site Nº 685

- Carlisle Archaeological Unit Report 4452

ANCIENT MONUMENTS LABORATORY REPORT No. 4452 Examination of a crucible from Carlisle

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A large crucible from Carlisle (**R** F 130) was examined and scrapings from inside the crucible and areas of its surface were analysed using qualitative energy dispersive X-ray fluorescence. The crucible is illustrated in figure 1 (sketch by Justine Bayley). It consisted of a beaker with a refractory, reduced fired fabric with a coating of much less refractory, heavily vitrified clay. There was no evidence from the impressions in the outer layer, which would have been relatively soft at the temperatures reached, to indicate how the crucible was held during the melting and casting process. Similar clay layers are often found on Roman and later crucibles. They would have protected the inner layer from thermal shock and increased the length of time that the metal inside remained at a high enough temperature for casting.

Two volumes were measured for the. crucible, its total volume when filled to the brim and the maximum amount of metal which could reasonably havebeen melted in it. These were 540 ml and about 430 ml respectively. Similar Roman ccucibles have been found, for example, at Chichester (P. Wilthew, A.M.L. Report. No. 4451), in York (Justine Bayley, A.M.L. Report No. 4432) and at Baldock (Justine Bayley, A.M.L. Report No. 3604). The scraping of metal analysed contained copper, zinc, tin and lead in significant amounts. This suggests that a leaded gunmetal (copper-zinc-tin-lead alloy) was being melted. The red vitrified areas on the outer layer were coloured by copper. Similar crucibles from other sites (A.M.L. Report No.s 3604, 4432 and4451) were used in melting various copper alloys including brass (copper-zinc alloy), gunmetal and leaded gunmetal.



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Figure 1 : A sketch of the crucible