of 600 MPa. Extensive fracturing, consistently extending many grain diameters in length, was characteristic of the ductile sample. Fractured and striated grains and cement gouge, indicating widespread frictional sliding, were observed throughout the sample.

Duba, A., and SONETT, C. P., Lunar temperature and global heat flux from laboratory electrical conductivity and lunar magnetometer data, Nature 258, 118-21 (1975).

Three-layer monotonic electrical conductivity models for the lunar interior to a depth of 600 km are used in conjunction with laboratory measurements of the electrical conductivity of olivine and pyroxene to estimate a temperature-depth profile. The temperatures calculated for depths of 400-600 km are consistent with attenuation of the seismic shear wave. The temperature calculated at a depth of 100-250 km yields a heat flow that is in good agreement with the directly measured lunar heat flow. The temperature, however, is sufficiently close to melting that mascon anisostasy would not be maintained. Thus a better conductor is required at this depth.

Duba, A., SHANKLAND, T. J., and Nitsan, U., Radiative heat transfer and optical absorption spectra of mantle minerals at high temperature and pressure, GSA Abstracts with Programs 7, 1266 (1975).

The transparency of iron-bearing minerals to heat transport by infrared radiation can be calculated from optical absorption measurements at high temperature and pressure. The coordination of iron is the most important single parameter; crystal field bands of Fe^{2+} in four- and eight-fold coordination mostly block black-body radiation, while the black-body peak tends to fall within a transmission "window" for six-fold coordination. Thus, radiative transfer is quite important in a principally olivine mantle. Measured absorption spectra at high temperatures and pressures show a strong closure of the window by temperature and a lesser effect of pressure. Oxygen fugacity also produces observable changes in the spectra, in particular in the resolvability of the dynamic Jahn-Teller effect.

DUBA, A., and Piwinskii, A. J., Composition of the lunar interior: ants to 300 km? Sixth Lunar Sci. Conf., Houston, March 17-21, 1975. [UCRL-76403, Abstract]

At least four petrologic models have been proposed for the lunar interior: olivine, pyroxenite, peridotite, and a high-pressure analogue of anorthosite. In this paper, we propose a new model for the structure of the lunar upper mantle (to about 300 km) that we feel is more in concert with recent