

GeoArch

Report 2026/09

Assessment of industrial residues from
Bratton House, Westbury, Wilts. (BHB25)

Dr Tim Young
3rd May 2026

Assessment of industrial residues from Bratton House, Westbury, Wilts. (BHB25)

Dr T.P. Young

Abstract

This report details a small collection of 10 items with a total weight of 1.2kg. One of these was a large block of 19th or 20th century blast furnace slag, one piece was natural rock and one mineralised iron. The remainder were piece of slag and mineralised iron likely to be associated with a phase of iron working (smithing). Many of the smithing-related materials derive from contexts also yielding Middle to Late Iron Age pottery.

The smithing assemblage includes a smithing hearth cake (SHC) weighing 423g. It is not known whether this derives from bloomsmithing or blacksmithing. The smithing was conducted using charcoal as fuel.

Contents

Abstract	1
Contents	2
Methods	2
Background	2
Assessment	2
Results	2
General	2
Details	2
Interpretation	2
Further work	3
References	3
Table 1: summary catalogue	4

A tiny fragment of flowed slag from (1002) is also probably from the margin of an SHC.

Another tiny fragment (2g) of slag from Findspot 1 is of broadly similar slag, but with a concave, rusty surface on one side. Such material is compatible with a slag bleb detached from the smith's tools, but this origin is not certain.

Hearth Ceramic: two fragments of bloated reduced-fired ceramic with a slagged surface (from (1002) and (1025)) are compatible with fragments from the wall of a smithing hearth.

A slag fragment (20g) from (1025) is locally pale and gritty. It represents slag largely derived from the wall of the hearth. It might have formed simply on the hearth wall or be part of an SHC where the slag sloughed from the wall has merged into the cake.

Iron: a small (3g) piece from (1009) represents a mineralised piece of iron, with the original iron being largely now a tapering cavity, with a maximum preserved diameter of 3mm. The piece could be an artefact fragment (perhaps the point of a nail), but equally it could just be a fragment of iron as process waste. This piece is compatible with being a part of the smithing assemblage but need not be.

Blast furnace slag: a large pale slag block from (1005) weighing 600g, is a section through a n approximately 100mm thick slag flow, preserving flow structures on the base and top, but largely homogenised through its variably vesicular body. This derives from iron smelting in a blast furnace employing hot blast, of later 19th or 20th century date. The most likely source of such material in the local environment would be the Westbury Iron Works (1858-1920; Day 1979). Such derivation need not have been direct – the slag is likely to have been used locally as 'hard-core' and was recorded as being used as ballast on the railway line.

Natural materials: a 51g fragment from (1041) is part of a natural concretion of oxidised pyrite or marcasite with a coarse radial crystal structure.

Methods

Background

This assessment was commissioned by Tracy Michaels of Foundations Archaeology. The materials described and assessed here arise from excavations undertaken on land at Bratton House, Bratton, Westbury, Wilts. The site code is BHB25.

Assessment

All submitted materials were examined visually in May 2026, using a low-powered binocular microscope where required. They have been examined and assessed (Table 1). No instrumental analysis has been undertaken.

Results

General

The submitted assemblage comprised 10 items with a total weight of 1.2kg. One of these was a large block of 19th or 20th century blast furnace slag, one piece was natural rock and one mineralised iron. The remainder were piece of slag and mineralised iron likely to be associated with a phase of iron working (smithing). Many of the smithing-related materials derive from contexts also yielding Middle to Late Iron Age pottery.

Details

Iron smithing slag: the main piece of evidence is a complete smithing hearth cake (SHC) weighing 423g from (1025). It has dimensions of 95mm length, 105mm width and 60mm depth, of which the bowl forms the lower 40mm. The flat top of the plano-convex bowl has a rusty top, overlain by a thin layer of slag, also with a rusty surface, which does not cover the whole top of the bowl. The SHC has a prilly base with pale prills, some fuel ash slag blebs and gravel inclusions. Large charcoal inclusions are visible on the fractured proximal face, many of which show pale margins.

A fragment weighing 70g from (1047) is probably from a very similar SHC.

Interpretation

The material suggests derivation from two sources: items from contexts (1002), (1025), (1047) and 'findspot 1' are all compatible with ironworking (blacksmithing) using charcoal as fuel; the piece from context (1005) is a late 19th or 20th century blast furnace slag. The mineralised iron from (1009) is not diagnostic. The item from context (1041) is natural.

The blacksmithing residues all derive from contexts that, where dated by pottery, have had Middle or Late Iron Age dates suggested.

The weight of SHCs can often provide some evidence for the broad type of smithing involved. The weight of individual SHCs produced during smithing depends upon the loss of iron to the hearth. Iron loss is higher during high temperature processes and particularly so during the working of raw blooms into processed iron (bloomsmithing). In contrast, SHCs produced during blacksmithing, may show a lower rate of iron loss,

depending on process (including the amount of welding involved)

At Bratton House, a weight of 423g for the sole complete SHC is rather ambiguous. Crew (1998) attributed SHCs with weights of 300-400g from Crawcwellt to bloomsmithing, but this is a site with particularly small furnaces. Middle Iron Age sites with bloomsmithing residues and with larger furnaces include Tregurra (Young 2022; SHCs range from 890g to 2050g), Folly Court (Young 2018, Young & Anelay 2025; SHCs range from 332g to 1120g) and probably Hartshill Copse (Young 2020, 2024; SHCs range from 448g to 2350g). These data suggest that bloomsmithing slags from the Iron Age are less different in size from those of the Roman or medieval periods than Crew suggested on the basis of the North Welsh material. It is therefore not possible to determine whether the present material derives from bloomsmithing (and therefore part of the *chaîne opératoire* of iron production) or from blacksmithing (the end use of iron for the production and repair of artefacts).

Bronze Age to Middle Iron Age occupation and iron production, Late Iron Age to early Roman enclosures and cremations, and medieval occupation at Hartshill Copse, Thatcham, West Berkshire. Thames Valley Archaeological Services Ltd, Monograph 36

YOUNG, T.P. & ANELAY, G. 2025. Iron Age iron smelting, Folly Court, Wokingham and the interpretation of 'dome' furnaces. *Historical Metallurgy*, **55**, 30-46.

Further work

The issue of whether the Westbury iron ores might have been exploited prior to the 19th century is an important question. Although in theory chemical analysis of SHCs can determine whether they were waste from bloomsmithing or blacksmithing, this depends upon understanding of the composition of both the smelting slag (or ore) and that of the hearth lining. In this instance, those other materials are not available and thus analysis of the SHC would not be interpretable in any robust manner.

No further work is therefore recommended, unless any specific archaeological questions are raised about the origin of the material.

References

(all GeoArch reports are available from <https://www.geoarch.co.uk/report%20library/>)

CREW, P. 1998. Excavations at Crawcwellt West, Merioneth, 1990-98: A late prehistoric upland ironworking settlement. *Archaeology in Wales*, **38**, 22-35.

DAY, R. 1979. The Iron Industry in Wiltshire, 1856 – 1939. *Bristol Industrial Archaeological Society Journal*, **12**, 29-40.

YOUNG, T.P. 2018. Archaeometallurgical residues from Folly Court, Wokingham, Berkshire. *GeoArch Report 2018/15*, 124pp.

YOUNG, T.P. 2020. Archaeometallurgical residues from Hartshill Copse (HCB01). *GeoArch Report 2020/17*, 34pp.

YOUNG, T.P. 2022. Chapter 7. Archaeometallurgy, pp. 170-204. S.R. Taylor, *Down the bright stream: the prehistory of Woodcock Corner and the Tregurra Valley, Cornwall*. Oxford.

YOUNG, T.P. 2024. Archaeometallurgical residues from the CA Site (HCB01), pp. 109-123 in: A-M Huvig, P-D Manisse & S Preston. *Later*

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

Context	Item wt.	Item No.	Notes
1002	4	1	small fragment of flowed slag; one surface shows surface reddening, the other not, one surface shows mineralised charcoal; the reddened upper surface appears to show small blebs of pale slag (FAS); most likely from the margin of a SHC.
1002	1	1	small fragment of hard grey, ceramic, slightly bloated towards one irregular margin, which is overlain by a pale glassy slag
1005	600	1	block showing cross section through a flow of variably vesicular hot blast slag.
1009	3	1	small fragment of mineralised iron; internal void approximately circular in cross section and tapering; approximately 3mm diameter at fracture; unclear if this an artefact fragment or just process waste.
1025	423	1	SHC; rusty top, prilly base; 95x105x60(40); top of plano-convex bowl has additional upper rusty sheet not covering whole top; base shows paler prills, with some FAS and gravel inclusions; large charcoal inclusions visible on fractured face, locally with pale cavity margins.
	20	1	dense gritty (to 4mm) dark slag; crudely lobate; some of the slag shows a pale surface.
	8	1	bloated grey ceramic with voids increasing in size towards pale vitrified surface; pale layer has inclusions (or incomplete layer?) of green glass.
1041	51	1	fragment of natural iron rich concretion with radial, strongly cleaved crystals, expanding outwards to 5-7mm in width over 25mm radius; probably a pseudomorph after pyrite or marcasite.
1047	70	1	fragment very similar to complete SHC from (1025); rusted top and base; large charcoal inclusions - each with white slag rim; margin shows dark, slightly purple surface - possible surficial coat over crystal terminations - maybe Mn rich?
findspot 1	2	1	small fragment of rough, dark surfaced lag, shows one concave rusty surface that could be a tool contact, the rest is rough, but not fully spiky

GeoArch



geoarchaeological, archaeometallurgical & geophysical investigations

Unit 6,
Western Industrial Estate,
Caerphilly,
CF83 1BQ

Office: 029 20881431
Mobile: 07802 413704

E-Mail: Tim.Young@GeoArch.co.uk
Web: www.GeoArch.co.uk