

Ancient Monuments Laboratory
Report 85/90

SLAG AND OTHER TECHNOLOGICAL FINDS
FROM REAWLA, CORNWALL.

Justine Bayley

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Summary

This site, a round, was occupied from 2nd-4th centuries AD. The slag came mainly from dumping in a ditch and weighed under 3 kg in total; it suggests small scale blacksmithing. About half the total weight of slag comprised fragments of clay tuyere blocks that had been built into the side of a hearth and which, when complete, would have measured about 250 x 150 x 70 mm. Metal finds included most of a plano-convex lead ingot about 80 mm in diameter.

Author's address :-

Justine Bayley

Ancient Monuments Laboratory
English Heritage
23 Savile Row
London
W1X 2HE

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The site was a round, occupied from the 2nd-4th centuries AD. The second phase of its occupation is considered to represent one of industrial use. The bulk of the slag came from dumping in the ditch, mostly early in phase 3 though some was from later levels or from other pits.

Some of the finds examined were slags of types that could be associated with specific processes such as iron smithing, while others were non-specific and could have formed in any high temperature fire. The latter's association with the former however suggests that most, if not all, were produced in a blacksmith's hearth. The identifications of the individual samples are given in Table 1; the names used have the following meanings:

Smithing slag - iron silicate slag with no specific shape that formed in a blacksmith's hearth.

Hearth bottom - a plano-convex 'bun' of smithing slag which derives its shape from the base of the hearth in which it collected.

Fuel ash slag - an alkali silicate slag formed by the reaction of silicate materials (clay, sand or stone) with ash from the fuel in a fire at sufficiently high temperature.

Hearth lining - the clay lining to a hearth that has acquired a vitrified (fuel ash slag) surface from contact with the fire.

Tuyere block - a roughly rectangular block of clay with a perforation (tuyere) where the air blast from a pair of bellows was introduced into the fire. The block was built into the side of the hearth as a replaceable section as the temperature was highest and thus the vitrification most severe in this region.

Ironstone - natural stone that is rich in iron. It could be considered as an ore, though there is no other evidence of smelting so its presence is likely to be accidental.

Iron object - piece of deeply corroded metallic iron.

The total weight of material is under 3 kg, and about half of this comprises the tuyere block fragments. This is not a lot on a settlement of this date and suggests small scale and/or intermittent blacksmithing. The distribution of slag on the site is not likely to help in identifying the area where metal working was carried out as most of the finds have been thrown away into ditches etc. The tuyere blocks are unusual, though not unique, finds. The larger fragment (from 0162) has traces of the perforation surviving, suggesting its dimensions when complete were about 250 x 150 x 70 mm. It is made of a very poorly sorted fabric which has not cohered well and gives the impression of not being well fired, except near the vitrified surface.

In addition to the slag, a considerable amount of fired clay was submitted for examination. Most were shapeless lumps, lacking any original surfaces. There was nothing which specifically associated any of them with the metal working.

Table 1: List of identified samples

Context	Finds No	Identification	Weight (gm)
u/s	6	smithing slag	50
		hearth bottom 95 x 55 x 50	220
		ironstone	
0001	616	smithing slag	20
	103	ironstone)	
	105	smithing slag)	75
	529	ironstone ?)	
	614	smithing slag)	
0012	533	fuel ash slag	
0019	635	fuel ash slag & iron object	25
	636	iron object	50
0023	620	smithing slag)	40
	637	smithing slag ?)	
0026	258	smithing slag	50
0039	130	fuel ash slag	
0148	197	smithing slag	80
	207	iron object	
	215	smithing slag ? (dense)	40
	619	smithing slag, fired clay and two iron objects	30
0157	671	fuel ash slag	
0158	343	fuel ash slag)	
	402	fuel ash slag)	
	405	fuel ash slag)	
	408	fuel ash slag)	30
	409	fuel ash slag)	
	410	iron object)	
	411	fuel ash slag)	
	413	smithing slag	50
	414	smithing slag)	30
	423	smithing slag)	
	514	hearth bottom 50 x 45 x 10	70
	668	iron object	
	676	iron object	
	677	iron object	
	679	hearth bottom 70 x 45 x 20	80
0162	424	tuyere block fragment	c.1000
0168	262	smithing slag	20
	270	iron object	
	272	fuel ash slag	
	273	hearth bottom 100 x 65 x 25	150
	274	fuel ash slag/hearth lining)	
	422	fuel ash slag)	30
	530	fired clay)	
0180	361	tuyere block fragment	180
0211	683	iron objects	
0277	684	smithing slag)	25
	685	smithing slag ? (dense))	
0288	682	ironstone	30
0296	680	hearth bottom 105 x 60 x 40	240
0314	702	ironstone ?	
0320	686	smithing slag	
0349	703	fuel ash slag	

Where no weight is given, the amount was under 20 gm.
Hearth bottom dimensions are major x minor diameter x depth in mm.

Boxed together with the slags were a number of metal objects. All were analysed qualitatively by X-ray fluorescence; the results are given in Table 2. The brass fitting is almost certainly modern.

Table 2: List of analysed metal artifacts

Finds No	Object	Elements detected	Metal
36	tack	Cu (Pb Sn)	copper
50	fitting	Cu Zn (Pb)	brass
251	fragments	Cu Sn Zn Pb	bronze
589	ingot	Pb	lead
615	rod/wire	Cu Sn	bronze
643	sheet fragment	Pb	lead

Note: Elements written within brackets only gave very weak signals; they are probably only present at a few percent or so. Cu = copper, Pb = lead, Zn = zinc, Sn = tin