

GeoArch

Report 2025/09

Assessment of materials from PLS25
Preston Lane

Dr Tim Young
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Assessment of materials from PLS25 Preston Lane

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Abstract

This report details the investigation of a small group of materials that comprised two examples of modern ironmaking slags and a plant fossil of Carboniferous age. All the materials were likely to be exotic to the site and to have been brought there in recent times.

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The fossil is probably of Late Carboniferous age. Such a piece is likely to be 'coal dirt' – a fragment of mudstone incorporated within a batch of mined coal.

Iron slag

These are two pieces (152g and 56g) of dense, dark, slightly translucent, glassy slag.

Both pieces were subjected to superficial analysis by pXRF. The two produced similar pXRF traces (Figure 1). These were dominated by iron, but with significant manganese too. Lighter elements are of reduced height in the traces because of the filter employed, but calcium still shows strongly. Low levels of titanium are also shown as are strontium and niobium. Trace levels of copper and zinc are present.

These are interpretable as modern ferrous slags – dominated by iron and manganese, with the limestone flux indicated by the calcium and strontium.

Methods

All materials were examined visually, using a low-powered binocular microscope where required. This assessment was conducted in March 2025 and was commissioned by Jon Welsh of AAG Archaeology.

The slag specimens were analysed at selected places on a semi-quantitative basis using a Bruker Tracer III-SD portable X-Ray fluorescence spectrometer (instrument belonging to the Department of Archaeology, Cardiff University). The instrument was operated with the Bruker 'yellow' filter (300µm Al + 25µm Ti), at 40kV and 9.60 µA, with a filament current of 189 µA, for 40s. The instrument was controlled by a PC running Bruker's S1PXRF with spectra stored as pdz files and csv files.

Further work

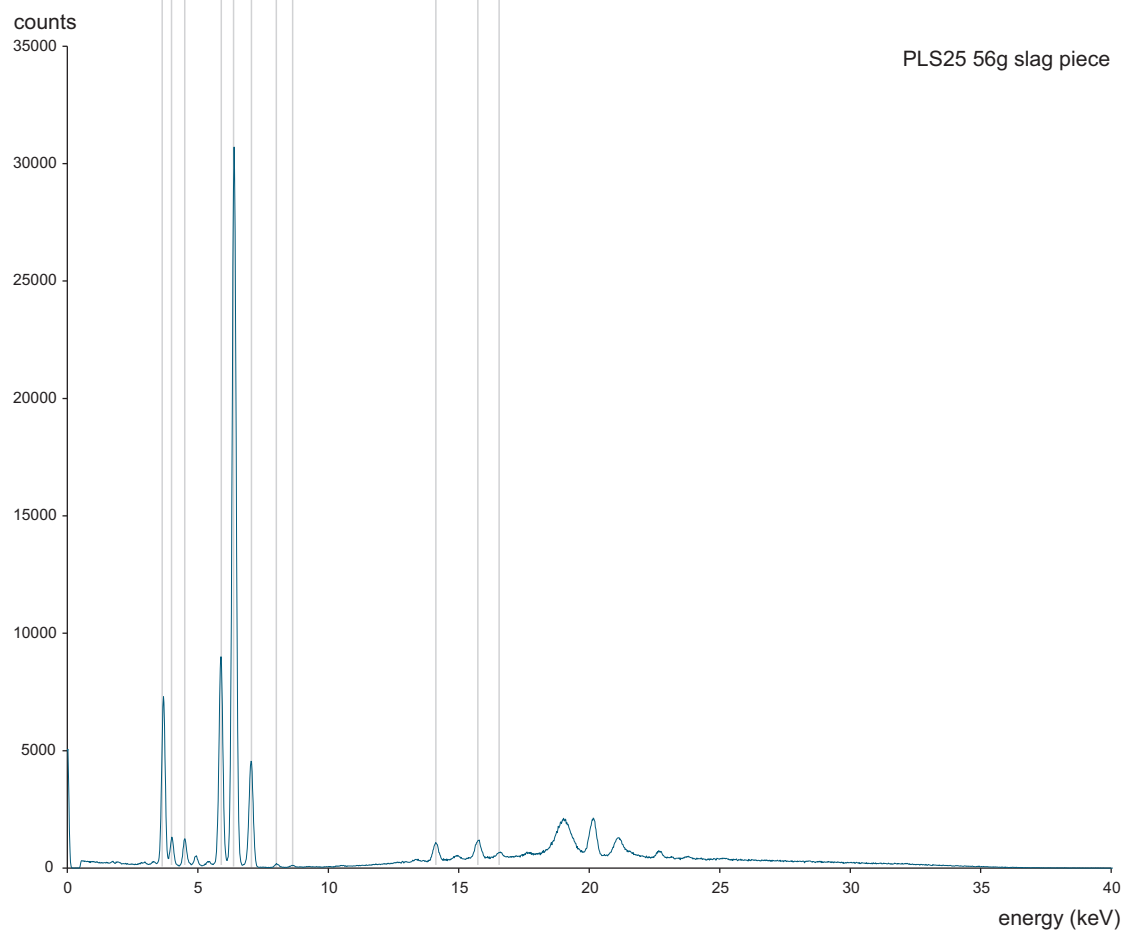
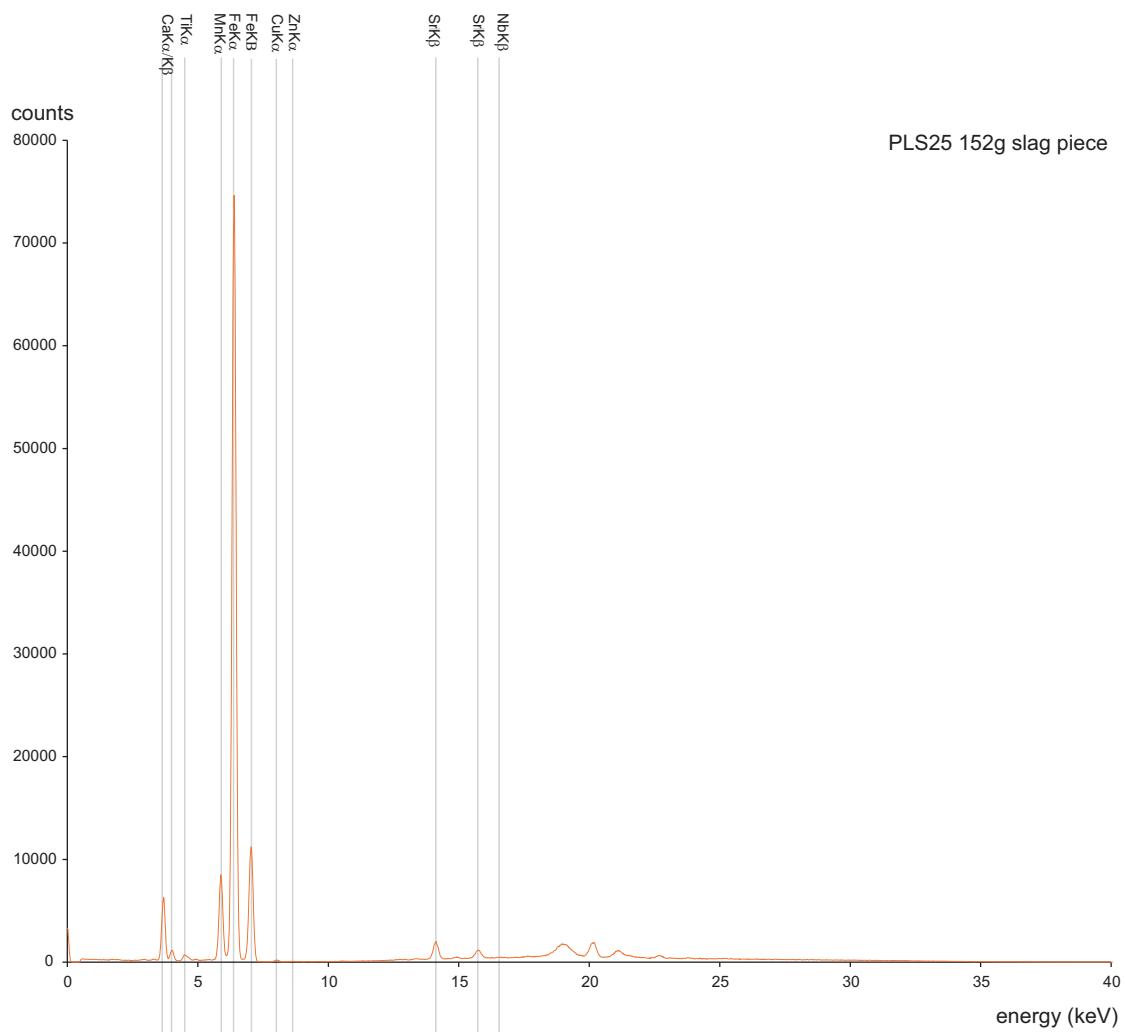
These materials are unlikely to have any further archaeological significance and no further investigation is proposed.

Results

Fossil material

This sample (26g) is a curving sheet of low-density mudstone. The outer (convex face) shows a thin veneer of carbonaceous material with a surface relief showing a slight 'scaley' relief, probably indicative of the external surface of a lycopod (probably *Lepidodendron* or a close relative). The internal concave surface is a similar carbonaceous surface, but smooth. It is likely that the piece represents a fossil formed by fine sediment intrusion between the layers of the decomposing wood.

Figure 1



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