computed and they are practically the same.

BD + 26°2508, HD 121648

The star BD + 26°2508, HD 121648, has been found on photographic plates to be an eclipsing variable of a straight Algol type. According to the paper published by G. H. Shajn¹ this star is a spectroscopic binary with double lines, of spectral class Fo + Fo, for which he gave the approximate period about 4.96 days. My elements are:

$$\text{Min.} = \text{JD } 2430878^{\text{d}}571 + 4.991749\text{E.}$$

The variable at maximum brightness is 6.75 mag; both minima seem to be of the same, or of nearly the same, depth, about 0.75 mag., a truly rare case among the bright eclipsing systems. The duration of the eclipse is extraordinarily small for such a short period, not more than 0.05P. All the values given above are of the first approximation, except that of the period. Over two thousand observations are being collected in order to obtain more accurate information concerning this system, which may fall into a very select group of eclipsing variables, a group of paramount importance with reference to their absolute dimensions along the main sequence.

1. *Ann. Crimean Astroph. Obs.* **5**, 105, 1950.

*Harvard College Observatory,
Cambridge, Mass.*

Greenstein, Jesse L. Abundances in a high-velocity F star.

Stars have slightly different spectra dependent on whether they are of Baade's population type I or II. The high-velocity stars show somewhat weaker spectral lines. A re-analysis of McDonald high-dispersion spectra of the star θ Ursae Majoris, a high-velocity giant F star, indicates that all lines of metals and of hydrogen are substantially weakened when compared with their strengths in normal F stars. There is no trace of a differential behavior between light and heavy metals. One explanation of this effect would be that some other element not detectable in the observable spectral region is more abundant than normal. The most probable element is helium. The observations indicate that helium would have to be roughly doubled in abundance in the high-velocity stars. For example, if we assume that in low-velocity stars hydrogen is 72 per cent, helium 28 per cent, and the metals 72 per cent/A, then in the high-velocity stars hydrogen would

be 39 per cent, helium 61 per cent, and the metals 39 per cent/A. A is the ratio of the abundance hydrogen to the metals. Thus, briefly, one might call the high-velocity stars helium rich.

*Mount Wilson and Palomar Observatories,
Pasadena, Calif.*

Hamid, Salah E. The formation and evolution of the Perseid meteor stream.

The formation of meteor streams in general, and the Perseid shower in particular, has been the subject of many investigations since 1850. Meteoric particles were visualized as having been ejected from a parent comet; in the case of the Perseid shower, from Comet 1862 III. These particles are dispersed along the orbit, due either to their velocities of ejection or to planetary perturbations, or both. In order to account for the phenomena of the Perseid meteor stream, which is characterized by the diffuseness in the radiants and by the long duration, more than two weeks, of the shower, large velocities of ejection were assumed of the order of several kilometers per second. The effect of planetary perturbations has not previously been discussed in detail and in some cases has even been discarded.

The formation and evolution of the Perseid meteor stream are considered in detail in this investigation. We expect, on the basis of Whipple's new model of comets, that the meteoric particles will be ejected from the comet at an appreciable rate when it is within about 2 a.u. from the sun, and that the velocity of ejection ΔV will be given by:

$$\Delta V = \left(\frac{R_c}{ns} \right)^{\frac{1}{2}} \frac{3.28}{q^{9/8}} \text{ meters/sec,}$$

where R_c = radius of the comet in kilometers, $1/n$ = heat absorption coefficient, s = radius of the meteoric particle in centimeters, and q = perihelion distance of the comet in a.u.

Consequently, in order to know the age of the stream, one should know how long it has been since the comet's perihelion distance has been within 2 a.u. This requires a knowledge of the history of the comet, particularly of its orbital elements. Hence, we must obtain analytical expressions for the secular perturbations by the different planets on the comet. Inasmuch as the classical methods are not applicable because of the retrograde motion and high eccentricity of Comet 1862 III, a new method, suggested mainly by Brouwer, has been developed for obtaining