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EXAMINATION AND ANALYSIS OF A MEDIEVAL MIRROR CASE FROM HEYBRIDGE, ESSEX

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The metal case, the glass and its backing were all analysed qualitatively by x-ray fluorescence (XRF). A sample of the white packing material which held the glass into the metal case was removed and analysed by x-ray diffraction (XRD).

The metal case gave signals for copper, zinc, tin and lead. Their various strengths suggested that the metal contained about 5-10% of both zinc and tin as well as several % of lead. This sort of alloy is known as a gunmetal. Other visually very similar cases from Kirkham Priory, Yorks, Perth, Scotland and Winchester, Hants have also been analysed. The results were similar though the proportion of tin to zinc seems to vary a little. This could be due to the varying states of decay of the objects and the fact that the analyses were carried out on conserved but still corroded surfaces rather than on clean metal. Even so, there is probably some variation in composition between individual mirror cases.

The glass inside the case was in a poor state of preservation being deeply weathered and very cracked. XRF analysis detected high levels of manganese as well as iron in the glass which suggests that it had originally been "colourless" although it now appears a deep muddy brown colour.

In the course of examination a piece of one of the mirrors became detached from the case which permitted examination of its back surface. This was covered by a thin foil of lead (confirmed by XRF) which had weathered to ^a deep red colour due to the presence of lead oxides. When new, the lead would have had a bright silvery sheen and so made a good reflective backing to the clear mirror glass.

The glass was held into the metal case by a ring of white 'cement'. This was analysed by XRD and calcite (calcium carbonate) identified. This could have been applied originally in either of two forms; firstly as putty, which is whiting (calcium carbonate) ground up in a drying oil or alternatively as a lime plaster (calcium hydroxide), which sets by absorbing carbon dioxide from the air to form calcite. Lime could also have been applied with a drying oil as lime putty. The present results cannot differentiate between these various possibilities though analyses seeking any organic fraction of the 'cement' might be able to identify drying oils.

The surface of the 'cement' looks orangey-red in places. This colour is almost certainly due to the presence of red lead (lead oxide); material of a similar appearance from another mirror-case has been identified as such by XRD (Bayley 1984). Other mirror cases previously examined (Bayley 1980) had a black layer over the 'cement' which was identified by XRD as galena (lead sulphide). This had been used as 'blacking' to improve the appearance of the mirror assembly; the red lead on the Heybridge example is almost certainly just weathered (oxidised) 'blacking'.

References

- Bayley J (1980) The hinged mirrors from Kirkham Priory, Yorks. AML Report 3014
Bayley J (1984) Examination and analysis of some medieval mirror cases from Winchester, Hants. AML Report 4161