ON THE LIGHT AND VELOCITY CURVES OF W SAGITTARI

After the completion of my paper on the radial velocity and orbit of W Sagittarii [L. O. Bulletin, No. 62], there came to hand the excellent set of photometric observations of this star appearing in The Annals of the Astronomical Observatory of

Harvard College, Vol. XLVI, Part II. The deductions from these observations possess certain points of interest that may well be pointed out in connection with my own radial velocity determinations of this variable.

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Forming the mean of ten determinations of light maxima of W Sagittarii from Table XVIII of the Harvard volume, and bringing this mean up to my epoch with Chandler's accurate period, I find for time of maximum, 1903, August 2.46 days. My value from Chandler's elements was, 1903, August, 2.86 days.

Adopting the new value, the only orbital element affected is T (Time of periastron passage after light maximum), which becomes 6.69 days. Thus the light maximum occurs 0.99 days instead of 1.39 days after periastron time, and almost exactly at velocity minimum instead of 0.4 days after it.

The greatest interest lies in the comparison of the light and velocity curves. In the accompanying diagram the Harvard light curve from Table XVII is drawn in parallel with the velocity curve to exhibit the correspondence of detail both in form and position referred to maximum. The striking concordance observed is certainly more than a coincidence. Indeed the strong general resemblance between the light and velocity curves of W Sagittarii is good evidence that the form of each is determined by the same underlying causes; but speculation on this point may properly wait until more data are available on similar stars.

The difference between the Harvard and Schmidt light curves seem hardly accountable on the ground

of observational errors. It is not impossible that the true explanation is to be found in actual changes in the system of this star in the interval of thirty years between Schmidt's observations and those of Harvard College Observatory. This variation in the form of the light curve, together with Schmidt's suspected perturbation in the light period, suggests that the light changes of W Sagittarii are complicated by factors whose forms and magnitudes cannot be determined until the spectrographic and photometric observations cover many years.

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