

Ancient Monuments Laboratory  
Report 71/91

REPORT ON THE SLAGS RECOVERED FROM  
TWO EXCAVATIONS IN GLOUCESTER,  
(SITES 9/83 AND 24/87).

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Summary

The ironworking slags and other residues from two excavations in Gloucester are described and listed. Site 9/83 produced only background levels of slag. Larger quantities were recovered from Site 24/87, but there was no strong evidence to indicate that iron smithing was practiced on the site. An insignificant quantity of possible tap slag was identified. No phasing information was available; the slag is likely to be Roman or medieval.

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# **Report on the Slags Recovered from Two Excavations in Gloucester, (Sites 9/83 and 24/87).**

**Dr Gerry McDonnell**

## **1 Introduction**

The slags from two excavations in Gloucester were examined. The sites uncovered deposits dating from Roman and Medieval periods. No phasing information has been incorporated in this report. The discussion of the sites could be significantly altered if phase and spatial analysis revealed distribution concentrations.

## **2 Slag Classification**

The slags were visually examined and the classification is solely based on morphology. In general they are divided into two broad groups. First are the diagnostic slags which can be attributed to a particular industrial process; these comprise the ironworking slags, i.e. smelting or smithing slags. The second group, the non-diagnostic slags, could have been generated by a number of different processes but show no diagnostic characteristic that can identify the process. In many cases the non-diagnostic residues e.g. hearth or furnace lining, may be ascribed to a particular process through archaeological association. The non-diagnostic residues recovered from the sites included hearth or furnace lining, cinder and 'other' material.

The residue classifications are defined below.

### **2.1 Ferrous Diagnostic Slags and Residues**

Smelting Tap Slag (TAP) - iron silicate slag generated by the smelting process, i.e. the extraction of the metal from the ore. Only two small pieces with the characteristic tap slag morphology were identified.

Smithing Slag (SSL) - randomly shaped pieces of iron silicate slag generated by the smithing process.

Hearth Bottom (HB) - a plano-convex accumulation of iron silicate slag formed in the smithing hearth. Ten examples were recorded from Site 24/87, and only one from 9/83. The ranges of the dimensions of the Site 24/87 examples are given in Table 1.

**Table 1 Range of Dimensions of Hearth Bottoms from Site 24/87**

Dimension	Range
Weight (gms)	500-2990
Major Diameter (mm)	90-220
Minor Diameter (mm)	60-130
Depth (mm)	30-80

## 2.2 Non-Diagnostic Slags and Residues

Hearth Lining (HL) - the clay lining of an industrial hearth, furnace or kiln that has a vitrified or slag-attacked face.

Cinder (CIN) - high silica-content slag that is formed by high temperature reaction between silica and ferruginous material. It can be ascribed to either the non-diagnostic slags or the diagnostic slags depending on the iron content and its morphology.

Other Material (OTHER) - which normally comprises fragments of ferruginous stones, iron objects, mortar etc.

## 3 Slag Distribution

### 3.1 Site 9/83

This site produced a very small amount (c. 1.5kg) of all slag types. A full listing of the slags is given in Appendix 1, ordered by trench and context number. This is considered 'background' levels, i.e. the expected low quantity of slag incorporated in other dumped material. It is not evidence for ironworking activity being carried out on the site in antiquity.

### 3.2 Site 24/87

Nearly 30kg of smithing slags (SSL + HB, Table 2) were recovered from Site 24/87. A full listing is given in Appendix 2, ordered by context number. A single piece of probable tap smelting slag (0.050kg), which may only have been liquated smithing slag, and a piece of cinder (0.10kg) were also recorded. The hearth lining (total 0.230kg) was probably derived from iron smithing activity, since all pieces except 0.020kg (Context 68) were recovered from contexts containing smithing slag. The material classed as 'other' included metallic iron, ferruginous concretions etc.

**Table 2 Totals Recovered from Site 24/87 (Weight in kg)**

SSL	HB	TAP	Cin	HL	OTHER
18.290	10.110	0.050	0.010	0.230	1.105

The smithing slag (SSL+HB) was dispersed amongst 51 contexts, of which 7 contained more than 1kg and a further 12 contained more than 0.5kg. This suggests a concentration of slag above background levels, i.e. that quantity of slag brought on to the site by normal processes. However, some of the larger deposits may derive from hardcore or build up material rather than the deliberate dumping of smithy waste. Such information could be available from the excavation records.

# APPENDIX 1

Context	Gloucester SSL	Slag Listings HB	CIN	Site 9/83 HL	TAP	OTHER
Trench XXIX						
8	230					40
27			10			
Total	230		10			40
Trench XXXIV						
9						20
13						180
Total						200
Trench XXXX						
6	60				20	
Total	60				20	
Trench XLIX						
7	40	440	60	275		
Total	40	440	60	275		
Trench LXVI						
3	60					
4	20					
Total	80					
Site Total	410	440	70	275	20	240

APPENDIX 2

Context	Gloucester SSL	Slag HB	Listings CIN	Site HL	24/87 TAP	OTHER
4	100		10	15		
50	50					
51						120
52	40				50	
54	650					
60	1370					
61	800					
62	630			40		
65	540			130		
67	1260			25		240
68				20		
76	20					
77	1900	500				
79	100					
80	50					
84		690				
88	780					
91	40					
107	10					
108	40					
109						20
110	100	500				
111	540					30
112						300
115	20					
128	40					
141	100					
142	190	780				
143	510					
146	30					
170	300					
171	70					
172	280					
186	160					
224	15					
243						15
306	20					40
313						80
319	3800	4560				
333		540				
338	110					
363	1080					
369	10					
391						400
392	60					
395		1200				
410	500					
412		540				
423	1000					
424	850	800				20
99999	125					140
TOTAL	18290	10110	10	230	50	1405