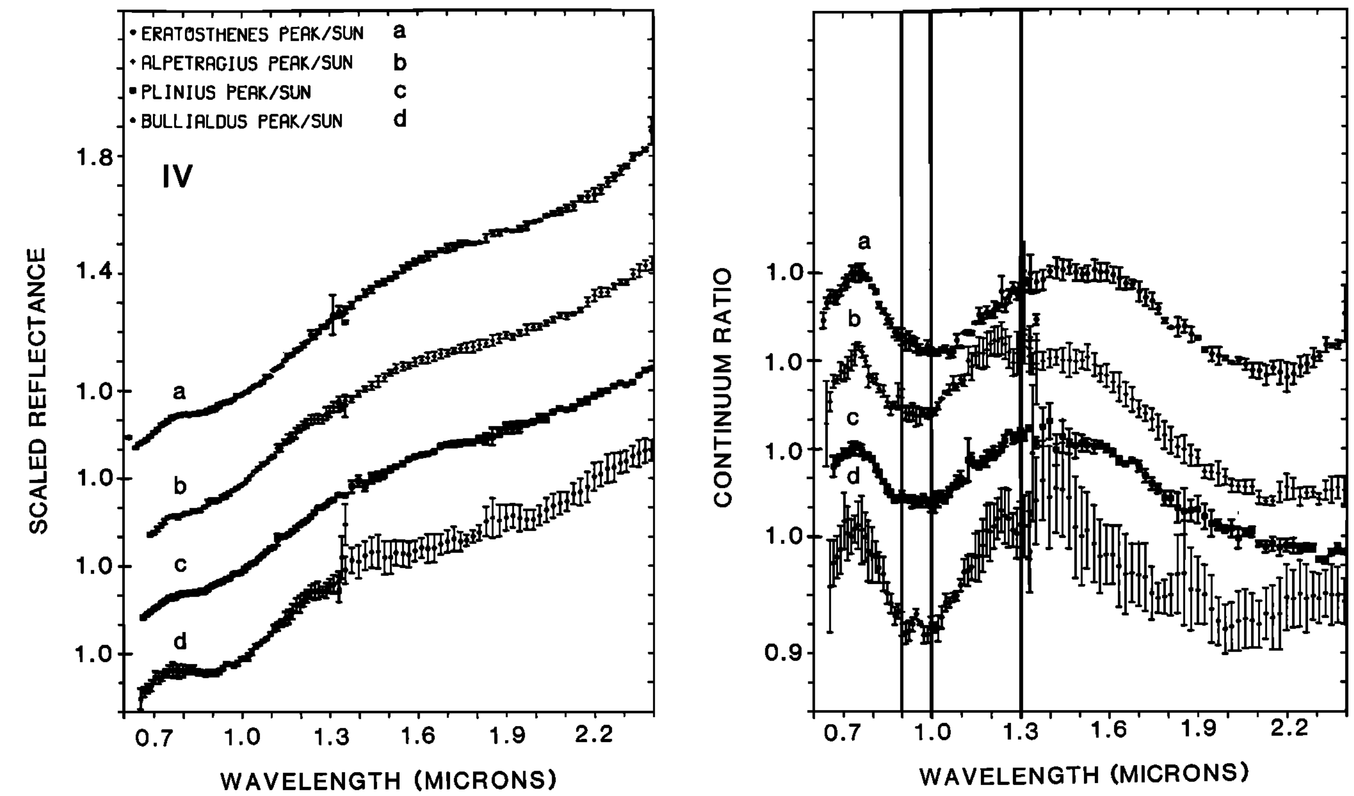

Fig. 14. Reflectance spectra for gabbroic (melt breccias?) central peaks IV crustal material: (left) spectra scaled to unity at 1.02 μm and offset vertically; (right) residual absorption after a single straight-line continuum has been removed.

program at the suggestion of R. Strom and A. Treiman (private communication, 1983) as a possible source area for the lunar meteorite ALHA81005 [*Pieters et al.*, 1983]. These near-infrared reflectance data indicate that this crater area on the near-side limb is the best candidate measured to date for a source area of the lunar meteorite.

Type G (*gabbroic*). Fresh craters of this compositional type (Figure 9) are in the minority for areas associated with the upper lunar crust, but occur across the entire lunar near side from Byrgius (near Oriental) to Censorinus (east equatorial highlands). Their spectra exhibit characteristic pyroxene absorption bands, but the band centers are at distinctly longer wavelengths, and the pyroxene band shape is broader (larger width/strength) than that observed for the noritic areas of similar band strength. These characteristics are typical of mineral mixtures involving more than one composition of pyroxene [*Singer*, 1981]. Because of longer-wavelength band centers, the pyroxene composition for type G areas clearly contains a clinopyroxene component that is more iron and calcium rich than that for other highland areas. Most type G areas also exhibit a notable inflection near 1.25 μm, indicating the presence of a significant crystalline Fe-bearing plagioclase component. The composition of type G areas is thus gabbroic in general nature, although the pyroxene abundance is not well constrained beyond a minimum 10–12%.

Type O (*olivine bearing*). A few small lunar areas associated with the Aristarchus plateau and Copernicus crater have been identified as containing only olivine as the major mafic mineral. These areas exhibit relatively unusual features: a broad asymmetric absorption band centered longward of 1 μm with no obvious band near 2 μm (see central peaks III). These spectral properties are characteristic of olivine-bearing rocks, or troctolitic material, with no pyroxene component ($<5\%$). The areas on the Aristarchus plateau (a mountain and a localized area on the south wall of Aristarchus crater) are interpreted as exposed olivine-rich crustal rocks [*Lucey et al.*, 1986]. Fe-bearing pyroclastic glass (which exhibits a band at similar wavelengths) exists in abundance on the Aristarchus plateau [*Gaddis et al.*, 1985], but the areas mentioned here are believed to be uncontaminated by such glass because of their very high albedo. Although poorer quality telescopic spectra suggest there may be additional troctolitic areas on the lunar near side, the Aristarchus mountain is currently the only area clearly identified that is not associated with materials excavated by a large impact event.

Type A (*anorthosite*). One crater and a massif associated with the Inner Rook Mountains of the Oriental basin exhibit spectra with no observable mafic absorption bands [*Hawke et al*, 1984; *Spudis et al.*, 1984]. Such featureless spectra were first observed for the central peaks of a few large craters on the near side and have been interpreted as shocked anorthosite. They are discussed in more detail below (see central peaks II).

Central Peaks

The central peaks of large craters (>50 km in diameter) are derived from a deeper stratigraphic zone than most material excavated by the small craters discussed above [e.g., *Grieve et al.*, 1981]. Central peaks of 14 large near-side craters have been measured to date. The inferred composition of each of the central peaks studied falls into one of the seven rock types discussed above. Because of their importance to lunar crustal stratigraphy, data for all central peaks studied to date are