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Assessment of materials from Abernant Farm (ANH)

Dr Tim Young
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Dr T.P. Young

Abstract

The investigated materials comprised a total of approximately 704g. Of this, almost 400g were of heat affected natural materials, but seven pieces (309g) of iron slag were also present.

The iron slags are almost all identifiable as being derived from blacksmithing, and all might be. The slags appear to have been worn at the time of deposition, so are likely to be residual with the contexts from which they were retrieved.

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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 January 2022 and was commissioned by Anne Leaver.

Results

Ironworking slags

This sample included seven fragments of iron slag with a total weight of 309g (a single 39g piece from Trench 1 and 270g from Trench 2.

The iron slags are all rather etched from preservation in an acidic soil, but all appear to have been worn and most are small fragments. Thus, there is a high probability that the material is residual within the contexts from which it was recovered.

The largest piece represents the majority of a smithing hearth cake (SHC). This piece weighs 211g and probably derives from a cake weighing in the range of 350-400g. The slag in the upper part of the SHC appears to have flown over the face of the fracture after the cake was broken – so it was probably broken by the blacksmithing during its extraction from the hearth.

The smaller fragments of dense iron slag are all compatible with derivation from similar slag cakes, although a 9g fragment from (204) with very elongate olivine crystals could equally be a bloomery iron smelting slag.

A low-density slag fragment (14g, from context (203)) shows melted material enveloping a partially-melted pebble. Such slags could be generated wherever a floor-level smithing hearth was cut into a gravelly substrate, but locally they are most common on Roman sites (a large assemblage of slag of this type was, for instance, recovered from immediately outside the Neath Roman fort, Young 2014, and the type was also common amongst the smithing residues from Priory Field, Caerleon, Young 2017).

Other burnt materials

This collection includes various pieces of burnt stone and a small quantity of fired clay (mainly from context (025).

The fired clay did not demonstrate slagged surfaces and may thus not necessarily have derived from a metallurgical hearth.

Two large pieces of burnt stone (from contexts (009) and (010)) had a complex fracture pattern that resulted from them experiencing prolonged hot on one face.

Interpretation

The slags in the assemblage are suggestive of blacksmithing (the working of iron for the production or repair of artefacts), rather than any process of iron production (except for one small slag fragment that could possibly derive from iron smelting but does not necessarily do so).

The interpreted original weight of the slag cake (350-400g) is well within the upper part of the range of weight of early (Iron Age to medieval) SHCs from blacksmithing.

There is nothing within the assemblage that is diagnostic of age. The worn surfaces of the slags preclude positive identification of the fuel type, which can often be helpful in this respect. The poor preservation of the pieces may suggest that they are residual, so an origin contemporary with the previous early medieval assemblages or contemporary with the residual Roman pottery are both possibilities.

Further work

No further investigation of the materials is recommended.

References

YOUNG, T.P. 2014. Archaeometallurgical residues from Dwr-y-Felin School, Neath (GGAT 677 & 716). *GeoArch Report 2013-27.* 53pp.

YOUNG, T.P. 2017. Archaeometallurgical residues from Priory Field, Caerleon. *GeoArch Report 2017/17*, 90pp.

Table 1. Catalogue of materials from Abernant Farm submitted for investigation, group by context.

find	context	weight	notes
152	009	20	conglomerate of small siltstone granules (grey) up to 4mm in a silty matrix, partly burnt. Unclear if this an artificial material or a natural one.
557	009	235	medium grained feldspathic sandstone, strongly heated-affected (heat altered and cracked), spalling of material defined by cracks has resulted in two apparent holes in surface (these appear to be solely the result of heat cracking and not fashioned).
572	009	39	heavily worn and corroded dense iron slag. Extremely long olivine internally. What was probably the base shows possible relicts of fuel dimples. Some internal boundaries are visible, but it is unclear if these represent flow lobes.
437	010	120	fine micaceous and feldspathic sandstone slab, heated affected from one side - leading to cracks that reduce in sharpness across block, similar to <557>.
672	025	2	two small grains: 1. small fragment of pelletal reduced fired clay; 2. fragment of natural micaceous siltstone, possibly heat affected.
677	025	18	magnetic fraction of sample from gully. Burnt stone and fired clay in roughly equal measure. A few dark, tabular, more magnetic pieces resemble hammerscale, but are dull and are probably slag fragments.
674	202	17	heavily worn and slightly accreted iron slag fragment. Shows crudely lobate surface on one face and some adhering quartz-rich lining(?) on the opposing face. Internal microstructure not very well seen but appears fine grained.
670	203	2	fine grained vesicular iron slag. Piece is etched and probably abraded.
671	203	14	low density 'lining' slag. The bulk of the piece appears to be a central bloated (and probably once glazed) pebble.
676	203	17	irregular crudely lobed nub of iron slag. Base finely dimpled, top has areas of smooth haematised surface surviving that appear blown. Probably a marginal fragment from an SHC
673	204	9	small fragment of weathered and worn iron slag. Base shows vesicular partially-melted lining material, this is overlain by 10mm of dense slag with elongate olivine extending through the entire thickness. No original surfaces preserved.
675	204	211	part of a medium-sized SHC, fractured in centre with possible rod cast folded onto fracture surface of bowl - so probable broken hot during extraction. Surviving parts of top shows concave areas of smooth haematised slag with fuel dimples, base irregular, locally crudely lobate, some adhering deposit on base contains hammerscale, probably more than half of original cake.

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Unit 6,
Western Industrial Estate,
Caerphilly,
CF83 1BQ

Office: 029 20881431
Mobile: 07802 413704

E-Mail: Tim.Young@GeoArch.co.uk
Web: www.GeoArch.co.uk