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Assessment of archaeometallurgical residues from Dungiven 2 (Site 4) (AE/17/115 A6-DD)

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Abstract

The assemblage comprised a single piece of slag, probably the central section of a small smithing hearth cake (SHC) bearing clasts of charcoal fuel, and a small microresidue assemblage (collected on a 1mm mesh) with moderately abundant flake hammerscale as well as spheroidal slag droplets, together with other slag fragments and ferruginous debris. This microresidue assemblage is suggestive of a within-hearth assemblage – which may be preserved either within the smithing hearth or in a location of dumping hearth waste. Such assemblages have rarely travelled far from their point of origin.

Both sets of material were produced during blacksmithing (the end-use working of iron for fashioning and repairing artefacts) but are not diagnostic of age.

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Methods

All materials were examined visually, using a low-powered binocular microscope where required. As an assessment, the materials were not subjected to any high-magnification optical inspection, not to any form of instrumental analysis.

The identifications of materials in this report are therefore necessarily limited and must be regarded as provisional.

This assessment was conducted in November 2018 and was commissioned by Colin Dunlop of Northern Archaeological Consultancy Ltd.

Results

General description of the assemblage

The assemblage comprised a single piece of slag (73g) and a small microresidue assemblage (8.3g)

Both sets of material were produced during blacksmithing (the end-use working of iron for fashioning and repairing artefacts).

Ironworking residues

Smithing hearth cake

The assemblage included a single piece of macroscopic slag (73g; (1442), <1439>, ss#1283), probably the central section of a smithing hearth cake (SHC). The top bears low, irregular smooth lobes. The base is also rather irregularly formed into lobes, the surfaces of which are finely indented or dimpled, probably through contact with fuel particles lower in the hearth). The slag bears small clasts of charcoal fuel.

Most of the edges show a degree of breakage and although reconstruction of the original SHC form based on such a small fragment is not possible, it is most likely that such an irregularly-formed fragment, with multiple lobes, is from the centre of a very small SHC, rather than from the margin of a larger one.

Micro-residues

A small microresidue assemblage (collected on a 1mm mesh) was collected from context (1149) (<1090, ss#1078). It contained moderately abundant flake hammerscale (for the nomenclature of microresidue particles see Young 2011) as well as spheroidal slag droplets, together with other slag fragments and ferruginous debris. The spheroidal/sub-spheroidal particles appear to be mostly slag droplets (i.e. frozen drips of slag that descended through the fuel bed of the hearth), rather than spheroidal hammerscale (SHS; droplets of molten scale typically expelled when the smith hammers of fire weld closed).

Distribution of the assemblage

The macroscopic slag piece was derived from context (1442) and the microresidue assemblage from context (1149). No further information on the archaeological nature or significance of these contexts was supplied.

Interpretation

The assemblage is entirely of material produced during blacksmithing (the working of iron for its end use rather than as part of the process of iron production). The two items might derive from the same episode of iron working, but do not necessarily do so.

The material is not closely dateable, other than that it must post-date the beginning of the Iron Age and is unlikely to be from the 20th century (because most smithies had switched to using coal as fuel by the end of the 19th century).

Small SHCs, such as that present here, occur through this period, but there is a tendency for medieval SHCs to be larger than those of other periods. Small SHCs are thus most likely, but not certainly to be either late/post- medieval, or Iron Age in date.

The dominance of slag droplets over spheroidal hammerscale is suggestive of the microresidue assemblage ultimately driving from a within-hearth location – but such assemblages may be preserved either still within the smithing hearth or in a location of dumping hearth waste. Such assemblages have rarely travelled far from their point of origin. Some caution must, however, be expressed on assigning a within-hearth origin on such a small assemblage, because SHS is commonly of less than 1mm diameter, and so would not necessarily have been retained on the mesh size employed here.

Further work

The assemblage has very limited research potential and no further work is recommended.

The residues are of low importance for preservation within the site archive, unless the archaeological context of the material means that either the identification of the material as deriving from iron-working (blacksmithing), or the age implications of that identification (for instance the contexts had been interpreted as earlier prehistoric) is unexpected.

Reference

YOUNG, T.P. 2011. Some preliminary observations on hammerscale and its implications for understanding welding. *Historical Metallurgy,* **45,** 1, 26-41.

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