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Evaluation of Archaeometallurgical residues from the M7/M8 Contract 2: Derrinsallagh 5 (E2181)

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Abstract

Archaeometallurgical residues from Derrinsallagh 5 total 909g. The majority of these (803g) derived from furnace C070 and were fines, mainly small descending prills and sub-spheroidal droplets, typical of the material which accumulates within the base of a slagpit iron smelting furnace. The furnace pit containing these materials was particularly small (0.25m diameter and 0.25m deep).The furnace gave a 14C date of 6th-3rd century BC, but this was on oak charcoal, which frequently gives" old" ages. Other pits on the site (some of which included small quantities of iron slag) gave a slightly younger, 2nd-1st century BC, date on ash and hazel charcoal. Whatever the details of the age, this small furnace is further illustration of the diversity of Iron Age furnaces.

Contents

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

The summary catalogue is given in Table 1. The majority of the residues are firmly identifiable as being from iron smelting and derive from within furnace C070 (with some residues having been sampled with the cut number and some with the fill context number, C081). These residues are dominated by small descending prills, formed by the solidification of slag dripping down through the fuel bed into the slag pit. Some material is in the form of sub-spheroidal droplets, often with a dimple from contact with the fuel particles, and given the informal name of "coffee bean" spheroids. These spheroids are unusually abundant in this assemblage,.

Material from the other pits is not particularly diagnostic, being rather fragmented, but that from C064 at least is identifiable as a smelting residue.

Interpretation

These residues are typical of the fine slag materials which solidify within the bed of charcoal in the lower part of the slagpit of a non-slag tapping slagpit furnace. They are intimately associated with the large slag block which have formed below the bloom, which itself consist of coalesced prills (Young 2005, 2006). The large slag block would be removed in the early stages of clearing the furnace ready for the next smelt, and may even have been removed with the bloom. The fine

slag debris, such as that seen here, may not be cleared until the point at which fuel is added for the next smelt, so these residues are likely to be remnants from the last use of the furnace.

The preserved slagpit is small, at 250mm diameter, but may have been truncated. Small furnaces are not particularly common in the Iron Age, where the more usual morphologies have pits of 350-550mm diameter. It is becoming clear, however, that the Iron Age has a great diversity of furnace morphologies (see discussions in Young 2008, 2009).

Evaluation of potential

The residues from this site are dominated by fines from the lower part of the slagpit; other facies of slag from the smelt are not represented. This makes further detailed analysis of the slag of less interest than a complete suite.

No further analysis is therefore recommended at this stage, but given the unusually fine nature of the particles and the potentially early age, retention of the material advised.

References

YOUNG, T.P. 2008. M7/M8 Contract 2. Detailed recording of furnace C397, Derrinsallagh 4 (E2180), *GeoArch Report 2008/34*.

YOUNG, T.P. 2009. Evaluation of Archaeometallurgical residues from the M7/M8 Contract 1: Leap 1 (E2131). *GeoArch Report 2009/03*

F	find	sample	context	wt	no	notes
			wt			
3		37		8	3	indeterminate slag fragments
3		38		50	18	small scrappy slag fragments, mainly rather low density material
64		39		48	2	rounded, blebby dense slag lumps
70		40		684	82	mainly fine dense descending prills, with a few more blebby pieces
81	residue	9		119	c200	mainly coffee bean spheroids, but a few prill fragments, with a couple of possible sinter fragments
			total	909		

Table 1. Summary catalogue

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