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ROMAN WEAPONRY IN THE PROVINCE OF BRITAIN FROM THE SECOND CENTURY TO THE FIFTH CENTURY AD.

TWO VOLUMES

By David John Marchant.

Ph.D Thesis

University Of Durham,
Department Of Archaeology

(1991)

Volume I

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- 8 JUL 1992

ROMAN WEAPONRY IN THE PROVINCE OF BRITAIN FROM THE SECOND CENTURY TO THE FIFTH CENTURY AD.

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Abstract.

This thesis deals with the weapons of the Roman army in Britain from the beginning of the 2nd century AD until the end of Roman rule in the early 5th century. Initially the various categories of evidence - literary, pictorial and archaeological - are examined, to try and assess their reliability. Then some attention is given to where and by whose authority weapons were produced. The main part of this work is based around the large body of material remains from this country. Individual chapters on each class of weapon discuss the historical references and group the finds according to size, shape or decoration. Some attention is paid to how different weapons were used and how effective they were and to which kinds of units were using particular types of weapon. Throughout, the supposed differences between legionary and auxiliary equipment are analysed, as well as the continuity or lack of it with the arms of the 1st century AD. Reasons behind changes in armament are also discussed. Careful use is made of parallels from other parts of the empire, to place the Roman army in Britain in its wider context.

ROMAN WEAPONRY IN THE PROVINCE OF BRITAIN FROM THE SECOND CENTURY TO THE 5TH CENTURY AD.

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List of Abbreviations used in the text and the bibliography.

A.A.	Archaeologia Aeliana.
A.C.	Archaeologia Cambrensis.
A.I.W.	Archaeology in Wales.
Arch.J.	The Archaeological Journal.
A.J.	The Antiquaries Journal.
AML.	Ancient Monuments Laboratory (London).
BAR.	British Archaeological Reports.
B.B.C.S.	Bulletin of the Board of Celtic Studies.
B.J.	Bonner Jahrbücher.

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B.R.G.K.	Bericht der Römisch-Germanischen Kommission.
C.A.	Current Archaeology.
C.B.A.	The Council for British Archaeology.
C.I.L.	Corpus Inscriptionum Latinarum.
D.A.J.	Derbyshire Archaeological Journal.
D.E.S.	Discovery and Excavation in Scotland.
H.B.M.C.	The Historic Buildings and Monuments Commission for England and Wales.
H.M.S.O.	Her Majesty's Stationary Office.
I.L.S.	Inscriptiones Latinarum Selectae.
J.C.A.S.	Journal of the Chester and North Wales Archaeological Historic Society.
J.O.A.I.W.	Jahreshefte des Österreichischen Archaeölogischen Institutes in Wien.
JRS.	The Journal of Roman Studies.
L.A.A.A.	Liverpool University Annals of Archaeology and Anthropology.
M.A.	Museum of Antiquities, Newcastle.
O.L.D.	The Oxford Latin Dictionary.
O.R.L.	Der Obergermanische-Raetische Limes Des Röemerreichs.
P.L.P.L.S.	Proceedings of the Leeds Philosophical and Literary Society..
P.S.A.L.	Proceedings of the Society of Antiquaries of London.
P.S.A.N.	Proceedings of the Society of Antiquaries of Newcastle-upon-Tyne.
P.S.A.S.	Proceedings of the Society of Antiquaries of Scotland.
R.I.B.	Roman Inscriptions in Britain (Collingwood and Wright).
R.L.O.	Der Römische limes in Osterreich.
S.J.	Saalburg Jahrbuch.
T.A.A.S.D.N.	Transactions of the Architectural and Archaeological Society of Durham and Northumberland.
T.B.W.A.S.	Transactions of the Birmingham and Warwickshire Archaeological Society.
T.C.W.A.A.S.	Transactions of the Cumberland and Westmoreland Antiquarian and Archaeological

	Society.
T.D.G.N.H.A.S.	Transactions of the Dumfriesshire and Galloway Natural History and Archaeological Society.
T.E.A.S.	Transactions of the Essex Archaeological Society.
T.L.M.A.S.	Transactions of the London and Middlesex Archaeological Society.
W.A.N.H.M.	The Wiltshire Archaeological and Natural History Magazine.
W.M.A.N.	West Midlands Archaeological Newsheet.
Y.A.J.	The Yorkshire Archaeological Journal
Y.A.T.J.	The Yorkshire Archaeological and Topographical Journal.

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Sources of Illustrations.

All of the illustrations were provided by the present

author, with the following exceptions:-

Plate 1 no.1 was supplied by the North West Museum and Art Gallery Service, Griffin Lodge, Blackburn, Lancashire.

Plate 1 no.2 was supplied by The Royal Museum of Scotland, Queen St., Edinburgh.

Plate 4 no.s 1-2 were supplied by the Museum of London.

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ROMAN WEAPONRY IN THE PROVINCE OF BRITAIN FROM THE SECOND CENTURY TO THE FIFTH CENTURY AD.

Introduction

This thesis is a detailed study of the weapons of the Roman army in one province and within a limited time period. The choice of this area of research calls for some explanation. Firstly, the material from Britain was the most readily available. The decision to exclude finds dating to between 43 and 100 AD may seem odd, but was based on sound reasons. The Roman army of the 1st century AD has been intensively studied and as further projects were underway when this thesis commmenced, it was felt wise to avoid excessive duplication of effort. The corpus is in any case still a very large one. Nevertherless the 1st century has not been completely ignored. Pre-2nd century finds are discussed where they contribute to our knowledge of later weaponry.

The objects chosen for study are exclusively the offensive equipment of Roman troops. Defensive items such as shields, helmets and body armour are excluded.

Sampling strategy was determined by a number of factors. Priority was given to the Hadrian's Wall area, since for much of the province's history it was the most important and most heavily garrisoned frontier.

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Due care and attention was also given to the Hinterland forts, the Antonine Wall, Wales and the Saxon Shore. All of the major collections were visited and as many of the others as time permitted. Every attempt was made to produce a representative sample. Most of the material which could not be directly examined can be found in the published works listed in the bibliography.

The question of dating is a crucial one. Unfortunately only a small proportion of the finds can be firmly dated by their contexts. In dating weapon "types" I have tried where possible, to rely on the well stratified evidence. All too often however, one can only give a broad date range based on the known history of the site. Dating by form alone is very dangerous and I have generally avoided doing so.

The aims and objectives of the thesis broadened as the work progressed. A primary task was to identify and catalogue the various classes of weapons. This in itself seemed worthwhile, as nothing on this scale had been attempted before.

A number of other questions interested me and are dealt with in detail. For example; can one see clear distinctions between legionary and auxiliary equipment in this period? If not, then what are the tactical/strategic implications of this?

I also intended to show how and when Roman equipment changed and the reasons behind the changes. Attempts were made to trace finds specific to individual units or types of unit. Models of weapon production were analysed and their relative importance assessed. Finally, since Britain was only one province in a very large empire, it was necessary to take a wider view. Is there good evidence for local production? How far did ideas and practices from other areas affect equipment used in Britain? It is hoped that the present work provides enough data to answer some of these questions.

I. The Nature of the Evidence: Literary, Pictorial and Archaeological.

Before examining the actual remains of Roman weapons from Britain, it is essential to consider the different sources of evidence for the study of the weaponry and to try and assess the reliability of these sources. Broadly speaking they can be divided into three categories, namely:- 1. The writings of contemporary or near contemporary Greek and Roman authors. 2. Sources actually depicting Roman weapons. This category includes such things as sculptures on monuments, tombstones, mosaics and even images on coins. 3. The archaeological evidence, consisting of numerous finds of weaponry recovered from the ground. Obviously the prime source of information but not without its problems.

Literary Evidence.

There are many texts from the Roman period which deal at least to some extent with the campaigns of the Roman army. These often constitute a very valuable source of information, against which we can check the knowledge derived from archaeology. In some cases the written sources provide details about weapons which have not yet been found or recognised. But there are nonetheless some grave defects with the Ancient literature which can cause problems. One difficulty is created by a serious imbalance in the nature of the texts. There are only a few works surviving which were written by military men and show a detailed knowledge of the methods of warfare. More references to weaponry occur in general historical works, specialist treatises on non-military subjects and even on occasion in poems. Such references can be useful but the terminology employed is often vague. Many of the writers to be considered here were civilians, with little or no direct experience of army life. Indeed when all is said and done there are hardly any detailed descriptions of Roman weapons in the literature of the period. Most Roman writers would have considered such information as uninteresting to their readers or else too commonplace to be worth mentioning. Even that seasoned

soldier Julius Caesar has very little to say about weapons in the accounts of his campaigns. It is no coincidence therefore that two of the primary texts for any study of the Roman army were written by non-Romans - Polybius (a Greek) and Josephus (a Jew). Both were writing for non-Roman audiences and therefore felt the need to explain some of the intricate details of the Roman military system.

A further problem has to do with the chronological distribution of the texts. There is a shortage of useful/reliable sources for much of the period under discussion, especially the 3rd century AD. This is unfortunate since it was a transitional period for the Roman army. There is much of value to be gleaned from Late Republican writings and those of the 1st century AD. The use of these sources can be justified, not only on the grounds of the sparsity of later material but also because it is clear that Roman weaponry evolved in a very gradual way. The start of the 2nd century AD did not see overnight changes in the weaponry of the Roman army, rather it provides a convenient starting point for this study. Some account has to be taken of 1st century equipment therefore as much of it continued to be used for a longtime thereafter. Likewise it is of interest to look at some 6th/7th century works, if only to show that there was some continuity after the fall of the western empire. Unfortunately very little of the literary evidence relates directly to Britain and we must therefore be cautious since the archaeological evidence does show that there were regional variations in equipment not only between provinces but even within a single province.

A. Republican sources.

Julius Caesar (100-44BC).

Caesar's account of his campaigns in Gaul between 58 and 50BC is extremely detailed, but there are surprisingly few specific references to weapons. Those that there are include a description of the battlefield use of the pilum (I,25) and passing mentions of Balearic slingers (II,7), clay slingshot (V,43) and the Verrutum (V,44), a kind of

spear or dart. The Bellum Africum, written by one of Caesar's lieutenants refers to arms production in camps (72). In the Spanish War, lead sling shot are mentioned (18).

Dionysius of Halicarnassus (1stc BC).

The author was born between 69 and 53BC, but the date of his death is unknown. His 'Roman Antiquities' covers the history of Rome from legendary times down to the start of the 1st Punic war. There is a description of the pilum (V,461-2) and a mention of slingers and stonethrowers in the Roman army in 279BC (XX,1).

Livy (59BC-17AD).

Livy's 'History of Rome' deals with the period from Rome's foundation down to the authors' own times. The battle accounts tend to be atmospheric rather than informative. He refers in passing to the gladius (VII,10,5), the hasta and the gaesum (VIII,8,5), the pilum (X,39,12) and the Verrutum (XXI,55,11). None are described in detail. The reference to the gladius in 331BC must surely be an anachronism.

Polybius (c208-126BC).

An extremely gifted historian and an observer of some of the events that he describes. Polybius's 'Histories' deals with the years 264-146BC. His description of the Roman army of that period is extremely detailed. He describes the pilum (VI,23,9-11) and the gladius (VI,23,6-7) and mentions the hasta (VI,23,16) and the gaesum (II,22,1; II,28,3; II,30,5; II,34,2; VI,39,3).

Sallust (86-34BC).

According to Sallust (Bellum Catilinae LI,38) the Romans derived their weapons from the Samnites. There is no evidence for this, except possibly in the case of the pilum (see page 177).

Virgil (70-19BC).

In his work The Georgics (I,309) Virgil refers to

Balearic slings made of hemp.

Xenophon (c431-354BC?).

Xenophon's 'Anabasis' is an account of the retreat of a group of Greek mercenaries across the Persian empire to their homeland in 401BC. His work is of interest in the present context because of several comments on the relative effectiveness of the bow and the sling (III,3,15; III,4,15). These need to viewed critically however.

B. The 1st century AD.

Celsus (c25BC-?).

Celsus's treatise 'De Medicina', perhaps written in the reign of Tiberius, contains some enlightening comments on the wounds caused by arrows, slingshots and spears (V,26,5; VII,5,1-5).

Josephus (37-c92AD).

Flavius Josephus's 'Bello Judaico', dealing with the Jewish revolt of 66-73AD contains some valuable discussion of the equipment of the Roman army, notably the arms and armour of legionaries and auxiliary cavalry (III,94-6) and the efficacy of artillery (III,243-7; V,269-73). He is not always very accurate, as when he states that legionaries wore their swords on the left side and their daggers on the right. His comments on artillery may be somewhat exaggerated.

Lucan (39-65AD).

Wrote an epic poem in ten books on the war between Julius Caesar and the Senate commonly referred to as 'Pharsalia'. At one point (III,110-112), he refers to the use of lead slingshots.

Pliny the Elder (23-79AD).

Pliny's 'Natural History' is a collection of information on all manner of subjects. His section on iron includes some details on how the metal is worked (XLI,146;

XLIII,149) and he expresses his sorrow that iron has been used to make implements of destruction, (XXXIX,138-9).

Plutarch (c50-120AD).

Plutarch's 'Lives' originally consisted of 22 pairs of biographies of famous Greeks and Romans, as well as some single Lives. The Life of Marius (XXV,3) contains a description of the pilum at the close of the 2ndc BC and there are some less important comments on the same weapon in the Life of Camillus (XL,4; XLI,4).

Suetonius (c69-141AD?)

Suetonius Tranquillus was the author of a collection of imperial biographies known as 'The Twelve Caesars' which covers the period from Julius Caesar to Domitian. Gossipy in tone and with a preference for lurid details there is little of direct interest to the military specialist. One interesting passage in the biography of Domitian refers to the creation of a new type of lance by a governor of Britain (Domitian, 10).

Tacitus (55-c120AD).

Gaius (or Publius) Cornelius Tacitus was the foremost historian of his age. Three of his main works- 'The Annals', 'The Histories' and 'The Agricola' include substantial battle scenes. There are however no detailed descriptions of weapons - Tacitus was evidently not interested in such matters. He is a valuable source nonetheless because he does mention many different types of weapons, including some not normally associated with Roman troops e.g. axes and stones.

Vitruvius.

Very little is known about the author, but his treatise 'De Architectura' was written sometime in the reign of Augustus. Included in this work are detailed descriptions of how to build arrow-firing and stone-throwing artillery (X,10-12). These are phrased in very technical terms (including dimensions for each part) and must be considered a sound source of evidence.

C. The 2nd and 3rd centuries AD.

Appian (c95-165AD).

Appian's 'Roman History' was written in the reign of Antoninus Pius. The work deals with the period down to 35BC, describing the wars waged by Rome against various peoples, treating each geographical area in turn. There are a couple of references to weaponry, of minor importance. There is a description of how the pilum was used in battle (Gallic History 1) and a mention of lead sling bullets (Civil Wars IV,36).

Arrian.

Lucius (or Aulus) Flavius Arrianus was born in Bithynia, probably not after 89AD and died before 180AD. He was governor of Cappadocia from c132-137 and saw some active service against the Alans. He was thus directly acquainted with warfare. In his 'Order of battle against the Alani' he shows the pilum being used as an anti-cavalry pike (16-17) and there is a description of the battlefield deployment of artillery (19). In his other major work 'Tactica', Arrian refers to the spatha (43,3), the Kontos (4,3), axes (4,8), the lancea (4,9) and various missile weapons (43,1).

Aulus Gellius (c123-169AD?).

Gellius's 'Attic Nights' is a collection of information on a wide range of subjects, rather like Pliny's 'Natural History'. It was probably written in the reigns of Antoninus Pius and Marcus Aurelius. In the tenth book (XXVI,1-4) there is a little known but fascinating list of weapons, not only Roman, but also Spanish, Celtic, Thracian, German and Dacian arms as well.

Cassius Dio (c163-235AD).

Dio's 'Roman History' written in 80 books covers the period from the arrival of Aeneas in Italy until 229BC. There are many references to weapons, but none of much value. Dio's battle scenes are dramatic but lacking in much factual detail.

Florus.

Possibly to be identified with P. Annius Florus, a poet and a friend of Hadrian. His 'Epitome of Roman History' deals with the period from Romulus to Augustus. He includes a description of Balearic slingers (I,43), possibly drawing his information from the very similar account of Diodorus Siculus (V,18).

Herodian.

The dates of birth and death of the author are unknown, but he was certainly an eye-witness to some of the events he described. His work covers the period 180-238AD and may have been written in the reign of Phillip the Arab (244-249AD). As with Dio, Herodian's battle scenes are artistic rather than factual. There are only a few useful passages, one concerning daggers (II,13,10) and another about artillery (III,9,4-7).

D. The 4th and 5th centuries AD.

Ammianus Marcellinus (c330AD-?).

His work was intended as an account of the period from 96AD down to his own days, but only the portion covering the years 353-378AD now survives. Ammianus deals in detail with military operations of the period, notably campaigns in Gaul and Persia and there are many references to weaponry. Of particular value are his descriptions of three types of weapon:- the ballista (XXIII,4,2-3), the onager (XXIII,4,4-7) and fire arrows (XXIII,4,14-15). Since he was a serving soldier and was present at some of the engagements discussed he would have been familiar with all manner of military equipment. Ammianus is therefore a prime source for the study of the later Roman army.

Claudian (c370-404AD).

Wrote panegyrics to the Emperor Honorius and to Stilicho, attacks on various corrupt officials and a large number of poems. There are a few mentions of weapons in his works but we have to beware here of anachronisms and artistic licence. Claudian was not primarily concerned with providing authentic details but with eulogising (or

condemning) his subject. He refers without comment to the gladius and the hasta (Second Book against Rufinus lines 384, 407) and to lead slingshots (Panegyric on the 3rd consulship of Honorius, line 50).

The De Rebus Bellicis.

This anonymous text was probably composed in the joint reign of Valentinian I and Valens (364-375AD). 'On Matters Military' puts forward a number of suggestions/inventions of the author which were designed to help save the empire. These include known weapons like the plumbatae (X-XI) and two otherwise unattested types of ballista (VI,XVIII). We cannot be sure that the latter ever existed. The artillery machines are described in very simple terms and the accompanying illustrations (copies many times removed from the originals) are also difficult to interpret. An interesting source but of limited value.

Julian (331-363AD).

The Emperor Flavius Claudius Julianus reigned from 361 to 363AD and was an energetic military commander. In his second oration 'On the Heroic Deeds of the Emperor Constantius' there are references to slingers (lines 57-8), fire darts and stone-throwing artillery (line 63).

The Notitia Dignitatum.

Literally a 'List of Dignitaries' for the eastern and western empires. It contains the titles and responsibilities of numerous officials, with (where applicable) the names of the units under their command and the locations of those units. The dating of this document has been the subject of much debate, but a consensus seems to have emerged for a date around 395AD. The Notitia has sections devoted to the two Magistri Officiorum (OR IX; OC XI), who were in charge of the imperial arms factories. These will be discussed in the next chapter. The sections concerning the British provinces are of some value (OC VII,XXVIII,XL), although there are errors and gaps in the text and the identification of some of the place-names is still controversial.

The Scriptores Historia Augustae.

A series of biographies of Emperors and usurpers running from Hadrian down to 284AD. Supposedly written by six authors, it seems more likely that the SHA was the work of a single man and it may have been written in the time of Theodosius I (379-395AD). There are many instances where weapons are just named, but there are also some anecdotes - for example it is said that the soldiers of Avidii Cassii practiced archery once a week (vita Avidius Cassius VI,3-4). However there is much in the SHA which is fictional, including imaginary authors and spurious documents. It is dangerous to rely on it much as a source therefore, even for minor details.

Sidonius Apollinaris (c431-486AD).

In his poem to Consentius of Narbonne (XXIII, lines 345-7) he talks of lead shot fired from Balearic slings.

Vegetius.

Wrote a treatise entitled 'Epitoma rei Militaris', probably sometime between 383 and 450AD (Ferrill 1986 p127). This discusses in detail most aspects of the Roman army, including weapons training (I,12-16; II,23), legionary equipment (II,15), artillery (II,25) and siege warfare (IV). Along the way, many types of weapon are described, including some not otherwise known. Vegetius is just about the most detailed source that we have, but he suffers from a severe chronological problem. He drew his information from a wide range of sources, from the Republican period down to his own times and mixed them freely, so his view of the Roman army combines the "best" features from several periods.

E. Later sources.

Maurices's Strategikon (c600AD).

A Byzantine manual of military tactics, believed to have been written by the Emperor Maurice. It is of interest because in it there are some throwbacks to the later Roman army. These include references to "lead-pointed darts" (XII,2,4,5) - perhaps descendants of the plumbatae -

crossbows (XII, 5), which may have been employed by Roman troops, slings (XII,B,3-4,18,20) and ballistae on wagons (XII,B,3-4).

Procopius.

Born at Caesarea, Palestine in the late 5th century AD. His main work was the 'History of the Wars', describing the campaigns by the Emperor Justinian (527-565AD), against the Persians, Vandals and Goths. In his account of the siege of Rome by the Goths (V,21,14-19) he describes the torsion artillery used by Belisarius. These machines were almost exactly like the bolt-firers described by Ammianus two centuries earlier.

Pictorial Evidence.

The approach to this category of evidence is of necessity rather different, for there are various mediums of representation involved here. Rather than discussing specific examples in detail - which will be done where appropriate in the chapters on individual weapon types - I shall look at the subject in a broader way and try to assess the advantages and drawbacks of the visual forms of evidence.

A. Monumental Sculpture.

Many monuments of the imperial period depict the Roman army in action, most especially those in Rome itself, but also some in the provinces as well. Of particular interest are the columns of Trajan and Marcus Aurelius, the arches of Septimius Severus and Constantine and the tropaeum at Adamklissi in Lower Moesia. Such edifices as these were erected primarily to glorify the campaigns of a particular Emperor and only to a limited extent are they useful for a study of weaponry. Coulston has recently expressed the opinion (Coulston 1989 p34-5) that Trajan's column cannot be used as an independant source of evidence for military equipment. This is unfortunately only too true and the statement can be justifiably applied to the other major monuments as well. For example, if one were to judge purely from the evidence of the columns of Trajan and Marcus then

one would believe that legionaries were generally armed with ordinary spears - the pilum being almost entirely absent. Does this really reflect the true state of affairs, or is some artistic factor at work? Perhaps pila were difficult to reproduce accurately in stone. Sculptors at Rome can have had little direct experience of military life - they probably worked from drawings (Lepper and Frere 1988 p30). Accuracy in every detail was not as critical as the overall effect and designs for sculpture would have been limited to what it was technically feasible to reproduce.

Apart from the problems of artistic licence there is also the matter of preservation. In relation to the monuments in Rome this is a major factor, due to the grave damage inflicted by weathering, pollution and earthquakes. In the case of the columns there is the additional problem that most of the weapons were originally supplied in bronze and these have long since disappeared. Projecting features like scabbards are very susceptible to damage and few have survived intact. On a more general note, the quality of the sculptures varies enormously. Compare for example the 'borrowed' 2nd century reliefs on the Arch of Constantine with the much cruder 4th century figures on the same monument. As a rule 1st-2nd century sculpture is of a better standard than later work and this inevitably introduces another bias in our evidence. Also some of the fine details may well have been painted onto monuments and this of course cannot survive centuries of exposure to the elements. Nevertheless, despite all of these problems it is possible to find some details of weaponry on Roman monuments which can be mirrored by archaeological finds - for example the ribbed sword grips often seen on Trajan's column (scenes XXXVII, CX, CXI, CXV).

B. Minor Sculptures.

This group includes such items as the porphyry statue of the Tetrarch's on St Mark's church in Venice (Beckwith 1963 plates 3-4), the Cancellaria relief from Rome showing a procession during the reign of Domitian (Brilliant 1974

fig V. 6) and a number of battle sarcophagi, to name but a few. The standard of preservation is often rather better since individual pieces of sculpture can be more easily protected and conserved, particularly if they are moved to museums, whereas conservation of major monuments is more difficult and without a definite end.

Depictions of Emperors in military costume tend not to be of much help in the study of equipment. The main aim of the sculptor in such cases was to show his subject in an "heroic" light. Traditional Greek costume - the muscled cuirass, greaves etc - predominates on imperial statuary even as late as the 4th century - for instance the statue said to be of Valentinian I at Barletta (Ferrill 1986 plate 17). Rather more relevant are the tombstones of serving soldiers, both legionaries and auxiliaries (A. S. Anderson 1984 plate 1ff; Oldenstein 1976 Abb. 13-14; Coulston 1987 p141-156; Balty 1988 plates XIII-XIV). Those from Britain are obviously the most useful, but others from Germany and even the eastern provinces are of some help. Many tombstones show the deceased in full military dress and archaeology has confirmed many of the details shown on them. The standard of the sculpture is quite variable and later tombstones are often (although not always) less expertly produced.

The "battle sarcophagi", for example those from Ludovisi (Brilliant 1974 fig II. 27) and Portonaccio (Henig 1983 p94) date from the late 2nd to the middle of the 3rd century. They show very confused and crowded battle scenes involving Romans and barbarians. Much of the equipment depicted shows obvious classical Greek influence, but some authentic details can be seen, such as the positioning and method of suspension of the swords.

Finally there are occasionally civilian sculptures which show weaponry, as with two reliefs from Gaul which appear to show crossbows (Esperandieu 1908 p442, 444). These will be discussed in more detail in chapter X.

C. Mosaics.

There are hardly any mosaics which show weapons and this is not really surprising since they were produced by civilian craftsmen and laid down in civilian buildings - houses, villas, public meeting places etc. Depictions of weapons on mosaics are, as far as I am aware, confined to scenes showing hunting and gladiatorial contests. Neither are directly relevant to this study. Spears are the weapons most commonly shown and not in much detail. They probably differed but little from their military counterparts. In one case however, on a mosaic from near Antioch in Syria there are some barbed spears identical to some actual examples found in Britain (Henig 1983 plate 10).

D. Coins.

There are a few reverses on Roman imperial coins which show military scenes, but these are generally too small to be of any use. One or two exceptions to this rule will be noted in the appropriate places.

E. Miscellaneous Art Forms.

Some minor works of Roman art show military equipment. Included in this category are the ivory diptychs of Stilicho and the Emperor Honorius, dating to 400AD/406AD respectively (Ferrill 1986 plates 18-19). Although these portraits are very idealised they do show some genuine pieces of equipment e.g. ribbed sword handles and scabbard runners. Also of interest are the pictures in two late Roman manuscripts - the De Rebus Bellicis and the Notitia Dignitatum. Both show some weapons but as the illustrations are only copies many times removed from the originals they are of limited value.

Archaeological evidence.

The actual physical remains of weapons from sites in Britain (and parallels from other provinces) are the main source of information used in this study. Approximately 3000 pieces of equipment have been examined by the present author, either directly through collections in museums and other institutions or else through excavation reports.

These finds obviously provide a wealth of detail on the forms of the original weapons but they do have a number of limitations.

With the older excavation reports there is the problem of reliability, or rather the lack of it in many cases. Weaponry (if mentioned at all) is often described in the most general way. Statements along the lines of "some spearheads were found" are all too common. A fair percentage of reports do give some measurements for the finds, but where these can be checked they usually turn out to be at best approximate and at worst wildly inaccurate. For a large number of finds there is no information at all on the context or stratification, so that dating becomes virtually impossible. Frequently all we have to go on is our knowledge of a site's history. Thus for example on present chronology one can date all the weaponry from the Antonine wall to the years c140-163AD. However some sites were occupied from the 1st century down to the 4th or even later and were largely excavated before the advent of modern techniques. The worst example of this problem is undoubtedly the material from the site of Corbridge. Much of the weaponry from here was found in the excavations of 1906-12 and there is virtually no stratigraphic/ contextual information for that period or indeed for many other pre WWII excavations. This means it is seldom possible to separate the Flavian finds from the later material. Therefore, although finds from Corbridge will be mentioned from time to time, they are seldom worth discussing in detail. A very few objects from Corbridge can be dated and these are noted in the relevant sections.

The Corbridge Hoard well illustrates the chronological problems posed by this site. Previously dated to the period 98-105AD, it has recently (Bishop and Allason-Jones 1988 p109) been re-dated to the Hadrianic period. This revision was based on the (limited) stratigraphic evidence alone and the authors admit (Ibid p110) that most of the finds could be dated anywhere between the mid 1st and mid 2nd centuries. The weapons in the Hoard (Leaf-shaped spears,

conical-headed bolts, ferrules and one possible pilum point) cannot I feel be used to date the context precisely. The presence of conical boltheads does imply a date in the 1st/2nd century. To sum up, given the ambiguity of the dating evidence and the thorough examination of the Hoard weapons already published (Ibid p9-22), a lengthy discussion of these finds simply does not seem necessary or justified. Attention will be drawn to parallels with material from other sites where appropriate.

Allied to the problem of dating is the use of typology to subdivide the archaeological material. This is always a rather subjective process for the physical characteristics used to arrange the finds into groups - length, width, style of decoration etc are numerous and it is up to the individual researcher to decide which are the most "significant" features of a type of artefact. There is a tendency for typologies to be over rigid - an example being the way that Roman archaeologists see all swords of the period as being either gladii or spathae and then forcing all new finds into one category or the other even if they clearly do not fit. Such an attitude ignores the existence of transitional or hybrid forms. On the other hand we have to avoid the danger of breaking our material down into too many groups on the basis of trivial differences. Clearly the study of weaponry requires some use of typology if we are going to make any progress at all, but we must always recognise that the categories we create are artificial and may not have meant much to the average Roman soldier. More importantly typology should not be seen as a substitute for good solid dating evidence. Many types of weapons remained basically the same over very long periods and so should not be dated by their shape alone. This is true even of objects like scabbard chapes which have distinctive decorative features. There are very few firmly dated examples and we cannot assume that the type of decoration has any chronological significance (c.f. Bishop 1987 p112-114).

Another factor which limits the value of the archaeological finds is their state of preservation. This varies enormously from the very fine weapons found in wet

deposits at Vindolanda down to severely corroded or damaged objects. The current condition depends not only on the circumstances of deposition but also on the subsequent conservation (if any) and storage. All of these elements will affect our appreciation of the original form of the weapons. Some types of object survive in the ground virtually unchanged - as with slingshots for example. Most of the metal items from Britain are badly corroded and organic materials like wood and leather are seldom preserved at all. This does introduce a serious bias in our evidence. We have for example very little direct information on the wooden parts of bows, on spearshafts or on scabbards (except for metal or bone/ivory parts). It is therefore necessary on occasion to look at finds from other parts of the empire to obtain a better picture of the form of some types of weapons.

II. The Production and Distribution of Roman Arms in the Second to Fifth Centuries AD.

"Sallustius Lucullus, Governor of Britain had equally offended Domitian by allowing a new type of lance to be called 'the Lucullean'". (Suetonius. Dom. 10).

The ways in which Roman weapons were produced and distributed have been discussed by several authors (Macmullen 1960 p23-40; Bishop 1988 p1-42; James 1988 p257-331). Apart from a recent study of the State arms factories (James loc. cit.) most of the discussion has centred on the situation prevailing under the early Principate and has been basically theoretical in character, without much discussion of the archaeological evidence. This chapter attempts to redress the balance somewhat by looking at the production of weapons within a single province during the later imperial period, drawing not only on the literary sources, but also the physical evidence for weapon making.

There were essentially five methods by which arms were produced in the Roman period. These were as follows:- 1. State controlled arms factories. These were probably created by Diocletian (James 1988 p265-6) in the late 3rd/early 4th century. There were apparently no such factories in Britain, although the compounds at Corbridge (3rd century?) may be seen as forerunners of this system. Others like them may await discovery. 2. The manufacture of weapons in the workshops (fabricae) of forts, whether legionary or auxiliary. This seems to have been very widespread in Britain and may have been the main way in which units acquired new weapons. Some, perhaps most, forts had structures designed specifically for the making of weapons and other items, but these varied in their design and their positioning within the fort. At some forts weapons were made in other buildings. Legionary bases, since they had a greater working area, may have produced arms for wider distribution i.e. to nearby auxiliary forts which lacked such facilities. 3. Private orders by individual soldiers to skilled civilian craftsmen. This is

particularly likely to have occurred with elaborately decorated arms like early dagger sheaths and pattern-welded swords. It has been claimed (Macmullen 1960 p25) that in the early empire small shops and traders were the army's main source of weapons. Some evidence for this view is provided by inscriptions mentioning "gladiarii" and "spatharii" (C. I. L. VI 1952, 9043, 9898).*1 In the East, where urbanisation had been firmly established long before the Romans arrived, much weaponry was produced in workshops in the cities. This was administratively convenient as many military units were garrisoned in the towns. In Britain this urban tradition was lacking and army units were generally based not in towns but in forts, which were often far from a substantial civilian settlement. Nevetheless there were almost certainly occasions when weapons were produced by civilian craftsmen, especially if any were present in the vicus of a fort. Such places would represent a good market for an enterprising trader. This would account also for the "Celtic" features sometimes noted on weapons from Roman contexts. The problem lies in identifying where such activity took place. Small workshops would leave very little trace in the archaeological record and usually we have only scattered finds of weapons as clues. 4. Bulk orders by the army to civilian communities for pieces of equipment. Such orders seem sometimes to have been paid for but this need not always have been the case. This very often happened on the eve of a major campaign but "requisitions" may have happened on a regular basis as well. We cannot definitely prove that this took place in Britain but there are several civilian sites at which substantial quantities of weaponry have been found. In some cases this may be the only evidence for a military garrison (epigraphically unattested), but the possibilty of civilian arms production should not be ruled out. 5. Weapons-making in the field. This would mainly have involved the repair of equipment damaged in battle and the manufacture of large quantities of missile weapons like slingshots and arrowheads. We are unlikely to be able to detect such activity by archaeolgy as no fixed structures would be involved, only portable forges, moulds and the like.

Literary Evidence.

Contemporary references to the manufacture of Roman arms are exceedingly sparse and none of them relate directly to Britain. The production of weapons in a fort workshop, perhaps by men of legio II Traiana is mentioned on the Berlin Papyrus (Bishop 1985 p3). Amongst the items being made were SPATHAR(um), ARCUS and CAPITULA BALL(istaria), swords, bows and components for ballistae. Similarly a writing tablet from Vindolanda (Bowman and Thomas 1983 p82-83) talks of "gladiarii". It is clear that the Roman legions (and to a lesser extent the auxiliary units) contained many individuals who had the status of "immunes", that is soldiers who were excused some of the more physical and unpleasant duties of army life in return for practising their craft. A fragment of the late 2nd century work of Tarrutienus Paternus preserved in Justinian's law code (50, 6-7) lists the legionary immunes. They included men responsible for the production and repair of weapons - BALLISTARII, SAGITTARII, GLADIATORES and ARCUARII.

Arms production in cities is recorded in a variety of sources. In 69AD, as Vespasian made preparations for his advance on Italy, "the strong towns were selected to manufacture arms" (Tacitus Hist. II, 82). Likewise, Dio records (LXIX, 12. 2-131AD) that before the outbreak of the Jewish revolt in Hadrian's reign the Jews "purposely made of poor quality such weapons as they were called upon to furnish". A receipt given by a standard-bearer to the elders of the village of Soknopaios, notes the delivery of some javelins and states that the agreed sum has been paid from the public moneys (Macmullen 1960 p26). Here we see that even very small communities might be prevailed on to supply the army and in this case at least received some financial contribution for the time and materials expended.

Vegetius (Ep. rei Mil. II, 11) tells us that the legions "had travelling workshops in which they made shields, cuirasses, helmets, bows, arrows, javelins and offensive arms of all kinds. "In a much earlier work we are

told that in his African campaign, Caesar "established smithies[officinas], took steps to ensure a plentiful supply of arrows and missile weapons [and] cast leaden bullets." (Bellum Africum 20). Josephus, in his description of a typical Roman camp (De Bell. Jud. III, 83) refers to an "artisans quarter", which may have included an area for the production of arms and armour.

The State arms factories are referred to in the Notitia Dignitatum (OR, XI;OC IX). They were controlled by the Magistri Officiorum - one official for each half of the empire - and they are listed province by province, with in each case the types of equipment which they produced. The eastern list notes 15 locations where arms and armour were produced. Some of these specialised in the manufacture of individual types of weapons. Thus the factory at Irenopolitana in Cilicia (OR. XI, line 24) is described as an "hastaria" i.e. a spear-works. Other factories produced arms in general:- Damascus (line 20), Antioch (line 21), Nicomedia (line 27), Sardis (line 30), Hadrianopolis (line 32) and Marcianopolis (line 34). Edessa (line 23) is described as being a "scutaria et armamentaria" i.e. it made shields and other arms. It is unclear what the distinction was (if any) between "armorum" and "armamentaria".

The Magister Officiorum in the west had twenty arms factories under his supervision. It should be noted at once that none of them were in Britain. This may be due to damage to the text of the Notitia at some point, or it may reflect the declining size of the British garrison at this time (James 1984 p161-186). An alternative suggestion is that it was felt unwise to place an arms factory in a province which had just been recovered from an usurper i.e. Allectus (James 1988 p263). The simplest explanation is that the Gallic arms factories were seen as adequate for the needs of the British garrison. As in the East, there were factories which made one kind of weapon. For instance, Concordia (OC. IX, line 24) in Italy and Matisco in Gaul (line 32) made arrows, Ticinum (line 28) produced bows;

Luca (line 29), Remensis (line 36) and Ambianum (line 39) all made swords ("spathae"), whilst Sirmium (line 18), Salona (line 22) and Verona (line 25) made "armorum". Argentomagus (line 31) produced "armorum omnium" and the factory at Treviri (line 38) made parts for ballistae. All types of weapons were thus readily available from Gaul or Italy and could have been shipped to Britain. As we shall see however, there is a good deal of evidence for local production by individual units.

There is no need here to examine the structure of the arms factory system, since this has recently been the subject of a detailed study (James 1988 p257ff). The creation of the factories was a significant step since it introduced a degree of central control over arms production. Given the size of the empire and the slowness of transporting any goods over long distances it was inevitable that traditional methods of weapons-making would continue, especially in geographically isolated provinces like Britain. We need to look briefly at why the arms factories were set up and more crucially, what their impact was on the province of Britain.

The most obvious effect of concentrating arms production in State owned establishments was to regularise supply and quality. Workers in the factories could be easily supervised and since they relied for their livelihood on the State they would have a greater incentive than civilians to work well. The reliability of civilians who had been coerced into making equipment for the army must often have been doubtful. Moreover, if they were theoretically being paid for their work (James 1988 p271) then the rampant inflation of the 3rd century, leading to severe debasement of the coinage, cannot have helped the situation. Another factor may well have been the considerable increase in the size of the army at the time of Diocletian (Connolly 1981 p250). There may also have been an element of security involved. If arms production was (in theory) confined to a few locations then it could be more easily controlled by the central authority.

There is no real evidence that the existence of the arms factories had any great effect on weapons production in Britain. Some weaponry may have been sent over from Gaul. This has been claimed for a sword from Silchester, but with little justification (Boon 1974 p68). There is no proof that this actually happened. It is most likely to have occurred with more specialised items like archery equipment or parts for artillery machines. What is certain is that even in the 4th century, weaponry was still being produced in some British forts e.g. Housesteads, so that local production had not been entirely supplanted.

The Archaeological Evidence.

a. Forts and Fortresses.

That weapons production could take place in military bases we have already seen from the literary evidence, the Berlin papyrus and the Vindolanda writing tablets. Physical proof of this takes two forms:- 1. Remains of supposed workshop buildings. 2. The items produced in them, together with tools, scrap material and slags. In general the identification of workshops rests on the discovery of finished or unfinished objects, forges, anvils and other evidence of industrial material. The commonest workshop plan was a rectangular building with a central courtyard and ranges of rooms opening off each side. Not all structures of this design were necessarily fabricae however and workshops might take other forms. The presence of weapons, tools and slag is a good indication that arms production was taking place, but excavations have seldom been thorough enough to determine the scale of this production.

Birrens.

An area to the west of the H. Q. building, excavated in 1967 may have contained the fort's fabrica during the Antonine period. A quantity of metalwork was found here, including three lead slingshots. (Wilson 1968 p178-9; A. S. Robertson 1975 p130, fig 44 no.s 4-6).

Caerhun.

In the 1929 season 18 clay slingshots were found in an ash deposit near to an hearth in the south intervallum (Baillie-Reynolds 1930 p78 and fig4).

Caerleon.

The 1927-9 excavations in Prysg Field produced large quantities of weaponry (Nash-Williams 1932 figs 17-22, 24, 34, 36, 42-3) which included pilum points, spearheads, arrowheads, scabbard fittings and laths for composite bows. Some of the latter were unfinished and there were also discarded scraps of bone. These finds came from buildings built against the back of the rampart in the NW angle of the fortress. They belong to the period c75-200AD. A courtyard building to the north of the H. Q. has been identified as a fabrica. This produced much evidence for iron-working, as well as a bone chape associated with coins of 197 and 196-211AD (find no. 88. 3H CBT 138/108 197). The building probably went out of use in the 3rd century (Boon 1972 p59, 82-5).

Corbridge.

Whilst perhaps not chronologically relevant to the present study, the well-known Corbridge Hoard may be considered as further evidence for the production (or at least repair) of weapons within forts (Gillam 1977 p55-6;Bishop and Allason-Jones 1988 p9-22). The Hoard was buried under the floorboards in the fort's hospital. The finds included bundles of spearheads tied together, most of them with the remains of the wooden shafts in their sockets. Whether these were broken weapons awaiting repair or whether the shafts were snapped off so that the heads would fit in the chest is impossible to determine. There was also a possible pilum point, some ferrules and several ballista bolts of the conical headed type. The weaponry, together with the lorica segmentata fittings may represent damaged equipment intended for repair in the fort's fabrica. Several iron bars in the Hoard may have been destined to be fashioned into arms or armour.

Housesteads.

There seems to have been some weapons-making going on in the principia. In 1898 about 800 arrowheads were found in the right-hand room of the H. Q. s rear range, together with an anvil, some scraps of iron and nails - perhaps intended to be made into more arrowheads. The finds apparently came from the 4th century level (Bosanquet 1904 p225).

Kirkbride.

Excavations in 1971 uncovered four furnaces which may have been used for smelting lead. Amongst the finds in this area were five objects which were possibly ballista bolts and one possible spearhead. No tools, wasters or iron slags were found (Bellhouse and Richardson 1975 p85).

Manchester.

Excavations to the north of the fort in 1972 revealed a shed containing a number of furnaces. There were over 30 by the end of the 2nd century and activity continued into the 3rd century. As well as iron smelting and the melting of lead there may have been a furnace for carburising iron. No remains of weapons were found here (G. D. B. Jones 1974 p67, 185).

Milecastle 35 (Sewingshields).

Many metal-working hearths were found during excavations between 1978 and 1982. Despite the quantity of well-preserved weapons, there were no tools or wasters, so the evidence for arms production is incomplete. Possibly the scrap material was removed and buried at some distance from the site. The metalworking may have involved civilians after the military had left (Haigh and Savage 1984 p74-86).

Templeborough.

Iron-working took place in an annexe outside the SE angle of the fort. A smithy, quenching tanks and some slag/cinder were found in 1916-17, but there were no weapons (May 1922 p55-8).

Vindolanda.

A quantity of weaponry has been found in the fabrica in recent years, pointing to some arms production here. Objects found include spearheads, ballista bolts and perhaps some pilum points. The finds (as yet unpublished) belong to the period c105-140AD.

b. Towns and Vici.

The bearing of arms by civilians - except for hunting and on journeys - was prohibited by the Lex Julia de Vi Publica and this decree was reinforced by a law of 364AD, preserved in the Theodosian Code (XV, 15, 1). It is quite probable that there was some evasion of this legislation, particularly in the troubled times of the later empire, but in general we must assume that when large quantities of weapons are found on civilian sites they were destined for the use of the Roman army. Support for this can be derived from the literary sources already mentioned.

Baldock.

A Romano-British temple and settlement were excavated here in 1968-72. Some metalworking crucibles were found, but more importantly about 33 spearheads and other projectiles were discovered in a well. This context dated to the 3rd century AD (Stead and Rigby 1986 p139, fig 61). The weapons are very crudely made, which might be due to the low level of skill possessed by the (civilian?) workers. There is no evidence for a military base at this site. The finds might be a votive offering to a hunting god e.g. Silvanus (pers. comm P. J. Casey).

Brancaster.

Nine ballista bolts, spearheads and arrowheads have been found in the vicus to the west of the Saxon Shore fort. They perhaps date to the 3rd century AD (Hinchliffe and Sparey-Green 1988 p48-9). There is however no proof that these weapons were actually made in the vicus - they could have been fired from the fort during target practice after the vicus had gone out of use.

Caerleon.

A bronze chape was found in building VIII of the vicus in 1954-63, a legionary dagger was found in the main lateral drain in 1958 and a spearhead came from building IX. All of these finds are unpublished. There are no half-finished objects, slag or metalworking equipment however.

Greta Bridge.

A ballista bolt and two "standard tips" were found in the 1973-4 excavations in the vicus, but again there is no evidence for manufacturing (information from Mr. John Casey).

Silchester.

A hoard of ironwork was found in a pit in insula I in in 1890 and included a sword dated to the later 4th century. The remaining objects were mainly tools. A further hoard was discovered in insula XXIII in 1900 but again largely consisted of tools. It did include one spearhead, but this could easily be a hunting weapon (Boon 1974 p66, 271). These deposits might be discarded material from workshops, but they could be ritual in character. There are other pieces of military equipment from Silchester, some clearly of a late date e.g. a 3rd century belt roundel (ibid p66) and several bone chapes. There are many undated and unpublished spearheads. There is a possibility therefore that the town had a military garrison in the 3rd/4th centuries, although there is no supporting epigraphic evidence. Equally the weapons might have been produced by civilian craftsmen for shipment to troops elsewhere, or have belonged to ex-soldiers living here.

Stanwix.

Excavations near the fort in 1930 revealed many pieces of scrap metal and a number of unfinished objects, including a bronze dolphin scabbard runner (Collingwood 1930 fig 2 no. 62). The excavator felt that the finds came from a bronze workshop, perhaps in the vicus (ibid p41). There were no hints as to the date of this deposit.

Vindolanda.

A considerable number of military items have been found in the vicus, belonging to the second period of occupation - perhaps extending from the reign of Severus Alexander to c270AD (Welsby 1982 p169). These included arrowheads, lead sling shots, spearheads and bronze scabbard chapes (R. Birley 1977 p72, figs 25-6).

c. Other sites.

Corbridge.

The workshop complex at Corbridge may represent a special case in arms production in Britain and is therefore dealt with separately. The site comes closer to the arms factories existing in other parts of the empire from the reign of Diocletian than any other in Britain. Occupation perhaps began in the Severan period and continued into the 4thc. There were two walled compounds (linked together) situated within the town. The western compound contained the headquarters building and eight workshops measuring 72 x 10 feet, with hearths and tempering tanks. These appear to have been built and manned by legionary detatchments (Macmullen 1960 p28). A spearhead, pilum points and arrow-heads were found in the lowest level of workshop III (Richmond and Birley 1940 p106, 112).

Evidence for weapons making was also uncovered in the 1912 season (Forster and Knowles 1913 p250), in the form of furnaces, anvils, tanks and many arrowheads, some unfinished. It is estimated that the compounds at this site housed several hundred men and if so the production was on a fairly large scale. It may be that the complex was designed to meet the needs of forts along Hadrian's wall. There is unfortunately no direct proof that weaponry was being shipped from Corbridge to other sites, but this is at least a possibility. If Corbridge (and perhaps other as yet undiscovered sites) functioned in this way then this would explain the lack of any British arms factories in the Notitia lists. They would simply not have been needed.

Conclusions.

We have seen in this chapter the evidence for weapons production in this country and some conclusions can be arrived at from it. But the question of ultimate responsibility for arms production remains difficult to answer. It seems incredibly unlikely that the emperor would have much to do with something so mundane as the design of for instance scabbard fittings. Roman bureaucracy (not to mention technology) would not have been up to standardising equipment right across the empire and indeed there would have been little point in doing so. The Roman army was highly responsive to the tactical needs of the moment and to adapting to meet diverse opponents. It is hardly suprising therefore that the archaeological evidence does not support any kind of empire-wide standardisation of weaponry. Tactics and equipment were surely largely a product of local needs, although the emperor might occasionally issue directives. The arms factory system gave greater scope for standardising equipment, but Ancient transport systems were inefficient and local production surely remained important. We might argue that the governors of individual provinces were responsible for the design of military equipment. The passage from Suetonius quoted at the start of this chapter seems to hint at some such involvement. But again it is hard to see such an important personage taking an interest beyond the most basic details. Long experience of their effectiveness dictated that the legions used the gladius and the pilum and they continued to be so armed as long as those weapons were useful. But the precise details of weapon construction were probably decided at a very low level - the commanders of individual units. This (and the limitations of technology) must account for the great variations in equipment even within a single province. With items like scabbard fittings we may come down to personal preferences, either of the craftsmen making them or of the customers.

Most of the archaeological evidence for weapons making in this country is very small scale. It is likely that individual fort's could largely satisfy their own needs -

although they perhaps took delivery of raw materials. Simple objects like arrowheads and spearheads could be produced by individual forts with no difficulty. More specialist objects like swords and decorated scabbard fittings may have been produced to order by civilian craftsmen. Swords were after all rather more costly to produce than most other weapons and large quantities would not have to be made at once - unless equipping a new unit or making up heavy losses in battle.

Comparatively large amounts of weapons have been found at Caerleon and Corbridge. The quantity of equipment at the former may simply be explained by the size of the garrison - 5000 men as opposed to the 500 or 1000 troops in most auxiliary forts. Other legionary bases in Britain have either been less thoroughly explored (Chester, Colchester, Exeter, Gloucester, Wroxeter) or were occupied for a very brief time (Inchtuthil). The size of the sample from Caerleon may not be exceptional therefore. If weapons were being produced at Caerleon for shipment to nearby auxiliary forts we might expect to find some artefactual evidence for this. The best determinants for this are scabbard fittings, which were made in fairly standardised forms - therefore parallels can be easily recognised. In fact the distributions of objects like pelta and median rib chapes, types 1-2 bone chapes and bronze "flat" runners (all found at Caerleon) fail to show that arms were being distributed from the fortress.

The case of Corbridge is in theory stronger, for in the 3rd-4th centuries there was no longer an active fort at this site, so the amount of weapons for "home" use might have been small. But the legionaries who manned the workshops must presumably have had some weapons and this might have included the numerous pila found in workshop III. As with Caerleon there is little proof that Corbridge served as a supply centre to, for instance, the forts of Hadrian's Wall. The quadruple-vaned arrowheads found at Corbridge can be paralelled at only one Wall site, namely Housesteads. Clearly much more excavated material is

needed, in well dated contexts, before we can show that weaponry was emanating from Caerleon, Corbridge or indeed any other British site.

The creation of the arms factories in the later 3rd century may have had little effect on arms production patterns in Britain, particularly if the garrison was declining in size at this time. Some weaponry may have been shipped over from Gaul but we are not in a position to prove this. In summary the available data supports the view that most weapons (and perhaps other equipment) was produced by individual units, primarily for their own use. Whilst there was some consistency in the types of weapons employed, precise shapes, dimensions and decoration were only standardised to a limited extent. Finds of weapons are sufficiently rare that the re-use of scrap material must have been very widespread. A very large percentage of finds are damaged in some way and most equipment probably only entered the archaeological record when it was no longer of any value. Small items may occasionally have been lost, but this is not very likely for complete swords or spears, unless they fell (or were deliberately placed) in water. There are thus severe biases in our evidence, resulting for instance in a great under - representation of swords than say spearheads, the latter being cheaper and easier to replace.

Levels of civilian weapons production are very difficult to assess as many of the finds from town or villa sites may represent hunting equipment. Where reasonably large quantities of weapons have been found e.g. Baldock, the quality of the finished products seems low. It appears unlikely that the army would have placed much reliance on civilian production unless:- a. Large amounts of equipment were needed in a short space of time i.e. for a campaign, or b. The unit or units in question did not have adequate facilities or personnel of their own to produce large amounts of weapons. One would expect that specialist items like artillery fittings and archery equipment would (in Britain at least) remained the preserve of military

craftsmen.

Table 1: Late Roman Arms Factories in
the Notitia Dignitatum.
(taken from O. Seeck, 1862. Some textual
complications have been omitted for the sake of clarity).

OR. IX

3. Sub dispositione viri illustris magistri officiorum

.....

18. Fabricae infrascriptae:

19. Orientis V:

20. Scutaria et armorum, Damasci

21. Scutaria et armorum, Antiochiae

22. Clibanaria, Antiochiae

23. Scutaria et armamentaria, Edessa

24. Hastaria Irenopolitana, Ciliciae

25. Ponticae [quatuor]tres: *a.

26. Clibanaria, Caesarea, Cappadociae

27. Scutaria et armorum, Nicomediae

28. Clibanaria, Nicomediae

29. Asianae una:

30. Scutaria et armorum, Sardis, Lydiae

31. Thracum duae:

32. Scutaria et armorum, Hadrianopolis

34. Scutaria et armorum, Marcianopolis

35. Illyrici quatuor:

36. Thessalonicensis

37. Naissatensis

38. Ratiarensis

39. Scutaria Horreomagensis

.....

*a. Only three factories are listed, so this is presumably a copyist's error.

OC. XI

3. Sub dispositione viri illustris magistri officiorum

16. Fabricae infrascriptae:

17. In Illyrico:
18. Sirmensis scutorum, scordiscorum et armorum
19. Acinensis, scutaria
20. Carnuntensis, scutaria
21. Lauriacensis, scutaria
22. Salonitana, armorum
23. Italiae:
24. Concordiensis, sagittaria
25. Veroniensis scutaria et armorum
26. Mantuana, loricaria
27. Cremonensis scutaria
28. Ticenensis, arcuaria
29. Lucensis, spatharia
30. In Galliis:
31. Argentomagensis armorum omnium
32. Matisconensis, sagittaria
33. Augustodunensis loricaria, ballistaria et clibanaria
34. Augustodunensis, scutaria
35. Suessionensis
36. Remensis, spatharia
37. Triberorum, scutaria
38. Triberorum, ballistaria
39. Ambianensis, spatharia et scutaria

.....

NOTES

*1. Numbers 1952 and 9043 are undated. Number 9898, which mentions a "spatarius", dates to 537/538AD.

III. Swords.

"If they offered a resistance to the auxiliaries they were struck down by the swords and javelins of the legionaries; if they faced against the legionaries they fell under the swords and lances of the auxiliaries." (Annals XII,35).

So runs the rhetorical and oft-quoted passage in which Tacitus describes the final encounter (in 50AD), between the chieftain Caratacus and the forces of Rome under the Governor of Britain, Ostorius Scapula. This is one of the comparatively small number of specific references to weapons in Roman/Greek writings and one which has often formed the basis for not only sword typologies, but also rather more general arguments about the nature of the Roman army, especially the perceived clear-cut distinction between legionaries and auxiliaries. This problem will be more fully discussed later, for it is one which cuts across many categories of weapons, not merely swords. Tacitus it should be noted is not at his best when discussing matters military. In this case we must be wary of accepting as fact a description which was phrased more with an eye to literary style than factual accuracy. The archaeological evidence from Britain presents a rather more complex picture. Even if Tacitus's neat divisions between legionary and non-legionary equipment were true of his own day, this is not the impression one gets from a study of the material of the 2nd century AD and later. We should also beware of overly rigid classifications. It is all too common to define a Roman sword as either a "gladius" or a "spatha" without giving thought to what these terms actually mean. Roman swords from Britain vary quite considerably in size and shape and not all can be easily categorised. Typologies need to be treated with care and approached with a fair degree of scepticism if distortions of the evidence are to be avoided.

Literary and Sculptural Evidence for Roman Swords.

An obvious starting point for a discussion of Roman

swords are the contemporary and near-contemporary textual and visual sources. Using these we can discover how the Romans viewed the weapons of their time, before we start arbitrarily arranging the material available to us. It is only reasonable to examine some sources from the Republican period and the first century AD as well, since Imperial Roman swords were heavily influenced by the swords used by other peoples in earlier days. In this section we will confine ourselves solely to Ancient sword terminology.

The Gladius Hispaniensis.

The classic description of this sword occurs in Polybius's Histories (VI,23,6-7), which although dealing with a period well outside the scope of this work[*1], is nonetheless worth quoting because of its clarity. In general Polybius's comments on weapons are of great worth. Since he was a Greek writing largely for a non-Roman audience, he gave close attention to details which Roman writers took for granted and thus ignored. Of the gladius Polybius writes:"They [i.e. the legionaries] also carry a sword which is worn on the right thigh and is called a Spanish sword. This is excellent for thrusting and both of its edges cut effectively, as the blade is very strong and firm." The context of this comment is the 2nd Punic war (219-202BC), but it could be that the Romans had adopted the sword from Spanish troops in the Carthaginian army during the 1st Punic war (264-241BC).[*2] The gladius hispaniensis became the standard sword of the Roman legionary throughout the late Republican and early Imperial periods. Even then however, its use was not solely confined to the legions. At the battle of Mons Graupius the Batavian and Tungrian auxiliary cohorts were employing these swords in the classic stabbing motion (Tacitus,The Agricola 36).

The contrast between Roman troops with their short, stabbing gladii and their Celtic opponents wielding longswords became something of a leitmotif amongst Greek and Roman authors (e.g Tacitus,Agricola 36; Plutarch,Life of Camillus XLI,1-4; Dionysius of Halicarnassus VII.14.10,18). In fact recent metallurgical studies have

shown that Roman swords were not greatly superior to Celtic ones, if at all (Tylecote 1976 p174; Williams 1977 p77; Lang 1986 p199-216). The constructional methods used in Roman swords will be dealt with later in this chapter.

Vegetius, looking back nostalgically to the legions of the early Empire dwelt at length on the advantages which the gladius gave to its user. Speaking of the methods used to instruct Roman recruits he says:- "They were likewise taught not to cut but to thrust with their swords. For the Romans not only made jest of those who fought with the edge of that weapon, but always found them an easy conquest. A stroke with the edge though made with ever so much force, seldom kills, as the vital parts of the body are defended by the bones and armour. On the contrary, a stab though it penetrates but two inches, is generally fatal. Besides in the attitude of striking it is impossible to avoid exposing the right arm and side;but on the other hand, the body is covered while a thrust is given and the adversary receives the point before he sees the sword." (Epitoma rei Militaris I,12).

The term "gladios" continued to be used by Roman writers long after (as is shown by archaeology) the sword which had borne this name had largely gone out of use, (e.g Ammianus Marcellinus XVI,12,27; XIX,11,11; SHA vita Hadrian XII,5; XXIV,9,12; vita Avidius Cassius XIII,6; vita Commodus XIV,8; vita Pertinax XIV,2; vita Geta VI,3; vita Maximinus XII,11; Claudian 2nd Book Against Rufinus L384). Either "gladios" is an anachronism in these cases or it had been applied to a new type of sword, or else most likely, it became the generally accepted term for any Roman sword. It does seem to occur in Roman literature much more frequently than the term "spatha".

We have to turn therefore to the sculptural evidence to decide when the gladius was superseded by the spatha. This seems to have occurred gradually during the course of the 2nd century AD. First century legionary gravestones show the sword worn on the right hip - the exceptions being

centurions, senior officers and some standard bearers.*3 (e.g Robinson 1975 plates 469-70). Monuments of the later 1st and early second century, such as Trajan's column and the Tropaeum at Adamklissi continue to show legionaries wearing short swords on their right sides.*4 This is also the case on the Column of Marcus Aurelius in the middle of the century (Caprino et al 1955). In the latter part of the 2nd or the early 3rd century the gladius finally went out of general use. Henceforth the long sword or spatha became standard issue for all types of Roman troops. This change in the positioning and type of sword also involved the use of a different method of suspension for the scabbard. The place of the ring method of suspension was taken by the baldric and scabbard runner assemblage. This will be discussed in detail under the scabbard fittings section.*5 The evidence for this change comes from a number of late Roman tombstones (Connolly 1981 p253,256). These include the tombstone of M. Aurelius Lucianus, that of Aurelius Sudecentius, a soldier of Legio XI Claudia, another of an unknown soldier, now in Istanbul and dated to c214AD and finally the memorial stone of Lepontius. The latter perhaps dates to the 4th century. All clearly show the sword being worn on the left side of the body and in some cases the scabbard runner is visible. Another source of evidence is the Ludovisi battle sarcophagus, dated to around 250AD (Brilliant 1974 p109). Here again, sword scabbards (where shown) are hung on the left hip. In this scene swords are being used both for thrusting and slashing. In a couple of instances what appear to be scabbard runners are shown (Abbate 1972 plate 64) - although these are positioned on the inner face of the scabbard. It may be noted that in general the Arch of Severus is useless when it comes to studying the evolution of Roman weapons, because of the extensive damage and weathering that the reliefs on this monument have suffered. Sixteenth and seventeenth century antiquarian drawings of the arch show swords being worn on both sides of the body (Brilliant 1967 plates 48a,60a,76a). However one has to wonder how accurate these drawings are, especially considering that there are many inconsistancies between different sets of illustrations. This is unfortunate for the Arch of Severus was erected at a time

when the Roman army seems to have been undergoing considerable changes.

The Spatha.

It seems that the Roman spatha was a direct descendant of the Celtic longswords;certainly there is a very close resemblance.*6 In their latest form, during the La Tene III period (c120-50BC), Celtic swords could be as long as 90cm. They were straight-sided and double-edged and were designed exclusively for slashing. They were worn on the right hip. It may be that the Celts were using a form of scabbard runner to suspend their swords (Connolly 1981 p117,fig24).*7 It is reasonable to assume that the Romans became familiar with the spatha through their employment of Gallic cavalry as auxiliary troops from the time of Caesar's campaigns onwards. The spatha was so obviously suited as a weapon for mounted troops that it was quickly widely adopted. It appears on many early Roman cavalry tombstones, not just among units with Gallic origins (A. S. Anderson 1984 plates 14-24). It is always shown being worn on the right hip and the ring method of scabbard suspension was used.

The spatha is referred to by one Roman author of the early 2nd century AD as the standard side-arm of the auxiliary cavalryman (Arrian,Taktika 43,3). If the passage in Tacitus already quoted (Annals XII,35), is not pure rhetoric, then it might be presumed that auxiliary infantry were or at least could be armed with the long sword. At some indeterminate point, the legions ceased to be equipped with the gladius and were instead armed with the spatha (Vegetius,Ep. rei. Mil. II,15). The dating of this change depends to some extent on the date of Vegetius's source for his "Antiqua legio".*8 Presumably it was at the same time that the baldric and runner replaced the ring and strap method of scabbard suspension. Vegetius's account of the legionary battle order is highly confusing, combining as it does, Republican terms such as hastati, principes and triarii, with references to weapons not attested before the 3rd or 4th centuries AD e.g the plumbata. Perhaps we are

dealing here with an idealised legion which never actually existed except in Vegetius's mind.

Whatever the date of the switch from the gladius to the spatha, the mere fact that it happened at all is of fundamental importance to any study of the Roman army. In all probability it was linked to other changes in equipment which took place during the 2nd and 3rd centuries AD and it may well reflect some major shift in tactics. The argument for this theory will be examined in some detail once the archaeological evidence from Britain has been reviewed.

It is interesting to note that whilst the term "gladios" was still used by writers in the later Roman period, it does not occur in the major official document of the period - the Notitia Dignitatum. Here, the State sword-producing factories at Remensis, Lucensis and Ambianensis are all called "Spatharia" (N. D. OC XI,29,36,39). This could be coincidental but equally, it might reflect the change in armanent that had taken place.

The Semispatha.

This type of sword is only referred to in Vegetius (Ep. rei. Mil. II,15). The semispatha is said to have been used by the legions, in conjunction with the spatha. No description is given of the sword, but its name implies that it was a shorter version of the spatha.

The Sica.

This is a very distinctive type of sword which is shown on Trajan's column at Rome, being used by Dacian warriors.*9 It consists of a simple straight handle with a curving, sickle-like blade. This sword has been termed the Sica by modern commentators (e.g. von Schnurbein 1979 p117ff). A wooden example of this type of sword has been found in the Augustan fort at Oberaden (Ibid Abb.1). It measures 46.5cm overall, with a blade length of 30.5cm. This can be interpreted as either a votive offering of some sort, or a practice weapon, but how it came to be at Oberaden is something of a mystery. It might imply the

prescence of a Dacian auxiliary unit, although this is hardly likely before the 2nd century. Perhaps it was being used to practice anti-sica tactics by Roman troops (a suggestion by Mr. P. J. Casey).

Given the wide range of nationalities serving in the Roman army, one would expect that in the auxilia at least, some native weapons would continue to be used, as long as this did not conflict too radically with the strong Roman traditions of discipline and training. Rome had very little to gain and much to lose by forcing all of its soldiers to fight in precisely the same fashion. That this did not always happen is obvious from such examples as the Oriental archer units e.g. the cohors Hamiorum;and the Raeti Gaesati with their javelin - the Gaesum. There does seem to be evidence that the Dacian troops in Roman service retained their old weapon, the sica, albeit in a somewhat changed form. The proof of this statement comes from the fort of Birdoswald on Hadrian's wall, which was for a considerable period the base of Cohors I Aelia Dacorum, a Dacian auxiliary unit. Two building inscriptions from the site, dating to c207AD and 219AD, appear to show the sica (RIB 1909,1914; Robinson 1976 p27,35). The only difference is that the blades are less severely curved than those of the weapons shown on Trajan's column. It can be argued of course that these depictions are purely symbolic, that they had nothing to do with the real armament of Cohors I Dacorum and that by the 3rd century there were probably no true Dacians in the unit anyway. These are all perfectly valid points and it is also true that so far nothing remotely resembling a sica has been found at Birdoswald - or anywhere else in Britain for that matter. Still Roman swords of whatever description, are hardly common site finds, so this fact is not necessarily that significant.

The sica must be distinguished from a rather longer two-handed sword, sometimes known as the falx (Robinson 1975 p170; 1976 p27,35; Lepper and Frere 1988 p273). This is shown on the Adamklissi monument being used by Dacians or their allies. As far as I am aware, the falx is not

attested outside the area of the lower Danube - certainly none have been found in Britain.

The Archaeological Classification of Roman Swords.

The following types of sword have been generally recognised as existing. Not all British swords can be classified with certainty and it must be stressed that the boundaries of some groups are rather elastic. Not all of these types are attested in the written sources, just as not all of those which are mentioned in the literature have yet been recognised from site finds.

The "Mainz" gladius.

This is the archaeological label given to the gladius hispaniensis, the sword of the Roman army from approximately the time of the Punic wars down to the mid 1st century AD. The earliest example of this class comes from Las Cogotes in Spain (Connolly 1981 p130), dating to the 4th century BC. The earliest Roman examples so far found date to the later 1st century BC. The type derives its name from the fine example found at Mainz (Bishop and Coulston 1989 fig13 no.4). Well-preserved specimens have been found in this country at Newstead (Curle 1911 plate XXII no.11) and from the Thames in London (Manning 1985 p148). This type of sword has a waisted, two-edged blade with a long, vicious point and would have been a very formidable weapon in close-combat. There was a great variation in the size of these gladii - examples of between 26.8 and 59cm are quoted in a recent survey (Hazell 1981 p71-82). The blade was usually in the region of 5cm wide with a point c7.5cm long. The grip was often of the fluted bone type;wood and ivory were also used occasionally. The grip could be silvered and the scabbards of such swords were frequently finely decorated (Manning 1985 p148-152). Hazell concluded from his study of 28 gladii that the longest examples were officers swords - which as noted, were worn on the left hip. This rather doubtful line of reasoning arose because it was felt that swords longer than 50cm could not be drawn easily from a scabbard on the right side of the body. Therefore Hazell decided that the

practical length for a gladius was 38-43cm.*10 Furthermore, he argued that since officers swords were better made and had more decoration, they were more likely to be used as votive offerings in watery deposits and so a disproportionate number of these weapons have survived. Whilst there may be some truth to this argument, the real problem lies with the way in which Roman swords are neatly placed into convenient pigeon-holes. Living in an age of mass-produced, machine made goods, it is easy to forget that the Romans had only very simple tools with which to make their weapons. Our definitions of "gladius" and "spatha" could in truth be overly simplistic given that we cannot prove that there were ever any written instructions on how large swords were to be. In fact it is not at all likely that imperial edicts were ever issued on such matters. The size of a sword probably depended mainly on the whim of the individual smith, the amount of iron available to him at the time and the vagaries of the ironworking processes, amongst other factors. Some guidelines may have been issued by governors or unit commanders, but again, we cannot prove this. The "Mainz" pattern gladius seems to have been replaced by the "Pompeii" form in the latter part of the 1st century AD and no certain specimens are known which are later than this date.

The "Pompeii" gladius.

This modified form of gladius is generally thought to have come into use towards the end of the 1st century AD (Connolly 1981 p233,Bishop and Coulston 1989 p27). It has been more precisely dated to the decade 40-50AD (Manning 1985 p152) on the basis of a scabbard tip from Hod Hill. These swords were about 44-55cm in length, with straight edges and a short point (Ulbert 1969 p97ff; Schoppa 1974 p102ff). Although termed a gladius, this kind of sword has little in common with the gladius hispaniensis. Only its smaller size marks it out from the spatha, indeed one could argue that here we have the "semispathas" of Vegetius. Once this sword had been introduced it would not be long before the distinction between the gladius and the spatha

disappeared altogether.

The Spatha.

Like the La Tene III Celtic swords the Roman spatha had a long, straight-edged blade and a short point. The length could be 70-80cm or even more in some cases. In the 1st century AD the archaeological finds suggest that this was mainly a cavalry weapon.*11 This is hardly surprising since a cavalryman would need a long sword if it was to be of any use to him whilst he was in the saddle. A short sword would not have been so useful, as the rider would inevitably overeach himself trying to strike his target and could even lose his seat. The spatha would have been a formidable weapon in the hands of a trained cavalryman, used overarm and brought crashing down on the head and upper body of an opponent. Infantry would be at a considerable disadvantage when faced with such a sword. As far as I am aware, there is no evidence from either tombstones or other monuments for Roman cavalry having used their swords two-handed. This idea is based on a false interpretation of two Roman spathae from Canterbury (Webster in Bennett et al 1982 p190). Later spathae have been divided into two groups:- 1. The Straubing-Nydam type with blades 66-79cm long and 4.4-6cm wide and 2. The Lauriacum type, c65.5cm in length and 6.5cm in breadth (Coulston and Bishop 1989 p50). As will be seen there are examples from Britain which will not fit into these groups.

Short swords.

The evidence for these weapons is derived mainly from the Rhaetian auxiliary fort of Künzing. In 1962 a hoard of ironwork was found buried to the east of the headquarters building (Herrmann 1969 p129-141,Abb.2 no.s 1-5). The objects in this collection included fourteen short swords, plus fragments of two others. The blade shapes varied from a triangular form to a more normal shape with straight edges and a rounded tip, to examples which had tapering blades. There was no uniformity with regard to size either;length ranged from 37.2 to 54.7cm, whilst the blades were between 23.1 and 38.9cm long (Ibid p133). The majority

were of the type with parallel sides (i.e. like miniature spathae) and some were "damasziert" (pattern-welded). Some had a groove running down the middle of the blade. The hoard - which also included daggers and spear-heads - was dated to the middle of the 3rd century. However one cannot rule out the possibility that the material had been in store in the fort's Armamentarium for a long time before it was buried - some of the daggers for instance are not unlike the 1st century legionary pugios. Possible parallels for these swords have been found in Britain and these will be discussed in the appropriate place.

The Production of Roman Swords.

One of the clearest indicators of a sword's effectiveness is its hardness, that is to say its ability to stand up to the stresses and strains of battle. This is no less true of Roman blades than of later weapons, although unfortunately the metallurgical data is rather sparse for this period. Before one can form a proper opinion of the archaeological finds from Great Britain it is necessary to appreciate what techniques Roman sword-smiths used and by what limitations they were constrained. Since a number of other pieces of Roman weaponry were also fashioned from iron - including spearheads/butts, arrowheads and ballista bolts - much of what follows will also be applicable to them. The commonest ironworking techniques of the Roman epoque are summarised here to avoid repetition later.

Furnaces and the Smelting of Iron ore.

Following the extraction and collection of the iron ore, the first major task was to reduce it to workable metal in some form of furnace. There were basically three types of furnace in use during the Roman period, namely the bowl furnace, the domed furnace and the shaft furnace (Aitchison 1960 p204ff; Manning 1981 p54-5). The first of these was the oldest, having been in use in this country before the Romans came and it continued in use for sometime thereafter. At its most primitive, a bowl furnace consisted of a simple pit in the ground into which was placed the ore

to be reduced and the fuel (either wood or charcoal). The ore was then roasted in the open air, bellows being used to create a draught and fan the flames. This was a very inefficient method of producing iron. The domed furnace which followed was an improvement since it reduced heat loss and slag from the ore could be tapped off. This kind of furnace was mostly used in the early part of the Roman occupation. Much more effective was the shaft furnace (Aitchison 1960 p204,fig93). The ore and the charcoal fuel were stacked together at the bottom of the structure and the heat of the fire was increased by air from bellows, blown in through an aperture in the side of the shaft. The resulting metal and slag ran out of another opening on the opposite side and into a pit, where it could be separated. This seems to have been the major type of furnace in use during the Roman period. Whatever type of furnace was used, the result was always a number of BLOOMS, large pieces of iron, still containing considerable impurities.*12 The latin term for a piece of metal from which edged tools/weapons could be formed was "Structurae" (Pliny,Natural History XLI,243).

Forging.

Once the ore had been reduced to a bloom, it had to be purified to the point where it could be used to make objects. This involved prolonged forging of the metal at red heat (about 700-850 degrees c) with hammer and anvil if effective cutting edges were required for the object. This was an extremely long, tedious and physically demanding process, but given the level of technology available at the time there was no alternative if you wanted to get reasonably pure iron. Forging gave the metal a homogenous structure, greater flexibility and increased strength (Guy 1960 p32). The benefits of forging were recognised by the Ancient writers. Pliny commented that "Iron that has been heated by fire is spoiled unless it is hardened by blows of the hammer." (Nat. Hist. XLIII,149).

Carburising.

The hardness of iron can be greatly improved if whilst

it is being heated and hammered, carbon is diffused through it. Adding carbon to iron produces steel, although since Roman smiths had no precise way of controlling this process, results were unsurprisingly, quite variable. The process may even have been discovered accidently (Forbes 1964 p206). In Roman times, carburising was achieved by coating the surface of the metal in fine charcoal. The few analyses which have been done of Roman swords have shown that the smiths of the period were not very proficient at achieving a high degree of hardness in their swords. The Whittlesey spatha for example had been made by adding cutting edges (0.3% carbon) to the central section of the blade (0.25% carbon). The resulting hardness of 150-200 HV was in fact inferior to several La Tene III Celtic blades which have been examined (Lang 1988 p201,Tylecote and Gilmour 1986 p164-5). This is rather at variance with the picture we get from certain historical sources of the supposed superiority of Roman weapons! A gladius from the Rheinisches Landes-museum, Bonn was examined by taking a section across half the width of the blade (Williams 1977 p77-87). The carbon content was found to vary from 0.3 to 0.7 percent, being greater near the edges. It was noted that there was "no trace of any piling or laminating visible in this section" (Ibid p78), but neither was there any trace of any dicontinuity in the structure of the sword. Therefore, either the sword had been made in one piece*[13], or else it had been made in several pieces and then forged until the distribution of carbon had been made fairly even. If the latter was the case then it does not argue well for the expertise of Roman sword-smiths. Overall, Williams felt (Ibid p77) that the reason for the superiority of the Roman gladius lay not in its hardness but in its shape. Finally in this respect we should note the short, straight-edged sword from Mansion House, London (Lang 1988 p214; Manning 1985 p152). This had a hardness of of 170-200HV, a carbon content of only 0.3% at greatest and no trace of any surface carburisation.

The picture obtained so far does not suggest that the technique of carburisation was widely used or well-

understood during the Roman period. However it would be unfair to lay all the blame for this on the makers of the swords. In order to carburise iron properly, the carbon has to be added whilst the metal is molten. This requires a temperature of about 1540 degrees centigrade and this could not be achieved by Roman furnaces except perhaps occasionally by accident (Manning 1976 p1). The surface carburisation used in antiquity was not satisfactory, since it could only penetrate for a very small distance below the surface of the metal. Subsequent oxidation could destroy what little benefit had been obtained.

Piling.

In this process, a number of smaller strips of iron were individually carburised and then forged together to form the complete object. There is evidence that this was sometimes done during the Roman period;for example, one of the swords from Canterbury was made in this way (Bennett et al 1982 p189). Piling resulted in a better carbon distribution through the metal and therefore improved its hardness (Forbes 1964 p272).

Welding.

This was used to join several sections of metal together, as when separate edges were added to a sword. The Romans used a hard solder consisting of brass with a high zinc content to join iron objects. This was done in conjunction with the hammer and anvil (Aitchison 1960,p212-214). The swords from Nydam serve to illustrate the possibilities of welding. In some cases pattern-welded strips were welded onto both edges of a blade or else steel edges were welded to a plain iron core (Forbes 1964 p266). In this instance one must allow that the sword makers had recognised the advantages of having weapons with hardened cutting edges and had found different methods of obtaining them.

Quenching.

The quality (and hardness) of the finished sword would be determined partly by the success (or failure) of the

carburising, but also by the speed at which the metal was cooled after forging. Quenching could be done in a number of substances, including water, oil and a salt solution. There is very little physical evidence available on this subject and as far as I can tell, only one reference in the classical texts. Once again, this comes from Pliny (Nat. Hist. XXXIV,xli,46). He states that "It is the custom to quench smaller iron forgings with oil, for fear that water might harden them and make them brittle." This is nowadays called "Slack" or "Slow" quenching. Much the same effect could be achieved if quenching in water was not done properly and this may have happened occasionally (Tylecote and Gilmour 1976 p17-18). As with carburising and piling, the process of quenching was familiar to the Romans, but it was not always effectively applied if at all. A spatha from Augst dated to the mid 2nd to late 3rd century was quenched, whilst the Mansion House sword and a gladius from Vindonissa (late 1st or early 2ndc) were not.

Tempering.

This involved the partial re-heating of a steel object, after it had been quenched.*14 It was designed to reduce the brittleness of the metal. Tempering was apparently known in Roman times, but either not widely employed or else little understood. The results of tempering must have been rather random, since the temperature to which the metal was reheated could not be adequately controlled and because carburising/quenching were not wholely predictable processes either. In such cicumstances, tempering might actually do more harm than good, if it was wrongly handled (Aitchison 1960 p210).

Finishing the cutting edges.

This could be accomplished in two ways, either by thinning the blade through forging, or else by the use of a file or similar tool (Lang 1988 p205).

Pattern-Welding.

Although the majority of Roman swords from Britain have not been subjected to a proper metallurgical

examination, those that have (including some 1st century examples not discussed in this work) have proved to be of relatively simple construction, combining some or all of the metalworking techniques outlined above. There was in addition a rather more complex method of sword manufacture known commonly as pattern-welding, which was used fairly infrequently, it seems by Roman smiths.*15 The first important point to note is the distinction between pattern-welding and another method of making patterned swords which is called "damascening". The two terms have sometimes been used as if they meant the same thing, which in fact they do not.*16 Damask steel (which originated in the area of Damascus,hence the name) resulted from a "crystallisation phenomenon" in wrought steel and was harder to produce than a pattern-welded blade (Anstee and Biek 1961 p71). There does not seem to be any proof that the Romans ever made "damascened" swords.

Pattern-welding proper, is said to have been invented by the Belgae (Aitchison 1960 p254), but there are no references to it by Roman writers. Put simply it involves the twisting together and forging (at white heat) of several steeled iron rods of varying carbon contents. This led to the creation of wavy patterns in the surface of the blade. Each component of the blade would have to be forged, carburised and quenched seperately of course. Since these were hit-and-miss processes at this time, it follows that the results of pattern-welding were somewhat unpredictable. In theory, a pattern-welded sword would be stronger than one produced by more conventional methods. The carbon content of such a sword could be up to 6%. However, such comments really apply to the pattern-welded sword at the height of its popularity amongst the Anglo-Saxons and the Vikings. Roman pattern-welded blades were actually made of fairly low carbon iron, consisting of alternate strips of high and low phosphorus metal. These would behave differently after etching so that the phosphoric iron showed up brighter, whilst the iron with the lower phosphorus content appeared darker. It may well be therefore that Roman smiths were more concerned with

producing the pattern than they were with making harder blades (Tylecote and Gilmour 1986 p1) - which is not at all like the generally practical Roman approach to arms and armour! Once the twisted core of the sword had been fashioned, plain carburised iron edges could be welded to it and the whole blade could be forged together. Later, the etching of the blade took place, in some corrosive substance to further enhance the pattern.

It is rather difficult to assess to what extent this proceedure was used in the Roman world, when compared to all the hundreds of thousands of swords which must have been made, we have such a tiny handful surviving. The pattern-welded gladius from Mainz (Schoppa 1974 tafs 24-25) may date to the 1st century AD in which case the technique was known very early in the Imperial era. However, most examples seem to belong to a later period. Of all the British swords which are examined in this chapter, only two - those from South Shields and York - are definitely pattern-welded, whilst one of the Canterbury swords exhibits a simplified form of the technique. The bulk of the evidence for pattern-welding comes from Nydam - outside the boundaries of the Empire.*[17] Out of a total of 106 swords found here, ninety were pattern-welded (Tylecote and Gilmour 1986 p150). This is a quite remarkable number, their preservation made possible by the exceptional site conditions. Many details of weaponry have been preserved at Nydam which have not survived elsewhere. The difficulty lies in deciding how relevant this hoard is to the study of Roman arms as a whole. While one cannot simply disregard the obvious similarities, it remains uncertain whether the Nydam hoard represents booty taken in battle, acquisitions from Roman traders or local copying of Roman equipment.

One fact is not disputed and that is that a pattern-welded sword represented a very substantial outlay in terms of both time and money. One estimate is that a top quality weapon of this type would take up to 200 hours to make (Anstee and Biek 1961 p88). This is clearly not the sort of side-arm that the average auxiliary or legionary soldier

could afford.*[18] One would judge from their comparative rarity (except at Nydam), that pattern-welded swords were status symbols, reserved for the wealthier echelons of the Roman army.

Overall it is hard to assess the quality of post-1st century Roman swords from Britain since comparatively few have been properly examined. In a study of five swords from the British Museum (Lang 1988 p199ff), it was noted that those dated to 50AD or later had lower carbon contents and were actually inferior to the majority of Iron Age swords! This group included the "short sword" from Mansion House. It has been pointed out by several authorities that techniques aimed at improving the quality and hardness of iron - carburising, quenching and tempering - were certainly known to Roman smiths, but they were not always used and even when they were, the results were mixed. The conclusions to be drawn from the data available is that the quality of Roman swords was generally mediocre. There are obviously exceptions to this statement, notably the pattern-welded swords. These are fairly high quality productions, but they are not common in this country and cannot therefore be considered typical.

The Archaeological Evidence from Britain. (Map 1)

TABLE 2:Late Roman swords in Britain.

SITE	QUANTITY	TL	BL	BW(MAX)	DATE	UNIT
BECKFOOT	1	*43	?	4.3	3rd-4thc?	Auxiliary?
BURNSWARK	1	59	42.3	4.7	M2ndc?	?
CAERNARVON	1	*68.9	48.7	4.7	?	Auxiliary?
CAMELON	3	*23.5	?	5.3	1st/2ndc?	Auxiliary?
		83.5	?	c4.5	1st/2ndc?	Auxiliary?
		*47	36.5	3.7	1st/2ndc?	Auxiliary?
CANTERBURY	2	87	65.5	5.9	M2nd-M3rdc?	Cavalry?
		91.5	69	5.6	?	Cavalry?
CHESTER	1	*c50?	c43?	c5.0?	3rdc?	Legionary?
LANCASTER	1	*?	?	?	4thc?	Auxiliary?
LONDON (M. H.)	1	43.1	30.5	4.5	Pre c150?	?
LONDON (THAMES)	1	49.2	?	?	1st/2ndc?	?
LONDON (WALB.)	1	42.1	27.9	3.4	Pre c150?	?
MILECASTLE 39	1	*39.4	28.9	4.5	L2nd/3rdc?	Auxiliary?
SILCHESTER	1	*69.5	*?	4.4	4thc?	?
SOUTH SHIELDS	4-5	*45.5	c40.5	6.5	E3rdc?	Cohors V Gall?

(one fairly intact plus 3 or 4 very fragmentary)

VERULAMIUM	2	*31.8	?	?	c130-150	?
		?	?	?	c280-315	?
VINDOLANDA	1	*54	c34	5.9	L3rd/E4thc	Cohors IV Gall?
WHITTLESEY	1	c72	60	?	2nd-4thc?	?
WROXETER	1	98	72	6.0	c160AD?	?
YORK	1	*41.7	*?	5.2	L2ndc?	Legionary?

*Indicates an incomplete specimen. E=early; M=mid; L=late.

Note:All measurements are given in centimetres for ease of comparison.

Beckfoot.

This sword was found in 1949 in a cremation burial a short distance to the south of the fort (Hogg 1949 p32-37). The location, coupled with the arrowhead, spearhead and sword which were among the grave goods, make it a reasonable assumption that the dead man had been a member of the fort's garrison. The portion of the sword found is c43cm long, 4.2-4.3cm wide and with a point 6.5cm long. Part of the blade, as well as the tang and all the fittings are missing. Even the surviving portion is in a rather poor state, so that meaningful analysis is difficult.*19 The blade is straight-edged, with a short point, so that it could have been either an example of the later type of gladius or else a spatha. Only through length can we really distinguish these two groups of swords and this is clearly of no use in this instance. We also lack any sort of dating evidence for the burial - no coins were found and the pottery is of no use. The presence of a quadruple-ribbed arrowhead, possibly of the socketed type, suggests a date for the burial in the 3rd or 4th century AD, since examples of this type have been found in late contexts at Corbridge. However it is always risky to date weapons by analogy with those from other sites. The most that can safely be said is that the burial probably does not date to earlier than the Hadrianic period.

Burnswark.

A somewhat corroded but virtually complete sword was found buried in the north rampart of the native hill-fort at Burnswark, together with a denarius of Domitian (Jobey

1

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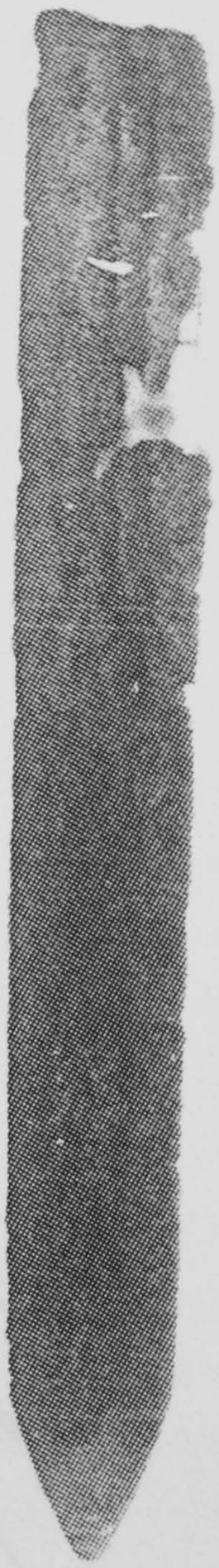

3

4

PLATE 1: Swords (all at 1:3)
1. Chester. 2. Camelon. 3. York. 4. Mansion House, London.

MAP 1: Swords.

1977-8 p86-7). Though the context is clearly non-Roman, it is now apparent that the "hill fort"was no longer occupied by the time that the "siege works"were built. The dating of the latter to the mid 2ndc is not so secure as was once thought (Breeze and Dobson 1984 p107) - the Roman works at this site may even date to the 3rd century. Also, it is quite possible that Flavian silver coins could continue in use into the second century or later so the association of the denarius and the sword is not necessarily significant. The Burnswark sword is c50cm long and 4.7cm wide, with a blade of 42.3cm in length (Breeze et al 1976 p83,Table 1). The edges of the blade are roughly parallel for most of its length and there is a short point (Jobey 1977-8 fig13). Part of a flat hilt guard made of bone survives and at the end of the tang there is a small, spherical "button" pommel of the same material. Similar pommels can be seen on Celtic swords (de Navarro 1959 taf10). The association with the coin and the presence on the site of other undoubted Roman material indicate that this was indeed a Roman sword. Unhappily, most of the fittings have not survived. In terms of size this sword is intermediate between the gladius and the spatha and could be of either type. It may date to the 2nd century AD - given the likely date for the practice siege works - but this is really only an educated guess and a later date cannot be ruled out. Nor can it be decided whether this is a legionary or auxiliary sword since both sorts of troops may have been present at the site.

Caernarvon.

The precise find spot of this sword is unknown, but it appears that it came from near the west corner of the fort, either from within the fort itself, from the ditches or even from the vicus (Wheeler 1910 p142-3; Bayne 1910 p411,Boon 1962 p85). A portion from the middle of the tang is missing so the exact original length is not known. Estimated measurements are as follows:- TL:68.9cm, BL:48.7cm, BW(Max) :4.7cm. The blade has a short tip and it narrows somewhat torwards that end, but since most of the original edges are gone, width measurements are not of much value. The most recent drawing (Boon 1962 fig1), shows a

sword which is basically straight-edged, although there is a marked widening near the junction with the hilt. The section is diamond-shaped and there are traces of a mid-rib. The latter is something which is not often noted on Roman swords, although corrosion could easily remove such a feature.

The pommel, guard and grip are all of elephant ivory. The former is oval in shape and when found was topped with a small metal finial, which has since been lost (Hughes 1910 p324; Boon 1962 p86). The guard is much wider than the blade, a feature which as Boon noted is also seen on the first century tombstone of the auxiliary cavalryman, T. Flavius Bassus (Ibid p88). The grip, which is incomplete, is of the fluted type. The use of ivory for sword fittings is fairly uncommon and may be taken as implying that the owner of this sword was a man of some substance. In the Augustan Histories (vita Hadrian X,6) it is recorded that the Emperor was so indifferent to luxuries that he "Would scarcely consent to have his sword finished with an ivory hilt." Fluted grips were frequently used on 1st century Roman swords, although they were more usually of bone (e.g. Newstead-Curle 1911 plate XXXIV no.13; Longthorpe-Frere and St. Joseph 1974 p68). Examples in ivory have also been discovered - at Carlisle (unpublished) and from London Wall (Museum of London Accession no.1126). Such grips were often very finely made, each section being of a width suitable for the width of the appropriate finger. Although appearing on 1st century swords, fluted grips have occasionally been found on later swords e.g. the sword from Whittlesey (see below). Most late Roman swords from Britain are lacking their grips, so it is somewhat unconvincing to date the Caernarvon sword to the 1st century simply because it has such a grip. One should note also in this context the 4th century spatha from Cologne (Bishop and Coulston 1989 p64), which has a fluted ivory grip. There are grounds therefore for dating the Caernarvon sword to rather later than the 1st century, possibly to the 2nd or 3rd centuries, in line with the suggested dates for most other ivory sword or scabbard fittings from Britain.

Another feature of the Caernarvon sword is the small tinned bronze band which runs around the grip where it meets the pommel. This was presumably designed to strengthen the grip and prevent it from splitting - a very real danger considering the size and weight of Roman pommels. There do not seem to be any parallels for the use of such bindings. Finally, mention must be made of the traces of wood (unfortunately not identified) and rust, on the surface of the blade - all that remains of the scabbard.

To sum up, it can be said that the dating of this sword presents something of a problem. Whilst the fluted grip may point to a date in the 1st century, ivory fittings were more common in the later period of the Roman occupation. Since we really know very little about the sword's findspot, it is impossible to make categorical statements. We no longer have to accept the old theory that the fort was abandoned or at least virtually so by c140AD. Occupation continued at Caernarvon until late in the 4th century at least.*[20] Therefore, a late date for this find should not be ruled out. I cannot really agree with Boon's assertion that "there can be very little doubt but that this is an infantryman's, rather than a cavalryman's sword, " (Boon 1962 p86). In terms of both shape and size this sword is closer to a spatha than it is to a gladius - as far as such labels are meaningful!

Canterbury.

Two swords were found in a double inhumation burial in Rosemary lane, Canterbury in 1977 (Goodburn 1978 p469-471,Bennett et al 1982 p185-190). Judging from the haphazard positioning of the skeletons and the other finds it looks as if the deceased met a violent end and were hastily interred. Both swords have very long, straight-sided blades with short points. They have been interpreted as cavalry spathae by Dr. Graham Webster and dated by him to the mid 2nd-mid 3rdc (Bennett et al 1982 p190). The shorter of the pair is 87cm long, the blade being 65.5cm long and 5.9cm across at its widest point. The blade has a

a groove (fuller) following the outline, probably on both sides (Ibid p187). This was common on Celtic swords but not so on Roman swords. The grip, pommel and guard are missing from this sword, revealing the long, tapering tang. The only fitting to survive was part of an iron chape, which will be described in the section devoted to such finds. Analysis of this sword showed that it had been made from several metal strips, the central one of which had perhaps been twisted. These components (which had been welded together) may themselves have been produced by hammer-welding smaller pieces of metal together. The intention must have been to make a strong core for the blade. If this is so it is odd that similar care was not taken with the edges, which were formed of strips of untreated metal. Perhaps then the appearance of the sword was more important to the owner than its strength.

The second sword is slightly longer at 91.5cm, but is very similar in its shape. The blade is 69cm long, tapering from 5.6 to 5cm in width. The central core of the sword is formed from a single twisted metal bar (a primitive form of pattern welding?) and again the edges are of plain metal (Ibid p189). One feature of both these swords is the length of the tang - 21.5 and 22.5cm respectively. This is something which recurs on many late Roman swords. Dr Webster has argued (Ibid p190) that these swords were perhaps used two-handed by cavalrymen, who he felt were "barely Romanised borderers". As far as I am aware there is no evidence either literary or sculptural to support the notion that Roman swords were ever used two-handed.*21 It seems more reasonable to assume that the (to our eyes) excessive length of the tang on such swords was balanced by a large pommel such as that already noted on the Caernarvon sword. To be most effective, a sword has to balance properly, that is the length of the blade must relate in some way to the length and weight of the grip/pommel. There is no specific evidence to prove it, but Roman swords must have been designed in this way. As to the type and the ethnic origin of the soldiers using these sword, this must remain pure speculation. The bronze pelta chape found with

the second sword from Canterbury is one of the commonest types found in Britain and may well have been used by both legionaries and auxiliaries. Moreover if the burial does belong to the 2nd or 3rd century then the presence of spathae need not imply that the owners were cavalry troopers. There is no clear evidence from this grave with regard to either the ethnic origin or arm of service of the two soldiers.

Camelon.

This site has produced three swords, which with varying degrees of certainty may be considered as Roman. The first of these was found in a cist burial on the south-east side of the fort in 1922 (Breeze et al 1976 p90,fig 4.7). It consists of a small fragment of iron blade and tang, with a straight bronze hilt guard and a wooden hilt. The top of the tang and most of the pommel are missing, although a small bronze washer which held the pommel to the handle can still be seen. The blade is diamond-sectioned near the tang but elliptical further down. The closest parallels for this sword come from Colchester and are of 1st century date (Ibid p86). We also have to take into account another group of finds discovered nearby in 1922, which included a pot considered by Gillam to be of Flavian date (Ibid p91). Neither of these points is conclusive however, for too little of the sword remains for positive dating. Bearing in mind the history of the site an Antonine date is a possibility. There are traces of the wooden scabbard on the blade, but the species has not been identified. TL:23.5cm;Tang length:10cm;BW:5.3cm.

Two other swords were found in a gravel pit to the west of the fort in 1975 (Ibid p73ff). One of these was an isolated find and to judge from its length was a spatha (Ibid p90). The tang is long and thin and is square-sectioned. Very little survives of the original edges and although the section of the blade is now lenticular, allowances must be made not only for much corrosion, but also for the amateurish treatment immediately after the sword's discovery. No fittings have survived with this

sword, but the general form and the proximity of the fort make this acceptable as a Roman weapon. Comparisons have been made with the Newstead spathae (Ibid p90), but I can see no reason why this sword should not belong to the later (Antonine) phase of the fort's history. TL:83.5cm;BW (Max) :c4.5cm.

The last and most interesting sword came from a double inhumation burial in a stone cist. Weapon burials do not appear to have been very common in Britain during the Roman period*22 and where they do occur they may be connected with some native tradition amongst the troops involved. Since Roman soldiers had to purchase their arms from the State (and pay for any replacements) and since on discharge (or death) the arms were returned to the unit in return for cash, most soldiers would naturally not be buried with their weapons. The Germanic style weapon graves on the continent are an interesting exception to this rule, but there are difficulties in their interpretation.*23 Auxiliary troops recruited in Britain, particularly in the period immediately after the Roman conquest would probably have used weapons not too disimilar to those used by the pre-conquest population. Certainly, this would account for the otherwise odd combination of Roman and "native" features seen on the sword from the burial (Ibid p88-9,fig 3.1 and see plate 1 no.2).

This sword is short, with roughly straight sides and a short point whose edges curve gradually, without any sharp angle. Thus it has much in common with the Roman gladius. The blade is broken in two at about its mid-point, revealing that the section is lenticular. Most of the fittings are missing. However there are the remains of the wooden handle, formed in two pieces. Also present is the pommel, which was a small spherical bone type c.f the pommel of the Burnswark sword. There are substantial remains of the scabbard adhering to the sword. This was of ash (and so perhaps was the handle?). The top edge of the scabbard was curved, implying that the hilt guard was of the arched type - in use during the Iron Age (Piggott 1950

fig2). The large spearhead with a mid-rib, also found in this burial (Breeze et al 1976 fig 3.3) is also distinctly unusual for a Roman weapon and native influence could be at work here too. However even if such features are native it would be dangerous to date the burial to the 1st century on these grounds alone, because we simply do not know how long Iron Age tradition continued to influence Roman weapons - and there were no coins or pots in the burial. We could assume that this was not a Roman burial at all, but this seems on balance unlikely. The balance of probability favours a 1st century date for the burial but the possibility that it really belonged to the Antonine period cannot easily be dismissed. TL:47cm (a small part of the tang and pommel is missing) ;BL:36.5cm;BW at junction with tang:c3.8cm;BW at 7cm from tip:c3.1cm.

Chester.*[24] (plate 1 no.1).

A portion of an iron sword from the Northgate Brewery excavations of 1974-5 can be seen on display in the Grosvenor museum at Chester. This is identified as a spatha, although in view of its likely late date, it need not necessarily be interpreted as a cavalry sword. The sides of the blade appear fairly straight, with a gradual taper down to a width of 4.3cm near the tip. I was not able to obtain measurements of this sword, so the dimensions quoted are taken from a photograph and are therefore only approximate. TL:c50cm. BL:c43cm. BW (Max) : c5.0cm. The tip of the blade is missing, so the original length is not certain, but it does not seem likely that much has been lost. It is rather short for a sword of the period and definitely not of a size one would expect for a spatha. Perhaps this is another hybrid form, as has been suggested for the Whittlesey sword (see below page 74), combining the shape of the spatha with the length of the gladius. The tang, which is covered in corroded wood, widens slightly at the point where it meets the blade. Here there is a slight ridge, the remains perhaps of the hilt-guard. None of the other fittings have survived. It did not prove possible to examine this find closely, but the x-rays were available for study. These were rather disappointing as they clearly showed that the sword was not pattern-welded, nor

apparently was the blade decorated in any fashion. The shape of the blade at the junction with the tang hints at the former presence of a curved hilt guard. Date:3rd century?

Lancaster.

A sword was found here in 1972 which may date to the fourth century AD (Wilson 1973 p282). However it seems that this object no longer exists and it may only have been a rust mark in the soil. (Information from Miss Marie Bailey of Lancaster Museum). No further details are known.

London. (plate 1 no.4).

There are two well-preserved short swords in the British Museum collection which merit attention here (Manning 1985 p152,plate 72 no.5 and plate 73 no. V4). The first of these (British Museum Accession no.1868.9-4.20) was found in the Thames and therefore can only be dated on the basis of stylistic features. The blade is slightly waisted, with a central groove and a very long point. The overall length is 49.2cm, which falls within the upper end of the range of the short swords from Künzing (Herrmann 1969 p133). The hilt guard was evidently of the arched type c.f. the "gladius" from Camelon (Breeze et al 1976 fig 3.1). The hilt itself has not survived, but its outline can be traced on the surface of the blade. Whilst the hilt form points to a date in the 1st or early second century (Manning 1985 p152), the closest parallel (as Manning admits) is the hoard (3rd century?) from Künzing. Either we must admit the possibility that Iron Age features continued to appear on Roman weapons in Britain until a later date than previously supposed or else we have to accept that even in the early imperial era, the Romans would occasionally make short swords - whether by accident or design.

The other sword (Accession no.1891.9-5.4), comes from the Mansion House site (Manning loc cit.). This is approximately 43cm long, of which the blade takes up 30.5cm. This has more or less straight sides and a short

point which forms a sharp angle with the rest of the blade. The width varies from 4.5 to 3.4cm, but the edges taper very gradually so the change in width is not very noticeable. The blade is elliptical in section, without any sign of a mid-rib. The tang is square-sectioned, terminating with a small circular button. None of the fittings have survived. Metallurgical analysis of the sword showed that it had probably been made from several strips. The carbon content was low - about 0.25 to 0.3% - and there had been no attempt at carburisation (Lang 1988 p214-5). In sum then, the Mansion House sword was a fairly crude production, functional but by no means of high quality. A date before c150AD is suggested for this piece*25, since it is considered likely that it came from the Walbrook stream, which had silted up by about that time. The sword is in some respects reminiscent of the short swords from Künzing (Herrmann 1969 Abb 2 no.s 3-5), although it lacks the central groove of those weapons.

Milecastle 39 (Castle Nick).

A short sword, reported to be like those from Künzing has been found in the recent excavations at this milecastle (unpublished small finds report,find no.765,3900,490,EM). The sword has parallel sides for most of its length. The tip of the blade is missing. The remains of the grip on the tang consist of two semi-circular sectioned pieces of wood rivetted on. The pommel and the hilt guard have not survived. TL : 39.4 cm ; BL : 28.9 cm ; Tang Length : 10 cm ; Width of Handgrip : 3.4 cm ; BW (Max) : 4.5 cm; Maximum blade thickness : 1 cm. (All measurements are approximate since they were taken prior to conservation). No other details are are available at present.

The obvious parallels for this find are the London short swords discussed above and a sword from Colchester (Hawkes and Hull 1947 p340,plate 104 no.5), dated to the mid first century;not forgetting the Künzing hoard.

The milecastle excavations have also produced an iron sword or dagger, with which survived part of the scabbard

(see the section on scabbards). Again, no other details are available at present.

Silchester. (plate 3 no.4).

A sword was among the finds in a hoard of ironwork found within the Roman town in 1890. (Boon 1974 p68,164,fig 8 no.10). This may have been a ritual deposit. Most of the tang has been lost, as has the tip of the blade and the remaining section is in two pieces. The blade tapers very gradually over the surviving portion and would have had a short point. It is of elliptical section, without any trace of a mid-rib. The two pieces do not have a firm junction. There are no surface indications of pattern-welding, inlay or any other decorative technique. On one side of the blade, near to the tang end are some rather faint stamped numerals. These have been interpreted as IXV (Boon 1974 fig 8.10). It is suggested by Boon that this sword was produced in one of the Gallic arms factories in the late 4th century and that the mark was meant to read XVI. This would presumably be the mark of the workshop responsible for making the sword. If this connection with the continent could be proved, this would go some way torwards explaining why there were apparently none of the great state arms factories in Britain comparable with those elsewhere. (Table 1 gives a list of the late imperial arms factories). Unfortunately, there does not appear to be any real dating evidence for the context in which the sword was found. Also, it remains to be proved that the mark on the blade had anything to do with an arms factory - Gallic or otherwise. No fittings survived with this sword, not even the hilt guard and were it not for the presence of other undoubtably Roman items in the context it would be unsafe even to call the sword Roman. Because of the loss of the point and most of the square-sectioned tang we can have no real idea of the true dimensions of this sword. However it was clearly not a gladius and fits in well with other Roman spathae. TL(Surviving) :c69.5cm. BL:unknown. BW:4.4cm at the junction with the tang, 4cm at 20cm from the tang and 2.5cm near the lower end.

This sword and other pieces of Roman military

equipment found at Silchester (Boon loc. cit.), point to some kind of military presence in the town, although what category of troops were involved is unclear. Some of the weaponry could come from a conquest period base e.g the boltheads, but on the other hand such finds as the three bone chapes (see below page 121) point to some sort of military occupation in the later second or third centuries. The sword, if it has has been correctly dated, may represent part of the equipment of a Field Army soldier serving in Britain and need not necessarily imply that there was a permanent military presence at Silchester in the 4th century.

South Shields. (plate 2 no.s 1-3).

The museum at South Shields has in its collection a substantial portion of one sword as well as innumerable small fragments of 3-4 others. The former is certainly one of the most interesting and valuable pieces of weaponry ever to be found in this country. The circumstances of the discovery of these swords are slightly confused. They are first mentioned by J. C. Bruce (Bruce 1885 p258):- "Several iron articles have been found in the course of the excavations. The most interesting of these are the short swords which were worn by the Roman soldier, and were chiefly used by him when in close personal conflict with an enemy. Four or five of these were found in the south-east angle of the station. They are from two to three feet long, and are about two inches and a quarter broad. They have been sheathed in a scabbard of wood tipped with a bronze chape. The woodcut shows one of these."

Clearly then, these swords cannot have been found later than 1884 (when the volume of Archaeologia Aeliana containing the article just quoted from was published). Therefore the recently published information that the swords were found in 1885 (Allason-Jones and Miket 1984 p296) must be incorrect. In fact excavations were taking place in the correct area of the fort in 1876 and it was probably then that the swords were found. (I owe this suggestion to Mr. Bill Hubbard,formerely Museum Officer at

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3. South Shields (at 1:3)

PLATE 12
South Shields
(detail at 1:1)

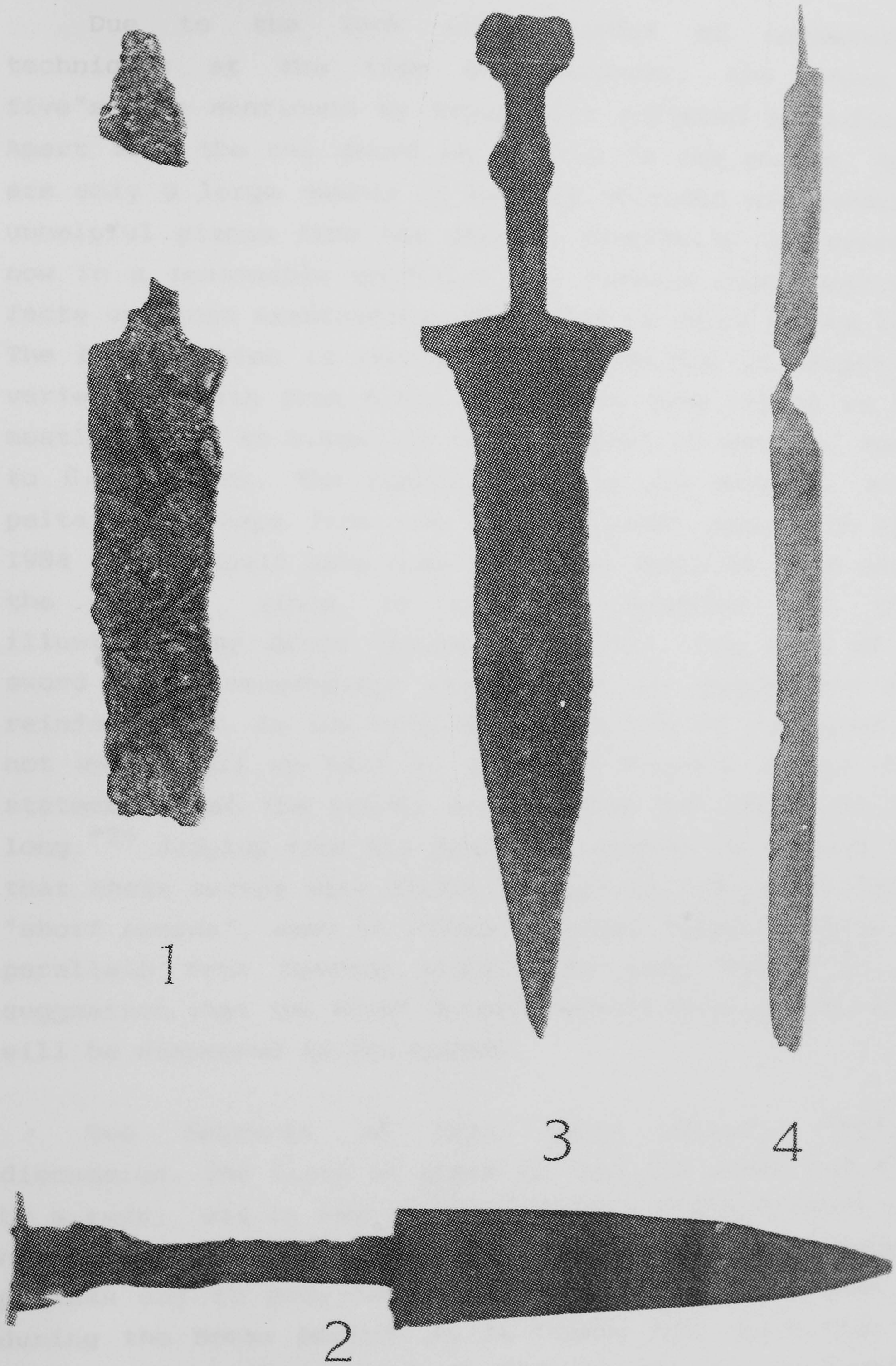


PLATE 3: Swords and Daggers
1. Caerleon (at 1:2) 2. MC.35 (at 1:2)
3. London, unprov. (at 1:2) 4. Silchester (at 1:4)

South Shields).

Due to the lack of knowledge of conservation techniques at the time of discovery, the "four or five"swords mentioned by Bruce have suffered accordingly. Apart from the one sword on display in the museum, there are only a large number of heavily corroded and generally unhelpful pieces from the others. Thankfully the sword is now in a reasonable condition and reveals some surprising facts on close examination. The sword is about 45.5cm long. The blade (which is incomplete) is c40.5cm in length and varies in width from 6.5cm at the The tang (which is also mostly lost), to 5.8cm. It is elliptical in section, and up to 0.5cm thick. The pommel and grip are missing, but a pelta type chape from the fort (Allason Jones and Miket 1984 p160), could have come from this sword or from one of the others, since it closely resembles the chape illustrated by Bruce (Bruce 1885 p258). The hilt of the sword has a cross-piece welded onto it, presumably as a reinforcement. As the original dimensions of the sword are not known, all we have to go on is Bruce's rather vague statement that the swords were between two and three feet long.*26 Judging from his published remarks he clearly felt that these swords were gladii because he refers to them as "short swords", used in "close personal combat." There are parallels from Germany which lend some weight to the suggestion that the South Shields swords were gladii. These will be discussed in due course.

Two features of this sword deserve detailed discussion. The first of these is that the blade (as shown by x-rays), was in fact pattern-welded. It has already been noted that this was a very costly and time-consuming process and it does not seem to have been in common use during the Roman period. It is likely that more than one (perhaps all) of the South Shields swords were produced in this way, for some of the corroded fragments are also pattern-welded (Allason-Jones and Miket 1984 p296). Given that such weapons were expensive and therefore probably had a prestige value, how did they come to be buried under the

rampart of a fort? I think that the possibility of them having been lost can be ruled out immediately;the idea of several soldiers having mislaid their weapons at precisely the same spot and not recovering them is very improbable. Far more credible is the idea that these swords were a votive deposit of some kind. Since they seem to have been buried under the rampart extension built when the fort became a supply base for Septimius Severus's campaign in Scotland, it is tempting to see these swords as an offering to the gods - not only for the safety of the base but also for the success of the coming war. This is of course wholely conjectural, but it is interesting to note the undoubtably military iconography of the decoration on the South Shields sword (see below).

The idea that the South Shields sword was made for someone of considerable status or for some ritual purpose is re-inforced by the decoration of the blade. This consists of figures cut from thin pieces of a yellowish metal. The impression I received from a close examination of the sword was that these had been applied to the surface of the blade rather than being actually inlaid. The decoration occurs on either side of the blade, near to the junction with the tang. One side has the figure of a sad-faced warrior (perhaps Mars?), standing about 5cm high. He is dressed in traditional Greek heroic costume with a crested helmet, muscled cuirass and a tunic with pteryges at the arms and waist. The figure has greaves on his legs and holds a spear in his left hand and a round shield in his right. On the reverse side there is an eagle standard, with the eagle clasping a laurel branch in its beak. To each side of this there is a standard (signum?) with a conical ferrule and a point not unlike the shape of the so-called "standard-tips" found on many Hadrian's wall sites (see the chapter on spearheads). These two standards are decorated with discs and crescents. On this side of the blade the decorative zone is about 4cm high. The metal from which the figures has been cut is said to be an alloy of copper and zinc, with smaller amounts of tin, silver, lead and iron also present (Allason-Jones and Miket 1984 p296).

The artistic quality of the decoration is not very high, although it has a certain naive charm.*27 This contrasts rather oddly with the pattern-welding. It would seem likely that the man who forged this sword was not responsible for the decoration. The latter may have been produced by a local craftsman and high quality may not have been the foremost consideration if the sword was soon to be buried in the ground.

A number of swords with similar "brass" decoration are known (Ibid p298), but these are mainly from outside the Empire;in Norway, Poland and the U. S. S. R. A much closer parallel is a gladius from Mainz (Schoppa 1974 Abb.2,Taf 26). The scabbard of this sword is decorated with "brass" figures; which stylistically speaking are very close to those on the sword from South Shields. The decoration on the Mainz sword includes the figure of a warrior rather like that described above.

The South Shields sword must date to the early years of the 3rd century - assuming that the provenance has been correctly recorded. The garrison at this time may have been Cohors V Gallorum, which is mentioned on an inscription of 222-223AD (RIB 1060), but the unit may have been at Cramond under Severus (RIB 2134). The second century garrison (s) are not known, but the size of the fort (c3.75acres) suggests a quingenary infantry or mixed cohort.

Verulamium.

The site has produced parts of two swords (Frere 1972 p95,fig 73 no.s 162-3). The first is a fragment of blade and tang, the point missing and roughly broken in two part way down the blade. The remaining portion is badly bent and heavily corroded. The surviving portion is 31.8cm long and tapers only slightly. It was found in a cellar in a layer dating to 280-315AD. The other find (no.163) is a small fragment from the hilt and upper part of the blade. This is elliptical in section and resembles the corresponding section of no.162. It is 9.4cm long and came from a deposit dating to 130-150AD.

Vindolanda.

A sword was found during the 1979 excavations between the north gate and the wall of the second stone fort. This sword was still in conservation at the time of writing, and the present author has not been able to examine it. The following account is therefore of necessity based solely on the published description of the weapon (Bidwell 1985 p130,fig 46 no.1). This too it must be noted, was not based on an actual first hand examination. The tang and a large portion of the blade survive, but the point is missing. None of the fittings were found. The fragment measures about 54cm, of which the tang comprises about 19.9cm. The blade tapers from a width of c5.9cm at the tang to c5.6cm. The tang is very long and narrow and the blade is wide and flat, tapering only slightly. Very little can be said of this find because of its incompleteness. In terms of blade width it belongs with the Wroxeter sword and the smaller of the two swords from Canterbury. It presumably dates to the 3rd or 4th century AD. , and so is most likely to have had a long, straight edged blade, a view also supported by the great length of the tang, clearly intended to match a very substantial blade. The garrison at this time would have been the Cohors IV Gallorum.

Whittlesey.

A sword was found in 1965 near Whittlesey, Cambridgeshire during mechanical earth removing (Wilson 1966 p207-209,plate ix no.4). The blade and tang are complete, but of the fittings only the fluted bone grip survives. The shape of the blade is rather interesting. Although the upper part is straight-edged, the tip is long and curves gradually inwards (Howe 1978 fig 14), a feature more reminiscent of the gladius hispaniensis than of the later long swords. However the size of the sword puts it firmly in the spatha category. The section of the blade is elliptical, without any mid-rib. The sword was found underneath layers containing 2nd to 4th century pottery (Wilson 1966 p209). The shape seems to be an attempt to combine the length of the spatha with the long point of the gladius, to give a sword which was useful for both stabbing

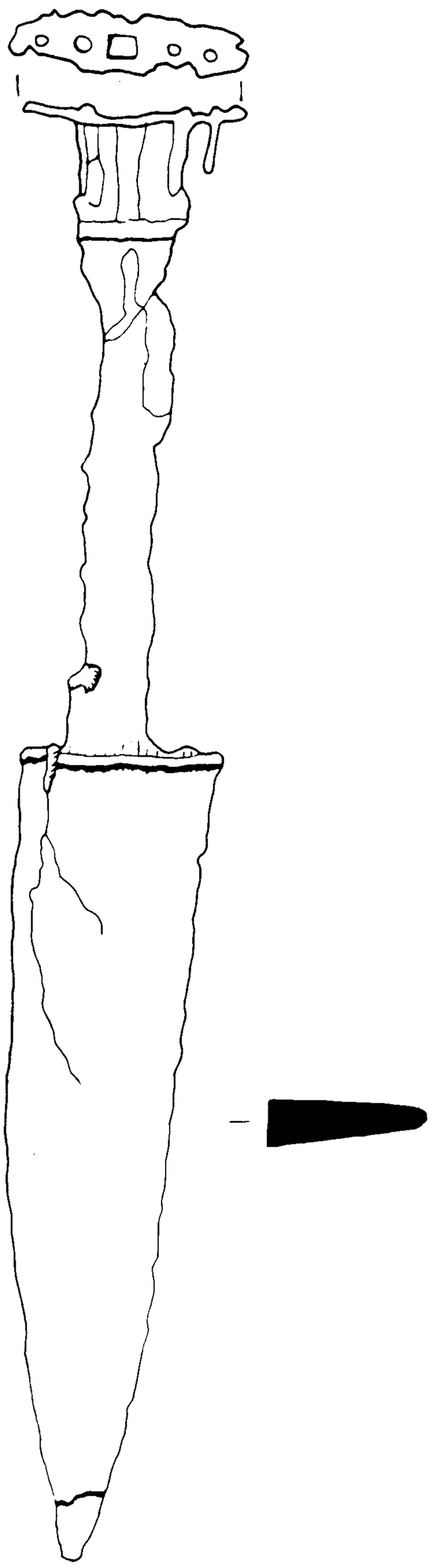
and slashing. This implies a date before the gladius went out of use, most likely in the 2nd century although this cannot definitely be proved. TL:72cm;BL:60cm. Other measurements are not known.

Wroxeter.

This sword was found in the east portico gutter of the forum beneath a destruction layer dated to c160AD (Atkinson 1942 p218,plate 56A). The illustration shows a lengthy blade with roughly parallel sides for most of its length and a short point. The tang is also very long and narrow. All of the fittings are missing. Atkinson felt that in view of the sword's great length it could not be Roman and therefore had to be "native". This false appreciation came about because Atkinson considered that this sword would not fit into either the spatha or gladius category. These categories he defined by referring to allegedly "typical" examples from Newstead (Curle 1911 plate xxxiv no.s 6-7,11), dating to the Flavian period. As already pointed out several times, Roman swords are very variable and if you fail to take this into account and try to rigidly divide up the material into pre-conceived categories then it is not really surprising if some finds will not fit into such a scheme. In terms of shape this sword is perfectly acceptable as a Roman weapon and there are undoubted Roman swords of comparable length, for example the longer of the pair from Canterbury. The context of this sword (in the middle of a Roman town) presents something of a problem. This could be a stray find from the 1st century military activity at the site. Alternatively, since civilians were forbidden under Roman law to carry arms*28, the sword may have belonged to a soldier who was in town on official business, on leave, or even perhaps in garrison, at a later period in the town's history. TL:98cm;BL:72cm;BW (Max) :c6cm.

York. (plate 1 no.3).

Part of a pattern-welded sword from this site can be seen on display in the Yorkshire Museum. The tang, all of the fittings and the upper portion of the blade are



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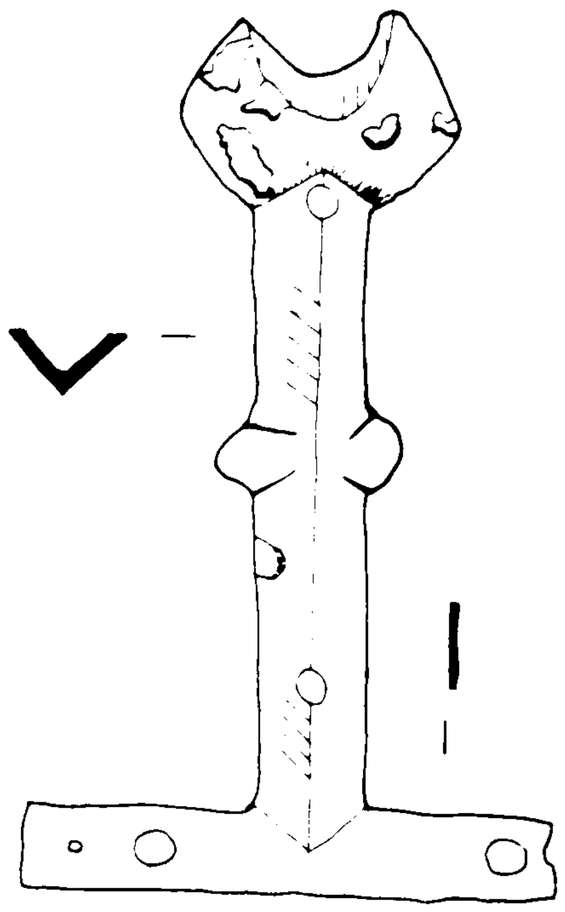

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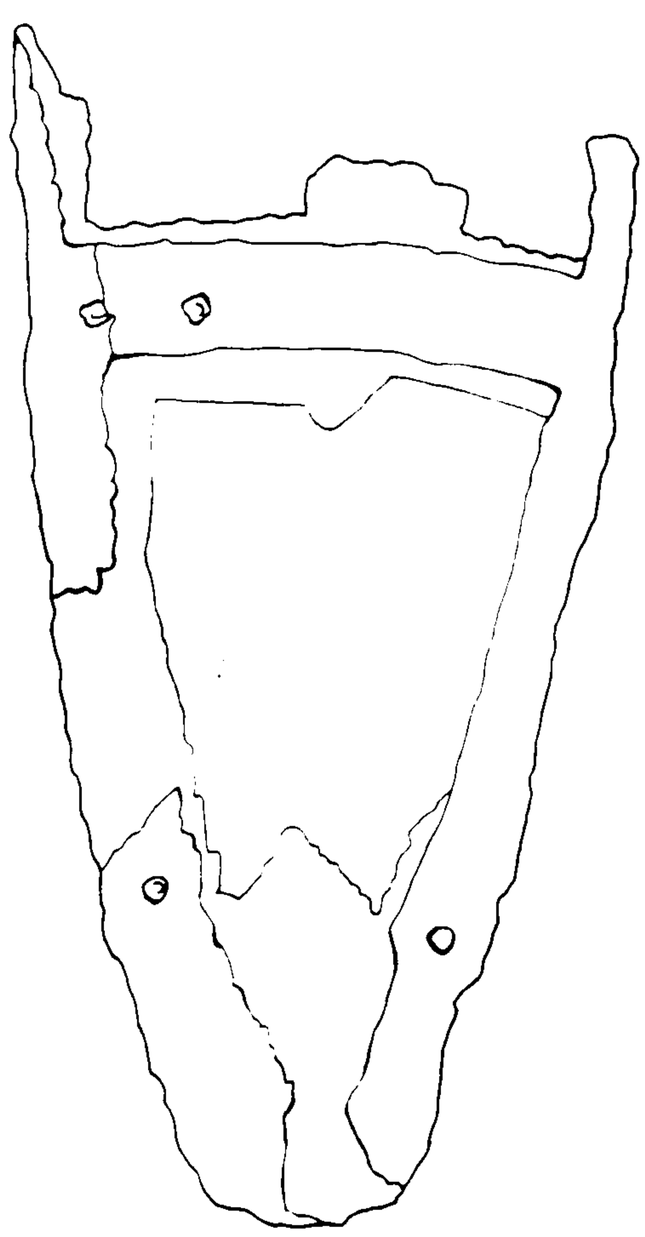

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FIG 1: Daggers
1. MC.35 (1:2) 2. Bar Hill, Handle (1:2)
3. Housesteads, Chape (1:1)

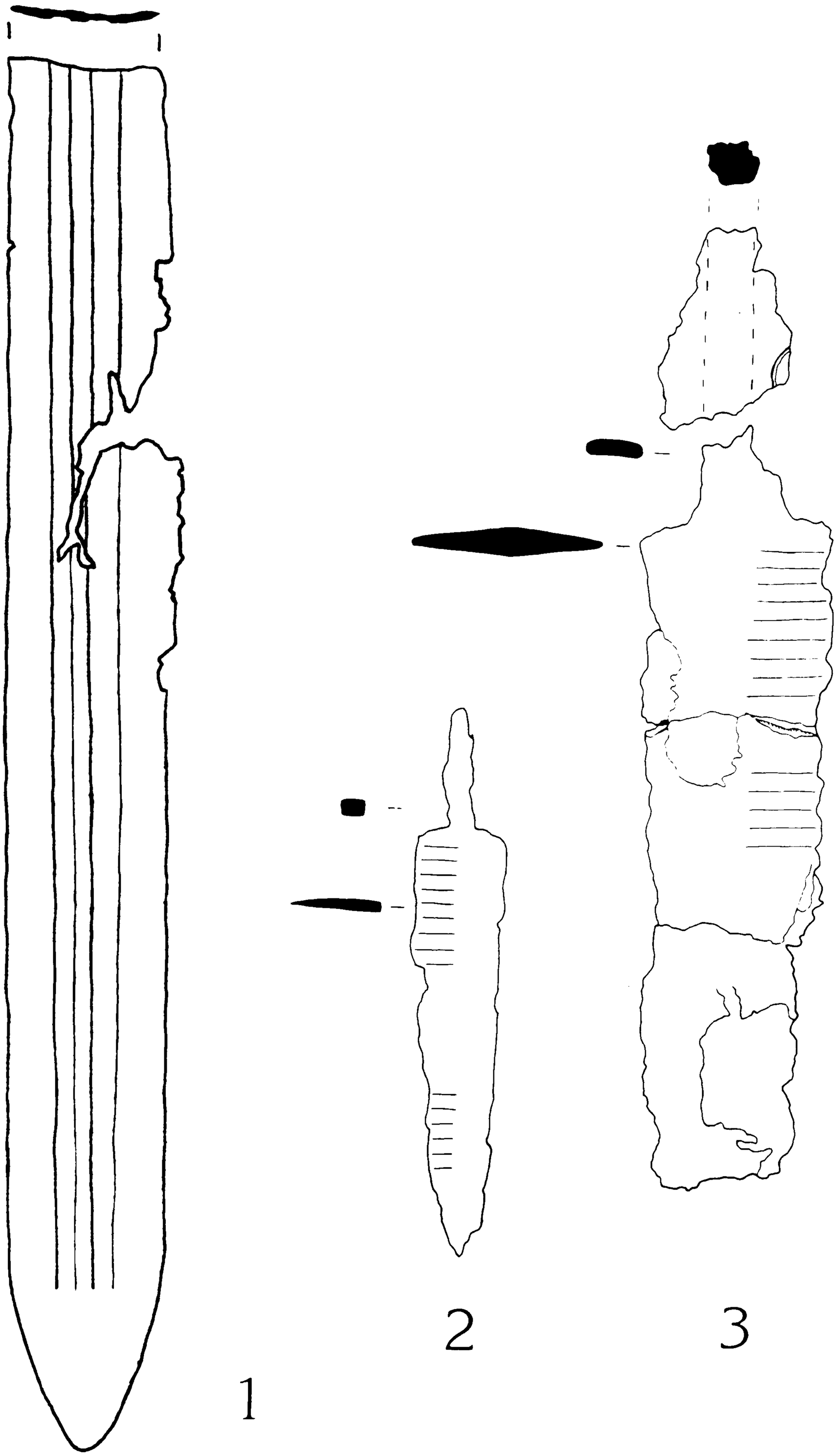


FIG 2: Daggers and Swords (all at 1:2)
1. York (Sword) 2. Caerleon (Myrtle)
3. Caerleon (Vicus)

missing. The remaining section is fragile and heavily corroded. The sides of the blade taper somewhat, varying from a maximum of 5.2cm down to 4.4cm at 5cm from the tip. The tip is short (c5cm) and the sides curve in gradually without any sharp angle. On both sides of the blade can be seen traces of a double groove running down the middle of the blade, leaving a slight ridge between them. This feature is reminiscent of the double groove or fuller seen on the shorter sword from Canterbury (Bennett et al 1982 fig99). TL:41.7cm;Blade thickness:0.3-0.4cm. The sword was found in Tanner Row, York in a late 2nd century context.

Sword Pommels.

The pommel was placed at the end of the sword handle, its purpose being to balance the weight of the blade. This was of especial importance when the sword was a very long one. Large oval bone pommels were among the most common of types, featuring for example on the Caernarvon sword, a Flavian sword from Newstead (Curle 1911 plate XXXIV no.13) and a spatha from Cologne (Robinson and Embleton. "The Armour of the Roman Legions",p30). This type of pommel seems therefore to have been in use from the 1st century down to the 4th. Other swords had small spherical pommels - silvered bronze in the case of a probably first century sword from Newstead (Curle 1911 p129,185,plate XXXIV no.8), or bone as with the Burnswark sword (Jobey 1978,p87,fig 13) and the cist burial sword from Camelon. Most Roman swords from Britain no longer have their pommels however, so we are left somewhat in the dark as to which types were most commonly in use. There are a number of detached finds which can be considered, but not all of them are necessarily Roman and some may not even be sword pommels. It is possible that wooden pommels may also have been used, but if so they have not survived.

Benwell.

A bronze lion's head with a corroded iron tang was found in the north-east corner of the aedes of the Principia, during the excavations of 1929. This was identified as being a pommel, although no other sword

remains were found (Spain 1929 p128). The current whereabouts of this find are unknown.

Brough-under-Stainmore. (plate 4 no.4).

A bronze object, identified as a sword pommel was found at this site in 1874 and can now be seen in Tullie house Museum (Accession no.58-1934). It is roughly triangular in shape and can be compared with a very similar find from Worton in Lancashire*29. The domed top piece (which is attached to the main part by an iron tang) is decorated with a series of grooves and ridges. Both faces of the pommel have two pairs of ridges at the top and bottom of the main section and there is a large round knob in the centre of each side. The underside is decorated with more grooves/ridges and there is a circular opening in the middle for the attachment of the sword tang. The decoration is rather basic - a characteristic of late Celtic work (Cowen 1937 p70). This does not necessarily mean that it could not have been a "Roman" piece, for we have a number of cases where pieces of apparently Roman equipment have Celtic featues:- for example the hilt guards on the Camelon and Thames swords. The Brough pommel has been dated to the 2nd century AD, although on what grounds is unclear. The pommel may have belonged on the sword of an auxiliary soldier recruited locally, in which case the Celtic features are easily explicable, but equally, it may have nothing at all to do with the Roman occupation of the site.

Turret 26a, Hadrian's wall.

The hollow bronze knob found here in 1959 (Woodfield 1965 p137), has recently been found to be modern and therefore definitely not a sword pommel (Allason-Jones in Coulston 1988 p203).

Watercrook.

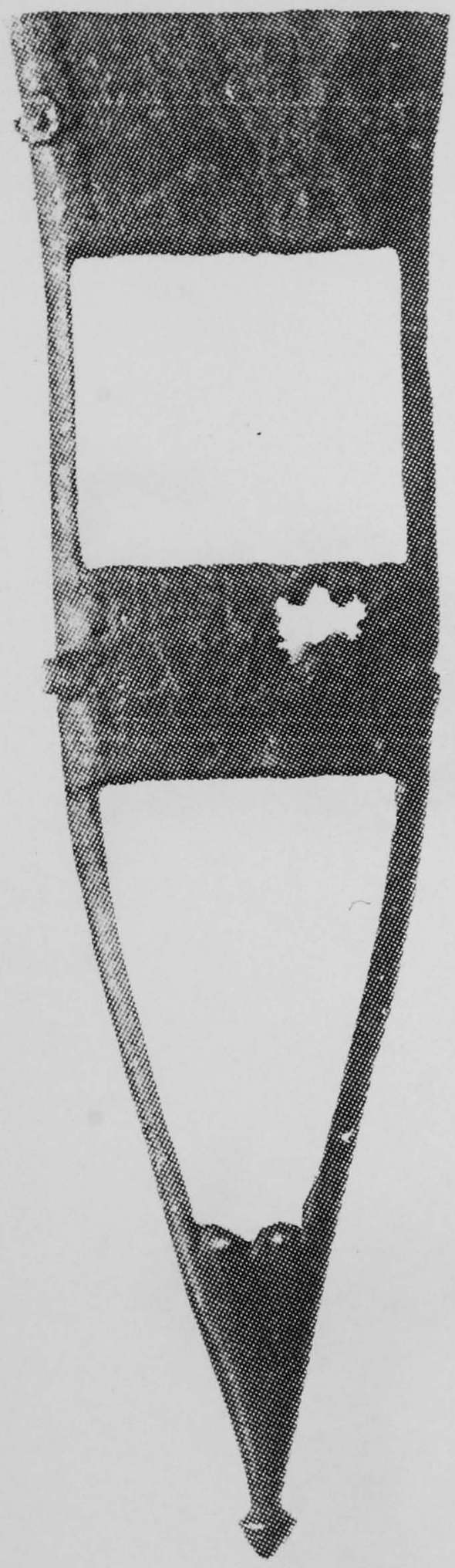
Finds from this site include a bronze handle in the form of a pawn, which has a rectangular slot cut into it for an iron tang (Potter 1979 p214,fig 85.36). It was unstratified. I cannot find any parallels for the use of such a fitting on a Roman sword.

Sword Handles/Grips.

As already noted in the discussion of the sword from Caernarvon, there seems to have been a preference not only in this country, but in general for Roman swords to have fluted grips. These were usually of bone, but occasionally of ivory. However, much of the evidence for this practice comes from the first or early second centuries. The majority of the swords discussed here no longer have their handles. Some may have had wooden grips, as did the dagger/knife from Sewingshields milecastle (Haigh and Savage 1984 fig 13.56). Sword grips are not uncommon as isolated finds but most of those found have come from 1st century contexts. There are some examples which may be later however, e.g.1. Bucklersbury House, London. A detached bone grip was found here in 1965 (Museum of London Acc. No.19164B). Length:8.6cm. Internal Diam.:1.4-1.9cm. External Diam.:2-2.7cm. Weight:49.9 grams. Date:Pre c150AD? 2. St. Clement's Lane, London. A bone grip, oval sectioned and damaged at both ends. (Museum of London Acc. No.71.7-14.24). Length:8.2cm. Internal Diameter:1.4cm. External Diameter:2.4cm. This find may belong to the 1st century however (Webster 1958 fig6 no.145). (see plate 4 no.3).

Sword Guards.

There is very little information available about these fittings with regard to swords later than the 1st-2nd centuries. Some Roman swords evidently followed Celtic models with regard to their fittings, as for example with the arched guards on the Camelon (Piggott 1950 fig2; Breeze et al 1976 fig 3.1) and Thames (Manning 1985 plate 72 no.5) swords. The Burnswark sword has a flat bone guard (Jobey 1977-8 fig13), the Caernarvon sword a large guard of elephant ivory (Boon 1962 fig1). The Chester sword may also have had a curved guard, but this is not certain. The sword/dagger from milecastle 39 has a copper-alloy hilt guard of unspecified shape (information from Mr Jim Crow). The other swords do not have any traces of their guards surviving. There are likewise few examples of detached guards of post 1st century date, excepting one recent discovery from Caister-on-Sea. This is a curved d-shaped



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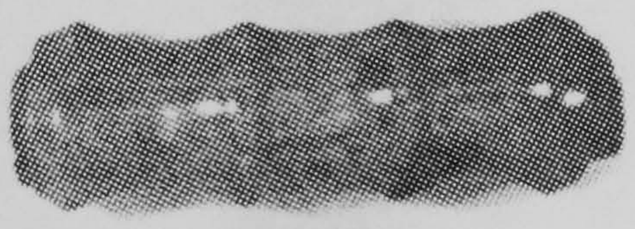

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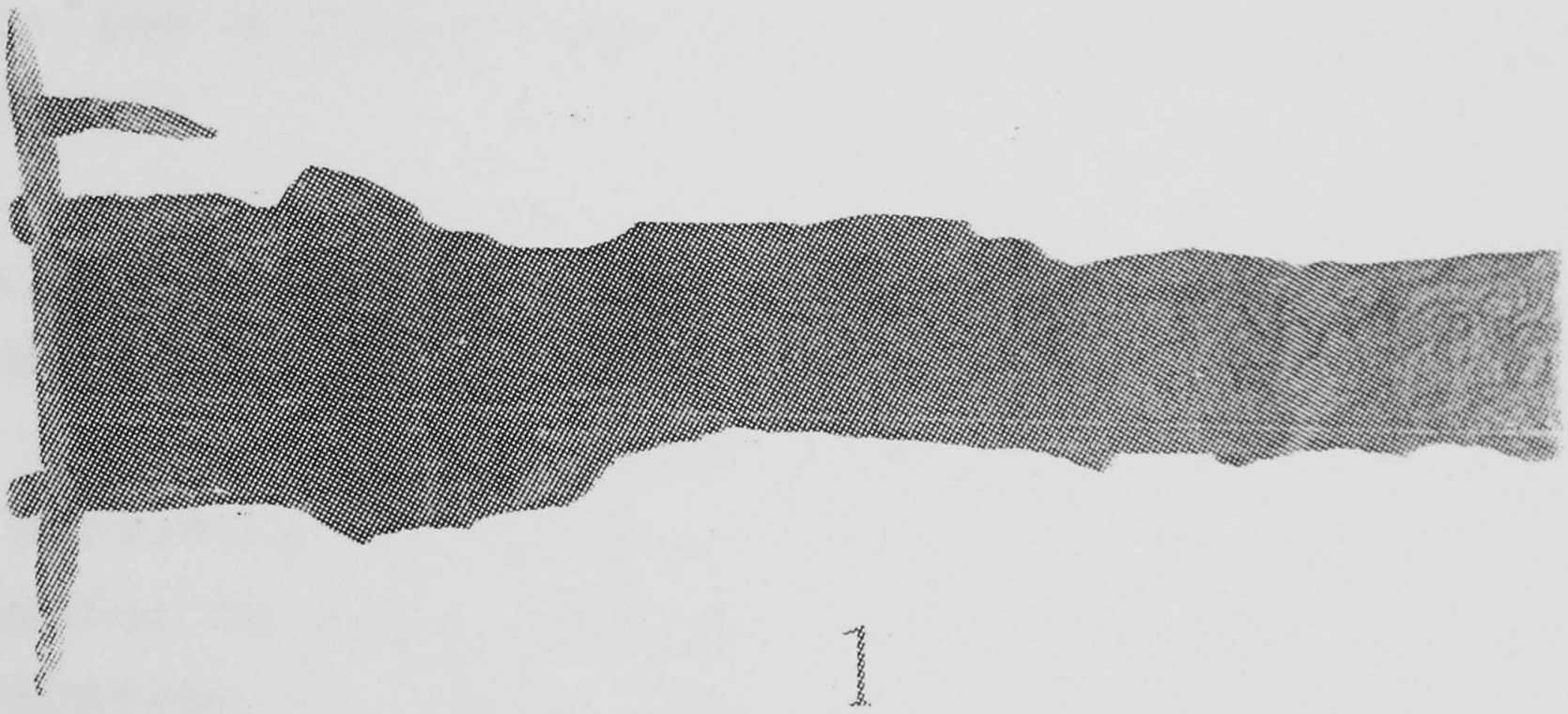
PLATE 4: Swords and Daggers (all at 1:2)
1-2 Copthall Court, London
3. St. Clement's Lane, London, Sword Grip 4. Brough, Pommel



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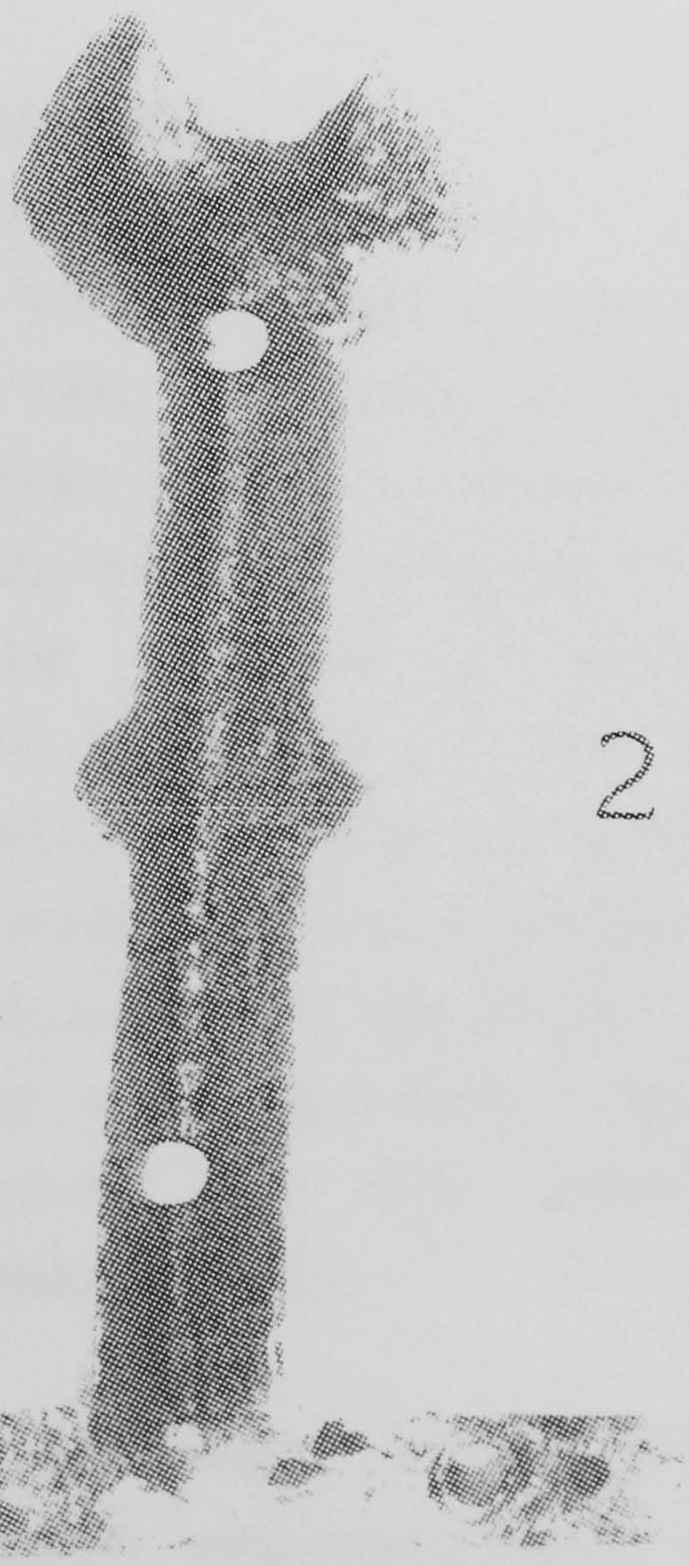

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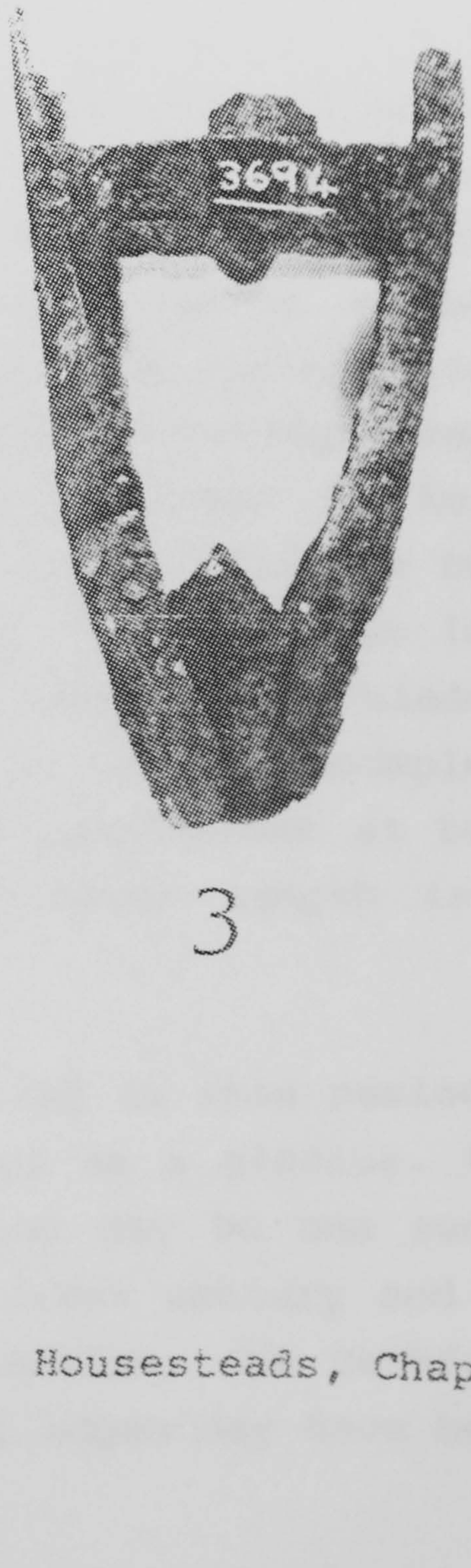

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PLATE 55: Daggers (all at 1:1)
1. MC.55 (detail) 2. Bar Hill, Handle 3. Housesteads, Chape

piece of horse or cattle bone. Most bone guards are early so this find could be residual (information supplied by Miss Maggi Darling). Continental swords are quite varied as to the form of their guards and do not in general provide close parallels for the British material. One exception is the sword from the Lyon burial (Bishop and Coulston 1989 fig36), which probably dates to c197AD. This has a straight strip for a guard, reminiscent of that on the sword from Burnswark.

Some general comments and conclusions on Roman Swords in Britain.

The main problem here lies in deciding to what extent the surviving swords from Britain fit into the traditional groups;or to put it another way, how far can we justify the application of terms like "gladius" and "spatha", which have often been used rather loosely when discussing Roman swords.

Secondly, is it possible to see some kind of pattern emerging amongst later Roman swords from this country with regard to size and shape? On the first point I feel that whilst the division of Roman swords into neatly arranged compartments has a certain validity for the early period, the distinctions between "types" becomes increasingly vague with the passage of time. There does appear to be a distinct tendancy in the later Roman period, visible both in mainland Europe as well as in Britain, towards long swords with fairly straight-edged and short-tipped blades. The smallness of the sample from Britain and the incomplete state of many specimens must make any conclusions at best provisional but the trend torwards greater length is I think undoubtable.

By contrast, it is difficult to find in this period a sword which can certainly be recognised as a gladius. The sword from the double burial at Camelon may be one such, but there again it could date to the first century and so may not be relevant to this study. Likewise, the Beckfoot sword with its short point and straight edges may have been

a gladius of the Pompeii type, but there is no way of telling how long it was originally. The Burnswark sword is even harder to classify, for if one accepts the standard typologies, it is too long for a gladius and too small to be a spatha (Hazell 1981 p77; Bishop and Coulston 1989 p50). We could get around this "problem" either by declaring this sword to be "native" or by designating it as an officer's sword. There is no evidence for either suggestion however. In truth the problem lies not with the sword but with the overly rigid classifications used by modern scholars. Given the relatively crude iron-working technology available in the Roman period it was not really possible to standardise production. No two swords would ever be exactly alike. It is not surprising therefore that the archaeological material sometimes does not fit our preconceived ideas on Roman sword types. The Burnswark sword may have been intended as a Pompeii gladius or as a spatha - and as we have already pointed out, the only practical difference between the two was one of size. it would be amazing indeed if there was not some overlap. The latest sword from Britain which can justifiably be called a gladius is the sword from South Shields. This is incomplete so again one must be cautious. Also the context of this find strongly suggests a ritual burial. The sword may even have been made specifically for this purpose and so might not be representative of the weapons in use at the time.

The so-called "short-swords" from Britain are a rather ill-defined group. As well as the examples from London and Colchester and the recent find from Milecastle 39, the cist burial sword from Camelon has also been included in this category by one author (Manning 1985 p152). However the latter sword has also been labelled as a gladius (Breeze et al 1976 p83,table 1). Clearly then there is yet another problem with terminology. Most of these swords fall within the size range defined for the gladius (Hazell 1981 p81). We are surely justified therefore in posing this question:How long does a sword have to be before it ceases to be "short" and becomes a gladius? The British "short swords" are not at all uniform in terms of shape - whilst

the Mansion House sword seems to be an undersize Pompeii gladius, the Thames sword looks for all the world like a Mainz type gladius. On the whole these swords do not appear to date as late as the Kunzing hoard, they do not form a homogenous group and it is misleading to compare them with the swords from Raetia. They may simply be rather undersized gladii.

The majority of later Roman swords from this country are relatively long, with straight-edged blades. They are clearly related to the early imperial spatha, although there is much variation in terms of size and also sometimes, the shape of the point. They range in length from the Caernarvon sword (69cm) to the Wroxeter blade (98cm). At present, there appear to be two types of blade - those with a maximum width of 3.5-5cm (Caernarvon,Camelon,Silchester) and those which are c5.5-6cm wide (Canterbury,Vindolanda and Wroxeter). Interestingly, the latter group includes all of the longest swords. However it must be stressed that the sample is a very small one, so this argument cannot be anything other than provisional until more complete swords are found and measured.

It remains to be discussed, why during the course of the second and early third centuries the Romans abandoned the gladius in favour of the long sword. It would seem very likely that the reason behind this move had to do with a change in the battle tactics of the Roman army in the later imperial period, possibly as a reaction to the tactics of the enemies it was then facing. These were increasingly peoples who relied heavily on mounted troops - for example the Alans, Sassanid Persians and Goths. Against such opposition the old legionary panoply of the short gladius and the heavy pilum must have seemed increasingly innappropriate. A longer sword with a greater reach would have been much more useful for a foot soldier faced by cavalry opponents. The change from gladius to longsword was not an isolated phenomemen however, but was linked to changes in other pieces of what were primarily legionary

equipment. It is not suggested that all of these happened at once, but the overall trend was always in the same direction - towards lighter, more flexible infantry soldiers. This of course was in stark contrast to the development of the Roman mounted arm, which was increasingly towards heavily armoured cataphracts. The alterations to Roman equipment which took place in the second and third centuries may be briefly summarised here:-

a. The pilum seems to have gone out of use during the 3rd century, to be replaced by a series of other throwing weapons - all lighter and smaller. The pilum is not shown on many 3rd century tombstones (Coulston 1987 p141) and there are no definitely 4th century examples from Britain.

b. The rectangular scutum was replaced by oval or circular shields. The latest scutum so far found comes from Dura-Europos and is dated to the mid third century AD. However there is some reason for supposing that this was for ceremonial use and so not typical of the shields of that period (Connolly 1981 p259). This change in shield type is confirmed by a study of later Roman tombstones. The abandonment of the scutum - which was essentially a large body shield for close order troops, could imply a move torwards a looser style of warfare. Long slashing swords like the spatha would not be very easy to use in a packed formation, which probably explains why its use was initially confined to the auxiliaries who were generally more lightly equipped.

c. Body armour may have been largely abandoned in the 3rd century, except amongst the heavy cavalry units. Again, this points to lighter and more mobile infantry, better suited to the needs of the field armies and more able to cope with their agile barbarian opponents. A tactical/strategic reason for the decline in the use in body armour seems preferable to Vegetius's claim that from the reign of Gratian onwards, Roman infantry could not bear the weight of their armour (Ep. rei. Mil. I,20).

The evidence for the abandonment of infantry body armour in the 3rd and 4th centuries is somewhat contradictory. Later Roman tombstones do not show armour, but this is not necessarily a decisive point since details like mail may have been painted on rather than sculpted. Mailcoats are shown in the Notitia Dignitatum (OC. IX,2; OR. XI,2), but these might have belonged to cavalrymen, even if such illustrations could be relied on for evidence. Ammianus mentions body armour on several occasions and in some cases this was clearly being worn by infantry (XVI,10,8; XXXI,13,3). A 5th century wood carving from Egypt (Beckwith 1963 plate 46) shows what are evidently Roman troops, some wearing mail and others muscled cuirasses. On the other hand, archaeological evidence for infantry armour in the later 3rd and 4th centuries is lacking. Monuments later than the Arch of Severus do not show infantry wearing any armour - as for example the 4th century reliefs on the Arch of Constantine. Perhaps body armour was retained by a few elite units, which would explain the occasional literary references.

d. The old style Roman helmets, culminating in the "Imperial Italic H" model (Robinson 1975 p73) disappeared in the late 2nd/early 3rd centuries. Not until the 4th century did infantry helmets re-appear and then in a much simpler form (Connolly 1981 p260).

To sum up, the general adoption of the longsword by Roman troops was only one of a series of changes, not necessarily occurring all at the same time, but probably occurring over a fairly short period. This transformation has been seen as evidence for the "barbarisation" and "decadence" of the later Roman army (Couissin 1926 p388-9,521-2). In reality it shows how well the Romans adapted to changing conditions, copying and modifying where necessary the equipment and tactics of their enemies.

NOTES.

*1 The forty books of Polybius's "Histories" when complete, covered the years 264-164BC, the critical period

of Rome's expansion.

*2 c.f. Webster 1987 p12, note 1 and Connolly 1981 p230.

*3 The positioning of the sword seems to have varied in the case of eagle-bearers (Connolly 1981 p306).

*4 I agree with Webster's conclusion (Webster 1987 p122,note 2), that the figures on the Adamklissi monument clad in mail and carrying scuta are legionaries.

*5 In the early imperial period the sword was suspended by two pairs of rings (Hazell 1987 p73ff). It would seem likely that the lower pair connected the scabbard to the belt, whilst a shoulder strap passed through the upper pair.

*6 c.f. De Navarro 1959 taf 1ff;Connolly 1981 p306.

*7 Piggott notes the use by the Celts of the scabbard loop (Piggott 1950,p6,17,figs 2,9-10).

*8 Parker (1932 p147) places the Antiqua Legio in the period between Gallienus and Diocletian. Webster (1987 p111,note 3) follows Watson (1969 p182,note 179), in considering that Vegetius's source was Tarrutienus Paternus, who served under Marcus Aurelius.

*9 The Sica appears in scenes LXVI, LXXII, XCV, XLVI and CXLV on Trajan's column.

*10 The question of the practical length for swords slung on the right hip has I feel been adequately dealt with through the experiments of Mr. Peter Connolly. It seems to be perfectly possible to draw swords from this position well in excess of 50cm length, providing that the scabbard is constructed so that the sword comes out cleanly (pers. obs.).

*11 As is probably the case for example with the spathae from Newstead (Curle 1911 plate XXXIV no.s 6-8).

*12 A very large example weighing 344 pounds and made up of several smaller blooms welded together, was found at Corbridge (Aitchison 1960 p207,fig 95). This was about 40 inches (101.6cm) long.

*13 It is technically quite possible to produce a sword from one piece of iron. At St. Fagan's Folk Museum near Cardiff in 1989, I was able to observe Mr. David Edwards, a practising blacksmith, making a Greek sword for a BBC television production. This was apparently drawn out from a single piece of metal, using tools and techniques like those available in the Roman period. Most of the work was done with hammer, anvil and files, with of course periodic re-heating.

*14 At 200-400 degrees C. according to Lang (1988 p205), at temperatures up to 727 degrees according to another source (Knox et al 1983 p98).

*15 There are numerous treatments of this subject e.g. Baldwin-Brown 1915 p212, 214; Aitchison 1960 p142, 254; Anstee and Biek 1961 p71-93; Tylecote and Gilmour 1986 p1, 150, 252.

*16 For instance, Herrmann (1969 p138) says that the short swords from Kunzing were "damasziert". The same term is used for a gladius from Mainz (Schoppa 1974 p102).

*17 Tylecote and Gilmour (1986 p150), date the Nydam weaponry to c300AD. Cowen (1948 p142) dates the barbed spears in the bog to c400AD. Another source (Oakeshott 1960 p97) dates most of the Nydam finds to the period c200-300AD.

*18 This estimate must be treated with respect since it was based on a long series of experiments concerning pattern-welding carried out at Reading in 1955.

*19 My thanks to Mr Ian Caruana of Carlisle Archaeological Unit for his comments on the Beckfoot burial. The sword is now broken into two pieces, which do not fit together. When found (Hogg 1949 p34), it had been bent double as part of the burial ritual.

*20 Simpson 1962 p113; Casey 1974 p69; Goodburn 1976 p292.

*21 Roman cavalry are generally shown carrying shields:- for example on tombstones (A. S. Anderson 1984 plate 14ff), on Trajan's column (e.g. scenes XXXVII,XXXIX,XL and XLIX) and in the Dura-Europos synagogue wall painting (Connolly 1981 p259), to name but a few instances.

*22 Apart from the burials at Beckfoot, Camelon and Canterbury, there are no other weapon burials from Britain which are definitely Roman.

*23 For example the weapon burials at Furfooz (Stillwell 1976 p339-40; Willems 1989 note 24). Although such burials contain arms and other equipment reminiscent of Roman types, it is mostly impossible to decide whether we are dealing with the grave of a German mercenary serving with the Roman army or simply a barbarian. The burial at Richborough is a comparable example from this country (Bushe-Fox 1949 p80,149,plate LXIII).

*24 Site Find CHE/NGB Ph II 74 168. The sword was found in a Saxon pit which contained pottery of the 3rd century AD. Dr. Peter Carrington of the Grosvenor Museum points out that the sword may not be Roman. Since no fittings of any kind have survived it cannot be definitely accepted as such.

*25 My thanks to Miss Christine Jones of the Museum of London for this and other dating information.

*26 i.e. about 61cm to 91cm - quite a range! These

dimensions are more fitting for spathae than for gladii. However we now have no way of checking the accuracy of Bruce's measurements.

*27 Nevertheless, the very fact that this sword is decorated at all marks it out from the rest of the swords in this study.

*28 Under the Theodosian Code, civilians were forbidden to carry arms except on journeys and for hunting.

*29 According to a note in the display case. I have been unable to find any information on the Worton pommel.

IV. Sword Scabbards and their fittings.

"Our soldier's sword hilts are made of chased silver ... their scabbards jingle with little silver chains and their belts with silver tabs. " (Pliny. Natural History XXXIII,152).

A. Scabbards.

There is very little evidence from this country for the form of Roman sword scabbards, due mainly to the generally poor preservative conditions. What information we do have leads one to the conclusion that scabbards were mostly constructed of wood. Large pieces of wood can be seen on the surfaces of the swords from Camelon and South Shields (personal observation), and Bruce (1885 p258) talks of the 4 or 5 swords found at the latter site being sheathed in wooden scabbards. The wood fragments on the surviving South Shields sword have not apparently been examined - they may in any case be too small and corroded. I am not aware that any analysis has been done of the substantial remains of the wooden scabbard which can be seen adhering to the blade and tang of the Camelon sword in Edinburgh museum. Outside the Empire there is further corroborative evidence for wooden scabbards. The remnants of such a scabbard were found in a bog deposit at Nydam, Denmark, dated to c200-250AD (Bidwell 1985 p132).

From the cemetery at Khisfine in Syria came a complete ivory scabbard containing a spatha (Chapman 1976 p251). However it is unlikely that this is representative of the average Roman scabbard, for such costly items must have been beyond the means of most soldiers. There is some archaeological evidence for ivory sword fittings in Britain, but no complete scabbard in this material has yet been discovered. A sword or dagger in a leather or wooden scabbard was amongst the finds from the recent excavations at milecastle 39 (information from Mr Jim Crow). The scabbard was held together with copper alloy rods and bands. Mention must also be made here of a scabbard from the Corbridge Hoard (Bishop and Allason-Jones 1988

p75,fig93). This is made of a single sheet of bronze, folded round, the join being covered by a thin strip of the same metal which is rivetted on. The end of the scabbard is square cut with two holes in it, perhaps for the attachment of the chape. The latter was not found. There are some affinities between this scabbard and sheaths of the La Tene period and this is one of several examples of Celtic tradition influencing Roman equipment. However, we cannot say that this piece is representative of Roman scabbards in Britain. TL:74cm. W:3.4-7.2cm. The length of the scabbard implies that the sword was a spatha, probably indicating that Corbridge had a cavalry garrison at this time. Date:Flavian/Hadrianic?

A "short sword scabbard" is reported to have been found at Birdoswald in 1931 during excavations in the southeast part of the fort (Simpson and Richmond 1932 p141) but nothing further is known about it.

B. Scabbards Bindings.

Much more frequent finds than actual scabbards are the metal bindings which were used to hold them together. The larger and thicker thicker pieces were probably shield edgings, but it seems reasonable to identify the smaller pieces as being from scabbards. Generally speaking they are of bronze although occasionally one comes across "brass" edgings as well. There does not appear to be any evidence for the use of iron bindings, but if they did exist it is unlikely that they would survive in a recognisable state.

Carrawburgh.

One piece of bronze binding was found during rescue excavations in 1964 on the car park site (Charlesworth 1967 fig16 no.169). A search through the Carrawburgh finds at Newcastle museum failed to locate this item. No dimensions known. Date:Hadrianic or later.

Milecastle 48 (Poltross Burn).

Two pieces of bronze edging were found during the excavations of 1910 (Gibson et al 1911 p443,fig 21 no.15;

Tullie House Acc. no.7-1911.8). The pieces show signs of having once been welded together. There is a hook (of unknown function) at one end. The total length of the two pieces when joined is 16.3cm. Date:Hadrianic or later.

Newstead.

Eighteen pieces of "brass" edging were found at this site during excavations early in this century (Curle 1911 p112,130,185,plate XXXV no.s 1-7). Most of these seem to have come from pits containing Flavian pottery, but at least one was from a pit with Antonine pottery (Ibid p130,plate XXXV no.1). This is the largest piece of the group, u-shaped in section and with a small (0.2cm diam.) rivet hole at one end. TL:16.3cm. Max W:c0.5cm. Thickness:0.4 cm. The remaining pieces range from 2.7 to 14.5cm long, many with rivet holes in them.

South Shields.

The site has produced at least two pieces of bronze binding, which are in the store at the site museum. Both pieces are u-sectioned. The first (Inventory no.1900.24.138) is 8.8cm long, the second (no number) is 7.8cm long. Date:Unprovenanced, therefore Hadrianic or later?

Turret 25b, Hadrian's Wall.

One fragment of bronze binding, either from a shield or a scabbard was found in 1959 (Woodfield 1965 p117). Date:Hadrianic or later.

Turret 26a.

One piece of bronze binding was found here in 1959 (Ibid p137). p137). Date:Hadrianic or later.

Turret 35a.

One unstratified piece of binding was found here in 1958 (Ibid Ibid p156). Date:Hadrianic or later.

Turret 48a (or b).

A piece of folded bronze binding was found at one of

the Willowford Turrets in 1922 (Shaw 1926 p144). Date:Hadrianic or later.

Turret 51b.

One fragment of a bronze sheath was found in layer 1, a level which produced quantities of Antonine pottery (Ibid p182). Date:Antonine?

Watercrook.

A small piece of bronze binding with a rivet hole in it was was found in the fill at the bottom of a ditch in the 1976-8 excavations (Potter 1979 p214,fig 85 no.38). Date:Flavian or later.

C. Scabbard Chapes

Scabbard chapes have been fairly common finds on British sites, although their true function has often not been recognised by excavators. They served to hold together the lower end of the scabbard, but in spite of this purely practical use, they were often, in fact usually, decorated. In many cases the the chape was clearly attached to the scabbard by means of a rivet which was put in the back of the chape presumably so as not to spoil its decorative effect. Other chapes seem not to have been rivetted on however, possibly they were held in place by some kind of glue.*1 Chapes were made of four types of material, namely bronze, iron, bone and ivory. Bronze chapes were the most common throughout the period under discussion and appeared in a wide variety of forms. Iron chapes seem not to have been very popular in Britain; very few examples are known to me. Perhaps this was simply a question of fashion and iron chapes did not find favour in Britain. They were certainly popular in Germany, where large numbers of highly decorated circular iron chapes have been found (Oldenstein 1976 tafs 21-24).

Bone chapes achieved some measure of popularity in the later empire, although they are almost entirely unrepresented on sculptures. Bone chapes would have been cheaper and easier to make than other types, but they never

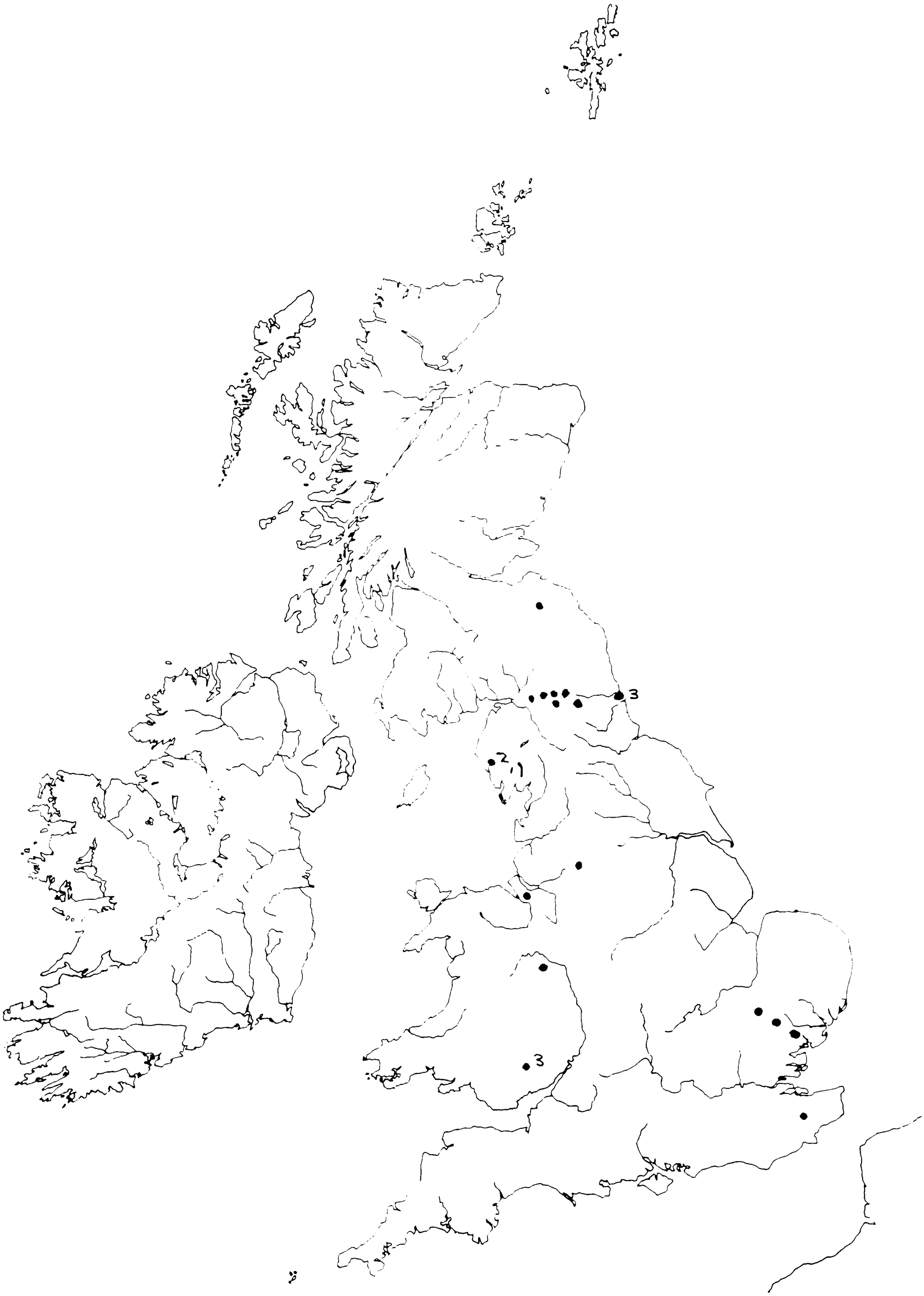
entirely supplanted their bronze counterparts. They seem to date entirely to the 2nd-4th centuries. No specimen can be definitely dated to the 1stc AD.

Ivory chapes are very rare indeed, no doubt because the cost of importing the material would have limited their purchase to the richer elements of the army. Finally it should be noted that most of the chape types found in Britain can be parallelled on continental sites, particularly along the Rhine/Danube limes. Clearly there was some interchange of artistic ideas between the military craftsmen in the two areas, although in which area a chape type originated it is usually impossible to say, as dating evidence is seldom precise. Similarities in equipment between Britain and the Rhine/Danube limes should not come as much of a surprise given the regularity of troop movements between the two areas.

Bronze chapes.

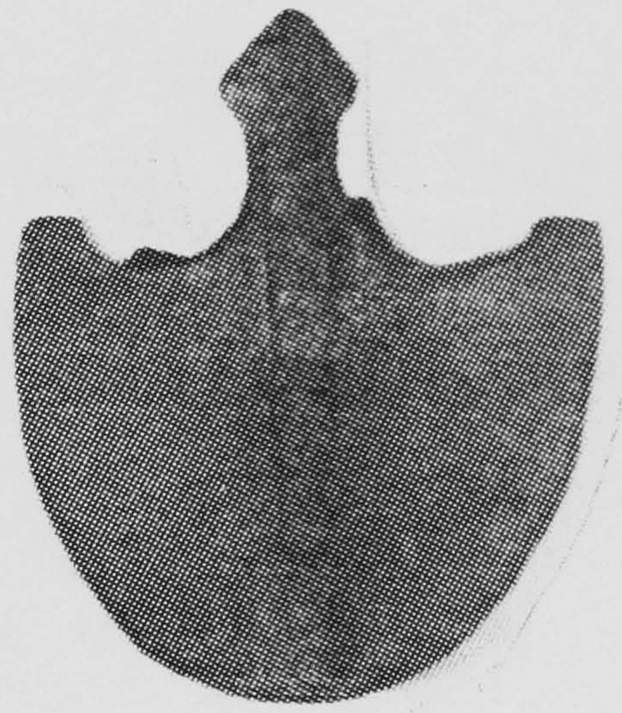
1. The Pelta type. (Map 2).

This is one of the commonest forms of chape in Britain and has also been found extensively abroad. The type derives its name from the decorative cutouts which characterise it. The pelta shape originated with shields of that shape used by the Thracians - the shields being used by light infantry troops known as peltasts - and it was also a common motif in Hellenistic art. In the Roman period the shape appears on mosaics and also features on some stone inscribed slabs. For example it can be seen on an opus sectile wall near the Porta Marina at Ostia, dating to the 4th century AD (Brilliant 1974 fig I,23), on a Severan mosaic from Antioch-Seleucia (Dorigo 1971 plate 56) and on several distance slabs from the Antonine Wall (F.H. Thompson 1968 p47). Chapes of the pelta type have a rounded lower end. The front face is flat or slightly convex and on this side there are two pelta cutouts set side by side near the top of the chape. A number of short triangular points project from the upper edge, either a solitary point in the middle or with two additional points on the thin strip of metal above the pelta cutouts.*2 The other side of the



MAP 2: Bronze Pelta Chapes.

1



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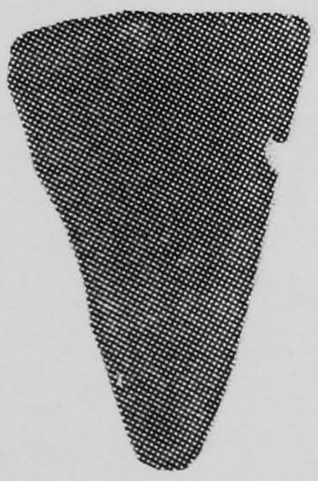

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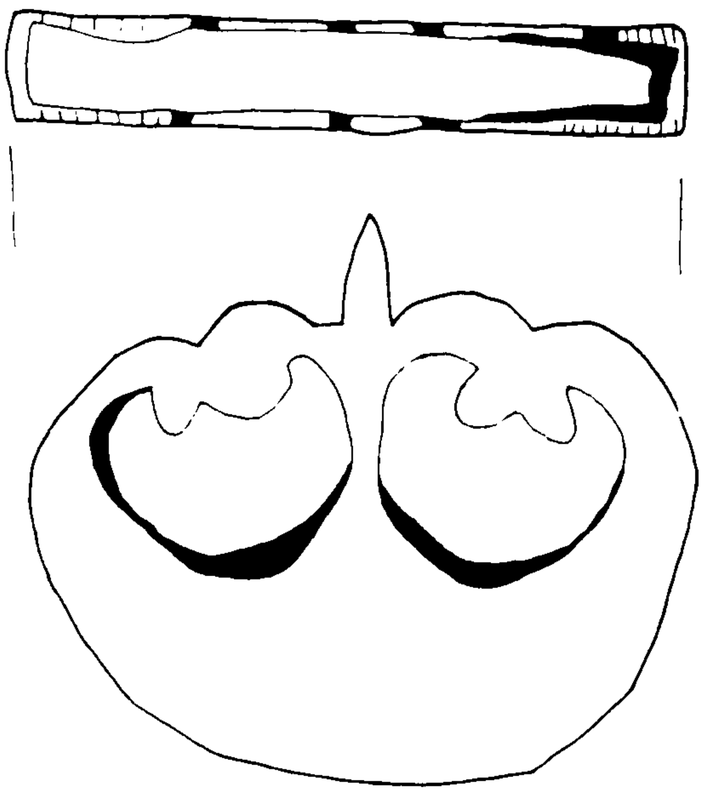
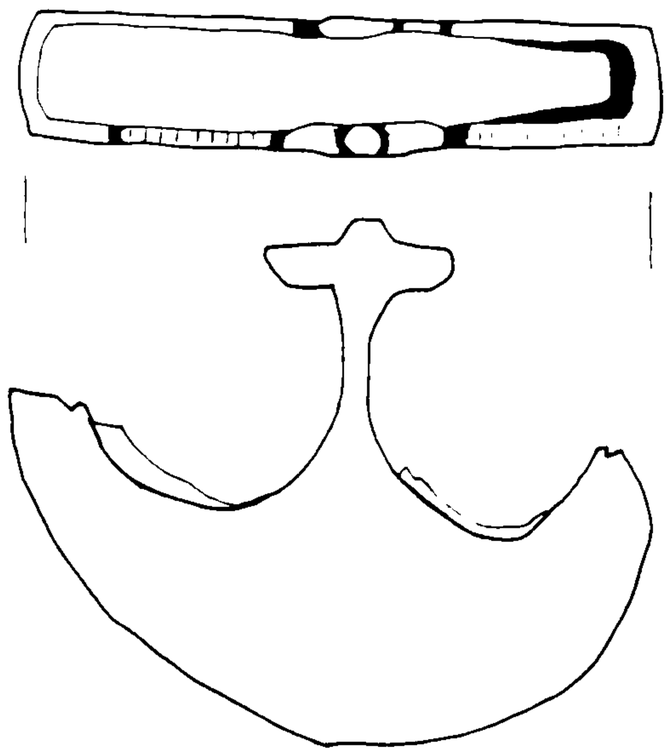
6

PLATE 6: Bronze Chapes (all at 1:1)
1. Corbridge 2. Caerleon 3. Great Chesters
4. Chesters 6601 5. Caerleon (Roman Gates) 6. Fremington



1



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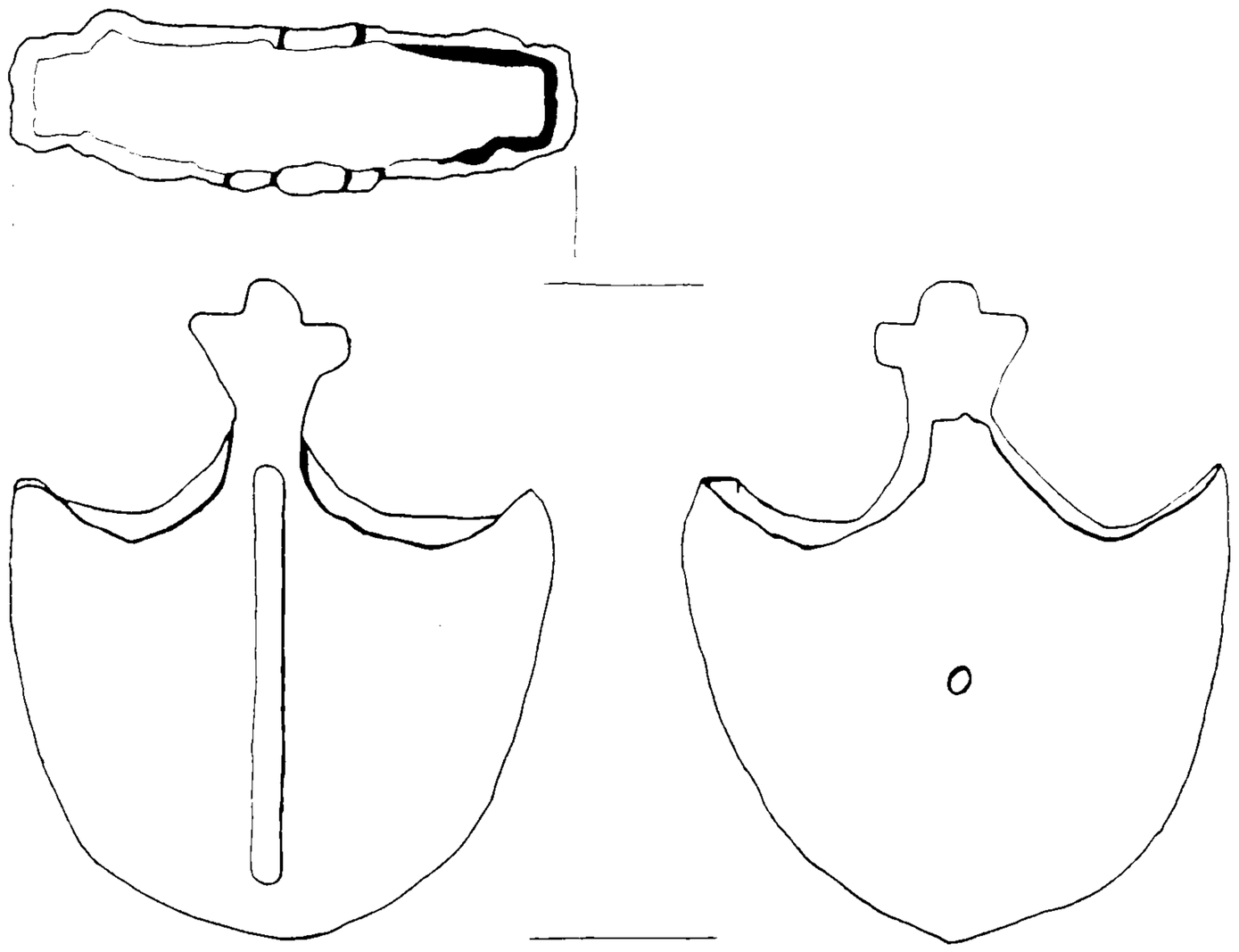

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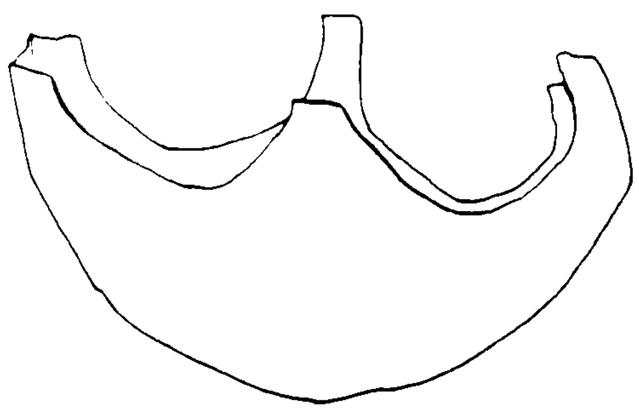
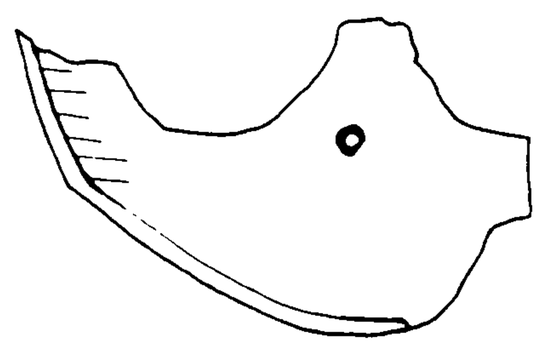


4



5

FIG 3: Bronze Chapes (all at 1:1)
1. Greatchesters 2. MC.35 3. Caerleon (Prysg)
4. Haltonchesters 5. South Shields 3.405

chape may be identical, or it can be simpler, with a thin central projection dividing two semicircular cutouts.

<u>British Examples.</u>

Brough-under-Stainmore.

Part of a chape from "Brough, Cumbria" is in the British Museum's reserve collection (Accession no.74 3-28 45). This is brass coloured and consists of only one side of the chape and that incomplete. It has a central point and two flanking ones. L:3.5cm, Max Surviving W:4.1cm. Date:Unknown, therefore Flavian or later.

Caerleon.

Two chapes of this kind have been found here. The first (Nash-Williams 1932 fig34 no.40) is of the one point type, the central projection being defined by two grooves. The upper part of the decoration is missing on one side of the chape. There are no rivetholes visible. L:3.9cm. Max W:4.3cm. T:1cm. An unstratified find from the Prysg Field excavations of 1927-29.

The second pelta chape is of very similar appearance (Ibid fig36 no.15). It came from a deposit in the northwest rampart buildings (Prysg Field) dated to c120-200AD.

An unpublished chape from the Vicus excavations of 1954-1963 may be of this type, although the upper part is lost so we cannot be sure. (Acc. no.56.214B. F3). It has a rounded lower end with semi-circular cutouts on the top edge. The back is entirely open. Surviving L:2.3cm. Max W:4.8cm. T:c0.7cm. Date:Unstratified.

Canterbury.

One chape of this type was found in the double burial at Rosemary lane along with the two swords and an iron chape (Goodburn 1978 p469-71,figs 19-20). It does not appear to have any projecting points on the top edge and yet it seems to be complete. Close examination of this find was not possible so its dimensions are not known. Date:Mid 2nd-Mid 3rd century?

Chester.

A pelta chape of the one point type can be seen on display in the Grosvenor museum, Chester. This appears to be of the same design on both faces. Said to belong to a cavalryman, although there seems no particular reason why this should be so. Date:unknown, therefore Flavian or later. There is also a fragment of a chape (Acc. No. CHE/HW 80 V 407 614) which may be of the pelta type.

Chesters.

One pelta chape can be seen in the site museum (Clayton Collection no.1092). It is unprovenanced. Generally it is of the usual form, with a single point on the top edge, but the cutout decoration is a little more complex than usual. L:4.4cm. Max W:4.8cm. T:1.2cm. Date:Hadrianic or later.

Colchester.

One pelta chape has been found here, dated to the 1st century AD (Webster 1958 fig 4.71). It has a single central point and lacks any rivetholes.

Corbridge. (plate 6 no.1).

A pelta chape was found at this site in 1910 (Forster and Knowles 1911 p188,fig36; Acc. No.75.1229). Unfortunately no provenance was recorded for this piece and it might just as easily belong to the 1st century occupation phase of the fort. The chape is of the three-point type, identical on both sides originally, although one side is now damaged. Unusually, a single rivethole has been placed in the upper part of the chape, above the cutouts. L:3.9cm. Max W:4.4cm T:0.8cm.

Gestingthorpe.

A pelta chape of the one point type has been found at this site (Draper 1985 p36,fig 15 no.114). It is basically the same on both faces, except that one side has a small diamond-shaped hole in the middle. The chape was found in an area described as "building 1, yard and gullies. Phase 2". Coins from the gully area included two dating to c270AD

and five of c335AD (Ibid p9). The chape was presumably brought to the site as a religious offering by a passing soldier. No measurements are given in the report.

Great Chesterford.

There is an unpublished chape from this site at the British Museum (Accession 1964 7-2 108). This is very well preserved and is the same on both faces. There is one central point. The chape was found near a group of 2nd century Romano-British cremation burials, but probably dates to the 1st century. (Information from Prof. Vera Evison, Birkbeck College, London). L:3.3cm. Max W:4.1cm. T:1.3cm.

Greatchesters.

Unpublished excavations in the 19th century produced a single pelta chape. No findspot was recorded for this, but it is known that diging took place at the "Praetorium", the barracks and at the south gate (information from Miss Lindsay Allason-Jones). The chape has a central point at the top and part of one face is missing. There are no rivetholes. L:4cm, Max W:4.7cm. T:0.8 cm. (Museum of Antiquities Acc. No.1956.150.17. A). Date:Hadrianic or later.

Lancaster.

Fragments of a pelta chape were found in West Vicarage field in 1972, along with a sword. Coins and pottery of c300AD were also found. (Wilson 1973 p282-3; information from Miss Marie Bailey, Lancaster City Museum).

Manchester.

The chape from Manchester is unusual because of the number of projections from the top edge. Two points can be seen on the remaining portion (Bruton 1909 plate 44) and if we assume two matching points on the missing half and one in the centre then we have five points in all. The chape could only broadly be dated to the period c100-320AD.

Milecastle 35 (Sewingshields).

Among the finds from the recent excavations (Haigh and Savage 1984 p75,fig 11.3,7) was an incomplete pelta chape and a small piece of another. The former lacks the upper part of the decoration, but can be seen to have had at least one point (in the centre). The rear side was cut lower than the front and had a small, diamond shaped hole in the middle of it. Surviving L:3.8cm. Max W:4.6cm. T:0.9cm. The small fragment is from the upper part of a chape with a central point. Date:2nd or 3rd century?

Milecastle 48 (Poltross Burn).

Half of a bronze pelta chape from this site can be seen in Tullie House museum, Carlisle (Acc. No.7-1911.7). It was found during the excavations of 1910 (Gibson et al 1911 p442,fig21). most of one face is missing and half of the decoration on the other, but enough survives to show that the chape was of the three-point type. There is a circular rivethole in the centre of the rear side (which is cut lower than the front). L:4.7cm. Max W:5.1cm. Date:Hadrianic or later.

Newstead.

Part of one pelta chape was found during the excavation of the bath-house (Curle 1911 plate XXXV.13). It is a three-point chape like the example from Corbridge. On display in the National Museum of Scotland, Edinburgh. Measurements unknown. Date:Flavian or Antonine.

Ravenglass.

Two fragments of bronze chapes, perhaps pelta-shaped were found here in the 1976-8 excavations (Potter 1979 p71,fig26 no.27). One was dated to c360-400AD, the other was an unstratified find.

Richborough.

In addition to the small pelta-shaped "dagger chape" (see below page 174), there is also a full sized example of the type from this fort (Cunliffe 1968,p93,plate XXXIV.92). This has a central triangular point and two smaller, flanking ones. The two faces of the chape are of identical

shape and there are no rivetholes visible. One side of the chape is decorated just below the central point with an incised x. The chape was found in the middle ditch of the earth fort and so ought to date to no earlier than the 3rd century AD. It is not known what troops formed the garrison of the fort at that time. Part of legio II Augusta arrived sometime in the 4th century or even earlier.*3

South Shields.

One virtually complete pelta chape and possible fragments from two others have been found at this site. The complete chape may well have been found with the cache of swords found at the fort (see above page 70) and could even be the chape figured by Bruce (Bruce 1885 p258). It had a central point at the top (now broken off) and a rivethole in the middle of one side. Both faces were identical but a large part of one face is now missing. L:4.4cm. Max W:5.8cm. T:0.8cm. (Allason-Jones and Miket 1984 Cat. no.3.401). This chape is on display in the museum at South Shields. There are two small chape fragments from South Shields amongst the finds at Newcastle museum (M. A. Acc. no.s 1956.128.36. A and 1956.128.36. A (4) ; Allason-Jones and Miket 1984 Cat. no.s 3.399 and 3.405). Both of these chapes clearly had openwork decoration, but the fragments are too small to be worthy of much comment. Date:Hadrianic or later? The nearly complete chape may belong to the early 3rd century - if it was found with the swords.

Vindolanda.

What may be part of a chape of this type was found in the Vicus (R. Birley 1977 plate 25). The identification is not certain since the upper part of the decoration is missing. It was found in a late context, which suggests that it belonged to a soldier of Cohors IV Gallorum, the last known garrison at this site.*4

Wroxeter.

A three-point pelta chape was found in a room on the east side of the forum at the original floor level (Atkinson 1942 p209,plate 48.1). If the provenance is

accurate then this find will date to the first century AD. The only dimension given is the width - one and a half inches (c3.8cm).

Continental Parallels.

In Germany, examples of the pelta chape are known from at least four sites, namely Neuss, Niederbieber, Stockstadt and Zugmantel. The Neuss chape (Jones and Miket 1984,p160) could date as early as the Augustan-Tiberian period. The find from Niederbieber is of the three-pointed type and dates to c185/192AD or later (Oldenstein 1976,taf19.112). Two triple-pointed pelta chapes were found in the Mithraeum at Stockstadt, dating to the Domitianic period or later (Ibid taf 19.114-5). The first is of the usual form, identical on both faces, but the second has two small, circular projections set side-by-side, a feature not found on any British pelta chape so far discovered. The chape from Zugmantel is of the single pointed variety, but it has a circular stud in the middle of one side (Ibid taf11.4). This find is dated to c160AD. Further examples of the pelta chape have been found at the Raetian forts of Theilenhofen and Weissenburg. The former has three points and dates to the Antonine period or later (Ibid taf 19.113), the latter has also produced one chape, of uncertain type (Jones and Miket 1984,p160), dated Domitianic or later. Finally one should note in passing the appearance of the pelta chape in the bog deposits at Thorsbjerg, Denmark. A Large amount of weaponry was recovered from here between 1856 and 1862. Coins found in the bogs go down to 197AD, giving a probable terminus post quem for the finds, (although this can hardly be described as a sealed deposit,so dating evidence should be treated with caution). Much of the weaponry shows distinct Roman influence, although with added native features. This includes a number of chapes which are obvious copies of the basic pelta shape, but with incised decoration, and even in one case, runes engraved on the surface (Engelhardt 1869,plate 9,Du Chaillu 1889,p204,fig 371).

The pelta type is thus well distributed, occurring in

contexts ranging from the mid first to the third or fourth centuries and over most of Britain (although interestingly no examples have yet been found further north than Newstead). All of the 3-pointed examples from Britain (Corbridge,Newstead,Richborough and Wroxeter) come from sites which at one time or another had a legionary garrison. However, this point can hardly be pressed too far, since in no case can the find be closely dated. The continental examples (Niederbieber, Stockstadt, Theilenhofen and Thorsbjerg) are similarly of no help when trying to date the type or to connect it with a particular type of unit. It is much the same story with the one-pointed type. This appears in the first century (Colchester) through to the third century (South Shields?), with many examples which cannot be closely dated (Chesters, Greatchesters, Poltross Burn). It is found in contexts which seem to indicate legionaries (Caerleon), but also on exclusively auxiliary sites as well. The lack of precise dating evidence usually makes it impossible to associate the find with a particular unit known to have been at a fort. This will be seen to be true of other chape types as well.

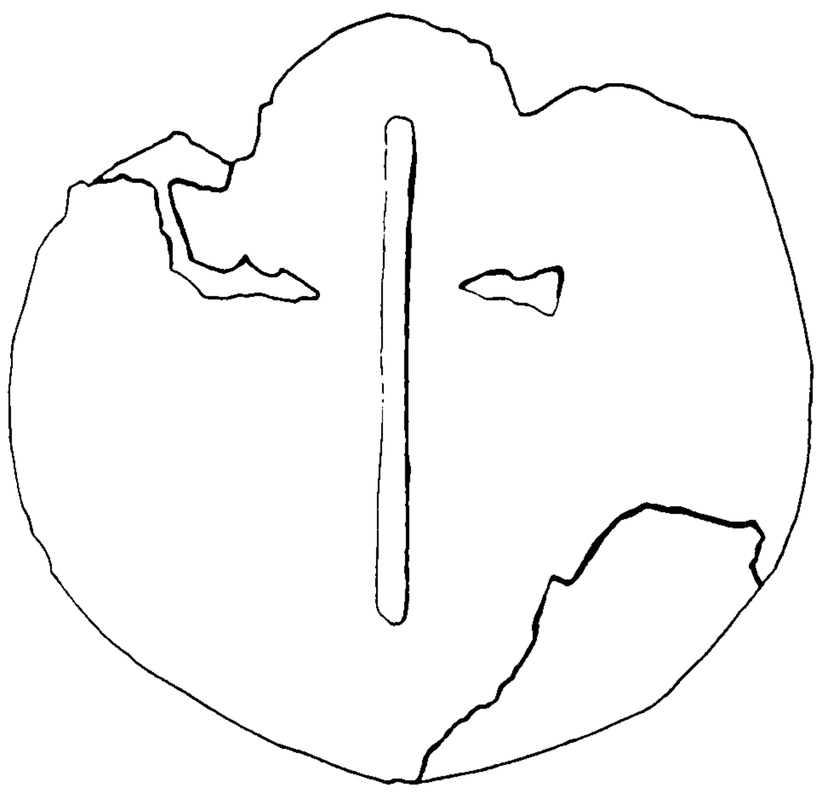
2. "Median Rib" chapes. (Map 3)

Chapes of this type have a rounded lower end, from which the sides curve outwards and upwards. Reaching their highest point they then curve downwards again to form deep semicircular cutouts in the top edge of the chape. Between these there is a central projection, which may be described as roughly cross-shaped. This usually appears on the front side of the chape only, the back of the chape being cut lower, with a simple, square ended projection in the middle between the two cutouts. The main feature of the chape is the mid rib, which can run down one or both faces of the chape, for all or only part of their length.

<u>British examples.</u>

Examples probably dating to the 1st century AD have been found at both Cirencester (Webster 1958,fig3 no.27) and Verulamium (Ibid fig7 no.203). Later examples are

MAP 3: Bronze Median Rib Chapes.



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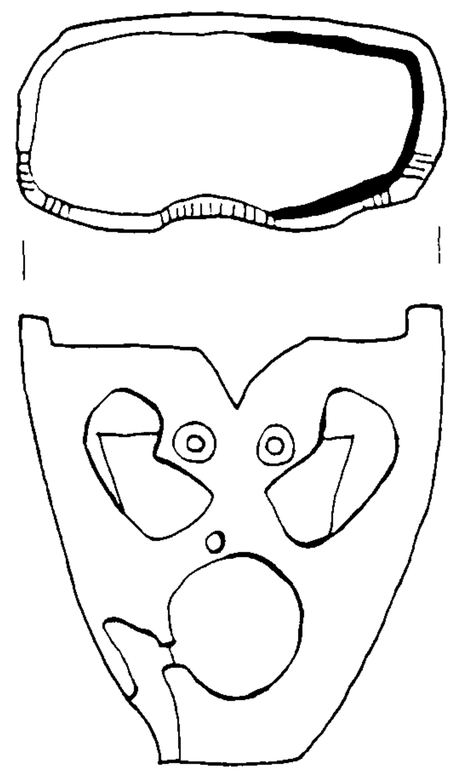

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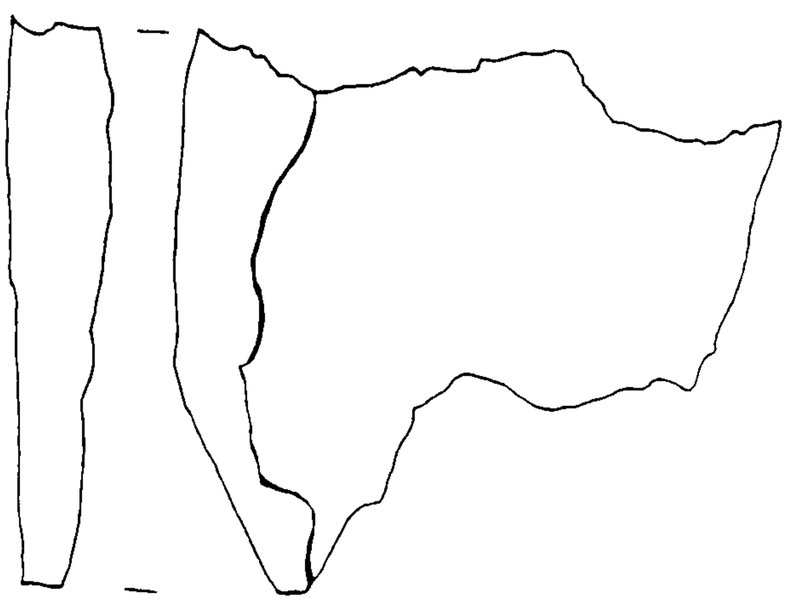

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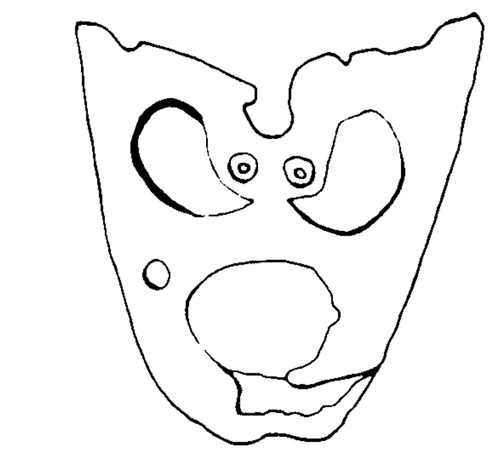

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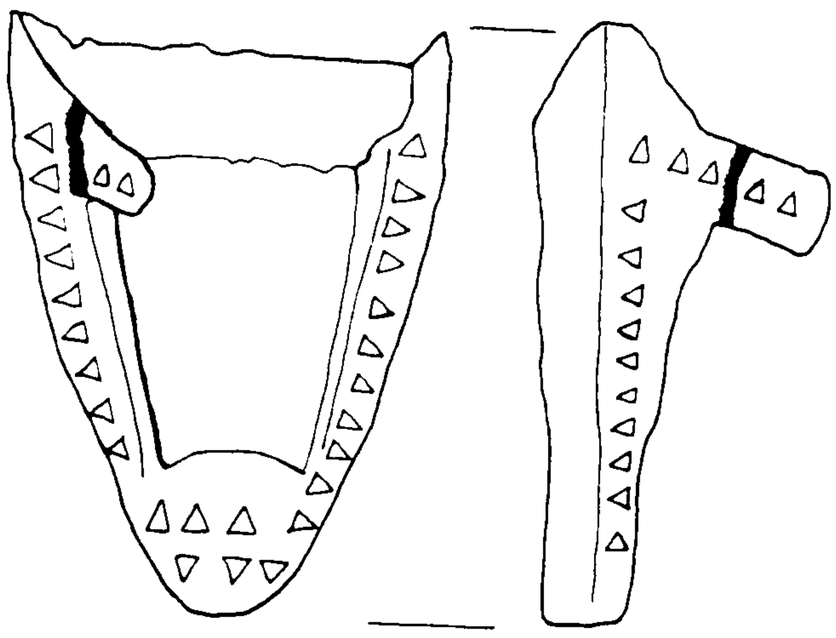

5

6

FIG 4: Bronze Chapes (all at 1:1)
1. Chesters 1091 2. Great Chesters
3. South Shields 3.397 4. MC.37
5. Chesters 6601 6. Chesters 838

discussed below.

Caerleon. (plate 6 no.2).

It would seem that at least 11 median rib chapes have been found at the fortress of legion II Augusta. Ten of these were from the 1927-1929 excavations in the Prysg Field, whilst the other is from the School Field site. Eight of the Prysg chapes are illustrated in the comprehensive excavation report (Nash-Williams 1932 p41-44,fig34 no.41,fig36 no.s 16-22). This includes a possible dagger chape (see page 172), much smaller than the rest. There are also two unpublished chapes from the Prysg excavations. The Prysg chapes vary in a few details, but are basically the same. Each has a mid-rib on one face only, the other side being plain and flat. All have rounded lower ends. Of the variations, the shape of the central projection is one of the most noticeable, but this is best appreciated by reference to the illustrations. Suffice it to say that the central projection is not in all cases the same shape on both faces of the same chape. Another obvious variation is in the positioning of the rivetholes. Four have no rivetholes at all, while others have a hole either near the middle of the back face or in the central projection on that side. The dimensions of the Prysg chapes also vary; from 5cm long by 3.1cm wide (Caerleon Mus. Acc no.31.78 C28 RB8T,Unpub.) to 6.1cm by 5cm (Nat. Mus. of Wales,no number.) The latter find is interesting, because its surface is a brassy colour, the result of the process commonly known as "tinning". One of the Prysg chapes in Caerleon museum (Accession no.31.78 C28 RB2 De) has traces of the same brassy colouration on the back. Dates: Of the median rib chapes figured by Nash-Williams (1932,fig36 no.s 17-22), two were unstratified, one belonged to the period 75-120AD and the remainder date between c120 and 200AD. The median-rib chape from the School Field site (Unpub.) cannot be closely dated. It is of the standard shape, with no rivetholes. L:5.2cm, W:3.1cm, T:0.6cm. The Caerleon median-rib chapes form by far the largest group of such finds in this country. Perhaps this was the preferred type of chape for the legion that was based there.

Chesters.

A well-preserved chape of this type can be seen in the museum at Chesters (Clayton Collection no.3038). On the front side the midrib extends the whole length of the chape. The rear face is cut lower than the front and has a blocked nailhole in the centre. L:5.5cm. Max W:4.5cm. The precise find-spot is not recorded. Date:Hadrianic or later.

Corbridge.

A chape from this site (Acc. no.75.1228) is cited as a parallel for South Shields chape 3.397 (Allason-Jones and Miket 1984 p160), but I was unable to locate this object at Corbridge. The catalogue card describes it as being in good condition, 5.6cm long and 3.8cm wide. Date:Flavian or later.

Kirkby Thore.

One median-rib chape is known from here (Collingwood and Richmond 1969 fig 108n). No other details are available and the whereabouts of the find are not known.

South Shields. (fig 4 no.3)

Two fragments of median-rib chapes from the fort can be found in the Museum of Antiquities store at Newcastle (Acc. No.s M. A.1956.128.36. A.1,1956.128.36.2; Allason-Jones and Miket 1984 p160-1, no.s 3.397,3.398). The first of these seems to be the back plate of a median-rib chape - it lacks the mid-rib but it is the right shape. L:4.3cm. Max W:4.2cm. T:0.6cm. The other piece is the remains of a front plate with a central rib. L:3cm. Max W:3.2cm. Neither piece has a precise provenance. Date:Hadrianic or later?

Vindolanda.

A well-preserved example with the rib running most of the length of the front face has been found in the vicus at Vindolanda (R. Birley 1977 fig25). Dimensions not known. Date:The find belongs to the second occupation phase of the Vicus. (see note 4).

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Continental parallels.

Two median-rib chapes have been found at the auxiliary fort of Zugmantel in Germania Superior, dating to the time of Domitian or later (Oldenstein 1976 taf18 no.s 105-6). One has been discovered at Buch in Raetia (Ibid taf18 no.107) dated Antonine or later. A small chape from the Saalburg (Ibid taf18 no.108) has the characteristic shape but lacks the mid-rib. A median-rib chape was found at Dura-Europos in 1931-2 (Rotovtzeff 1934 plate XXIII). Date:3rd century? The chape from the Lyon burial (Waurick 1989 fig6) dates to about 194AD.

3. Decorated triangular chapes. (Map 4)

These chapes are roughly triangular in shape, though with a rounded rather than pointed lower end. They are entirely open save for a slim crossbar at the top of the front side (and sometimes a corresponding one on the rear side too). Below this there may be cutwork in the form of an arcade. These chapes are usually decorated with small triangular indentations, sometimes all over the front face, but more often just along the crossbar. These indentations would have been filled with small slivers of coloured enamel, though these are very seldom found in place.

Benwell.

One badly corroded chape was found in the excavations of 1927 (Petch 1928 p72,plate XXII.1 no.2). The whereabouts of this find are not known. The illustration of the chape is poor, but it is clearly triangular, with crossbars and projections at the top. It may have had arcaded cutwork. No find-spot is recorded. Date:Hadrianic or later.

Chester.

One such chape was found in the Hunter Street School excavations of 1979 (Small Find no.41). It is in a rather worn condition, but it is probable that the front crossbar would have had the triangular settings for pieces of enamel usual with this type of chape. The back crossbar is missing. Below it there are the remains of arcaded cutwork decoration. L:3.6cm, Max W:3.3cm T:1cm. Date:Unknown,

MAP 4: Bronze Triangular Chapes (Decorated).

therefore Flavian or later.

Chesters. (plate 6 no.4,fig 4 no.5)

There is a triangular chape from this site which had crossbars on both the front and the back-but part of the former (which is curved) is now missing. The whole of the front face, including the crossbar is covered with triangular insets for enamel (none of which remains). L:4.7cm. Max W:3.1cm. Drawn by Morna Macgregor (Macgregor 1976 no.166) who however omitted some of the decoration. Date:Hadrianic or later (Clayton Collection no.6601).

Housesteads.

One triangular chape is known from this fort (Macgregor 1976 no.168). The back crossbar is missing, but the front bar is decorated with a row of triangular indentations (arranged pointing upwards), filled with pieces of red and yellow enamel. Below this the chape has some arcaded cutwork. L:5.2cm. Max W:4cm (measurements taken from Macgregor). The current whereabouts of this find are unknown. A thorough search in the store at Corbridge museum failed to locate it and it is not at either Housesteads itself or Newcastle. Date:Hadrianic or later.

South Shields.

The site has produced one chape of this sort, badly damaged and in two pieces (Allason-Jones and Miket 1984 p160; Macgregor 1976 no.170), which can be seen on display at South Shields museum. The front crossbar is decorated with the usual row of triangular depressions (pointing upwards). None of the enamel inlay remains. Three triangular points project from the middle of the top side of this crossbar. The rear crossbar has broken off. The chape also has arcaded cutwork. L (estimated) :4.7cm. Max W:3.7cm.

Vindolanda.

This seems to be the only site in Britain to have produced more than one of these chapes. One was found in a 3rd century level at the north end of the Principia (R.

Birley 1970 p137-8,fig1 no.14). The front cross-bar has a row of triangular insets pointing upwards. Another chape of this type has been found in the vicus at Vindolanda, belonging to the second phase of occupation (R. Birley 1977 fig25). This has both front and back crossbars, the former being decorated with triangular enamel insets. Both Vindolanda chapes have the same projections from the top of the front crossbar that are a feature of the chape from South Shields. Date:see note 4.

Apart from the above finds there are two more examples of this type from Britain said to date to the 1st century AD. The first is from Corbridge (Acc. no.75.1243) said to belong to the Flavian period. The other chape is from Richborough. It is a little different but shares some common features with the rest of this group (Bushe-Fox 1949 plate XXXVII no.131,p131). A large part of this chape is lost including a portion of the front crossbar. This is decorated with incised triangles, which unlike those on other chapes already discussed, point downwards. Most of the other decoration is lost, but one suspects from the fragment that survives that this chape had arcaded cutwork or something very similar to it. The chape terminates in a round knob marked by a horizontal ridge. The excavator (Ibid p131) felt that this chape was "native", but one must doubt this, just as one has to treat with caution many of the dates given for the weapons from the site, bearing in mind its confused stratigraphy. The Richborough chape can be parallelled by a number of similar finds from Denmark, which have been dated to the early Roman period i.e. the 1st and 2nd centuries (Nylen 1963 p138,186). This may point to the area of origin of this type, but it is more likely that its appearance in Scandinavia is as a result of plunder, trade or direct copying from Roman prototypes. In Britain this type of chape is largely confined to the northern frontier. Such chapes do not seem to have been found on the Rhine-Danube limes (Oldenstein 1976 tafs 18-28) but this could just be a matter of chance. There are a couple of iron chapes from Britain of very similar form and these will be dealt with later (see below page 114). Triangular chapes appear on the sheaths of auxiliary

cavalry on Trajan's column (scene XXXVII), on the (Hadrianic?) tombstone of a marine from Athens (Waurick 1989 p51,fig8) and on the gravestone of the optio P. Aelius Mestrius from Aquincum (Ibid p51,fig9) which is early Hadrianic. They can also be seen on the column of Marcus Aurelius (Ibid fig11) on the sheaths of auxiliaries wearing mail and scale armour. A panel from the reign of Marcus Aurelius, re-used on the Arch of Constantine (Strong 1988 pl133) shows a sacrifice. The soldier on the right, wearing lorica segmentata has a triangular chape on his sheath, ending in a finial. We thus have sculptural evidence for triangular chapes in the 2nd century AD, but none that I can find after this. Unfortunately the detail is never sufficient to see if the chapes were decorated with inlays in the manner of the finds from Britain. The pictorial sources show that the same chapes were used by various kinds of troops.

4. Other triangular chapes.

These are much cruder in form than most of the bronze bronze chapes discussed so far. They consist of simple pockets of bronze, either completely plain or decorated in a very basic fashion. No two are exactly alike, but it seems best to classify them together. These chapes tend to be rather small and this, added to their complete disimilarity from other chapes makes one wonder if they came from scabbards at all - other implements may have used such bronze tips. No comparable examples from the continent are known to me.

Caerleon. (plate 6 no.5).

There are two triangular chapes from the "Roman Gates" site. The first of these (Acc. no.88.165H 31/418.660/1538 1281) is oval in section, with an incised line around the top edge and a mid-rib on both faces. It is probable that it came to a point at the bottom, but the object is badly damaged in that area. There is a rivethole near the top edge on one side. L:3.5cm. Diameter :2.4cm. Found in Block A, phase VI. Date:Unknown.

The other example is similar but flatter (Acc. no.88.165H 31/37/1963 1686). Decoration on this piece consists of wavy lines forming a V-shape on each face. There are also three horizontal lines across the top. Most of one face is lost. The chape is pierced by several rivetholes. From Block A, phase IV. Date:Mid 2nd century? (plate 6 no.5).

Chester.

A bronze sheath tip identified as coming from a dagger or sword was found in Deanery Field in 1924 (Newstead 1928 plate VIII no.1). This is triangular in shape and facetted. One face has two holes cut into it, perhaps for rivets. The end has been roughly cut or filed into an X-shape. L:4.1cm. Max W: 2.6cm. T:1.3cm (width of opening 0.8cm). From room 4a, barrack block B. Date:Unknown, therefore Flavian or later.

London.

There is a very corroded sheath tip in the collection of the Museum of London (Acc. no.18) which may belong with this group. The upper part is lost but it was probably triangular. The lower section is solid and ends in a domed finial. One side may have been open. L:3.6cm. Max W:c2.5cm. From 44, London Wall, 1984. Date:Pottery from the area was dated to 120-160AD.

5. "Heart-shaped" Chapes.

These chapes are exceedingly rare, in fact I know of only two examples in Britain and no directly comparable examples from the continent. As with the decorated triangular chapes (type 3) these chapes may only have been used in Britain. The front plate may be described as being roughly heart-shaped, whilst the back is entirely open except for a crossbar at the top. Decoration on these chapes consists of symetrically arranged cutouts and circular recesses, the latter holding pieces of enamel.

Greatchesters. (plate 6 no.3,fig 4 no.2)

A chape of this sort was found in the fort during

excavations in the last century, currently unpublished. Torwards the top of the chape on the front side there are two pelta shaped cutouts, between which are two small circular insets for enamel, set side by side. Below these, and set slightly off-centre is a small circular cutout, with a much larger one below. The lesser of these two openings may have held a rivet for the attachment of the chape to the scabbard. Overall the arrangement of the various decorative features on the front of this chape recalls human facial features, with eyes, ears, nose and mouth. This may just be coincidental of course. The back of the chape has a crossbar at the top. L:c3.2cm. Max W:3cm. No precise findspot is recorded for this object. Date: Hadrianic or later.

Milecastle 37 (Housesteads). (fig 4 no.4)

A similar chape to that from Greatchesters was found near the west wall of the milecastle in 1933 (Blair 1934 p117,Macgregor 1976 no.169) and can now be found at Corbridge museum (Ancient Monuments Laboratory no.79208629). The decoration consists of (from top to bottom) a small circular hole (0.2cm diam.), below this two circular insets for enamel (some traces of red enamel can still be seen) and below these a large, circular cutout (1cm diam.). On one side (only) of this is a small circular opening (0.2cm diam.) but there is no trace of any corresponding hole on the opposite side of the large cutout (contra the impression given by Macgregor 1976 no.169). The back is completely open. Length:3.2cm. Width:2.8cm. Date:Hadrianic or later.

6. Oval/Circular chapes.

Such chapes are uncommon in Britain, and quite distinct from the truely circular iron chapes found in Germany (see below page 115). Within this category there are two distinct groupings:-

a. Type 6a chapes are characterised by being oval in shape with a semicircular projection on the top edge, and are decorated with a mid-rib flanked by pelta cutouts.

Chesters. (fig 4 no.1)

A chape of this sort can be seen on display in Chesters museum (Clayton Collection no.1091; Budge 1903 p377). This has a mid-rib on one side only, but the pelta cutouts appear on both sides of the chape. There is a large section missing from one face and the condition of the whole object is rather worn. L:5.5cm. Max W:5.6cm. As is usual with the early finds from this site, no precise provenance has been recorded. Date:Hadrianic or later.

Fremington Hagg (?). (plate 6 no.6).

This chape has become associated with a hoard of Roman cavalry harness fittings, perhaps pre-Flavian in date, from Fremington Hagg in Yorkshire (Webster 1971 p109, fig10.6). It is basically the same as the chape from Chesters, although in this case there is a raised elliptical panel on the front of the chape on which the decoration (mid-rib and pelta cutouts) is placed. The semi-circular projection is marked by five vertical grooves, evenly spaced. The back is flat and does not have the mid-rib, but it does have the cutouts. There is a small rivethole set centrally below the projection. L:5cm, Max. W:5.2cm. The original thickness is not determinable due to severe crushing of the chape. The history of the Fremington hoard is somewhat confused and the association of the chape with it must be considered doubtful at best. The Pre-Flavian dating is therefore highly speculative; it could easily be much later. The chape has a tinned surface and may be found in the British Museum (Acc. no.80 8-2 155).

Richborough.

There is a large oval bronze chape from the Shore fort which has certain similarities to the two finds mentioned already (Bushe-Fox 1928 plate XXI,2 no.53). The surface is tinned and there is a round projection from the centre of the top edge. This occurs on one side only. There is also the usual pair of cutouts, but in this case no mid-rib. The other side may have been the same, but it is now badly damaged. The upper part of the chape is pierced by two rivetholes (0.2cm diam.). The chape is unusually large.

L:6.5cm. Max W:6.2cm. T:c1cm. Date:Unstratified, therefore Claudian to 4th century or even later.

York.

There is one bronze chape of this type in the Yorkshire museum (on display,no accession number). It has a raised panel on the front face which curves to follow the edges of the chape. The front face has a central groove flanked by two ridges and neatly executed pelta cutouts. The back has the cutouts but is otherwise undecorated. There are some faint traces of tinning on the surface. L:5.5cm. Max W:5.4cm. T:1.1cm. Date and context unknown.

Continental parallels.

Oval chapes of this kind have been found at two sites in Germany (Oldenstein 1976 taf 19 no.s 117-118,120). These are Niederbieber (185/192 AD or later) and Zugmantel (Domitianic-c260AD). Further chapes from Butzbach, Osterburken, the Saalburg and Zugmantel may belong to this type (Ibid taf20) may have been of this type but are incomplete. Oldenstein's dating of the group to the late 2nd/first half of the 3rd century (Ibid p122) is based on slim evidence, but derives further support from an example found recently at Scheveningen in Holland (J. A. Waasdorp. "Roman Military Finds from Ockenburg and Scheveningen, The Hague". Lecture at the 6th Roman Military Equipment Conference, Bonn.1988). This is dated to the late 2nd/3rd century. Type 6a chapes appear to represent a fusion of the pelta and median rib types with the addition of a totally novel shape. The British finds are only really dateable by analogy with the material from the continent and this is unfortunate for the finds from Germany are dated simply by the overall history of the site concerned.We may assume with some safety that the chape from Chesters is Hadrianic at the earliest, but otherwise we are in the dark. Certainly this is a small and closely knit group.

b. Type 6b chapes are small round objects, pierced by rectangular openings in the underside. One cannot rule out entirely the possibility that these are indeed from

scabbards, although they could equally well be some kind of harness fitting.

Chesters. (fig 4 no.6)

A small, circular bronze object in Corbridge store (Clayton collection no.838<1095>) identified as a strap junction, shows some affinities with scabbard chapes. It is hollow with a rounded lower end. Large parts of both front and back plates are missing. Unusually, the end is not totally solid, but instead has rectangular cutouts 1.5cm by 0.5cm spaced at intervals of about 1.5cm. There are no traces of any rivets in either of the flat faces (the usual place that chapes were rivetted) but the remains of an iron rivet can be seen in one of the solid parts of the end. L:3.6cm. Max W:4cm. No provenance is recorded. Date:Hadrianic or later.

Housesteads.

An unnumbered object in Corbridge mueseum store, which originates from Housesteads. When or exactly where it was found is unknown. It is of tinned bronze, but otherwise identical to the Chesters specimen discussed above. It is badly damaged around the edges and there are no rivetholes. The find is identified as a strap junction. Length:4.5cm. Width:4.4cm. Date:Hadrianic or later.

<u>Continental parallels.</u>

Oldenstein illustrates a circular iron chape from the fort of Niederbieber (Oldenstein 1976 taf24,no.146) which has a rectangular cut-out in its lower end. Unlike the British examples this object is decorated. The find from Niederbieber will date to 185/192AD-c260AD (Johnson 1983 p284). Of course it might be argued that Oldenstein was mistaken in his identification of the object from Niederbieber, but it is quite similar to undoubted iron chapes from elsewhere (Ibid tafels 22-24). There is some chance that the finds from Chesters and Housesteads are also chapes. If so the type does not seem to have achieved much popularity.

7. Square/Rectangular chapes.

Birdoswald.

A supposed bronze chape was found here in 1929 (Richmond 1931 p134,fig4 no.11). This was roughly rectangular in shape, with one end and the sides straight and the other end wavy. The current location of this find is not known. Assuming that the illustration is at 1:1, then the chape would have been about 3.5cm long by 4.5cm wide. It was found in a barrack block in a layer then associated with the restoration by Count Theodosius in c369AD. However this dating may not be correct.

Vindolanda.

There are three chapes from this site, differing in their decoration, but all either square or rectangular, with straight or roughly straight lower ends (R. Birley 1977 fig25). All three came from the Vicus. The first (Ibid,bottom row left) looks rather like the chape from Birdoswald. It is rectangular and flat, the sides and the lower end being slightly curved. The top edge has a wavy profile. The second chape (Ibid,bottom row,centre) is square with spiral cutouts in the top edge. The final chape is rectangular with a battlement-like arrangement on the top edge and is decorated with incised lines running both horizontally and diagonally.

The three chapes belong to the second period of occupation in the Vicus (see note 4) at which time the garrison of the fort was presumably still Cohors IV Gallorum. These finds were unfortunately not available for examination at the time of my visits to Vindolanda. From the illustrations one gets the impression that these are rather crudely produced objects, with only simple decoration. This could imply they were made by people in the Vicus for soldiers of the garrison.

There do not seem to be any parallels for the chapes from Birdoswald and Vindolanda in any other province. It would appear that this type of chape was in use in the 3rd/4th centuries.

8. Other types and doubtful specimens.

There are a few bronze chapes from Britain which cannot definitely be placed in any of the major groups defined here, often because the state of preservation is so poor. In general they are of little interest, but some brief notes on each seem in order for the sake of completeness.

Chesters.

Two chapes found at this site (Budge 1907 p377,no.s 839-840) may have been of the pelta type, although since both are incomplete this can only be regarded as a suggestion. The current location of these two finds is not known. Date:Hadrianic or later.

Corbridge.

One bronze chape of uncertain type. Not located (Acc. no.75.1227). L:6.6cm. Max W:5.5cm. Date:Flavian or later.

Haltonchesters. (fig 3 no.4)

There is an incomplete chape from this site, perhaps of pelta type (M. A. Acc. no.1978.8). Found in the northeast section of the fort by a field walker in about 1977. L:c2.8cm. Max W:c4.5cm. Date:Hadrianic or later.

Lancaster.

A scabbard tip was found here in 1929. This was "made of thin sheet bronze, folded longitudinally and bears traces of having been rivetted to a sheath with iron rivets" (R. Newstead and J. P. Droop in L. A. A. A. XVII,1930,pages 69-70). Coins ranging from Victorinus to Constantine II were found.

London.

Among the recently excavated material (Museum of London Acc. no.19732) is a chape consisting of "a thin iron sheet with relatively thick copper alloy sheet/plating on both sides. " There do not seem to be any other examples so far of chapes made in this way. The lower end is rounded, whilst the upper edge has two cutouts, with a triangular

projection between them. The chape is in two fragments and most of one face is lost. The larger piece is 3.4cm long and has a maximum width of 6.9cm. It is 0.7cm thick. The other piece is 3.5cm long and 5.2cm wide. Date:The chape was found in the Walbrook streambed near to Bucklersbury. House in 1955. It should therefore in theory date to before c150AD.

Milecastle no.9 (Chapel House).

Part of a chape was found here in 1929 (E. Birley 1930 p160,figB). This was reconstructed as having a straight-ended projection in the centre of the top edge, flanked by semicircular cutouts. It may perhaps have resembled the "crescent" chape from turret 35a (see below) or it may be another example of a pelta chape without its top section. No measurements are given. Date: Hadrianic or later.

Newstead.

Curle (1911 plate XXXV,no.s 16,18) shows two chapes which are probably of the pelta type, but both are incomplete so this is not certain. Number 16 is pierced by two circular holes, probably to hold rivets, whilst no.18 has only one hole, set centrally. Neither piece is provenanced. Date:Flavian or Antonine. These chapes probably belonged to either legionaries or cavalrymen.

Turret 35a.

There is one chape from this turret which may best be described as being crescent-shaped (Allason-Jones 1983 fig3). It is basically a pelta chape without the upper section, but it does not appear to be incomplete or damaged in any way. It may therefore be a variation on the basic type. There are no direct parallels for this find. Date:Hadrianic-Antonine?

<u>Continental parallels.</u>

A chape of similar shape to those from Newstead, but lacking the holes has been found at the fort of Butzbach-Degerfeld in Upper Germany (Oldenstein 1976 taf 20,no.131). Date:Domitianic or later. Two chapes from the Saalburg

recall the Chesters chapes in their general shape, but difer in their decoration (Ibid taf 20,no.s 130,132).

B. Iron Chapes. (Map 5)

As previously noted, there is a distinct lack of iron chapes from this country, in sharp contrast to their prevalence on the continent. Since there was certainly no shortage of iron in Britain, the rarity of such chapes must be due to some other factor e.g. non-identification or non-survival because of poor preservative conditions. Alternatively the army in Britain may have preferred chapes in other materials-we must not rule out the vagaries of fashion and taste in this case.

<u>British examples.</u>

Aldborough.

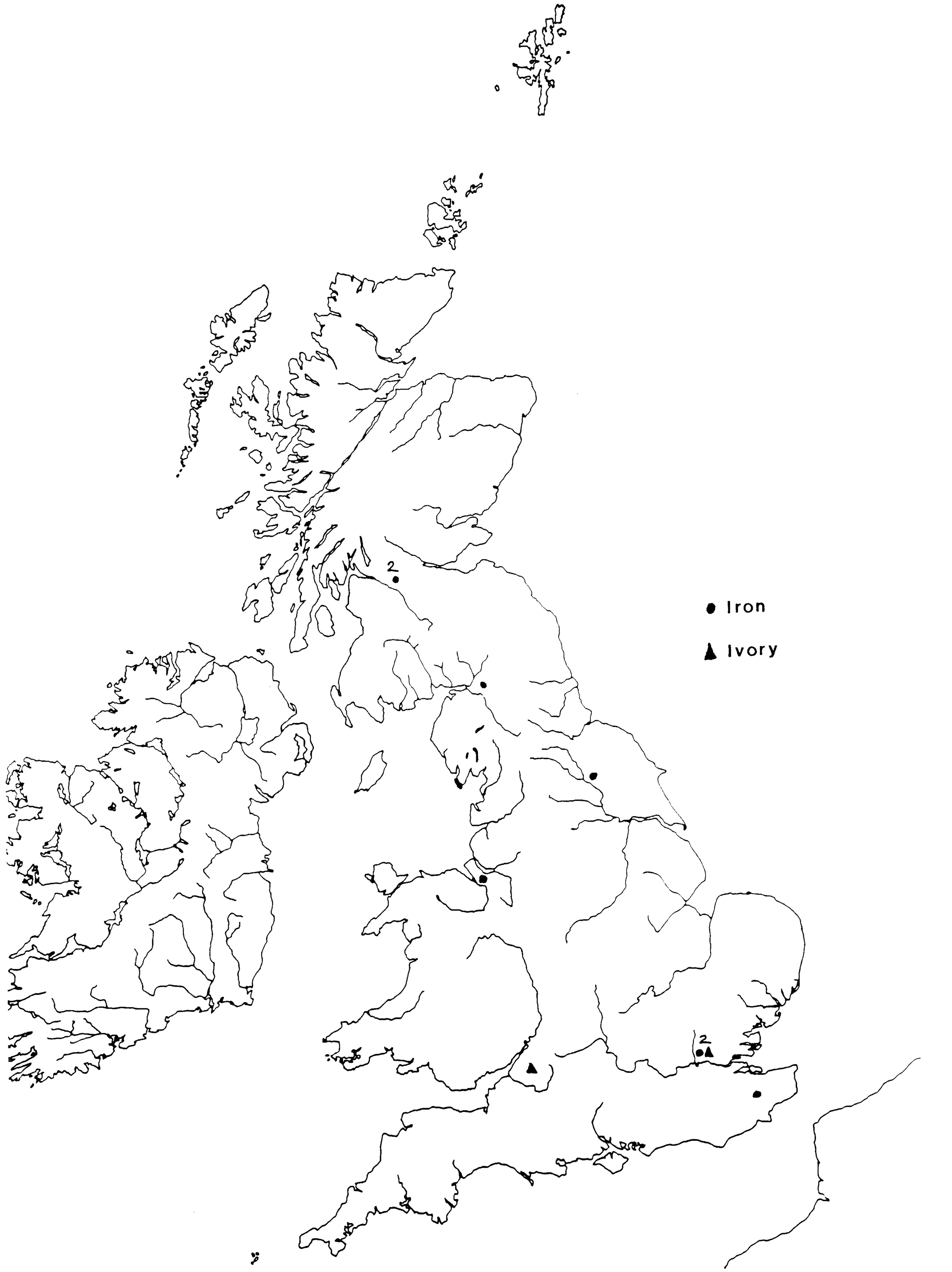
An iron chape has recently been found along with other late Roman military equipment. No details of the chape's form are available (pers. comm Dr. M. C. Bishop).

Bearsden.[*5] (plate 7 no.1).

Amongst the finds from the recent excavations at the fort is a very corroded iron object, apparently a chape of triangular form. Much of the upper part is lost and the corrosion obscures any decoration that there might have been. The chape has a small ridged finial at the end. In this feature it recalls the supposedly "native" chape from Richborough (Bushe-Fox 1949 plate XXXVII no.131). L:c5.5cm, Max Surviving W:c3.5cm. There is also a detached tip with a finial, presumably from a second chape of this type. Date:Antonine.

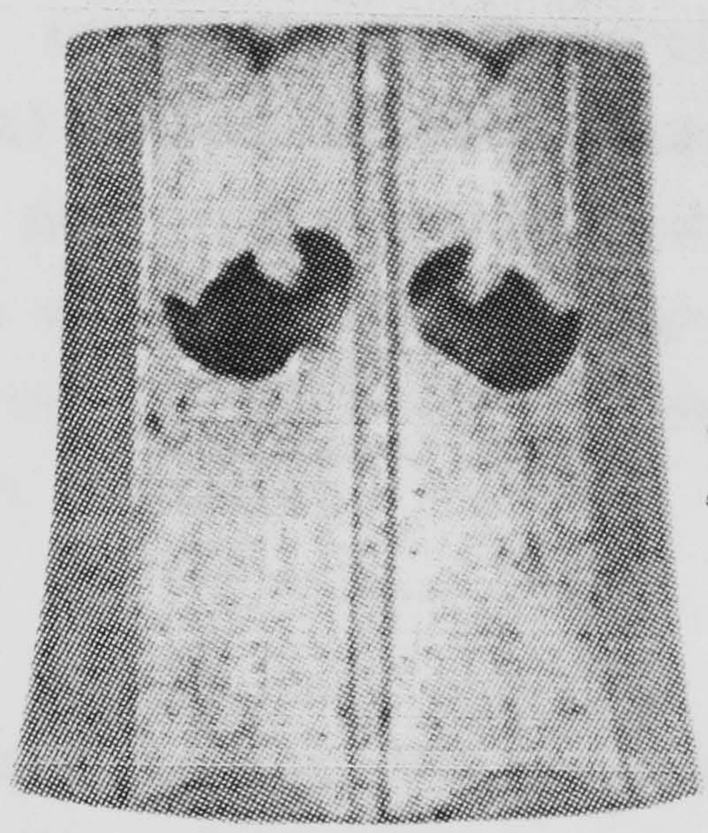
Canterbury.

One of the two chapes from the double burial in Rose-mary Lane was of iron (Goodburn 1978 p469-71,figs19-20). The chape when found was attached to the shorter of the two swords in the burial. It is in a rather poor condition, with the upper portion missing so its original shape can only be conjectured. It may have been of the pelta form. No dimensions appear to have been published for



MAP 5: Iron and Ivory Chapes.

1



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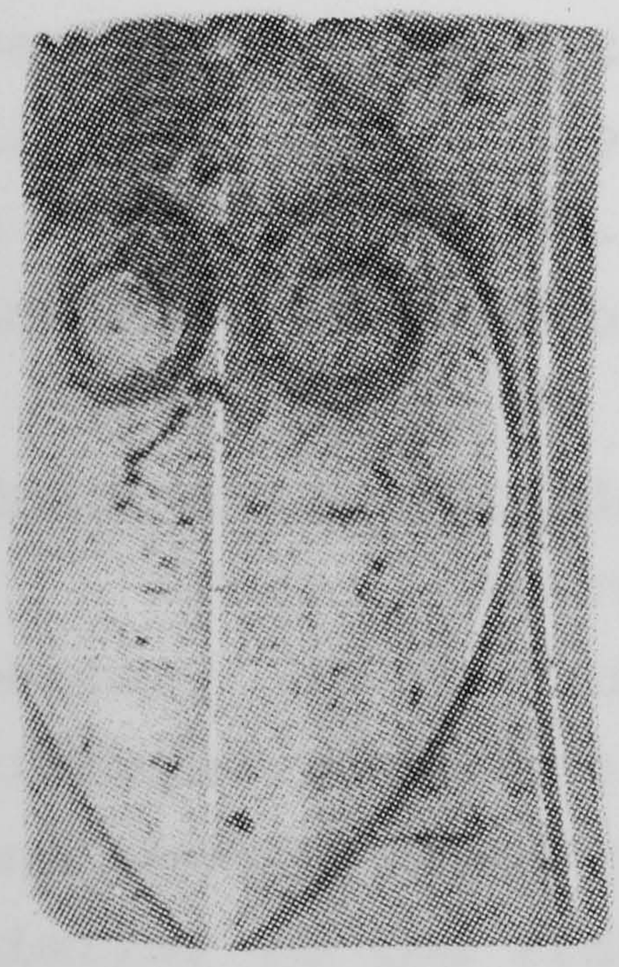

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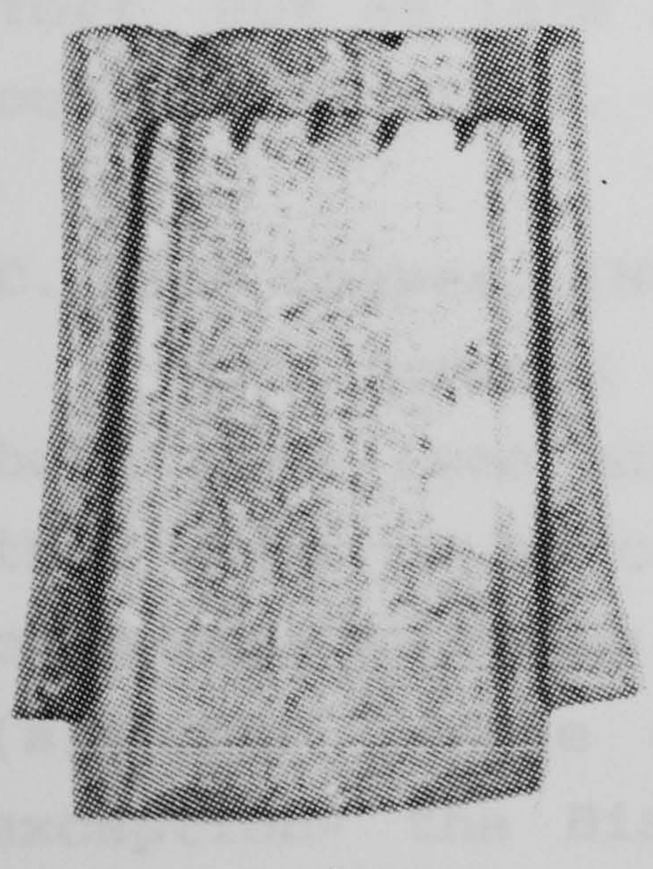

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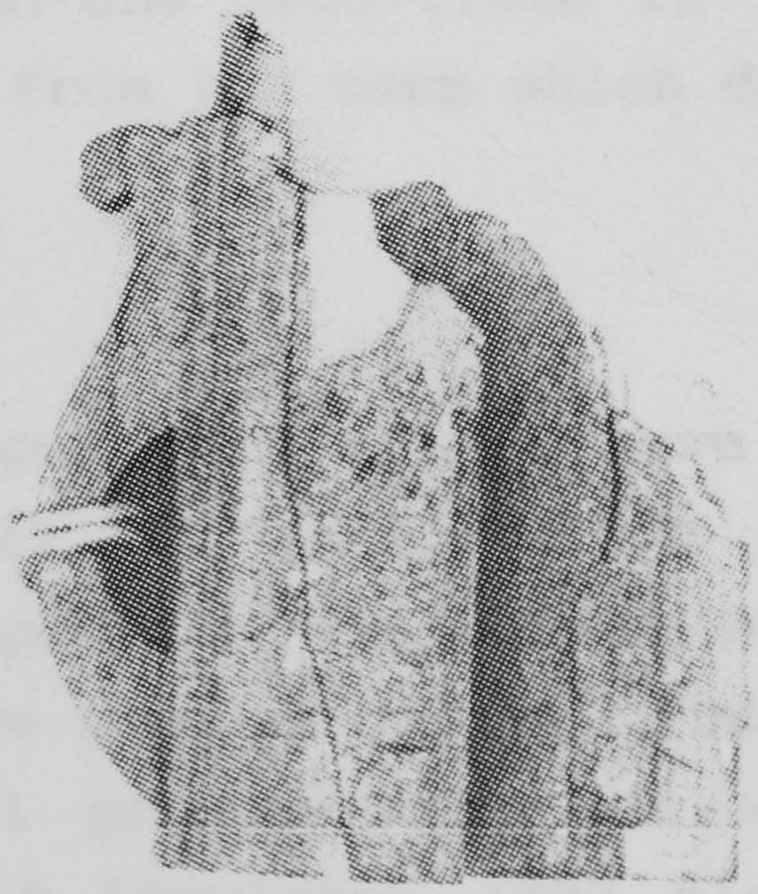

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PLATE 7: Iron, Bone and Ivory Chapes (all at 1:1)
1. Bearsden (Iron) 2. Caerleon (Bone) 3. Richborough (Bone)
4. Kirkby (Bone) 5. Caerleon (Bone)
6. Greenwich Park, London (Ivory)

this find and I was unable to examine it closely. Date:Mid 2nd-mid 3rd century.

Chester.

A hollow, "shield-shaped" iron object from the Hunter Street excavations of 1981 (Small Find no.1383) may well be a chape. The front is convex and undecorated, whilst the back-which has a large section missing at the top-is flat. The object is heavily corroded. L:4.7cm, Max W:3cm. Date:Unknown, therefore Flavian or later.

Turret 51b (Lea Hill).

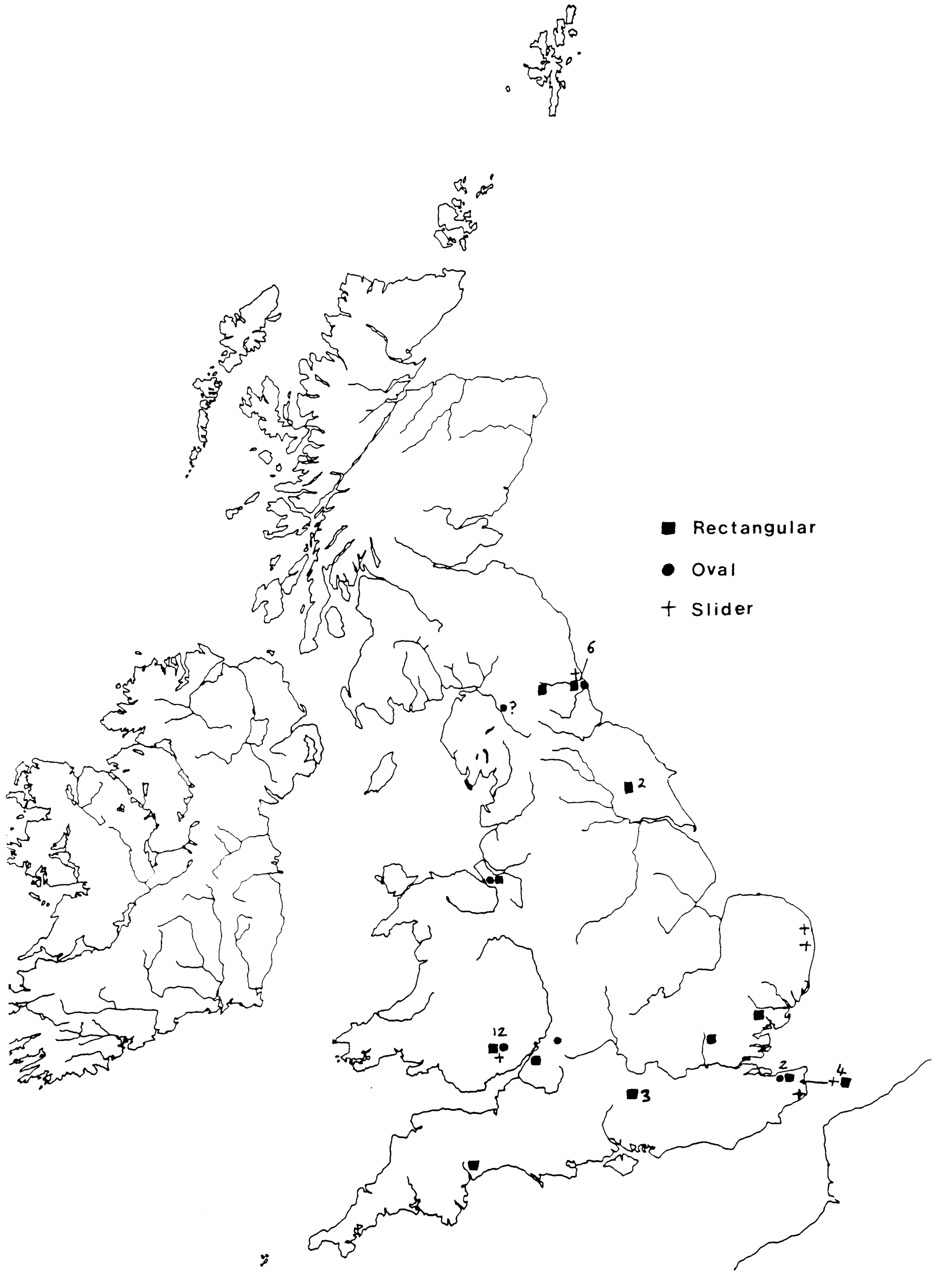
An iron chape was found here during the excavations of 1958 (Woodfield 1965 p182,fig Y). This chape was found in layer 1 (ruin of the turret), with pieces of straw stuck to the outside and traces of bronze on the inside. A large part of this chape is missing, but going by the illustration in Woodfield's report, it looks as if this was a circular chape. The current location of this find is unknown. Date:probably 2ndc.

<u>Continental Parallels.</u>

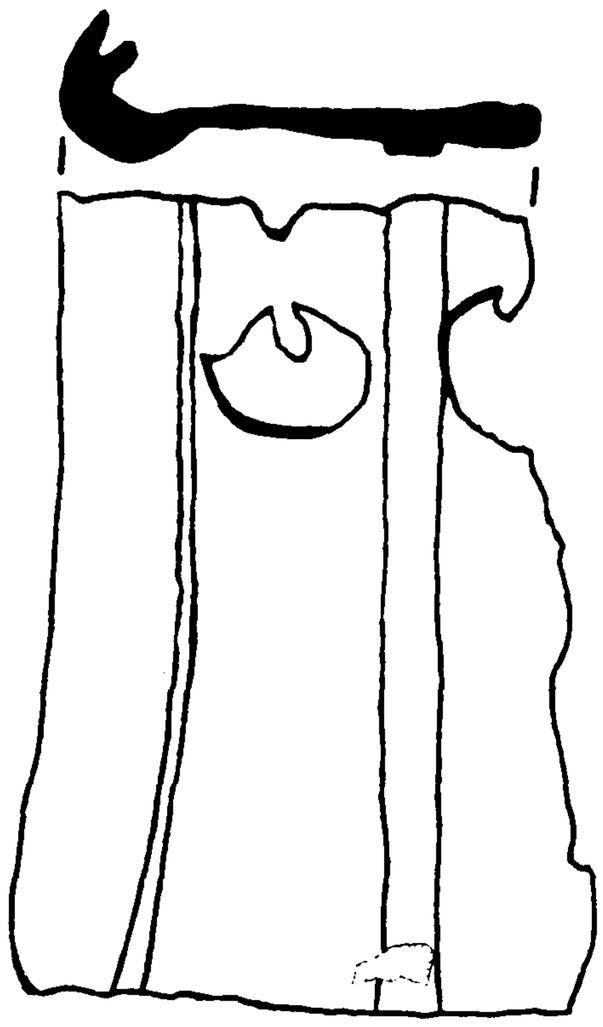
Large numbers of iron chapes have been found in Germany (Oldenstein 1976 tafs 21-24). Most of these are circular and decorated with intricate patterns. However, one chape (Ibid taf24,no.147) from Heddernheim is quite similar to the fragment from Turret 51b. This would date to between the reign of Vespasian and c100-110AD if from the fort, but as late as 260AD if from the town which developed out of the vicus.

C. Bone Chapes. (Map 6)

Some general comments about bone chapes have already been made (see above page 91). To recapitulate briefly, they seem to be confined largely to the second and third centuries AD. They became quite popular in the later empire (although bronze chapes still predominate) and with one exception- the Bishapur relief (Coulston 1987 p147) they are not depicted in sculptures. The standard of workmanship of many of these chapes seems crude when compared to the more elaborate bronze types - possibly the popularity that



MAP 6: Bone Chapes.



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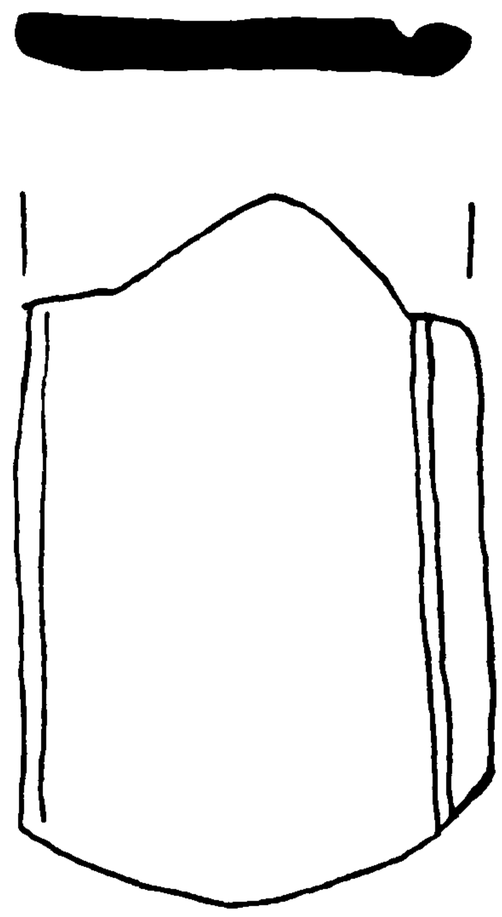

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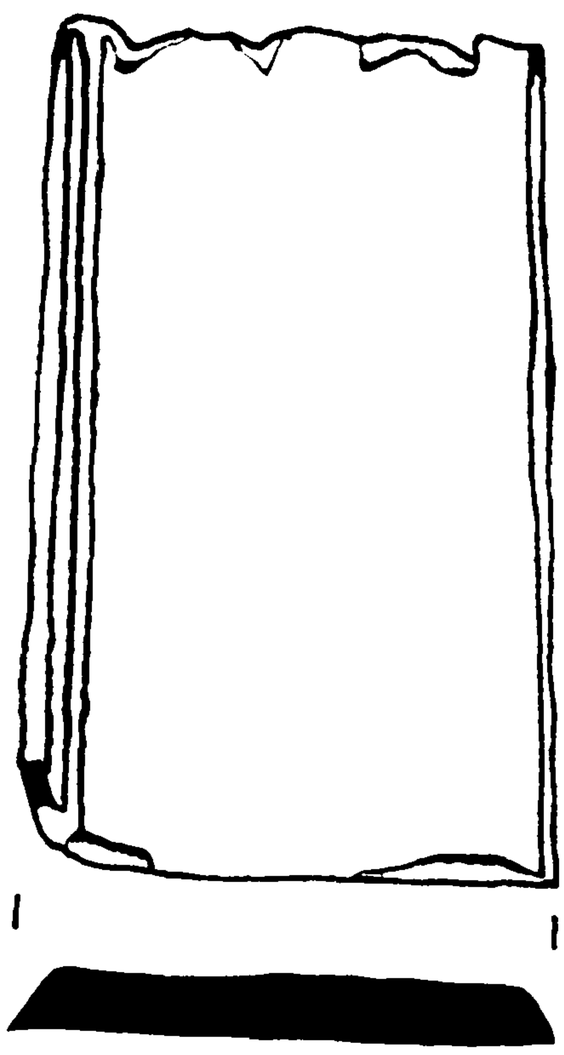

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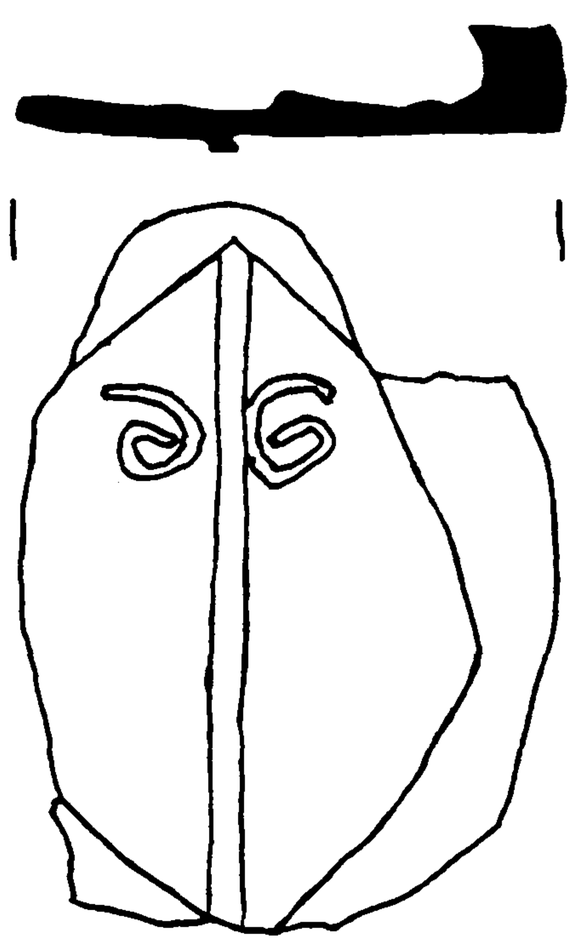

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FIG 5: Bone Chapes (all at 1:1)
1. South Shields 2.80 2. South Shields 2.77
3. South Shields 2.78 4. South Shields 2.81

these chapes achieved in the later empire was due to the ease - and cheapness with which they could be produced. Bone chapes were usually made in two pieces these being the decorative front plate and the slider. The two piece construction was due to the nature of the material used (Oldenstein 1976 p116), it not being possible generally to find a piece of bone large enough to make a chape in one piece.

The slider fitted into grooves on the rear of the front plate to form a boxlike assemblage. This then slid over the end of the scabbard. Very few of these chapes have any rivetholes in them so it is likely that they were clipped into place or glued. The sliders are more rarely found, as being smaller they were more easily lost. They can have notches at the top edge and grooves down their length but are otherwise plain, decoration being superfluous since the slider would not normally be visible. The gap left between the front plate and the chape when it was assembled (plate 7 no.5) resulted in a much lighter assemblage than the metallic chapes. There were two basic types of bone chape - rectangular and circular/oval. There are variations within these two types with regard to decoration. One notable feature is the prevalence of pelta cutouts on bone chapes. These are often very roughly executed but nevertheless part of the continuing tradition of the use of this motif, also seen on many bronze chapes.

Type 1. These chapes are rectangular in shape. Decoration consists of a mid-rib flanked by pelta cutouts and grooves down the margins of the front plate. The long edges of the chape are often slightly curved. The short ends are usually straight or at least roughly so. The top end generally has triangular notches cut out of it, while the other end is chamfered.

<u>British Examples.</u>

Caerleon. (plate 7 no.s 2 and 5).

Five bone chapes of this sort have been found in the fortress, four during the excavations of 1927-9 (Nash-

Williams 1932,fig43 no.s 1,4,6 and 8), as well as a more recent find (Caerleon Museum Acc. no.88.3H CBT 138 /011.) The Prysg Field finds at least are all made from ox-bone*6. Two of them (Ibid no.s 1 and 4) were found together with their sliders. Each front plate had two marginal grooves, in matching positions to the decorative ones on the front. These back grooves do not run parallel but converge slightly at the top. It has been suggested, quite plausibly, that this was to stop the slider falling out (Ibid p53) The surfaces of the sliders are smooth except for some marginal grooves, but the edges are treated in the same way as the front plates, namely, with notches and chamfering. All of these chapes were found in the north-west rampart buildings. No.s 1 and 4 were dated to the period c120-200AD, whilst no.6 and the fragmentary no.8 were dated to 200-300AD. The best preserved chape from Prysg field (loc. cit. no.1) also has its slider. This is wider at the top than the bottom and the lower end curves slightly. The whole assemblage measures 6.2 x 5.4cm. Number 4 has one of the grooved flanges on the back missing. L:5.8cm. Max W:3.9cm. T:c1.1cm. Number 6 is in the National Museum of Wales (find no. RB135), unlike the others which are all at Caerleon. L:5.4cm. Max W:4.4cm. T:1.1cm. Number 8 is only a small fragment of a chape, which was certainly rectangular and perhaps of this type. L:6.3cm. Max Surviving W:2cm. The latest find is also incomplete. It was definitely a rectangular chape and may have had pelta cutouts. L:5.7cm. Max Surviving W:3cm. T:0.3cm. Date:Unstratified, possibly 3rd century.

Colchester.

A type 1 chape has recently been found at this site, complete with its slider (Crummy 1983 p137-8,fig158). It has all the usual features i.e. midrib, pelta cutouts, marginal grooving, notched and chamfered ends and slightly curving sides. The find is dated to the mid third century AD, but this appears to be on analogy with other finds rather than being based on any stratigraphic evidence. L:5.8cm, Max W:4.2cm.

Corbridge.

There are said to be two such chapes from this site, the accession numbers being 75.1225 and 75.1226 (Allason-Jones and Miket 1984 p47). Inspection of the site index cards at Corbridge revealed that 75.1226 is in fact a bronze chape, although the other chape is of bone. Neither of the finds can be located at present.

London.

There is a fragment of a bone chape from Seal House, 1-8 Upper Thames street (Museum of London Acc. no.75.10,small find 313) which may be of this type. The upper edge is notched, whilst the lower end has a wavy outline. One grooved flange survives on the back and there is a groove on the front down the one remaining edge. L:7.3cm. Max surviving W:2.4cm. Date:No information available.

Lydney.

Part of a bone chape has been found at this site and is illustrated by Mortimer Wheeler in his excavation report (Wheeler and Wheeler 1932 plate XXXIA no.150.). About half of the front plate is missing. It appears to have a groove down the centre, flanked by two ridges. The slider was not found. Lydney was the site of a religious sanctuary and no permanent military presence is recorded here, so one must assume that the chape was dropped by (or was an offering from) a visiting soldier. The chape was unstratified, but was dated by Wheeler to the 2nd or 3rd century AD - on analogy with other such finds.

Richborough.

Fragments of two of these chapes were found in the excavations at the fort. The first (Bushe-Fox 1932 plate XI.22) has a central groove flanked by a double mid-rib and pelta cutouts. There is a marginal groove down the left side. The right edge is missing. Both ends are notched and the lower end is also chamfered. The back had grooved flanges (only one survives), for the insertion of the slider. L:6.3cm, Max Surviving W:3.2cm, T:1.1cm, Width of

opening at top:0.8cm. Undated.

South Shields.

One type 1 chape has been found at the fort, and can be seen on display in the site museum (Allason-Jones and Miket 1984 p47, 49). As is usual with these chapes, the upper end is notched while the lower end is chamfered. It has a midrib, very roughly executed pelta cutouts and marginal grooves. Date:Unprovenanced, therefore Hadrianic (?) or later.

York.

There is a fragment of a bone chape in the Yorkshire museum (Acc. no. ME55 1971.299) which clearly came from a rectangular example. It has a central groove on the front, flanked by two low ridges. One grooved flange on the back survives. Unfortunately the upper portion of the chape is lost so it is not known if there were any pelta cutouts. Surviving L:6.6cm. Max W:3.6cm. The chape came from Blossom street in York, but no information is available as to its date.

Continental Parallels.

Type 1 chapes have been found at the following sites:- Holzhausen, Mainz, Niederbieber (4), Saalburg, Stockstadt and Zugmantel (3) in Upper Germany; Buch and Pfunz in Raetia; and from the site of Scheveningen in the Hague, Holland. The continental finds show a fairly even split between those with a simple midrib and those with a central groove flanked by two ridges (c.f the Lydney chape). The Holzhausen chape (Oldenstein 1976 taf 25 no.152) is Antonine or later. That from Mainz is probably 3rd century (Klumbach 1968 p36ff, taf 5 no.4). The 4 chapes from the fort of Niederbieber (Oldenstein 1976 taf 25 no.s 148-9, 155-6) must date to between the fort's foundation in 185/192AD (Johnson 1983 p284) and the abandonment of the limes c260AD. The Saalburg chape (Oldenstein 1976 taf 25 no.159 is Domitianic or later, as is the one from Stockstadt (Ibid no.150). The Zugmantel chapes (Ibid no.s 151, 154, 158) date to 150-200AD. The chape from Holland is

thought to date to the late 2nd or 3rd century ("Roman Military Finds from Ockenburg and Scheveningen, The Hague. "Lecture given by J. A. Waasderp at the 6th Roman Military Equipment Conference, Bonn, November 1988). The chape from Buch is Antonine or later, whilst that from Pfunz belongs to the period from Domitian down to 233AD when the fort was destroyed (A. Johnson 1983 p260; Schönberger 1969 p176).

Type 2. The second main form of bone chape is in most respects identical to the first except that on the front face there is a raised panel on which there are a mid-rib and flanking pelta cutouts. This panel can best be described as being of elliptical shape. It is worth noting that some oval chapes also have these panels. Type 2 chapes are far less common than Type 1. No examples have yet been found on the northern frontier, and there are only about eight finds from the rest of the province.

Caerleon.

One of the chapes found in the northwest rampart buildings in 1927-29 was of this kind (Nash-Williams 1932 page 53, fig 43 no.2). The chape has a raised panel and central midrib, but instead of the more usual pelta cutouts it has two incised scrolls. The chape also has marginal grooves and a notch in the upper end. The lower end is chamfered. The upper end of the matching slider (Ibid fig 43 no.3) has four pairs of notches. There are two marginal grooves and the lower end is chamfered. The chape measures 5.7 x 3.5cm, whilst the slider is 5.9 x 3.8cm and is 0.3cm thick. Date:c200-300AD? More recently a chape with a raised panel and scrolls was found in an area of metal and bone working (Caerleon Museum Acc. no.88.3H CBT 138/108 297). The top edge is notched. There is a small circular hole (0.2cm diam.) near the top left corner and the remains of another on the opposite corner. These must have been for rivets to hold the chape onto the scabbard. L:6.3cm. Surviving W:2.9cm. T:0.2cm. Date: The find was associated with coins of 197 and 196-211AD.

Chester.

A chape of this type can be seen on display in the Newstead Gallery of the Grosvenor Museum, Chester and is described as being a cavalry chape. It has a raised panel and incised scrolls like those on the find from Caerleon. This example is unusual in having a double mid-rib. The left edge has a longitudinal groove, while most of the right edge is lost. The bottom end is chamfered and the upper edge is cut by 8 v-shaped notches. There are two circular holes for rivets, one each near the top left and top right corners of the front of the chape. The chape was found in the Deanery Field excavations of 1925. The slider was not found. Date:Unknown, therefore Flavian or later.

Exeter.

The chape from this site is of the standard form, with raised panel, midrib and openwork pelta decoration. It was found on the site of the Roman public baths in 1932, possibly from the natatio (swimming pool). It is thought to date to the 2nd or 3rd century AD (Bidwell 1979 p239, fig 74 no.56), although this dating may simply be by analogy with other finds.

Richborough. (plate 7 no.3).

Part of the front plate of a type 2 chape is amongst the finds from this site (AML Acc. no.4746). The raised panel bears a mid-rib and incised scrolls. The top and bottom ends are notched and chamfered respectively and there is one marginal groove-the other edge of the chape is missing. There are no rivetholes on the surviving portion. L:6.3cm. Max W:4cm. Date:Unknown, therefore Claudian or later.

Silchester.

Boon illustrates a rectangular chape with a raised panel, the mid-rib being flanked by two very irregularly shaped cutouts, possibly meant to be pelta shaped (Boon 1974 p68, fig8.5). The top edge is notched and the lower end chamfered. The long sides are slightly curved. The slider is similarly notched and chamfered, with two

marginal grooves to match those on the back of the chape. The piece is dated to the 3rd century but this appears to have been done on analogy with the finds from elsewhere rather than being based on any evidence from the site itself. Personal examination of the Silchester finds has shown that there are in fact three virtually identical bone chapes from the site. Two of these also have the back plate (slider) surviving and there is also one detatched slider and fragments of another. Both types of slider are present - those with a curved upper edge and those with notches (Oldenstein 1976 p117). The detached slider has a rivet-hole through its centre, near to the top edge. The dimensions of the three chapes are as follows - Lengths:5.8/5.6/5.7cm, Widths: 4.7/3.5/4.7cm, Thicknesses:1.9/1.8/2cm. The second of these chapes is probably the example illustrated by Boon. The detatched slider has a curved upper edge and a rounded lower end. It has maginal grooves and a rivethole through the middle near to the top edge. L:4.6cm. Max W:3.5cm. T:0.4cm. Unfortunately there does not seem to be any dating evidence for these finds.

York.

This find is a fragment of a front plate with raised panel bearing a mid-rib and incised scrolls (York Archaeological Trust Acc. no.1984.32 2077 II 1515). The upper edge is decorated with a series of notches, whilst the lower edge is chamfered. On the back one of the grooved flanges to hold the slider survives. A large piece of corroded material covers part of the back face. This has been identified as leather - perhaps from the covering of the scabbard. There is further decoration in the form of an extra groove down the back flange. L:6.1cm. Max surviving W:3.5cm. Max surviving T:1.3cm. Date:late 2nd or early 3rd century.

<u>Continental Parallels.</u>

There are at least eight chapes of this sort from Germany, identical to the finds from Britain except that most have incised scrolls either side of the mid-rib as

opposed to pelta cutouts (Oldenstein 1976 taf 27 no.s 170-176). The German chapes include three from Niederbieber (185/192AD or later) and one each from the Saalburg, Stockstadt (both Domitianic or later), Osterburken (Antonine-c260AD) and Degenfeld (date uncertain). Additionally, there is a chape of this type from Bonn (Munten and Heimberg 1976 p400), which was found with its slider. The chapes from Bonn and Osterburken are the only two of the German group to have pelta cutouts. The Bonn chape was dated (by analogy) to the mid 2nd-mid 3rd century.

Type 3. This group consists of two chapes from the fort of South Shields, which share some basic characteristics but are differently decorated (Allason-Jones and Miket 1984 p47, 49, no.s 2.76-7). There are so far as I am aware, no parallels for these finds either in Britain or on the continent. The first chape (Ibid 2.76) is of sub-rectangular form, flat, and has curved ends. The sides taper, so that the chape is considerably wider at the top than at the bottom. Decoration consists of five small circular holes (0.2cm diam.) arranged to form a diamond pattern on the front of the chape. Four of these are linked by roughly scratched lines to form a triangle. There are also two marginal grooves. Length:3cm, Width:3.8cm. The second chape (Ibid 2.77) is of approximately the same shape, but the only feature on the front face is a single marginal groove. The surface has been polished and the edges are chamfered. Some sections of the edges show signs of having been scored with a sharp tool. Length:5.2cm, Width:3.4cm, Thickness:0.4cm. The form of these chapes when complete is somewhat of a mystery, and as already mentioned, there seem to be no parallels from which we can extract any relevant information. Possibly there were sliders to go with these pieces. On the other hand these finds really have more in common with sliders than front plates and perhaps that is what they are. The quality of workmanship is crude, even by the generally poor standard for this type of artefact. Number 2.77 seems to be incomplete, since it surely would have had a pair of

grooves on the front if it had been finished, rather than the one which actually exists. Date:Unknown, therefore Hadrianic or later (?).

Type 4. Flat and rectangular, with notches and grooves.

South Shields.

From this site we have one fragment from what may have been a rectangular chape (Allason-Jones and Miket 1984 p47, no.2.75) and one rather more complete example (Ibid no.2.78). The former is notched at one end (the other end is missing) and has two marginal grooves running down its length. L:3.3cm. Max W:3cm, T:0.2cm. The final South Shields chape consists of a rectangular piece of bone which is flat on both sides. One end has a series of notches cut into it, whilst the remaining edges are chamfered. There is one marginal groove. L:6.2cm. W:3.8cm. T:0.2cm. Date:Unknown, therefore Hadrianic or later (?).

There is apparently a chape from Reculver similar to number 2.78 from South Shields (Allason-Jones and Miket 1984, p47) but I have not been able to obtain access to this find. It is dated to the 3rd century AD - but whether this is based on analogy or on real evidence is unknown to me. As with type 3 these finds are uncommon and the same reservations as to their identification as chapes apply. They could equally well be sliders.

Type 5. This group consists of chapes which are oval in shape and have the raised elliptical panel common to the Type 2 chapes. Three examples are known to me from Britain.

Kirkby Thore. (plate 7 no.4).

About half the front plate from one of these chapes can be seen in Tullie House Museum, Carlisle (Accession no.22-1926.296). Its provenance is not certain, but it probably came from the fort at Kirkby Thore. The slider was not found. The chape has the usual raised panel with mid-rib and pelta cutouts. On the back one of the two grooves

for the insertion of the slider survives. L:5.3cm Max surviving W:3.5cm. T:0.9cm. Date:Unknown, therefore Flavian or later.

Reculver.

There is supposedly a type 5 chape from the Saxon Shore fort (Allason-Jones and Miket 1984, p47) but as with the other Reculver chape I have been unable to examine this piece, so I cannot comment on it. It is dated to the 3rd century AD.

South Shields.

A fragment from a type 5 chape can be seen in the site museum (Allason-Jones and Miket 1984, p47). It has the usual raised panel and a midrib, in this case flanked by incised scrolls. L:5.3cm, Max W:3.8cm. No context is recorded for this find. Date:Unknown, therefore Hadrianic or later (?).

Continental Parallels.

Examples of this form have been discovered in at least three forts on the German limes (Oldenstein 1976, taf 28 no.s 181-3) - at Niederbieber (185/192AD or later), Osterburken (Antonine-c260AD) and Zugmantel (Domitianic or later).

Type 6. These chapes are in most respects identical to the previous type except that they lack the raised panel. They are thus the oval equivalent of the type 1 chapes. Only two specimens of this type have been found in Britain.

Chester.

This chape was found during excavations in Castle street in 1976-8 (Mason 1980 p52, fig 30 no.189). The front of the chape is decorated with a mid-rib and two very roughly executed pelta cutouts. The back has two double-grooved flanges - one set of grooves presumably for the insertion of the slider, the other for the attachment of the chape to the scabbard. The grooves are closer together at the bottom than at the top; a feature seen also on a

chape from the vicus at Caerleon. This chape is on display in the Grosvenor museum and could not be closely examined. Date:late 3rd-mid 4thc.

Wycomb.

A chape was found at this site in Gloucestershire during excavations in the 1860s (Lawrence 1861-4 p305). To judge from the illustration in Lawrences's article, the chape was made in one piece, rather than the more usual arrangement with a separate slider. The front, (part of which is missing) has a midrid and flanking pelta cutouts. The back has two pairs of grooves, converging slightly towards the top end of the chape. Wycomb may have been a religious centre of some kind - a temple and possibly a theatre have been observed (Stillwell 1976 p995. Lawrence's list of finds includes fibulae, styli, knives and keys, also pointing to a civilian occupation. The chape may be interpreted as an offering from a passing soldier, as with the ballista washer from Bath (see below page 89).

Continental Parallels.

A fragmentary chape, similar to the examples discussed above has been found at the fort of Niederbieber in Germania Superior (Oldenstein 1976, p245, taf 28 no.178). This consists of about half of the front plate with a mid-rib and pelta cutouts. It can be dated to 185/192AD or later. A round bone chape was found at Dura-Europos in the hypocaust of a bath block (Rostovtzeff et al 1936 p82, plate XXVI.2). It was pushed over the tip of a sword, probably a spatha. Only the back of the chape is illustrated, so we cannot tell if it was decorated in any way. Date:3rd century?

Other Examples.

There are two small round chapes from Caerleon, which are completely undecorated. One of these (Nash-Williams 1932 fig43.7) was found with its rectangular slider. The front of the chape has a convex surface, whilst the back has two grooved flanges. The slider has one marginal groove and its ends curve to follow the line of the front plate.

The chape is 4.4cm by 4.6cm and the slider is 4.4 by 3cm. The whole assemblage is about 1cm across. Date:Found in the NW rampart buildings in a context dated to c120-200AD. A second, very similar find also from Prysg, was never published. It is incomplete and lacks the slider. L:5.3 cm. max Surviving W:2.5cm. Date:Unknown.

There are also a number of detached sliders from several sites. One from Brancaster (Hinchliffe and Sparey-Green 1985 fig37 no.121) came from a posthole in the vicus. Width:2.5-3cm. Date:late 2nd century or later? There are two unstratified sliders from the Prysg Field excavations at Caerleon, which measure 5.3 x 3.8cm and 5.4 x 3.9cm. There is a slider from Caister-on-sea which was found with mid to late 4th century pottery*7. If correctly dated this is an indication of the use of this form of chape at a later date than is usually believed. However the find could be residual. The upper edge of this example is notched and there is one marginal groove. Finally there is a slider from Dover (Philp 1981 p169 fig 43 no.242). This came from a barrack block in the Classis Britannica fort. Date:c163-208AD. Apart from a similarity in decoration, the common feature of sliders is that they are much wider at the lower end - perhaps to stop them slipping out of the chape easily.

D. Ivory Chapes. (Map 5)

Only two chapes made of this material have so far been found in Britain and in terms of their shape they are unparalelled by any finds on the continent. That ivory was used so seldom for military fittings is not surprising, for it is and must always have been an expensive and much prized material. In a province where the ivory was not available except by importation, the cost must have been even greater. Thus one would expect that only a few soldiers could have afforded to have pieces of equipment made of ivory.

Greenwich Park, London. (plate 7 no.6).

Two pieces from an ivory chape were found during the excavation of a Roman building in 1902 (Greep 1983, p61-5,

figs1-2). Both the front plate and the slider are incomplete, but it seems reasonable to assume that the chape was rectangular, as all the surviving edges are straight. The upper part of the front plate is missing. On the surviving portion, the decoration consists of a pair of grooves near each edge (on both the front and the back). Carved on one edge is a miniature representation of the type of scabbard runner made of bone or ivory (see below pages 152-157). This is pierced by a semi-circular opening (rather than the rectangular one found on true scabbard runners) and the top end terminates in a rounded knob. Here then we have clear proof of the contemporaneity of the ivory chapes and the ivory/bone runners. Enough remains of the slider to show that it too was grooved. The two pieces are both 6.8cm long. The slider is 2.8cm wide, whilst the front plate is 5.6cm across at its widest point. The two piece construction although usual for bone chapes, is unparalelled by other ivory chapes, which are all fashioned from a single piece - the difference being presumably that bigger sections of ivory could be cut than was the case for bone. The Greenwich chape is highly polished on the outside but the interior was left rough (because it could not be seen). This is true also of some bone chapes. Date:Not known, perhaps 2nd or 3rd century on analogy with other finds.

Nettleton.

This site in Wiltshire was for a time in the Roman period the home of a shrine to the god Apollo. One of the finds from the site is an object which resembles a chape, although the excavator rejected this identification in favour of a suggestion that it was a pouch used by a hunter to hold his arrows (Wedlake 1982, p145-6, fig62). This chape resembles the find from London only in that they were both originally rectangular. The Nettleton chape has some peculiar features which distinguish it from all other chapes so far found in this country. The chape is carved in one piece, a large portion of the front face being missing. The two ends have a recurved profile, and the one long edge that survives is virtually straight. Decoration consists of

two pelta cutouts set side by side near the top of the chape. Two features distinguish this find from other chapes. Firstly there is a rectangular slot about 3cm long by 1cm wide cut out of the chape near its left edge. The cutting of this slot has caused damage to the pelta cutout on that side of the chape. It may be doubted whether this slot seved any function, and one need not infer as the excavator did (Ibid p146) that there was a matching slot on the missing portion of the chape. It is perhaps more likely that the chape ceased to be used (or was never used at all) and that someone cut out a sliver of ivory for some other unknown purpose. The upper portion of the chape is hollow, and this part, clearly, would have fitted over the end of the scabbard. The lower part is solid but has a horizontal hole of circular section bored right through it. Possibly this was an additional way of securing the chape to the scabbard, by means of a long nail going through the and also through the portion of the scabbard covered by the chape. One final feature is the small round hole above the left-hand pelta cutout. This may have been decorative - perhaps matched by a similar hole on the lost part of the chape - or it may have held a rivet. We may presume that the chape was either dropped by a visiting soldier or left as an offering. Date:Unknown, perhaps 3rd or 4th century.

Continental Parallels.

There are no finds from the continent which closely resemble either of the British chapes. Ivory chapes from outside this country are mostly circular and made in one piece (Greep 1983, p61-2, 64, note 7). An exception is a chape from Lauriacum (Von Groller 1906 p73, fig 33.4) which is rectangular with a raised elliptical panel bearing two pelta cutouts. It is thereore like the type 2 bone chapes, except for the lack of a mid-rib. There are three rivetholes near the top edge. Date:Early 3rd century or later.

Some general comments and Conclusions.

Bronze chapes were in use right through the period under discussion and judging from the quantity we have were

generally the most common type. Out of 130 examples known to the present author, 81 are of bronze, 41 are of bone (including detached back-pieces), 6 are of iron and 2 of ivory. In bronze the main forms were the pelta type (at least 25 examples) and the "median rib" type (c20 examples). As regards the distribution and date of the various kinds of bronze chape, the evidence is interesting, but limited. Firstly one must note the complete lack of any bronze chapes from the Antonine Wall or indeed any Scottish site except Newstead. Apart from Newstead, chapes of any kind have only been found at one Scottish site - the two iron examples from Bearsden. This is rather odd considering the fairly large amount of weaponry which has been found at Bar Hill, Bearsden and Mumrills, to name but three sites. This may just be a chance factor or a result of the short period of occupation on most Scottish sites.

The distribution of the pelta chape is very widespread. The type is found in all the areas where there were large concentrations of troops at one time or another - Hadrian's Wall and its hinterland, Wales and the border area and some from the south-east. Many examples are only loosely dated, but there are probably some 1st century finds (Colchester, Great Chesterford, perhaps also Brough-under-Stainmore, Corbridge and Newstead), as well as examples which seem to belong to the 3rd/4th centuries (Gestingthorpe, Ravenglass and Richborough). The continental evidence indicates a similar chronological spread. We cannot really say much about the types of unit which used these chapes. It is very likely that several kinds of chape were in use together and this may have been true even within a single unit. The most likely factor influencing the choice of chape type is personal preference. Pelta chapes have been found in what should be legionary contexts and also on sites where only auxiliary garrisons are attested. The latter had widely differing garrisons, so no clear pattern emerges. Pelta chapes seem generally to have been fixed onto the scabbard with a single rivet. The hole for this is usually in the centre of the back face. The Corbridge chape is an exception and a

few others have no rivetholes at all. What may be simplified pelta chapes appear on the column of Marcus Aurelius (Waurick 1989 fig3). The type was still known in the 4th century as is shown by ornate gilded silver and niello chapes from Ejsbol Mose at Kragehul in Denmark (Orsnes 1963 fig18).

With the median-rib chapes the picture is similar. Only those from Caerleon and Vindolanda can be properly dated and finds appear on legionary and auxiliary sites. About half the finds come from Caerleon. Those from the south of the province may belong to the 1st century and so point to an early origin for this type.

As already noted, type 3 chapes appear on Roman scuptures of the 2nd century AD. The type may go back to the 1st century - to judge from some of the finds in Britain and the chapes from Vindolanda probably extend the period of use into the 3rd century. The majority of the finds (7 out of 9) come from Hadrian's Wall or nearby. This type must have been clipped, glued or bound on to the scabbard, unless rivets were put through the openwork sections - there are never any rivetholes as such. It may be that the twin projections at the top were to give the chape a more secure grip on the scabbard.

The undecorated triangular chapes are not an homogenous group, but rather a collection of basically similar finds. Two examples may belong to the 2nd century. The linking factor is the simplicity of their construction.

The iron chapes are few in number and evenly spread across the country. They probably belong to the 2nd/3rd centuries, although as usual the finds are generally not well dated. They are not uniform in shape and nothing is known about their method of attachment. Comparisons with the iron chapes from the continent are not very meaningful.

The dating of the bone chapes from Britain relies to a great extent on the evidence from Germany/Raetia and the

latter is not as good as it might be. There are bone chapes from Buch (Antonine or later), Holzhausen (c150-260AD), Koln-Braunsfeld (found with 3rd century material), Niederbiber (c185/ 192-c260AD), the Saalburg (Domitianic or later), Stockstadt (Domitianic or later), Zugmantel (Domitianic-c260) and a number of others. In most cases we are dealing with fairly broad time periods and one cannot even wholely exclude the possibility that some finds may belong to the Flavian period. Finds from Britain have often been dated to the 2nd/3rd centuries simply because of stylistic similarities with continental examples. This is a tempting but ultimately dangerous tendancy because it produces a consensus in the evidence which may be more apparent than real. The dating of the Caerleon chapes/sliders must be treated with some caution. One type 2 chape from York came from a late 2nd/early 3rd century context; whilst finds from Caister and Verulamium may belong to the 4th century, as may a type 6 chape from Chester. None of the other chapes are helpful for dating purposes. Bone chapes may be readily divided into types on ther basis of decoration. Types 1 and 2 are by far the most common. I am inclined to view types 3-4 as sliders. Distribution patterns are not very significant, except that the lack of such finds from Hadrian's Wall may be noted. Legionary, auxiliary and civilian sites have all produced bone chapes and more than one type can appear on the same site. Doubtless several designs were in use simultaneously.

Very little can be said about ivory chapes for we only have two examples from this country and they are not much alike. The Greenwich chape is unusual for being made in two pieces. There are no rivetholes so it must have been clipped or glued or bound onto the sheath. Greep (1983 p63) has argued for a date in the 2nd/3rd centuries for this piece and this may be so. But this view is based on the dating evidence for bone chapes which is itself limited. Ivory chapes were probably more expensive and this would explain both their rarity and their individualism - customers tastes must have played a large part in determining their design.

Overall it is mostly not possible to closely date types of chapes or to assign them to specific types of unit. The earliest chapes were probably of bronze.

IV. Scabbard Runners.

The scabbard runner was the usual means by which (in the later Roman period) the scabbard was attached to the sword belt. It replaced the earlier system of loops arranged in two pairs (see chapter III note 5). Scabbard runners in Britain were usually made of bronze, but also of iron, bone and ivory. With the metal runners the mounting was fixed to the side of the scabbard by a number of projections on the underside. Usually the sword belt or baldric ran through the space between the runner and the scabbard. The broader end was attached to the scabbard by an iron or bronze phalera (Oldenstein 1976 p96). However on some sculptures the baldric is shown lying across the scabbard with the phalera covering the slide. In such cases it is presumed that the belt was fastened to an eye on the back of the phalera (Coulston 1987 p147). Here the runner served a purely decorative purpose. With bone or ivory runners the baldric went through a rectangular slot cut in the runner. The pair of round openings present on these runners are thought to have been for bindings to further secure the runner to the scabbard.

When and in what circumstances did the Roman army become acquainted with the scabbard runner? This is a very difficult question to answer definitively, but by looking at the archaeological and pictorial sources we can gain some clues. A number of other peoples are known to have used the scabbard runner as a method of sword suspension before the Romans had knowledge of it and it was presumably from one of these peoples that the Romans adopted it. The Celts used very long swords - up to 90cm long in the La Tene III period - which were worn on the right hip and were designed for slashing rather than thrusting (Connolly 1981 p116, 120). The method of suspension involved a length of chain with a loop at one end and a hook at the other. "The longer piece forms the back and left side of the belt. A

strap is attached to the ring and passed through the loop on the back of the scabbard where it is fastened to one of the rings of the short piece of chain to complete the belt which is fastened with the hook and remaining rings. " (Ibid p117, fig24).

Initially this loop was on the back of the scabbard, but later it was placed on the outer, decorated face - the position in which Roman runners were used (Piggott 1950 p6, 17, figs 2, 9-10). Early Celtic runners were placed near to the mouth of the scabbard and sometimes continued as a narrow strip (Ibid fig 2 no.s 3-4). This method of suspension is found on British scabbards of the 2nd and 1st centuries BC through to the early 2nd century AD. Its use among the Celts thus predates its first appearance in the Roman army. The Romans were in contact with the Celts as early as the 4th century BC, but there does not seem to be any sculptural evidence for its use by Roman troops before the 2nd century AD (see for example A. S. Anderson 1984 plate 1ff). Admittedly though, the method of suspension is often not clearly defined on many Roman monuments and tombstones so we must be cautious. Celtic troops may have continued to use their traditional method of sword suspension when recruited into the Roman army, but there is no evidence to support such a theory.

The scabbard runner can be seen on Trajan's column, but in this case it is not being used by Roman troops (Coulston 1985 p148). It can be found on the base of the column on Dacian or Sarmatian scabbards and on the sheath of a barbarian horse-holder in scene C (Lepper and Frere 1988 pl LXXIII). In the latter depiction the scabbard is on the left hip. Roman swords on the columns of Trajan and Marcus are suspended from a baldric and hung on the right hip. The exact details of the suspension method are generally not shown - the belt simply disappears behind the scabbard. In one case only is a loop shown on a Roman scabbard (Waurick 1989 p51, fig 7). Although this might be an attempt to represent a scabbard runner as Waurick claimed, it could also be one of a pair of suspension

rings, the other hidden behinds the scabbard. Loops on scabbards on the Ludovisi battle sarcophagus dated to around 250AD are equally difficult to interprete (Abbate 1972 plate 64). It is not until the 3rd century that we find undoubted representations of scabbard runners in Roman art. They appear on the tombstone of the praetorian guardsman M. Aurelius Lucianus and on that of Aurelius Suro of Legio I Adiutrix (Oldenstein 1976 abb 13-14; Coulston 1985 plate 3). The Lyon burial, containing coins of 194AD provides more evidence for the dating of scabbard runners. From it came a long sword, a phalera and a bronze runner (Coulston 1985 p148; Waurick 1989 fig 6). In Palmyrene art the scabbard runner is first shown on the Beth Phaseil genii relief of 194AD (Colledge 1976 p44). Runners can also be seen on the Bishapur rock carving (c260AD) showing the submission of the emperor Valerian to the Persian king Shapur I. A phalera is also visible on Valerian's scabbard (Ferrill 1986 plate 8). Later depictions of runners include the porphyry statue of the Tetrarchs (Beckwith 1963 plates 3-4) and the ivory diptych of Stilicho dating to c400AD (Ferrill 1986 plate 19).

One thing that must be noted is that in all cases where runners are shown the scabbard is suspended on the left hip. This was the normal position for the sword to be worn from the third century onwards. For example the tombstones from Apamea show the sword on the left side (Balty 1988 plates XIII- XV) and although the details of suspension are not shown we may be reasonably confident that the scabbard runner was being used. The change in sword position and the switch from suspension loops to scabbard runners are almost certainly linked to the increasing length of Roman swords from the later 2nd century onwards. Oldenstein (1976 p109) suggested that the ring suspension method was too delicate for use with the longer, heavier spatha and this may well be so. Whatever the reason for the changes, it is clear from the sculptural sources that by the 3rd century or even a little earlier, the scabbard runner had become the main (perhaps the only) method of sword suspension. As far as actual examples of

runners are concerned, very few of them can be closely dated. Oldenstein argued on the basis of material from Germany and Rhaetia that most runners can be dated to between the mid 2nd and mid 3rd centuries (Oldenstein 1976 p109). Whilst this view is not flatly contradicted by the evidence from Britain, there is as will be seen some need for qualification.

Most commentators have assumed that the Romans acquired the scabbard runner from the East, perhaps through contact with the Dacians/ Sarmatians or from the Parthians - who may in turn have adopted them from nomads (Coulston 1985 p148). This may be so but the evidence is very sketchy. Jade and nephrite runners from China (Chapman 1976 p252, fig 2) do resemble Roman bone and ivory runners in their basic shape and they also have the "binding holes". The ends of the Chinese runners are different however. There are some metal runners from Germany which have features in common with the ivory/bone examples (Ibid p252-3), namely one end with a round projection and in a single case, binding holes. It is not unlikely therefore that the bone/ivory runners owe their shape to knowledge of Chinese examples - perhaps acquired through trade. But one cannot on present evidence say that the bone/ivory runners are earlier than their metal counterparts. Whether the Romans first learned of the scabbard runner from the Celts or via the East must remain an open question.

1. Bronze Runners.

As with chapes, bronze was the preferred material in Britain for the manufacture of scabbard runners. There are also a considerable number of examples from Germany (Oldenstein 1976, tafs 12-14). There is much variation amongst the British runners with regard to their shape and decoration, but they can be divided into two basic types, namely "dolphin" runners and "flat" runners.

<u>a. "Dolphin" runners. (Map 7)</u>

This type of runner is certainly the most visually attractive, being fashioned in the form of a miniature

MAP 7: Bronze Dolphin Runners.

1

2

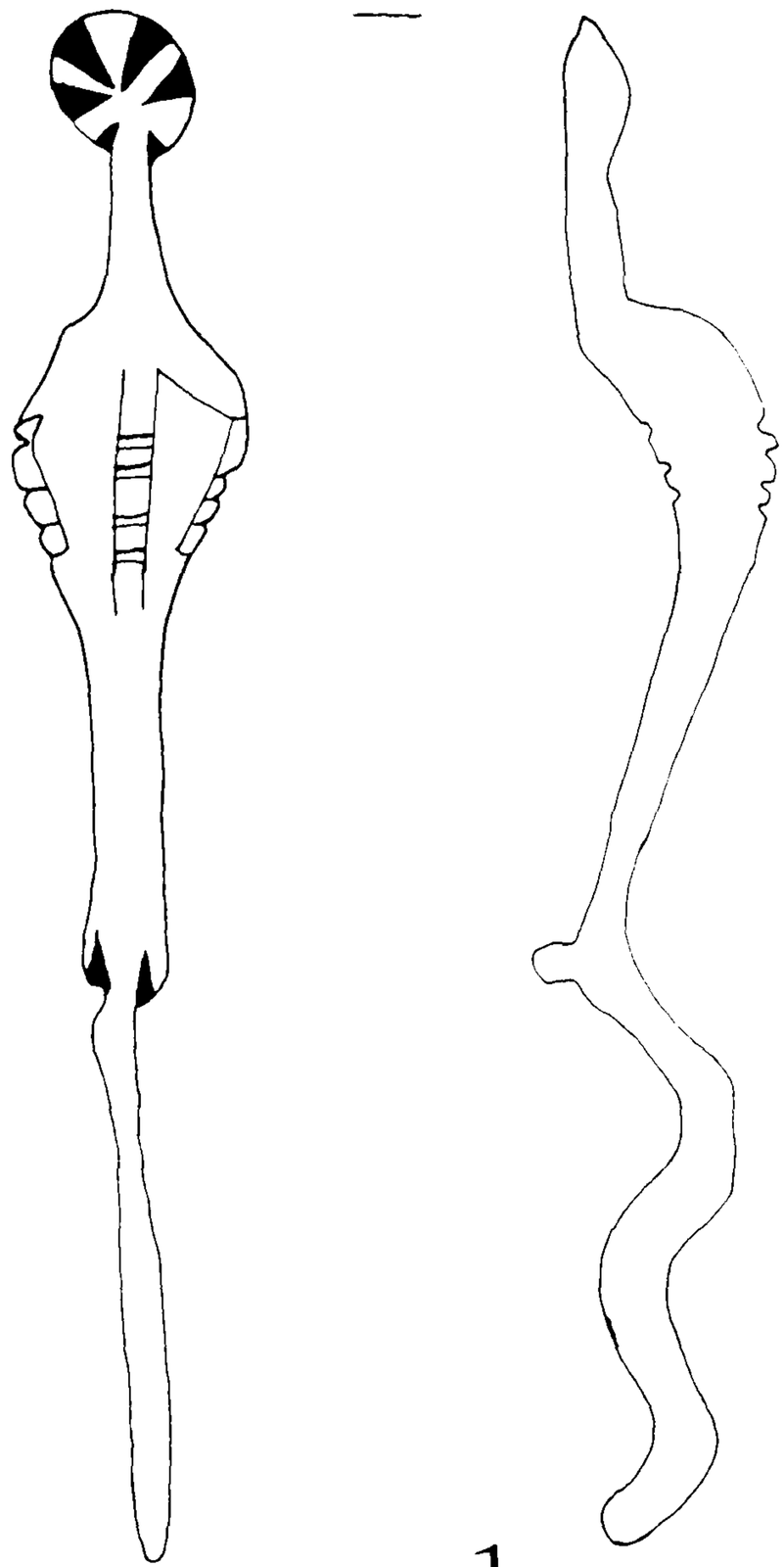
3

4

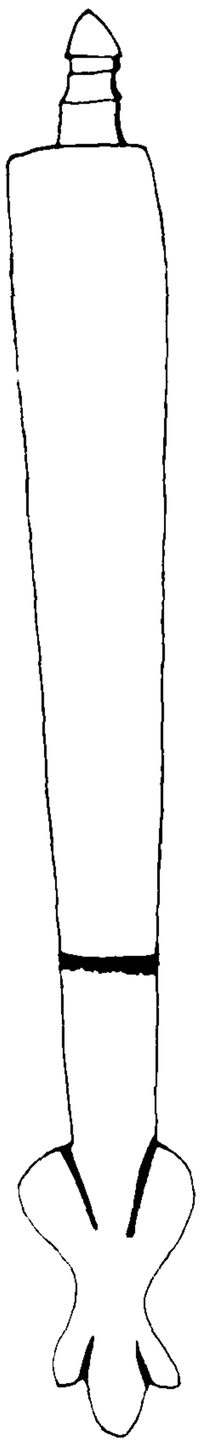
5

6

PLATE 8: Bronze Runners (all at 1:1)
1. Chesters 1522 2. Corbridge 75.1241 3. Caerleon
4. Chesters 1583 5. York H2420 6. Caerleon



1



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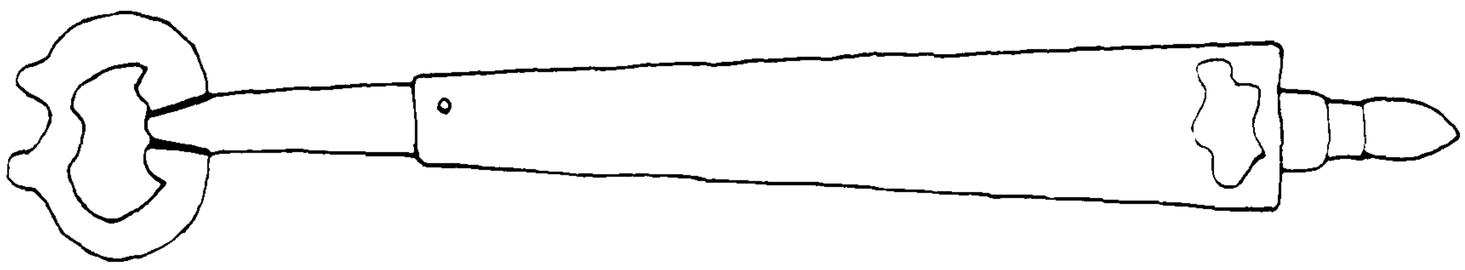


3

FIG 6: Bronze Runners (all at 1:1)
1. Chesters 1570 2. York H2420
3. Caerleon (Prysg)

dolphin. The upper end of the runner (above the dolphin's head) often has a terminal in the shape of a rosette. The dolphin is shown with dorsal (back) and pectoral (side) fins, the latter arranged in pairs. The lower terminal varies in shape from a simple attempt to render a tail to a more elaborate form which resembles a fleur-de-Lys or an anchor (Ramsay-Dixon 1990 p19). On the underside of these runners there were a number of projecting points (generally circular in section) which would have fitted into corresponding openings in the body of the scabbard. As a rule (but not in every case), there were three such points, one on the underside of each terminal and one at about the mid-point of the runner. These generally survive only as stumps.

<u>British Examples.</u>

Brough-under-Stainmore.

One dolphin runner has apparently been found at this site (Collingwood 1930 fig 66c), though the circumstances of its discovery and its current location are both unknown to me. Most of the Roman material that has been found at Brough has come from the river which runs below the north side of the fort and one might expect that this was the case with this find too. The runner has a rosette shaped upper terminal and the other end is fashioned in the form of a pair of flippers. Two spikes project from the underside of the runner - one beneath the rosette, and another at about the mid-point. Date:unknown, therefore Flavian or later.

Carlisle.

A dolphin runner can be seen on display in Tullie House museum, said to have been found in King's Meadow, Carlisle in 1930 (Accession no.4- 1930.62). The head of the dolphin has been lost and the body is simply a flat, undecorated strip of metal. The lower terminal is of roughly fleur-de-lys shape. There are two circular lugs on the underside of the runner and the usual pair of fins on the body section. Length:6.5cm. Date:Unknown, therefore Flavian or later. Another dolphin runner has been found in

recent excavations (unpublished), at the Blackfriars site in Carlisle. This has a rosette terminal at the upper end and the head is decorated with a central ridge. There are two points of attachment on the underside. The tail is broken off. Length:7cm. Date:Antonine?

Chesters. (plate 8 no.1).

This site has produced five dolphin runners - the largest number found on any one site (Clayton Collection no.s 1522, 1523, 1570, 1573, 1574; Ramsey-Dixon 1990 p18-19, figs 1-2). All are of cast copper alloy and all are incomplete. They have rosette upper terminals and a variable number of fins - 2 or 3 dorsals and 2 pairs of pectorals. TL:9.2-12.7cm. Max W:1.7-1.9cm. All have at least one stud on the underside. Date:It is not known when or exactly where any of these runners were found. One of them might even be from Kirkby Thore. Hadrianic or later?

Corbridge.

Three dolphin runners have been found at this site (Acc. no.s 75.1231-75.1233, Ramsey-Dixon 1990 p19 fig 2 no.s 2-4). As with the finds from Chesters all of these runners are incomplete. TL:8.2-14.5cm. Max W:1.7-1.8 cm. Number 75.1231 is the best-preserved. It has a rosette terminal at the end of the head, two dorsal fins and two pairs of pectorals. Two eyes are engraved on the head and there are three studs on the underside. The remains of the tail end suggest that it was of the fleur-de-Lys/anchor type. This runner appears to have been the one found in the 1911 excavations (Forster and Knowles 1912 p206, fig 22). Unfortunately we have no details on the contexts of any of these finds. Date:Flavian or later.

Kirkby Thore (?).

There seems to be some confusion about the dolphin runner from this site. The earliest illustration (Collingwood 1930, fig66b) shows a runner with a rosette upper terminal, dorsal/pectoral fins, and one point of attachment under the rosette. The lower end of this runner is missing. This find is said by Collingwood to be in

Chesters museum. There is in fact such a runner in the museum (Acc. no.1570), but there is nothing now to show that this is not from Chesters itself rather than from Kirkby Thore as Collingwood claimed. The problem of identification is further compounded by the fact that in the revised edition of "The Archaeology of Roman Britain" (Collingwood and Richmond 1969 fig 108b) a different runner from Kirkby Thore is shown. This is the same runner that in the 1930 edition (Collingwood 1930, fig66c) was said to have come from Brough-under-Stainmore!Clearly there is some reason to doubt whether any dolphin runners have been found at Kirkby - unless no.1570 has been wrongly provenanced.

Milecastle 39 (Castle Nick).

An example from the recent excavations at this site is a simplified version of the usual dolphin runners. It has two points of attachment on the underside. The lower end tapers to a point and is undecorated, whilst the upper terminal is of the rosette type. L:c11cm. Date:Late 2nd or early 3rd century. (Object no.1144).

South Shields.

An incomplete example is on display in the site museum (TWCMS C5478; Allason-Jones and Miket 1984, p197, 201). The terminal at the top end might be described as spoon/shell shaped (Ramsey-Dixon 1990 p19) and it lacks the grooves characteristic of the rosette type. There are two dorsal fins and two pairs of pectorals. Of the two circular-sectioned projections on the underside, one is in the form of a hook. The lower part of the runner is very slender - and the tip is missing. L:9.1cm. Max W:1.8cm. Date:Hadrianic or later.

Stanwix.

Part of a dolphin runner was found in the fort in 1930 (Collingwood 1930 fig2 no.62). This is described as being a "flawed casting". Date:Hadrianic or later.

Strageath.

An incomplete runner has been found here (Ramsey-Dixon

1990 p19, fig 3.3). This has engraved eyes, two dorsal fins, one pair of pectorals and two studs on the underside. The terminal at the head end is the right shape for a rosette but lacks the engraved lines. Perhaps this piece was never finished. L:6.6cm. Max W:1.8cm. Date:Flavian/Antonine.

Vindolanda.

Finds from the 1980 excavations in the stone fort included about half of a dolphin runner (Bidwell 1985, p119, fig40 no.13). This is broken off just below the point where the pectoral fins project from the body. There is a rosette terminal, on the underside of which is a circular projection. There is another such projection near the lower end of the surviving fragment. L:7.8cm. Max W:1.7cm. Date:Unstratified but probably from mid 3rdc material. The runner came from a section through the east rampart.

<u>Continental Parallels.</u>

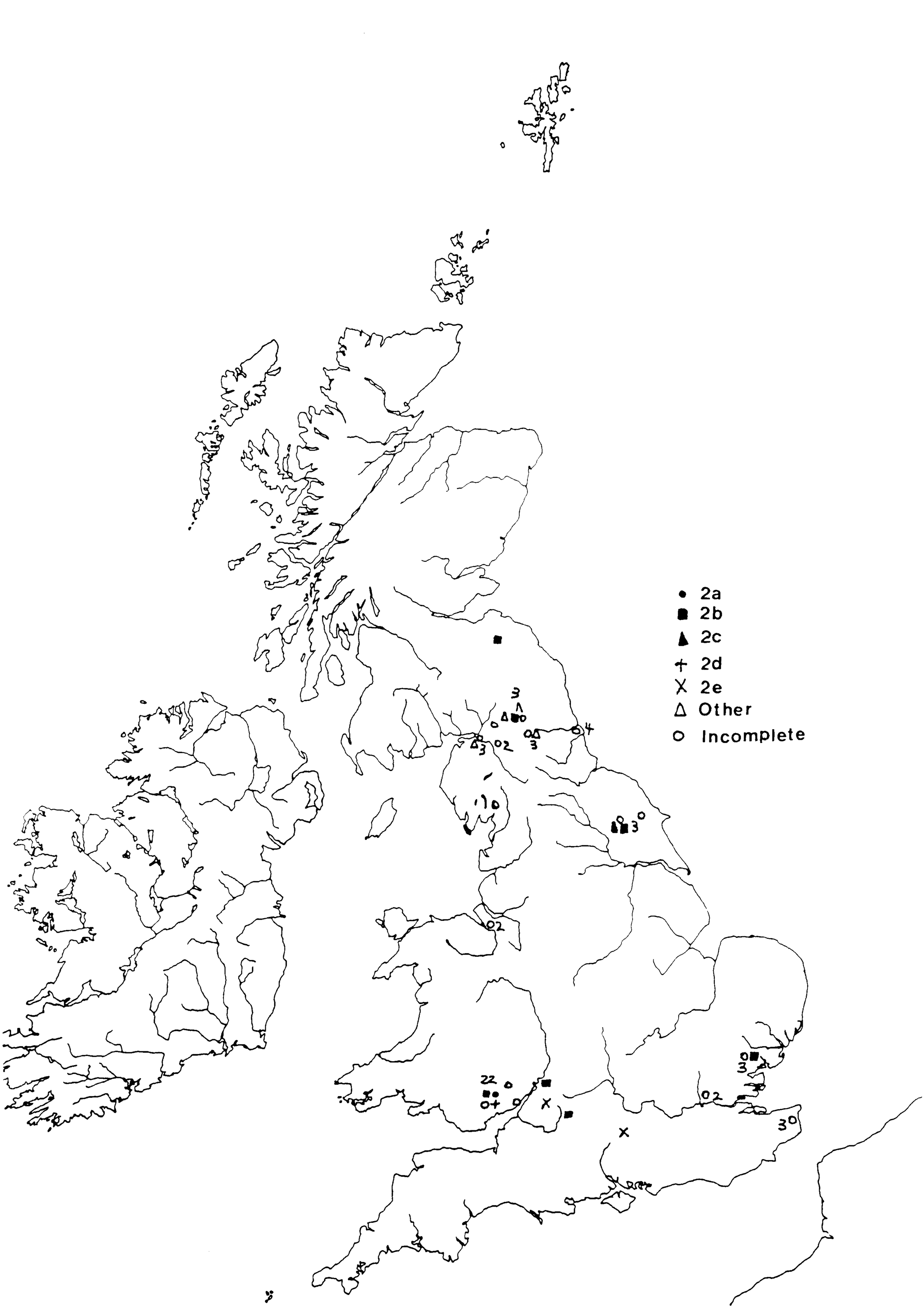
There are only two dolphin runners from Germany so far as I am aware. These come from Jagsthausen and from Zugmantel (Oldenstein 1976 taf 14 no.s 61, 63). The Zugmantel runner resembles quite closely the examples from this country, while the Jagsthausen runner seems to be unique. The dolphin has been given a scaly skin and a much exaggerated "beak". It has engraved eyes, three dorsal fins and one pair of pectorals. TL:18.9cm. Max W:2.2cm (Ramsey-Dixon 1990 p19, fig 3.1). Although similar in concept to the British examples the find from Jagsthausen is in a class of its own with regard to decoration. Date:Antonine or later. The Zugmantel runners is much closer in form to the finds from Britain. It dates to between the reign of Domitian and c260AD.

A dolphin runner from Vimose in Denmark (Engelhardt 1870 plate 9 no.70) has all the classic features of the British examples:- a rosette shaped upper terminal, fins and two studs on the underside, one at either end. The lower terminal is of the fleur-de-Lys/anchor variety, seen on runners from Carlisle and Corbridge. As with the find

from Jagsthausen the Vimose dolphin has engraved eyes. Like many of the finds from the Danish bog sites this piece shows clear Roman influence, but whether this came about as a result of copying, trade or looting cannot be determined. Date:Unknown, perhaps 3rd or 4th century?

b. "Flat" Runners. (Map 8)

This category covers the majority of bronze scabbard runners found in this country and indeed on the continent. They consist of a flat strip of metal, rectangular in shape and narrow, tapering in width from top to bottom. There is normally a "step" in the profile at one or more points and as with the dolphin type, there are a number of projections on the underside to fix the runner to the scabbard. The most distinctive feature of the type are the decorative terminals at either end of the runners. It was by means of these terminals that the runners from the Rhine-Danube frontier were categorised (Oldenstein 1976 p95-100, tafs 12-14) and it seems reasonable to apply the same method to the British material. Naturally however, such a study needs a large body of complete finds in order to be truely viable. It is an unfortunate fact that this pre-requisite is lacking for the British runners. Sixty one runners are known to the present author, either through personal examination or via published sources. Of these a mere 14 actually survive intact, whilst 36 have one terminal remaining and a further 11 have both ends missing. With this rather unpromising data it would be very unwise to assume that we have a representative sample of the types of scabbard runner in use in this country in the Roman period. We must be content with observing that there were a number of different combinations of terminal in use, but little can be said with regard to their relative popularity or geographical spread when the sample is so small and unhelpful. "Flat"type runners were certainly in use in the 2nd century and possibly earlier as well. Most examples seem to belong to the 2nd or 3rd centuries, there being very few that can definitely be dated later than this. They appear both on legionary and auxiliary sites and have occasionally been found in apparently civilian contexts as



MAP 8: Bronze "Flat" Runners.

well. The latter category probably represent losses by passing troops, for civilians under Roman law were not entitled to bear arms and therefore could not really have any use for scabbard fittings.

British Examples.

Type 2A. Runners with a "double loop" terminal at one end and a "ribbed" (or "corrugated") terminal at the other. (plate 8 no.3).

This type of runner has so far only been found at the fortress of legion II Augusta at Caerleon in Monmouthshire. Of the two loops, the inner one might be described as "kidney-shaped", while the outer one resembles a diamond. The double loop terminal ends in an arrangement reminiscent of a fleur-de-lys. The other terminal is narrow, with a rounded end and a series of steps, giving it a ribbed effect. Four runners of this type were found in the Prysg Field excavations of 1927-9 (Nash-Williams 1932 fig36 no.s 2-3, 8-9). Three runners have been examined by the present author. Two are at the Legionary museum at Caerleon (Accession no.s C28 RB2 De and 31.78 28. RB2 De) and correspond to Nash-Williams' no.s 3 and 8. Both of these have iron rivets projecting from the underside, which have been driven through from the top. This is unusual - most bronze runners have bronze lugs for attachment to the scabbard. Lengths are 11.4 and 10.6cm, the latter incomplete. The third runner is on display in the National Museum of Wales at Cardiff. This has no number on it, but is presumably one of the runners from the Prysg excavations. This runner has a "tinned" surface. Perhaps other runners were like this too. L:11.6cm. Dates:Nash-Williams no.s 2, 3 and 8 were dated to c120-200AD, no.9 to c75-120AD. However pottery and coin evidence now shows that occupation ceased in this part of the fortress by the Severan period*8.

Continental Parallels.

Very similar to the Caerleon finds is a runner from the Vimose hoard (Engelhardt 1870 Bind III plate 8 no.64).

There are no close parallels from Germany, although several German runners have both loop and ribbed terminals (Oldenstein 1976 taf. 12-13).

Type 2B. Runners with a Heart-shaped terminal at one end, often marked with an incised X, the other terminal ribbed.

Atworth.

There is an incomplete runner from this villa site in Wiltshire, which probably belongs under this heading, since the one remaining term inal is heart-shaped and marked with an X (Griffiths 1982 p49-50). There is no precise dating evidence for this piece.

Caerleon. (plate 8 no.6).

Four runners of this kind were found during the Prysg Field excavations and were illustrated in the final report (Nash-Williams 1932 fig36, no.s 4-7). Of these, no.6 is the most interesting. This has a shortened version of the heart-shaped terminal with the usual X. The other end is lost. On the shaft of the runner, just above the terminal is a small "hump", semi-circular when looked at from the side. Surviving length:10.7cm. Another of the Prysg runners (no.4) is marked with a pair of grooves near the heart-shaped terminal, coming together to form a v-shape. There are traces of "tinning" on the surface of this runner, which is one of the few complete examples from Britain.

Nash-Williams dated no.s 4 and 5 to c120-200AD, the other two were unstratified. In addition there are fragments from four other runners of this type, all unpublished (Caerleon Museum Accession no.s 32.60 C28. A2; 32.60 C28. A2X; 31.78 C.157 and 84.43H CMG 76). Each consists of an heart-shaped terminal with an X and a short piece of the body of the runner.84.43H has a hump on the shaft above the terminal (c.f. Nash-Williams 1932 fig 36 no.6).

Chesters. (plate 8 no.4).

One example of the type can be seen in the site museum (Clayton Collection no.1583). The heart terminal is longer than usual, but it has the characteristic X mark. The other terminal is ribbed. A very small part is missing. Length:11.4cm. Date:Unprovenanced, therefore Hadrianic or later.

Colchester.

The excavations of 1978 produced part of a bronze runner which is most probably of this type (Crummy 1983 fig158 no.4243). With its shortened heart-shaped terminal and hump on the shaft it is reminiscent of the runner from Caerleon already noted (Nash-Williams 1932 fig36 no.6). The other terminal on the Colchester runner is missing and there are two bronze projections on the underside. Length:10.3cm. Dated to the 2nd or 3rd century AD on analogy with other finds.

Gloucester.

A runner with one terminal marked with an X has been found here (Griffiths 1982 p49). Date:1st century?

Newstead.

A runner with a heart terminal at one end, NOT marked with an X, was found during Curle's excavations, "at a considerable depth on the south side of Block XIV ... being three and seven eigths inches long" - c10cm (Curle 1911 p187, plate LXXIV no.4). The other terminal had broken off. Block XIV can be identified as a granary. Date:Probably either Flavian or Antonine.

York. (plate 8 no.5; fig 6 no.2).

This runner (Yorkshire museum Acc. no. H2420) may be related to group 2B. It has a ribbed terminal at one end. The other terminal has convex edges and comes to a point. This is flanked by two smaller points. However it has no incised X, but instead has two pairs of grooves, which meet to form triangles. L:10.5cm. Max W:1.3cm. From Tanner's Row, York. Date:Flavian or later.

Continental Parallels.

There are similar runners from Niederbieber and Stockstadt in Germany, as well as a detached heart shaped terminal from the fort of Osterburken (Oldenstein 1976 taf12 no.s 35, 40, 42). Dates: Niederbieber = c185/192 or later; Osterburken = Antonine-c260AD; Stockstadt=Domitianic or later.

Type 2C. These runners combine a vaguely "leaf-shaped" terminal at one end with a single loop at the other. Only one example has so far been found in this country. This is suppposed to be part of the hoard of cavalry fittings from Fremington Hagg, Yorkshire, supposedly dating to the Flavian period (Webster 1971 fig 16 no.82). However, the association and therefore the date of this find is doubtful. The runner has a rectangular hump on the upper side, near to the leaf-shaped terminal and there are two points of attachment on the underside. L:12.8cm. Max W:1.8cm. The find is in the Yorkshire museum (Acc. no. H.141.87. K.83) and like other finds supposedly from Fremington, could instead be from York. (plate 9 no.1) A runner from Vimose in Denmark is quite similar, although its "leaf" terminal is marked with an X as with type IIB runners (Engelhardt 1870 plate 8 no.65).

Type 2D. Runners with an acorn-shaped terminal at one end and a single loop at the other. Again, as with Type IIC, only one example is known and this is rather doubtful. It is said to come from Caerleon (Collingwood 1930 fig66e), but a search of the collection at Caerleon Museum failed to locate it.

Type 2E. Runners with a single loop at one end and a rosette shaped terminal at the other.

Cirencester.

An unstratified runner from the site has a rosette terminal at the one surviving end. There is a semi-circular hump on the upper side near to the terminal, as with runners from Caerleon and Colchester (see above page 143).

Silchester.

A runner similar to the one from Cirencester, but with an extra piece on the end of the rosette terminal (Boon 1974 fig8 no.8). This is dated to the 3rd century AD, but this was on analogy with other finds rather than being based on any stratigraphic evidence. The runner was found in the excavations of 1954-8, but no context is recorded for it (Boon 1969 fig 5.12).

Other "Flat" type runners.

These may be divided into two broad categories:- those with one terminal remaining, which may be tentatively placed with one of the groups already discussed and secondly, those runners on which no terminals have survived. These obviously cannot be categorised, but the finds do serve to extend the known distribution of the "flat" type somewhat.

<u>a. Runners with a ribbed terminal.</u>

Caerleon.

Eight runners from the fortress fall into this category, including two published in the Prysg Field report (Nash-Williams 1932 fig 36 no.s 10-11) which were dated to c120-200AD.

Carlisle.

Two runners from the unpublished Castle street excavations are dated to the 3rd century or later.*9

Colchester.

There is a runner with a ribbed terminal from this site, possibly of 1st century date (Webster 1958 fig 4 no.74).

Corbridge.

A runner with a ribbed terminal was found in the 1910 excavations (Forster and Knowles 1911 p188, plate IV no.10; Collingwood 1930 fig 66g). The shape of the other terminal is unclear due to the poor quality of the illustration and the object cannot now be found. Date:No context recorded,

therefore Flavian or later.

London.

One runner from the 1935 Bank of England excavations, is said to be of 1st century date (Webster 1958 p86) and there is another from the excavations at St. Thomas's street, Southwark (Bird et al 1979 p303, 390, fig 177). The latter came from a timber lined pit containing some late 2nd century pottery and was identified as a runner from an auxiliary cavalryman's spatha.

Richborough.

There is a fragment of a runner in the AML (marked 8175). L:6.9cm. Max W:1.2cm. Date:Claudian or later.

South Shields.

Two incomplete runners with ribbed terminals have been found here (Allason-Jones and Miket 1984 p197-8, no.s 3.644, 3.645). Date:Hadrianic or later?

Turret 50B (Appletree).

One runner was found in the 1911 excavations (Allason-Jones 1988 p213, fig 5 50b.3). Date:Unstratified, therefore Hadrianic or later.

These runners may perhaps have belonged to either Type 2A or Type 2B, although the material from Germany shows (Oldenstein 1976 tafs 12-13), that ribbed terminals could appear in combination with a variety of other types, some of which have not so far been found in Britain.

<u>b. Runners with a single loop terminal.</u>

Caerleon.

One example was found in the Vine Cottage excavations (Caerleon museum Acc. no.36.472). Date:Unknown, therefore Flavian or later.

Caerwent.

A runner of this kind can be seen in Newport museum (pers. obs.). Its date and other details are unknown.

Chester.

There is a runner in the Grosvenor museum's Old Collection (Acc. no.255. R.1977) with a loop at one end. It came from excavations in the Deanery Field. Date:Unknown, therefore Flavian or later.

Chesters.

A small fragment of a runner from this site (Corbridge museum Acc. no.1672) probably had a loop at one end. Date:Unknown, therefore Hadrianic or later.

Colchester.

Part of a runner from the 1957 excavations in the Forum, said to be of 1st century date belongs here (Webster 1958 fig 4 no.61).

Fremington Hagg.

A runner, said to be part of the hoard from this site, has an incomplete loop at one end (Webster 1971 fig16 no.83; Yorkshire museum Acc. no. H.141.88. K.84). Could alternatively be from York. Date:Flavian or later?

South Shields.

A small fragment from a single loop runner (Allason-Jones and Miket 1984 p197-8, no.3.646). Date:Unknown, therefore Hadrianic or later.

Usk (Gwent).

There is a piece of a runner with a loop terminal from this site (Caerleon museum, find no.71 FNF 216). The legionary fortress here was only occupied from the mid 50's to the mid 70's AD, although the scabbard runner might not date this early (A. Johnson 1983 p247).

The above-listed runners could belong to Types 2C, 2D or 2E.

c. Runners without any surviving terminals.

Under this heading we have runners from Chester (Grosvenor Museum Old Collection, Foregate street 1903-4) ;

Corbridge (Acc. no.75.1242) ; Malton (Mitchelson 1964 fig19 no.31) ; South Shields (Allason-Jones and Miket 1984 p197-8, no.3.647) and Watercrook (Potter 1979 p214, fig85 no.37). In addition there are two unpublished runners from Old Penrith*10. a runner in Chesters museum (Clayton Collection no.1576) and two fragments from Richborough in the AML (1360, 7350810). None of these finds have any significant features, nor can any of them be closely dated.

Anomalous Forms.

Brief mention must be made here of a runner which does not belong either to the dolphin or the "flat"type and seems to be without parallel either in Britain or on the continent. This is a runner from the unpublished excavations at the Blackfriars site in Carlisle.

The runner consists of two long and narrow rectangular bars, joined together at both ends but open in between them. In shape it rather closely resembles the bone and ivory runners with their rectangular slots (see below pages 152-157), which are occasionally found in this country. The upper surface is convex, with blue enamelled decoration; whilst the underside is flat and decorated with repeating heart-shaped motifs in red and blue. Altogether it is an attractive and highly unusual piece. L:7.9cm, W:1.4cm, T:1.2cm. Date:The find came from a late Antonine deposit.*11

A runner from Corbridge (Acc. no.75.1241) has a single loop at one end and a three point terminal (a little like that on York H2420) at the other. There is one lug for attachment on the underside. This represents a distinct combination from any of those mentioned above and further illustrates the problem of producing a typology for bronze runners. L:11.7cm. W:1.2cm. Date: Flavian or later. Finally, there is part of a runner from Housesteads, apparently unpublished (Corbridge museum, find no. H209 6 7381). This could not be located, but a picture on the file index card indicates that it had a round terminal. Date: hadrianic or later.

2. Iron Runners. (Map 9)

Iron scabbard runners are extremely uncommon in this country, as is also the case with iron chapes. There are relatively large numbers of them on the continent however (Oldenstein 1976 tafs 15-17). In shape they resemble bronze "flat" runners, for they consist of rectangular tapering strips with a number of points of attachment on the underside. With regard to decoration and terminal types they are completely different however. As with the iron chapes, the lack of finds may be due to the generally poor preservative conditions in Britain, but it may simply be that iron runners never became very popular with the army in Britain.

<u>British Examples.</u>

Kirkby Thore. (plate 9 no.3).

There is said to be one iron scabbard runner from this site, with narrow leaf-type decoration inlaid with copper-alloy. (Bidwell 1985 p132). However the runner from Kirkby which is in Tullie House Museum is definitely of bronze.*12 There is however an unprovenanced iron runner on display, which does have a leaf pattern on the upper surface. Both terminals are of the rolled type, found on the iron runners from Germany. There are two points for attachment on the underside. L:10cm, Max W:1.4cm. Probably a local find, but its date is unknown.

London. (plate 9 no.2).

There are two iron runners in the Museum of London, from the site of Bucklersbury House (Accession no.s 19501, 19502). The former has a rolled terminal at one end, the other terminal being reminiscent of the heart-shaped terminals found on some bronze runners. It has two spikes projecting from the underside. There is no sign of any decoration. L:10.2cm, Max W:1.1cm.

The second runner has one end missing, the surviving terminal is of the rolled type. Again there is no sign of any surface decoration. Two iron spikes (now bent) project from the underside. L:7.6cm, Max W:1.5cm. These runners may

MAP 9: Iron Runners

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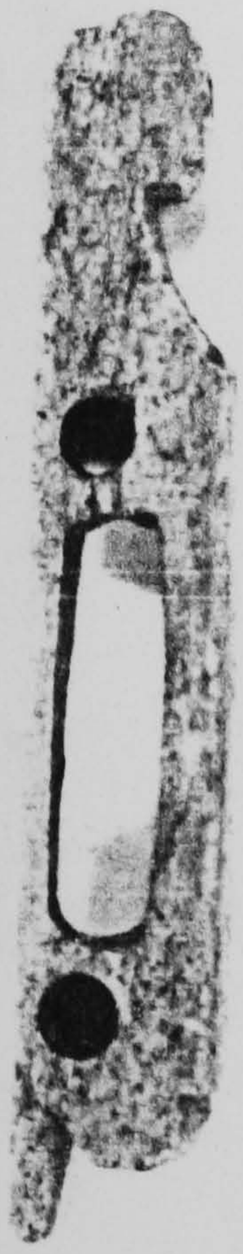

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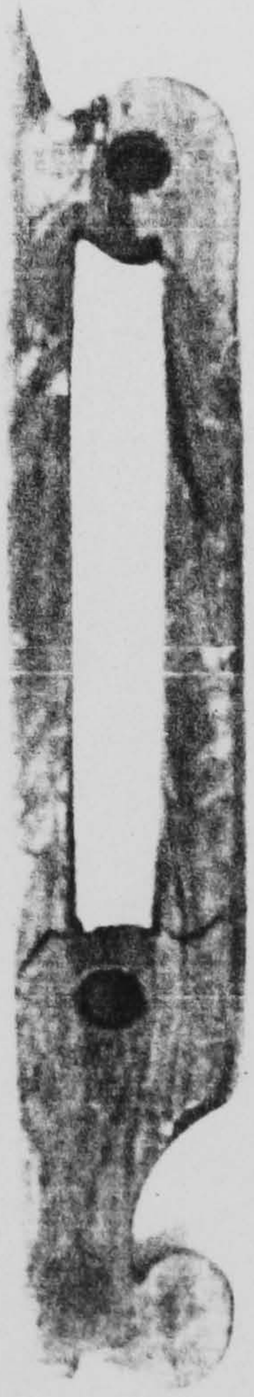

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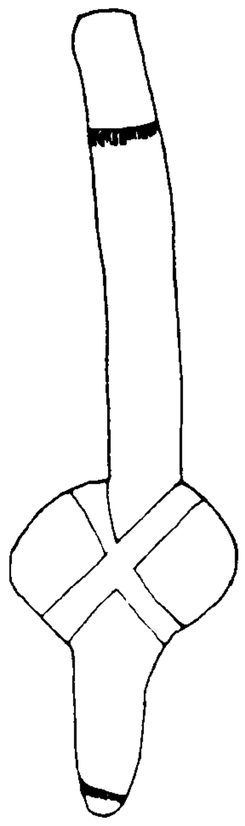
PLATE 9: Bronze, Iron, Bone and Ivory Runners (all at 1:1)
1. York H141627 (Bronze) 2. Bucklersbury House, London 19501 (Iron)
3. Unknown prov. (Iron) 4. Llandough (Bone)
5. Bank of England, London (Bone) 6. South Shields (Ivory)



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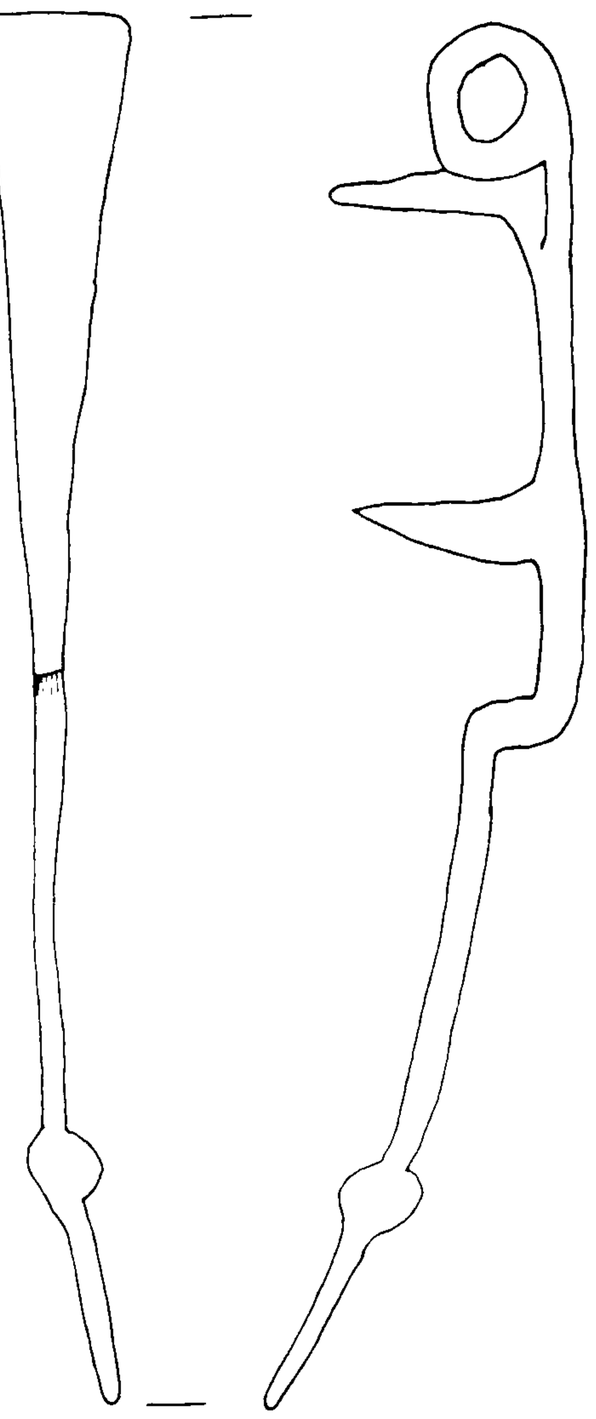

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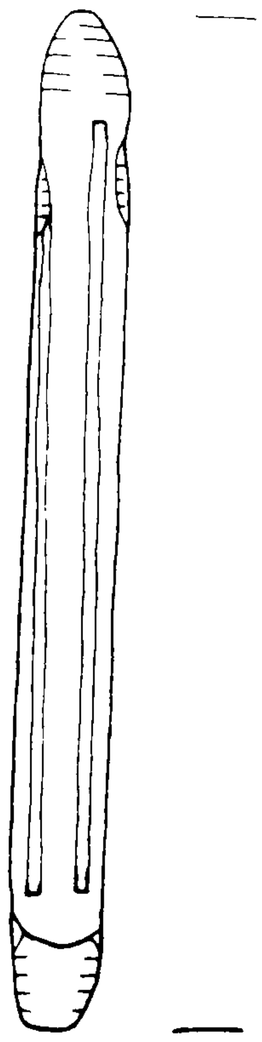

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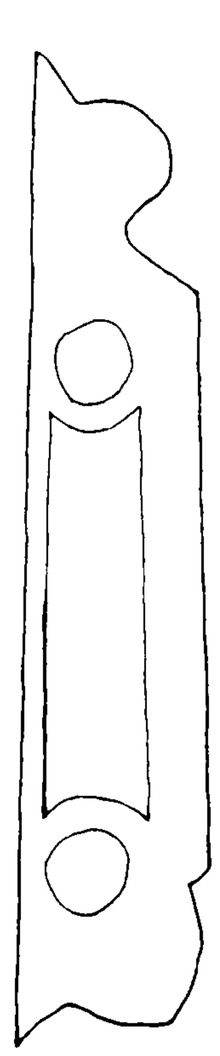

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FIG 7: Bone, Bronze, Iron and Ivory Runners (all at 1:1)
1. Caerleon (Bronze) 2. Buckerlersbury House,London 19501(Iron)
3. South Shields (Bone) 4. South Shields (Ivory)

date to before c150AD.*13

Old Penrith.

There is one unpublished runner from this fort*14. This has one rolled terminal, the other end is incomplete. One point of attachment remains. TL:9.5cm, Max W:1.9cm. Date:3rd century or later?

Silchester.

There is one iron runner from this site, now in Reading Museum. (Bidwell 1985 p132). This is presumably the same as the runner mentioned as having been found in the 1954-8 excavations (Boon 1969 fig 5.12a). No context is given for this find, which has a rolled terminal at one end and two lugs underneath.

Vindolanda.

One flat iron runner with a stepped profile and lacking both terminals was found during the excavation of the stone fort in 1980 (Bidwell 1985 p132, fig 47.5). The upper surface of this is decorated with a series of wavy lines. X-rays showed that this was in fact a punched design, consisting of a stem and tendril design with angular leaves - this being one of the two designs commonly found on iron runners from Germany. The excavator suggested that the hollows made by the punch would have been filled with niello, enamel or the like, but no traces actually remain in this case. There is one spike on the lower side. No measurements known. Date:Found with 3rd century material.

<u>Continental Parallels.</u>

The evidence for decorated iron runners from Germany has already been dealt with in detail (Oldenstein 1976 taf 15 no s 66-69). Examples have been found at Osterburken, the Saalburg and Zugmantel, which are similar to the runner from Vindolanda. There are also three examples from the Danish bog site of Vimose, which all have narrow, angular leaf decoration, in this case inlaid with copper-alloy. (Bidwell 1985 p132; Hundt 1960 p53, Abb 1, no s 2-4). Hundt

thinks that there were two styles of leaf and stem decoration; one with broad rounded leaves, the other with narrower, angular leaves. However, it should be noted that many of the iron runners from Germany and Rhaetia do not have any inlay decoration at all (Oldenstein 1976 tafs 15-17). This is also true of several British examples. The features they share in common are the general shape, the rolled terminal (where surviving) and the method of attachment to the scabbard. As yet though, the number of specimens available from Britain is too small to say anything very conclusive.

3. Bone and Ivory Runners. (Map 10)

Scabbard runners of these materials are rare in comparison with the bronze types, although taken together they are more numerous than those of iron. In form they are very different from the other types and they are generally much simpler and less decorative. Bone runners would obviously have been the cheaper alternative as the material was readily available. Ivory runners would presumably have been more expensive as the material would usually have had to be imported over a considerable distance. The precise details vary a little, but the basic form of bone/ivory runners may briefly be summarised as follows:-

The runner is usually a slim rectangular piece of material, much longer than it is broad.*15 It is often wider on the top than on the bottom, so that it has sloping sides. The lower end terminates in a ball-like projection above a point, whilst the upper end is pointed. The upper surface of the runner generally has some decoration in the form of several grooves. Cut through the runner is a slot, rectangular or sub-rectangular, running for most of its length. The sword belt passed through this opening. Flanking this there are usually two smaller circular, holes through which it is assumed bindings were passed to further secure the runner to the scabbard (Chapman 1976 p250-253). There does not seem to be much visual evidence from tombstones, monuments, sculptures or other sources, that these objects were indeed scabbard runners. We have to rely

MAP 10: Bone and Ivory Runners.

largely on the fact that they resemble in several ways the bronze runners - which are shown on some tombstones. No other convincing identification of these bone/ivory objects has so far been offered. There is however, one previously unnoticed piece of evidence concerning these objects. This is the porphyry statue of the Tetrarchs at Venice (Beckwith 1963 plates 3-4). Clearly visible on the scabbard of each figure is a grooved object with concave sides and curved ends. These are not disimilar to scabbard runners and they resemble very closely indeed a bone object found long ago at Greatchesters, which I contend, must be a runner too.*16

<u>British Examples.</u>

Colchester.

A bone runner was found in excavations in 1920 (Wheeler 1923 p37, fig9). It was pierced by a rectangular slot and two flanking circular holes. Undated.

Greatchesters.

Illustrated in a Report of the Northumberland Excavation Committee (A. A.1st series Vol. XVII-1895 pxxxi), is a curious bone object. This is said to have come from the fort at Greatchesters and to have been three and a half inches (c8.9cm) long. Unfortunately this find is not mentioned anywhere else in the report, so it is not possible to give a context for it. The excavators were unable to suggest a function for this piece, but it seems very likely that it must be a scabbard runner. It is roughly rectangular in shape, but the long sides are not straight; instead they curve gently inwards from both ends, giving the object a slightly concave appearance. The short ends are rounded. There is a cutout through the central section, for the passage of the sword belt and this is flanked by two small circular openings, presumably binding holes. Date:unknown, therefore Hadrianic or later.

Llandough. (plate 9 no.4).

This Romano-British village site has produced a fine example of the standard type of bone runner (National

Museum of Wales Acc. no.82.44H 25/002). It is complete except that the pointed tongue at the upper end has broken off. It is pierced by a rectangular slot 2.9cm long by 0.8cm high, this being flanked by two circular holes, 0.5/0.6cm in diameter. There is the usual rounded projecting piece at the top end and a rectangular one at the other. The sides of the runner slope inwards so that the bottom, which rested on the scabbard, is narrower than the top. The upper surface has two, roughly parallel grooves running for most of its length. The ends of these are marked by short grooves extending across the width of the runner. L:8.4cm. Max W on top:1.1cm. Max W on underside:0.6cm, Max Thickness:1.4cm. Date:unknown, perhaps 2nd or 3rd century on analogy with other finds. The civilian context of this find is odd, but may be explained by the presence of a passing military unit (or individual soldier). Alternatively the runner may have been made in the village for delivery to a customer in the army.

London. (plate 9 no.5).

Three runners, two of bone and one of ivory are in the Museum of London.*[17] To take the ivory runner first, this is exactly like the bone examples, with a rectangular slot (5cm by 0.7cm), two round holes and sloping sides. L:10.2cm, Max W at top:1.1cm, Max W at bottom:0.9cm, Max thickness:1.7cm. An unstratified find from the Bank of England Excavations 1928-34. The material has been identified as brown elephant ivory, probably from the tusk of an African elephant (Chapman 1976 p250-1). The bone runner from the Angel Court excavations in 1974 has all the usual features. The slot for the sword belt measures 2.7 by 0.8cm and the circular holes are 0.5cm in diameter. The sides slope and the upper surface has two long grooves and two short ones crossing them at the ends. Part of the projecting tongue at the lower end is missing. Probably made from the metatarsal of an ox (Chapman 1976 p250-1). L:7.5cm, Max W at top:0.9cm, Max W at bottom:0.5cm, Max thickness:1.2cm. As with so many other finds, this piece can only be approximately dated. It came from a rubbish dump which yielded 14 coins, including one of Valens (364-

378AD) and two of the House of Valentinian. This points to a fairly late date for this find, although it is only fair to point out that the runner could have been added to the refuse heap much earlier. The other bone runner from London came from Swanlane in Upper Thames Street. This is incomplete, but has most of the usual features. The top is decorated with two pairs of grooves. Pierced near one end by a circular opening (0.3cm diam.). Surviving L:7.4cm, Max W:1.8cm, Max thickness:0.8cm. Date:The find came from a context containing 1st to 3rd century pottery.*18

South Shields. (plate 9 no.6).

There are two bone runners and one of ivory from this site. The ivory runner is an exquisite little piece and very well preserved. (Allason-Jones and Miket 1984 Catalogue no.6.1). This is on display in the Museum of Antiquities, Newcastle.*19 It is decorated with two parallel grooves running for most of its length and is pierced by a rectangular slot 3 by 0.7cm and by two round holes, 0.6cm in diameter. The tip is missing, otherwise the preservation is excellent. L:7.4cm, Max W:1cm, Max thickness:1.3cm. Dated to the 2nd or 3rd century. Of the two bone runners from this site, one is in the museum at South Shields, while the other is at Newcastle.*20 The first of these is not complete. It is decorated on the upper side with a series of parallel grooves, running along the runner and on the underside by two cross-grooves. L:6.7cm, Max W:1.5cm, thickness:0.3-0.8cm. Undated. The other bone runner was clearly very much like the ivory example, although it too is incomplete. There are two parallel grooves along the top and one circular binding hole cut through it from side to side (0.6cm diam.). L:7.4cm, Max W:0.8cm, thickness:1cm. Date:2nd or 3rd century?

York.

There is one bone runner from this site in the Yorkshire Museum (Cook Collection no.156), which was found outside the city walls between 1845 and 1855. This is incomplete, wider on the upper surface than on the bottom

and decorated with grooves along the top. Date:Unknown.

Continental Parallels.

There are a fair number of bone or ivory runners from mainland Europe, though as in Britain they appear to have been much less common than their metallic counterparts. There are a couple of examples which support the argument that the Greatchesters find is indeed a scabbard runner (Oldenstein 1976 taf 14 no.s 64-65). These are from Niederbieber and Worms. In both cases the long sides are slightly curved and the ends are rounded. The Niederbieber runner has three grooves running for most of the length of the upper surface, whilst the runner from Worms has two circular binding holes. Both have a stepped profile on the underside so that the sword belt could be passed between the runner and the scabbard. The Niederbieber runner is a particularly important find because it provides useful dating evidence - the fort was not built until c185/190AD and was given up by c260AD. On the continent two types of bone runner have been found. The "bridge-like" runners are represented by those from Niederbieber and Worms already described and in Britain by the find from Greatchesters. There may also be an example from Heddernheim (Oldenstein 1976 p101), a fort which was given up in 100-110AD (Schönberger 1969 p155, 165). The town was destroyed in 259/260AD. The "bar-like" type (Oldenstein 1976 p102) is more widely represented and all of the examples in ivory are of this type as well. Two ivory runners were found in the cemetery at Khisfine, south of Damascus in 1943 (Chapman 1976 p251, plate XLV.6). One of these was separate, the other was part of an ivory scabbard which contained a 78cm long sword with ivory pommel, grip and guard. Date:Possibly 2nd century. An ivory runner is also known from Mainz (Beal and Feugere 1987 p96, fig 4.2). This find may date to the 3rd century, on analogy with the bone chape also found here (Klumbach 1968 taf 5.4).

A bone runner has been found at Cologne (Beal and Feugere 1987 fig 4.3). There is one from the fort of Intercisa in Pannonia, which suggests that this kind of

fitting had an eastern origin (Barkoczi et al 1954 p72, taf20.3; Lengyel and Radan 1980 p234, 400). In the later 2nd century a Syrian archer unit, the Cohors Milliaria Hemesenorum was based here. In the Notitia Dignitatum (OC. XXX III, 38) three units are listed in garrison at Intercisa, one of them being the Equites Sagittarii. This could be the Hemeseni under a different name or another unit. Unfortunately the picture is complicated by the fact that the Huns occupied the site in the 4th or 5th century, so this is not necessarily a piece of Roman equipment. Two bone runners, one of either type were found in early excavations at Lauriacum in Raetia (Von Groller 1919 fig92 no.s 1-3). These will date to between the Severan period and the early 5th century. A bone or ivory runner from Vimose may date to 200-250AD (Chapman loc. cit.), although this can hardly be described as a sealed context. There is another bone example from Virunum in Noricum (Oldenstein 1976 p102) and an unprovenanced find in the Römisch-Germanischen Zentralmuseum in Mainz (Beal and Feugere p96, fig 4.3). Overall then the continental material seems to belong to the later 2nd and 3rd centuries, although some examples may fall outside this time period.

Clearly of relevance to the dating of bone/ivory runners are the miniature swords found on Roman sites in Britain, France, Germany and other places (Greep 1981 p103-106), as well as a dagger from Omal (Beal and Feugere 1987 fig 5.5). The former were made in five parts; the blade (of iron) and the guard handle, pommel and scabbard which were all of bone. The sheaths have what are clearly miniature representations of runners carved on their sides. Most of the sheaths are undated but one from Augst belongs to the mid 2nd century and another from Verulamium may also be of Antonine date. Greep considered (Ibid p104) that the majority of the sheaths date to the 1st or 2nd century, which has clear implications for the dating of the scabbard runners. The dagger from Omal, perhaps a ceremonial object, has miniature runners on the side of the blade (Beal and Feugere 1987 fig 5.5).

Some general comments and conclusions on scabbard runners.

A total of 94 scabbard runners from Britain are known to the present author. Of these 78 are of bronze, 8 of bone, 6 of iron and 2 of ivory. Of the bronze examples c17 are dolphin-shaped, the rest (except one) are of the "flat type". Like chapes therefore, scabbard runners seem generally to have been made of bronze.

The dolphin type has a very limited distribution area. With the exception of the find from Strageath all of the examples come from on or just to the south of Hadrian's Wall. This may imply that this kind of runner was not in use before the time of Hadrian. It is true that a couple of examples do come from sites which had a Flavian occupation e.g. Corbridge, but none of the finds can definitely be dated to that period. The lack of any such runners from the south of the province would be explained if this type was transferred direct from Germany - where a couple of examples are known - when troops were moved to Britain from the Rhine frontier. One possible context for this might be the transfer of Legio VI Victrix to Britain in about 122AD. Most British examples are undated, but the find from Blackfriars, Carlisle may belong to the Antonine period and the Vindolanda find may be mid 3rd century. How long after this the type continued in use one cannot say.

Type IIa runners are only known from Caerleon, where they perhaps date to the 2nd or very early 3rd century. Type IIb runners seem to have been used in the same period, although there is little solid dating evidence. They are found on both legionary and auxiliary sites in a broad area from East Anglia to Scotland. The remaining groups are so small that they defy analysis, especially since very few examples are complete. There are finds from sites with a 1st century occupation, but there is no proof that any of them actually date that early. Finds from civilian sites may represent losses by passing soldiers or be evidence for garrisons in the case of towns. It is likely that several kinds of bronze runner were in use at one time. Sculptural depictions of scabbard runners are seldom detailed enough

to make comparisons with excavated finds. An exception may be the tombstone of Aurelius Sito (Oldenstein 1976 Abb 14.2) which dates to the 3rd century. The runner on his sheath appears to have an heart-shaped terminal, although it does not have an incised X.

The lack of iron runners from Britain has already been commented on - in contrast to the 35 or so from Germany or Raetia illustrated by Oldenstein (1976 tafs 15-17). Dating evidence is limited but points to the use of such objects in the 2nd-3rd centuries. Features in common with the continental examples can be seen - a stepped profile, lugs for attachment on the underside, a rolled terminal and in some cases a leaf pattern - but the sample is at present too small for any pattern to be discerned with regard to decoration or distribution.

Apart from the eccentric example from Greatchesters the bone runners are of a very uniform appearance. The dating evidence is exceedingly poor, but the find from Angel Court may indicate that the type continued in use into the 4th century. They are not at all common as site finds in this country.

Ivory runners are very rare, no doubt because of the comparative expense of producing them. Like the bone runners they vary little in shape. None of the British examples are independently dated.

It may well be asked whether there is any proof that the bone/ivory objects are indeed scabbard runners. They are not shown on any Roman tombstones. They may appear on the statue of the Tetrarchs and perhaps on the Bishapur rock relief (Ferrill 1986 plate 8). In the latter case, a figure to the right of the emperor Valerian has a runner on his scabbard which is not unlike the find from Greatchesters. We must also allow that there are certain similarities with the undoubted metal runners, which are unambiguously depicted on many monuments. The bulk of the bone/ivory finds do come from military sites, but this does

not in itself prove that they are pieces of military equipment. They have turned up in civilian contexts, prompting alternative explanations for their use. The runners from Lauriacum were described as "carved bone plates, probably from the covering of a knife or some other tool or implement. " (Von Groller 1919 p254; translation my own), but this was a guess, the author not being familiar with the concept of scabbard runners. At Intercisa a bone runner was found in a grave (possibly of a woman and child). None of the other finds were of a military character and the suggestion was put forward that the bone object was in fact an item of female coiffure (Barkoczi et al 1954 p72; Oldenstein 1976 p102).

On the surface such an explanation might appear convincing, but it is impossible to dismiss the miniature sheaths (see above 157) and more particularly the ivory scabbard from Khisfine (Chapman 1976 p251) which have integral scabbard runners. The appearance of bone/ivory runners on civilian sites is odd, but should not cast doubt on their identification as military fittings.

NOTES

*1 Some chapes may simply have been clipped onto the end of the scabbard. The function of the twin projections at the top of the bronze types 3/5 chapes was probably to ensure a better grip on the scabbard.

*2 An exception is the Canterbury pelta chape which has no points whatever. There does not appear to be any chronological significance to the number of points on the chapes. Of those with one point, the one from Colchester may be the earliest example and the type persisted down to at least the 120's AD as shown by several finds from Hadrian's Wall. The three-point variety is more common on the continent. The earliest example from Britain may be that from Newstead.

*3 Legio II Augusta is listed as the garrison of Richborough in the Notit (OC. XXVIII, 19).

*4 The second period of the vicus was formerly (R. Birley 1977 p172) dated to c270-350AD. Birley now dates the end of this phase to 270 (Welsby 1982 p169). It may have begun in the reign of Severus Alexander (222-235AD).

*5 Access to the Bearsden material in advance of its publication was kindly granted by Dr. Lawrence Keppie.

*6 This is one of the very few cases where the species involved has been identified. It would be interesting to know which species and which bones were preferred when it came to making military equipment.

*7 Information from Miss Maggi Darling.

*8 Personal comment by Mr. P. J. Casey.

*9 Information from Mr. Ian Caruana, Carlisle Archaeological Unit.

*10 The Old Penrith runners are Austen (unpub.) no.s 656-7; AML no.s 7814188, 7814867.

*11 See note 9.

*12 Accession no.27-1926.196 (letter from Dr. Colin Richardson dated 26/9/89).

*13 Letter from Miss Christine Jones dated 16/8/89. The Walbrook stream which ran near the site had probably silted up by c150AD.

*14 Austen (unpub.) no.655; AML no.7826492.

*15 Sources of ivory would have included elephants (the most likely source), prehistoric mammoth tusks, walrus and narwhals (A. Macgregor 1985 p38-41).

*16 Beckwith 1963 plates 3-4.

*17 Bone:Acc. no.s 1250 SWA81 (Swanlane) ; ER1582 ACW (Angel Court). Ivory:Acc. no.13936 (Bank of England).

*18 My thanks to Miss Christine Jones for dating information on various excavations in London.

*19 Acc. no. M. A.1956.129.90. A (1).

*20 Allason-Jones and Miket 1984 no.2.34=M. A.1956.128.90. A (2). The runner at South Shields museum was accidently omitted from the small finds catalogue.

V. Daggers, dagger scabbards and their fittings.

"After Severus had given this order, the Illyrian troops rushed forwards and took away from the soldiers the daggers they were carrying which were inlaid with silver and gold for ceremonial use." (Herodian II, 13,10).

Introduction.

In order to put the daggers and associated fittings of the 2nd century and later in their proper perspective it is necessary first to examine briefly the dagger as it existed in the 1st century AD.*1 The dagger of this period is usually referred to as the "Pugio". Just as the gladius was derived from an Iberian model, so too the pugio owed its shape to earlier, Spanish daggers. Roman daggers of the first century were generally about 20-25cm long, the waisted blade having a mid-rib and a long point. Sometimes the rib was flanked by two grooves. The form of the handle was quite variable (Manning 1985 p152-6) with regard to details, but in essence it usually consisted of an iron tang, a surround of some organic material e.g. wood or bone and metal covering plates. Some daggers of the 2nd century continued to have such handles and they may even have been used in the 3rd century.

The dagger itself was of iron only, but some at least had very elaborate sheaths (Manning 1985 plates 74-5;Webster 1986 p21), with gold, silver or enamel inlays. The decorative schemes on these sheaths vary greatly.*2 This is more likely to reflect regional styles rather than having any chronological significance. The pugio was worn on the left side of the body, suspended on a different belt than the sword. Although referred to by Josephus (De Bell. Jud. III 93-4) as a second sword, the pugio would not in truth have made a very effective weapon, simply because it was so short. No doubt in an emergency if nothing else was available then the dagger might be used in self-defence, but it is unlikely that this was its primary function. Given the amount of care and attention lavished on the decoration of the sheaths, it seems more reasonable to

suggest that in this period the dagger was mainly a prestige item, to be brought out and shown off at parades. The variations in the style of decoration might be due to the personal tastes (and financial means) of the individuals concerned. In addition a knife would be a very useful general purpose tool when on campaign e.g. for trimming the edges of frayed clothing or leather sandals, for cooking and for skewering food. The pugio may have been like the proverbial boy scout's knife. For a parallel one might look to the bayonets on muskets of the Napoleonic era. These were officially issued pieces of equipment (as the pugio may have been) but were used for a variety of unofficial purposes. The bayonet was very seldom used in combat although this was its intended function. Most pugios have been found in legionary contexts, but they also appear on auxiliary tombstones (Manning 1985 p153 note 1) so perhaps all troops were equipped with them.

It is often assumed that daggers were only used by the Roman army during the 1st century and that thereafter they disappeared. It is true that the decorated sheaths have up to now not been found in post first century deposits, but there is archaeological evidence for later daggers, albeit not of precisely the same form. Some of these have features in common with the pugio, as with the daggers from the Kunzing hoard, others are entirely different. The number of finds is not great and it may well be that the dagger was no longer an official piece of equipment or that it was only used by a few units. Some at least of the finds belong to the 2nd century. It may be therefore that the dagger never entirely went out of favour. Perhaps the pugio existed for a time alongside other forms of dagger.It is unlikely that such changes of equipment occurred overnight - the Roman army was a highly conservative force in many ways - Indeed there is a 2nd century pugio from Buciumi in Dacia and one is shown on the tombstone of C. Castricius Victor (Bishop and Coulston 1989 p43-4). There are no daggers on the columns of Trajan and Marcus, although since both monuments spiral from left to right, any weapon worn on the left hip would not be visible anyway. However even

in cases where figures do show their left sides, there are still no daggers to be seen. I can find no trace of the dagger on later Imperial monuments e.g. the Arch of Severus and from Britain there is only one tombstone later than the 1st century which may show such a weapon - and even this is not a pugio.

The disappearance of the pugio may have been a question of expense or practicality. Whatever the cause it was replaced by daggers of other forms. A problem exists in identifying those knives which were simply tools and those which were intended as weapons - there may of course have been some overlap between the two categories. The best criteria for separating the two groups are size and shape, but in the absence of absolute proof, such judgements as have been made are admittedly somewhat subjective. What follows is a discussion of the finds most likely to be "daggers" in the strictest sense of the word, together with some foreign comparanda. Some attention is also given to dagger scabbards and their fittings.*3

Literary Evidence.

As mentioned before, the literary evidence for daggers is rather limited and much of it applies only to the pugio of the 1st century. Josephus (De Bell. Jud. III,94) erroneously states that the dagger was worn on the right hip. He describes it as being no more than a span (c23cm) long, a measurement which we can see from the actual finds is approximately correct. We have one instance at least where daggers were used in combat (Tac. Hist. IV,9). This was when Roman troops were besieged in their camp at Vetera by Civilis's rebels. This must be seen as an exceptional occurrence however. The early imperial army was simply not equipped to defend fortifications and if forced to do so Roman troops would have had to use whatever weapons were to hand, no matter how inadequate. The term "gladiolis" appears in the SHA (vita Clodius Albinus VIII,1). This may perhaps mean daggers, but could signify short swords like those already discussed (see page 50. The danger of accepting information from this source has been noted in several other places. One final reference comes in the work

of Herodian (II,13,10) and was quoted at the start of this chapter. If reliable, this passage shows that the Praetorians at least still had daggers in the closing years of the 2nd century. Admittedly the equipment of this body may not have been typical of the army as a whole. The Praetorians may have continued to wear the dagger long after it had gone out of general use.

Sculptural Evidence.

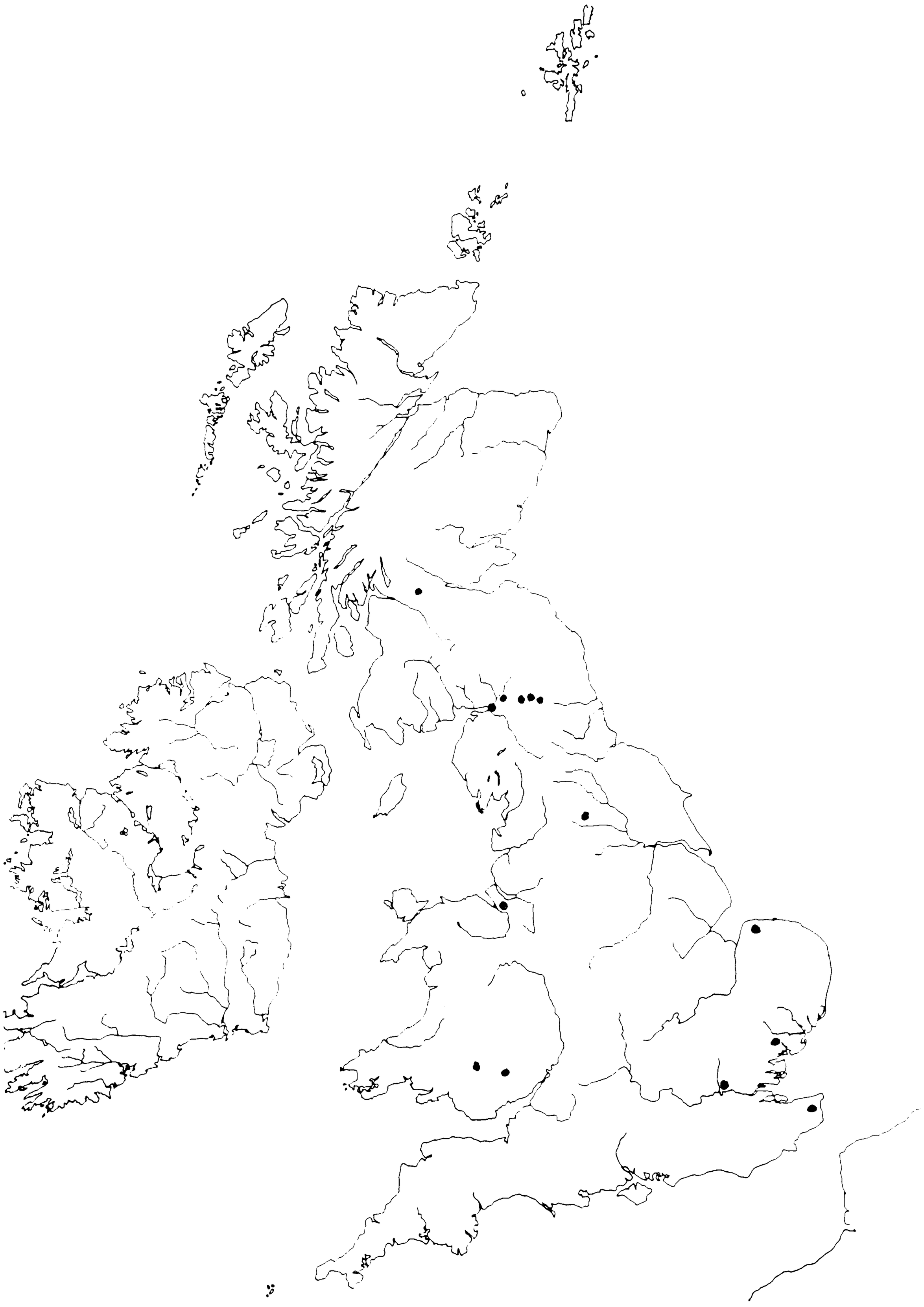
As already mentioned, the dagger does not generally appear as part of the military panoply on tombstones later than the 1st century AD. A possible exception is the archer tombstone from Housesteads (Webster 1985 p152, plate XVI). The figure wears on his right hip a weapon which may either be a dagger or a short sword. It has a bird-headed handle, which may have had an eye carved on it. One edge of the blade is totally straight. The other edge is partly obscured but it does curve near the tip. This suggests it was a weapon with a single cutting edge, rather like the dagger found at Sewingshields milecastle (see below page 170).

Catalogue of British Finds:

<u>a. Daggers and dagger fragments. (Map 11)</u>

Bar Hill. (plate 5 no.2).

This fort on the Antonine wall has produced half of an iron dagger hilt (Macdonald and Park 1906 fig29 no.27 ;Robertson et al 1975 p99, fig32 no.15). The hilt is t-shaped, both the shaft and the cross-piece being pierced by two circular rivetholes. Those on the crossbar are near to the ends. The shaft has two semi-circular projections, one either side, about halfway down its length. The butt end of the hilt is crescent-shaped. This is one of a pair of iron plates which would have been rivetted to the bone/wooden handle of the dagger, which in turn encased the iron tang. L:11.5cm. Max W:7.9cm. Although there may have been an earlier occupation at this site, it seems fairly safe to assume that this piece dates to the mid-second century A. D. A complete dagger from London (see below), has a similar composite type handle. Other good parallels come from the



MAP 11: Daggers and fittings.

hoard of weaponry at the fort of Künzing on the Raetian limes (Herrmann 1969 p132, Abb 3 no.s 5-7). This hoard, dated to the middle of the 3rd century A. D. came from the area of the Principia. It included over 50 daggers, several of them with hilts similar to the Bar Hill find. The blades of these daggers vary from a simple triangle to a waisted form reminiscent of some first century daggers. They are about 40cm in length, with blades 28cm long (Ibid p133).

Brancaster.

Portions of three knives were found here during the recent excavations, although it must be seriously doubted whether any can really be classed as weapons. (Hinchliffe and Sparey-Green 1985 p49, fig 32 no.51). The most complete example was in fact found in a ditch within the civil settlement. This has a thin tang and a blade whose sides curve outwards to the mid-point before curving back in to the tip. It is suggested that the civil settlement dates to the later 2nd century, perhaps associated with a fort of that period which preceded the Saxon Shore base (Ibid p180).

Caerleon. (plate 3 no.1)

Three knives/daggers from this site were examined by the present author during his visit to the Legionary Museum. Of these two can be fairly confidently dismissed as not being weapons as such. One of these, together with its decorated bone handle, was found during the excavation of the amphitheatre. (Wheeler 1928, p170). This is a mere 14cm long, with a blade of c12cm and surely belongs in the "pocket-knife" class. A second knife from the stone barrack level at the Myrtle Cottage site (2ndc or later) is 16.5cm long with a blade of c13cm. (Unpublished). This find is interesting because the blade is thicker on one side than the other, giving the knife only a single useful cutting edge. This is a feature also seen on the much longer Sewingshields "dagger" (see below page 170). The blade of the Myrtle Cottage knife is flat, curves very gradually and has a long point. The final object from Caerleon is the only one of the three which can seriously be accepted as a dagger, the others being much too short to be of real use

in combat. This find was found in the main lateral drain of the vicus in 1958 (Boon, unpublished). It seems quite likely that this dagger was manufactured in the vicus for one of the legionaries in the fortress. If so, it forms one of the few pieces of evidence for civilian production of arms in this country, during the Roman period. The blade is of ellilptical section, with rounded shoulders flared out slightly from the rest of the blade. It is broken in several places and the tip is missing. Boon reconstructs the dagger as having a point of about 4.5cm long. The overall length of the piece is unknown, since besides the missing point, most of the tang (square-sectioned?) is missing. There is a detached portion of the tang with the dagger, but this is heavily corroded and does not seem to fit onto the larger fragment. TL (surviving) :23cm, BL:20.4cm, BW at junction with tang:5.8cm, BW at 10cm from tang:4.8cm, BW 1cm from tip:3.9cm. Blade thickness :0.7-1cm. Date:c130-200AD. (plate 3 no.1).

Carlisle.

Fragments of a dagger have been found in a late 2nd to early 4th century level in Annetwell Street. (Unpublished, find no. FE352). No details of it are known, but it is described on the finds list as not being worth conserving so the fragments cannot have been very significant.

Colchester.

Recent excavations have produced what may be part of a copper-alloy hilt guard (Crummy 1983 p138, fig139). This is oval in shape, with a groove down the middle and has decorative cutouts on the edge. It may be compared with examples from Saalburg and Zugmantel in Germany (Oldenstein 1976 tafs 9.1 and 9.2) - neither of which have the decoration however - and also with a find from a grave at Lyons (Ibid p88). The Colchester find measures 6.2cm long by 2.2cm wide. Date:Probably 1st half of the 5th century AD.

Copthall Court, London. (plate 4 no.s 1-2).

An iron dagger and sheath frame from here can be seen

in the Museum of London (Robinson 1976, p35). The blade of the dagger is leaf-shaped and and waisted, with a mid on both sides. It has many similarities with some of the Kunzing daggers (Herrmann 1969 Abb3). The profile of the blade is fairly flat and the point is long. The handle is of the composite type seen on several daggers in the British Museum (Manning 1985 p156-7, plate 73) - all of which probably date to the 1st century AD. The iron tang is enclosed by a wooden handle and this in turn is covered by a pair of t-shaped iron plates which are rivetted into place. These are just like the example from Bar Hill already discussed. The lower ends of the plates form a kind of guard at the top of the blade and greatly increase its width. TL:42.1cm. BL:30.5cm. Width at junction with tang:9.3cm. Width at 5cm from the point:2.6cm. Width at 10cm from the point:4.9cm. Width at 5cm from the tang: 6.1cm. Minimum width at "waist":5.9cm. Date:The dagger and its sheath are dated to the 3rd century on analogy with the finds from Kunzing. However both the London dagger and those from Raetia have features in common with 1st century pugios - notably the form of the hilt - so the situation may not be entirely straight-forward.

Gelligaer.

An iron dagger or knife with a very thin blade, slightly thicker at one edge than the other (Ward 1903 fig 18 no.3). The blade edges are badly damaged and the point is missing. The tang is square-sectioned, widening slightly at the junction with the tang. As with the Brancaster and Caerleon knives, this is perhaps too small to be considered a proper weapon. TL:17.8cm, BL:15.1cm, BW (Max) : 3cm, Blade Thickness:0.2cm, Tang width:0.8cm, Tang Thickness:0.4cm. Date:Unknown, but probably 1st or 2nd century?

Ilkley.

From the excavations in the Commandants house in 1919-1921 came a fragment from the butt end of a knife or dagger, with a short, wide tang curved over. This was nearly two inches long and about the same in width. There

is no further information available on this object and the smallness of the remaining piece prevents meaningful comments anyway. The site was occupied from the Flavian period through to the 4th century and this find does not appear to have been found in a dateable context (Woodward 1926 p288).

Milecastle 35 (Sewingshields). (plate 3 no.2;plate 5 no.1)

A substantial quantity of well-preserved weapons were found during the excavations conducted here in 1978-1982 (Haigh and Savage 1984 p75, 81-86). Most of them were dated to the 2nd or 3rd centuries AD. The most striking find was a virtually intact dagger (Ibid fig 13 no.56). The blade is a long, narrow triangle in shape, a notable feature of this is that it has only one cutting edge (like the Frankish Scramasax). This is due to the fact that the back of the blade slopes steeply from a thickness of c1cm at one edge to less than one tenth of that at the other. X-rays have shown that the blade is not decorated in any way. It is seperated from the tang by a low ridge. The tang has a distinct taper and is rectangular in section. Fragments of the wooden grip still adhere to it. The handle was held onto the iron tang firstly by an iron binding 0.4cm wide, about 2cm from the end and also by a thin bronze end plate. The latter is elliptical in shape and was originally fastened to the wooden handle by four dome-headed bronze rivets. Three of these still remain in place. The square hole in the centre of the end plate would presumably have been for the attachment of a small pommel to balance the weight of the blade. One final feature of this remarkable piece must be mentioned. Analysis of the wood forming the handle showed that this was made of Silver Fir - a species of tree not native to Britain but found in the Alpine region (Watson 1985 p1). This may indicate the area of origin of the troops who were garrisoning the milecastle (or at least that of the owner of the dagger) but equally the wood may have arrived in Britain in some other form - perhaps as part of a barrel - and been converted to a dagger handle later. TL:31cm. BL:17.5cm. BW (Max) :4.2cm. Although the blade section is peculiar, the size of the

dagger suggests it may have had a military use. It brings to mind the knife on the archer tombstone from Housesteads (Webster 1985 plate XVI), which has a bird-headed pommel. This is thought to date to the 2nd century. There is a dagger from the fort of Rainau-Buch which has a similar blade (Planck 1983 p133-5, taf92) and there may be some similar daggers from Hungary (According to Miss L. Allason-Jones of the Museum of Antiquities, Newcastle). No information is available on these at present.

Milecastle 39 (Castle Nick).

A possible dagger (alternatively it may be a short sword) was found in the recent excavations at the milecastle (unpublished finds report, object no.400, 3900, 151, CH). The dagger is contained in the remains of its sheath, which is of leather or wood strengthened with copper-alloy rods or bands. There is also a copper-alloy hilt guard. Examination of this object was not possible at the time of writing. Date:Probably 2nd or 3rd century.

Milecastle 48 (Poltross Burn).

A fragment of a knife blade, 8" (20cm) long was found here (Gibson et al 1911 p445). Nothing further is known of it and it was not necessarily part of a weapon. Date:Hadrianic or later.

b. Dagger Sheaths and their fittings. (Map 11)

Very little is known about dagger sheaths of the 2nd century and later in Britain. It would seem that they were usually constructed wholely or at least partly of leather or wood;materials which are only going to survive many centuries of burial in the ground under the most exceptional circumstances. The inference that scabbards were of wood/leather is supported by the recent find from Milecastle 39 and the dagger from Copthall Court has traces of leather on the guard which are presumably the remains of the sheath. The dagger sheath from Milecastle 39 was strengthened with metal bindings - a feature also seen on sword scabbards - and this may have been the case in general. However the evidence is at present scanty and

better preserved specimens are needed to improve our understanding of these objects.

Some bronze chapes are also known, which to judge from their small size could well be from dagger scabbards. Generally however these were not found with any daggers, so the identification is only conjectural. Some "dagger chapes" mirror types commonly found on sword scabbards. Notable by their absence are the lavishly decorated metal scabbards of the 1st century. In the later period, simple and cheap, but robust construction is the rule. This change in construction methods may well imply some change in function for the daggers.

Caerleon.

One of the nine "Median Rib" type bronze chapes found at the fortress is significantly smaller than the rest and may have come from a dagger sheath (Nash-Williams 1932 fig36 no.16). This is of the usual form, both faces of the chape being identical, with a diamond-shaped projection in the middle of the top edge. There is a rivethole in the centre of the back face-which is otherwise plain. L:3.7cm, Max W:2.2cm, T:0.6cm. From the NW rampart buildings in Prysg Field. Date:120-200AD?

Chesters.

The bronze openwork frame for a dagger sheath can be seen in the site museum (Clayton Collection no.s 3470, 8601). The find is broken in two and is rather corroded and fragile. In shape it is a long, narrow triangle, terminating in a finial. TL:c14.5cm, Max W:4.3cm, Thickness:1.5cm. Date:Context not recorded, therefore Hadrianic or later.

Cirencester.

A bronze chape of the median-rib type may be from a dagger sheath - although there is no definite proof of this (Webster 1958 fig3 no.27). No rivetholes are visible on the front face - the back is not shown. Date:presumed to be 1st century as no later military occupation is known.

Copthall Court, London. (plate 4 no.2).

There is an iron sheath frame from this site, found with the dagger already discussed (see above page 168). It is leaf-shaped and slightly waisted, terminating in a small domed finial. The upper and lower sections are solid and there is also a crossbar in the middle connecting the two sides, but otherwise the frame is open. The frame is grooved on the back in order to improve the grip on the scabbard proper - which was probably of leather. There are also four rivets to further secure the frame to the sheath. The upper surface of the frame is decorated with lines of rivets running from top to bottom. L:31.8cm. Width at top: 9cm. Width at mid point:7.6cm. At least 29 sheath frames were found in the hoard from the fort at Kunzing (Herrmann 1969 p133, Abb 3 no.4), dated to the mid 3rd century. These varied in small details but were basically all of the same type and much like the example from London. First century daggers have entirely different types of sheath, so this feature may be our best evidence for dating the Kunzing weapons - and therefore perhaps also the London dagger/sheath to the 3rd century.

Housesteads. (plate 5 no.3).

The fort has produced a bronze sheath frame of the same general form as that from Chesters. This can be found in the store at Corbridge museum. (Clayton Collection no.3694). Records indicate that this object was found during F. G. Simpson's excavations at the site in 1907-10. It is roughly triangular in shape, lacking the tip and is fashioned from a single sheet of bronze, wrapped around and secured with a number of small bronze rivets. Some of these remain in place. The sheath is entirely open, save for front and back crossbars at the top. As with other examples, this frame must have fitted onto a wooden or leather scabbard. TL:8.7cm, Max W:4.8cm, Thickness:1.1cm.

Milecastle 39 (Castle Nick).

The discovery of a dagger or short sword in its leather or wooden scabbard with copper-alloy bindings has already been noted (see above page 171).

Netherby.

A supposed dagger chape from this fort can be seen in Tullie House museum, Carlisle (Acc. no.35-1949.11). This consists of a thin sheet of bronze wrapped around to form an oval pocket with a rounded end. It is not really clear whether this can be considered as part of a Roman weapon or whether it is in fact "native". L:4.4cm. Max W:2.3cm. T:1.1cm. Date:The exact context of this object is not known. Flavian-4th century?

Richborough.

A bronze pelta chape from the Saxon Shore Fort was identified as coming from a dagger scabbard because of its small size. (Cunliffe 1968 p93, plate XXXIV.91). On the front side this has a single central point at the top, whilst the back is cut low, with a circular rivethole through it. Date:Unknown, therefore Claudian-4th century or later.

Watercrook

A pawn-shaped object perhaps a sword or dagger pommel has been found here (see page 77).

NOTES

*1 For more detailed discussion of 1st century daggers see in particular Manning 1985 p152-9;Scott 1985 p160-213 and Webster 1985 p214-219.

*2 For a discussion of arms production in the 2nd-5th centuries see chapter II. Whilst it is clear that under the empire weapons were generally supplied to the soldiers by the state, decoration was most likely a question of individual taste and financial means.

*3 There are for example knives from Brancaster (Hincliffe and Sparey-Green 1985 fig32 no.51), Richborough (Bushe-Fox 1949 plate LX;Cunliffe 1968 plate LIII) and Verulamium (Wheeler and Wheeler 1936 plate LXIV). In terms of size and shape none of these are convincing as weapons.

VI. Spears, Javelins and Darts.

"Hasta, pilum, phalarica, semi-phalarica, soliferrea, gaesa, lancea, spari, rumices, trifaces, tragulae, framae..." (Aulus Gellius, Attic Nights X, 26, 2).

This list of spear types - some of them non-Roman and some of them non-military - serves to illustrate the diversity of names for this form of weapon. Spear-type weapons of one kind or another were important in the Roman army from the earliest times. The early Republican army, divided into several classes, based on property, relied heavily on spearmen. Some elements of it were organised in a phalanx (Connolly 1981 p95). By the 3rd century BC at least the pilum was the principal shafted weapon of the legions, but the triarii still carried ordinary spears and the hastati must have done so at one time to judge from their name. The pilum continued to be used down to the early 3rd century AD, with perhaps some legionaries still being armed with ordinary spears.

A variety of other spears and javelins of diverse shape and size were prevalent in the 3rd-4th centuries. These may have assumed increased importance because of the demise of the gladius and hence the need for extensive training in sword-play (a slashing sword being much easier to use). Light troops, such as the Republican velites and the lanciarii, were often equipped with javelins. Spears and javelins were always very important to many of the auxiliary forces, whether cavalry or infantry, which were employed by the Romans. We know the names of many types of weapon, but unfortunately all to often very little else. The following chapter examines the extensive archaeological evidence for spears/javelins and darts in the Roman army in Britain and attempts to relate this to the information available in other sources.

The Pilum.

The pilum (along with the gladius) was one of the main weapons in use by the Roman legions for much of the

imperial period. It was a javelin about two metres long, the upper half consisting of a thin iron shaft topped by a pyramidal point, the remainder being the wooden shaft (Webster 1985 p127-8). The precise design and size of this weapon changed considerably during the course of its long history but the basic details remained essentially the same. The two halves of the weapon could be joined either by a tang or a socket.

The origins of the pilum may never be known for certain. All that can definitely be said is that the javelin was in use by the 5th century BC at least (Couissin 1926 p129-138; Connolly 1981 p98, fig 9; Bishop and Coulston 1989 p18). This is shown by an example from an Etruscan tomb at Vulci. This is socketed and about 120cm long, with a head of c15cm and a slender metal shank. It is not precisely the same as the pila described by later Greek and Roman writers, but it does have enough features in common with them to make the identification acceptable. The pilum may also be shown on a 4th century BC wall painting from Tarquinia. In addition there is literary evidence for the use of the pilum at this time. Livy has the Romans using it in 494BC (II, 30) and the Etruscans in 484BC (II, 46). Dionysius of Halicarnassus speaks of the Romans using the pilum against the Sabines in 477BC (V, 461-2), whilst Plutarch says that the dictator Camillus taught his men to use the pilum as a thrusting spear (Life of Camillus 40.4; 41.4). Finally, Appian (Gallic History I) mentions this type of weapon being employed against the Gauls in 358BC. Some of these references could be anachronistic, but the archaeological/pictorial evidence from Etruria does point to an early origin for the pilum. Unfortunately none of this proves that the Romans adopted the pilum from the Etruscans - something that Roman writers would be unlikely to admit to anyway. The sources are ambivalent and it is equally possible that the pilum was a Roman invention. Several alternative theories have been put forward as to the pilum's place of origin and these may be briefly considered here.

One possibility is that the pilum developed from a Spanish javelin known as the solliferrium. This weapon was very long and thin, but unlike the pilum it was made entirely of iron. It is possible that this javelin had some influence on the development of the pilum, but since true pila are not found in Spain before the mid 2ndc BC - the finds from Numantia (Couissin 1926 p210; Connolly 1981 p131 - it is not likely therefore that the pilum was first used in Iberia.

A few javelins with pyramidal heads have been found in 4th-3rd century Gallic tombs at Montefortino (Couissin 1926 p135, figs 37-8). In a passage relating to 358BC, Appian notes that:- "The Gauls used spears not unlike javelins, pila as the Romans called them, four-sided, half of wood, half of iron, which was soft except for the pointed end." (Gallic History I). However the Romans were also using the pilum in this engagement and given the date of the available archaeological evidence a Gallic origin for the pilum is improbable. It is not unlikely that the Gauls learnt of the pilum from either the Romans or the Etruscans following their first incursions into Italy.

For the theory that the Samnites were the inventors of the pilum there is a little archaeological evidence. Some pila of the tanged variety have been found in Samnite graves, which also contained 4th century BC pottery (information from Mr. Peter Connolly). Sallust (Bellum Catilinae LI, 38) states that the Romans took their offensive and defensive arms ("Arma atque tela militaria") from the Samnites, but he offers no supporting proof. As Couissin pointed out (Couissin 1926 p184), there is no reason why we should accept "tela" as referring specifically to the pilum. It is a word which occurs occasionally in Roman sources and it appears to be a general term for javelins, darts and even ballista bolts, rather than being a particular type of weapon (e.g. Ammianus Marcellinus XIX, 5, 6; SHA vita Aureliani XXVI, 4).

Overall the available information indicates that

either the Romans or the Etruscans invented the pilum - which we cannot say without more data.

Historical Development.

Through the Latin and Greek literature we can trace the gradual refinement of the pilum. Although the length of the weapon varied somewhat from period to period, changes were in the main concerned with the method of fastening together the shaft and the iron part of the javelin. Polybius (VI, 23, 9-11) describes two kinds of pila in use at the time of the Punic wars, one thick, the other thin:- "Of the stout ones some are round and a palm's length in diameter and others are a palm square. The fine pila which they carry in addition to the stout ones are like moderate sized hunting spears, the length of the haft being in all cases about three cubits[c54 inches]. Each is fitted with a barbed iron head of the same length as the haft. This they attach so securely to the haft, carrying the attachment halfway up the latter and fixing it with numerous rivets that in action the iron will break sooner than become detached, although its thickness at the bottom where it comes in contact with the wood is a fingers breadth and a half, such great care do they take about attaching it so firmly." It is presumed that the two pila were thrown in quick succession before the legions closed in for hand-to-hand fighting. The type of pila with a tang rivetted to the shaft is known from finds at Telamon and Numantia (Couissin 1926 p192-3, 210). The shaft had a pyramidal expansion at this point, which may have been intended as a guard for the hand if the pilum was being used in close combat. This feature persisted into the imperial period - it is found for instance on the pila from Oberaden. A socketed variety is also known from archaeology. The existence of these two methods of attachment probably explains Polybius's reference to "thick" and "thin" pila. Less probably, he may have meant that the two types were of different weights. Using Polybius's account we arrive at a figure of over eight feet for the length of the pilum, which seems rather excessive for a throwing spear. Archaeology cannot be used to decisively prove or disprove Polybius's reckoning as the

wooden parts of the weapons do not survive. However it would appear that he only gave a rough estimate of the size of the javelin. There are two pilum heads from Hod Hill (Manning 1985 p159) which seem to be complete down to the point where the wooden shaft would have begun. These are only 55cm and 61 cm long. Clearly, these weapons could vary greatly in size - the heads from Numantia ranged from 27 to 95cm (Couissin 1926 p210).

Dionysius of Halicarnassus (V, 461-2) says of pila that they had "long shafts large enough to fill the hand and.... pointed iron heads, not less than three feet[91cm] in length projecting straight forward from the end and with the iron they are as long as spears of moderate length." Assuming that the wooden part was of equal size then the pilum would have been about six feet (c183cm) long; a practical length for a javelin.

A major change in the pilum's construction occurred at the turn of the 2nd/1st centuries BC, allegedly at the instigation of Marius (Plutarch, Life of Marius XXV.3). One of the rivets was replaced by a wooden pin, thus ensuring that when the javelin struck home, the pin would break, leaving the shaft dangling on the ground. This would render useless any shield that the javelin hit and prevented the weapon from being thrown back by the enemy. By the time of Julius Caesar however, a different approach had been taken to this problem. Henceforth only the point was hardened and the shank was left soft so that it bent on impact, creating the situation already described. The effectiveness of this measure may be judged from the account of Caesar's battle against the Helveti in 58BC (De Bello Gallico I, 25). The Helveti "were greatly encumbered for the fight because several of their shields*1 would be pierced and fastened together by a single javelin cast." The crucial feature of the pilum's design is noted by several later writers (Arrian, Order of battle against the Alani 16-17; Appian, Gallic History 1).

The principal function of the pilum was as a missile

weapon and when used in massed volleys the effects must have been devastating (Appian, Gallic History 1). However there were occasions when pila were used in other ways. Camillus is said to have trained his men "to use their long javelins like spears, to thrust them under the enemy's swords and catch the downward strokes upon them." (Plutarch, Life of Camillus 40.4). Arrian as Governor of Cappadocia in the reign of Hadrian ordered that in battle the legions should be drawn up in eight lines:- "Let the first four lines be composed of men armed with pila, the points of whose pila are drawn out so as to be long and slender. The front rank men are to hold these pila for protection so that if the enemy comes to close quarters they may plant their pila by preference in the chests of the horses. The second rank men and those of the third and fourth lines are to throw forward their pila by way of missiles (Order of battle against the Alani 16-17). Here is a clear example of the Roman army adapting its weaponry to fit the local circumstances and this must have happened in many provinces.

The pilum maintained its dominant position in the legionary arsenal into the second century AD. From then on it declined in importance and eventually disappeared. It was replaced by a number of shorter/lighter darts or javelins. The precise date of this change cannot be pinpointed, but as with other changes of equipment it seems to have occurred during the second half of the 2nd century and the early part of the 3rd. The pilum is referred to at least three times in the SHA (vita Pescennius Niger VI, 1; vita Diadumenianus IX, 4; vita Divo Claudio VII, 5) - a work supposedly composed in the reign of Diocletian, but which in reality seems to have been written over a century later in the time of Theodosius I.*2 Pila are virtually unknown by that date, so these references may well be anachronisms. More reliable perhaps is a passage in Vegetius (Ep. rei Mil. I, 20). The author states that the pilum was "headed with a triangular sharp iron, eleven inches or a foot long." (c28-30cm). If it is really the pilum that is meant then it had shrunk somewhat. In the

early empire pilum heads were mostly about 65-75cm long (Connolly 1981 p233). Vegetius goes on to say that "at present they [pila] are seldom used by us but are the principal weapon of the barbarian heavy armed foot. They are called bebrae and every man carries two or three of them into battle." As will be seen in due course there are reasons for suspecting that Vegetius is NOT talking about the pilum as such - there is no evidence that the barbarians used this weapon - but rather he is describing a slender barbed spear, sometimes referred to as the gaesum. This may owe its form to the pilum. The lack of any references to the pilum in work of Ammianus is striking and can hardly be a matter of chance.

Pictorial Evidence.

For the history of the pilum in the second century AD and later we need to turn to various pictorial sources. The tanged type with the pyramidal expansion at the junction of the head and the shaft appears on an Antonine relief from Croy Hill (Robinson 1975 plate 201; Coulston 1988 p1ff) which is presumed to represent legionaries. The socketed form is certainly known from archaeological finds but is largely absent from sculptures. A possible exception is a panel in the Palazzo dei Conservatori in Rome which depicts the emperor Marcus Aurelius receiving defeated barbarians (Couissin 1926 p359; Strong 1988 plate 135). Here a figure to the left of the emperor holds a weapon with a pyramidal head and a thin neck which expands into a socket. The pilum is notable by its absence from the columns of Trajan and Marcus*3, even the legionaries carry ordinary spears. However some artistic factor may have been at work here for finds from Britain show that the pilum was still in use down to the early 3rdc. Another type of pilum known so far only from sculptures had a circular weight (presumed to be of lead) immediately below the pyramidal expansion of the shaft. Weighted pila appear on the Domitianic Cancellaria relief (Brilliant 1974 fig V.5), the Trajanic Adamklissi monument and a number of tombstones including 3rd century praetorian stelae (Coulston 1988 p9 - 10). A figure to the left of the emperor's chariot on a relief on the Arch of Titus is in my opinion carrying such a weapon (Strong 1988

plate 69). From the sculptural evidence these pila seem to have been introduced in the late 1st century AD and to have persisted into the third. The purpose of the lead weight might have been to increase penetration and therefore killing power.*4 It would be useful to have some archaeological evidence to back up the sculptural depictions. We cannot be certain that the objects depicted are indeed weights or that they were circular - since the representations are basically two-dimensional. The use of lead weights on weapons is not unknown as is shown by the plumbata (see pages 219-224).

A further development is what appears to be a double-weighted pilum. A spear/javelin with two circular weights, a thin metal shank and a conical butt is shown on the tombstone of the praetorian M. Aurelius Lucianus (Oldenstein 1976 abb 13.2). This stone is dated to the 3rd century AD (Couissin 1926 p369). Similarly, the beneficiarius tribuni Petronius Proculus, depicted on a tombstone from Apamea (Balty 1988 plate XIV, 2) carries a double-weighted weapon with a pyramidal head and a conical ferrule. His tombstone belongs to the early 3rd century. Again, no actual examples of this type have been found.

These changes to the pilum mark the last attempts at maintaining the offensive capability of the weapon. They may have been rather short-lived. Although the addition of weights would have helped improve the pilum's stopping power, they must have been detrimental to the range. This is usually reckoned as being about 30 metres at most. Changes in offensive weapons are often tied to changes in an opponents defensive protection and this may be the reason behind the introduction of the weighted pilum. The absence of weighted pila from Britain could thus be due simply to the lack of any heavily armoured opponents. The available evidence for weighted pila begins in the late 1stc AD. Perhaps they were introduced as a counter to the armoured Sarmatian cavalry with whom Rome had considerable difficulties in the late 1st and 2nd centuries.

Most military sculptures of the later 2nd century do not show the pilum (Coulston 1988 p141) and it seems reasonable to assume that the weapon gradually began to disappear at this time.

The Archaeological Evidence from the Continent.

Remains of pila are exceedingly uncommon in Britain and generally consist solely of the hardened iron point. Naturally enough very little of the wooden shaft ever survives, but also the untempered iron shank is seldom found since it was thin and very susceptible to corrosion. On the tanged pila, the tang itself was equally vulnerable to decay once buried in the ground. It is rarely possible to tell whether a pilum point came from a socketed or a tanged weapon. There is as yet no clear proof that the lead-weighted pila were used in Britain.

For a clearer picture of the pilum's overall appearance we have to rely heavily on a few well-preserved specimens from the continent, all of them pre-dating the period under study here. Most important of these are the pila from Oberaden (Robinson 1975 plate 1; Robinson and Embleton no date p31). Three pila were found, dating from the Augustan period. Unfortunately these finds were destroyed during the bombing of Cologne in World War II and no records survive except some photographs. The pila had pyramidal heads and thin iron shanks (bent in two cases) ending in tangs. The tang was rivetted to the wooden shaft (which had an expansion of the type already described) and the joint was further secured by a pyramidal iron binding. A little of the shaft survived below the expansion. These are (or rather were) the only pila found with substantial parts of the wooden component surviving.

The 29 points from Numantia (Couissin 1926 p210, fig58) were from 27 to 95cm long, of which the socket or tang comprised 7 to 10cm. These finds belonged to the mid 2nd century BC. They had pyramidal points.

The pila from Alesia had either round or square-

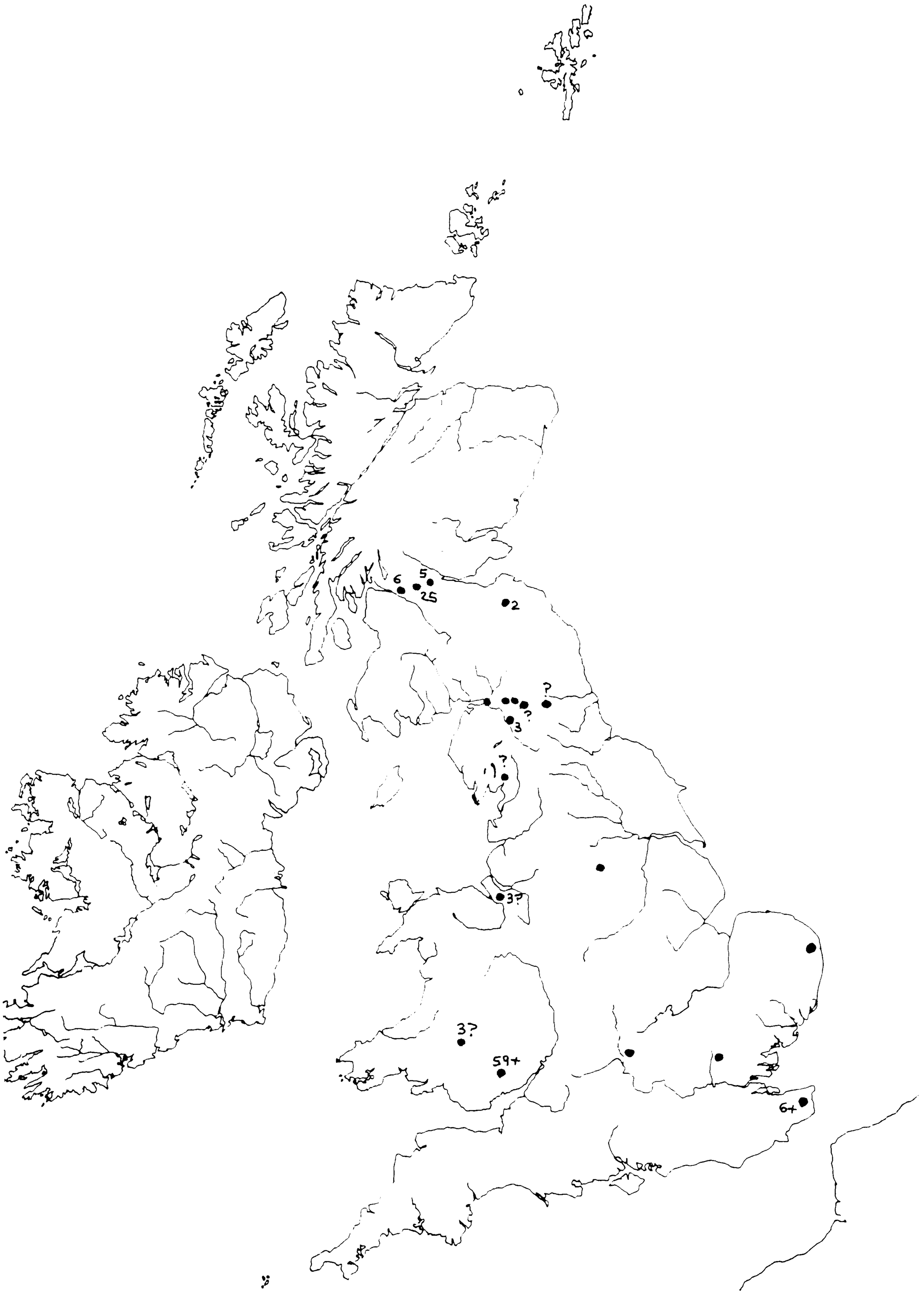
sectioned shanks, the thickness usually being about 1.2cm. There were 39 in all, both tanged and socketed. The shape of the heads varied greatly, from the common pyramidal form to harpoon-shaped, quadruple barbed and even leaf-shaped (Ibid p285). This variability is startling and has clear implications for the identification of pila on other sites.

From the Augustan period there are socketed examples from Ornavasso and Great St. Bernard in Italy, the former incidently with a three-sided head - yet another variant. The Ornavasso pilum is 73cm long with a head of 13cm, whilst for the St. Bernard find the measurements are 87cm and 15.8cm respectively. The pila from Osuna in Spain (c45BC) have both pyramidal and flat heads and both socketed and tanged types are represented. One of the pila from Mainz is over one metre long (Ibid p363). Pila have also been found at Carnuntum (Von Groller 1901 p126), Hofheim (Ritterling 1913 taf XVII no.s 26-28, 55) and at Lauriacum (Von Groller 1919 taf 60 no.1) amongst other places.

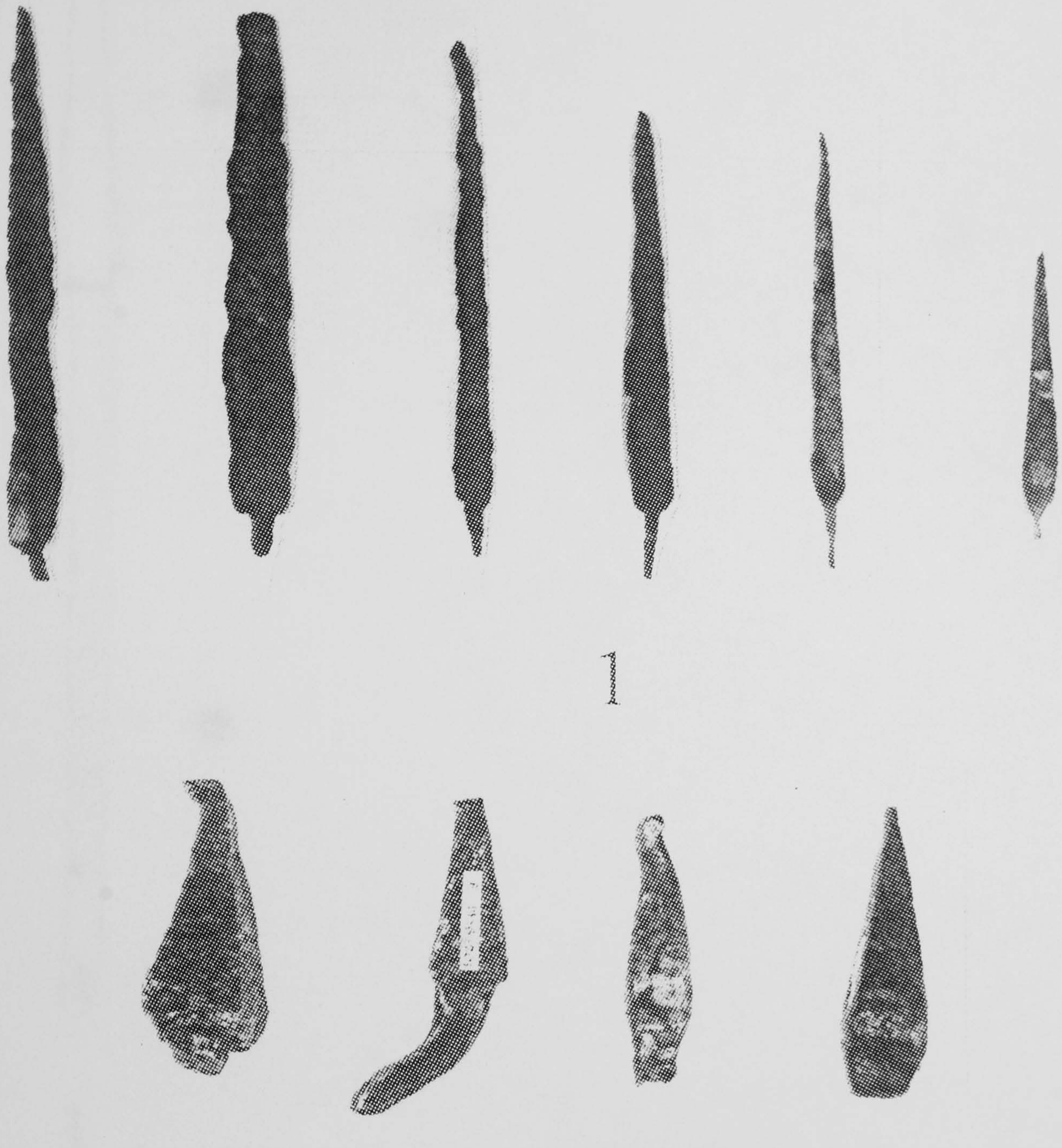
Without dwelling for too long on the continental finds, it is easy to see that there was tremendous variation with regard to the size, shape and constructional details of the pilum. This may have been true also of the pila from Britain. Some of the variability in length may be due to the frequent reforging of broken pila (Couissin 1926 p293) which would thus become shorter every time. We would be unwise therefore to accept any one find as being of typical length. Probably some flexibility was allowed even when new weapons were being made. Couissin estimated from sculptural depictions that the pilum was about 2 metres and 20cm in length (Ibid p367), but this can only be an approximation given the problems of scale and artistic licence.

The Archaeological Evidence from Britain. (Map 12)

We now turn to pilum heads from Britain dating to the 2nd century or later. The distribution of these finds is rather interesting, including as it does not only legionary bases, but also a substantial number of auxiliary forts.



MAP 12: Pilum Points.



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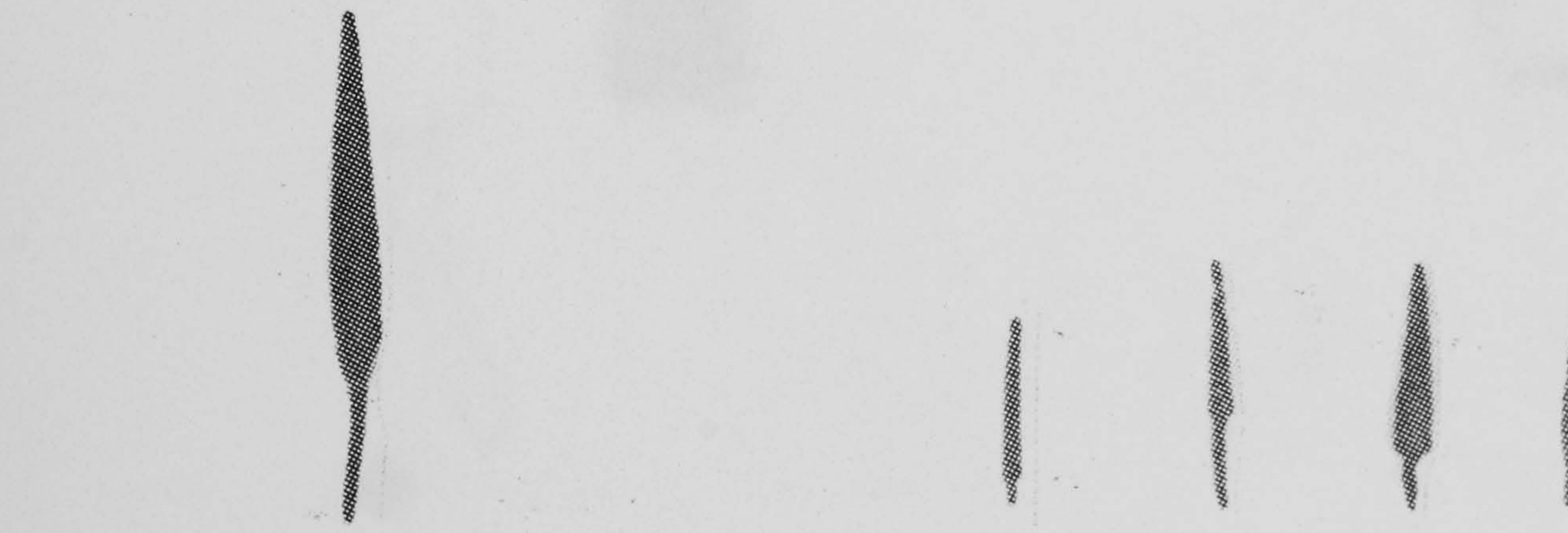

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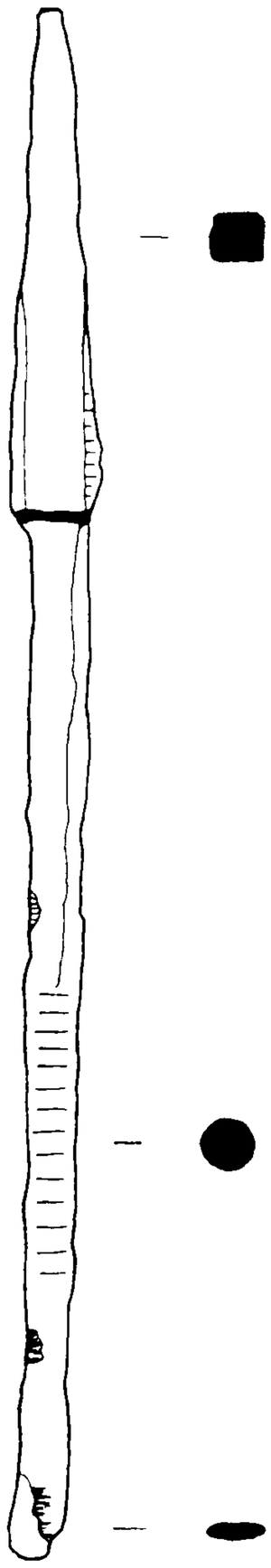
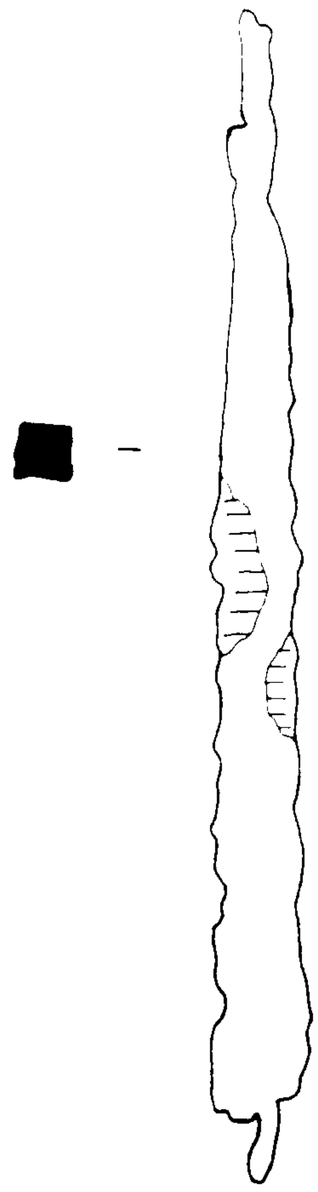
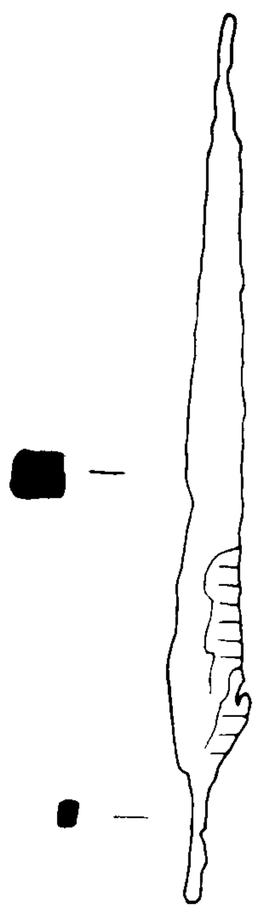
PLATE 10: Pila/"Bodkin" Arrows (all at 1:3)
1. Caerleon 2. Bar Hill
3. Carlisle 4. Richborough







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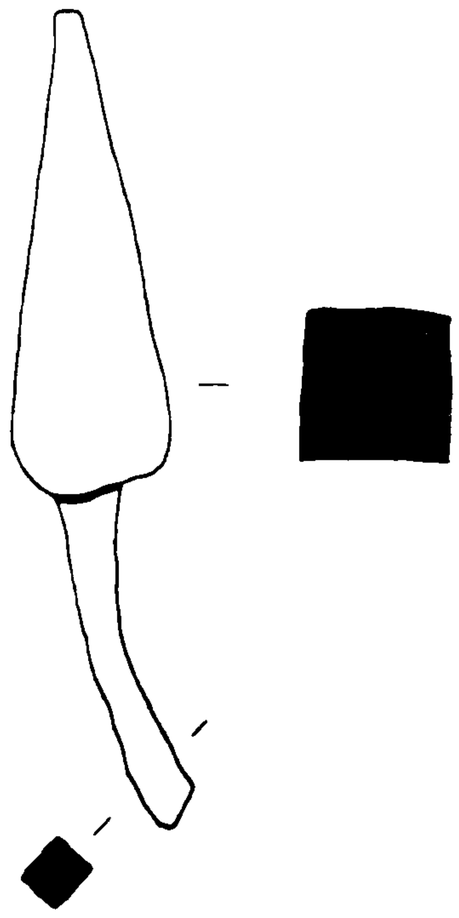

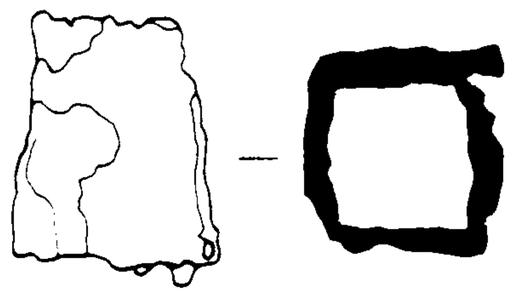

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FIG 8: Pilum Points (all at 1:2)
1. Richborough IV 282 2-3. Caerleon
4. Bar Hill 5. Hod Hill, Binding (1st c)

This is a significant point which will be considered in detail later (see below page 194).

Alchester.

An "iron object resembling a pilum point" was found in the 1926 excavations in the town. It came from a context dated to the 2nd century AD (Hawkes 1927 p181, fig 10 no.6). No further details are known of this find.

Bar Hill. (plate 10 no.2).

Excavations took place in the fort in 1902-5 and the excavators recorded the discovery of 22 wedge shaped iron objects in the well, all bent and blunted. A further four were found in the ditch of the titulus outside the east gate (Macdonald and Park 1906 p117). Twenty five such objects can now be found in the Hunterian museum (A. Robinson et al 1975 p100; Acc. no. F.1936.201). They are pyramidal in shape and square of section and they clearly had square-sectioned shanks, although these are mostly lost. The majority range from about 5 to 7cm long and they are all extremely thick and heavy - at least 1.5cm across and 2.3cm in one case. One better preserved specimen has a piece of the shank attached. TL:14.3cm. HL:c5cm. Max W:1.4cm. The most striking feature of these finds is their great thickness in proportion to their length. The damaged state of most of them suggests violent contact with a solid object/surface. It is quite possible that these are pilum heads - the shape is correct - but they might be tool heads of some kind. Date:Antonine. Two auxiliary units are known to have been based here - Cohors I Baetasiorum and Cohors I Hamiorum. As the Hamians were archers the pila are more likely to have belonged to the other unit, or to a legionary working party.

Bearsden.

Excavations in 1978 produced six possible pilum points (Breeze et al 1979 p23; Hunterian Museum - no accession numbers). These are very like the finds from Bar Hill and equally thick and heavy. Some of the points are bent and none has more than a fraction of the shank remaining. The

largest is 1.7 cm across at its widest point. One of the objects has an arrowhead adhering to the side of it. The suggested garrison of this fort (Breeze 1979 p22-3) is three turmae of Cohors IV Gallorum Equitata from nearby Castlehill, but there is no epigraphic evidence to back up this theory. Legio XX is recorded on a building inscription from the site and the pila are perhaps more likely to have belonged to that unit. There may of course have been some other unit based here. Date:1st Antonine phase (c140-155AD).

Brecon Gaer.

Wheeler (1926 p118) mentions two or three pilum points in his excavation report but does not describe them. These were not available for study but I did examine a very corroded piece of iron shaft from Brecon which might have been part of the stem of a javelin (National Museum of Wales, no accession number). This is 11.4cm long, triangular (?) in section and ends in a closed socket. SD (Int) :1.1cm. SD (Ext) :1.3cm. Date:unknown, therefore Flavian or later. The Ala I Hispanorum Vettonum was the garrison in the 1st century (Simpson 1963 p17), although it is suggested (Jarrett 1966-8 p430) that by c150AD a quingenary cohort was based here. Legion II Augusta built the stone fort around 140AD or later (Simpson 1963 p36).

Caerleon. (plate 10 no.1).

Fifty-five pilum points were found in the Prysg Field excavations of 1927-9 (Nash-Williams 1932 figs 20-1, p27), as well as two pieces of shank without the heads (Ibid p28, fig 24 no.s 6-7). Although a number of the points are complete, very few have much of the shank surviving. They range from 7.3 to 18.4cm. All are pyramidal in shape and square-sectioned and where it can be determined the section of the shank is square also. The Caerleon pila exhibit much variation in size and thickness. This is NOT merely a result of differential preservation. In seven examples where the heads are complete the length varies from 7.7 to 16.2cm and one incomplete head is 18.4cm long. The maximum width is between 0.9 and 1.7cm. This is probably more to do

with the random nature of the forging process than anything else. There does not seem to be any correlation between length and width so we are probably not dealing with different grades of pila. Date:Nash-Williams dated these finds to c200-300AD. However it seems that this part of the fortress was abandoned by c200AD (J. Casey pers. comm. ; Boon 1972 p56).

The two pieces of shaft are probably also from pila. No.6 is square-sectioned, with the remains of a flat tang at the lower end. TL:30.2 cm. Max Thickness:0.8cm. Width of tang:1.9cm. Date:105-200AD? found in barrack block 7, room 37. No.7 also has a square-sectioned shaft, ending in a closed socket. TL:30.2cm. Thickness of shaft:0.6cm. SD (Int) :0.9cm. SD (Ext) :1.1cm. Date: 105-200AD? A pilum point associated with this find in the display case was not in fact found with it. These finds indicate that Legion II Augusta was using both socketed and tanged pila.

Caister-on-Sea.

One possible pilum point has been found here. It is pyramidal and square-sectioned and there is a distinct junction with the thin square-sectioned tang. This might alternatively be an awl. Date:3rd/4th century? (Information from Miss M. Darling).

Carlisle. (plate 10 no.3).

A possible pilum point from this site can be seen in Tullie House museum (Acc. no.81-1975.3). This is of the usual form, with a thin, square-sectioned shank. TL:13.2cm. HL:c8.5cm. Date:No context is recorded for this find. One may speculate that it is connected with the building of Hadrian's wall, when legionary troops were in the general area but this cannot be proved. The find may even be Flavian, but there does seem to have been a military presence in the town as late as the early 3rd century (McCarthy 1984 p70).

Chester.

There are two possible pilum points in the Grosvenor

museum. In addition there is a very corroded piece of shaft, possibly circular in section from the Deanery field site (Old Collection B. A.1928; Droop and Newstead 1931 p136 no.85). This is 10.3cm long. An unnumbered diamond-shaped point in the Old Collection is described as being a "javelin head". The section of the head may be square and this is definitely the case with the remains of the shaft. The find is known to be from Chester but is otherwise unprovenanced. TL:12.5cm. Max W:2.6cm. The second point came from the Abbey Green excavations (CHE/AG 75.3 II 795 2314). The head (lacking its tip) is square-sectioned and pyramidal, whilst the shank is also square. The identification as a pilum point is admittedly rather speculative - the object is very small. TL:8.5cm. HL:4.2cm. Max W:1.2cm. Thickness of shank:0.6cm. Date:Unknown, therefore Flavian or later. The finds ought to be associated with Legio XX Valeria Victrix.

Corbridge.

Numerous pilum points have been found at this site, the most notable discovery being a group of 23 found in 1938-9 (Richmond and Birley 1940 p112, plate XI). These were of the usual form. Five of them were about 4" (c10 cm) long, eight were 2.25" (5.7cm) long and the rest 1.5" (3.8cm) in length. In all cases the measurements exclude the remains of the shanks. The finds came from Workshop III in the west compound and were dated to the Severan period (Ibid p106). Unfortunately the documentation for these finds is inadequate and it is not possible now to identify these objects from amongst the many pilum points in the collection at Corbridge. The workshops are reckoned to have been manned by detachments from the legions (Richmond and Birley 1940 p106), but which troops these pila were intended for we cannot know with certainty. Part of a socketed pilum was among the finds in the Corbridge Hoard (Bishop and Allason-Jones 1988 p9, fig9). As noted in chapter 1 (see page 22) the dating evidence for the Hoard is ambiguous and a Flavian date is quite feasible. The pilum had a pyramidal point (broken off) and a square-sectioned shank. Length:c34cm?

In addition there is another, unpublished find from Corbridge.*5 The head is pyramidal and of square section, lacking the tip. Most of the square shank has also been lost. The similarity with the finds from Caerleon is unmistakable and it seems quite reasonable to identify this object as a pilum point. TL:13.3cm. HL:12cm. Max W:0.8cm. Date:No context is recorded for this find. Flavian or later.

Kirkby Thore.

Three possible pilum points from this site can be seen in Tullie House museum (Acc. no.s 27-1926.106, 27-1926.107, 27-1926.108). All three are of the usual form. TL:7-8cm. HL:5-7.5cm. These objects do not seem to have been published. Date:Unknown, therefore Flavian or later. An altar from Kirkby (RIB 764) may have recorded a unit of Syrian archers-not the kind of unit one would normally associate with the use of the pilum. The Numerus Defensorum may have been based here in the 4th century - if we accept that Kirkby is the "Braboniaco" of the Notitia.

Milecastle 48 (Poltross Burn).

This object is also in Tullie House museum (Acc. no.7-1911) and is identical to those from Kirkby Thore. The shank is broken off and the tip is missing. TL:7.4cm. Max W:1.2cm. This is too short to be identified with any of the published spearheads (Gibson et al 1911 p445) unless the measurements quoted are very innaccurate or the find has lost some of its length since its discovery. Alternatively it may be an unpublished find. Date:Hadrianic or later.

Newstead.

There are two finds from the excavations early this century which may be points from pila (Museum of Antiquities, Edinburgh Acc. no.s FRA 218, 1550; Curle 1911 plate XXXVIII no.s 9, 11). Both have heads of the usual shape, the shank square-sectioned in one case and probably round in the other. TL:9.4/8.3cm. HL:6.1/7cm. Max W:0.8/1cm. These finds are very small and slender and they could be projectile heads of another kind e.g. arrowheads.

No.9 was found near barrack block XVI. The context of the other find is not known. The Antonine garrison here consisted of a legionary vexillation and the Ala Vocontiorum. Date:Flavian or Antonine.

Richborough. (plate 10 no.4).

Four objects are identified as pilum points in the 4th excavation report (Bushe-Fox 1949 plate LVIII no.s 281-2; plate LIX no.s 295-6) and a number of other projectile heads (some unpublished) may belong in this category. To deal with the published finds first, two (no.s 295-6) are in fact heads of plumbatae and will be examined later. No.281 is the remains of a socketed pilum. The point is square-sectioned near the tip but rounded further down. The socket is incomplete. TL:23.6cm. SD (Ext) :2cm. Found in Area X (south of the monument). No.282 is the point and upper section of the shank from a pilum. There are two very similar finds amongst the Richborough material (housed at the AML, London) which could be identified with the published object. One of these is actually labelled "IV 282". The shank of this is round for most of its length but the last 4cm or so has been flattened out. This implies it was a tanged pilum. TL:29cm. HL:6cm. The other find is virtually identical, including the flattening of the lower part of the shaft. TL:24.5cm. HL:7.8cm. Max W of head:1.3cm. Max W of shank:1cm.

Three diamond-shaped objects may also be pilum points (c.f. Cunliffe 1968 plate LIII no.266). Two are unlabelled, the third is marked "595". All have square-sectioned heads and one has the remains of the shank, also square. TL:10.3/13.2/10.8. Max W:1.6/2.5/1.6.

Yet another unlabelled object has the familiar pyramidal shape and the stump of a square shank. TL:7.2cm. Max W:1.7cm. Date:Very little of the Richborough material was stratified and this includes the pilum points. They could be residual finds from the first century occupation but that phase of the site's history was probably very short. Part of Legio II Augusta was based here in the late

4th century or earlier and the finds may be pila (or similar weapons) belonging to that unit.

Seabegs Wood Fortlet (Antonine Wall).

Five pilum points and a detached section of shaft were found here in 1977 (Hunterian museum Acc. no.s 1981.450-5). These are of the usual form, with very little of the shanks surviving. TL:c5.5-7cm. Max W:1.5-2.2 cm. The piece of shaft is c14.5cm long. The garrison of the fortlet is unknown. Date:Antonine.

Templeborough.

There is one possible pilum point from this site (May 1922 p76). Date:unknown, Flavian or later.

Turrets 48a/48b (Willowford East/West).

A "small heavy fragment, pyramidal in form" was amongst the finds in the 1923 excavation (Shaw 1926 p444). No other details are known. Date:Hadrianic or later.

Verulamium (St. Albans).

Part of a what may be a socketed pilum (lacking the head) was found amongst 4th century material in a cellar (Wheeler and Wheeler 1936 p218, plate LXIVA no.1). Assuming that this was a pilum it constitutes the latest evidence from this country for that kind of weapon.

Vindolanda.

One possible pilum point was found in the fabrica in 1986 (find no.3417). The head is rather worn and could have been square or round-sectioned. It comes to a very sharp point. Tne object is socketed however and does not have the long thin neck characteristic of pila. I prefer to see this find as a ballista bolthead. TL:8.1cm. HL:4.6cm. SD (Ext) :0.7cm. Date:120-140AD. Other pilum points have apparently been found since but are not available for study*6. Several auxiliary units are attested here, whereas legionaries are only mentioned on a single writing tablet out of nearly 1000 found so far. I do not think that this constitutes sufficient evidence for a legionary garrison and this

should not be assumed merely because pilum points have been found at the site.

Some general comments and conclusions.

A fair number of projectile heads from Britain have been identified as pilum points*7, but the quantity (around 135 excluding early finds) is minute considering that for most of the period under discussion there were three legions in the province. Assuming an allocation of two pila per man and 5000 men per legion there should have been around 30000 pila in existence at any one time. This takes no account of losses, irreperable breakages and the possible existence of reserve stocks of weapons. The surviving sample represents only 0.5% of the pila theoretically in existence in any one year - and remember we are dealing with a period of over 300 years.

It is true that for all types of weaponry we have only a small sample when compared to the great quantities which must have been made. The amount of pila from Britain is undeniably small however, especially when we compare it to the number of other javelin/spearheads. What are we to make of this fact? Where are all the pila? The heads of these weapons ought to survive very well, for they were extremely robust and it is not likely that many have been mis-identified as the shape is very distinctive. Some small leaf-shaped points may also be from pila - note the variety of head forms of the Alesia pila (Couissin 1926 p285) - but we cannot prove this. A consideration of the relative quantities of pilum points and spearheads found at legionary fortresses in Britain makes for interesting reading.

Table 3: Pilum Points and Spearheads from Legionary Sites. *8.

SITE	PILUM POINTS	OTHER SPEARHEADS	GARRISON
Caerleon	55	18	Leg.II Aug.
Chester	2	8	Leg.XX V.V.
Richborough	6	24+	Leg.II Aug?

It is only fair to point out that the pila from Richborough could well belong to the conquest period. Legio II Augusta did not arrive here until the late 3rd century or later. The finds from the 3rd century workshop compound at Corbridge, manned by legionaries (Richmond and Birley 1940 p112, plate XI) included 23 pilum points and only one spearhead, but we do not know which bases and which kinds of troops the weapons produced here were intended for. The Corbridge Hoard included pieces of Lorica Segmentata (Bishop and Allason-Jones 1988 p9-17) usually thought to have been worn only by legionaries. There was only one possible pilum fragment as opposed to no less than 47 spearheads. Other legionary bases in Britain - Colchester, Exeter, Gloucester, Inchtuthil and Wroxeter do not seem to have produced any pila at all, although the early levels at several of these site have not been extensively explored. The supposed "vexillation fortress" at Longthorpe (Frere and St. Joseph 1974 figs 40-41) yielded only one pilum point and a length of shank, whereas six spearheads were discovered. It has not proved possible to make a thorough study of the evidence from other provinces, but the pattern of finds from Germany, Pannonia and Raetia does not seem to contradict the evidence from Britain.*9 Thus pila have been found at several auxiliary forts and the legionary bases have produced just as many spear-heads as pilum points. In fact the number of pilum points from continental sites may be even smaller than the figures suggest, for we must keep in mind that some of these objects may be arrowheads or parts of tools. It is of course worth bearing in mind that some legionary fortresses are known to have had mixed garrisons at some times and the presence of auxiliaries

would explain the relatively high numbers of spearheads at some legionary bases. This would still not explain the lack of pila however. What then are we to make of the archaeological data?

As already noted, the hardened points of pila ought to survive well in the archaeological record, so poor preservation is not likely to be the reason for the relative dearth of pila in contexts of the 2nd century AD and later. Spearheads often had very thin blades and most of those that have come down to us are in very poor condition. Surviving pilum points on the other hand tend to be well-preserved. It seems equally improbable that all the spearheads from sites like Caerleon - where there is no evidence for auxiliaries - belonged to the legionary cavalry. There were after all only 120 horsemen in a legion as opposed to 5000 infantrymen.*10 In theory therefore the ratio of pila to spears would be in the region of 80:1 assuming that each legionary had two pila. Of course it frequently happened that parts of legions were absent from their home base for extended periods and this would reduce the number of pila that could be lost/discarded due to damage.*11 But if the British legions were frequently abroad or scattered around the province manning small forts,*12 then one would expect substantial quantities of pila from these sites. There are pila from both sources, but not as many as one might expect. Table 4 gives some data on finds of pilum points and spearheads from auxiliary forts, milecastles and fortlets in Britain. Newstead, which is known to have had a partly legionary garrison is shown for comparison. The nature of the military occupation at Carlisle is uncertain.

Table 4 : Numbers of Pilum Points and Spearheads on Auxiliary Sites in Britain. (some 1st century material has been included).*13

SITE	PILA	SPEARHEADS	GARRISON

Bar Hill	25/6	2	Auxiliary
Bearsden	6	4	Auxiliary?
Brecon Gaer	2-3	2	Cavalry?
Carlisle	1	10+	?
Kirkby Thore	3	2	Auxiliary
Milecastle 48	1	4?	?
Newstead	2?	18+	legionary/ aux.cavalry
Seabegs Fortlet	5	-	?

We are thus faced with three problems. Firstly the number of pila from contexts post-dating the 1st century AD is not high; secondly many of the pila that we do have come from seemingly inappropriate contexts and thirdly the legionary sites are not producing anything like the numbers of pila that one would expect and are producing as many if not more spearheads.

Obviously one should not overlook the problem that finds of weapons are uncommon on Roman military sites - due no doubt mainly to a desire for tidiness and the recycling of material. However the available data does tend to suggest that even in the 2nd century AD the use of the pilum was declining. The finds of pila on auxiliary sites may be explained in a number of ways. Some of the finds from the Antonine Wall may reflect the activity of legionary building parties. It is however stretching credibility a little far to try to explain away all the finds of pila from non-legionary sites. It is most tempting to see here another blurring in the distinctions between legionaries and auxiliaries. It could well be that on occasions auxiliaries were equipped with the pilum. It was essentially a weapon for close-order infantry and the auxilia were sometimes called on to perform in that role - as at the battle of Mons Graupius. Equally it can be argued that some legionaries continued to be armed with ordinary spears - as with the triarii of the Republican legions - and thus stocks of such weapons were kept at legionary bases. The archaeological evidence by its very nature is unlikely by itself to be able to prove such hypotheses. We might hope however for some new epigraphic evidence.

Pilum derivatives:The Literary Evidence.

a. The Spiculum.

Apart from the pilum Vegetius refers to two other types of javelin used by the legions; "the largest of which was composed of a staff five feet and a half long and a triangular head of iron nine inches long. This was formerly called the pilum, but now it is known by the name of spiculum. The soldiers were particularly exercised in the use of this weapon because when thrown with force and skill it often penetrated the shields of the foot and the cuirasses of the cavalry." (Ep. rei Mil. II, 15).

Celsus (De Medicina VII, 5, 5) says that the barbs (spiculis) on a missile head "cause greater laceration if extracted backwards." One might expect from its name therefore that the spiculum had a barbed head.*14

Given this rather limited information how are we to identify the spiculum amongst the archaeological material? We know that the head was about 9 inches (c23cm) long and possibly barbed. It is not clear whether it was triangular in shape or in cross-section. Couissin (1926 p480-1) considered that the spiculum was the weapon shown on three 3rd century tombstones (Ibid figs 177-9; see above page 181). This had a pyramidal head, triangular in section and with what may have been a spherical weight. If this weapon is not the pilum itself then it must certainly be related to it and so Couissin's identification is possible.

b. The Verrutum.

For this weapon Vegetius is once again our main source. Of the verrutum he says:- "The other javelin was of smaller size; its triangular point was only five inches (c13cm) long and the staff three and one half feet. It was anciently called the verriculum." (Ep. rei Mil. II, 15). Ammianus (XVI, 12, 46) mentions the verrutum in his account of the battle of Strasbourg, but he does not describe the weapon. In fact a weapon had existed under the name of verrutum for a very considerable period of time. In his account of the battle of the Trebbia in 218BC, Livy

describes the velites throwing "verutis" (XXI, 55, 11). Caesar mentions a centurion who threw a verrutum (De Bell. Gall. V, 44, 7, 10) and a weapon of this name is included in the list of Aulus Gellius (Attic Nights XXVI, 2).

From the sources we have it can be seen that the verrutum was a light spear or javelin. What is unclear is whether the weapon described by Vegetius and mentioned by Ammianus is the same as the arm referred to in the earlier sources. Did the verrutum begin as an ordinary javelin and gradually acquire features of the pilum? Or, was it in origin simply a smaller version of the pilum which eventually supplanted it? Sadly the literary evidence is insufficient to answer such questions. We must accept Vegetius's description and look for similar javelin heads amongst the archaeological finds.

The Archaeological Evidence from Britain.

From Vegetius's descriptions as they stand it would seem that the spiculum and the verrutum differed only in terms of their size. There are some spearheads from British sites which could be the remains of these two weapons. There is no way of definitely proving this statement and they are offered only as possibilities.

Chesters.

There are five spearheads with triangular sectioned blades in the site museum (Clayton Collection no.s 1638, 1659, 1668, 1671, 2690). The heads are long and thin, meeting the sockets with a saw-tooth pattern. They have short barbs lying close to the head. The best preserved specimen is 15.2cm long, of which the head takes up 9cm. Maximum blade width is 1.1cm, as is the external socket diameter. The remaining examples are 11.5, 13.4, 14 and 14.5cm long. Date: Unknown, therefore Hadrianic or later.

Newstead. (plate 11 no.6).

There is one spearhead from this site which is the same as those from Chesters (Nat. Mus. of Scot. Acc. no. FRA199). The tip is slightly bent and the socket is closed.

TL:14.8cm. BL:7.8cm. BW (Max) :1.2cm. SD (Int) :1.1cm SD (Ext) :1.5cm. Date:Flavian or Antonine. This find does not appear in the original excavation report (Curle 1911). Scott says that it may be from a late pit (Scott 1980 p337).

Unprovenanced.

There is a spearhead of this type in the Fulling Mill museum at Durham, the findspot of which is unknown. There are small barbs on the head and the socket is filled with the remains of the wooden shaft. TL:10.3cm. BL:c4.8cm. BW (Max) :1.1cm. SD (Ext) :1.5cm.

There are a few other spearheads which may be related to the above type. One from Corbridge (Acc. no.75.1188) has a four-sided point which meets the socket with the same saw-tooth pattern already mentioned. TL:10.4 cm. BL:c6.8cm. BW (Max) :2.9cm. SD (Ext) :2.1cm. There is also a slim spearhead of diamond section from the same site (Acc. no.75.1186) which is catalogued as a pilum point. TL:15.8cm. BW (Max) :2.2cm. SD (Ext) :1.8cm. Neither of the Corbridge finds can be closely dated. All of the finds discussed here are of a size more appropriate to the verrutum than to the spiculum.

<u>Continental Parallels.</u>

Four spearheads with triangular sectioned blades and closed sockets have been found at Kunzing in Raetia, in a the mid 3rd century hoard of ironwork (Herrmann 1969 Abb 4 no.s 11-14). They have the same saw-tooth pattern as the British finds. This feature is lacking on a triangular sectioned spearhead from Moos-Burgstall, another Raetian fort (Schonberger 1982 Abb 29 no.181). Additionally, Couissin illustrates some "verrutum heads" from the Rhine valley (Couissin 1926 figs 180-1). These are triangular in section but lack both the barbs and the saw-tooth arrangement.

"Standard Tips". (Map 13)

Under this label we shall be discussing a very

MAP 13: "Standard" Tips.

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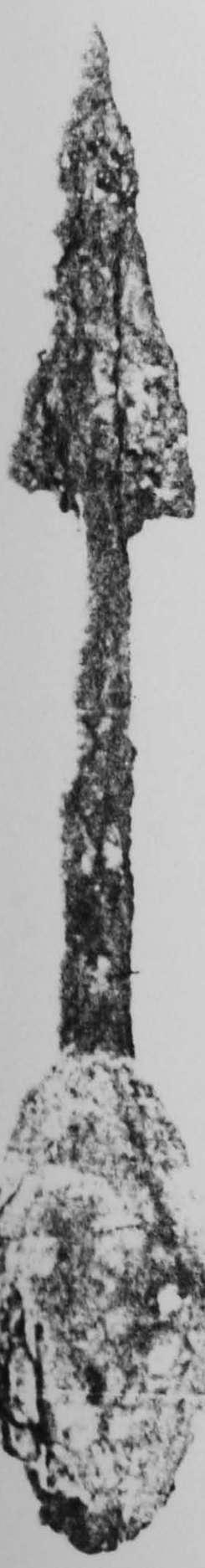

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PLATE 11: Barbed Spears
1. Carvoran (at 1:5) 2. Housesteads (at 1:1)
3. Richborough (at 1:1) 4. Caernarvon (at 1:1)
5. Richborough (at 1:1) 6. Newstead (at 1:1)

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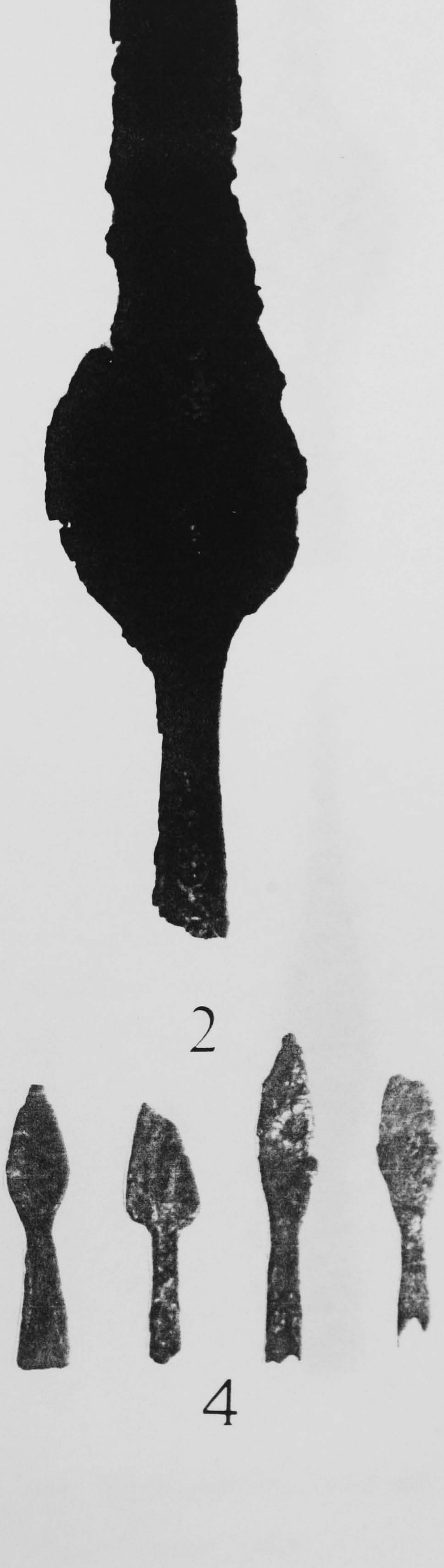

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PLATE 12: "Standard Tips" and Spearheads (all at 1:2)
1. Chesters 2. Chesters
3. Housesteads, "Lance" 4. Richborough

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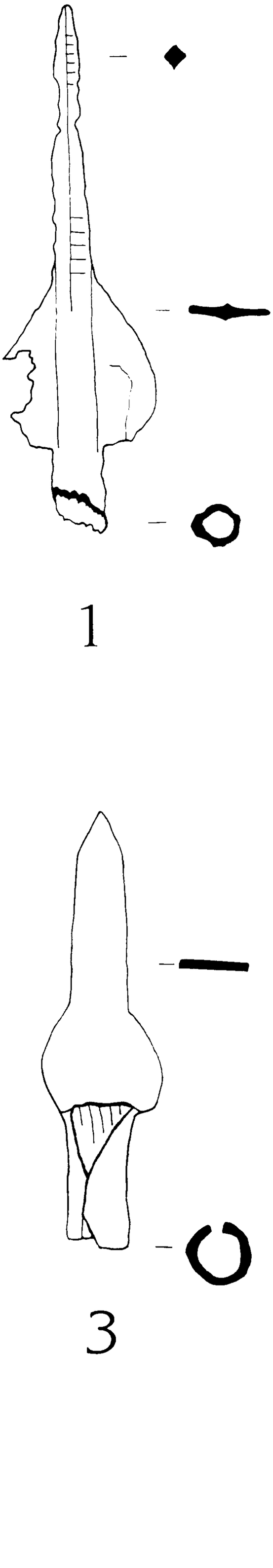
PLATE 13: "Standard Tips" and Spearheads (all at 1:2)
1. Burnswark "Lance" 2. Catterick
3. Richborough, IV 283 4. Vindolanda 3745



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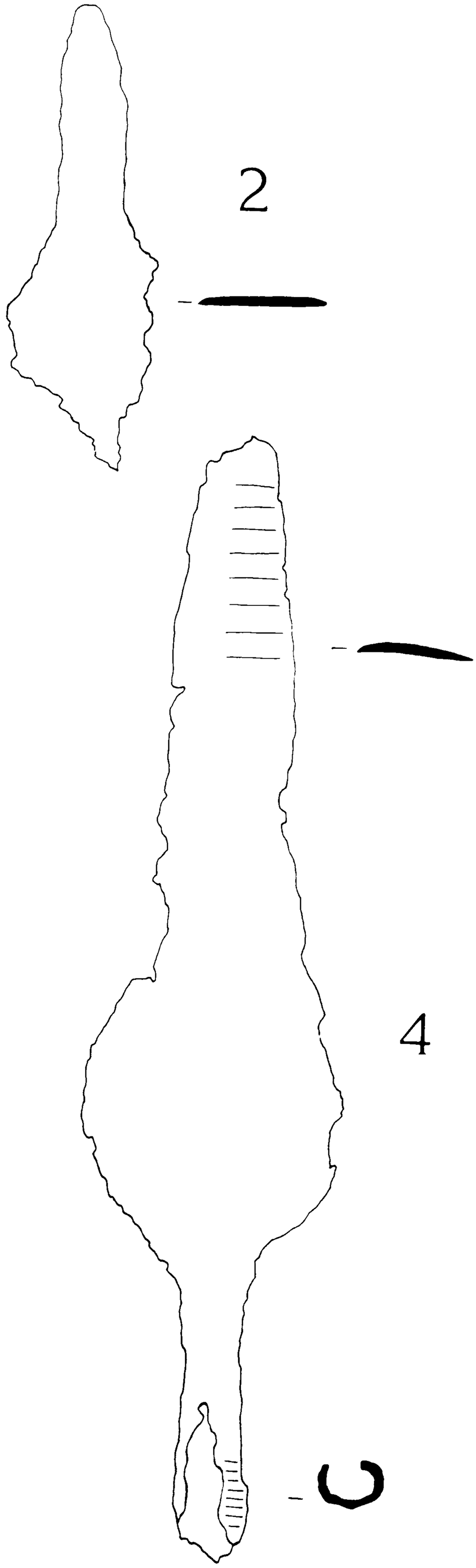

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FIG 9: "Standard Tips" (all at 1:2)
1. London 2. Haltonchesters
3. Vindolanda 3683 4. Chesters 1603A

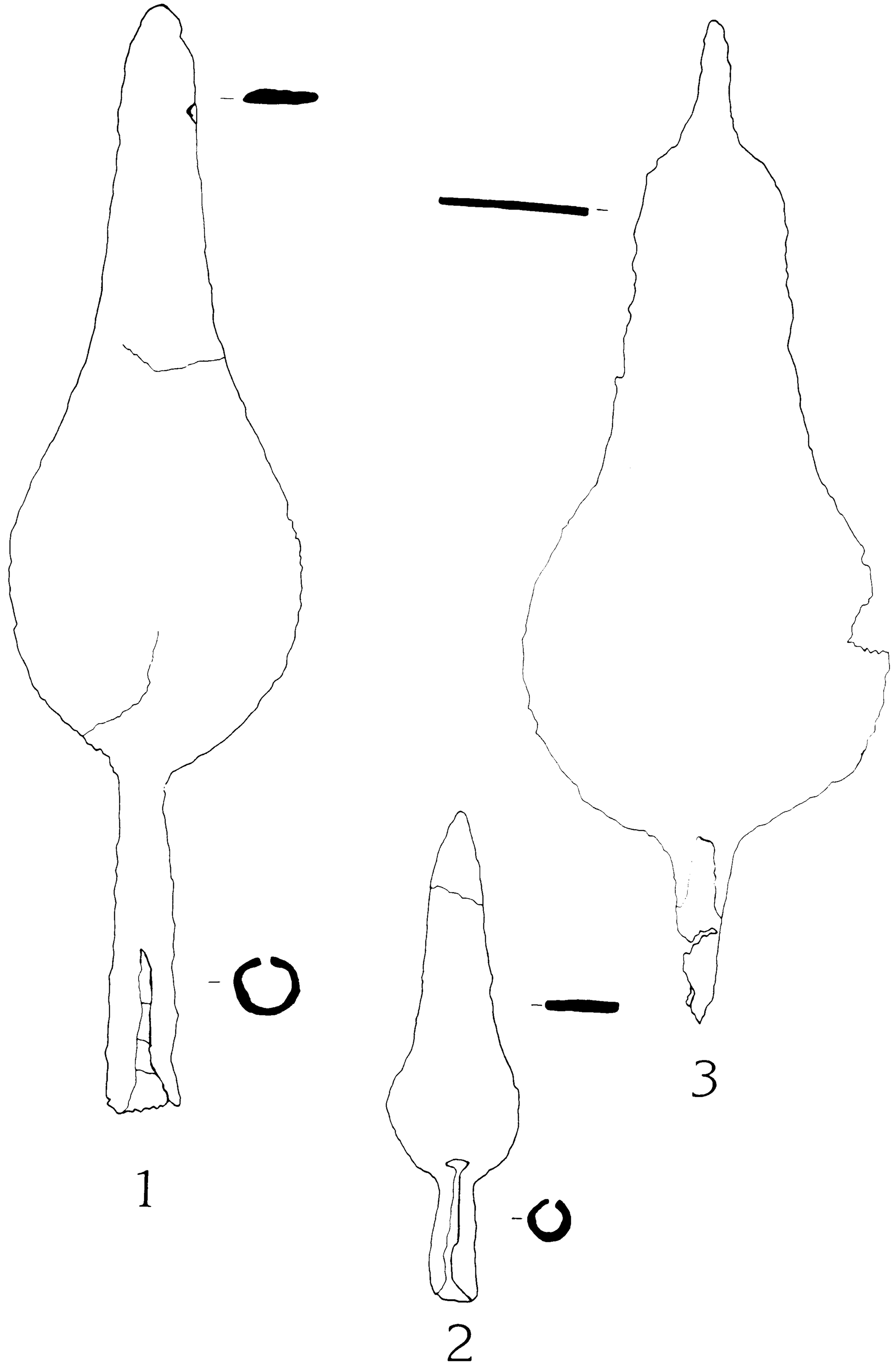


FIG 10: "Standard Tips" (all at 1:2)
1. MC.35 No. 39 2. MC.35 No. 40
3. Chesters 1604A

distinctive form of spearhead which in Britain is found mainly in the area of Hadrian's Wall. They are also sometimes found on the continent. The upper section of the blade is generally fairly straight-sided, but there is a marked swelling outwards in the lower portion before the blade curves back into the socket. The blade is usually blunt and lacks cutting edges. It is flat or nearly so on both sides and this gives it an almost rectangular cross-section. The socket is frequently of the wraparound type - the most insecure of all hafting methods - and the junction between blade and socket is often dangerously thin. To sum up, although these objects are basically spear-shaped - hence their inclusion in this work - they can hardly have been weapons as such. Several possible identifications exist and these will be discussed after the artefactual evidence has been reviewed.

Birdoswald.

There is an example of the type in Tullie House museum (Acc. no.31-1929) which lacks both the tip and part of the (split) socket. The construction is very crude. TL:16.8cm. BL:c11.9cm. BW (Max) :4.8cm. SD (Ext) :c1.8 cm. Blade Thickness:0.4-0.5cm. Date:Unknown, therefore Hadrianic or later.

Brancaster.

One example has been found here. It is flat-bladed with a blunt tip (Hinchliffe and Sparey-Green 1985 fig 93.88). Date:3rd/4th century?

Caerleon.

One possible "standard tip" was found during Wheeler's excavations of the amphitheatre (unpublished). The tip of the blade is lost but the bulge at the base suggests an affinity with this group. The socket is split. Not available for detailed study. Undated, therefore Flavian or later.

There is also an example from the unpublished "Roman Gates" excavations (ironwork report find no.584 671).

TL:11.9cm. Date:Flavian or later.

Of more crucial importance is a silver object found in the Praetorium in 1928 (Nash-Williams 1946 p18, plate VIB). It resembles in some respects the iron objects discussed in this section and was identified as the tip of a staff officer's standard.

Carlisle

One example was found in the Annetwell street excavations (find no. FE184). from the x-ray it can be determined that it had a rounded tip and a split socket. TL:14cm. BL:9.5cm. BW (Max) :c4.3cm. SD (Ext) :c1.8cm. Found in a post-Roman context. Another "standard tip" came from a watching brief in Fisher Street. The split socket is decorated with some disjointed incised marks which may have been intended as a name. Date:2nd century?

Catterick. (plate 13 no.2).

There is one such find in the Yorkshire museum (Acc. no.1980.54.4058). The tip is rounded and the edges are blunt. The socket is split, with a rivethole in one side about 1cm from the end. TL:18.2cm. BL:12cm. BW (Max) :4.8cm. SD (Int) :1.2cm. SD (Ext) :1.6cm. Date:Unknown, therefore Flavian or later.

Chester.

There is a badly corroded example from the Hunter Street School excavations of 1979 (unpublished, find no. IV 268 2065), broken into two pieces. The blade is almost rectangular in section and has no cutting edges. The socket is split. TL:15.7cm. BL:10.8m. BW (Max) :4.1cm. SD (Int) :1.5cm. SD (Ext) : 1.7cm. Date:Unknown, therefore Flavian or later.

A larger example came from the Crook Street excavations of 1963-4 (unpublished, find no.272). The blade appears to be fairly flat and the socket is split. The find is on display in the Grosvenor museum and was not available for detailed study. Date:as above.

Chesters. (plate 12 no.s 1 and 3).

There are no fewer than nine "standard tips" from this site (Clayton Collection no.s 1603A, 1604A, 1617, 1630, 1637, 1642, 1654, 1668, 1667; Scott 1980 p339, fig 24 no.s 1-3, 5). The precise form of these varies greatly.1603A has a particularly exaggerated shape and quite clearly was not designed as a weapon. TL:34.7cm. BL:28.2cm. BW (Max) :12.4cm. SD (Ext) :c1.8cm.1604A is much closer to normal spearhead shape, the upper section of the blade being quite broad so that the basal expansion is less noticeable. Like 1603A it is very large. TL:33.2cm. BL:23.9cm. BW (Max) :7.4cm. SD (Int) :1.7cm. SD (Ext) :2cm. On 1677 the blade expansion is asymmetrical. The socket has a rivethole in it. TL:13.4cm. BL:9cm. BW (Max) :4.8cm. SD (Int) :1.3cm. SD (Ext) :1.6cm. On 1637 the narrow upper section of the blade is unusually long. TL:20.5cm. The remaining finds are between 14 and 15.2cm in length.

The group as a whole share a number of common features. The blades are flat (or nearly so) on both sides and there are no cutting edges. Most have rounded rather than pointed ends. The sockets are either split or wraparound, except in the case of 1617 which has a closed socket. Date:Unknown, therefore Hadrianic or later.

Colchester.

A "standard tip"with a split socket was found in the 1920 excavations (Wheeler 1923 p7, 37, fig 10). No details available. Date:Claudian or later.

Greta Bridge.

Two pieces of an iron object were found in building G of the vicus during excavations by Mr. P. J. Casey in 1974 (unpublished). This was in fact a "standard tip" with a split socket. TL:c16.3cm. BL:c10cm. BW (Max) : c3.6cm. A second example from another building in the vicus is smaller, lacking the tip and much of the socket. The blade is virtually flat. TL:c11.8cm. Max W: c4.5cm. Date:2nd/early 3rd century.

Halton Chesters.

There is one example from this fort (Manning 1976 p20, fig 13 no.18). The point and the sides of the blade are blunt and most of the socket is lost. TL:13.4cm. BL:12.6cm. BW (Max) :4.3cm. Date:Hadrianic or later.

London.

There is one "standard tip" in the Museum of London (Acc. no. A16902). This is of the usual form, but with the addition of a prominent mid-rib on both sides of the blade. A large part of the blade and the end of the socket are missing. TL:15.2cm. BL:12.6cm. BW (Max) :4cm. SD (Ext) :c1.3cm. Date: The object is part of the Ransom collection. Presumed to be from London, but its exact provenance is unknown. It is most likely Roman, although the mid-rib is an unusual feature.

Milecastle 35 (Sewingshields).

Two "standard tips" have been found here (Haigh and Savage 1984 p81-2, fig 13 no.s 39-40). The first of these is very large with an exaggerated basal expansion and a very slender socket. It would have been totally useless as a weapon because of the very weak junction between the blade and the socket. The blade is very nearly flat, with blunt edges and a rounded tip. Wood from the shaft preserved in the socket is either willow or poplar (Watson 1985 p1). TL:37.1cm. BL:25.8cm. BW (Max) :9.8cm. SD (Ext) :2.2cm. The other find is much smaller and of less extreme form. The edges are blunt, but unusually, the tip is pointed. The cross-section is elliptical. The socket is of the wraparound variety and very short in proportion to the blade. TL:16.7cm. BL:10.5cm. BW (Max) :4.3cm. SD (Ext) :1cm. Date:probably 2nd or 3rd century.

Milecastle 39 (Castle Nick).

There is one very large example from recent excavations from this site. The blade is of elliptical section, with most of the original edges missing. The socket is split. TL:40cm. BW (Max) :7.5cm. Date:Late 2nd or 3rd century?

Milecastle 54 (Randylands).

There is part of a "standard tip" from this site, lacking some of the socket. TL:14cm. (Allason-Jones et al 1984 p229). Date:Hadrianic or later.

Old Penrith.

There is an unpublished example from the excavations by Mr. P. Austen (AML no.7710244). This is very corroded, with the tip of the blade and part of the socket lost. The blade is flat on both sides. TL:c14cm. BW (Max) :4cm. Date:3rd century or later? (but could be residual).

Richborough.

There is a single "standard tip" from this site (Bushe-Fox 1949 plate LVIII no.279). The upper section is narrow, with almost parallel sides and a short point. The blade is flat and lacks cutting edges. TL:20.8cm. BL:15cm. Max Surviving W:4.6cm. SD (Int) :1.3cm. SD (Ext) :1.5cm. Date:No context is recorded for this find. Claudian or later.

South Shields.

Pieces of metal found at the side of the parade ground have been interpreted as the remains of a practice spearhead (Davies 1989 p86). Not available for study.

Vindolanda.

Ten or eleven examples have been found here. One came from the vicus (R. Birley 1977 plate 26). This probably belongs to the second phase of occupation, perhaps ending c270AD. Seven examples were found in the excavations of the stone fort in 1980 (Bidwell 1985 p132-5, fig47 no.s 6-10, fig48 no.s 11-12). They were between 9.1 and 16.8cm in length, mostly with wraparound sockets. One example has a very broad blade with a rectangular sectioned tongue at the upper end (Ibid fig47 no.10). This has an iron rivet projecting from its centre. Several of the sockets contained corroded wood and in one instance this was identified as Ash. Dates:Four of the finds were unstratified, two were found with mid 3rd century material

and the example with the rivet was dated to c275/300-370AD.

Two or three more examples have been found in recent excavations. One (find no.3683) came from the fabrica. It has a short point (c1.5cm), but as usual the edges are blunt. There are traces of a mid-rib on one side. The socket is of the wraparound type. TL:13cm. BL:8.8cm. BW (Max) :3.4cm. SD (Int) :1.4 cm. SD (Ext) :1.6cm. Weight:90 grams.*15 Date:105-120AD.

Another find (no.3888) is a little doubtful, since the upper part of the blade is missing. The remaining part is broad and flat with a wraparound socket. It was found in the late fort's ditch. TL:10.4cm. BL (Surv) : 6.1cm. BW (Max) :3.9cm. SD (Int) :1cm. SD (Ext) :1.1cm. Date:300AD or later.

Finally there is find no.4803 which came from the outer Antonine ditch. This is incomplete, with a large dome-headed iron rivet in the socket. On one side of the flat blade are some punchmarks, perhaps forming an inscription. Unfortunately this is not legible. TL:29.8cm. BL:c23.7cm. BW (Max) : 6.7cm. SD (Int) :1.5cm. SD (Ext) :1.7cm. Date:140-180AD. (N. B. There is also an example from the 1967-9 excavations, found in a rampart section east of the north gateway of the "Diocletianic" fort i.e. stone fort II (R. Birley 1970 p141, fig 2 no.9). Unstratified, but perhaps 3rd or 4th century.

Wallsend.

There is a single example from this site (find no. G420 534) in Wallsend Heritage Centre. This has a very long, rounded tip and a small basal expansion. The blade is pretty well flat on both sides and the socket is closed. TL:25.4cm. BL:c17.6cm. BW (Max) :c5.4cm. SD (Int) :1.4cm. SD (Ext) :1.8cm. Date:Hadrianic or later.

<u>Continental Parallels.</u>

At least four "standard tips" have been found in the auxiliary fort at Carnuntum (Stiglitz 1986 taf2 no.s 10-

13). They are of the usual shape, but the blade section is variable - either diamond or elliptical. One has a mid-rib on one side. Where complete, the sockets are either split or wraparound. TL:7.4-19cm. Date:The finds probably belong to the period from Trajan to Marcus Aurelius (Miss S. Jilek, pers. comm.). Two examples have also been found on the road between Carnuntum and Vindobona (Von Groller 1900 taf VII no.s 1-2). Reminiscent of the silver "standard tip" from Caerleon is a find from the mid 3rd century hoard at Künzing in Raetia (Herrmann 1969 Abb 4 no.10). The upper part consists of a diamond-sectioned spike - a continuation of the mid-rib on the broad lower part of the blade. This object was identified as an emblem of rank or authority rather than a standard tip as such (Ibid p133). Several "standard tips" have been found at Nydam in Denmark (Engelhardt 1870 plate X). These probably date to the 3rd or 4th century AD.

There are a great many other such finds from sites in Germany. Many of them have a very elaborate form, in contrast to the rather crude examples from Britain and the two groups did not necessarily have the same function - although I think that this is probable. In German sources these finds are commonly referred to as "Benefiziarenlanzen", implying that they were the badges of office for staff officers. A particularly fine example with cutouts and a finial on top was found near Strasbourg. It is made of iron and bronze (Connolly 1981 p221; Planck 1985 abb.607). The ritual and symbolic meaning of these objects has been discussed (Alfoldi 1959 p1ff). Although the British finds have the same general shape, they lack any visible decoration.*16

Conclusions.

Obviously the principal problem is in determining the function of these extraordinary objects, but one must also consider when and where they originated. As with many other pieces of Roman military equipment - helmets, mail shirts and longswords, it would appear that the "standard tips" are a product of Celtic influence. There are a number of

decorated spearheads of the La Tène period (Connolly 1981 p115, fig 3), some with circular openings in the blades, which resemble the Roman finds. One from the Marne area of France, dated to c250-120BC (Ibid p117, fig 37) is very like the examples from Britain except that it has a mid-rib. The type seems to have survived in a modified form beyond the Roman period. There are some Anglo-Saxon spearheads with split sockets and basal expansions (Swanton 1973 p39, figs 7, 8, 57) although these have a rather angular appearance instead of being rounded.

What then was the purpose of these objects? We can safely dismiss any notion that they were used as weapons, although by their shape they are related to spears. Admittedly some examples have a less exaggerated shape, but it seems reasonable to assume that they all had the same function. The variability in size/shape may be due to one of several factors - the type of unit involved, the rank of the officer (if they were personal emblems), or simply the vagaries of the manufacturing process. Several authors have suggested that these were standard tips (Manning 1976 p19; Scott 1980 p339), but if so, who carried them and for what purpose? There is a little supporting sculptural evidence for this suggestion. An object very like the "benefiziarenlanzen" appears on the Domitianic Cancellaria relief, which depicts a procession in Rome, including Praetorians. The context implies that the object is a standard/emblem of some kind. Nearly all of the finds from Britain have come from auxiliary forts. It might be therefore that these objects were carried by standard-bearers in individual troops and centuries in auxiliary units. Vegetius (Ep. rei Mil. II, 14) states that in the legions a "vexillo" was carried by each century and cavalry troop. As they survive these objects have a very crude appearance and are made of plain iron (except for the Caerleon find). However when newly made, with a banner attached and perhaps gilded, silvered or even tinned, they may have looked more presentable. The rivet projecting from one of the Vindolanda finds may have been intended to hold a small pennon. The Caerleon find, perhaps because it was

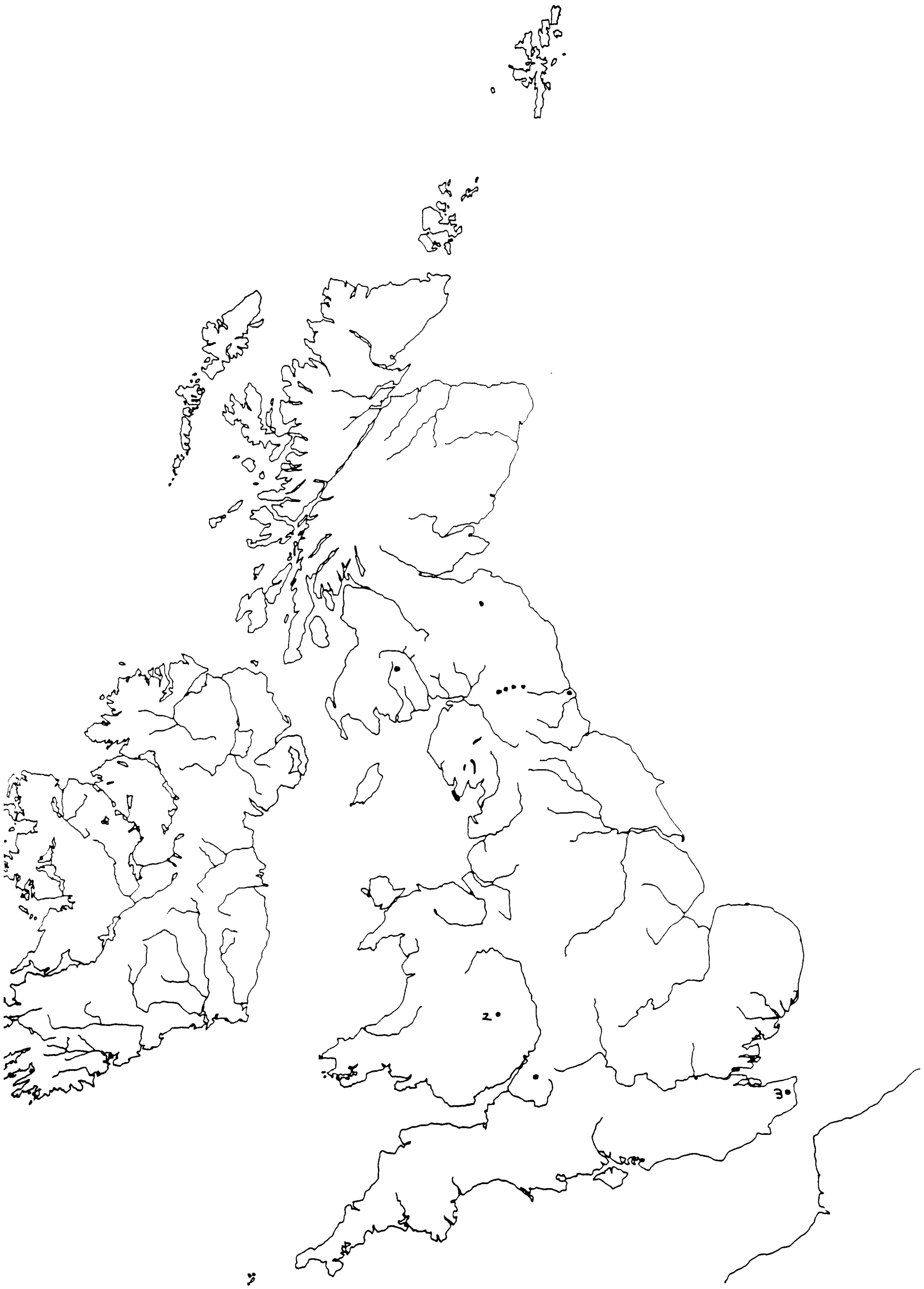
intended as the standard of citizen troops was better made and of a more valuable material.

Another possibility is that these objects were the heads of practice spears, a task for which their blunt heads would make them suitable. Practice spears are mentioned by a number of Roman authors. Sometimes they were simply spears without heads, but in other cases the point was masked with a leather button to prevent accidents (Davies 1989 p82-5). The problem is that some of these finds have such unusual shapes that a practical use for them seems unlikely - no.1603A from Chesters for example.

One other possibility seems hitherto to have been over-looked, namely that the "standard tips" were in fact military decorations, like the silver spears (hastae pura) awarded to legionaries. The SHA (Vita Aureliani VI, 2) records that as a reward for his Gothic victory the senate awarded the emperor numerous marks of distinction, including "ten spears without points". It is tempting to see the objects under discussion here as similar rewards to individual soldiers or units. About two-thirds of the "standard tips" come from the area of Hadrian's Wall, where there was the largest concentration of troops and the best prospects of performing stirring deeds in battle which might attract the attention of senior officers.

Barbed Spearheads. (Map 14)

The purpose of barbs on spearheads (or indeed arrowheads) was to inflict a jagged, more painful wound and to make it more difficult to extract the missile. Thus Celsus (De Medicina VII, 5, 5) notes that barbs caused greater laceration if extracted backwards. Barbed spears were certainly known to the Romans but do not seem to have been very commonly used, especially before the 3rd century AD.*17 Apart from some barbed pila and pilum derivatives (see pages 196-198) there are three other categories of barbed spears. These are shorter barbed spears, a longer type sometimes known as the gaesum and small lead weighted javelins called plumbatae.



MAP 14: Barbed Spearheads.

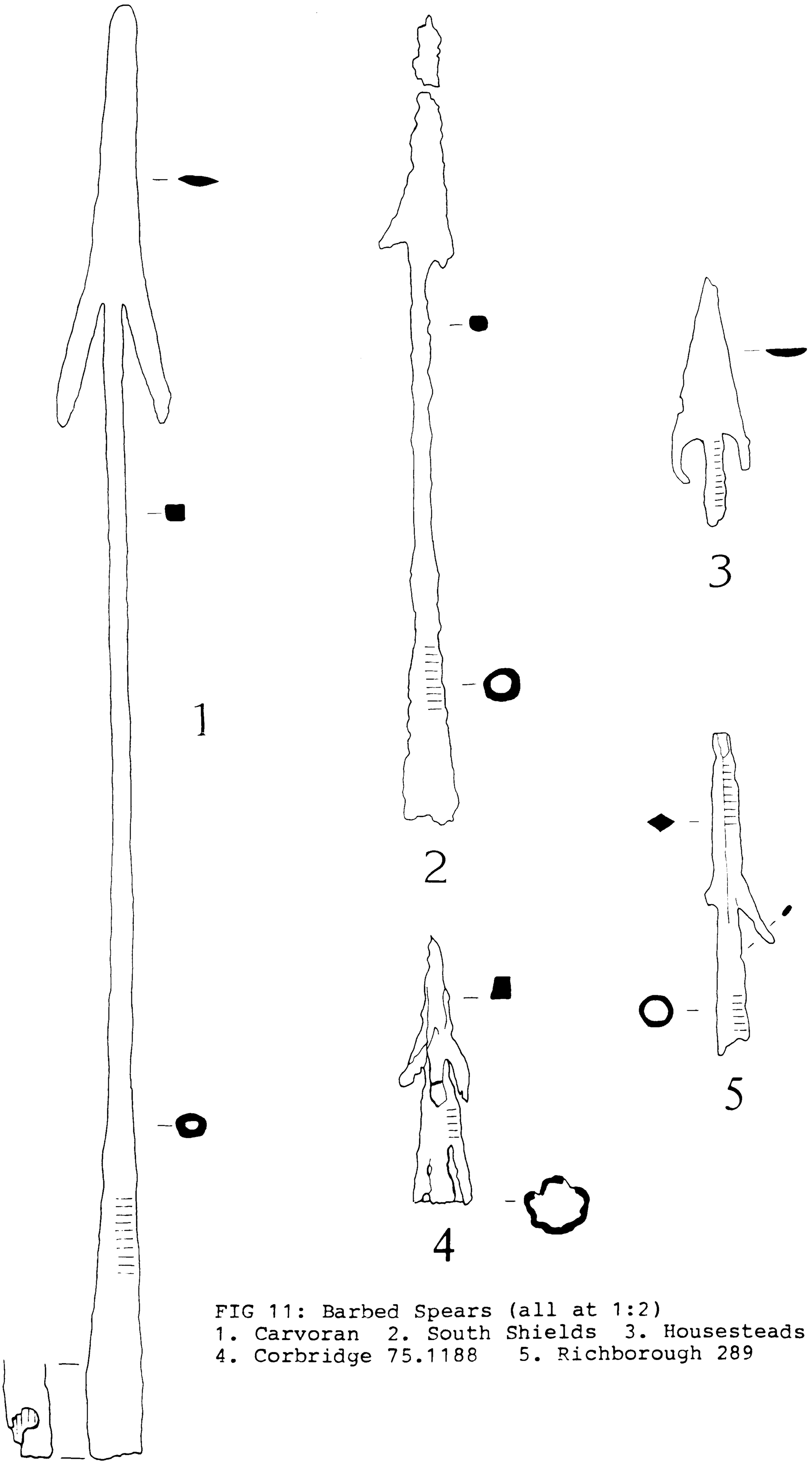
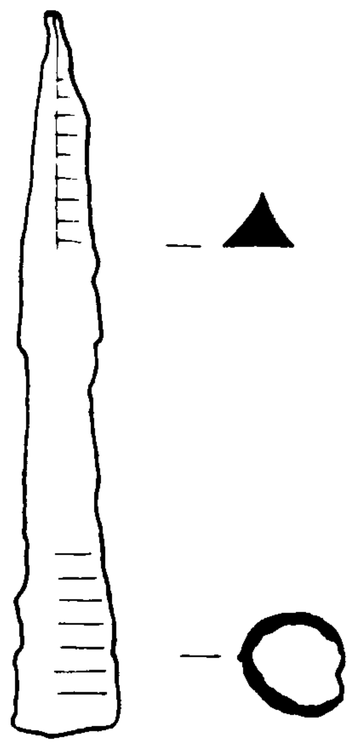


FIG 11: Barbed Spears (all at 1:2)
1. Carvoran 2. South Shields 3. Housesteads
4. Corbridge 75.1188 5. Richborough 289



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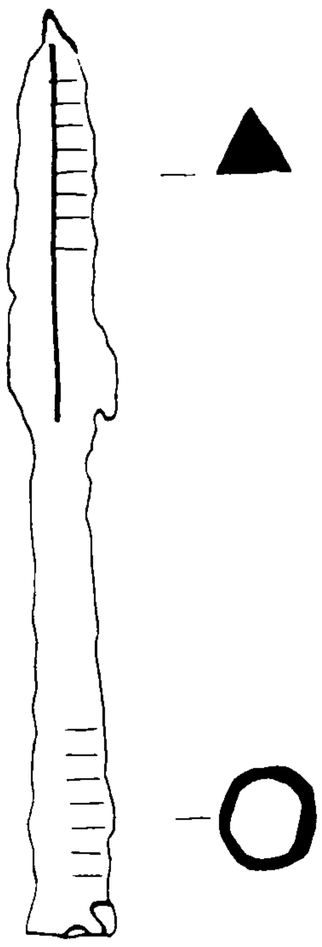

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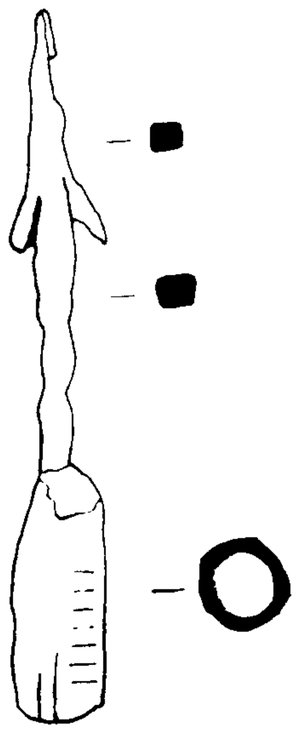

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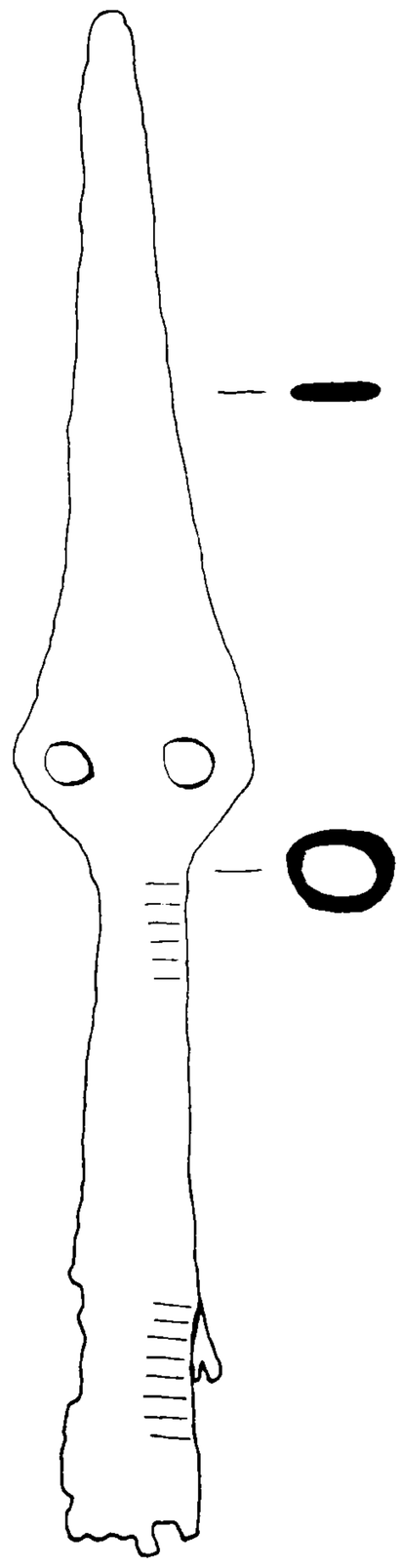

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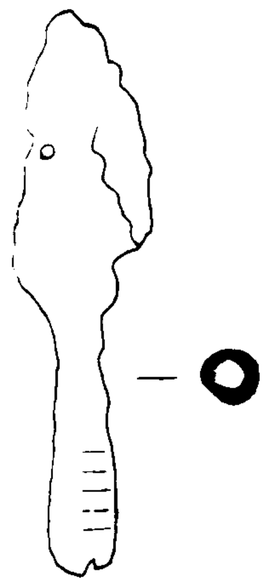

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FIG 12: Barbed Spears and other items (all at 1:2)
1. Fulling Mill 2. Chesters 1668
3. Richborough 4. Broomlee Lough
5. South Shields

a. The "Gaesum".

The term gaesum has been applied to the class of large barbed spearheads, the best example of which from this country is undoubtably that from Carvoran (Manning 1976 p20-1, fig 13 no.s 22-3; Scott 1980 p339, fig 24.4-5). Spears under this name are known from at least the 4th century BC, but we know very little about the appearance of the gaesata described in the Ancient sources. Therefore it is worth looking very closely at all the available evidence to see if the term "gaesum" has been rightly applied. Some attention must also be paid to the troops who were armed with the gaesum.

The Gaesati were in origin a celtic tribe, living in the Alps near to the Rhone river. The Romans first came into contact with them when some of the tribe invaded Italy in 231BC as part of a much larger force of Gauls (Polybius, II, 22). Polybius was under the impression that the tribe acquired their name because "they serve for hire, this being the proper meaning of the word." However it is more probable that the tribe acquired their name from the type of spear that they used. The word "gaesum" does not have any particular meaning, being translated simply as "spear" (O. L. D. p752). The Gaesati certainly did hire themselves out as mercenaries and in Celtic armies they formed something of an elite. They fought naked, in the front rank and seem to have had some of the characteristics of Viking berserkers (Polybius Hist. II, 28). Polybius refers to the gaesum - the Greek version is Ταῦρον - on several occasions (II, 28, 3; II, 30, 5; II, 34, 2; VI, 39, 3) but without any description of it.

It is in 340BC that we first encounter the weapon in the Roman army, being used by "leves" - lightly armed troops (Livy, VII, 8, 5). The Roman commander at the siege of Capua (211BC) is described as being hit in the leg by a "gaeso" (Livy, XXVI, 6, 5) and "Alpinaque gaesa" are amongst the trophies in a temple in Rome during the second Punic war (Silius Italicus, Punica I, 629). Caesar (Bell. Gall. III, 4, 1) mentions the Gauls using the gaesum during an attack on a Roman camp. Further references to the weapon

occur in Strabo (Geography V, 1, 6), Statius (Thebaid IV, 64) and Aulus Gellius (X, 26, 1). More specifically the Greek lexicographer Hesychios describes the gaesum as being made wholly of iron (Maxfield 1981 p85). Possibly he is confusing this javelin with the Spanish solliferrium (see page 177) which was indeed entirely of metal.

A curious passage in Diodorus Siculus may be concerned with the gaesum (V, 30, 4; Couissin 1926 p215). In it two types of spear are described. They have iron heads a cubit (c18 inches/45cm) or more in length and a little under two palms (c5.8 inches/14.7cm) wide. The latter measurement is surely greatly exaggerated, even if the spears had very broad barbs. Some of these spears (which were used by the Celts) were straight, whilst others "twist in and out in spiral shapes for their entire length, the purpose being that the thrust may not only cut the flesh but mangle it as well and that the withdrawal of the spear may lacerate the wound." This passage may imply that some Celtic spears had barbed heads.*18 However when he made this identification Couissin was evidently not aware of a type of Celtic spear which had a wavy-edged blade (Connolly 1981 p115, no.3, p117, no.s 44, 47) and it is probably these to which Diodorus was referring.

This then is the sum total of what is known about the gaesum and it does not amount to very much. It has further been conjectured that the weapon was a kind of light pilum with a throwing thong (ammentum) attached to it and that it came into use at the start of the 4th century BC (Couissin 1926 p214-219). The evidence is insufficient to support such statements.*19

Under the empire the gaesati are encountered serving in the ranks of the Roman army, in units of numeri. They are generally described as coming from Raetia, a province which probably included some of the former home-land of the tribe mentioned by Polybius. Whether they were still armed with the same weapon is unknown, but it is at least likely. Gaesati are recorded on an Augustan inscription from

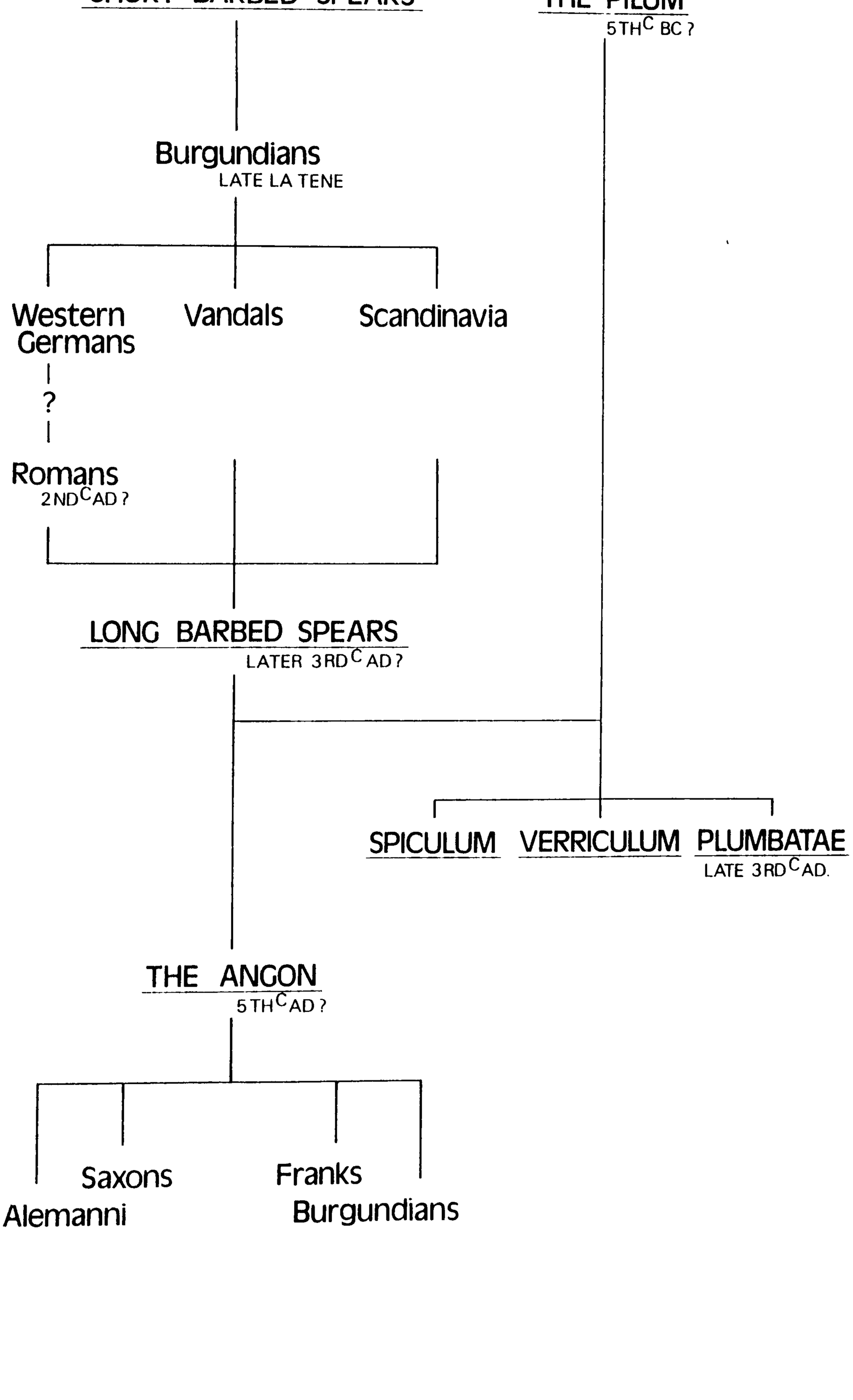
Saintes (C. I. L. XIII, 1041), an inscription from Trieste (C. I. L. V, 536) and on several others besides. A cohors I Aelia Gaesatorum is known from Dacia (Southern 1989 p109). In Britain a unit or units known variously as the Raeti Gaesati and the Vexillatio Gaesatorum Raetorum (R. I. B.1235, 1724) is attested at Greatchesters and at Risingham. The inscription from the latter site dates to 213AD. An inscription of 166-9AD from Greatchesters (R. I. B.1737) put up by a "cohors Raetorum" probably refers to an "ordinary" auxiliary unit. There do not appear to be any sculptural depictions of the gaesum - or at least none that we can definitely identify.

However, one line of inquiry remains. This centres on a difficult passage in Vegetius (Ep. rei Mil. I, 20) which seems to refer to barbed spears:- "As to the missile weapons of the infantry they were javelins headed with a triangular sharp iron eleven inches or a foot long [c28-30cm] and were called pila. When once fixed in the shield it was impossible to draw them out and when thrown with force and skill they penetrated the cuirass without difficulty. At present they are seldom used by us but are the principal weapon of the barbarian heavy-armed foot. They are called bebrae and every man carries two of them to battle." There seems to be no evidence that the barbarians ever used the pilum as such. Possibly Vegetius is referring to barbed spears of the type represented by the finds from Carvoran, Housesteads and South Shields (see pages 214-218). These certainly have features in common with the pilum. The term "bebrae" implies that the weapons had barbed heads.

The Angon and the Development of Barbed Spears.

The Angon, along with the Francisca was the principal weapon of the early Franks.*20 It stands at the end of a long line of development which probably included shorter German barbed spears, the pilum and the bebras/gaesum. The precise nature of the relationship between these weapons is unclear despite many attempts to unravel the problem. One possible solution is outlined here (see fig 13). The Angon

FIG. 13 The Development of Barbed Spears
Amongst the Germans and the Romans.



is described by the Byzantine historian Agathias in his account of the battle of Casilinum in 554AD. This encounter, which took place in north Italy pitched the Franks against the Byzantines under Narses:- "Angons are spears that are neither very short nor very long, but suitable for throwing should it be necessary, as well as for engagement at close- quarters. The greater part is covered all over with iron - and the same with the ferrule - so that very little of the shaft can be seen. At the tip round the head of the spear are curved barbs reaching downwards from the blade itself on both sides like hooks. If the spear strikes a man anywhere the point will penetrate and neither the wounded man nor anyone else can easily pull it out because the barbs which pierce the flesh hold it in and cause terrible pain, so that even if the enemy is not fatally hit he still dies as a result. Alternatively if the Angon hits a shield the Frank treads on the ferrule pulling the shield down and exposing the opponent to the killer blow." (Swanton 1973 p29).

Some details at least of this account would apply equally to other barbed spears and even to the pilum - which was designed to render shields useless. For our purposes it does not much matter if the Angon was a direct development of the pilum (Baldwin Brown 1915 p239) - which seems unlikely given that the pilum seems to have fallen from use not far into the 3rd century - or that it was descended from long-shanked barbed spears of the bebras-gaesum variety (Scott 1980 p339). What is more important is to try to establish how and when barbed spears came to be used by the Roman army.

Barbed spears are found among the Burgundians in eastern Germany in the late La Tène period, spreading gradually to the western Germans and the Vandals (Cowen 1948 p142). They are also found in Scandinavia, as is shown by an example of c100AD (Nylen 1963 fig3) - although the latter could be due to Roman influence. These early barbed spears had shorter, thicker sockets than the "bebras-gaesum" or the angon. Early Roman barbed spears are similar

and perhaps date to the 2nd century AD. Longer barbed spears appear to be a product of the 3rd and 4th centuries and it is not entirely clear where they originated. Some light barbed spears were found in the bog at Nydam in Denmark (Engelhardt 1870 plate XI; Swanton 1973 fig3 no.s d, f). These have elliptical sectioned heads and large flaring barbs. The sockets are very long and slender, with the lower part often having twelve facets. Many of the weapons from Nydam are bent, either through use in battle or because they have been ritually "killed". The date of the Nydam hoard is disputed, but it may lie between c200 and 350AD (Oakeshott 1960 p197). A date of c250AD has been suggested for the barbed spears (Bushe-Fox 1949 p153). Similar spears have been found in Vandal, Teutonic and Burgundian territory (Swanton 1973 p27) and although they can be up to 60cm long, 20-30cm is the norm. The design of spears like those from Carvoran, Nydam and South Shields clearly owes something to the design of the pilum. It is difficult to see why these weapons would have been provided with such a long and slender neck if the intention was not that they should bend on impact (after sinking in or possibly going right through the target). It would be interesting to analyse either the Carvoran "gaesum" or the Nydam spears to see if the points had been hardened and the shanks left soft.

Barbed Spearheads in Roman Art.

Depictions of barbed spears in Roman art are generally confined to the 3rdc or later. There are however a couple of exceptions to this rule which need to be considered. The earliest evidence I can find comes from a victory frieze on the temple of Athena at Pergamum, dating to the 2nd century BC (Robinson 1975 plate 459). Some spearheads are shown with large flaring barbs. This scene represents captured Galatian equipment and seems to represent the only firm proof that the Celts used barbed spears. Spearheads on early imperial sculptures are usually either "leaf-shaped" or pila. A possible exception is the distance slab from Bridgeness on the Antonine Wall (Ibid plate 308). This shows a cavalryman, perhaps an eques of legio II Augusta.

He carries a spear whose head apparently has very short barbs. A figure of Mars engraved on a shield boss from Vindonissa (Ibid fig 194) carries a spear with large flaring barbs. A figure on a similar style knee-guard from Künzing (Ibid plate 512) dates to the late 2nd century.

The tombstone of Aurelius Sudecentius of legio XI Claudia (Connolly 1981 p256) shows a pair of barbed spearheads - perhaps "gaesa" of equal length. This stone probably dates to the 3rd century AD. The tombstone of an unknown soldier in Istanbul museum and also that of Apricius Spicatus, a soldier of the Numerus Divitensium show spearheads with triangular blades and incipient barbs (Coulston 1985 plates 1-2).

A mosaic from Daphne, Antioch-on-the-Orontes in Turkey is also of value here (Henig 1983 plate 10). This shows a hunting scene. Several of the hunters have long barbed spears. In some cases the barbs flare outwards - as on the Carvoran spear - but in others they curve inwards towards the shaft (as with the spearhead from Housesteads). The mosaic dates to c350AD and provides evidence for the civilian use of this type of spear.

Two pieces of carved stone were found on site XII at Corbridge, re-used in a wall (Knowles et al 1909 p343-4, fig 11). This showed a partially draped male figure, holding a spearhead with large flaring barbs and leading a horse by the bridle. Whether this is a soldier or a deity is unknown. Several second century coins were found in this area.

Coins of the late 3rd and 4th centuries also show long shanked barbed spears. The reverse of the Arras medallion (296-7AD) shows such a weapon (Henig 1983 plate 45). Similar spears appear on an antoninianus of Probus (RIC V, 2 p36 no.166; Breglia 1968 p201), on a Gloria Exercitus billon issue of 326-330AD and on the Fel Temp Reparatio coinage of the 350's and 360's (Carson et al 1960 plate I no.987, plate II no.s 196, 424, 2295). Overall therefore

apart from a couple of dubious exceptions the pictorial evidence for Roman barbed spears belongs to the 3rd-mid 4th centuries.

The Archaeological Evidence from Britain.

Birrens.

One barbed spearhead is reported as having been found here in 1895 (Christison et al 1896 p192). This was 12" (c20.5cm) long with a quadrangular sectioned head with a barb on one side. The shank was square-sectioned near the junction with the head, but rounded lower down. The description makes it clear that this a long-shanked spear - an angon or something similar. The parallel quoted is a barbed spear from an Anglo-Saxon grave at Strood, Kent (Swanton 1973 fig 55a). It must not be presumed therefore that the Birrens spearhead is in fact Roman. Unfortunately no context is recorded for this find.

Carvoran. (plate 11 no.1).

This site has produced the best example of the "gaesum" from Britain (M. A. Acc. no.1956.265. A; Manning 1976 p21, fig 13 no.22; Wylie 1853 p55; Cowen 1948 p142-4; Richmond 1942 p136-8). The weapon has a long narrow tip with a rounded end and two large flaring barbs. The section is elliptical. The upper part of the shaft is solid and square-sectioned, but further down it is rounded and eventually swells out into a closed socket. There is a rivethole in the latter. Richmond commented that the socket was made by "beating out a rod of iron which forms the shaft of the head." (Richmond 1942 p137). He detected signs of a join just under nine inches (c23cm) from the lower end. If true it is not visible now. TL:54.7cm. BL (Incl. barbs) :c15cm. BW (Max) :4.2cm. SD (Ext) :1.5cm.

It is known that this spearhead was found in 1833 in a 55 feet deep well somewhere inside the fort. The only objects known to have been associated with it are a pair of deer antlers, so dating evidence is entirely lacking. Opinion has therefore been divided on this point. Bruce even felt (Wylie 1853 p55) that the weapon was not Roman at

all. The similarity in form to the angon has frequently been noted and because of this it has been argued that the fort had a Germanic, possibly even Frankish garrison (Richmond 1942 p138). There is no evidence to support this theory. However it does make some sense to see this kind of spear as a combination of German barbed spears and the pilum (c.f. Cowen 1948 p142). But the misapplication of the term "gaesum" has thrown more darkness on an already murky subject. Date:On the basis of the similar finds from Nydam and the pictorial evidence the Carvoran spearhead may be plausibly dated to the 3rd or 4th century.

Chester.

There is an object in the Old Collection at the Grosvenor museum which might be the remains of a barbed spearhead. This find (which is unnumbered) has a slim square-sectioned head with one barb surviving. The upper part of the shaft is also square, but it becomes a socket further down. Both the point and the socket are damaged. TL:18.4cm. BL:c7.5cm. BW (Max) :2cm. SD (Int) :1.7 cm. SD (Ext) :1.9cm. Unstratified.

Chesters.

There is a small barbed spearhead in the site museum (Clayton Collection Acc. no.1675). This has a triangular flat blade with a short socket and is quite distinct from the "gaesum" type. TL:10.5cm. BL:5.5cm. BW (Max) :3.1cm. SD's:Not determinable. Date:Hadrianic or later.

Cirencester.

There is a long-shanked barbed spearhead from this site (Webster 1958 fig 4 no.41). This has an elongated point and a slender shaft - the section of which is unfortunately not indicated in the drawing. Although included in a collection of material from the conquest period, all the available data suggests that this weapon is unlikely to date before the 3rd century AD.

Greatchesters.

A barbed spearhead from the fort can be found in the

Hunterian museum (Acc. no. F.1989.2). It has a slim head, with one short barb - the other has broken off. The shaft is incomplete, but what remains is square for the upper 3.5cm or so and rounded below this. The spearhead was found in Eric Birley 's excavations in the 1960's, together with a leather shoe fragment (Acc. no. F.1989 .1), but no context is recorded. TL:17cm. BL:2.9cm. BW (Max) :1cm. Max diameter of shaft:1.1cm. Date:Hadrianic or later.

Housesteads. (plate 11 no.2).

A barbed spearhead was found near the north wall of barrack block 1 in 1898 (Bosanquet 1904 p291, fig47; Manning 1976 p21, fig13 no.21; M. A. Acc. no.1956.151.66. A). The head is triangular and elliptical in section. The barbs curve in towards the shaft in the manner of one of the spearheads on the mosaic from Antioch in Turkey (see page 213). Only a short part of the shank survives so it is impossible to determine if this weapon was of a similar size to the Carvoran "gaesum". What remains of the shaft is circular in section. TL:9.7cm. BL (incl barbs) :8cm. BW (Max) :3cm. Shaft width:0.6cm. There is also a detached piece of shaft 4.1cm long, perhaps from this find. Date:The alleged association with another spearhead and a coin of Constantius I is best discounted (Manning 1976 p21). Hadrianic or later.

Kenchester.

Two spearheads with broad barbed points were found in the excavations of 1912-13 (Jack 1916 plate 47 no.s 1-2). These are comparable with the finds from Carvoran and South Shields. One is 6" (c15cm) long and is socketed. Date:Unknown, therefore Flavian to late 4th/early 5th century.

Lyne.

A barbed spearhead was unearthed at the fort in 1901 (Christison and Anderson 1901 p186, fig17; Scott 1980 fig 24.3 no.4; Nat. Mus. of Scot. Acc. no. FR281). The blade is triangular with short barbs. The socket is closed. Although quite large, this find does not have the big barbs or the

socket form characteristic of the "bebras-gaesum" type. TL:19.4cm. BL:c9.5cm. BW (Max) : c3.5cm. SD (Int) :1cm. SD (Ext) :1.7cm. Date:Probably Antonine.

Newstead.

One barbed spearhead is known from here (Curle 1911 plate XXXVII.4; Nat. Mus. of Scot. Acc. no. FRA 178). The head is triangular with short barbs, whilst the socket is short and thick. Parts of both the blade and the socket are missing. TL:11.4cm. BL:4.5cm. BW (Max) :2.7cm. SD (Int) :0.8cm. SD (Ext) : 1.1cm. Date:Flavian or Antonine. Scott prefers the latter date for this find (Scott 1980 p337).

Richborough. (plate 11 no.3).

Several barbed spears of varying forms have been found here in addition to two plumbatae (see page 222). One came from excavations in the 1920's, in the west gate of the Shore fort (Bushe-Fox 1926 p45, plate XIV.17). The illustration shows a weapon with a broad triangular head, the tip of which is missing. The socket is short and quite thick at the base, but tapering markedly towards the junction with the blade. It is closed, with one rivethole in it. The blade section is elliptical. Overall it is quite similar to the spearhead from Newstead. TL:12.6cm. BL (Incl barbs) :c6.5cm. BW (Max) :5.2cm. SD (Int) :2.1cm. SD (Ext) :2.5cm. Unstratified.

Two further examples appear in the 4th report on the excavations (Bushe-Fox 1949 p153, plate LVIII no.284, plate LIX no.289). The first of the pair came from an area to the south of the fort and resembles the find described above. Not located, so no measurements are available. No.289 was found in the filling of the stone fort ditch. It has an elongated head with one long curved barb surviving on it. It is of diamond section. What remains of the socket is circular sectioned. Perhaps an example of the "bebras-gaesum" type. TL:12.5cm. BL (Incl. barbs) :8.3cm. BW (Max) :1.2cm. SD (Int) :0.9cm. SD (Ext) :1.1cm. Date:late 3rd or 4th century?

South Shields.

A barbed spearhead like that from Carvoran has been found here (Manning 1976 p21, fig13 no.23; Allason-Jones and Miket 1984 p298-9; M. A. Acc. no.1956.128.96. A). The head is elongated, but the barbs have sadly been lost. The shaft is partly square, partly round in section. TL:29.7cm. BL:7.7cm. BW (Max) :2.8cm. SD (Ext) :1.8cm. Date:Hadrianic or later? The precise context is not known, although the spearhead had certainly been found by 1885 (Bruce 1885 p271).

Parallels.

From Britain there are long-shanked barbed spears from Anglo-Saxon contexts (Swanton 1973 p33, 146, fig 4c-e, fig 55a). These are examples of the angon, but as with the Roman finds their precise form is not consistent. The head can be elliptical or diamond sectioned, the barbs can be long or short and they may flare outwards or lie close to the shaft. The length of these spears - all from the south of the country - is also variable-from 44.1 to c116cm.

On the continent as has been noted barbed spears were initially short but gradually became longer. Examples of the longer type (=the "gaesum") have been found at Nydam, but also in the Esjbole bog at Hardershar (Orsnes 1963 p241, 243, fig11). The latter finds are thought to date to the 4th century AD. The true angon developed during the course of the 5th century. It had much in common with the "bebras-gaesum" type but was much longer - frequently a metre or more for the metal part alone. As well as the Saxons the weapon was used by the Burgundians, the Alemanni*21, the Langobardii and the Franks (Swanton 1973 p28). The word angon appears in several Germanic languages (see note 20). Angons have been found in Frankish cemeteries in Belgium and along the Rhine (Cowen 1948 p143).*22

Discussion.

Given the obvious similarities between the "bebras-gaesum" type spears and the angon one is inclined to

believe that they are related in some way. There is some overlap in size but generally the earlier examples (including those from Roman sites) are shorter. It seems logical to see the angon as a development of the shorter barbed spears. There remains the lingering doubt that weapons like those from Carvoran, Housesteads and South Shields are not Roman at all. Gildas (De Excidio 19) speaks of barbarians using "barbed darts" in their attacks on northern Britain. The finds from Roman sites could just conceivably be the weapons of invaders therefore, especially since none of the finds is well stratified. On the other hand these weapons may represent evidence for units of Germanic origin serving in Britain and using their native weapons. The epigraphic evidence is unfortunately lacking to support this conjecture and as yet barbed spears of the "bebras-gaesum" type have not been found in Roman contexts in Germany (information from Dr. M. Gechter of the Rheinisches Landesmuseum, Bonn). Of those sites in Britain at which such spearheads have been found, only Housesteads has produced any evidence for specifically Germanic units - the Numerus Hnaudifridi and the Cuneus Frisiorum in the 3rd century. As for the term "gaesum", this seems to have been applied to the class of large barbed spears without any justification.

b. The Plumbatae. (Map 15)

The earliest reference to this kind of weapon appears in a little-known military handbook addressed to the emperor Tacitus (275AD) and written by one Modestus.*23 This allows us to put back the introduction of the plumbata a few years earlier than was previously reckoned. Vegetius (Ep. rei Mil. I, 17) speaks of the weapons in a way that shows they were being used before the accession of Diocletian in 284AD:- "The exercise of the weighted javelins called martiobarbuli must not be omitted. We formerly had two legions in Illyricum consisting of six thousand men each which from their extraordinary strength, dexterity and skill in the use of these weapons were distinguished by the same appellation. They supported for a long time the weight of all the wars and distinguished

MAP 15: Plumbatae.

themselves so remarkably that the emperors Diocletian and Maximian on their accession honoured them with the titles of Jovian and Herculean and preferred them before all the other legions. Every soldier carries five of these javelins in the hollow of his shield. And thus the legionary soldiers seem to supply the place of archers for they wound both the men and horses of the enemy before they come within reach of the common missile weapons." Vegetius makes further references to plumbatae (II, 15; IV, 29) but nowhere does he say anything about their construction. For this we have to turn to the De Rebus Bellicis (X-XI) in which the author describes two kinds of weighted dart.

The plumbata tribolata functioned not only as a missile, but also as a caltrop - because it had metal spikes soldered onto the shaft and pointing at all angles. The head was of iron and at the lower end of the wooden shaft "are fixed flights to give speed." This type of plumbata has not so far been found. It may simply have been a flight of fancy on the part of the anonymus author of the treatise. The plumbata mamillata (the "breasted" javelin) owed its name to the presence of the lead weight, although this feature is omitted from the illustrations accompanying the text. The weapon is described in the following terms:- "A shaft nicely long and straight, will have fitted to one of its ends a piece of iron, round in section and tapering to a point, with a lead weight and flights attached at the same point as in the caltrop type, so that the bulbous weapon, assisted by the weight of the lead and the swiftness of the flights will be powerful enough to penetrate very easily the enemy's shields and similar obstacles." Other late Roman sources such as Ammianus Marcellinus do not mention plumbatae and we may well wonder just how widely they were used. Certainly the numbers so far found are not very substantial.

The Archaeological Evidence from Britain.

A number of short barbed and lead weighted missile heads have been found in this country, which clearly fit the description of the plumbata given by the De Rebus

Bellicis. Some early finds were misidentified as pilum points. The finds can be divided into two categories. Some had socketed heads and the head was secured to the shaft by a rivet. Others had tangs which tapered to a point and these would have been fixed into a split wooden shaft, perhaps by the use of bindings. The former method would have given greater security, but involved a little more effort to produce a finished weapon. Many finds are incomplete so we cannot tell which shafting mechanism they used.

Burgh Castle.

There are two lead-weighted darts from this site (Sherlock 1979 p101). One found in the 19th century was about 10" (c25cm) long with a nailed socket. The more recent find is tanged. The head is elliptical-sectioned, whilst the tang is square. TL:15.8cm. Date:c275AD or later.

Caernarvon. (plate 11 no.4).

Three plumbata were found in the south-east corner of the praetentura in 1975-7 (forthcoming publication by Mr. John Casey). At least two of the finds are socketed. The metal shanks are circular-sectioned. In one case the lead weight survives. This is 3.7cm long and 2.3cm in diameter. TL:12/11.1/ 10.9cm. HL:4.1/4.4/4cm. SD (Ext) :1.3/1cm. Weight:74.8g (with lead), 19.6g/22.6g. Date:Probably late 4th century.

Caerwent (?).

There is one plumbata in Newport museum (pers. obs.). The slim head has an elongated point and one of its barbs is damaged. Part of the barrel-shaped lead weight remains. Date:Late 4th/early 5th century?

Catterick

Two plumbatae were found here in late contexts (Wacher 1971 fig26 no.s 4-5; Yorkshire Museum - no accession numbers). One of them has a diamond-sectioned head, with a tapering, square-sectioned tang. One of the barbs is missing. TL:11.7cm. HL:3.6cm. Max Surv. W:1cm. The other

example is socketed but otherwise the same as the above. The point is rather elongated. TL:15cm. HL:5.7cm. Max W:1.6cm. SD (Ext) :c1cm. Neither find has its lead weight. Date:late 4thc?

Doncaster.

There is one example from this site, which still retains its lead weight (Buckland and Magilton 1972 p275). It is not clear whether it is socketed or tanged. Date:Unknown.

Richborough. (plate 11 no.5).

Two plumbatae from the Saxon Shore fort were published as pilum heads (Bushe-Fox 1949 p152, plate LIX no.s 295-6). Number 295 has its barbed head and part of the lead weight. The head and the neck have a square cross-section, whilst the weight is circular-sectioned. TL:10.2cm. HL:3.5cm. Internal diameter of weight:1cm. External diameter:1.5cm. The other find has lost its head. TL:11.3cm. Internal diameter of weight:1cm. External diameter: 1.4cm. Date:Unstratified, but probably post c275AD.

Wroxeter.

A total of six plumbatae have been found here (Barker 1970 p33; 1972 p19; 1979 p97; Wilson 1971 p260-1), one in the 19th century, one in Dr. Webster's excavations in the 1960's and four from Barker's excavations in the bath's basilica. The latter were about 12cm long with oval-sectioned lead weights. Neutron radiography showed that the darts had split sockets, with some wood still in place. The chronology of the later buildings which occupied the site of the basilica is complex. Barker has suggested (Barker 1979 p97ff) that the plumbatae date to the early 5th century and represent evidence for a Roman garrison here. The baths had gone out of use by c330AD and it is unlikely that the weapons date before this - a bath-house being a rather unlikely context for such finds. Although this is the largest number of plumbatae found anywhere, it is still hardly evidence for a substantial garrison. After all, a single soldier supposedly carried five of these darts

(Vegetius, Ep. rei Mil. I, 17).

Continental Parallels.

Not many plumbatae seem to have been found on the continent, but probably many have simply never been published. The lack of any such finds from Dacia may be noted. Perhaps this shows that the weapons were not in use before c275AD when that province was given up. One example has been found in the so-called "laeti cemetery" at Furfooz in Belgium (letter from George Boon in Current Archaeology Vol.26, May 1971, p85). The fort here was occupied in the late 4th/early 5th centuries, possibly by a Germanic unit (Stillwell 1976 p339-40) At least four plumbatae have been found in the legionary base at Lauriacum in Noricum.*24 Two of these have been published, one apparently with a split socket (Von Groller 1908 fig47 no.3; 1909 fig36 no.3). These two have the barbed heads and the weights intact. Little attention was paid to stratigraphy in these excavations, so that accurate dating is impossible. The fortress was built in the reign of Severus, the initial garrison being legio II Italica, but there was some form of military occupation down to the late 5th century. There is one example (type unknown) from Weissenburg, also in Raetia (Sherlock 1979 p101). There is also a single find from Lentia (Linz) in Noricum and another in Wiesbaden museum (pers. comm. J. C. Coulston).

To return for a moment to the account of Vegetius (Ep. rei Mil. I, 17), it is worth remembering that originally it was only two legions "in Illyricum" who were equipped with these weapons. These were legions I Iovia and I Herculea. In the Notitia Dignitatum (OR. XXXIX 33-4) legio I Iovia is found under the command of the Dux Scythiae with five cohorts at Noviodunum and the other five at Aegissos. Perhaps excavations at these sites might one day provide us with further examples of plumbatae.

Constructional details and Performance.

Vegetius's comment that each man carried five plumbatae "in the hollow of his shield" implies that these

weapons were fairly small - perhaps c4 feet at most - since otherwise they would have projected at one or both ends.*25 Since it would have been difficult to carry both the shield and a bundle of darts, one must presume that the shield had some kind of holder for the plumbatae on its inner face. When Vegetius says that the plumbatae could outrange the "common missile weapons" (presumably javelins) he seems to confirm suspicions that plumbatae were fairly small and light - but not necessarily as small as the darts we know today. The text and illustrations of the De Rebus Bellicis tell us that plumbatae had barbed heads, lead weights and flights on the wooden shaft. The likely size and the range of these weapons has been the subject of investigation in two experiments. In the earlier test, three replica plumbatae were made at the Tower of London Armouries. The length of the wooden shaft was set at 3' 1" (94cm), which gave the weapons balance and there were feathers at the end. With a leather throwing thong attached a distance of 30 yards was achieved, whilst with a piece of string tied to the shaft 70-80 yard throws were possible (Musty and Barker 1974 p275-7).

More recently several plumbatae of various designs were tested, some substituting a ball bearing head for the barbed point (Eagle 1989 p247-253). Again a socketed head was used and a length of 24" (64cm) was employed. The experiments demonstrated that the darts could be thrown in a variety of ways; like a normal javelin, but also from behind the head (gripping the short protruding section of the shaft behind the flights) and - most effectively - under-arm. They also showed the importance of the lead weights, as the replicas without them did not fly well and lacked both range and penetration.

Both sets of tests showed that with only a little practice a dramatic improvement in performance was possible. It is likely therefore that in the hands of well-trained troops these weapons could have been very effective indeed.

General Comments.

Although Vegetius states that plumbatae were issued to two crack legions, the archaeological evidence implies that the weapons were used by other types of unit. Lauriacum and Richborough were legionary sites, but Burgh Castle and Doncaster both had cavalry garrisons in the 4th century and Furfooz and Wroxeter may both have been occupied by Germanic troops. Caernarvon was certainly not occupied by legionary troops and nor so far as we know was Catterick. More finds and better epigraphic evidence are needed, but it does seem likely that plumbatae were used outside the legions.

The Hasta:Literary Evidence.

There is no more vague and little understood class of weapon than the hasta. It is a term which has a very long history and at one time lent its name to a class of troops in the Roman army - the hastati. By the time of which Polybius was writing however the hastati carried two pila rather than spears (Polybius VI, 23, 8-9). The hasta was certainly still known in the imperial period, but what did it look like and who used it?

In Tacitus (Annals XII, 35) auxiliary infantry are said to be equipped with "spathis et hastis". In Hadrian's address to the army of Africa (C. I. L. VIII 2532, 18042=I. L. S.2487, 9133-5) it is a cavalry unit, the Ala I Pannoniorum who are using "hastae breves et durae" - javelins which are short and stiff. These have been interpreted as light-weight practice weapons (Davies 1989 p85) but might equally have been ordinary javelins. Ammianus Marcellinus (XXV, 3, 6) also uses the term hasta for a cavalry spear. Most other references to the hasta only imply spears in the general sense (Aulus Gellius X, 26, 2; SHA Vita Pertinax XI, 9; Ammianus Marcellinus XVI, 12, 13; XIX, 2, 6; Claudian, Against Rufinus 1407; Josephus Bell. Jud. III, 94). The word is even used in connection with the staff on which a draco standard is carried (Ammianus Marcellinus XVI, 12, 39).

It is abundantly clear therefore, that at least in the period under discussion the word hasta could be used for many kinds of spear and not for one specific weapon. It would be a useless exercise to try and identify the hasta from amongst the archaeological material. Attempts have been made to calculate the size of the hasta, based on the sculptural reliefs of the period. The figure of 1.82-2.73 metres (6-9 feet) was arrived at by this method (Robinson 1975 p10). This ignores the problems of scale and artistic convention, let alone the fact that we cannot specifically identify the hasta with any of the spears shown in Roman art.

The Lancea:Literary Evidence.

As with the hasta, we lack much precise evidence about the lancea, but the use of this kind of weapon does seem to have been confined to certain categories of troops. Again there are difficulties with matching the name to types of spear known from excavations.

Aulus Gellius (Attic Nights XV, 30, 7), drawing his information from Marcus Varro's "Divine Antiquities" states that the word is of Spanish origin. A passage from Diodorus Siculus already quoted (see page 209) in connection with the gaesum, might alternatively refer to the lancea - it is impossible to be certain here to which Roman weapon the Greek word equates. To briefly recapitulate, Diodorus (V, 30, 4) speaks of Celtic spears which had heads about 18" (c46cm) long by c5.8" (c15cm) broad. Some of them were straight, whilst others it seems had curved blades. Many of the references from the Republican and early imperial periods show that the lancea was a cavalry weapon. For instance Livy (X, 26, 11) has the Gallic cavalry in 295BC carrying "lanceis" and Hadrian complimented some of the members of the Ala I Pannoniorum on the way they hurled their lanceae (I. L. S.9134). Josephus also speaks of Roman cavalry armed with the lancea (Bell. Jud. III, 96). More important is a passage in Arrian's Tactica (IV, 9). Speaking of cavalry weapons he says:- "As for the lanceae they are carried for both purposes, both to hurl from a distance, whenever there is need for this and to fight with

at close quarters..." There were possibly several varieties of lancea. Suetonius (Domitian, 10) talks of a new kind of lancea known as the "Lucullean". The term "lanceola" appears in the SHA (Vita Maximini XXX, 2). There are also many non-specific uses of the word (Lucan III.465; Seneca, Naturales Quaestiones I, 1, 14; Statius, Silvae V, 1, 93; Tacitus, Germania 6.1; Virgil, Aeneid XII.375). Lancea is also used in an abstract sense in the phrase "spear-thrust of anxiety" (Apuleius, Metamorphosis I, 11). The word lancea has caused problems with modern scholars because of a tendancy to assume that the weapon was used like Medieval or Napoleonic lances. This in turn leads archaeologists to identify long, slim-bladed spearheads found in Britain as "lanceheads", often without any proof that the weapons concerned belonged to cavalry. Firstly we have no firm evidence for what these cavalry lancea looked like and secondly the literary evidence shows that in the early imperial period lanceae might be used both for throwing and for thrusting. As will be seen (page 230) the evidence for the use of "lances" in a couched manner in the Roman period is very slim indeed.

Vegetius (Ep. rei Mil. IV, 29) includes the lancea in a group of missile weapons, showing that the name at least still survived in the 4th century. By this time however the word referred to a different kind of weapon, used by elite troops known as the lanciarii. These are often said to have been the creation of Diocletian (Connolly 1981 p250), but we now have epigraphic evidence to show that they existed by at least the Severan period. A "discens (trainee) lanciarius" of legio II Parthica is recorded on a tombstone from Apamea in Syria (Balty 1988 plate XIV, 2). The equipment of this man, named Aurelius Mucianus differs radically from the traditional legionary panoply. He carries a bunch of five equal length spears with small "leaf-shaped" heads in one hand and has a small round shield on his other arm. Overall he has the appearance of a light infantry skirmisher. By the time of the Notitia, the lanciarii were not parts of legions, but separate units in their own right. Eight legions of lanciarii are listed in the Notitia (OR V, 2; V, 42; VI, 7; VI, 47; VIII, 12; VIII,

44; IX, 14; IX, 36; IX, 38; OC V, 9; V, 90; V, 109; V, 110; V, 152; V, 239; V, 260; VII, 9; VII, 58; VII, 81; VII, 82). Two units were in Gaul, two in Illyricum, one in Thrace and the rest part of the central reserve in Italy.

The Kontos.

This type of spear, referred to by Greek writers as the κοντός, was used by cataphract cavalry. The word has been literally translated as pole or punting pole (Liddell and Scott 1968 p928). The most important reference to it appears in Arrian's Tactica (IV, 3). Nothing is known of the form of this weapon and it cannot be positively identified archaeologically. Given that it was issued to armoured cavalry it was probably a long, thrusting spear, perhaps with a narrow blade to facilitate withdrawal after deep penetration. The kontos was apparently used two-handed (W. E. Brown 1980 p22). Spears of this kind were of eastern origin. For instance the armoured Sarmatian cavalryman Triphon who appears on a marble stele from Tanais on the Don (Sulimirski 1970 plate 33) is using his spear by his side, two-handed. Sassanid Persian sculptures of cataphracts show the "lance" being used overarm and thrusting downwards, as does a tombstone of a member of the Ala I Contariorum from Tipasa (information from J. C. Coulston). The length of the kontos has been estimated at 3.64 metres or c12 feet (Robinson 1985 p10) but it is unclear what evidence was used to arrive at this figure.

The well-known graffito of a clibanarius from Dura-Europos could represent either a Roman or a Persian soldier. He carries a long spear in his right hand, but the depiction is too crude to make any detailed analysis. There is only one known depiction of a couched lance from the Roman period and this appears on the Arch of Orange (Robinson 1985 p10). Debate over the feasibility of using a long lance in this manner without stirrups has been considerable. The usual argument is that if the lance was held under the arm, then the shock of impact would unhorse the rider or at least cause him to drop his weapon. This in turn is held to account for the generally poor performance

of Roman cataphracts in battle (Eadie 1967 p162-173). In fact the presence or absence of stirrups may not be the decisive factor, since stirrups really only provide lateral security and would not prevent a rider from being thrown off the back of his horse. What really gave the Medieval Knight his safe seat was his all-embracing saddle (Norman 1971 p233, plates 18, 21). If recent reconstructions of Roman saddles with horns are correct (Connolly 1981 p235) then the old argument against couched lances may be invalid. A demonstration of such a saddle at the Sixth Roman Military Equipment Conference at Bonn in 1989 by Mr. Peter Connolly showed that it provided the rider with a very secure seat (pers. obs.). Admittedly though, no one yet seems willing to try charging with a couched lance!

Whether all units of cataphracts used the Kontos we do not know and the weapon cannot be positively identified through archaeology - at least at present. In Britain two units of armoured cavalry are attested. One of these was a unit of Sarmatians which was based at Ribchester (C. I. L. VII, 218, 221). This was part of a force of 5500 sent to Britain in 175AD following the defeat of their tribe in the Marcomannic war (SHA vita Marcus Aurelius 27). Probably not all of the 5500 were cavalry and there may have been many non-combatants among them. No other units of Sarmatians are definitely attested in Britain (but see below). The unit at Ribchester is described on inscriptions as a numerus or an ala and in the Notitia (OC. XL, 54) it is called a cuneus - literally a "wedge". How they were armed we do not know. No spearheads seem to have been found at Ribchester. A tombstone from Chester (R. I. B.550) may represent evidence for another such cavalry unit. It was found in 1890 in the west part of the north wall and shows a mailed cavalryman on a partially armoured horse. Unfortunately only the letters D. M. remain of the inscription. The other unit of cataphracts in Britain was the Equites Cataphractarii, listed in the Notitia (OC. XL, 21). This unit was based at Morbio - possibly Piercebridge - but is otherwise unknown. Four spearheads have been found at this site (see page 251) of which one 14.5cm long with a slender "leaf-shaped" blade might fit the bill as a cavalry "lance". A horse eye-guard

from Chesters (Richmond 1945 p18) might be evidence for a cataphract unit at this site but may simply be a piece of parade equipment belonging to an ordinary cavalry unit. A number of long, slim-bladed spears have been identified as cavalry lances, but the identifications are only conjectural.

The Spear in Roman Sculpture.

We are concerned here with the ordinary kinds of spear, leaving aside pila, barbed spears and other specialised weapons. The term "leaf-shaped" has commonly been applied to such weapons. Although all such spearheads on Roman sculpture are basically similar, there are some slight variations in form. However the details of spearhead shape were not a prime concern for the artists and it is really impossible to relate the forms shown on monuments to the archaeological material. Such depictions are usually very crude and are simply attempts to show "typical" Roman spears.

a. Infantry spears.

These can be broad-bladed with rounded shoulders, as with the spears of the imperial bodyguard on the base of the obelisk of Theodosius in the Hippodrome at Constantinople (Henig 1983 plate 201). Spears with angular heads also occur, as in the panel of Marcus Aurelius showing a scene of sacrifice (Robinson 1975 plate 498). Here they are being carried by legionaries in lorica segmentata. A longer more slender form of head appears on the silver missorium of Theodosius I (Henig 1983 fig 206). Representations of spears with mid-ribs are rare. Two examples are the mid 1st century tombstone of Firmus of Cohors VI Raetorum (A. Johnson 1983 plate 14) and the triumphal relief from Trajan's forum (Robinson 1975 plate 238). The latter shows troops in plumed helmets, perhaps Praetorians.

b. Cavalry spears.

As with the infantry weapons, the standard of depiction, coupled with the often poor preservation makes it difficult to say much about spearhead forms, except that

they are "leaf-shaped". One cannot say that the long, slender form, characterised as being "lanceheads" is especially common. What is evident is that with the exception of the couched lance on the Arch of Orange (see page 228) Roman cavalrymen are usually shown using their spears one-handed for stabbing/thrusting downwards. This is apparent for example on many 1st century tombstones from Britain and Germany (A. S. Anderson 1984 plates 14, 16, 18, 20-1, 24), on Trajan's column (scene XXXVII), on a distance slab from the Antonine Wall (Robinson 1975 plate 308) and on the Ludovisi battle sarcophagus (Strong 1988 plate 139). The spear is generally held at least two-thirds of the way down the shaft and sometimes very near the butt. There are examples where spears are shown being held at thigh level and pointing straight forwards e.g on Trajan's column (scenes XXXVII, CXLII) and the spear of a mailed cavalryman on the monument at Adamklissi (Robinson 1975 plate 478).*26 So perhaps some Roman spears were used rather like lances but without being couched. It would however have been difficult to retain the weapon after a thrust unless perhaps wrist thongs were used. Problems of scale and artistic convention prevent any definite statements on the size of these weapons, but we seem to be dealing with substantial spears, at least six feet long and probably much larger. Some 1st century tombstones show an additional figure (a servant?) behind the cavalryman carrying a pair of spear-type weapons. These may have been replacements in case the first spear was lost or broken in combat. Again the lack of mid-ribs on the spears is the most notable feature. A possible exception is the tombstone of Rufus Sita of Cohors VI Thracum (A. S. Anderson 1984 plate 24). Cavalry spears are generally shown without barbs - the presence of them would have been detrimental to the chances of retrieving the weapon after a thrust. The spear on the Bridgeness distance slab may have barbs but the definition is poor (Robinson 1975 plate 308).*27

Overall we can derive little information about Roman spears from pictorial sources because of lack of detail, although we can in the case of the cavalry perhaps form

some picture of the ways in which the weapons were used.

"Leaf-shaped" spears: The Archaeological Evidence. (plates 12-14, figs 12, 14-16).

Introduction.

"Leaf-shaped" is the term almost invariably used to describe the bulk of the spears used in the Roman period. It is a phrase enshrined by long usage, yet it is frighteningly inexact. After all, what kind of leaf is meant? Even a cursory look at the material reveals the wide range of shapes and sizes that exist. "Leaf-shaped" spears might be as little as 6.6 x 1.5cm (Richborough) up to 41 x 9.2cm (Wallsend). Within this range there is an infinite variation and at the bottom end of the scale the boundary with arrowheads is rather hazy. No two spearheads are ever exactly alike. This may seem an obvious point, but one that is worth repeating when we come to consider how to construct a typology for Roman spears. One critical factor is the simple nature of the tools and techniques used to produce weapons at this time.

"Leaf-shaped" spears in one form or another have been in use for as long as spears have existed as weapons. There have of course been variations in size, shape, cross-section, presence or absence of a mid-rib and socket type, but the basic concept remains unchanged over time. "Leaf-shaped" is the natural form a spearhead will take when hammered out from a piece of metal. other forms require a great deal more work to produce and are consequently rarer.

In any excavation report or spearhead typology certain terms and concepts recur and it is important to be familiar with these before looking at the material and assessing the worth of any typology. Total length (TL) is the overall size of the metal part of the weapon. BL=Blade length. BW (Max) = the maximum width of the blade. LOE=length of entry, that is the distance from the tip of the blade to its widest point. The "shoulder" is the part of the blade where it turns in towards the socket. The shoulders can be described as rounded or steep (i.e. entering the socket at

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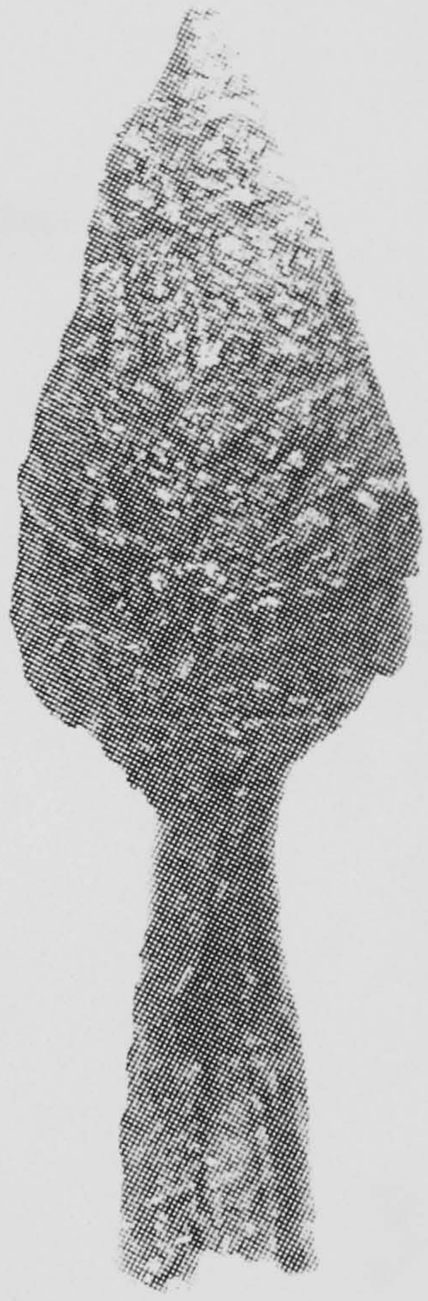

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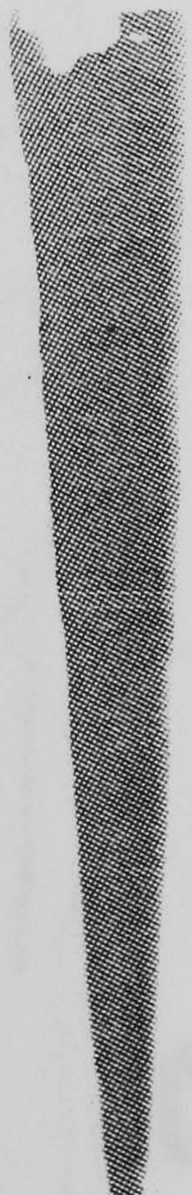

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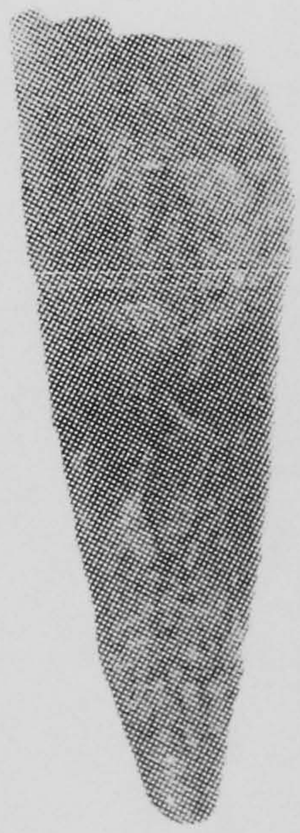

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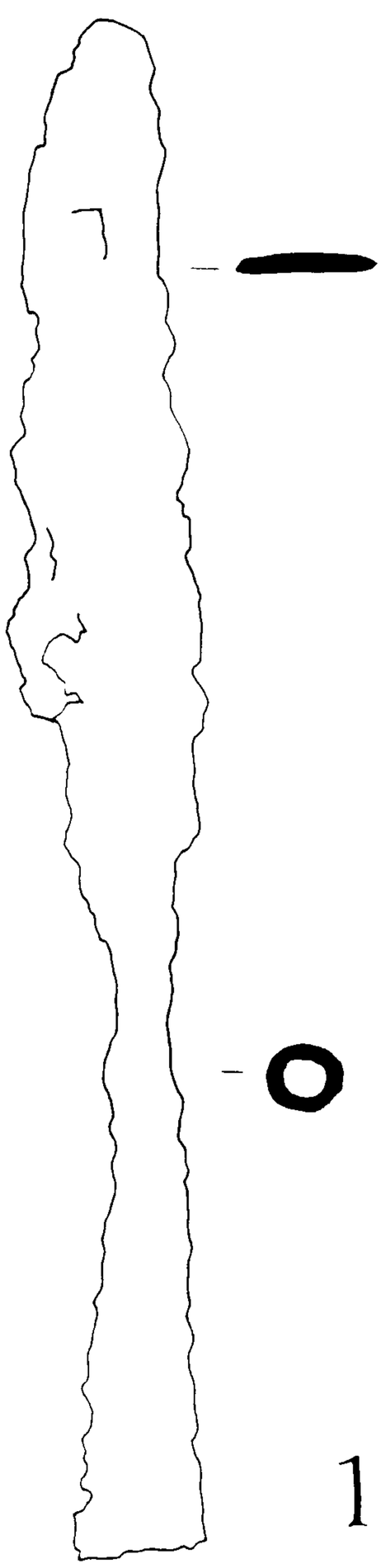
PLATE 14: Spearheads and Spearbutts (all at 1:2)
1. Mucking 2. South Shields
3. Corbridge 4. Chesters



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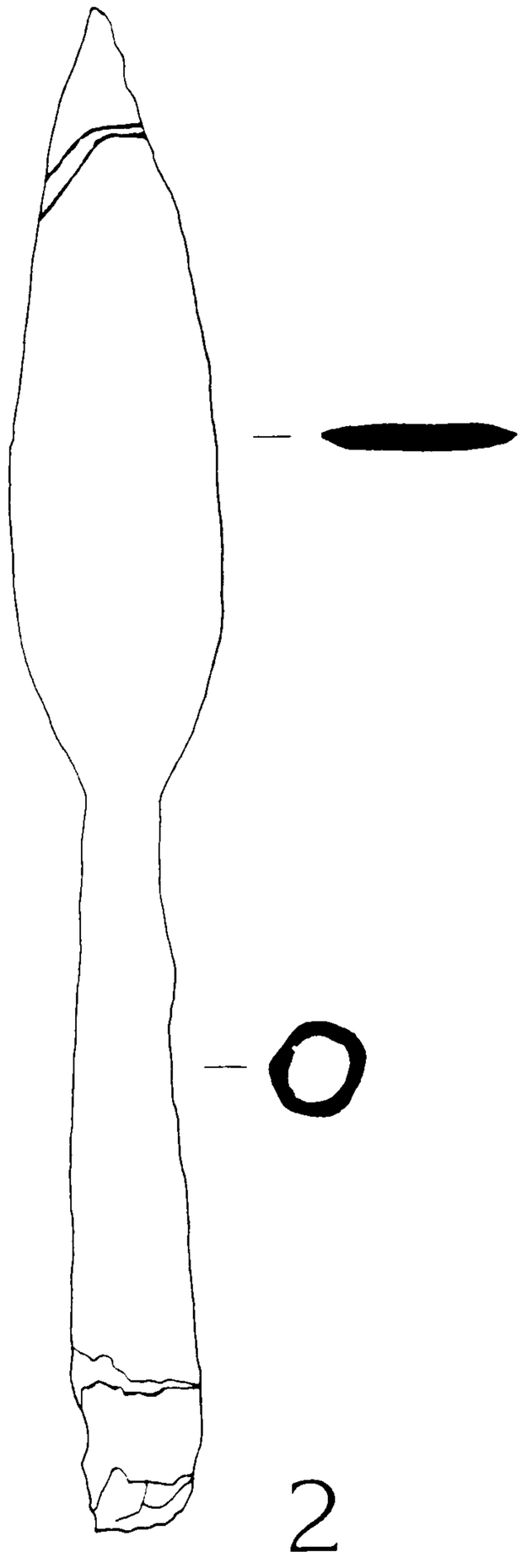

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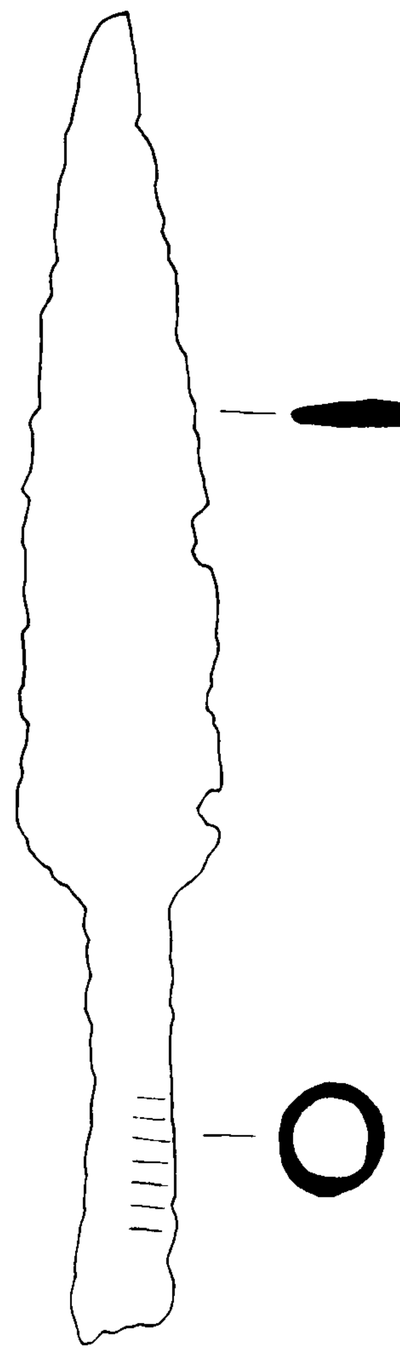

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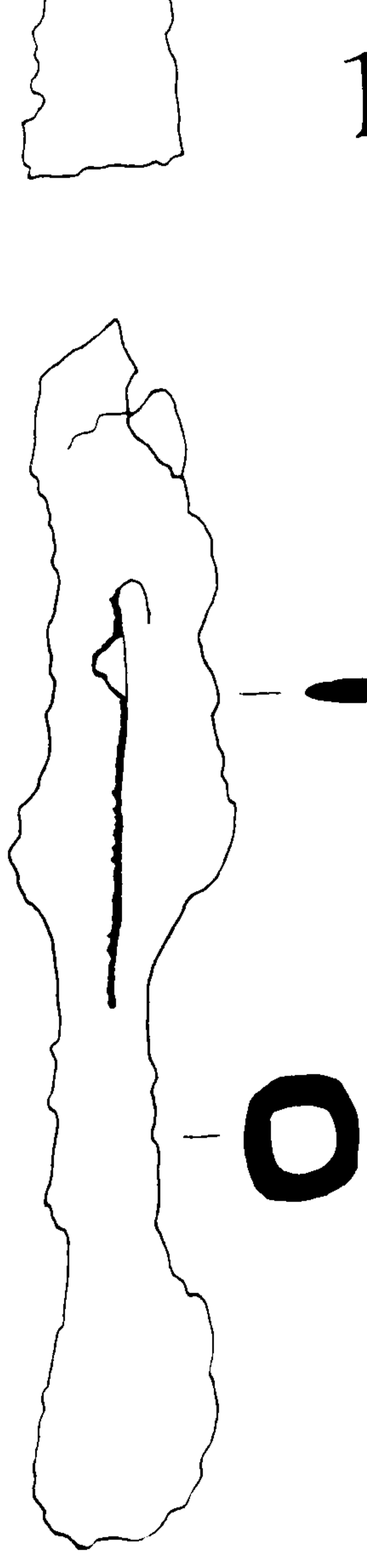

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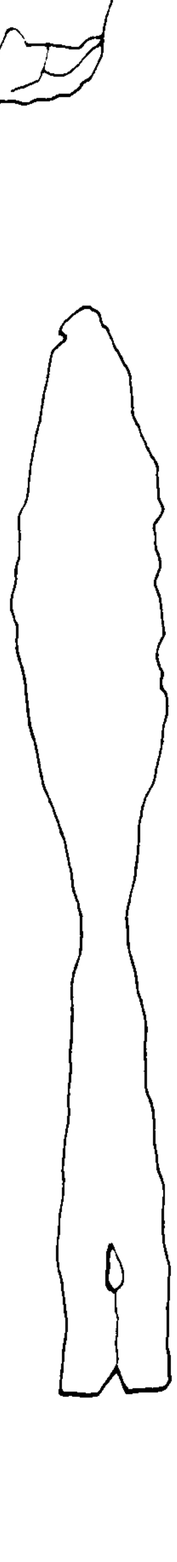

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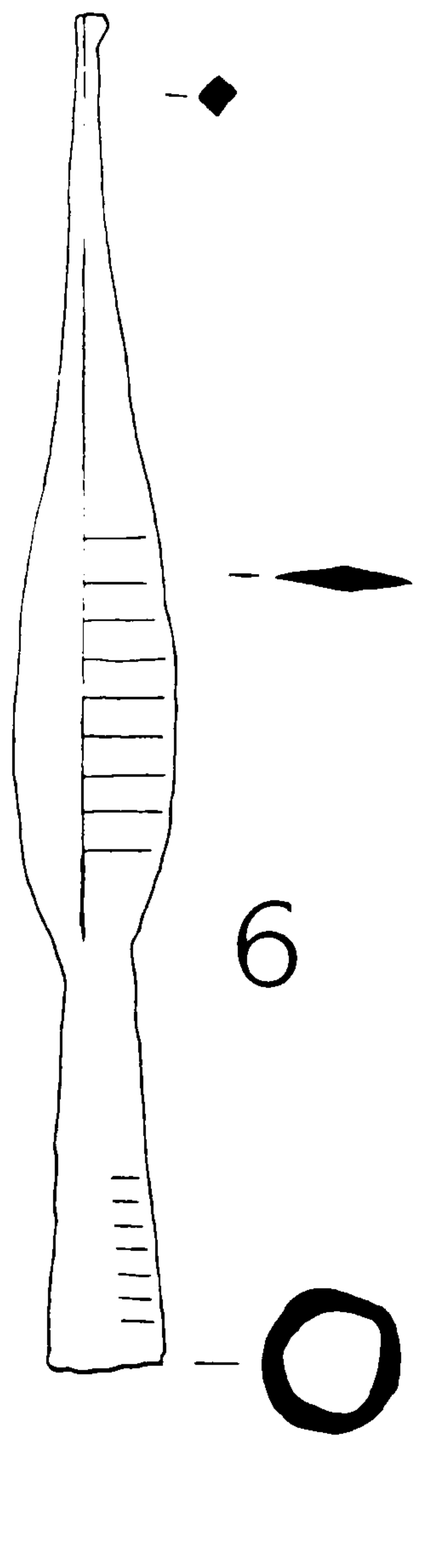

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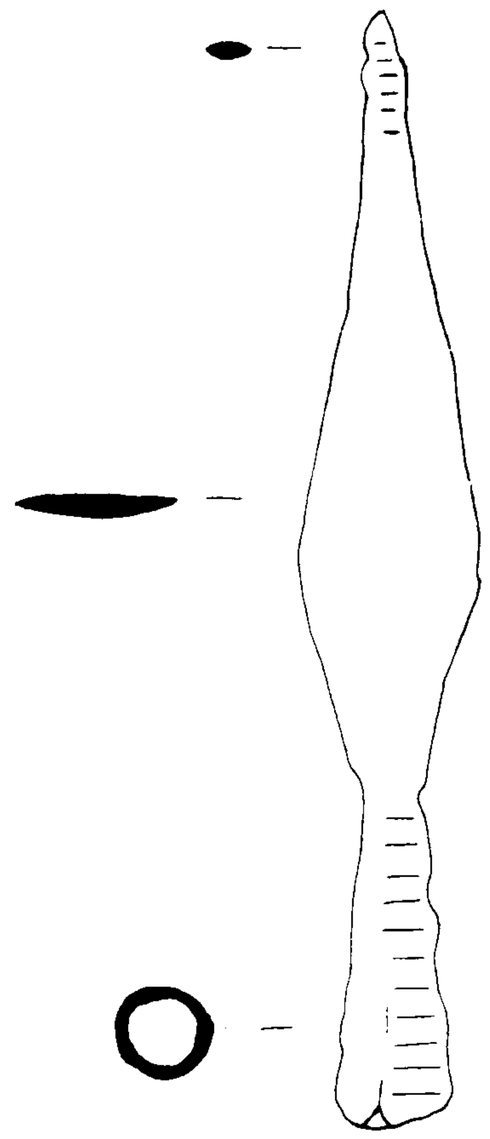
FIG14 "Leaf Shaped" Spears (all at 1:2)
1. Housesteads "Lance" 2. MC.35 No.43
3. Corbridge 75.1172 4. Housesteads No.3
5. Vindolanda 3803 6. Vindolanda 3745



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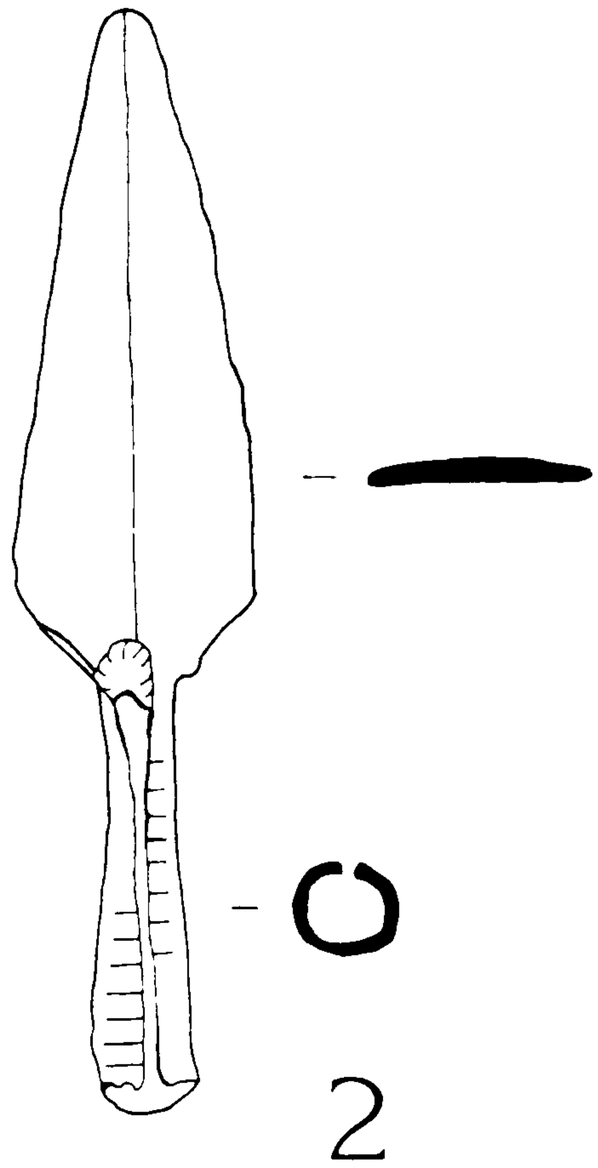

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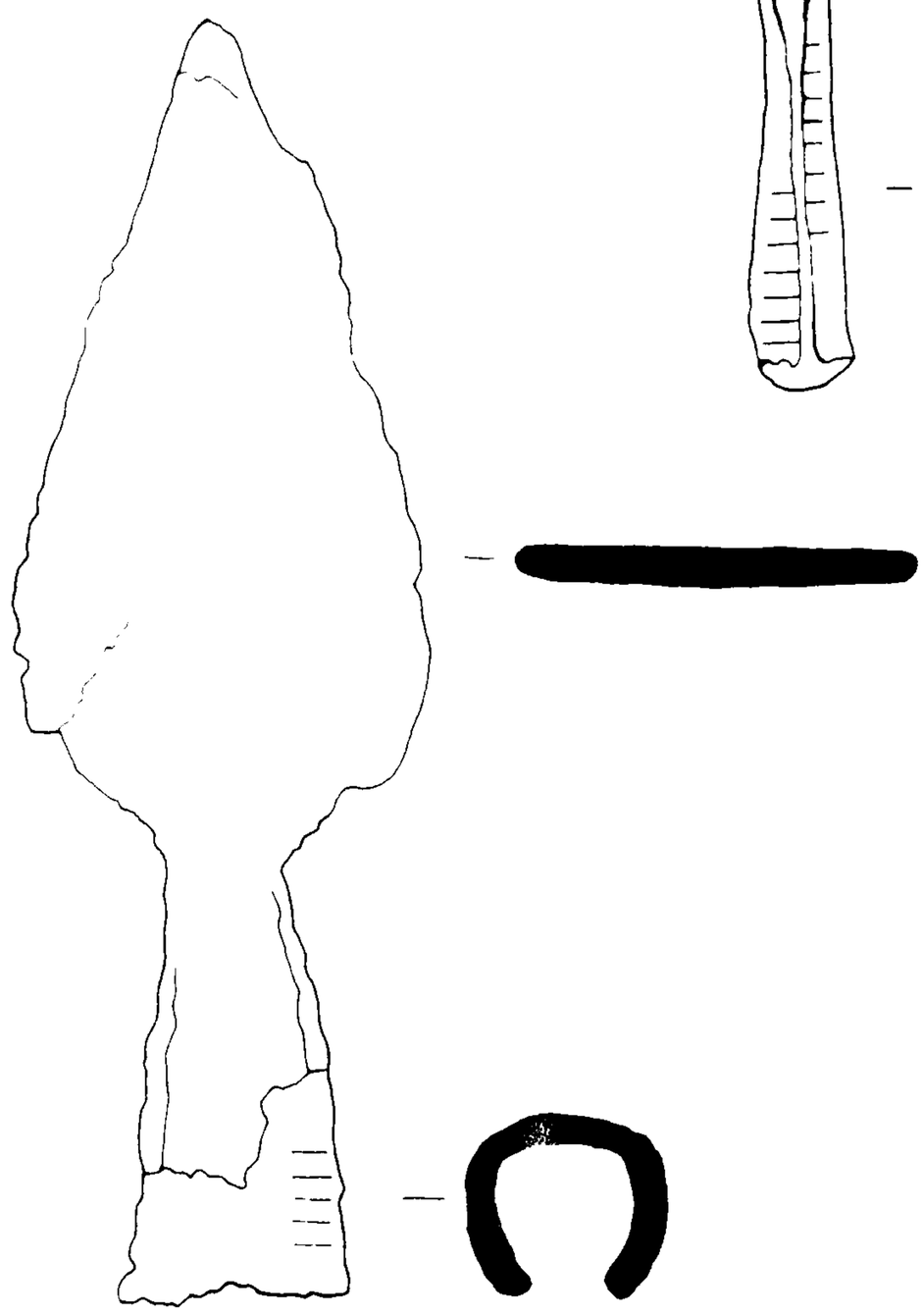

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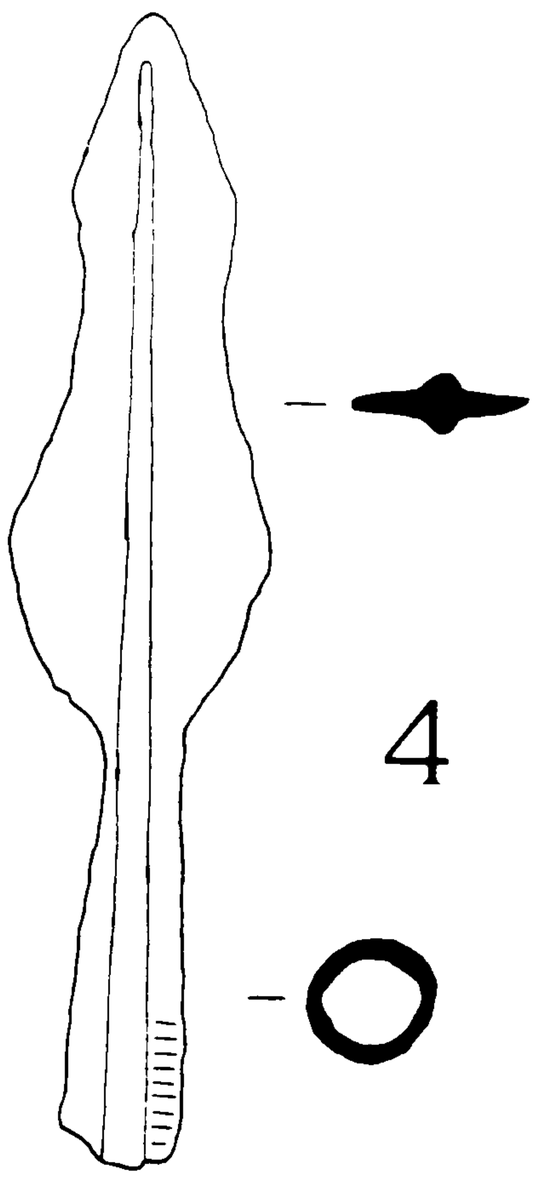

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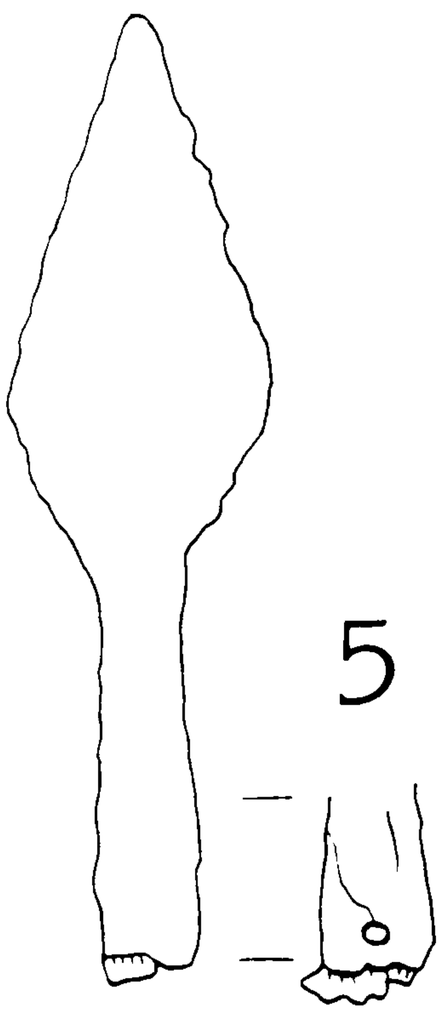

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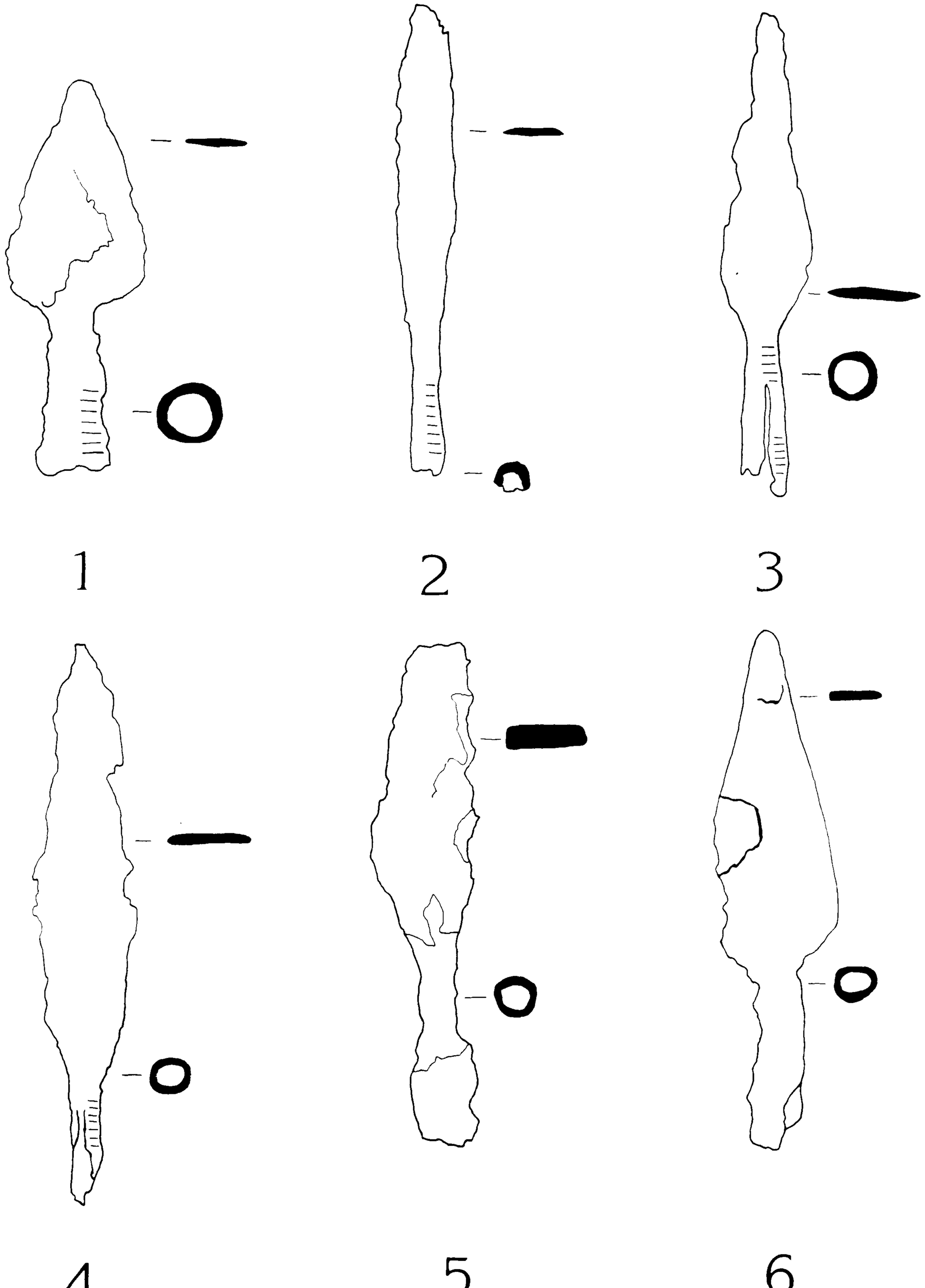
FIG 15: "Leaf Shaped" Spears (all at 1:2)
1. Carlisle, Annetwell Street 2. Binchester?
3. South Shields 5.91 4. MC.35 No. 41
5. MC.35 No. 45



1 2 3

4 5 6

FIG 16: "Leaf Shaped" Spears (all at 1:2)
1. Caerleon (Prysg) 2. Chesters 1619 3. Corbridge 75.1177
4. Housesteads No.2 5. Housesteads No.5 6. Housesteads No.8

a sharp angle). These terms are of course rather subjective. Often there is no clear junction between the blade and the socket. "Low shouldered" implies a spear whose widest point lies near the base of the blade. "Mid-shouldered" naturally means a spear whose widest point is near the middle of the blade. "Javelin" is a term applied to spears which are presumed to have been thrown rather than used in hand-to-hand combat. "Lancehead" is an equally vague label for spears thought to have been used for thrusting or stabbing, especially in connection with cavalry spears. This term is rather misleading because as already noted the evidence that the Romans used their cavalry spears in the manner of Medieval/Napoleonic lances is exceedingly sparse. SD (Int) and SD (Ext) are respectively the internal and external diameters of the sockets. The sockets can be "closed" i.e. a complete circle, "split" - open up one side - or "wraparound" - largely open and created by folding over the lower edges of the blade. The difference between the latter two categories is one of degree.

Catalogue of "leaf-shaped" spears in Britain.

Ambleside.

One spearhead was found in 1914. This appears to have had a fairly short, broad blade, lacking the point (Collingwood 1915 p59, fig 30). A corroded mass of ironwork found near the east gate of the later fort in 1915 proved to be a bundle of eleven spearheads (Collingwood 1916 p89, figs 17-18). These had very broad blades and some had split sockets. TL:c14" (35.5cm). BL:c9- 10" (23-25cm). BW (near base) :4-5" (c10-12.7cm). SD (Ext?) :c1.5" (3.8cm). Date:Hadrianic-4th century?

Ardoch.

Three spearheads were found in 1896-7 (Christison et al 1898 p464). The first was c14cm long, with a blade c8.2cm long by c3cm wide. The socket diameter (external?) was 0.8cm. The other two were incomplete. Date:Flavian or Antonine.

Bainbridge.

There are two "leaf-shaped" spears from this site in the Yorkshire Museum. The first is marked in ink-possibly B 864 - and is only a fragment of blade. TL:13.7cm. BW (Max) :4.3cm. The other find lacks the tip of the blade and most of the socket. TL:c13cm. BW (Max) :c2.8cm. Date:Flavian-4th century.

Baldock.

The spearheads found at this Romano-British settlement may be divided into two groups according to their basic appearance and size. The first category consists of 9 relatively large and well-made spears with closed or split sockets (Stead and Rigby 1986 p145, fig 64 no.s 440-8). In some cases the blade runs smoothly into the socket, as with no.443 which was at least 20cm long and is identified as a lancehead. It is dated to the 3rd century. No.444 has a diamond-shaped blade and no.446 is triangular. Several parallels are cited for latter, including a spearhead from Lyne (see page 216), but these all have barbs which the Baldock spear does not. Dates:1=Claudian, 1=Flavian, 1=1st-2ndc, 2=3rdc, 1=late 4thc (no.444) and 2 are undated.

The remaining spearheads came from a 3rd century well (Ibid figs 64-5). They have "leaf-shaped", diamond or triangular blades of elliptical (i.e. convex on both sides) section. Most have "wraparound" sockets. Their crude appearance is very striking. In particular the arrangement of the socket is very insecure when compared to other methods. This may imply civilian production, although it is possible that this was a votive deposit. There is great variation in size within the group. The larger examples e.g. fig 65 no.s 490-2 are surely spearheads, but others might be arrowheads. The shape of the projectiles is not appropriate for ballista bolts. To my mind there is no point in looking for rigid dividing lines in this material. One example (no.491) has a faint mid-rib.

Balmuildy.

Two possible spearhead fragments were found in 1922

(Miller 1922 p97-8, plate LIV no.s 28, 32). The first had a point c7.9cm long with a well-defined shoulder. The other was a fragment of blade c13.3cm long and up to 5cm wide. A spearhead in the Hunterian museum (Acc. no. F.1922.87) equates with the second of these finds. The tip is missing and the blade is of elliptical section. The socket is closed. TL:13.8cm. BL:c8.5cm. BW (Max) :2.8cm. SD (Int) :1.5 cm. SD (Ext) :1.7cm. Date:Antonine.

Bar Hill.

Fragments of two spearheads with "leaf-shaped" blades and split sockets have been found here (A. Robertson et al 1975 p99; Hunterian museum Acc. no. F.1936.217). TL:9.6/11.3cm. BL (Surv) :8.5/3.5cm. BW (Max) :2.4/4.5 cm. SD (Int) :?/1.3cm. SD (Ext) :?/1.5cm. Date:Antonine.

Bayford.

The remains of a "leaf-shaped" spearhead with steep shoulders and an elliptical section were found "at the sites of funeral pyres, Bayford, near Sittingbourne, 1881" (British Museum Accessions register, find no.1883 12-13.524; Manning 1985 p160, plate 76 no.27). The socket is closed and filled with corroded wood. TL:13.7cm. BL:7.8cm. BW (Max) :3cm. LOE:c6cm. SD's:Not determinable (henceforth n. d.). Date:2nd century?

Bearsden.

A spearhead was found in the unpublished excavations of 1977 (Hunterian museum, no accession number). This is very corroded, with a broad "leaf-shaped" blade and probably a closed socket (and a clear junction between them). TL:16.2cm. BL:c8.5cm. BW (Max) :4.6cm. LOE:c5.7cm. SD's: n. d. Date:Antonine.

Beckfoot.

There is one spearhead from a cremation burial near the fort (Hogg 1949 p34-5; information from Mr Ian Caruana). This has a short, broad blade with rounded shoulders and a strong mid-rib - which continues onto the socket. It resembles a spearhead from Caerleon (Nash-

Williams 1932 fig 18.4). TL:18cm. BW (Max Surviving) :4.7cm. SD (Int) :c2cm. Date:Hadrianic or later?

Bellshiels.

A spearhead was found at Bellshiels long cairn, not far from Dere street (Manning 1976 p19, fig 12 no.7; M. A. Acc. no.1925.1.42). The blade has an even curve, meeting the socket without a clear junction. It is diamond-sectioned. Most of the socket is lost. TL:15cm. BW (Max) :3.4cm. SD (Ext) :c1cm. Date:Roman?

Bewcastle.

Two spear fragments have been found here (unpublished excavations by Mr. Paul Austen). Both probably had short, broad blades of elliptical section and closed sockets. TL:9.4/10cm. Date:One unstratified, the other from a period III floor (c180/213-273+AD).

Binchester. (fig 15 no.2)

A spearhead from the Fulling Mill museum, Durham may be from this site (Acc. no.1986.120). The blade is unusual in that it is convex on one side with a slight mid-rib, but flat on the other side. There is a clear junction with the wraparound socket. TL:15.8cm. BL:9.6cm. BW (Max) :3.4cm. LOE: c7.8cm. SD (Int) :1.2cm. SD (Ext) :1.4cm. Date:Flavian-4thc.

Birrens.

Fragments of two spearheads were found in 1895 and another in the 1960's but apart from the fact that they were "leaf-shaped" they are too poorly preserved to say anything about their form (A. Robertson 1975 p129, fig 43 no.s 5, 11-12). TL:17.5/16/15.5cm. BL:11cm/?/? BW (Max) :2.3/5/4.5cm. Date: Flavian-Antonine.

Bowness-on-Solway.

A fragment of a spearhead with a prominent mid-rib was found here in the 1976-8 excavations (Potter 1979 p47, fig 7). TL:16.4cm. BW (Max Surv.) :4.9cm. Date:Found in a 3rd century level, probably pre 250AD.

Brancaster.

Part of a spearhead was found in the vicus (Hinchliffe and Sparey-Green 1985 p49, fig 32 no.50). The upper part of the blade is lost and it runs into the socket without a clear junction. No measurements known. Has an elliptical section. Date:late 2nd-4th century.

Brecon Gaer.

Two spearheads have been found at this site (Wheeler 1926 p32, 118, fig 60 no.s 17-18), both of them "leaf-shaped". These are in the National museum of Wales (no accession numbers) - see table 5 for measurements. Date:one unstratified, the other from a deposit in the north guardroom of the east gate dated to the early 2nd century.

Brigstock.

A fragment of a spearhead, lacking the tip was found here in 1961 (Greenfields 1963 p247, fig 7). This appears to be fairly small, perhaps a javelin, with no clear junction between the blade and the socket. Possibly a civilian hunting weapon. Date:Unstratified, but found 100 feet north of the round shrine, so perhaps 3rd or 4th century.

Broomlee Lough. (fig 12 no.4)

Two spearheads have been found in this pond/lake near to Housesteads fort (Manning 1976 p19-20, fig 12 no.6; fig 13 no.19). The first of these has a "leaf-shaped" blade with a long thin point and a split socket. TL: 16.6cm. BL:10.6cm. BW (Max) :2.2cm. SD (Ext) :c1.5cm. The other find is unusual. It has an angular blade of diamond section, with a long point. There are two small circular holes set side by side near the base of the blade. The socket is closed. The holes might have been for the attachment of a standard. TL:23.5cm. BL:13.5 cm. BW (Max) :3.6cm. SD (Ext) :c1.8cm. Date:Possibly Roman. There are some Anglo-Saxon spearheads of similar shape (Swanton 1973 figs 25-6), but they lack the holes in the blade. (fig 12 no.4).

Brough-under-Stainmore.

Some spear/lanceheads were allegedly found here (E. Birley 1959 p42) but I have been unable to locate any such finds.

Burnswark. (plate 13 no.1).

Two spearheads have been found here. The earlier find (Anderson 1899 p249, fig 8) lacked its point and had steep shoulders. TL:c16cm. BL:c10cm. BW (Max) :c5.7cm. SD (Ext?) :c1.9cm. The other find (Cormack 1960 p190, plate IX; Nat. Mus of Scot. Acc. no. FR.689) has a very narrow blade with virtually parallel sides for most of its length. It is diamond-sectioned. The socket is closed. Because of its slim shape this weapon has sometimes been identified as a cavalry lancehead, but there is absolutely no evidence to back up this theory. TL:26.3cm. BL:15cm. BW (Max) :1.9cm. LOE:c14.5cm. SD (Int) :1.8cm. SD (Ext) :2cm. Date:Antonine or later?

Cadder.

A spearhead of unspecified form was found in the east gate guardhouse in 1929-31 (Clarke 1933 p18, 83). Not available for study. Date: Antonine.

Caerleon.

Fifteen spearheads are illustrated in the report on the Prysg Field excavations of 1927-9 (Nash-Williams 1932 figs 17-18). Nine of these (Ibid fig 17 no.s 1-9) are fairly standardised, with slender "leaf-shaped" blades tapering smoothly into closed or split sockets. The widest point is near the base of the blade. These spears were identified as lanceheads (Ibid p25) and certainly the shape of the blades would make them suitable for stabbing with, as they could be easily extracted. In several cases the tips are thickened and squarish in section. The group varies in length from 16.5 to 22.6cm. The blades are 10.4-13.5cm long and the maximum width is 2.3-2.8cm. Internal socket diameters are 1.2-1.4cm and externally the sockets are between 1.6 and 2cm across. Clearly someone had gone to some trouble to produce spears of a uniform shape and size.

Two of these "lances" were dated to c120-200AD and four others to 200-300AD while the rest were unstratified. In fact it is unlikely that any of them date much after 200AD and it is attractive to see this group as being made in one batch (fig 16 no.1).

The rest of the Prysg spears were broader "leaf-shapes" (Ibid fig 18 no.s 1-6), some with rounded, others with slightly angular outlines. The variations are probably more to do with chance than any desire to produce "types" of spearhead. The exception to this is perhaps a very broad-bladed spear with a prominent mid-rib (Ibid fig 18 no.4). TL:13.6cm. BL (Surv.) :8cm. BW (Max) : 4.7cm. Date:120-200AD? There is another (unpublished) spearhead from Prysg which is just like the above. This too is incomplete. TL:17.9cm. SD (Ext) :2.3cm. A third spearhead of this form was found in more recent excavations in the vicus (Caerleon museum Acc. no.56.217. F13). The closed socket has an iron rivet in it and also contains part of the wooden shaft. This was identified as ash (fraxinus excelsior). TL:c19cm. The other "leaf-shaped" spears are unremarkable. Their measurements - where available - have been summarised in table 5. In all there are some 20 spearheads from Caerleon, a high number for a legionary site. Perhaps this implies that some legionaries were equipped with spears rather than the traditional pila.

Caernarvon.

A diamond-shaped spearhead with a faint mid-rib and a closed socket came from the principia (Wheeler 1923 p142 fig 65 no.1). This was dated to the 4th century AD. There was also a javelin/arrowhead with a "leaf-shaped blade, missing most of its socket (Ibid p144, fig 66 no.15).

Three spearheads were found in excavations by Mr. John Casey (publication forthcoming). These range from 15.6 to 19.8cm, although all are incomplete. The largest of these has a "leaf-shaped" blade with steep shoulders and a clear junction with the closed socket. An unusual feature is a shallow channel running down the lower 7-8cm of the blade. This might be the result of imperfect forging rather than a

deliberate design feature. The only parallel from the Roman period is a find from Carlisle (see page 200). One of the others has a mid-rib. Dates:The spear with a mid-rib (TL:17cm) came from a Trajanic-Antonine deposit. It resembles spears from Cirencester (Webster 1958 fig 4 no.39) and Portchester (Cunliffe 1975 fig 124 no.171). There is also a 2nd or 3rd century relief from Caernarvon (publication forthcoming), which shows such a spearhead.

Caister-on-Sea.

Three spearheads have been found in recent excavations (information from Miss Maggi Darling). One has a slim blade of elliptical section with a closed socket. Another has a flat, triangular blade and a split socket. The third has a small angular blade and a split socket. No measurements available. Date:Possibly 3rd or 4th century, but some material may be residual.

Camelon.

Six spearheads were found here in 1899 (Christison et al 1901 p407, fig 46) and of these three are illustrated in the report. The biggest of these has a very slim blade and would have been useful as a stabbing weapon. TL:c36.5cm. BL:c30.4cm. BW (Max) :c5cm. The tip is missing. A second spearhead has a broad, evenly curved blade with rounded shoulders. Most of the socket is missing. TL:c22.5cm. BL:c18.4cm. BW (Max) :4.4cm. The widest point is about halfway down the blade. A third specimen has a small, angular blade. TL:13.3cm. BL:c7.6cm. BW (Max) :c3.8cm. Both blade and socket are incomplete.

Two further spearheads were found in a cist burial in 1975 (Breeze et al 1976 p84, 89-90, fig 3 no.s 3-4). The larger of these is the more interesting. The blade is broad with a rounded tip, straight sides and steep shoulders. The socket is closed. There is a prominent mid-rib on the blade. There are enough parallels from Roman contexts e.g. Mumrills (see page 250) to show that ribbed spears were used in this period. TL:38.2cm. BL:19.5cm. BW (Max) :c5cm. LOE:c16cm. SD (Int) :2.1cm. SD (Ext) :2.3cm. Both these spearheads have a length of well preserved shaft in the

socket, but the wood species has not been identified. Date:Flavian/Antonine.

Cappuck.

Several spearheads "of the usual type" i.e. probably "leaf-shaped" were found here in 1886 (Stevenson and Miller 1912 p474). Nothing further is known of them. Date:Flavian/Antonine.

Carlisle. (fig 15 no.1)

One spearhead from Annetwell street, probably a 19th century find is in Tullie House museum (Acc. no. OM 146). An unusual feature of the "leaf-shaped" blade is a shallow channel running down both sides. This is 0.3-0.4cm wide. This may be the result of incomplete forging rather than deliberate design i.e. to let blood flow down the groove. The only parallel I know of is one of the unpublished spearheads from Caernarvon (see page 239). TL:19.1cm. BL: c12cm. BW (Max Surv.) :2.5cm. SD (Int) :1.8cm. SD (Ext) :2cm. Undated.

Apart from indisputably 1st century examples there are 10 other spearheads from Carlisle. A 3rd century or later example from Castle street (find no.469) has a short, steep shouldered blade of diamond section. There is a clear junction with the closed socket. TL:11cm. BW (Max) :3.4cm. SD (Ext) :2cm. Eight of the spearheads are from the Annetwell street excavations and they range in date from the early 2nd to the 4th century. Three have very slim blades which have no clear junction with the sockets (FE no.s 266, 593, 599). Two of these are dated c90-105AD, whilst the other is probably 4th century. This emphasises once again the futility of trying to date such spears by shape alone. (fig 15 no.1).

Catterick.

Five or six spearheads have been found here (Wacher 1971 fig 26 no.s 1-3, 6). They range from 8.8-39.7cm. The biggest of these has a very long, thin blade and would function well as a "lance" (Ibid fig 26.1). The others are

small-medium sized spears, in one case with a mid-rib. The final item (Ibid fig 26.6) with its pyramidal, square-sectioned head and split socket is more likely to be a ferrule or perhaps a ballista bolt.

Chester.

At least seven spearheads have been found here:- 1 from the Deanery field in 1928 (TL:c24cm), 1 from Old Market Hall in 1967-9 (TL:18.6cm), 1 from Crook street in 1963-4 (TL:17.4cm), 1 from Abbey Green in 1975-8 (TL:21.8 cm) and 2 in the Old Collection (TL:14.8/16.2). One of these is from Hunter street. All of these it should be noted are of moderate size-Chester has not so far produced any extremely small or very large examples. The larger of the Old Collection spears has a mid-rib, whilst the one from Crook street has part of the wooden shaft in its socket. This was identified as coppiced alder or hazel. Dates:Unknown, therefore Flavian-4th century.

Chesters. (fig 16 no.2)

Excluding barbed examples and "standard tips" there are 18 spearheads in the site museum. They range from 11 to 25.5cm, many of them badly damaged. Number 1639 (TL:13.9cm) has a mid-rib on both sides and two blocked rivetholes in the socket. Number 1627 (TL:18.6cm) has a very slim blade with a mid-rib on one side. The socket is split.1607A (TL:21.5cm) and 1611 (TL:11cm) also have mid-ribs.1605A (TL:23.5cm) and 1640 (TL:15cm) have diamond-shaped blades and closed sockets. Overall the impression is one of extreme variability with little attempt at standardisation. Date:Hadrianic-4th century. Some spearheads (type unknown) were found in four barrack rooms in the NE angle (Bruce 1889 p374).

Cirencester.

Corinium museum is reported to have at least ten spear-heads (Webster 1958 p75) although some or all of these may be of 1st century date. There is one with a very slim, straight-sided blade and a split socket, perhaps a stabbing spear (Ibid fig 4 no.40). Another (Ibid fig 4

no.39) has a steep shouldered blade with a mid-rib c.f. spears from Caernarvon and Portchester.

Corbridge. (fig 16 no.3)

Forty-seven spearheads were amongst the finds from the famous Corbridge Hoard (Bishop and Allason-Jones 1988 p11-17, figs 10-19). These vary in length from 11.8 to 39.4cm. They difer in details but basically they have moderately sized blades, steep shoulders and their greatest width towards the base of the blade. They appear to be fairly standardised (fig 17 and page 277) and certainly cannot be divided into types on the basis of blade length:blade width ratio. Several species of wood were identified from traces in the sockets (Ibid p13) including ash, hazel and willow/poplar. These species can be readily coppiced to produce long, straight poles - an obvious requirement for spear shafts.

Different from the above was a spearhead with a short and very broad blade (Ibid fig 19 no.47). This is comparable to a spearhead from South Shields (Allason-Jones and Miket 1984 no.5.91; see page 253). The Hoard spears date to between the Flavian and Hadrianic periods.

Many other spearheads have been found at Corbridge but is generally impossible to date any of these closely and one cannot therefore separate the 1st century material from the later finds. Likewise it is difficult to match up published descriptions/illustrations with surviving finds from pre-WWII excavations. A spearhead with a very slender blade was found in Workshop III in 1938-9 (Richmond and Birley 1940 plate XI). It perhaps dates to the Severan period. Several spearheads in case 3 supposedly from forts 3 (c121-5) and 4 (c139-163) are in fact completely unprovenanced. Two other "leaf-shaped" spears (Acc. no.s IA80 and DZ80) are dated to the 3rd century (Bishop and Dore 1988 p31-2). They are 14 and 22cm long respectively. Again the dates must be treated with caution.

Gadebridge Park.

To illustrate the universality of "leaf-shaped" spears we can look at comparable finds from civilian sites, probably hunting weapons. This villa has produced one small (7.7cm) example, which was unstratified (Neal 1984 p172).

Gellygaer.

A "leaf-shaped" spear with a closed socket was found in 1899-1901 (Ward 1903 p88, fig 18.1). This was of "lozenge" section, the tip missing and a distinct junction with the socket. A very fragmentary find in the National museum of Wales (unnumbered) may be this spearhead. Date:Flavian or later.

Godmanchester.

A "leaf-shaped" spear with a split socket was found here in 1963, together with a piece of late 2nd century pottery (Frend 1966 p28, 32, 40). TL:c12cm. BL:c6.8cm. BW (Max) :c3.2cm. A civilian weapon?

Greatchesters.

A spearhead (form unknown) was found in 1894 to the east of the SW angle tower (see Report of the Northumberland Excavation Committee 1895 pXXV).

Greta Bridge.

A small, very corroded spearhead, its blade possibly "leaf-shaped" was found in the vicus in 1973-4 (unpublished excavations by Mr John Casey). Date:2nd/early 3rd century.

Haltonchesters.

Two spearheads have been found here (Manning 1976 p19-20, fig 12 no.s 10, 15; M. A. Acc. no.1956.183). Of the first of these little survives of either the blade or the socket. It was of elliptical section and measures 11.3cm long. The smallness and lightness suggests a throwing weapon. This may well be true also of the other find, which is equally mangled. TL:8cm. There are similar spearheads from Housesteads and South Shields (Ibid fig 12 no.s 13-14). Date:Hadrianic or later.

Haltwhistle.

Three spearheads and nine sockets (some with parts of the blade attached) were discovered in 1907 (Gibson and Simpson 1908 p59). The best preserved was 8" x 2" (c20 x 5cm). Date:Trajanic or Hadrianic.

Hardknot.

One "lancehead" was found in the NE angle tower in 1889, "the flat blade seven and a half inches[c19cm]long, the ferrule[of bronze]ornamented with two double lines... and there were two inches of wood attached like hard bog oak." There was also "a large spearhead, which, like the lancehead broke in two (Ferguson et al 1893 p420-1). A spearhead is illustrated in this report opposite page 433. It has a short, broad blade with a mid-rib and possibly a split socket. It thus resembles a spearhead from Caerleon dated to c120-200AD (Nash-Williams 1932 fig 18.4). The Hardknot spearhead is elsewhere described (Ibid p435) as being 2" (5cm) long. Another spearhead was found in the principia in 1890 (Maxwell Bart 1893 p232). Date:Probably 2nd century.

High Rochester.

An unspecified number of spearheads were found in 1855 (Bruce 1857 p84). Nothing further is known of them.

Housesteads. (plate 12 no.3, fig 14 no.s 1, 4; fig 16 no.s 4-6)

At least seven spearheads were found here in 1898 (Manning 1976 p18-19, fig 12 no.s 1-5, 8, 14) and a further three spearheads from the Museum of Antiquities in Newcastle may be from the same site. The definitely provenanced finds are between 8.2 and 27cm in length. Manning no.1 is the most distinctive, having a long, slender blade tapering into the closed socket without a clear junction. Although clearly suitable for thrusting it need not be a cavalry "lance". Only one mounted unit - the Cuneus Frisiorum - is attested here. No.s 3 and 5 are similar but smaller. No.14 with its short, broad blade and slim socket is perhaps from a light javelin. A comparable

find comes from South Shields (Ibid fig 12 no.13). No.4 has a mid-rib. Date:All undated, so Hadrianic or later.

Huntsham.

A spearhead found in a corn-drying kiln has a short, broad blade with a prominent mid-rib. This type as we have seen has been found on military sites such as Caerleon (see page 238) and Hardknot (see page 245). This example may be a civilian hunting weapon (Taylor and Wilson 1961 p171, fig 20). Date:Found with coins of Victorinus and Carausius, so probably last quarter of 3rd century or later.

Ilkley.

A spearhead was found here in 1919-21 (Woodward 1926 p287). A second fragment may actually have been a conical butt. HL:c8" (c20cm). The blade was flat and tapering. Date:Flavian-4th century.

Inveresk.

A spearhead and some Antonine pottery were found in the praetentura of the fort (Maxwell 1970 p32).

Kinneil.

Fragments of two "leaf-shaped" blades, possibly spearheads were discovered in 1980. One of them came from "turf slump" from the north rampart; the other was unstratified (information from Mr. J. M. Sanderson, Falkirk museum). Date:Probably Antonine.

Kirkbride.

A possible spearhead fragment was found in 1971 (Bellhouse and Richardson 1975 p85). TL:9cm. Date:c80-120AD.

Kirkby Thore.

There are two spearheads in Tullie House museum one definitely and one probably from this site (Cumpston Bequest 63-1951.59. A; Gillbanks Bequest 27-26.102). The first has a broad, flat blade with steep shoulders. The socket is split. TL:23.2cm. The other is only part of a

blade. This is "leaf-shaped" and of elliptical section. TL:12.3cm. Date:Flavian-4thc.

London.

Many spearheads have been found here but most probably do not post-date the 1st century. Four possible exceptions are considered here. Three spearheads from Bucklersbury House (Museum of London Acc. no.s 19795, 19901 and 20406) are of broadly similar appearance. They have "leaf-shaped" blades of elliptical section, with in two cases, a mid-rib. The sockets are split and in one instance a rivet remains in place. Date:pre c150AD?

A recent find from St. Magnus, New Fresh Wharf, Lower Thames Street (Mus. of Lon. Acc. no.210, site SM75) has a very slim blade with no clear junction with the closed socket. TL:17.5cm. Date:Pottery in the context belonged to the period c225-245AD.

Loudon Hill.

Seven spearheads have been found here (Hunterian museum Acc. no.s F.1952.68-71, F.1952.65, F.1954.17-18). Most are incomplete and not worth describing. In one case part of the wooden shaft - identified as ash - survives. The best preserved find (F.1952.65) has a low-shouldered blade with a long point. This would have been suitable as a thrusting weapon. TL:29.4cm. The blade section is elliptical and the socket was probably closed. Date:Flavian/Antonine.

Lyne.

A rather corroded spearhead from this site may have had a triangular blade with the maximum width near the base. The socket is incomplete (Christison and Anderson 1901 p186, fig 17). TL:c21.6cm. Date:Antonine.

Manchester.

Two spearheads, both incomplete have been found here (Bruton 1909 p88, plate 45 no.s 1-2). The length (of the more complete find?) was 10.25" (c26cm). The socket

diameter (external?) was 0.75" (c1.9cm). One was probably long with a fairly evenly curved blade, whilst the other perhaps had a short, broad blade. Date:Flavian-4th century.

Maryport.

One spearhead was found here, as well as sockets from two others (Bailey 1915 p170). TL:7" (c17.8cm). Date:Hadrianic or later?

Milecastle 35 (Sewingshields). (plate 14 no.1; fig 14 no.2; fig 15 no.s 4-5).

At least six spearheads are known from this site, some of them exceptionally well preserved (Haigh and Savage 1984 fig 13 no.s 41-6). There are also a couple of unpublished fragments, perhaps also from spears.

Number 41 has an unusual blade, with a wavy outline and a strong mid-rib on both sides, which continues onto the closed socket. One would expect that this was a throwing weapon for the shape of the blade would make it difficult to extract after a deep thrust. TL:16.6cm. The nearest parallel is a spearhead from Mumrills (see page 250). Some Celtic spears took this form (Connolly 1981 p115, 117) and this perhaps explains the origin of the type. (fig 15 no.4).

Numbers 42, 44 (incomplete) and 45 were perhaps all light throwing spears. The first has a triangular blade, whilst the others are "leaf-shaped". All have split sockets. TL:14/12.2/14.4cm. Number 44 was found with a fragment of Hadrianic or early Antonine samian. (for 45 see fig 15 no.5).

Number 43 is a much larger spearhead with an evenly curved blade of elliptical section which runs steeply into the split socket (plate 14 no.1). Inside the socket is a well preserved length of wooden shaft. This was identified (Watson 1985 p1) as willow or poplar. The size and shape make this weapon most appropriate as a thrusting spear. (plate 14 no.1; fig 14 no.2). Date:Most of the spearheads

belong to the 2nd or early 3rd centuries.

Milecastle 39 (Castle Nick)

About ten spearheads have been found here, mostly broken and not worth discussing (unpublished excavations by Mr. J. Crow). The largest of these has an extremely broad blade, with its widest point about a third of the way down its length (object no.427) and was probably a thrusting spear. TL:32.8cm. BW (Max) :7.2cm. Two other finds (object no.s 51, 84) were perhaps small throwing spears. Number 84 is 12.7cm long by 3.4cm wide. Date:The weapons from this site probably date to the late 2nd or early 3rd century.

Milecastle 48 (Poltross Burn).

Four spearheads and a socket were found here (Gibson et al 1911 p445). They were between 5" and 7.5" in length (c12.7-19cm). Part of a "leaf-shaped" blade in Tullie House museum (Acc. no.7-1911) is probably one of these finds. TL:16.3cm. Date:Hadrianic or later.

Milecastle 50 (High House).

Four spearheads were found at this site (Simpson 1913 p388), each about 8" (c20cm) long. Date:Hadrianic or later.

Milecastle 54 (Randylands)

Two spearheads were discovered here (Allason-Jones et al 1984 p229). One of these has an angular blade with a split socket. It is similar to no.42 from milecastle 35 and to an unprovenanced spearhead in the Newcastle collection (Manning 1976 fig 12 no.11). TL:14cm. The other has a short, broad blade and was probably also a throwing spear. TL:11.5cm. Date:Hadrianic or later.

Milecastle 79 (Port Carlisle).

Three spearheads have been found here (Allason-Jones et al 1984 p229). No details are known. Date:Hadrianic or later.

Milefortlet 5 (Cardurnock).

Excavations in 1943 produced parts of two spearheads

(Simpson and Hodgson 1948 p94, plate IXa). TL:6.5" (c16.5cm) and 10" (c25cm). Date: Hadrianic?

Mumrills.

Eight spearheads have been found here, all "leaf-shaped" with split sockets (Macdonald and Curle 1929 p559, fig 121 no.s 1-4). These are unremarkable, except for no.1 which has a wavy outline and a prominent mid-rib. It thus resembles a spearhead from milecastle 35 (see page 248). This object was found in a field to the west of the Antonine fort, the site of the alleged Flavian base. Date:All probably Antonine.

Newstead.

At least 18 spearheads have been found here, but detailed discussion is pointless since none definitely came from the Antonine levels (Curle 1911 plate XXXVI no.s 1-7, plate XXXVII no.s 1-7, 10, 13, 22; Curle 1913 p393, fig 6). They include a number of very long, slender spears which might have been cavalry "lances". This identification would fit in with the known garrison of the fort, which included a cavalry ala. One very broad-bladed spear has a mid-rib (Curle 1911 plate XXXVII no.10). Date:Flavian/Antonine.

Old Kilpatrick.

One "leaf-shaped" spearhead has been found here (Miller 1928 p51, plate XXVB; Hunterian museum Acc. no. F.1928.27). This is incomplete, but probably had an evenly curved blade (of elliptical section) with steep shoulders. TL:10.3cm. BW (Max) :3.2cm. Date:Antonine.

Old Penrith.

Seven spearheads have been found here, mostly incomplete and badly corroded (unpublished excavations by Mr. P. Austen). Find no.633 (AML no.7814335) has a slender blade appropriate for stabbing or thrusting. This runs without a clear junction into a split socket. This is filled with mineralised wood, identified as ash. TL:22.4cm. BL:c13cm. BW (Max) :3cm. Find no.634 (AML no.7814146) was probably similar, but is badly damaged. TL:19.6cm. Find

no.636 (AML no.7813260) is a very broad, flat-bladed object, more like a trowel than a spearhead. Date:3rd century or later?

Papcastle.

There is a fragment of blade and socket in Tullie House museum (Acc. no. RF 368) perhaps from a "leaf-shaped" spearhead. TL:c9.9cm. Date: Flavian (?) -4th century.

Pen Llystyn.

There are fragments of a "leaf-shaped" spear in the National Museum of Wales (Acc. no. CAE 17.6 640205). TL:20.1cm. Date:late 1st/early 2nd century.

Piercebridge.

Four spearheads have been found here (unpublished iron-work report, supplied by Miss L. Allason-Jones). One of these has a slim "leaf-shaped" blade which tapers imperceptibly into a split socket. Perhaps a stabbing spear. TL:14.5cm. BW (Max) :2cm. Date:mid 3rd-4th century.

Portchester.

At least seven spearheads have been found here, as well as a couple of more doubtful specimens (Cunliffe 1975 p233 no.s 171-9). Number 171 has a split socket and a prominent mid-rib. Numbers 177-8 are probably small throwing spears. Date:late 3rd/4th century?

Ravenglass.

Two spearheads have been found here (Potter 1979 p89, fig 32 no.s 75-6). The first of these has a mid-rib and a wavy outline, similar to finds from milecastle 35 and Mumrills. The socket is lost. Date:c130-190/210AD. The other blade probably had a fairly even curve and is diamond-sectioned. The tip is missing. Found on cliff face in 1962. Undated.

Richborough.

Twenty "leaf-shaped" spears were examined by the present author at the AML and a further five published

finds (Bushe-Fox 1949 plate LVIII no.280, LIX no.s 290-1, 297-8) could not be located. Most of the excavations at this site were badly conducted and so there is little dating evidence. The possibility that some of the finds came from the 1st century levels cannot, therefore, be excluded. As usual there are subtle variations in both size and shape, but a number of broad categories may be defined.

There are 4 spearheads c23-25.5cm long, with blades 14.5-16.5cm long by 2.6-2.7cm wide (greatest width).*28 Two of these are published (Bushe-Fox 1949 plate LVIII no.s 277-8). The length of entry is about 10-10.5cm in each case, making them excellent as thrusting or stabbing weapons. The blades are elliptical in section and have no clear junction with the sockets. The latter are either closed or split.

Six spearheads from Richborough have mid-ribs, but they are not of uniform shape or size. One has a wavy edged blade (Ibid plate LVIII no.287) reminiscent of spearheads from Milecastle 35 and Mumrills. This has a split socket with one rivethole. TL:13.2cm. Another find (Ibid plate LVIII no.283) has a short, broad, evenly curved blade and a closed socket. This is like a number of ribbed spears from Caerleon (plate 13 no.3). TL:12.7cm. Number 283 was found in the filling of the stone fort's ditch and therefore probably dates to c275AD or later. Ten of the Richborough spearheads are very small-between c6 and 10cm - and probably belong to light throwing weapons (Ibid plate LVIII no.s 291-3, 297-9). Numbers 298-9 came from the stone fort's ditches. (plate 12 no.4).

Rudchester.

A spearhead was found here in 1924 (Brewis 1925 p107). This was 7.5" (c19cm) long with a triangular point and a conical socket. Date: Hadrianic or later.

Scarborough.

A fragment of a spearhead, probably "leaf-shaped" has been found here (British Museum Acc. no.1914 3-9 1). There are traces of a mid-rib on one side and like the spearhead

from Broomlee (see page 237) there are two small circular holes in the blade. TL:13.6cm. Date:If Roman, then probably late 4th century.

Silchester.

The site has produced at least 15 spearheads, but as with the group from Richborough, many of the finds may belong to the 1st century. There is little information available about these finds, which are currently in a store belonging to Reading museum. There are several broad "types". There are four small heads (c7-10cm) all incomplete, perhaps from javelins. A further 3 examples lie between 22 and 28cm, with long length of entries. These would be apprpriate as stabbing spears. The remainder are between 11.5 and 16.9cm, one with traces of a mid-rib. They are relatively broad and might have been larger throwing spears - although some could have been dual purpose. No contexts are recorded for any of these finds. One spearhead (form unknown) was found in Insula I in 1890, amongst a hoard of ironwork supposedly dating to the 4th century (Boon 1974 p271).

South Shields. (plate 14 no.2; fig 12 no.5; fig 15 no.3).

Four "leaf-shaped" spearheads have been found here. One was probably a light throwing weapon (Manning 1976 p19 fig 12 no.13). TL:8.2cm. It has a small circular hole in the blade (fig 12 no.5) c.f. spearheads from Broomlee and Scarborough. This might be an accidental feature. Another example (Allason-Jones and Miket 1984 p299, no.5.93) has a blade which tapers without a clear junction into a split socket. It also has a mid-rib. TL: 13.9cm. A third find is similar to the above, but without the mid-rib (South Shields museum Acc. no.200 6368 5587). TL:14.3cm. This was found in a barrack, probably converted to a granary in c208AD. The last spearhead has a short, broad blade, with rounded shoulders and a split socket. TL:19.1cm. (plate 15 no.3). A close parallel is a spearhead from the Corbridge Hoard (Bishop and Allason-Jones 1988 p17, fig 19 no.47). Dates:Hadrianic (?) or later.

Templeborough.

One spearhead with a broken blade was found here (May 1922 p76, plate XVII no.1). TL:6.5" (c16.5cm). Date:Flavian or later.

Tower 16a (Cote Howe).

Two spearheads were found here (Duff 1938 p158). One was fragmentary, the other had a slim "leaf-shaped" blade with a mid-rib. TL:14" (c35.5 cm). Incomplete. Date:Hadrianic?

Tower 16b.

Parts of three spearheads are said to have been discovered here (Bellhouse 1955 p45). The best preserved was 3" (c7.6cm) long. Two corroded pieces of iron in Tullie House museum (Acc. no.22-1956.1) are supposed to be the remains of one spearhead, but it is difficult to see how they might fit together. The longest piece is 33.3 by 7.7cm. The other fragment is 18.4 by 7.2cm. Date: Hadrianic?

Turret 7b (Denton Hall).

One spearhead (form unknown) was found here in 1929 (Allason-Jones 1988 p197). Date:Hadrianic-4th century.

Turret 10a (Throckley).

One spearhead was found in 1930 (Bennett 1983 p51, fig 16; Allason-Jones 1988 p198 fig 1 10a). This has a long blade (incomplete) with rounded shoulders and a mid-rib. The socket is closed with one iron rivet in it. TL:28.6 cm. Date:Perhaps not later than c140AD.

Turret 18b (Wallhouses West).

A piece of blade, possibly from a spear was found just outside the turret in 1959 (Woodfield 1965 p99; Allason-Jones 1988 p200). TL:4.25" (c10.8cm). W:1.5" (c3.8cm). Date:Probably 2nd century.

Turret 29b (Limestone Bank).

A large "leaf-shaped" spearhead was found in the

excavations of 1912 (Newbold 1913 p61). It was 10" (c25cm) long. Date:c120-200AD?

Turret 34a (West Grindon).

A spearhead was found at the original floor level of the turret (Charlesworth 1973 p109, fig 10; Allason-Jones 1988 p208). This had a diamond-sectioned blade with low, steep shoulders and a split socket. No measurements available. Date:Hadrianic?

Turret 48a/b (Willowford east/west).

Fragments of two spearheads were found in one of these turrets (Shaw 1926 p444). One was 6.5" (c16.5cm) long, the other was 4.5" (c11.4cm) long by 2.25" (c5.7cm) wide. Date:Probably 2nd century.

Verulamium.

There are at least 3 spearheads from this site from 2nd/ 3rd century contexts (Wheeler and Wheeler 1936 plate LXIVa no.s 2, 4, 6) but there is nothing to show that these are not simply hunting weapons.

Vindolanda. (plate 13 no.4; fig 14 no.s 5-6)

The precise number of spearheads from this site is not known, but it is at least forty. One was found in 1967-9 (R. Birley 1970 p141, fig 3 no.6). This has the long, slender blade suited to stabbing weapons. A variety of spears - some perhaps hunting weapons - were found in the vicus (R. Birley 1977 fig 26), but these were not available for study. At least 20 spearheads were found in the excavations of 1980 (Bidwell 1985 figs 46, 48, 49) and there were fragments of about 8 others. There was a bewildering array of shapes and only the briefest of comments can be made here. Overall length ranged from c7-30cm. The most unusual example was found with a sword near to the north gate of the stone fort (ibid p130). This has a very slim "leaf-shaped" blade and an even thinner socket. TL:30.3cm. Bidwell calls this a "lancehead", but the slenderness of the socket makes this unlikely. Probably it was some kind of throwing spear. Date:3rd or 4th century.

There are several slim-bladed spears (Ibid fig 48 no.s 14-17) which might have been used as lances. TL:c14-17.5cm. Date:Two were found in 4th century contexts and could perhaps have been the weapons of the mounted part of cohors IV Gallorum Equitata. There are also four small "javelin" heads (some are perhaps from arrows), which are c5.5-7cm long (Ibid fig 49 no.s 26-29). No.29, with an angular blade and split socket dates to c370AD. Three spearheads have mid-ribs (Ibid fig 48 no.21, fig 49 no.s 23-4). In two instances, wood in a socket was identified as willow or poplar.

Several well-preserved spearheads have been found in recent excavations. One (find no.3803) is another example of the slim-bladed type with no clear junction between the blade and the socket (fig 14 no.5). TL:15.8cm. Weight:45grams. Date:c140-180AD (from the outer Antonine ditch). Number 3863 is a large (32.4cm) spearhead with a mid-rib on both sides and a split socket. The tip has been crushed flat by a tremendous impact. Date:c105-120AD (from the fabrica). One other example also has a mid-rib (no.3745). It has a slim blade with a long tip and steep shoulders. TL:20cm. Date:140-180AD. (plate 13 no.4; fig 14 no.6).

Wallsend.

Six spearheads have been found here, none closely dated. Two are in Newcastle museum (site refs 8565 2449 and 1602), both incomplete. TL: 13.6/12.8cm. The other four are in Wallsend Heritage Centre (find no.s N5 196, N16 346, 1537 and L14 1 557). The first of these is the most interesting. It has a very broad blade, with a mid-rib on both sides. The socket is closed. TL:41cm. Date:Hadrianic or later.

Watercrook.

Five spearheads were found in 1974 (Potter 1976 p32), but no details are known of them. A further three were found in 1976-8 (Potter 1979 p223-4, fig 89 no.112). The example illustrated has a slightly angular blade (the tip

missing) of elliptical section. The socket is closed. From one of the fort's ditches. Date:Flavian to c295AD?

Table 5: "Leaf-shaped" Spearheads from Britain

The following table gives all the available measurements for the finds listed in the preceding section. Some figures are taken from very old reports and are therefore only approximate. Allowance also has to be made in many instances for very extensive corrosion. Where a dimension is incomplete it is marked with an *. All measurements are given in centimetres.

SITE	TL	BL	BW(Max)	LOE	SD Int	SD Ext
Ambleside (11)	c35.5	c23-5	c10-12.7	-	-	3.8
Ardoch	c14	c8.2	c3	-	-	0.8
Bainbridge	13.7 13	- -	4.3 2.8	- -	- -	- -
Balmuildy	13.8	8.5*	2.8	-	-	-
Bar Hill	9.6* 11.3*	8.5* 3.5*	2.4 4.5	- -	- 1.3	- 1.5
Bayford	13.7	7.8	3	c6	-	-
Bearsden	16.2	8.5	4.6	5.7	-	-
Beckfoot	18	-	4.7*	c2	-	
Bellshiels	15	-	3.4	-	-	c1
Binchester	15.8	9.6	3.4	7.8	1.2	1.4
Bowness	16.4	-	4.9	-	-	-
Brecon	11.6 12*	c9.2 c8.5*	- 2.4	- -	- 1	- 1.2
Broomlee	16.6 23.5	10.6 13.5	2.2 3.6	- -	- -	1.5 1.8
Burnswark	c16 26.3	c10 15	c5.7 1.9	- c14.5	- 1.8	1.9 2

Caerleon	16.9	c11.3	4	c8.5	-	1.9
	17.9*	-	-	-	-	2.3
	18.8	-	-	-	-	-
	12	7	4.3	5.5	1.7	2.2
	13.6*	c8*	4.7	-	-	-
	16.5*	-	-	-	-	-
	18.5	10.5	2.3	c6.5	-	-
	14.7*	c9	-	-	-	-
	c19	-	-	-	-	-
	21.7	c11	2.8	c8	1.3	1.7
	18.4	c11	c2.5	c7.5	1.3	1.8
	19.2	c11*	2.5	c7	1.2	1.6
	15.8	c9	4	c7.6	1.6	2
	20.2	c12	2.6	c9	1.4	2
	17.9	10.4	2.3	-	1.3	1.7
	26.5	16.5	6.5	-	-	2.3
	22.6	13.5	2.4	c10	1.2	1.6
Caernarvon	19.8*	c13*	3.7	-	1.7	1.9
	17*	10.8*	3.2	-	1.5	1.8
	15.6*	10.4*	2.6	-	1.2	1.4
Camelon	c36.5*	c30.4*	c5	-	-	-
	c22.5*	c18.4	c4.4	-	-	-
	c13.3	c7.6*	c3.8	-	-	-
Carlisle	19.1*	c12	2.5	-	1.8	2
	11	-	3.4	-	-	2
	20.5	14.3	3.8	c9.5	1.5	1.8
	c20	c10.5	-	-	-	-
	16	11.2	2.5	7.7	1.4	1.6
	13.9	7.5	3	c6	-	c1.5
	c15	-	-	-	-	-
Catterick	39.7	15.5	3.3	c12.5	-	c2.5
	14	c8	2.7	5	1.3	1.7
	10.2	6.5	3.2	c3.7	1.2	1.4
	8.8	5.5	1.9	c3.4	0.7	0.8
	10.4	8	2.2	c4.5	0.3	0.6
	15.5	c8.5	1.1	-	1.2	1.4
Chester	c24.4	-	-	-	-	-
	18.6	11.7	2.7	c9	1.1	1.7
	17.4	c12	5.2	c8.5	-	2.2
	16.7	11	4.3	-	1.6	1.8
	21.8	15.9	2.4	-	-	1.7
	16.2	-	-	-	-	-
	14.8	c8.5	4.1	-	1.8	2.5

Chesters	11*	c5.5	-	-	1.6	2
	13*	-	-	-	-	-
	13.9	9.2	3.2	c7	1.8	2.3
	14.8	c8.4	c1.9	c6.3	0.7	1.1
	15	-	-	-	-	-
	16.8*	11.6*	2.5	-	1	1.4
	15.6	10.6	4.7	c7	1.5	1.7
	17.5*	-	-	-	-	-
	18.5*	-	-	-	-	-
	18.6*	c11	2.1	c9.5	1.2	1.4
	19	-	-	-	-	-
	20.5	-	-	-	-	-
	21.5*	13.3*	4	-	1.4	1.7
	23.5*	-	-	-	-	-
	25.5	-	-	-	-	-
Corbridge	14	-	3.2	7	-	1.5
	8.5	5	1.9	c3	0.6	0.8
Corbridge Hoard	15.9	10	4.1	7.1	-	1.9
	16.9	11.5	3	7.8	-	2
	16*	10*	3.3	7	-	2
	15.5	11.5	2.5	5	-	1.6
	39.4	30.5	5	27.8	-	2.5
	38.5	30	1.6	29.5	-	2.5
	21.6*	14.2*	c3.3	10.5	-	2.2
	17.2	13	-	8.3	-	1.8
	12.5	8.7	2.5	-	-	2
	17	12	-	-	-	2
	17*	12*	-	-	-	2
	c17.2*	11.5*	-	-	-	1.5
	21.7*	15.5*	-	-	-	2
	14.7*	12*	-	-	-	2
	16*	11.5*	-	-	-	2
	c18*	12.5*	-	-	-	2
	c15*	10.5*	-	-	-	c1.5
	c19*	13.5*	-	-	-	1.5
	17	11	-	-	-	1.5
	19*	13*	-	-	-	1.5
	16.2	10	3.5	7.7	-	1.5
	18.3*	12*	3.2	9	-	1.6
	14.1*	9.7*	3.1*	7.3*	-	1.5
	21.1*	16.5*	5.1	14.6*	-	-
	20.5	14.5	3.3	11	-	-
	17.2*	9*	3	-	-	2.9
	12.5	8.5	2.5	6	-	1.8
	12.3	7	2.5	5.5	-	1.6
	20.5	14.5	3	11	-	1.6
	17	12	c2.8	10	-	1.8
	13.8*	7.8*	6	-	-	2.5
	16.1	11.5	2.7	c9	-	1.9
	19.2	14.5	3.2	12	-	2.1
	15	9.5	3.6	6.7	-	1.9
	19.5	13.5	3.1	12.2	-	2.2

	17.8*	11*	3.2*	9.3*	-	2.2
	24.9*	16*	3.8	12.4*	-	1.9
	18.9*	13*	3	10.5	-	2
	11.8*	6.5*	2.1	-	-	1.4
	14*	10*	2.5	7.1*	-	1.8
	19*	13*	3	8.9*	-	2
	12.5	7.5	3	6.1	-	1.5
	16.3*	10.5*	3	8	-	1.7
	20.3	15.5	2.5	13	-	1.8
	18.6	15	3.4	12.8	-	1.3
	19.5	12.5	6.3	9.5	-	3
Godmanchester	c12	c6.8	c3.2	-	-	-
Haltonchesters	11.3*	-	2.7	-	-	-
	8*	-	2.4	-	-	c0.9
Housesteads	27	14	3.4	10	1.7	2.4
	17.6	9.8	3.3	7.5	1.8	2
	16.1*	6.5*	3.1	7.5	1	1.5
	17.7	13	3.4	8.5	0.7	0.9
	15.3	10	2.8	8	1.5	1.8
	16.5	11.2	3.9	c7.8	c1.5	1.7
	8.2*	-	-	-	-	-
Ilkley	c20.3	-	-	-	-	-
Kirkby Thore	c23.2*	c16	4.6	-	1.8	2.1
London	17.7	12.5	2.1	c9.5	1	1.3
	18.2	12.7	3	c8.5	1.2	1.5
	16.3	11.3	2.9	c8.5	1.1	1.3
	17.5	-	1.7	-	1.2	1.4
Loudon Hill	9*	-	2.7	-	-	1.5
	10*	c8.5	2*	-	-	-
	13.2*	7.6*	2	-	-	1.3
	13.3*	c5	2.9*	-	-	1.3
	11*	6.3*	2.2*	-	-	-
	10.7*	-	2	-	-	-
	29.4	c21.5	c3.9	c16	1.7	2.1
Manchester	c26	-	-	-	-	1.9?
Milecastle 35	16.6	10.5	3.6	-	-	1.5
	14	6.5	3.8	-	-	1.8
	26.2	13.2	3.6	-	-	2
	12.2*	-	3.5	-	-	1.5
	14.4	8	3.7	-	-	1.7
	5.3*	-	3.8	-	-	-
Milecastle 39	12.7	-	3.4	-	-	-
	15.8	-	4	-	-	-
	14.7*	-	3.5	-	-	-
	10.3*	-	5.1	-	-	-
	28.3	-	5.8	-	-	-
	32.8	-	7.2	c19	-	-
	14*	-	5.2	-	-	-
	13.8*	-	3.8	-	-	-

Milecastle 48	16.3*	-	-	-	-	-
Milecastle 54	14 11.5	- -	- -	- -	- -	- -
Milefortlet 5	c25.4* c16.5*	- -	- -	- -	- -	- -
Old Kilpatrick	10.3*	-	3.2	-	-	-
Old Penrith	22.4 19.6* 16* 8* 16.6* 8.9* 5.4*	c13 c12* - - c12.5 - -	3 c3.5 3.6 3.4 4.3 - 2.8	c8.2 - - - c8 - -	1.1 - - - - - -	1.5 2.2 - - - - -
Papcastle	9.9*	-	-	-	-	-
Pen Llystyn	20.1	c12.5	c3.4	-	1.4	2.2
Piercebridge	14.5	-	2	-	-	1.2?
Richborough	25.6* 12.7* 8.3* 13.1 23* 8.2* 16.3* 7.3* 16.7 25.6 13.2 13.5* 24.1 9.8* 9.5 6.6 7.6* 6.1* 7.6* 6.1*	c16.5* c8* c7 c11 - - - - - c14.5 7.9 c6 c15 6.9* c5.2 c3.5 - - - -	2.7 - 2.1 - - 1.2 2.2 - - 2.7 3.1 2.4 2.6 1.8 2.6 1.5 1.9 - - -	c10.5 - 5.5 - - - - - - c10 c6.5 c4 c10.5 c3.5 - 2 - - - -	1.4 - - - 1.2 0.6 - - - - 1.9 - 1.4 - - 1 - - - -	1.8 2 1.1 0.5 1.7 1 - - - c2 2.3 - 1.8 - 1.1 1.2 - - - -
Rudchester	c19	-	-	-	-	-

Scarborough	13.6*	8.8*	-	-	c1.1	1.5
	9.8*	-	2	-	-	1
	8.8*	-	2	-	-	1
	7.2*	-	-	-	-	1.5
	11.5	c8	2.9	c3.5	1.5	1.7
	9.9	c5.5	2.4	c3.5	-	1.4
	22	-	2.2	-	-	-
	13.4	-	2.9	-	-	-
	22	c12.5	2.2	c7.5	1	1.4
	15.2	10	3.7	c8.5	1.9	2.5
	28.6	18.5	4.3	17	-	-
	c22*	c10*	-	-	-	2.9
	14.4	-	-	-	-	-
	16.9	-	-	-	-	-
	14.1	-	-	-	-	-
South Shields	8.2	-	2.1	-	-	0.7
	19.1	11.7	6	c8	2.4	2.8
	13.9	7.5	2.3	c5.5	-	1.7
	14.3*	8.5*	2.9	-	-	-
Tower 16a	c35.5*	-	-	-	-	-
Tower 16b	33.3*	-	7.7	-	-	-
	18.4*	-	7.2	-	-	-
Turret 10a	28.6*	-	5.4	-	-	1.9
Turret 18b	c10.8*	-	3.8	-	-	-
Turret 29b	c25	-	-	-	-	-
Turret 48a/b	16.5*	-	-	-	-	-
	11.4*	-	5.7	-	-	-
Vindolanda	c30.3	-	-	-	-	-
	15.7	-	-	-	-	-
	17.5	-	-	-	-	-
	15.3*	-	-	-	-	-
	14.7*	-	-	-	-	-
	13.8	-	-	-	-	-
	10.5*	-	-	-	-	-
	16.1	-	-	-	-	-
	10.8*	-	-	-	-	-
	c15*	-	-	-	-	-
	6.3*	-	-	-	-	-
	18.7	-	-	-	-	-
	8.6*	-	-	-	-	-
	12.5*	-	-	-	-	-
	5.9*	-	-	-	-	-
	7.2*	-	-	-	-	-

	12.5	-	-	-	-	-
	10*	-	-	-	-	-
	7	-	-	-	-	-
	6.9*	-	-	-	-	-
	5.4*	-	-	-	-	-
	9.8	-	-	-	-	-
	20	14	2.4	c10	1.6	1.8
	15.8	8.5	2.2	c5.2	1.5	1.6
	17.4	11.2	3.1	c9.5	1.3	1.5
	13.3*	c9.5	c2.1	c3.5	c1.1	c1.5
	15.4	c11	2.9	c7	1.2	1.6
	24.3	15.1	2.8	-	1.5	-
	17.5	c6.5	1.6	-	1.1	-
	c17.7*	-	-	-	0.6	-
	32.4	c20	4.6	c14	1.6	1.9
Wallsend	13.6*	-	2.1	-	1.1	1.6
	12.8*	7.4*	5.4	-	-	c1.2
	41	c31	9.2	c23	2.3	2.6
	26.7*	15.8*	6	-	2	2.5
	14.5*	-	5.7	-	-	-
	TL	BL	BW(Max)	LOE	SD Int	SD Ext

Problems with Spearhead Typologies.

At the heart of all spearhead typologies lies the supposed distinction between throwing and thrusting spears. The different requirements of each type should theoretically be reflected in their design, primarily in the size and shape of the blade. Javelins have been characterised as having shorter, lighter blades with the centre of gravity near the middle to keep the weapon steady in flight. Thrusting spears on the other hand, ought to have longer, heavier blades, with the weight near the point (Cohen 1975 p28-9). Particularly with cavalry "lances" a relatively slender blade would be useful, so that the spear could be withdrawn after a deep thrust. It is possible that some cavalry spears had thongs attached for wrapping around the rider's wrist, as with lances of the Napoleonic era. This would help in retaining the spear. Descriptions of specific spear types are relatively uncommon. Josephus (De Bell. Jud. III, 96) states that the Roman cavalry carried "in a quiver slung alongside, three or more darts, broad-pointed and as big as spears." Spearheads of the more extreme forms are relatively easy to categorise. Those with very long slender blades (e.g. plate 12 no.2) are clearly

appropriate as thrusting weapons, whilst very small heads (e.g. plate 12 no.4) are most likely from small throwing spears. The problem lies with the bulk of the "leaf-shaped" spears, lying between these extremes. We know that the pilum (see page 183) and even the Angon with its large barbs (see page 210) could be used for both thrusting and throwing and the same is probably true of many of the "leaf-shaped" spears. Some benefit might be derived from experiments with different blade forms to see how well they perform under different circumstances. We turn now to several past attempts at categorising Roman spears and attempt to assess how effective they have been. Attention is focused on the "leaf-shaped" heads as these cause the greatest problems. We should keep in mind at all times that our divisions and types are artificial, 20th century creations. For the Romans, the boundaries between spear types may not have been so clear cut.

1. J. W. Brailsford (1962 p5-6, plates V-VI).

Brailsford's typology was based on 79 spearheads from Hod Hill, which belong to the conquest period. His categories were as follows:- Group A "Large"; i. broad-bladed, ii. narrow-bladed, iii. "local manufacture". Group B "Slender". Group C "Small"; i. "well made", ii. "local manufacture". Brailsford's categories were arranged largely according to length and width, although in fact he quoted only the overall length in each case. It can be seen that labels like "large" or "broad" are very subjective and have only a limited value. One of the key factors in any typology is its "repeatability" i.e. could the same results be achieved by another person. In this case we are bound to say that with such subjective categories precise duplication is unlikely. Nevertheless Brailsford's categories, although a little fuzzy at the edges are basically valid - for the one site only.*29 The Hod Hill collection seems to consist of some relatively standardised "types", adding more evidence to the theory (see page 36) that weapons were basically produced by individual units for their own needs. The wider application of this typology is limited, because resemblances between spearheads from different sites and periods (see pages 277-279) are

probably a matter of coincidence more than anything else.

2. M. J. Swanton (1973).

Although concerned with Anglo-Saxon spears, Swanton's typology does contain some remarks relevant to the present study. His groups were based on shape, proportions, length and weight. Factors like socket diameters, the number of rivetholes and the type of wood used for the shaft he dismisses as "statistically irrelevant" (Swanton 1973 p6). More importantly he notes that since iron can only be worked in a few ways there is a limit to the number of spearhead shapes which can be produced (Ibid p12). This fact, rather than any conscious design accounts for most of the resemblances between spearheads from widely separated sites and dates. Also no two spearheads can ever be exactly alike because of the random nature of the forging process (Ibid p13). As spearheads had a practical rather than a decorative function, any changes in them were probably related to tactical factors rather than to "fashion". Roman spears are conservative in form, the same basic shapes appearing right from the conquest to the end of Roman occupation. There must therefore have been some good practical reason for the upsurge of barbed spearheads in the 3rd and 4th centuries. Perhaps this was related to an upsurge in the recruitment of Germanic troops?

Swanton's categories rely little on measurements but more on the shapes of the blades. Thus his groups H1-H3 all have basal expansions but some are less marked. Spears of group H1 are c16-22cm long, H2 spears are c20-25cm long and H3 runs from c35-50cm. Allowing for the inevitable overlaps and some subjectivity of classification (basically unavoidable) Swanton succeeds in defining several "types" of Saxon spears. He avoids assigning functions to most of these.

3. P. C. Barker (1975) - for a convenient summary see Orton 1980 p38-9.

Barker's typology starts from the assumption that the blade was functionally the most important part of the

weapon. Therefore "types" of spear can be defined by measurements taken from the blade. Barker employed eleven measurements in all, which included overall length, head length ("run and entry"), maximum width ("width at full entry"), widest point of the blade to the top of the socket ("length of run"), length of entry, width half way between the tip and the widest point ("width at half entry"), socket length and socket diameter. These measurements were then divided by the total length to give ratios. As with other statistical methods I remain sceptical about the relevance of this approach to objects which were basically produced in a random fashion.*30

4. R. Densem "Roman Military Spearheads and Projectiles from Britain." Undergraduate dissertation, The Institute of Archaeology, London (1976) - for a convenient summary see Orton 1980 p38-9, 56-64).

Densem took Roman spearhead typologies into a new realm by using a computer to look for significant patterns and correlations in the dimensions of spearheads. Several statistical methods were used. One technique, known as principal component analysis (p. c. a.) involves identifying the factors which contribute most to the variability of spearheads. Densem's sample consisted of 94 missile heads from all over Britain, ranging in date from the 1st to the 4th century. The seven "significant" measurements selected by Densem were as follows:- 1. Total length.2. Blade length.3. Maximum blade width.4. Distance from the "waist" (the top of the socket) to the widest point.5. Width of the blade halfway between the tip and the widest point.6. External diameter of the socket.7. Distance across the waist. The p. c. a. showed that there was a very close relationship between variables 1 and 2 - something which ought not to come as a great suprise. Expressed as percentages, the seven measurements were responsible for the following amounts of variability:- 1.64.4%.2.19% 3.8.2% 4.4.8% 5.2.2% 6.1.3% 7.0.2%. Variable 3 might be said to represent the "pointedness" of the spearheads (Orton 1980 fig 2.32). Drawing spearheads with high and low values in each of the first three variables gives us a visual

explanation of how spearheads differ in shape. As a result of the p. c. a Densem deduced that there were seven types of spear, namely:1. fairly large, broad. 2-3. Fairly large, moderate shape. 4. Very large, broad, blunt. 5. Very large, narrow, sharp. 6. Small, moderate shape. 7. Very small, fairly narrow and blunt. When the seven clusters were checked against the first three p.c.s, there was unsurprisingly much overlap between the types. There was least overlap with p.c.1 (overall length). Perhaps this shows that total length was the main distinguishing factor? A final step was to compare the clusters in terms of their date, geographical distribution and, where possible, the associated units (Ibid fig 2.35). With regard to the first and third factors there was simply too little positive data for meaningful analysis. This would unfortunately have remained true even if Densem had used a much larger sample. Densem's analysis showed that cluster 2 was concentrated in Wales (eight examples out of eleven) and cluster 7 in the southeast (five out of eleven), but the numbers of finds involved here are so small that conclusions based on this data would be risky in the extreme. Our surviving spearhead sample is in any case tiny in comparison with the millions which must have been produced.

Although an interesting experiment, the conclusions which we can draw from Densem's study are sadly, very limited. It can be seen that total length, blade length and blade width were the most important factors in spearhead design, but one could deduce this without using computers or involved statistical proceedures. Densem's seven "types" are very vaguely defined, with too much overlap to be meaningful. The phrase "not... particularly productive" (Bishop 1987 p11) perhaps best sums up this attempt at a typology.

5. W. H. Manning (1976).

This study was based on just 23 finds, which the author himself acknowledged (Manning 1976 p18) is hardly enough for a complete typology. Manning defined four groups:- 1. Narrow. "leaf-shaped" blades (Brailsford's

Groups Aii and B). 2. Relatively wide, short blades (Brailsford's Group C). 3. Small, narrow spearheads with an expansion at the base (the "standard tip"). 4. Barbed spears. Groups 3 and 4 are well-defined and can be ignored here. Groups 1 and 2 were defined by their length and width, although only the total lengths are given in the catalogue. In group 1 the spears range from 15.1 to 27cm in length and are 2.2 to 3.4cm wide. In group 2 the lengths are between 8.2 and 16.5cm and the widths between 2.1 and 3.9cm. There is thus some overlap. Group 1 does cluster quite well, mainly one suspects because most of the finds are from Housesteads or from nearby Broomlee - yet more evidence for standardisation at single fort level. This material cannot really be used in a meaningful way because too many of the spearheads are badly preserved and of uncertain provenance. Several of them may not even be Roman.

6. I. R. Scott (1980).

Scott's typology relied on features like blade shape, blade section, barbs etc to identify "types". Material was drawn from all parts of Britain, ranging in date from the 1st to the 4th century. Lengths are given for some groups. As usual it is the "leaf-shaped" spears which cause all the problems. Scott's group 1 (Scott 1980 p333) are the "Hod HIll lanceheads", 17-29.8cm long, with narrow blades which have rounded points and straight sides. This type seems well-defined and is found in a limited period and in a small area. Other groups are less convincing, as with group 5, which are "broad-bladed spearheads" (Ibid p337), 15-30cm long. There is also rather too frequent use of the term "lancehead" although Scott acknowledges that such weapons are not invariably associated with cavalry units. The problem with this typology is one of subjectivity. If we choose to pick out certain individual finds we can identify "types" of "leaf-shaped" spears, but if we consider the material as a whole, then the picture is much more complicated than such typologies suggest.

7. W. H. Manning (1985).

Manning's second typology was based around the spearheads from Hod Hill, already studied by Brailsford (Manning 1985 p161-2, fig 33). Using 68 spearheads, he plotted the blade length against the maximum blade width. The four groups which Manning claimed were represented are quite well differentiated by their width, but in terms of length the gaps are not very wide. This is especially true of groups 1 and 2. It could be argued that given a slightly larger number of complete spearheads to measure, these gaps might disappear altogether.

It would be interesting to test Manning's method with collections of spearheads from other sites, but the number of examples with complete blades is very small. There is no value at all in plotting a graph for all available finds as this simply gives a fairly even spread across the graph. This is not suprising since we are dealing with material covering several centuries. One large group available for study is the Corbridge Hoard (Bishop and Allason-Jones 1988 figs 10-18). If we use Manning's approach on these finds (fig 17), it can be seen that with few exceptions the blades are c6-15cm long and c2-4cm wide. Their appearance is very uniform and there appears to be some evidence here of standardised production. The spearheads from Caerleon, Richborough and Silchester (fig 18) do not show any particular patterns. There are many well-preserved finds from Vindolanda which might be used for such a study, but at the time of writing, measurements are not available for many of these.

Spearbutts.

The spearbutt or ferrule as it is sometimes referred to had, essentially, two functions. Firstly it acted as a counterweight to the blade of the spear/javelin, ensuring that the weapon was balanced and therefore effective. Secondly, the butt kept the wooden shaft out of contact with the ground if the spear was grounded and thus avoided damage to it. It is possible that Roman spearbutts may have been used as weapons in an emergency if the blade was

FIG.17 Blade Length: Blade Width Ratio of the Corbridge Hoard Spearheads.

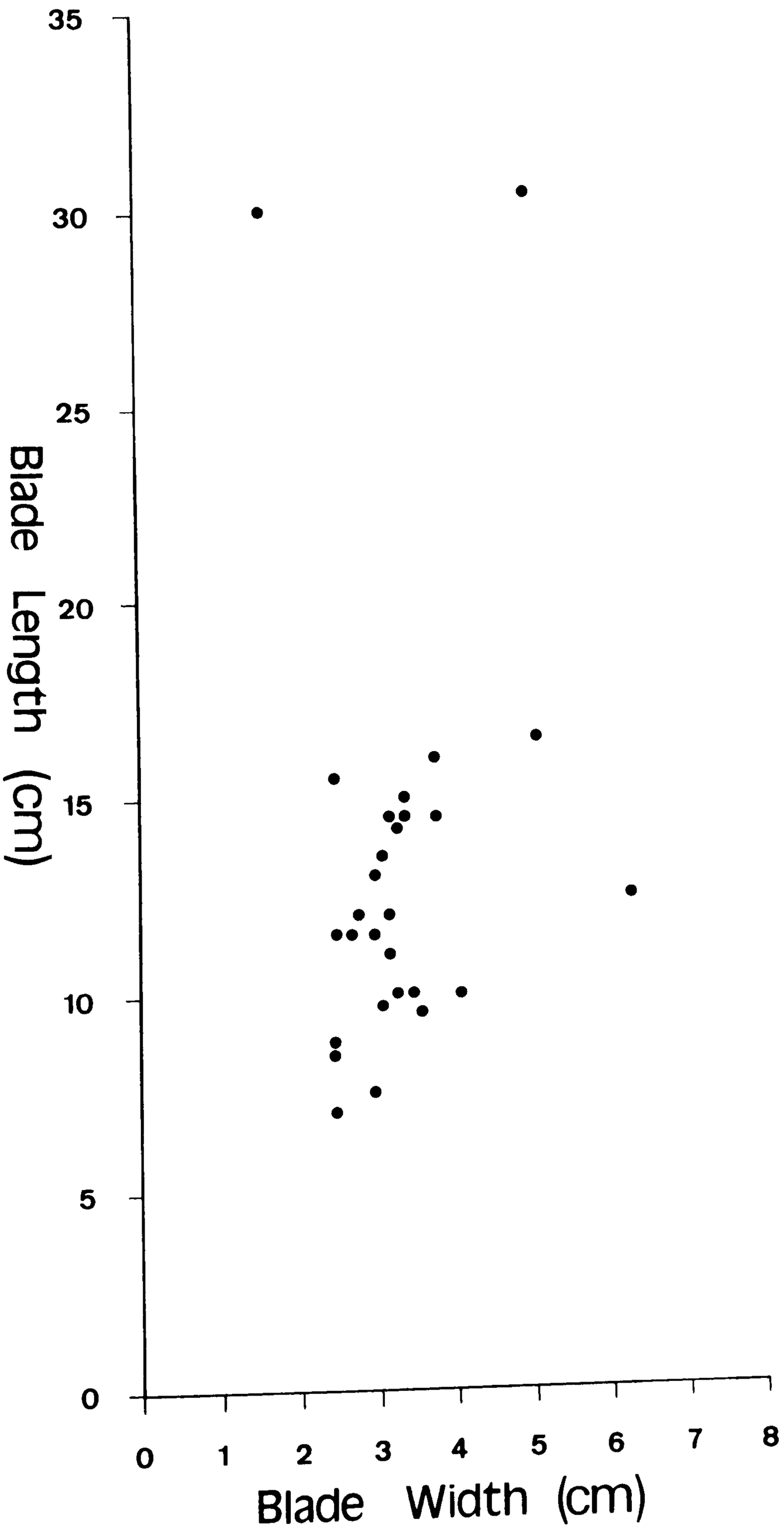
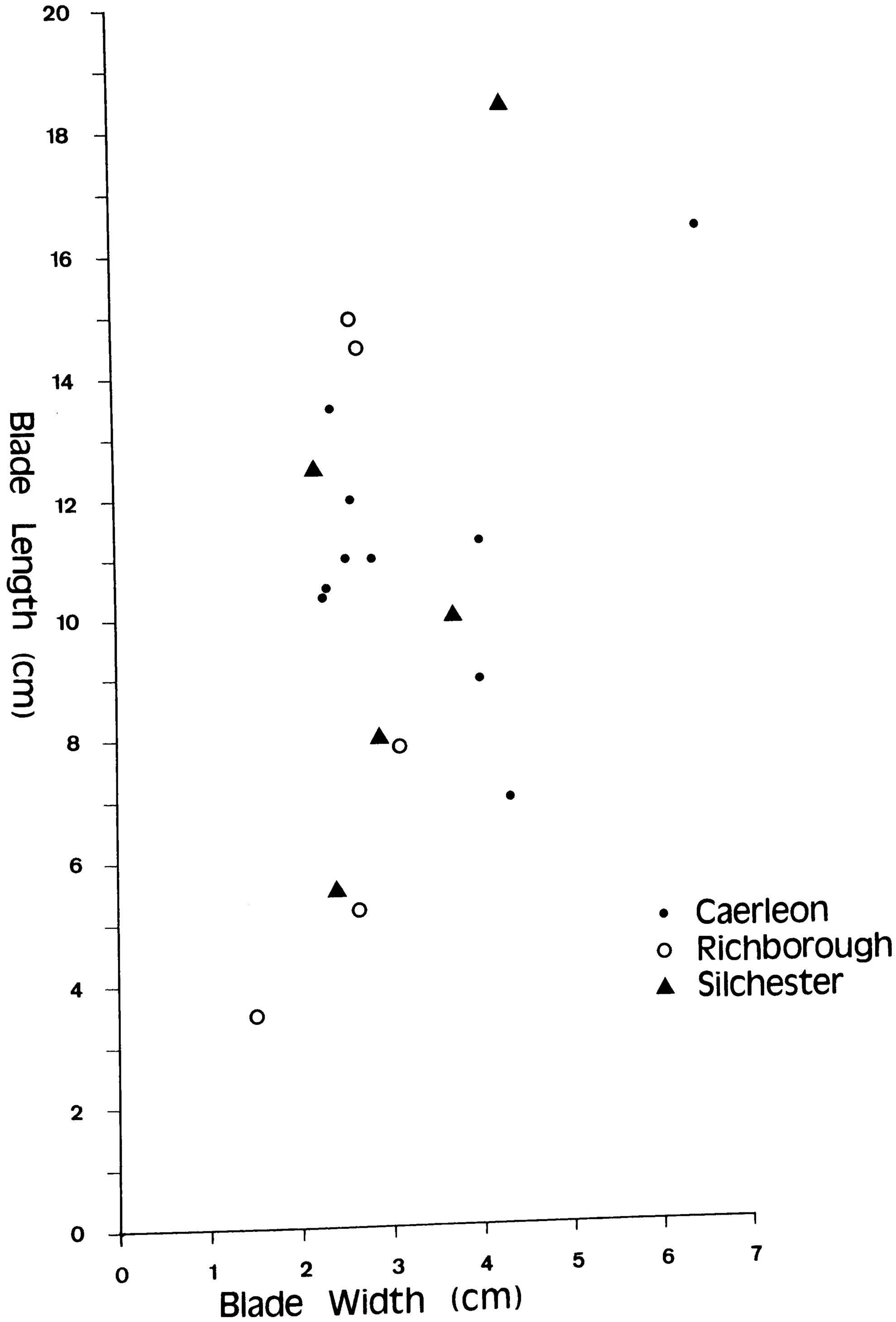


FIG.18 Blade Length: Blade Width Ratio of Caerleon, Richborough and Silchester Spearheads.



broken or blunted.

The usual form of spearbutt in this period was a cone shape, of circular section, sometimes split down one side, but more often forged into a complete circle. The butt was fastened to the wooden shaft by one or more rivets. Sculptural depictions of spears are seldom detailed enough to show the ferrules, but the conical form is occasionally depicted on tombstones. For example the 3rd century stone of the praetorian M. Aurelius Lucianus shows a conical butt on a double-weighted spear (Oldenstein 1976 Abb 13.2). This is decorated with spirals. A conical butt also appears on the tombstone of Petronius Proculus of legio II Parthica from Apamea (Balty 1988 plate XIV.2). This stone dates to the first half of the 3rd century AD.

It is possible that the conical-headed objects discussed in chapter X (see pages 113-117) were spear butts, but I prefer the identification of these as ballista bolts, partly because of their frequent association with boltheads. Also it would seem unnecessary to make elaborate forms of spearbutt when the conical type was perfectly adequate.

A different form of ferrule, used by the Caledonians and Maeatae was "a bronze apple attached to the end of the spear shaft" (Dio LXXVII, 12, 3-4). Although the Romans certainly came into contact with these tribes I have not found any archaeological evidence for their having adopted this kind of ferrule. However, on the porphyry sarcophagus of Helena, which dates to c320AD (Brilliant 1974 fig VI.53), Roman cavalrymen do have spears with round butts.

"Coiled" ferrules have been identified at several sites, e.g. Longthorpe (Frere and St. Joseph 1974 p76, fig 41 no.s 13-14) and Old Penrith (Unpublished, AML no.7814325). There is no sculptural evidence to support an identification as spearbutts. A more likely explanation is that they are ox-goads (pers. comm. Mr. John Casey).

The Archaeological Evidence from Britain.

The following is a list of all the ferrules from this period known to the present author. Not all of them are necessarily from spears, as ferrules might be used to tip other implements. As with much other Roman equipment they are simple and practical.

Bewcastle.

Excavations in 1937 produced six conical ferrules (Richmond et al 1938 p208, fig 13). These came from the cellar in the principia. Date:coins from this deposit dated to 268-273AD, but there was a considerable jumble of material in this area, so the ferrules might date to another period.

Bowness-on-Solway.

One ferrule was found here in 1976-8 (Potter 1979 p337). Date:Hadrianic or later.

Brecon Gaer.

Three conical ferrules have been found here (Wheeler 1926 p118, fig 60 no.12). These are in the National Museum of Wales (no accession no.s). TL:16.7/8.2/14.2cm. SD (Int) :?/1.5/2.1cm. SD (Ext) :3/1.7/2.5cm. Date:Flavian or later.

Caernarvon.

A ferrule was found in the shrine of the principia (Wheeler 1923 p142, fig 65 no.2). Date:Mid 4th century?

Caister-on-Sea.

Thirteeen conical ferrules were found here in recent excavations. Most of them have a square or rectangular sectioned tip (information from Miss M. Darling). Date:3rd or 4th century?

Carlisle.

There is an unpublished conical ferrule from Annetwell street. TL:c12cm. Date:c320-330AD.

Carrawburgh.

Three ferrules were found in 1964 (Charlesworth 1967 p135-138; Manning 1976 p21, fig 13 no.s 24, 26, 27). The two better preserved examples have split sockets, whilst the third consists only of the tip. One was found in the principia's strongroom and another on the intervallum road. The other was unstratified. TL:11.8/8.7/7.5cm. Date:Hadrianic or later.

Chesters. (plate 14 no.4).

Three ferrules are in the site museum (Clayton Collection no.s 1602, 1771, 1772). A fourth object (no.1685), with a solid, square-sectioned lower part, might be a plough share. Date:Hadrianic or later.

Corbridge. (plate 14 no.3).

Fragments of three butts were found in the Hoard (Bishop and Allason-Jones 1988 p17, fig 20 no.54). TL:9/4/2.1cm. Date:Flavian-Hadrianic. Three more ferrules (Corbridge museum Acc. no.s 75.1365-7) are in a case devoted to finds from fort 3 (c121-5AD) and fort 4 (c139-163AD). Two may have rivetholes in them. TL:9.4/10.9/10.6cm. SD (Int) :2.7/2.9/2.8cm. SD (Ext) :5/3.2/3.2cm. Another find came from site XII (Acc. no.75.3921). TL:12.3cm. SD (Int) :4cm. SD (Ext) :4.2cm. Date: possibly Antonine.

Housesteads.

There is one spearbutt from this site (Manning 1976 p21, fig 13 no.25). This came from the 1898 excavations. TL:11.7cm. Date:Hadrianic or later.

Ilkley.

One possible spear butt was found here (Woodward 1926 p287). Date:unknown.

Kirkby Thore.

There is a small conical ferrule from here in Tullie House museum (Acc. no.27-1926.110). TL:7cm. SD (Ext) :1.1cm. Date:unknown.

Milecastle 35 (Sewingshields).

Two ferrules have been found here (Haigh and Savage 1984 p84, fig 14 no.53). X-rays revealed two circular-sectioned nails in one of these. TL:5/9.9cm. SD (Ext) :2/1.7cm. Date:2nd or 3rd century?

Milecastle 39 (Castle Nick).

Two possible spearbutts were found in recent excavations by Mr. J. Crow (finds no.s 48 and 120). One had a split socket. TL:8/9.2cm. Date:late 2nd or 3rd century?

Richborough.

At least five conical ferrules can be found amongst the material in the AML. None of them have been published and several are incomplete. Three have split sockets and two have the lower part squared-off. TL:25.5/15.7/7.7/9.1/13.4cm. SD(Int) : 5.2/2.8/2.8/1.9/? SD(Ext) : 6.2/3.2/3/2.1/? Date: Claudian or later.

Silchester.

There are three possible spear butts from here. Two of them are of the conventional form, with squared-off lower ends. TL:13/7.7cm. SD (Int) :1.6/? SD (Ext) :2.3/2cm. A third object (Boon 1974 fig 8.9) has a squared-off lower end and a distinct conical tip. TL:12cm. Date:unknown.

Slack.

A bronze ferrule was found in the 1913-15 excavations (Dodd and Woodward 1922 p77, fig 50 no.6). This was conical, with the remains of an iron spike inside. TL:c5cm. Date:Flavian-c140/160AD.

Verulamium.

One alleged spearbutt was found in a layer dated to the 4th century (Wheeler and Wheeler 1936 p219, plate LXIVA.7). This had a split socket and a squared-sectioned tip.

Vindolanda.

Up to five potential spearbutts were found in the 1980

excavations (Bidwell 1985 p136, 138, fig 48 no.22, fig 49 no.s 35-6). The largest of these is square-sectioned, with traces of willow or poplar in the socket. TL:15.8 cm. Date:3rd century. Three of the others are of the usual conical type, with split sockets and solid, square-sectioned tips. TL:10.4/10.7/7.5cm. Date:one=mid 3rdc, the others were unstratified. There is one other fragment. TL:5.5cm. Date:c370AD.

Wallsend.

There is one unpublished conical ferrule from this site (Wallsend Heritage Centre find no. F8 19 2391). TL:12.2cm. SD (Ext) :2.5cm. Date: Hadrianic or later.

Watercrook.

One conical ferrule was found in the east vicus (Potter 1979 p224, fig 89 no.114). This had a split socket and one rivethole near the top. Date:c155/165-220AD.

<u>Parallels.</u>

This type was in use throughout the Roman period. First century examples are known e.g. one from Longthorpe (Frere and St. Joseph 1974 fig 41 no.12). Finds from the continent include some from Hofheim (Ritterling 1913 taf XVII no.s 67-77), Carnuntum auxiliary fort (Stiglitz 1986 taf 2 no.s 17-19) and Lauriacum (Von Groller 1919 fig 60.3, 5).

Spear Shafts.

Not suprisingly, we have very little direct information about spear shafts in the Roman period, as even in the best conditions little of the wood survives. Parts of some shafts were found in the bogs of Esjbol and Nydam (Engelhardt 1870 plate XII; Orsnes 1963 p235, 243), but nothing is known of the species of wood which were employed. Attempts have been made, based on sculptural depictions to estimate the length of spears/javelins (Couissin 1926 p367). Couissin put the length of the pilum at 2m 10-20cm and the length of the shaft alone at 1m 40cm. Likewise, the length of the hasta has been reckoned at

1.82-2.73 metres, whilst the kontos was supposedly c3.64 metres long (Robinson 1985 p10). The trouble with such estimates is that they ignore artistic factors. The average sculptor would have been more concerned with fitting his subject into the available space than maintaining the correct proportions. I do not think therefore that we can really use pictorial sources as a guide to the lengths of weapons. Likewise the few literary references to these matters probably give us only an approximate idea of spear sizes. Vegetius (Ep. rei Mil. II, 15) says that the spiculum was c1m 68cm long, with a head of c23cm. The verrutum he says had a shaft c1m 7cm long and a head of c13cm. Polybius states (VI, 23, 9-11) that the shaft of the pilum was c1m 37cm long and the head was the same size.

Quite probably there was some relationship between the length of the shaft, the weight of the head and the weight of the butt, so that the spear was properly balanced. There might be some scope here for experiments with replica spears. Most spearheads are far too corroded to be accurately measured, let alone weighed, but some of the recent finds from Vindolanda are very well preserved. Finds no.s 3730, 3745 and 3803 weighed 62, 102 and 45 grams respectively. Unfortunately no well-preserved butts have yet been found here.

For information on spearshafts we have to rely mainly on the analysis of small pieces of wood preserved in the sockets of spearheads and butts. This is possible because each species or group of species has its cells arranged in a distinctive pattern (Dinwoodie 1981 p104-113). Naturally this kind of information is only available for finds from fairly recent excavations.

Table 6: The Evidence for Roman Spear Shafts.

SITE	OBJECT	SPECIES OF WOOD
Bewcastle	Butts	Oak?
Caerleon	Head	Ash
Chester	Head	Alder/Hazel
Corbridge	Head	Ash
	Head	Alder/Hazel/Willow/Poplar
	Head	Willow/Poplar
Loudon Hill	Head	Ash
Milecastle 35	Head	Willow/Ash
Old Penrith	Head	Ash
Vindolanda	Head	Willow/Poplar
	Head	Willow/Poplar
	Butt	Willow/Poplar

Apart from the unusual use of oak (if correctly identified) at Bewcastle, a common thread emerges from this data. The species usually chosen were those which could be coppiced readily to produce long, straight poles and no doubt usually local resources were utilised. Thus ash is native to the Corbridge area (Allason-Jones and Bishop 1988 p103).

Some comments and conclusions on spearhead typologies.

It will have become apparent in the course of this chapter, that especially with the "leaf-shaped" spears constructing a typology is fraught with difficulties. Labels like "large" or "broad" are value judgements on the part of the researcher and subsequent investigators might not share them. Terms such as "javelin" and "lance" are innapropriate unless severely qualified, because the literary/pictorial evidence is too vague for us to be sure how most spear types were used. With mathematical methods of classification the problems are even more acute. We have seen that the blade length/blade width equation produces different results on different sites and is in any case based on very small numbers of finds. What if we were to try statistical analysis of other spearhead measurements, such as internal socket diameter? (fig 19). This might tell us something about the thickness of spear shafts being employed. In fact, based on data from 71 sites, there does not seem to be any strong pattern here, although most of them had diameters of between c1 and 2cm. The Corbridge

FIG. 19 The Internal Socket Diameters of Spearheads from Britain.

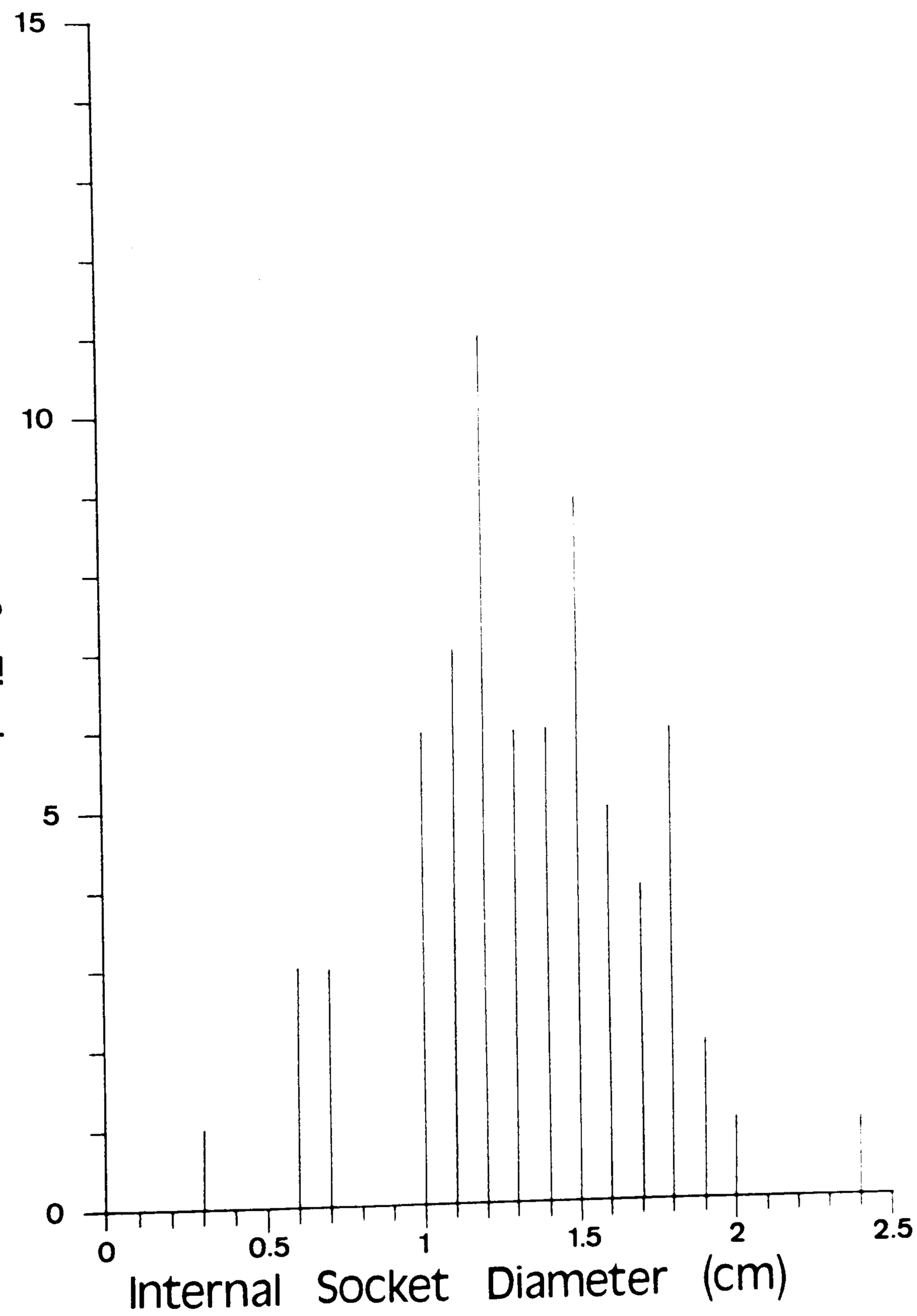
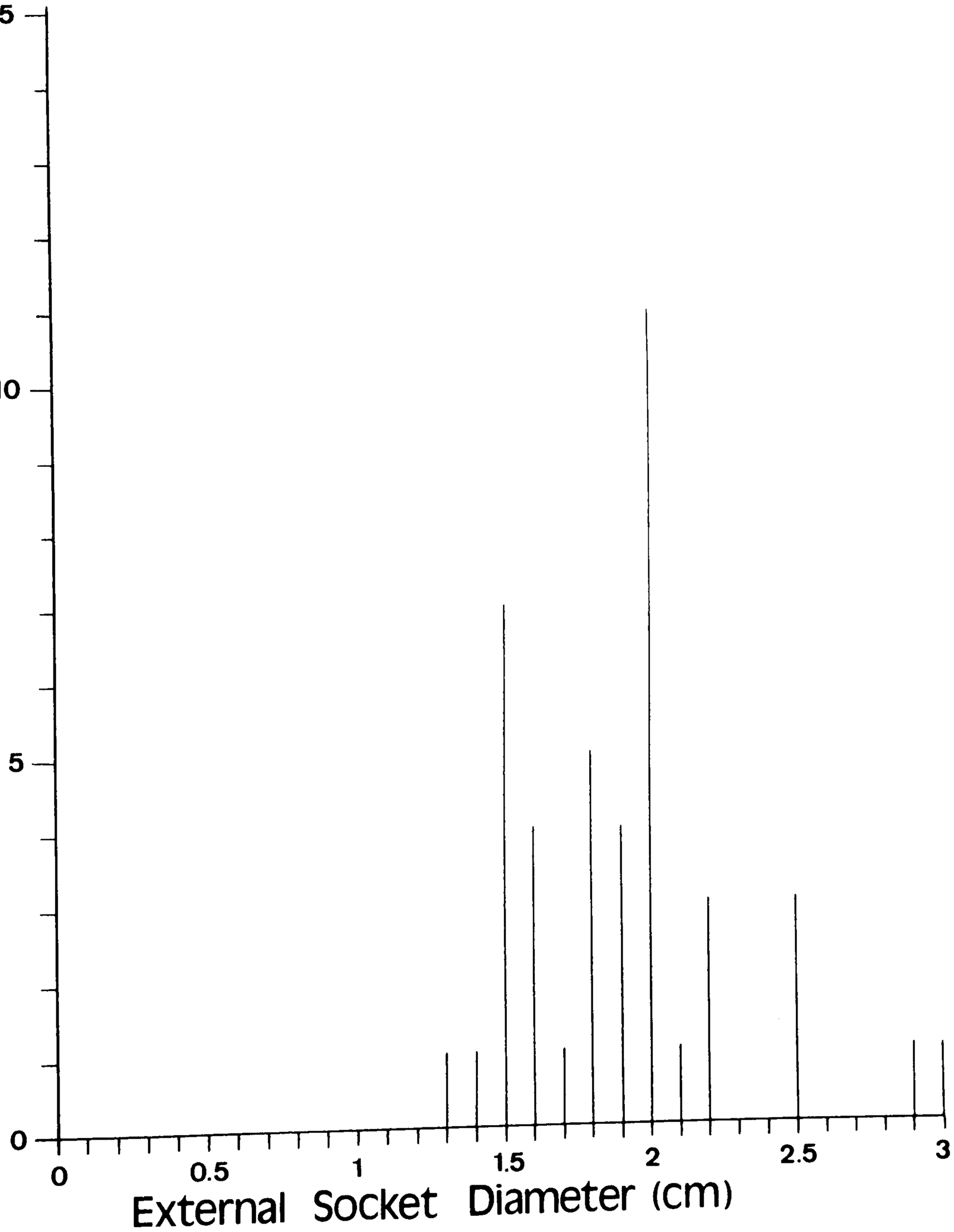


FIG.20 The External Socket Diameters of the Corbridge Hoard Spearheads.



Hoard spears do seem to show a fair amount of standardisation in this respect. Of 43 spearheads measured (Allason-Jones and Bishop 1988 p11ff) 32 have an external socket diameter of 1.5-2cm and 39 fall in the range 1.5-2.5cm (fig 20).

The problem with using statistical methods (apart from the poor quality of the data) is one of applicability. As was discussed in chapter 2, there is little or no evidence for central control of arms production with regard to precise sizes or shapes of weapons. Spearheads were produced in a basically random fashion by hammering red-hot pieces of iron on an anvil. Except with regard to special features like barbs, mid-ribs or lead weights, resemblances between two spearheads are largely coincidental. Any attempt at standardisation could only really be attempted at the level of individual units and even then the available technology was a limiting factor. The different working proce dures of individual smiths might also affect spearhead design. We should not therefore make too much of "parallels", especially between finds of widely differing dates. Bearing all this in mind, the application of computers to Roman spearheads seems very innapropriate.

Ultimately however, one cannot get away from the fact that our finds need to be described in some way unless we are going to draw every single Roman spearhead we find - a rather profitless and expensive exercise. What then can be done? With pila, barbed spears and the "standard-tips" we are on relatively solid ground, since although there are variations in size, these groups possess readily identifiable and constant features. With the "leaf-shaped" spears it seems in the end that simple descriptions and a few measurements work best. The key factor seems to be overall length. Of course we must always recognise that there are no hard and fast boundaries between our types. We are not really in a position to know how the Romans are not really in a position to know how the Romans distinguished their spearhead "types", if they did so at all. One suspects that total length (including the shaft) was the key factor, but we are unlikely to get much firm

data on this point. Some types of weapon may have been used for thrusting or for throwing, but many were multi-purpose. The overriding impression is one of diversity and not standardisation.

NOTES

*1 If this were true then the pilum could penetrate an estimated 1.3-2.5cm of oak and hide (Warry 1980 p133).

*2 A. Birley 1983 p9-13.

*3 Although since many of the weapons were originally supplied in bronze this is not a decisive point.

*4 Some pilum points with spiked tangs may have come from weapons of this kind (Connolly 1981 p233).

*5 In the possession of Mr. John Casey.

*6 Information from Mr. Robin Birley of the Vindolanda Trust.

*7 In addition there are finds from the conquest period e.g. from Hod Hill (Brailsford 1962 plate IIB, B108-9; Manning 1985 p160), Waddon Hill (Manning loc. cit.) and Dorchester (Webster 1958 fig 7 no.219).

*8 The figures are based on finds actually examined and descriptions in reports.

*9 Based on known published finds only. Pila have been found at Osterburken, Pfunz, the Saalburg and Weissenburg, all supposedly auxiliary forts (Von Petrikovits 1976 p118).

*10 The number of cavalry is given by Josephus (Bell. Jud. III, 6, 2).

*11 Caerleon for instance, was only partially occupied for much of the 3rd century (Boon 1972 p53ff).

*12 Legionary garrisons have been suggested at Benwell and Greatchesters (Jarrett 1968 p83) on the basis of inscriptions. But the legionaries may simply have been engaged in building work.

*13 The garrisons listed are based solely on epigraphic evidence. The presence of legionaries need not imply they were in garrison.

*14 The Oxford Latin Dictionary (p1804) defines SPICULUM as:- 1. "The sharp point of a weapon, the head, barb, sting of a bee. 2. A sharply pointed weapon e.g. a javelin or arrow."

*15 Like much of the weaponry found here, the preservation is excellent, thus the weight may not be too far removed from the original.

*16 X-rays might perhaps reveal some inlayed decoration.

*17 For example, of over 100 spearheads from Hod Hill (Manning 1985 plates 76-81) none are barbed. Out of some 400 post 1st century spearheads from Britain known to me only about 40 are barbed. None of these definitely belong to the 1stc. This has led one author to speculate (Scott 1980 p337) that barbed spears were a 2nd century introduction. Barbs are very susceptible to corrosion so the surviving sample may be misleading.

*18 It is in fact rather puzzling as to how the term gaesum came to be applied to the class of large barbed spears. The word does not appear in the various papers on the Carvoran spear (Wylie 1853 p48-55; Richmond 1942 p136-8; Cowen 1948 p142-4). Russell Robinson twice uses the word (Robinson 1985 p10) and claims that these spears were Celtic weapons. In fact Celtic spears are almost invariably

"leaf-shaped", often with a mid-rib. There is a total absence of barbed types (Connolly 1981 p117). One can only conclude that the Celtic "gaesum" and the barbed spears are distinct weapons.

*19 There is one literary reference to the throwing thong in Roman sources (Cicero Brutus 78) and there is the 2nd century tombstone of the legionary P. Flavoleius from Mainz (Couissin 1926 p120-129). Experiments in the 19th century (ibid p127), showed that the range of spears could be greatly increased with the addition of a throwing thong.

*20 The word may be translated as "fish-hook", perhaps pointing to an origin as a fishing spear. The long-shanked barbed spears used by the Romans may also have begun as hunting weapons.

*21 For barbed spears amongst the Alemanni see Christlein 1978 p68, abb 41.

*22 There is some disagreement on the identification of the angon. One supposed example from the Moselle department (Wylie 1853 p50) is very like the Carvoran spear. This is about 56cm long. However, another source maintains that this spear is too short to be an angon (Akermann and Lindenschmitt 1855 p78-9). This source lists five angons:- two from Mayence, two in Wiesbaden museum and one at Darmstadt museum. They range in length from c107-122cm - far bigger than Roman barbed spears.

*23. Information from Mr. John Casey.

*24 Conversation with Herr. H. J. Ubl of Vienna University.

*25 Five oval shields were found at Dura-Europos, dating to about 250AD. These were between 1.07 and 1.18m (c3'5" and 3'9") long (Connolly 1981 p259).

*26 The information from Trajan's column is deduced

from the positions of the arms, since the spears have long since vanished.

*27 Mid-ribs were very common on Celtic spears (Connolly 1981 p117) and also featured on some Saxon weapons (Swanton 1973 fig 2). Only about 40 out of some 400 post 1st century Roman spears in this country have mid-ribs.

*28 Bushe-Fox 1949 plate LVIII no.285 (AML 2926) is perhaps the remains of another such spearhead. TL:16.3cm. BW (Max) :2.2cm.

*29 The distinction between "well-made" and "locally manufactured" spearheads is more apparent than real. Although the latter have "wraparound" sockets, in terms of blade length/width they lie within the norms (Manning 1985 p162, fig 33).

*30 Unfortunately the present author only learned of this work when much of the material had already been examined. Therefore sufficient measurements are not available to fully test Barker's approach. I am in any case very doubtful about the value of taking so many measurements.

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