

# GeoArch

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Evaluation of archaeometallurgical  
residues from Princess Way, Swansea

Dr Tim Young  
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# Evaluation of metallurgical residues from Princess Way, Site 598, Swansea

Dr T.P. Young

## Abstract

*This small assemblage includes two pieces which are probably smithing hearth cakes (SHCs) produced during iron working in a traditional forge hearth with a clay blowhole/tuyère. The size of the SHCs is compatible with blacksmithing rather than bloom refining.*

*One piece is a glassy slag produced by interaction of waste from copper-alloy working with hearth or technical ceramic.*

*One piece is probably clinker (partially melted coal fuel residue). This material might be from a metallurgical process, but other high temperature coal-burning processes might equally be responsible.*

*The fifth piece is highly corroded and is more likely to be cored on a corroded piece of metallic iron (artefact) rather than an iron-rich slag.*

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The final piece appears to be a concretionary mass, probably around a piece of iron metal.

## Interpretation

Material such as this indicates a low background of metallurgical activity, such as would be typical in a medieval town. The technology implied by the SHCs is appropriate for the medieval age. Any evidence for the date of the onset of coal use is always interesting, but use of coal is already well documented in South Welsh towns from the 13<sup>th</sup> century at least.

## Methods

The archaeometallurgical residues have been evaluated by brief visual inspection and the use of a lower-powered binocular microscope. Descriptions and interpretations of material are necessarily limited by this approach.

This report should not to be taken as a final interpretation of the materials described herein, but is a brief catalogue, description and interpretation of the materials, together with an evaluation of their potential for further post-ex investigation.

## Results

A brief catalogue of the materials is presented in Table 1.

The materials include residues which are almost certainly from iron working (blacksmithing; c3068, c3095), one piece from copper alloy working (c3352). One piece may be metallurgical (c3087), but might derive from any other high temperature use of coal as fuel.

## Evaluation of potential

Although further information about the materials could be gleaned through further investigation of these specimens, their lack of association with metallurgical features and small number, means that such further work may add little to the understanding of the site.

Further investigation of the residues is not recommended unless there are compelling reasons, or questions to answer, from the field archaeology.

The concretionary mass from c3095 is probably worth X-raying as it may be an artefact.

Context	Area	Weight (g)	Notes
3068	B1	452	Rounded block of very dense vesicular slag. Grey colour. Probably water-rolled and highly abraded. Top shows remnants of low raised, smooth lobes with maroon superficial tint. Base shows small dimples from fuel contact – most likely but not certainly charcoal. This probably represents most (70-80%) of a medium sized smithing cake, but it is now very abraded.
3087	B1	41	Curved fragment of dark glassy slag. Vesicular. Colour varies from black to grey to red across specimen, with the glass having a resulting streaky appearance. The glass bears numerous variably partially melted small rock fragments. Many of these particles are strongly foliated. Most likely to be clinker (coal residue). Dense clinkers like this may be from metallurgical processes, but may also result from other high temperature uses of coal as a fuel.
3095	B1	139	Ball of ferruginous material. Contains metallic iron. Outside is concretionary mass of sand grains and fine gravel bound by iron oxides. Overall form resembles central part of smithing hearth cake, but probably an accretion around an iron artefact. Would be worth an X-ray. 65x45x45mm.
		194	Small smithing hearth cake, semi-circular, straight proximal attachment showing small amount of reduced ceramic centrally. Upper surface glassy with abundant sand grains. Fairly smooth planar top, but with blebs of lining slag central to surface. Margins of upper surface show crude lobes with slight maroon surface bloom. Lower surface rough, showing margin flow lobes, especially proximally. 75x100x40mm, with "bowl" 27mm deep.
3352	B3	8	Fragment of dark glassy slag rich in sand grains. Bears abundant discrete blebs bearing green Cu-alteration products. Overall form suggests a high viscosity lobe of slag resting on, but not wetting, fuel particles. Texture would be compatible with a slag generated within a hearth or on a crucible.

Table 1: Summary catalogue

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*geoarchaeological, archaeometallurgical & geophysical investigations*

54 Heol y Cadno,  
Thornhill,  
Cardiff,  
CF14 9DY.

*Mobile:*  
*Fax:*  
*E-Mail:*  
*Web:*

07802 413704  
08700 547366  
Tim.Young@GeoArch.co.uk  
www.GeoArch.co.uk