

Report on the metallurgical residues from the
Robing Room, Church Lane,
Kilkenny (11E0157ext.)

Paul Rondelez
PhD researcher
University College Cork

Mitchelstown
20th of March 2013

1. Introduction

A trench excavated in front of the Robing Room building in Kilkenny produced just over 2 kg of metalworking slag and 400 g of associated vitrified materials. The material was recovered from contexts dated to the late medieval period and later. It consists of remains related to smithing activities, with indications of the use of ceramic tuyeres. The lack of hammerscale in the samples shows the actual smithing took place elsewhere. Several fragments of brick-like material are interpreted as unconnected to metalworking and a connection with lime kiln technology is proposed.

2. Analysis and description of the material

All the remains were examined visually and, where necessary, under a low-powered binocular microscope. The description and weight of each piece was entered in the appended catalogue. Both the sample flots and residues were checked with a magnet by Nikolah Gilligan.

The slag consists of several complete and fragmented bun-shaped lumps identifiable as smithing hearth cakes (Pl. 1). These are formed below the hottest area within the smithing hearth through the accumulation of iron lost from the object, fuel ash and vitrified material from the hearth wall and/or ceramic tuyeres (Young 2012:44). The weight of these smithing hearth cakes can vary from below 100 g to several kilograms and are known in Ireland to date from the Iron Age to the post-medieval period. Several slag pieces from the Robing Room excavation have embedded charcoal fragments, no coal was observed. One piece has a globular hammerscale particle adhering to its outer surface. Globular hammerscale is formed during forge-welding, while the flat variety, flake hammerscale, is the result of hammering heated iron (Dungworth and Wilkes 2009). Hammerscale is typically highly magnetic, but none was recovered from the soil samples which were checked with a magnet (Nikolah Gilligan, pers. comm.).

One piece of slag has in its matrix a light grey portion which is often observed in slag formed in close contact with a ceramic tuyere (bellows protector). A piece of vitrified ceramics showing a convex outer surface is a fragment of one of these tuyeres (Pl. 2). Several other undiagnostic pieces of heated ceramic material could also represent tuyere material. A different type of ceramic material included in the assemblage consists of brick-like material with occasional calcium-rich inclusions. One piece shows three flat outer surfaces at 90° angles to each other, suggesting a cuboid shape of

the original (Pl. 3). The same piece has strong vitrification on one side. Another piece made of the same type of material shows half of a tubular hollow and indications of a parallel second one (Pl. 4). Both the shape and the brick-like composition of this material is uncharacteristic for ceramics associated with metalworking.

3. Stratigraphy of the material

About 1300 g of material was recovered from contexts dated to the late twelfth to thirteenth century, mostly from lime kiln chamber [103]. This includes smithing hearth cake, the brick-like material and the slag with possible tuyere influence. The rest of the material was found in contexts dated to the seventeenth to eighteenth century and also contains smithing hearth cake, brick-like pieces and the tuyere fragment. The similarity of both groups could point to the younger material being residual, although both smithing hearth cakes and tuyere are known to have been produced and used well into the post-medieval period (Young 2008). All the post-medieval contexts with metalworking residues also contained sherds of medieval pottery, further suggesting a possible residual origin.

4. Discussion and conclusions

The slag from the Robing Room site is material typically associated with the smithing of iron, confirmed by the hammerscale embedded in one of the pieces. The lack of hammerscale in the samples convincingly points to the actual metalworking taking place elsewhere and the recovered material having been dumped in the area of excavation. The tuyere fragment is a further example of the continued use of these implements in the late medieval, or later, periods in Ireland. A near complete frontal piece of tuyere was recovered from a late twelfth century context nearby at No. 1 Irishtown (Doyle 2004:103). The brick-like material is very atypical of metalworking ceramics, both in its constituency and its shape. The vitrification on one of the fragments, however, suggests some connection with heat-related activity. The piece with the tubular hollow(s) was recovered from the late medieval lime kiln and a function as an air-inlet for the latter might be suggested. The general similarities between the slag and brick-like pieces recovered from both the late medieval and younger contexts, together with the frequent occurrence of late medieval pottery in those later contexts, could indicate that at least part of the more recent remains are residual late medieval material.

Bibliography

- Doyle I. 2004 *River Nore (Kilkenny City) Drainage Scheme: Archaeological Excavations at Rear of No 1 Irishtown, Kilkenny*. Unpublished Final Excavation Report, Margaret Gowen & Co. Ltd.
- Dungworth D. and Wilkes R. 2009 Understanding Hammerscale: the Use of High-speed Film and Electron Microscopy. *Journal of the Historical Metallurgy Society* 43 (1):33-46.
- Young T. 2008 Evaluation of archaeometallurgical residues from Mucklagh, Co. Offaly NTB06, A033/E2845. (= GeoArch Report 2008/07). In Twomey J. (ed.). *N52 Tullamore Bypass: Final Report on archaeological excavations at Mucklagh E2845, in the townland of Mucklagh, Co. Offaly*. Unpublished Final Excavation Report, Headland Archaeology (Ireland) Ltd.:62-71.
- Young T. 2012. *Appendix 3 - Exploiting the bog - Iron production and metalworking* (= Appendix on CD) In Stevens P. and J. Channing (ed.) *Settlement and Community in the Fir Tulach Kingdom: archaeological excavation on the M6 & N52 road schemes*. Dublin, National Roads Authority.

Plates



Pl. 1. Roughly triangular smithing hearth cake (context 86, find 34)



Pl. 2. Tuyere fragment with convex outer surface and adhering slag (context 86, find 36)



Pl. 3. Brick-like material showing two sides at 90°, with the third covered by vitrification (angle visible on interior of piece) (context 87, find 11)



Pl. 4. Brick like material with tubular hollow with possible remnants of second parallel hollow (marked) (context 102, find 46)

Catalogue

Fill	Cut	Find	Description	Weight (g)
1	NA	94	Small irregular piece of vitrified ceramic material. Some rounded quartz-like inclusions.	4
76	77	38	Piece of sandstone with strong vitrification on one side.	167
76	77	57	Small lump of vitrified slag.	9
76	77	58	Rather dense piece of slag, probably part of small SHC.	13
76	77	59	Small lump of vitrified slag.	19
76	77	60	Fragment of brick-like material	11
86	NA	34	Roughly triangular SHC with charcoal impressions. A specimen of globular hammerscale is embedded on the lower side.	571
86	NA	35	Small fragment of reddish vitrified ceramic material. Many small stones in the clay matrix, mostly angular quartz.	11
86	NA	36	Piece of slightly reddish vitrified ceramic material with adhering slag. A convex outer surface is visible. Tuyere material.	19
86	NA	37	Piece of limestone with fossil of tubular organisms	
86	NA	43	Small rather flat piece of slag. Some charcoal impressions.	40
87	100	11	Piece of brick like material with strong vitrification on one side. Seems to be have three sides at straight angles from each other	23
90	91	3	Small piece of reddish vitrified ceramic material with some quartz inclusions.	3
90	91	4	Small piece of rather dense slag.	13
90	91	5	Tiny lump of slag.	5
98	NA	41	Small piece of slag with minor charcoal inclusions. One part of this piece has a light-grey matrix, potentially showing influence of tuyere material.	11
98	NA	42	Small irregular piece of slag with multiple charcoal impressions	6
98	NA	45	Small fragment of slag with charcoal impressions	9
98	NA	46	Small piece of rather dense slag with multiple charcoal impressions.	20
102	103	46	Fragment of brick-like material with circular linear hollow. Two small smoothed patches could be the remnants of a second parallel hollow. Some calcium-rich inclusions in the fabric.	131
102	103	47	Small piece of slag with many charcoal inclusions.	8
102	103	64	Lump of dense slag with some charcoal impressions. Part of a SHC.	269
102	103	65	Partial SHC with crystalline upper part and heavily oxidised lower part.	180

Fill	Cut	Find	Description	Weight (g)
102	103	66-69	Four pieces of relatively dense slag. Fragments of SHC's.	256
102	103	70-86	Seventeen small pieces of relatively dense slag. Some with charcoal inclusions and/or impressions.	140
102	103	87-88	Two small pieces of drippy slag.	8
102	103	89	Fragment of vitrified ceramic material.	9
102	103	90-91	Two small pieces of slag encrusted by yellowish clay material.	7
102	103	92	Fragment of brick-like material	28
102	103	93-97	Five pieces of heavily corroded iron, one piece has bone included in the rusty crust	
102	103	254	Irregular lump of rather dense, oxidised slag with charcoal impressions	182
102	103	255	Small piece of reddish vitrified ceramic material.	2
102	103	256	Small fragment of slag.	2
105	100	1	Small dense irregular SHC with some charcoal impressions.	222
106	100	2	Small fragment of flat vitrified ceramic material. A small piece of slag is embedded in the reddish oxidised clay matrix. No other obvious tempering.	11
107	103	1	Small piece of slag with minor charcoal inclusions	23
110	103	14	Small piece of corroded iron	