THE SLING AND ITS PLACE IN THE ROMAN IMPERIAL ARMY

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This paper, which is inevitably brief and inconclusive, is divided into two parts. The first is a technical study of the sling, or Funda, and its missiles, and the potential of the sling as a weapon in war. The second is a review of the evidence, largely literary, for the use of the sling in the ancient world; and the Imperial Roman army in particular. However it in no way attempts to place any firm conclusions but rather advance some suggestions as to the place of the sling within the military.

TECHNICAL

SOURCES

Literature

It is from literature that we learn most about the use of the sling in the classical period, the weapon often being mentioned, though usually only fleetingly, in accounts of battles. Several authors also discuss specialised slingers (Funditores), such as the Balearic Islanders, in some detail. However, only the soldier writers such as Caesar and Xenophon discuss at any length the sling's actual uses in warfare, most other writers simply class it with the light armed infantry. This is presumably the result of a lack of familiarity with the sling among non military authors. One explanation for this ignorance may be that in the Mediterranean world the sling was essentially a weapon of the peasants, requiring little money to produce, while the writers were members of the aristocracy, some of whom would probably have regarded the sling with disdain.[1] This social division is clearly demonstrated in the Servian reforms for the army of the Republic, by which the army was divided into five classes according to wealth, the lowest class being armed only with slings or stones.[2]

Archaeology

Here the main problem lies in the survival and recognition of the remains. The sling itself was made from organic materials such as leather or hemp, and as a result will only survive in waterlogged or arid contexts.[3] Thus archaeological evidence for the use of the sling comes in the form of the sling-shot, be they of stone, clay, or lead. However here too identification is by no means straightforward. For instance in the case of stone shot recognition is usually only possible when hoards are located. It is impossible to prove, all things being equal, that a single pebble was ever used as a slingstone in antiquity.

Baked clay shot is much easier to identify, indeed, many of the finds from Britain are of single shot as opposed to hoards (fig. 8), although some identifications are by no means secure, examples from Old Kilpatrick and Bar Hill being alternatively seen as marbles.

Lead shot is the easiest to identify, being of a distinctive shape and size (see fig.2). However, many were missed in the 1898 excavations

at Burnswark,[4] although this may have been the result of inferior excavating techniques. A further problem is in knowing whether the shot was used for hunting or in warfare; and indeed, with the exception of lead shot, whether it was used by Roman or Native.

SLING CONSTRUCTION

Most of the evidence for the construction of the sling comes either from the classical texts or modern ethnographic parallels. As stated above, slings were, without exception, made from organic substances, which provided the pliancy necessary for them to function. The ancient writers mention slings of several different materials. Virgil for instance, tells of a smooth leather thong,[5] whilst in his Georgics he states that Balearic slings were made of hemp.[6] Strabo informs us that the Balearic Islanders used slings,

> 'of black tufted rush (that is a species of rope rush out of which the ropes are woven)...or of hair or of sinews.' (Geog. III;5;1-3)

In its simplest form the sling was a thong widened at the centre to hold the slingstone. However, it can also take the form of two thongs linked by a cup.[7] Such a design is known from, amongst other places, Mongolia.[8] We have no evidence of its existence in the classical period, but there is no reason to suppose the design was not adopted.

Livy tells of a more complex design when referring to the slings of the people of Aegium, Patrae, and Dymae;

> 'The bullet carrier is triple, stengthened with numerous seams, that the missile may not fly out at random, from the pliancy of the strap at the moment of discharge, but, seated firmly while being whirled may be shot out as if from a bow string.' (XXXVIII;29;8)

It may be that Livy does not entirely understand what he is describing. If he is referring, by 'bullet carrier', to the whole sling, then it could be that he is describing a braided sling pouch as is known from Hawaii.[9] If he is referring only to the pouch then he may be describing a method of construction which would, by breaking up an otherwise smooth surface, prevent the shot from slipping out accidentally, thus allowing a surer aim. However, without any actual archaeological examples it is impossible to know what he means. Statius tells of 'firmly woven slings',[10] which suggests that the Hawaian design was indeed employed at this period, even if it is not the design to which Livy is referring.

The sling is an economical weapon to produce, both in terms of material and technology. But Livy's statement, confused as it may be, indicates that this did not mean that no care was taken in its production. Indeed, it is interesting to note that the Balearic Islanders used three slings of different lengths, the shortest for close range work and the longest to achieve the greatest distance ,[11] which shows that their production was a precise art. A badly

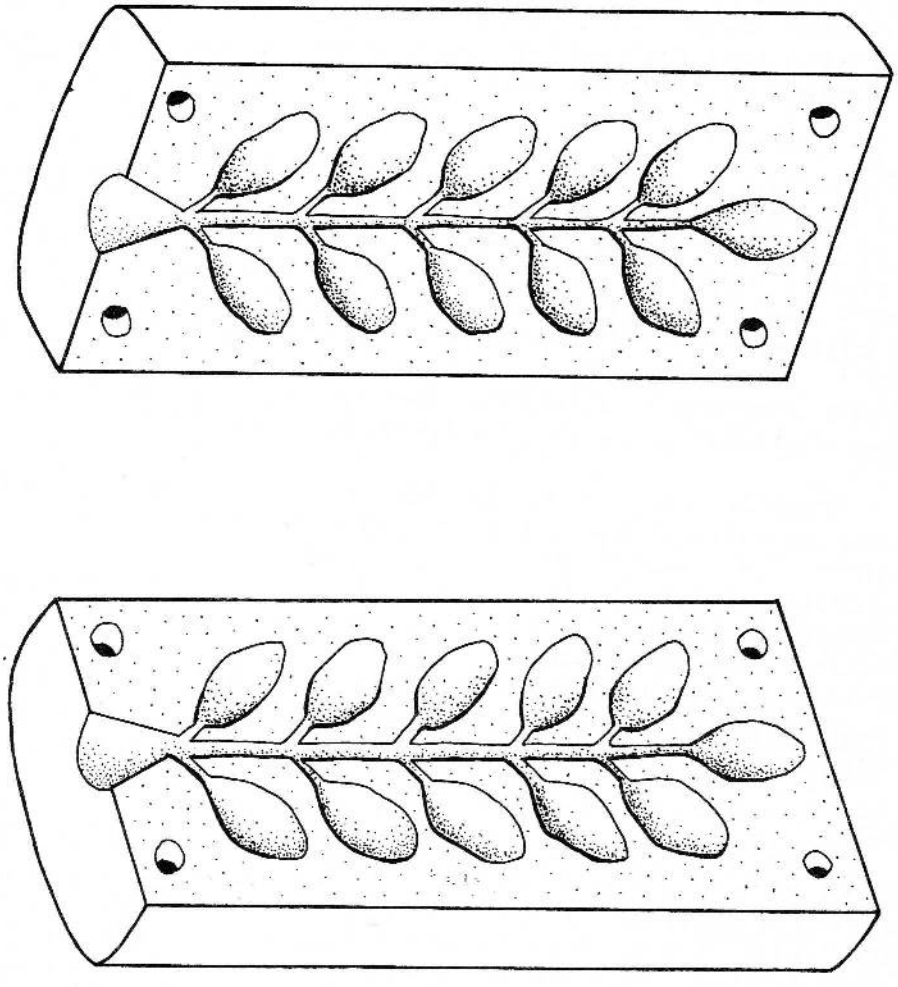


Fig.1: Clay moulds for Glandes (after KORFMANN, 1973).

manufactured sling would throw the sling-shot off balance and reduce the accuracy of the slinger.

TYPES OF SHOT

Stone

Stone sling-shot are known from all periods. This is because of their main advantage over all other types of shot - ready availability - they can simply be picked up and used. However, there is evidence for a more careful selection of stones. The favoured type were water-worn pebbles, as found in the hoards at Maiden Castle, transported from river or coastline.

Despite the economy and availability of stone, shot were also manufactured. The advantage of this is that the slinger has a much more uniform and streamlined missile, thus allowing him to cast over an increased range with greater accuracy. Early examples of manufactured shot were made from easily worked stone such as limestone. However, the advantages of clay were also observed at an early date.[12]

Clay

Several examples of baked clay shot have been recovered from Roman and Iron Age deposits in Britain, while a hoard of 6,000 were recovered from the Roman Legionary fortress at Lambaesis.[13] In the East at least, clay shot appears to have been dried in the sun. In order to maximise their weight in relation to their size they were made from pure clay, as opposed to being tempered with chaff, or, occasionally, a pebble would be sheathed in clay. Naturally, drying in the sun is not such a likely occurrence in Britain, and the evidence from Caerhun suggests that clay shot could also be baked in a hearth.[14]

Usually clay shot is biconical in form. There are some round examples which may be the result of erosion or impact, or which may simply be misshapen.[15] Single examples from a site should be interpreted with caution as they could concievably be waste or casually created. On the whole they appear to have been used in the normal manner, like stone shot. However, Caesar records an added advantage. A Roman force was trapped in its camp in 54 B.C. by the Nervii who at one point 'began slinging moulded bullets of red-hot clay' into the camp in order to set the thatched roofs of the huts alight.[16]

Lead

Lead shot was confined in use to the classical world. It was first known among the Greeks of the fifth century B.C. and appears to have gradually declined in use during the Imperial period, although examples are still known from late Roman contexts (see below p.271). Caesar tells us that lead shot was cast by the army.[17] Archaeology supports this. Robinson, excavating at Olynthos, recovered the moulds used for casting shot.[18] As seen in fig.1 several shot would be cast at once, linked by a sprue, from which they would be later filed off. Shot from Britain indicates a similar method. Some of the bullets from Windbridge show casting flashes,[19] while examples from Corbridge show signs of hammering after casting had been carried out, presumably in order to smooth out the lines of the shot.[20]

Lead is a very easy/pliable material to work, with a melting point of 327°C. It was a metal common both to the Roman world in general, and the army in particular, which even employed its own lead smiths, or Plumbarii.[21] However the major reason for its use is probably the fact that it is a very dense metal, and thus could weigh proportionately more for its size than other materials. It took two basic forms, see fig.2. Type 1 is a simple biconical form with oval section, whilst type 2 is similar in shape to an acorn. It is from the latter that lead shot took its Latin name glandes, meaning acorn. The Greeks appear only to have used type 1 shot, but in the Roman world both types were freely used with no apparant chronological or geographical division between them, although type 1 shot is far more common. There is a large variation in both the length and weight of known glandes.[22] The weight may well be dependant on the quality of the lead used. However the length of a shot can be easily regulated. Thus it seems likely that shot size varied according to personal preferences, with 4cm as the average length.

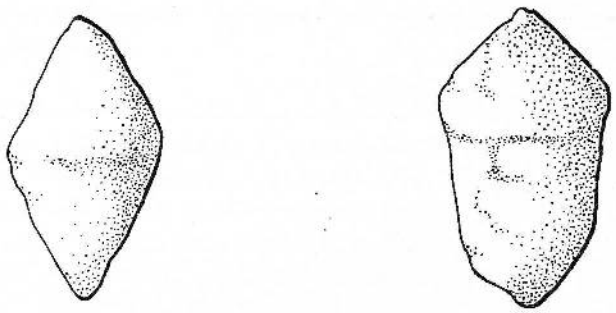


Fig.2: Glandes. Scale 1:1

Several of the ancient authors make reference to glandes heating up and even melting when hurled, the velocity causing friction with the air.[23] The number of references to this phenomenon lend to it a certain amount of plausibility, however no half melted examples have yet been identified, and the melting is not referred to outside poetry which makes it seem dubious. If such melting was a frequent occurrence it seems unlikely that glandes would have been used. Onasander, however, does refer to them heating up, which allowed them to penetrate the flesh more deeply.[24]

Some lead shot were inscribed with messages, which were presumably originally inscribed in the moulds. It appears that only type one glandes were used for carrying messages which could include unit titles,[25] commanders' names,[26] or invocations to the Gods[27]; as well as less formal tidings such as 'take that'.[28] Some even show erotic scenes.[29]

The Dart (Cestros)

This was apparently a form of dart shot from a sling (see fig.3). It is only recorded in Polybius and Livy, and Livy's work is probably a copy of Polybius. They are relating its use by the forces of Perseus against the Roman army in the third Macedonian war in 171 B.C.[30] Polybius' description of it as 'a novel invention at the time of the war with Perseus', combined with the lack of any mention of its use subsequent to this war indicates that, if it ever existed, it was not in use before or after this period. Yet Polybius claims that it was a very effective weapon, in that it 'inflicted severe injury on those who were hit by it.'

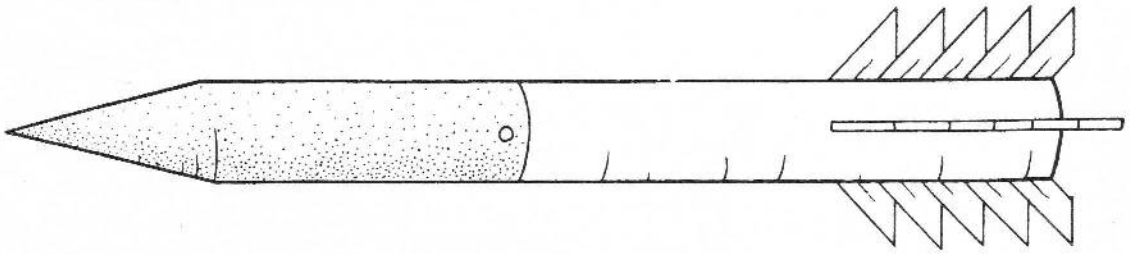


Fig.3: Cestros. Scale 1:1

Different translations of Livy and Polybius give widely differing measurements for the weapon, one even claims it was over a metre (Loeb translation of Livy) which is clearly nonsense as it would be impossible to whirl such a weapon. Walbank suggests the correct translation for Polybius should be two palms or 154.2mm.[31] This is the size to which I have reconstructed the weapon in fig.3.

Polybius describes a special sling used to throw the Cestros. This suggests that, if it was used, which must remain doubtful in view of the lack of any corroborative evidence, it was certainly a very specialised weapon, and one which must have required a lot of practice if it was to be used effectively.

The Calthrop

Dionysius of Halicarnassus relates that when the Romans met Pyrrhus in battle they used wagons to counter his elephants, mounting on them; 'Bowmen, hurlers of stone, and slingers who threw iron calthrops.' (XX;1)

The calthrop was a common device often used against elephants or cavalry. However this is the only reference to its use with the sling. It thus seems likely that either Dionysius is confusing slingers with

the men who threw calthrops by hand, or that a later translation has amalgamated the two. Either way it is difficult to imagine a calthrop being accurately thrown from a sling. Indeed there would be no need to use a sling as, judging by the fact that the hand thrown stone was employed, the wagons were close enough to the elephants for the calthrops to be thrown by hand also.

EFFECTIVENESS AS A WEAPON

The effectiveness of the sling as a weapon in warfare can be determined by a study of its range, accuracy, and ability to inflict damage; and by comparison of its performance with other long range missile weapons, notably the bow, its closest counterpart. An understanding of the potential of the weapon may go some way towards explaining how and why it was, or was not, employed in the various aspects of classical warfare. Most of the evidence is furnished by the classical authors and in some cases it is difficult to know if they are simply generalising or even exaggerating, or to what extent alterations and corruptions to the text have taken place through time. Modern experiments can provide some idea of effectiveness, but the lack of regular practice for a slinger will mean that effectiveness cannot be fully tested. Ethnographic parallels have been used to indicate the potential of the weapon.

Range

Vegetius provides the most direct statement concerning the range of the sling. When discussing training with both the sling and the bow he advocates establishing targets approximately 180 metres away.[32] If this is the range for target shooting then the ultimate range for the sling must surely be greater. Other evidence for the range of the sling supports Vegetius' claims. Natives in New Guinea can sling pebbles the size of billiard balls approximately 180 metres on the level,[33] while trained slingers in modern Ibiza can hit targets one metre square at a range of 200 metres,[34] 'an accuracy and range which is in accord with what the ancient sources have to tell us'.[35] Indeed if we assume, as is generally done, that the glandes from Burnswark, recovered from atop the collapsed ramparts by the gateways, were fired from the Roman south camp, we are dealing with a range, uphill, of 150 metres.

Xenophon tells us that Rhodian slings, owing to their lighter missiles, had twice the range of their Persian counterparts. He also writes that they could outrange most of the Persian archers.[36] The Persians appear to have been using a composite bow at this time and recent experiments have shown such bows to have had a range in excess of 350 metres. This suggests that the Rhodian slingers were capable of reaching a similar range. As Korfmann puts it; 'Considering that the archers of Persia were then regarded as the best in the world, his (Xenophon's) statement speaks well for the range of the Greek slingers'.[37] Korfmann also conducted some experiments of his own:

> 'I asked some young men in Eastern Turkey to sling ordinary pebbles for me. In five out of eleven trials, the pebbles struck beyond a mark placed 200 metres away and the three best casts fell between 230 and 240 metres away. None of the young men appeared to be a skilled slinger, at least none had

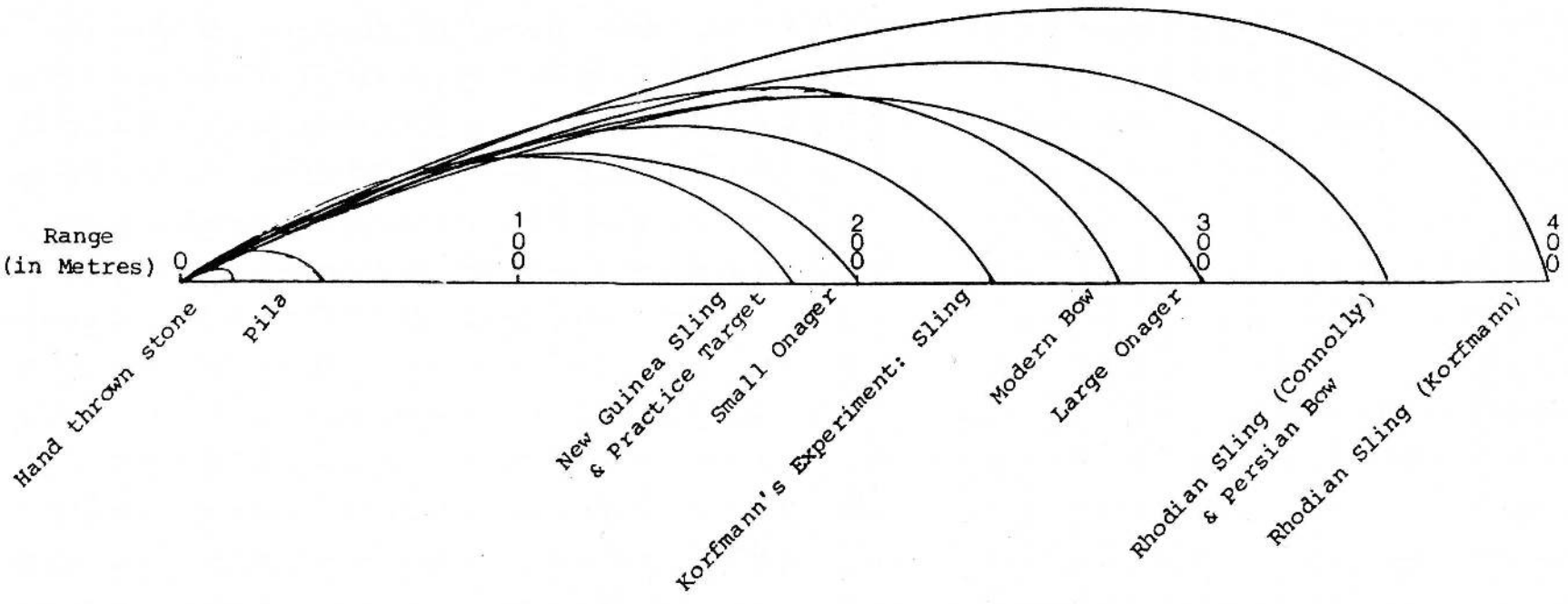


Fig.4: Comparative ranges of missile weapons.

> a sling in his possession at the time. Moreover, the missiles were pebbles selected at random rather than the carefully shaped stone, clay or lead missiles launched by slingers in Greek and Roman times. On the basis of Xenophon's comment alone it seems probable that a slinger casting lead missiles could attain a range in excess of 400 metres.' (1973,37)

Connolly is more conservative in his estimate of the Rhodians' range, placing it at 350 metres,[38] in line with the range of the Persian archers. Thus it would seem that slingers could easily achieve ranges in excess of 200 metres, and the best in excess of 300 (see fig.4).

Accuracy

The fact that the sling was used for hunting as well as in warfare indicates that it was a weapon capable of great accuracy. The New Guinea slingers mentioned by Wheeler could hit a stick at fifty paces.[39] Cited in the Bible is a force of 700 picked slingers, 'each of whom could sling a stone at a hair and not miss'.[40]

The classical writers also make much of the early training of some groups of slingers, notably those of the Balearic Islands, who as children were apparently not given bread by their mothers until they hit it with their slings.[41] Livy writes that the slingers of Aegium, Patrae and Dymae were 'trained to shoot through rings of moderate circumference from long distances'. As a consequence 'They would wound not merely the heads of their enemies but any part of the face at which they might have aimed'.[42] Silius Italicus tells of the inhabitants of Corfinium who 'carried slings that had struck down many a bird high in the air'.[43] It may be that in many of these cases the writers are exaggerating the slingers' accuracy for effect. However, the variety of these references does indicate that, in the right hands at least, the sling could be a very precise weapon.

Ability to inflict Damage

Vegetius writes of the sling:

> 'Soldiers... are often more annoyed by the round stones from the sling than by all the arrows of the enemy. Stones kill without mangling the body, and the contusion is mortal without loss of blood.' (Ep. Rei Mil. I;16)

Onasander gives a more graphic description of its effectiveness as a weapon:

> 'The sling is the most deadly weapon that is used by the light armed troops, because the lead slug is the same colour as the air and is invisible in its course, so that it falls unexpectedly on the unprotected bodies of the enemy, and not only is the impact itself violent, but also the missile, heated by the friction of this rush through the air, penetrates the flesh very deeply so that it even becomes invisible and the swelling closes over it.' (The General XIX;3)

Both these writers unequivocally state that the sling was a most effective weapon, rating it more highly than the bow in terms of its

ability to inflict damage. This is a view which Celsus supports in his medical treatise: 'it is better to be wounded by a sharp weapon than by a blunt one'.[44] He also points out that by dipping the slingshot in poison it could be made even more effective.[45]

The sling was also of use against elephants. Elephants were a hazardous mount to use in warfare, because they could be turned by the enemy, causing them to trample their own forces in fear and confusion. Caesar tells us that during the course of the African war Scipio trained his elephants to resist the terror which slingshot brought upon them.[46] However, at the battle of Thapsus, Caesar's forces still managed to rout them:

> 'Meanwhile the slingers and archers on the right wing hurled rapid volleys of missiles at the dense mass of elephants with the result that the beasts, terrified by the whistling of the slingshot and the showering stones and lead bullets, turned round and began to trample down their fellows.' (Bell. Af. 83).

Livy records a similar successful use of sling stones by Eumenes against horses towing scythed chariots.[48]

The sheer force it is possible to put into casting a shot from a sling is also capable of inflicting damage, as the Spanish Conquistadores discovered when they faced Peruvian slingers:

> '"Their chief weapon," wrote one Spanish observer, "is the sling. With it they throw a large stone with such force that it could kill a horse...I have seen how a stone flying from a sling over a distance of thirty paces broke in two a sword that a man was holding in his hand."' (Korfmann 1973,40)

An early fifteenth century poem also records the effectiveness of the force of a sling: 'Men harneysed in steel may not withstonde the multitude and myghty cast of stonys.' (from Knyghthode and Batayle) .[48]

The annoyance of the sling to armoured troops can also be seen in way that some Pompeian troops put wicker coverings on their helmets in an attempt to protect themselves from slingstones.[49]

Effectiveness in comparison to similar missile weapons

As shown in fig.4 and above p.263 the sling appears to have had a range similar to that of the bow. Its range is also comparable with ancient artillery devices such as the onager. These, however, would have been able to project far larger shot and achieve greater accuracy, although with a much slower rate of fire and the risk of mechanical breakdown.

In terms of accuracy the main advantage of the bow over the sling is that it allows clearer aim and requires less skill for effective use. It appears that to be truly proficient with the sling a long period of training is required.

Vegetius sums up the various advantages of the sling in warfare thus:

'The sling cannot be reckoned an incumbrance, and is often of the greatest service, especially when they are obliged to engage in stony places, to defend a mountain or an eminence, or to repulse an enemy at the attack of a castle or city.' (Ep. rei Mil. I;16)

A final advantage of the sling over other long range missile weapons is its cost effectiveness, outlined in Knyghthode and Batayle:

'And stonys in effect are every where,
And slynges are not noyous for to bear.'

Whether ancient armies were truly concerned with economising is however a matter for debate.

HISTORICAL

THE ANCIENT WORLD

Evidence for the use of the sling in the Near East dates back to before the Eighth millenium B.C.[50] It appears to have been developed originally for use in hunting; its use in warfare was apparently a secondary development. This transition is demonstrated in Iron Age Britain. It is now generally accepted, on the basis of evidence from Maiden Castle, that the sling was one of the factors behind the development of multivallate defences at several hill-forts.[51] At Maiden Castle the defences were constructed during the Iron Age B period, and the lack of arrow heads, in contrast to the large numbers of sling stones from that period, (almost 50,000) led Wheeler to conclude that the defences were designed to exploit the advantages of the sling for the defenders whilst at the same time minimalising them for the attackers. The sling was in use at this and other sites for several centuries before the construction of such defences. However there were far fewer stones found in the Iron Age A fort; even ignoring the hoards of the later period the proportions were one shot of A to 30 to 40 of B. This led Wheeler to conclude that the sling was used primarily for hunting in the earlier period.

By the early First Millenium B.C. slingers were a regular part of the Assyrian army, as seen in the bas relief of the siege of Lachish from Nineveh. The helmet, body armour, and swords shown on this relief give these troops 'maximum combat value'.[52] As with so many other branches of the Assyrian army, slingers had been developed into a comprehensive fighting unit.

The most familiar ancient reference to the sling, the story of David and Goliath,[53] illustrates its use in guerilla warefare. The story can be taken as a symbolic representation of Jewish tactics when faced with a superior hoplite force, represented by Goliath, which the Jews were not equipped to face in open battle. Only by keeping their distance and using missile weapons could they hope to defeat such a force.

Fig.5: Assyrian slingers (after HUMBLE, 1980).

In Xenophon's Anabaisis, too, we see how useful missile weapons could be against an otherwise seemingly invulnerable heavy infantry force. The 10,000 Greek mercenaries attempting to return home after the battle of Cunaxa were so plagued by the Persian cavalry, slingers and archers, that they only managed to travel some three miles.[54] Their heavy equipment and lack of missile weapons caused them to take casualties without being close enough to inflict them. In order to prevent this happening again Xenophon called forward the Rhodians in the Greek force, they being a race well versed in the use of the sling, and created a unit of 200 slingers. As stated above (p.261) these slingers kept the Persian forces at a distance. This incident also illustrates the bias against the sling in the Greek world, Xenophon has to grant special concessions in order to gain a force of slingers a simple appeal it seems would not have been enough.

> 'If then, we find out who has a sling in his possession, and pay for any there are, and pay more money to anyone who volunteers to make more slings, and think of some extra privilage we can give to anyone who volunteers to serve as a slinger in the ranks, then perhaps enough will come forward

to be of use to us.' (Anab. III; 3).

This negative attitude towards the sling and other missile weapons can be traced back to the Heroic Age where the only form of combat held in esteem was close combat between individuals. Only the rich, who could afford to equip themselves with the relevant weapons and armour, fought in this manner. Thus was created a social bias against the sling and other long range weapons. As a result weapons such as the sling thrived rather in smaller, economically backward, areas such as Rhodes and the Balearic Islands.

The Republic

As stated above, the sling was a weapon common to only certain areas of the Mediterranean: it was not intrinsic to Roman culture. However, during the Republic it, along with other weapons and fighting styles with which the Romans were not fully conversant, came to be incorporated within the framework of the army. In the early Republic, when the army was formed for specific campaigns, the Romans gained their specialist troops in the form of allied contingents. For example, in 217 B.C. Hiero of Syracuse sent a force of slingers and Cretan archers to Rome's aid.[55] The Balearic slingers employed by Caesar in Gaul[56] were part of the army and not an allied contingent; their islands having been conquered for Rome by Metellus in 123 B.C. They are still mentioned in the sources of the late fourth and early fifth centuries A.D.[57] However it appears that these writers', and indeed several of their predecessors', knowledge of the Islanders stems from literature rather than from any first hand experience. It may well be that the Balearic Islanders suffer from racial stereotyping, something common in Roman literature.[58] Before being subjugated by the Romans, they hired themselves out as mercenaries.[59]

Although we know Caesar used Balearic slingers in his Gallic campaigns, it is not clear whether he recruited them specially, as happened over a century ealier when the Carthaginians took 2,000 auxiliaries from Menorca,[60] or whether they formed a regular (that is full time) auxiliary unit within the army. Pompey appears to have such a force a few years later at Dyrrhachium. Caesar refers to them as 'Funditorum Cohortis Sexcenarias II'.[61] But it is difficult to be sure exactly what the status was of such a unit, with the two factions in the Civil War raising units wherever they could.

Much of the inscribed lead shot of the Roman period known to us dates from the late Republic. This is probably due to the desire of the various factions to make their particular points using the glandes. For instance several shots have been recovered from Italy inscribed 'ITAL'[62] referring to the capital Italia formed in the early first century B.C. by the Italian confederation in revolt against Roman rule. Caesar tells of a shot with a message for him inscribed on it from a supporter behind the enemy lines.[63]

According to the literary sources the usual position for the slingers in battle was with the rest of the light armed troops on the wings where they could protect the flanks of the heavy infantry. This is illustrated on Trajan's Column (see figs.6 and 7) and in the drawing up of Caesar's forces at the battle of Pharsalus:

Fig.6: Trajan's Column: slinger (minus sling) in traditional position on wing of army (CICHORIUS, 1896 and 1900, scene LXX).

Fig.7: Trajan's Column: slinger (CICHORIUS, 1896 and 1900, scene LXVI).

'His right wing was protected by a stream with steep banks and he therefore put all the cavalry, archers and slingers on the left wing.' (Bell. Civ. III; 88)

When Caesar wanted to delay conflict his tactics were different, on that occasion he posted his archers and slingers in front of the army.[64] In this position they could be used to keep the enemy at bay, by showering them with missiles, until such time as Caesar felt ready for battle.

The sling was extensively employed by the armies of the Republic, generals such as Caesar clearly appreciating its worth. As a result we should perhaps expect that it would continue to be widely employed in the Empire. However this does not appear to have been the case.

The Place of the Sling in the Roman Imperial Army

At the advent of the Roman Empire and Augustus' rationalisation of the late Republican forces the Roman army was essentially a heavy infantry force, in which the legions were provided with necessary light infantry support by the auxiliaries. The auxiliaries were originally designed to bring to the Roman army a degree of flexibility in battle, by contributing their own native style of fighting. As the auxilia gradually became more standardised, this role transferred to the numeri who fought using their own distinctive styles. It is amongst such units that we should expect to find the units of slingers who suceed those of the Republican armies. However, there is no unit known before the fifth century A.D. which has a title indicating a specialisation in the sling, nor is there one indicating a Balearic origin, which there would presumably have been if slingers from the Islands had been brigaded together under the Empire.[65] As a result of this clash between fact and theory modern writers are divided as to the actual place of the sling in the Roman Imperial Army. For instance, Saddington claims that the 'funditores Libritoresque' mentioned by Tacitus [66] employed by Germanicus in Germany were in fact a unit of auxilia;

'Slingers in the Republican period were auxiliaries and there is no reason for not regarding these as such.' (1982; 29).

However, 'Funditores Libritoresque' is not in itself a proper unit title, and, as said, no other accounts written give a unit title for any slingers they mention; nor are there, as we might expect, any inscriptions, diplomas, or the like attesting such units. Watson suggests rather that training in the sling was carried out generally throughout the Imperial forces. In support of this he refers to Vegetius' discussion of legionary training.[67] However Vegetius is describing how soldiers should ideally be trained, training methods having been allowed to lapse in the later Empire, so that it is not entirely clear whether such training as he recommends was ever practised. Yet Vegetius does refer to the use of the sling against practice targets, which suggests that perhaps it was. Watson cites Hadrian's Adlocutio to show that auxiliaries also received general training with the sling. It states that cohors VI Commagenorum, a cavalry unit, 'hurled stones from slings'.[68] It is by no means clear that they were mounted when using it. The 6,000 clay sling shots recovered from the legionary fortress at Lambaesis indicate that perhaps legionaries were indeed trained in the use of the sling.

Certainly there would have been advantages to the Roman army in the despecialisation of the sling. For one thing it would have given otherwise heavy infantry close combat troops a long range weapon which would have been no extra burden to their load. Also, simply in terms of a training exercise, it had its uses, keeping men fit and providing variety in their training. It could also have been used by most auxiliary units.

It is easy to see how such despecialisation could have occured. The survival of specialist units would have relied upon continued recruitment from areas such as the Balearic Islands where the slingers were trained from birth. The usual recruitment patterns of the auxilia would not allow such a situation. However, special arrangements were made in the case of archers, and the same could perhaps be postulated for slingers although there is no evidence to support this. Also the development of the army from a campaigning to a frontier force would have removed the need for permanent units of slingers designed to operate in tandem with the legions. Such slingers, if not adequately trained with other weapons, would have been a liability if placed in a garrison on a frontier line. Standing against this is the fact that archers were garrisoned on frontier lines. Indeed specialist archery units survived despite the fact that archery, like slinging, seems to have been adopted as a matter of general training.[69] If the bow could remain a specialist weapon, then why not the sling also? the answer may be contained in the pages of Livy, who states of the Balearic Islanders that:

> 'The sling now their most used weapon, was then their only one.' [70]

This may perhaps indicate a decline in the popularity of the sling among the Islanders, probably as a result of the influence of Roman civilisation where the sling was not so highly regarded (see above p.267).

Sidonius Apollinaris, writing in the fifth century, tells of lead bullets fired from Balearic slings, possibly indicating that Balearic slingers were still in existence by the end of the Empire (see above p.267). However, it is used in a poem and it seems rather that he is using the reference for good effect, taking up a theme common in earlier poetry (see above p.256).

The only sculpture of the Imperial period which depicts slingers is, almost inevitably, Trajan's Column (fig.4).[71] Certainly the slinger figures portrayed are very distinctive, dressed only in a chiton and cloak, rather than the armour of many of the other troops. It could be argued that this distinctive style of dress indicates the existence of a specialist unit of slingers, possibly numeri; or possibly a unit recruited specifically for the Dacian campaigns. It seems unlikely that the slingers were camp followers, owing to the training needed to gain proficiency in the use of the sling. A case can be argued for their being merely slinger detachments from regular units. Their style of dress the main indicator that they are something out of the ordinary, could be rather explained on practical grounds, as it left the right arm totally free to work the sling. Against this the Assyrian slingers

in fig.4 are wearing armour. In many ways the evidence from the column is far too tenuous to be relied upon for any interpretation beyond the fact that slingers were actually used by Trajan. The slingers may well be based on artistic interpretation rather than substantiated fact.

The archaeological evidence also suggests a despecialisation of slingers. During the course of the first century A.D. lead glandes appear to have become largely obsolete throughout the Empire. Watson suggests that:

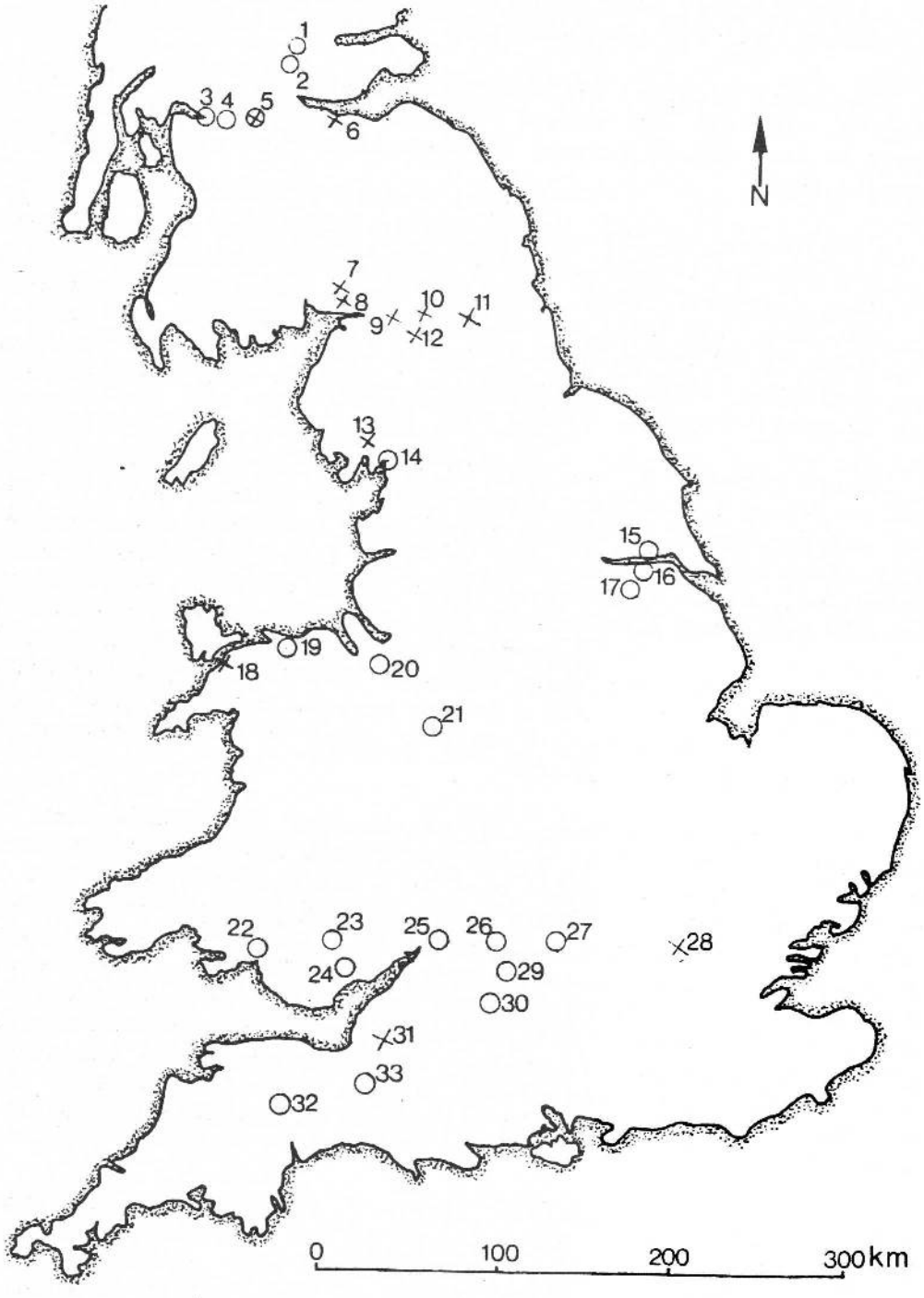
> 'The reason for the comparative disappearance of these during the Empire is perhaps to be found in the despecialisation of the slingers. When they had been specialists brigaded together in their own units they had taken greater pride in their craft and materials, but in later days the "amateur" legionary slingers tended to look down upon the sling as a barbarian weapon.' (1969, 61)

Until recently it was only in Britain that the manufacture of lead shot was known to continue beyond the first century A.D. [72] Elsewhere the manufacture of inscribed glandes was believed to have ended in the early first century A.D.; one of the latest examples coming from Vindonissa, with a Terminus Ante Quem of A.D 46.[73] However, two recently published glandes from the 'Collezione Gorga' mention legio II Italica [74]; thus giving a Terminus Post Quem to the shots of A.D. 165. However the fact that these examples list legions points further to a more general use of the sling in the Empire. Indeed glandes have been found on a large number of military sites in Britain suggesting still further a general employment.

The large number (over 130) of examples from Burnswark [75] which were used in some form of military exercise indicate that in Britain at least the sling was still used in a military context by the Imperial Army. As yet there is little evidence of glandes on the Continent beyond the first century A.D. Certainly it seems logical to assume that if glandes continued in use in Britain then they should presumably have continued in use throughout the Empire. However, the continuation of the use of the sling in Britain specifically, rather than the Empire as a whole, may be partly the result of a continuation of the Iron Age use of the sling, although we might perhaps therefore expect to see a continued use of the sling in Gaul where it was used in the Gallic wars (see above p.267).

There is one possible literary reference to the use of lead glandes after the first century A.D. on the continent. The Scriptores Historae Augustae records that Severus was at one point in battle believed to have been killed by a lead ball.[76] However this interpretation of the reference is by no means conclusive.

As stated above (p.269), only one unit of specialist slingers is attested from the Roman Empire. This unit is listed in the Notitia Dignitatum as the 'Funditores Pseudocomitatenses', part of the Syrian field army. It may be that this unit of slingers way formed specifically to combat eastern threats such as elephants, against which its use had been proven. The existence of this unit cannot be taken to indicate the presence of specialist slingers throughout the Empire,



KEY

○ Sites where clay shot has been found

× Sites where lead shot has been found

Fig.8: Distribution of lead and clay slingshots of the Roman period in Britain.

Key to Fig.8

No.	Site	Type/Quantity	Date
1	Strageath	Clay; large group	Ant. I
2	Ardoch	Clay; 75	Flav. or Ant.
3	Old Kilpatrick	Clay; 2 (?)	Ant.
4	Balmuildy	Lead; 1	Ant.
5	Bar Hill	Lead; 1 & Clay; 6 (?)	Ant.
6	Cramond	lead; 2	Ant. or later
7	Burnswark	Lead; 133	?Ant. or later
8	Birrens	Lead; 3	Ant.
9	Birdoswald	Lead; 1	Had. or later
10	Housesteads	Lead; 1	?C3rd.
11	Corbridge	Lead; 9	Late Flav. +
12	Chesterholm	Lead; 14	2=? 12+mid C4th.
13	Ambleside	Lead; 16	Late Flav. +
14	Watercrook	Clay; 2	1+? 1=late Rm.
15	Brough on Humber	Clay; 1	?
16	Old Winteringham	Clay; 1	C3rd./4th.
17	Winterton	Clay; 1	?
18	Segontium	Lead; 1	Flav.
19	Caerhun	Clay; 30-40	Flav.-Traj.
20	Chester	Clay; 1	?
21	Greensforge	Clay; 1	C1st. A.D.
22	Neath	Clay; 1	Flav.-Traj.
23	Abergavenny	Clay; 13	?Flav.-Traj.
24	Caerleon	Clay; 1	Flav.-Traj.
25	Gloucester	Clay; 1	?
26	Alchester	Clay; 1	?
27	Woodeaton	Clay; 1	?
28	Windridge	Lead; 100+	?C1st. A.D.
29	Oare	Clay; 1	?early Rm.
30	Cold Kitchen Hill	Clay; 1	?
31	Charterhouse	Lead; 4	?
32	*Tiverton	Clay; 1 (?)	C1st. A.D.
33	Catsgore	Clay; 1	Late Roman

(?) = Identification uncertain.
Info. from Greep (1987) except * Dr. V.A. Maxfield.

although it may be that they survived in the east where their skills would have been more keenly appreciated.

CONCLUSIONS

As shown in the first part of this paper the sling was clearly effective as a weapon of war. As such it might perhaps be reasonable to assume that the Imperial army would utilize it to their advantage. However the evidence, such that there is, points to a decline of its use as a result of the lack of specialised units and an attitude aligned against long range weapons. Although until a close study is conducted of the sling-shots themselves it would be foolhardy to make any definite assessment in the decline of the use of this weapon.[77] It must be borne in mind that the various biases of the evidence may well combine to make the decline seem greater than it in fact was.

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NOTES

1. This literary bias also manifests itself in the glorification of the Legions in literature at the expense of the auxilia.

2. LIVY I;43; KEPPIE, 1984, 16-17.

3. GÖPFRICH, 1986, Abb.52. 162.

4. JOBEY, 1978, 71.

5. Aeneid, XI;579.

6. Georgics, I;309.

7. HAWKINS, 1847, 98 and Fig.000 here.

8. HARDING, 1980, 77.

9. HARDING, 1980, 77.

10. Thebaid, IV;66.

11. DIODORUS SICILUS, V;18; STRABO, Geog., III;5; 1-3.

12. Examples dated to approx. 5,000 B.C. were found at Hassuna in Iraq. KORFMANN, 1973, 39.

13. CURLE, 1911, 58.

14. BAILLE-REYNOLDS, 1930, 78.

15. Of the six sites in Britain from which rounded clay shot has been recovered (see index to fig.8) at the two sites where they are not lone examples, Bar Hill and Old Kilpatrick, they have been identified by some as marbles. ROBERTSON, 1975, 124-5 for Bar Hill & MILLER, 1928, pl. XXV, 8-9 for Old Kilpatrick. In both cases this seems, in view of their small size, a more likely interpretation.

16. De Bell. Gall., V;43.

17. Bell. Af., 20.

18. KORFMANN, 1973, 40.

19. GREEP, 1987, 187.

20. TYLECOTE, 1962, 100.

21. WEBSTER, 1985, 119.

22. Examples known range between 2 and 7 cms in length, and between 18 and 140 grs. in weight.

23. E.g. SENECA, II;57;2; OVID, II;727-9.

24. The General, XIX;3.

25. CERCHIAI, 1984, 199-204 for examples. (I am grateful to Dr. M.C. Bishop for bringing this reference to my attention.)

26. E.g. T. LAF(renius) PR(aetor) from Asculum. (GREEP, 1987, 190, fn.25)

27. CERCHIAI, 1984, 208, 63.

28. CONNOLLY, 1981, 49.

29. CERCHIAI, 1984, 195, 7.

30. POLYBIUS XXVII;11; LIVY XLII;65;9-10.

31. WALBANK, 1979, 309.

32. Ep. rei Mil., II;23.

33. WHEELER, 1943, 49.

34. HUBRECHT, 1964, 93.

35. JOBEY, 1978, 87.

36. Anab., III;3-4.

37. KORFMANN, 1973, 37.

38. CONNOLLY, 1981, 49.

39. WHEELER, 1943, 49.

40. Judges, XX;16.

41. E.g. STRABO, III;5;1.

42. LIVY, XXXVIII;29;7-8.

43. Punica, VIII;522.

44. CELSUS, V;26;5.

45. CELSUS, VII;5;5.

46. Bell. Af., 27.

47. LIVY XXXVII;41.

48. STRUTT, 1845, 74.

49. CAESAR, Bell. Civ., III;63.

50. KORFMANN, 1973, 42.

51. WHEELER, 1943, 49; CUNLIFFE, 1978, 278.

52. HUMBLE, 1980, 27.

53. I Samuel, XVI;17.

54. Anab., III;3.

55. POLYBIUS, III;75.

56. Bell. Gall., II;3.

57. VEGETIUS, I;16; SIDONIUS APOLLINARIS, Carmen, XXIII;345.

58. BALSDON, 1979, 214ff.

59. POLYBIUS, XV;2; GARCIA, 1972, 94.

60. LIVY XXXVII;6.

61. Bell. Civ., III;4;3-6, and see SADDINGTON, 1982, 8.

62. British Museum, Pulsky Collection, GR 1868 5.20.37.

63. Bell. Sp., 14.

64. Bell. Civ., III;83.

65. CHEESMAN, 1914, 152.

66. Annals, II;20;2.

67. WATSON, 1969, 60, discussing VEGETIUS, II.23.

68. C.I.L., VIII, 18042.

69. VEGETIUS, I.15.

70. LIVY, XXVIII;37;6.

71. CICHORIUS, 1896 and 1900, LXXII,

72. 12 Glandes from Vindolanda have been dated to the mid fourth century A.D. (GREEP, 1987, 199).

73. JOBEY, 1978, 88; GREEP, 1987, 191. The shot carries an inscription of LEG. XIII which left the site in A.D. 46.

74. CERCHIAI, 1984, 199.

75. GREEP, 1987, 198.

76. S.H.A. Severus, II.2.

77. The author is at present engaged in such a study of slingshot, most notably those of lead, and would be interested to hear of any known examples.

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