'BELL-SHAPED STUDS'?

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One of the most common finds from Roman sites, particularly in the north of Britain, is the 'bell-shaped' stud. It is also one of the more puzzling finds with almost as many suggestions for its use as there are examples known. Because of this lack of clear identification the present author coined the phrase 'bell-shaped stud' on the grounds that they could all be described as roughly bell-shaped and had shanks.[1]

The object in question consists of a cast circular bronze head with a countersunk face, in the centre of which there is either a dimpled boss or cone (Fig.1). Some of the central bosses do not project beyond the lip whilst others project several millimetres. The studs themselves vary remarkably in size from 13mm to 57mm in diameter. The heads are decorated with lathe-incised concentric circles on the faces and occasionally around the waist and skirt.

The studs divide into two clear types: those with an iron shank secured in a trough in the head by lead, and those with a bronze shank cast in one with the head. The method of caulking an iron shank to a bronze head with lead is also known on the dome-headed studs from northern military sites, particularly the 4th century fort at Piercebridge.[2] The iron shanks of Type 1 tend to be roughly square in section and, as far as one can tell after corrosion, seem to be quite short. The bronze shanks of Type 2 are much longer (up to 60mm) and twice as wide as they are thick. Complete examples of this type have a circular hole near the end of the shank and some have pieces cut from the edge of the shank.[3]

Types 1 and 2 have been regarded until recently merely as variations of the same object having the same function, and there have been numerous suggestions as to the character of that function. Curle in 1911 called the Newstead examples 'bolts for fastening lockplates'.[4] Kenyon referred to the Leicester studs as 'handles from boxes or drawers'.[5] Webster, in his catalogue of military bronzes at the end of the article 'The Advance under Ostorius Scapula', described them as 'probably decorations for a vehicle or piece of furniture although the suggestion has been made that they are the ends of keys or latch-lifters'.[6] This latter suggestion had been made by Jacobi in 1897.[7] In 1979 the present author interpreted them as doorstuds of the type commonly

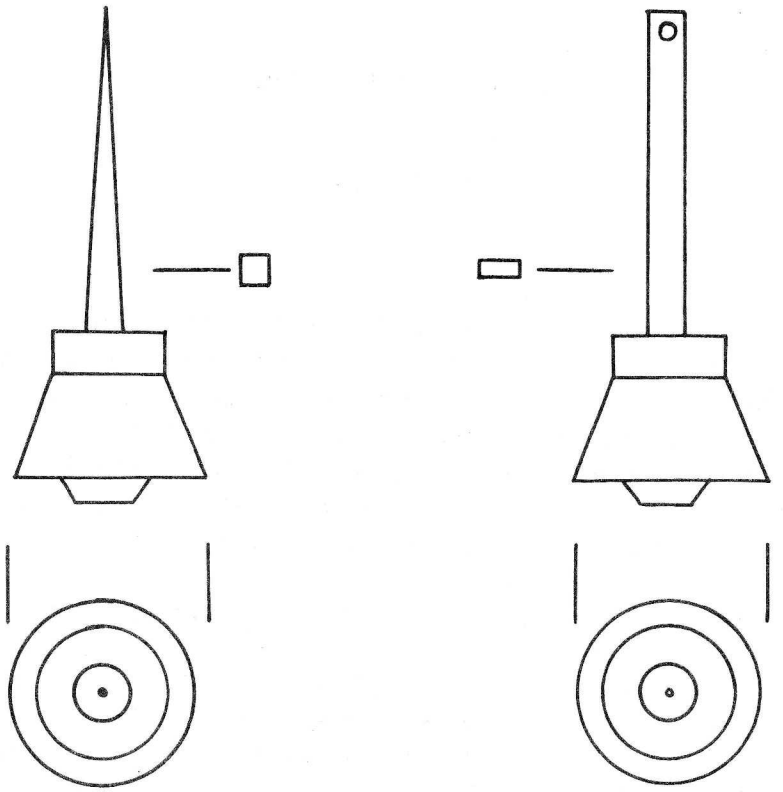


Fig. 1: Bronze bell-shaped studs. Drawn by W. Hubbard.

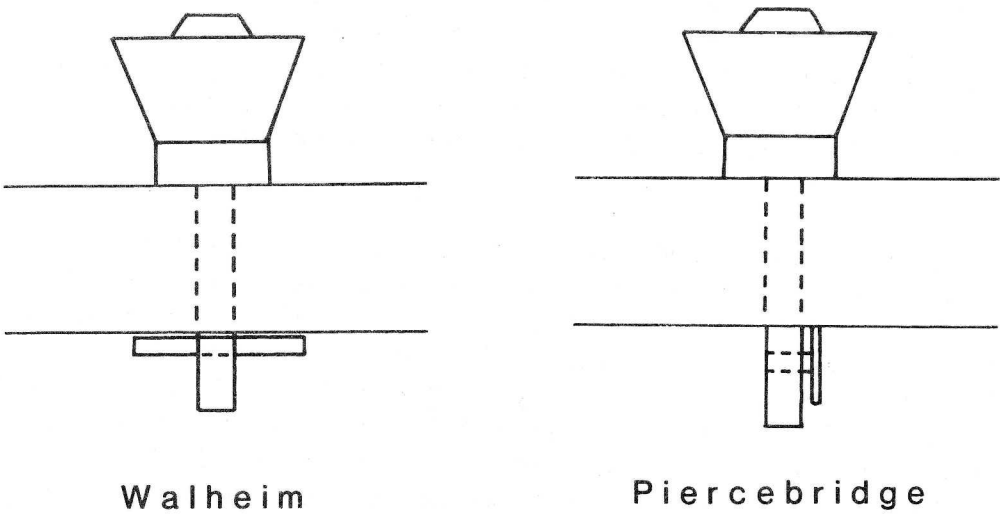
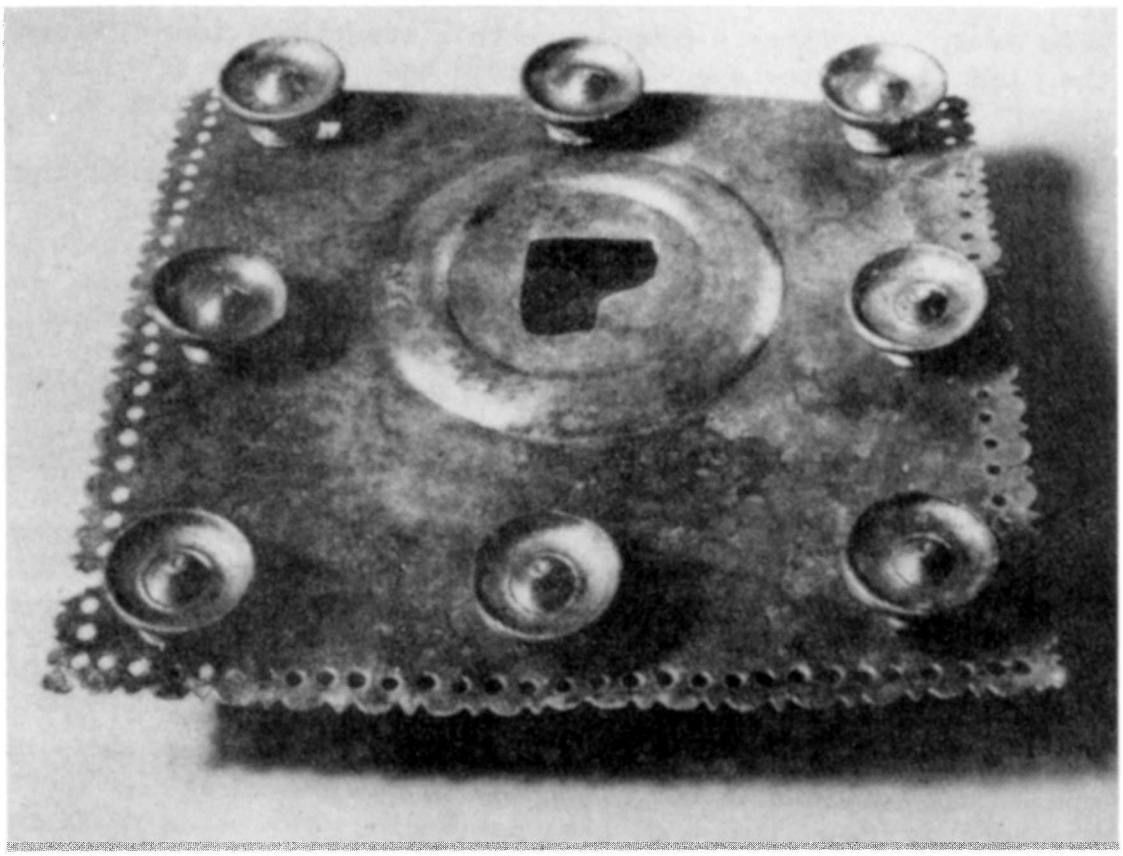


Fig. 2: Methods of fastening the studs. Drawn by W. Hubbard.

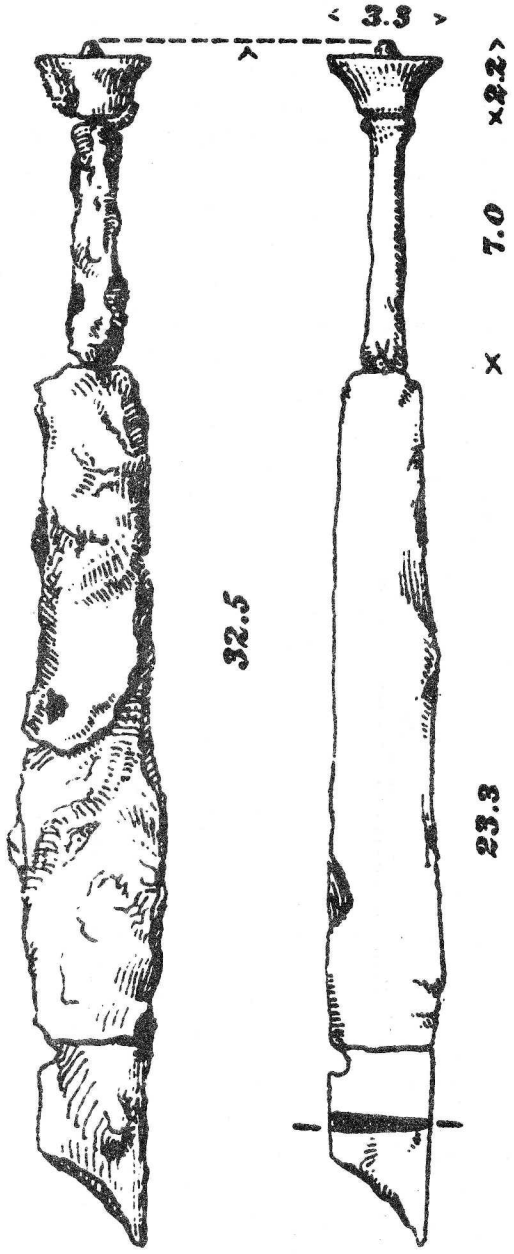
found on medieval church doors and known in modern building parlance as 'Spanish studs'.[8] That such studs were being used during the Roman period can be seen on coins, e.g. a sestertius of Nero showing the closed doors of the temple of Janus on the reverse.[9]

In 1982 Planck published a group of eight studs found in position on a plate from a wooden chest or box found at Walheim in West Germany (Pl.I).[10] This may not appeal to modern taste yet it appeared to solve the problem of how bell-shaped studs were used. Two factors complicate this identification. Firstly the length of the shanks. It would have been a massive box to warrant a stud shank of 60mm, the length of several examples from Piercebridge and thicker than a door to a modern room. It is therefore possible that they were used, not only for fixing a plate over the entire surface of a casket but also to fix a lockplate to a substantial chest. A bronze bar piercing the chest wall and fixed by a metal rod would ensure that the lock could not be wrenched or levered off. The second factor is the small disc-headed stud found in position in the hole at the end of the shank on a Type 2 stud from Piercebridge (Fig.3).[11] If this was used as a box decoration with the smaller stud acting as a chock, 20mm of shank would project inside. Several of these would limit the internal area of a small box and would catch on the contents. The limited length of the small stud's shank which barely projects through the hole coupled with the diameter of the head (10mm) makes it unsuitable for securing the shank through wood - to hold the main stud firmly a rod which could be held tightly against the box wall would be more efficient (Fig.2). The implication is that this particular stud may not have been used in the same manner as the Walheim studs. The shank has obviously been intended to be covered as the surface has been roughly filed and the patination is of a different quality to that of the head. It is possible that the shank was attached to a second material rather than intended to penetrate wood and the limited length of the smaller stud might suggest leather or cloth. However, it is equally possible that this bell-shaped stud was used as a box fitting and the small disc-headed stud used to replace a missing rod - a 'Heath Robinson' repair.

Despite these two factors there seems to be little doubt that the majority of Type 2 studs were intended to be used as box fittings of one sort or another. It is possible that they were designed to allow the boxes to be stacked, holding each box clear of the locks or decorative panels of the others. However, when one looks at the Type 2 studs in the light of this identification several problems arise. Firstly, none of the Type 1 studs have been found attached to boxes and the majority of them appear to come from military contexts rather than from civilian sites. The



Pl. I: Box plate from Walheim. Taken from PLANCK 1982.

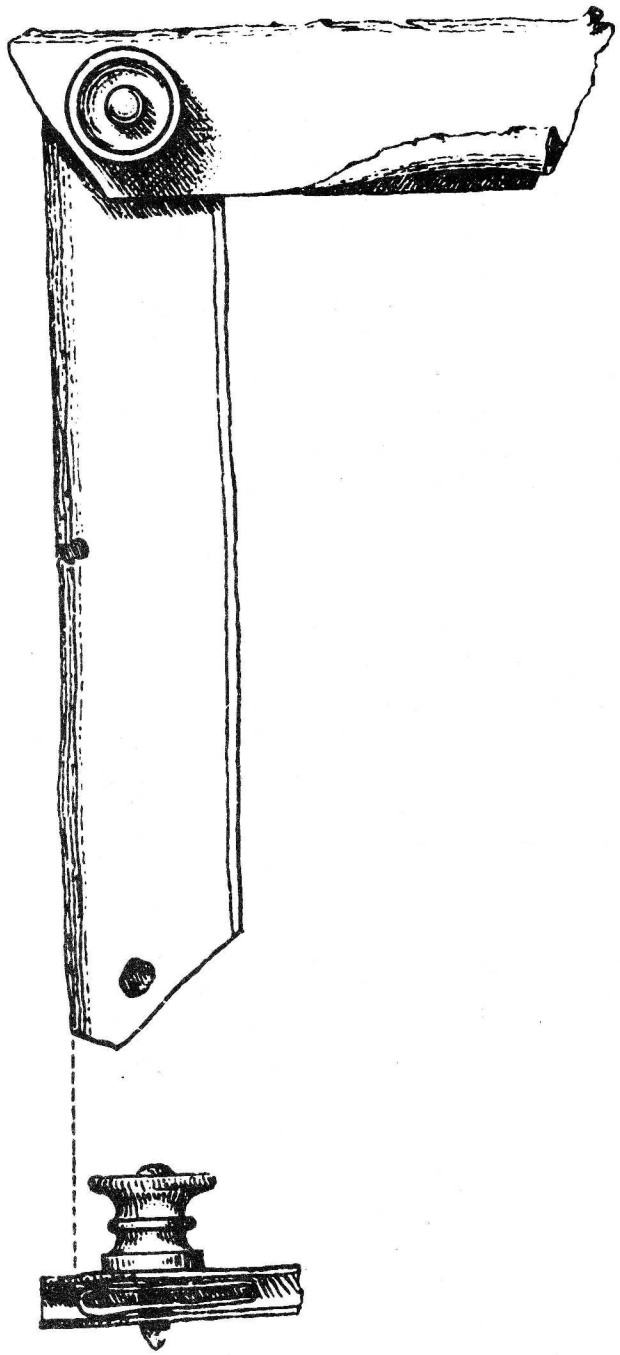


Pl. II: Bell-shaped stud from Carnuntum used as a dagger pommel. Taken from RLÖ III, 1902, Taf.X.

two from Shakenoak and one from Newport (Isle of Wight) seem to be the exception rather than the rule.[12] Secondly, all eight of the Walheim studs are exactly the same: they are a matching set of the same size with the same decoration and apparently come from the same mould. A similar casket from Pfünz published by Winkelmann in 1926 also shows a set of six matching studs on the upper plate.[13] In contrast there are forty-nine examples of Type 1 studs from the 19th and 20th century excavations at South Shields, not one of which can be found to match another. It would be inconceivable that on one site forty-nine boxes would each lose a single stud, particularly as the excavated area was limited in size.[14] The recently excavated material from Housesteads, Piercebridge and Wallsend has also failed to produce any matching studs. Coventina's Well at Carrawburgh produced the most interesting group in this respect: the Well consists of a stone trough 8'6" X 7'9" internally and 7' deep, which was sealed in the early 4th century by large slabs of stone.[15] Seven bell-shaped studs were found in the votive deposit in the Well - four of Type 1 and three of Type 2, all varying in size and appearance. The diameter of the Type 1 studs range from 25mm to 35mm and the Type 2 studs from 42mm to 57mm. This must suggest that these particular examples were used singly rather than in sets. There would be little point in throwing a single stud from a box into a votive deposit.

In 1902 a bell-shaped stud from Carnuntum was published which had been found in situ as the pommel of a short sword or dagger (Pl.II).[16] The text states that many more 'Schwertknäufe' were found but omits to say how many. In 1904 Groller showed a second stud in diagram form used in the same way but did not make it clear if the stud was found in situ or if the author was merely explaining its use on the evidence of the 1902 stud.[17] In 1909 another, found at Lauriacum, was identified as a dagger pommel although attention was drawn to their use as box decorations, unfortunately giving no parallels.[18] A single stud found in a male grave from Fischamend (Aquinoctium) on the R. Leithen in Austria, adds to the evidence.[19] Their use as dagger pommels might explain the individual examples found on military sites although the quantities involved imply an unmilitary carelessness.

Close scrutiny of the article by Groller in 1902 reveals a possible second use for the Type 1 studs as a hinge for a bronze border or guard, apparently a dolabra-sheath (Pl.III).[20] Such sheaths were fitted over the cutting edge of military axes and held in place on either side of the blade by hooks which were tied by cords to the wooden hafts.[21] Some of the studs from Piercebridge which have fragments of thick bronze sheet under the heads may have been used in this way.



Pl. III: Bell-shaped stud used as a dolabra-sheath. Taken from RLÖ III, 1902, Taf.X.

The studs of both types which come from dated contexts in Britain suggest that they were used over a long time span. They are present at the Agricolan supply base at Corbridge Red House which cannot have continued in occupation long after A.D.90[22] but none have been found at the main site at Corbridge which was built in A.D.90 and continued in some form of occupation into the 4th century. Why there should be a dearth at Corbridge is unclear particularly when most of the other excavated forts along the line of Hadrian's Wall and the Stanegate have produced them.[23] Their use in the 2nd century A.D. is implied by their discovery at Sewingshields, a milecastle on Hadrian's Wall which had limited use in the 2nd century before being abandoned and reused as a metalworking factory in the 4th century,[24] and at the wall forts of Housesteads, South Shields and Wallsend - sites which had no 1st century occupation. Their survival into the 4th century is indicated at Piercebridge which is believed to have been built in the time of Constantius or Constantine.

On the Continent they have been found at Kapersburg which was built around A.D.100 and abandoned in the middle of the 3rd century,[25] and at Stockstadt, Saalburg, Zugmantel and Pfünz, which were all built under Domitian and abandoned in the mid 3rd century.[26] The box from Walheim has been dated to the second half of the 2nd century.[27] So far no reference has been found to their discovery in Gaul or Italy.

A group of ten Type 1 studs from Piercebridge were analysed semi-quantitatively by energy dispersive X-ray fluorescence by Justine Bayley and Brian White (see table). They proved to be of leaded bronze or gunmetal which is somewhat surprising in view of the suggestion that military fittings were normally brass.[28] If they were domestic fittings then their composition, a mixture of leaded alloys, is what would normally be found for massive castings where mechanical strength was not important. This seems to contradict the evidence that most Type 1 studs are found in military contexts but the date range is so extensive that the apparent contradiction may not be significant.[29]

To conclude one can suggest that the Type 2 studs were used for attaching decorative panels or lock-plates to boxes or chests but that the Type 1 studs were used for a variety of purposes. Although both can be found throughout the Roman period Type 1 studs tend to cluster on military sites whilst Type 2 studs can be found in either military or civilian contexts. To test these hypotheses more information is required as to the context and association with other finds of each bell-shaped stud found in future excavations.

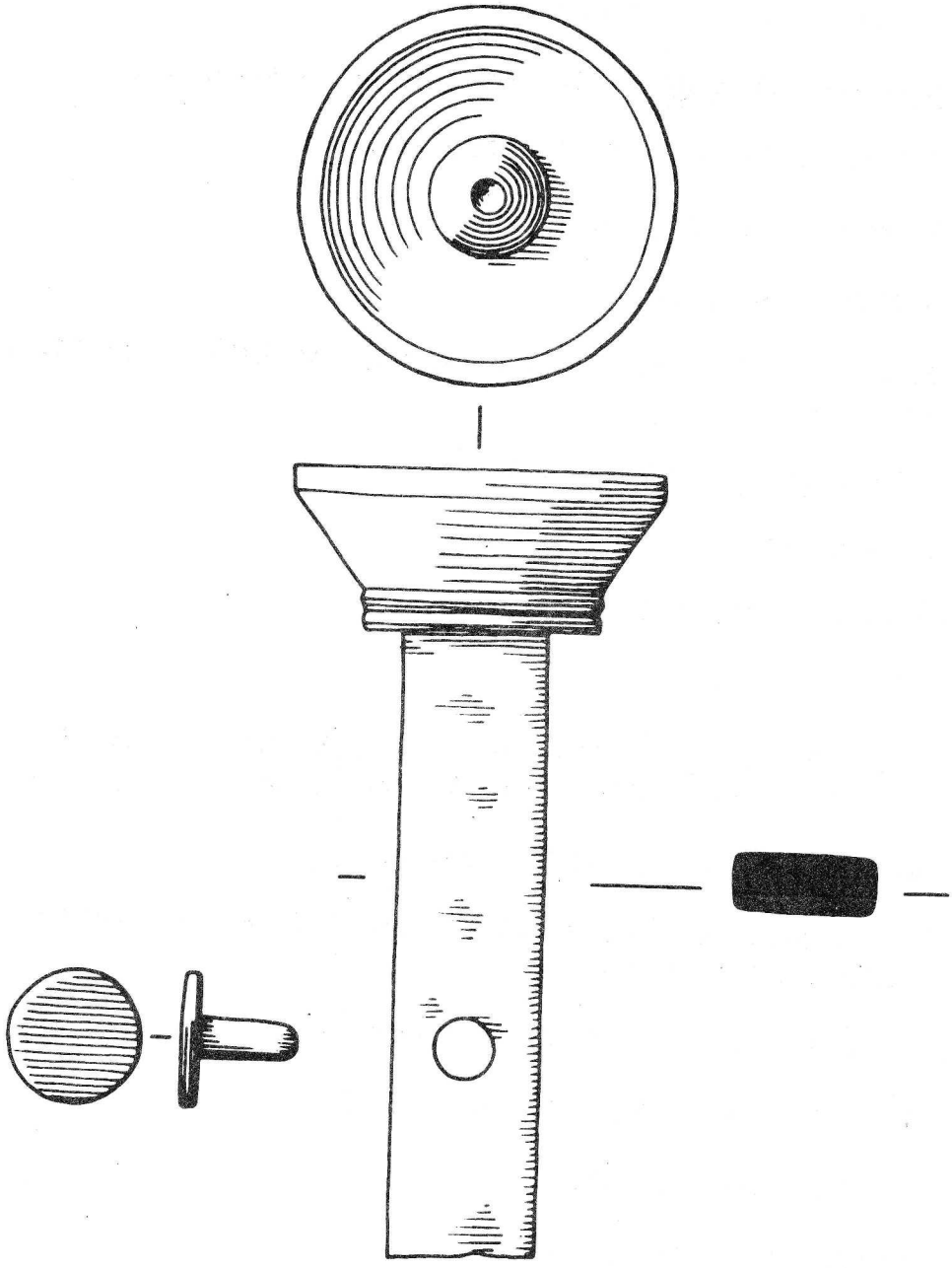


Fig. 3: Bell-shaped stud from Piercebridge. Drawn by S. Morris.

FOOTNOTES

1. HANSON et al., 1979, 62.

2. Allason-Jones, in preparation.

3. Saalburg Jahrbuch, VII, 1930, Taf.X, nos.15, 18.

4. CURLE, 1911, 306 & Pl.LXXVIII, No.10.

5. KENYON, 1948, fig.88, No.23.

6. WEBSTER, 1960, 94.

7. JACOBI, 1897, fig.76, nos.49, 56, Taf.XXXXV, nos.14, 15, 18, 19.

8. HANSON et al., 1979, 62-64.

9. SUTHERLAND, 1974, no.309.

10. PLANCK, 1982, 123.

11. SF No.129 v38.

12. BRODRIBB et al., 1968, Part I, fig.3, no.53; Part II, fig.50, no.124. STONE, 1929, 148, fig.2, no.12.

13. WINKELMANN, 1926, p.103, Abb.22.

14. ALLASON-JONES & MIKET, 1984, nos. 3.889 - 3.995; DORE & GILLAM, 1979, fig.2.

15. ALLASON-JONES & MACKAY, forthcoming.

16. RLÖ III, 1902, Taf.VIII, nos.23, 24, 25.

17. RLÖ V, 1904, Fig.33.

18. RLÖ X, 1909, fig.36, no.7.

19. RLÖ V, 1904, fig.11, p.23.

20. RLÖ III, 1902, Taf.X, fig.1.

21. See examples from Vindonissa illustrated in CURLE, 1911, p.279, fig.39.

22. HANSON et al, 1979, 62.

23. E.g. Benwell: Museum of Antiquities of the University and Society of Antiquaries of Newcastle upon Tyne Acc.No. 1926.23; Chesters: Chesters Museum 1467, 2538, 2984, 2989, 2542, 2982, 1492, 1469, 887; Wallsend: SF Nos. 125, 839, 1053, 1135, 1340; Vindolanda: BIDWELL, P., forthcoming; Carlisle: Blackfriars SF No.77.

24. Archaeologia Aeliana[5] XII, 1984, p.78, fig.12, nos.13, 14.

25. ORL 12, Taf.VII, no.24.

26. ORL 33, Taf.VII, no.43; JACOBI, 1897, Taf.XXXXV, nos.14, 15, 18, 19; ORL 8, Taf.XIII, nos.60, 67, 68, 71; ORL 73, Taf.XIV, nos.72, 79.

27. Personal comment from D. Planck.

28. Bayley, in preparation; Craddock, P.D., pers. comm.

29. Cf. brooches: Bayley, J., 'Copper alloys and their use in Iron Age and Roman Britain', a paper presented to the 1984 Symposium on Archaeometry, Smithsonian Institute, Washington.

TABLE OF RESULTS

AM Lab. No.	**XRF peak heights**				**Alloy**
	Copper	Zinc	Lead	Tin	
841146	65500	-	5550	1070	Leaded bronze
841147	65500	-	19800	2000	Leaded bronze
841148	25500	-	3600	400	Leaded bronze
841149	55200	-	9400	570	Leaded bronze
841150	65500	8000	1500	400	(Leaded) gunmetal
841151	61300	-	3500	590	(Leaded) bronze
841152	56600	8800	4800	230	Leaded gunmetal
841153	32300	3600	5500	600	Leaded gunmetal
841154	65500	6350	380	405	Gunmetal
841155	65500	1250	2730	275	(Leaded) bronze/ gunmetal

NOTES TO TABLE

'(Leaded)' alloys probably contain less lead than 'Leaded' ones; all contain more than a few percent of the metal. Bronzes are copper-tin alloys while gunmetals also contain significant amounts of zinc. Pure copper-zinc alloys are called brasses. Different elements fluoresce more or less strongly so the absolute figures cannot usefully be compared. It is the values of the ratios of each element to copper which are compared with ratios obtained from objects of known composition and so provide an indication of the types of alloy used.

ABBREVIATIONS

RLÖ - Der römische Limes in Österreich
ORL - Der obergermanisch-raetische Limes der Römerreiches

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