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Archaeometallurgical residues from Hedd yr Ynys, Llangefni, Anglesey

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Abstract

The assemblage contained a very small collection of residues (both macro- and micro-), probably from blacksmithing and compatible with the proposed Roman age, although not themselves diagnostic. A single piece of clinker from an overlying plough-soil might be from a post-medieval steam-powered implement.

Two concretions have cores containing metallic iron, and these should by X-rayed to ascertain whether the cores are significant iron artefacts.

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Methods

All materials were examined visually with 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.

The examined materials are listed in Table 1.

This project was commissioned by Jane Kenney, of The Gwynedd Archaeological Trust.

Results

Description of materials

The submitted assemblage comprised 298g of macroscopic material, five small assemblages of magnetic separates (total 20g) from sieving and one sieved fragment of fired clay (0.2g). The macroscopic material included several pieces of hearth/furnace lining, a very small quantity of slag, some concretions that may contain iron artefacts and various natural iron-rich materials. The sieved samples contained very small quantities of slag, a single piece of coal and one contained some hammerscale, as well as natural materials

The single piece of **clinker** (the partially melted inorganic residue from the burning of impure coal) (11g), was of typical variegated colours and contained a large grey coal-shale clast.

The **hearth/furnace lining fragments** (probably hearth lining rather than furnace lining since the other residues suggest blacksmithing) are not themselves diagnostic of purpose, but are typical of early materials. The comprised four pieces with a total weight of 73g.

True **slags** are limited to minute fragments in some sieved samples and to two slightly larger fragments (total weight 4g), both showing a strong influence from the hearth lining.

Two **concretions**, one rounded, the other flat and rectangular, are both cored on material containing metallic iron (though that material could be slag containing metallic iron). They have a combined weight of 194g.

One sieved sample contained a small assemblage of **flake hammerscale** (the oxidised surface layer that forms on hot iron and spalls off when the iron is cooled or struck).

Several samples contained highly polished very dark grains with a slightly red surface. These pieces are likely to be rolled natural fragments of **iron ore**. It is not possible to determine whether these are Lower Palaeozoic ores from N Wales, or derived pieces of later ores from Cumbria.

The majority of the particles in the sieved samples were natural grains. The single piece of fired clay broadly resembled the material if the vitrified examples, but was, strictly indeterminate.

Distribution of the residues

The fragment of clinker derived from a ploughsoil (1005).

The remainder of the materials came from the fills of various cut features, most or all of probable Roman age.

Interpretation

This is an extremely small and sparsely-distributed assemblage. It is unlikely that any significant amount of metallurgical activity took place within the excavated area.

The single piece of clinker from plough soil may well represent a residue from steam-powered agricultural equipment, although other origins are certainly possible,

The assemblage of hearth lining, sparse slag and a tiny quantity of hammerscale present in the cut features, suggests that the area was close to a location at which charcoal-fuelled blacksmithing was undertaken. Almost every Roman farmstead shows at least some signs of blacksmithing, for the demands of rural life mean that tools and equipment are frequently in need of repair or replacement. The materials are not, in themselves, dateable (beyond belonging to some pre-industrial period) or interpretable in terms of detailed process.

Further work

No additional work is recommended on the archaeometallurgical assemblage. Retention of the assemblage with the site archive could be considered a relatively low priority.

It is recommended however, that the concretions are submitted to X-radiography, to determine whether they contain iron artefacts.

Table 1: Sampled material

Context	SF	sample	S wt	l wt	l number	notes
1005	206		11	11	1	fragment (now with small break) of highly porous clinker; typically variegated in colour; contains large shale clasts
1038	181		155	155	1	rounded concretion core includes metallic iron; very dense; some possible slag showing through surface of sandy/ashy concretion; contains small charcoal fragments; unclear if an iron core or an iron-bearing slag core; some minor expansion cracking just starting, indicating corrosion of iron inclusion
1038	182		61	61	1	slightly convex lump of hearth lining; outer vitrified layer has weathered pale; overlie an approximately 10mm thick dark, reduced fired and strongly vitrified layer, which in turn overlies 20mm of oxidised fired cermaic; the cermaic is rich in gravel fragments and has a silty matrix
1038	214	7	18.9	18.9	1	33x23x8mm, small pebble of iron ore; dense, almost black in colour, but with slight maroon surface sheen; highly polished surface, but where rougher appears to show a granular oxide texture; unclear if this is a derived, perhaps Cumbrian ore, or a more local sedimentary iron ore.
1053	176		38.7	38.7	1	concretion with irregular margins but central rectangular piece, 43mm x 30mm x 7mm; the central area contains a small amount of metallic iron.
1063	191		12.9	0.9	1	slag fragment, probably a lining slag
				12	3	vitrified oxidised fired hearth lining
hammerscale subsamples (magnetic separation)						
1038	216	7	2.1g	assm		1 particle (<0.01g) of probable slag
1045	223	4	0.60g	assm		includes three possible grains of slag and one small fragment of coal
1051	218	1	0.72g	assm		includes two flakes of rust and a broken elongate concretion, which is probably iron pan formed on a plant root or burrow, but might just possibly be mineralised iron wire
1063	219	2	4.43g	assm		largest grain (3.19g) is a dense slag fragment of dimpled grey slag, with slightly greenish glazed rounded lobe, probably of more lining-influenced material; small material includes 1 grain with dark highly polished surface, possibly slag, but probably another polished ore grain; there are three pieces of probable slag and five fragments of flake hammerscale.
1099	226	6	0.08g	assm		assemblage of just 4 grains; the largest, 0.06g, is black and highly polished - probably an iron ore grain similar to SF214

Context	SF	sample	S wt	l wt	l number	notes
clay subsample						
1099	227	6	0.19g		1	single piece of oxidised fired, sandy ceramic with some coarser grit

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