

## VARIABLE STAR SECTION.

CIRCULAR No. 163.

NEW VARIABLE IN MUSCA.

= EG Mus

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SUMMARY: The discovery of a new variable in Musca is reported. Its 1950 position is:- 12h 39.1m -68° 33!2. A chart is reproduced showing its location. V and B observations are listed and photographic results are given. The star is probably a red semi-regular variable with a range in V of 11.4 to 12.2 and a period of about 140 days but as an entire cycle has not yet been observed this period may be incorrect.

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DISCOVERY: In 1970 March, B. Ward, of Tirau, reported a star of about magnitude 11.5 (ptg) on a photo taken by him on 1969 December 28 (U.T.). Estimates from his observations give the following photographic magnitudes, which are considered to have an accuracy of  $\pm 0.3m$ .

	<u>U.T.</u>	<u>PTG. MAG.</u>
1968	Aug. 28	12.5
1969	Jan. 7	12.5
	Feb. 9	<13
	Mar. 22	12.5
	Oct. 13	12.5
	Dec. 28	11.5
1970	Feb. 5	11.5
	Mar. 1	12.0
	Mar. 12	12.0
	Apl. 5	12.5

There is a star of approximately mag. 13 (ptg) on the Franklin Adams charts at the 1875 position of the variable-- 12h 34.6m -68° 08!6. It does not appear on Vehrenberg's Atlas.

CHART: A chart is included in this Circular showing the location of the variable. Its 1950 position is:-

12h 39.1m -68° 33.2

COMPARISON STARS:

At the Auckland Observatory, three colour UBV observations were made from 1970 April 5 U.T. Observations were made against comparison stars marked "d", "c" and "b" shown on the chart. "c" is CPD -68° 1735 and was used as comparison star. "d" (CPD -68° 1734) and "b" were used as check stars.

During 1970 July the magnitudes and colours of these three stars were determined on the UB system, using the following stars, as listed in R.O.B. 64 (1962):

<u>H.D.</u>	<u>C.P.D.</u>	<u>1950</u>	<u>1950</u>	<u>SPEC.</u>	<u>V</u>	<u>B-V</u>
110716	-68° 1745	12h 41.9m	-68° 33'	Go	6.14	+0.68
110717	-68 1744	12 41.9	-68 45	A2	7.34	+0.13

The system constants were determined from the cluster IC 4665 yielding:-

$$\epsilon = -0.04; \mu = +1.032; \psi = +1.007; k''_{bv} = -0.052$$

$$k''_{ub} = -0.011$$

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All observations were made differentially from the comparison star and reduced using the equations.

$$\Delta V = \Delta v - 0.04 \Delta(B-V)$$

$$\Delta(B-V) = 1.032 (1 + 0.052X) \Delta(b-v)$$

$$\Delta(U-B) = 1.007 (1 + 0.011X) \Delta(u-b)$$

The magnitudes derived for the comparison stars were:-

<u>CHART</u> <u>LETTER</u>	<u>C.P.D.</u>	<u>V.</u>	<u>B-V.</u>
"d"	-68° 1734	9.89	+0.04
"c"	-68 1735	10.27	+1.27
"b"	...	11.27	+0.24

The U-B values will be computed and published at a later date after the standards for the field have been observed at a lower airmass.

The transformation coefficients used are expected to yield an accuracy better than 0.03m in V; 0.04m in B-V.

The Cape magnitudes for CPD -68° 1734 are:-  
 $SP_g = 9.69$ ;  $SP_v = 9.96$ ; Spec. AO C.I. = -0.27

OBSERVATIONS:

The following observations have been made, but U-B values are omitted until the standards have been observed at a lower airmass.

	<u>1970--U.T.</u>	<u>V.</u>	<u>B-V.</u>
April	5.3271	11.82	+1.86
	5.4465	...	+1.95
	12.3250	12.07	+1.85
May	16.4021	12.11	+2.07
	15.3889	12.19	+1.94
	17.2910	12.15	+1.82
	27.3778	12.17	+1.77
June	9.2889	12.03	+1.79
	15.4201	11.94	+1.76
	20.5917	11.96	+2.02
July	8.3708	11.62	+1.80
	17.2944	11.55	+1.74
	31.4618	11.49	+1.84
Aug.	16.3000	11.47	+1.94
	23.3118	11.47	+1.90
Sept.	9.3681	11.55	+2.06:
	11.3514	11.59	+1.79
	13.3722	11.54	+1.92

Observations followed by a colon indicate limited accuracy due to low net brightness counts. V magnitudes were determined against two comparison stars yielding an accuracy considered to be better than 0.02m on all nights.

COMMENTS: If it is assumed that Ward's photo of 1969 Dec. 28 was taken when the variable was at maximum a period of approximately 140 days fits the results to date. Range 11.4 to 12.2 in V.

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ACKNOWLEDGEMENTS: Observers were B.F. Marino, W.S.G. Walker, G. Christie and R. Feasey. System calibration and reductions were made by Marino & Walker. We thank the Director, VSS, (F.M. Bateson) for material assistance in preparing this paper.

1970 October 1

18 POOLES ROAD,  
GREERTON.  
TAURANGA, NEW ZEALAND.

CHART.

