ANOTHER VARIABLE WITH CHANGING PERIOD

Magnitudes for one of my hitherto unpublished var-
iable stars in Sagittarius, at $18^h33^m07^s - 21°14\!.2$ (1900)
were estimated by Miss Loretta J.Locicero on some 250 Har-
vard and 500 Nantucket plates. For the Harvard plates of
the MF series (10-inch Metcalf, scale 167"/mm) for the
years 1924-34, she found a reciprocal period of $2^{-d}\!.467859$,
and for the Nantucket plates (7.5-inch Cooke,scale 248"/mm)
a slightly shorter value, 2.467825. Harvard plates of other
series for the intermediate years 1942-51 are sparsely
distributed and do not fit either of these periods well. In
Figure 1, therefore, I have plotted the phases of ascending
light, on the basis of the reciprocal period, 2.467825 and
for magnitudes brighter than 13.7, against the Julian day
from J.D.24$\underline{24}$000 to beyond 24$\underline{40}$000. This indicates that the
period in changing progressively. All of the observations
are then satisfactorily represented (Figure 2) by

$$\text{Phase} = 2.467825 \, (JD) - n - 0.130*10^{-8}(JD - 2438500)^2.$$

The final term in this expression is represented by the
smooth curve through the points in Figure 1. In terms of
the period itself we get

$$\text{Max} = JD \ 2438563.748 + 0^d\!.4052151 \, n + 0.865.10^{-10}n^2.$$
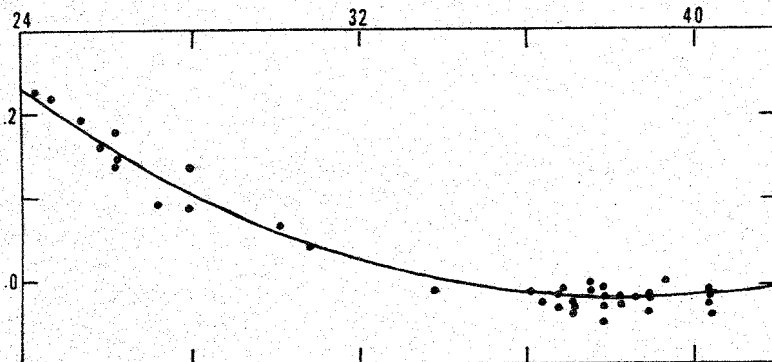

Figure 1

The period and change of period are given by

$$P = P_0 \ (1 + 5.27 \cdot 10^{-10} n)$$

representing a progressive lengthening of the period by $1.85 \cdot 10^{-5}$ seconds per cycle.

The observations seemed to indicate a possible secular change in amplitude or magnitude at maximum. This can, however, be interpreted merely as systematic errors corresponding to the use of different instruments, different emulsions, and different effective exposures in a field where overlapping images are prevalent. The horizontal spread in the ascending branch of the light curve appears to be random and does not suggest a correction either to the basic period or the secular term.

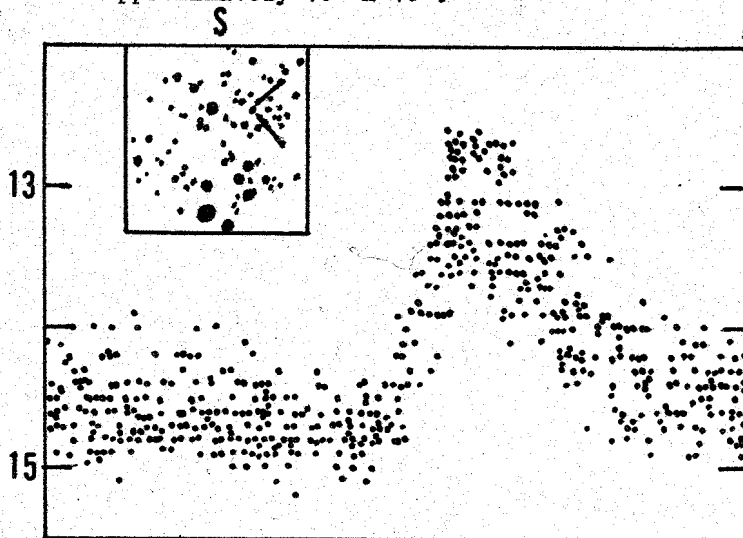The insert in Figure 2 is a finding chart showing a field of approximately $10' \times 10'$.

Figure 2

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