

INTRODUCTION: 15689 is a regolith breccia containing white clasts (biggest about 5 mm) (Fig. 1). It was originally described as unique on account of its bright, orange-brown, sugary clasts. One white clast is a fragment of pristine (but shocked) norite. 15689 was collected as part of the rake sample from Station 9A.



Figure 1. Pre-chip view of 15689. S-71-49814

PETROLOGY: 15689 is a regolith breccia consisting of a pale brown fine matrix containing mineral and lithic clasts, devitrified brown glass, and pale yellow glasses. One large clast is a norite (Fig. 2); other lithic clasts include a fine-grained highlands granulite and a fine-grained subophitic-interstitial impact melt (similar to Apollo 16

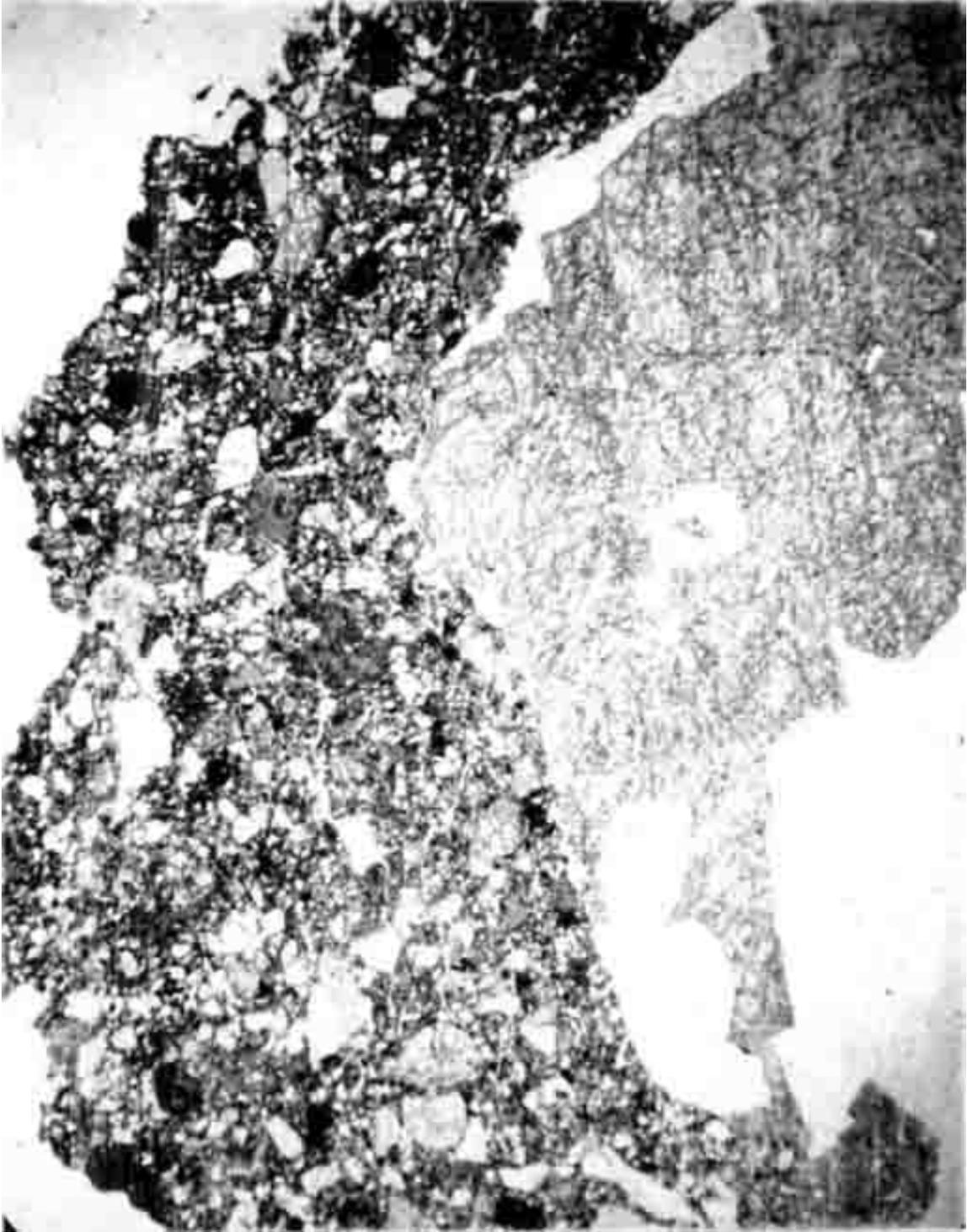


Figure 2. Photomicrograph of 15689,7 showing pristine norite clast.
Width about 3 mm. Transmitted light.

"VHA's"). Steele et al. (1977) reported a mode of 5% glass, 60% lithic clasts, 15% mineral clasts, 20% fine matrix, and 0% porosity for one thin section. The large proportion of "lithic clasts" results from the single large clast of norite, which consists of low-Ca pyroxene and maskelynite. This clast (clast B) has a 4 mm pyroxene and is similar to pristine norite 78235. The pyroxene is about $En_{74}Wo_3$ (Fig. 3), and the plagioclase is An_{91} with low iron. There is minor equigranular diopside (Al_2O_3 about 1%), and several veins, similar to other norites, in which there are chromite, whitlockite, Ca-Cr-Zr armalcolite, a K-Na-Si-Al phase, diopside (Al_2O_3 about 4%), troilite, and metal. Metal analyses are listed in Steele et al. (1977) and are non-meteoritic (about Co 2.7%, Ni 5.7%). Hansen et al. (1979) reported microprobe minor element data for plagioclase ($An_{92.5}$) in the norite: MgO 0.039%; FeO 0.039%, K_2O 0.058%. Steele et al. (1980) reported ion probe trace element data for the plagioclases in the norite ($An_{92.3}$): Li 11 ppm, Mg 230 ppm, Ti 250 ppm, Sr 290 ppm, Ba 300 ppm. Part of this data was plotted in count form in Steele and Smith (1979). Steele et al. (1977) also reported a small shocked intersertal clast with "large" plagioclases (0.4 mm) and minor pyroxene. The plagioclases were high Ca and low Fe, i.e. highlands. Olivines and pyroxenes were analyzed (Fig. 3).

PROCESSING AND SUBDIVISIONS: Chipping produced a single chip (.1) which contained the white norite clast; this does not appear to be the large clast seen in Figure 1. .1 was partly used to produce thin section .6 and .7. Some small chips (.2) were also chipped off. .0 is now 2.10 g.

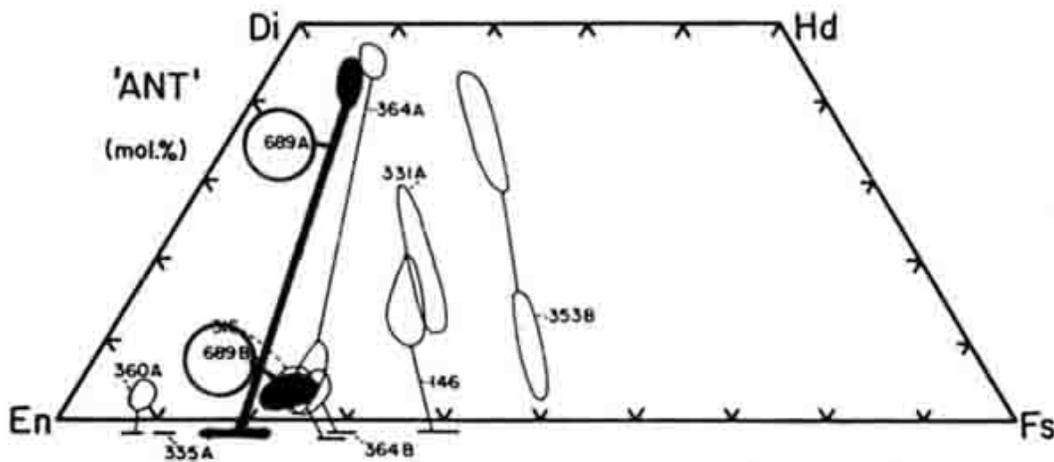


Figure 3. Pyroxene and olivine compositions in two clasts for 15689. "A" is the pristine norite. "B" is subophitic (Steele et al., 1977).