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Assessment of residues from the Southern Sustainable Placement (SSP), West Ruislip (IS19SSPTT)

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Abstract

The submitted material comprised 8.9kg (24 items) of material.

The collection comprises clinker, the melted inorganic residue from the burning of coal, in various forms, apart from one tiny fragment of coke (the organic residue from the burning of coal).

These materials are broadly similar to those recovered from the nearby site of Ruislip Golf Couse. Some of the material is a dense khaki-coloured glass, variably vesicular, in zones within the clinker of up to several tens of millimetres in thickness. The vesicularity of the khaki glass ranges from coarse, abundant and sub-spherical (a 'frothy' texture), to stout tubular vesicles rising from the base of the clinker mass. Such material was present within the samples from Ruislip, but it forms a larger part of the current collection.

The generation of clinker in substantial volumes is usually most associated with the hearths of steam boilers. The khaki glass present in this assemblage is, however, also similar to clinker from cupola furnaces in iron foundries and that alternative interpretation is possible, if unlikely, for the current assemblage.

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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 October 2020 and was commissioned by Dr Rhiannon Philp of Archaeology Wales Ltd.

Description of the assemblage

Pyrotechnological residues

The submitted material comprised 8.9kg (24 items) of material, of which 8kg derives from the fill (7006) of a single land drain.

The collection comprises clinker, the melted inorganic residue from the burning of coal, in various forms, together with one tiny fragment of coke (the organic residue from the burning of coal).

Much of the collection is present as particularly large blocks (8 out of 24 pieces are over 400g in weight). As is typical with larger masses of clinker, the textures and microstructures are very variable.

Although a part of the collection comprised typical clinker, with flow lobes, a maroon surface and abundant shale clasts, some was of a more highly melted material. This latter material comprised a khaki glass, that was either massive, coarsely vesicular or bearing tubular vesicles. This khaki glass also showed local adhesions of rusty accretions present as blebs 5-10mm across.

As with the assemblage previously described from Ruislip (Young 2000) several pieces showed a clinker accumulation of unusual thickness (well in excess of 100mm). Such a great thickness of clinker accumulation would imply a very large firebox, if the material is from a steam boiler.

Only one large block (a 492g piece from context (7006)) showed the wedge-shaped profile present in several pieces amongst the Ruislip material. This piece shows a planar dense slag of slab overlying a wedge of pendent slag-like prills. These features suggestive of in-situ formation within a hearth.

The large masses of molten material represented by the khaki glass might also have been formed in a very large firebox, particularly perhaps if fuelled with very impure coal or with a component of melted brick -lining as a contributor. An alternative interpretation might be offered by their similarity with some slags from iron foundries, produced when using a cupola furnace without flux. Such an interpretation would be compatible with the observation of rust spots on this clinker facies – potentially indicative of iron inclusions. The clinkers do not resemble cupola slags that have been fluxed with lime. It should be noted however, that most cupola slags carry large fragments of coke (many 10s of millimetres across) and none has been observed here.

Interpretation

The size of the clinker fragments most likely suggests their formation within a large boiler firebox. As a much less likely interpretation, the formerly more fluid clinkers with their spots of possible iron corrosion, might suggest an origin in an iron foundry.

The material would suggest a 19th or 20th century date.

Further work

The residues are probably simple residues from the burning of coal, capable of yielding little significant further evidence, even if be subjected to detailed analysis. It is just possible that at least some of the material might be waste from an iron foundry and further work would be able to distinguish this on the basis of the presence of cast iron prills. However, given the relatively recent origin of these pieces and their ex-situ findspots, it is unlikely that this discrimination would be of major archaeological significance.

No further investigation is therefore recommended. The residues may be considered as of low potential for inclusion in a deposited site archive.

Reference

YOUNG, T.P. 2020. Assessment of residues from West Ruislip Golf Club (1519WRPTT). *GeoArch Report 2020/10*, 4pp.

Table 1: summary catalogue of submitted macroscopic materials. Weights in g.

Context			item wt.	item no.	notes
1000	ssf	topsoil	210	1	fragment of 60mm thick dense glassy clinker in 3 layers - top a dark irregular glass with lots of shale clasts (10mm), below which 20-30mm of clear even khaki glass with few inclusions, below that 20mm of khaki glass but more crystalline, with tubular vesicles and iron staining. If correct way-up, base planar and rough, top rough maroon surfaced black glass.
			210	1	rough, porous lobate clinker with mass of accreted/incorporated shale debris and white vitrified stone
2000	ssa / ssb	topsoil	23	2	small fragments of vesicular, black, maroon-surfaced clinker
4001	ssd (ph)	subsoil	<1	1	probable coke fragment
			<1	1	small fragment of clinker
4003	ssd	linear	10	3	small fragments of grey vesicular glassy slag varying from glassy where paler to coarsely crystalline where darker
7006	ssf	land drain	690	1	very irregular clinker, some irregular maroon surfaces, some dense khaki glass areas
			1170	1	large block of clinker >100mm thick, various irregular maroon surfaces, zones of khaki glass varying from highly vesicular to massive dense, small coke inclusions in vesicles in one area.
			1515	1	block of around 150mm thickness, irregular, contorted, lobate maroon surfaces, internally various from dense khaki glass, through to zones with abundant vesicles. Some vesicles appear associated with rusty blebs
7006	ssf	land drain	1490	1	60-90mm thick slab fragment, base irregular but slightly corrugated, top complex, brecciated and deformed with surfaces in flow lobes thrown into strange orientations. Must have been very viscous, partly solidified when deformed, shale clasts occur occasional
7006	ssf	land drain	378	1	irregular clast rich clinker fragment
			318	3	vesicular clinker with greenish core and almost black glassy margins below maroon, locally lobed surface
			492	1	rough top over slab of dense green glassy clinker lying above wedge of maroon surfaced descending prills
			1020	1	irregular large block of greenish massive vesicular glassy clinker with maroon surface on top
			658	1	similar greenish vesicular clinker, but on one surface glass is darker and vesicles become smaller, rather similar to 318g/3 pieces
			154	2	vesicular pale khaki glass with flow lobed maroon top
			66	1	highly vesicular greenish glassy clinker, mostly with pale surfaces around vesicles
11001	ssf	topsoil	474	1	rounded, vaguely lobed mass, top dimpled and smooth with maroon colour, sandy dense clinker with a few small shale clasts

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