this receiver substituted for the 8.6 mm equipment in the NRL 3-m antenna, an over-all sensitivity comparable to that at 8.6 mm for point sources was obtained. As in the case of the earlier 8.6 mm observations of Venus with this antenna, it was necessary to average groups of drift curves in order to obtain clearly measurable deflections for Venus. Atmospheric extinction was measured by comparison of observed and calculated self-emission as a function of elevation angle, and by the measured variation of absorption of solar radiation vs elevation angle.

Data were obtained on 25 days between February and June of 1961. The mean of the values for the brightness temperature was found to be 352°K , with an estimated upper value for the probable error of ± 50 deg. No definite evidence of a variation with phase was detected. The mean brightness temperature obtained is in close agreement with the temperature (340°K) given by Öpik for the top of the visible clouds of Venus. Fairly good agreement was obtained with the value of 390°K ($\pm 120^{\circ}$) recently given for 4 mm wavelength by Kisliakov, Kuz'min, and Salomonovich.

Delay Time from Flare to SC-Storm as Function of Pre-Existing Geomagnetic Conditions.

M. W. HAURWITZ, *National Bureau of Standards*.—Obayashi, at the April 1961 American Geophysical Union meeting, first called attention to the following: Short delay times between flares and geomagnetic storms tend to be associated with pre-existing magnetically disturbed conditions. We have pursued this relationship further, and have quantitatively checked its significance.

For this study, we have correlated delay time from flare to sudden commencement storm with the degree of geomagnetic activity existing one to three days before the SC. Table I is a 2×2 contingency table showing the first breakdown used in calculating the degree of association.

The probability that this degree of association could occur by chance is about $P=0.01$.

A linear correlation study of the two parameters, that is, of *increasing* delay with *increasing* magnetic

activity yields $R=-0.35$, a value significant at the 5% level.

We thus feel, in agreement with Obayashi, that short flare-SC delay times are significantly related to pre-existing geomagnetic disturbance.

Micrometeorite Collection from a Recoverable Sounding Rocket.

I. C. L. HEMENWAY, *Dudley Observatory, Albany and Union College, Schenectady, New York*, R. K. SOBERMAN, *Geophysics Research Directorate, Air Force Cambridge Research Laboratory, Cambridge and Northeastern University, Boston, Massachusetts*, AND E. F. FULLAM, *Dudley Observatory and Ernest F. Fullam, Inc., Schenectady*.—Collection of micrometeorite particles at sufficient altitude to rule out terrestrial contamination has been achieved. The "Venus Flytrap" collector was fired from White Sands, New Mexico, on June 6, 1961 at 05:31 a.m. local time. Specially prepared particle impactors were exposed for 4 minutes between the altitudes of 88 and 168 km and successfully recovered. The experimental surfaces exposed consisted of 0.24 m^2 of $6\text{-}\mu$ thick Mylar foil for impact and cratering studies and 0.13 m^2 of sealed boxes which were loaded with high-purity materials and surfaces suitable for electron microscopy.

Three "flapped" holes, apparently caused by low-velocity impacts, were found by helium leak-testing the Mylar foils. Their sizes were 90×330 , 450×1160 , and $330 \times 550\text{ }\mu$.

Three independent electron microscopes and observer teams have been used to evaluate, count, electron micrograph and measure the micrometeorite particles collected on the boxed samples. Most of the particles collected were submicron in size and approximately 7 particles per square millimeter were collected. The micrometeorite particles generally fell into three types: high-density spheres, medium-density irregular particles and extremely irregular medium-density particles (fluffy particles). Some of the micrometeorites had sufficient momentum to rupture the exposed 200 Å thick Formvar and nitrocellulose electron microscope films. Laboratory and nose cone control surfaces were carefully studied to permit identification of micrometeorite particles. Typical particles and size distributions are shown.

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TABLE I.

Flare to SC delay time (hours)	Magnetic activity ^a one to three days before SC			
		<4	≥4	
>46		10	0	10
≤46		13	14	27
		23	14	37

^a Arbitrary index, 0 to 9, based on 3-hr K figures.