14268 - 23.12 grams
14269 - 17.19 grams
14271 - 97.41 grams
14272 - 46.68 grams
14273 - 22.4 grams
14275 - 12.46 grams
14277 - 7.59 grams
14278 - 7.6 grams
14280 - 6.2 grams
14281 - 12 grams
Vitric matrix Breccia

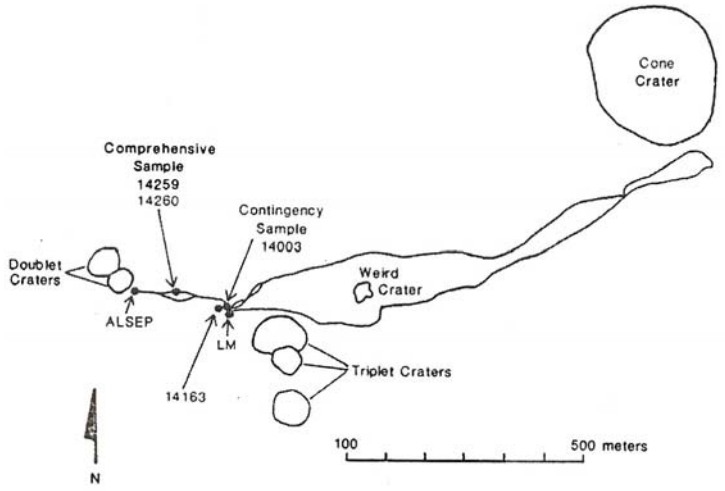


Figure 1: Traverse map for Apollo 14 showing location of comprehensive sample.

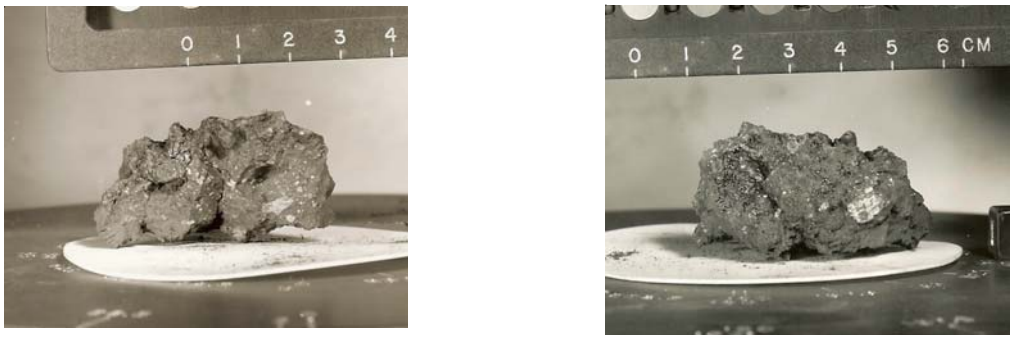


Figure 2: Photos of 14268. Scale in cm. S71-36393 and 392.

Figure 3: Photos of 14271. Sample is 5 cm across. NASA S71-29213 and 29211.

Introduction

These ten small rocks were all collected as part of the "comprehensive sample" (Phinney et al. 1975). A circle about 14 meters in diameter was drawn and every rock on the surface placed in the same bag along with large soil samples 14259 and 14261. Some may be from the soil. These ten samples are similar in texture and all appear to be soil breccia or vitric matrix breccia made from the soil. They are similar to 14264, 14265 and 14267 also collected from the same circle, and better studied.

Figure 4: Photo of 14272. Sample is 4 cm across. NASA S71-30353

Petrography

Phinney et al. (1975) and Carlson and Walton (1977) described these samples as vitric matrix breccias made from the Apollo 14 soil. They are each a little different (figure 2 – 10), but they all have glass. Some have glass spheres. The largest, 14271, has two large clasts of crystalline matrix breccia. They all have an abundance of small lithic clasts (figure 11 to 17). Many of the lithic clasts have the texture of impact melt rocks.

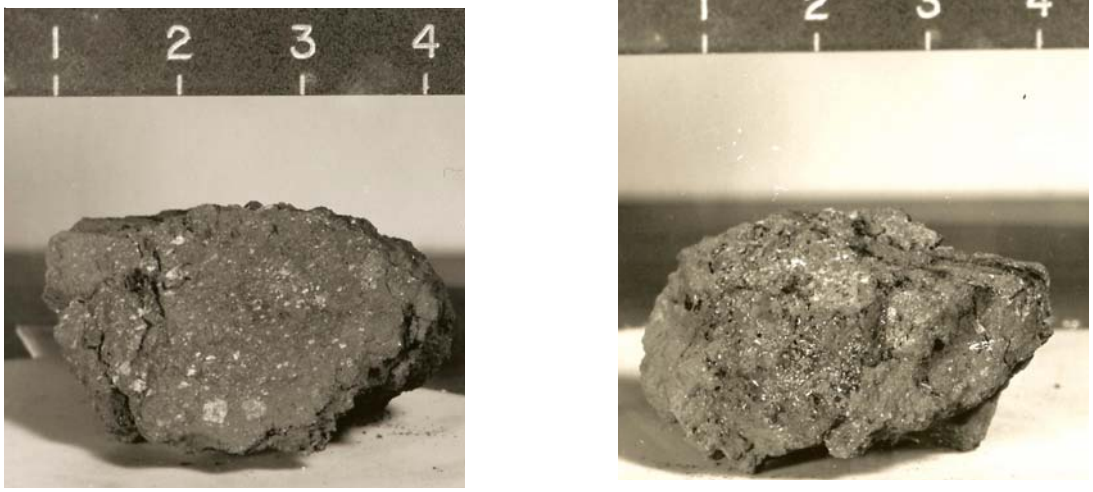


Figure 5: Photos of 14273. Scale is in cm. S71-26618 and 620.

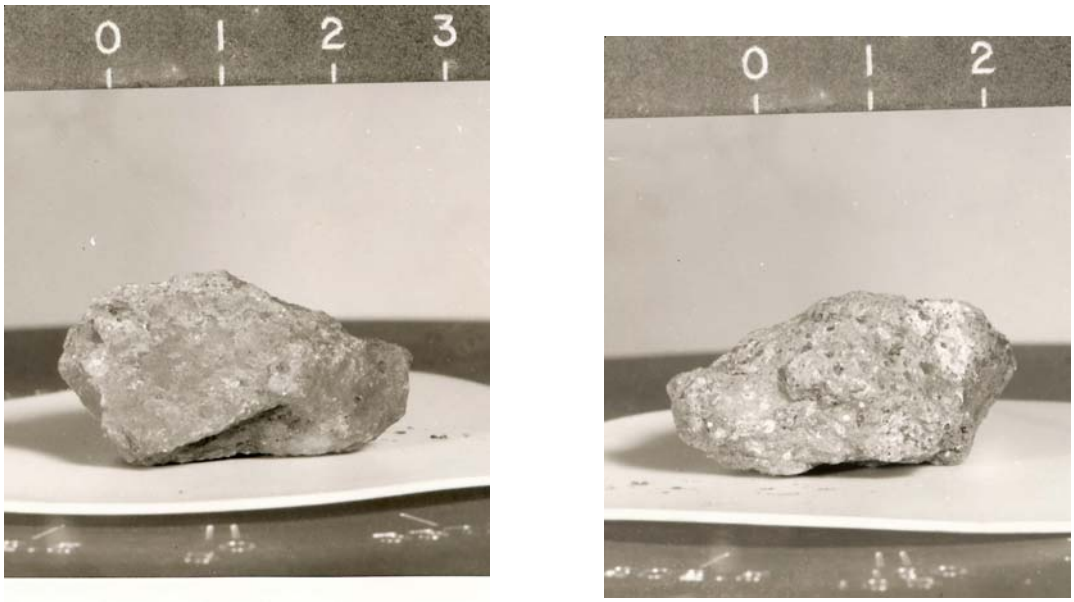


Figure 6: Photos of 14275. Scale in cm. S71-26985 and 986.

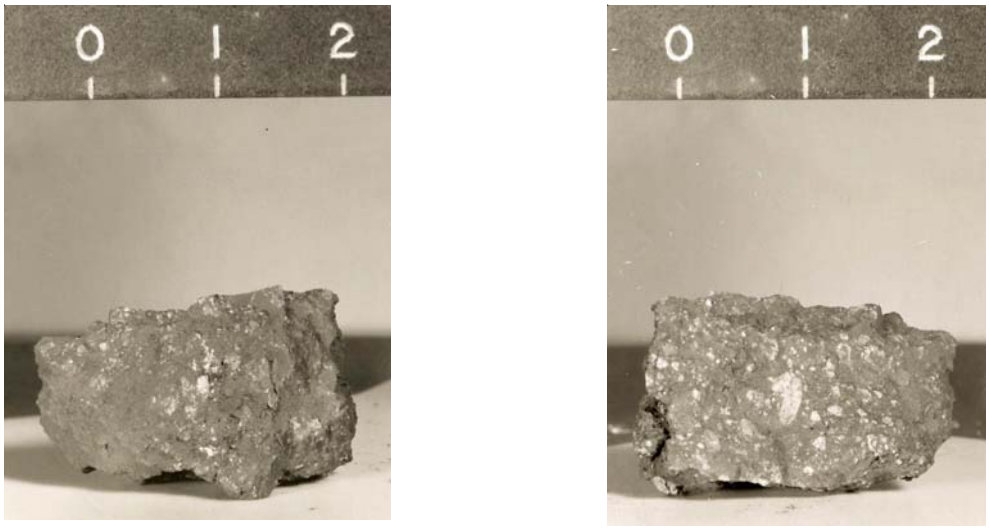


Figure 7: Photos of 14277. Scale in cm. S71-26630 and 632.

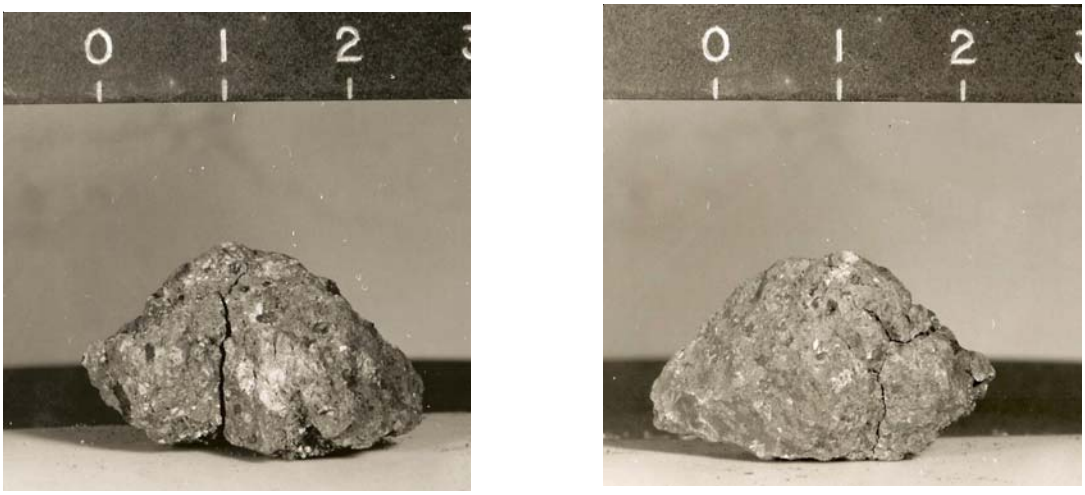


Figure 8: Photos of 14278 . Scale in cm. S71-26636 and 637.

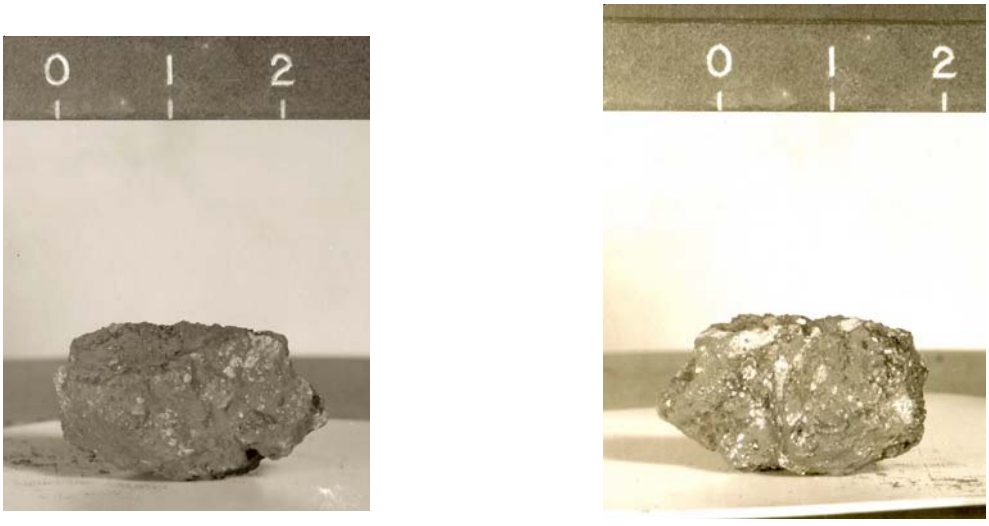


Figure 9: Photos of 14280. Scale in cm. S71-26025 and 026.

Figure 10: Photo of 14281. Scale in cm. S71-26642

Number of polished thin sections
14268 - 2
14269 - 2
14271 - 6
14272 - 2
14273 - 2
14275 - 2
14277 - 1
14278 - 2
14280 - 1
14281 - 4

Chemistry

Eldridge et al. (1972) determined the K, U and Th for 14271, 14272 and 14273 (table 1).

Radiogenic age dating

None

Cosmogenic isotopes and exposure ages

Eldridge et al. (1972) determined the cosmic-ray-induced activity for ^{22}Na = 61, 78 and 66 dpm/kg for 14271, 14272 and 14273, respectively and ^{26}Al = 118, 94 and 73 dpm/kg. respectively. They were clearly at the surface during the last solar flare.

Processing

All these samples were collected from the surface within a 14 meter circle as part of the comprehensive sample (Swann et al. 1977). They were returned, along with soil, in weigh bag 1039, which was in ALSRC 1007. However, 1007 did not seal, and these samples were exposed to air (minimal).

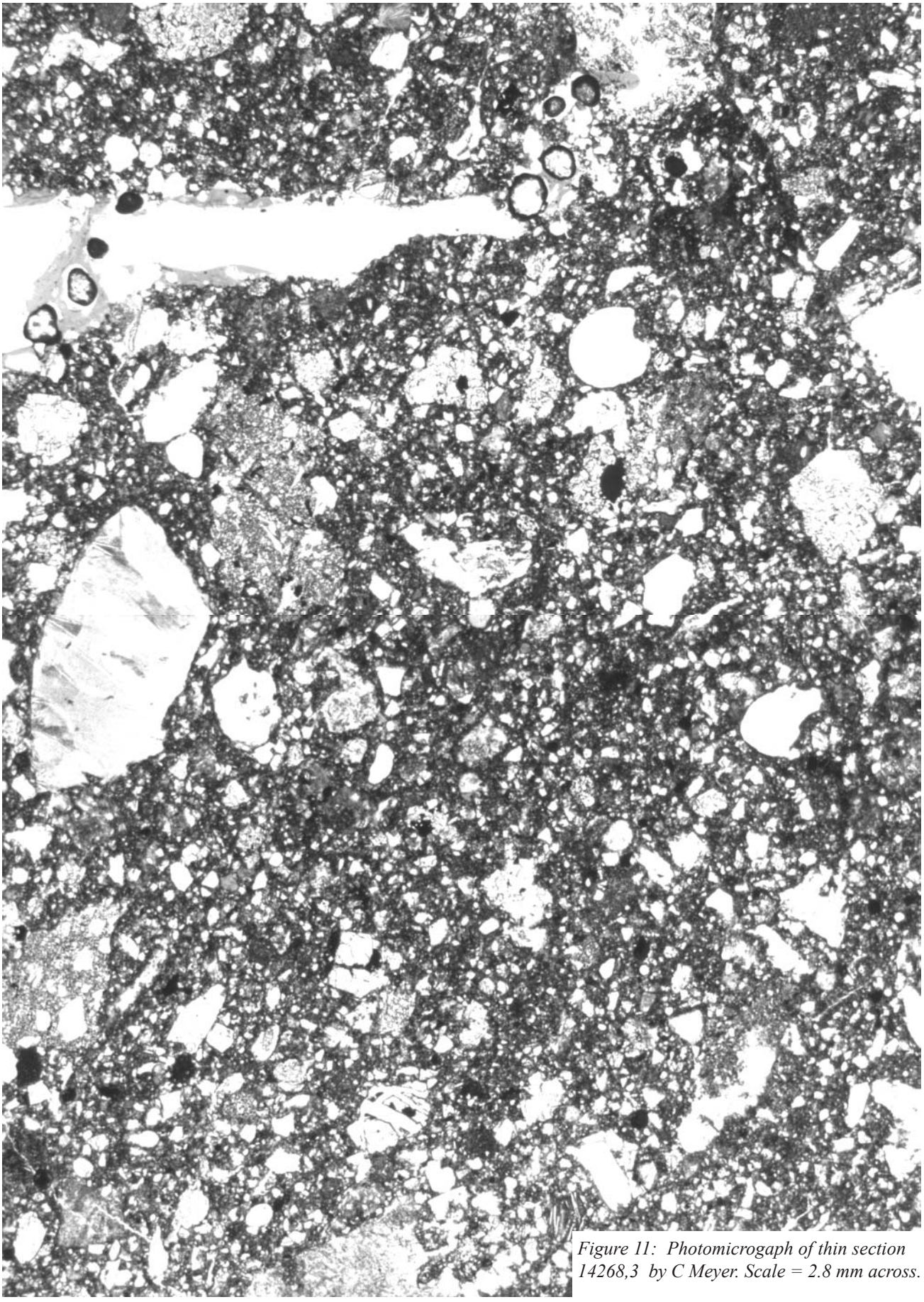


Figure 11: Photomicrogaph of thin section 14268,3 by C Meyer. Scale = 2.8 mm across.

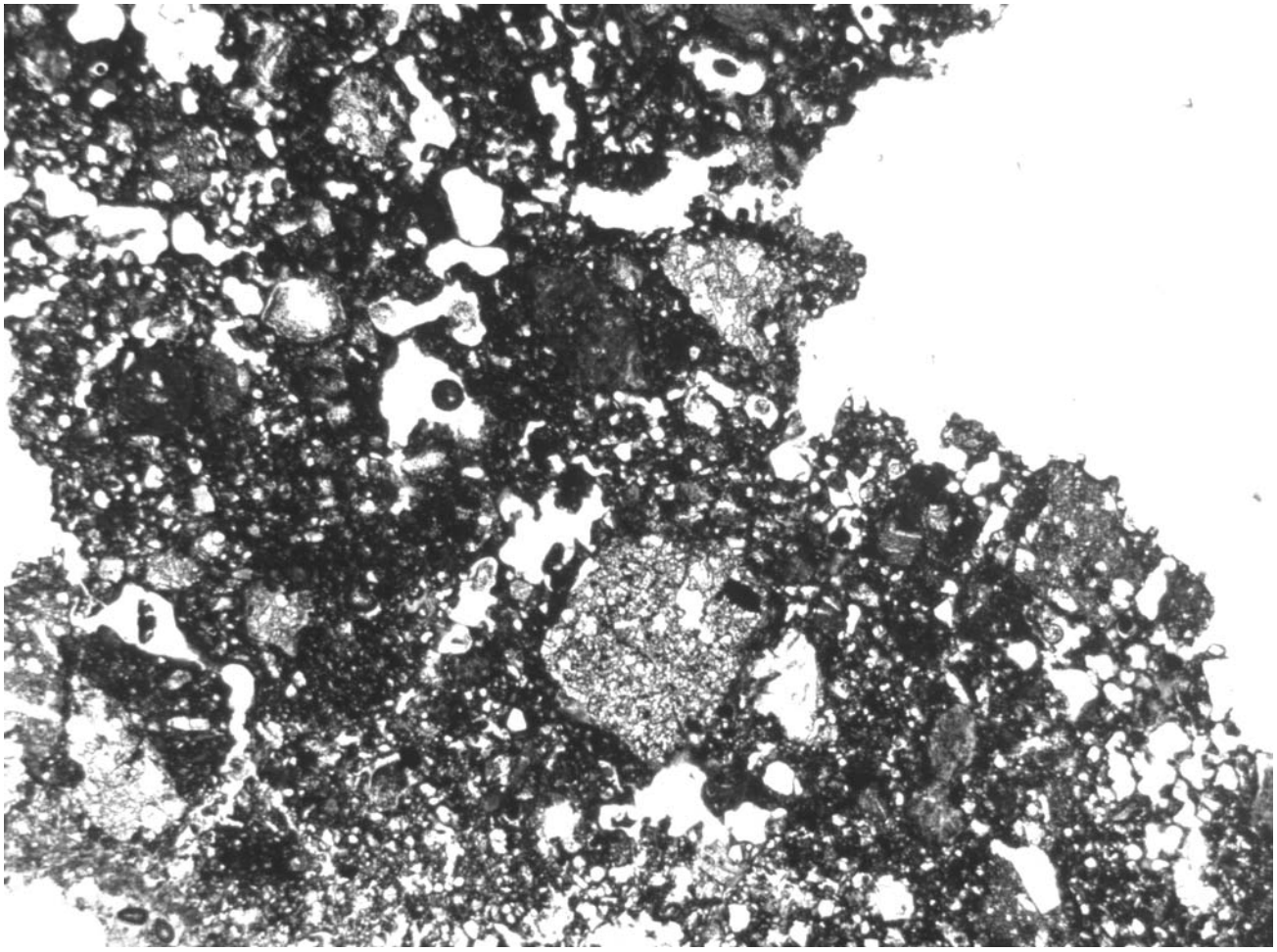
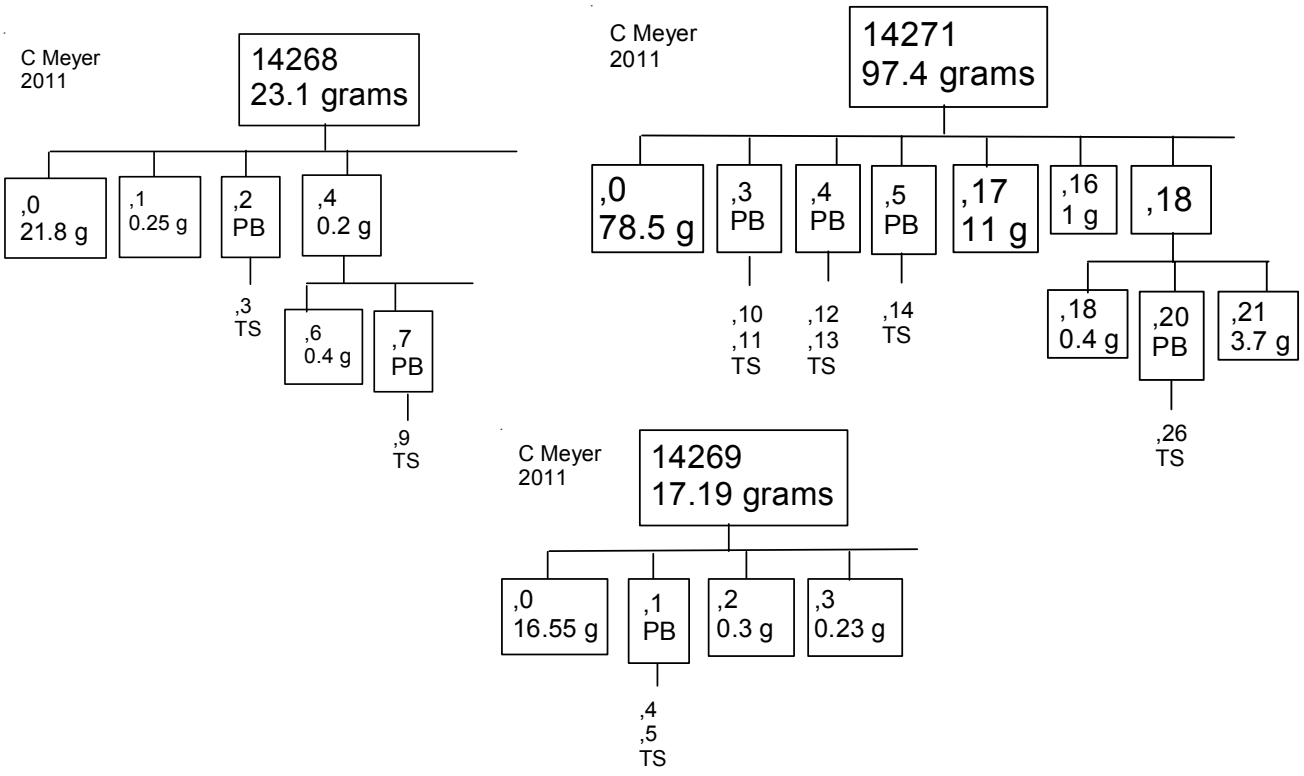
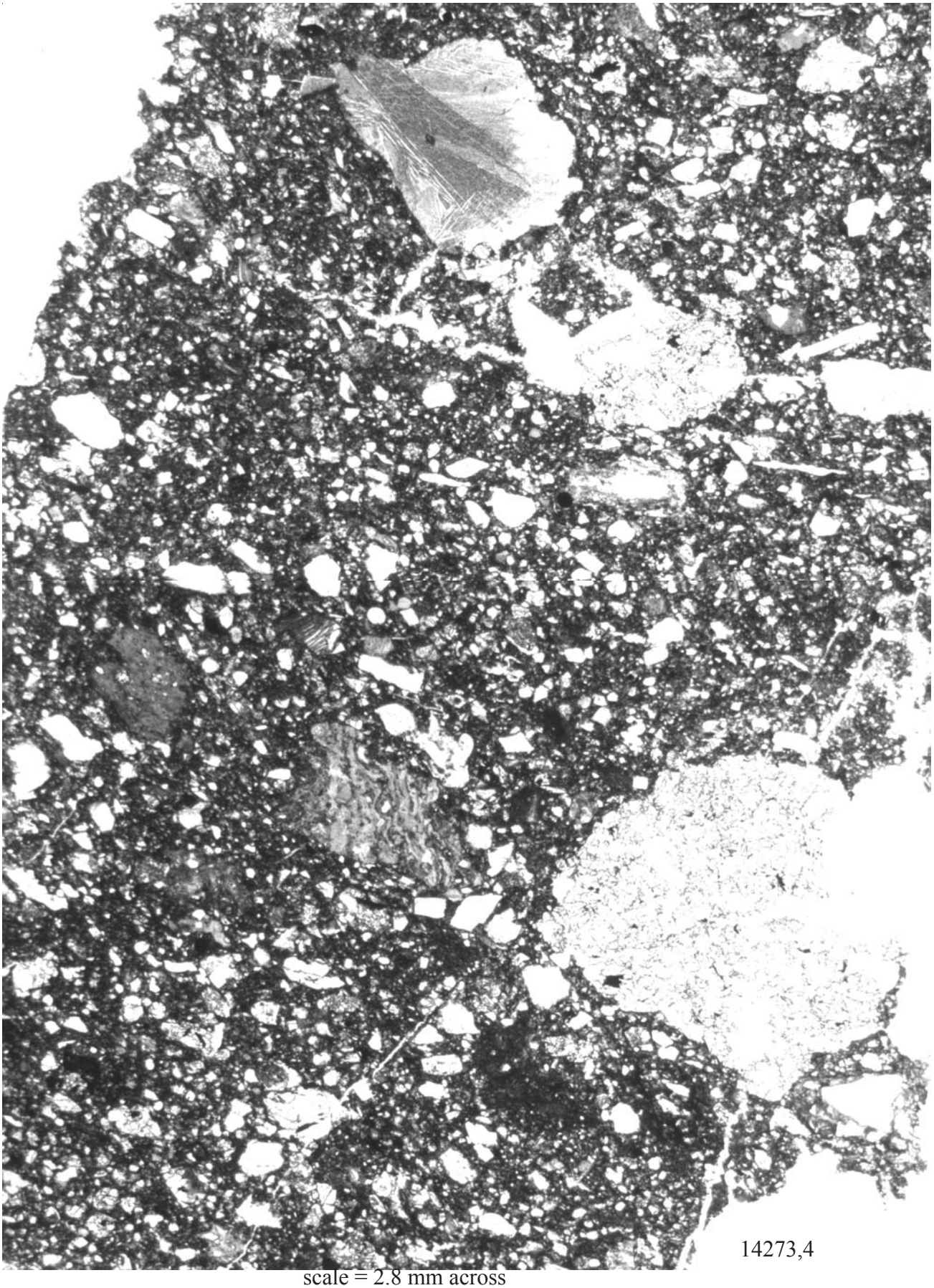
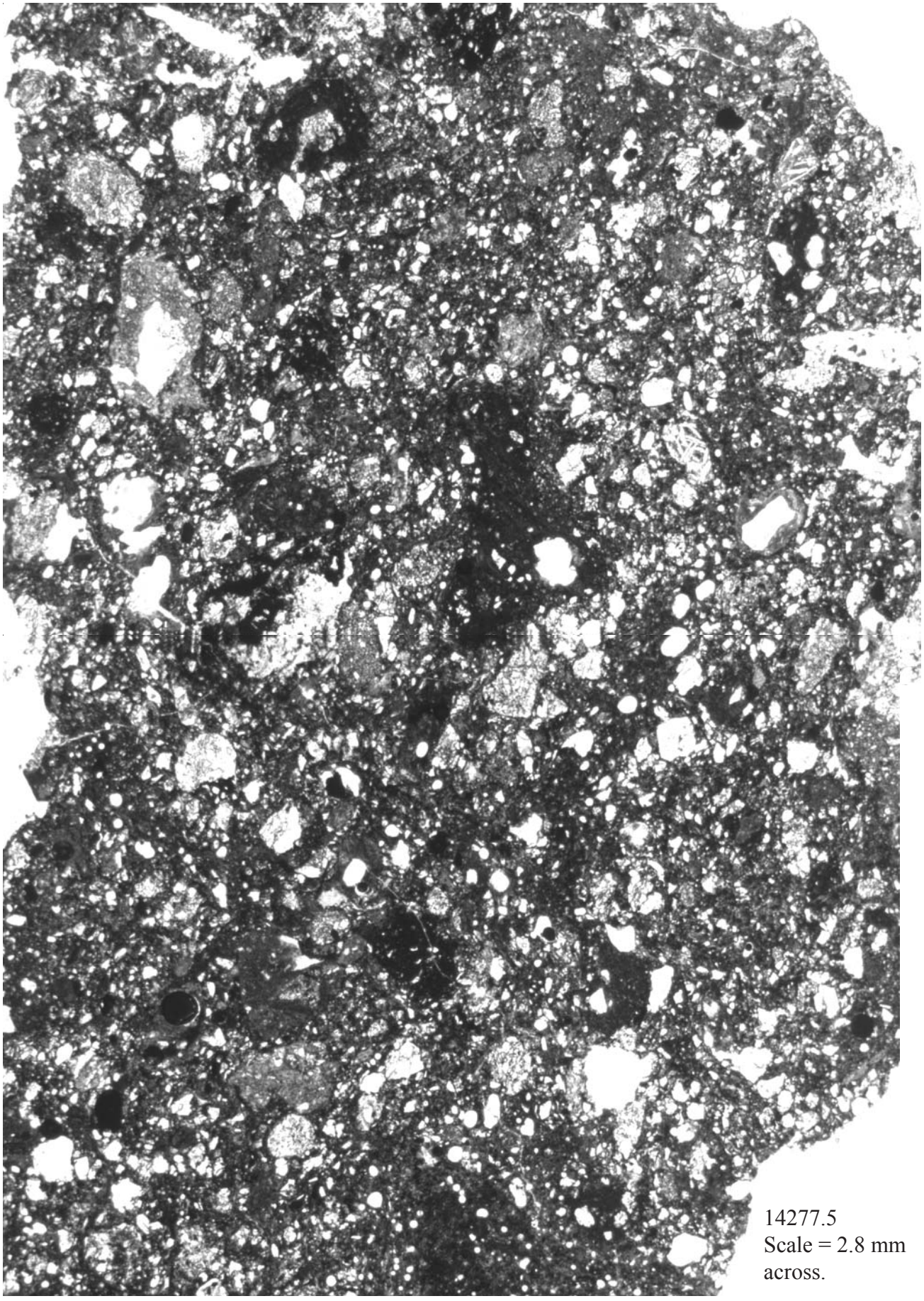


Figure 12: Photomicrograph of thin section 142712,10 by C Meyer. Scale = 2.8 mm

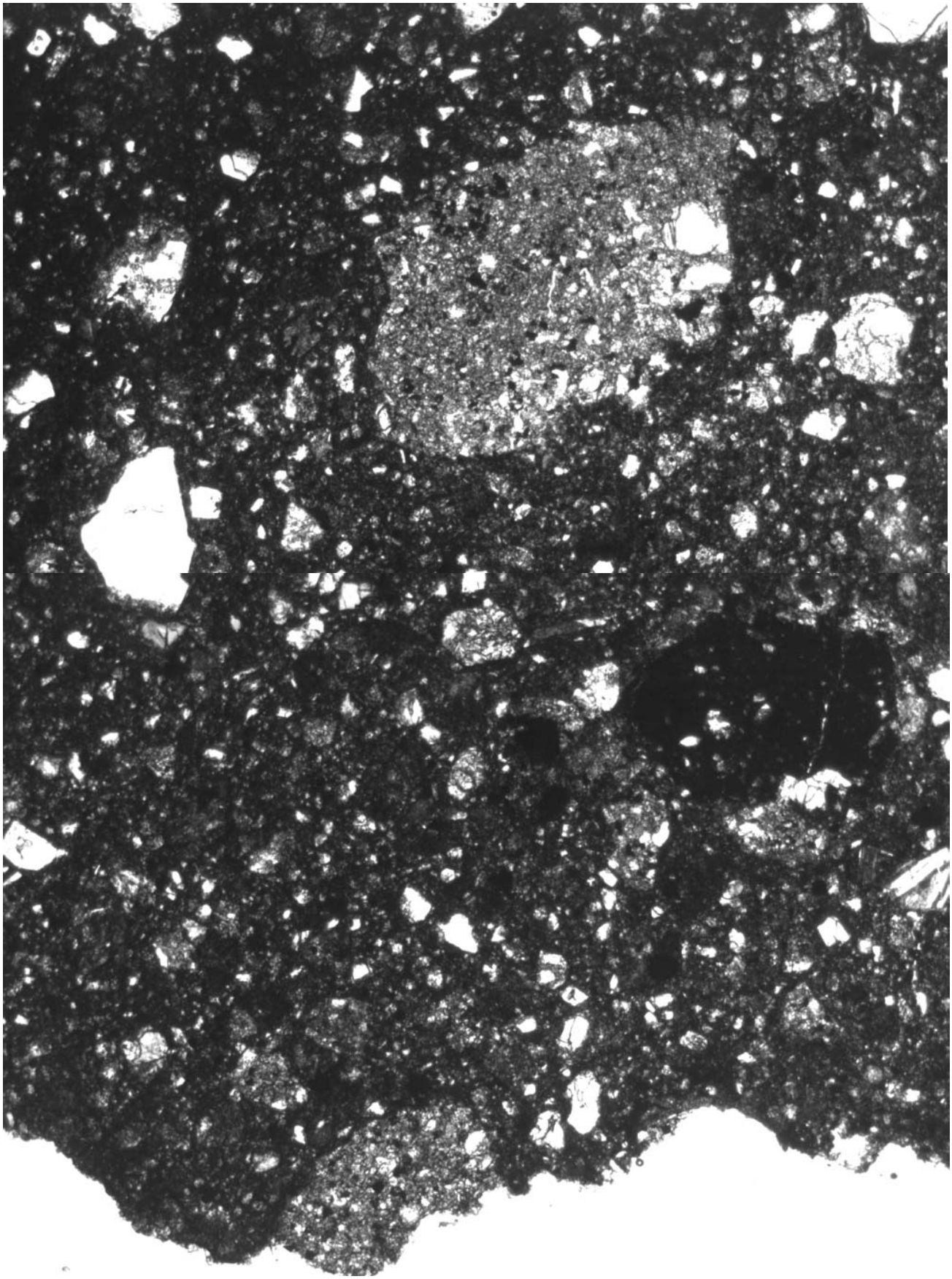




scale = 2.8 mm across

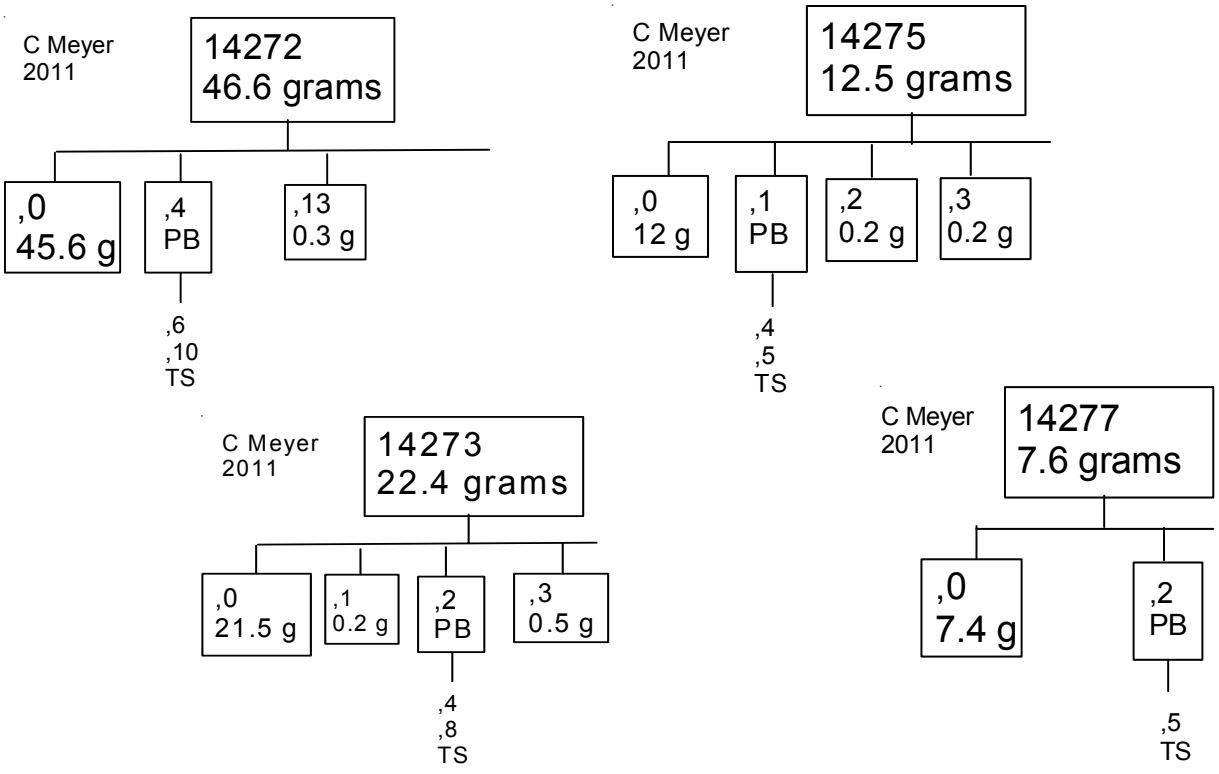


14277.5
Scale = 2.8 mm across.



14278,5 Scale = 2.8 mm across

Figure 16 : Photomicrograph of thin section 14280,5 by C Meyer. scale 2.8 mm across



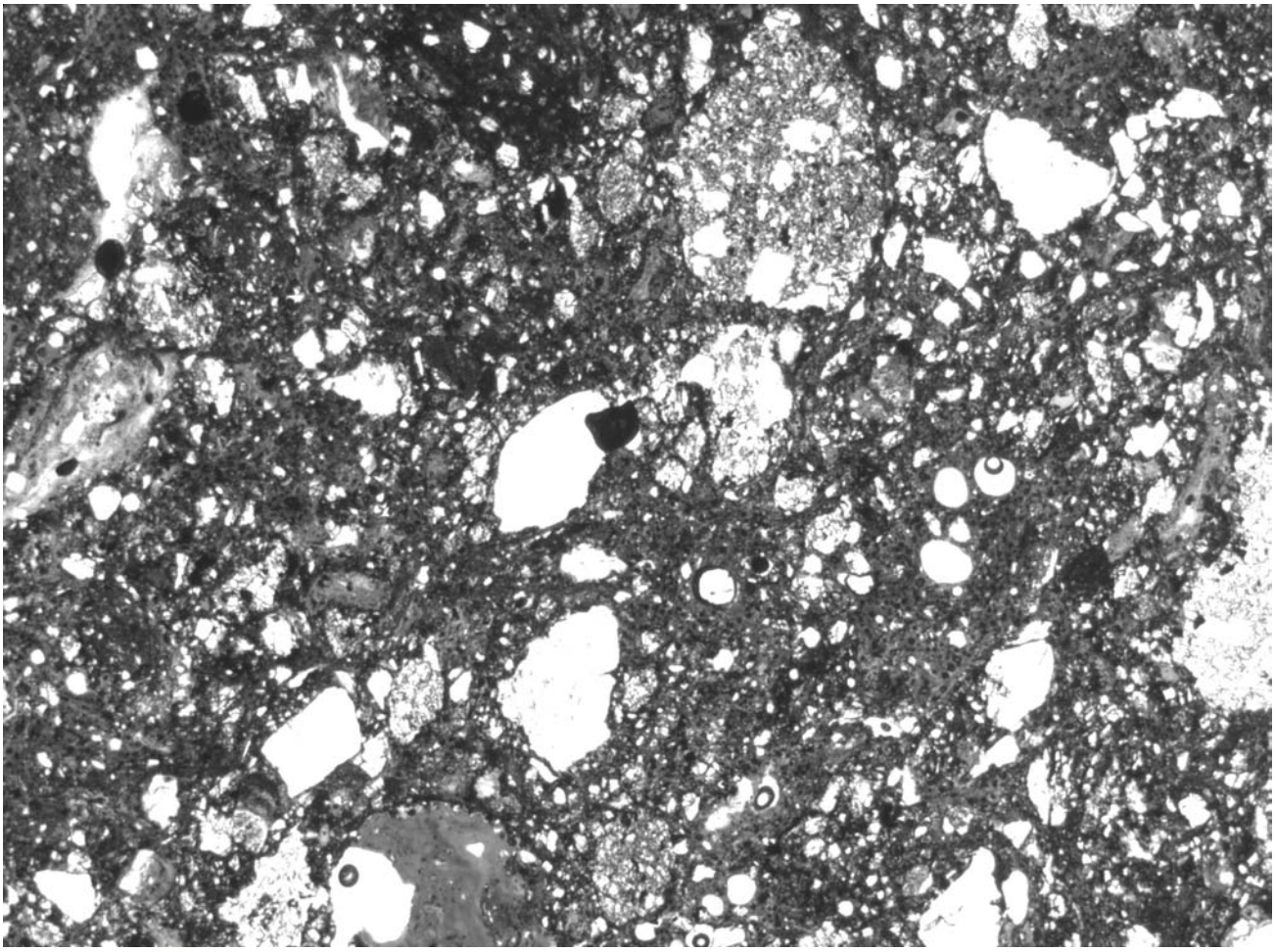


Figure 17: Photomicrograph of thin section 14281,3 by C Meyer. scale = 2.8 mm across

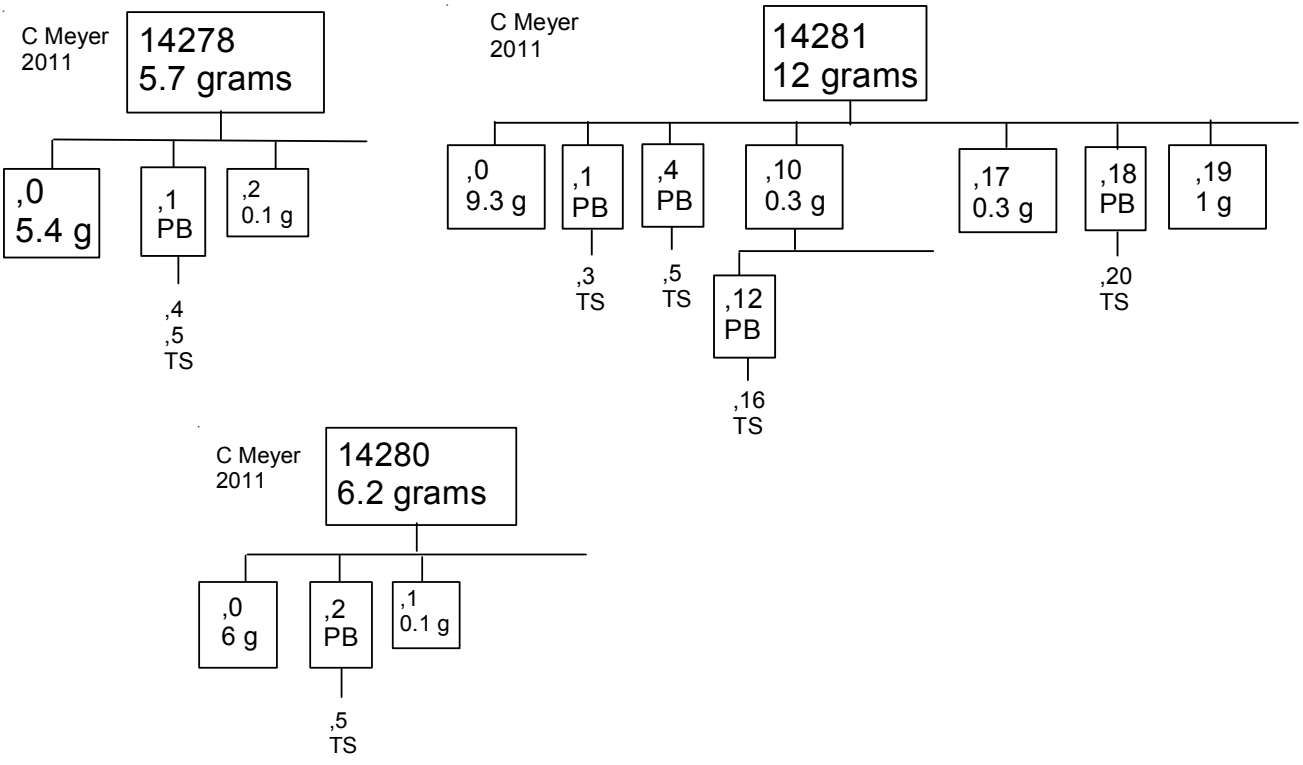


Table 1. Chemical composition of 14271, 14272 and 14273.

	14271							14272		14273	
reference	Eldridge72		Simonds77					Eldridge72		Eldridge72	
weight			clast		clast	matrix					
SiO2 %			47.38	(b)	48.39	48.3	(c)				
TiO2			1.68	(b)	1.59	2.06	(c)				
Al2O3			16.29	(b)	15.95	16.48	(c)				
FeO			9.33	(b)	10.41	10.51	(c)				
MnO					0.14	0.15	(c)				
MgO			11.66	(b)	12.62	9.54	(c)				
CaO			10	(b)	9.85	10.07	(c)				
Na2O			0.9	(b)	0.83	0.89	(c)				
K2O	0.63	(a)	0.66	(b)	0.27	0.8	(c)	0.54	(a)	0.55	(a)
P2O5					0.65	0.65	(c)				
S %					0.06	0.09					
sum											
Sc ppm											
V											
Cr			2200	(b)							
Co											
Ni											
Cu											
Zn											
Ga											
Ge ppb											
As											
Se											
Rb											
Sr											
Y											
Zr											
Nb											
Mo											
Ru											
Rh											
Pd ppb											
Ag ppb											
Cd ppb											
In ppb											
Sn ppb											
Sb ppb											
Te ppb											
Cs ppm											
Ba											
La											
Ce											
Pr											
Nd											
Sm											
Eu											
Gd											
Tb											
Dy											
Ho											
Er											
Tm											
Yb											
Lu											
Hf											
Ta											
W ppb											
Re ppb											
Os ppb											
Ir ppb											
Pt ppb											
Au ppb											
Th ppm	15.6	(a)						11.3	(a)	11.7	(a)
U ppm	4.5	(a)						3.3	(a)	3.1	(a)

technique: (a) radation counting, (b) e. probe, (c) XRF

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