64476 DILITHOLOGIC (ANORTHOSITE AND BASALTIC IMPACT MELT) BRECCIA 125 g

INTRODUCTION: 64476 consists of ~70-80% cataclasized, granoblastic anorthosite, probably monomict, and ~20-30% dark aphanitic to basaltic impact melt (Figs. 1 and 2). The latter is variable in texture and clast content and might even represent more than a single lithology. The white material clearly invades the dark in places, but elsewhere dark rims surround white clasts.

64476 was collected from the region of two subdued shallow craters on Stone Mountain. Its orientation prior to actual collection is; known, but the sample may have been moved prior to its being photographed. The sample is angular and coherent with few fractures. A few zap pits are present on three sides, including the lunar top as photographed.

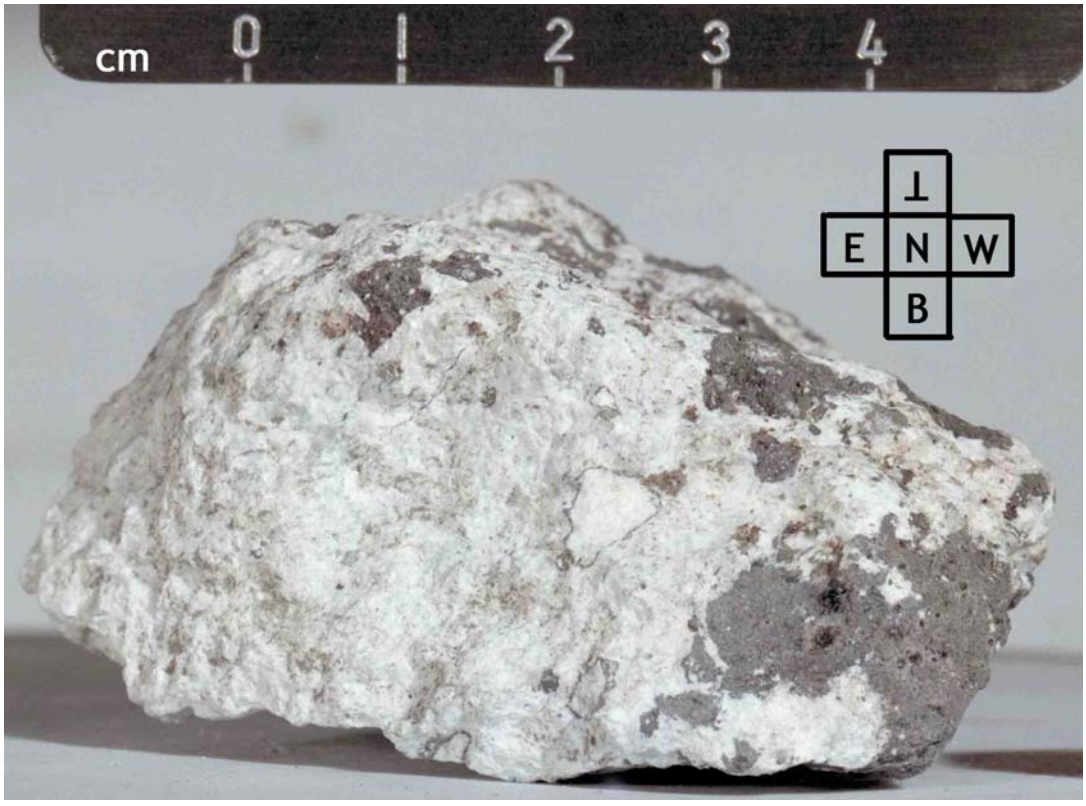

FIGURE 1. S-72-43099.

PETROLOGY: The white phase is homogeneous, macroscopically containing sparse yellow-green minerals. Thin sections show it to be apparently monomict, non-porous, brecciated anorthosite (Fig. 3) with more than 90% plagioclase. Both olivine and pyroxene grains appear to be present. The preserved! texture is granoblastic with triple

junctions but most plagioclases are shocked. Plagioclase grains are up to 2 mm in diameter and mafic grains are less than 500 μm in diameter.

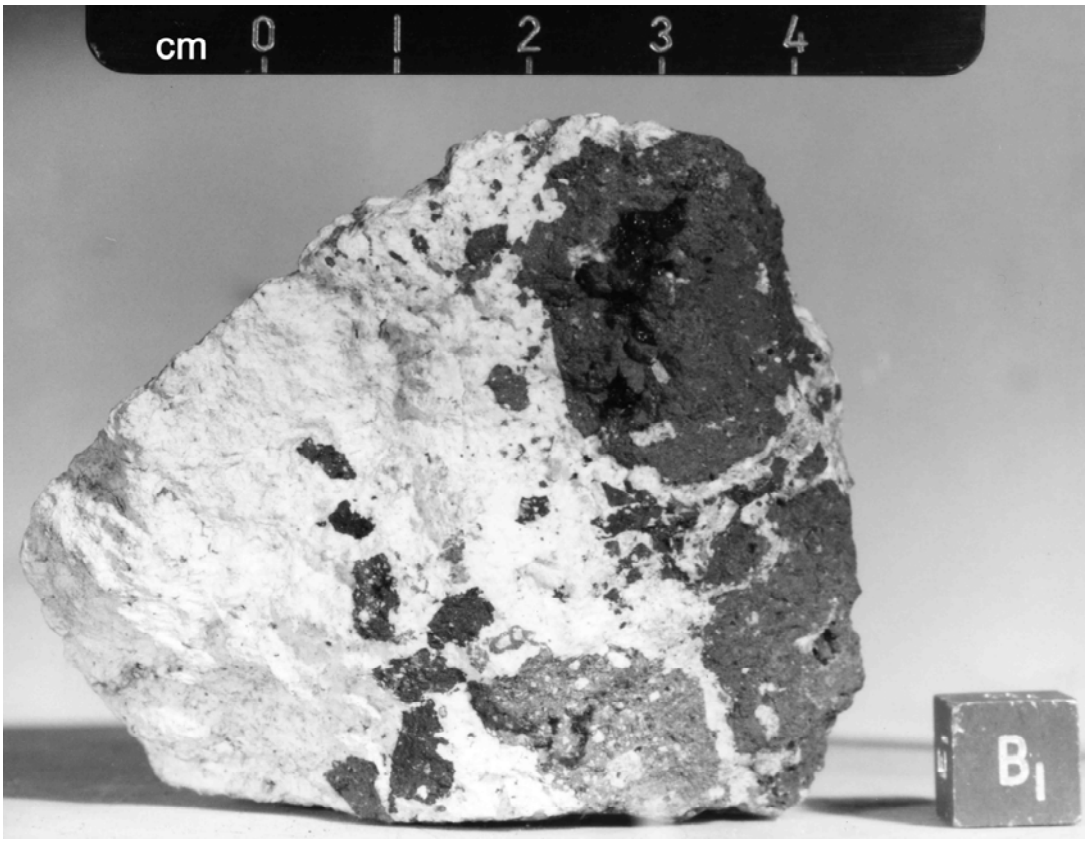

FIGURE 2. S-72-43114.

The dark phase is variable. One type is clast-rich, fine-grained, and consists of skeletal olivines in a felsic groundmass (Fig. 3). The clasts are nearly all shocked plagioclases and lithic clasts are absent. A second type is darker-colored, coarser-grained, mesostasis-rich basaltic impact melt with few clasts (Fig. 3). Both types contain Fe-metal. One large clast (shown in Figure 1) appears macroscopically to have a gradation between the two types.

The relations between the white and dark lithologies are complex. In some places the angular black fragments are clearly intruded by white matrix, but selvages of dark material around white material, and the plagioclase clasts in the dark material suggest that the latter is the host. Wilshire and Moore (1974) suggest that originally the dark phase formed the matrix but a later event reversed this relationship by mobilizing the white phase.

CHEMISTRY: Clark and Keith (1973) analyzed the bulk rock for K (0.066%), U (0.31 ppm), Th (1.19 ppm) and radionuclides using y-ray spectroscopy. The analysis indicates that the white phase is extremely low in KREEP elements.

PROCESSING AND SUBDIVISIONS: The rock has not been sawn and most of it remains as ,0 (124 g). Only ,1 and ,2 have been removed, and both were made into thin sections. ,1 was from the clast-rich melt area (Fig. 1) and ,2 consisted of loose chips of black and white material, unlocated but believed to be generally from the area at the top of Figure 1.

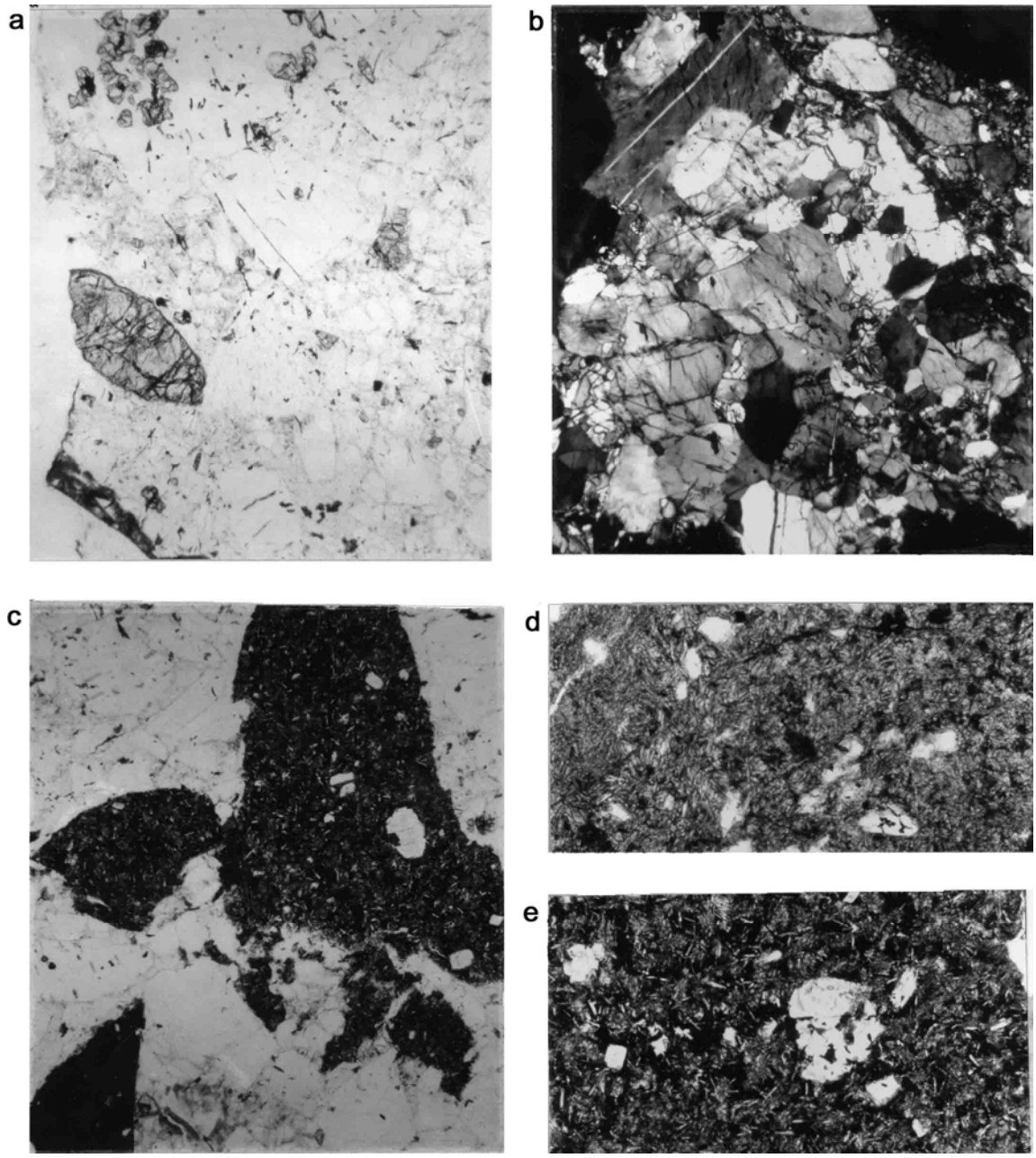

FIGURE 3. a) 64476,8, anorthosite, ppl. Width 2 mm.
b) 64476,8, anorthosite, xpl. Width 2 mm.
c) 64476,7, basalt clasts in anorthosite, ppl. Width 2 mm.
d) 64476,5, finer-grained basaltic impact melt, ppl. Width 1 mm.
e) 64476,8, coarser-grained basaltic impact melt, ppl. Width 1 mm.