

2FH3 LAB(2T)983

AM Lab Report 4062Analyses of brooches and other objects from Wickford, Essex

Justine Bayley

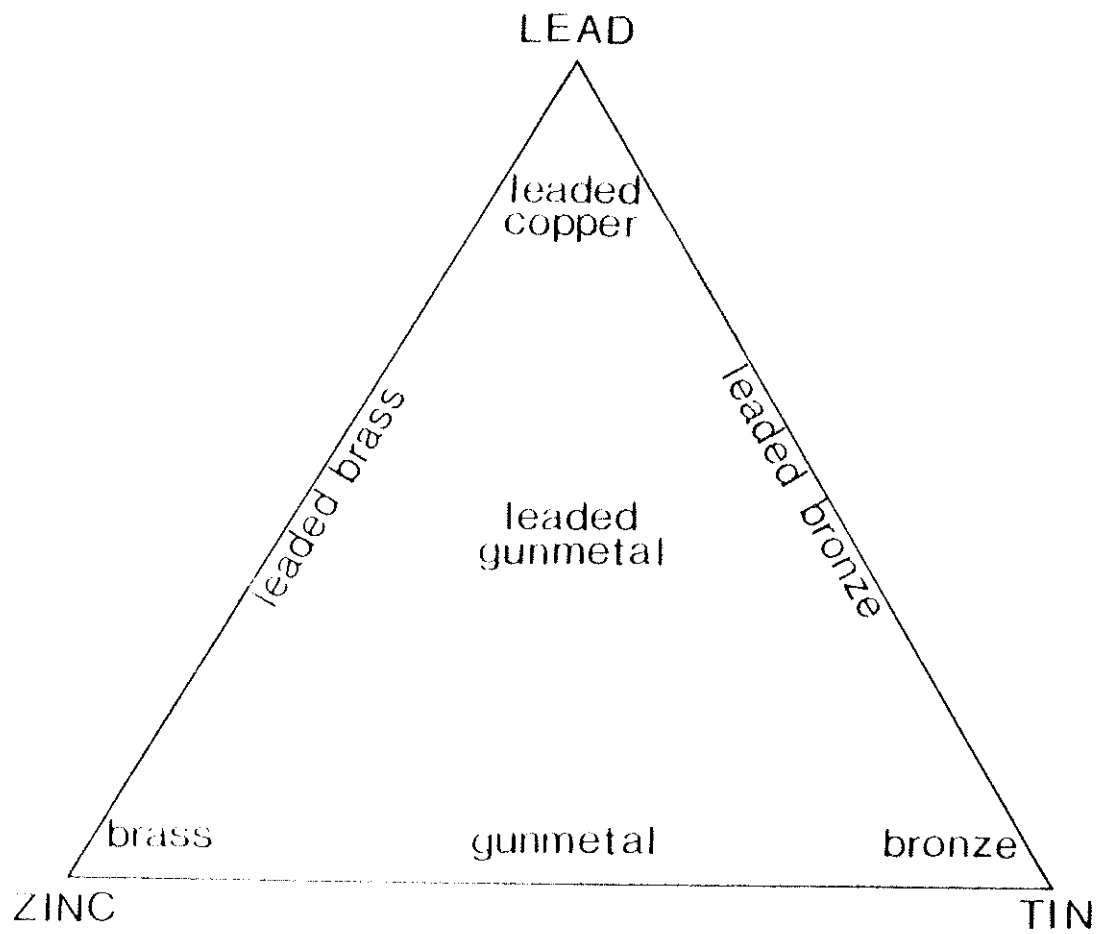
Ancient Monuments Lab

All the brooches were analysed by energy dispersive x-ray fluorescence (XRF). The results are only semi-quantitative but can be interpreted to indicate the alloys of which the brooches were made. The white metal surface coatings on some of the objects were also analysed. Some samples were taken for quantitative analysis by atomic absorption but results from these are not yet available.

A wide variety of copper alloys were used in the manufacture of this collection of brooches. The names applied to the various alloys are indicated in the figure below. Eg gunmetals contain both tin and zinc in addition to copper while brasses contain predominantly copper and zinc. It should be noted that there are no hard and fast dividing lines between adjacent alloy types; the divisions made are somewhat arbitrary but give an approximate indication of composition.

Comparisons with objects from other sites suggest the brasses contain 15-25% zinc, the bronzes 5-10% tin and the leaded alloys up to 25% lead, though 10-20% is more common. Alloys described as "(Leaded)" probably contain less lead than those described as "Leaded" though more than the unleaded alloys which may contain a percent or two of the metal. Most of the objects contain detectable amounts of tin, zinc and lead, though minor amounts of any of these

Figure: Copper alloys and their compositions



elements can be ignored as their effect on the properties of the resulting alloy are minimal.

The results, which are tabulated below, generally agree with the pattern that is being built up for Roman brooches. Sites used for comparison include Richborough, Baldock (Ian Stead's excavations) and Wanborough, Wilts. The one piece brooches (Nos 259 and 283) are bronze, as are over half these types. The Hod Hill variants (Nos 252 and 260) are tinned brass and the one-piece Colchester brooches are also brass as are the vast majority of both these types. The two-piece Colchesters are mainly leaded bronzes, the common alloy used for them, while Nos 255 and 258 contain far less lead, unusual but not unique compositions.

Trumpet brooches are found in a wide range of alloys so these leaded gunmetals (Nos 186 and 248) are not unexpected, though insufficient analyses are available to allow for comments on the relationship between composition and sub-type. The sheath-footed brooches are all leaded bronzes or gunmetals, as are most of these types. The two divided bow brooches are tinned and possible traces of tinning were also noted on No 44. The disc brooch is a leaded gunmetal, a composition not unexpected for the type.

Table: Analytical Results

<u>Brooch type</u>	<u>Ae number</u>	<u>Composition</u>
? La Tène I	351	Bronze
Nauheim derivative	259	Bronze
? 1-piece	283	Bronze
Hod Hill	252	Brass + tinning

Table (continued)

Hod Hill (cont.)	260	Brass + tinning
1-piece Colchester	249	Brass
	251	Brass
2-piece Colchester	27	Leaded bronze
	102	Leaded bronze
	187	Leaded bronze
	253	Leaded bronze
	254	Leaded bronze
	255	(Leaded) bronze
	256	Leaded bronze
	258	Bronze
	301	Leaded bronze
	348	Leaded bronze
Trumpet	186	Leaded gunmetal
	248	Leaded gunmetal
Divided bow	250	Leaded bronze + tinning
	257	Leaded gunmetal + tinning
Crossbow	28	Leaded bronze
	112	<i>Leaded</i> gunmetal
Sheath-footed	44	Leaded gunmetal ?? tinning
Disc	119	Leaded gunmetal
?	147	Bronze

The non-brooches include three objects submitted directly to AML (AM Nos 831661-3) and one which was in with the brooches.

Ae 147 (with the brooches) was bronze. Ae 262 (AM 831663) was a gunmetal. The reddish-brown corrosion layer is a product of the conditions in which it was buried and not specifically related to the composition of the metal.

Ae 270 (AM 831661) was a circular seal-box with an enamelled lid. The pattern was in red with an opaque turquoise background, the design being executed in reserved metal.

Ae 271 (AM 831662) was also a seal box. The enamel in the main field was much decayed but was originally red. The original colour of the enamel in the small circular field could not be determined as only traces of greenish material, possibly corrosion products, survived.