GeoArch

Report 2019/12

Assessment of residues from Ysgol Bro Aberffraw, Newbrough (G2530)

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14th July 2019

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Abstract

The investigated material includes three broad classes of samples: firstly samples from areas 6 and 7 of ferruginous materials that might be termed bog iron ore, mostly with iron oxide coatings upon charcoal particles, secondly a very sparse assemblage of residues from ironworking from area 1 and thirdly material from area 2 that was largely natural, but include one piece of mineralised iron.

Of these materials, a total of less than 4g is archaeometallurgical residue. It is uncertain whether the shale inclusion in the particle from (1036) is a coal shale; it is perhaps more likely to be a rock fragment from the hearth wall and therefore not indicative of the type of fuel used. The materials from (1033) and (1036) are indicative of ironworking (blacksmithing) having taken place in the general area, but the tiny amount of material suggests that it was outside the excavated area and may be residual.

Contents

Abstract 1

Contents 2

Methods 2

Description of the assemblage
Iron working (blacksmithing) residues 2
Bog iron ore/iron pan 2
Other materials 2

Distribution of the assemblage 2

Interpretation 2

Further work 2

Table 1. Summary Catalogue 4

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 June 2019 and was commissioned by Bethan Jones of GAT.

Description of the assemblage

Iron working (blacksmithing) residues
The assemblage included 3 pieces (weighing <4g) which were identifiable as being residues from smithing.

Context (1033) produced a small concretion containing smithing microresidues, particularly a compound piece of partially-melted flake hammerscale with sub-spheroidal attached particles, as well as single isolated piece of spheroidal hammerscale.

Context (1036) produced a small chip of complex lining slag, containing a core formed by a denser, maroon-surfaced slag bleb. The lining slag contains a small fragment of shale, but this appears more likely to be a rock fragment from the hearth wall, rather than a piece of coal shale.

Bog iron ore/iron pan
Material from contexts (6007), (6009), 6012) and (6025) show the development of granular iron oxide-cemented particles, many of which can be shown to be cored on charcoal particles. This material appears to be the result of probably seasonal iron oxide precipitation during drying and oxidation of iron-bearing porewaters. Although the stone fragments in these deposits also received iron oxide coats, the charcoal seems particularly to have formed the nuclei for the iron oxide mottles.

Contexts (7006) and (7052) produced somewhat similar material to those from area 6, but with the iron oxides forming an impregnation of the charcoal particles but with much less well-developed overgrowths.

These materials share an origin with bog iron ores and that term may be loosely applied here, despite uncertainty over the actual degree of iron enrichment and the different substrate within which the materials formed.

Other materials
Samples submitted from Area 2 context (2019) were dominated by natural materials, including weathered basalt, an oxidised sulphide nodule and some concretionary materials including fragments of granite, coal, shale and other rock types. The main concretionary fragment had formed around a mineralised square-sectioned iron fragment, possibly a nail.

Distribution of the assemblage

The ironworking materials were all from Area 1 and the main bog iron assemblages from Area 6, with less well-developed examples from Area 7.

Interpretation

This ironworking assemblage is indicative of smithing within the general area. The quantities are small, suggesting the activity was not within the excavated area.

The occurrence of natural post-depositional ferruginous cements within burnt deposits is a relatively common phenomenon. The iron minerals are formed when reduced iron-bearing porewaters become oxidised during (usually seasonal) drying and thus such materials are closely related to iron pans and bog iron ores. Within burnt deposits, the charcoal clasts act both as nuclei for the precipitation of the iron minerals and also probably an absorbent material encouraging the uptake and retention of pore-waters, round which oxidation of those porewaters occurs during seasonal drying.

Further work

This small assemblage has limited research potential to inform understanding of the site and no further work is suggested

Table 1: summary catalogue of submitted materials. Assm = assemblage

context	sample	item weight	item number	notes
1033	12	0.92	1	concretionary material containing apparent impact of semi-solid slag, containing flake hammerscale with attached spheroids
		<	1	isolated large example of spheroidal hammerscale
1036	18	2.44	1	chip of complex slag, maroon-surfaced rounded slag fragment as core, coated in sandy lining slag containing a small shale fragment
2019	10	13.78	10	rounded fragments of deeply weathered basalt
2019	11	2.41	1	worn oxidised sulphide nodule with coarse cubes
2019	11	1.36	2	coarse crystalline sediment (granitic?) bound by pale orange ochreous cement
		5.64	1	concretion containing stone fragments, coal, shale and square-sectioned mineralised iron
6007	37	322	assm	mostly individual iron oxide coated pieces of charcoal and stone. Less indurated that 6009, comparable with 6025
6009	19	174	assm	a slightly more indurated version of the textures visible in 6025. here the charcoal can be seen to have developed harder oxide crusts than the more amorphous, powdery materials between the clasts. Voids are filled with a pale silt with some possible, but far from certain, examples of coated silt clots (these may instead be filled voids)
6012	21	16	6	examples of iron oxide coated charcoal particles, stone and a small sandy concretion of similar origin
6025	36	62.19	assm	granular iron-rich material of variable consolidation. Some agglomerated pieces appear to have joined 6-10mm peds, but fracture suggests that these 'peds' are charcoal fragments. Binding material appears to be a silty iron oxide
7006	48	4.1	5	porous iron oxides binding charcoal fragments
7052	58	4	13	mostly iron oxide coated and impregnated charcoal particles, one small pebble of slightly altered basalt (fresher than examples from 2019 but probably similar)

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