the above figure does represent an average particle size.

Some Consequences of the Addition of Extra Forces in the General Problem of Three Bodies.

J. M. A. DANBY, *Yale University*.—Two problems are considered. That of motion in the vicinity of the Lagrangian triangular points of the earth-moon system when solar effects are taken into account; and that of the stability of the linear Lagrangian points when rotational and tidal deformations are allowed.

The first problem can be made tractable on the hypothesis that unstable motion resulting from solar action is essentially a secular perturbation by the sun, so that when considering it the sun's orbit (assumed circular) can be replaced by a uniform circular ring. The validity of this hypothesis is questionable; but, if it is granted, then the pattern of the stability of the triangular points is not materially affected.

The second problem (suggested to the author by D. Lyndon-Bell) might apply in situations when a galaxy (such as NGC 2950) has two pronounced condensations at the ends of a diameter. Here, even when the central mass is prolate with its longest axis pointing along that diameter, the configuration is unstable.

Nucleosynthesis Problems from the Subdwarfs γ Pav and ζ^1 Ret.

I. J. DANZIGER, *California Institute of Technology*.—The spectra of the southern subdwarfs γ Pav and ζ^1 Ret have been investigated at high dispersion. A curve of growth analysis relative to the integrated sun gave results of some interest in the theory of element production. γ Pav showed an underabundance of the elements lighter than nickel by a factor of 0.7 in the logarithm and ζ^1 Ret for the same elements a factor of 0.4. In both stars the carbon under abundance obtained from the rotational lines of the CH molecule was considerably more than for the other elements—1.3 in the logarithm for γ Pav and 0.8 for ζ^1 Ret. Here the problem is that α -process elements such as Mg and Ca do not show the same effect. Another result of interest is that Mn is not more underabundant than Fe a result which was obtained for other metal-deficient dwarfs by Wallerstein (*Astrophys. J. Suppl.* 6, 407, 1963). The heavy rare earth elements in both stars are more underabundant than the iron group elements. The availability of accurate slow-neutron capture cross sections σ has allowed the construction of $N\sigma$ versus the atomic weight A diagrams. Recent theory of the s process by Seeger *et al.* (*Astrophys. J. Suppl.* 11, No. 97.) allows an observational test to be made. The data for γ Pav as well as data for the sun, HD 116713, HD 83548, HD 26, and HD 201626 shows

a series of objects containing material with different histories of slow-neutron flux exposures. The consequent changes in the shapes of the $N\sigma$ vs A diagrams strongly supports the present theory of slow neutron capture producing the s-process elements.

The Evolutionary Status of β Cephei Stars.

PIERRE DEMARQUE AND JOHN R. PERCY, *David Dunlap Observatory*.—Use is made of the evolutionary tracks for stars of 10.1 and 15.5 M presented at this Meeting by Demarque, Morris, and Percy. Following Schmalberger (*Astrophys. J.* 132, 591, 1960), the coincidence in the H-R diagram of the phase of hydrogen exhaustion in the core and the position of the β Cephei stars is emphasized. The effective ratio of specific heats in our models is found to be close to but somewhat below the value of 1.6 found by Chandrasekhar and Lebovitz (*Astrophys. J.* 136, 1105, 1962) to explain the nonradial pulsation models of β Canis Majoris. Changes in the period of adiabatic pulsation with time are also investigated and compared with observation.

A New Class of Radio Spectra.

W. A. DENT AND F. T. HADDOCK, *The University of Michigan*.—A survey of radio sources at 8000 Mc/sec (λ 3.75 cm) with the University of Michigan's 85-ft reflector confirmed and extended the evidence that the spectra of most nonthermal radio sources are straight or curve downward at centimeter wavelengths. However, contrary to expectation two sources were found to have spectra that curved significantly upward near 8000 Mc/sec. To investigate this further observations were also made at 16 500 Mc/sec (λ 1.81 cm).

The spectral index of NGC 1275, a Seyfert galaxy, was found to change abruptly from -0.67 below 3200 Mc/sec to $+0.84$ between 3200 Mc/sec and 8000 Mc/sec and then to about zero above 8000 Mc/sec. The radio source 3C279 (called to our attention by CSIRO) was also found to have a similar spectrum when extended to the above frequencies. Thus these two sources represent a new class of radio spectra.

If the observed spectrum of NGC 1275 is assumed to be a composite, then an isolated spectrum of a high-frequency component can be obtained which has a spectral index of about $+2$ below and nearly zero above 8000 Mc/sec. Several models were investigated to explain this spectrum. The first assumed free-free emission from a region of ionized hydrogen opaque near 8000 Mc/sec. However this model requires 4×10^{10} solar masses of ionized hydrogen as well as an exceptional excitation mechanism to produce its peculiar optical spectrum. A second model consisting of a self-absorbing synchrotron source is excluded because it requires a magnetic field in excess of 1000