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Assessment of archaeometallurgical residues from Mount Kelly, Co. Galway

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Abstract

The submitted material comprised examples from an indurated layer of burnt stone bound by a ferruginous cement and from an underlying layer of less consolidated material of rather similar character.

In both samples the iron-rich concretionary material was in the form of dark, hard, particles (mottles) forming either an amalgamated concretionary mass or remaining more discrete. A distinct generation of ferruginous material in the form of a fibrous grain-coating on charcoal particles probably reflects the importance of the charcoal in holding groundwater during drying episodes.

There is no indication that the abundance of the ferruginous cement has had any metallurgical influence; it is most likely the result of an entirely natural process. It might be termed a bog iron ore, despite the atypical host sediment. It is possible that the presence of the raised burnt mound may have enhanced the process of seasonal drying, thus potentially encourage more oxidation of iron from the groundwaters than in adjacent lower areas.

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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 June 2019 and was commissioned by Fiona Rooney.

Description of the materials

Sample 1: indurated 'slag'

This sample comprises burnt stone fragments bound by a ferruginous material with granular texture that is harder and slightly browner than in sample 2. The matrix includes abundant charcoal.

Sample 2: Below level of slag Co5 in the NE quadrant of the site

This sample was 320g of dark, granular, material of bog ore aspect. The material holds clasts of charcoal and of siliceous stone. A fine-grained mineralisation of dark powdery material binds the dark coloured peds. The charcoal clasts are overlain by a fibrous growth, presumably of Fe-Mn oxides.

Interpretation

This material is typical in appearance of natural mottled bog iron ores. Such materials form in sediments that undergo wetting/drying cycles, with iron (or iron-manganese) oxides deposited during oxidation of the groundwaters during the drying phase. The granular texture derives from the precipitation of iron minerals into either the void space around a loosely granular substrate, or into void space caused by sediment shrinkage during desiccation.

Bog iron ores and related iron enrichment has often been noted from burnt mounds. It appears likely, although it is untested, that the presence of a mound in a damp environment encourages bog iron ore formation through localised enhanced evaporation/drying.

Further work

This material has only limited potential to inform understanding of the archaeology of the site and no further work is suggested.

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