63355

Poikilitic Impact Melt Breccia

68.24 grams

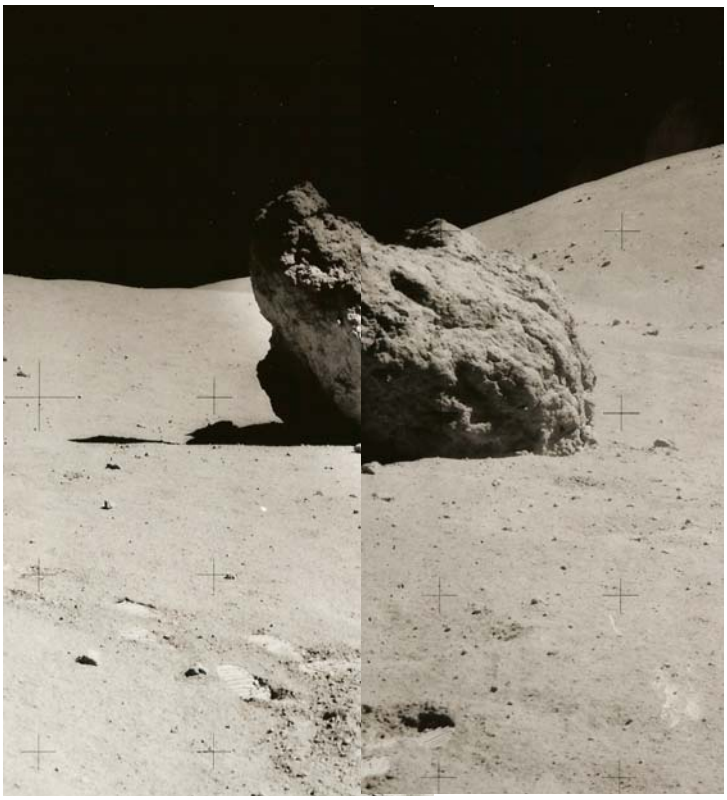

Figure 1: Shadow Rock near North Ray Crater, Apollo 16. S16-106-17392, 17394. Boulder is 5 m wide.

Figure 3: Photo of 63355. Sample is 3 cm across. S72-37962.

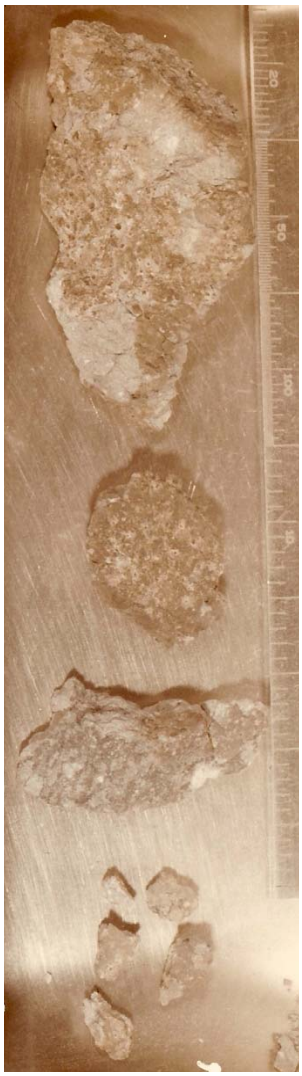

Figure 2: 63355 was actually several pieces of rock collected from the regolith beneath where the chipping of the boulder occured.

Introduction

63355 was collected from the chips off of Shadow Rock (see also 60017 and 63335). It is in several pieces and since they were picked from the soil, they may not all be from the boulder (see transcript in 60017). In any case, the chemical composition of 63355 is different from the other samples of Shadow Rock. Pieces of 63355 have patina and micrometeorite craters (figure 2).

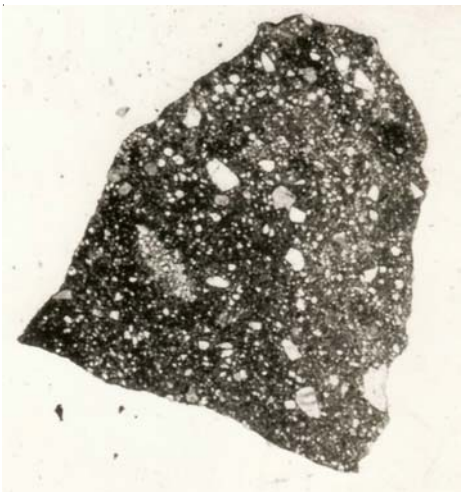

Figure 4a: Thin section photomicrograph of 63355,48. S72-49934. Field of view about 1 cm. Compare with thin section shown in Nord et al. (1975).

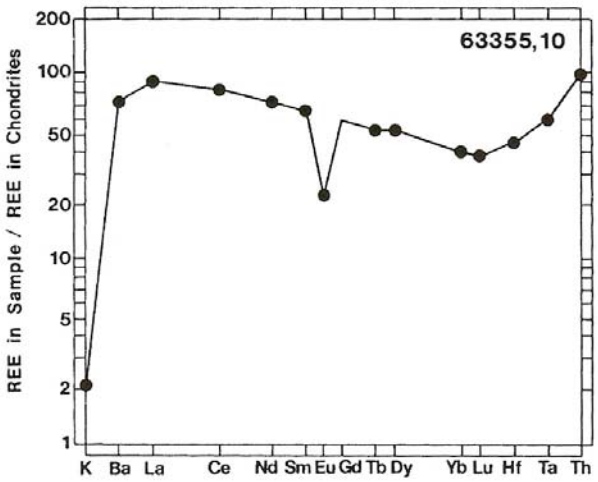

Figure 5: Normalized rare-earth-element diagram for 63355 (data from Laul et al. 1974).

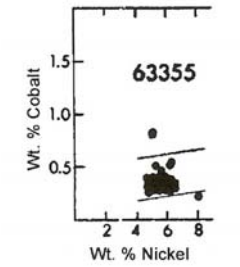

Figure 6: Chemical composition of metal grains in 63355 (Misra and Taylor 1975).

Petrography

Nord et al. (1975) report that 63355,7 is a dark matrix breccia with a clast population of angular noritic and anorthositic fragments. Nord et al. (1975) found that plagioclase in 63355 was shocked with many deformation features from an HV electron microscope petrographic study. They found that the matrix contains glass and there is no evidence of flow, as there is in 60017.

Ryder and Norman (1980) found that thin section 63355,48 is a poikilitic impact melt containing clasts and schieren of cataclastic plagioclase. The matrix has small orthopyroxene oikiocrysts with irregularly shaped plagioclase inclusions. There is ilmenite and glass between the oikiocrysts (see figure 4b, just for fun).

Misra and Taylor (1975) studied the metal particles (figure 6). Hunter and Taylor (1981) reported rust (which was not the case for 60017 nor 63335).

Chemistry

63355 has high Fe and Mg, and only moderate Al (table). The trace element content is also high, and not like that of the other samples of this boulder (table, figure 5). Ni, Ir and Au are very high.

Radiogenic age dating

none

Cosmogenic isotopes and exposure ages

Clark and Keith (1973) determined the abundance of natural and cosmic ray induced radionuclides in Apollo 16 lunar samples. They reported ^{26}Al = 98 dpm/kg, ^{22}Na = 48 dpm/kg and ^{54}Mn = 25 dpm/kg for 63355,1.

Processing

63355 was collected as several pieces (figure 2). There are three thin sections.

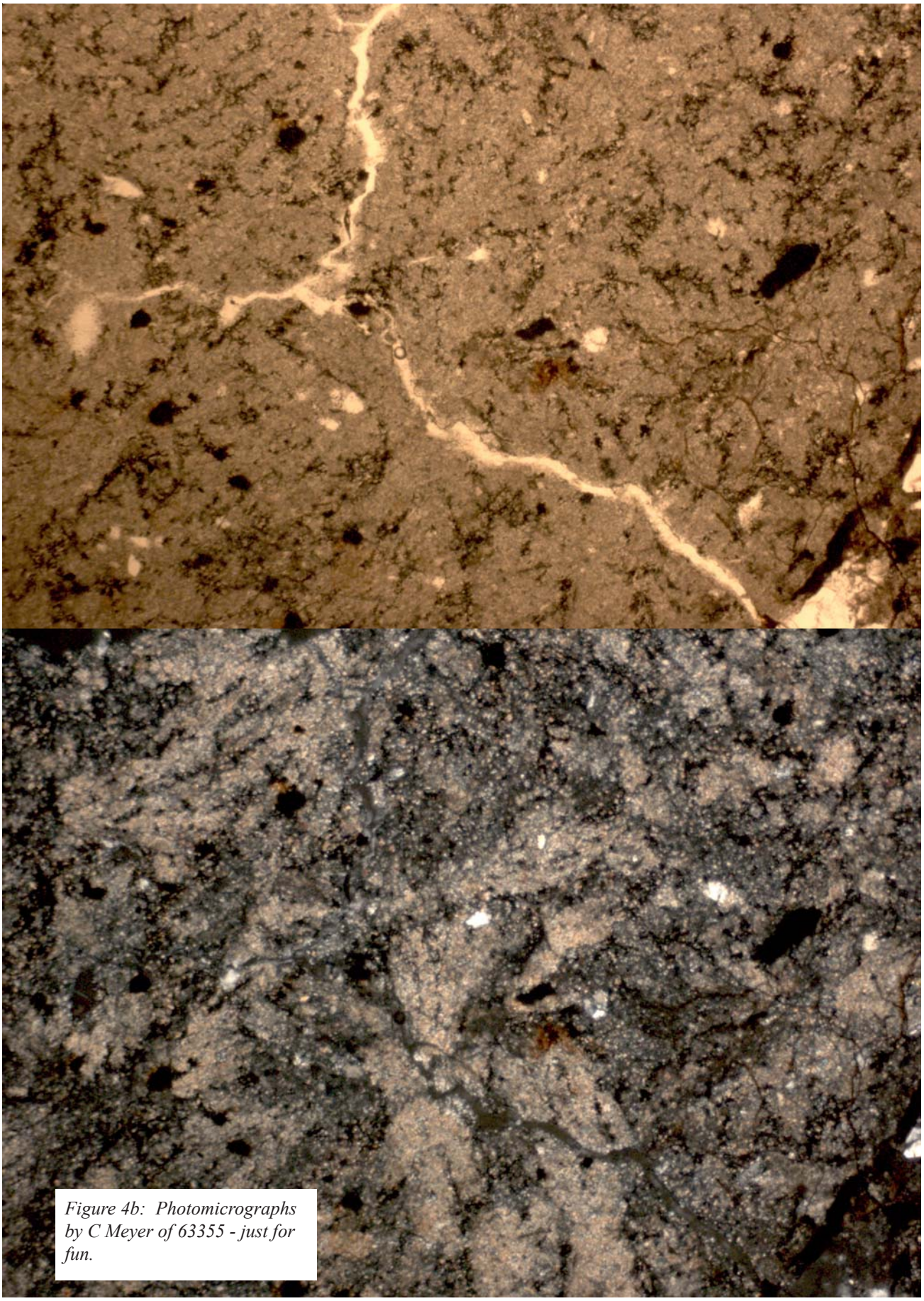

Figure 4b: Photomicrographs by C Meyer of 63355 - just for fun.

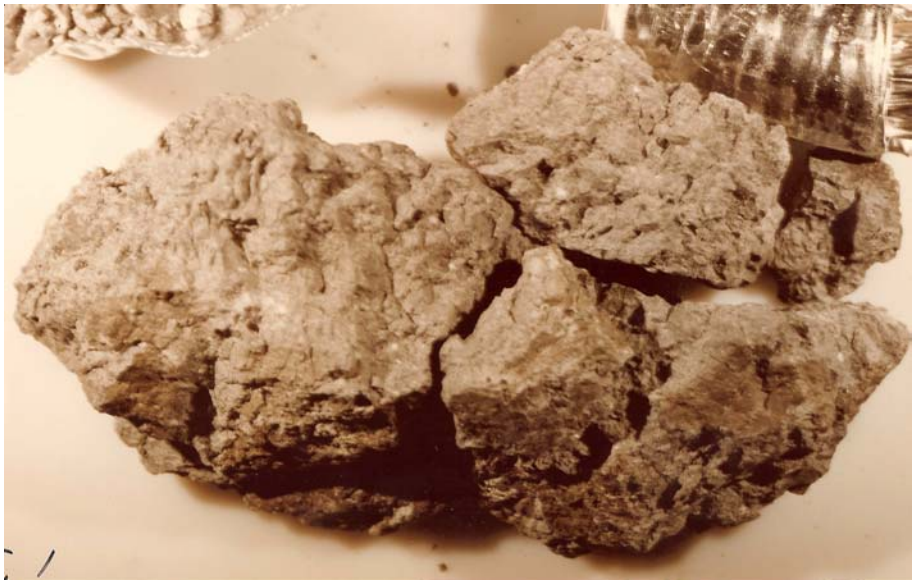

Figure 7: 63355,1. S79-36145.

Figure 8: 63355,2 (7-12). Note zap pits. Cube is 1 cm. S73-28681

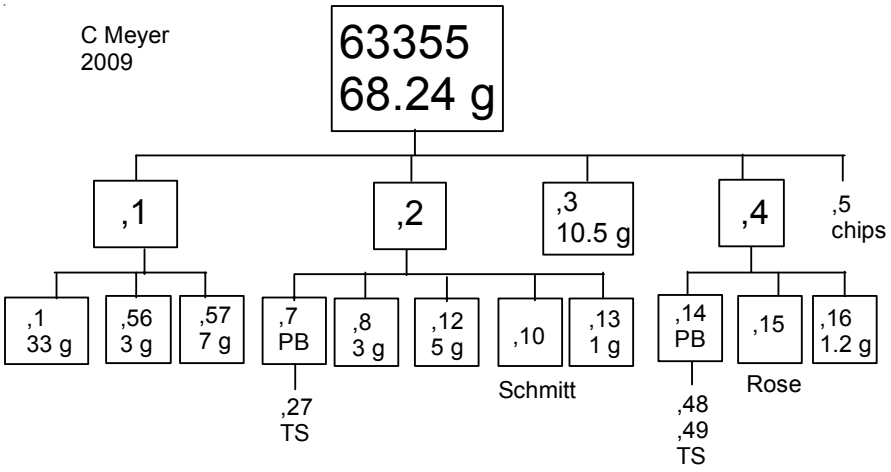

Table 1. Chemical composition of 63355.

reference	Laul74		Ganapathy74		Clark74	
weight						
SiO2 %						
TiO2	0.88	(a)				
Al2O3	21.5	(a)				
FeO	8.3	(a)				
MnO	0.09	(a)				
MgO	8	(a)				
CaO	12	(a)				
Na2O	0.5	(a)				
K2O	0.22	(a)			0.24	(c)
P2O5						
S %						
sum						
Sc ppm	12	(a)				
V	35	(a)				
Cr	1156	(a)				
Co	62	(a)				
Ni	940	(a)	800	(b)		
Cu						
Zn			5.2	(b)		
Ga						
Ge ppb			1910	(b)		
As						
Se			340	(b)		
Rb			6.5	(b)		
Sr						
Y						
Zr	280	(a)				
Nb						
Mo						
Ru						
Rh						
Pd ppb						
Ag ppb			2.3	(b)		
Cd ppb			5.7	(b)		
In ppb						
Sn ppb						
Sb ppb			5.87	(b)		
Te ppb			38	(b)		
Cs ppm			0.3	(b)		
Ba	280	(a)				
La	30	(a)				
Ce	74	(a)				
Pr						
Nd	47	(a)				
Sm	12	(a)				
Eu	1.51	(a)				
Gd		(a)				
Tb	2.5	(a)				
Dy	16	(a)				
Ho						
Er						
Tm						
Yb	8.8	(a)				
Lu	1.3	(a)				
Hf	8.9	(a)				
Ta	1.2	(a)				
W ppb						
Re ppb			2.27	(b)		
Os ppb						
Ir ppb	24	(a)	16.6	(b)		
Pt ppb						
Au ppb	16	(a)	18.4	(b)		
Th ppm	4.2	(a)			4.85	(c)
U ppm	1.2	(a)	0.98	(b)	1.31	(c)

technique: (a) INAA, (b) RNAA, (c) radiation counting

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