AJC Bk I

March 5, 1896

Estimates of photographic brightness of S Cygni
a, c, b, e, d, g, f, k, l, m, o, h, p,
Fl. star, n, q, r, s.

Plate I 141 taken Nov. 16, 1889.
v n. s. v < 11.52
11.42 t = .1

Plate I 1369 taken June 30, 1890.
Whole region is on extreme edge. v n. s. v < 9.78
9.68 m = .1 .

Plate I 1767 taken Sept. 1, 1890.
v n. s. v < 10.23
Extreme edge. 10.13 o = .1

Plate I 1922 taken Oct. 1, 1890
v n. s. v < ~~10.03~~ 11.13
11.03 n = .1

Plate I 1923 taken Oct. 1, 1890.
Poor plate with region on extreme edge. v n. s. v < 9.57
9.47 f = .1 ?

Plate I 2064 taken Oct. 25, 1890
v. n. s. v < 10.23
o = .1

Plate I 2454 taken Dec. 9, 1890
v n. s. v < 9.84
9.54 l = .3

Plate I 2778 taken Jan. 12, 1891.
~~k 1 v~~ 10.13 o 3 v 10.~~43~~ 52 10.6~~8~~ 0 = 10.5~~3~~ 68 ~~.1~~ ~~.04~~ ~~.1~~ .04
~~k 3 s~~ 10.6~~3~~ 0 v 1 p 10.73

Plate C 3611 taken April 6, 1891
Broken. Estimates were taken from another plate by mistake. ~~9.68 m 3 v~~ ~~9.98~~ 10.67 ~~10.0~~8~~ 0 = ~~10.0~~3~~ ~~.02~~ .04 ~~.03~~
~~10.0~~8~~ 0 v 0~~ ~~10.13~~ 00 10.13

March 5. 1896.

Estimates of photographic brightness of S Cygni (cont.)

Plate C 3625 taken April 9. 1891.

Images 9.68 m 2 v 9.~~88~~ 94 ~~10.33~~ 9.87 = ~~10.1~~ 9.90 ~~.22~~ .04 ~~.23~~ .03

elongated. ~~10.33~~ 9.87 v 2 o 10.13

Plate C 3633 taken April 13, 1891

9.68 m 2 v ~~9.88~~ 9.94 ~~10.33~~ 9.87 = ~~10.1~~ 9.9 ~~.22~~ .04 ~~.23~~ .03

Images crescent ~~10.33~~ 9.87 v 2 o 10.13

shaped.

Plate C 3649 taken April 24. 1891.

Double images. 10.13 o 2 v 10.3~~8~~9 10.~~43~~34 = 10.3~~8~~5 ~~.05~~ .04 ~~.06~~ .01

10.~~43~~34 v 3 p 10.73

Plate I 4198 taken Sept. 10. 1891.

Plate C 3973 taken Sept. 19. 1891.

Succession v n.s. v < 10.2~~8~~3

of images of each star. 10.13 o = .1

Plate I 4451 taken Oct. 5. 1891.

v n.s. v < 9.~~78~~ ~~84~~ .78

9.68 m = .1 extreme edge.

Plate C 4155 taken Nov. 6. 1891.

v n.s. v < 10.2~~8~~3

10.13 o = .1

Plate C 42~~5~~45 taken Dec. 2. 1891

v n.s.

9.54 l = .1 v < 9.6~~4~~4

Plate C 4246 taken Dec. 2. 1891.

v n.s. v < 9.6~~4~~4

9.54 l = .1 or less.

March 5, 1896.

Estimates of photographic brightness of S. Cygni (cont.)

Plate C 4251 taken Dec. 3. 1891

v n.s. v < 10.2~~8~~3

10.13 o = .1 or less

Plate C 4263 taken Dec. 8, 1891.

v n.s. v < 11.~~08~~ ~~11~~ .08

10.98 n = .1

Plate C 4264 taken Dec. 8. 1891.

v n.s. v < 10.2~~8~~3

10.13 o = .1

Plate C 4290 taken Dec. 13, 1891.

v n.s 10.73 ~~8~~ 7 = .1 or less v < 10.8~~8~~3

Plate C 4301 taken Dec. 17. 1891.

~~p~~ 10.98 n 2 v v = 11.~~08~~ 24

~~p~~ q n.s.

Plate I 5275 taken Dec. 28, 1891

Region at extreme top 9.68 m 3 v v = ~~9.78~~ 10.07

of plate. o and p are not seen.

Plate I 5381 taken Jan. 9. 1892

Region is at extreme 9.68 m 2 v 9.~~88~~ 94 ~~10.29~~ 9.87 = ~~10.11~~ 9.90 ~~.17~~ .04 ~~.18~~ .03

top of plate. ~~The variable seems to show the same left hand, o & p are not seen~~

~~10.23~~ 9.87 v 2 o 10.13

Plate I 6566 taken July 11, 1892

Star d at v n.s. v < 9.84

top of plate. 9.54 l = .3

Plate I 6660 taken July 25, 1892.

Top of plate. v n.s v < 9.64

9.54 l = .1

March 5. 1896.

Estimates of photographic brightness of S Cygni (cont.)

Plate I 6717 taken Aug. 6. 1892.

Images very poor v n. S. v < 10.23

10.13 o = .1

Plate I 6737 taken Aug. 16. 1892

Region not on plate.

Plate I 6739 taken Aug. 16. 1892.

v n. S. v < 9.64

9.54 l = .1

Plate I 6779 taken Aug. 23. 1892.

v n. S. v < 9.64

9.54 l = .1 or less.

Plate I 6809 taken Sept. 1. 1892.

v n. S. v < 9.74

9.54 l = .2

Plate I 7093 taken Sept. 18, 1892

The region is at v. n.S. ? There seems to be a faint trail

extreme top, & indistinct 9.54 l = .1 or less. v < 9.64 ?

Plate I 7187 taken Sept. 27. 1892

Extreme top v n. S. v < 9.64

very indistinct 9.54 l = .1

Plate I 7204 taken Sept. 29. 1892

v n. S. v < 10.83

10.73 p = .1

Plate C 5197 taken Dec. 3. 1892

9.54 l 1 v 9.6~~4~~7 9.55 = 9.61 ~~.06~~ .06

9.55 v 1 m 9.68

Plate C 5198 taken Dec. 3, 1892

8.72 g 5 v 9.37 9.28 = 9.32 .05 .04

9.28 v 2 l 9.54

March 5. 1896.

Estimates of photographic brightness of S Cygni (cont.)

Plate C 5640 taken June 29. 1893.

v n. S. v < 10.33

10.13 o = .2

Plate C 5644 taken June 30, 1893

v n. S. v < 11.18

10.98 n = .2

Plate C 5645 taken June 30, 1893

very little on plate. v n. S. v < 9.67

9.47 f = .2

Plate C 5697 taken July 11. 1893.

v n. S. v < 11.13

11.03 s = .1 or less.

Plate I 9035 taken Aug. 2. 1893.

Top of plate. v n. S v < 10.83

10.73 p = .1

Plate I 9063 taken Aug. 3. 1893.

Good plate. v n. S. v < 11.44

11.34 q = .1

Plate I 9148 taken Aug. 9. 1893

v n. S. v < 11.08

10.98 n = .1

Plate C 5862 taken Aug. 11. 1893

v n. S.

t = .1

Plate I 9326 taken Aug. 29. 1893.

v n. S v < 11.53

11.33 r = .2

Plate C 5966 taken Sept. 9. 1893

v n. S. v < 11.08

10.98 n = .1

March 5. 1896.

Estimates of photographic brightness of S Cygni (cont)

Plate C 6097 taken Oct. 16. 1893

9.54 l 1 v 9.67 9.74 = 9.70 .03 .04

9.74 v 30 10.13

Plate I 9720 taken Oct. 21. 1893.

Edge of plate. 9.54 l 1 v 9.67 9.74 = 9.70 .03 .04

9.74 v 3 0 10.13

Plate I 9747 taken Oct. 24. 1893.

Images poor 9.54 l 1 v 9.67 9.61 = 9.64 .03 .03

9.61 v 4 0 10.13

Plate C 6283 taken Dec. 4. 1893.

10.13 0 3 v 10.52 10.46 = 10.49 .03 .03

10.46 v 4 n 10.98

Plate C 6284 taken Dec. 4. 1893

10.13 0 3 v 10.52 10 34 = 10.43 .09 .09

10.34 v 3 p 10.73

Plate C 6363 taken Dec. 20. 1893.

10.73 p 2 v 10.99 10.94 = 10.97 .02 .03

10.94 v 3 r 11.33

Plate C 6465 taken Jan. 12. 1894

v n. S. v <10.83

10.73 p = .1

Plate C 6718 taken April 25. 1894

v n. S. v < 10.83

10.73 p = .1 or less.

Plate C 6893 taken July 9. 1894.

Plate C 6944 taken Aug. 3. 1894.

March 5. 1896.

Estimates of photographic brightness of S Cygni (cont)

Plate I 11412 taken Aug. 26. 1894.

v n. S. v < 9.74

9.54 l = .2

Plate C 7063 taken Sept 29. 1894.

Images not round. 9.54 l 1 v 9.67 9.61 = 9.64 .03 .03

9.61 v 4 0 10.13

Plate C 7108 taken Oct. 14. 1894.

10.13 0 1 v 10.26 10.21 = 10.24 .02 .03

10.21 v 4 p 10.73

Plate I 11626 taken Oct. 14. 1894

0 = v v = 10.13

v 6 p 10.73

Plate I 11835 taken Nov. 11. 1894.

11.33 r 2 v 11.59

s n. S.

Plate C 7231 taken Nov. 16. 1894.

v n. S. v <9.02

Very little on this plate. 8.72 d = .3

Plate C 7330 taken Dec 17. 1894.

v n. S. 9.68 m = .1 or less v < 9.78

March 9. 1896.

Estimates of photographic brightness of S Cygni (cont.)

Plate C 7$\overset{3}{\cancel{2}}$31 taken Dec. 17. 1894.

v n. S. v < 9.88

9.68 m = .2

Plate C 7373 taken Dec. 22. 1894.

v n. S. v < 10.23

10.13 o = .1

Plate C 7406 taken Jan. 1. 1895.

v n. S. v < 10.23

10.73 o = .1

Plate C 7567 taken Feb. 22. 1895

v n. S. v < 10.23

10.13 o = .1 or less.

Plate C 7605 taken March 5. 1895.

v n. S. v < 10.83

10.73 p = .1

Plate C 7692 taken April 16. 1895.

Poor images.

v n. S. v < 9.64

9.54 l = .1

Plate C 7766 taken May 1. 1895.

v n. S. v < 9.64

9.54 l = .1

Plate C 7832 taken May 9. 1895.

v n. S. v < 10.43

10.13 o = 3

Plate C 7926 taken June 16 1895.

v n. S. v < 10.33

10.13 o = .2

March 9. 1896

Estimates of photographic brightness of S Cygni (cont.)

Plate C 7927 taken June 16. 1895.

v n. S. v < 10.33

10.13 o = .2

Plate C 7970 taken July 11. 1895.

9.54 l 1 v 9.67 9.74 = 9.70 $.\underline{03}$ .03

9.74 v 3 o 10.13

Plate C 8028 taken July 26. 1895

v o l 9.54 v = 9.54

Plate C 8123 taken Aug. 14. 1895.

9.47 f 2 v 9.73 9.55 = 9.64 .09 $.\underline{09}$

9.55 v 1 m 9.68

Plate C 8153 taken Aug. 19. 1895.

9.50 k 1 v 9.63 9.55 = 9.59 .04 $.\underline{04}$

9.55 v 1 m 9.68

Plate C 8195 taken Aug. 30. 1895

9.68 m 2 v v = 9.94

o n. S.

Plate C 8238 taken Sept. 4. 1895.

9.54 l 2 v 9.80 10.00 = 9.90 $.\underline{1}$ .1

10.00 v 1 o 10.13

Plate C 8276 taken Sept. 13. 1895

10.13 o 1 v 10.26 10.26 = 10.26 0 0

10.26 v 1 h 10.39

Plate I 13553 taken Sept 30. 1895

10.73 p 1 v 10.86 10.94 = 10.90 $.\underline{04}$ .04

10.94 v 3 2 11.33.

Plate C 8358 taken Oct. 10. 1895.

11.33 r 1 v

v 1 S 11.03

March 9. 1896.

Estimates of photographic brightness of S Cygni (cont.)

Plate C 8436 taken Oct. 28. 1895.

v n.s. v < 11.43

11.33 r = .1

Plate C 8480 taken Nov. 15. 1895.

v n.s. v < 9.98

9.68 m = .3

Plate C 8535 taken Nov. 29. 1895.

v n.s v < 9.88

Bad plate

9.68 m = .2

Plate C 8564 taken Dec. 6. 1895.

v n.s. v < 10.83

10.73 p = .1

Plate C 8565 taken Dec. 6. 1895.

v n.s. v < 11.43

11.33 r = .1

Plate C 8635 taken Dec. 19. 1895.

v n.s. v < 9.98

9.68 m = .2

Plate C 8636 taken Dec. 19. 1895.

v n.s v < 10.33

10.13 o = .2

Plate C 8641 taken Dec. 19. 1895

v n s v < 9.77

Poor plate

9.47 f = 3

Plate C 8667 taken Dec. 22 1895.

v n.s. v < 16.33

10.13 o = .2

↓

May 14, 1896

H.L. records.

Obs. of Spectra.

Plate B 943$\overset{1}{9}$

V	H	Cl	K line	Bright	
4.2	5.2	A	N	3	
4.1	5.8	A	N	3	
4.7	5.9	A	N	2	
4.2	6.2	A	N	4	
4.2	7.4	M	N	4	
4.2	8.1	A	N	2	
4.2	10.4	A	N	3	
4.4	1$\overset{1}{2}$.4	A	N	4	
4.4	11.9	A	K 0.8 H	3	
4.7	13.1				Very bright spectrum overlaps
4.7	13.2	A	K 0.5 H	4	
4.4	1$\overset{5}{8}$.8	A	N	2	
5.0	2$\overset{3}{8}$.8	A	N	2	
5.2	6.2	A	N	2	
5.2	6.5	A	K = H	3	
5.6	6.3	A	N	1	
6.2	7.5	G?	K = H	4	
6.1	7.6	A	N	2	
5.9	8.1	A	N	5	
6.2	10.1	A	K 0.5 H	2	
6.0	13.5	A	N	2	
5.7	13.8	A	K 0.8 H	4	
6.3	17.2	M	N	3	Br. lines or fluting
5.8	18.9	A	K 0.5 H	3	
6.2	23.5	A	N	1	
6.5	5.9	A	K 0.3 H	2	
7.0	7.5	A	N	2	

May 14, 1896

Spectrum Obs. cont
Plate

V	H	Cl	K line	Bright
7.2	8.0	A	K 0.2H	2
7.4	8.2	A	N	2
7.3	14.2	A	K = H	4 ~~3~~
7.0	15.4	A	K = H	5
7.9	21.3	A	N	2
8.6	21.3	A	K 0.5H	2
8.0	22.5	A	N	1
8.1	22.7	A	K 0.5H	2
8.7	23.2	A	K 0.8H	4
7.3	6.2	A	N	2
7.1	6.5	A	K 0.3H	1
7.9 ~~8~~	9.4 ~~XX~~	A	K 0.5H ~~H = K~~	3
7.8	10.2			

May 18. 1896

Spectrum Obs. cont 1
Plate B 943X

V	H	Cl	K line	Brightness	
8.0	10.2	A	N ~~K = 0.8H~~	4	
8.8	10.4	G	K = 1.2H	3	
7.6	10.8	A	K = 0.2H	4	
7.8	12.9	A	N	5	
7.9	13.8	A-G		3	Two H lines double. Superposed
7.8	14.4	A	K = 0.5H	2	
7.8	15.4	G	N	3	
7.6	16.6	A	K = 0.5H	4	
7.5	16.8	A	K = 0.4H	5	
8.3	19.0	M ?		2	
7.8	21.3	A	N	3	Lines extremely faint.
8.3	23.2	A	N	4	
9.0	8.1	A	K = 0.8H	2	
9.0	10.1	A	K = H	5	
8.9	11.0	A	K = H	2	
9.0	12.2	A	N	2	
8.7	12.4	K	K = 1.2H	4	
8.9	15.8	A	K = H	2	
9.5	18.5	A	K = 0.3H	3	
9.7	9.3	M	N	3	
9.8	16.6	A	K = 0.8H	2	
9.8	11.3	A	N	3	
9.9	11.8	A	K = 0.3H	4	Superposed. Some fine visible lines

May 25, 1896.

Spectrum obs. cont.
Plate B 9439.

V	H	Cl	K line	Brightness	
9.8	12.1	G?		3	
9.8	12.4			5	Superposed. can not distinguish lines.
9.9	12.7	A	K = 0.5H	2	
9.9	13.0	A	K = 0.2H	3	
10.0	14.6	A	K = 0.1H	3	Spect about on K line.
9.5	14.8	A-G	K = H	3	
9.4	15.4	A	N	3	All H lines double
10.1	16.8	A	K = 0.65H	4	
9.8	16.9	A	K = 1.5H	4	
9.5	20.0	A	K = 0.1H	5	Some fine lines visible
9.8	23.7	M		2	
10.4	5.3	a	K = 0.1H	3	
10.2	6.0	G?			
10.7	8.5	G	K = H	2	
10.1	8.7	G?	K = 1.3H	3	
10.9	10.3			5	Superposed.
10.8	12.8	A	K = 0.5H	~~4~~ 4	
11.0	13.2	G	K = H	3	
~~13.9~~ 11.0	13.9	S	n	1	4 dark lines, one very broad.
11.6	6.1	M	n	2	
12.0	9.4	G	K = 1.3H	2	
12.2	11.8	G?	K = 0.8H	2	
12.4	12.6	G	K = 1.2H	4	Seems to have 2 dark lines
12.6	13.8	O	n	4	

Oct. 1~~4~~3 1896

Subdivision of Spectrum Plates. Cl. G.

I. Plate X 4534 α Aurigae. Typical Star.
Plate X 4509 δ Leporis
~~" " 4505 ξ Puppis~~
Plate X 4535 β Phoenicis
" " 4723 ε Telescopii
" " 4890 ν Octantis
" " 4899 ξ Sagitt. ?
" " 4875 ε Telescopii
" " 4877 ζ Telescopii
" " 4873 β Apodis.
" " 5111 β Apodis
" " 4911 μ Gruis
" " 4937 ζ Pavonis
" " 4882 δ Octantis
" " 4940 b Capricorni
" " 4190 ε Scorpii ? Intermediate bet. I & II ?
" " 4434 α Reticuli
" " ~~4499 α Reticuli ? Shows bands~~
" " 4431 β Dorado
" " 4510 η Columbae.
" " 4409 G Scorpii
" " 4489 ι Eridani
" " 4483 ζ Gruis
" " 4473 χ Eridani
" " 3983 α Centauri Shades a little towards K line
" " 3959 μ Velorum

Oct. ~~14~~13 1896

II Plate X 4530 α Tauri. } Typical Star, very much
" " 4920 ε Indi ? } like an M star.
" " 4847 ε Crucis
" " 4859 α Apodis
" " 4851 γ Arae
" " 4711 β Centauri
" " 4989 ω Capricorni (fades towards K line)
" " 4170 η Arae

Oct, 13. '96

II Plate x 4514 δ Volantis. F + G lines very distinct (h line double?)
" " 7245 δ Volantis

III (a) Plate x 4500 β Doradus. H lines very distinct
" " 5166 ζ Tucanae

IV Plate x 4593 ε Carinae Shaded. K line very faint. H lines
especially h + H quite bright.
Is this a K star?

V Plate x 7240 δ Phoenicis G-K. Shades towards K line
" " 7323 α Reticuli
" " 4477 ν Eridani
" " 4479 β^2 Leporis
" " 4128 θ Centauri
" " 4396 δ Pavonis faint spectrum showing a little shading.
" " 5081 ρ Gruis
" " 5051 ν Librae. very much like K
" " 5018 c Sagitt. (star marked (1) on plate)

Oct. 14. '96.

I (cont.) α Aurigae typical star
~~R~~ ε Plate x 7418 α Centauri
" " 4398 β Indi
" " 4111 β Corvi
" " 4021 υ Carinae

Oct. 15. 96

(Cl. VI are all long but dispersion varies)

VI Plate # 7666 α Tucanae. Long spectrum, fading towards K line.
" " 7658 τ Capricorni - long but not shaded so much.
" " 7719 β Hydrae - long and apparently like α Aurigae except H lines are faintly visible.
" " 7653 β Hydrae. Fades tow. K more than 7719. H lines distinct.
" " 7657 ? Scorpii. H lines very distinct.

V (cont.)
Plate # 4842 — Sagittarii
" " 4837 M Centauri
" " 4852 ε Telescopii ?
" " 4128 θ Centauri
" 4988 f Sagittarii
" 4705 ζ Antliae. Shades very perceptibly tow. K.
" 5075 γ Gruis
" 4711 β Centauri
" 5008 η_2 Hydrae
" 5033 b Capricorni
" 5002 ω Sagitt.
" 4443 ι Gruis
" 5005 μ_1? Gruis
" 5003 ω Sagitt.
" 4860 ε Triang. Aust.
" 4885 δ Triang. Aust.
" 4717 — Centauri
" 4732 ι Antliae

Oct. 17. '96

I (cont.) Plate # 7325 β Leporis.
" " 7645 α Centauri long spectrum, band in ultra-violet.
~~" " 5071~~
" " 5071 ε Telescop.
" " 4803 M. Centauri
" " 4858 δ Octantis
" " 4807 δ Apodis.
" " #4962 ε Phoenicis B_3 some shading
" " 5000 ε Telescopii
" " 4995 δ Pavonis
" " 5769 β Fornacis.
" " 5767 μ Phoenicis
" " 5016 P Pavonis
" " 5146 π Phoenicis
" " 5021 ρ Gruis
" " 4783 α Tucanae

Oct. 19. 96

Subdivision of G plates (cont)

V Plate x 4460 ι Gruis
" " 4445 α Phoenicis
" " 5170 e Eridani
" " 5208 β Indi
" " 4499 α Reticuli

I Plate x 4447 ι Eridani
" " 4450 β Hydrae
" " 4444 ε Phoenicis

Oct. 22. 96

V Plate x 4736 δ Centauri
" " 4753 ω Sagittarii
" " 4806 ε Triang. Aust.
" " 4774 δ Octantis ?
" " 4738 ζ Lupi
" " 4778 Q Scorpii
" " 4713 κ Hydrae
" " 4739 γ Normae
" " 4724 — Sagitt.
" " 4770 ν Sagitt.
" " 4155 π Hydrae

II Plate x 4717 ζ Cham. ?

Oct. 27. '96.

Plate x 5058. ζ' Scorpii Not marked as bright line star, but F is seen plainly bright,
G has bright edge of longer wave-length, with a dark line of still longer wave-length.
The first line visible with longer wave-length than h also seems ~~black~~ bright in the centre, may be a defect in the plate.
There is also a band between F & G which has the same appearance as G as described above
The dark part of this band towards the violet end of spectrum is coincident with the Orion line towards F (about 447 ?)
The first line visible with longer wave-length than F looks to me bright, especially without the magnifying glass. It seems to be bright edged on side of greatest wave-length.
The 2 groups of lines between F & G are composed of 2 lines the 2 of each group with longest wave-length being ~~lines~~ distinctly double.

Oct. 29. '96

Plate x 6463 ζ' Scorpii.

F bright
Orion line of shorter wave-length than F faintly bright.
G consists of a bright thin line superposed on dark broad line
Between F & G there are the same two conspicuous groups of two lines each, but the one in each group of longest wave-length looks hazy, instead of double. It may come from a difference in the plates.

Plate x 5753.
The spectrum is so faint that I can not tell whether these lines are double or not. there does not seem to be any indication of it.

Plate x 6325
Spectrum poor towards F.
Do not see those lines double

Plate x 4400
Those lines are double
G line quite bright, and the nearest one of shorter wave-length than G looks bright

Oct 29. '96

ζ' Scorpii (cont)

Plate X 5753

Spectrum faint. The lines before described do not look double.

Plate X 4985. Good spectrum.

Lines clearly double

Orion line of longer wave-length than F seems bright.

I found a spectrum plate of P Cygni and compared it with this star. It seems to be nearer like P Cygni than any I have yet seen

Nov. 2. 96.

A re-classification of G plates.

Class I. Hydrogen line or lines somewhat prominent.

Plate X 4514 δ Volantis
" " 7245 " "
" " 5166
" " 4431

Class II α Aurigae and α Centauri, typical stars

Nearly uniform density from F to H.

Plate X 4534 α Aurigae
" " 5760 α Centauri
" " 3983 " "
" " 7418 " "
" 4937 ζ Pavonis?; poor plate faint tow. K.
" 4021
" 4111
" 5170 e Eridani
" 4858
" " 5111
" " 4873 ? III ?
" " 4875
4509
4473
" " 3959

Nov. 2. '96

Class III. Showing two bands bet F & G, & slight shading bet G & H.

Plate # 4995 δ Pavonis.
" " 4510 η Col.
" " 5016 ~~δ~~ ζ Pavonis. {This star was marked δ, instead of ζ
~~" " 3959~~
" " 7325
" . 5071
" " 4803
" " 7248 Typical of this division
" . 4877
4899
4890
4723
4535
" " 4409. Narrow. not showing shading clearly. but lines agree with Class III
" " 4940. line near h stands forth prominently.
" " 4882
" .. 5167? Banding not decided.
" .. 5000
" " 4479.
" .. 4396
" " 5081

Nov. 3. '96

Class II (cont.)

Plate # 5169
" " 5021
" " 4783
" " 4447
" .. 4450
" " 4444
" " 4807
" " 4434
" " 4962
" " 4483

Class IV. Bands are more noticeable than in Cl. III & part near H of decreasing density. H lines dim

Plate # 5146
" " 4477

Nov. 4. '96

Class IX (cont)
Plate X 5200

Class X. Composite ?
Plate 4593 ε Carinae, seems to be peculiar,
Calcium K is faint & hazy,
Hydrogen lines are distinct, G + h seem
to be double H wide and hazy.
Can there be two stars, one cl. G and cl. A,
superposed, so that K is almost ? blotted out
and hydrogen lines are made brighter or double?
Look up plate 3992, the only one given
in catalogue for ε Carinae besides this.

Nov. 5 '96

Class II
Plate X 5075
" " 5080
" " 4155 (typical star of this class?)

Composite
X 4593. ε Carinae
Found one line certainly corresponding to an
Orion line, another possibly.
Too dark for further work to-day

Nov. 6. '96.

x 4593 ε Carinae.
x 3992 " " H_δ + $H_{\cancel{\gamma}\beta}$ possibly show slight displacement when H_β is matched with H_β in Orion star β Crucis plate x 6295. It may be due to different width of hydrogen lines in the two plates.

Nov. 9. '96

Plate x 4995 δ Pavonis.
K line shows peculiar broadening out on both sides of it. ~~It~~ There seems to be a narrow line on each side of K.

Plate x 4396 δ Pavonis.
Same affect at K, only more indistinct. The narrow line of longer wave-length looks wholly merged into K, the one of shorter wave-length looks partly distinct.

Plate x 5767 δ Pavonis
Same hazy effect of K, though line beyond of shorter wavelength is quite clear.

Plate x 6949. δ Par.
excellent definition in violet. The K line is clear with a fine line on each side
Plate x 7769. δ Par. wider dispersion.
The K line distinct with two lines distinct
H_δ looks hazy.
Plate x 7604 δ Par. Good spectrum, wide dispersion
K line has the same fine lines.
It seems to have a narrow line near it of shorter w'lgth.

Nov. 10 '96

ε Carinae. x 3992

The "Orion" line ~~before~~ of longer wave-length than H seemed possibly to coincide with a line in an M star, but on superposition, it is seen to be of longer wave-length than the one nearby in α Orionis, plate x 3883.

This line seems to be undoubtedly an Orion line, matching up with nothing else that I can find on any G plate.

Also a hazy line of shorter wave-length than this (also ~~shorter~~ longer wave-length than H) coincides with an Orion line.

Matching 3992 up with a B star ε Orionis x 4041 the H line in 3992 seems broadened out on side of shortest wave-length.

From present observations, I would conclude that the star ε Carinae is Composite Type, in which G + B types are blended.

The hydrogen lines are more conspicuous than in G stars. H_γ seems hazy, H_δ perhaps double, H_ϵ indistinct and widened on side of shorter wave-length.

Shading between H_γ + H_δ is rather marked, while the part between H_δ + H_ϵ is clearer and lines more distinct than in G stars where the shading is so marked.

Nov. 10. 96.

ε Carinae (cont)

One prominent Orion line between H_δ + H_ϵ is especially noticed. It is the most conspicuous line ~~[illegible]~~ in this region, and is not in a G star.

The other Orion line nearer H_ϵ is hazy, and almost joined to a G line of shorter wave-length.

The Orion line of slightly shorter wave-length than H_η seems faintly visible, though hazy.

Nov. 16. 96.

G. plates

Class IV

Plate X 5578 K?

5096

Class III

93

Plate X 4~~79~~6

" " 5016

" " 4937

" " 7240

" " 4445

" " 4460

" " 4732

" " 4988

" " 7128

Nov. 11. 96

Class IV

Plate X 7243

" " 7238 ξ Puppis. H lines look rather bright for this class.

The spectrum has rather a peculiar look.
Compare plate 4505

Class I.

Plate X 4766

" " ~~4860~~ 5303

Class II.

Plate X 4707.

" " 4860

Class III

Plate X 4885

Nov. 12. 98

Class II

Plate # 4837.
" " 4176 ? Poor plate.
" " 4292 ? " "
" " 5002
" " 50~~2~~^{3}3 (2
" " 5008

Class III

Plate # 4852.
" " 4398. poor plate. no bands but shading off towards K.
" " 4190 K line broad.
" " 4911
" " 5005
" " 6893 A. G. C. 29200

Class I.

Plate # 7239.
" " 4451
" " 4500
" " 5033 (1
" " 4995 H lines have a hazy look.

Class IV.

Plate # 6893 A. G. C. 28918
" " 4920
" " 4859
" " 5080
" " 5200

Nov. 12. 98.

Class V. Very thin towards K. Lines like α Tauri, but break not ~~denied~~ denied.

Plate # 4154.
" " 4989
" " 6515

Class III.

Plate # 4443
" " 7323
" " 5075 ?

Nov. 14. 96.

Class I

Plate X 5325 β Hydrae.

Hydrogen lines conspicuous, hazy line of ~~shorter~~ longer wavelength than F.

Plate X 5932 β Hydrae

" " 7719 " "

" " 7653 " " I find two sets of marks on this plate. Is it a double?

Plate X 4450 H_γ double?

Nov. 17. 96.

Class I.

Plate X 5649 α Tucanae. H_ζ double.

I find this spectrum matches up well with α Tauri, so I am mistaken in placing it in Class I. It should go in with a much later division.

Class II

Plate X 4483.

" " 4736 d Centauri ?; Seems to have a peculiar darker line bet h & H, somewhat similar to line in ε Carinae, but this plate is scratched ~~at this point~~ and I can not readily match. Plate 5599 is not in box, and that is the only other plate of d Centauri.

Class III

Plate X 4806 ? ε Triang. Aust.

H lines are dim, but no distinct bands are visible. Plate not very good.

Plate X 4813 ? Faint, looks like a ~~[illegible]~~ Class II G star except the H lines are dim, so I put it in this class though there is not much shading shown.

Nov. 17. '96.

Class II
Plate X 4447.
" " 7769

Class IV.
Plate X 4705
" " 4729 Lines show breaks, due probably to rate of the clock.

Nov. 18. 96.

Composite Type.
Plate X 4505 ξ Puppis ?
Hydrogen lines are noticeable, and there may be an Orion line between Hδ & Hϵ, but I am not sure of this. Plate X 7238 was classed on p. 37 as Class II probably peculiar.

Class IV.
Plate X 4004

Class V.
Plate X 4092
" " 4075
" " 4013

Class VI like α Tauri.
Plate X 4061.
" " 3962 ? same star as 4061, but there seems the evidence of motion

Nov. 18. 96.

Class ~~X~~ II

Plate x 4188 Notice line marked on plate.
" " 6604
" " 6450. Is that a bright line or is of slightly longer wave-length than F.

Nov. 19. '96

Class IV.

Plate x 4738 Hγ double?
" " 4774
" " 4783
" " 4834 faint
" " 4713
" " 4331
" " 4119

Class II.

Plate x 4962? very poor plate.
" " 4807
" " 4434. few lines visible
" " 5169
" " 4765
" " 4333

Class III.

Plate x 4444
" " 5021
" " 4037

Class ~~IX~~ I ζ Capricorni

x 7168 Hydrogen lines rather inconspicuous especially F. Shading pronounced for this class. Line of shorter wave length than Hγ very ~~bright~~ conspicuous

x 5880 ζ Cap. I superposed this plate on x7168 ξ Puppis & find them much alike

Nov. 19. '96.

Class V.
Plate x 7671
" " 4778
" " 4717
" " 4177
" " 3956 - very poor.
" " 4057 Pec: Look for other plates.

Class VI
Plate x 4175
" " 4178
" " 3878
" " 3987
" " 3864

Class II.
Plate x 4023

Class E
Plate x 4017 δ Muscae. Pec: Look up other plates.

Nov. 20. '96.

Class III
Plate x 5301 δ Phoenicis.
" " 3896 " " more like Class II?
" " 5949 " "
" " 5210 I thought H δ looked double on this plate, but it must be poor focus as it is distinct on other plates.
" " 7794 " " long dispersion. H δ double?

Class V.
Plate x 6208 λ Vel. Cl. V. VI ? Sp. very much like α Tauri except that the break is of shorter wave-length.
" " 3955 " " poor plate.
" " 3900
" " 4872
" " 3956 λ Vel. motion of telescope?

Class XI.
Plate x 3998

Nov. 20, 96.

Class IV.
Plate X 4012
" " 3986 α Bootis

Class III.
Plate X 4853 θ Cor. Aust. There is another ~~star~~ spectrum on this plate, of Class A or A-F, in which the hydrogen lines look hazy, K line distinct. I will look for other plates.
Plate X 7118 θ Cor. Aust. { $H\gamma$ double? $H\beta$ seems to have a clear dark line in a hazy one. The same haziness is seen in A star.
" " 5922 " " " Bright lines?
Same haziness in A star.
" " 5586 " " " K line double? Haziness very pronounced in A star.

Nov. 21, 96.

Class II.
Plate X 5018. (1) ω Sag. Bright line bet F & $H\gamma$?
" " " (2) ~~β~~ A Sag.
" " 5781 Spectrum faint, but there is appearance of one or two bright lines in (1) bet. F & $H\gamma$.
" " 4753 The bright lines do not show.
" " 6868 The "br. lines" seem to be spaces bet. dark lines.

Class V.
Plate X 5018 (3) b Sag. X
" " 5823 (3) " " seems peculiarly shaded.
" " 4825. $H\delta$ seems wide.
" " 7688. Is $H\gamma$ always double w. wide dispersion
What is hazy line of shorter w'length than F?
" " 7673 ? Two stars or motion?

Class II.
Plate X 5823. ω Sag. few lines visible

Class IV.
Plate X 7677

Class VI.
Plate X 5051. The neck is not quite so decided as in α Tauri.

Class III.
Plate X 4537.

Nov. 21. 96.

Class ~~IX~~ V.

Plate X 4507 (1) What is dark narrow streak of long w'lgth than $H\delta$?

On this plate I also observe a star (2) with F line bright, $H\gamma$ either double or having a narrow bright line superposed on a dark wide line, and two or three bright streaks between F and $H\gamma$.

Later. On looking it up down stairs, I see it is known as having F line bright, but I do not see other peculiarities mentioned.

Nov. 23. 96.

Class V.

Plate X 4540
" " 4432
" " 4506 (1)
" " 5087 } – Sag. ~~hardly anything visible beyond $H\gamma$~~! faint at both ends.
" " 5086 }
" " 4462 ?

Class IV.

Plate X 7684 – F seems rather distinct
" " 7693 C_2 Aquarii. Look up other plates.
" " 5098
" " 7091
" " 7301
" " 5584
" " 5023 $H\beta$ has appearance of brightness on side of greater w'lgth.

Class VI.

Plate X 4851 . Bright streaks marked on plate.

Class II.

Plate 45824

Nov. 24, '96.

Class V
Plate X 5073. (1)
" " 4329 faint at both ends.
" " 7648. F' rather conspicuous.
" " 7618
" " 5129 ? faint & small portion visible.
" " 5706
" " 4461 ? Almost too faint to classify.
Class IV.
Plate X 5120.
" " 7664 Long dispersion.
" " 7704 " "
" " 7728 Streaks that look like br. lines.
" " 7611 Long dispersion
" " 5126
" " 5118 Bright lines!
Class VI. Seems rather to be Class V–VI
Plate X 5793 } Break not so decided as in α Tauri.
" " 5794 } α Tri. Aust.
" " 7542 Long dispersion α Tri. Aust. F line distinct for Class VI. Looks more like Class V.
" " 7650 Long dispersion – faint towr. violet. F line clear
" " 5143 ?
" " 5123. Apparent bright lines!
" " 4782

Class III.
Plate X 5144, faint.

Nov. 24 '96.

Class
IV.
Plate X 5704 Br. line?
" " 4902
" " 5132
" " 5095
" " 4482
" " 7613
" " 7623
Class V.
Plate X 4909
" " 4906 Br. line?
" " 4903
" " 6452
" " 5094
" " 5092
" " 5751
" " 5667 faint.
" " 7643

Nov. 27. '98.

Cl. III Plate X 4345
" " 5082

Class II
4330 ? very narrow
5134 ? Star marked (1) Hβ ~~lines~~ & H.γ conspicuous, but the spectrum fades twr. violet, which I take to be due to thinness of plate.

Class I.
4363
4358
4344?
4295. V – VI or even Cl. VI of the photograph showed red region clearly?
4881
5642
5135
5137? ~~Hβ~~ ~~Hβ is noticeable~~
5148
4969?
5163
5181 Lines seem broad.

Nov. 27. '98.

Class VI
X 4169
45

Class II.
X 5134 Star marked (2)
5149
5150
5765
5178. In its spectra not in oth. the H lines look more distinct than in other. Spectrum thin & not well seen twr. violet.
5179
5184.

I here came across a B plate X 5783, τ_8 Eridani in which the H lines look hazy. Plates 6167 & 7203 also show same effect.

Nov. 30. 98.

Class IV

Plate x 5035

" " 5089 (2)

4854

4472

4826

Cl. I.

5159.

4968.

4948.

4939 - poor plate.

4361

5097

Cl. III.

5715 ? Breaks toward violet

5017 ? " somewhat " "

7159

4949

5293

5034. Bright lines?

4403

4293 (2)

4442

4997 (2)

Nov. 30. 98.

Cl. I.

5089. (1)

4293 (1)

4997 ?(1) Sp. rather indistinct. ~~Hδ~~ hazy. Corr is marked δ Cep. but I can not find it in X Ledger
Line near Hδ towards violet is very distinct

Cl. V

5084

4404

4457 ? Poor sp. appearance of bright lines.

4218

4781

5020

4886

5786

Cl. VI

4519

4493

5029 Continues into red, ~~M~~ marked by decided streaks that look like bright lines.
This number was put by mistake under VI instead of V.

Dec. 1. 98

Class IV
Plates 4359.
4109
5154 . F & G rather conspicuous
5145
5153
5111 H lines conspicuous.

Cl. III
4184?

Cl. I.
4463
4446
4987. There is another star on this plate of Type A, or A-F, in which the faint lines are bright-edged.
5786 Faint lines of a star have the same appearance but the spectrum is not so well-defined towards F.
7574 Long dispersion, bright edge not so distinct, but it seems to be present bet. F & G
7846. Long dispersion. Spectrum of a star is faint. Plate is scratched and I can not see the bright edges.

Dec. 1. 98.

Cl. V
4990
4994
5113 There is a faint star on this plate, having the same appearance of bright-edged lines as star referred to on preceding page

Cl. VI.
4996.?

Dec. 9, 96.

A list of the plates I put in a box marked
G stars Class I.
A lines noticeably distinct
4514 δ Volantis
4293 ζ Cap. { Line of shorter w'lgth than Hδ
4997 " " is much more conspicuous
7168 " " than Aδ
5033 " " ? ζ } + ε both on plate. Plate marked ζ Cap
4500 β Doradus
4481 " " poor plate.
5166 ζ Tucanae
7239 " "
7245 δ Volantis
4766 ν_2 Centauri
4107
4780 γ Cor. Aust.
~~5138 c_3 Aquarii~~ (Rather among F stars)

This classification was changed later.

Dec. 12, 96.

For star with many Orion lines see
plate 5637 τ Pavonis.
also " 5708 δ Scorpii

Dec. 14. 96

Plate x 5353 J Puppis.
Is star marked (1) a double? It can not be two exposures of the same star, unless star is a composite.
This is the only plate given in the Ledger of J Puppis.

B plate. x 5861 α Lupis - this seems to me the best B plate I have seen.

Plate x 5840 β Sculptoris, K line looks faintly bright-edged.

Dec 18. 96

Plate x 7168 ζ Capricorni compared with α Aurigae x 4534.
In ζ Cap. the hydrogen lines have about the same intensity as in α Aurigae, except h, which seems less conspicuous. The K lines seem broader, Fraunhofer's G band included. The line near h of shorter λ is much greater intensity in ζ Cap. It is there more intense than any hydrogen line. The shading is more pronounced than in α Aurigae and it looks as if ζ Cap. should hardly be in the same class.

Class I. The whole class includes all the G stars in which the H lines are intense.

(a) Typical star, δ Canis Maj. - Defective G band
Plate x 6275 " " "
" " 4766
4780 γ Cor. Aust.
4500 β Doradus
4431 " "
4514 δ Volantis poor definition
(b) ~~Typical star~~ 7245 " ~~ζ Capricorni. Strong line near Hζ of shorter λ~~
H lines are not marked enough for this class.

Group ~~Class~~ 1. Dec. 18. 98.

(b) Typ. star β Hydri
Plate 45932
ζ Tucanae
~~ζ Volantis. strong line like ζ Cap.~~ Upon consideration, this star seems more like (a). The G band looks hazy but it seems to be due to poor definition.

Dec. 22. 98

Typical stars
Group 2
α Aurigae Plate 4534 in box of G stars labelled Group 2

Group 3
α Reticuli Plate 7323

Group 4
π Hydrae Plate 4155

Group 5
G Scorpii Plate 5779

Group 6
α Tauri Plate 3868

A.G.C. 9311
29 Can. Maj.

Dec. 22. 96.

Plate X 6265 τ Canis Maj.

A.G.C. 9311 like ζ Puppis the bright bands are fainter, the ζ Puppis lines between $H\beta$ & $H\gamma$, $H\gamma$ & $H\delta$ are brighter than in ζ Puppis. These two lines are found in Miss Maury's Group 1 stars.

I looked through all the boxes in which I have placed B stars for one like Group 1. I found nothing with the characteristic lines of Group 1 except on the plate marked ι Orionis. The star was identified as ι Orionis, in the first of Miss Maury's Group 1.

I thought I saw a faint bright streak where the ζ Puppis bright bands are but can not determine definitely from my plates and it does not seem to be so on the C plates. But the characteristic lines of ζ Puppis between $H\beta$ & $H\gamma$, $H\gamma$ & $H\delta$ match up exactly with these early Orion lines.

Is A.G.C. 9311 intermediate between ζ Puppis and ι Orionis as it shows some of the peculiarities of each star and moreover the bright bands seem to be fading, the characteristic early Orion lines to be growing in intensity.

Jan. 30. '97

I brought up plates from 6500 to 7900 and commenced to separate them according to types.

Feb. 1. '97

Continuation of general division of the X plates.

Feb. 3. '97

δ Can. Maj. 6275

Plate X 5778 ι Scorpii – like δ Can. Maj. in defective G band but H lines are more distinct and K lines ~~broader~~, narrower.

Plate X 5964 θ Gruis? Line near H δ like ε Cap. Should not this come later?

Plate X 6165 ρ Puppis H lines more distinct K lines narrower. K band less marked. Metallic lines less marked, probably comes before δ Can. Maj.

X 6405 b Vel.

Feb. 3. '97.

Like β Hydri

Plate x 6929 c_3 Aquarii.

Note that H is much broader than K.

7204 ζ Doradus.

7081 γ Pavonis.

6261 α Fornacis - H lines not so clear cut as in β Hydri.

6206 — Puppis - like β Hydri in lines and intensity of the lines.

Like ε Capric.

Plate x 7245 δ Volantis. This star seems on close examination the more like ε Cap. than δ Can. Maj.

Feb. 4. '97

F-G. or G stars with conspicuous H lines.

The first star named in each group is the typical one, and ~~differences~~ variations from this star are spoken of

α Can. Minor. Lines sharp.

ρ Puppis x 6165 lines broader.

θ Gruis ~~6834~~ 7217

~~ζ~~ η Scorpii x 6364 This spectrum appears to be exactly like ρ Puppis (x 6165) in width of lines, and number, position and intensity.

β Hydri	x 5932
γ Pavonis	5768.
C_3 Aquarii	6929
ε Tucanae	x 7239
— Puppis	5423
α Fornacis	5334
ζ Doradus	7204
α Col. Aus	5764
ζ Puppis	6172

Feb. 4. 97.

δ Can. Maj. X6275

{ι Scorpii 5778 } These two stars are alike, & differ from
{A.G.C. 11755 6259 } δ Can. Maj. in having H lines more distinct & K lines narrower.

v_2 Centauri 6585. It is doubtful whether v_2 Cen. should go here or under α Can. Min. The G band appears to resemble that in δ, but the H lines are more marked.

b Velorum 6405 more metallic lines bet. Hβ & Hγ
K lines narrower.

δ Volantis ?; X7245. poor definition

ζ ~~ε~~ Capricorni
X7168. Shows some shading. Peculiar intensity of line near Hδ.

Feb. 5, 97

γ Carinae plate X4757
Nearly like ι Scorpii. Plate 4754 is not very good.

α Aurigae X4534
This is not a very good plate of α Aurigae and I can not now find the plates of the others.
The following stars seem near enough like α Aurigae to go in the same group.
Differences from α Aurigae are stated.

β Corvi X6435, Slightly banded.
X4111 7507 ? Can not find

β Leporis 6151. see no diff. from α Aurigae.
" " 8028 2 prisms, no distinct shading though density slightly decreases towards K.

— Centauri {5591
{4707

δ Pavonis 6949.
7604 two prisms.

Feb. 5. 97.

α Aurigae (cont.)

β Phoenicis X 5957 (Can not find Qual. 5 one prism plate)

" " 7805 two prisms, slight decrease of density towards K.

Feb. 6. 97

Under α Aurigae

γ Apodis X 5937
" " X 6517

ω Sag. X 6868 } Star marked (1) ω Sag.
" " " 5003 }

ω Sag X 6868 } Star marked (2) A Sag. Seems to be banded and to fade a little towards violet like β Corvi.
" " 5003 }

" " (3) like α Bootis ?

η₂ Hydri X 5008 } Like β Corvi.
" " 5942
(all the plates of this star)

— Phoenicis X 5024 1^4 } Like β Corvi.
" " 5925 1^3
7181 1^3 5419 1^3
5406 1^3
~~Phoenicis 7181?~~

α Reticuli 47323 " " "

Feb. 6. '97

Under α Bootis

β Gruis 5081 lines not sharp

" " 6825 Shading very pronounced

δ Leporis X4509.

π Hydrae 4155

δ Sag. 5807 The shading and

" " 5163 absorption towards violet rather indicates ~~the~~ next division

" " X7664 (2 prisms) This indicates also that the star is nearer α Tauri.

π Phoenicis 6883 Shaded like δ Sag.

" " 7270 Shading not so marked

Feb. 8, 97

α Bootis

μ Phoen. X5167. best plate. lines sharp.

X7301 1^4

5884 (1^3) 5925, ^{3} X5115 1^4

7091 1^4 X5023 ,^{3}

H lines look broad on this plate. probably poor focus.

None of these spectra of μ Phoen. have sharp lines. All look as if focus were out.

~~X E Lupi X6450~~

~~δ Phoenicis X5210~~ See next page.

~~5301~~

E Scorpii X4190 F line faint or out of focus.

E Phoen. X5209

X4444

X4962 1^3

X7204 2^3 faint

X5883 ,^{3} poor

X7673 poor

X7795 2^4 the best for classification

X8006 2^4

X5973,^{3} (were marked δ Phoen. by mistake)

Feb. 8. '97

α Aurigae

α Centauri, brighter star. X5760, X7418

ι Eridani X6138 λ4227 rather strong.

" " " 5170

ψ Eridani X7248

Under β Corvi

β Fornacis X6147.

δ Phoen. X5710 & X5301.

" " 7794 (2 prisms)

ξ Lupi X4180. This plate shows the star to be exactly like β Corvi

Under α Bootis υ Carinae X6511 1^{4} X6425 1^{3} Hγ is slightly fainter than λ4326.0. See also p. 110

α Phoen. X4445

ι Gruis X6952

Feb. 8. '97

Under β Corvi

υ_7 Eridani X5360.1^{4} X4477.1^{2} From these two plates approaching α Bootis. Look for 6141 & 8191. See p. 84.

Under α Bootis ε Gruis 7099 1^{5} 7090 1^{4} 5144 1^{4} 7887 2^{3} 7798 2^{3} λ4227 not quite so strong as in α Bootis. 4330 1^{2} too poor.

Under α Bootis ε Telescopii X6739 1^{4} 6607 1^{3} 6646 1^{3} poor. 6000 1^{4} This plate shows it nearer α Bootis. ~~6730~~

θ Cor. Aust. X5586.1^{4} X7118 1^{4} X5922 1^{3} X4853 1^{3}

ξ_2 Sag. X4987

Feb. 9. '97

Under α Bootis
δ Octantis. X4665 3.
β Apodis X5153

~~Under β Corvi~~ α Bootis.
M Centauri X4837 1⁵ G band crossed by one line.
X4803 1⁴
X6460 1³ G band seems divided } Seem to be due to focus.
X5655 1³ } Lines are not clear and sharp on any plates.
X4656 2 1³
X6670 1³ poor.

Feb. 9, '97

Under α Aurigae
δ Triang. Aust. X5606. Plates show bands slightly, but intensity of the lines and of H lines especially seem more like α Aurigae than the following class.

~~Under~~
ε Triang. Aust. X6475 between α Bootis & α Tauri. 4227 is stronger than in α Bootis and the absorption extends almost to the G band with the exception of one patch near Hδ.

Under ε Triang. Aust.
–Sag. X6823. 19ʰ 57ᵐ

γ Normae. X6442 H_β & H_γ distinct and 4227 does not seem so pronounced as in ε Tri. Aust.
" " X4739. Spectrum on this plate looks more like β Corvi.

Feb, 10. 97

Under β Corvi,

γ Micros. X 4919. Can not find X 5661 the only other plate of this star

b Cap. X 5033 Appears on plates of ~~χ~~ ζ Cap.

c Aquarii X 7159, 1^3 X 5693, 1^4 4949, ~~missing~~

(β Cor. Aust. X 5017 1^4 4966 1^3 7613 2^3 (Plate stained almost useless)
5690 1^4 7096 1^4

δ Pavonis X 4995

γ Apodis X 5110

μ Phoen. X 7091

χ Eridani X 5705

Under α Bootis

ζ Pavonis X 5808 marked absorption in the violet which may be due to thin plate.

" " 6618

c₁ Aquarii X 5694, 1^4 X 4331 (1^3) 5034 (1^4) 5882, 1^4 6853 1^3

X 7792 2^3

X 7836 2^3

Absorption in X 6895, 1^4 seemed at first to indicate the following group.

γ Sculptoris X 6962. Plates are thin but relative intensities of the lines appear to indicate this group.

" " X 7132

ζ Sag. 7073 ? Certain lines seem rather to indicate β Corvi. as the H line but 4227 is stronger.
4988
6859

Feb. 10. 97

Under ε Triang. Aust.

γ Gruis X 5954 1^4
X 5179 1^3 porr. X 5075 1^3
7195 1^3 no porr. X 4921 1^4
5904 1^3 porr X 6900 1^3

λ 4227 seems stronger than in α Bootis and absorption extends up to G except for small patch.

5137 1^3 like α Bootis.
5098 1^4 " " "
6852 1^{3i} porr. like α Bootis.

See also p. 111.

5184
6768 } missing.
7076

Under α Bootis

κ Phoen. X 5397

A. G. C. 28918 X 6893 η λ 4227 not very strong. This is a thin plate with marked absorption towards violet.

ζ Sag. 4403
5909
7571 [illegible]

μ Columbae 6142
X 7244 seems to be nearer β Corvi

Feb. 10, '97.

Under β Corvi
A.G.C. 28782 X6893
δ Phoen. X7240
~~α Phoen. 6138~~ nearer like α Bootis

Line 4227 in α Phoen. does not seem quite so strong as in α Bootis, but the H lines have about the same intensity. In the absence of any very good plates of α Bootis, and of any two prism plates, α Phoenicis if near enough like α Bootis, might be taken for typical star of this group. There are several good plates both of one and two prisms of α Phoen.

ν² Eridani X6141
ι Eridani X7110 1^4
4447 too poor. X6176 1^4
4489 1^3 α Bootis X7202 1^3 Like α Bootis.
5916 1^3
4490
~~5916~~
~~5967~~ } missing
5967, ^{ii}

Under α Aurigae
– Centauri X6459. Where are plates 4765 & 5585?

Feb. 11, '97.

Under α Bootis
β Gem. X4025 X8117 3^5 match up this plate with a 3 prism one of α Bootis.
G Scorpii X6311
7826 (2 prisms)

β Indi X6520 possibly with some characteristics of the following group, as absorption towards violet, not, however, shown in all plates.
X7594 (2 prisms)

Under ε Triang. Aust.
λ Gruis X6692
X6833
X5799

– Sag. 18h 11.8m
X5095 1^3 like α Bootis. X7103
X7227 1^3 blurred X7137 Absorption extends to G.
X7179 1^3 G band seems almost divided.
X6795 1^3 ~~[illegible]~~ G band divided? ~~7167 1^3~~ but the plate is thin.
X5680 1^3 thin X4227 ends spectrum.
X5121 1^{3c} too poor.
X5086 1^3, thin. like 5680
Compare X5095 before final decision. In this plate, H γ looks rather conspicuous for this group.

4751
5043 7056
~~5086~~ 7072 } missing.
6703
6704
6914

Feb. 11. 97

Under α Aurigae

μ$_1$ Gruis X6951

X5005

Under β Corvi

μ$_2$ Gruis X6951, Mch. 14. These are poor spectra

X5005 but seem like α Bootis.

ι Gruis X4443 }

5391 }

7770 (two prisms) }

Under δ Can. Maj.

χ Sag. X7057 Find X7960 & 7961.

Feb. 12. 97

Under β Corvi

δ Gruis X4345

X5986 This plate shows marked absorption in violet.

θ Centauri 4128

7491 (two prisms.) strongly approaching α Bootis, perhaps should be in same group, but line λ4227 does not seem quite strong enough and F line is too distinct. Where is 7648?

Feb. 27. X7648 found and alone would put the star under ε Tri. Aust. Why this discordance?

I find that X7542 α Triang. Aust. was in cover of X7648. See p. 104 for further discussion of θ Cent.

μ Vel. X6281 1^3

X3959 1^5 X5439 1^4 Like α Aurigae?

Look up plate 7538 and 6435.

Apr. 2. X6435 1^4 These plates show H lines of greater intensity than following group, while λ4227 is nearly as strong and shading as pro-nounced. This star was recently found to be a double with a companion of about 13th mag. purplish in color. Could this have any effect?

ξ Hydrae 4037

5641

j Lupi X5666 } slightly ~~perhaps~~ approaching α Bootis

X4736 }

Feb. 12. '97

Like α Bootis

ε Scorpii x 7858. Can not find any 1 prism plate, so classification is uncertain.

β Volantis x 6302
x 4004

ι Antliae x 7460
x 7381

ε Triang. Aust. x 4860. This plate looks almost exactly like α Bootis, other plates should be examined to see where the discordance lies.

η Pavonis x 4902
x 4461 (very poor)

Feb. 12. '97

Under ε Triang. Aust.

N Vel. x 4012
x 6330
x 7386

This seems to me now one of the best spectra I have seen intermediate bet. α Bootis and α Tauri. λ4227 is stronger, H β has almost faded out the absorption is great in violet and H & K do not appear on x 6330 & x 7386, and are only faintly visible on 4012. Can not find x 4632.

ε' Arae x 6701
4177 6866
7065, 3 7064
5029

Shown on all these plates, possibly less evidently on x 5029, to be decidedly intermediate bet α Bootis & α Tauri.

α Antliae x 4705
x 7438
x 6446

x 4227 in x 6446 seems wider from than in α Tauri, but other things seem to indicate this group, as fading off at both ends.

κ Hydrae x 7404
6579
4713

Feb. 12, '97

Under α Aurigae

δ Hydrae X4023.

Under ε Triang. Aust.

ε Crucis X6334 λ 4227 is as strong as in α Tauri, but there is more absorption at both ends.

X6333

X4881 Approaching α Tauri.

α Apodis X4859 nearer like α Bootis?

X7411 } Clearly intermediate and

X7419 } beyond α Bootis.

ζ Arae X5738

X7817 (2 prisms)

Feb. 13, '97

Under β Corvi.

$τ_2$ Eridani X5707 X52621^3

X7182

~~ζ Telescop. X3732. or intermediate betw. this & α Bootis.~~ See below

δ Pis. Aust. X5726

X6886

— Sag. 18^h 19^m.4 X6867

X7067

α Bootis ν Octantis X6950 H lines rather faded perhaps due to focus.

more absorption than α Bootis

X43441^3 X74521^4 Thin toward violet.

X66911^3 X70981^4 The best plate for class.

X76852^3 X70991^5 May be under α Bootis.

X5293 too poor. Under α Bootis X51501^3

h Eridani X6149. Thin at violet end.

ε Columbae X7243. This spectrum maps up exactly in shading and intensity of lines with ζ Tel. X3732 and perhaps they are both nearer α Bootis than β Corvi.

ζ Tel. X5732

τ Sag. X5887

X7677

c_2 Aquarii X5865

X7842

Feb. 13. 97.

Under α Σ Triang. Aust

ω Lupi λ6642 1^{3} 5667 1^{4} G band seen divided by one line λ4227 as strong as in α Tauri.

λ7420 1^{4} 6452 1^{4}

4872 1^{3} 5084 1^{3} 5543 1^{3} 7441 1^{3} 5131 1^{3}

e Centauri λ5578. Classified from this one plate.

ξ Pav. λ5120
λ6505
λ6673

ω Cap. λ6917
λ6797
λ6983. Apparent bright streaks appear near red end. These streaks seem to be growing more noticeable. The H line has faded out. λ4227 is stronger than in α Bootis

α Tucanae λ5649
λ5107
λ4295. Banding pronounced.

Feb 13. 97.

Under α Bootis

ε Hyd. λ7440
" " 6613
λ5862 1^{3} poor
λ5118 1^{3} thin
λ6528 1^{3}
λ4850 missing.

On this plate λ4227 looks stronger and wider than in α Bootis. ~~Should the star go in next group~~?

δ Muscae. λ4017
λ6298

Feb. 15, '97

An examination of all the A & B stars I have in the boxes to see if I can find the ζ Puppis lines

Plate ✗ 7175 π Can. Maj. 6h 51m.3
Star marked (1) may have ζ Puppis lines but it is uncertain because the lines are rather blurred and indistinct. Look up other plates.
Dec. 9. 1897. These are solar lines.

Box 6001 - 7800 B stars.
Plate ✗ 6471 μ Crucis
Star marked (2) has ζ Puppis lines and resembles 29 Can. Maj. except ~~bright~~ bands are ~~Hs~~ lacking

Feb. 16, 97.

μ Crucis. Double.
Fainter component has F line bright. Other hydrogen lines wide.
Mrs. Fleming measured the H lines of both components and the apparent Orion lines of the brighter component.
I drew a curve with wave-length of H lines as abscissas, and measures as ordinates. The observed measures of the other lines (called b or above 'apparent Orion lines.') were then ~~read off~~ put in as ordinates and the wave-lengths read off, as follows,

	From Table of Orion lines
4388.0	4387.8
4145.0	4144.0
4012.0	4009.5
3927.0	3927.1

The b measure near Hβ was not used, as I had no wave-length of Hα given, and could not draw the curve at that point.

Feb. 17. '97

Further examination of B plates for ζ Puppis lines.
Plate X4069 Star ι Orionis has ζ Puppis lines.
Note was put on this cover in December. See env.

Two boxes of A plates examined. No star found having the new set of lines.

X4984 β Tucanae, double star, and has a peculiar look

Feb. 18 '97

X4984 superposed on other plates of β Tucanae. In X4984, the fainter set of H lines is towards red end of spectrum, In other plates, the fainter set is towards violet.
Feb. 27. Mrs. Fleming says this reversion is due to a change of the prism.

X5701 γ Circini. Star on edge of plate shows ζ Puppis lines between Hγ & Hδ, Hδ & Hε. The spectrum is cut off at Hγ. This star does not appear on X4883 and X6401, image too poor on X4768, image not on X5622. These are all the plates given in ledger of γ Circini.

Feb. 19. 97

Under α Triang. Aust.
c Puppis. X5489
X6234

Under α Tauri.
π Puppis X5480
X4507

One box of A plates looked over for new Hydrogen lines but found none.

Feb. 20, 97

Under α Tauri.
υ Ceti X4448 Poor plates so the grouping
X7271 is doubtful. The G band
seems broken up and
λ 4227 strong. Cannot
find other plates.

γ Cham. X6686
γ Phoen. X7255
X7799 Inner-looking edge.
X6965 Greater absorption at red end.

Under α Bootis
β Columbae X5429
X6160 good plate. Shading
is pronounced and λ 4227
somewhat strong, perhaps bringing
the star intermediate bet.
α Bootis and α Tauri.

δ Scorpii
X5668
X6547
.6757
.4778

τ Puppis. X7326
5962
4540

Feb. 20, 97

Under β Corvi.
δ Geminis. X5824 See also p. 112.
71
X4971

Under ε Triang. Aust.
H Scorpii X7450
X5094
Cannot find 5070 (Dual. 5)
A Cap. X4782
X5135
X5106
Where are plates 6860, 6944, 7113, 7454?
From the plates I have it is uncertain whether star should go here or under α Tauri.
ε Leporis X6195 G band not quite but nearly as much broken up as in α Tauri.
X5157
Find X8186 (two prisms)

– Ceti 1h52m X7144
X5159

Feb. 20, '97

Under α Bootis
~~e Centauri X4893~~
~~X5642~~ Further comparison pats e Cent. under ε Triang. Aust.
η Pav. X5777

Under ε Triang. Aus.
e Centauri X4893
X5642
The G band is seen to be almost divided

Feb. 22, 97

Under α Bootis

ι Sag. X5638
4967

The last box of A plates inspected for new Hydrogen lines but nothing found.

Feb. 24, 97

Under α Bootis

ξ Sag. X5786

ο Sag. X4956

Under ε Triang. Aust.

C, Centauri X6575 approaching α Tauri.

λ Vel. X6208 Peculiar?

This is the only plate I can now find. X4227 is wide, & shading in bands.

Feb. 27. X3955, X3962, X4061 found, and seem also to place star in this group.

Under α Tauri.

ε Indi X6871 G band not quite broken

X4920 " " broken but spectrum does not reach towards red end like α Tauri. From these two plates, its ~~class~~ group does not seem clearly defined. Perhaps it is nearer preceding group.

Feb. 27, '97

Under ε Triang. Aust.

b Sag. X 7139

g Carinae X 7523. This is the only plate I can find, and as it is a 2 prism plate, this classification is a temporary one.

~~θ Cent. X 7648~~

α Tucanae X 7835
X 7666

η Arae X 6310

ι Librae X 6689 X 6476

Under α Bootis

ξ_2 Sag. X 7574. X 5786 is to be found.

θ Cent. X 7648 Are plates X 7648 + X 7491 of different dispersions? Both are 2 prism plates but there was a diff. combination of prisms. 7491 looks like a ~~good~~ typical 2 prism plate for this group.

γ Eridani ?

X 7229 { H lines strong.
X 5254 { No very good plate but on
X 6213 { all H lines are rather broad
X 5959 { and hazy.

θ Doradus X 6178
X 7187

β Retic. X 6156 very good plate for this class

ο Col. X 5466 X 7296

ν Erid. X 5918 The other three plates given in Ledger are too poor.

Feb. 27. 97.

Under α Tauri
A Cap.

X 5123 { These plates are not good, but
X 4996 { from the G band and
X 5143 { intensity of λ 4227, indicate this group

ε Indi X 5113

Under β Corvi

κ Col. X 7194
X 6152

Under ε Triang.

α Triang. Aust. ✓ X 5793
X 7650
X 4169 good typ. star for this group

ν Hydri X 6157
X 5303
X 7249 . more like α Bootis;

Under α Bootis

ε Retic. X 6272
X 5336 Useless for class } all the plates.

ζ Caeli X 7166
X 6159

α Can. minor?
Feb. 27. 97

κ Ret. x5344
H lines strong. Under α Can. minor?
Can not find other plates.
Probably in box of F stars.

f Puppis x5331
x7329.
H lines strong.

Mch. 1. '97

Under ε Triang. Aust.
ε Crucis x4075
α Erid. x5373
x7094

Under α Bootis
δ Cor. Aust. x4854

L_2 Puppis x5364 useless for classif.
x7246 slightly app. ε Triang. Aust.
This plate is good in def. but is thin,
showing strong contrast. It is like
Miss Maury's α Cass.
x6267 very thin.

ζ Vol. x5404
x7392
c Vel. x5405
x6269
x7344 } One other plate x4109

α Horolog. x5409
x7233
x7220
γ^2 Volan. x5467
x6216 } all the plates in Ledger.
G Hyd. x5567
x7317 like α Cass?

Mch. 1, 97

Under β Corvi. ~~Under α Aurigae~~

β Pyxidis x5365 } all the plates. Slightly app.
x6366 } β Corvi.

~~β Phoen. x5398 good plate.~~
α Carinae x5436 1³ Strong H lines.
x6198 1⁴ The plates are all
x6274 1⁴ rather thin but show
x7212 1³ bands and absorption

In 6198, the spectrum looks like β Corvi, in 5436, more like α Aurigae. On the whole, however, it seems more like β Corvi.

Under ε Triang. Aust.
ζ Pyx. x5396
ρ 6 Puppis x6242 } Good typical star
x5488 } for this class.

Mch. 8. Closer exam. shows x5488 to be almost exactly like α Tauri.
g Carinae? x5506.
Where are the other plates?

Mch. 1, 97

Under β Corvi

~~β Phoen. x5398~~ good plate.
~~g Erid. x5400~~
~~x6139~~

δ Col. x5448
x6162
η Normae x5571
x6503

[e Vel. x5490 } Too poor to classify.
x5491 } Where is 6346?]

Mch. 1. 97

Under α Bootis

υ Car. √ X 6407 - good plate but H line looks stronger than in α Bootis.

X5575

X7416 Seems to be almost exactly like α Phoen.

X7380

See also p. 149.

α Micros. X5588? Perhaps nearer β Corvi.
The other plates, 6808, 7119, 7458, seem useless for classif.

Mch. 2. '97

Under α Aurigae

η Gemin. X5589. H δ very marked.

Under α Bootis

γ Sag. X5723

I have commenced to use α Phoen as comp. star instead of α Bootis. α Phoen. plate X5397 is used for superposing. The plates of α Bootis are hardly good enough.

c_3 Aquar. X5744 like h_2 Puppis.

b Sag. X 5788

b_1 Aquar. X5800

b^1 Cent. X5678 X5695 (good)

ν Octantis X5876

ζ Gemin. X5836

ξ Lupi X 5887 a poor plate for classif. Can find no other.

γ^2 Normae X6537

X5888

ι Erid. X5916

ε Retic. X 5917

Mch. 2, 97

Under β Corvi

δ_1 Gruis X5758 } no more plates.
X7169 }

There is an M star on the plate.
Which is δ_1 & which δ_2 Gruis?

δ_1 Gruis is the G star
δ_2 " " " M star.

On plates of δ_2 Gruis.

δ_1 Gruis 5986^4.
" " 5824^4.

On these plates, some banding is seen, I & II bands being moderately bright and also some absorption in the violet like later second-type stars.
The lines are not sharp as in α Bootis, but the H lines are distinctly stronger.
Hγ = approx. 4326.8
4227.0 = 3/4 α Bootis.

Mch. 2, 97

Under ε Tri. Aust.

η Arae. 45699 Almost like α Tauri. I would put it in that group if the ~~[illegible]~~ band is seen divided. This plate is not very good focus so I can not tell.

Mch. 3. 97

Under α Bootis

ζ Phoen.? X5973 poor plate. Where are the others?

α Chamaeleon X6145

Where is 4019 the only other plate?

γ Pict. X6179 X7305

ε Col. X6187

ν Octans X6690

b. Aquarii X6853

Under β Corvi

π Car. X6135

marked absorption with strong H lines. < γ Hydrae X6379 1^3 ~~The only plate~~ X6573 1^4

δ Vel. X6423 Do not see other plates. X4227 looks as strong as in α Phoen. but H lines are more marked.

Under ε Triang. Aust.

L_2 Puppis X6190 Where is X5354?

X7321 } Poor

X7422

δ Muscae X6448

ε' Arae X6453 Good plate.

Mch. 3. 97

Under α Tauri

σ Can. Maj. X6233

ε Corvi X6668 Shading slightly diff. [illegible] X4227 not quite so strong

X6611 as in α Tauri?

Under β Corvi

~~a Puppis X6257. (The one other plate given is prob. 1)~~

~~The H lines seem like β Corvi but X4227 more like α Phoen.~~

Under ζ Cap.

χ Vel. X6339 } From these plates

X7414 } χ Vel. seems nearer ζ Cap. than any other

Where is X4716?

Mch. 3, 97

Under ε Tri. Aust.

ε Antliae X 6347

Only one other plate given qual. 1.

Mch. 6, 97

Under β Corvi

β Phoen. X 6890

ε Erid. X 7192. X 4227 more like α Bootis
but altogether especially
in H lines it is nearer
β Corvi.

α Tauri

X 6898 – Sag. $19^h 5{-}6^m.9$

Under α Bootis

γ Tel. X 6961

ρ Herculis X 7060

~~α~~ g Erid. X 7193

β Fornacis X 7210

δ Leporis X 7235 –

β Horolog. X 7273. Where are other plates?

_ Ceti on $25^m.4$? Not good plate. Has this
star been classified?

δ Sag. X 7760 good 2 prism plate.

Mch. 6. '97

X6984 ε Cap.
ζ Cap. also on plate. The F and G Hydrogen lines look as strong as in α Aurigae.

X6985 κ Pav.
Can not see lines to classify.
X6532 : Do not see plate
X7768 Under α Aurigae? or before?

π Puppis X7215 Peculiar?
Hζ looks stronger than line bet. it and G. while λ4227 is as wide as in α Tauri.

ξ Puppis. X7238, 14 See notes pp. 37 & 43. X4505, 1?
H lines look stronger than in β Leporis.
The ζ Cap. line (near Hδ and η of shorter w'lgth) is stronger than Hδ.
λ4227 stronger than in ξ and absorption greater.
I find on superposing this plate on ζ Cap. that they are much alike. λ4227 on this plate seems stronger than in ξ.

This star looks more peculiar than ζ Cap.
H lines are stronger. Absorption greater. λ4227 stronger.

Mch. 6. '97.
Under ε Triang. Aust.
ε Arae, X7063, λ4227 is as strong if not stronger
also X7065 than in α Tauri. The G band is partly broken but not so
See p. 156. clearly divided as in α Tauri. This may be due to poor definition. Spectrum does not extend into red like α Tauri. This may be due to short exposure or fainter star. Should this star go under α Tauri?

ι Retic X7173? Faint, short spectrum.
X7250 Look up earlier plates.

β Reticuli X7232

Mch. 8. 97

Under α Boötis
- Doradus X 6188
X 7189

(Plate X 5662 θ Pis. Aust. poor spectrum.
Where are others)

(X 7319 ξ Tucanae cluster.
Can not classify.)

Under α Tauri
σ Puppis X 4519
This star was classed on p. 105 as under ε Triang. Aust. It was a mistake. The focus is not perfectly adjusted but the G band is broken up.

X 4154 δ Muscae.
G band not seen exactly divided but that may be poor focus. Look up plates already used.

X 4119 ε Corvi.
ι Librae X 4215. G band divided.

Mch. 16. 97

Under β Corvi.
υ Eridani X 5705

δ Triang. Aust.
X 6615. Exactly like β Corvi.
X 4885.
This ~~pl.~~ star was classed under α Aurigae from plate 5606. While on this plate and on 4885, the H lines seem to have the intensity of α Aurigae's, there seems to be no decided banding & not much absorption in violet. From 6615, it is certainly like β Corvi

March 17.97

There is no two-prism plate of α Aurigae and as I find few stars exactly like it, I shall not use it as a comp. star. I shall take β Leporis as the typical star of the first G group. It shows slight banding, some absorption in violet on plate 6151, the violet end is shown though faint.
Hγ stronger than 4326.0
4227 about equal to Hβ.

Under β Leporis.
δ Pavonis. The differences on all the 1 prism plates seem due to changes of focus.
45767 (best)

Plate 7604 (2 prism) matches up almost exactly with 8028 two prism of β Leporis. 7614 has however, more absorption in violet.

δ Triang. Aust. 46615 1^3 (no two prism plate)
See p. 121.
5606 1^4
4885 1^4 Plates not good. ~~In some respects this star is nearer α Aurigae~~.

β Pyxidis 5365 1^4 Faint 1st type star
6366 1^3 on plate.
Plates show absorption in violet but they are thin and if allowance is made for that, they seem like δ Par.

Mch 17.97

Under β Lep. & δ Par.

β Phoen. 4535 1 5398 1^5
5957 1^3 6890 1^4.
6903 1^5
4333 1
7805 2^4

In 7805, there is more absorption, and the star seems to be ~~somewhat~~ intermediate if I make such a division. 6903 however shows it to be very nearly like β Lep. See p. 131 for discussion of β Phoen.

Under α Phoen.
A.G.C. 965 visible on plate 4535 and very faint on 6903.

(Under β Lep. & δ Par.) Rather under α Aurigae a little before these two stars.
μ_1 Gruis A.G.C. 30395. 46951 1^3
Plates not very good. 5087 1^3
6894 1^3
5005 1^3

Under β Lep & δ Par.
μ_2 Gruis A.G.C. 30405. Same plate nos. as μ_1 Gruis.

Under α Aurigae
A.G.C. 30378 46951
5087 (barely visible)
6894
5005 (faint)

This spectrum is too poor to classify w. certainty. It is either under this or intermediate.

Mch. 17. 97

Under δ Par.

~~δ~~ Hydrae^{4023}
γ (identifies as)

This plate must be identified. It is the only one in ledger. and δ Hyd. is given in Miss Maury's cat. as a first type star.

w Say.
A Say.

5018 1^4
4781 1^3 (on edge)
5002 1^3
~~4535~~
7139 1^4 A Say. appears. Plate is in ledger of w Say.
6868 1^4 A Say. shows more banding + absorption
5003. 1^4
5067 1^3
5781 1^3
5823 1^3
5939 1^3 On this plate A Say. looks more intermediate bet. this + next
6870 1^3 Good plate for classification
If inter group is made, A Say. might be put in it

Line 4077.9 is less intense in w than in A, and in A is more like same line in β Corvi.

Mch. 17. '97

Under δ Par.

w Say.
A Say.
6869 1^3
6915 1^3 narrow
7138 A Say. on edge. w not on 7138.

A Say.
w
5788 (in ledger of b)

e Eridani
6138 1^4
5170 1^4
7192 1^3
~~Where is plate 7192~~

Shows an approach to α Phoen. but the H lines are more like δ Par. Shading like α Cass + 4227 like α Phoen.

On the whole, e Erid. seems nearer α Phoen. with strong H lines.

— Cent. $11^h 42^m$ $-60° 37'$
4707 1^4
5591 1^4
6459 1^3

γ Hydrae
4023 (1^4) See opp. page.
6379 1^3
6513 1^4
Approaches following group in absorption.

Where are 4336 + 7566
Not γ Hydrae Not γ Hydrae

δ Col.
5448 1^4
6162 1^4
Where is 4416?

Mch 17. 97

Under α Phoen. or before, probably intermediate

6256 a Puppis 1^4 These are much
$1'$ alike, showing strong
6135 N Car. contrast and
Where is 5460 1^4? decided shading.
It is hard to
classify from
one plate.

δ Vel. 6423

Have not seen other plates. See also p. 114.

~~γ Hydrae 6513~~

From the single plate I have of these three ~~these~~ stars, their spectra seem much alike having the peculiarity of strong Hydrogen lines with the other characteristics of a later group. They are like α Cass in absorption.

Under α Phoen. Mch 17. 97

δ_1 Gruis.

5758 1^4 poor. very thin
7169 1^5 H lines like δ Par. but
4345 1^2 absorption is too marked.
5986 1^4 It is like Miss M's α Cass
~~Where is 5986~~? in absorption

There is an M star to be identified.

~~Under δ Par.~~ Under α Phoen. marked banding.

κ Col. but H lines more like β Corvi.

7194 1^4
6152 1^4
5338 1^3
7316 1^3

γ_2 Sag. 4987 1^4
7846 2_4^3 (or 3 prism?)

β Fornacis 5149 1^3 Star may be ~~under δ Par.~~ β Corvi
5169 1^4 Where ~~is~~ are 6147
7086 1^3 + 7210?

Poor plates for classif.

δ Pis. Aust.

5126 1^4
6886 1^5

April
~~Mar.~~ 2, '97.

α Aurigae. (See p. 130)

β Hydri X5325 1^{4}

H lines slightly stronger than in α Aurigae and H & K very slightly wider.

X7653 2^{4}

Hδ has double the width of the other H lines. The plate is thin and faint towards violet. The widening may be due to focus.

X7910 3^{3} Matches up almost exactly with 79$\overset{8}{6}\overset{4}{8}$ α Aurigae, H lines show the same intensity as compared with those of α Aur. as in one-prism plates.

7719 2^{4}
4451 1^{2}
X4450 1^{2}

April 2, '97.

α Aurigae X4479 1^{2}
β Leporis X4615 1^{5}
X7325 1^{4}
X8028 1^{4}

There is more absorption in the violet than in α Aurigae. General distribution of the light in the spectrum and intensity of H lines are about the same, however, as in α Aurigae

μ, Gruis (see p. 123)

A.G.C. 30378 (see p. 123)

κ Pav. (see p. 118)

April 2, 97.

α Aurigae

X 4534 $1^{?}$

X 7968 3^{4}

X 7984 3^{5}

X 8099 3^{5}

X 3886 1^{3} Few lines visible except H + K

X 3887 1^{3} violet end.

April 2, 1897.

β Phoen. seems like a good typical star of intermediate type bet. α Aurigae and α Bootis

Hγ is of about equal brightness w. 4326.0. The K band is broader than in α Aurigae. This type of spectrum seems to include many of the Southern stars.

Superposing $\overset{\beta\text{ Phoen}}{6903}$ on 5397 α Phoen. the differences are too slight to make ~~α~~ β Phoen. typical of a preceding group. Is it best to put it under α Phoen. with the remark that it approaches preceding group. Final decision as to β Phoen.

To go under β Corvi intermediate bet α Aurigae and α Phoen.

April 6. '97.

Discussion of β Phoen.

47728 2^4 as compared with 7849 α
47805 2^4 Phoen.

H lines of nearly same intensity
λ4227 little stronger in α.
A little more absorption in violet in β, which seems to be due to the quality of the phot. rather than to the star.

This reverses the judgement of the preceding page and puts β Phoen. under α Bootis.

5398 1^5 (best plate) Hβ slightly stronger than in α Bootis.
4333 1^2
6890 1^4
5957 1^3 H lines on this plate appear stronger than in α Bootis
4535 1^2
6903 1^5 Shows a decided approach to preceding group.

Under α Bootis
A.G.C. 965 too poor on 5957 & 5398 on 4535 and 6903 faintly seen.

April 6. 97.

β Corvi.

ψ Eridani 5705 1^4
7248 1^4 Like α Aurigae in
4473 1^2 having little absorption wr. violet.

April 6. '97.

α Bootis
δ Centauri 5599 1^4 A. G. C. 18376.
4736 1^4

Slightly peculiar.

δ Centauri also appears on plate 3977, having only portion of spectrum bet H & K and a little beyond visible. It is marked peculiar and then crossed off with the remark that it is due to the plate not covering the region.

Plate 5599 has λ4227 weaker than in α Bootis

Hγ approximately equal to 4326.0
Hβ and Hδ slightly stronger than in α Bootis.
In the red end of the spectrum, there is a tendency to break in light ~~like α Tauri~~
One break has shortest λ at Hβ, the other shortest λ at 0.43 mm. from F towards the red end. These breaks do not seem to coincide exactly with those in α Tauri, and are not like 3rd star class.
On superposing this plate on δ Sag. 5807. the breaks do not seem any different from those in a banded K star. The only peculiarity about this red end is that it is seen well beyond Hβ ~~and~~ while the whole spectrum is not very intense

April 6. '97.

A. G. C. 18268 5599 1^4
4736 1^4
3977 1^3 too poor.

Intermediate or app α Tauri.
The spectra are poor, but they show a dark streak at red end coincident with one in a third-type star
G band not seen broken up.
Probably like α Bootis.

April 7. 97

Under β Corvi (from the best plate 6943) through approaching α Bootis

α Indi

47628 2^4 Lines not sharp.

7583. 2^4 Doubling of lines probably due to motion of clock.

6943 1^{5-} like β Corvi Lines sharp.

4472 1^4 Nearer α Bootis

4442 1^4

5879 1^4

5165 1^5

x6943 looks like a good typical star of this group.

(Sep. 92) ω Lupi

5543 1^3 narrow spectrum, poor.

April 8. 97

α Aurigae

α Centauri x7366 1^5

H + K narrow probably due to dark spaces on spectrum of comp. star. General indistinctness, while some lines are stronger than in α Aurigae Spectrum extends well into the violet.

x7573 2^4

6392 1^3

7418 1^{5-}

x7541 2^4 violet end well shown.

x7645 2^4 Red end " "

x5760 1^3

x3983 1^{5-} Comp. not seen.

x7572 2^4

x7562 2^4

x7557 2^3 Peculiar fraying out at edges.

x7561 2^4

x7484 2^4 Slightly diff. dispersion from 7573

x7556 2^3 Indistinct

7560 ^{3} excellent of violet end.

6668 2_2^3

6654 $_2^3$

6473 $_2^3$

7901 $\cdot 3^{5-}$

~~α Boötis~~ α Tauri April 8. '97
α² Centauri.

X 7366 1^5 Like α Tauri.

Spectrum is very narrow but is seen clearly beyond K.

X 7573 2^4 Shown from slightly shorter w-length than H to longer than F. To be matched w. α Tauri.

X 6392 1^3 Like α Tauri. G band broken.

X 7418 1^5 λ 4227 not quite so strong as in α Tauri but the G band seems broken.

X 7541 2^4

X 7645 2^4 Poor of α²

X 5760 1^3 Good of α², like α Tauri.

X 3983 1^5 α² not seen.

X 7572 2^4 α² is in this plate on opposite ~~under~~ side of spectrum from that ~~as~~ seen in above nos. and has its lines towards violet end of α², instead of towards the red as above.

X 7562 2^4. Poor of α²

X 7557 2^3 α² not seen.

X 7561 2^4 To be looked up by Miss Wells.

X 7484 2^4 Good of α². Like α Tauri.

X 7556 2^3 Poor.

6654 2^3 fair of α² 6473 2^3 fair of α²

6688 2^3 " "

7560 2^3 poor of α²

April 8. '97.

α Boötis — Sag. 18^h $19.^m4$ $-20°$ $35'$

X 5946 1^3 too poor

X 5581 1^3 like α Boötis

X 5132 1^3 Thin but H lines like β Corvi.

X 6802 1^3 α Boötis

X 6867 1^4 H δ looks broad on most of the plates but it seems to be due to poor focus or definition.

X 4798 1^3

X 4825 1^3

X 5573 1^3 too poor

X 7066 1^3

Where ~~are~~ is ~~7067~~ & 7451?

The H lines have almost the same intensity as in β Corvi. In other respects the star is like α Boötis. Note the peculiarity of H δ.

Additional a star visible on 6802 and 5581.

April 8. 97.

α Bootis

γ Erid. X5400 1^3

X6139 1^4 Like β Corvi.

X8048 2^3

Where are 4414, 5427, 7193?

X5400 looks exactly like α Bootis and also the two-prism plate seems nearer α Phoen. than β Corvi.

ι Gruis In some respects like β Corvi.

X6880 (1^2) like α Bootis but lines are not sharp.

X5851 (1^4) α Bootis.

4443 (1^2)

5391 (1^4)

4460 (1^2)

6762 (1^{3i})

7770 (2^4)

8058 (2^4) Seen best to be like α Bootis on a two-prism plate.

6952

~~446~~

~~6952~~ } missing

7988

α Tauri. April 8, '97.

Star on plates of b, Aquarii. See p. 82

See p. 190

X4331 } Poor spectrum on the Edge.

X5034

X5582

X6853

X5694 1^4 This star is seen to be like α Tauri.

X6895 1^4

7792 2^3 } Faint.

7836 2^3

~~The~~

5800 } missing

6946

b, Aquarii on X5694 looks like a good typical α Bootis star.

April 9. '97

See also p. 63.
Under β Corvi and marked Peculiar.
X7168 1^4
Get λ of peculiarly strong line of shorter λ than Hδ. Marked shading.

X5880 1^4 Marked by Miss Maury?

X6682 1^4
X7684 2^3
X4293 1^3
X4997 1^4
X7658 2^4
X7811 2^4
X7841 2^3 b Cap. appears.

ξ Cap. also appears on plates of b Cap.
See opp. page.

April 9. '97

α Bootis.
b Cap.
X6984 1^3 poor.
X4293 1^2 like α Bootis.
This plate is in ledger of ξ.

X4940. 1^3 poor.
X5033 1^4 like α Bootis.
X5798 1^4 poor.
X6861 1^4 Poor definition

Also see plates of ξ Cap.
On 4293 + 6652, the spectra of b Cap are as good as any in ledger of b. On some plates, the star seems nearer like β Corvi.

X5880 b Cap. Like β Corvi good plates.
X7168 " " " " "

April 9.'97

μ_1
μ_2 Pavonis X7769 δ Pav.

Rather indistinct but are probably under α Bootis. certainly here or under β Corvi.

ν_1 Sagittarii

X5154,^{4} thin
poss. {X5284,^{3} X5618,^{3}} X5134,^{4} thin
X5104,^{4} (thin)
X5178,^{3} (very thin)

~~To be identified before classifying. Plates are put in pile for keeping.~~

I find these stars identified on X6796 ν_2 Sag.

X6796 in ledger for ν_2 like β Corvi

ν_1 appears clearly on this plate. At violet end another star laps. Identify

April 9.'97.

ν_2 Sag.
X5938,^{3} too poor. no lines clearly seen
X6796,^{3} like α Bootis with λ4227 stronger.

A.G.C. 25876. ν_2 Sag. 5741,^{3} too poor.
ν_1 " 4752,^{3} thin
ν_2 " 7111,^{3}
ν_1 " 7104,^{4}

A.G.C. 25853 ν_1 Sag. on plate 6796, the only plate where the image is dense enough to show the lines distinctly is almost exactly like ζ Puppis. The end of shorter wave-length is overlapped by DM −22° 4966.

ν_2 from all the plates seems to approach α Tauri. 4227,0 is stronger than in α Bootis. There seems to be a tendency to break at 4762, but the break at F is stronger.

ν_2 Sag. 4759,^{4} like α Bootis with 4227,0 stronger. There is absorption on this plate like δ Sag. but the plate is rather thin and it is safer to put it under α Bootis, saying 4227,0 is stronger and absorption is seen on most of the plates.

April 12. '97

ζ Puppis X 4505 K line shown as in α Bootis.

X 7238

3.73 mm. from F line (the line seen in ζ Cap.)
4.09 " " " " (the line seen in ε Car. and which seems to be an Orion line)

Plate X 3992 ε Carinae
The line at 4.09 mm. from F in ζ Puppis matches up with a line in ε Carinae, which is stronger in ε Carinae.

Plate 4505 ζ Puppis shows breaks like α Tauri at the red end. The line at 4.09 mm. from F also seems to coincide with one in α Tauri.

April 13. '97.

α Bootis
A. G. C. 15877
X 4707
X 5591

These spectra are on the edge of the plate. The star belongs without doubt to this or β Corvi.

April 16, 97

α Bootis

γ Caeli 6159 First type star appears overlapping violet end of γ Caeli. F line of first type being 0.95 mm (shorter λ) from λ 4227 of γ Caeli.

On plate 7310, the first type star laps at the red end.

ε Retic.

×5336 lines indistinct, light even

×6272 marked absorption H & K only faintly seen

April 16, 1897

47416 faint 1st type star alongside of μ Carinae.

~~×7380~~ Hδ of faint star coincides with slightly shorter w'ggth than 4277 in μ

7380 Hδ of faint star coincides approximately with 4227.

~~6407 faint star not seen.~~

5575 Hδ of faint star still farther away towards violet from 4227 than in 7380.

4021 taken May 17, '92

Hδ of faint star is 0.28 mm ~~from~~ shorter w'ggth than 4227 of μ Carinae

5575 taken June 9, 1894.

Hδ has 0.17 mm shorter w'ggth than 4227 in μ

6407 taken April 24, 1895.

Measure uncertain Hδ of faint star is broad and faint

6425

April 16, 1897.

46511 u Carinae taken May 10, 1895.

7380 Mch 23, 1896
See preceding page.

7416. April 8, 1896

Hδ of faint star has 0.09 shorter w'lgth
than 4227 of u.

April 16. 1897.

δ
σ Can. Maj. 6233.
Like α Tauri? Shading like δ Sag. ✓
4227 as strong.
Hβ + Hγ stronger.
G band broken up but not sharp.
Where is plate 4513?
8204 has not come from Peru.

April 17. 1897

L₂ Puppis 6190. Like α Tauri.
On 7422, Hζ looks strong. Poor plate.

q Velorum like ζ Puppis or similar.
X6339
X7414
H K K are narrower than in α Bootis.
K seems too indistinct to judge accurately of its width.

α Antliae 7345, very poor.
Like α Bootis?
5508 X4227 strong. Hζ strong.
Where are other plates?

m Vel. X6338. Like ζ Puppis
Hζ equal or slightly stronger than 4326.0
To be confirmed on other plates.

April 17. 97

δ Muscae

40171³	Looks like δ Sag.
6296	all the lines are broad and adjacent faint ones seem united.
6448	Peculiar. Between α Bootis & α Tauri, with the tendency to break like a third type star.
7634	Shows the G band almost divided.
4154	Nothing at all peculiar seen. Breaks at F, not at 3rd type places. ~~Intermediate~~ More like δ Sag.

β Gem. 8117
What is absorption in the red?

April 19. 97

α Apodis.
An examination of all the plates to determine its class with certainity. It was placed once intermediate bet α Boötis and α Tauri, and once under α Tauri.

4859,^{4}
Like α Boötis in intensity of H lines.
Shading more like δ Sag.
λ4227 slightly stronger than in α Boötis.

7419,^{4} Definition poor. lines broad.
4227 as broad as in α Tauri though not quite as strong.
Shading in the red end more like α Tauri but the Edges of the absorption bands are not seen.

6595,^{3}
4227.0 nearly as strong as α Tauri.
G band almost broken up.
Contrast great.
Tendency to break at 4762 & 4954 barely seen.

5697,^{4}
Intermediate bet α Boötis & α Tauri.

April 19. 97

α Apodis
Tendency to break in light shown best
Definition is poor and the G band is not divided.

April 20, 97

Under β Corvi

α Reticuli X 4499

" 4434 (very poor) 1st type shown on plate.

μ Vel. 6434, 4i

H lines broad & strong.

All lines broadened out, possibly due to focus.

ζ Cap. 7684.

α Tauri.

7664 ε, Arae, 4

G band divided by one strong line.

48195 λ Vel. 2 prisms.

Shows the star to be like α Tauri as to G band & Hγ. Red end of spectrum not on plate.

April 20, 97

q Carinae

X 7523 24

X 6279 14 Spectrum thin.

Hγ stronger than in α Tauri. Slight breaks at H.

G band not sharply divided — 4013 14

Hγ almost as strong at 4326.0

A slight tendency to break at 4762 & 4957.

On 7523, Hβ & Hγ are both stronger than in ε Leporis, a two prism plate.

April 26, 97

o Ceti.

4446. Shows breaks more like α Orionis than α Tauri.

7271. Very faint, break at 4762 distinctly seen.

These spectra are rather poor.
Where are the three-prism plates?

May 3. 97

α Orionis 44533

H lines much stronger than in α Tauri

On a one-prism plate, Hγ appears from 2-3 times as strong as 4326.0

4227.0 not more than 1/2 as strong as in α Tauri.

G band seen as three distinct lines one narrow distinct one towards red, two wider, more diffuse ones towards violet.

H seems narrower than in α Tauri

K about the same

Of the bright bands marked on this plate, ~~the middle seems fainter~~, between F & G, I is brighter, the band between I & II is perhaps a little fainter than II, III is not sharply defined. The absorption bands are outlined by bright edges at 4762, 4954 & 5168. The band 4762-4954 seems fainter at F, which is sharp, and to brighten gradually towards both edges, 4954-5168 fades very slightly towards red end.

May 3. 97.

θ Apodis, X4039.
Too poor. Breaks clearly seen.

θ Apodis X4067.
Focus so poor that all lines
are broad. Three breaks seen.

α Scorpii 4098
Plates all the reserved for a special
study of this star.

A.G.C. 18566 4106 plate poor.
Looks like 4067 θ Apodis, poor focus.
Additional star A
New bright band ‖ is slightly brighter than I.
Spectrum very poor. probably a little beyond α Orionis.

A. G. C. 16139. 11h 43.7m X4166.
Plate very poor Star probably
comes under α Orionis

X4171. ? No name in Catalogue.
Star probably under α Tauri

May 3, 97
β Gruis X4182.
Spectrum almost cut off at 4954,
very faint beyond towards red

4227.0 very broad, focus poor
Hγ stronger than 4326.0

Of the bright bands,
III has almost faded
II is faint
Shown Bet. I & II is wider than I and
about as strong. These two are
the most conspicuous shading
seen in the spectrum from
4762 to the violet. very faint
towards violet H & K not seen

β Gruis 5650^{5}
4227.0 ~~2 + 3~~ 4 – 5 times as strong as in α Orionis
Hγ = 4326.0
Spectrum seen to 5768.
Bright bands I and bet. I & II
much stronger than in α ~~Tau~~ Orionis
Lines are not sharp towards red
end. In absorption bands, lines
seem often obliterated. Is this
due to focus?
Spectrum seen to beyond K, light almost even
very little change at 4307.

May 3, '97

β Gruis 7914_2^3

" " 7659_2^4

" " $4296,^?$

" " 7899_2^3
" " 7829_2^4

In 7829, the two bands I & bet. I & II are the only conspicuous marking at the red end. They seem about equally strong. There is only a very slight change in light at 4307. The G band consists of two wide lines, the narrower one seen in γ Crucis having almost disappeared.
{β Gruis probably forms one the group following α Orionis.}

On 5650, there is a tendency to show a break near the λ 4762, about .18 mm nearer the red end of spectrum. Is this characteristic of stars beyond α Orionis?

May 3, '97

ο Librae 418$\overset{6}{7}$.1? poor.
Under α Orionis?

δ Librae 418$\overset{7}{6}$
4227.0 2 as strong as in α Orionis
No lines are sharp in absorption bands.
I, I-II, & III of nearly equal brightness.
Is this star beyond α Orionis?

γ Hydrae 4336. too poor.

ο Librae 5614 + best plate.
Spectrum seen to λ 4954
The new band I to II is getting brighter, is clearly intermediate between I & II. II has faded.
H lines. Hγ slightly ~~bright~~ stronger than 4326.0
Lines are certainly seen in the absorption bands.
I think this star should go in same class as α Orionis.
1st type star too faint on this plate

May 3, 97.

η Sag. 4365.
Same as δ Librae 4447.0 a little stronger however.

May 4, '97

C Sag. 4844.
New bright band = I or slightly brighter
Absorption bands are bright-edged.

C Sag. 5105
New band wider but not quite so strong as I. II has almost faded out.
Hγ is stronger than 4326.0

C Sag. 4938.
New band not quite so strong as I.

C Sag. 7112.
Under α Orionis.

May 4, 97.

τ_4 Eridani 7257. Focus very poor. New bright band = I and is wider. 4227.0 very broad probably owing to other lines near being joined with it. The bright borders of absorption bands do not seem on this plate so strong as in α Orionis.

τ_4 Eridani 5271.
Bright borders of absorption bands are here seen stronger. Tendency to flute at red end. Is certainly beyond α Orionis

g Centauri 4756.
Like τ_4 Erid.
4227.0 a little stronger than in τ_4

τ_4 Erid. 7807^{3}_{2}
" " 8029^{3}_{2}
" " 8143^{3}_{2}

May 4, 97

γ Crucis 3989. Under α Orionis
4227.0 1.5 as strong as in α Tauri.
Lines not sharp towards red. Is this focus or tendency to approach next group?

γ Crucis 3982

η Sag. 5112.
Seems a little beyond α Orionis, as new bright band is nearly as strong as I, III has faded, II is barely seen. thin plate.

η Sag. 5030.
Same as above, but not quite so far advanced as τ_4 Erid.

η Sag. 5086,^{4}
After α Orionis

η Sculptoris (poor) 5147,^{3}
Looks like τ_4 Erid

η Sculptoris 5176,^{3}
Like τ_4 Erid

May

May 4, 97

τ Sag. 5797,^{3} very poor
Like τ4 Erid.

ψ Phoen 5202,^{4}
Like α Orionis approaching next group

ψ Phoen. 5261.

η Sculptoris 5295,^{3} very poor & narrow.

ψ Phoen 5302,^{3}
Like τ4 Erid.

May 5, 97

ψ Phoen. 5302 "3"
Like α Orionis, with the exception that
H lines are much weaker, & line
4227,0 stronger.

θ Apodis 4067
Queer-looking. No lines seen clearly
Is it focus or is the star fluted?
It looks at any rate beyond
α Orionis

η Sculptoris 5341 poor.
Under α Orionis ?

γ Hydri 5485 4
α Orionis, ~~good typical plate~~
This spectrum looks very much like
γ Phoen, or seems intermediate bet.
α Tauri & α R Orionis.
The heads are sharper than in γ Phoen,
and there are other slight differences.
The new bright band is fainter
than I or II

May 5, 97.

γ Hydri 5495^{4}
Intermediate bet α Tauri
& α Orionis.

θ Pyxidis 5562,^{3} (poor)
Star may be under α Tauri.
Certainly not so far advanced
as α Orionis
Nearer intermediate.

ψ Phoen. 5261
As to bright bands, like α Orionis
but there seems to be a tendency
to show bands at red end
instead of lines. Is this focus?
May 14, This star is clearly beyond α Orionis.

ψ Phoen. 4931,^{3}
Certainly under later group
than α Orionis

δ^{2} Gruis 4971,^{4i}
α Orionis approaching next?

δ^{2} Gruis 5053
α Orionis approaching next.

May 6, '97

η Sculptoris 5056,^{3} (vy poor)

~~δ~~ ε Muscae 5576,^{4}
Under α Orionis?
The spectrum breaks perceptibly at
4307. Near bright band is almost
as strong as I. Lines seen ~~nr~~ above
λ 4954. 6669,^{4}
4791,^{4}

η Sculptoris x5583,^{3}
Under α Orionis!

N Scorpii 6564^{2} (as good as many B's)
Either under α Tauri or slightly
beyond. On side of plate, to be
identified —

η Sag. 5716,^{4}
Under α Orionis

N Scorpii is type B. The third-type star appears
on
5623,^{4} like α Tauri as to banding. Breaks off the plate
6443,^{3} " " "
684~~4~~8,^{4}

May 7, 97

δ_2 Gruis 5986,^{4}
Under α Orionis approaching next.

γ Hydri 6262 4.
Under α Orionis
Near band seems a little fainter than II, Star shows a faint break at the F line like preceding group but it is much nearer α Orionis than preceding.

γ Crucis 6369,^{5}
α Orionis

This might be a good typical star for α Orionis, as α Orionis does not seem to be at all typical having peculiarly strong H lines and weak 4227,0

σ Libræ 6537,^{4}
α Orionis.

η Sculptoris 6873,^{3}
α Orionis

May 7. 97.

ψ Phoenicis 6884.
As to bands like γ Crucis.
No lines clearly visible however in absorption bands as γ Crucis shows.

c Sag. 6897,^{4}
Near bright band = I
Star breaks in a sort of double line at F.

e Sag. 5718,^{3} (poor).

May 8, 97

A. G. C. 1962, on plate of ν Ceti 5270
Under α Tauri, or ~~perhaps~~ a little beyond, not so far as α Orionis. To be put in intermediate group if it is made.

A. G. C. 1924 $^{1^h 52.^m4}$ η^2 Hydri 4537
Under α Bootis or 4227.0 weaker
η^1 Hydri is too poor on this plate.
Are there others ?

On plate 5008, η^1 Hydri appears a first type star.

May 10, 97

γ Crucis is adopted as the typical star for 3rd type group.
Plate 3982 shows new light band slightly fainter than I.
6369 shows strong contrast, a marked diminution in light at 4317.
4227.0 is very strong, as wide if not a little wider than in β Gruis. The absorption ^{edges} at 4762 & 4954 are seen, but the spectrum ends almost abruptly at 4954. It is seen very faintly a little beyond towards the red. This plate is probably underexposed giving the strong contrast and faint ends.
3989 shows less contrast and gives the typical points. It looks very much like α Orionis, except that the H lines are weaker and 4227.0 stronger.

c Sag. 6982,^{3} too poor.

ψ Phoen. 7109,^{3} poor
slightly beyond α Orionis;

η Sculptoris
7171^3 Plainly under α Orionis
New light band is bet. I & II.

May 10. 97

γ Hydri 8072$_2^4$ (poor)

γ Hydri 8008 poor.

c Sag. 7428$_1^3$ poor.

β Gruis 7678$_2^5$
Plate shows good definition

May 11. 97

{δ^1
{δ^2 Apodis 6746$_1^{3i}$ (poor)

" 6748$_1^{2i}$ ~~(poor)~~

" {5644$_1^4$ (blurred)
{Good of γ Apodis

" 5077$_1^3$ (Spectra on edge)
" 6625$_1^3$ (burned out)
" 6605$_1^2$ images separated
δ^1 is type M.
δ^2 looks like α Tauri

" 6402$_1^3$
δ^1 Apodis is like α Orionis
in violet bands. One of these bands seems to be due to δ^2. δ^1 is more like β Gruis.

" 6747$_1^{3i}$ lines are not sharp, but the two stars are separated enough to match up the two spectra with other plates.

" 6402$_1^3$
δ^1 = α Orionis ?
δ^2 = α Tauri ?

" 5102$_1^4$
δ^2 is not seen

May 11. '97

δ^1
δ^2 Apodis 6847.

δ^2 looks like α Tauri in the strength of 4227.0. Lines are not sharp. This is as good a plate as I have seen.

" 4807,^{3i} (poor)
" 4758,^{3i} (poor)

The G band of δ^2 seems like almost in same vertical line as 4227.0 in δ^1

May 12, '97.

α Ceti 7944$_3^3$
Breaks seem a little sharper than in α Tauri - but it is nearer α Tauri than α Orionis.

Comparison of plates 7829 β Gruis
and 7576 γ Crucis
One plate (7576) is denser than the other.

Bright band II is weaker on 7829.
Change in light at 4307 is perhaps less on 7829.
Breaks are more decided on "
and show brighter edges " "

May 13, '97

Comparison of plates 7899^{3} β Gruis
and 7972^{3}_{3}4 α Orionis.

7899 is a poorer plate, but it shows
the new bright band decidedly stronger
than in α Orionis, the absorption edges
decidedly brighter, and almost
a total obliteration of lines towards
red end. Some of this obliteration may
be due to poor focus.
On 7899, there seems to be another
absorption edge, having longer λ
5.2 mill. from 4762 towards red end,

May 13. 97
Comp. of plates 4533 α Orionis
and 3982 γ Crucis.

Distribution of light about the same
The brightness of bands ~~in~~ I, II, III
and I - II about the same
4227,0 on 3982 = 3 times its strength
on 4533.
H lines on 4533 are 2 - 3 times as
strong as on 3982.
Hβ is not seen distinctly on 3982
This is the best plate to take for
γ Crucis in one prism since 6369,
although it gives sharper lines, yet
is under-exposed so it makes the
contrasts too great

May 13, '97

ψ Phoen. 5934,^{3} (~~no~~ poor.)

ψ Phoen. 5933,^{3} (poor) like β Gruis?

c Sag. 6897,^{4}
Thir bright band = I or slightly stronger.
absorption edges bright edged. Thin plate.

η Sculptoris 6931,4
Under γ Crucis as to strength
of bright bands, and changes at 4307 but showing decided tendency
to split up into smaller absorption bands
and to lose lines. Examine other plates.
It may be focus.

δ₂ Gruis ~~ψ Phoen~~ 5824,^{4} Beyond α Orionis?

ψ Phoen 6146,4 beyond α Orionis.

May 14, '97

γ Crucis 7401,5 something like 6369.
strong contrast.
Shaded strongly from G to 4762,
and then faintly to F.
Spectrum ends abruptly at 4762,
and shades off at H.
II is much fainter than I-II.

δ₂ Gruis
Plates 5824 & 5986. are thin
& give strong contrast.
The plate shows Y band with the
fine lines (very sharp, though) towards red as in α Orionis
& γ Crucis. The lines are not sharp.
Hγ on 5824 approx. = 4326.0
There are no distinct lines tow. red and
in this respect the plate seems beyond
α Orionis.

7169,5 δ² Gruis. Thin plate, strong contrast
I & I-II stand strongly out.
Hγ = 4326.0 Hγ is too indistinct.
4227.0 very wide & strong as generally is
in an under-exposed plate
δ, Gruis does not show clear lines toward
red. As the general indistinctness in this
part of the spectrum may be due to focus.

May 14, '97.

δ^2 Gruis 7169.

4762 is bright edged
4954 does not look so.

γ Crucis 7363_2^4

c Sag. $5705,^4$ beyond γ Crucis?

$7563,^3$ η Sag. γ Crucis.

May 15, '97

3rd type star on plate 4037 ζ Hydrae, to be identified.
The bright band I-II is barely seen, the spectrum is poor but looks like γ Phoen. The break at 4762 is just about as sharp.

R Carinae $7384,^3$
very poor, ~~H lines seen bright~~
Hγ, Hδ, Hζ seen bright
Break at 4762 bright-edged.
" " about 4586 seen.

May 15, 97

Plates having ι Retic. δ Retic & ζ Retic. on them.

7173,$^{4}_{1}$

ι Retic very faint & thin.
Either under δ Sag or α Tauri. no poor.

δ Retic. Like ζ Phoenic, δ breaks at
4762 much more than ξ ι
ζ Retic not all on.

5161 no three ζ not on
5312,$^{3}_{1}$

ι Retic. Like α Tauri.
δ Retic. a little beyond α Tauri
ζ Retic. Looks like ε Sag.

6941,$^{4}_{1}$ Like 5312.
The three star stars seem to show three stages of growth of third-type.

6177,$^{3}_{1}$ Same as 5312

6131,$^{3}_{1}$ " " "

5297,^{2} " " "

May 15, '97

5969,$^{3}_{1}$
ζ Retic. not on.

6194,$^{4}_{1}$

7313,$^{3}_{1}$

7078,$^{3}_{1}$

h, Puppis 7246.
Like α Tauri?
The break at 4762 is weak
Other plates must be looked up. See p. 114. I do not find this star entered in my Ledger. Was it overlooked.
This plate is put in box with secondary B stars to be classified

May 17, '97.

A.G.C. 31734

b_2 Aquarii on plates of b_1

6895,^{4} like α Tauri.

The G band not seen sharply divided but other lines near by are wide and not separated, so it is evidently due to focus. The break at 4762 is seen about as in α Tauri. Spectrum indistinct beyond F.

5034,^{4} Same as above.
I-II bright band very faint.
II is narrower than I. Is this characteristic of α Tauri stars?
If so when does I narrow down?

7792$_2^3$ - faint.
7836$_2^3$ - ~~poor~~ not good

6853,^{3}

5800,^{3}

5882,^{4}
4331 b_1 & b_2 both seen.

May 17, '97

Stars on plates of m Velorum

6338,^{3i} A.G.C. 13451 like α Tauri
" " " 13440 " δ Sag. probably

7375,^{3} these spectra are poor.

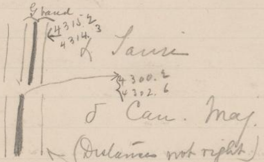
May 17, '97.

δ Canis Maj.

G band is divided, consisting of one central strong line with ~~two~~ one on each side, the one towards ~~violet~~ red being slightly farther away, both being of about same strength.

Note that while the G band in α Tauri also consists of three lines they are not the same lines.

The weak line tow. violet in α Tauri is here the central strong line



The wide line of G band in α Tauri is not seen in δ Can. or is very hazy if there at all.

4326.0 is very faint in δ Can. M. has not more than 1/2 the intensity of Hγ. On 8274_{2}^{5}. 4326.0 looks much wider as compared with Hγ, about 1/3 as strong.

The line 4315.2 does not seem to coincide with anything in the spectrum of α Aurigae,

May 17, '97

In α Aurigae, the G band seems to commence a little nearer the violet end than 4315.2

Hγ = 1/5 of same in Sirius

Hδ seems fainter on this plate than Hβ or Hγ, not more than 1/2 as strong.

δ Volantis

6221, 4
4514, 2
7245, 4

This star resembles δ Can. M. more than any other.
H lines about the same
H + K " "

Intensity of the solar ~~sol~~ lines seems like δ Can. M. The lines are not so sharp however and the G band looks different in certainly having a line present bet. 4302.6 & 4315.2. (See opp. p.) This line seems to coincide with the strong line in α Tauri.

The definition is poor on these plates.

The line near Hδ like G Cap. is strong in both these stars.

May 17. 97.

c_3 Aquarii

$K = 0.\overset{6}{\cancel{7}}\ H$
$H\delta = 0.9\ K$
$H\gamma = H\beta = 0.7\ H\delta$
H lines are hazy, especially Hδ.
G band is continuous.

$H\beta + H\gamma = 1.2$ ~~α Aurigae~~ β Hydri, which I happen to be comparing with
4326.0 is slightly weaker than in β Hydri.

Bright bands I + II are seen
7693,³ too near edge, Cr lines blurred.
6887,³ H lines very hazy. on edge of plate of c_2
5744,³

G Carinae 5418³
Looks like δ Can. Maj. in the presence of strong lines in the line near Hδ, and in G band, though this is not sharp. 4326.0 seems slightly stronger than in δ.

c_3 Aquarii 4961,³ rather poor.
c_2 " seen clearly on Edge of this plate.

May 17. 97.

α Fornacis 6261,⁴
Something like c_3 Aquarii.
H lines not so hazy.
Hδ is if anything weaker than Hγ.
$K = 0.\overset{8}{\cancel{6}}\ H$ decidedly ~~narr~~ wider than in c_3 Aq.

H lines about same intensity in α For. and c_3 Aquar.

ν_2 Centauri.
4766,⁵ Like δ Can. M.
H + K not so wide as in δ — about 0.8 as wide.

May 18, '97

ζ Tucanae 7239,5

Something like C_3 Aquarii but differing in these respects.

H lines in this star are sharper, especially Hδ which looks particularly hazy in C_3. The solar lines seem narrower and sharper.
K is narrower than in C_3
Here K & H are nearly equal whereas in C_3, H is decidedly wider. This may be due to the haziness of the H lines in C_3.

ζ Tucanae looks very much like β Hydri but the H lines are slightly stronger in ζ. H & K are about the same in both stars.

7842$_2^3$ like 7719,4 β Hydri.

7804,4 " β Hydri. with exceptions noted
The H lines seem stronger in both these stars than in α Aurigae, They seem slightly stronger in ζ Tuc. than in β Hydri.

May 18, '97

γ Cor. Aust. 4780,4 like ζ Tucanae.

θ Gruis 7207,5. Lines sharp.
H & K narrow. G band barely seen.
A great many solar lines are present.
Looks more like α Can. Min.
H & K are slightly wider however.
H lines stronger.

5839,4 more like δ Can. Maj.
Lines are broader however.

χ Sagittae 1057,3 like δ Can. Maj.?

θ Gruis A.G.C. 31380 5215,3 poor
A.G.C. 31437 also on plate. Like ζ Tuc. fairly poor.

A.G.C. 11334 θ Chamaeleon 5432,4 poor, few lines seen. ~~α Can. Maj.~~ α Carinae? ?

" 11405 Other star on 5432 like α Tauri?

May 18, '97

α Cor. Aust. 5764,^{4}

This identifies as γ Cor. Aust. { Like ζ Tucanae, H lines strong and hazy
Hδ very wide and hazy.

α is upper a.

~~b~~ ι, Scorpii ~~Velorum~~ 4421,^{5}

This star resembles δ Can. Maj.
The H & K lines are however ~~ι Scorpii~~ much narrower. They are about 1/2 as wide as in δ Can. Maj. The violet end may not be alike either. The H lines are much stronger, and it is probably under a sharp-lined star of an earlier division.

A. G. C. 24218 on plate 4421
very poor. Under γ Crucis most probably.

May 19, '97

α Fornacis 8190^{3}
Like β Hydri^{2} except that H lines are slightly stronger.
Lines are not sharp in this two-prism plate of α Fornacis, nor in 7719 β Hydri

α Fornacis 7716,^{5}
This greatly resembles β Hydri 5932.
H is slightly narrower than in β
H lines slightly stronger, especially Hγ than in β.
4326.0 is weaker than in β.
Here Hγ = 4×4326.0
in β Hyd. " = 2×4326.0
This star can not go under α Aurigae, while β Hyd. may.

α Fornacis 4433,^{2} poor.

α Fornacis 4508,^{2} Compared with α Aurigae the differences consist mostly in the strength of the H lines and 4326.0 as above compared with β Hydri.
α Fornacis is nearer like ζ Tucanae
Lines seem sharper in α Fornacis than in ζ Tuc.

May 1~~8~~9, '97.

ι Scorpii 5778,^{5}

b Vel. is A.G.C. 11755

Plate a Vel. 4515,^{5} The star here discussed is b Vel, on plate of a
Like ι Scorpii.

a Vel. 6259,^{4} Star examined is b Vel. on plate of a.
Lines very sharp and clear

b Vel. 6405,^{4}
b Vel. 4502,^{5}

η Carinae 7417,^{4}
Like b Vel. + ι Scorpii
H + K are slightly narrower

A.G.C. 15305 on plate.
V type.

η Carinae 6291,^{3}

V type star A.G.C. 15305 also seen

η Carinae 6292,^{4}
Focus seems poor so that lines are not sharp. It is probably due to focus as the lines are hazy in the other stars on the

May 19, '97

plate.
A.G.C. 15305 seen
η Carinae 4754,^{31}

A.G.C. 15305 seen as in the other plates on a broad bright band on a faint continuous spectrum.

η Carinae 7355,^{4} poor, nothing seen clearly except the H lines.

A.G.C. 15305 looks on this plate to consist of one strong ~~dark~~ bright band at red end and several fainter ones towards the violet

ζ Puppis
7329,^{4}
5331,^{3} { These are all the plates. They are poor, but the spectrum looks like ζ Tau. in strength of H lines and H + K. The G band looks hazy towards the red. 4326.0 is not quite so strong as in ζ Tau.

May 19. '97

α Argus 3849,^{4}

H = K = ~~2~~ 2.0 F, G, & h

violet well shown

α Argus 3861,^{4}

11 Hyd. lines beyond K.

F, G, & h look hazy

α Argus 3860,^{4}

11 Hyd. lines seen beyond K

α Argus 3871

K = 0.8 H.

α Argus 3877,^{4}

K = 0.8 H.

Note ~~dark~~ bright streak bet. K & α.

also a fainter one beyond α.

H lines very broad.

α Argus 3888^{3}

very broad lines.

α Argus 3889,^{4} poor.

α Argus 3878,^{5} - Good in ultra-violet region

May 19. '97

α Argus 3892,^{4}

Over-exposed so that everything is burned out except the ultra-violet.

α Argus 7897$_{3}^{4}$

H γ looks distinctly double.

H β also looks double.

The other lines bet. H β & H γ seem wide.

K = H very nearly.

α Argus 7813$_{2}^{5}$

Lines sharp and clear.

α Argus 7801$_{2}^{5}$

Excellent.

α Argus 6241,^{5} Sharp.

α Argus 6163,^{5} Fine line burned out.

α Argus 5307,^{4c} too wide

α Argus 4597,^{5} Bright streaks in violet plainly seen.

May 20, 97

Description of α Argus.
H & K nearly equal. K slightly weaker.
K = 2 F, G, h
Bright streaks in violet, bet K & α, ~~and~~ one wide and one narrow one, and three fainter ones beyond α.
On the earlier plates, the H lines are very broad.
On one plate Hβ and Hγ are distinctly double.
Solar lines abundant but not strong.

May 20, '97

α Persei 7983$^{5}_{3}$
Looks nearly like α Can. Min.
Yet the H + K bands are decidedly wider in α Persei. The Hyd. lines also look hazier, solar lines more abundant and stronger. Hδ seems narrower than Hβ or Hγ.

θ Scorpii
7551$^{5}_{2}$
Like α Argus?
H + K hazier and slightly wider.
Other H lines clear, not hazy in any degree.
Same bright streaks at violet end.

θ Scorpii 5731,^{4}
Lines sharp!
Solar lines numerous but weak.
K = H = 3 F, G + h.

α Orionis 4185,$^{2}_{1}$
K = 0.9 H = 2 F, G, + h
Line near Hδ (3 Cap. line) is strong
Two lines stand out between Hγ & Hδ

May 20, '97.

α Circini 6400,^{4}

K = 0.9 H.

Lines sharp.

A sort of banding or shading seen in various parts of the spectrum.

α Circini 6514,^{4}

Certain lines strong.

α Circini 7567_2^{4}

H lines slightly hazy, as compared with α Carinae 7821.

Solar lines stronger not seemingly as a whole, but certain ones stand out from the others.

~~& f~~

H + K about equal to same in α Carinae

F, G, & h about 1.3 sharper than " " "

May 20, '97.

γ Muscae 7590_2^{3} Poor in definition. Hyd. lines hazy.

K sharp

K is weaker than H.

K = 0.7 H.

~~This~~

4038^{1} γ Muscae

This spectrum resembles θ Scorpii. The Hyd. lines are hazy here, however, whereas in θ they are sharp.

A.G.C. 16133 ~~also~~ on plate. Like α Tauri.

A.G.C. 16085 ✓ λ Muscae 6349^{40}

✓ A.G.C. 16133 on plate. ~~Probably~~ Under α Tauri.

η Scorpii 7598_2^{4}

K = 1.2 H.

K = 3-4 F, G, & h

Solar lines do not seem any stronger than in α Carinae

This plate is not sharp.

May 20. 97

α Hydri 7705$_2^4$
Cover marked Cl. F? Peculiar?
Hδ is very hazy. There seems to be a haze going from Hγ to next line of longer λ.

α Hydri 4300,^{2}
Nothing peculiar seen.
K = 0.8 H
K = 2 F, G, & h.
K is slightly stronger than in λ Muscae.

α Hydri 8087$_3^4$ poor
Nothing peculiar noted except hazy H lines and a general indistinctness in others. Can not find other plates.

May 28. 8071$_2^4$. α Hydri.
Lines very broad. Hyd. lines hazy
Examine plate for doubling.

May 20. 97.

μ Hydri 7273,^{3} 2^h 33.^{m}8
This marked β Horolog. by mistake
It is the only plate of μ Hydri
It is under α Bootis, showing a little absorption but not enough to speak of.

γ Hydri 5853,^{5}
K = H very nearly
Relative intensity of the lines about equal to θ Scorpii, but H lines are not so sharp here, and the solar lines are not at all well-defined.

θ Scorpii 7642$_2^3$
poor.
K = H.
Hδ hazy, and wide.

γ Tucanae 1785$_2^3$
Trace of G band seen

γ Tuc. 5987,^{3} poor
" " 5866,4 Trace of G band

May 20. 97

γ Luc. ~~5988,^4~~ $5392,^4$
K slightly stronger than H.
$K = 3\,H\gamma$
$H\delta$ is narrower than $H\gamma$.

γ Luc. $5988,^4$
Solar lines not so clearly seen as in 5392
This star seems a little nearer δ Canis Maj. than θ Scorpii does. The lines F, G, & h are a little weaker, and K is slightly stronger.
And the lines that form the G band seem to be a little crowded together.

ψ Luc. 7830_2^3

May 21. 97

$7308,^3$ A. G. C. 608, the only plate
poor spectrum
Probably under α Bootis. Hyd. lines rather strong.

$7308,^3$ A. G. C. 544. (also on plate)
Probably under α Bootis. Spectrum poor on edge of the plate.

7834_2^4 π Sag.
$K^2 = H^{\pi} =$ 3 F, G & h.
Lines are sharp. The slightest indication of the H band is seen.

o Sag. also on plate, at top, and spectrum is faint.

α Hydri 8017_2^4
$K = 1.1\,H$.
Hyd. lines especially towards violet are hazy, and solar lines look almost double. Is it focus?
There seems to be a sort of banding extending over most of the spectrum
A similar effect was observed in α Circini 6400.

May 21, 97.

ο Sag. 6541,^{4}
Two stars on plate.
One is ο Sag, the second-type star
The other is π Sag.

ο Sag. Like α Bootis.

π Sag. $K = 1.1 H$
$K = 4\text{-}5\ H\delta$.
The solar lines are not clear.

ο Sag. 6540^3
Same as above. Poor.

ο Sag. 4009,^{4}
Only the first-type star appears.
Is'nt it π Sag.? Poor.

π Sag. 5901,^{5}
$K = 1.1 H$

$K = 4 H\delta$
G band not seen, but the central
line 4302. (?) seems to stand
out stronger than surrounding lines

May 21. 97

β Caeli 6186,^{4}
$K = 1.2 H = 4 H\delta$
Some sign of the G band. There is
a decided haziness towards the red
probably due to the appearance of
other lines between 4302. + 4215
Hyd. lines hazy.
a star on plate, showing no K line

β Caeli 7177,^{4}
All lines hazy.
A star on plate with no K line
Hyd. lines very broad.

5970,^{3} β Caeli, narrow

7224,^{4} I Puppis
$K = 1.1 H = 3 H\delta$
Hyd. lines rather hazy.
No decided trace of the G band

7307,^{4} ζ Retic.
$K = 1.2 H = 4 H\delta$
Decided trace of the G band.

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