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Evaluation of Archaeometallurgical residues from the M7/M8 Contract 1: Curragh 2 (E2249)

Dr Tim Young
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Dr T.P. Young

Abstract

This site yielded a small assemblage of metallurgical residues, numbering 12 pieces with a total weight of 770g. Most of the residues were obtained from a single pit, C15, with single items recovered the topsoil, from C148 and C164. The collection was dominated by material that was rather non-diagnostic, being dense slags that had flowed, but whether during iron smelting or smithing was not possible to determine. The single find from topsoil was part of a probable slagged tuyère tip, which would be indicative of smithing.

In addition to the collection of residues, there was 4.3kg of ferricrete from C116, which comprised an iron-rich cement binding, silt, sand and large pebbles, together with a high proportion of charcoal.

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Methods

All investigated materials were examined visually, using a low-powered binocular microscope where necessary. All significant materials were summarily described and recorded to a database (Table 1). As an evaluation, the materials were not subjected to any high-magnification optical inspection, nor to any other form of instrumental analysis. The identifications of materials in this report are therefore necessarily limited and must be regarded as provisional.

Results

Iron slags

Iron slags from this locality were rather undiagnostic. They included two examples of burrs (one from pit fill C16 and one from ditch fill C164) both of which showed evidence of down-wall slag flow below the burr itself. Such a slag flow is typical of iron smelting, but in this material the burrs were well formed but smaller than typical in smelting and the possibility exists that these examples were produced during iron working. Well –developed burrs such as these are not typical of early Irish smithing using a tuyère, for the contact area of the hotzone with the tuyère tip does not have sufficient area for the development of slag-ceramic interaction.

The small fragments from C16 had a poorly-developed lobate morphology; a form usually associated with smelting slags from non-slag tapping furnaces, but which can also occur if fluid slags become mobile in a smithing hearth.

Tuyère

A single piece from C2 is a fragment of slagged ceramic. The reverse of the piece shows an arcuate line demarking the margin of the slagged surface's attachment to its ceramic substrate. This is strongly suggestive the piece is from the tip of a tuyère.

Ferricrete

The collection of material from C116 comprises 4.35kg of a porous but dense ferricrete. The iron minerals bind fine-grained sediment as well as larger pebbles of various lithologies. The matrix contains a very high proportion of charcoal.

Evaluation of this material provides no further clues to its origin. Ferricretes may develop entirely for natural reasons due to oxidation of iron-rich pore waters, but are often indicative of anthropogenic elevation of iron – for instance because of adjacent slag deposits, or particularly fine grained smithing waste. However, visual inspection of this material showed no indications of hammerscale.

Interpretation

The site showed evidence for a low level of metallurgical activity, certainly including smithing (evidenced by the tuyère sherd) but possibly also smelting.

The iron slags, if produced during smelting, would be indicative of smelting in a non-slag tapping furnace. Evidence is accumulating for the survival of such technology into the post-medieval period.

Evaluation of potential

Analytical investigation could probably determine whether the iron slags were produced from smithing or smelting, but given the lack of dating evidence for the slags and a lack of structural evidence for iron-working the results would have limited utility.

Further analysis might also be able to assist with determination of the origin of the ferricrete deposits from C116.

In general it is recommended that further analysis of the residues from this site is probably of low priority compared with other sites on the scheme. There is no particular need for retention of the samples if such further analysis is not pursued.

context	*sample*	*weight*	*number*	*notes*
1	54	28	1	probably part of a slagged tuyère tip - slagged ceramic with a curve of attachment on reverse, suggesting diameter of 80mm (a very imprecise estimate)
16	55	353	9	8 smaller pieces of poorly lobate dense slag - may be flow slags, but just possibly hearth slags; larger piece (236g) is possibly a burr with some flow - probably from smelting but could be a small fluid SHC
116	23	4350		bulk samples of ferricrete/bog iron ore with abundant charcoal and pebble clasts
148	56	30	1	highly-weathered grey vesicular slag lump
164	57	361	1	dense bowl-shaped burr with attached descending prills, non-wetting contact with wall below burr. Presumably a smelting burr, but could be an odd smithing slag.

Table 1: summary table of residues by context.

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54 Heol y Cadno,
Thornhill,
Cardiff,
CF14 9DY.

Mobile: 07802 413704
Fax: 08700 547366
E-Mail: Tim.Young@GeoArch.co.uk
Web: www.GeoArch.co.uk