

Beobachtungstag	M. Z. O-Gyalla	Zahl	Vgl.- St.	Größe	Luft	Beob.	Bemerk.
TT Cygni.							
1906 Juli 31	10 ^h 17 ^m	3	a, b, c	7.03	2-3	Cz	1)
Aug. 15	10 17	2	a, b	7.62	2-3	»	2)
» 23	11 10	3	a, b, c	7.22	2	»	
Sept. 27	9 22	3	»	7.03	3-4	»	3)
Okt. 9	9 1	2	a, b	7.62	1-2	»	
» 10	8 47	2	»	7.18	2-3	»	
» 11	8 37	2	»	7.28	2-3	»	
» 12	9 4	2	»	7.52	2-3	»	
Nov. 11	7 50	2	»	7.72	2-3	»	3)
» 15	6 8	2	»	7.44	2	»	2)
» 20	5 41	2	b, c	7.42	2-3	»	
» 21	6 25	2	a, b	7.59	2	»	Mond

$$a = +32^{\circ}3531, b = +32^{\circ}3526, c = +31^{\circ}3717.$$

1) Heller Mond. 2) Unruhige Bilder. 3) Luft undurchsichtig.

χ Cygni.

1906 Juli 24, Sept. 27, Okt. 12, Nov. 11 χ unmeßbar schwach. Cz

R Aquilae.

1906 Juli 24, Aug. 14, Okt. 12, 17, Nov. 21, 1907 Sept. 7 R unmeßbar schwach. Cz

R Delphini.

1906 Jan. 4	6 48	2	a	9.02	3	Ta	
Aug. 14, Okt. 12	R unmeßbar schwach. Cz						
Okt. 17	8 53	2	a	8.88	3-4	Cz	
Nov. 11	8 11	2	»	8.74	2-3	»	
» 15	6 24	2	»	8.56	2-3	»	
1907 Aug. 13	10 30	2	»	8.54	2	»	
Sept. 7	9 56	2	»	8.61	3	»	
» 10	10 0	2	»	9.19	3	»	

$$a = +8^{\circ}4393.$$

S Delphini.

1906 Jan. 4 S unsichtbar. Ta
 Aug. 18 | 10 6 | 2 | b, c | 10.17 | 3 | Cz |
 Okt. 12 unsichtbar; Okt. 17, Nov. 11, 21 unmeßbar schwach. Cz

1907 Aug. 13 S unmeßbar schwach. Cz
 Dez. 17 | 6 6 | 2 | a | 9.29 | 3 | Cz |

$$a = +17^{\circ}4378, b = +16^{\circ}4355, c = +16^{\circ}4350.$$

Astrophysikalisches Observatorium O-Gyalla, 1908 August.

Beobachtungstag	M. Z. O-Gyalla	Zahl	Vgl.- St.	Größe	Luft	Beob.	Bemerk.
V Cygni.							
1906 Sept. 15, Okt. 12	V unsichtbar. Cz						
T Aquarii.							
1906 Aug. 18	T unsichtbar. Cz						
R Vulpeculae.							
1906 Aug. 18	10 ^h 23 ^m	2	a	8.48	3-4	Cz	
Okt. 4, 17	R unsichtbar; Nov. 11 R unmeßbar schwach.						
Nov. 21	5 42	2	a	9.01	2-3	Cz	
$a = +23^{\circ}4224.$							
T Cephei.							

1906 Juli 31	10 35	2	a	7.44	2-3	Cz	1)
Aug. 23	11 30	2	a, b	8.40	2	»	
» 30	9 58	2	»	8.30	3	»	
Nov. 11, 15, 20	T unmeßbar schwach. Cz						
$a = +67^{\circ}1288, b = +67^{\circ}1299.$							
1) Heller Mond.							

S Cephei.

1906 Jan. 24	S unmeßbar schwach. Ta						
Aug. 30	10 10	2	a, b	8.68	3	Cz	
Okt. 4	8 23	2	c	7.18	3	»	
» 10	9 28	2	»	7.60	2-3	»	
Nov. 11	9 7	2	»	7.40	3	»	
» 20	6 24	3	a, c	6.98	3	»	
1907 Dez. 17	6 38	2	»	7.10	3	»	
» 21	6 14	2	»	7.75	3	»	
$a = +78^{\circ}757, b = +78^{\circ}758, c = +77^{\circ}834.$							

R Pegasi.

1906 Jan. 4, 24	unmeßbar schwach. Cz						
Aug. 14	10 49	2	a, b	8.52	3	Cz	
Nov. 11	R unmeßbar schwach. Cz						
$a = +9^{\circ}5156, b = +10^{\circ}4887.$							

S Pegasi.

1906 Jan. 4	7 2	2	a	8.91	3	Ta	
» 24, Aug. 18, Nov. 11, 15	S unmeßbar schwach. Cz						
$a = +8^{\circ}5039.$							

A. Tass.

16 new variable stars in Harvard Map, Nos. 4 and 13.

(Harvard College Observatory Circular No. 140).

Nos. 4 and 13 of the Harvard Map have been examined for variable stars, by Miss Cannon. Four new variable stars were found in H. M. 4, besides the known variables, T Camelopardi, X Camelopardi, 044068, S Camelopardi, V Camelopardi, Z Aurigae, X Aurigae, R Lyncis, RU Camelopardi, and Y Camelopardi. Twelve new variable stars were found in H. M. 13, besides the known variables, RX Aurigae,

RW Aurigae, 79.1907 Aurigae, W Aurigae, Y Aurigae, U Aurigae, U Orionis, 9.1904 Orionis, 060426, RT Aurigae, 062938, and X Geminorum. In the latter region, Nova Geminorum, the planet Neptune, and the minor planet Ceres, were also found. The star 060426 shows undoubted variability of at least one magnitude, on these plates. No letter has yet been assigned to this variable, although it was an-

nounced by Backhouse in 1897, and confirmed by Wendell with a range of 0.94 mag. See H. A. 55.38.

At the beginning of this investigation, there were 24 known variables in the region of H. M. 4, and 38 in the region of H. M. 13, brighter than magnitude 10.5 at maximum. Assuming the proportion that the number of known variables found is to the total number found, as the number

already known to exist in the region is to the entire number in the region, it follows that in H. M. 4, there are probably 34 variable stars of which 28, or 0.82, have been found, and in H. M. 13, there are probably 76, of which 50, or 0.66, have been found.

The new variable stars are given in the following table.

New variable stars.

Designation	H. V.	Provis. designation in A. N.	BD	RA. 1900	Decl. 1900	Bright	Faint	Range	Class
050840	3086	44.1908 Aurigae	+39° 1225	5 ^h 8 ^m 14 ^s	+40° 1'0	9.3	10.1	0.8	IV?
053538	3087	45.1908 Aurigae	—	5 35 2	+38 53.2	9.5	< 12	> 2.5	II
053913	3088	46.1908 Tauri	+13 971	5 39 23	+13 31.9	8.5	9.4	0.9	IV
054319	3089	47.1908 Tauri	—	5 43 12	+19 2.0	10.0	< 15	> 5	II?
054528	3090	48.1908 Tauri ¹⁾	+28 921	5 45 49	+28 5.2	9.4	11.0	1.6	IV
054945	3091	49.1908 Aurigae	+45 1202	5 49 42	+45 29.1	9.3	10.3	1.0	—
055013	3092	50.1908 Orionis	+13 1034	5 50 11	+13 40.2	9.7	10.7	1.0	V
055424	3093	51.1908 Geminorum ²⁾	+24 1056	5 54 33	+24 28.1	9.3	10.3	1.0	V?
055622	3094	52.1908 Geminorum	+22 1146	5 56 35	+22 14.7	9.5	11.0	1.5	IV
055716	3095	53.1908 Orionis	—	5 57 16	+16 22.3	9.5	< 12	> 2.5	II?
060222	3096	54.1908 Geminorum	+22 1187	6 2 32	+22 37.9	9.0	10.0	1.0	IV?
062061	3097	55.1908 Lyncis	+61 887	6 20 24	+61 37.1	9.2	9.9	0.7	—
062220	3098	56.1908 Geminorum	—	6 22	+20 37	9.6	10.5	0.9	V
062367	3099	57.1908 Camelopardi	—	6 23 40	+67 6.0	10.6	< 11.6	> 1.0	—
070473	3100	58.1908 Camelopardi	—	7 4 9	+73 29.7	9.8	10.9	1.1	V?
080165	3101	59.1908 Ursae majoris	+65 613	8 1 41	+65 31.6	9.2	10.1	0.9	—

Remarks.

050840. The variability was confirmed by an examination of 20 photographs, taken between Jan. 25, 1893 and Febr. 8, 1908. The period is probably short.

053538. An examination of this star on 84 photographs, taken between Dec. 29, 1890 and March 12, 1908, shows that it is a variable star of long period. These observations are represented by the formula for the times of maxima, J. D. 2416792 + 452 *E*.

053913. The variability was confirmed by an examination of 15 photographs, taken between Nov. 3, 1891 and Jan. 31, 1908. The period is short. The variable was at minimum on Jan. 14, 1905, but on Jan. 28, 1905, it was at maximum.

054319. This star has been examined on 82 photographs, taken between Dec. 15, 1898 and Jan. 10, 1908. The variation is large, but it appears uncertain whether the star belongs to Class II, variables of long period, or is peculiar, and resembles R Coronae Borealis. Photographs taken with the Bruce telescope, on Oct. 11, 1899 and Nov. 16, 1904, show no trace of this star, although stars as faint as the fifteenth magnitude are seen. The maximum appears to continue for a long period. Thus, 11 photographs taken between Sept. 24, 1901 and March 1, 1902, 10 between Oct. 2, 1902 and Febr. 26, 1903, 8 between Oct. 2, 1903 and Jan. 15, 1904, and 12 between Aug. 31, 1905 and March 23, 1906, show the star near maximum brightness.

054528. The variation was confirmed by an examination of 12 photographs, taken between Dec. 15, 1898 and Jan. 31, 1908. The period is short.

054945. This star was examined on 12 photographs, taken between Dec. 11, 1889 and Jan. 29, 1906. The nature of the light curve is not indicated. The star is probably red in color, since the magnitude 8.5, in the Bonn Durchmusterung, indicates that the star is brighter visually than would be inferred from its photographic magnitude at maximum.

055013. This is a variable star of the Algol type. It was at or near minimum on 9 of 187 photographs, taken between Dec. 15,

1898 and Febr. 22, 1908. On 7 photographs it is slightly fainter than normal, and on the remaining 171, it is of normal brightness.

055424. This variable is faint on 3 of 24 photographs, taken between Dec. 29, 1899 and Jan. 31, 1908. The variability is probably of the Algol type.

055622. Near border of Orion. The variability was confirmed by an examination of 16 photographs, taken between Febr. 4, 1893 and Jan. 30, 1908. The period is short.

055716. The variability was confirmed by an examination of 15 photographs, taken between Dec. 29, 1890 and Nov. 16, 1904. On Febr. 22, 1891, Dec. 12, 1899, and Nov. 16, 1904 the magnitude of this star was 9.5. It was fainter than magnitude 12 on Jan. 1, 1899, March 10, 1900, and Febr. 7, 1901. The period is probably long.

060222. The variability was confirmed by an examination of 12 photographs, taken between Jan. 6, 1900 and Dec. 28, 1904. The period is probably short.

062061. The variability was confirmed by an examination of 19 photographs, taken between Febr. 19, 1891 and Jan. 25, 1906. The character of the light curve is not indicated.

062220. This star precedes +20° 1432, magn. 9.5, about 0^m 1, south 1'.5. The variability was confirmed by an examination of 76 photographs, taken between March 3, 1890 and Febr. 8, 1908. The light is at or near normal on all of the photographs, except five. The variability is probably of the Algol type. The star was faint on Oct. 25, 1901, Febr. 6, 1902, Nov. 9, 1903, Jan. 29, 1906, and March 18, 1908.

062367. The variability was confirmed by an examination of 15 photographs, taken between Febr. 23, 1893 and Oct. 27, 1906.

070473. This star follows +73° 366, magn. 7.5, 24^s, north 0'.5. The variability was confirmed by an examination of 34 photographs, taken between March 8, 1890 and Jan. 25, 1906. The variable is fainter than normal on 5 of these plates. It is probably of the Algol type. It was faint on Dec. 22, 1903, but on Dec. 23, 1903, the light was normal.

080165. The variability was confirmed by the examination of 12 photographs, taken between March 8, 1890 and Jan. 25, 1906.

Harvard College Observatory, Cambridge, Mass., 1908 July 13.

Edward C. Pickering.

¹⁾ Das Harv. Circ. hat Aurigae. *Kz*.

²⁾ Das Harv. Circ. hat Tauri. *Kz*.