Analysis of the archaeometallurgical residues from Thomastown, Co. Kilkenny (95E0233)

Paul Rondelez
PhD researcher
University College Cork

Mitchelstown
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Introduction

Trial excavations of four trenches at Chapel Lane in Thomastown in October 1995 revealed several pits and layers of Late Medieval date (Murtagh 1998). Three of these pits and one of the layers produced remains of iron working. This material was visually and microscopically analysed, weighed and described (see Appendix 1).

Description and chronology of the residues and features

Most of the material consists of so-called Smithing Hearth Cakes (SHC's), one of the most distinctive residues resulting from early iron smithing. Several of these are well formed, one example showing a 'blowing hollow' created by the the air from the belows creating a dip in the still semi-liquid slag which then solidified (Pl. 1). Other SHC's are more irregular and all are rather dense. The weight of the SHC's varies between around 400 g and 1150 g. Of particular interest is a pie-shaped piece of slag/vitrified clay which represents the remnants of the front of a large-diameter ceramic bellow-protector or tuyere (Pl. 2). The original diameter would have been just under 25 cm. While nearly all the evidence for the fuel used in the metalworking at Thomastown consists of pieces and impressions of charcoal in the slag, one piece, from pit (60), exclusively contains clearly recognisable coal inclusions (Pl. 3).

The slag material from Thomastown was recovered from three pits (60, 90 and 96) and a layer (29) which was stratigraphically earlier than the upper fill of pit (60) (Murtagh 1998:4-5). These pits were interpreted as cess pits used for discarding rubbish and were dated, based on pottery finds, to the 13th - 14th century. Striking was the fact that a large proportion of the slag material from pit (60) was heavily weathered as opposed to that from the other contexts, suggesting this material was only deposited after it had been exposed to the elements for a certain time. Also, the absence of smaller fragments, if not the result of selective sampling, would point to the material being redeposited from elsewhere.

Discussion

The occurrence of rather substantial Smithing Hearth Cakes probably points to object manufacture and it is interesting that the only Irish murage charter mentioning a levy on iron blooms (*massa ferri*), is the one for Thomastown issued in 1375 (Chart. Priv. Immun.:68). Iron blooms are the products of iron smelting and would have been traded in purified form.

Large diameter tuyeres are unique to Ireland and are known from 7th to 9th century contexts at Lisleagh, Co. Cork, where the front of the tuyeres measured up to 18 cm across tapering back to a larger diameter (Cherubini 2005:113-114). Recently, they have also been identified from post 14th century contexts at Ballykilmore, Co. Westmeath (Young 2005:3; 2009:7). Here, the tuyere had a diameter of between 20 and 30 cm, but it was remarked that these were not necesseraly circular. The latter site also revealed ceramic supports for these large tuyeres. Finally, an assemblage dated to the late medieval period from the excavations at the site of the Dominican Priory at Blackhall Lane, Mullingar, Co. Westmeath, currently under study by the author, has also revealed a rather similar piece to the one from Thomastown, this time with a diameter of about 20 cm.

The use of coal in late medieval Ireland has not been researched to date, but it has been encountered in ironworking contexts at Carrickmines Castle, Co. Dublin (Young and Kearns 2010), Philip's Lane, Cork (Rondelez 2012a), The Parade (Rondelez 2012b) and 33 Patrick Street (Unfinished

report, the author), the latter both in Kilkenny. The mentioning of sea-coal in two pavage charters, one for Drogheda (1323) (Cal. Anc. Rec. Dublin Vol. 1:13) and the other for Dublin (1346) (ibid:18) suggests coal was imported into Ireland from at least the 14th century onwards. The charters for Kilkenny (Munby and Tyler 2005:199) are also of interest; whereas the 'coal' mentioned in the 1291 murage grant is potentially charcoal, the reference to 'coals of any kind' in both the 1420 and 1441 charters probably indicates the use of mineral coal in Kilkenny in that period. While the coal from the late medieval contexts from Dublin and Cork could have been imported, it is possible that the coal found in the 13th to 14th century layers at Kilkenny and Thomastown was exploited locally, for example at the Castlecomer coal-fields. Coal, as it invariably contains sulphur, is not suited for object manufacture, and would have been used in iron smithing for activities such as object repair, steeling, etc.

Conclusion

Although a limited collection of material, the residues from Thomastown provide new evidence for the use both of large diameter ceramic tuyeres and coal in late medieval ironworking in Ireland. The material points to both object manufacture and further processing.

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Plates

Pl. 1 Smithing Hearth Cake with central 'blowing hollow', fill (109) of pit (96)

Pl. 2 Pie-shaped fragment of vitrified ceramic tuyere, layer (29)

Pl. 3 Slag with adhering clay, all inclusions are coal, fill (61) of pit (60)

Appendix 1. Catalogue

Context no.	Feature	Description	Weight (g)
29	Layer	Well formed, dense bun-shaped SHC	463
id.	id.	Dense lumpy SHC	506
id.	id.	Flat SHC with oxidised exterior	348
id.	id.	Squarish fragment of dense SHC	291
id.	id.	Piece of light vitrified slag	112
id.	id.	Roughly wedge-shaped piece of highly vitrified ceramic material (L: 10.5 cm), likely piece of large tuyere	165
id.	id.	27 fragments of dense SHC material	1941
id.	id.	Three pieces of oxidised iron, one possible knife blade	NA
61	Pit (60)	Weathered, rounded dense SHC	759
id.	id.	Weathered, rounded dense SHC	475
id.	id.	Roughly rectangular, oxidised partial SHC	401
id.	id.	Lump of weathered dense slag	315
id.	id.	Two fragments of dense SHC's	348
id.	id.	Piece of light vitrified slag	99
id.	id.	Slag with adhering clay which contains frequent coal inclusions	87
108	Pit (90)	Two small SHC's fused together, both dense, one with crust of oxidisation	379
id.	id.	Small SHC, dense with a crust of oxidisation	130
id.	id.	Partial dense SHC	300
id.	id.	Triangular dense slag piece, the small area of lighter slag on one of the corners could suggest this is a 'pro-tuyere tongue'	68
id.	id.	Two fragments of dense SHC's	179
109	Pit (96)	Dense, squarish SHC with blowing hollow visible on upper side	1150
id.	id.	Partial , rather dense SHC	688
id.	id.	Rather dense SHC with porous bottom half and oxidised upper part	532
id.	id.	Dense, irregular SHC with more oxidised upper part, could represent two working phases	297
id.	id.	Rather dense, irregular SHC with more oxidised upper part.	261
id.	id.	Eight fragments of dense SHC's	529