

Ancient Monuments Laboratory
Report 28/87

**FINAL REPORT ON THE BROOCH
ANALYSES AND CRUCIBLES FROM
PRESTATYN, CLWYD**

Justine Bayley

AML reports are interim reports which make available the results of specialist investigations in advance of full publication. They are not subject to external refereeing, and their conclusions may sometimes have to be modified in the light of archaeological information that was not available at the time of the investigation. Readers are therefore advised to consult the author before citing the report in any publication and to consult the final excavation report when available.

Opinions expressed in AML reports are those of the author and are not necessarily those of the Historic Buildings and Monuments Commission for England.

Ancient Monuments Laboratory Report 28/87

**FINAL REPORT ON THE BROOCH ANALYSES AND CRUCIBLES FROM PRESTATYN,
CLWYD**

Justine Bayley
March 1987

Summary

This report should be read with AML Report No 4685. A further group of crucible sherds were examined and analysed and results for atomic absorption analyses of 18 brooches are given.

Author's address:

Ancient Monuments Laboratory
Historic Buildings and Monuments Commission
23 Savile Row
London W1X 2HE

01-734-6010 x524

© Historic Buildings and Monuments Commission for England

FINAL REPORT ON THE BROOCH ANALYSES AND CRUCIBLES FROM PRESTATYN, CLWYD

This report should be read in conjunction with Ancient Monuments Laboratory Report No 4685. A further group of crucibles (AM 856216) were examined and the deposits on them analysed qualitatively by X-ray fluorescence (XRF); the results for these and the original group of crucibles are summarised and discussed below. The quantitative analyses of the brooches are also presented and the alloy compositions compared with those for similar objects from other sites.

The crucibles

All the fragments analysed are listed in Table 1. In the first batch there were two major groups; thick-walled fragments which appeared to be from triangular crucibles which were heated from above, and a smaller group of sherds from smaller and thinner-walled vessels. The second batch of crucible sherds contained examples of the two types previously identified and also a piece of a large, shallow vessel or structure (SF 1461).

The majority of the sherds seem to be from triangular crucibles which are usually considered an iron age form. They did however continue to be used into the late 1st century AD and beyond in areas outside lowland England. Their presence is therefore not unexpected here in contexts which date between 80 AD and the mid 2nd century. What is more surprising however is that the clay moulds are piece moulds, the standard Roman mould type, rather than investment moulds which were commonly used in the later iron age. It is interesting that the more modern mould technology had been adopted though the native tradition in crucibles continued.

Despite their iron age form, the crucibles were used to melt a far wider range of alloys than is normal for that period; neither silver nor copper alloys containing major amounts of zinc are known in truly iron age crucibles so the range of metals being worked as well as the type of moulds indicate a Romanised industry. The second batch of crucibles, like the first, showed evidence for the melting of a range of copper alloys and silver too. In these cases the silver was not associated with a large amount of lead and therefore probably represented melting rather than refining.

Table 1: The crucibles

S F No	Elements detected				Ag	
	Cu	Zn	Pb	Sn		
457(1)	++	++	+	+		
(2)	++	++				
462	+	++	++	+		
505	++	+	++		+) These two) sherds join
507	++	+	++		+	
512	++	+	++		+	
544	++	+	+	+		
571rim	++	++		+		
inside	++	++	+	+		
621	?	?				
626	+	+	+			
627rim	++	++	+	+		
628	++	++	+	+		
677	+	++				
679	++	+		+		
686	+	++	++	++		
689	?	?				
692	++	++		+		
889	+	++		+		
919	++	++	+	+		
922	?	?				
1366	+	++		?		
1445	+	++	+		+	
1461	+	++	+	+		
1464	+	+	+		+	
1481	++	++				
1488	+	++				
1979	+	+	+		++	
-	?	++				[context 1001]

Key: ? = very weak signal + = element detected
 ++ = strong signal

Those crucibles giving very weak signals may not have been used. Nos 464, 625, 1391 and 1614 were pieces of hearth lining and not crucibles. Nos 11, 458, 498, 720, 1323, 1326, 1493 and 1580 were also not crucibles. No 1324 was possibly a mould fragment.

The brooches

All the brooches were analysed qualitatively by X-ray fluorescence and most were also sampled and then analysed quantitatively by atomic absorption. The results are given in Table 2 and supercede those in the interim report. Where a different alloy name is now assigned to brooch it is because the quantitative results allow greater precision.

Table 2: Analytical results for the brooches

SF No	Cu%	Zn%	Sn%	Pb%	Ag%	Alloy	Type
1924						brass	Langton Down
1585	93.75	1.04	5.95	.89	.00	bronze	Early hinged
61	86.74	1.03	10.29	.29	.00	bronze	Hinged dolphin
76	77.27	12.61	2.27	4.32	.25	brass/gunmetal	" "
204						leadcd gunmetal	" "
231	64.69	.00	8.55	25.00	.04	leadcd bronze	Polden Hill
148	84.30	2.25	6.20	7.17	.21	(leadcd) bronze	Dolphin/Prestatyn
404	87.50	7.84	2.05	.68	.00	brass/gunmetal	Headstud
438	89.55	.00	4.85	3.36	.00	bronze	"
427	85.31	11.01	2.38	.99	.00	brass/gunmetal	Prestatyn
93	77.38	.00	7.86	14.04	.26	leadcd bronze	"
284	89.29	.00	9.82	.59	.00	bronze	"
1316	75.96	.00	12.12	11.54	.00	leadcd bronze	"
437	76.68	19.96	2.31	.21	.00	brass	cf Prestatyn
1376	84.16	2.97	6.93	.99	.00	bronze	?
286	88.24	.11	8.19	.21	.00	bronze	Trumpet
434	77.01	11.83	1.79	4.69	.29	brass/gunmetal	"
1291	74.59	.00	9.48	15.32	.20	leadcd bronze	Fantail
381						leadcd gunmetal	Plate
655	76.22	9.15	7.62	6.71	.00	gunmetal	Penannular
426						bronze	"
433						bronze	"
1708	89.29	.00	9.82	.59	.00	bronze + brass or gunmetal terminals	"
1238						leadcd bronze	"

It has been found that in general brooches of a particular type have a preferred alloy or limited range of alloys from which they are normally made, no matter where in the country they are excavated (Bayley and Butcher 1981). For many of the brooch types represented here there are no large numbers of analyses so comparative data cannot always be quoted and, even where data is available, there are insufficient results for statistically significant patterns to emerge. For some of the types with multiple examples here it can be seen that a wide range of alloys was used in their manufacture but where comparative data is lacking the common and unusual alloys cannot be identified.

Among the bow brooches the following comparative data is offered for the analyses presented in Table 2. Several dozen Langton Down brooches have been analysed and, like SF 1924, they are brasses. Similarly, Polden Hill brooches are normally leaded bronzes as is SF 231. Trumpet brooches can be divided into two analytical groups which relate to typological sub-groups. One of these, like SF 434, are made up of brass/gunmetals while the other group are normally leaded bronzes. There are very few trumpet brooches which, like SF 286, are unleaded bronzes.

Penannular brooches are made of unleaded alloys as most are wrought and cannot therefore be made of leaded metal. Any low-lead or lead-free alloy can be, and was, used; there is no apparent correlation of alloy type with typology. Compositionally the penannular brooches here are unexceptional except that the terminals on SF 1708 are made of a different alloy to that of the body of the brooch.

Reference

Bayley, J and Butcher, S (1981) Variations in alloy composition of Roman brooches. Revue d'Archeometrie Supplement, 29-36.