from instrumentation in orbit at different altitudes are investigated in terms of relative standard error. Making a conservative calculation but neglecting background, we estimate a resolution of 95 km (diameter of Copernicus' Crater = 90 km) at an altitude of 400 km with 90 per cent confidence of the counting statistics at a flux of 10^4 protons/sec. At lower altitudes or higher proton flux, the resolution will be considerably improved. The critical importance of background problems is indicated, and possible approaches to solution are outlined.

YIN-CHAO YEN (U. S. Army Cold Regions Research and Engineering Laboratory Corps of Engineers, Hanover, N. H.), *Effective Thermal Conductivity of Ventilated Snow.* Thermal conductivities of unconsolidated snow particles through which air flows in a direction parallel but opposite to the energy flow have been investigated. The results are interpreted as being the effective thermal conductivity of snow. For snow densities from 0.376 to 0.472 g cm^{-3} and corresponding snow particle sizes of 0.07 to 0.22 cm nominal diameter, the results can be represented by the following least-squares equation: $k_e = 0.0014 + 0.58G$ where k_e is the effective thermal conductivity of snow in cal cm^{-1} sec^{-1} deg C^{-1} and G, the mass flow rate of dry air, ranges from approximately 10 to 40 $\times$ 10^{-4} g/cm^{-2} sec^{-1} based on the total cross-sectional area of the flask containing the snow sample. When there is no flow, or when $G = 0$, k_e reduces to a constant value of 0.0014 cal cm^{-1} sec^{-1} deg C^{-1} which is equivalent to the thermal conductivity of snow, $k_e°$, with stagnant air included in the void space. The value of 0.0014 is in good agreement with the data reported by A. S. Kondrat'eva in 1945.

R. E. ZARTMAN AND G. J. WASSERBURG (California Institute of Technology, Pasadena), *A Geochronologic Study of a Granite Pluton from the Llano Uplift, Texas.* Granite and related pegmatite and aplite from several localities within a pluton from the Llano uplift, Texas, are being studied geochronologically. Biotite, muscovite, hornblende, microcline, plagioclase, quartz, apatite, and fluorite have been analyzed by refined chemical and mass spectrometric methods in order to determine the consistency in ages between various minerals and between different localities within an individual pluton. Field and petrologic evidence suggests that this intrusive has had a simple history of emplacement and no later metamorphism. Quadruplicate analyses on a master biotite yield K-Ar and Rb-Sr ages reproducible to 1 per cent. In most cases K-Ar determinations on biotites, muscovites, and hornblendes and Rb-Sr determinations on biotites, muscovites, and microclines give ages which fall within a 5 per cent spread. A half-life of 1.307 $\times$ 10^9 years and a branching ratio of 0.124 are used to calculate the K-Ar ages, and Rb-Sr ages are calculated with a half-life of 50 $\times$ 10^9 years. The average age of the pluton thus determined is 1060 m.y. K-Ar determinations on microclines give ages which are 5 to 15 per cent lower. One plagioclase from the granite gives a K-Ar age of 920 m.y. Two suites of biotites, one from pegmatites and one from a border facies of the granite, give anomalously low Rb-Sr ages. The pegmatitic biotite also has a somewhat low K-Ar age; however, the biotite from the granite gives a normal age by this method, as do coexisting microclines from both these rocks by the Rb-Sr method. Geologic evidence suggests that meteoric or hydrothermal fluids may have been responsible for this age discrepancy. Ages determined on a gneiss, a pegmatite cutting the gneiss, and a granite porphyry all give results approximately equal to those of the granite. No evidence of a significantly older basement rock or a younger igneous or metamorphic event in the area has been obtained to date.

S. P. ZIMMERMAN AND K. S. W. CHAMPION (Geophysics Research Directorate, Bedford, Mass.), *Shear Turbulence in the Upper Atmosphere.* The diffusion of chemical clouds created in the upper atmosphere by explosive release from a rocket has been studied by radar and photographic techniques. Measurements of the growth rate of turbulent clouds simultaneously with measurements of shear fields, within which the clouds are placed, allow a turbulent power density to be assigned to the atmosphere. This is based upon an assumption of some value for R_ν, the viscous criterion for turbulence, derived in this report. Measurements of large- and small-scale eddy sizes in the region examined determine the correct value of ϵ_a, the power density of the eddy containing the greatest power density. Thus, values for ϵ_ν (the power density of the eddy which is limited by viscosity), R_ν, scale lengths, and time constants may be determined as a function of altitude.