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Ancient Monuments Laboratory  
Report 6/90

EXAMINATION OF A GLASS BEAD FROM  
WINCHESTER, HAMPSHIRE.

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#### Summary

A fragment of a glass bead found in a late medieval context in Winchester was examined and analysed. The bead was of colourless glass but contained small fragments of coloured glass and millefiori. Visual examination of the millefiori fragments suggests it was produced in the Venetian style and is likely to date from the 16th century. Qualitative analysis was used to identify the colourants involved in the production of the glass canes in the millefiori.

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## EXAMINATION OF A GLASS BEAD FROM WINCHESTER, HAMPSHIRE

A part of a decorated glass bead found during excavations in Winchester High Street (AML No. 900562) was examined and analysed to attempt to identify the composition.

The bead would originally have been roughly spherical, approximately 45 mm in diameter, and had been perforated during manufacture with a central, circular hole of approximately 6.5 mm diameter. The outer surface of the bead is opaque and iridescent due to weathering, however the broken cross-section is less iridescent which suggests it was broken some time after it had been originally buried. It may be that it was broken during excavation, however the presence of some slight iridescence on the cross-section surface suggests it may have already been cracked causing some weathering to take place inside the ball before it was completely separated into two, or more, pieces at a later date.

The bulk glass of the bead is colourless, however there are several fragments of coloured glass and multi-coloured millefiori fragments contained within the bead. Qualitative analysis using energy dispersive X-ray fluorescence (XRF) suggested that the base glass was a soda-lime-silica glass, decolourised by manganese (see Table 1). The coloured glasses could not be individually analysed as the analysed area was greater than the size of the individual colour fragments but a general analysis of the cross-section area in comparison to the base glass showed increased levels of copper, lead and tin. These colourants probably account for the opaque white glass (tin), opaque red glass (copper and possibly lead), translucent light blue (copper and possibly iron) and translucent dark blue glass (copper and possibly some undetected cobalt which can influence the colour of the glass even when present at very low levels).

The bead was found in a late medieval context and was originally thought to be residual and possibly of pagan Saxon origin. However detailed examination of the millefiori fragments indicates that they are likely to have been produced using the Venetian style process which was introduced in the medieval period. This process involved embedding thin slices of coloured glass canes into a glass matrix to create a polychrome effect of flower shaped designs when viewed in cross-section (Tait 1979). The colours and design of the millefiori in the Winchester bead match closely those known in comparable beads produced in the Venetian style (eg item 161 in Tait 1979). Earlier millefiori produced in the Roman and Saxon periods are usually much more geometric in design (eg Cramp 1970).

The glass bead must be of medieval date, possibly 16th century AD, and is therefore not residual in the context within which it was found.

### References

Cramp, R.J. 1970 "Decorated window-glass and millefiori from Monkwearmouth", in Antiquaries Journal Vol.50, 327-35.

Tait, H. 1979 The Golden Age of Venetian Glass. British Museum Publications Ltd, London.

**Table 1**

**Results of qualitative XRF analysis**

The bead was analysed using energy dispersive X-ray fluorescence (XRF) with an evacuated sample chamber. No sample preparation of the surface of the bead was possible so the results will have been affected by the weathering of the surface of the glass. Since silicon is expected to be present at a relatively constant level in the glass as it is the major constituent of early glass it was used as an internal standard. The results were normalised by taking the ratio of the K-alpha peak height of each element (except for lead, when the L-alpha peak height was used) to that of the corresponding silicon K-alpha peak.

The ratio figures for each element cannot be compared between elements (ie down the table) as the ratio bears little relation to the proportion of that element present. Different elements are excited with varying efficiencies by the primary X-rays, eg tin is excited far less than copper so that the ratio will be a lot lower even when the amounts involved are similar. However, comparisons between analyses (ie across the table) are valid.

Light elements (those with an atomic number below 14) were not analysed as they are likely to have leached out from the glass during burial, though sodium, aluminium and magnesium are likely to have originally been present in the glass. In the absence of high levels of potassium or lead it is likely that the glass was manufactured using a soda alkali source.

Four different areas of the bead were analysed. The analyses of the outer surface and the middle of the inner surface were just of the bulk glass, but the areas on the edge of the inner surface also included areas of coloured glass in the millefiori.

	Outer surface	Inner surface (middle)	Inner surface (edge)	Inner surface (edge)
P/Si	.03	.02	.03	.03
K/Si	.25	.26	.25	.28
Ca/Si	.58	.50	.52	.54
Ti/Si	.02	.01	.02	.02
Mn/Si	.16	.16	.13	.15
Fe/Si	.24	.27	.32	.27
Cu/Si	.03	.03	.17	.14
Zn/Si	.02	.02	.02	.02
Pb/Si	.05	.04	.29	.25
Sr/Si	.08	.06	.06	.05
Sn/Si	.04	.03	.06	.05
Sb/Si	.00	.00	.00	.00