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Analysis of Inlays and Fittings on Medieval Iron Knives and Shears from the Museum of London (Part 2)

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A group of 64 knives and 2 shears from the Museum of London were examined and the non-ferrous metal inlays and fittings on them were analysed qualitatively using energy dispersive X-ray fluorescence. The objects were from Baynard's Castle (BC), Billingsgate (BIG) and Billingsgate watching brief (BWB) and were comparable to a group of similar objects analysed previously. This report should be read in conjunction with the report on the latter (A.M.L. Report No. 4311).

The interpretation of the analytical results, which are given in the appendix below, was complicated by the fact that detectable signals for copper, zinc and lead were often obtained from areas where no non-ferrous metal was likely to have been present originally. This was probably due to contamination during burial. Therefore the detection of a minor amount of copper, zinc or lead does not necessarily mean that the element was intentionally present originally. The analyses carried out, which did not involve any sample preparation, were adequate to characterise the types of metal present but could not be used to distinguish differences within those types.

Most of the knives were from contexts dated between c1350 and 1400 A.D., although they might have been made at an earlier date as they would have had, potentially, a fairly long useful life. About 85% of the inlays and fittings analysed on objects from these contexts were either brass (copper-zinc alloy) or tin, although small amounts of lead or copper may have been present sometimes in the tin (but see above). The tin used for one handle inlay (Accession No. 2429) was hardened with mercury and one cutler's mark inlay (3622) was almost certainly a tin-lead alloy. The brass used in the shoulder plate of (376) contained some arsenic. Gunmetal (copper-zinc-tin alloy) was used for a shoulder plate and its rivet (1932), a cutler's mark inlay (552) and an end cap (376). The shoulder plate and end cap also contained arsenic. Two cutler's marks (786 and 156) were inlayed with copper and the shoulder plate and rivets of (4214) and the end plates and shoulder plates of (2) were silver.

Several objects were from unstratified or undated contexts, including both shears, but all their non-ferrous metal inlays and fittings were brass apart from one tin hilt band (2341).

Only two knives were from contexts dated before c 1350, (2398) - context date c1250)- which had a blade inlaid with silver and (2952) - context date c1220 - which had brass

decorative discs along its handle.

These results are similar to those obtained in the previous work (A.M.L. Report No.4311). Together the results from the two pieces of work suggest that during the period 1340-1460 brass and tin alloys were the metals normally used for both inlays, including inlays in cutler's marks, and fittings on iron knives and shears. Occasionally other metals such as copper, silver and gunmetal were used. A few objects from 13th century contexts were analysed and the results suggest that there was less uniformity in the alloys used, however more objects from this period would have to be analysed before any firm conclusions could be drawn.

Appendix- Analytical Results

Key :

'Context Date' column : U = unstratified ; ? = unknown

'Areas Analysed' column : All objects were knives unless stated otherwise

'Elements Detected' column :

a) The element (apart from iron) detected at the highest level is listed first, but the order of the remaining elements is not significant

b) Underlined elements were present at a relatively high level

c) Elements in parentheses were present at a very low or trace level

d) ? = possibly present at trace level

e) - = not analysed

Context	Accession No.	Context Date	Areas Analysed	Elements Detected	Alloy Type
BC72					
+	1500	U	End plates,handle strips,handle back	Cu Zn (Pb)	Brass
+	2289	U	End plates, shoulder plates	Cu Zn (Pb)	Brass
			Rivet	Cu Zn	Brass
+	2992	U	End cap,shoulder plate	Cu Zn (Pb)	Brass
73	2050	U	Cutler's mark not found	-	-
79	2111	c1380	Rivet	Cu Zn	Brass
79	2421	c1380	Cutler's mark	Sn Cu Pb	Tin (? with lead and/or copper)
79	2422	c1380	Cutler's mark	Sn (Cu ?Pb)	Tin
79	2425	c1380	Cutler's mark	Cu Zn (Pb)	Brass
79	2427	c1380	Cutler's mark	Cu Sn Pb	Tin (? with lead and /or copper)
79	2429	c1380	End cap	Cu Zn (Pb)	Brass
			Handle inlay	Sn Hg (Cu Zn)	Tin with mercury
79	2430	c1380	Blade inlay	Cu Zn (Pb)	Brass
79	2431	c1380	Cutler's mark	Sn Cu Pb	Tin (? with lead and/or copper)
79	2432	c1380	Blade inlay	Cu Zn (Pb)	Brass
79	2447	c1380	Cutler's mark	Sn Cu (Zn Pb)	Tin (? with lead and/ zinc and/or copper)
79	2448	c1380	Rivet,shoulder plate,cutler's marks,blade inlay	Cu Zn	Brass
79	2450	c1380	End cap,rivets	Cu Zn (Pb)	Brass
79	2453	c1380	Rivet,shoulder plate,end cap	Cu Zn	Brass
79	2528	c1380	Rivets/tubes, shoulder plates	Cu Zn	Brass
83	1932	c1380	Rivet,end cap	Cu Zn	Brass
			Shoulder plate	Cu Zn Sn As (Pb)	Gunmetal,with arsenic
			Shoulder rivet	Cu Zn Sn (Pb)	Gunmetal

Context	Accession No.	Context Date	Areas Analysed	Elements Detected	Alloy Type
88	2984	c1380	Rivets	Cu Zn	Brass
88	2841	c1380	Cutler's mark, inlaid groove	Fe	Not detectable
			Pins	Fe	Iron
88	4178	c1380	Rivets	Cu Zn	Brass
89	2803	c1380	Cutler's mark	Sn (Cu Pb)	Tin
118	2801	c1380	Cutler's mark	Cu Zn (Pb)	Brass (black area was not analysable alone)
118A	4260	c1380	Cutler's mark	Cu Zn (Pb)	Brass (black area was not analysable alone)
119	3836	c1380	Cutler's mark	Cu Zn (Pb)	Brass
150	2986	c1380	Rivets/tubes	Cu Zn	Brass
150	2990	c1380	Rivets/tubes	Cu Zn	Brass
150	4214	c1380	Cutler's mark	Sn Cu (Pb)	Tin (? with lead and/or copper)
			Shoulder plate and rivet	Ag Cu (Pb ?Sn)	Silver (? debased with copper)
			Rivets	Ag Cu (Pb)	Silver (? debased with copper)
150	4274	c1380	Shoulder plate	Cu Zn (Pb)	Brass
			Pins	Fe	Probably iron
150	4313	c1380	Cutler's mark	Sn (Cu)	Tin
150	4314	c1380	End cap (cutler's mark not found)	Cu Zn (Pb)	Brass
150	4316	c1380	Cutler's mark	Cu Zn (Pb)	Brass
250	4636	c1350	Handle (sheet)	Cu Zn (Pb Sn)	Brass
255	3622	c1350	Cutler's mark	Sn Pb (Cu)	Tin-lead alloy
255	4751	c1350	Handle pins	Cu Zn	Brass
255	4752	c1350	Inlay in handle groove	Cu Zn (Pb)	Brass
BIG82					
2635	2341	U	Hilt band	Sn (Cu Pb)	Tin
2913	2398	c1250	Blade inlay	Ag (?Cu)	Silver
5594	2952	c1220	Discs on handle		
			- middle group	Cu Zn Sn (Pb)	Brass (with some tin)
			-other groups	Cu Zn (Sn Pb)	Brass
BWB83					
15	123	?	Rivets	Cu Zn Pb	Brass
108	2	c1380	End plates, shoulder plates	Ag (Cu Pb Zn)	Silver
			Rivets	Fe Sn (Cu Pb Zn)	Tin or tinned iron
110	464	c1380	Cutler's mark	Cu Zn (Pb)	Brass
111	572	1400-1450	Cutler's mark	Sn (Cu Pb)	Tin
117	1	c1380	Rivets/tubes	Cu Zn (Pb)	Brass
151	552	c1380	Cutler's mark	Cu Zn Sn	Gunmetal
156	501	c1380	Cutler's mark	Sn (Cu Pb)	Tin
162	766	c1380	Cutler's mark	Cu Zn	Brass
256	115	c1380	Rivet	Cu Zn Sn (?Pb)	Gunmetal
			Rivet, decorative	Cu Zn (?Pb)	Brass
27	566	c1380	Cutler's mark (rivets)	Sn (Cu Pb)	Tin

Context	Accession No.	Context Date	Areas Analysed	Elements Detected	Alloy Type
277	376	c1380	Rivet	Cu Zn (Pb)	Brass
			End cap	Cu Zn Sn As (Pb)	Gunmetal with arsenic
			Shoulder plate (+ rivet)	Cu Zn (As)	Brass with arsenic
278	126	c1380	Cutler's mark	Cu Zn (Pb)	Brass
285	556	?	Shears - cutler's mark	Cu Zn (Pb)	Brass
291	783	c1380	Cutler's mark	Sn (Cu Pb)	Tin
292	169	c1380	Cutler's mark	Cu Zn (Pb)	Brass
293	170	c1380	Cutler's mark	Sn (Cu Pb)	Tin
293	786	c1380	Cutler's mark	Cu (Pb)	Copper
295	156	c1380	Cutler's mark	Cu (?Pb)	Copper
298	412	c1380	Hilt band	Cu Sn (Pb)	Tin with redeposited copper on the surface
299	496	?	Shears - cutler's mark	Cu Zn (Pb)	Brass
306	775	c1380	'Hollows' for mounts	Fe	Only iron detected
308	620	c1380	Blade inlay	Cu Zn (?Pb)	Brass
310	543	c1380	Rivets	Cu Zn (Pb)	Brass
318	565	c1380	Blade back	Cu Zn (Pb)	Brass
			Blade inlay (+ back)	Sn Cu (Zn)	Tin
332	309	U	Cutler's mark not found	-	-
359	404	c1380	Blade inlay	Cu Zn (Pb)	Brass