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Analysis of a glass bead from Beeston Castle, Cheshire

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The bead was of bright blue, transparent glass though it appeared only translucent when seen without magnification. This was because it contained many tiny bubbles and a few opaque white particles which were probably unreacted raw materials from the manufacturing of the glass.

It was analysed by X-ray fluorescence and the peak heights for each element detected were normalised by dividing the recorded values by that of the main silicon peak. Silicon is a major constituent and is present at a roughly constant level in all ancient glass and so can be used in this way to standardise results to allow comparison between different objects.

The analytical results show that the blue colour is due to the presence of cobalt. Cobalt has been used as a glass colourant from the earliest times to the present and so, on its own, cannot be used to date glass. The low levels of the other elements detected and the absence of many elements usually present, albeit at low levels, in ancient glass (see table for comparative data) suggest that this bead is probably post-medieval in date.

XRF peak heights normalised to silicon

Site	Beeston	Sewerby	Dunadd	Portway	Dover	Finglesham
No. analysed	1	2	6	5	2	6
Elements						
Ti	.01	.03/.07	- /.11	.02/.37	?	.03/.09
Mn	.08	.44/.47	.20/.32	.04/.55	? /.06	.04/.26
Fe	.23	.78/1.14	.59/.86	.33/.98	.22/.41	.63/.96
Co	+	? / +	+ /.30	? / +	? / +	?
Cu	.09	.14/.16	.17/.35	.11/.26	.09/.11	.13/.32
Zn	-	-	- /.11	-	-	- /.29
Pb	-	.19/.35	.15/.53	.10/.25	.15/.33	- /.84
Sn	-	-	- /.07	-	- /.14	- /.50
Sb	-	- /.12	- /.13	-	-	- / ?

Key: - = not detected
? = signal not certain
+ = element detected
Where two figures are given they are the minimum and maximum for the group