

1910HarCi.152.....11

## HARVARD COLLEGE OBSERVATORY.

CIRCULAR 152.

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### 20 NEW VARIABLE STARS IN HARVARD MAP, Nos. 2, 5, 32, 44, AND 53.

THE following table gives a list of twenty variables found by Miss E. F. Leland from an examination of Nos. 2, 5, 32, 44, and 53 of the Harvard Map of the Sky. One new variable was found in H.M. 2 which has a centre in R.A.  $0^h$ , Dec.  $+60^\circ$ ; two in H.M. 5, R.A.  $9^h$ , Dec.  $+60^\circ$ ; five in H.M. 32, R.A.  $20^h$ , Dec.  $0^\circ$ ; nine in H.M. 44, R.A.  $20^h$ , Dec.  $-30^\circ$ ; three in H.M. 53, R.A.  $21^h$ , Dec.  $-60^\circ$ . Besides these, the following known variable stars were also found. In H.M. 2, T Cephei, W Cephei, V Cassiopeiae, R Cassiopeiae, T Cassiopeiae, and  $\delta$  Cephei. In H.M. 5, R Ursae Majoris, W Ursae Majoris, Y Draconis, and RS Camelopardalis. In H.M. 32, R Aquilae, U Sagittae, X Aquilae, and SS Aquilae. In H.M. 44, RU Sagittarii, RR Sagittarii, R Microscopii, RT Sagittarii, and S Microscopii. In H.M. 53, RU Sagittarii and RZ Sagittarii.

In Table I, the designation of the variable, the H.V. number, or number in the order of discovery here, the constellation, the Durchmusterung number, the right ascension for 1900, and the declination for 1900 are given in the first six columns. The magnitudes of the brightest image and of the faintest image, as indicated by the photographs so far examined, are given in the seventh and eighth columns. These are not standard magnitudes, but are approximate and are found by the method described in H.A. 47. The difference between these two magnitudes, or the range of variation, is given in the ninth column. The Class of Variable is given in the tenth column, II indicating a variable of long period; IV, a variable of short period; V, a variable of the Algol Type.

If we assume that the number of known variables found is to the total number found, as the number already known is to the whole number in the region, it follows that in H.M. 2 there are probably 32 variables, of

which 28, or 0.88, have been discovered. In H.M. 5 there are probably 14 variables, of which 11, or 0.79, have been discovered. In H.M. 32 there

TABLE I.  
NEW VARIABLE STARS.

Desig.	H. V.	Constellation.	DM.	R.A. 1900.	Dec. 1900.	Bright.	Faint.	Range.	Class.
				<i>h. m. s.</i>	<i>° ' "</i>				
084849	3209	Ursa Major	+50° 1590	8 48 20	+49 52.2	10.0	11.0	1.0	..
104055	3210	Ursa Major	+55° 1409	10 40 19	+55 34.3	8.2	9.7	1.5	..
181146	3211	Telescopium	-46° 12279	18 11 22	-46 35.3	9.5	<12.0	>2.5	II?
185639	3212	Corona Australis	-39° 13082	18 56 20	-39 42.6	10.0	<13.0	>3.0	II?
191340	3213	Sagittarius	R	19 13 10	-40 23.1	10.0	<13.0	>3.0	II?
191739	3214	Sagittarius	..	19 17 50	-39 26.8	10.0	<13.0	>3.0	II?
191935	3215	Sagittarius	..	19 19 37	-35 32.8	9.5	12.2	2.7	II
192201	3216	Aquila	+ 1° 4003	19 22 33	+ 1 50.7	9.8	<13.5	>3.7	II
192238	3217	Sagittarius	-38° 13504	19 22 43	-38 17.5	10.0	<13.0	>3.0	II?
193245	3218	Telescopium	..	19 32 22	-45 48.3	9.2	<13.5	>4.3	II
193742	3219	Sagittarius	..	19 37 16	-42 5.4	9.0	13.2	4.2	II
194613	3220	Aquila	..	19 46 24	+13 42.6	10.6	12.7	2.2	IV
200103	3221	Aquila	..	20 1 38	+ 3 34.4	9.0	10.8	1.8	IV
200706	3222	Aquila	..	20 7 58	+ 6 0.1	10.0	13.9	3.9	II
200913	3223	Capricornus	..	20 9 21	-13 15.1	9.6	<11.0	>1.4	..
201217	3224	Capricornus	-18° 5641	20 12 14	-17 59.3	8.8	10.6	1.8	V
205148	3225	Indus	-48° 13729	20 51 12	-48 27.4	9.4	10.2	0.8	..
210445	3226	Indus	-45° 14237	21 4 51	-45 29.0	7.9	9.5	1.6	..
214750	3227	Indus	-50° 13517	21 47 52	-50 24.9	10.3	11.6	1.3	..
222656	3228	Cepheus	+56° 2793	22 26 22	+56 28.9	9.2	10.8	1.6	..

### REMARKS.

185639. The variable is the southern and preceding of two close stars, either or both of which might be identified as C. DM. -39° 13082.

191340. This star is C. P. D. -40° 8913, and is not in the C. DM.

191935. Measures of 97 photographs, taken between August 6, 1889 and May 20, 1908, show that this is a variable of long period, and give the formula for times of maximum, J.D. 2410186 + 197<sup>d</sup> E.

192201. Measures of 72 photographs, taken between August 1, 1890 and May 12, 1907, show that this is a variable of long period, and give the formula for times of maximum, J.D. 2410220 + 270<sup>d</sup> E.

193245. Measures of 126 photographs, taken between June 19, 1889 and July 31, 1907, show that this is a variable of long period, and give the formula for times of maximum, J.D. 2410077 + 230<sup>d</sup> E.

193742. Measures of 77 photographs, taken between

June 8, 1892 and October 16, 1907, show that this is a variable of long period, and give the formula for times of maximum, J.D. 2410184 + 263<sup>d</sup> E.

194613. Measures of 62 photographs, taken between June 2, 1890 and November 14, 1905, show that this star is a variable of short period.

200103. Measures of 78 photographs, taken between July 15, 1897 and July 18, 1906, show that this star is a variable of short period.

200706. Measures of 50 photographs, taken between August 19, 1891 and July 18, 1906, show that this star is a variable of long period, and give the formula for times of maximum, J.D. 2410028 + 240<sup>d</sup> E.

201217. This star was examined on 100 photographs. On August 1, 1900, May 14, 1902, August 19, 1904, June 10, 1905, August 15, August 19, and November 8, 1906, it was a magnitude fainter than the normal magnitude, 9.3.

are probably 61 variables, of which 32, or 0.52, have been found. In H.M. 44 there are probably 64 variables, of which 32, or 0.50, have been discovered. In H.M. 53 there are probably 42 variables, of which 20, or 0.48, have been discovered.

Several of these stars were measured by Miss Leland on a large number of plates, and the elements given below were derived, by Miss Cannon, from these measures.

EDWARD C. PICKERING.

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