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Assessment of materials from Lechlade (LMH17s)

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Abstract

The assemblage comprised two small collections of blocks of conglomeratic material, up to 140mm across (from contexts (1079) and (1088)), and one small particle of probable slag (from context 1096).

The ferricrete conglomerates were natural, although probably burnt. The small particle from context (1096) was probably slag, although an interpretation as an igneous rock fragment is also possible. The piece shows a fine-grained microstructure and granular dark inclusions, which suggest that it is likely to be a coal-fuelled smithing slag, and therefore likely to be Roman in age (although probably highly reworked).

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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 April 2018 and was commissioned by Andy Hood of Foundations Archaeology.

Results

The assemblage comprised two small collections of blocks of conglomeratic material, up to 140mm across (from contexts (1079) and (1088)), and one small particle of probable slag (from context 1096).

The conglomeratic material, comprised small rounded pebbles, of a variety of limestone types (visually resembling typical local gravel), cemented sequentially by (1) a thin dense grain-coating cement of dense Fe-Mn oxides, (2) brighter-coloured ochreous Fe-oxides and (3) a pale pore-filling cement, probably calcite. The thin dense grain-coating cement formed small growths, which hen spalled from the rock bore a passing resemblance to hammerscale. The iron oxides also impregnated many of the limestone clasts.

The ferricrete was present as angular blocks, apparently of fractured lithified material. In one instance (from context (1088)), the ferricrete appeared to be a fractured part of a larger rounded block, suggesting that this piece of material at least may have been naturally reworked at some point in its history.

The colour of debris broken from ferricrete from context (1079) was brighter red, and more was attracted to magnet, than for material from context (1088).

The single particle from grave-fill (1096) was an extremely fine-grained material, bearing both pale and slightly greenish minerals. There were infrequent small (millimetre scale) rounded vesicles. The particle had an irregular, roundedly invaginated, outline, which was coated in both fine-grained ferricrete (bearing small dark particles, possibly of charcoal), and more generally in a finely developed, almost botryoidal coat of very dark Mn-Fe oxides. Two of the hollows in the surface of the piece bore dark granular materials, at least in one case with a texture suggestive of coke.

Interpretation

The ferricrete is a natural material, representing iron cementation of limestone gravel. The colour and magnetic properties suggest that the material might have been burnt. The degree of heating might have been greater for the material from (1079) than that from context (1088). Although such heating might be entirely coincidental, the production of bright red iron oxides might be associated with the production of a red pigment. Similar material, although rather fragmented, was present in context (1174) of adjacent site LMH17m.

The small fragment from context (1096) is somewhat problematic, as the morphology strongly suggests that this is a slag particle, although the microstructure is more reminiscent of a fine-grained igneous rock than a typical slag. The most likely interpretation (although not certain in the absence of a more detailed laboratory investigation) is that this may be a small fragment of a coal-fuelled smithing slag. Such slags may have a

relatively low iron, but high aluminium, content that promotes some unusual mineralogy. The presence of textures suggestive of coke inclusions would support such an identification. The secondary oxide coating suggests that this piece was residual; that it had been reworked, probably rounded, and coated in Mn-Fe oxides before being incorporated into the context in which it was found. If it is a smithing slag, as appears likely, it would be most likely to be of Roman date.

Further work

The ferricrete material is of natural origin, although it is possible (but not certain) that it has been burnt. No further analysis is required.

The identification of the possible slag fragment could be confirmed by further laboratory work. Given the small size of the piece and its apparent residual nature, further work is not, however, recommended.

Table 1: summary catalogue of material submitted as possible archaeometallurgical residues. Weights in grams.

Context	Sample wt.	Item no..	Notes
1079	2710	4	Ferricrete; clasts mainly limestone, set in cement comprising dark, dense Fe-Mn oxides and a brighter red ochre. Broken fine-grained debris moderately magnetic. Maximum block dimension 140mm.
1088	870	3	Ferricrete; clasts mainly limestone, set in cement comprising dark, dense Fe-Mn oxides and a brighter red ochre. Broken fine-grained debris poorly magnetic. Maximum block dimension 100mm.
1996	10	1	Fine grained probable slag, coated in dense Mn-Fe oxides. Possible coke clast. Single particle 18mm across.

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