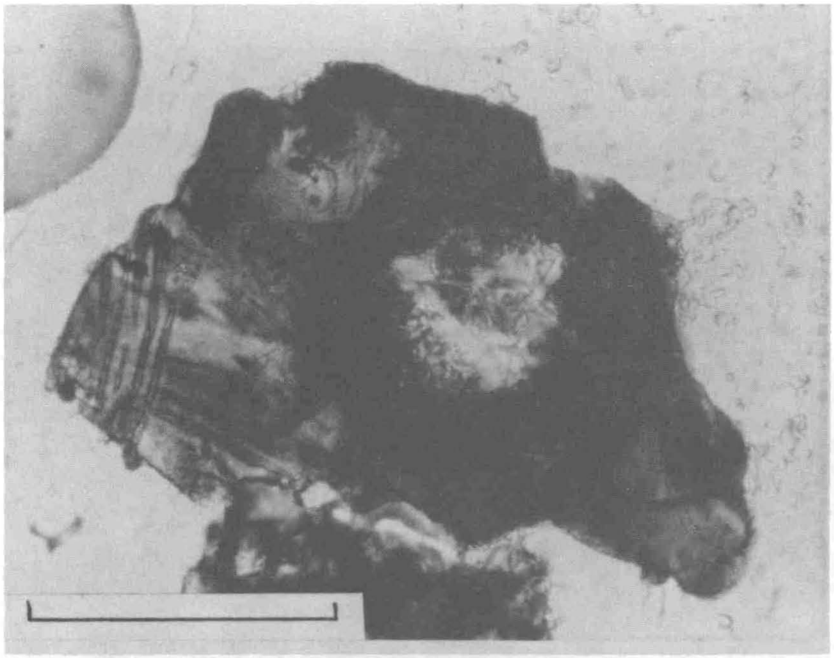

Figure 36. Yellow-brown glass fragment, partly quenched to elongate pyroxene laths (left) and microlites. The large opaque halo surrounds an apparently felsic inclusion and may have been produced by radioactivity in the inclusion. Fragment 318,325; plane polarized light; scale bar 0.1 mm.

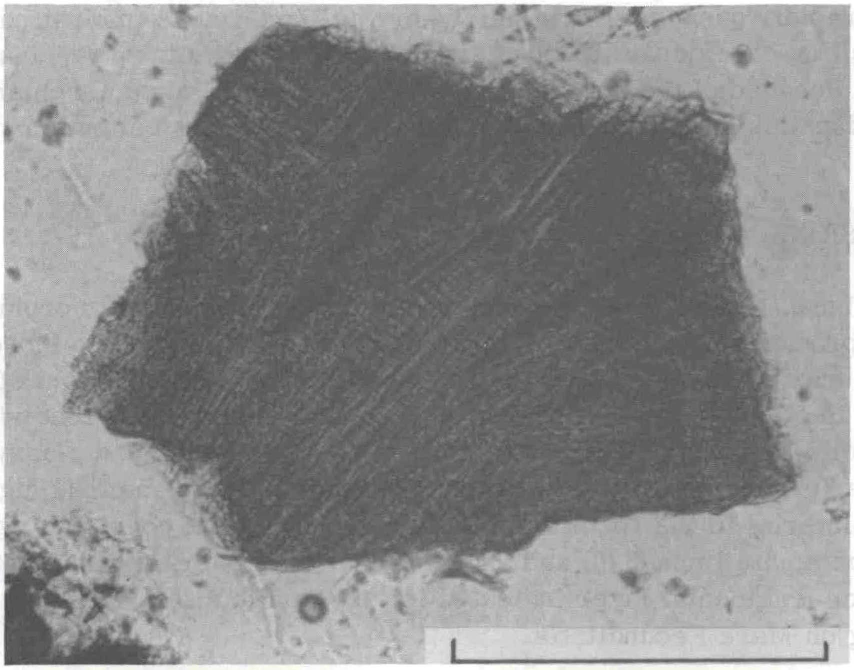

Figure 37. Angular fragment of reddish-brown glass (pyroxene-rich?) containing numerous, diversely oriented quench microlites of a high-relief phase (pyroxene?) in a glass matrix. Fragment 318,73; plane polarized light; scale bar 0.1 mm.

Figure 38. Dark reddish-brown fragment with well-developed quench crystals of pyroxene arranged in parallel and radiating arrays in a matrix of less crystallized glass. Fragment 318,510; plane polarized light; scale bar 0.1 mm.

magma, rapidly quenched, or a partly-crystallized impact melt produced by shock melting of feldspathic rocks similar to the light microbreccias described earlier. Because of the apparent high degree of shock metamorphism in the other feldspathic fragments, the second interpretation is believed more likely.

CONCLUSIONS

The Luna-16 soil particles exhibit distinctive shock-metamorphic effects, uniquely produced by meteorite impact and virtually identical to those observed in other lunar samples. Distinctive rock and mineral deformation effects are observed in only 1-2 percent of the fragments, a result consistent with studies of the Apollo samples. However, shock-produced glasses and glassy breccias constitute 70-80 percent of the fragments studied. The generally high shock level of material in the regolith on Mare Fecunditatis is consistent with continuous meteorite impact (6) and suggests that the reworking and overturning of the surface fragmental layer indicated for the Apollo sites (1, 5, 11) is also occurring on Mare Fecunditatis.

As in the Apollo samples, two families of source rocks, basaltic and feldspathic, can be recognized in the Luna-16 material. The predominance of