March 22, 1904

Examination of spectrum of ε Aurigae, on C plates.

C10837 (2 prs.) shows violet end. It was because violet end was thought ~~seen~~ to ~~be~~ extend farther beyond H & K than in other stars of similar type, that Dr. Eberhard suspected this star to be composite.

C10837 superposed on ~~C5399 α Can. Minoris~~
C.10620 α Cygni

Hydrogen system stronger in α Cygni, other lines much stronger in ε. Hydrogen system seen in ε nearly as far at violet end as in α Cygni.
In α Cygni, 12 hyd. lines of shorter λ than K.
In ε Aurigae 9 or 10 " " " " " "
Other lines are so much stronger in ε Aurigae, that the hyd. series do not stand out as in α –

C2310 ε Aurigae superposed on C2113 α Persei 1 pr.
Both show well developed violet end, of about same extent.

March 22, 1904.

ε Aurigae

The following C plates have been taken of this spectrum

C 317	$\overset{4}{3}$ prisms	
C 10816	4 "	
1460	1 "	lines burned out.
2310	1 "	good
2416	3 "	
4564	2 "	
6173	" "	very poor, only a part of the sp.
10815	" "	
10837	" "	

C 4564 taken superposed on C 10837

taken ; show no ~~such~~ changes.

Friday, April 8, 1904

Examination of peculiar spectra of ~~peculiar~~ photographed by request in Peru.

X 10755 π Scorpii

Lines hazy.

X 10756 ε Cap.

Hβ shows a bright line on edge of vi.
? Dark Hβ is very narrow and sharply defined. Hγ & Hδ very sharp, while the Orion lines are wide.

X 10757 υ Sag.

Hβ very faint and dark.
4387 broad, | * Few lines near, & of good very sharp
Lines 4387 and 4922 look like Hβ and Hγ, something like and map up as such but there is no line to correspond with Hδ. A faint bright line is seen near position of Orion line 5013. Spectrum towards red of this bright line is less intense, so that this line seems to form a head somewhat like those in 3rd type stars.

April 8, 1904.

X10759 ε Cap

$H\beta$ sharp dark & distinctly br. on edge of gr. λ.

$H\gamma$ also slightly bright on edge of gr. λ.

Orion lines hazy.

X10758 υ Sag.

Very narrow & poor.
$H\beta$ but distinctly seen

X10760 υ Sag.

The best phot. yet seen of the fine lines in this spectrum. Should be measured.

$H\beta$ bright on edge of gr. λ and a distinct bright line seen at about λ 5016.
Intensities strong near $H\delta$.
A special study must be made of this plate.

April 8, 1904.

X10761 ε Cap.

$H\beta$ very faintly dark with bright edge to red.

Hyd. lines narrow
Orion lines hazy.

X10762 υ Sag

Appears to be like 10760.

Bo. line seen bet. $H\beta$ & $H\gamma$

X10763 ε Cap.

$H\beta$ br. on edge greater λ
Orion lines hazy.

X10764 υ Sag.

$H\beta$ br. on edge greater λ.
A dark line of about same intensity as $H\beta$ is present on side of shorter λ of $H\beta$
Probably nearly like 10760, some differences in int. seen towards violet.
Bo. line seen bet. $H\beta$ & $H\gamma$.

April 8, 1904.

X10765 ε Cap.
Hβ very faint and bright on edge fr. X.
Orion lines hazy & broad.

X10767 ν Sag.

Hβ dark, very narrow and slightly bright to red, Br. line at 5013 clearly seen
Fine lines well shown

X ~~106~~ 10768 ~~ν Sag.~~ ε Cap

Hβ very faint. Appears to be faintly dark with bright edge ~~to red~~
Orion lines wide & hazy

X10769 ε Cap.
very poor plate.
Hβ barely seen

April 8, 1904.

X10771 ν Sag.

Hβ faintly dark. Shows fewer faint lines than 10760, but this may be due to atmospheric condition.

X10776 ν Sag.
Hβ almost invis.
Place occupied by two very faint dark lines of which one of gr. λ map up with Hβ. in 10760.

X10777 ε Cap.

Hβ very faintly dark with a bright edge to red.

X10772 ε Cap.
Hβ and 4922 both very faint and hazy.

X10770 ν Sag.
Probably like 10776.

April 8, 1904.

X 10779 ε Cap.
$H\beta$ very faint with bright edge
$H\gamma$ very faintly bright twr. red.

X 10780 A.G.C. 9181.

ω Can. Maj. shows $H\beta$ and $H\gamma$ bright

9181 shows $H\beta$ dark with just a suspicion of a bright line.
Other lines dark.

X 10781 ε Cap.
$H\beta$ in just a faint hazy blur.
with faint bright line seen.

X 10784 ε Cap.

Narrow. Too poor to see $H\beta$ distinctly.

X 10785 ε Cap.
$H\beta$ very faint. Bright line seen

April 8, 1904.

X 10786
ω Can. Maj. $H\beta$ & $H\gamma$ bright.
A.G.C. 9181, all lines dark.

X 10789
$H\beta$ extremely faint. λ922 also ft.
All Orion lines ft. and hazy.

X 10790 ε Cap.
$H\beta$ is a distinct though faint bright line, apparently superposed on a hazy dark band.

X 10778 υ Sag.

Like 10760 on casual exam.
It is now too late to make a careful study of the lines

X 10782 A.G.C. 9181
$H\beta$ & $H\gamma$ bright in ω Can. Maj.
all lines dark in 9181.
$H\beta$ is ~~fainter~~ less intense than $H\gamma$

April 8, 1904,

X 10783 υ Sag.

Some lines near Hζ, which are visible on 10760 are not seen on 10783.

X 10788 υ Sag.

Spica lines well seen.
Hβ dark

April 8, 1904. 23h

X 10641 A. G. C. 9181,

9181 shows Hβ very narrow and slightly bright on edge of gr. λ. This spectrum looks like some of ε Cap. Hβ and Hγ are very sharply defined. 4471 is also sharp.

X 10646
A. G. C. 9181. Hβ sharply defined band, has a very faint brightening on edge shorter λ.

X 10659 A. G. C. 9181
Hβ narrow and dark but may be bright-edged faintly tow. red.

9198 shows Hβ and Hγ bright

Monday, April 25, 1904

υ Sagittarii Sept. 5, 1888

B 2873
I think this is the plate on which Hβ was found to be bright by Mrs. Fleming and announced some years ago. The brightness is very faint, (hardly 1 on my scale) and there seems to me to be a dark line superposed.

Upon careful examination, this faint bright line seems to be of slightly greater λ than Hβ, and I do not see Hβ at all. Hγ and Hδ are very faint. This bright line probably corresponds with the line seen on X plates or it may be the extreme edge of gr. λ of Hβ.

B 2872 Sept. 5, 1888

υ is near the edge. Hβ not seen. All lines indistinct.

April 25, 1904.

B 30448 υ Sag. July 25, 1902

Hβ is a narrow dark line ~~about~~ ~~equal to~~ stronger than 4922. Violet end quite strong, and lines do not agree with those of the bright star near of spectrum A or F or H. This end should be compared with a bright star of Orion type in same dispersion.
Line 3819.2 appears to be seen near Hη.

B 30435 July 24, 1902
Hβ very fine and dark. All lines indistinct.

April 28, 1904 $21^h 31^m$

Spectrum of υ Sag
C 13857
Violet end examined. Comparison with β Orionis on C 13750

C 13857 shows $H\gamma$ < 4387. $H\beta$, very not distinctly seen on account of absorption on isochromatic plate. This is a poor plate but evidently representing the phase of faint hydrogen lines.

Lines present in υ common to β Orionis

4471
4481
4387 – Extends farther twr. violet in υ.
4144 stronger in υ than in β
{4131
{4128 seen together on these plates both stars
4120
4116? Not in β, but seen in υ.
4026
4009 wider in υ, may be joined to solar lines
3994
Line bet. 3994 & $H\epsilon$ seen in both plates not in Table 25, Vol. 28.

April 28, 1904.
Cont. of preceding.

Between $H\epsilon$ and $H\zeta$ this plate of β Orionis is too poor to tell with certainty, but the strong lines seem to be present in both spectra. Between $H\zeta$ and $H\eta$, the same strong lines seem to be present in υ as in β. These lines are 3872 & 3867 due to helium and and 3863 and 3856, due to silicon.

3819.2 appears even stronger on this plate of υ than of β –

3872 + 3867, due to helium, are much stronger in υ than in β –

Line bet. 3819 & $H\theta$ is seen in both spectrum. This line is not given in Table 25.
Strong line seen in υ bet. $H\theta$ and $H\iota$ about half-way. This line may be present in β, but if so it is very faint and hazy. It is very strong in υ.

$H\kappa$ very narrow in υ. $H\iota$ is medium.

April 28, 1904.

C 13857 υ Sag. (cont.)
$H\beta$ is not seen on this plate but 4922 is quite strong.

$H\gamma < 4387$
$H\delta < 4128-31$

$H\epsilon$, ~~$H\zeta$~~ K and 4026 are of nearly equal intensity.

C 13857 compared with C 13859 α Cygni
The violet end of υ agrees much more nearly with that of β Orionis than with α Cygni.

In α Cygni there is a trace of a line betw. $H\delta$ and $H\epsilon$ but of no great intensity and probably not the same as the strong band seen in υ.

The violet end of υ appears to be more of Orion type than later on this plate which shows the faint phase of the hydrogen lines.

April 28, 1904.

υ Sag.
X 10764 compared with sp. of η^2 Doradus X 10088, sp. Md, to see if bright streaks at red end of υ agree with the bands in a third type star.

The bright line of shortest λ comes quite close to the band 4954, but the brightest line in υ is of considerably greater λ. There does not appear to be any resemblance betw. this spectrum and third type stars.

These bright lines in υ appear to be anomalous.

δ ~~Orionis~~ Centauri shows bright lines in this region on X 9197 but they do not appear to be the same as these lines. In δ Cent. the bright lines are identified as 5015.7 and 5047.8.

Saturday, April 30, 1904.

X10449 υ Sag. (Slide 2040)

$H\beta$ appears to be a very faint bright line on this plate. 4922 also has a bright edge.

The brightness of $H\beta$ is extremely faint, hardly 1 on any scale.

Monday, May 1, 1904 22h

υ Sagittarii

Re-examination of all the X plates for detecting changes in intensities of lines other than those of hydrogen.

X10260 July 17, 1901.

Lines very hazy & indistinct. X10259 is a chart plate, and it is possible that the prism was not well adjusted for X10260. X10261 ε Cap. shows hazy lines also. Hence it may be that the haziness is due to instrumental conditions, but not the faintness of the hydrogen lines.

$H\gamma < 4387$

$H\delta < 4026$.

$H\beta$ not clearly seen

Plate too poor to show fine lines or to make close comparisons. On superposing on X10266 taken the next night, no certain changes are seen.

$H\beta = 0$

$H\gamma = 0.5$ (4387)

May 1, 1904.

o Sag.
X 10266.

Helium very strong.

What is line of gr. λ than Hδ? It is not 4116, as it has shorter λ. 4116 also appears to be present, slightly less intense than this unknown line. I will call this line ψ.
Lines very hazy, and fine lines barely distinguishable.
X 10265, taken the same night (ε Cap.) shows lines rather broad.

Line taken for 4116 is found to be 4120, and I think "ψ" may be 4116 – May 3 –

Allowing for instrumental errors it does not seem possible that the changes in the faint lines seen by comparing this plate 10266 with 10764, could all be instrumental.

Strongest lines are
4471 = 4481
4387
4144
4128-31
4116
~~unknown~~ ψ
4026
K

Hyd. weak.
Several fairly strong lines bet. Hβ and 4471 have not been identified.
Hβ is seen and nearly as strong as 4922
Hβ = 3?

May 1, 1904.

X 10268
Plate very poor.
Lines barely seen.

X 10331
Hβ = 1
4922 br. on edge gr. λ. Brightness = 1

The line ψ is quite strong and nearly equal to Hδ. Lines of ~~shorter~~ greater λ than Hε + K not seen as on X 10764. Perhaps the lines H + K are too wide and hazy to show these fine lines.

X 10355
Hydrogen at max. absorption.
The Orion type sp. is predominant.
Hε > 4026
Hδ > 4128
Hγ > 4387
Hβ much > 4922.

Hβ = 10
Hγ, Hδ double
Fine line to red of Hε not seen
ψ = 4116.
Line ψ appears to vary.

May 1, 1904.

X10355 (cont.)

Sp. appears to be like β Orionis as to all the stronger lines, and the familiar lines appear to be due to the other star.

K appears to be widely double or to have a fainter band to violet

X10272

Hβ mixes or 1

4922 bright to red.
4471 ≤ 4481. Otherwise, helium very strong.

X10483
Hβ absent. Other hydrogen ft.
Judging from intensities of the lines this sp. is more nearly like that of 10355 with strong hyd. lines than of 10764

May 2, 1904 8^h —

X10629
Hβ = 1

Tuesday, May 24, 1904

Examination of C plates.

C 14832 υ & ρ Sagittarii May 22, 1904.

Both spectra hazy, atmospheric condition being probably very bad.
The faint phase of the hydrogen lines is seen in υ Sagittarii. The violet end is stronger in υ than in ρ. The spectrum of υ appears to be like that of C 13857 (see p. 14) as far as general effect goes.
Image too poor for details.
Hβ is not seen at all in υ, but the focus is very poor at violet end.

C 14821 υ & ρ Sag. May 12, 1904

Images very narrow, & near the edge.
υ Sag. Hβ not seen. Spectrum appears to be just like that in C 13857

May 24, 1904

C 14823 Com. Ber.
very good plates
8 spectra seen, and part of another.

H.P. 2103 (1) K line very sharp.

Sp. A2F, like ι Centauri.

H.P. 2111 (2) A2F or possibly A3F.
hydrogen lines seem to be slightly fainter than in (1), but am not sure.

H.P. 2109 (3) Not all on. Hβ & Hγ are about as in (1) Hδ & Hε not on

(4) H.P. 2117 Peculiar K not seen. Like θ Aurigae & 12 Can. Ven. nearly, also resembles α Doradus
Is nearly like τ⁹ Eridani

H.P. 2116 (5) A3F

(6) +27° 2138 A3F.

May 24, 1904

C14823 (cont.)

(7) ″ ✓ a3 F
+26° 2352

(8) ″ ✓ a5 F
+26° 2345

(9) ″ ✓ a5 F.
+26° 2343

C14822 Com. Ber.

(4) Peculiar. Not so good an image as on 14823

Other stars too faint

C14824 Com. Ber.

(1) a2 F

(2) a2 F

(3) Interruption

May 24, 1904

C14824

(4) Peculiar. but narrow image and fine lines are burned out.

(5) a3 F

(6) a3 F

(7) a3 F

~~(6)~~ (8) a5 F or F. $K = H_\epsilon$ but solar lines not well seen. This may be due to faintness

(9) a5 F

C14826 ν & ρ Sag

ν not on plate.

Tuesday, Sept. 20, 1904   23

67 Urs. Maj. C 14852   H.P. 2054 = DC 5984

A3F. with strong lines resembling δ Normae.

C 14853   α Cygni

Focus plate, Too dense

C 14854   H.P. 3162;   – Serpentis $5^{m}71$
Qual. 2

Too poor.

η Delphini C 14855   H.P. 3597 = DC 9172

A2F.

7 Pegasi. C 14856   H.P. 3826 = DC 9489

2nd type
Shows bands, but too faint to classify.

Sept. 20, 1904

f Ophiuchi C 14857   H.P. 2942 = DC 7629

A2F.

18 Aquilae C 14858   H.P. 3264 = DC 8568   f Aquilae

B8A. Good example. 4026 much more intense than K. 4471 and 4481 are about equal.
This is classed A in Prov. Cat. from ~~B plate~~ I plate, but it should certainly be B8A.

ι Delphini C 14859   H.P. 3607 = DC 9191

A2F.

6 Com. Beren. C 14860   H.P. 2079 = DC 6059

Too poor to classify.

π Serpentis C 14861   H.P. 2687 = DC 7196

A2F   ~~Nothing~~ Little seen but hyd.
lines & K

Sept. 20, 1904.

— Draconis C 14862 H.P. 2084 = DC 6085

A2 F.

84 Urs. Maj. C 14864 H.P. 2337 = DC 6565
1st type
Too poor

✓ C 14865 H.P. 2337 = DC ~~6565~~ 6565

84 Urs. Maj. (1) Peculiar — just like H.P. 2117
See p. 25

(2) Ma. +55° 1625 = H.P. 2315 = DC 6536.

e Capricorni C 14866 H.P. 3838

K

47 Capricorni H.P. 3844 also on plate. Sp. Ma.
Hugs is classed A? in D.C.
The image is good on this plate.
Check ident.

13 Com. Beren. C 14867 H.P. 2103 = DC 6119
A2 F.

H.P. 2098 = 12 Com. Beren. Also on plate.
Composite spectrum, resembling c³ Aquarii
K is fainter than H. hydrogen lines
are strong, and G band is developed

Sept. 20, 1904.

ρ Aquilae C 14869 H.P. 3523 = DC 9062
A — very narrow.

33 Bootis C 14870 H.P. 2448 = DC 6784
A.

ψ Aquilae C 14871 H.P. 3453 = DC 8945
A2 F.

13 Delphini C 14872 H.P. 3651 = DC 9243
Too poor. A or A2 F.

δ Equulei C 14873 H.P. 3735
Quality 2
Too poor

— Equulei C 14874 H.P. 3772
Qual. 2. Too poor.

Sept 21, 1904 0^w

7. Pegasi C14875 H.P. 3826

K5M.

74 Urs. Maj. C14894 H.P. 2122

1st type.

Too faint. very narrow.

74 Urs. Maj. C14895 H.P. 2122

A5F

Oct. 12, 1904

C15019 υ Sag. + ρ Sag.

Image of υ is too narrow. Hdy. lines Hγ and Hδ appear narrow. Hβ not seen but image too dense to tell whether it is really present or not.

Hγ < 4387

C15026 υ + ρ Sag.

Hβ invis. or an extremely fnt. dark line

Hγ + Hδ very narrow.
Good of lines in violet and these ought to be especially studied.

C15041 υ ~~[illegible]~~ ρ Sag.
very narrow. No changes seen from C15026

C 15045 υ Sag.
very good image. Hβ is a very faint dark line

Oct. 12, 1904.

✓ C 14902

18 Aquarii DC 9395 H.P. 3770 21 19 - 13.3

✓ A5 F. Just like α Pictoris

C 14903

ν Draconis DC 7633, 7634 H.P. 2945 and 2946

These spectra are partly superposed. They are nearly alike and probably A5 F. Pec. In the intensities of some of the lines, they resemble δ Normae

Reserved to be examined when I have more plates of the same dispersion. Former C plates are of greater dispersion.

– Sagittarii ✓ C 14904 DC 8570 H.P. 3263 ✓

Sp. B5 A. or possibly B3 A.

4128-4131 is seen but of less intensity than 4120

✓ Second examination shows that this is nearer B3 A.

Oct. 12, 1904

✓

ξ Aquarii C 14905 DC 9468 H.P. 3811

A3 F or A5 F

K < H but seems to be a little more intense than Hδ

K = 1.1 Hδ
I think this is nearer A5 F than A3 F.

✓

ω² Aquarii C 14906 D.C. 10289 H.P. 4190

Sp. A

H.P. 4189 = DC. 10288. very poor. Sp. K;

95 Herculis C 14907 DC 7866, 7, 8. H.P. 3026 3027

Only two spectra on plate

DC 7866 (U) & 7867 = 95 Herculis

The ft. edge referred to is not sp. of fainter star, because the edge is also seen on DC 7878, the other sp. on plate; ∴ must be instrumental. This must be a close double. Plates I 8729 and I 11804 show the images single & prismatic comp. single. Mch. 20, 1915. See also p. 156.

Probably two spectra superposed, as a faint edge is seen on preceding side. It looks as if the fainter star were Class G and the brighter A or near A. K is less than H, and Hβ, Hγ, Hδ, very strong, but the G band is seen distinctly

Spectrum certainly composite

Oct. 12, 1904 ✓

H.P. 3033 = 96 Herculis (2) ✓ C 14907 (cont) DC 7878

B3A.

δ Aquilae ✓ C 14908 DC 8840 H.P. 3394

Sp B3A. Poor focus. A better plate might show it to be B2A.

C 14909 DC 9328, 9329
H.P. 3726, 7

γ Equulei (1) (5) Peculiar, F?
Identify line marked.

6 Eq. (2) A2F.
H.P. 3727

11 Pegasi ✓ C 14910 DC 9521 H.P. 3851

~~A2F~~ A ✓ 4481 is the only conspicuous solar line.

Oct. 12, 1904

β Piscium ✓ C 14911 DC 10025 H.P. 4077

Announced by Frost in A.P.J. 18, 389, as having bright hyd. lines

Hβ, Hγ and Hδ bright superposed on dark bands. Hβ = 3

Sp $B\overset{5}{3}A$ ✓. I do not now recall another sp. showing all three lines bright, and also showing the dark Hβ so broad.

29 Piscium C 14912 DC 10462 ✓ H.P. 4245

B8A ✓. K ~~seems~~ is not distinctly seen. Otherwise the sp. appears to be of normal B8A type. Focus is poor at violet and that may account for the absence of K.

DC. 7334 = H.P. 2781
C 1491$\overset{4}{\cancel{3}}$ ~~DC 7312 H.P. 2766~~

~~γ Drac.~~ (1) H.P. 2781 = A Draconis A2F? or O new? K is quite strong also 4026. May be composite. Plate needed giving better focus.

H.P. 2765 (2) Faint sp. on plate.

Class K

Oct. 13, 1904

~~A~~ Draconis η C1491~~4~~ 3 DC ~~7334~~ 7312 H.P. ~~2781~~ 2766

G5K.

~~A2 F1. 40 x 6 quite strong. May be composite.~~

~~Repeat~~ +62°1478 is also seen adjoining this sp. and also a~~ppears is late~~ G5K

30 Pegasi C14919 DC9738 H.P. 3948 ✓

Too narrow.
Only hyd. lines seen
May be A or some division of B

Repeat

31 Pegasi C14920 DC 9748 H.P. 3957 ✓

Too dense.
Probably Orion type

Repeat

34 Piscium C14921 DC 36. H.P. 12

Too poor.
May be Orion or A

Repeat

Oct. 13, 1904

ε Piscium C14922 ✓ DC 544 = H.P. 162 ε Piscium

Too narrow & poor.

K = H. Probably G.–

Repeat.

– Serpentis ✓ C14923 DC8349 H.P. 3162

~~A2 F~~
A. solar lines not seen, K nearly as strong as in A2 F.

6. Scuti C14948 DC8373 H.P. 3174

Class G. Very good example.

– Scuti C14951 DC8102 H.P. 3102

G5K. Very good example.
Hγ < 4322.

Oct. 13, 1904

{o Draconis C14952 DC8819 H.P. 3389
{61

G5K with some advance towards K in strength of λ 4227 and a few other lines. Intensities peculiar should be studied. Compare with a K star of same dispersion
C14959 DC8668

F? Too thin

Repeat

– Sagittarii C14970 DC10168 H.P. ~~3314~~ 4149

G5K

– Sagittarii C14971 DC8263 H.P. 3142

B8 or 9 A.

Too thin

Repeat

Oct. 13, 1904

27 Pegasi C14974 DC9648 H.P. 3912

H.P. 3917 (1) π Pegasi ✓ F5G. Good spectrum

H.P. 3912 (2) G5K.

16 Lacertae ✓ C14975 DC9979 H.P. 4055

H.P. 4055 ✓ B3A ✓ Fainter sp.

H.P. 4073 ✓ = o Andromedae B3A. Br. sp. near edge. These may be the same

– Lyrae ✓ C14977 D.C. 8046 H.P. 3079

✓ B5A Rather thin. Line 4026 appears unusually strong.

π Draconis C14978 DC8716 H.P. 3345

A or F. Good

12 Lacertae C14981 DC9881 H.P. 4014

B2A. Good

Oct. 13, 1904

ι Androm. ✓C14982 DC1824/ H.P. 4176

Probably ✓B8A. Thin.

On comparison this is certainly B8A.

ι Aquarii C14987 DC9621 H.P. 3901

B8A on re-examination

B8A? or B9A. Focus poor.

— Draconis C14993 DC8535 H.P. 3249

(1) B3A. Excellent example

(2) G or G5K. Image thin

θ Cephei C 14994 DC9170 H.P. 3594

✓ A5F. Hyd. lines rather narrow. Compare with others.

Oct. 13, 1904

2 Lacertae C14995 D.C. 9751 H.P. 3953

B5A✓

53 Piscium✓ C14996 D.C. 265 — H.P. 84 0 31.6 +14.7

B3A.✓

~~f³ Cygni~~ C14999 D.C. ~~9076~~ ✓9080 H.P. ~~3529~~ 3532 20 11 +56.3

A3F.✓ Focus poor for solar lines.

η Androm. C15000 D.C. 482 H.P. 150

η Androm. (1) G5K✓

H.P. 141 = 36 Androm. (2) ~~A~~ ~~K.~~ ~~K5M~~ Rather faint. K

λ Ceti ✓C15001 D.C. 1713 H.P. 477 2 54.3 +8.5

~~[illegible]~~ B5A✓

— Sagittarii C14959 D.C. 8668 H.P. 3312 19 14.6 −22.6

✓ A5F? Too thin

Line 4077 quite strong as in α Circini.

Repeat

Oct. 13, 1904

57 Aquilae
-8° 5154

✓
C 14972 D.C. 8932 H.P. 3441

Two spectra superposed.
The brighter star shows the Orion lines 4026 and 4471.

-8° 5155 The fainter shows only the hydrogen lines with a suspicion of 4471. Hyd. lines very hazy in this star.

Hβ appears to have a bright streak through centre and more photographs should be taken to see whether this fainter component really has Hβ bright.

Trace of a bright line also seen superposed on Hγ dark, not centrally but towards the red.

Oct. 13, 1904

δ Bootis C14928 D C 6654 H.P. 2385

Quality 1.

Repeat.

C14901 DC 8052 18 13 + 64.4
H.P. 3081

36 Draconis

Quality 2i

Too thin. Hγ + Hδ are strong absorption lines K not seen.

Repeat.

Oct. 14, 1904

C14998 DC 7595 H.P. 2928

Too poor

A3F?
Repeat.

✓
C14985 DC. 8932

H.P. 3441 = ✓
DM −8° 5154 Two spectra superposed. The brighter star is probably B3A, 3819, 4099, 4026, 41~~20~~44, 4387, and 4471 all being seen.

✓
−8° 5155 The fainter star shows only the hyd. lines. They are very wide and hazy. This is probably due to the superposition.

✓
−8° 5150 Sp. K. Faint.

Oct. 14, 1904.

C14918 ε Lyrae.
Two spectra seen.
DC 8356-7

A5F from intensities of hyd. lines and line K. Solar lines not well seen

DC 8354-5

Very nearly like that of D.C. 8356, 7, but K ~~seems to be~~ is slightly less intense.
Sp A3F. Solar lines not well seen

Oct. 15, 1904

C 15045 ω Sag.

Type of spectrum is just the same as C 13857 (see p 14) only the lines are narrower on C 15045.

Wednesday, Oct. 25

21^{2}

C 15043 DC 9848
9867

Two peculiar objects on this plate.

(1)
D.C. 9848
DM +38°4808
Clearly double on I 19449.
Both components bright. The southern one is brighter. ¥
H.P. 3997 =
¥ 8 Lacertae

A double star. Hβ is missing, or perhaps is a very faint bright line, in the ~~component~~ spectrum of the southern component.
Very little difference in the intensities of the lines in these two components. More plates should be secured to see whether this is another Hβ variable spectrum.

(2)
D.C. 9867 =
H.P. 4005 =
10 Lacertae

This spectrum shows the additional lines of hydrogen, and is very nearly like τ Canis Majoris. Lines seen besides those of hydrogen Hβ etc. 4686, 4649, 4542 (hydrogen) 4471, 4387, 4200, 4144, 4120, 4116, 4096(?) 4089, 4026, K(?), 3819, (3924?)

Since only 14 stars having this spectrum were found in classifying the 1803 stars contained in Vol. 28, this may be considered a rare type at least among the brighter stars.

Oct. 25, 1904.

✓ C15052 DC972 = H.P. 272.

G5K.

C15058 ✓ DC 263.

B3A or B5A. The sp. is too dense and it is difficult to judge of the relative intensities.

Except for the intensity of 4128–31, which is equal to that of B5A, the sp. is ~~[illegible]~~ of B3A.

✓ C15059 DC1350 = H.P. 377

Sp. F. K = ~~Hδ~~ or 1.1 Hε

✓ C15065 DC803.

Sp. F.

K = ~~1.1 Hδ~~. 1.1 Hε.

✓ C15066 DC1579

also = H.P. 436 η Ceti. (1) B5A

-15° 478 (2) F5G.

-15° 473 also on plate Sp. F.

Oct. 26, 1904 0h

✓ C15067 DC2621

D.C. 2621 = H.P. 813. (1) A2F.

-12° ~~967~~ 969
6.9 = D.C. 2640. (2) A2F

-13° 937
-13° 938 = D.C. 2614 (3) A Hydrogen lines very thick and probably double, with fainter comp. towards the red.

Better omit -13° 937 & 938.

C15055 α Lyrae

A.

C15072 DC 10254

✓ also = HP. 4177 (1) B9A. Good.

✓ +48° 4127 (2) A3F.

C15078 ο Sag.

Just like that on C15045.

Hβ very faint. Hγ < 4387. Good of violet end.

Oct. 26, 1904

C 15056 v Sag
Poor image
Just like C 15045 & C 15070.

Oct. 28, 1904 $0^h 38^m$

C14915 DC9969

A2 F, from strength of K,
A, from solar lines, only 4481 being distinctly seen

Probably nearer Sp. A.

Saturday, Oct. 28, 1904 22^h

X10798 κ^2 Apodis

Images narrow and dense. Lines burned out.

X10799 ε Cap.

Hβ very faint and hazy.
4922 also faint and hazy.
The two lines look alike. No bifidness seen at Hβ.
All lines broader than on 10790.

X10880 π Scorpii
Lines double. Fainter component to red.
Focus poor and lines blurred but the fainter lines are seen at 4387 and 4471.

X10809 κ^2 Apodis
Locality "2"
very poor. Hβ seen in κ^2
Hβ not seen in κ^1

Oct. 28, 1904

X10810 ε Cap.
Whole spectrum very blurry.
Hβ and 4922 as on X10799, only fainter.

X10811 υ Sag.
Hβ not distinctly seen. As compared with 10788, this sp. shows very few fine lines. Some of this may be due to focus, but not all.

Hγ < 4387.

X10815 ε Cap.
All dim and faint.
Hβ barely seen.

X10814 κ^2 Apodis
very poor.
Hβ not seen in κ^1 Ap—
4472, 4387, Hγ, Hδ, 4026, Hε, Hζ seen

A κ^2 Hβ well marked

Oct. 28, 1904.

X10816 υ Sag.

Except as to intensities of hydrogen lines, this spectrum is like X10357, and shows few of the faint lines. In the intensity of the hydrogen lines, it resembles X10788.

Additional plates seem to complicate instead of simplify the peculiarities of this spectrum.

X10819 κ^2 Apodis
narrow
A very faint trace of $H\beta$.
Image too poor to do much with.

X10820 ε Capricorni
Lines broad and hazy
$H\beta = 4922$, both of H. & hazy.

X10821 υ Sag.
$H\beta$ is a very fine dark line, barely visible
$H\gamma < 4922$
In other respects, the spectrum is almost exactly like that in 10357.

Oct. 28, 1904.
X10824 κ^2 Apodis

κ^1, $H\gamma$ and $H\delta$ are very fine dark lines.
$H\beta$ is invisible
The Orion lines are very broad and faint
It does not seem possible that the hydrogen and helium lines in this spectrum proceed from the same body, unless the two elements are present under entirely different conditions.
κ^2 Apodis. Lines well marked and none are narrow as in κ^1.
X10825 ε Capricorni
$H\beta$ and 4922 faint. A faint trace of a bright line is seen on $H\beta$ dark

This is the best of the faint lines in ε. of the plates examined to day.

X10826 υ Sag
$H\beta$ faint.
$H\gamma < 4387$
* ε Aurigae lines faint
β Orionis lines strong.

Oct. 28, 1904

X10829 κ'_2 Apodis   June 7, 1904
Too narrow and dense.

X10831 ε Cap.   June 7, 1904

Lines very hazy. Fine lines not seen as on 10825, taken the night before. Is this real or due to focus?

X10832 υ Sag.   June 7, 1904
Probably same as 10826.
4922 stands out as a strong line.
Study these lines with care.

X10840 κ'_2 Apodis
Poor spectrum but the lines Hγ and Hδ are broad, and not sharply defined as on 10824.

X10841 ε Cap.
Hβ ~~and~~ 4922 broad and faint.
No change.

Oct. 28, 1904

X10842 ε Cap.
Hβ broad and faint, perhaps a little < 4922.
No changes.

X10843 υ Sag.
Too narrow.
Apparently the same spectrum as on 10832 and others examined today.

X10846 κ'_2 Apodis
κ' Hβ not seen.
Hγ and Hδ not very narrow as 10824

X10847 ε Cap.
Like 10842

October 31, 1904 22^h

X10848 v Sag

Hβ invisible
Hγ & Hδ very faint.
Otherwise the sp. is very nearly like 10357, where the hyd. lines are quite strong.
The ε Aurigae lines are faint.

X10851 κ'_2 Apodis
Image too narrow and dense.

X10852 ε Cap.

Hβ very hazy and less than 4922

X10853 v Sag.
Definition seems much poorer than in ε Cap. the preceding plate taken the same night.
Spectrum the same, or nearly the same as on 10848.

X10854 J Velorum
Hβ dark with no bright line

October 31, 1904

X10855 η Carinae
This spectrum ~~is~~ shows numerous bright lines but does not show the dark lines as on 4709. It seems strange if those dark lines are always present, why they can not be photographed again!

The other stars on this plate show no differences from former plates and will not be recorded separately

X10856 - κ'_2 Apodis

Broken. Where is plate?

X10860 β Lupi
Lines single, slightly broad

X10862 # μ_2 Scorpii

μ^1 Lines very wide and double but the focus does not seem to be good enough to show the separation clearly
μ^2 Lines ~~sharp~~ rather broad for this star

Oct. 31, 1904.

X10872 π Scorpii
Lines single, slightly hazy.

X10871 η Centauri

Hγ is quite sharp. Orion lines are very wide. Hβ is a faint dark line superposed on a faint bright line.
Dark component of Hβ lying to violet is not seen, but a faint line to red is suspected.
There is no trace of the solar lines.

X10873 μ_1 Scorpii
Lines double, stronger component to violet.

X10881 μ_2 Scorpii

Lines single but wider and hazier than in μ_1 Scorpii

November 4, 1904

C 15043
DC 9848. Two images of this double star.

The wider image does not show Hβ in the northern component, although Hβ is clearly seen in the southern component which has greater λ than ~~the~~ Hβ of the northern star would have.

The narrower image is very poor at red end, but I seem to see a hazy Hβ of the northern component. but it is certainly fainter than in the southern component.

Evidently, this star needs to be watched and more photographs should be secured.

See also p. 49.

This star is not given double in DM or in H. P., or in vol 45, H.C.O. but is given double in the Potsdam photom. catalogue, magnitudes 5.92 and 6.68
5.92 = nf component
6.68 = sp "
These are 4133 and 4134 p. 435, Part II Potsdam Photom. DM.

Nov. 4, 1904.

C15043 (cont.)

DC9848. Both components show the presence of Orion lines. The northern component (5.92 magn.) shows 4009, 4026, 4387 & 4471 with one or two others suspected. n.f. = 5.92
The southern component shows 4026 certainly and several others are suspected. s.f. 6.68

+..°

November 15, 1904

Continuation of examination of C plates

✓C15122 DC9642

B3A.
Lines (2) of shorter λ than K are ~~[illegible]~~ seen clearly.

θ Andr. ✓C15123 DC103 0 12 +38.1
= H.P.46

A2F

ρ Androm. DC.136. H.P.49 partly on plate. Sp. F5G.

✓C15124 DC595 1ʰ 02 +43.4

✓A$\overset{3}{\cancel{2}}$F Fine lines are stronger than in DC123

✓C15125 DC1018 1 45.4 +54.6

(1) B3A DC.1018 = H.P.283

✓(2) A2F +54°408 = DC1037.

+54° ~~394~~ 393✓ DC1012 (3) Faint but resembles τ^9 Eridani. Only hydrogen lines and ~~[illegible]~~ 4128-31 seen

Nov. 15, 1904.

C15125 (cont.)

~~+54°393~~ (4) ~~= DC1012~~ DC 2448 = H.P. 735

On plate with red end turned the other way from that of the three other plates. Prism evidently reversed before this exposure was made.

Sp. B3A with line 4128-4131 clearly visible.

DC1889 = +54°672

C15126 ~~DC 1335 2 15.3 +55.4~~

a5 F. very poor and thin

~~Image too thin. Repeat.~~

C15127 DC9646 22 4 -28.8

a5 F. Only the hydrogen lines and K seen. Image very narrow. Low altitude of the star probably makes it hard to get a good spectrum.

Nov. 15, 1904.

C15128 DC9914 = H.P. 4028. 22 42 -14.6

D.C. 9914 = (1) H.P. 4028 B9A. 4026 seen distinctly.

H.P. 403(2) = D.C. 9927 K5M ~~or Ma.~~

Map up with typical sp.

I think this is more like α Sacci

C15129 DC118 = H.P. 42 0 1.3 +36.2

A or A2 F. Only the hyd. lines and K are seen, but the line K is as intense as in A2 F.

C15131 DC1304 2 12.8 +46.9

(1) A

DC1318 (2) B5A.

DC1305 (3) A3F

DC1265 (4) K

DC1245 (5) ~~A5G~~ F

✓ Nov. 15, 1904.

✓ C15132 DC1773 3 1.8 +49.2

G. good example.

C15134 v Sag. Nov. 2, 1904.

Image very poor but sp. shows no change. 4387 > Hγ.

✓ C15136 DC616 1 0.4 +68.2

A. Image hazy.

✓ ✓ C15141 DC9987 22 53 +48.2

Clock irregular.

D.C.9987 = (1) H.P.4060 B3A

H.P.4058 (2) DC9983 ✓ ~~Probably K5M.~~

On second examination, this is classed K. The bright bands between Hγ and Hβ do not agree at all with those of K5M stars.

Nov. 15, 1904

✓ ✓ C15142 DC317 = H.P.100 0 36.5 +50.0

B3A, with 4128–4131 and 4481 seen.

✓ ✓ C15143 DC723 = H.P.209 1 14 +26.8

A2F.

C15110

✓ H.P.4097 = (1) DC ~~10056~~ ✓ 10061 B9A. 4026 > K. Better focus might show this. Also B8A.

✓ (2) A3F H.P. ~~4097~~ ~~4102~~ ✓ = DC ~~10061~~ 10075

✓ (3) Mb H.P.4095 = DC10056

DM +8°5020 ✓ (4) Mb. Faint but bands clearly seen.

Nov. 15, 1904.

✓ C 15104 DC 1044 1 48.2 +68.2

B8A.

✓ C 15102 DC 9703 22 10 +45.0

✓ A.

(2) +44°4083 = A3F.

C 15103 DC 10836 23 43 +67.2

(1) A

~~(2)~~

(2) B3A. Hβ off the edge of plate

✓ C 15112 DC 2713 4 46.9 +55.1

✓ A. poor image.

C 15113 DC 355~~9~~8 = H.P. 1168. 6 10.8 +59.1

✓ A.

Nov. 15, 1904

superposed { C 15006 v Sag. & ρ Sag.
C 15012

v shows the faint phase of hyd. lines

ρ = ~~[illegible]~~ F.

C 15078 v Sag.

Very dense. Probably no change.

✓ C 15111 DC 2321 3 59.1 +50.1

Sp. A

(2) DC 2337 Sp. A.

✓ C 15120 DC 103 0 1.2 +38.1

θ Androm.

✓ (1) A2F DC 103 = H.P. 40

✓ (2) F DC 136 = H.P. 49

ρ Androm G band partly formed. Probably means F5G.

Nov. 15, 1904.

C15114 υ Sag.

Hγ < 4387.

Reserve for careful study.

✓ C15115 H.P. 3903 22 0.1 +64.1

Slightly peculiar. K < H but solar lines quite strong and a trace of the ~~G~~ band is seen

✓ Probably A5 F.

~~Reserve~~

✓ C15092 DC885

✓
D.C.885 (1)
H.P. 248 υ Androm

G

✓
H.P. 259 = (2)
DC919

B & A. Lines very indistinct, but 4471 and 4481 are seen distinctly.

Nov. 15, 1904.

✓ C15116 DC10206 = H.P. 4157. 232.8 −21.4

✓ ~~A2F~~

A solar lines not seen

C15117 DC678 $1^{h}8.9$ −8.5

✓ F? Too poor to classify with certainty

Repeat

C15118 υ Sag.

Faint phase of hydrogen lines

Fair of the fine lines

✓ C15119 DC10059 234.7 +74.8

✓ G5 K

✓ DC 10115. A2F

C15093 DC1754 259.6 +24.9

✓ A?

Too poor. Repeat.

Images narrow & lines burned out

Nov. 15, 1904.

C15094 DC2475 4 16.5 +25.4

✓ Focus too poor to determine whether this is B8A, B9A or A.

Repeat.

C15095 DC3200 5 33.5 +35.8

Sp. appears to be peculiar.

✓ The strongest lines are of Class B3A, but there are lines present not of this class. The image is faint, and focus poor.

One lines falls near the additional hydrogen line 4542.
Sp. may be composite and should be photographed again.

Nov. 15, 1904

C15099 ν Sag

Dense

✓ C15085 DC154 = H.P. 55 0 1.9 +57.5

✓ B5A.

✓ C15086 DC935 = H.P. 264 1 36.3 +34.7

✓ Probably B8A. The fine lines do not show very clearly.
Repeat.

✓ C15087 DC1692 2 52.4 +39.2

A2F? Very poor.

Nov. 15, 1904   22^h

✓ C 15130   DC 9683   λ Cephei
Iso

✓ Two bright bands as in ζ Puppis, but they are fainter.

Lines seen
$H\beta$, two bright lines, $H\gamma'$, 4471, a line having approx λ 4417, $H\gamma$, $H\delta'$, $H\delta$, $H\varepsilon''$ $H\varepsilon$, K (~~and a line of shorter~~ λ, $H\zeta'$, $H\zeta$. $H\eta$.

The bright bands λ4633 and 4688 do not have the same relative intensity as in ζ Puppis. In ζ Puppis 4688 is much more intense than 4633. In λ Cephei, 4688 is less intense than 4633, and both are hazy. These bands are more like those of A.G.C. 22748 & 22843 than they are like ζ Puppis.

K is very sharp in λ Cephei and $H\zeta'$ is well marked having slightly gr. intensity than K, and is wider.

Nov. 15, 1904

C 15130 (cont)

DC 9676 = ✓ H.P. 3923. Other star on plate.
G5K

✓ C 15135 λ Cephei
Ordinary plate
This sp. is certainly more like ~~a~~ Cam. May. (A.G.C. 9311) than ζ Puppis, at least between $H\gamma$ and $H\beta$.
✓ The region of $H\delta$ is more like ζ Puppis than it is like A.G.C. 9311.

Line 4514 is faintly seen near $H\beta'$ toward the violet.

✓ +57°2475 - ✓ DC 9676 Additional sp. on plate is Class K.

C 15140 υ Sag. Nov. 5, 1904,
Quality 1. Nothing seen.
Star too low in west.

Monday, Nov. 21, 1904. $21^h 30^m$

C DC9298

This plate was brought to me by Prof. Pickering. It has a bright line star marked by Mr. King. Spectrum peculiar Hβ bright, Dark components, if visible, are very faint. Hγ bright, with strong dark component to red and fainter to violet. Hδ & Hε bright with dark component stronger to red. Hζ looks widely double, space between faintly bright. The Orion lines are very indistinct. There is a distinct bright line near position of 4128 - 4131 (silicon).

Spectrum may resemble β Lyrae but I can not find a good plate to compare. β Lyrae has 4120 or 4128 bright, and I think a peculiar line near Hζ is sometimes present in β. ζ Velorum has an intense dark line near Hζ at λ 3875, and the Hζ component of shorter λ may be the same in DC9298. D M gives a ph. star $9.^m3$ near DC9298. Scale seems different from C14995. Plate given to Miss Breslin for Mrs. Fleming.

Wednesday, Nov. ~~21~~ 22, 1904. $21^h 40^m$

✓

(1) C 14986 DC 9288

H.P. 3687 = DC 9288

Sp. A.

(2) +39° 4368 20 49 55.4 +39 45.2 $7.^m2$

✓ Also on plate. Marked by Mrs Fleming "Continuous spectrum." The image is as dense as several others on the plate which show the hydrogen lines clearly. No absorption lines seen, although very faint traces of Hγ and Hδ are suspected.

✓ (3) +40° 4354 This spectrum shows a faint line at 4524 which is the additional hydrogen line Hζ'. It may resemble ζ Puppis and a longer exposed plate should be taken.

Sp. probably B8A. The line 4524 above referred to, is not very distinct and may be a defect. Line 4026 is the only Orion line distinctly seen.

Nov. 22, 1904.

C 15071 λ Cephei DC 9683

H.P. 3929 λ Cephei

Plate marked "Found by Prof. E.C. Pickering to be same spectrum as ζ Puppis Oct 21 1904."
See pp. 76 and 77 for description of sp.

+58° 2403 (2) DC 9690 K

+57° 2475 (3) DC 9676 = H.P. 3923 K (Hβ 1/3 plate)

+58° 2395 (4) DC 9657 Two spectra partly superposed. Both are Class A.
I 23521 shows this star clearly double. Prec. K. comp. looks brighter.

+58° 2393 (5) G5K.

+58° 2419 (6) DC 9702 A5F.

+58° 2413 (7) DC 9718 ~~A5F.~~ A.

~~Oct~~ Nov. 22, 1904.

C 15064 DC 10431 = HP 4237

B2A. excellent example

H.P. 4232

F5G. good

+55° 3055

Sp. K.

+54° 3103

Hβ bright (marked by Mrs. Fleming)
Intensity = 2

Sp. probably B5A. Image faint.

4026 and 50 seen distinctly,
also other helium lines.

DM +55° 3049. 4471, 4387 & 4026 seen. Certainly Orion type, but so faint that none of the division Hγ suspected but image is so fp. the same Omit

C 15079 DC 9386.

"Hβ bright. W. P. Fl. Nov. 2, 1904"

Brightness = 2

Sp! B3A.

Nov.
~~Oct.~~ 22, 1904.

Le 15069 DC 3611. = HP. 1196

"Bright line. E.S.K.
Hβ bright B.P.F."

✓ Hβ bright = 6
Hγ very wide.

Sp B2 A.

✓

H.P. 1204 H.P. 1204.
Sp. K.

✓

-11° 1459

✓ ~~Looks like K5M, or may be Ma. Map up~~

On superposing this appears to be
Class K.

Nov. 22, 1904

L 15063 DC 9632

"Sp. Pec. Mrs F."

✓ Class Oe5B. Almost exactly like τ Canis Majoris. Indeed, it seems to be exactly like τ, except that Hζ is fainter.

It is probably what Miss Maury would call approaching Class B.

(2) ✓ +61° 2233 21 56.3 + 61 47.

✓ DC 9596 Class B. Like ε Orionis. This class of spectrum is rare among the bright and faint stars.

✓ (3) ✓ +62° 2028 = H.P. 3904
DC 9618
Mb

✓ (4) ✓ +62° 2029 = H.P. 3906
DC 9630
K5M

✓ ✓

(5) +60° 2323 21 54.6 +60 58
✓ +60° 2323 A 3 F! Too poor

Nov. 22, 1904

C 15063 (cont.)

(6) ✓ +60° 2329   21 57.0 +60 51

✓ very thin and faint
Probably B3A
4026, 4387 & 4471 seen

✓ (7) Not identified
+62° 2010 Sp. Mb.

✓
+61° 2234 (8) K

✓ (9) A-F
+60° 2333
2334 }

Saturday, Nov. 25, 1904   23^h

A search for sp. of v Sagittarii
on small dispersion plates.

B
2873 This is the plate on which Mrs. F. found
Hβ bright.
3683 Faint phase of hyd. violet and strong
6545 Too dense
7745 " "
8234 " "
9552 " "
~~20061~~ " "
14208 Too dense
14380 " "
Not found 20061
" " 20207
" " 30435
" " 30448

I 11172
11252
12921
12982 Too dense
15116
23263 Too dense.

It is probably little use to search further on
these plates.

Dec. 2, 1904 1ʰ

✓C 15149 DC 3830 = H.P. 973

✓ very narrow & poor.

Sp. K.

✓ C 15148 H.P. ~~180~~ 721 = DC 2418

✓ G5 K

Line ~~4233~~ near 4227 but of shorter λ is very fb. in this star. This is probably 4215 – 4217.

C 15155 DC 3303

✓ Like ε Orionis but lines very narrow.

B.

It is getting too dark to do more to-night. (4 P.M)

Saturday, Dec 2, 1904 22ʰ

C 15155 DC 3303

B

Lines peculiarly narrow.

✓ Line 4089 very strong.

Line 4116 weaker than in ε?

C 15146 DC 570-71

Quality 2

Too poor

Repeat

C 15152 DC 136

F or F5 G

✓ There is a trace of the G band.

Better F5 G – Jan 27, 1905.

C 15153 H.P. 576 = DC ~~2003~~ 2021 3 28.2 – 9 48

✓ (1). K

✓ (2) A DC 2037 = DM –10°704.

✓ Dec. 2, 1904

C15151 DC9872 = H.P. 4009

✓ ✓ (1) A 2 F

+63° 1872 ✓ (2) K very faint violet and not seen
✓ Omit?

C15150 υ Sag.

Very narrow & poor.

Hydrogen faint.

C15154 DC2784 = H.P. 883.

Very poor focus for ft. lines.

✓ Appears like Sp. ~~W~~ F.

C15147 DC1846 = H.P. 519

A 2 F, but lines bet. Hε and
✓ Hδ are stronger than normal. Focus
poor for fine lines and they are not
seen separately. See next page

Dec. 2, 1904.

C15147 DC1846

✓ On careful comparison, I think this is nearer A ~~8~~ 5 F. The K line is narrower than in some stars of A 5 F but it is certainly 0.6 Hε, and the solar lines are too strong for A 2 F.

DC1856 (2) = H.P. 523 Probably F. Rather indistinct.

✓ C15165 DC9424 = H.P. 3784

✓ (1) B 3 A

✓ (2) B good = H.P. 3782 or +36° 4557.

Dec 2, 1904

✓ C15145 λ Cephei

(1)

Class Od. Nearer like ζ Puppis than any other spectrum I have seen

The K line is much sharper than the other lines.

4471 is almost as intense as Hγ

✓ Bright band 46~~88~~33 is more intense than 4688.
4688 has a dark line on edge of greater wave length.

(2) ✓ K
DC9620 = [illegible]58°2403
✓

(3) ✓ K Red end of plate.
✓ DC~~9679~~ 9676 = H.P.3923

✓ (4) Two spectra superposed.
✓ DC.9657 Better near Class A.
Solar lines not seen distinctly.

Dec. 2, 1904.

✓ C15145 (cont.)

(5) G5K
✓ +58°2393

(6) ✓ A5F
✓ DC9702 = +58°2409

(7) ✓ A2F
✓ DC9718 = +58°2413
✓ (8) +59°2482 = K

C15156 DC9822

✓ B3A.

C15157 DC3404 = H.P.1111

✓ (1) A5F

✓ (2) A5F −9°1284 5 52.1 −9 23.4 (1855) 7.0

✓C15158 DC9772 = H.P.3959

✓ K

Dec. 2, 1904

~~32 Eridani~~ ✓ C15159 DC1686 = H.P. 463 ~~H.P. 644, 645~~ =
~~1900 (3^h 49.2 − 3° 14) DM − 3° 631~~
Focus poor and solar lines very indistinct
A2F

32 Eridani ✓ C15160 DC 2235, 2236 = H.P. 644, 645 = DM − 3° 631 (3^h 49.2 − 3° 14) (1900)
Composite spectrum. G5K or K comp.
✓ $H\gamma$ about equal to same in G5K stars. No Orion lines seen.
$H\delta$ widely double. K weak.
$H\beta$ hazy. $H\gamma$ of ordinary strength and width.
I do not see why $H\delta$ should be double when $H\gamma$ is single. The focus is excellent in region of $H\gamma$.
Look up this double star on chart plate.

I 2939 shows this star double the fainter component ~~having~~ being north. The prismatic companion does not appear double on this plate.

Dec. 3, 1904 0^h

C15161 DC 2873
2885

✓ (1) B2A. lines blurry = DC. 2885 = H.P. 917

✓ (2) B8A = DC 2873

✓ (3) = DC 2864 Probably B8A. Lines indistinct but 4626 is very strong & the other Orion lines are indistinctly seen as in B8A stars.

C15162 DC 3667 = H.P. 1217

(1) B3A - good

(2) B5A DM − 4° 1514

(3) B3A − 4° 1510 = DC 3655

(4) Appears to be two first type stars superposed

Dec. 3, 1904

✓ C15163 DC 4160 = H.P. 1390 = −5°2089
Poor plate.

✓ (1) A5 F or F

✓ (2) B3 A or B5 A. DC4142 = −5°2080

✓ (3) G. DC4188 = −5°2112

✓ C15167 DC 9089 ✓

B9 A.
K 4026, 4128-4130, 4481 are the only fine lines well seen
K much more intense than the others.

✓ ✓ C15168 DC9703 = H.P. 3936.

A.

Dec. 3, 1904

✓ C15170 DC1632 = H.P. 446

✓ F.
~~A5 F or F~~

Two exposures of same star? No.
F | K > H.

✓ (2) = DC1657 = H.P. 455 Sp. F

C15171 DC 2689 = H.P. 836

✓ Seems to come between τ Canis Majoris and ϵ Orionis. At $H\delta$ it is very much like τ, but the additional hydrogen lines seem no more intense than in ϵ. $H\delta'$ is certainly present but $H\gamma'$, if really seen, is very faint.
Class to B. with additional hydrogen lines $H\delta'$ stronger than in typical star.

Monday Dec. 4, 1904   23h

✓ C15172 DC3328 = H.P. 1078

(~~A2F.~~

DC3360 = DM+60°915 ✓ Another star on plate is Class F probably. Too ft. to include? No, put it in

C15173 DC4505 = H.P. 1526 8 6.9 +30

✓ Somewhat peculiar. Like τ⁹ Erid. ~~4144~~ 4120–4131 is the most intense line except those of hydrogen.

I would like a photograph of this showing the fine lines ~~b~~better focus

As far as can be determined from these plates, this sp. is just like H.P. 2117 on C14823 (see p. 25) which was found to be nearer of like τ⁹ Eridani than anything else

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Dec. 4, 1904

✓ C15174 = H.P. 1646.

A with 4026 seen

C15175 DC5167

✓ DC5167 Poor plate, grainy.

A2 F.

✓ +30° 1898 Fainter additional star

A5 F.

✓ C15176 DC5470 = H.P. 1884.

A2 F.

✓ C15178 DC. 10156 23 20 +22 8

G

✓ (3) +22° 4844 K

C15180 DC1248 = H.P. 352 0.8 +8. K

✓ (1) G5-K

✓ H.P. 343 (2) = +7° 347 G

Dec. 4, 1904

C15181 DC2797 4 56.6 −7.3
Quality 2
Too narrow.

Repeat.

C15182 DC9300 20 58 +45.8
Quality 2

Repeat

C15183 DC390 =H.P. 127 6 44 +40.5

✓ DC390 = (1) +40°171 B3A. 4128-31 almost as strong as in B5A

✓ +39°198 = DC427 (2) G or F5G.

✓ C15184 DC3464 = H.P. 1133 6 1.6 −4.2
✓ B3A but 4481 is nearly as intense as 4471.
4128–4131 is barely seen.

Dec. 4, 1904.

C15185 DC3977 = H.P. 1336

✓ (1) B3A. probably ~~very~~ narrow & some anomalous fine lines appear to be seen.

✓ (2) K −5°1943 6 57.0 −5 6.8 (1855)

C15186 DC4278 7 32.3 −39

✓ F5G – good

✓ C15188 DC8784 = H.P. 3366 19 2.8 +34

✓ DC8784 = H.P. 3366 (1) B3A. good

✓ +33°3487 DC8776 (2) A2F

✓ +33°3480 DC8770 (3) K faint.

✓ +33°3507 (4) Mb

✓ +34°3620 DC8812 (5) Probably B8A 4026 is the strongest helium line present.

✓ +32°3474 (6) G. Hβ not on plate

✓ +33°3570 (7) A.

Dec. 4, 1904.

C15189 DC10126 = H.P. 4132 23 16 +23.2

✓ A5F. Hydrogen lines a little narrow than normal. Solar lines very indistinct. Focus probably poor.

✓ C15190 DC154 = H.P. 55 0 19 +51.5

✓ B3A.

✓ C15191 DC1194 = H.P. 334 2 2.5 +37.4

A5F.

✓ C15194 DC9498 = H.P. 3833 21 38.6 +50.7

✓ B3A - good

✓ C15196 DC379 = H.P. 121 0 43 +50.4

✓ (1) B9A, but focus is very poor & the lines K and 4026 are the only ones (besides hydrogen) seen clearly.

Dec. 4, 1904.

✓ C 15196 (cont)

✓ (2) A DC408 = DM +50°164

✓ (3) A5F DC403 = DM +50°161

✓ (4) A ~~2F~~ DC366 = DM +50°143.

C15197 DC1085 1 52 +64.1

(1) A.

✓ Marked by W. P. F. "K line double" Further plates needed to show whether this is due to focus or not.

✓ (2) B5A - good DC1118 = H.P. 312

✓ (3) A2F DC1116 = H.P. 311

✓ (4) A DC1136

✓ (5) Not all on DC1038 = H.P. 287

B3A or B5A

Dec. 5, 1904 0h

✓ C15198 - DC ~~483~~ 1883 = H.P. 532

✓ (1) A2F = DC1883 H.P. 532 3h 14.7 +43.0

✓ (2) Probably B5A. Fine lines in very poor focus
DC1842 = H.P. 517

C15208 DC9298 = H.P. 3701

✓ (1) Bright line Orion type.
Some peculiarities
Hγ has a dark line on side of greater wavelength only. Hδ has rather faint hazy dark lines on both sides of the bright line
Hε has dark line on side of greater wavelength only. This is very marked.
Hζ looks triple, the centre decidedly bright and both edges like a distinct dark line. From Hη to violet it is too hazy

---

Dec. 5, 1904
C15208 (cont.)

(2) Appears to be like β Orionis but focus is not very good.
H.P. 3684 = +46° 3111

✓ (3) A5F
+46° 3159 = DC9309

(4) Too poor.
+47° 3240 Only the hydrogen lines are seen

✓ C15227 DC9298

✓ Orion type, with Hβ, Hγ, Hδ, Hε and Hζ bright.
The dark bands accompanying the bright hydrogen lines are stronger towards the red.
I do not remember seeing a spectrum having such bright hydrogen lines, and otherwise so nearly continuous.
The helium lines are very indistinct only bare traces are seen of 4120, 4144, 4387 & 4471. I am not yet at all sure that these lines are really present
Probably resembles γ Cass. in which the lines are very diffuse. Bright streaks seen

Dec. 5, 1904.

C15227 (cont.)

DC9277 (2) Like β Orionis?

DC9309 (3) A5 F

C15215 DC9298

(1) Bright line Orion with dark components stronger to red. Strong bright line at λ4128–4131, or near. Dark lines if really present, are certainly very faint, and appear to be accompanied by bright lines.

(2) H.P. 3684 DC9277 This is the best so far seen of this star. Certainly like β Orionis. Lines very sharp.

+46°3159 DC9309 (3) A5 F

+47°3240 (4) B8 A 4026 > K

Dec. 5, 1904

C15215 (cont.)

(5) +46°3141 B8 A or B5 A. Rather ft. Fine lines very indistinct except 4026.

(6) +47°3234 A ft.

C15135 DC9683 γ Cephei.

(1) Resembling ζ Puppis See former plates for detailed discussion.

(2) 4 Too ft. Second type.

(3) K

(4) Two spectra superposed. Boötes appear to be Class A.

Dec. 5, 1904

C15232 DC9298

(1) Very good of this bright line star. Orion lines very faint if really visible.

(2) +46° 3111 = H.P. 3684 = DC 9277 Like β Orionis B8A sharp lines

(3) DC9309 A5A

(4) +47° 3246 Probably B8A. Helium line 4026 is very clearly seen. Other lines hazy & indistinct.

(5) +46° 3141 Probably B8A. 4026 seen & is very strong

Dec. 16, 1904

C15232 DC9298

This is nearer like γ Cass. than any spectrum I have seen. Lines very hazy and indistinct and hydrogen series widely double as in γ. This doubling in DC9298 was thought at first to be due to a fainter component, but the DM star nearby is of magnitude 9 which is probably too faint to produce these lines.

See C 683 for γ Cass.

Friday, Jan. 26, 1905 23^h

✓ C15326 DC4467
✓ a~~5~~3 F

✓ C15327 DC193
F, Good

✓ C15329 DC2129
✓ B8A. Good
Lines hazy.

✓ C15330 DC4162 = H.P. 1391
✓ (1) B8A.

✓ (2) F = DM -19°1813

✓ C15331 DC ~~4777~~ 4477 = H.P. 1516 = -2°2450
G.

Jan. 26, 1905.

✓ C15334 DC2665. = H.P. 830 = -3°876
✓ (1) B5A

✓ (2) A2F = DC 2667 = -3°884

✓ (3) A5F or F. Rather faint. = -3°881
Omit Spect.

C15337 DC2634
So dense and narrow 1st type.
Repeat.

✓ C15338 DC4331 = H.P. 1465 = +11°1670
✓ A

✓ C15340 DC 2471 = H.P. 749
✓ A

Jan. 26, 1905

C15341 DC 3133
40

✓ DC ~~3133~~ 3140 (1) B$\overset{2}{x}$A. Good

✓ DC ~~3140~~ 3133 (2) B$\overset{2}{x}$A Good

The dispersion is not great enough to differentiate bet. B A and B 2 A, and since 4649 is not very strong it seems safer to call these B 2 A.

4116 is not seen.

✓ ✓ ~~=19~~ −1°949 = DC 3145 (3) B3A

✓ DC 3136 = −1°939 (4) B3A Lines hazy.

✓ ~~DC 3146 =~~ −1°913 = DC3095 = H.P. 997 (5) K5M Like α Tauri

✓ DC 3146 = −1°950 (6) K faint

✓ H.P. 1029 = ~~20~~ [illegible] (7) B very dense

✓ ✓ −0°1009 (8) B3A K not on plate 5 27.8 −0 49.8 (1855)
8.13

Jan. 26, 1905

✓ C15342 DC4279 = −19°1967

✓ (1) B3A

✓ (2) B3A = −19°1950

✓ (3) K = DC 4255 = −19°1944

✓ C15343 DC5695 = H.P. 1956

✓ (1) A5F

✓ (2) A3F or A5F = DC5673

✓ (3) B3A = DC5672

C15344 ~~DC5829~~ DM −9°3344

Qual. 2. Repeat

✓ ✓ C15345 DC6166 = H.P. 2131

A

Jan. 27, 1905   0h

✓ C15352 DC4686 = H.P. 1600

G. very good.

See p. 114. C15242 DC9164 (2027+4886)

(1) B3A.

(2) Ma

(3) A

(4) ~~G~~ F

(5) ¿B8A?   Faint.

✓ Jan. 27, 1905

✓ C15258 DC ~~4888~~

H.P. 1662 = DC4888 (1) B8A.

H.P. 1667 = DC4898. (2) G5K.

C15260 DC1911

1st type.

Too medium.

Repeat.

✓ C15266 DC156.

✓ (1) B9A = DC156 ✓ = H.P. 56

✓ (2) B3A DC198 fh. wedge.

✓ (3) A5F. DM+60°45

✓ (4) K. faint. +61°94 ✓

✓ Jan. 27, 1905

✓ C15267 DC1634 = H.P. 189.

(1) A5 F

✓ (2) G5 K, with some peculiarities. Line 4227 is strong, and 4215 not seen. This sp. is nearly like DC8819 or C14952.

μ Cass. DC583 = H.P. 175.

✓ C15269 DC1207 = H.P. 337

✓ F

✓ C15242 DC9164 = H.P. 3587.

✓ (1) B3A

✓ $\overset{3}{(\cancel{1})}$ A2F ~~H.P. 3595~~ +48° 3148

✓ $\overset{2}{(\cancel{3})}$ Ma ~~+48° 3148~~ H.P. 3595 = +48° 3154.

✓ (4) F DC9154 = H.P. 3579.

✓ (5) Orion type, probably B DC9175. very faint but 4649, 4116, & 4089 seem to be present.

Monday Jan ~~27~~ 30, 1905 3²

✓ C15325 DC1382 = H.P. 384

A5 F, peculiar.
This appears to be exactly like ω Ophiuchi, which is nearly like α Circini, but differs slightly in region bet. Hγ and Hβ. Line 4077 is very strong.

Line 4490 and one of gr. λ form a pair resembling 4471 and 4481 in B5A stars.

✓ C15324 DC179 = H.P. 59.

(1) A2F. K line narrow & well defined.

✓ DC206 (2) B8 A
= DM +43° 97

✓ DC218 (3) A2F. Hβ off edge
= DM +42° 99

✓ DC153 (4) A5 F. very faint
= H.P. 53

✓ Jan. 30, 1905.

✓ C15322 DC 2603. = H.P. 803

B5A.

C15320 DC 1557.

✓ A. K line double. Have more photographs taken to see if it is due to focus.

Jan. 31, 1905

C15158 DC 9772 = H.P. 3959.

✓ (1) G5K

(2) Too poor. Sp. looks almost continuous but since another one near by looks the same, it is probably due to poor focus.

✓ (3) A3F

+50°3695
22 17.9 +51 28.

Other stars on plate are too poor.

C14901 DC 8052 H.P. 3081.

Too poor. Quality 2.

Repeat.

✓ Wed. Jan. 31, 1905, 22^h

C 15328 DC 1219 = H.P. 348

Two sets of lines.
✓ Both spectra appear to be alike and of Class A or B9 A. The K line is very faint in both, and no Orion lines of any strength are seen. Lines 4128–31, and 4481, are seen.
Perhaps best to class both A.

Plates I 15973 and 24605 show that DM +38°425 is a double star having both components bright. The principal image and prismatic companion are both clearly double. The north following component is fainter.

59 Androm. +38°425 is No. 353 + 354 in Potsdam DM, and is given double. = Σ 222 s.f. comp. = $6.^m52$
n.f. comp = $7.^m7$

✓ +37°486 ✓ Partly on plate. Hβ not on plate.
A2 F

✓ +38°408 ✓ A2 F very faint

✓ +38°416 ✓ A2 F

Jan. 31, 1905.

C 15354 DC 5406.
Quality – 1.

C 15363 DC 4296 Many star.
✓ A5 F Quality – 2.
Repeat.

✓ ✓ C 15368 DC 6659 = H.P. 2390
K.

✓ ✓ C 15378 U Hydrae
N 4th type shows a wide absorption band

✓ ✓ C 15384 U Hydrae
U Hydrae well shown

✓ Other spectra on plate too poor to classify in detail

C 15367 U Hydrae
N

February 1, 1905

✓ C15380 o Ceti

✓ Good.
Hδ very bright.
Hγ less intense, but bright.

4227 strong dark line

✓ C15376 o Ceti

✓ Same as above, only not so good.

✓ C15385 α Hydrae.
Thin
✓ Md.
Hδ bright, Hγ not seen bright,
but image is thin.

C15379 DC6168.

✓ G, having rather an unusually intense
violet end.
Map up violet end with another star
showing as much.

Feb. 1, 1905

C15362
✓ DC1765

A or A2 F1 Focus poor and
no solar lines seen.

✓ C15353 U Hydrae.
✓ (1) Md. Some bright lines or spaces
appear in the red.

✓ (2) F5G −13°3165

✓ (3) K −12°3194

✓ C15248 U Hydrae
N.

~~C15361 DC2805~~

Feb. 1, 1905

C 15361 DC 2808
2809

✓ DC 2808 is of the Orion type having $H\beta$, $H\gamma$, & $H\delta$ bright. and $H\epsilon$

Lines characteristic of B3A stars are present.
A line is present of w.l. & about 4144 which is not in Orion stars.
This may be due to the sp. of DC 2809.
The mags of these stars in vol. 45 are 5.41 and 6.38. Unless 2809
Dc. 2808 2809
is very red, they ought to be more trace of its sp. There is a faint edge on the foll. side of the bright line star which may be the sp. of 2809 but it is not distinct enough to be classified.

I ~~1663+~~ 16500 examined, & no trace of this spectra seen. Only one, of class A.

March $\overset{9}{8}$, 1905

✓ C 15273 DC. 3732
Too poor. $H\gamma\delta$ lines only are seen
Repeat.

✓ C 15278 DC 3902 = H.P. 1313 ✓
B8A.

✓ C 15279. DC 5406 = H.P. 1854.
Too poor.
Plate shows U Hydrae 4th type star
✓ U Hydrae = H.P. 1869 (not in DC)
Break very well shown.

✓ C 15283 DC 3332 = H.P. 1083. ✓
B3A. good.

March ~~8~~ 9, 1905

C 15293 DC 3804 = H.P. 1282.

A.

C 15303 DC 5406 = H.P. 1854

Focus poor. A or B9A.

(1) K line double. Probably due to focus

This is probably B9A

(2) = -12°3194 K

(3) = -12°3205 A5F. F line off plate.

Saturday, Mch. 11, 1905

C 15312 DC 1753 = H.P. 492

A3F
Focus poor & solar lines not well seen.

(2) 2nd type. G or G5K
-8°568 = very poor.
H.P. 486 = DC 1738

C 15313 DC 4502 = H.P. 1524 = -12°2385

Sp. K poor

(2) = F5G probably may be F8G.
DC 4495 = Poor spectrum on edge of plate. On close
-13°2420 examination, the spectrum appears nearer G
than F5G. Oct. 23, 1907.

C 15314 DC 4958 = H.P. 1680 = -8°2623

Hydrogen lines only seen

Probably B9A.

Repeat

✓ Mch. 11, 1905

C 15315
✓ DC 5208 = H. P. 1762. = -7° 2909.

A 2 F1 poor focus.

✓ C 15323 DC 3882 = H. P. 1309 = -11° 1681

very poor.

✓ K ! may approach K5 M.

✓ C 15326 DC 4467 = H. P. 1514 =
- 20° 2395

✓ A 2 F.

✓ C 15329 DC 2129 = H. P. 611 = -1° 526

✓ B 8 A.

✓ C 15353 U Hydrae = H. P. 1869.
4th type. N

✓ Wide band of absorption very good

✓ 2 = -13° 3165 G narrow

✓ (3) = -12° 3194 K

Mch. 11, 1905.

✓ C 15364 U Hydrae
N. Thin.

✓ C 15367 U Hydrae
N. Thin.

~~C 15368~~

✓ C 15386 DC 2696 = H. P. 841

✓ A

✓ C 15388 DC 5831 = H. P. 2003

K

Other places too poor.

✓ C 15395 ~~U~~ Hydrae
N

Mch. 11, 1905

C 15396 R Hydrae

✓ Hδ strongly bright.
Hβ & Hγ not bright.

C 15403 o Ceti

✓✓ Md.

✓ C 15408 U Hydrae

✓ N

✓ C 15417 α Orionis

✓ Ma

✓ C 15418 U Hydrae

✓ N

C 15419 U Hydrae

✓ N

Mch. 11, 1905.

C 15424 α Orionis

✓ Ma

C 15423 α Orionis

✓ Ma

C 15425 α Orionis

✓ Ma

C 15426 U Hydrae

✓ N

C 15427 DC 5976 = H.P. 2052

✓ B3A.

C 15428 DC 6354 = H.P. 2224

✓ (1) A

✓ (2) −4° 3432 A5F

Mch. 11, 1905

✓ C 15429 DC 6693 = H.P. 2408

A2F

✓ (2) −13° 3873. F5G or G. poor

C 15433 o Ceti

✓ Hγ + Hδ bright

C 15438 DC 6199 = H.P. 2154

✓ F5G

✓ (2) = H.P. 2160 = −13° 3586 A

✓ (3) = −12° 3685 A5F

C 15439 DC 6820 = H.P. 2474

✓ A

Mch. 11, 1905

✓ C 15446 U Hydrae

N

C 15447 ζ Urs. Maj. H.P. 2264-5.

✓ K line single. Spectrum of companion seen as a faint edge. Spectrum very similar to ζ.

What is other star on plate?

Sp. A5F.

✓ C 15448 DC 6164 = −18° 3416

✓ A5F

✓ (2) A5F

DC. 6176 = −19° 3521

C 15449 DC 6994

✓ F

C 15453 o Ceti

Md

Mch. 11, 1905

C15457 ζ Urs. Maj.

✓ A2F. K line single.

✓ Other star is A3 or 5 F.

~~C15437 U Hydrae.~~

Monday, Mch. 13, 1905

C15437 U Hydrae

✓ N. Excellent spectrum, the best so far seen of this star

(2) Hδ looks double.
✓ −13°3188 Marked "Two stars"? by Mrs. F.

✓ (3) 7.5 A2F very poor.
−12°3228

✓ (4) 8.0 A2F or A5F. very poor.
−12°3219

✓ (6) ✓ F
−13°3165

This classification of these stars should have been in pencil. It represents the original observation. A.J.C.

C15461 ζ Urs. Maj.

✓ A2F
K line rather wide. Perhaps this dispersion is not great enough to show it double.

✓ Other star. A5F

Mch. 13, 1905.

C15462 U Hydrae.

✓ N.

Not so good as ~~H~~ C 15437.

C15464 DC6864 = H.P. 2499

✓ F.

✓ F5G

✓(2) DC 6873 = -4°3783

✓ -3°3698 (3) F5G.

✓ C15467 o Ceti.

Excellent.

Hγ, Hδ, Hζ bright. Hδ most intense.

✓ C15469 o Ceti

Not so sharp as 15467.

H & K bands are split up.

Mch. 13, 1905.

✓ C15471 DC4278 = H.P. 1437

2nd type.

Quality – ½.

Repeat.

✓ C15473 o Ceti.

Md,

Rather thin.

C15489 DC 3314 = H.P. 1071.

✓ B9A.

✓ (2) DC 3300 = +12°902 B5A

✓ (3) DC 3309 = +11°945 B8A

C15490 DC 4292 = α Can. Min.

✓ (2) Burned out except in violet.

F or F5G

✓ (1) DC 4299 = +5° 1742 — A

Mch. 13, 1905.

✓ C15491 DC4797 = H.P. 1639.

A5F1

✓ C15497 o Ceti.

Excellent,

$H\beta$ not seen,

$H\delta$ = 20

$H\gamma$ = 8

$H\epsilon$ ~~not~~ bright. may be concealed by calcium

$H\zeta$ = 4

$H\eta$ = 2

$H\theta$ = 0? very ft. if really present.

$H\iota$ = 2

$H\iota$ is much stronger than $H\theta$.

Mch. 13, 1905

✓ C15498 DC.3707 = H.P. 1238

B3A.

✓ C15499 DC4101 = H.P. 1372.

A2F

✓ (2) ✓ DC4131 = −16°1898 F

(3) ✓ DC4094 = ✓ −15°1732 B3A.

✓ C15501 DC5073 = H.P. 1714

A5F,

✓ C15502 ✓ DC5403 = H.P. 1850.

B5A. good.

✓ ✓ C15503 DC5890 = H.P. 2016.

G5K.

Mch. 13, 1905.

C15504 o Ceti.
Quality-1.

✓ C15518 o Ceti.

Md.
Focus not very good.

✓ C15018 DC8364, 65

✓ (1) = 8364 = H.P. 3172 ~~F~~ F

✓ (2) = 8365 = H.P. 3173. Same division of 1st type. This spectrum shows as a ft. edge of DC8364. A longer exposed plate should be taken, or one with narrower images, so as to separate the two. As the R.A. is 18h this can not be taken for several months.

Mch. 13, 1905

✓ C15029 DC1373 = H.P. 382.
B5A. broad lines.

✓ (2) DC1400 = +9°323 G

✓ (3) DC1395 A5F

✓ C15030 DC1648 = H.P. 452
B5A.

✓ C15034 DC2140 = H.P. 616.
B3A.

✓ (2) +6°583 = K.

✓ C15035 DC711 = H.P. 207
A2F.

Mch. 13, 1905.

✓ C15036 DC1404 = H.P. 389.

A

✓ (2) = +8°386 A5F.

C15037 DC1998 = H.P. 567

✓ K

✓ (2) = Dc 1950 +12°477 ✓ A

C15038
Ind. 1.

✓ C15040 DC9661 = H.P. 3917.

✓ F

✓ (2) DC9648 = H.P. 3912 K

Mch. 13, 1905

✓ C15042 DC9356 = H.P. 3743

B8A. focus rather poor.

✓ C15048 DC 10089 = H.P. 4109.

K

✓ (2) = H.P. 419 = DC 10106
B5A

✓ (3) = H.P. 4124 = DC10112 A.

✓ C15058 DC263 = H.P. 83.

B3A. focus very poor.

✓ C15221 DC 2057 = H.P. 582
Can not classify.
Sp. pec. No lines seen except the hydrogen which are very strong. Repeat. Focus poor.

✓ (2) −17°707 K

Mch. 13, 1905

✓ C15222 DC3029 = H.P. 972

✓ B3A.

✓ (3) −13°1152 A

✓ C15223 DC3800 = H.P. 1278

✓ A2F.

✓ (2) DC3807 = H.P. 1283. No lines seen distinctly except those of hydrogen. Focus poor & spectrum is probably B8 or 9 A.

✓ (3) DC 3828 = H.P. 1291 B5A. Lines very hazy & indistinct.

✓ (4) ~~DC3805~~ DC 3805 A3 or 5 F.

✓ C15231 DC9691 = H.P. 3889

✓ B5A. Lines very hazy. Hβ has the hazy appearance of spectra in which there are bright lines. A faint bright line is suspected on Hβ, but not certainly seen.

Mch. 13, 1905

C15235 ψ' Pisc. H.P. 169–70

✓ Too poor. On edge.

Class A or A2F?

C15236 ψ' Pisc.

Quality 1.

C15245 DC1703 = H.P. 472

✓ A2F. Lines rather narrow, but focus is too poor for fine lines

✓ (2) DC1691 = H.P. 466 F

✓ (3) DC1700 A3F

Mch. 13, 1905.

✓ C15248 U Hydrae.
N.

✓ C15249 DC9546 = H.P. 3867.

✓ B3A. Line 4128-31 looks as strong as in B5A. stars, but 4481 is not clearly seen.

C15252 DC1684 = H.P. 461

✓ Sp. Pec. resembling τ^9 Eridani. but not exactly like it. 4128-31 and 4077 are the strongest lines except the hydrogen

Mch. 14, 1905

✓ C15254 DC1830 = H.P. 515.
A.

✓ C15256 DC3828 = H.P. 1291.
B5A.

✓ C15257 DC4283 = -6° 2207
Probably B9A. 4026 almost = K
Image on extreme edge of plate.

✓ C15259 DC5406 = H.P. 1854.
A or B9A. Focus very poor.

✓ C15265 DC ~~H.P.~~ 9567 = H.P. 3875
A2F

Mch. 14, 1905.

✓ C15277 DC2092 = H.P.594.

B2A, good.

✓ ✓ (2) F5G

DC2075

✓ ✓ (3) B3A.

DC2102

C15279 DC5406 = H.P.854.

✓ 1st type. Too poor to see fine lines.

(3) U Hydrae. On edge.

N.

✓ C15284 DC4078 = H.P.1366.

✓ B1A. 4649 fainter than 4471.

4089 quite strong.

Mch. 14, 1905.

C15285 DC1550 = H.P.427.

✓ G.

C 15319 DC1402 = H.P.388.

✓ A5F.

Very wide & hazy, probably due to focus.

C15337 DC2634 = H.P.819

✓ Too narrow. Lines burned out.

A or near A.

Repeat.

✓ C15340 DC2471 = H.P.749

A

✓ C15470 DC2327 = H.P.677.

✓ Only the hyd. lines and a trace

of 4128-31 seen.

Repeat

Mch. 14, 1905.

✓ C 15479 DC 5691 = H.P. 1962.

A.

✓ C 15480 DC 6155 = H.P. 2125

✓ Peculiar spectrum, very much like ι Phoenicis. A2F, Pec.

Intensities of lines other than the hydrogen in order
K
4077
4233
(4128 = 31)

4172 which is quite intense in ι Phoenicis, is not seen in DC 6155

Find out what substance line 4077 is due to, if known.

✓ For F5 G

(2)
DC 6146 = H.P. 2118 Probably F, since solar lines are not very strong

✓

(3)
+25°2523 A2F.

Mch. 14, 1905.

✓ ✓ C 15482 DC 3381 = H.P. 1099

B, A

A 25°1058 K. very thin.

✓ C 15483 DC 3838 = H.P. 1293

✓ A.

✓ ✓ C 15484 DC 4368 = H.P. 1481

A2F

✓ C 15492 DC 3180 = H.P. 1032

✓ B3A. Image very dense & exact class somewhat uncertain.

✓

(2)
+21°918 A2F

Mch. 14, 1905

✓ C15495 DC5761 = H.P. 1980

A2F.

✓ (2) ✓ +39° 2452 $7^{m}.8$ A3F

✓ (3) ✓ +39° 2450 $7^{m}.8$ A5F

✓ (4) ✓ +39° 2453 $8^{m}.0$ G5K or K – Too thin

✓ (5) ✓ +40° 2432 $8^{m}.1$ K Thin

✓ C15496 DC6172 = H.P. 2136

✓ A.

(2) DC6187 K

✓ (3) DC6174 K

Mch. 14, 1905

✓ C15500 DC4701 = H.P. 1610

G5K.

✓ ~~DC~~ C15513 DC5289 = H.P. 1800

✓ K

✓ (2) ✓ DC5286 = H.P. 1799 F

✓ C15514 DC5943 = H.P. 2044.

A.

✓ C15515 $^{A}_{7}$ DC6096 = H.P. 2091.

B8A.

✓ (2) ✓ DC6091 G5K

Mch. 14, 1905

✓ C15534 DC 3298 = H.P. 1063

K

✓ (2) DC 3317 = H.P. 1073 K

✓ (3) DC 3326 A2F

✓ ✓ C15511 DC 3457 = H.P. 1130

A. K line very narrow.

✓ C15454 DC 2988 = H.P. 953

✓ A

✓ (2) DC 2942 = H.P. 937 B3A

✓ (3) DC 2954 A2F

Mch. 14, 1905

✓ ✓ C15113 DC 3558 = H.P. 1168

A.

✓ C15555 α Lyrae

A

✓ C15294 DC 4283

Probably B8A. very narrow & poor.

✓ ✓ C15253 DC 1119 = H.P. 314.

B8A

✓ ✓ C15132 DC 1773 = H.P. 495
G

✓ C15460 DC 4308 = H.P. 1448.

✓ A

/ (2) DC 4274 F5G

Mch. 14, 1905.

✓ C 15477 DC4453 = H.P. 1509

A

✓ C 15485 DC4930 = H.P. 1675.

A5F. very poor.

C15486 DC5197 = H.P. 1756.

Quality 2.
Too poor, & broken also.

Repeat.

Probably A or A2F.

✓ C15487 DC6525 = H.P. 2309.

A2F

✓ (2)
DC6551 =
H.P. 2325

A

Mch. 14, 905.

✓ C 15488 DC6668 = H.P. 2395

A5F

✓

(2)
DC6687 =
H.P. 2404

A5F

C 15521 DC4864 = H.P. 1656.

✓ A3F. Pec.

Just like δ normal in intensities of lines;
Lines very sharp and well defined.

✓

✓ C 15156 DC9822 = H.P. 3985.

B3A.

March 20, 1905

C 15216, DC 9549 = H.P. 3870.
Two sp. superposed.

+55°2639 = DC 9549 = H.P. 3870

Brighter sp. = B3A.

+55°2638

Fainter sp. shows only the hyd. lines $H\beta$, $H\gamma$, $H\delta$, $H\epsilon$, $H\zeta$, perhaps $H\eta$.

✓

These lines appear as a faint edge on the spec. side of DC 9549 and also cross the sp. of the latter.

✓ +55°2641 (2) ✓ K

DC 9553 (3) +54° 2646 ✓ Probably B8A.

C 14907, DC 7886, 67.

✓

Sp. composite. See also p. 35.
G band clearly formed. K < H.
Hydrogen lines strong.

Brighter component is probably Class G and not later since the bright bands of K stars are not seen.
Fainter Comp. is probably of Class A, since no Orion lines ~~of the~~ are certainly seen.

April 4, 1905

C 15655 DC 4210

✓ This plate was just handed to me by Mrs. Fleming. In the sp. was marked peculiar by Mr. King.

The central spectrum (presumably that of DC 4210) resembles the $H\beta$ bright variable stars (η Centauri etc.). $H\beta$ appears to be (very faintly bright, but almost invisible.)
The class not considering $H\beta$, is B2A.

This star should be followed up.

(2) DC 4220 ✓ Solar lines peculiarly intense as in α Cygni. Hydrogen lines are wider than in α, but sp. is on the edge and wideness may be due to focus.
Class it A F^3 F Pec, and state that the intensities resemble those of ι^2 Scorpii

✓ DC 4232 = H.P. 1416 (3) Faint, Probably B8 or 9 A

A.G.C. 9551 (B4) A. Too hazy

✓ DC 4179 (5) Too poor. B8 or 9 A. 4026 barely seen

April 17, 1905.

C15335 DC 2808, 2809. A.P. 885, 886

✓ 2809 shows as a faint edge on the following side of 2808. The sp. is probably second type as no distinct hyd. lines are seen. A photograph should be taken of longer exposure with narrower images so as to show this spectrum more distinctly.

DC 2808 shows bright lines at $H\beta$ $H\gamma$, $H\delta$, $H\epsilon$ and $H\zeta$. Sp = B3A, but numerous additional lines are present, probably belonging to the spectrum of 2809.

✓ C15361 DC 2808 2809

Same as above.
DC 2809 is too faint to classify.

April 17, 1905.

✓ ✓ C15377 DC 2808, 2809.
This shows the two spectra:
2809 is of class K.

✓ C15374 DC 2808, 9
B3A, $H\beta$, $H\gamma$, $H\delta$ & $H\epsilon$ bright.
2809 is too ft.

C15251 DC 633, 636.

✓ (1) DC 636 Sp. B8A

✓ (2) DC 633 Sp. B9A

✓ (3) DC 619 = A3F, very ft. & hazy.

April 17, 1905

C 15458 DC 3522

✓ (1) A

✓ DC 3528 (2) A5F or F. Fine lines hardly seen by this may be due to focus.

✓ DC 3504 (3) A

✓ DC 3534 (4) G

✓ C 15459 DC 3795

B3A

C 15481 Polaris

Sp. A. hazy
This can not be Polaris for its spectrum is F8G.

✓ C 15502 DC 5403.

B5A, good.

April 17, 1905

C 15546
✓ DC 6280
Sp. F

✓ (2) K
DC 6301

✓ C 15573 DC 5057

G5K

C 15588 H. P. 2264–5
ζ Urs. Maj. very dense
Sp. A

✓ Sp. of companion seen and is nearly the same as ζ. The K line in companion is perhaps a little stronger than in ζ but am not sure.

✓ g Urs. Maj. other star is A5F

C 15599 DC 5349

✓ A

✓ (2) A3F DC 5306 ✓

✓ (3) K DC 5383

April 17, 1905.

C 15602 ζ Urs. Maj.

✓ A – very dense

Companion is A or A2F.

g Urs. Maj. also on plate.

Sp. A3F

C 15604 DC 6962 ✓

G

(2) +68° 823 ✓

✓ A2 or 3 F.

C 15610 ζ Urs. Maj.

A.

✓ Comp. seen, but image is poor.

g Urs. Maj

~~A2F~~ A3F

April 17, 1905.

C 1559 0

Plate given me by Mrs. F. some days ago with no cover.

Hβ strongly bright. Hγ, Hδ and Hε very ft. Bright lines superposed on hazy dark bands. Hζ also faintly bright.

Sp. B3A

C 15501 DC 5073.

✓ A2F, solar lines rather narrow and well marked.

✓ C 15103 DC 10336

A

✓ DC 10321 = H.P. 4199

B3A. Hβ off edge of plate.

April 17, 1905

C15115 DC9619 = H.P. 3903

✓ Slightly peculiar. K < H but solar lines quite strong. 4077.9 is very well marked.
Probably better class it F.

✓ DM +63° 1815

✓ A2F

✓ C15555 DC4822

✓ A2F

✓ C15556 DC5469

✓ F. very good example.

✓ +46° 1658 (3) ✓ G5 K very faint

✓ +46° 1659 (2) ✓ B8A.

April 17, 1905

✓ C15570 DC3894

✓ A2F

✓ (2) A5F
DC3841

(3)
✓ DC3862 K

✓ C15585 DC5213

✓ A2F

✓ (2) A
DC5229 = DM +50° 1702

✓ C15607 DC4917 = H.P. 1671

✓ B8A.

✓ C15608 DC5414
F. Poor focus

April 19, 1905.

C 15547 DC 6503 = H.P. 2299

✓ A 3 F

✓ (2) K 13 30.7 + 50 13.7 (1855)
+50° 2014

C 15596 DC 6686 = H.P. 2403.

✓ A

✓ (2) K
DC 6683,
+46° 1948

(3) G
+46° 1944

C 15597 DC 7042 = H.P. 2584

✓ A 2 F

✓ (2) K 5 M
DC 7135
H.P. 2583

April 19, 1905

✓ C 15600 DC 5520 = H.P. 1903

A

C 15615 DC 6687 = H.P. 2404

✓ A 5 F

✓ (2) A 5 F. This spectrum has a faint edge on the preceding side. This edge does not appear to be instrumental since the other stars on plate do not show it. However I find no star given in DM near +52° 1782. Sp. is on edge. Could the edge be due to irregularity of clock?
DC 6668 =
H.P. 2395
DM +52° 1782

✓ (3) A
DC 6694,
+51° 1908

✓ C 15616 DC 7188 = H.P. 2680.

A 5 F

April 19, 1905

C 15553 DC 3336. = H.P. 1084.

✓ A, K line very fine. 4026 not seen. Image quite dense.

✓ (2) K +27°888

✓ (3) +27°914 B2A. Faint but lines are clearly seen

✓ (4) +27°886 F5G

✓ (5) +28°918 A probably. very poor focus

✓ (6) +27°906 F, very poor

✓ (7) +27°880 K probably very poor.

April 19, 1905

✓ C 15554 DC 3537

(1) K (good).

✓ (2) DC 3571 A (good)

✓ (3) DC 3546 B9A

✓ (4) +29°1165 A

✓ (5) +28°1062 Spectrum probably slightly peculiar. May resemble F normal. Very faint. Map up.

✓ (6) +28°1036 B8A.

✓ (7) +30°1177 A

April 19, 1905

C 15586 DC 5562 = H.P. 1919

✓ F

✓ (2) A2 F. Hβ + Hγ off the edge
DC5587 = H.P. 1936

✓ (3) A5 F or F.
+39° 2413

C 15593 DC 3778 = H.P. 1261.

✓ A2 F

✓ (2) F or F5 G
+59° 1013 Better focus might show it to be F5 G, since Hβ, Hγ, & Hδ do not seem to be as intense as in F spectra.

April 19, 1905

C 15595 DC 6409 = H.P. 2248.

✓ F . Perfect;

✓ (2) A5 F K slightly < H
DC6393 = H.P. 2241

✓ (3) K
DC6384 = H.P. 2237

✓ (4) K
DC6425 = H.P. 2255

C 15598 DC 4774 = H.P. 1631

✓ A3 F

✓ (2) K
DC4769 = H.P. 1640

(3) Too poor. Only hydrogen lines seen
DC4748

✓ (4) A5 F very poor
DC4775

April 19, 1905

✓ C15605 ζ Puppis

Od. Very hazy, probably due to low altitude

C15609 DC 5479 = H.P. 1886.

✓ A. very poor.

✓ C15623 DC 5368 = H.P. 1834.

F good!

✓ (2) A3F
DC5354 = H.P. 1830

✓ (3) K
DC5357 = H.P. 1832

April 19, 1905

✓ C15624 DC5532 = H.P. 1908

A

✓ (2) DC5527 F

✓ (3) DC5538 K faint

C15642 DC5085 = H.P. 1717

✓ K very poor

✓ (2) K
DC5162 = H.P. 1722

C15648 DC4677 = H.P. 1597

✓ A

(2) A2F

(3) A2F

April 19, 1905

✓ C15649 DC5417 = H.P. 1860.

A2F

✓ C15650 DC6332 = H.P. 2243

B9A

✓ C15658 DC6575 = H.P. 2304

F

April 20, 1905

✓ C15563 DC4771

A3F

porr.

✓ C15591 DC7322 = H.P. 2771

K

✓ C15611 DC4415 = H.P. 1501

A2F

✓ C15620 DC5400 = H.P. 1846

B9A

✓

(2) A

DC 5392

-3°2929

✓ C 15622 DC 4985 = H.P. 1687

G5K

-10°2804 ✓

DC 4979 (2) A2F

April 20, 1905

C 15626 DC6929 = H.P. 2531

Probably slightly peculiar

✓ K, 4026 & 4128-31 are quite strong.

Very nearly like τ^9 Eridani.
4128-31 is the strongest line except
the hydrogen.
Line which appears when 4026 is
seen ~~clear~~, but it is very hazy.
✓ This line is perhaps stronger than
in τ^9 Eridani.

(2)
DC6933 A2F

C15656 DC4711 = H.P. 1614

✓ B9A.

Monday, April 24, 1905

C15548 DC6909

(1) ✓
~~DC6915~~ G - very good

✓(2)
DC6915 A. very good

✓(3)
DC6888 A Pec.
one of the stars resembling τ^9 Erid.
4128-31 & 4077 the most
intense solar lines. K very
weak & hazy.

C15560. DC7115

✓ Pec. Numerous faint solar
lines seen, K very ft.

A Pec

May 2, 1905.

C15512 DC 3771 = H.P. 1260

✓ A

very narrow & poor.

C15523 DC 5647 = H.P. 1948.

✓ A. Solar lines ft.
4026 perhaps seen.

C 15536 DC 3333 = H.P. 1082.

✓ (1) Probably B9A.
K line is very faint other lines
only seen very indistinctly.

/ (2) On edge focus very poor.
H.P. 1075 Probably K.

✓ (3) B8 or 9A. 4026 certainly seen of
DC 3323 about same intensity as K. Other ft.
lines barely seen.

May 2, 1905

C15536 (cont.)

✓ (4) G5K ~~+14° 1048~~ +13° 1036

/ (5) K +14° 1074

(6) 2 stars superposed. Too ft. to classify.
+13° 1026 One is certainly first type.
1027

(7) Second type. Too ft. to classify.
~~+13° 1036~~ +14° 1048

C15537 DC 3871 = H.P. 1315.

✓ F very good.
Lines sharp.

C15538 DC 4443 = H.P. 1507.

✓ (1) A

✓ (2) ~~[illegible]~~ F5G DC 4469

✓ (3) K faint DC 4438

/ (4) K faint +13° 1832

May 2, 1905.

✓ C 15539 DC 4874 = H.P. 1659.

B8A.

✓ C 15540 DC 5498 = H.P. 1892.

A

✓ (2) A. or possibly A2 F.

+10° 2208

10. 41.5 +10 55.7 (1855) Faint, hazy image.

C 15564 DC 5278 = H.P. 1796.

✓ A.

C 15565 DC 5591 = H.P. 1931.

✓ F.

C 15576 DC 5566 = H.P. 1922

✓ A5F

✓ C 15663 DC 5150 = H.P. 1739.

Probably B3A, Lines in poor focus.

May 2, 1905.

✓ C 15666 R Hydrae

Md. H δ + H γ very bright

C 15668 DC 4488 = −15° 2280

✓ Probably B3A. 4026 quite strong.
Image very narrow & poor.

✓ C 15674 DC 7108 = H.P. 2623

A5F. lines broad.

✓ C 15683 R Hydrae H.P. 2275

Md. H δ + H γ bright.

✓ C 15685 DC 5233 = H.P. 1775

A

✓ C 15591 DC 7322 = H.P. 2771

K

May 2, 1905.

C 15517 DC 6929 = H.P. 2531.

(1) A Pec. resembles τ⁹ Eridani
K very faint. 4128–31 is the strongest line except those of hydrogen
Two lines seen bet. Hγ and Hη, perhaps ✓ the silicon lines 3856–63.
These stars having silicon lines very strong seem ~~to~~ form a peculiar class.

(2) Marked by Mrs. F. "K line double"
DC 6933 Class, A3F.
✓ Focus poor, lines all hazy.

C 15561 DC 6929

✓ (1) Better plate than the above and shows more lines. 4026 seen, and a line of shorter λ than K.
This sp. appears to be exactly like α Doradus.

✓ (2) Marked by Mrs. F. "K double"
Fainter component towards red.
~~other~~ Hydrogen lines broad.

May 2, 1905
C 15578 DC 6929

✓ (1) A Pec.

✓ (2) "Lines double" W.P.F.
DC 6933 Sp. A2F

✓ (3) K
−18°3997

✓ (4) F
−19°4036

C 15584 DC 6929

✓ (1) Lines narrow

✓ (2) " "

C 15589 DC 6929

✓ (1) A Pec
✓
DC 6933 (2) "Lines single" W.P.F.
✓
−18°3997 (3) K or K5 M
✓ −19°4036 (4) F

May 2, 1905.

C15603 DC6929.

✓ (1) A Pec

✓ DC6933 (2) Lines broad. K double? Fainter Doublet?

✓ -18°3997 (3) K faint

✓ -19°4036 (4) F. or F5 G

(3) & (4) numbered incorrectly on plate?

C15632 DC6929

✓ (1) A Pec

✓ (2) Lines broad

C15~~6~~567 DC6929

✓ (1) A Pec.

✓ (2) "Lines double." W. P. F.
Lines broad A. J. C.

May 2, 1905.

C15657 DC6929 = H.P. 2531

✓ (1) A Pec.

(2) DC6933 A2 F Broad lines

✓ (3) -19°4036 F or F5 G

✓ (4) -18°3997 K

C15659 DC6929.

✓ (1) A Pec

✓ (2) A2 F. Lines broad

C15693 DC6929
Hard plate.

✓ (1) Fine lines well seen. 4077 is quite well marked & slightly more intense than in α Doradus

✓ (2) A2 F

May 2, 1905.

C15524 DC6206 = H.P. 2157.

✓ (1) A

✓ (2) A5F DC6201
+11°2484

✓ (3) F
+10°2459

✓ (4) K, possibly showing an advance towards M! Near edge of plates
+10°2468
DC6223=
H.P. 2166

✓ C15532 DC6722 = H.P. 2423

A3F.

C15541 DC5891 = H.P. 2017.

✓ (1) A3F

✓ (2) A2F DC 5902 = H.P. 2023

May 2, 1905

C15542 DC6206 = H.P. 2157.

✓ (1) A

✓ (2) A5F. DC6201

✓ (3) Probably F. Faint. K > H.
+10°2459

✓ C15543 DC6563 = H.P. 2333

F5G. Violet end quite strong.

✓ C15544 DC6789 = H.P. 2453 ζ Boötis
6790

A2F. Must be a close double as no peculiarity or separation of lines seen.

✓ (2) A5F. A better photograph might show it the F.
DC6786=
+14°3769

May 2, 1905.

✓ C15545 DC5752 = H.P. 1978.

K

✓ (2) Probably K. Very faint and poor.

DC5746 = H.P. 1976 = +3°2502 ~~DC25~~ +3°2573 not seen. Image too faint to show any trace of this star.

✓ C15558 DC5975 = H.P. 2051.

A5F.

Image narrow & lines burned out

✓ C15577 DC5967 = H.P. 2049

A

C15579 DC6954 = H.P. 2538

✓ (1) A5F

✓ DC6961 (2) K +0°3337

✓ +1°3059 (3) K

✓ +1°3052 (4) K

May 2, 1905

C15587 DC5939 = H.P. 2041

✓ (1) A2F

✓ (2) A2F

DC5926 +16°2307

C15625 DC6358, 59 42 Com. Ber.

H.P. 2226, '27.

✓ F5G.

No trace of duplicity seen.

Companion may be very faint or very red

✓ (2) K

DC6353 = +17°2595

C15688 DC5749 = H.P. 1704

✓ (1) F5G. (2) = −2°2902 $8^{m}.3$ not seen

✓ (3) A3F

−1°2268

May 2, 1905

C 15690 R Hydrae

✓ Md. Hγ, Hδ, Hζ & Hη bright.
Hδ most intense.
very good spectrum

C 15692 DC 5829 = H.P. 2002

B9A.

✓ K > 4026.
4471 & 4481 about as in B8A.

C 15665 DC 6059 = H.P. 2079
Narrow images.

✓ (1) A

✓ (2) K very poor.
+15° 2442

May 5, 1905.

✓
C 15531 DC 6495 = H.P. 2292

✓ Peculiar. Like θ' Mucis on X 6899
A2 F. Pec

C 15557 DC 5901 = H.P. 2042

✓ ~~F5 G~~ F8 G.

+20° 2650
(2) ✓ Probably F5 G. very faint.

✓ C 15601 DC 5813 = H.P. 1998
B3 A. Lines double. May be instrumental

✓ C 15667 DC 7398 = H.P. 2825
Probably F5 G. Focus poor.

✓ C 15669 DC 5380 = H.P. 1840

✓ (2)
+37° 2088. A5 F or F. K > H. Probably F.
very faint

May 5, 1905

✓ C15670 DC5305 = H.P. 1808

A

✓ C15682 DC5691 = H.P. 1962

A2F

✓ C15686 DC5797 = H.P. 1756

A2F

✓ C15691 DC4782 = H.P. 1634

(1) A ~~5~~ 3 F

o Cancri K not quite equal to K in (2)

Lines quite sharp in both plates.

✓ (2) A5F

H.P. 1635 K line stronger and wider than in
DC 4785 (1)

May 5, 1905.

✓ C15695, DC7355 and DC7356, 57.
Two sp. superposed.
The darker star is brighter and is n.p.
according to H.P. The other star, DC7355
seems to precede on the plate however

(1) Brighter, n., following on plate

17 Draconis
✓ DC 7356, 57 Sp. A.

(2) south prec. on plate.

16 Drac K certainly fainter than in (1) but
DC 7355 Orion lines not seen.
I think, however, the sp is either B8A
or B9A.

✓ C15696 DC ~~4687~~ 4687 = H.P. 1602

K

May 7, 1905

✓ C15435 DC4083 = H.P. 1368.

Images very narrow & poor
Hβ not seen image burned out.

✓ (2) H.P. 1370
Hβ not seen, image burned out.

Other star too poor.

C15445 H.P. 1368
Hβ not seen distinctly

✓ H.P. 1370 Hβ not seen
Image dense.

(3) A.G.C. 9168
B3A.

C15474 H.P. 1368 + 1370

Very poor plate. Hβ not seen
in either star.

May 7, 1905

H.P. 1368. Quality = 2,
Foc poor.

✓ C15572 DC4654 = H.P. 1590

Foc poor.
Probably A. K line faintly seen
& no others except the hydrogen

✓ C15612 DC4654 = H.P. 1590
B8A or B9A.
Focus poor probably owing to low
alt. of star which has dec − 28.9

✓ C15618 ζ Puppis

O.d.

✓ C15619 DC4654

Probably B9A

✓ (2) H.P. 1586 A2F

May 7, 1905.

✓ C15621 DC4657
B9A.
K about as strong as in A to F.
but 4026 is sharp.

✓ (2) H.P. 1586
A2F

C15676 DC7408 = H.P. 2826.

✓ Slightly peculiar
4077 is very strong and fine.

Resembles θ' Micros. See DC 6495
p. 191.

C15679 DC5121 = H.P. 1727

✓ (1) A5F

✓ (2) K
DC5153 = H.P. 1738

✓

C15689 DC5269 = H.P. 1792
A5F

May 7, 1905.

✓ C15516 DC6614 = H.P. 2366
B8A

✓ (2)
DC6619 =
H.P. 2369 F

C15519 DC3935 = H.P. 1324

✓ B3A

(2) B3A
DC 3968 = H.P. 1331.

✓ C15522 DC5174 = H.P. 1746.
Looks like F5G as G band is
clearly seen. Some lines bet. $H\epsilon$ and
$H\zeta$ appear more like A5F.
Spectrum rather poor.
Class it F5G.

May 7, 1905

✓ C 15548 DC 6909

G

✓ (2) A DC6915 = H.P. 2523

✓ (3) A Pec. Like τ^9 Erid.

DC6888 = H.P. 2571.

✓ C 15560 DC 7115

A Pec. Like τ^9 Erid ?

K very faint. λ128-31 strong.

~~May 23, 1905~~

~~C 15376 o Ceti.~~

~~Image poor.~~

~~Hδ & Hγ bright.~~

~~Hδ stronger than Hγ.~~

See p. 202. The following record was not noticed when this was studied. Don't know why a blank page was left here. A.J.C.

May 13, 1905

/ C 15528 DC 3853 = A.G.C. 8522

B3A. Lines hazy, probably due to low altitude. Dec = −25

C 15613 DC 5166 = H.P. 1741

"Hβ bright". W. P. F.

/ Hβ is the very faintest bright line Int. = 1 The dark band Hγ is also faint, and very wide & hazy. The Orion lines are very faint except 4026 & 4009. 4471, 4387, & 4144 indistinctly seen.

/ The image is too poor to class the sp. with certainty. It may be B2A or B3A or B5A.

G

(2) ✓
H.P. 1743 =
DC 5168.

May 13, 1905

C 15536 DC 3333 = H.P. 1082

✓ (1). A, Pec. Probably resembles α Dor. K is very faint and all lines faint except those of hydrogen.

✓ (2) Probably K. Focus very poor.
H.P. 1075 = +14°1041

✓ (3) A
DC 3323 = +14°1047.

✓ (4) G5K +13°1036
+13°1036

✓ (5) K +14°1074

✓ C 15648 DC 4677 = H.P. 1597

A – good

✓ (2) A2F Hβ ff edge
+20°2178

✓ (3) A2F Hβ ff edge.
+21°1909

May 23, 1905.

C 15376 o Ceti Jan. 26, 1905
$H\delta$ + $H\gamma$ bright
$H\delta$ sharper
~~Oth~~ Several other portions of the sp. seem to be as bright as $H\gamma$ δ but they may be spaces.
H & K are broad & dark. No lines seen of shorter λ than K. Probably if $H\zeta$ were bright, it would be visible.

C 15380 o Ceti Jan. 28, 1905.

Very sharp at region of H & K.

$H\zeta$ is divided into two portions, widely separated, of which the one of gr. λ is more intense. On comparing this region with H & K in DC 3537 on C 15554, the appearance is about the same.
$H\epsilon$ is a very narrow dark line with a very slight brightness to red.

May 23, 1905

C 15403 o Ceti Feb. 2, 1905.

Image very narrow. $H\epsilon$ seen as a narrow dark line & bright to red.

C 15433 o Ceti Feb. 7, 1905.

The bright portion of $H\epsilon$ is more marked than the dark.
Otherwise like 15380

C 15453 o Ceti Feb. 11, 1905.

The bright & dark components of $H\epsilon$ both seen, almost equally intense

C 15467 o Ceti Feb. 14, 1905.

Bright $H\zeta$ certainly more intense than dark $H\epsilon$. Three bright lines of shorter λ than $H\zeta$ seen, $H\eta$, $H\theta$ & $H\iota$. $H\iota$ is quite strong but $H\eta$ and $H\theta$ are very faint.

May 23, 1905

C15469 ο Ceti Feb. 16, 1905

Plate rather thin.
Bright Hζ seems a little weaker than dark Hζ

C15497 ο Ceti Feb. 25, 1905

Good plate.
Order of int. of hyd. lines

Hδ, Hγ, Hζ, Hε, Hη, Hθ
Hθ is barely seen.
Hβ not seen. The dark component of Hζ is seen very distinctly. Dark component of Hη is suspected.

Saturday, May 27, 1905

C15673 DC6929

✓ A Pec. 4128-31 strong as in τ⁹ Erid.

✓ DC6933 A2F. Lines broad & hazy.

C15697 DC5566

✓ F. Lines very sharp.

C15698 DC6155

✓ Very peculiar. Probably like or nearly like θ¹ Micros. Also like DC 7408 on C15676.
Line 4077.9 is very strong, as is also 4215.
K = 0.2 Hε.
Other fairly strong lines are 4128-31 & 4481.

✓ (2) DC6146 = H.D. 2118 F5G.

/ (3) DC6165 A3F

May 27, '05.

C15705 DC5479

✓ B9A.
Poor, but K & 4026 have about the proper intensity for B9A

C15707 DC7395.

A Pec.
✓ K is as in Sp. A.
~~4471 & 4481 are as in B8A~~
Sp. probably composite but not marked enough to class it certainly composite
4128-31 about as in B8A.
4077 also seen and traces of many faint lines.

C15708 DC7546 = H.P. 2912.

✓ A or A2F. Hε looks double. Sp. near edge.

✓ (2) A

DC7546 = H.P. 2904

May 27, '05.

C15709 DC5417

✓ A2F. Lines in poor focus.

C15716 ξ Urs. Maj

A2F. Comp. very poor.

Alcor = A5F

✓ C15721 DC5691.
A2F

✓ C15722 DC6528
A2F. lines hazy.

C15726 DC6164
✓ ~~Too poor.~~ Repeat
Probably A5F. or F.

May 27, '05.

✓ C15727 DC6670 ≐ H.P. 2393

B9A. very poor.

(2) A Pec.
Line 4128-31 strongest.

C15729 DC7838 = H.P. 3013

✓ F5G? May possibly be F, but K is > than H. Hydrogen lines look stronger than in F5G.

Class A F.

C 15731 DC6658

Quality 1 nothing seen

C15734 DC6658

✓ Peculiar. Like τ9 Eridani. ~~44~~ 4128-31, is the strongest line except the hydrogen.
K extremely ft. if really present.
Traces of numerous ft. lines seen

May 27, '05.

✓ C15736 DC6729

A5F

C15463 DC6508

✓ Hβ, Hγ, Hδ and Hε have ft. companion lines toward red.

Plate cover marked "Bruce plate A 3877 shows that this is probably a close double" W.P.F.

Sp. of the brighter star is A2F. The fainter star is probably of Class A or some division thereof.

(2) A5F or F, very poor.
A.G.C. 18431.

June 3, 1905

C15699 Seeal. 1. Nothing on plate.

✓ C15701 DC6663 very poor
A2F

✓ (2) DC 66~~2~~3 Too poor.
A2F?

~~C15~~
✓ C15715 DC5057 = H.P. 1706
G

✓ (2) ~~+69° 5314~~ +69° 531 $9^h 29.8$
Sp. K.

June 12, 1905

C15664 DC 6254, 6255 = H.P. 2188
2189

Two spectra nearly superposed. The spectra are very nearly alike. The K line however of the northern star is slightly less intense than that of the southern.

✓ H.P. 2188 preceding, northern,

✓ Sp. A

H.P. 2189. A2F.

✓ C15~~68~~71 DC 6787 = H.P. 2449
6788 2450

Sp. A with 4026 clearly seen.

The K line is too strong for Class B9A

See if this star is a close double.

Tuesday, June 27, 1905

✓ C15740 DC6919

A5 F or F. very poor

Other stars too poor.

✓ C15739 DC6697

A5 F or F. very poor.

✓ C15743 DC6843

(1) DC6843 G5K

✓ (2) ~~5° 3845~~ DC 6852 = +19° 2881 K 14 46.8 +19 45 (1855) ~~14. 8.8 5 56.5.~~

✓ (3) DC 6826 = +20° 3026 B8 or 9 A very poor focus. No lines distinctly seen except the hydrogen.

June 27, 1905.

✓ C15748 DC6675

(1) F5G

DC6675 = H.P. 2378

Other stars too poor.

✓ C15750 DC7930 = H.P. 3144

G5K.

✓ C15755 - DC6654

F$^8_5$G. Almost G, but hydrogen is a little too strong.

✓ C15759 DC6713 = H.P. 2420.

(1) A

✓ (2) DC6718 A , K a little stronger than in (1)

June 27, 1905

✓ C15774 DC7118

B8A.

✓ C15775 DC8849 = H.P. 3399

G

✓ K

(2)
DC8857 =
H.P. 3402

✓ C15782 DC8500 = H.P. 3231

K.

✓ C15785 DC8476 = H.P. 3222

✓ B8A.

(2)
+2°3730 K

C15786 DC8612 = H.P. 3284

✓ Too poor. B8A or B9A.
No lines clearly seen except the hydrogen

June 27, 1905.

✓ C15788 DC8432 = H.P. 3197

~~B8A~~
B9A

✓ C15789 DC8641 = H.P. 3300

B5A.

✓

(2)
DC8632 =
H.P. 3294

A 3 or 5 F
K < H.

C15791 DC6862 = H.P. 2898.

Too poor.
Quality 2.

C15792 DC6862 = H.P. 2898

✓ A.

✓ C15793 DC 7728
7729

72°804 = 4.8^m
805 = 6.2^m & follows 1^m

Bright spectrum is F or G. A faint edge on the following side is probably due to ~~DC 77~~ DM +72° 805, but it is too faint to classify

June 27, 1905.

✓ C 15793

(2) DC 7693 = H.P. 2971

K.

✓ C 15794 DC 8134 = H.P. 3118

A2 F.

Wednesday, Sept. 6, 1905

✓ C 15797 DC 6894 = H.P. 2512

K

✓ C 15800 DC 9023 = DM +23°3896.

B3 A.

C 15814 DC 9199 = H.P. 3619

✓ (1) B5 A.

✓ (2) +23°4085 = G.

C 15827 DC 7424 = H.P. 2832

✓ A? Too poor.

DC 7435 = H.P. 2838 = K

✓ C 15831 DC 7135

A2 F.

✓ C 15832 DC 7146 = H.P. 2657.

✓ (1) A2 F

(2) K5 M = DC 7082 = H.P. 2616

Sept. 6, 1905.

✓ C15833 DC7823 = H.P. 3019.

F5G

✓ C15834 DC8445 = H.P. 3211

(1) A

✓ (2) DC8520 = +75°683

a very poor focus

✓ C15835 DC8650 = H.P. 3313.

F.

✓ C15836 DC7757 = H.P. 2989

A.

✓ C15837 DC7202 = H.P. 2694

very poor focus

B8A or B9A. K line + 4026 certainly ~~clearly~~ see

✓ C15838 DC 7487 = H.P. 2865

7488 " 2866

F5G

no trace of duplicity

Sept. 6, 1905

✓ C15839 = DC8483 = H.P. 3205

Partly on plate

~~K~~ G5K

Check ident. ✓

C15840

✓ (1) H.P. 3486 = DC8997

K

✓ (2) DC8967 = H.P. 3465

A.

✓ C15841 DC7089 = H.P. 2614

7090 2615

B8A.

✓ C15846 DC7840 = H.P. 3014.

B3A. lines broad

✓ C15848 DC8158 = H.P. 3116

A2F.

Peculiar objects on X plates.

A.G.C. 24839 $H\beta$ bright or invis.

" 6182 See x 5466, 6171, 6240, 7167, 7296.

" 14349. $H\beta$ faint