[CO₂], clouds are required to close infrared radiation leaks through atmospheric windows. We find that the same ice clouds which explain the observed albedos can, because they are poorly absorbing and strongly forward-scattering in the visible, but strongly absorbing and nearly isotropically scattering in the infrared, provide the additional opacity needed to construct consistent Venus greenhouse models. With their underlying atmosphere, the same clouds—primarily ice crystals, with water droplets towards their bottoms—account, with no further assumptions, and within observational error, for the general millimeter spectrum, the millimeter phase effect, the Mariner II microwave limb-darkening, and the infrared limb-darkening of Venus.

Greenhouse Effect in Semi-Infinite Scattering Atmospheres. R. E. SAMUELSON, *Goddard Space Flight Center*.—The method of discrete ordinates is extended to describe the steady state intensity distribution of thermal radiation and the corresponding depth-dependent thermal structure of a plane-parallel semi-infinite particulate medium in radiative equilibrium in the presence of an outside point source of visible radiation. The greenhouse factor $[B(\tau)/F(O)]$ is found to approach a finite limit as $\tau \rightarrow \infty$. Phase functions and albedos for single scattering in the infrared are computed for a wide variety of complex indices of refraction and particle size distributions in accordance with the Mie theory. Three sets of single scattering parameters in the infrared are chosen from these computations to be representative of a wide range of physically interesting conditions. Appropriate visible radiation single scattering parameters are selected accordingly, and the equation of transfer solved, in accordance with the theory, for the temperature profile and the law of darkening relevant for each of the models. Numerical calculations show that the diffuse field of visible radiation generated by multiple scattering processes is extremely effective in heating the lower regions of a particulate atmosphere. In particular, with albedos for single scattering in the visible of $\omega_0^v=0.99$ and in the infrared of $\omega_0^0=0.5$, and for equal particle cross sections in both wavelength regions, it is found that surface temperatures of $T_s \sim 700^\circ\text{K}$ and effective temperatures of $T_E \sim 400^\circ\text{K}$ may be obtained. In this model the sun is assumed to be at normal incidence and at a distance comparable to that relevant for Venus. For slightly more realistic single scattering parameters than those considered in this study, it would appear that the large differences in temperature between the surface and the effective level of infrared radiation of Venus, as inferred from the infrared and microwave observations, can be mostly accounted for.

Short-Term Correlations of Decameter Radio Emission from Jupiter and Solar Activity. CH. V. SASTRY, *Yale University Observatory* (Present address: *National Radio Astronomy Observatory*).—An analysis of decameter radio emission from Jupiter and solar activity over the past 10 yr by the Chree method of superposed epochs showed that there is a significant increase in the radio emission from Jupiter following enhanced solar activity during the past sun-spot maximum. The indices used to represent solar activity are (1) geomagnetic planetary index Ap, (2) solar radio flux at centimeter wavelengths.

It is pointed out that due to the directivity of the source on Jupiter, the effect of the satellite Io and the observing procedures the Jupiter data contain periodicities which are not inherent in the source. These periodicities are estimated in the following way. A two-dimensional histogram giving the occurrence probability as a function of LCM (system III) and the position of the satellite Io is calculated using all the available data. For an assumed 4 h observing function each day the theoretical probability of observing Jupiter based on the two-dimensional histogram is calculated for a number of days. A power spectrum analysis of these theoretical probabilities showed that there can be a number of periodicities in Jupiter data with periods ranging from 2 to 30 days. It is well known that solar data exhibit similar periodicities. The observed correlations may be due to the existence of similar periodicities in both time series. To test this hypothesis the probability of observing Jupiter for each day, for which observing times are available, during the period 1957 through 1961 is calculated using the two-dimensional histogram. These theoretical probabilities are correlated with the solar indices for the same period. The correlation curves thus obtained are similar to the correlation curves obtained by using the days on which Jupiter emission is detected. On the basis of these results it is suggested that there is no conclusive evidence that decameter radio emission from Jupiter and solar activity are related.

Preliminary Results of a High-Sensitivity Study of the Galactic North Polar Region at 1415 Mc/sec. D. J. SCHEER AND J. D. KRAUS, *The Ohio State University Radio Observatory*.—A continuum survey of the galactic north polar region has been conducted at 1415 Mc/sec using the Ohio State University 260-ft radio telescope with a liquid-nitrogen refrigerated parametric preamplifier. The survey covers approximately 960 sq deg of sky and includes most of the area between right ascensions 08^h 00^m and 16^h 00^m and declinations 26°00' and 38°40' north. The antenna half-power beamwidths are 10' in right ascension and 38' in declination. A minimum