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## Provisional elements of the variable star Harvard 2738

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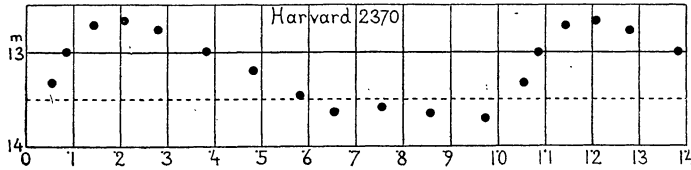
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dividing into groups of from 2 to 5 plates, the mean values given in Table 2 and represented graphically in the Figure are found. Judging from the differences in magnitude between two observations of similar phase, the mean error of one observation is  $\pm 0.15^m$ . The total weight of all the observations is therefore only  $46 \cdot 15^2 = 2000 m^{-2}$ .



The limiting magnitudes found here are  $12^m.6$  and  $13^m.7$ . Their mean  $13^m.15$  is passed on the ascending branch of the lightcurve at phase  $0.07$ . The ephemeris of the corresponding epoch is

$$J. D. M. T. Grw. 2423781.089 + .41 E \\ \pm .005 (m. e.)$$

This variable does not fit into the period-luminosity curve of the Great Magellanic Cloud, but it is doubtful, whether it belongs physically to the cloud. This last remark may also hold for the unmentioned number of variables of the RR Lyrae type found at Harvard in the region of the Small Magellanic Cloud (*H. B.* 765; 1922). The general density in the sky of faint variables of the RR Lyrae type ought first to be investigated before conclusions of this kind may be drawn.

TABLE 2.

phase	number of plates	mag.	phase	number of plates	mag.
P		m	P		m
.055	2	13.32	.482	4	13.20
.085	2	13.00	.582	5	13.46
.143	3	12.72	.655	4	13.64
.208	4	12.67	.755	4	13.59
.280	3	12.77	.856	5	13.65
.382	5	13.00	.972	5	13.70

Provisional elements of the variable star Harvard 2738, by *Ejnar Hertzsprung*.

The variability of this star, the position of which is  $5^h 37^m.0, -66^\circ 42'$  (1875), has been confirmed on photographs of the Great Magellanic Cloud taken at the Union Observatory of Johannesburg. The combined results of my provisional estimates on 44 of these plates are given in Table 1. As there is no evidence

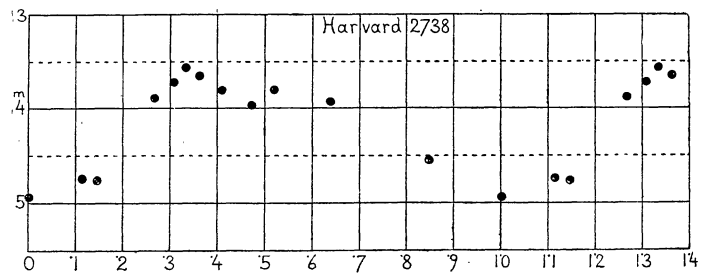
In Table 2 the estimates have been further combined according to phase into groups of 3 or 4 plates. The normal places thus obtained are graphically represented in the accompanying Figure.

At minimum the star is so faint that it is difficult to estimate its brightness on my plates, but the present discussion is mainly based on the part of the light curve, where the star is bright. The length of

TABLE 1.

J. D. M. T. Grw.	number of plates	appr. phot. mag.	phase	J. D. M. T. Grw.	number of plates	appr. phot. mag.	phase
2423700+				2423700+			
d		m	P	d		m	P
56.428	2	13.82	.291	86.396	3	14.6	3.880
57.368	2	13.8	.403	87.413	3	14.05	4.002
57.474	2	13.8	.416	88.310	2	14.88	4.109
58.417	1	13.8	.529	88.413	2	14.6	4.121
62.364	1	14.6	1.002	90.313	2	13.55	4.349
63.400	2	14.85	1.126	90.408	2	13.7	4.360
64.384	2	13.95	1.244	91.455	1	14.1	4.486
65.392	2	13.6	1.364	97.303	1	14.6	5.186
66.381	1	13.9	1.483	98.298	2	13.7	5.305
83.352	2	13.8	3.515	98.349	2	13.72	5.311
84.375	3	13.92	3.638	98.406	2	13.58	5.318
85.328	1	14.4	3.752	99.448	1	13.9	5.443

of a period less than a day, the plates taken during the same night have eventually been combined into groups of 2 or 3. The observations are satisfied by a period of  $8^d.35$ . The phases are given in fractions of that period and have been arbitrarily counted from 1923 Dec. 0 or J. D. M. T. Grw. 2423754.0.



the adopted period,  $8^d.35$ , is the reason for making the variable the object of this note. Periods of similar length of variable stars of this kind are namely of special interest in connection with the general relation between period and shape of the light curve. It has been pointed out by LUDENDORFF (*Astron. Nachr.* 5006, 209, 217; 1919) that for variable stars of the  $\delta$  Cephei type the values for the single stars of the fraction of the period during which the brightness is