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Ancient Monuments Laboratory
Report 85/91

COMPOSITIONAL ANALYSIS OF FOUR
EARLY ANGLO-SAXON COPPER-ALLOY
VESSELS FROM LOVEDEN HILL,
LINCOLNSHIRE

Catherine Mortimer BTech DPhil
and Brian Gilmour PhD

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Summary

Four large copper-alloy vessels dating to the sixth or seventh centuries AD were analysed using surface X-ray fluorescence. Two hanging bowls and a cauldron were bronzes (6-13% tin). A Coptic bowl was made of a heavily-leaded low-zinc brass. The results are comparable with analyses carried out by other authors.

Authors' addresses :-

Catherine Mortimer BTech DPhil

Ancient Monuments Laboratory
English Heritage
23 Savile Row
London
W1X 1AB

Brian Gilmour PhD

The Royal Armouries
H.M. Tower of London
London
EC3N 4AB

Compositional analysis of four early Anglo-Saxon copper-alloy vessels from Loveden Hill, Lincolnshire

Catherine Mortimer and Brian Gilmour

Four large copper-alloy vessels were analysed using surface X-ray fluorescence analysis (XRF) at the Royal Armouries, Tower of London (courtesy of Brian Gilmour). Each of these vessels are important because of high-status associations. They are dated to the sixth or seventh centuries AD. The results given below are consistent with the compositional patterns discovered in vessels from other early Anglo-Saxon contexts by Oddy (1983).

Both hanging bowls are bronzes with very low levels of zinc detectable (cf Oddy et al 1983, 301-315; Hunter and Foley 1987, 17). A third bronze vessel is a plain cauldron with a solid curved rim. It is rather badly damaged and its type is unclear.

None of the bronzes contained more than 1% lead, making them appropriate for metal-working processes such as hammering, which would have been necessary for finishing these pieces. The escutcheons are coated with white metal (presumably tinning, but this was not tested) and enamelled, in enamel which is now green, but may originally have been white or red (Oddy et al 1983).

The bowl with handles and decorated stand is a low-zinc brass with low tin content (1.1%). This alloy is similar to others used for a variety of vessels said to be 'Coptic', which were buried in Britain during the early medieval period (Oddy 1983, 953). Both the handles and the vessel itself have high lead contents, but it should be noted that XRF analysis may overestimate the lead content (Oddy and Craddock 1983, 753). The high concentration of lead confirms the impression that the vessel was cast and not subsequently worked, although it would have been possible to 'turn' the bowl, thus forming the concentric ridges seen in the interior.

Chemical analysis by surface XRF

Object	Number	Percentage weight							
		Cu	Zn	Sn	Pb	Sb	Ni	As	Fe
Small HB	105(a)56	86.2	.3	12.4	.95	-	-	0.1	-
Large HB		90.0	.3	9.7	-	-	-	tr	-
Coptic bowl	910213	63.8	6.8	1.1	27.1	tr	tr	1.0	.2
Cauldron	910214	93.3	-	6.6	tr	-	-	tr	-

Figures normalised to 100%.

Two small wire loops associated with the small hanging bowl are made of leaded bronze.

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