30	27.36	−0.4	27.1
9.12	27.89	+0.3	25.9
9.66	27.82	+0.4	26.4
10.29	27.36	+0.2	26.7
10.80	27.16	+0.4	26.9
11.43	26.18	+0.1	27.3
11.91	25.74	+0.2	27.6
12.38	24.57	−0.3	27.3
12.75	23.79	−0.5	27.1
13.35	22.84	−0.4	26.4
13.81	22.36	−0.1	24.8
14.45	21.39	+0.3	23.0
15.28	19.72	+0.2	20.9
15.99	18.08	−0.3	19.0
16.60	17.28	−0.4	18.3

Schönfeld says his obs^{ns} do not admit the const^{e} of a lt-curve with double max. & indeed make such a form of curve very improb. Schmidt's obs^{ns} from 5^d to 12^d are not confirmed by E.S.'s obs^{ns}. He thinks his earlier lt-curve needs very small corrections.

E.S. then constructs a new curve from wh. he puts Max. 8^d.2 after Min. He uses the new curve to the complete recalculation of all his obs^{ns} including Max. & Min. & these again to the evaluation of the epochs of Min. & Max.

		Minima	p	C−O
Ep. 1	1866	Apr. 25.32	2	−0^d.005
3		May 29.58	2	+0.280
4		June 15.83	2	+0.303
19	1867	Mar. 2.25	2	−0.828
20		19.27	1	+0.225
23		May 10.90	3	−0.588

			p	C−O
Ep. 24	1867	May 26.85	2	+0^d.735
26		July 1.16	3	−0.030
27		18.36	2	+0.043
41	1868	Mar 16.43	3	−0.210
42		Apl 3.58	2	−1.088
43		19.26	1	+0.505
44		May 6.82	3	+0.217
45		" 24.31	3	0.000
64	1869	Apl 18.09	3	−0.600
67		June 8.62	1	−0.312
68	1869	June 25.13	3	+0^d.450
69		July 13.14	1	
83	1870	Mar. 11.87	1	−0.287
86		May 1.71	1	
87		19.82	3	−0.200
89		June 23.47	2	+0.771
103	1871	Feb 20.11	2	−0.600
104		Mar 9.26	3	−0.165
108		May 17.30	3	+0.012
125	1872	Mar. 6.02	2	+0.135
126		22.80	1	+0.183
127		Apl 9.70	2	+0.101
128		27.00	2	+0.594
132		July 5.48	2	−0.034
				−0.061
				−0.437

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Maxima

				d					d
Ep. 0	1866	Apl.	16.45	−0.208	Ep. 83	1870	Mar.	19.61	+0.260
2		May	20.99	− .203	85		Apl.	22.78	+ .635
3		June	6.95	+ .110	87		May	28.58	− .620
22	1867	May	0.94	+ .300	105	1871	April	3.61	+ .258
24		June	4.61	+ .175	107		May	8.65	− .237
41		Mar.	24.69	− .270	108		"	25.79	− .105
43	1868	April	27.12	+ .845	109		June	12.33	− .372
44		May	15.32	− .083	124	1872	Feb.	25.79	+ .258
63	1869	Apl	8.69	− 273	127		Apl.	17.78	+ .086

From the 30 equations for the minima it follows: —

Ep. 65 = 1869 May 4.77761 ± 0.d04798

Period 17.d27 2670 ± .007185 —

From the 18 max.

Ep. 65 = 1869 May 4.73778 ± 8.2 d · ± 0.d05675

Period 17.272589 ± .001450

& the p.e. of a determination $p = 1$

for minima ± 0.d3807

maxima ± .3498

Here it appears the max. are somewhat more exact, while before the reverse was the case. Both about equally good.

As definitive elements S. gives

Min. epoch 64 = 1869 April 17.49 Mannh. M.T

Max. " 64 25.69

Period 17.d27263 = 17d 6h 32m 35s

E.S. then gives two tables, the first giving minima to the beginning of the yr. & the second, the epochs in a year — (I do not give these – C.a.c.)

Then follows a table for the construction of the light curve, with argument time since min. in tenths of days.

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Light-curve of W. Vrg.

Argument = time from min. after Brightness in steps (a = 15.8, b = 18.5, c = 19.2, d = 20.0, z = 27.9, h = 31.8)

d		d		d		d		d		d	
0.0	17.6	3.0	21.4	6.0	27.2	9.0	27.7	12.0	25.7	15.0	20.0
.1	17.6	3.1	21.7		27.2		.6		.5	.1	19.8
.2	17.6	3.2	21.9		27.3		.6		.4		19.7
.3	17.6	3.3	22.1		27.3		.6		.2		.5
.4	17.7	3.4	22.4		27.4		.6		.0		.3
.5	17.7	3.5	22.6	6.5	27.4	9.5	.5	12.5	24.8	15.5	.2
.6	17.8	3.6	22.9		27.4		.5		.6		.0
.7	17.8	3.7	23.1		27.5		.5		.4		18.8
.8	17.9	3.8	23.4		27.5		.5		.2		.7
.9	18.0	3.9	23.6		27.5		.4		.0		.5
1.0	18.1	4.0	23.8	7.0	27.6	10.0	.4	13.0	23.8	16.0	.4
1.1	18.3	4.1	24.1		.6		.4		.6	16.1	.3
1.2	18.4	4.2	24.3		.6		.3		.4	16.2	.1
1.3	18.6	4.3	24.5		.6		.3		.2	16.3	18.0
1.4	18.7	4.4	24.7		.7		.2		.0	16.4	17.9
1.5	18.8	4.5	24.9	7.5	.7	10.5	.2	13.5	22.8	16.5	.8
1.6	19.0	4.6	25.1		.7		27.1		6	16.6	.8
1.7	19.1	4.7	25.3		.7		27.0		4	16.7	.7
1.8	19.2	4.8	25.5		.7		.0		2	16.8	.7
1.9	19.4	4.9	25.7		.7		26.9		0	16.9	.6
2.0	19.5	5.0	25.9	8.0	27.8	11.0	26.8	14.0	21.8	17.0	.6
2.1	19.6	5.1	26.1		.8	11.1	26.7	14.1	21.6	17.1	.6
2.2	19.8	5.2	26.3		.8	11.2	26.6	14.2	21.4	17.2	.6
2.3	20.0	5.3	26.4		.8	11.3	26.5	14.3	21.2	17.3	.6
2.4	20.2	5.4	26.6		.8	11.4	26.4	14.4	21.0		
2.5	20.4	5.5	26.7		27.7	11.5	26.3	14.5	20.8		
2.6	20.6	5.6	26.8		.7	11.6	26.2	14.6	20.7		
2.7	20.8	5.7			.7	11.7	26.1	14.7	20.5		
2.8	21.0	5.8	26.9		.7	11.8	25.9	14.8	20.3		
2.9	21.2	5.9	27.0		.7	11.9	25.8	14.9	20.2		
			27.1								

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A.N. vol. 87, p. 20. No. 2066 E. Schönfeld Sept 19, 1875 (Bonn)

Obsⁿˢ yield the follᵍ similar continuation of the table of epochs as in A.N. 1931.

	MINIMA				MAXIMA			
Epoch			p	C−O	Ep		p	C−O
147	1873 Mar. 21.31		2	−0.ᵈ191	145	1873 Feb. 23.07	2	−0.297
148	Apl 7.67		2	−.279	146	Mar. 12.95	2	−.904
165	1874 Jan 26.28		2	−.254	166	1874 Feb. 20.22	3	+.278
166	Feb. 11.85		3	+.448	167	Mar. 10.26	2	−.489
167	Mar. 1.43		2	+.141	170	May 0.43	3	+.159
168	18.56		3	+.284	171	17.46	2	+.401
170	April 22.39		3	−.001	173	June 20.92	2	+.487
173	June 12.97		3	+.237	174	July 8.64	3	+.039
174	24.63		2	+.849	188	1875 Mar. 7.47	1	+.026
175	July 18.40		1	−.648	192	May 15.14	2	+.446
176	Aug 4.82		2	−.795				
188	1875 Feb. 26.58		1	+.716				
189	Mar. 16.53		1	+.039				
191	Apr. 20.43		3	−.316				

By assuming equal unit weight (Gewichtseinheit) for both phases one obtains the yearly mean (Jahresmittel)

Ep. 147	C−O =	−0.ᵈ4477	p = 8
170		+0.1212	36
190		+.0906	8 × in mean
170		+.0336	52

This, compared with chief epoch 65 of the table gives

Corr. to Period −0.ᵈ00032 ; 1^P = 17.ᵈ27231

The solution of the single eqⁿˢ of condⁿ would give the period somewhat smaller but yet within the p.e. (0.ᵈ00091) agreeing ~~corresponding~~ with the table. There seems to be no essential correction to the table so far as seen —

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A.N. Vol. 163, p. 326 E. Goot (Heidelberg) 1902-3 No 3909

8-inch refractor with Zöllner photometer - Comp. stars as given in H.A. 37, pp 102

1903 Feb. 16^d 12^h 49^m Königstuhl M.T. b = -2.08, k +0.05, m +0.96

(b = -2.08 mags > vble) "m" is from Hagen's chart. ? No

The comp. stars are named as in H.A. by Pickering. For faint stars the nos are from Hagen's charts.

A.N. Vol. 143, p. 253 No. 3424 Jos. Hagen (Dated Louvain Feb. 1897)

Observations made at Georgetown Univ., Washington, (in continuation of a series given in No. 3366) In all 26 estimations were made, distributed very irregularly over interval Feb. 11 – June 16, 1896. Since a determination of the phases by means of a single curve w'd be always somewhat arbitrary and w'd remain uncertain, a normal curve was calculated, notwithstanding the slight material this same then simultaneously all the obs^{ns} satisfied & by means of it the foll^g max. & min. were laid down:

E	Phase	Date	Mag	O–C
633	Min	1896 Mar. 14.2	9.6^m	+0.53
634	Max	Apl. 8.3	8.8	+0.16
636	Min	May 4.5	9.65	+0.01
636	Max	May 12.7	8.8	+0.01
637	Max	May 30.6	9.0	+0.64
638	Min	June 8.4	9.6	+0.37

The normal curve resembles that of Schönfeld (A.N. 161, p. 161) yet the two neighboring Max. on Mar 5 & 30 not against the view of Schmidt (80, p. 142) that there is a sec.? min., as in β Lyrae. A few suitable obs^{ns} shd this matter clear up, wh., in the case of a lack of suitable comp. stars w'd be very difficult. The dates, which the normal & single curves give differ in the mean by ± 0.^{d}6 & + 0.^{d}3 resp, especially since the max. of May 30 w'd fall 1.^{d}4 later accord^g to the single-curve. The variation of the light on average = 0.^{mag}7, 8.^{m}9 to 9.7

The elements are 1866 Apl 16 2402708.2666 + 17.2711 E (Charlois III Ct. Hagen A.J. 19, 173)

He gives references to A.T. Yendell Vols 9–15

Spera vols 15. 16 ff

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1916phae.proj . 793C

A.N. vol 189 p. 314 No. 4515. Max Mündler Heidelberg

Observations made in 1909 + 1910 with 6-in. comet seeker ×27. Exact mags. not known & so step-estimations are given. The mags given for comp. stars are from the BD (Middle Europ. Time)

h = BD −2°.3698, Mag 8m.5 ; g = B.D. −2°.3689, 9m.0 ; d = −2.3690, 9m.5.

	M.E.T	seeing			M.E.T.		
1909 Apl 11	10.42	good	g 1 W 2 d	1910 Mar. 9,	11h 11m	good	Wg (very deep / sehr tief)
" 15	11.07	"	g 2 W 2 d	" 30	11 12	"	g 3 W d
May 9	10.25	Fair	g 3 W d	Apl 10	9 42	"	h 2 Wg
" 20	11.16	v. good	g 2 W 2 d	" 30	10 24	"	g 2 W 2 d
				May 12	11 16	"	g 1 W 2 d

A.N. vol 197 p. 238 no. 4719 K. Graff, Hamburg Observatory

All mags. are reduced to photometric system accord.ᵍ to Hamburg Mitt. No. 11, p. 11. Color-scale is that of Osthoff. A large no. of the comp. stars be found in H. A vol 74. (Photometric catalogue)

On p. 250 are the results for W Virginis

~~*a = −2°.3698, *b = −2°.3689, *c = −2°.3687~~

1906 Mar. 27 c 5 v v = 11m.3

1910 ~~Apl~~ Mar. 31 a o v, v 2.5 b (This is for V Vug)

Apl 1 b 3 v

" 2 b 2 v

" 4 b 3 v

11 b 5 v, c o v

*a = −2°.3688 *b = −2°.3687 Time Gr. M. T.

1906 Mar. 27 v = 10m.4 Color 4c

1910 Mar 31 v o a, v 3 b

Apl 1 v o a, v 1 b

2 a o v v 3 b

11 v o V Vug

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Astronomical Journal

A.J. V. 9, p. 83 – P. S. Yendell Dorchester Mass. (4¼-inch)

W Virg. is interesting as being the only known vble of short period, not of Algol type – Betw 1889 May 24 & July 24 got 22 obs. 4 max. wh. were deduced by use of Schönfeld's light-scale & mean lt. curve as pub. in A.N. 85, p. 161.

Epoch	1889	W	O–C	O–C′
425	May 29.4	5	−1.83^d	−0.46^d
426	June 17.16	3	−0.44	+0.93
427	July 6.06	1	+1.18	+2.56
428	20.8	4	−1.35	+0.03

The max. of ep. 425 & 428 were deduced fr. single curves formed, respy from 7 & 8 obs. & are given higher wt. that of ep. 426 from 4 obs., one near max & 3 on falling curve. That of ep. 427 from 2 obs. upon rising curve.

Using these residuals & also Schönfeld's from 1886–1872 & applying least sqq. corrections were obt.^{d} of +0.^{d}0123 to principal epoch and −0.^{d}00276 to period. Result: 1869 April 25.678 + 17.^{d}26987 E.

From these elements the residuals O–C′ were obtained — Y. considers these not definitive

A.J. 10, 85. Yendell.

From 1890 Mar. 17 to July 18, 35 obs.; 6 max., 3 min. deduced. Obsns much interrupted by bad weather – All max., except Apl 23, obtd by mean lt. curve – This exception & all the times of min., deduced from single curve.

Maxima		W	Minima		W
1890 March	19.8	2	1890 April	15.8	4
April	8.1	3	May	19.4	4
	23.5	4	July	10.7	4
June	13.6	3			
July	1.9	2			
	19.1	2			

A.J. 10, p. 178 J. G. Hagen. Georgetown

Peculiar difficulties with this star. Two wks of good weather are necessary for an indepᵗ determinᵒⁿ of a max. or a min. & the moon shd not be full near time of min. Also the proximity of bright stars & the gt. distᶜᵉ of convenient comp. stars increase the difficulty

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As seen from table (below) there is only one case in 2 yrs. in wh. 13 obsns could be secured for the same minimum – 45 obs. in 1889 & 1890. two doubtful & rejected. Phases derived from method of Argelander in first paper on β Lyrae. The 43 obs. were combined into 15 normal pts wh. gave a lt. curve so closely resembling Schönfeld's that no chge can be detected in course of 20 yrs.

E	Phase	Gr. M.T.	p	O–C	O–C′
423	Min.	1889 Apr. 18.5	1	–0.3	
423	Max.	26.8	3	–0.2	+1.0
424	Min.	May 6.1	2	0.0	
424	Max	13.9	3	–0.4	+0.8
441	Min	1890 Feb. 23.3	4	–0.4	
442	Max	Mar. 21.0	6	–0.2	+1.0
444	Min	Apr. 15.5	8	–1.0	
447	Max	June 15.2	2	–0.3	+0.9
449	Min	July 11.3	13	–0.6	

p the wt. = no. of obsns

The periods in Col 1 are counted from Schönfeld's epoch:

Min 1869 Apr. 17.466 } Gr. M.T.
Max 1869 " 25.666 }

Col. 5 gives residuals from Schönfeld's 17.27263

Col. 6 those from Yendell's 17.26987

From signs of residuals mean period from 1869 – 1890 has a val betw. those given – To get correction H. takes

$$\frac{\text{Mean. (by wts.) of O–C}}{\text{Mean. of com. epochs E}} = -\frac{0.507}{4441} = -0.000115^d$$ which added

to 17.27263 gives $17.^d27148$ for mean period

Max. brightness = 8.9 } as derived from mean light curve.
Min " = 9.5 }

A.J. 12–64 P. D. Yendell – Observations 1891–9[2]

	Max.		
1891	April	2.15	2
	May	8.94	3
		25.89	1
	June	11.00	2
		28.78	1
1892	Mar	31.7	4
	April	16.7	4
	May	22.3	3
	June	13.4	4

	Min.	
1891	March	26.52
	April	11.15
	June	3.21
1892	Mar.	25.0
	April	26.2
	May	31.7

The 1891 obs. were reduced by a mean lt. curve formed from all Y's obs., 110 in all, from 1889–1892. The normal lights indicate quite distinctly a secondary max about 4d. after principal one, somewhat resembling Schmidt's curve A.N. 80, 142

Obsns too few for definitive determin.

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A.J. 13–122 - Yendell

Obs. badly broken up by weather; 21 obtd from 1893 March 12 to July 18
By applying a mean lt. curve, 4 max + 2 min: —

Max.		w	Min.		w
1893	May 2.08	3	1893	April 8.69	2
	June 6.18	3		May 11.10	3
	21.96	2			
	July 11.89	3			

A.J. 14–85 - Yendell

Betw 1893 Nov. 16 and 1894 April 2, 42 obs. 4 max + 4 min:

Max.		w	Min		w
1893	Dec. 24.88	4	1893	Dec. 14.8	3
1894	Jan. 20.20	4	1894	Jan 8.0	3
	Feb. 15.52	2		Feb. 4.0	4
	Mar. 16.21	3		Mar. 4.5	4

A.J. 15–110 W. E. Spera -

3-inch tel. Argelander method - Mags. on historic scale. Time G.M.T.
10 obs. on W Vir. from 1894 June 19 to July 8

Max.	June 21.9	8.5m	} mags. only approx.
Min.	July 1.4	9.6	

A.J. 16–52 W. E. Spera (same conditions as above)

28 obs. from 1895 May 12 to 1895 June 24 3 max.

Max.	1895 May	17.0	8.7m
Max.	June	1.7	8.9
Max.		19.3	8.6

A.J. 17–67 P. D. Yendell

26 obs. from 1896 Apl. 2 to July 1

Max.		w	Min		w
1896	April 9.2	4	1896	May 4.6	3
	May 13.6	4			
	" 29.2	3			

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A.J. 24 – 93 Yendell

13 obs. from 1900 Mar. 25 to May 22 ; 13 in 1902 from Apr. 28 to June 9

Maxima		wh	Minima		w
1900	Mar. 31.5	4	1900	May 26.9	2
1902	May 31.9	4	1902	May 8.6	4

A.J. 26 – 6 W. E. Speer

26 obs. from 1907 May to 1907 July 14. 3 max + 2 min

			m	
Min. 1907	May	12.5	10.0	Good
Max	"	18.6	9.0	Fairly good
Max	June	7.0	8.9	Good
Min.	July	3.5	9.9	Somewhat uncertain
Max	July	10.7	8.9	" "

P.A. 1 – 318 J. A. Parkhurst

W Virg is one of the shortest of the "long period" vbles. He gives a chart, showing W and V, abt ½ deg. apart.

P.A. 3 – 406 W. E. Speer (Randolph, Ohio)

22 obs. betw 1895 May 12 & June 20 yield 3 max. being an av. of 7 obs. to each max.

May 17.0	8.7	The rise & the fall of this star are accom-
June 1.7	8.9	plished in nearly equal periods; but
June 19.3	8.6	owing to faintness at min. a tel of 3 in. must be used – (at least 3 in. aperture)

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Pub. Georgetown Coll. Obs. - Obsns of Variable Stars 1884–1890 (1901)
by J. G. Hagen. p. 122 W Virginis

(1900) $12^h\ 20^m\ 52^s$ $(+3^s.09)$; $-2^\circ\ 51'.5$ $(-0'.31)$

Period $17^d.2711$ Variation $9^m - 10^m$

Comparison Stars.

Obs	ASV	BD	Steps	Magn.
f	5	-3°.3458	6.0	8.3
g	–	3.3461	10.0	(8.5) BD.
h	8	3.3460	16.9	9.0
c	–	2.3697	(19.0)	(8.9) BD
m	22	2.3679	21.4	9.5
e	18	2.3678	23.6	9.4
n	23	3.3463	23.9	9.6
d	15	2.3688	27.0	9.5
p	–	1°.2821	29.7	(9.5) BD
b	24	−2 3687	31.3	9.7

Observations

Date	G.M.T	Steps	J.D 2411 000+	Remarks
'89 Apr. 4	$17^h.5$	23.0	097	
" 23	16.8	20.9	116	
May 3	15.2	24.4	126	
" 17	15.1	21.1 ~~19.5~~	140	
" 23	15.1	27.6 ~~24.6~~	146	Difficult
'90 Feb. 15	13^h–15^h	14.0 ~~21.1~~	414	
" 17	"	19.2 ~~20.5~~	416	
" 20	"	28.5 ~~27.6~~	419	
" 21	16.8	28.7 ~~25.0~~	420	
" 26	13^h–15^h	25.2	425	Cloudy
Mar. 9	"		436	DDimin
" 16	"	16.1	443	
" 19	"	13.2	446	

Observations

Date	G.M.T.	Steps	JD 2,411,000	Remarks
90 Mar. 23	13^h–15^h	15.4	450	
" 26	"	17.7	453	D
April 1	15.5	30.5	459	DD
" 7	15	17.2	465	DDD
" 11	13–15	18.3	469	
" 12	"	25.9	470	
" 13	"	29.2	471	not anim
" 14	15.1	23.7	472	
" 19	14.6	20.1	477	
" 20	15.1	16.9	478	
" 21	13–15	18.3	479	
" 22	15.1	17.4	~~480~~	
" 28	16	15.4	486	

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Date	Gr. M.T	Steps	J.D.	
'90 May 8	14.6	14.5	496	
" 12	15.5	16.4	500	seeing poor
" 21	14.6	23.3	509	
" 27	15.2	15.6	515	
June 14	14.5	14.0	533	
19	15	19.6	538	
July 5	14	14.0	554	
" 6	15.6	19.6	555	
" 7	15.6	21.3	556	
8	14.5	27.1	557	
9	14.6	25.8	558	
10	14.8	30.0	560	Difficult, but sure
11	14.8	26.9	561	
13	15.2	27.8	562	
14	14	20.9	563	
15	14	24.0	564	$n \geqq W$!
16	13.8	18.9	565	
18	14.5	15.7	567	
19	14.5	14.3	568	

N.A. 24-256

1888 May 20 < 9.0

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W Virginis

Cl. IVa. Max. 9.54 Min 11.04

Epoch 2402708.2666 P = 17.2711

Comp. star −2°.3684, mag. 7.29

1899 mag A

J.D	Magn.	Ep.	Phase	J.D.	Magn	Ep.	Phase
241,							
47824.651	9.83	699	3.885	4833.622	9.66	702	1.043
.657	9.85	"	3.891	.632	9.68	↓	1.053
.662	9.88	9.85	3.896	.640	9.69	9.67	1.061
.674	9.84	3.899	3.908	.647	9.69		1.068
.679	9.83		3.913	.656	9.71	1.060	1.077
4785.643	10.04		4.877	4835.592	9.80		3.013
.649	10.04		4.883	.603	9.79		3.024
.656	10.00	10.02	4.890	.608	9.82	9.81	3.029
.663	10.03	4.891	4.897	.616	9.81		3.037
.672	9.99	"	4.906	.622	9.82	3.029	3.043
4801.654	9.80	700	3.617	4839.593	10.69		7.014
.660	9.85		3.623	.601	10.71		7.022
.665	9.86	9.84	3.628	.608	10.69	10.69	7.029
.678	9.83	3.631	3.641	.616	10.69		7.037
684	9.84		3647				
4807.615	10.91		9.578	.624	10.68	7.029	7.045
.622	10.88	10.89	9.585	4841.601	11.07	11.07	9.022
.629	10.88		9.592	.615	11.07		9.036
.637	10.88	9.592	9.600	4847.586	9.55	9.029	15.007
.644	10.89	(−.799) "	9.607	.592	9.54	−8.242	15.013
4816.558	9.62	701	1.250	.599	9.55	9.54	15.020
.566	9.62	"	1.258	.605	9.52		15.026
.573	9.60	9.62 "	1.265	.612	9.54	15.020	15.033
.587	9.59	1.268	1.279	4849.562	9.73.	−2.251	16.983
.595	9.63		1.287	.569	9.67	9.69	16.990
4827.559	10.35		12.251	.578	9.71	16.999	16.999
.565	10.39	10.34	12.257	.588	9.69	" −0.272	17.009
.573	10.35	12.265	12.265	.593	9.67	702	17.014
.581	10.30	−5.006 "	12.273	4851.556	9.72	703	1.706
.589	10.33	"	12.281	.562	9.73	"	1.712
					9.70		1.724

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Wendell's measurements

H.A. 69 – 44

J. D.	Mag	Ep.	Phase
4851.576	9.72	703	1.726
.604	9.65	"	1.754
4860.551	10.67		10.701
.558	10.52		10.708
.564	10.56	10.59	10.714
.570	10.56	10.714	10.720
.576	10.54	-6.557	10.726
4862.558	10.14		12.708
.567	10.16		12.717
.575	10.15	10.15	12.725
.583	10.17	12.725	12.733
.590	10.15	-4.546	12.740
4863.552	9.86		13.702
.538	9.81		13.708
.565	9.79	9.80	13.715
.572	9.77	13.715	13.722
.578	9.75	-3.556	13.728
4864.541	9.57		14.691
.546	9.55	9.55	14.696
.550	9.55	14.696 -2.575	14.700
4867.542	9.69	704	0.421
.549	9.66		0.428
.556	9.66	9.63	0.435
.562	9.51	0.439	0.441
.570	9.65		0.449
4874.551	10.78		7.430
.559	10.76	10.82	7.438
.567	10.76	7.437	7.446
.548	11.00		8.427

J. D	Mag	Ep.	Phase
4875.555	10.99	704	8.434
.563	11.01	"	8.442
1899 Aug 8 ↗	11.00		8.438

From alone Observations

Mag	Phase		
9.85	3.899		21.170
10.02	4.891		22.162
9.84	3.631		20.902
10.89	9.592	-7.699	26.863
9.62	1.268		18.539
10.34	12.265	-5.006	29.536
9.67	1.060		18.331
9.81	3.029		20.300
10.69	7.029		24.300
11.07	9.029	-8.242	26.300
9.54	15.020	-2.251	
9.69	16.999	-0.272	
9.70	1.724		18.995
10.59	10.714	-6.557	27.985
10.15	12.725	-4.546	
9.80	13.715	-3.556	
9.55	14.696	-2.575	
9.63	0.439		17.710
10.82	7.437	-9.834	24.708
11.00	8.438	-8.833	25.709

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