computations of the radii of the components leave little doubt that the old suggestion of the great radius difference in the systems with a thick atmosphere remains still valid.

All the photoelectric observations will soon be published by Cheng-yuan Shao.

Brightness Temperature of Venus at 1.35 cm.

J. E. GIBSON AND H. H. CORBETT, *Radio Astronomy Branch, U. S. Naval Research Laboratory*.—Previous observations have indicated that the radio-wavelength spectrum of the dark hemisphere of Venus corresponds to equivalent blackbody temperatures of 560–600°K at wavelengths between 3 and 21 cm, but lower temperatures of 350° and 410°K were found at 0.43 and 0.86 cm, respectively. In order to investigate the brightness transition between 0.86 and 3.15 cm, measurements were undertaken at 1.35 cm during the period near the lower conjunction of November 1962. This wavelength, at the center of a water vapor absorption band, was chosen with the intent of revealing any evidence of Cytherean water vapor.

To ensure unity with previous millimeter results, these observations were made using the same 10-ft equatorial reflector, with north-south polarization as before. A rapid-comparison crystal-mixer superheterodyne receiver with input noise figure of 8.5 dB and 11 Mc bandwidth (at 43 Mc) yielded an output fluctuation of 0.15°C (rms) for 10 sec integration time. Terrestrial atmospheric extinction was found to be comparable to that at 0.86 cm, probably because of lessened oxygen absorption at 1.35 cm.

Measurements near conjunction yielded 520° ± 40°K (probable error) for brightness temperature. This value may be increased somewhat when additional data are reduced. This temperature approaches the 3-cm value, and shows no obvious indication of high-altitude Cytherean water vapor attenuation of thermal radiation from below, in agreement with recent spectrographic analysis by Spinrad (*Icarus* 1, 266, 1962). The high 1.35-cm temperature compared to the 0.86-cm value does not conform to CO₂ spectra computed by Barrett (*Astrophys. J.* 133, 281, 1961). The observations are being continued in search of brightness change with phase of illumination.

The λ4430 Band and Interstellar Grain Temperatures. J. MAYO GREENBERG AND PEARL R. LICHTENSTEIN, *Rensselaer Polytechnic Institute*.—It has long been recognized that the strength of the unidentified λ4430 band is strongly correlated with the interstellar extinction (Greenstein, J. L., and Aller, L. H., *Astrophys. J.* 111, 328, 1950) with the

possible exception that λ4430 is somewhat weaker in O stars than the reddening would indicate (Morgan, W. W., *Astron. J.* 51, 21, 1946). A recent investigation by Stoeckly (*Astron. J.* 67, 588, 1962) correlates the variation of the ratio of λ4430 to color excess with high-velocity clouds. In view of the fact that high-velocity clouds are associated with bright, hot stars we are led to consider the possibility that the grain temperatures play an important role. We have shown that the grain temperature varies sufficiently with size for dielectric grains that in high-temperature high-radiation density fields the smaller grains may be evaporated, leaving the larger ones unaffected. This would have the effect of raising the ratio of total to selective extinction (A/E). The observations of H. L. Johnson (private communication, 1962) may be interpreted on this basis.

If λ4430 is produced by absorption *within* the grain then the temperature required to evaporate enough small grains to decrease λ4430 would also sensibly modify the value of A/E . On the other hand, if λ4430 is produced by a surface absorption mechanism [perhaps by hydrogen molecules as suggested by Herbig (private communication, 1962)], then only a modest increase in grain temperature is required to decrease the λ4430 by inhibiting the formation of the molecules (Gould, R. J., private communication, 1962) and no large change of A/E would be expected. Thus a correlation or lack of correlation between λ4430 and the value of A/E might well suggest whether λ4430 is produced within the grains or by molecules formed on the surface.

Iterative Solution for the Source Function in the Grey Atmosphere in Radiative Equilibrium.

KENNETH GROSSMAN, *Computer Applications Inc.* AND MYRON LECAR, *Institute for Space Studies and Yale University Observatory*.—An iterative solution for the source function in the grey atmosphere in radiative equilibrium, first derived by Unsöld [A. Unsöld, *Physik Der Sternatmosphären* (Springer-Verlag, Berlin, 1955), p. 142], is rederived and applied numerically to a variety of initial guesses. The correction to the n th guess of the source function is

$$\delta b^{(n)}(\tau) = -\frac{3}{4} \int_0^\tau [1 - f^{(n)}(t)] dt + \frac{1}{2} [1 - f^{(n)}(0)] + \frac{1}{4} \frac{\partial f^{(n)}(\tau)}{\partial \tau},$$

where f is the flux and b is the source function, normalized so that $f=1$. It is shown analytically that this method converges uniformly in the sense that the maximum error decreases with successive iterations. The method is insensitive to the initial