Aeronautics and Space Administration.—Data from the acoustic system mounted on the satellite, 1959 η (Vanguard III), for registering impacts of interplanetary dust particles on the satellite show a particularly high level of activity during the 16–17 November Leonid meteor shower. Approximately 2800 impacts of particles with momenta greater than 1×10^{-2} dyne sec occurred within a 70-hour interval. The limiting mass sensitivity of the detector for particles of the Leonid stream was 1.3×10^{-9} g.

Two of the sampling intervals contained impact rates of about 7 times the average impact rate for the 70-hr interval. One pass of $6^m \pm 20^s$ duration contained 200 ± 10 impacts, giving a impact rate of 50 times the average rate. In contrast, one sampling interval of 2.3-hour duration contained no impacts. A histogram of the impact rate reveals large variations in the impact rate, implying that there is considerable fine structure in the stream.

The presence in the meteor stream of particles of the sizes measured and the fluctuations in the impact rate of such particles are of considerable interest in the study of comet and meteor-stream evolution. Since dynamical perturbations and the Poynting-Robertson effect will tend to rapidly disperse concentrations of small dust particles, the association of such concentrations with a meteor stream suggests a rather recent origin for the observed particles. The possibility of observing dust particles in the micron-size range within particular meteor streams is discussed on the basis of known characteristics of the streams.

Further Evidence of Broadening of CaII Line Profiles in Chromospheric Spicules by Magnetic Fields. R. GRANT ATHAY, *High Altitude Observatory*.—Profiles of the H, K, $\lambda 8498$, and $\lambda 8542$ lines of CaII, H ϵ of hydrogen and $\lambda 7772$ and $\lambda 7774$ lines of OI for chromospheric spicules are used in conjunction with earlier observations of hydrogen, helium, and CaII profiles to investigate the line-broadening mechanisms. The CaII profiles are all markedly non-Gaussian, and, with the instrumental resolution used, are indistinguishable from rectangular profiles. The total linewidths at the half-intensity points are 0.86 Å for the H and K lines, 1.28 Å for $\lambda 8542$, and 0.90 Å for $\lambda 8498$. All profiles studied other than those of CaII and H α are Gaussian in shape and consistent with a kinetic temperature of the order of 40–50 000° and a macroscopic broadening velocity of about 8 km/sec.

The width of $\lambda 8498$ corresponds to a broadening velocity of 16 km/sec. Self-absorption is shown to be negligible in this line. Hence, the CaII lines are apparently broadened by a macroscopic motion not shared by the neutral atoms. This additional motion of the ions may arise from an interaction

between the systematic spicule velocity and magnetic lines of force. Both the shapes and widths of the $\lambda 8498$ profile can be explained by assuming that the CaII ions either spiral about, or follow sinusoidal perturbations in the lines of force, such as may be induced by hydromagnetic waves. At the densities occurring in spicules, the neutral atoms would not necessarily mimic such motions of the ions.

The H, K, and $\lambda 8542$ lines of CaII show an additional broadening over that in $\lambda 8498$ that is reasonably consistent with self-absorption arising from the probable opacities in these lines.

The Draco System, a Dwarf Galaxy. W. BAADE and H. H. SWOPE, *Mount Wilson and Palomar Observatories*.—Draco, a dwarf galaxy similar to the Sculptor system, has over 260 variables. The 138 variables in the center of the cluster were measured. Of these all but five proved to be RR Lyrae type, only seven of which are Bailey's type *c*'s, the others are type *a*'s. The mean period of the type *a*'s is 0^d.611. Two-thirds of the variables have good light curves and the rest show differing amounts of amplitude variation. In the two years observed only two showed actual changes of period. Of the five non-RR Lyrae type variables, four have periods between 0.9 and 1.6 days. They seem to be brighter than variables with corresponding periods in globular clusters.

The magnitude of the mean intensity in *B* of the RR Lyrae stars is 20^m.48, which gives a distance of 99 kpc and a diameter of 1380 pc for Draco, assuming an absolute magnitude of the RR Lyrae variables as +0^m.5.

The color-magnitude diagram is similar to globular cluster diagrams, showing that it is an old system of population II. The horizontal branch has few stars on the blue side of the Hertzsprung gap and a strong red branch. The giant branch at $B - V = 1^m.4$ is 3^m.0 brighter than the horizontal branch which indicates that the stars of the Draco system are metal poor. There are a few details in the color-magnitude and luminosity diagrams that seem to differentiate it from a typical globular cluster.

The Pulsations of Models of δ Cephei Stars. N. BAKER (now at *Convair Scientific Research Laboratory, San Diego, California*) and R. KIPPENHAHN, *Max-Planck-Institut für Physik und Astrophysik, München, Germany*.—Model envelopes of five population I stars in and near the δ Cephei region of the Hertzsprung-Russell diagram have been constructed by numerical integration of the equations of hydrostatic equilibrium, assuming radiative energy transfer. Linearized time-dependent equations representing radial pulsations of