KG
113666
198

1923phae.proj.1200w

Ida E. Woods
Book 22.
Cluster Variables.

N.G.C.
3201

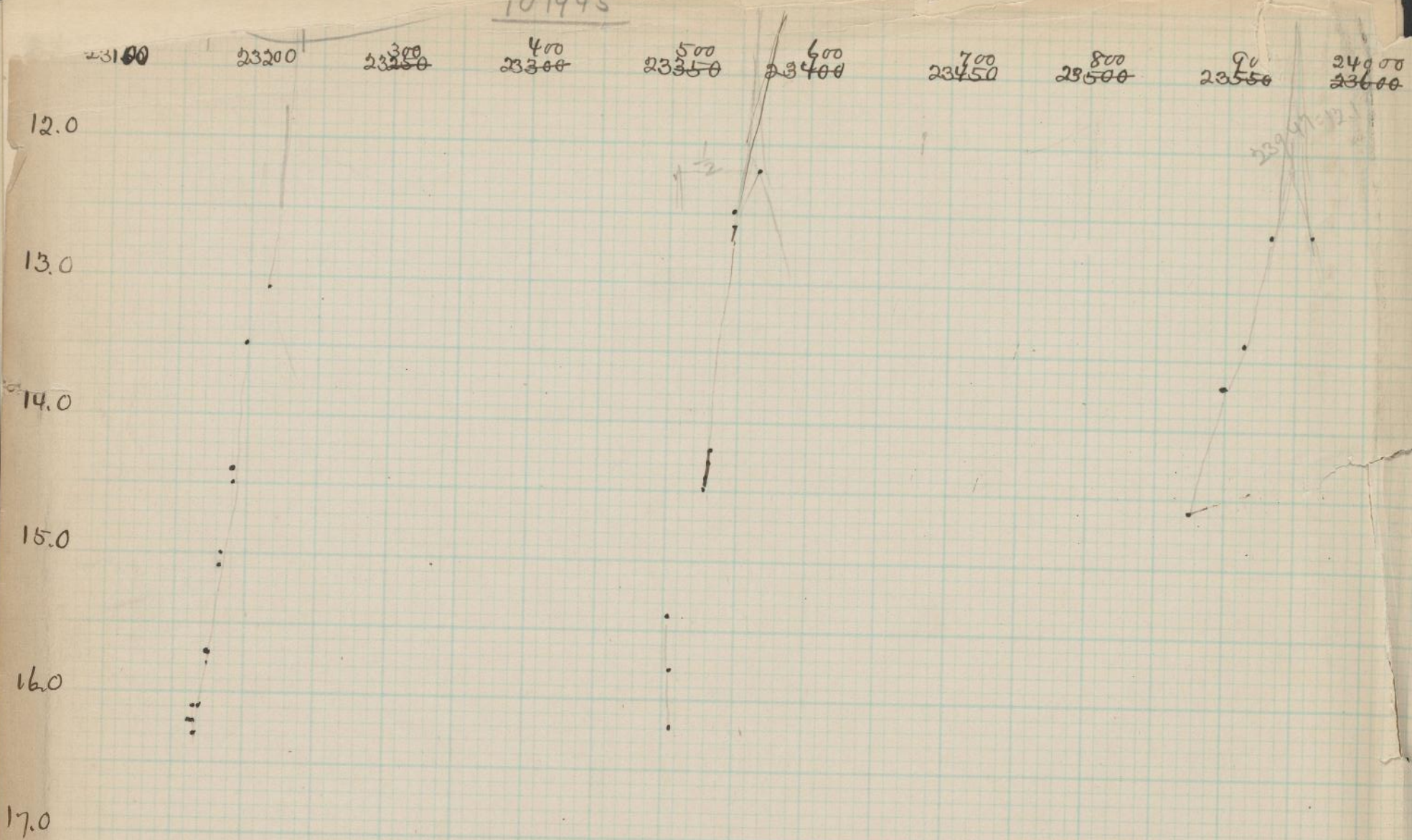
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AG11366.198

1923phae.proj.1200W

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101945



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1923phae.proj.1200w

1923phae.proj.12000w

Bibliography

3901

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1923phae.proj.12000w

Harvard College Observatory.

Ida E. Woods. Book No. 22.

Cluster Variables.

Continued from
Book 6.

Measures, etc., N.G.C. 3201.

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1923phae.proj.120

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1923phae.proj.120mw

KE11366.198

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2

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1923phae.proj.1208w

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1923phae.proj.1200

4

$10^h 14^m - 45.^\circ 9$

Saturday, April 7, 1923

Exam. of N.G.C. 3201

New A plates taken recently to be examined for new vars.

~~Carte 10.0 -40~~

174 K 10.6 -45 B 27299 Magns. Bb. 48, p. 66.

List of best recent plates, see p. 7.

No MF no Gord B

Take 2 center at 10.4

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1923phae.proj.1208w

α11930 — long exp. = 240m

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1923phae.proj.1200

6

NGC. 3201.

Exam.: a 11911
11916
11911 superposed.

Found No. 13
32
17
18.
49
(in order of finding)

✓ Might be watched, but no evidence yet of var.

Nov Var? near 14



very ft., does not appear on print.

A very ft star, See 11928 Eff 120°

Exam. 11972
11999
11999 superposed

found 10
32

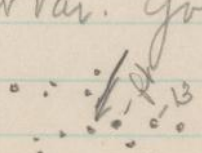
✓ Confirmed by H.S.
Make this No. 62

N.B.
11931 to 11934 are on same date

greater (?) range than most

11929
Br. 11933 ft. 11931

Nov Var. good range



Br. 11999 Ft. 11972
11998 11922.
11932
*11934

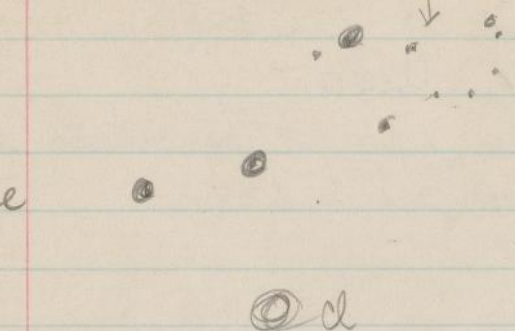
Effort was made to exam. all area covered by these 2 plates.

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1923phae.proj.120w

Repeat 11972 Excellent pl.

New?



Br. 11999 Fr. 11972
small range

beyond print N.
compare with outside Vars

This is
55, see
print of
scale
10" to mm.

Fr. 11934
11923

Recent A plates examined.

Best plates *11972
11998
11932 probably not showing fr. star
11922
11923
* 11924
11926 used by Prof. B.?
11933
11916
11911
11956
11931 used by Prof. B.?

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1923phae.proj.1200w

Monday, April 9, 1923

Compared many stars of print (Sample) and
@ 1930, Ref. 240m
Noted no changes except in stars already
marked as vars.
Example :- 25

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1923phae.proj.120

Tuesday, April 10, 1923.

11923 shows faint stars

a 11933
' 11956 compared.

Var.
fund 49
11956 is too far for comparison

a 11933
11923

watch → 23

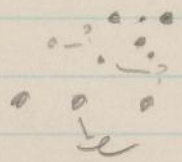
Probably a slight change
Fainter on 11927.
Too small to measure?

? watch → 28

Ft. 11934
11999 ?

to mark Sup Vars. Difficult to prove —
11933 image flattened.

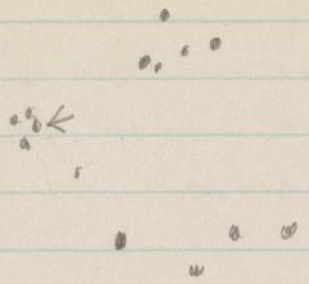
✓



These are Vars. 1 & 2.

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1923phae.proj.1200



Old vars. are not recorded when re-discovered

Not moved Exam. on other plates.

very faint. Ft. on X 11904
Br. a 11924

→ Exam. of a 11924
X 11904
a 11924 superposed (when possible)

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1923phae.proj.1200w

Wednesday, April 11, 1923.

Exam. a 11924
a 11976

New Var: near 32

Confirmed by H.S.
Make this Var. 63

~~32~~
32

Br 11924, 11929 | Ft 11976, Ft. on print, Ft. 11975
→ good range
not exam. further.

Not proved

match

images very close together.

May be * changes marked
of y see
equal on 11924
brighter on 11926 four images
y y seems brighter on 11928

Exam 11929
11975
No objects

Exam 11922
11934
No objects

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1923phae.proj.1200w

Exam. 11916
11977

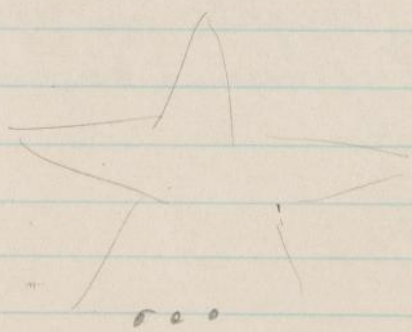
✓

.-15

Watch

Exam. plates Slight if any var. Vars. near make comparison difficult.

N.B. Space between 9 to m
and 1 & 2 to bright stars S of 17.
Notice this on 11925
See this on 11916



Center of Cluster ~~at~~ near star S of
Var. 17 or, perhaps, 17

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1923phae.proj.1200w

Exam. of stars that were suspected on first exam. of I plates but not confirmed by Prof. B
See Bk. 4, p. 53.

Old Nos.

Susp. Var. 10 exam. on many plates — no change.

Susp. Var. 42 " " " " " "
is close to 4 which has large range. Undoubtedly this makes 42 seem to change.

Susp. Var. 48 exam. on many plates. Very slight var. if any.
is close to Var. 49 which has marked changes.

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1923phae.proj.120mm

Thursday, April 12, 1923

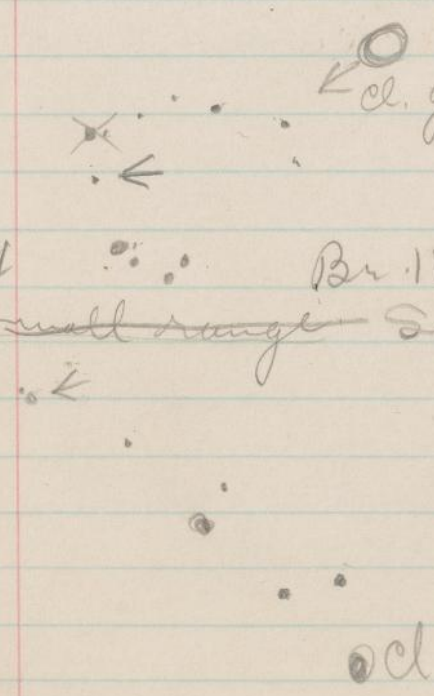
Exam. A 11920
11955

Images not good but tried to find
setting stars.
No objects

Exam. A 11918
11931
No objects

Exam. A 11924 Excellent plates
11932

Confirmed by H.S.
Make Var. No. 64



~~Small range~~ See next page.

Neb.? See 11924.
See this on 11928, eff 120m

cl

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1923phae.proj.120

Exam a 11919
11998
No objects

Exam, a 11917
11925
No objects

Var. on 11932 — Good range. N.B. 11916 & 11918 are both April 19

Br. 11918*

Fr. 11911
11915
*11916 very ft.
11917
* 11925
11976

For prof 11918 — 11925
11932 — 11924

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1923phae.proj.120dw

Tuesday, April 17, 1923.

Examination of Suspected Vars.

See f. 9

Another star found near 23.

Confirmed by H. S.

23 — ∴ — Var

Make Var. No. 65

	Br.	Ft
	11914	11923
	11919	11911
	11920	11922
Rapid change	11956	11924
	11972	*11926
		*11931

Prof — 11932 Ft
11933 Br.
11934 Br.
} Pl. 27

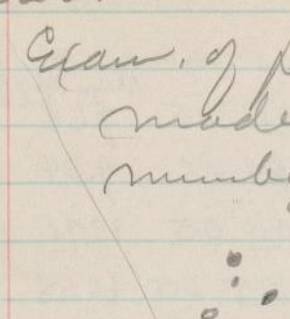
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1923phae.proj.120

Copied on
p. 25
~~WSC 3201~~

Wednesday, August 29, 1923.

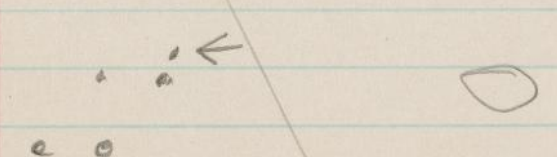
Exam. of plates for new vars. No record to be made of re-discovery of Vars. already numbered and proved.



○ north of Cl

NB long dist. from Cl. Is this 61, Off print 5?
Br. 11926 Ft. 12367

a 11926
a 12367



Long distance from Cluster.
Can this be a Nova on later plates?

12365
Br. 12367
12362
12368
12389

Ft n NS. 11926 12335
12297 12337
12301
12323
12329
12333

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1923phae.proj.1200

April 27, 1923

N.G.C. 3201

Scale Meas.

Scale Nr Meas. of 174 K — Comparison Sequence
Cam 10448 Scale Sc. B Sc. C Seq. as mkd. on B 27299

			Mean			Magn. 26.48	Magn. ÷ 2.6 Mean
1	F	5.4 = 5.0	5.1	5.05	.05 05	7.68	2.63
2		7.6 = 7.2	7.2	7.20	.00 00	9.54	2.34
3		8.6 = 8.2	8.3	8.25	.05 05	10.71	2.46
3a		8.7 = 8.3	8.4	8.35	.05 05	10.88	2.53
4		F	8.9	8.90	. . Q	11.29	2.39
5			9.2	9.20	. . Q	11.66	2.46
6			F	F		12.06	

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1923phae.proj.1200w

*B Almost combined with E

Scale N Meas. of Cluster Sequence.

Am 10448	Sc. a	Sc B	Sc. C	Mean			Deg. as marked on Read. Fr. Curve	Mag. Prints.
A		8.8 = 8.4	8.6	8.50	10	10	2.42	10.92
* B		(9.2)	9.4°	9.00	.	a	2.42	11.42
C		(9.3)	9.2	9.20	.	a	2.43	11.63
D			9.3	9.30	.	a	2.43	11.73
E			9.7	9.70	.	a	2.44	12.14
a			9.7	9.70	.	a	2.44	12.14
b			9.8	9.80	.	a	2.45	12.25
c			F	F				

Sc. B − 0.4

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1923phae.proj.120w

20

NGC 3201

Scale Meas.

	Scale N		Meas. of 174K		Comp. Seg.	
Am 13027	Sc. A	Sc. B	Sc. C	Mean	Seg. as marked on B27299	Magn. Bb.48, r.66 Diff.
2.5 1	4.7 = 4.5	4.2 = 3.8	B	4.15	7.68	3.53
2	~~6.2~~	6.7 = 6.3	6.2	6.25	9.54	3.29
3		8.0 = 7.6	7.6	7.60	10.71	3.11
3a X		8.1 = 7.7	7.7	7.70	10.88	3.18
4 5		8.8 = 8.4	8.6	8.50	11.29	2.79
5			8.7	8.70	11.66	2.96
6			F			
7						

Sc. A, Corr. = -0.2

B, " = -0.4

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1923phae.proj.1206w

Scale N Means of Cluster Sequences

And 13027	Sc. A.	Sc. B.	Sc. C	Mean	Read. fr. Curve	Magn.
A		8.6 = 8.2	8.2	8.20	3.03	11.23
B		8.9 = 8.5	8.6	8.55	2.98	11.53
C		F	8.7	8.70	2.95	11.65
D			8.9	8.90	2.91	11.81
E			9.4	9.40	2.82	12.22
a			9.1	9.10	2.88	11.98
b			9.3	9.30	2.84	12.14
c			F			

Sc. B Corr. = -0.4

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1923phae.proj.1200w

N.G.C. 3201 July 4, 1923.

New Variables

Meas. of Position with nearby earlier Vars. for check. See Bk. 5, p. 182.

D 17378 film up N up

Measuring machine.

		ver.	hor.	ver	hor	Mean Ver. Reid.
	Var. 13	16 30	7.78	16.29	7.79	162.95 05 05
p.6	New 62	16.30	8.42	16.31	8.42	163 05 05 05
	Var. 32	19.45	14 38			1945.0
p.11	New 63	18 87	14 26	1888	1427	18875 05 05
	Var. 38	13 61	10 18			136.1.0
p.16	New 65	13 98	10.10	1398.	1010	13980 00 00

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1923phae.proj.120dw

Mean Hour. Resid.	V Star - Center 14965	H Star - Center 11205	ver. x5" hor. x5"	
17.85 05 05	(162.85	78.05	Bb. 5, p. 183)	
84.20 00 00	13.40	−27.85	+ 67.00 −139.25	62
143.80	(1944.0	144.00	Bb. 5, p 185)	
14265 05 05	39.10	30.60	+ 195.50 +153.00	63
101.80	(136.1.0	10200	Bb. 5, p. 185)	
10100 00 00	− 9.85	+11.05	− 49.05 −55.25	65

	X	Y	0.155X	0.155Y
62	−139.25	+67.00	21.	
63	+153.00	+195.50		
65	−55.25	− 49.05		

			0.155X	0.155Y	X+0.155Y	Y−0.155X
62	−139	+ 67	− 21.545	+ 10.385	− 129	+ 89
63	+153	+196	+ 23.715	+ 30.380	+ 183	+ 172
65	− 55	− 49	− 8.525	− 7.595	− 63	− 40

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1923phae.proj.120

Tuesday, August 14, 1923.

N.G.C. 3201.

A few plates (8×10 a) rec'd from Arequipa.

Comparisons made for new vars.

a 11999

12365 May 8, 1923

At least 3 of the earlier vars. were noted. Iden. by original print. Nos. not kept as others were already known.

a 12368

12389 May 26

Only Cluster exam. Known Vars. found.

a 12385 Too poor to compare

a 12367

11926

Known Vars. found

New.? Already marked as Susp.? No number

Br. 1

12362

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1923phae.proj.1200w

Wednesday, August 29, 1923

N.G.C. 3201

New Var. bilar

This var. is not very near Cluster

Exam. of plates for new vars. Note record to be made of rediscovery of vars already numbered and prod.

and appears to be long period. Make special study of this — See Bk. 19, p. 152 for meas. of Position.

Exam
A 11926
12367

Confirmed by being suspected on p. 114
Conf. by ?
Make this No. 656

○ Cl.

Br. 11926

North of Cl
NB long distance from Cl
Is this 61 (off print)? No
Fr. 12367

New Var. ○ Nr. -45° 6020 $10^h 18^m 10^s.5$ (1875) $-45° 39'.4$ 10

Iden. checked by Miss Walker

○ Cluster
Long distance from Cl.
Can this be a Nova on late plates?

12362
Br. 12365
12367
12368
12389

Fr or N. S. 11926
12297
12301
12323
12329
12333
12335
12337

Not numbered in Vars. of Cluster.

Confirmed by Dr. Shapley, August 30.

Note above — top of page is for this Var.

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1923phae.proj.120

Thursday, August 30, 1923.

N.G.C. 3201 $10^h 19^m.0 \quad -45°.8$ (1900)

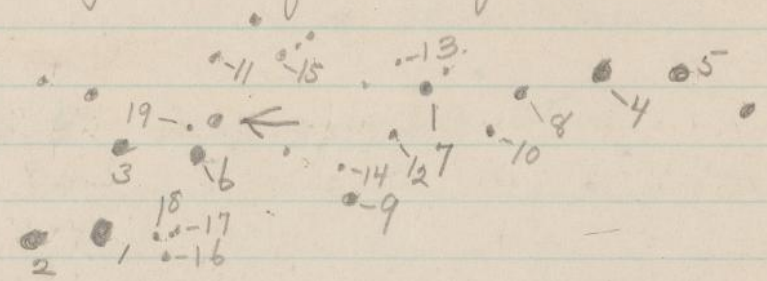
Cont. exam. of plates, last Var. 25.

To find Object Slight before A 12362.

Preliminary Eq.

A 12367

Approximately in order of Magn.



magns marked on A 11915

March 1908 I 11885 N.S ~~Ob.~~ Ft. Star on extreme edge of film

April 1908 " 11904 Br. = 8

Apr. 1922 A 11911 N.S or Trace 17 cm

11923 Ft

11999 = 11 (abnr) star

(Do not use these for exact estimates

(N.B. Interval 11-12)

* If Magns. are needed later, make new est. in tenths.

Mar 26, 1923	12297	= 18
Mar 27 "	12299	= 18
" 27 "	12301	= 17
April 18 "	12323	= 12
Apr. 19 "	12329	= 12
" 21, "	12333	11
" 22, "	12335	11
" 22, "	12337	11
May 7, "	12362	8
" 8, "	12365	8
	12367	8
" 8, "	12368	8
" 26, "	12389	7

A 2968 Corr. 15.5 Apr. 13, 1898 Eff. 60 more definite magn than 17

A 2330 N.S. < 13.4 May 27, 1897 Eff. 10

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1923phae.proj.1206w

Mrs Leg. A. 12389

Early plates

Not using 19 later — may change a trifle...

Estimate a new No. 19

April 17, 1922

λ.26 A 11911

~~11923~~

~~14999 = 11~~

11914 N.S. 18 seen Apr. 18

11915 = 19 Apr. 19

11916 ~~<19~~ Seen <19 Apr. 19 | All these plates are extreme Min?

11917 Seen <18 Apr. 19

Faintest Min: 11918 Seen <18 Apr. 19

11919 Seen <18 Apr. 19

11920 N.S 18 seen Apr. 19

11921 Trace 18 seen Apr. 20

11922 Seen <18 Apr. 20

11923 Seen <18 Apr. 20

11924 Seen <18 Apr. 20

Faintest? Min? 11925 Seen <18 Apr. 20

11926 Seen <18 Apr. 20

11927 Seen <18 Apr. 21

Faintest ? * 11928 Seen <18 Fainter stars Apr. 21 seen. Effexure 120m

11929 Seen Trace <18 Apr. 21

11930 Seen <18 Fainter stars Apr. 22 seen Eff. 240m

11931 Trace <18 Apr. 27

11933 FF =18? Apr. 27

11934 Seen <18 Apr. 27

11936 Trace? <18 Apr. 27

11955 =16 a trifle brighter May 6

11956 =15 May 6

11972 =13 May 15

11975 =13 May 16

11976 =12-13 May 16

11977 12-13 May 16

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1923phae.proj.1200w

Reject earlier estimates Remeas. 1927, all W. should differ only slightly

	A 11998	=10		May 23
λ.26	11999	=11		May 23

May. X	B 41278	May 17, 1910	11.0 = 11.2	~~May 17, 1910~~
	B 15843	May 13, 1896	N.S.	
	B 27299	May 10, 1901	N.S.	
	B 15583	April 11, 1896	N.S.	
Est. Sept. 5.	Exam. of all B plates		corr.m.	
	B 10876	April 11, 1894	12.3	
	13637	June 5, 1895	N.S.	Corr.m.
X	18447	Jan. 30, 1897	Br.	12.1
	21071	March 26, 1898	N.S	
	21554	June 1, 1898	N.S.	
	22672	May 2, 1899	N.S.	
	24993	April 7, 1900	N.S.	
X	26789	Dec. 11, 1900	Br.	12.2
	26997	March 26 1901	N.S	
	27046	March 30, 1901	N.S.	
	29354	April 14, 1902	N.S.	
	31279	Jan. 16, 1903	N.S.	
	31449	April 17, "	N.S.	
	35450	Jan. 10, 1905	N.S.	
X	38587	April 8, 1908	Seen ~~N~~	12.3
	39892	February 24, 1909	N.S.	
	41278	See above		
	52358	April 8, 1918	N.S.	

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1923phae.proj.129w

Poor Plates — rejected for usual exam. but examined for this bright star to give more dates.

a 11935	N.S.		April 27, 1922
11973	Ff	Much fainter than 8	~~May 15, 1922~~
→ 12016	=8		June 7, 1922
12017	=8.		June 7, 1922
Max? 12385	=6-7		May 24, 1923

Approx Magnitudes for stars, p. 26.
Seq. 1741K on B27299, Magns. Bk. 48, p. 66

Using:

5	11.66	6	11.8
6	12.06	7 = 6	12.0
7	12.29	8 = 7	12.3
8	12.41	9 = 9	12.8
9	12.92	10 = 11	13.4
10	13.35	11 = 12	13.9, 14.0
11	13.58	12 = 13	14.2
12	(14.0)	13 = 13-14	14.3
13	(14.5)	14 = 14	14.5
14	—	15 = ~~13~~ 14	14.6
15	—	16	
		17	
		18	
3	10.71		
3a	10.88		
4	11.29		

see p. 30

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1923phae.proj.1200w

Preliminary Seq.

On a 12367

			from a pl.	
			h:29	Mean
		7	12.0	12.0
		8 = 12.3	12.3	12.3
	8 - 9 = .6	9 = 12.9	12.8	12.8
not	9 - 10 = .5	10 = 13.4	13.4	13.4
included	10 - 11 = .2	11 = 13.6	13.95	13.8
in mean	11 - 12 = .5	12 = 14.1	14.2	14.2
Use for	12 - 13 = 3	13 = 14.4	14.3	14.4
approx.	13 - 14 = 1	14 = 14.5	14.5	14.5
check only	14 - 15 = 2	15 = 14.7	14.6	14.6
	15 - 16 = 3	16 = 15.0		15.0
	16 - 17 = 4	17 = 15.4		15.4
	17 - 18 = .2	18 = 15.6		15.6
		added as needed 6	11.8	11.8
		5	11.9	11.9
		4	11.0	11.0
		3	10.8	10.8

19

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1923phae.proj..120dw

Seq. f.26.

	Corr.	Magn.
+2	12.0	6
+2	12.2	7
	12.5	8
+2	13.0	9
+3	13.7	10
+3	14.1	11
+2	14.4	12
	14.6	13
	14.7	14
	14.8	15
	15.2	16
	15.6	17
+2	15.8	18
+2	12.0	6
+2	12.1	5
+2	11.2	4
+2	11.0	3

10.8? measurement on plate

15.9 19

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1923phae.proj.1200w

32

Range 11.2 – [16.0 Corr. Magn.

10 19.0 -45.8 1900
Not in Var. Cat.

Proof: Range
B41278 11.2
to A11916 <16.0?

Range Verified by Miss Wallace.

See prov. magns. mkd on A12367

Map A12385, 12389*
Special Mem.

Position reduced from C.DM. 1875
10 19 12.6 -45 46.9 (1900)
(Bk. 19, p. 152.)

~~Magn of faint star near, x a~~

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1923phae.proj.1200

Note: On Ame plates the Max of this Var

Not seen on Ame plates, probably.
A very good plate, Ame 13314, barely
shows Star 6, M. 26

Aug. 30 Dr. S. says to scan Ame plates for Maximum.

Marked Regim on Ame 10448
" Var. Br. on Ame 6131 (not Max?)

Plates at $10^h - 45°$

Ame 6121	Br.	May 13, 1907	
10387		April 6, 1915	Too poor
10407		April 13, "	May be trace, no est.
10416		April 15, "	N.S.
10422		Apr. 17, "	N.S.
10449	8	Apr. 20, "	Seem, faint ?
10448		" 20, "	N.S.
10466		" 22, "	Trace ?
10719		June 21, "	N.S.
11488		Dec. 11, "	N.S.
11603		April 4, 1916	N.S.
11909		June 7, "	N.S.
11950		" 11, "	N.S.
12016		" 19, "	N.S.
12624		Oct 18, "	N.S.
12673		" 23, "	N.S.
12957		April 10, 1917	N.S.
13027			
13265		June 13 "	N.S.
13290		June 17, "	N.S.
13297		" 18, "	N.S.

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1925phae.proj.1200w

is near limit of plates. Record of N.S. means that Var. is not seen — not, that it is necessarily faint. A record of < 12.0, for example, does not seem necessary to make. Because we only want measurable maxima. Var. will be difficult to estimate, so faint.

Am	13314	June 20, 1917	N.S.
	13801	April 2, 1918	N.S.
	13817	April 4, "	N.S.
	13831	" 9, "	N.S.
	13853	" 13, "	N.S.
	13862	" 17 "	N.S.
	14073	June 14, "	N.S.
	14079	" 15, "	N.S.
	14085	" 16, "	N.S.
	14605	April 5, 1919	N.S.
	15094	" 10 1920	N.S.
	15233	June 7 "	N.S.
	15247	" 10, "	N.S.
	15685	April 12, 1922.	N.S.

Plates at $11^h - 45^\circ$

Slide 3186

Am	360		
	430	April 9, 1900	N.S.
	441	" 17 "	N.S.
	750	April 6, 1901	N.S.
	769		

Slide 285

	837	June 7 "	N.S.
	1164	April 1, 1902	N.S.
	1223	April 30, "	N.S.

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1923phae.proj.1200w

$11^h - 45^\circ$

am	1341	June 12, 1902	N.S.
	1370	" 17, "	N.S.
	1750	Dec. 6, 1902	N.S.
	1771	Dec. 23, "	N.S.
	1814	Feb. 3, 1903	N.S.
	1850	April 3, "	N.S.
	1858	" 6, "	N.S.
	1987	June 2, "	N.S.
	1996	June 3, "	N.S.
	2056	" 22, "	N.S.
	2077	" 29, "	N.S.
	2403	Dec. 10 "	N.S.
	2428	" 24 "	N.S.
	2493	March 26, 1904	N.S.
	2502	April 4, "	N.S.
	2516	" 9, "	N.S.
	2562	" 20, "	N.S.
	2605	May 4, "	N.S.
	2667	" 23, "	N.S.
	2699	June 3, "	N.S.
	2742	" 12, "	Trace?
	2821	July 7, "	N.S.
	3271	Dec. 6, "	N.S.
	3320	Jan. 12, 1905	N.S.
	3353	Feb. 25, "	N.S.
	3439	April 5, "	N.S.
	3469	" 23, "	N.S.
	3528	May 13, "	N.S.
	3556	May 25, "	N.S.

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1923phae.proj.1200w

3718	July 12, 1905	Possibly Br.
4013	Dec. 5, "	N. S.
4076	Jan. 30, 1906	N. S.
4098	Feb. 3, "	N. S.
4133	March 17, 1906	N. S.
4185	April 28, "	N. S.
4225	May 12, "	N. S.
4287	June 11, "	Br.
4352	" 29 "	Br.
4720	Dec. 12, "	N. S.
4765	April 16, 1907	N. S.
4829		Slide 3066
4848	May 22, "	Dem, Ft
5309	Feb. 20, 1908	N. S.
5381	April 9, "	N. S.
5400	April 23, "	Ft —
5432	May 6, "	N. S.
5539	June 7, "	Br.
5681		Too Poor
5932	Dec. 21 "	N. S.
5949	Feb. 1, 1909	N. S.
6083	May 7, "	Br.
6202	June 9, "	N. S.
6210	June 10, "	N. S.
6860	April 4, 1910	N. S.
6901	" 30, "	Apparently Br.
6992	June 5, "	N. S.
10525	May 2, 1915	N. S.
10575	" 10, "	Slide 4134

?

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1923phae.proj.1200w

Am	10590	May 22, 1915	N.S.
	10759	July 9, "	N.S.
	11517	March 1, 1916	N.S.
	11538	March 7 "	N.S.
	11655	May 1, "	N.S.
	11694	May 10, "	N.S.
	11705	May 11, "	N.S.
	12102	July 1, "	N.S.
	12134	July 4, "	N.S.
	12204	July 17, "	N.S.
	12791	Nov. 19, "	N.S.
	12888	March 23, 1917	N.S.
	12896	March 24, "	N.S.
	12918	" 28, "	N.S.
	13103	May 9, "	N.S.
	13397	July 14 "	N.S.
	13407	July 16, "	N.S.
	13794	March 18, 1918	N.S.
	13944	May 3, "	N.S.
	13961	May 8, "	N.S.
	14134	July 7, "	N.S.
	14157	" 14, "	N.S.
	14589	March 22, 1919	N.S.
	14671	May 2, "	N.S.
	14717	May 23, "	N.S.
	14724	May 26, "	N.S.
	15161	May 9, 1920	N.S.
	15185	May 14, "	N.S.
	15201	May 23, "	N.S.

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1922phae.proj.1200

am 15548 May 10, 1921 N.S.
15855 June 14, 1922 N.S.
15906 June 29, " N.S.

Extra. MF Plates

MF 3368	April 26, 1919	~~<+8~~ Stars	N.S.
3482	May 2, "	<+~~8~~9	N.S.
3629	May 22 "	<+~~2~~9	N.S.
5183	April 9, 1920	<10	N.S.
5506	May 10, "	<9	N.S.
5549	" 12, "	<9	N.S.

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1923phae.proj.120

August, 1927

101945

Est. on B Plates

B	9226	J.D		
	10876	April 11, 1894		
	13637		13350	<15.9
	18447			12.2
	26789	Dec. 11, 1900	15365	11.7
	38587	April 8, 1908	18040	12.5
	41278	May 17, 1910	8809	11.0

Est. on All Plates

All	3718	July 12, 1905	17039	11.8
	4287	June 11, 1906	7373	12.0
	4352	June 29, "	7391	11.6
	4848	May 22, 1907	7718	abnt 13?
	5400	April 23, 1908	8055	Seem very ff abnt 12.5?
	5539	June 7, 1908	8100	11.5?
	6083	May 7, 1909	8434	11.4?
	6901	April 30, 1910	8792	11.2

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1923phae.proj.12000

101945

Estimates made out of order -

Est. on A Plates

a 11915	JD 23164	16.2
916	"	16.3
917	"	16.2
918	"	16.2
919	"	16.2
921	23165	16.0
922	"	16.0
923	"	16.2
924	"	16.1
925	"	16.3
926	"	16.2
927	23166	16.4
928	"	16.4
929	"	16.2
930	23167	16.1
932	23172	15.8
933	"	15.7
934	"	15.6
955	23181	15.1
956	"	15.0
972	23190	14.4
977	23191	14.5
998	23198	13.5
999	"	13.5
12016	23213	13.2
12017	"	13.0
12297	23505	15.4

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	J.D.	
a 12299	23506	15.8
12301	"	16.2
12323	23528	14.5
12329	23529	14.4
12333	23531	14.3
12335	23532	14.2
12337	23532	14.2
12362	23547	12.5
12365	23548	12.5
12367	"	12.6
12368	"	12.6
12385	23564	12.2
12389	23566	11.9
12886	23877	14.6
12900	3899	13.7
12934	3914	13.4
12952	3932	13.1
13002	3961	13.1

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Tuesday, September 4, 1923

NGC 3201 Examination for new Vars.

Comparing
a 11976 May 16, 1922
a 12365 May 8, 1923
11976 superposed

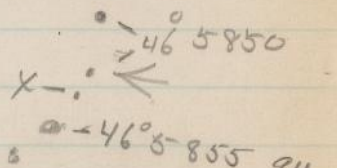
New Var.? (appx 1875) 10 3.5 -46 24
Long way from Cluster.

Od

Marked on 12367
and B ~~18447~~ 26789

Position meas.
Bb. 19, f. 154
10046

Not numbered in Vars. of Cluster.
Announce separately.



Br.		Ft	
	11976		12365
	11975		12333 Probably ft — on extreme edge of film — perhaps not wholly exposed
	11977		
	11998		
Max	12301		
	~~12367~~		12362 ft
			12367 not Max
			12368
	1923		
	12301 Mar. 27 max		12385 Poor — but Min ?
	12333 ?		
	12362 etc may early faint,		12389 Min
	12385 May late Min		

Long Period Var?

	CDm		(1875)		May.	
-46°	5855	10 3	38.4	-46 26.0	9.4	Var follows 5850 slightly.
-46	5850	10 3	23.8	-46 21.6	10	$\delta = \frac{1}{2}$ diff 5850 - 5855

Var

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1923phae.proj.120

Marked on A 12365, 11976

Exam. of A plates for new Var. p. 50

A 11911 Off edge — Near edge but three A plates are
11914 " " " taken in a circle and exposure
11915 " " " ends near this region
11916 " "
11917 " "
11918 " "
11919 " "
11920 " "
11921 " "
11922 " "
11923 " "
11924 " "
11925 " "
11926 " "
11927 " "
11928 " "
11929 " "
11930 " "
11931 " "
11933 " "
11934 " "
11936 " "
11955 " "
11956 " "
11972 " "
~~11977~~
~~119~~
11999 " "
12297 " "

A 12299 Off edge
12323 " "
12329 " "
12335 " "
12337 " "
~~12368~~ " "

12385 } p. 50
389 }

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1923phae.proj.1200w

Faint Stars - 31279
33363

Nov Var. f. 50.

For Sequence
26789
21554
31279

Exam. B plates

	13637 June 5, 1895	Probably Br.
	15843	N.S.
	21071	N.S.
For dates of these plates see f. 28.	18447	N.S.
	21554	N S
	22672	N S
	26789	Br ?
These two plates show variation but at extreme limit of plate. Var. would not be found on B plates	Show faint stars ~~But near edge~~ 26997	N.S.
	27046	N.S.
	29354	Trace?
Best X plate?	31279	N.S. - (Trace? No d
	31449	N.S.
	35450	N.S.
	38587	N.S.
Map	39892	Br.
	41278	Seen
	52358	Br. ?
	27299	N.S.

This star is too faint for our plates.

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1923phae.proj.120dw

Cour. magn.
Range — ~~13.0 to 15.0~~ 12.2 to 15.2.

Additional B Plates 10.0 -47.

B 9226		Br.	
12870	March 15, 1895	N.S.	Reject Magns. see f. 56, 57 revised.
12871	" 15 "	N.S.	
15583	April 11, 1896	N.S.	
28880	Nov. 30, 1901	N.S.	
* Max 33363	April 15 1904	Br.	
43062	May 3, 1912	N.S.	

a 2968 April 13, 1898 Seem Br.
X a 2330 Br. Max —
(* Max.)

Range: B 39892 = 12.8
33363 = 13.0
a 2330 13.0?
a 12301 abnt 13.0

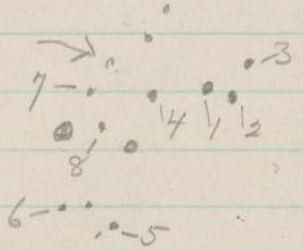
Min. B 31279 13.7?
a 12389 14.8 .2 < Star 8 f. 54
2nd est comparing Seq. f. 31 on this plate —
* var. let 15-16 = 15.0

Magn. of faint star near, * on f. 50 Bk. 22 Bk. 19, = Star 13 of seq. f. 31 = 14.6 on a 12367

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1923phae.proj.1200

Prel. Seq.



Not satisfactory
Comp. Seq. very far.
This seems fairly accurate comparing different plates and is sufficient for range and Prel. Seq.

Seq. of Var. f.26 is somewhat out of focus.
Difficult
Compare this sequence with f.26 as seen on A 2968 using also B 26789

August 2, 1927.

Corr. Magns. Confused with f.31

1	= 12.2	116	Magns. comp. with Seq. f. 31 on A 12365 also, B 26789 for br. stars
2	= 13.0	124	
3	= 13.0	127	
4		13.6	
5		~~13.87~~	omit 5 probably a little brighter than 4
6		14.0	
7	= ~~13.7~~ 14.4	14.43	
8	= 14.8	14.8	

This is based on Corr. Magns. Sequence f. 31, therefore is already Corrected

See Seq 3201
Magns would be .2 or .3 fainter if Comp. with this Seq. When finally used, perhaps take means.

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1929phae.proj.1200w

August 2, 1927

Segment of 174K too far off to use on A plates and ~~Stars~~ only faint stars are needed, so am plates are not used.

See, also, Seg. N.G.C. 3201 (Leavitt Seg) meas. Bk. 44, p. 184. Marked B 5.2381

Several plates of Var. were compared directly with this Seg. to check estimate already made with Seg. p. 54. Only 1 magn. was ent/in these cases.
Some cases differ perhaps .2

5 — on edge of film, therefore perhaps a little too bright. Will probably be satisfactory for Var. magns.

Magns. Marked on A 12301
N B edge of film. 2 & 3 not perfect.

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1923phae.proj.1200w

Aug. 2, 1927 100446

Var. estimated on A plates

A	11975	
	11976	12.7
	11977	12.6
	11998	12.5
	12362	14.1
	12365	14.3
	12367	14.3
	12368	14.2
	12385	Too poor
	12389	15.2
	12952	Fairly bright T. or close to film edge to estimate
	12301	12.1

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1923phae.proj.120mw

100446

Var. estimated on B plates

B13637

26789	Dec. 11, 1900	13.2
31279	Jan. 16, 1903	<14.0
33363	April 15, 1904	12.5
39892	Feb. 24, 1909	12.4
52241	April 1, 1918	12.2
52381	Apr. 9, "	12.2
53044		Too ft.

41278 Too poor

52985	June 6, 1918	
53031	June 12 "	
53041	" 13, "	

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1923phae.proj.1200w

Thursday, September 6, 1923.

N.G.C. 3201 Exam. of new & old plates.

a 11926 April 20, 1922, Exp. 30m

12389 May 26, 1923, 30

12389 Superpod.

No new vars. found.

12337 April 22, 1923 Exp. 32

a 12367 May 8, 1923, Exp. 35

12337 ~~April 22,~~ Superpod ~~32~~

No new vars. found.

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1923phaeq.proj.1200w

Friday, September 7, 1923.

NGC 3201 Exam of new & old plates.

A 12297 March 26, 1923 Exp. 18'
12335 April 22, " " 40
12297 superposed

As this is only 18m exp., only a brief exam is made -

Trans?
NS 12297
12952
11999

See p. 60. New Var.? B 12335
Make this No. 67 Very ft. at Max. cl.
Br. 12296, 11915, 11916, 12301
mcb.

A 12323 April 18, 1923 Exp. 40m
12335 Apr. 22, " Exp. 40
12323 superposed

Images of these plates are unusually comparable although not especially round or good.
Plates are about equal in color, intensity, elongation images, etc.

mcb

mcb

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1923phae.proj.1200w

Exam. of plates for Susp. Var. p. 59.

normal-Max This is as faint as can Max. or Normal indicates star at abnt limit of plate.

a	11911	Normal
	11914	Doubtful
	11915	Normal
	11916	"
	11917	"
	11918	"
	11919	A little fainter?
	11920	Slightly fainter?
	11921	Normal
	11922	Normal
	11923	Max
	11924	Normal
	11925	"
	11926	Slightly fainter?
	11927	Normal
	11928	"
	11929	"
	11930	"
*	11933	Trace
	11931	Very Ft
	11934	Trace
	11936	"
	11955	Normal
	11956	"
	11972	"
	11975	"
	11976	Slightly faint

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1923phae.proj.1200w

a	11977	Normal	May 16
*	11998	Min	May 23
	11999	Min	
—	12297	Trace	March 26 1923
—	12299	Normal	March 27
	12301	"	
	12323	"	
	12329	"	
	12337	"	
	12362	Ft	
	12365	Normal	
	12367	Slightly faint ?	
	12368	" "	
	12385	Normal	
	12333	Faint	April 21
	12335	Normal	" 22

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1923phae.proj.1200w

Saturday, September 8, 1923

W.S.C. 3201

A-11926 April 20, 1922 Eqf. 30m
12368 May 8, 1923 Eqf. 35
12368 surprised

No new Vars. found.

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1923phae.proj.1200w

Magnitudes, Sequence.
Mean of 2 AM Plates
Bright stars for standard.

	p.19 AM 10448	p.21 13027	Mean		
A	10.92	11.23	11.08	~~11~~ 15	
B	11.42	11.53	11.48	06	05
C	11.63	11.65	11.64	01	01
D	11.73	11.81	11.77	04	04
E	12.14	12.22	12.18	04	04
a*	12.14	11.98	12.06	08	08
b	12.25	12.14	12.20	05	06
c	F	F	F		
d					
e					

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1923phae.proj.1200

Saturday
December 1, 1923.

Meas. of Sequence NGC. 3201.

Meas. of Comp. Seq. 174 K
Seq. as marked on B 27299

MF 8065

Images rather flat, elong. film uf.

Scale M

B 6.48, 2.66.

	Sc. 1	Sc. 2.	Mean	Res.	Magn.	Magn.-Mean.
1	B	..	..		7.68	..
2	2.7 = 2.9	B	2.90	a	9.54	6.64
3	~~3.4~~ 4.8=5.0	4.9	~~4.95~~	05 05	10.71	5.76
3a	~~3.7~~ wrong	5.1=5.3 5.5	5.40	10 10	10.88	5.48
4	~~3.8~~	5.7=5.9 5.8	5.85	05 05	11.29	5.44
5	~~4.7~~ 5	6.4=6.6 6.5	6.55	05 05	11.66	5.11
6		6.8=7.0 7.0	7.00	00 00	12.06	5.06
7		F 7.2	7.20	. a	12.29	5.09
8		7.4	7.40	. a	12.41	5.01
9		7.7	7.70	. a	12.92	5.22
10		7.8 9	7.90	. a	13.35	5.45
11		8.1	8.10	. a	13.58	5.48
12		8.6	8.60	. a	..	..
13		8.8	8.80	. a	..	..
14		9.1	9.10	. a	..	..
15		F	F	. .		

Sc. 1 Corr. = +0.2

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1923phae.proj.12000

Meas. of Seq. 3201
Seq. 1, see print.

Scale M

	Sc. 1	Sc. 2	Mean	Reading from Curve	Magn.
A	6.2 = 6.4	6.4	6.40	5.25	11.65
B	6.3 = 6.5	~~7.1~~ 6.4 Irregular st.	6.45	5.24	11.69
C	6.6 = 6.8	6.8	6.80	5.15	11.95
D	6.7 = 6.9	6.9	6.90	5.12	12.02
E		7.6	7.60	5.13	12.73
F					
a		7.5	7.50	5.12	12.62
b		7.9	7.90	5.20	13.10
c		8.2	8.20	5.30	13.50
d		8.4	8.40	5.38	13.78
e		8.8	8.80	5.51	14.31
f		8.9	8.90		
g		8.8	8.80	5.51	14.31
h		9.2	9.20		
k		9.3	9.30		
l		9.3	9.30		
m		9.4	9.40		
n					

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1923phae.proj.1200w

Monday
Dec. 3, 1923

Meas. of Comp. Seq. 174 K.
Sc B 27299

MF 8063

Scale M

48:66

	Sc. 1	Sc. 2	Mean	Rec.		Magn.	Magn. − Mean
1	1.1 = 1.3	—	1.30	a	.	7.68	6.38
2	3.7 = 3.9	B	3.90	a	.	9.54	5.64
3	5.7 = 5.9	5.8	5.85	05	05	10.71	4.86
3a	6.3 = 6.5	6.4	6.45	05	05	10.88	4.43
4	6.7 = 6.9	6.7	6.80	10	10	11.29	4.49
5	6.9 = 7.1	6.9	7.00	10	10	11.66	4.66
6	B	7.8	7.80	.	a	12.06	4.26
7		7.9	7.90	.	a	12.29	4.39
8		8.1	8.10	.	a	12.41	4.31
9		8.5	8.50	.	a	12.92	4.42
10		8.6	8.60	.	a	13.35	4.75
11		8.8	8.80	.	a	13.58	4.78
12		9.4	9.40	.	a	...	
13		9.6	9.60	.	a	...	
14		B	B	.	.	...	
15							

Sc. 1, Corr. = +0.2

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1923phae.proj.120dw

Seq too much
out of center but this
plate is best of the
three available plates.

Meas. of Seq. N.G.C. 3201
Seq I, see prints

MF8063 Scale M

	Sc. 1	Sc. 2	Mean Res.	Reading from Curve	Magn.
A	6.1 = 6.3	6.4	6.35 05 05	4.74	11.09
B	6.4 = 6.6	6.5	6.55 05 05	4.68	11.23
C	6.7 = 6.9	6.8	6.85 05 05	4.59	11.44
D	6.9 = 7.1	7.1	7.10 00 00	4.51	11.61
E	9	7.87	7.70 ~~00 00~~ a	4.40	12.10
a		7.86	7.60 . a	4.40	12.00
b		7.9	7.90 . a	4.37	12.27
c		8.6	8.60 . a	4.29	12.89
d		8.7	8.70 . a	4.28	12.98
e		9.0	9.00 . a	4.26	13.26
f		9.2	9.20 . a	4.24	13.44
g		9.3	9.30 . a	4.24	13.54
h		9.5	9.50 . a		
k		9.7	9.70 . a		
l		F.	F . .		
m		9.8	9.80 . a		
n		F.	F . .		

Sc. 1, Corr. = +0.2

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1923phae.proj.1200W

a 11924

Scale P		Scale 1	Scale 2	Mean	Res.		p.63 Magn.	Diff.	Mean +6.89
	A	4.6 = 4.3	4.3	4.30	00	00	11.08	6.78	11.19
	B	4.8 = 4.5	4.4	4.45	05	05	11.48	7.03	11.34
	C	5.2 = 4.9	4.7	4.80	10	10	11.64	6.84	11.69
	D	5.3 = 5.0	4.8	4.90	10	10	11.77	6.87	11.79
	E	5.3 = 5.0	4.9	4.95	05	05	12.18	7.23	11.84
	a	5.5 = 5.2	5.1	5.15	05	05	12.06	6.91	12.04
	b	5.8 = 5.5	5.7	5.60	10	10	12.20	6.60	12.49
	c	5.9 = 5.6	5.7	5.65	05	05		7)6.26	12.54
	d	6.1 = 5.8	5.8	5.80	00	00		6.89	12.69
	e	6.5 = 6.2	6.1	6.15	05	05			13.04
	f	6.6 = 6.3	6.3	6.30	00	00			13.19
	g	6.8 = 6.5	6.7	6.60	10	10			13.49
	h	6.8 = 6.5	6.7	6.60	10	10			13.49
	k	6.8 = 6.5	6.8	6.65	15	15			13.54
	l	5	7.0	7.00	·	a			13.89
	m		7.0	7.00	·	a			13.89
	n		6.9	6.90	·	a			13.79
	o		7.1	7.10	·	a			13.99
Sc. 1	p		7.5	7.50	·	a			14.39
Corr. = -0.3	q		7.5	7.50	·	a			14.39
	r		7.8	7.80	·	a			14.69
	s		8.2	8.20	·	a			15.09
	t		8.4	8.40	·	a			15.29
	u		8.3 4	8.40	·	a			15.29
	w		8.5	8.50	·	a			15.39
	x		8.5	8.50	·	a			15.39

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1923phae.proj.120dw

A11924	Scale 1	Scale 2	Mean Res.	
Cont	y	8.8	8.80 · $\underline{\underline{a}}$	15.69
	z	9.0	9.00 · $\underline{\underline{a}}$	15.89

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1923phae.proj.1200w

Sc.A. Corr. = −0.2
B " = −0.4
C " = 0.0

Project

A 11923

Scale IV

	Scale A	Sc. B	Sc. C	Mean Res.			
A	1.4 = 1.2	B		1.20	a	11.08	9.88
B	1.6 = 1.4			1.40		11.39	9.99
C	2.0 = 1.8			1.80		11.57	9.77
D	2.2 = 2.0			2.00			9.72
E	2.3 = 2.1			2.10			10.05
a	2.2 = 2.0	B		2.00			10.04
b	2.8 = 2.6	B		2.60			9.62
c	3.0 = 2.8	3.2 = 2.8		2.80	00	00 ·	10.09
d	3.2 = 3.0	3.5 = 3.1		3.05	05	05 ·	9.93
e	3.6 = 3.4	3.7 = 3.3	B	3.35	05	05 ·	9.91
f	4.0 = 3.8	4.2 = 3.8	4.0	3.87	07	07 13	9.57
g	4.8 = 4.6	4.9 = 4.5	4.6	4.57	03	07 03	8.97
h	4.8 = 4.6	4.6 = 4.2	4.7	4.50	10	30 20	
k	4.8 = 4.6	4.9 = 4.5	4.6	4.57	03	07 03	
l	F	5.6 = 5.2	4.9	5.05	·	15 15	
m		5.9 = 5.5	5.7	5.60	·	10 10	
n		5.6 = 5.2	5.2	5.20	·	00 00	
o		6.4 = 6.0	5.6	5.80	·	02 02	
p		6.7 = 6.3	6.4	6.85	·	05 05	
q		6.8 = 6.4	6.5	6.45	·	05 05	
r		7.1 = 6.7	6.6	6.65	·	05 05	
s		7.8 = 7.4	7.6	7.50	·	10 10	
t		8.1 = 7.7	7.8	7.75	·	05 05	
u		8.5 = 8.1	~~7.8~~ 8.1	~~8.10~~	·	00 00	
v		8.5 = 8.1	8.2	8.15	·	05 05	
x		8.8 = 8.4	8.4	8.40	·	00 00	
y		8.7 = 8.3	8.4	8.35	·	05 05	
z		—	9.1	9.10	· ·	a	

12) 1.1754 / 9.80

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1923phae.proj.120

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1923phae.proj.1200w

project

Sc. A = -0.2
B = -0.4

A 12367

Scale N	Sc. A	Sc. B	Sc. C.	Mean Res.	
A	0.7 = 05		0.50	11.08	
B	0.8 = 0.6		0.60	11.39	
C	1.4 = 1.2		1.20	11.57	
D	1.7 = 1.5		1.50	11.72	
E	2.3 = 2.1		2.10	12.15	
a	2.2 = 2.0		2.00	12.04	
b	2.8 = 2.6	B	2.60	12.22	
c	2.9 = 2.7		2.70	12.89	
d	2.9 = 2.7		2.70	12.98	
e	3.7 = 3.5		3.50	13.26	
f	3.9 = 3.7	4.2 = ~~4.0~~ 3.8	3.75	13.44	
g	4.6 = 4.4	4.8 = ~~4.6~~ 4.4	4.40	13.54	
h	4.5 = 4.3	4.7 = ~~4.5~~ 4.3	4.30	—	
k	4.6 = 4.4	4.7 = ~~4.5~~ 4.3	4.35		
l	F	5.4 = ~~5.2~~ 5.0			
m		5.6 = ~~5.4~~ 5.2			
n		5.3 = ~~5.1~~ 4.9			
o		6.5 = ~~6.3~~ ~~6.1~~			
p		7.3 = ~~7.1~~ 6.9			
q		7.1 = 6.7			
r		7.4 = 7.0			
s		8.4 = 8.0			
t		8.6 = 8.2			
u		8.5 = 8.1			
w		remote to right ?			
y		8.8 = 8.4			
z		—			
x		—			

for a slight variation? Centr. with print

faint images are not comparable with good images are larger and hazy

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1923phae.proj.1206

add 10.06 to Mean

Magn. - Mean	
10.58	10.56
10.79	10.66
10.37	11.26
10.22	11.56
10.05	12.16
10.04	12.06
9.62	12.66
10.19	12.76
10.28	12.76
9.76	13.56
9.69	13.81
9.14	14.46

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1923phae.proj.120Mw

Meas. Feb. 19, 1924

Scale P A 1923

	Sc. 1	Sc. 2	Mean	Magn.		Mean +7.19
A	4.2 = 3.9	4.0	3.95	11.08	7.13	11.14
B	4.3 = 4.0	4.3	4.05	11.48	7.43	11.24
C	4.7 = 4.4	4.5	4.45	11.64	7.19	11.64
D	5.1 = 4.8	4.87	4.75	11.77	7.02	11.94
E	5.1 = 4.8	4.8	4.80	12.18	7.38	11.99
a	5.2 = 4.9	4.9	4.90	12.06	7.16	12.09
b	5.5 = 5.2	5.2	5.20	12.20	7.00	12.39
c	5.8 = 5.5	5.4	5.45		7)131	12.64
d	5.9 = 5.6	5.7	5.65		7.19	12.84
e	6.3 = 6.0	6.0	6.00			13.19
f	6.4 = 6.1	6.3	6.20			13.39
g	6.6 = 6.3	6.5	6.40			13.59
h	6.7 = 6.4	6.6	6.50			13.69
k	6.7 = 6.4	6.5	6.45			13.64
l	6.9 = 6.6	6.7	6.65			13.84
m	7.1 = 6.8	7.0	6.95			14.09
n	6.9 = 6.6	6.7	6.78			13.84
o	7.2	7.2	7.20			14.39
p		7.5	7.50			14.69
q		7.6	7.60			14.79
r		7.8	7.80			14.99
s		8.1	8.10			15.29
t		8.6	8.60			15.79
u		8.5	8.50			15.69
w		8.5	8.50			15.69
x		8.6	8.60			15.79
y		8.7	8.70			15.89
z		8.9	8.90			16.09

Sc. 1
Corr. = -0.3

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1923phae.proj.1200

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1923phae.proj.1200w

(Beissard.)

Wednesday, February 20, 1924.

Scale ♀

a 8623 Eq. 10m Mean

	Sc. 1	Sc. 2		Resid	Magn.	Magn. − Mean	Mean +6.51
A	4.98 = 4.5	4.6	4.55	05 05	11.08	6.53	11.06
B	4.9 = 4.6	4.8	4.70	10 10	11.48	6.78	11.21
C	5.5 = 5.2	5.3	5.25	05 05	11.64	6.39	11.76
D	5.1 = 4.8	4.8	4.80	00 00	11.77	(6.97)	1—
E	5.7 = 5.4	5.5	5.45	05 05	12.18	6.73	11.96
a	5.8 = 5.5	5.5	5.50	00 00	12.06	6.56	12.01
b	6.5 = 6.2	6.1	6.15	05 05	12.20	6.05	1266
c	6.7 = 6.4	6.5	6.45	05 05	♀	Mean rejecting D	12.96
d	6.8 = 6.5	6.7	6.60	10 10		30 4 / 6	13.11
e		7.1	7.1	. a2		6.51	13.61
f		7.7	7.7	. a			14.21
g		8.0	8.0				14.51
h		8.2	8.2				

(D Further from center—out of focus; apparently larger than C but not blacker image)

two faint for comp. with mean already derived.

This plate meas. to see results of scale used with 10m a plate.

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1923phae.proj.120w

Dr. Eliot's 90 birthday

March 20, 1924.

A few magns, not regular sequence, estimated in Northern portion of region, for convenience in estimating magnitudes of those stars which are far from the sequence.

These were compared on at least three plates, best one = 11923, magns. marked on A 11925 and on print, as adopted.

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1923phae.proj.1200w

	h.19 AM10448	h.21 AM13027	h.74 A11923	h.68 A11924	Mean	Resid
A	10.92	11.23	11.14	11.19	11.12	20 11 02 07
B	11.42	11.53	11.24	11.34	11.38	04 15 14 04
C	11.63	11.65	11.64	11.69	11.65	02 00 01 04
D	11.73	11.81	11.94	11.79	11.82	09 01 12 03
E	12.14	12.22	11.99	11.84	12.05	09 17 06 21
a	12.14	11.98	12.09	12.04	12.06	08 08 03 02
b	12.25	12.14	12.39	12.49	12.32	07 18 07 17
c	F	F	12.64	12.54	12.59	05 05
d			12.84	12.69	12.76	08 07
e			13.19	13.04	13.12	07 08
f			13.39	13.19	13.29	10 10
g			13.59	13.49	13.54	05 05
h			13.69	13.49	13.59	10 10
k			13.64	13.54	13.59	
l			13.84	13.89	13.86	
m			14.09	13.89	13.99	
n			13.84	13.79	13.82	
o			14.39	13.99	14.19	
p			14.69	14.39	14.54	
q			14.79	14.39	14.59	
r			14.99	14.69	14.84	
s			15.29	15.09	15.19	
t			15.79	15.29	15.54	
u			15.69	15.29	15.49	
w			15.69	15.39	15.54	
x			15.79	15.39	15.59	
y			15.89	15.69	15.79	
z			16.09	15.89	15.99	

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1923phae.proj.1200w

Corr 1922 Scale	Corr Magn.		MF 8464 FWW	8462	FWW mean	AM 10448	13027	F.W.W.
+0.24	11.36	A	11.05	1113	11.09	1152	1143	1128
+0.24	11.62	B	1150	1134	11.42			1150
+0.24	11.89	C	1155	1150	11.52	1182	1167	1163
+0.24	12.06	D	1167	1166	11.67	1187	1182	11.75
+0.24	12.29	E	1228	1223	12.25			1225
+0.24	12.30	a	1214	1195	12.06 4	1206	1215	1207
+0.24	12.56	b	1240	1223	12.32	1224	1240	1232
+0.25	12.84	c	1303	1282	12.92			1292
+0.25	13.01	d	1332	1348	13.40			1340
+0.26	13.38	e	1392	1409	14.00			1400
+0.26	13.55	f	1407:	1378 2	13.88 9			1388 9
+0.26	13.80	g	1407:	1408: 5	14.08 6:			1408 6:
+0.26	13.85	h	1495:	1521: 1493	~~15.04~~ 1494:			~~15.00~~ 1494:
+0.26	13.85	k	1437:	1478: 1460	~~14.57~~ 1448:			~~1457~~ 1448:
+0.25	14.11	l	1455:	1521: 1493	~~14.88~~ 14.74:			~~14.88~~ 14.74:
+0.25	14.24	m						
+0.26	14.08	n						
+0.25	14.44	o	1539:	160: 1547	1543 15.69:			15.43 ~~15.69~~:
+0.25	14.79	p						
+0.25	14.84	q						
+0.24	15.08	r						
+0.24	15.43	s						
+0.22	15.76	t						
+0.22	15.71	u						
+0.22	15.76	w						
+0.22	15.81	x						
+0.20	15.99	y						
+0.19	16.18	z						

16.63

1.25 64

Final log. adopted by FWW is not the one given here. It is given on an N.B.C. 3201 chart & also shown & explained in F.W.W. Var. 2 Record Bk.

1599 Y
1501 N
91

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1923phae.proj.120

N.G.C. 3201

MF Plates:

MF 8063 poorly centered, results are accordant

MF 8065 better center but flat, poor images.

Two other MF plates, too poor -

Request Feb. 27, 1924

Ask for 4 exactly centered MF Plates

4 p. 1 plate at 68m 10 25 -45.8 (1900)

2 - 30

1 10

Good images.

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1923phae.proj.120

3201

Equation of Light Correction.

See Geschichte und Literatur des Lichtwechsels.
Vol. 3, p. 112
(Using T T Velorum $10^h 16^m - 45^\circ 44'$)
Results, entered by Dr. Shapley on back of print of Cluster.
Add to Geocentric Time to get Heliocentric

March	1	+4.8 =	+0.003
	10	+5.0	+0.003
	20	+5.1	0.003
	30	+5.0	.003
April	9	+4.8	.003
	19	+4.5	003
	29	+3.9	.003
May	9	+3.3	.002
	19	+2.6	.002
	29	+1.9	.001
June	8	+1.0	.001

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1923phae.proj.120mw

Magnus mkd 11917 / N.G.C. 3201 Meas. of Magn. of Variables.
Letters " 11915
identifications.

Corr. Magnus. used

		Variable 1	Var. 2	Var. 3	Var. 4	Var. 5	
See print for ^	X 11885	14.9	14.3				
	11889	Too poor					
	11904	14.1	15.0				
	A 11911	14.3 or 4	14.1	14.9	15.0	14.9	scratched possibly a little brighter.
Poor	11914	15.2	14.5	14.6	15.1	13.8	
	11915	14.3	14.9	14.7	~~14.2~~ 13.9	15.2	
	11908						
	11909						
	11912						
	11913						
	11916	14.3	13.9	14.2	14.0	15.3	
bad images	11917	15.0	14.0	14.7	14.2	15.2	
	11918	14.8	14.1	14.3	14.1	14.4	
	11919	14.7?	14.3	14.5	14.3	14.0	
	11920	14.9	14.3	14.7	14.9	14.0	
	11921	15.0	14.6	14.9	15.0	15.8	
	11922	15.2	15.0	15.1	14.8	15.6	
	11923	14.2	15.3	14.8	14.8	15.6	
	924	14.1	14.0	14.4	15.0	15.6	
	925	14.2!	13.9	14.2	15.4	14.0	
	926	14.2	14.1	13.9	15.3	13.9	
	927	15.0	15.3 or 2	14.5	14.1	15.3	
	928	15.5	14.6	14.5	14.3	15.6	X
	929	15.2	14.0	14.8	14.6	13.8	
Blurred images Long exp.	930	14.3	14.8	14.3	15.3	— too much in center	
	931	14.6	14.7	14.8	15.1	15.0	

Poor pair

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1923phae.proj.120dw

NB Var 1 33 image very small — black - Another star back ga...

	Var. 1	Var. 2	Var. 3	Var. 4	Var. 5
12368	14.56	14.0	14.7	15.0	15.0?
11932	14.7	14.0	14.5	14.9	14.9
933	15.0	13.9	14.8	15.2	14.7
934	15.5	14.0	14.9	15.1	14.7
935	Too poor				
936	14.8	14.1	14.6	13.9	13.9
11955	14.2	14.3	14.9	14.1	—
11956	14.59	15.2	14.4	13.9	—
11971	~~14.3~~	~~14.9~~			
972	14.3	14.9	14.7	14.4	14.9
973	Too poor				
975	15.1	15.0	14.3	15.5	15.1
976	14.7	14.7	14.2	15.2	15.0
977	14.0	14.5	14.5	14.1	14.9
998	14.6	14.7	14.6	14.3	14.7
11999	14.6	14.4	15.2	14.0	15.4
12016	Poor	might be used if needed for Max.			
12017		Max.			
12297	14.0	14.2	14.0	14.5	Ft.
Poor, fuzzy 12299	15.6	13.9	"	15.2 But on late exam.	Ft.
12301	15.5	14.0	14.9	13.9	Ft.
12323	14.2	15.1	14.9	14.7	15.5
329	15.0	14.6	14.3	14.7	15.3
333	14.3	14.0	15.1	15.0	15.3
335	15.2	15.5	14.1	14.4	15.5
337	15.5	13.9	14.3	14.2	15.5
362	14.9	13.9	14.0	13.9	15.7
365	14.1	15.4	14.9	14.8	15.5
367	14.4	13.9	14.9	15.0	15.5
385	Too poor	"			
a 12389	15.2	15.1	14.7	14.0	14.7

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1923phae.proj.120

	Var. 6	Var. 7	Var. 8	Var. 9	Var. 10
X 11885					
11889					
11904					
a 11908					
11909					
11911	14.5	14.0	14.8	14.9	15.0
11912					
11913					
11914	15.2	14.7	14.7	14.7	—
11915	14.0	14.1	14.9	15.0	14.4
11916	14.1	14.3	15.0	15.0	14.7
11917	14.5	14.4	15.0	15.2	14.9
11918	14.8	14.6	14.5	14.8	14.9
11919	15.3	14.5	14.5	15.2	15.0
11920	15.2	14.6	14.3	15.0	15.0
921	13.8	14.7	14.9	15.0	14.0
922	13.8	14.7	14.7	14.8	14.2
923	14.0	14.3	14.9	15.0	14.4
924	14.3	14.1	15.0	15.1	14.5
925	14.3	14.0	15.0	15.1	14.7
926	14.5	14.0	14.9	15.1	14.9
Very four changes 927	14.3	14.2	14.7	14.5	13.9
928	14.0	14.6	14.7	15.2	14.0
929	14.2	14.4	14.1	15.1	14.6
930	14.5	14.2	15.2	15.0	14.0 or 13.9
931	14.7	14.4	14.6	14.9	14.2
932	14.7	14.1	14.5	14.8	14.5
933	15.0	14.0	14.7	14.9	14.7

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1923phae.proj.120

Probably σ = 14,4 varies slightly - on many plates it seems σ = μ 14,8

	Var. 6	Var. 7	Var. 8	Var. 9	Var. 10
~~12368~~					
11934	15.0	14.0	14.7	14.6	14.7
~~935~~	~~14.9~~	~~14.2~~			
936	14.9	14.3 2	14.8	13.8	14.9
955	~~15.2~~ 14.9	14.3	14.8	14.8	13.7
956	~~15.0~~ 15.2	14.8 3	15.0	14.7	14.0
971					
972	14.7	14.5	14.1	14.2	14.0
975	14.8 9	14.0	14.8	14.8	14.7
976	14.7	14.0	14.9	+ 14.7	15.0
977	14.7	14.2	14.5	14.0	15.2
998	14.9	14.1	14.5	14.0	15.2
999	14.3	14.3	14.8	14.3 2	15.3
12016					
017	—				
297	14.0	14.4	15.0	14.0	15.5?
Poor 299	14.7	14.5	15.0	15.0	14.5
301	14.0	14.2	14.7	14.0	15.2
323	14.4	14.6	14.3	14.9	14.8
329	15.0	14.6	14.8	15.0	14.9
333	15.0	14.5	14.9	14.9	14.5
335	15.1	14.1	14.5	14.8	13.7
337	15.1	14.2	14.9	14.9	13.9
362	14.0	14.2	14.2	14.9	13.9
365	15.4	14.3	15.0	15.1	14.8
367	14.2	14.4	14.7	14.7	13.8
368	13.7	14.5	14.9	14.6	14.0
Very poor images 12389	13.6	14.2	14.7	14.7	??

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1923phae.proj.1200w

	Var. 11	Var. 12	Var. 13	Var. 14	Var. 15
X 11885					
11889					
11904					
11908					
11909					
11911	14.4	13.7	13.9	14.6	14.1
11912					
913					
914	—	—	13.9	Ft.	14.5
915	14.5	13.8	14.8?	14.0	14.9
916	14.8	13.9	14.7	14.5	14.0
917 (14 small but black)	14.6	14.2	14.7	14.5*	13.8
918	14.0	14.1	14.6	14.9	13.9
919	14.0	14.5	14.7	15.6?	14.0
920	14.0	14.6	14.8	14.9	14.2
921	14.8	13.7	14.0	13.8	14.9
922	14.2	13.8	14.2	14.1	14.6
923	14.4	14.1	14.2	14.2	14.7
924	14.3	14.1	14.4	14.7	14.1
925	14.3	14.6	14.7	14.6	13.7
926	14.6	14.7	14.7	14.9	13.7
927	14.0	13.6 m 7	14.4	14.0	15.0
928	14.7	14.6	14.0	14.4	14.7
929	14.6 5	14.7 5	14.2	14.7	14.7
930	14.7 9	14.0	14.9	14.0	14.6
931	14.2	14.0	14.4	15.5	14.9
932	14.3	14.0	14.5	15.3	14.9
933	14.6	14.5	14.7	14.9	14.0

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1923phae.proj.1206

	Var. 11	Var. 12	Var. 13	Var. 14	Var. 15
a 11934	~~13.7~~ 14.6	14.5	14.6	13.9	13.7
~~935~~	~~Ft.~~				~~13.9~~
936	14.4	14.9	14.9	14.2	~~14.5~~ 13.9
955	14.5	14.5	14.0	Ft.	14.5
956	14.5	14.5	14.1	15.3 ?	14.~~7~~5
971	~~14.9~~	~~14.9~~	1		— ~~14.5~~ 7
972	14.9	14.~~8~~9	14.9	14.4	14.~~5~~
975	14.~~4~~9	14.~~9~~8	14.6	14.0	14.5
976	14.~~8~~4	14.~~8~~9	14.7	14.3	14.5
977	14.0	14.8	14.7	14.5	14.5
998	14.0	14.8	14.9	15.3	14.6
999	14.3	14.9	15.1	15.2	14.7
12016					
017	)				
297	14.2	14.5	14.3	15.7 ?	14.9
299	14.2	14.0	14.0	15.0	15.1 Small but flux ? at this defect
301	14.5 ?	14.5 ?	14.0	15.4	14.5
323	14.1	15.1	15.0	13.8	14.7
329	14.5	14.7	14.3	13.9	14.8
333	14.1	15.2	14.5	14.1	14.8
335	14.3	14.9	14.4	14.9	14.2
337	14.5	14.9	14.5	14.8	14.4
362	14.6	13.8	14.6	14.6	14.3
365	14.9	14.1	14.0	14.3	14.0
367	14.1	14.0	14.1	14.7	14.2
368	14.1	14.2	14.4	14.7	14.5
a 12389	14.5 ?	14.3	—	—	14.9

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1923phae.proj.1200w

	Var. 16	Var. 17	Var. 18	Var. 19	Var. 20
V 11885					
11889					
V 11904					
a 11908					
11909					
11911	14.3	14.1	14.5	14.3	14.8
11912					
913					
914	14.0	D2?	Ft.	14.3	—
915	14.1	15.5	13.9	14.3	14.5
916	14.0	15.5	14.4	14.3	14.5
917	14.4	15.5	14.5	14.5	14.3
918	14.5	15.2	14.4	14.8	14.5
919	14.2	15.6	15.0	14.9	14.6
920	14.2	14.9	15.0	14.6	14.5
921	14.2	14.8	15.0	14.0	14.2
922	14.0	15.3	15.0	14.1	14.2
923	14.1	15.6	14.3	14.6	14.5
924	14.3	15.8	14.2	14.3	14.5
925	14.4	15.7	14.6	14.7	15.1
926	14.3	15.3	14.5	14.7	14.8
927	~~14.2~~ ~~15.0~~	14.0	15.3	14.0	14.0
928	14.2	Ft.	—	14.0	14.0
929	14.1	15.0	14.0	14.4	14.5
930	14.3	—	—	13.8	14.0
931	14.3	15.0	15.0	14.5	14.8
932	14.5	15.3	14.6	14.8	14.7
933	14.4	15.6	13.9	14.6	14.7

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1923phae.proj.1206

	Var. 16	Var. 17	Var. 18	Var. 19	Var. 20.
a 11934	14.1	15.3	14.1	14.7	14.6
~~+1935~~					
936	14.0	14.0	14.2	14.2?	14.8
955	14.8 4	Fl.	Fl.	14.5	14.6
956	14.4	15.5	15.3	14.5	14.8 8
971	~~14.0~~				
972	14.0	15.5	15.0	14.0	15.1
975	14.3	14.9	14.4	14.8	14.5
976	14.3	15.0	14.5	14.6	14.7 {black but small image
977	14.3	15.0	14.5	14.7	14.6
998	14.0	15.0	14.0	13.7 or 8	14.7
999	14.7 7	15.1	14.6	14.0	14.6
12297	14.0	15.5	14.6	13.7	13.9?
299	14.3	—	—	14.2	—
301	14.3	15.5	15.2?	14.0	13.8
323	14.2	15.5	15.7	14.9	14.6
329	14.0	14.7	15.8	14.6	14.5
333	14.4	15.6	15.0	14.9	14.2
335	14.1	15.5	14.1	14.2	13.7
337	14.2	15.6	14.6	14.5	13.9
362	14.0	about 15.6	14.6?	13.9	14.8
365	14.2	15.5	*15.0?	14.6	14.1
367	14.0	15.3	15.0	13.9	14.2
368	14.2	15.3	14.7	13.7	14.4
a 12389	14.3	15.2	14.6	13.9?	14.1?

* Blurred on background

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1923phae.proj.1200w

Var. 23 difficult. Combined with others on many plates, when more background shows

9 11 B ! many Br.

a 1	Var. 21	Var. 22	Var. 23	Var. 24	Var. 25
1908					
909					
911	15.0	14.9	13.9	14.2	14.0
912					
913					
914	—	15.0?	13.9?	14.1	14.2?
915	14.8	14.0	14.3	14.5	13.8
916	14.9	14.0	14.1	14.5[6]	14.0
917	14.6	14.3	14.3	14.6	14.0
918	14.9	14.2	14.1	14.8	14.2
919	14.8	14.3	14.7	14.9	14.4
920	?	15.0 or diffuse	14.7	14.1	14.8?
921	14.1	14.9	14.2?	14.2	13.7
922	14.5	14.7	14.2	14.3	13.8
923	14.5	14.9	14.0	14.6[5]	14.0
924	14.5	14.6	14.5	14.2	14.0
925	14.7	14.1	14.2	14.9	14.3
926	14.8	13.9	14.2	14.6	14.5
927	15.0	14.3	13.9	13.9	13.9
928	✓ 13.8	15.3	14.2	13.9	14.0
929	14.2	14.~~8~~9	14.0	14.1	14.2
930	15.1	15.0	—	14.4	14.1
931	14.5	14.4	14.0	14.0	14.8
932	14.7	14.4	14.0	14.1	14.6
933	14.9	14.3	13.9	14.2	14.7

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1923phae.proj.1200w

	Var. 21	Var. 22	Var. 23	Var. 24	Var. 25
a 11934	14.8	14.6	14.2	14.1	14.5
~~935~~					
936	14.8	14.9	14.2	14.6?	13.8
955	14.5?	14.3	14.5	14.3	14.0
956	14.9	14.2	13.9	14.2	14.1
971		~~14.0~~	~~13.9~~		
972	14.3	14.0	13.9	14.6	14.5
975	13.9	14.7	14.0	14.7	14.5
976	14.0	14.7	14.4	14.6	14.6
977	14.0	14.4	14.2	14.6	14.8
998	14.5	14.0	14.1	14.4	13.9
999	14.5	14.1	14.2	14.2	14.0
12297	Defective	14.3	14.5	14.0	14.5
299	14.2?	14.8	14.7	14.2	14.4
301	14.0	14.6	14.1	14.1	14.9
323	14.6	14.6	14.0	14.5	14.4
329	14.5	14.7	14.3	14.4	14.2
333	14.4	14.5	14.1	Defective	14.3
335	15.1	14.6	14.3	14.6	13.8
337	13.9	14.5	14.1	14.9	14.1
362	14.9	14.3	14.2	14.0	14.0
365	14.0	14.9	14.0	14.4	13.8
367	14.4	14.3	14.2	14.7	14.2
368	14.6	14.0	14.0	15.0	14.3
a 12389	15.2	14.7?	14.3	14.1?	13.7

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1923phae.proj.120dw

Close to br. star

On many plates Close to br. star diff. dist. separat

	Var. 26	Var. 27	Var. 28	Var. 29	Var. 30
a 11908					
909					
911	15.0	14.2	15.2	14.9	14.3
912					
913					
914	15.0	14.0	Ft.	—	Ft
915	14.3	13.5	14.7	14.5	14.2
916	14.3	13.8	14.0	14.8	14.4
917	14.9	14.0	14.0	15.0	14.8
918	14.9	14.1	14.2	14.7	14.5
919	14.9	14.0	14.1	14.7	14.9
920	14.9	14.3	14.8 ?	14.7 ?	15.2 ?
921	14.3	13.7	15.5	14.5	14.0
922	13.9	13.9	15.3	14.6	14.1
923	14.0	14.0	15.3	14.6	14.1
924	14.0	14.1	15.6 ?	14.5	14.3
925	14.3	* 14.3	15.5	15.3	14.1
926	14.5	14.2	14.3	14.7	14.3
927	15.0	13.7	14.7 ?	14.3	13.9
928	14.6	14.0	15.8 ?	14.5	14.0
929	14.0	14.4	15.8 ?	14.5	14.3
930	15.1	14.0	—	14.3	14.2
931	14.4	14.5	15.1	14.6	15.2 ~~15.2~~
932	14.4	14.6	15.0	14.8	15.1 ~~15.0~~ ?
933	14.5	14.5	15.0	14.7	14.5 ~~13.9~~

* Not diff in shape, Var. 5 14.1

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1923phae.proj.1200w

	Var. 26	Var. 27	Var. 28	Var. 29	Var. 30
a 11934	~~14.8~~	14.5	14.2	14.5	14.3
~~935~~					
936	15.0	14.3	14.0	14.7	13.9
955	14.0	13.8	14.9?	14.3	"
956	14.0	14.1	14.4?	14.9	14.0
971		+4			
972	14.3*	14.5	15.2	14.9	15.0
975	14.9	14.5	15.1	14.7	
976	14.8	14.4	14.8	14.3	
977	14.8	14.4	15.1 5	14.3	
998	14.4	13.9	15.3 ~~a faint star long~~	14.9	
999	13.9	14.0	15.3 ~~14.4~~ ~~images~~ 5.3	15.0	
12297	14.6	14.1?	~~+4.0~~	15.2	
299	14.6	14.0	14.7	15.1	
301	14.5	14.0	14.0	15.2	
323	14.0	14.7	14.4 3	14.8	
329	14.8	13.7	15.4	14.7	
333	14.9	13.6	14.8	Defective film	
335	13.8	13.6	15.1	14.2	
337	14.1	13.8	13.9	14.2	
362	14.9	13.6	about 15.0	14.2	
365	14.1	13.6	14.9	14.3	
367	14.3	13.9	15.6	14.3	
368	14.6	14.1	14.9	14.2	
a 12389	14.8	13.9	15.2 or defective	14.0	

*26 – Bright Defect close to Var. on 11972

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1923phae.proj.1200w

	Var. 31	Var. 32	Var. 33	Var. 34	Var. 35
	On aft. Combined with another star		0	Beyond Cl. Out of focus? Difficult	Est. as this Star probably affected by close
a 11908					
909					
911		13.8	14.3	13.6	14.5
912					
913					
914		13.8	14.3	–	—
915		14.5	14.6	14.2	14.5
916		14.9	14.6	14.7	14.9
917		14.6	14.2	14.5 ?	14.3
918		15.1	14.6	14.9	14.1
919		15.1	14.4	14.9	14.1
920		14.8	14.4	14.9	13.9 or 14.0
921		14.0	14.5	14.3	14.2
922		14.5	14.3	14.7 or 8	14.7
923		14.5	14.8	14.5	14.7
924		14.6	14.6	14.9	14.8
925		15.1	14.6	14.6	14.3
926		14.8	14.3	14.8	14.7 ?
927		13.7	14.3	15.1	14.0
928		14.1	14.6	14.7	14.0 ?
929		14.3	14.3	14.5 ?	14.3
930		13.8	too close to center	14.5	??
931		14.7	14.3	14.5	14.5
932		14.8	14.5	14.6	14.5
933		15.0	14.3	14.9	14.4

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1923phae.proj.1200w

ly
2e faint stars.

Wrong star meas.
plates 11975-12337

	Var. 31	Var. 32	Var. 33	Var. 34	Var. 35
a 11934	1	14.0	14.4	15.0	14.1
~~935~~		~~13.~~			~~14.1~~
936		13.7	14.2	14.8	14.0
955		14.5 (?)	—	14.7 ?	14.5 ?
956		15.3	—	14.6	14.5
971		~~14.9~~			
972		14.9	14.5	14.0	13.9
975		15.0	14.5 7	13.5	14.4
976		15.2	14.7 6	13.7	14.5
977		14.9	14.5 3	13.9	14.6
998		13.6	14.2 4	14.1	14.0
999		14.1	14.0 5	13.7	14.0
12297		—	~~15.0~~ —	14.4	14.1
299		13.7	—	14.2 ?	—
301		13.9	14.8 6	14.~~7~~	14.3 ?
323		14.3	14.0 4	14.8	14.2
329		14.0	14.8 8	15.0	14.1
333		15.0	14.9 4	13.8	14.3
335		14.2	14.7 5	14.9	14.4
337		14.5	14.7 3	13.6	14.8
362		13.8	blurred 14.5	13.6	14.1
365		14.8	14.7	13.7	14.5
367		13.7	14.5	14.1	14.5
368		13.8	14.1 ?	14.3	14.4
a 12389		14.5 ?	14.4	—	14.3

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1923phae.proj.120dw

	Var. 36	Var. 37	Var. 38	Var. 39 (Close to Bright Star)	Var. 40
a 11908					
909					
911	14.7	14.3	14.7	15.0	14.7
912					
913					
914	13.8	14.6?	15.0?	Bl.	14.3 or 4?
915	14.9?	14.9	14.9	15.2	14.9
916	14.7	14.5	14.7	15.5	15.2
917	14.1	14.6	14.7	14.1	15.1
918	13.8	14.4	14.9	14.0	14.9
919	13.9	14.0	15.2	14.6	15.5?
920	14.1	14.0	15.2	Faint	14.7?
921	14.3	14.9	14.8	15.1	14.5
922	14.7	14.5	14.7	15.5	14.6
923	~~14.2~~ 14.6	~~14.8~~ 14.9?	~~15.0~~ 15.2	14.1	14.6
924	14.X[2]	14.7[8]	~~14.8~~ 15.0	14.5	14.6
925	14.1	14.8[7]	14.7[8]	14.5	14.7
926	14.1	14.8	14.7	14.X[6]	14.8
927	14.3	14.1	14.6	—	14.9
928	14.1	14.8	15.5	14.5?	15.2
929	14.1	14.8	14.9	14.5	14.5
930	14.4	14.7	15.4	15.0	14.9?
931	14.1	14.7	14.0	14.5	14.4
932	14.3	14.6	14.2	15.1	14.3
933	14.4	14.7	14.5	15.1	14.3

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1923phae.proj.120dw

	Var. 36	Var. 37	Var. 38	Var. 39	Var 40
a11934	14.3	14.5	14.7	15.5	14.4
~~11935~~		~~14.5~~	~~15.0~~		
936	14.2	14.65	15.2	~~Fl.~~	14.9
955	—	14.6	15.2	Pour	14.5
956	14.4	14.5	14.8	14.1	14.6
971					
972	14.6	14.3	15.0	15.4	14.96
975	14.7	14.6	14.9	15.5	14.9
976	14.7	14.7	15.0	15.3	14.6
977	14.6	14.5	14.7	15.3	14.7
998	14.4	14.7	14.3	14.2	14.7
999	14.0	14.4	14.3	14.6 ? Defective	14.9
12297	15.0	14.0	14.7	—	
299	15.2	15.0	14.5	—	
301	14.5?	14.7	14.7	15.5 ?	perhaps 14.4
323	14.0	14.0	14.7	15.3	14.4
329	14.4	14.5	14.7	15.5	15.0
333	14.5	14.5	14.8	15.6	15.1
335	14.3	15.1	14.5	15.6	14.6
337	14.9	14.0	15.0	15.6	14.9
362	too hazy	15.0	15.5	15.5	15.0
365	14.9	14.6	15.0	15.6	14.4
367	14.5	14.7	14.9	14.9	14.4
368	14.7	14.9	14.0	14.9	14.3
a12389	14.5	14.8	13.9	—	perhaps 14.5

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1923phae.proj.1200w

Valeby 94 entered wrkd Var on 11925 Var on 11925 Var. 41

Has ft. star N. Pole. Usually not satisfactory clearly separated + mean. Var. 42

Var. 43

Var. 44

Fol. N. of 2 close stars. Cannot Var. 45.

?

be separated Later — check var. again.

a 11908					
909					
911			14.9	14.2	
912					
913					
914			—	Ft.	
915	14.3	14.4	14.7	14.7	
916	14.1	13.7	14.7	14.8	
917	14.2	13.8	14.4	14.7	
918	14.3	13.9	14.1	15.0	
919	14.4	14.0	14.0	15.4	
920	14.4	14.1	14.0	Defective	
921	14.6	14.2	14.1	15.3	
922	14.6	14.7	14.1	15.3	
923	14.8	14.9	14.5	14.3	
924	14.7	14.1	14.3	14.3	
925	15.2	13.6 or .7	14.3	14.2	
926	15.1	13.9	14.7	14.2	
927	14.3	14.6	14.7	—	
928	14.1	14.7	14.5	15.5?	
929	14.7	14.7	14.0 x	14.7	
930	14.7	14.7	14.0	15.3	
931	14.3	14.8	14.7	14.4	
932	14.4	14.8 7	14.9	14.3	
933	14.3	15.0 14.8	14.6	14.3	

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1923phae.proj.1200w

	Var. 41	Var. 42	Var. 43	Var. 44	Var. 45
a 11934	14.3	14.0	14.9	14.6	
~~11935~~			~~14.~~		
936	14.5	13.9	14.4	Ft.	
955	14.7	14.3	14.4?	Poor.	
956	14.9	14.4	14.0	14.1	
971	~~14.3~~	—	~~14.6~~		
972	14.3	14.1	14.6	14.6	
975	14.7	13.8	15.0	14.6	
976	14.9	13.9	15.1	14.5	
977	14.6	14.0 or 1	15.0	14.6	
998	14.3	13.7	14.0	14.7	
999	14.3	13.9	14.0	14.4?	
12297	14.7	14.5	14.7	—	
299	14.2	14.0?	14.9	—	
301	14.2	14.5	14.7	14.7	
323	14.2	14.1	14.3	14.5	
329	15.0	14.2	14.9	14.1	
333	15.0 ∝	13.8	Defective	14.5	
335	14.2	14.8	14.0	15.4	
337	14.4	14.8	14.2	14.4	
362	14.8	14.7	14.5	14.7	
365	14.3	14.3	14.9	14.1	
367	14.4	14.5	14.3	14.3	
368	14.4	14.7	14.1	14.5	
a 12389	14.4	—	14.6	—	

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1923phae.proj.1200w

Difficult Emulsion test plates. In center, close to other stars.

	Var. 46	Var. 47	Var. 48	Var. 49	Var. 50
a 11908					
909					
911		14.1	14.2		
912					
913		1			
914		14.1	14.6		
915	14.3	14.1	14.0		
916	14.5	14.0	14.1		
917	14.9	14.0	14.0		
918	14.9	14.2	14.6		
919	14.7	14.2	14.6		
920	15.0	14.3	14.6		
921	14.0	14.1	14.2		
922	14.2	14.1	14.2		
923	14.3	14.0	14.6		
924	14.6	13.9	14.1		
925	14.9	14.1	14.1		
926	14.7	14.4	14.3		
927	13.8	14.2	14.1		
928	14.1	14.0	14.0		
929	14.5	14.1	14.2		a
930	13.7	14.0	14.1		
931	13.9	14.5	14.5		
932	14.1	14.4	14.3		
a 11933	14.2	14.4	14.6		

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1929phae.proj.1200w

	Var. 46	Var. 47	Var. 48	Var. 49	Var. 50
a 11934	14.3	14.4	14.5		
~~935~~					
936	15.0	14.7	14.0		
955	14.5	14.3	14.5		
956	14.5	14.3? large but faint	14.8		
971					
972	14.3	14.1	14.0		
975	14.0	13.9	14.0		
976	14.1	13.9	14.1		
977	14.2	14.0	14.1		
998	14.0	14.7	14.0		
999	13.8	14.9	14.4		
12297	14.4	14.2	14.6		
299	14.0	14.3	14.2		
301	14.2	14.2	14.2		
323	14.9	14.0	14.0		
329	14.7	14.0	14.1		
333	14.3	14.2	Defective		
335	14.1	14.3	14.3		
337	13.8	14.5	14.35		
362	14.8	14.9	14.83		
365	14.3	14.2	14.3		
367	14.6	14.6	14.35		
368	14.6	14.9	14.56		
a 12389	14.6	15.1	14.1		

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1923phae.proj.120w

	Var. 51	Var. 52	Var. 53	Var. 54	Var. 55
a 11908					
909					
911	14.9				
912					
913					
914	13.6				
915	14.9				
916	14.7				
917	14.7				
918	14.9				
919	13.9				
920	13.6				
921	14.8				
922	14.8				
923	14.0				
924	14.6				
925	14.6				
926	14.9				
924	14.6				
928	15.0				
929	14.9				
930	15.1				
931	13.7				
932	13.9				
a 11933	14.1				

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1929phae.proj.1260w

	Var. 51	Var. 52	Var. 53	Var. 54	Var. 55
a 11934	14.3				
~~935~~					
936	14.9				
955	14.2				
956	14.1				
971					
972	14.7				
975	14.9				
976	14.8				
977	14.9				
998	14.4				
999	13.9				
12294	14.1				
299	14.6				
301	14.6				
323	13.9				
329	14.0				
333	Defective				
335	14.6				
337	14.7				
362	14.8				
365	14.5				
367	14.9				
368	14.9				
a 12389	14.0				

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1923phae.proj.120dw

		Var. 56	57	58	59	60
a	11908					
	909					
	911					
	912					
	913					
	914					
	915					
	916					
	917					
	918		14.2			
	919		14.0			
	920		14.3			
	921		14.9			
	922		14.7			
	923		14.6			
	924		14.9			
	925		15.0			
	926		15.1			
	927		14.7			
	928		14.9			
	929		14.9			
	930		14.1			
	931		14.9			
	932		14.7			
	11933		14.7			

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1923phae.proj.1206

Va. 56	57	58	59	60

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1923phae.proj.120w

Var. 61 62 63 64 65

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1929phae.proj..120W

Van. 61 62 63 64 65

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1923phae.proj.1200w

Var. 66 67 68 69 70

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1923phae.proj.1200w

Var. 66 67 68 69 70

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1923phae.proj.120W

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1923phae.proj.120dw

Tuesday, July 29, 1924.

A few plates of 1924 for NGC 3201 recd from Arequipa. Exam. for new vars. in field. Not noted when vars. already found are re-discovered. Identified by original print.

Make this Var. No. 66

A 12886 April 1, 1924, Ef. 30m
12934 May 8, " , Ef. 30m

12886 superseded

Bi. 12934 Ft. 12886

o-A

Already suspected f. 25

67 is page

For prof, add to f. 25 -

Make this new Var. No. 67&8

Bi. 12934 Ft. 12886

66

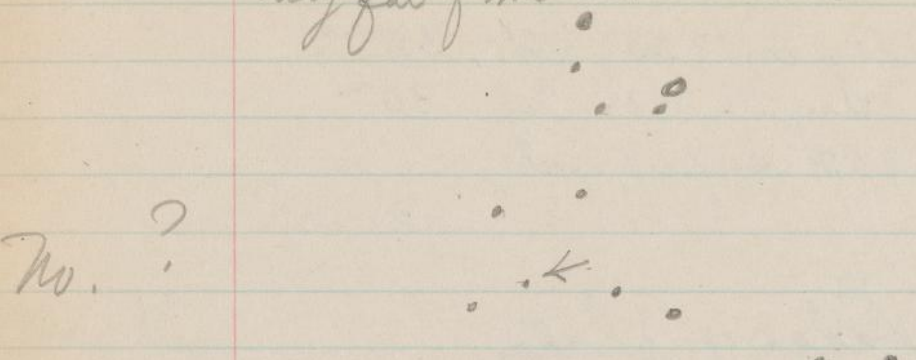
67&8

Bi. 12301 Ft. 11926
11933
11934
12335
12362

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1923phae.proj.1200w

Very far from Cl. — North —



a ft. star at Max. apparently.

No. ?

Br. 12888
11926
11934
12333
* 12365

Ft. 12934
12953 ? Not Min.

Get more proof of Min.

Neb. marked on 12888 seen on other plates

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1923phae.proj.120

July 29, 1924.

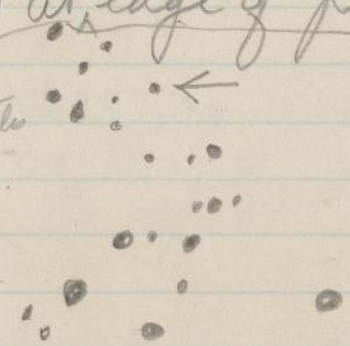
3201 Cont.

A 12965 May 8, 1923, Eff. 35m.
12952 May 26, 1924, Eff. 30m
12952 superposed.

New Var. Cl.

Approx. 1900
10h 11.0 -47.4

S
↓ at edge of plate



See Bk. 29, p. 64
Brighter on MF plates of 1924
Max. apparently on only 1 plate proved but sufficient proof of change on others

Br. 12952

Brighter than Min
12389
12385
(12886 does not cover
12984 " " "
*12952 Br.

Ft. 12365
Very ft. 12329
12335
n.S. 11977
nS. 11936
nS 11931
nS 11976

Make this No. 689 or announce separately?

Proof all above — Wait for more plates to prove bright.
Probably long period.
Image of 12952 seems good and bright.

{ Very ft. but seen on B 25440 Eff. 60m
{ Br. B 27299 Eff. 64m

For Proof
12389 — 12329
12952 — any pl. above
B 27299 — 25440

Continued, p. 132

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1923phae.proj.1200w

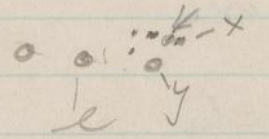
Wednesday, July 30, 1924.

3201 Cont.

12365–12952 Cont.

New Var.?

Make this No: 69



x 5 Var Close dbl.

with fol. star ft.;

This is noticeably double on print and on plates. The fol. star seems brighter on 12952. Is this a real change or effect of images of 12952?

Probably brighter than Max. on 11926
" faint on 11929
Equal to prec. st. x on 11932
Br. 12934
Br. 12368
" 12367

Do both stars change? Large image either combined or overlapping prec. star x

12337 x bright, Var. ft.
12335 Var. very ft
12329 Var. brighter

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1923phae.proj.120Nw

Friday, August 1, 1924.

3201 Cont.
a 11929
12934

12934 superposed
Both plates already examined with other plates. Wish to compare one of the recent plates with an early one.

New Var. far from Cluster

Del.

Detail of plot. of Var.

Make this Var. Sto. 70

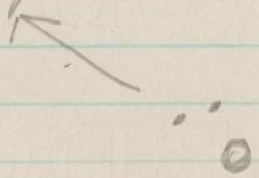
Br. 11929 — Ft. 12934
~~12886~~ — 12886
11927 — 11975
11918
12362

Probably long Per?
Was ft. on two plates already compared together, ~~11934~~ 12934 & 12886
This Var. would have been found on 11929 when comp. with 11975, p. 11, probably, if entire field had been compared. Undoubtedly only immediate region of the Cluster was exam. as no cross lines were marked on either plate.

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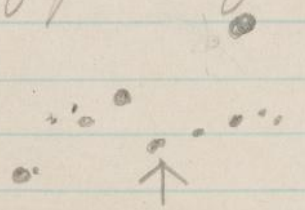
1923phae.proj.120ow

a 11918
12362
11918 superposed
Images not very good, but comparable between these plates.



Probably Defect

Near Var. long distance from Cluster.
Detail of plate of Var.



Br.	Fr. or N.S.
11918	12362
11917	12329
11915	12333
11919	11930
	11928

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1923phae.proj.120

Saturday, August 2, 1924.

3201 Cont
A 11919
12329
12329 superposed.

No new objects found.

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1923phae.proj.120dw

Monday, August 4, 1924

See tracing sheet with vars. beyond 61 marked, if not on Prints 1 or 2.

Marked 1 square degree, 60 m.m., =60'
1 m.m. = 60' = 1'
60 m.m. = 60' = 1°

Checked by estimated degree marked North & South of Cl. on B 25440 and A 11929

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1923phae.proj.120

August 4, 1924.

3201 Cont.

a 11923
12833
12833 superposed.
12323 has large clear space, defective film, prec. Cluster.

Eqaw long Eqf. fol

Eclaw. for nebulae included in this pair of plates. Many hazy objects seem nebulous but have not been noted as probably extremely faint Stars.
Neb.

← Ocl

1) extreme fol., North portion of plate Confirmed as Neb. by 11928 Eqf. 120m

2) extreme prec. North portion of pl.

Ocl

Conf.

3)

← Ocl

Conf.

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1923phae.proj.1200w

Tuesday, November 25, 1924

N.G.C. 3201

Comparing lately received MF plates, region 3201

MF 8462

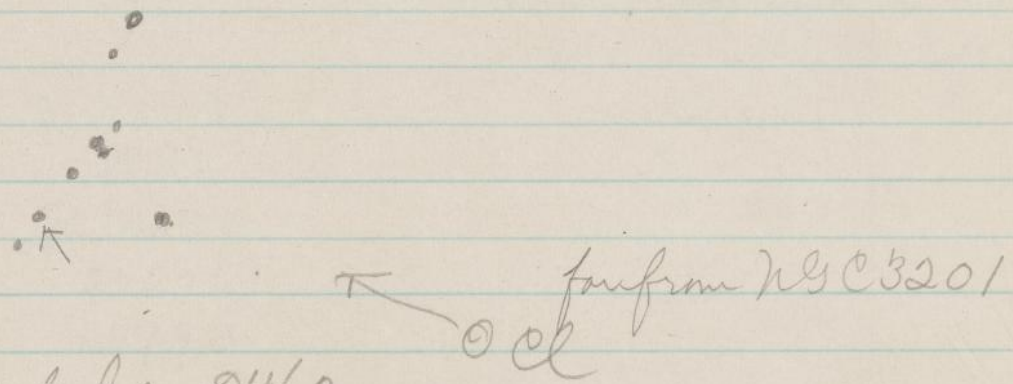
8484

8462 superposed

fund Nov. 26.

Var.?

Br. 8462 Ft 8484



Marked on 8462

Watch & confirm

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1923phae.proj.1200w

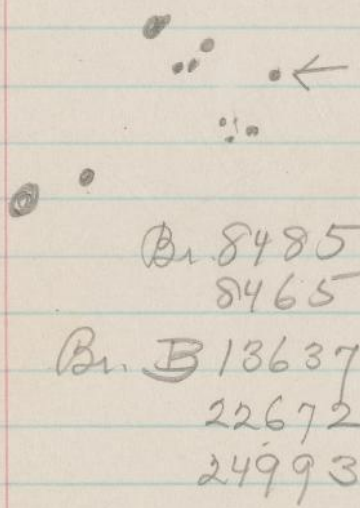
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1923phae.proj.1208w

Var.? near foll. edge of M 8482 Br,

8462 Br. 8484 Ft. miles affected by defective film.

Not in field of a plates of 3/20.1



Br. 8485
8465

Br. B 13637
22672
24993

Ft. 8484 Apr. 25
Br. 8485 Apr. 25 10 min later. due wholly to defective film?

Walch Is this Var.?

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1923phae.proj.120N

Saturday, November 29, 1924.

Comparing MF8485 and
B 25440
MF 8485

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1929phae.proj.120dw

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1923phae.proj.1200w

Thursday, December 4, 1924.

Meas. of Comp. Seq. 174 K.
2a B 27299

MF 8464 Two seq. are equally dist fm center
Plate taken especially for this region

Scale IV	Sc. 1	Sc. 2	Mean	Diffgn.	Magn. - Mean
1	0.5 ? = 0.7	–	0.7	7.68	6.98
2	3.2 = 3.4	–	3.4	9.54	6.14
3	4.7 = 4.9	4.9	4.90	10.71	5.81
3a	5.1 = 5.3	5.4	5.35	10.88	5.53
4	5.7 = 5.9	5.7	5.80	11.29	5.49
5	6.1 = 6.3	6.2	6.25	11.66	5.41
6	6.7 = 6.9	6.8	6.85	12.06	5.21
7		7.2	7.20	12.29	5.09
8		7.6	7.60	12.41	4.81
9		7.8	7.80	12.92	5.12
10		8.1	8.10	13.35	5.25
11		8.3	8.30	13.58	5.28
12		8.6	8.60		
13		8.9	8.90		
14		9.2	9.20		
15		9.5	9.50		

Sc. 1, Corr. = +0.2

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1923phae.proj.120ow

Meas. of Sequence, 3201

MF 8464

Scale M	Sc. 1	Sc. 2	Mean
A	5.2 = 5.4	5.3	5.35
B	5.7 = 5.9	5.8	5.85
C	5.9 = 6.1	5.9	6.00
D	6.0 = 6.2	6.0	6.10
E	—	7.1	7.10
a	6.6 = 6.8	6.7	6.75
b	—	7.4	7.40
c		7.8	7.8
d		8.1	8.1
e		8.5	8.5
f		8.6	8.6
g		8.6	8.6
h		8.8	8.8
k		8.8	8.8
l		9.0	9.0
m		9.1	9.1
n		9.2	9.2
o		9.3	9.3
p		9.4	9.4
q		—	—

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1923phae.proj.1200w

Friday, December 5, 1924.

Comp. Seq. of 174 K Sec B 27299

MF 8462 All stars slightly elongated (Used scale sideways)
Fk. stars hazy, not definite.

Scale M	Sc. 1	Sc 2	Mean	Magn.	Diff.
1					
2					
3	~~4.9~~ 5.0=5.2	5.2	5.20	10.71	5.51
3a	5.2=5.4	5.4	5.40	10.88	5.48
4	5.7=5.9	5.9	5.90	11.29	5.39
5	6.3=6.5	6.3	6.40	11.66	5.26
6	6.9=7.1	7.1	7.10	12.06	4.96
7		7.3	7.3	12.29	4.99
8		7.6	7.6	12.41	4.81
9		7.8	7.8	12.92	5.12
10		8.0	8.0	13.35	5.35
11		8.4	8.4	13.58	5.18
12		8.8	8.8		
13		9.3	9.3		
14		9.5	9.5		
15		9.8	9.8		

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1923phae.proj.1200w

Seq. 3201

MF 8462

	Sc. 1	Sc. 2	Mean
A	5.4=5.6	5.4	5.50
B	5.6=5.8	5.7	5.75
C	6.0=6.2	5.9	6.05
D	6.1=6.3	~~5.8~~ 6.0	6.15
E	F	7.2	7.20
a		6.7	6.7
b		7.5	7.5
c		7.9	7.9
d		8.1	8.1
e		8.5 ?	8.5
f		8.6	8.6
g		8.7	8.7

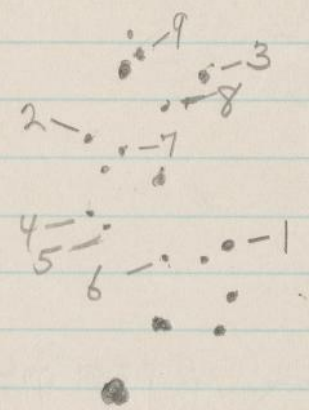
Ft. stars doubtful

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New Variable p. 116 Cont.

from
a 11972
extreme S edge



MF 8462
Harv Seg. p. 31

1 12.0
2
3

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February 13, 1928

Dr Shapley marked on print

— Selected bright stars

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1923phae.proj.1200w

February 13, 1928

Magns. mkd on A 11922 from B 22, p. 79.

(Est on 2 A plates (see other prints) Comp with Vars and Comp St.

		A 11922	A 12367		
✓	101	12.9	12.8	12.8	See print of selected brightest stars. Mkd by Dr. Shapley, Feb. 13.
✓	102	13.0	12.8	12.9	
✓	103	~~13.5~~ 12.9	12.9	12.9	Tr estimate on 2 A plates
✓	104	13.5	135	13.5 ✓	+1
✓	105	13.5	136	13.6 ✓	+2
ℓ	=106	13.4	134	13.4 ✓	0
✓	107	13.6	136	13.6 ✓	+2
✓	108	13.4	135	13.4 ✓	0
✓	109	13.0	13.1	13.0 ✓	-1
✓	110	13.3	13.6	13.4 ✓	-0
✓	111	13.4	13.6	13.5 ✓	+1
✓	112	13.6	138	13.7 ✓	+3
✓	113	13.5	135	13.5 ✓	+1
✓	114	13.6 (too close?)	135	13.6 ✓	+2
✓	115	13.1	13.1	13.1 ✓	-3
✓	116	13.1	13.2	13.2 ✓	-2
near 118 ✓	117	13.5	13.4	13.4 ✓	0
✓	118	13.5	13.6	13.6 ✓	+2
✓	119	13.5	135	13.5 ✓	+1
✓	120	13.5	133	13.4 ✓	0
✓	117a	13.2	134	13.3 ✓	-1
✓	118a	= 2 stars			

N.B. 1) not consistent difference bet two plates
2) possibly some variation.
3) omit Vars. as ext. margin
4) include any more?

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1923phae.proj.120w

	a 11922	a 12337		
✓ 121	13.2	13.1	13.2 ✓	-2
12 = 122	~~14.0~~	—		
✓ 123	13.1	129	13.0 ✓	-4
23 = 124	—	—		
✓ 125	13.5	135	13.5 ✓	+1
✓ 126	13.0	129	13.0 ✓	-4
4 = 127	—	—		
K = 128	13.8	13.8	13.8	
✓ 129	~~14.0~~ 13.9	137	13.8	
✓ 130	13.6	137	13.6 ✓	+2
6 = 131	—	—		
13 = 132	—	—		
✓ 133	13.9	14.0	14.0	
✓ 134	14.0	139	14.0	
✓ 135	13.9	137	13.8	
✓ 136	140	139	14.0	
21 = 137	—	—		
✓ 138	13.9	138	13.8	
✓ 139	14.1	140	14.0	
✓ 140	14.0	14.0	14.0	
m = 141	14.2	142	14.2	
142	13.7	13.7	13.7 ✓	+3

$$\text{Mean}_{25} = 13.38 \pm 0.18.$$

$$\begin{array}{r} -25 \\ +21 \\ \hline 25 \overline{)\,46} \\ 1.8 \end{array}$$

Three brightest not measured

Reject 2[th] and take mean of next 25.

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