suggested by this approach to cosmic chemistry.

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FIREMAN, E. L. AND DEFELICE, J. **Argon-39 and tritium in meteorites.**

The radioactive isotopes A^{39} (260-year half-life) and tritium (12.4-year half-life) were measured in seven iron and in two stony meteorites. A^{39} was detected and measured in the iron meteorites Sikhote-Alin (1947), Treysa (1916), Pitts (1921), and in the stony meteorites Norton County (1948) and St. Michel (1910). The detection and measurement of A^{39} in these meteorites makes it possible to determine their argon exposure ages (Fireman, E. L. *Nature*, **181**, 1613, 1958). On the basis of the same assumptions used in that article, the ages are 4.9×10^8 years for the Sikhote-Alin meteorite, 5.7×10^8 years for the Treysa meteorite, 6.5×10^8 years for the Norton County meteorite, 1.7×10^8 years for the St. Michel meteorite, and, for the Pitts meteorite, an unusually low figure in the range of 10^7 years.

The short argon exposure ages may be interpreted in two ways: they may result from the loss of shielding material, worn off the meteorite in space by interplanetary dust and gas (suggested in private discussion with Professor Fred L. Whipple); or they may represent the times since the breakup of planets. From the lack of A^{39} in the Carbo and Grant meteorites and the small amount of A^{39} in the Washington County meteorite whose dates of fall are unknown, one can conclude that Carbo and Grant fell more than 1500 years ago and that the Washington County meteorite fell about 1000 years ago. In the case of the Cañon Diablo meteorite the He^3 content is so low that the measured absence of A^{39} and tritium does not necessarily mean that it fell long ago.

The ratio of tritium to A^{39} radioactivities (decays g^{-1} min^{-1}) in the Norton County meteorite is 230 to 1 at the time of fall. This ratio in the Sikhote-Alin meteorite is anomalously low being less than 1 to 1 at the time of fall.

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GAPOSCHKIN, SERGEI. **On γ Velorum, ϵ Carinae and a Carinae as eclipsing variables.**

γ Velorum, a first-magnitude object, is the brightest star within a large region of the sky, so that no suitable comparison stars can be found on the usual plates of the Harvard collection. ζ Puppis, about .4 mag. fainter and eight degrees away, was used to estimate its brightness. Since both stars are excessively bright on the plates recently taken, I availed myself mostly of earlier plates taken prior to 1920. In addition, during my stay in Australia in the years 1956 and 1957, I estimated the star's brightness visually and obtained several dozen spectrograms for radial velocities. The data indicate that γ Velorum is very possibly an eclipsing variable with a small range, but the following parameters should be considered tentative because the scatter of observations in both brightness and velocity is equal to or even greater than the ranges themselves, especially in radial velocities.

Photometric

Period = $16^d.2334$
Epoch = 2435905.025JD (observed)
$A_1 = 1^m.65 - 1^m.84$
$A_2 = 1.65 - 1.78$
$D_1 = D_2? = 0^p.09$
$k = 0.39$
$i = 84°.5$

Spectroscopic

$K_{O,1} = 142$ km/sec (absorption)
$K_{W,2} = 174$ km/sec (emission)
$(a_1 + a_2) \sin i = 70.4 \times 10^6$ km
$(m_1 + m_2) \sin^3 i = 53.2\ \odot$

Absolute

$R_O = 0.123a = 12.5\ \odot$
$R_W = 0.049a = 5.0\ \odot$
$Mu_O = 29.71\ \odot$
$Mu_W = 24.23\ \odot$
M_{vis}(system) $= -6^m.7$

While making estimations, I noticed that the bright yellow star ϵ Carinae, a Carinae, and very possibly ι Carinae undergo definite changes of brightness, amounting to about 0.3 mag. The period of ϵ Carinae is about 785 days and the photographic range 3.57–3.83 mag.; the period of a Carinae is 6.751154 days and the ranges are 3.20–3.56 and 3.20–3.52 mag. ι Carinae has a very strong color, making it very difficult to estimate the brightness of its close neighbor, a Carinae.

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