THE GLADIUS

The Roman Short Sword

M.C. BISHOP

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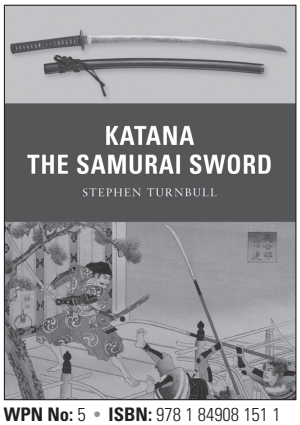

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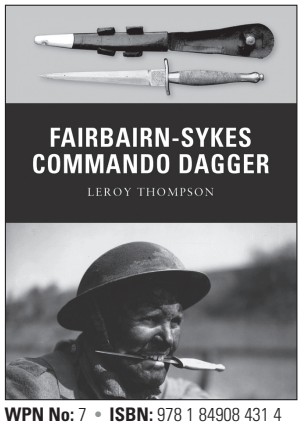

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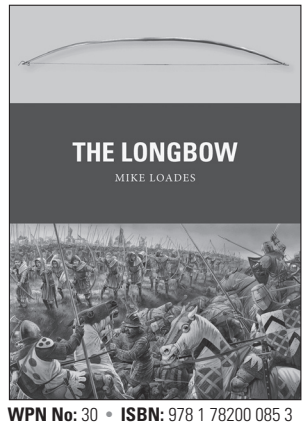

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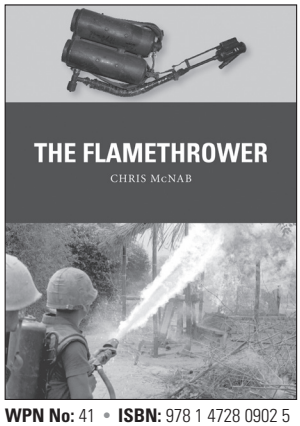

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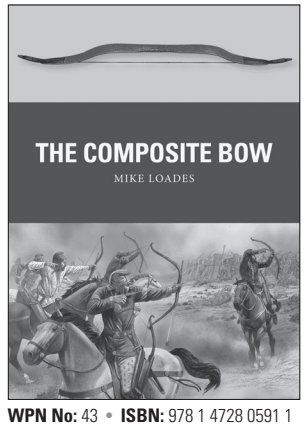

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M.C. BISHOP

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Author's note

The tables of dimensions include reference numbers for Miks' (2007) catalogue of Roman swords. Swords with no such number were not included in that publication, either because they were not deemed to be Roman or are recent discoveries.

Editor's note

Metric units of measurement are used in this book. For ease of comparison please refer to the following conversion table:

1m = 39.37in
1cm = 0.39in
1mm = 0.04in
1kg = 2.20lb
1g = 0.04oz

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Title-page photograph: relief from Palmyra depicting three deities wearing *gladii* in frame scabbards, lamellar armour, and Parthian clothing, 1st century AD. (Photo: © World Imaging)

Artist's note

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INTRODUCTION

In order to gain a first impression of the efficacy of the Roman short sword, we could do worse than turn to the historian Livy, who vividly described the impact upon Philip V's Macedonian troops in 200 BC when they first witnessed the aftermath of a skirmish with some Roman cavalry equipped with the *gladius*:

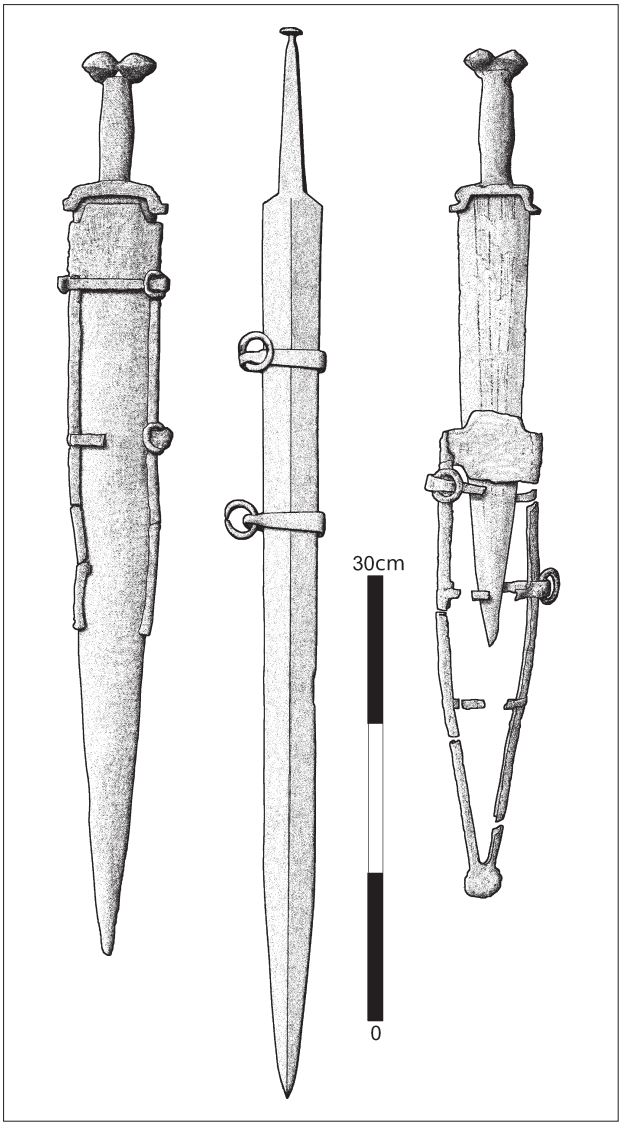
> Men who had seen the wounds dealt by javelins and arrows and occasionally by lances, since they were used to fighting with the Greeks and Illyrians, when they had seen bodies chopped to pieces by the *gladius Hispaniensis*, arms torn away, shoulders and all, or heads separated from bodies, with the necks completely severed, or vitals laid open, and the other fearful wounds, realised in a general panic with what weapons and what men they had to fight. (Livy 31.34.4)

Livy of course was a Roman writing some two centuries after the events he described, basing his account on older sources. Even so, he managed to convey something of the horror the Macedonian troops must have felt when confronted with this terrible weapon. Indeed, in recent years, the excavation of mutilated bodies at two Spanish sites, Cerro de la Cruz (150–125 BC) and Valencia (75 BC), have only served to confirm the accuracy of Livy's observation.

Our second impression is provided by a decorated column base from the legionary headquarters building in the fortress at Mainz-Mogontiacum (Germany). We see a legionary of the 1st century AD advancing, crouched behind and peering over the top of his shield, short sword at the ready by his side. This, the sculpted relief almost proclaims, was what Roman legionaries did best.

The Roman short sword, frequently referred to as the *gladius* (pl. *gladii*), is arguably the one weapon that provided Rome at once with offence, defence and entertainment. Offence and defence were supplied by the

OPPOSITE A reconstruction of the Fulham Mainz-type sword and scabbard. (Photo: © M.C. Bishop, courtesy of the Ermine Street Guard)



Celtiberian 'antenna' swords and a Castilian La Tène sword, probably the inspiration for the *gladius Hispaniensis*, from Monreal de Ariza (left), Chamartin de la Sierra (centre) and La Mercadera (right) in Spain. (Drawings: M.C. Bishop)

Roman Army (and Navy), while entertainment was delivered by gladiators. These are huge over-simplifications for two reasons. First, the term *gladius* was used for any sword, not just the short sword. Second, neither all Roman soldiers nor all gladiators used the double-edged short sword. Nevertheless, the *gladius Hispaniensis* (literally 'Spanish sword' – Livy also calls it the *gladius Hispanus*) was a key and highly recognizable component of the Roman armoury, symbolizing Rome's ability to adopt and adapt arms and armour that proved sufficiently impressive when used against them.

As the passage from Livy indicates, the *gladius Hispaniensis* was originally used by citizen and allied cavalry in the Republican period, but came to be replaced by the Celtic-style *spatha*, as the sidearm of choice for auxiliary cavalry. The short sword survived as the principal blade of both legionary and auxiliary infantry for more than three centuries, finally being replaced by the longer cavalry sword, the *spatha*. Even then the short sword was not finished. In the 3rd century AD, the appearance of the *semispatha* – often just a cut-down *spatha* – was to all intents and purposes a return of the short sword that turned a weakness of the longer blade to advantage.

The *gladius* underwent a series of subtle changes over the centuries, with a steady evolution of the long-pointed variant into the 1st century AD and then a sudden, revolutionary change to parallel edges and a short point. The reasons for these changes were probably as much technological as tactical, but the modern scholar inevitably sees evidence here for a change in the style of fighting employed by Roman infantry.

How to use the short sword seems to have been one of the great controversies within the Roman Army: stab with the point or chop with the edge? Our sources preserve instances of both types of use, but Roman writers of prescriptive texts and manuals seem to have favoured particular ways of dealing death to potential foes. That those foes were impressed with the Roman weapon is shown by a number of attempts to imitate it, some more faithful than others, but it has to be noted that the true significance of the *gladius* lay in the way it formed part of the whole

Roman military 'package'. It was at its most efficient when the technology, organization (both on and off the field) and training were employed harmoniously. No barbarian picking up a discarded short sword was as well equipped to use it as a Roman soldier.

When the *gladius* was first adopted by the Roman Army, an intimate relationship between the foot soldier and the gladiator was inevitably born. Just as they used the same weapon, so they used the same training methodology. The Romans had their far-sighted young general Scipio Africanus to thank for this; but his legacy was to last even longer than the sword, for the system of weapons training known as *armatura* was to impress the Late Roman writer Vegetius to such an extent that he included it more than once in his *De Re Militari*. Vegetius in turn was widely read in the medieval period, so it might be argued that it is doubtful that any sword was ever quite so influential in Western warfare as the *gladius*.

Our knowledge of the *gladius* has advanced in leaps and bounds since the 20th century, culminating in the appearance of Christian Miks' monograph and catalogue of Roman swords in 2007. Finds of increasing numbers of Republican-era examples have brought the development of the sword into much sharper focus for the first time. Questions about its origins are being answered with more conviction than ever before, while archaeology is bringing to light ever more examples of the wounds suffered by the victims of the weapon. Nevertheless, any study of the Roman short sword has to make carefully balanced use of the literary, representational and archaeological evidence in order to reconstruct the story of the weapon. No one element tells us the full story, but taken together, they provide a vivid impression of life fighting with and against the *gladius*.

DEVELOPMENT
Adopt and adapt

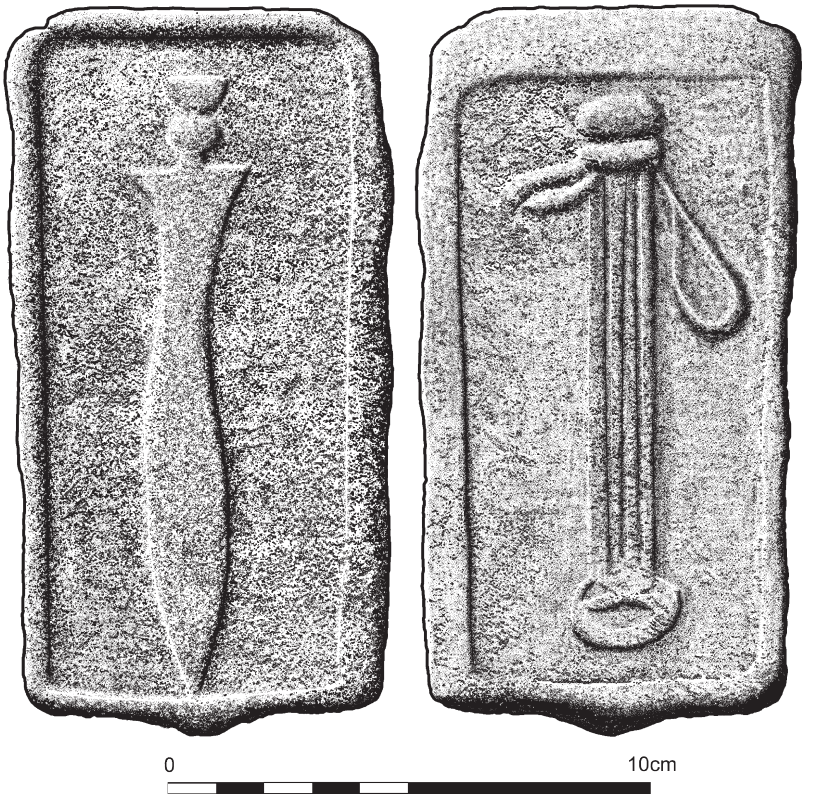
SPANISH ORIGINS

An example of a *xiphos*-type sword from Alfedena in Italy. (Photo: © C. Rusalen)

The Romans believed that their short sword originated in Iberia, as the name *gladius Hispaniensis* suggests, and the archaeological evidence can certainly be interpreted as supporting that belief. A Byzantine encyclopaedia, known as the *Suda*, relates an interesting tale:

> The Celtiberians differ greatly from others in the construction of their swords; for it has an effective point, and can deliver a powerful downward stroke from both hands. Wherefore the Romans abandoned their ancestral swords after the [war] against Hannibal, and adopted those of the Iberians. But while they adopted the construction of the swords, they can by no means imitate the excellence of the iron or the other aspects of their careful manufacture. (Suda s.v. *machaira*)

It has been suggested that the text derives from that of the Greek writer Polybius, whose *Histories* includes a detailed description of the Roman Army at this time and two passages that closely accord with the *Suda*. The term 'ancestral swords' is generally held to be a reference to the Greek *xiphos* (so not truly 'ancestral'), which had been retained from the old hoplite-style panoply of earlier times. Examples of the *xiphos* (pl. *xiphoi*) are known from a number of Italian sites (including cemeteries at Campovalano and Alfedena), with blades of around 600mm in length, although none can be identified as being unequivocally Roman. The *xiphos* (the word, like the Latin *gladius*, is actually just a generic term for 'sword' which has come to be associated with a particular type of Greek short sword) was even depicted on early Roman currency, specifically the so-called *aes signatum* (effectively ingots of bronze) of the 5th to 4th centuries BC, suggesting that it had come to be seen as synonymous with

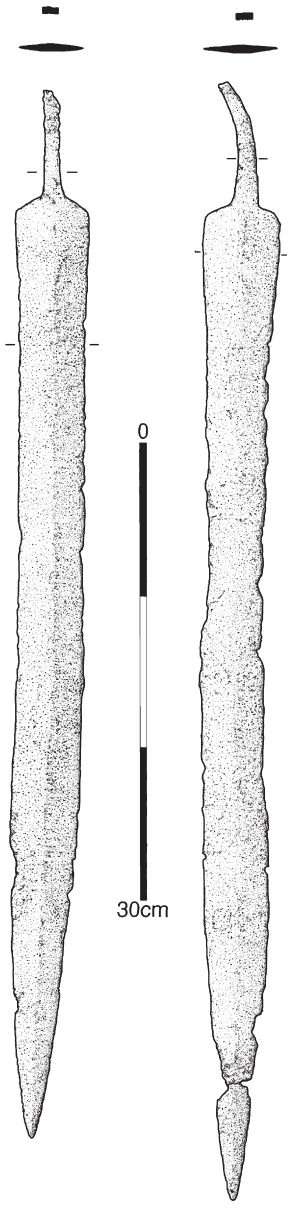


Aes signatum currency of the 5th to 4th century BC depicting (left) a *xiphos*-type sword and (right) a scabbard for such a sword. (Drawings: M.C. Bishop)

Roman military prowess before the Punic Wars of 264–146 BC. Clearly, the Spanish short sword must have made a considerable impact upon the Romans for it to replace the *xiphos* so thoroughly.

It can be argued that calling the short sword 'Spanish' is something of a misnomer, for the Celtiberian warriors whose weapons we believe were among the prototypes for the *gladius* were undeniably linked to the much broader 'Celtic' cultural and technological traditions of western and central Europe. Indeed, waisted, two-edged short swords with broader and longer points can be found in bronze in the Halstatt period during the first millennium BC, so short swords had a long pedigree even before the Romans arrived in Spain.

The Spanish short sword usually identified with the prototype for the *gladius Hispaniensis* was a formidable weapon in the hands of Celtiberians serving with Hannibal. Surviving examples from the Iberian peninsula, such as those from Osuna, La Osera and Quintana de Gormaz, are shorter than most *xiphoi*, averaging around 400mm in length. They also have arched hand guards and bilobate (or 'atrophied antenna') pommels. Another common feature was the use of a frame scabbard, usually with two or three suspension rings. These may be the swords referred to by Polybius (3.114) and, echoing him, Livy (22.26.5) in describing the weaponry of Celtiberian warriors at the battle of Cannae in 216 BC: 'The shields of the Spaniards and Celts were very similar, but their swords were entirely different, those of the Spaniards thrusting with as deadly effect as



Possible *gladius Hispaniensis* swords from Grad, near Šmihel (Slovenia), 2nd century BC. (Drawings: M.C. Bishop)

they cut, but the Gaulish sword being only able to slash and requiring a long sweep to do so' (Polybius 3.114).

As Quesada Sanz (1997: 253) has pointed out, however, the Celtiberian single-edged *falcata* could just as easily be used for stabbing as cutting, so this is far from being a definitive statement. Therefore, what the Romans seem to have taken from the Celtiberian weapons was the form of the blade and the frame scabbard, while ignoring specific refinements like the fuller, the handle and – as the *Suda* suggests – the manufacturing process. Crucially, to judge from later Republican finds, the Romans seem to have rejected the smaller size of the Spanish blade, preferring something close to the *xiphoi* with which they were familiar.

Whether there was a gradual adoption of this type of sword is open to debate, but one possible occasion for it was Scipio Africanus' introduction of new training methods while his army was based in Carthago Nova (Cartagena) in Spain during the Second Punic War of 218–201 BC. Whether this would have happened wholesale or piecemeal is unknown and probably unknowable on current evidence (see page 50).

MID-REPUBLICAN

In the interests of balance, it should be stated that there is much scholarly debate concerning the identification of possible early examples of the *gladius Hispaniensis*. At one extreme, it has been suggested that many if not all of the early *gladius*-type swords are, not least on the grounds of size, little more than derivatives; a view expressed repeatedly by Miks (2007 and 2015; Davoli & Miks 2015). In contrast, other scholars – in particular the late Peter Connolly (1997) – have been more positive about at least a few of the weapons. While a degree of ambivalence over some of the swords found in burials is probably wise, there are certainly some examples that come from plausibly Roman contexts. The problem is that, by dismissing the early, large, *gladius*-like swords from the evolutionary line between the short Celtiberian weapons and the Mainz-type blades of the Early Imperial period, a vast gap is left in our knowledge of the development of the sword. As a source, archaeological evidence can be very fickle, but for none of the so-called Republican blades to actually be Roman is perhaps stretching credulity too far. It is thus perhaps better to acknowledge that the *gladius Hispaniensis* may well have undergone a period of being what may to us seem unusually large, before use and experience produced blades of the size we know from the Imperial period. Use of the early *gladius Hispaniensis* by both infantry and cavalry may in any case be thought to indicate the necessity for a longer sword. Oscillation between favouring short or long blades for infantry was certainly to be found later, when the *gladius* was replaced by the *spatha* during the 2nd century AD, only to see the *semispatha* come into use, so a preference for long blades (which Miks would class as *spathae*) in the Republican period cannot be ruled out.

The unusual size of the *gladius Hispaniensis* helps explain Cicero's quip recorded by Macrobius – 'who strapped my son-in-law to his *gladius*?'

(Macrobius *Saturnalia* 2.3.3) – when he saw him (Cornelius Lentulus Dolabella, who was evidently not very tall) with his sword on its belt.

With this in mind, a hoard of Roman ironwork from Grad near Šmihel (Slovenia) included two examples of what some believe to be the earliest certain form of *gladius Hispaniensis*. With their waisted blades, it is easy (although not necessarily correct) to see them as antecedents of the later Mainz-type sword; an assertion that may be supported by the use of piling to forge at least one of them (Williams 2012: 51–52). Generally held to date to the first half of the 2nd century BC, the collection – which was discovered in the 19th century and lacks a definitive archaeological context – is not without its own problems. Nevertheless, Connolly noted the similarity between those and fragments of swords found in Roman camp III at Renieblas near Numantia (Spain) believed to date to the middle of the 2nd century BC. One other weapon of note in this period came from a tomb at Es Soumâa in Algeria, believed to be that of a Roman client king, perhaps Micipsa, who died in 118 BC. The weapon's reconstruction is problematic but its shape and frame scabbard suggest it is part of the same tradition of blades as the other possible examples of the *gladius Hispaniensis*. Blade lengths seem to have been mostly in excess of 600mm, with widths averaging 45mm, and they tended to be slightly waisted. These early blades all have rounded shoulders.

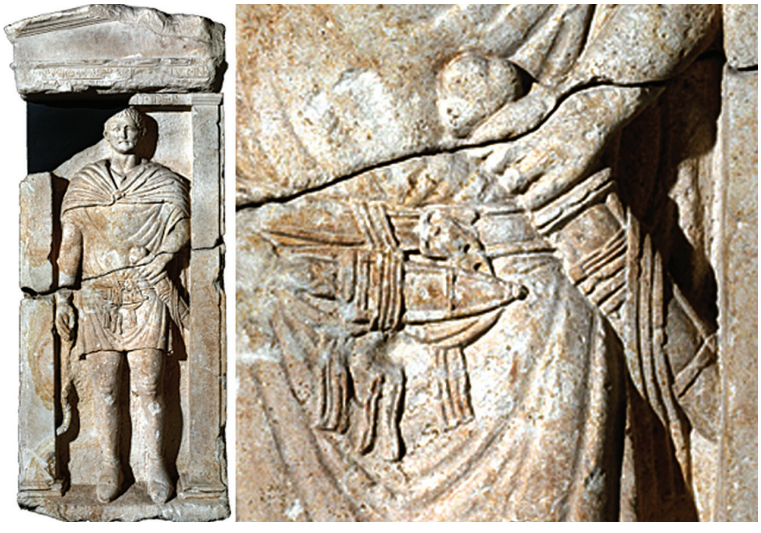
LATE REPUBLICAN

A sword from the island of Delos (Greece) has been associated with one of Rome's campaigns against the Cilician pirates of the 1st century BC; they used Delos as the centre of their slave trade. Recognizably a *gladius Hispaniensis*, it retained both its organic scabbard and the associated fittings. With a blade length of 640mm, it is a big sword by comparison with the earlier Celtiberian proto-*gladius* blades or even later Mainz-type swords such as the Sword of Tiberius (*c.*100mm shorter) or the Rheingönheim (Germany) blade (*c.*150mm shorter). A fragmentary blade from Osuna (Spain) may also belong to this period.

This period also sees a rare depiction of this type of sword on the tombstone of the Roman centurion Minucius from Padua (Italy) which dates to the middle of the 1st century BC and has a distinctive trilobate pommel. A sword excavated at Soknopaiou Nesos in Egypt (Davoli & Miks 2015) shares many of the characteristics of the other early weapons, but is even larger than the Delos sword and therefore classified by the excavators as a *spatha*. It was found with its handle intact and with elements of its scabbard in place. In place of a hand grip, however, there was merely cloth wrapped around the tang, which may well have been a makeshift repair rather than an original feature. Dated to around the time of Minucius' tombstone, or perhaps slightly later, it not only has what has been identified as the form of the *gladius Hispaniensis*, but even the same sort of lobed pommel (in this case made of ebony) as that depicted on Minucius' tombstone.

Some swords that appear to date from the very early Augustan period (the last three decades of the 1st century BC) seem to fit with the Late

The Delos (Greece) sword in its scabbard, 1st century BC (Miks A123). (Drawing: M.C. Bishop)



Detail of the *gladius Hispaniensis* on the tombstone of the centurion Minucius from Padua (Italy), 1st century BC. (Photo: © C. Rusalen)

Republican swords, in that they are larger than Mainz-type blades. These include examples from Fontillet (France) and Giubiasco (Switzerland), although none of these come from Roman contexts as such.

Blades are still in excess of 600mm in length but appear to be slightly broader, at around 60mm maximum, and tend to be slightly waisted. Rounded shoulders are still found at the tops of blades.

MAINZ

The swords of the Early Imperial period are generally classed as belonging to the Mainz type, named from a number of examples from the Rhine near the legionary fortress of Mogontiacum (Mainz, Germany). In shape, these tend to resemble their predecessors in both form and proportions, with tapering, often waisted, blades and long points, but their overall blade length was considerably reduced. Mainz-type swords were known long before Republican-era swords started to be discovered and recognized, largely as a result of dredging activities in the 19th century in major European rivers like the Rhine. Miks has isolated six principal Mainz-type blade forms which he has called Mühlbach, Sisak, Classic, Fulham, Wederath and Haltern-Camulodunum (Miks 2007). Although all have long points, the blade shapes range from the classic waisted form (Mühlbach, Sisak, Classic and Fulham) to those with virtually parallel edges (Wederath and Haltern-Camulodunum). All have either diamond-shaped or lenticular cross-sections, the former being more common than the latter, and there is seldom any indication of blades being the ancient equivalent of hollow ground (this is also true of most examples of the *gladius*). While the variations between the different Mainz-type blades are many, they are not inherently datable, since most examples come from rivers; but the scabbard forms associated with them are. A range of

A sword and scabbard from the River Ljubljanica (Slovenia), 1st century BC (Inv. No. V1366; Miks A767). (© National Museum of Slovenia; photo: Tomaž Lauko)

The so-called Sword of Tiberius from Mainz (Germany), a Mainz-type *gladius* of the 1st century AD (Miks A465). (© The Trustees of the British Museum. All rights reserved.)

The Mainz-type sword from Rheingönheim (Germany) with a silvered hilt (Miks A609). (© Historisches Museum der Pfalz Speyer; photo: Peter Haag-Kirchner)

distinctive scabbard designs are known and some of these – often fragmentary – come from excavated archaeological contexts which can be dated with some confidence.

A number of Mainz-type handles survive, allowing us to identify its distinctive characteristics. An oval hand guard of wood, bone or ivory (with a copper-alloy plate at its base) was placed onto the tang, followed by a ribbed hand grip (usually hexagonal-sectioned and of bone, but also found in wood and ivory and rounded in section), and then an ovoid pommel, usually of wood, all secured in place by a peen block or top nut fastened to the tip of the tang. Some early Mainz hand grips lacked the ribbing and were instead incised with a spiral design, examples being known from Dangstetten (Germany) and Pannerden (Netherlands). In one instance – the sword from Rheingönheim – the whole handle (pommel, hand guard and ribbed hand grip) was encased in silver foil. Wooden hand guards excavated from the Vindonissa fortress midden at Windisch (Switzerland) display delicate, arcaded patterns carved into them (also shown on some stone sculpted representations), found too on a sword from Velsen (Netherlands). Wooden handle components from both Mainz and Pompeii types found at Windisch were primarily of boxwood, but some cherrywood was also used.

The frame scabbard was retained from the *gladius Hispaniensis*, with two suspension bands to hold the familiar four rings, but now additional metal plating was added – purely for decorative purposes, it seems.

All of the Mainz-type scabbards were constructed around a standard organic core of wooden laths covered in leather, often completely concealed by the outer, metallic plates. For the metal parts, the manufacturers took advantage of a new copper alloy: a form of brass known as *orichalcum* (80 per cent copper and 20 per cent zinc). This had the inviting quality of looking almost identical to gold, hence it was sometimes known as *aurichalcum*. The alloy was in fact the basis for Augustus' new coinage, the *sestertius* being made of it from around 23 BC, and valued at 25 per cent of a silver *denarius*, or 1 per cent of a gold *aureus*. This meant that Roman military equipment made of *orichalcum* was, quite literally, bullion. Tinning was then used as a white-metal wash for some brass components. Because of its low melting point, brass components could be dipped in (or wiped with) tin when it was molten to coat them, producing a surface that looked very similar to silver and which had the added benefit of being resistant to corrosion. Combining brass with tinning therefore meant that craftsmen had access to low-cost substitutes for gold and silver that could look every bit as good as the real thing – providing that the items were kept clean.

An example of the Mainz-type sword from the River Ljubljanica (Slovenia) was recovered still in its sheath made of wood and bound with brass guttering and 'net-like' decoration. Such fittings are known from a number of sites with Augustan associations, including Kalkriese (Germany) and Sisak (Croatia), and seem to date to the last years of the 1st century BC.

Another group of swords is known with metal-plated scabbards which incorporate intricate openwork designs (so-called *opus interrasile*)

in the locket and chape plates. Most of the complete examples known come from the Rhine at Mainz but are, by definition, undated. These scabbards were usually made of brass but tinned to resemble silver. Again, fittings from such scabbards are known from sites like Windisch in Switzerland and Dangstetten, Oberaden and Kalkriese in Germany. They can be dated to the Augustan period, although similar finds from Magdalensburg (Austria) show that they were still in use up to just before the invasion of Britain, since that site was abandoned by AD 42. None has yet been found in Britain.

One of the best-known of all Mainz-type swords is the so-called Sword of Tiberius, found in the Rhine at Mainz and now in the British Museum. The embossed locket plate depicts the Emperor Tiberius shaking hands with a figure usually identified as his general (and nephew) Germanicus; the plate bears the legend FELICITAS TIBERII ('the delight of Tiberius') while the chape appears to refer to the two eagle standards recovered by Germanicus after their loss under Augustus during the Varian disaster of AD 9. This places the sword firmly in the reign of Tiberius (AD 14–37) and probably after the recovery of the eagles in the latter part of AD 16 (and possibly after the triumph celebrated by Germanicus in AD 17). A medallion on the scabbard bears a portrait head of Tiberius. The whole piece is a magnificent example of Roman display art and in the past scholars were so impressed by it that they felt moved to identify it as an officer's weapon or even a special presentation piece. The mundane truth is that many scabbards were elaborately decorated in this way, a fact confirmed by the tombstones of ordinary soldiers from the early 1st century AD.

A further group of scabbards completely covered the front of the sheath with embossed plates and employed an even wider range of

The so-called Fulham sword, a Mainz-type *gladius* of the mid-1st century AD (Miks A445). (Photo by Museum of London/Heritage Images/Getty Images)

OPPOSITE Mainz-type *gladius* from Windisch (Switzerland) (Miks A790). (Drawing: E. Deschler-Erb)

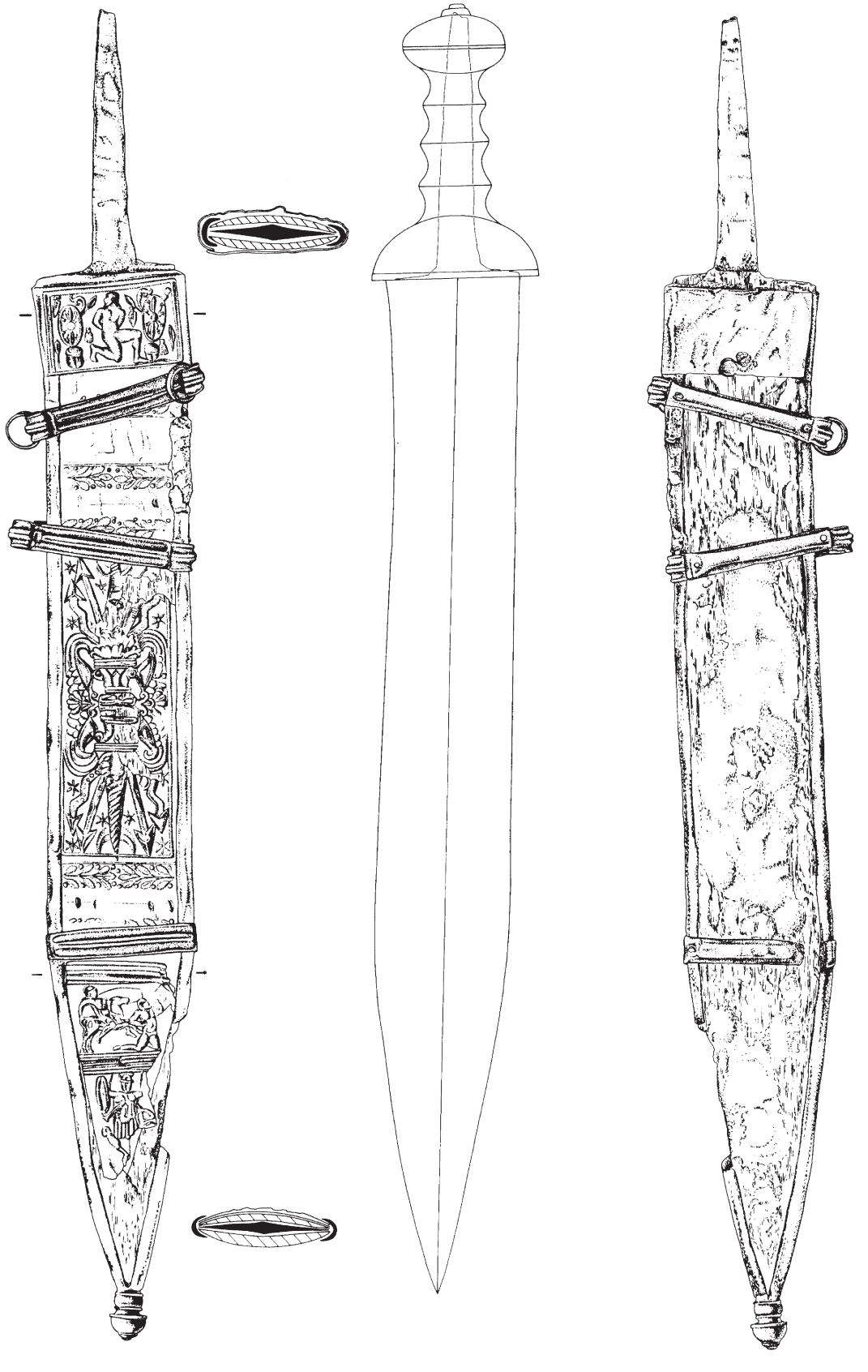
Mainz-type *gladius* from Chichester (West Sussex, England) (Miks A102). (Photo: © The Novium (a service provided by Chichester District Council). All rights reserved)

decorative motifs, combining elements of 'propaganda' art with various other components from the classical repertoire. These seem to be among the latest of the Mainz-type scabbards. One example, found in excavations in a barrack building in the legionary fortress at Windisch with a blade still in it, has been dated to the last third of the 1st century AD. It depicts a captive barbarian and trophies on the locket plate and a thunderbolt, lightning and wings device on the main plate instantly recognizable as that found on many legionary shields. Another example, likewise still in its elaborately decorated scabbard, was another riverine find; often called the Fulham Sword, it was in fact found in the River Thames near Putney (Greater London, England). Two of the presumed four embossed scabbard plates have survived. These depict the Lupercal (or she-wolf and the twins Romulus and Remus of Rome's foundation myth) on the locket plate, with an intricate vegetal design on the lower main plate, with tendrils inhabited by birds and butterflies (the upper main plate and chape plate are missing). A possible former for such plates, perhaps used for stamping them out, has been found in the civil settlement outside the legionary fortress at Nijmegen (Netherlands), and this too bore the thunderbolt-and-lightning motif. We know that a similar process was used for stamping decorated, embossed belt plates.

The latest-dated examples of Mainz-type *gladii* come from Britain. Even though the Fulham Sword, coming from a river, was undated, it almost certainly post-dates the Roman invasion of Britain in AD 43 and was presumably old by the time it entered the archaeological record. The second British example comes from a securely dated excavated context within the early military base of Chichester (West Sussex) on the south coast of England, probably associated with *legio II Augusta*, which we know was campaigning in that area immediately after the invasion. The British examples were not the latest such swords, however. Indeed, the longevity of the Mainz type of sword is indicated by two little-known finds of such weapons from around Pompeii in Italy (one coming from Regio VII, Insula 7.10, 13), suggesting that in some cases use continued into the third quarter of the 1st century AD.

Two things are very clear from this: Mainz-type blades are all very similar, while their scabbards fall into several distinct groups. The advent of the Imperial period seems to have seen a degree of standardization in blade forms, accompanied by an overall reduction in size. Why this may have happened is a matter of conjecture – it may even have been the result of a combination of factors – but the suspicion must be that there was a change in the way in which Roman infantry fought and that this change manifested itself in the size of their swords. The reduction in size may also have been related to, and perhaps responsible for, the emergence of a separate cavalry sword: the *spatha*.

Mainz-type blade lengths vary between 425mm and 590mm, maximum widths are 36mm and 75mm, and they tend to be slightly waisted. Mainz-type swords were the first with squared shoulders to the blade. Modern replicas (blade and handle assembly) weigh between 0.68kg and 0.8kg.



Anatomy of a short sword (opposite)

This plate depicts the three main types of *gladius* with examples of their respective scabbards. The *gladius Hispaniensis* (**1**), a weapon long enough for both cavalry and infantry to use, was suitable for both chopping and stabbing. It is based on the Delos sword and the weapon depicted on the funerary relief of the centurion Minucius from Padua. The Mainz-type sword shown here (**2**) has a decorated scabbard adorned with brass plates, some of which were tinned to produce a pleasing visual contrast, others pierced with openwork decoration. Shorter than the *gladius Hispaniensis*, it is still suitable for both cutting and thrusting. The Pompeii-type sword (**3**), smallest and lightest of the three blades, was apparently intended as a thrusting weapon but still used to both cut and thrust. Here, the organic core of the sheath is partly exposed and the decorative plates confined to the mouth and chape.

The 'business-end' of the *gladius* was the point or *mucro*. Long on the *Hispaniensis* and Mainz type, short on the Pompeii type, it fulfilled the first of the important functions of the short sword: stabbing (*punctim*). Next came the blade (*lamina*) with two cutting edges (*acies*) which provided the second function of the sword: chopping or cutting (*caesim*). Both the tip and blade generally had a diamond-shaped, or occasionally lenticular, cross-section. The narrow, rectangular-sectioned tang (*cauda*) held the various elements of the hilt (*capulus*), consisting of the hand guard and its basal brass hand guard plate; the hand grip; the pommel; and the peen block. The peen block may itself have been used as a secondary weapon in a similar manner to the 'skull-crusher' on the Fairbairn-Sykes commando knife.

The scabbard (*vagina*) originally consisted of a mouth plate at the top and a terminal knob at the bottom with the sides made of U-sectioned copper-alloy binding (or guttering). Metal plates could be added for decoration, including the locket plate at the top and the chape at the bottom. Suspension bands were normally riveted to the guttering and held freely moving suspension rings.

POMPEII

Just as the invasion of Britain saw the Mainz-type sword still in use, a new blade form was evidently beginning to appear in the middle of the 1st century AD. Named by modern writers after four swords found in various locations in and around Pompeii which were deposited during the eruption of Vesuvius in AD 79, this new form of sword had a parallel-edged blade and a short point. As such, it resembled a shorter version of the *spatha*, the long cavalry sword ultimately derived from Iron Age long swords. Miks has identified three main types of Pompeii-type blade shape, namely the Classic, Putensen-Vimose and Hamfelde variants (Miks 2007). Most examples of the first form come from within the boundaries of the Roman Empire, while the other two variants are mainly found beyond its frontiers. Scabbard fittings from a number of sites in London, as well as garrisoned southern British hillfort sites at Waddon Hill and Hod Hill (both in Dorset, England), suggest that the Pompeii type was already in use in Britain by the time of the Boudican revolt in AD 60/61, while an example of the palmette so characteristic of the scabbards of these swords was found mounted above the chape of a Mainz-type sheath (Miks A596) found in a Tiberio-Claudian shipwreck at Porto Novo (Corsica).

The eponymous blades from around Pompeii itself were all found within their scabbards. These include examples from the Villa of Mysteries


1
2
3

Pompeii-type sword and scabbard from the gladiatorial barracks (*quadriporticus*), Pompeii (Italy) (Miks A590). (Photo: © Salvatore Ortisi)

(Miks A593) and Regio VI, Insula 2 (Miks A592). Another sword (Miks A590) came from the gladiatorial barracks (*quadriporticus*) and it is tempting to see this as the weapon of a gladiator, but the iconography on the scabbard plates is the same as that of the other swords (and those from many military sites) and it fits best into a military context (see page 43). A further sword and scabbard (Miks A591) came from the Villa San Marco at Stabiae (Italy) and were found together with a set of embossed belt plates. These older finds were more recently complemented by a sword (Miks A152) found on the beach at Herculaneum (Italy), being carried by a man who had wrapped the decorated sword belt around it.

Among the river finds, one particular Pompeii-type sword from the Rhine at Mainz (Miks A467) stands out (see page 75). Formerly in the Guttmann Collection and now in the Royal Armouries in Leeds, this example was found with elements of its scabbard and had ownership inscriptions punched into its blade. It also features a 'bullet-tip' swelling at the tip of the blade, probably designed to enhance penetration during a stabbing action. Recent forensic research into the dynamics of knife crime has shown that most resistance to penetration during a stab comes from the skin and that broader blades meet with more resistance than narrower ones (Hainsworth 2008). The bullet tip may have been a response to that favoured by some *gladiarii*. Similar bullet tips are seen on some, but by no means the majority of, other Pompeii-type blades, other examples being swords from Klein-Winternheim (Germany) and Gué de la Casaque (France) (Miks A354 and A251 respectively). Even on lenticular-sectioned blades, these expansions tend to be diamond-shaped (or, more accurately, square) in section.

In general, the Pompeii-type swords are even smaller than the Mainz type, not only in length but also in breadth. In fact, considerably less iron was needed to manufacture the newer form – around 10–20 per cent less, depending upon which blades are compared – so the swords were inevitably lighter than their predecessors; features which seem to indicate an evolving manner of use. One intriguing blade, unprovenanced but now

Pompeii-type sword and scabbard from the Villa of Mysteries, Pompeii (Italy) (Miks A593). (Photo: © Salvatore Ortisi)

OPPOSITE LEFT Pompeii-type sword and scabbard from Regio VI, Insula 2, Pompeii (Italy) (Miks A592). (Photo: © Salvatore Ortisi)

OPPOSITE RIGHT Pompeii-type sword and scabbard from the Villa San Marco at Stabiae (Italy) (Miks A591). (Photo: © Salvatore Ortisi)

in Baena Museum (Spain), while ostensibly a Pompeii-type sword with a short point, retains elements (particularly in terms of its width and a slight taper) of the Mainz-type *gladii*. Taken together with the Porto Novo Mainz-type sword, with its Pompeii-type scabbard design, it might seem that there are hints of an evolutionary process between the two types of sword here, rather than a sudden change from one to the other.

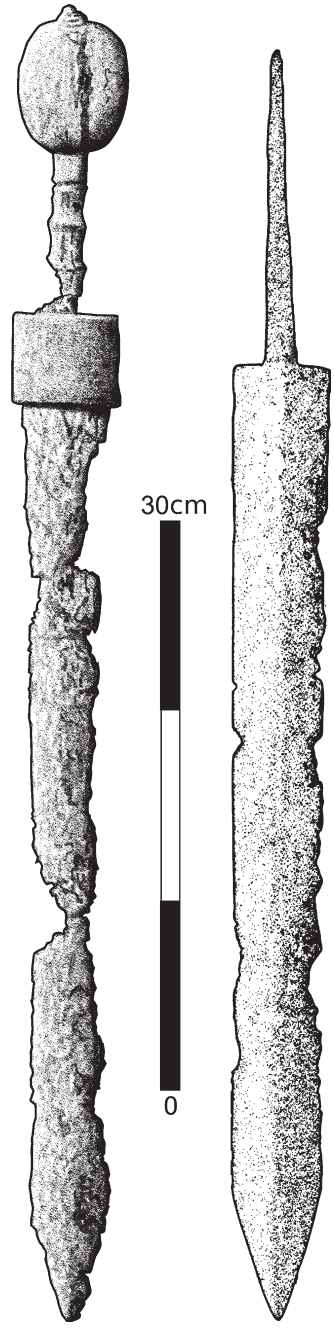
There were also differences between the handles of the Mainz and Pompeii types. Although the ribbed, hexagonal-sectioned hand grip was retained, in some cases the pommels of Pompeii-type swords were closer to spherical than their predecessors, while their hand guards were nearly hemispherical.

The Pompeii-type scabbards were much less varied than those of the Mainz-type swords. The body of the scabbard was organic, with wooden laths covered externally in leather. Unlike Mainz swords they did not incorporate guttering around the complete blade, thereby breaking a tradition that stretched right back to the Celtiberian frame scabbards of the 3rd century BC. At the top of the scabbard, immediately beneath the mouth plate, was a locket plate, normally decorated with an engraved and pierced motif – usually mythological – with one suspension band dividing the plate into two fields and a second one at the base of the plate, both of them riveted to the U-sectioned guttering that accompanied the locket plate. The V-shaped chape was placed at the foot of the scabbard, incorporating U-sectioned guttering finished at the top, on either side, with stylized palmettes, with a triangular plate, similarly decorated with engraved and pierced motifs. Immediately above the chape, in the centre of the scabbard, a further stylized palmette was riveted in place. A slight variation in the decoration of the scabbard can be seen on the example from Stabiae, whereby eleven pairs of studs (*c.*15mm in diameter and closely resembling the studs worn on the 'apron' straps of infantry) are arranged vertically between the locket plate and the chape. The Herculaneum sword preserved an unusual scabbard adornment in the form of a chain of decorated plaques attached to its outside. This can interestingly be paralleled on Rhineland tombstones, where it was applied to Mainz-type sword scabbards. A further type of scabbard plate decoration favoured simple geometric piercings, rather than the mythological scenes. One such example, traditionally known as the Long Windsor sword, probably comes from the Roman hillfort of Waddon Hill (Dorset, England), which has produced other Pompeii-type scabbard components.

The Herculaneum (Italy) Pompeii-type sword after conservation, AD 79 (Miks A152). (© The Trustees of the British Museum. All rights reserved.)

LEFT Pompeii-type sword from Baena (Spain), 1st century AD(?). (Photo: © E. Kavanagh)

RIGHT The Pompeii-type *gladii* from (left) Caernarfon (Gwynedd, Wales) and (right) Newstead (UK), last quarter of 1st century AD (Miks A90 & A528,2). (Drawings: M.C. Bishop)



The pierced scabbard components, which were usually tinned or silvered, depended for their decorative effect upon a contrast with the colour of the underlying sheath covering material. No information about the pigmentation of sheath coverings survives, but the pierced plates would have worked best with dark colours, since they would then have resembled niello-inlaid military equipment but without the effort and expense of that technique.

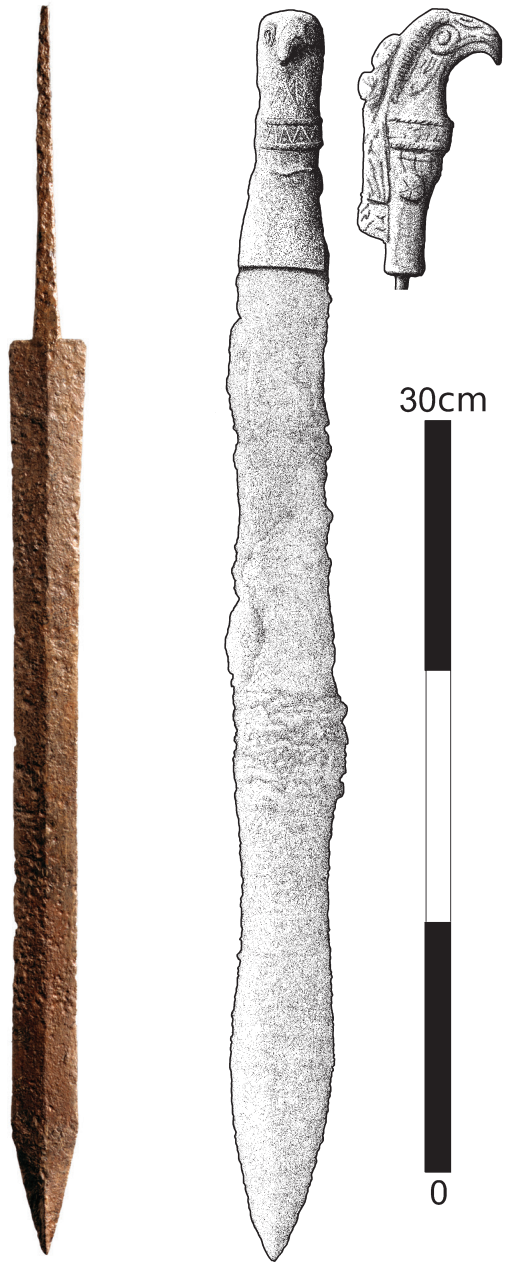
Just how long the Pompeii-type sword remained in use is a vexed question. A marble relief now in Chatsworth House (Derbyshire, England)

showing bearded soldiers (presumably Praetorians) burning tax records is traditionally dated to the reign of Hadrian, who ordered that very act in AD 118. These soldiers are shown wearing Pompeii-type swords and, although most have been broken above the chape, the sword of a centurion figure is intact. Many scholars assume, though on admittedly tenuous evidence, that the Praetorian Guard always used deliberately old-fashioned equipment, so this relief is no guarantee that the frontier armies were still using Pompeii-type swords; archaeological evidence would be a more reliable indicator of a continued Hadrianic use for these swords, were it to exist.

Blade lengths of Pompeii-type swords vary between around 375mm and 565mm, widths between 35mm and 70mm, and are mostly parallel-edged. Like Mainz-type swords, Pompeii-type blades had square shoulders. Unsurprisingly, perhaps, modern replicas of this type of *gladius* (blade and handle assembly) tend to weigh slightly less than the Mainz-type swords: in the region of 0.66kg.

EAGLE-HEADED

Frequently depicted as senior officers' and even emperors' sidearms, the eagle-headed sword is as familiar as it is rare as an archaeological find. While excavations on military bases are more likely to produce fragments of emperor statues depicting them than the actual weapons themselves, some rare finds from Pompeii show us what this short sword was like. There is a far less definite junction between the blade and point than either the Mainz- or Pompeii-type *gladii*, and in some ways it resembles the old *xiphos* form of short sword. As the name suggests, the copper-alloy grip was cast in the shape of the head of an eagle and in at least one case covered with a white-metal overlay. Several other eagle-headed grips were found in Pompeii, together with a variant on it in the form of horse-headed grips. Far less ergonomically designed than the organic handle assemblies of battle swords, these were clearly weapons for show rather than frequent use. The blade length of the Pompeii example is 396mm and its width 42mm maximum, and it is slightly waisted.



LEFT The Pompeii-type sword from the temple of Mars Leucetius and Nemetona at Klein-Winternheim (Germany), last quarter of the 1st century AD (Miks A354). (© GDKE-Landesmuseum Mainz; photo: Ursula Rudischer)

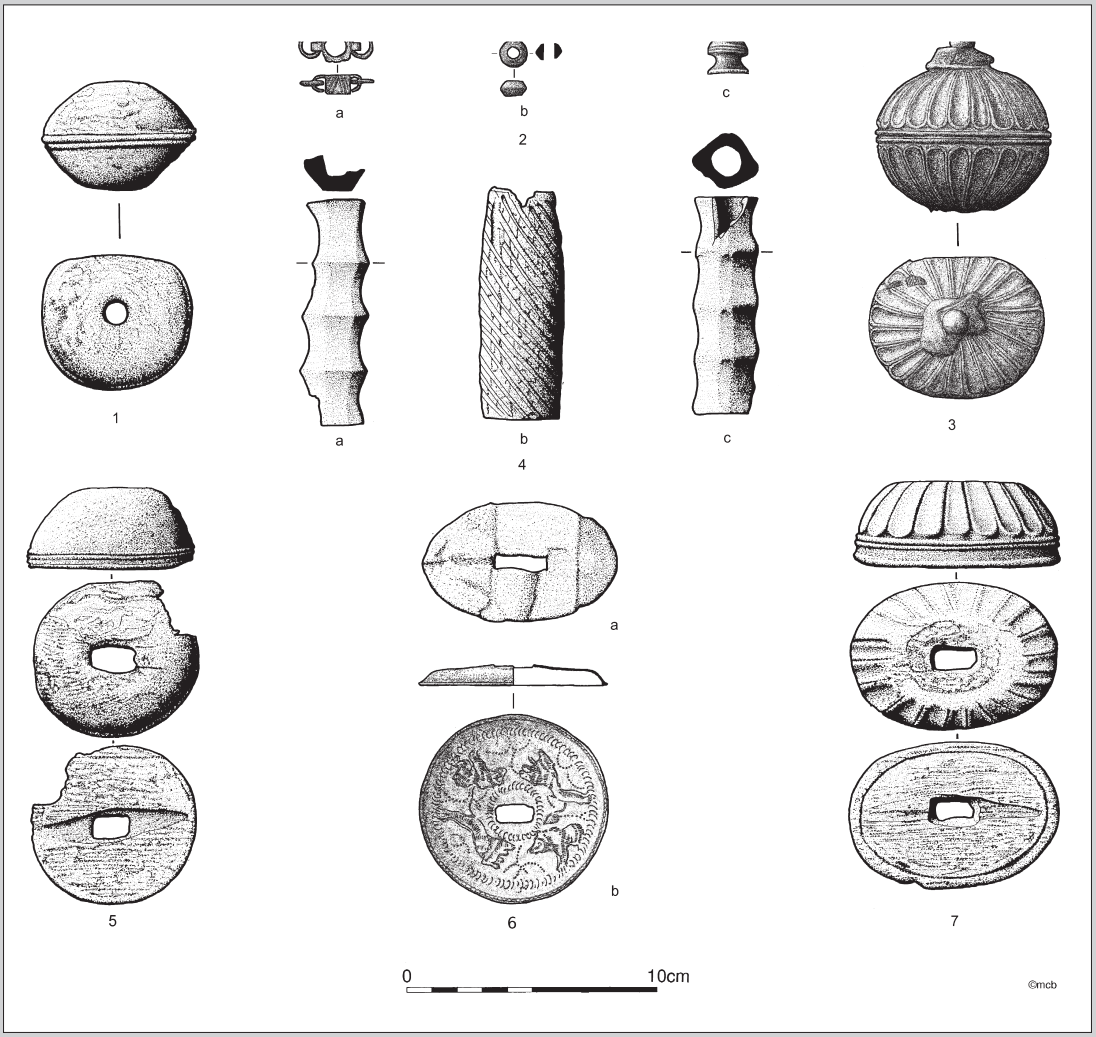
RIGHT An eagle-headed sword from Regio VIII, Insula 7 at Pompeii (Italy). (Drawing: M.C. Bishop)

Manufacture

We know a reasonable amount about the methods of manufacture of the Roman short sword, thanks to the increasing use of scientific analysis of surviving examples, especially the use of metallography to examine sections through blades. The technique of manufacture of the Celtiberian weapons, and the way in which it differed from that of the *gladius Hispaniensis*, was summed up by a Greek writer of the 2nd century BC when discussing steel in the context of torsion artillery:

> Then, to test whether they are useful, the handle is taken with the right hand, the point of the sword with the other, putting it over the head and pulling it down on both sides until touching the shoulders. Then it is quickly let go, withdrawing both hands, the released sword straightening once more and returning to its former shape, showing no sign of curvature. Even with frequent repetition of this experiment, they remain straight. (Philon, *Mechanicae syntaxis* 4.46 trans. author)

Metallographic analysis of the cross-sections of blades reveals that there was no one way of forging a *gladius* blade (Williams 2012: 51–59). It also reveals, however, that the advanced techniques later used on the *spatha* – notably pattern welding – were not used for the *gladius*. In some cases, harder (higher-carbon steel) edges were simply forge-welded to softer (lower-carbon iron) cores to provide a combination of flexibility and strength in a blade. This is a technique known as piling and we know it was used on the Sword of Tiberius and the Fulham and Chichester Mainz-type swords. Analysis of a *gladius* blade from Windisch, on the other



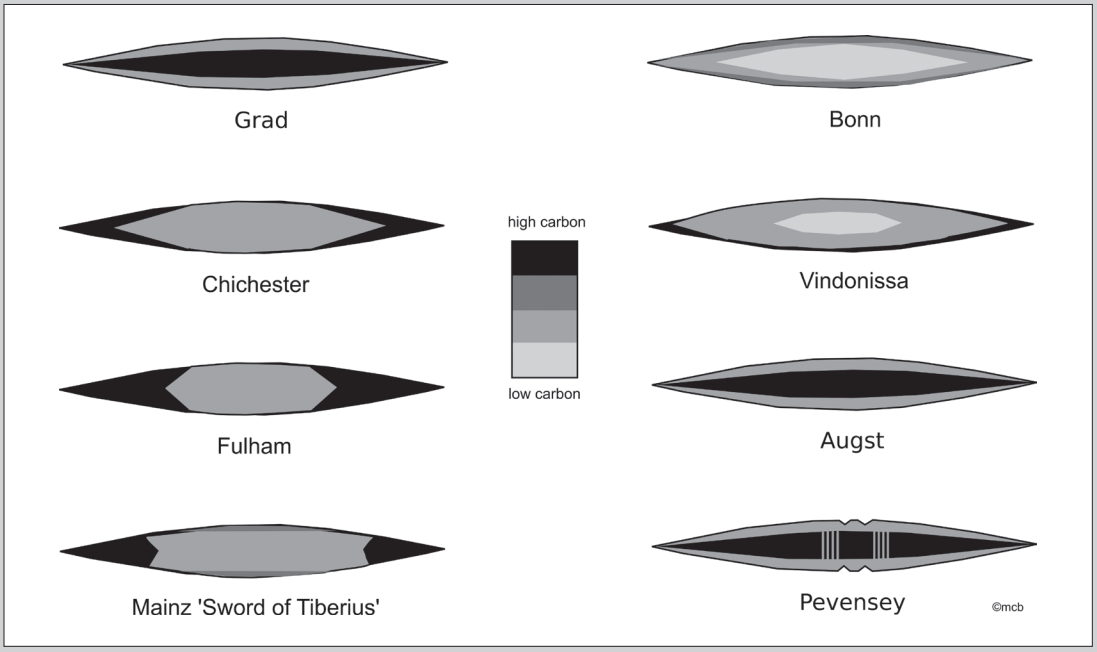
ABOVE Handle components from Mainz- and Pompeii-type swords. (Drawings: © M.C. Bishop)

hand, showed that a layer of steel had been wrapped around an iron core by forge-welding. A *gladius* from Bonn (Germany), meanwhile, seemed to be formed of medium-carbon steel throughout and had not been quenched. It is possible that it may have been piled but, if so, had been expertly forge-welded and that has masked the fact. The Pevensey ring-pommel sword had been pattern welded (Lang & Jackson 2015) while the Mansion House *semispatha* was piled in layers. Quenching steel will make it harder, but also more brittle, so a quenched blade would ideally be tempered by reheating and requenching.

One of the Republican blades from Grad that was analysed metallographically proved to have a harder core and softer edges. While no less sharp, this would have made it easier to repair any minor damage to its blade in the field without the need for a forge, while hard edges would need a forge to facilitate repair (David Sim, pers. comm.). This suggests that the Roman Army forces in the Imperial period were confident of having access to field forges after combat.

In the Republican period, sword manufacture (but not necessarily repair) was probably largely outsourced to civilians. We know that, after the capture of Carthago Nova (Cartagena, Spain) in 209 BC, Scipio Africanus set the inhabitants to work producing arms for the Roman Army (Polybius 10.20.5). Swords were certainly being manufactured by the Army themselves by the Imperial period, however. Vegetius mentions in-house weapons manufacture (*DRM* 2.11) and we know as much from inscriptions and writing tablets of *gladiarii* (sword smiths) working at the legionary fortress of Vindonissa. The *Digest* (50.6.7, citing Tarrutienus Paternus) includes '*gladiatores*' (possibly a scribal error for *gladiarii*) as being *immunes* in the Army (specialists relieved of fatigues; gladiators were slaves and not kept on Army strength). There was almost certainly private sword manufacture as well. A *gladius* from the Rhine near Bonn is stamped SABINI (with a *punctim* ownership inscription SVLLA), while embossed inscriptions on Mainz-type scabbards from Vindonissa and Strasbourg name manufacturers (C. Coelius Venustus and Q. Nonienus Pudes respectively). The latter two are clearly Roman citizens, so could be serving soldiers working within a legionary workshop, but could equally be veterans producing equipment in their own, private establishments. The discovery of a possible die for stamping embossed scabbard plates in the civil settlement at Nijmegen (see above) not only reinforces this impression, but shows how production processes would be simplified wherever possible.

The Rheingönheim sword has a punched manufacturer's inscription on the underside of the silver plate beneath the hand guard. It reads L VALERIVS FEC P £) VII and shows that L. Valerius made it; the subsequent symbols have been interpreted as providing a weight of *pondo semiunciam scriptula septem* ('by weight one half and seven twenty-fourths of an ounce', or 21.6g) for the foil used. This may represent a craftsman who undertook the silvering of the handle assembly rather than the sword smith himself.



ABOVE Stylized cross-sections through short sword blades. (Drawings: M.C. Bishop)

RING-POMMEL

The late 1st and early 2nd centuries AD saw increasing contact between the Romans and trans-Danubian and steppe peoples, reaching a peak with Trajan's two Dacian Wars of AD 101–02 and AD 105–06 respectively. This contact brought with it a whole range of new influences for the Roman Army, just one aspect of which was the adoption of the ring-pommel sword. This was a form that originated in Han China during the 3rd century BC and spread westwards towards the Danube through its adoption by steppe peoples such as the Sarmatians. Like the *gladius*, it was a short sword and it was still worn by the soldier on the right-hand side (this can be seen on tombstones), but it was different in form in both the blade and tang. Blades normally had less angular points than the Mainz- and Pompeii-type swords. The tang, instead of tapering to a point, had a large ring riveted to its terminal and this replaced the organic pommels found on the various forms of the *gladius Hispaniensis*. Pommels could be plain, but some were decorated with wire inlay. A cross guard was also employed instead of the organic hand guard favoured on earlier swords. A tombstone from Budapest (Hungary) indicates that ring suspension was now being replaced with scabbard slides, a system that was adopted wholesale when the *spatha* came to dominate.

Most examples of ring-pommel swords that survive come from outside the Roman Empire, but there are a few from Roman contexts, one (now in the British Museum) reportedly coming from near the Saxon Shore fort at Pevensey (East Sussex, England), although Miks doubts the veracity of this find. Fragmentary ring-pommel swords are also known from the legionary fortress at Mainz and from the civil settlement outside the frontier fort at Bad Cannstatt (Germany), as well as from the Danubian fort of Mautern (Austria), all from 2nd-century AD contents. There is also a ring pommel (without the rest of the sword) in the Clayton collection at Chesters, on Hadrian's Wall (England). Its provenance is unclear, but it almost certainly originates from one of the forts originally owned by John Clayton in the central sector of the Wall. Part of a hand guard, tang and blade is also known from South Shields (County Durham, England). The fashion for such swords was evidently short-lived and by the second half of the 2nd century AD, short swords of all kinds were being phased out in favour of the longer *spatha*, now worn on the left hip.

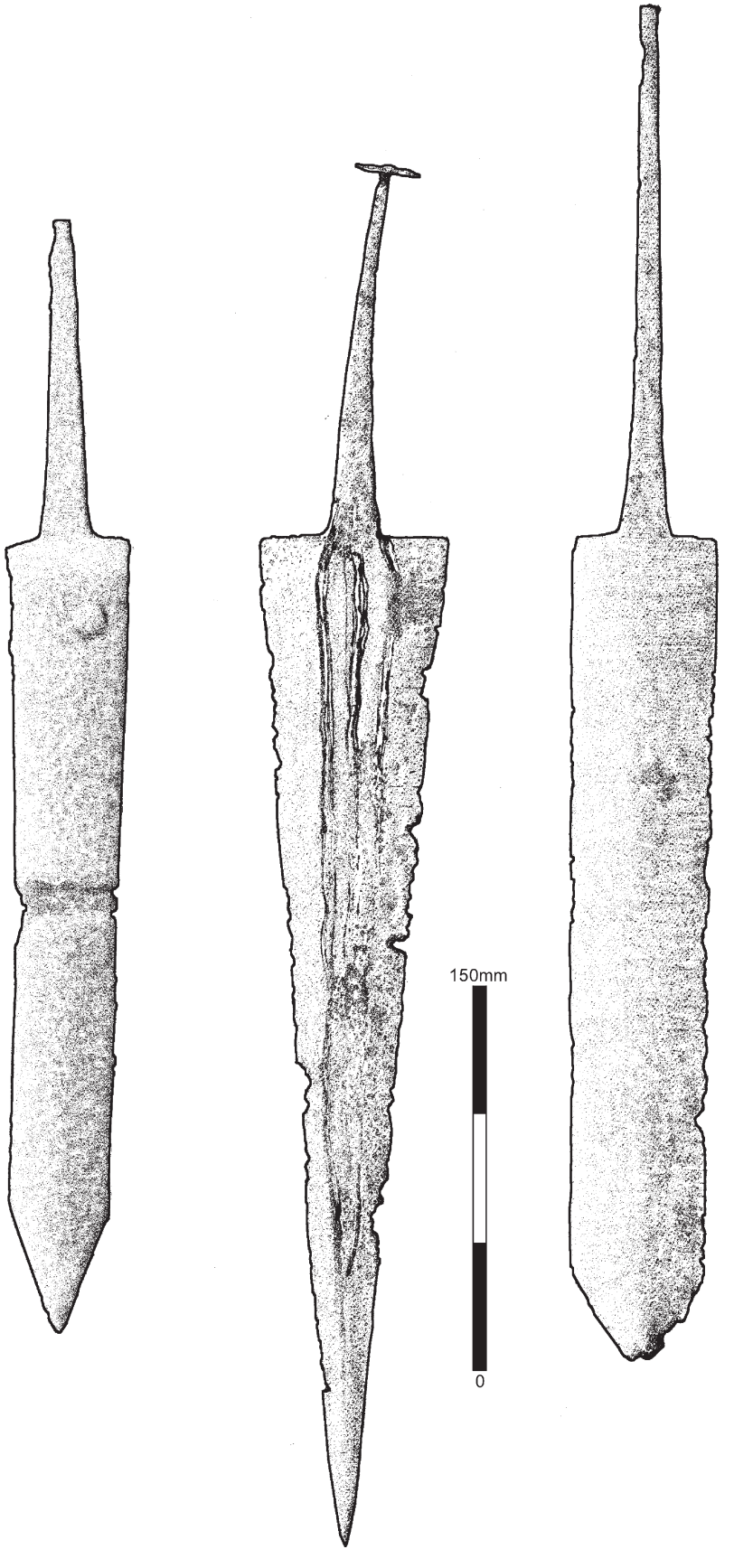
Blade lengths of known Roman examples of ring-pommel swords vary between around 410mm and 505mm, maximum widths are 30mm and 55mm, with some slight waisting.

SEMISPATHA

The demise of the ring-pommel sword was not quite the end for short swords in the Roman Army. A number of 3rd-century AD hoards included examples of short swords, some quite clearly cut down from *spathae*. It is often assumed that these blades are to be identified with the *semispatha* mentioned (but only once) by the Late Roman writer Vegetius (*De Re Militari* 2.15), but it must be stressed that this is only a modern-day assumption.

OPPOSITE The ring-pommel sword from Pevensey (East Sussex, England), late 2nd century AD(?) (Miks A191). (Photo: © Ross Cowan)

A *semispatha* from Mansion House (London, England), undated (Miks A441), and two types from Künzing (Germany), mid-3rd century AD (Miks A398,1). (Drawings: M.C. Bishop)



GLADIUS SIZES	Total length (mm)	Blade length (mm)	Blade width (mm)	Tip length (mm)	Thickness (mm)	Museum
Republican						
Grad 1	696	624	40	200	6	Kunsthistorisches Museum Vienna, Austria
Grad 2	748	664	40	200	6	Kunsthistorisches Museum Vienna, Austria
Renieblas 1	>408	>408	40	–	?	?
Renieblas 2	>324	>324	40	*c.*140	?	?
Es Soumâa	668	580	44	>*c.*160	8	Musée National Cirta (Constantine, Algeria)
Delos (A123)	760	631	*c.*56	*c.*200	?	Delos Museum, Greece
Soknopaiou Nesos	945	773	58	275	5.5–7.8	SCA general storehouse (Fayum, Egypt)
Fontillet (A160)	*c.*730	*c.*640	*c.*54	*c.*232	*c.*8	Musée de Berry-Bourges, France
Mainz type						
Vrhnika (A767)	*c.*683	*c.*644	45–47	*c.*200	*c.*8	Narodni Muzej Slovenije (Ljubljana, Slovenia)
Mainz (A464)	657	*c.*510	50–54	*c.*180	?	Landesmuseum Mainz
Rheingönheim (A609)	590	*c.*490	75	184	*c.*6	Historisches Museum der Pfalz Speyer
Mainz ('Tiberius'; A465)	*c.*574	533	70	180	4	British Museum (London)
Windisch (A790)	*c.*673	535	70	*c.*180	*c.*6	Vindonissa-Museum (Brugg)
Fulham (A445)	565	*c.*536	*c.*69	185	6	British Museum (London)
Chichester (A102)	665	520	*c.*74	175	*c.*5	The Novium (Chichester)
Pompeii (A588)	549	435	*c.*64	160	?	Naples
Pompeii type						
Pompeii (*quadriporticus*; A590)	*c.*585	*c.*429	45	*c.*60	?	Soprintendenza archeologica (Pompei)
Pompeii (Villa of Mysteries; A593)	542	514	<62	*c.*80	?	Museo Archeologico Nazionale (Naples)
Pompeii (Regio VI, Insula 2; A592)	692	*c.*510–25	*c.*42	*c.*80	?	Soprintendenza archeologica (Pompei)
Stabiae (A591)	602	*c.*500–10	*c.*38–42	*c.*75	?	Museo Archeologico Nazionale (Naples)
Herculaneum (A152)	720	515	60	90	?	Soprintendenza archeologica (Pompei)
Wiesbaden/Mainz (A467)	635	485	40	75	?	Royal Armouries (Leeds)
Oosterbeeck (A549)	642	470	44	80	?	Rijksmuseum van Oudheden (Leiden)
Klein-Winternheim (A354)	670	490	42	65	?	Landesmuseum Mainz
Caernarfon (A90)	689	486	46	*c.*60	?	Museum of Welsh Antiquities (Bangor)
Newstead (A528,2)	663	495	50	68	?	National Museums of Scotland (Edinburgh)
Baena	635	475	49–60	79	*c.*8	Museo Histórico Municipal (Baena, Spain)
Eagle-headed						
Pompeii (Regio VIII, Insula 7)	500	400	45	42	?	Soprintendenza archeologica (Pompei)
Ring-pommel						
Pevensey (A191)	693	505	54	*c.*60	?	British Museum (London)
Mautern (A488)	557	*c.*410	*c.*30	?	6	Bundesdenkmalamt Österreich (Vienna)
Semispatha						
Künzing 1 (A398,1)	531	389	72	389	4	Archäologische Staatssammlung (Munich)
Künzing 2 (A398,7)	528	365	*c.*40	20	?	Archäologische Staatssammlung (Munich)
London (A444)	411	279	35	35	4	Museum of London

Two (separate) hoards of weapons and tools from the frontier fort of Künzing (Germany) are thought to have been concealed during the abandonment of the site in AD 259/60 following a second incursion into the region by the Alemanni. These included several short swords, most of them cut down from much larger weapons, including examples of Straubing/Nydam and Lauriacum/Hromowka types of *spatha*. These were given rounded points similar to those of the original long swords, in contrast to the more angular points of the earlier Mainz- and Pompeii-type *gladius* blades. Künzing is by no means the only site on the 3rd-century German frontier to have produced such cut-down blades, for these weapons are also known from similar contexts at Köngen and Saalburg. One example from Köln is even shorter than some of the contemporary large daggers. It is perhaps in this context that some at least of these so-called *semispathae* should be seen: as secondary sidearms, rather than as short swords per se. Beyond the German frontier, another extremely short sword from Mansion House (London, England) may also fit into this category.

Besides the cut-down *spathae* from Künzing, there were some examples of weapons that seem always intended to have been short swords. These too have been tentatively identified with Vegetius' *semispathae* but they may also belong within the dagger tradition, rather than that of swords. Nevertheless, it remains a distinct possibility that the short sword survived into the 3rd century AD as a favoured combat weapon among frontier troops.

Blade lengths vary between around 290mm and 390mm, widths are 40mm and 75mm, and could be triangular or parallel-edged.

USE
Cut and thrust

INTERPRETING THE EVIDENCE

The Republican period: *gladius Hispaniensis*

Evidence for the use of the *gladius* in the Republican period comes in two principal forms. First, we have literary accounts describing the way in which the Romans employed it. Second, we have graphic archaeological evidence of what happened to the victims who came up against the weapon. An element of caution is necessary in both cases, as we shall see, but the overall picture is consistent.

The Greek historian Polybius, who had fought against the Romans, been captured by them, then later became the friend and confidant of the general Scipio Aemilianus, was an eyewitness to the efficacy of the *gladius*: 'Besides the shield they also carry a sword, hanging on the right thigh and called a Spanish sword. This is excellent for thrusting, and both of its edges cut effectually, as the blade is very strong and firm' (Polybius 6.23.6–7). In one passage, he highlights the importance of the sword as a thrusting weapon: 'The Romans, on the contrary, instead of slashing continued to thrust with their swords which did not bend, the points being

Valencia, 75 BC (overleaf)

The legionaries of Pompey break into the town of Valencia in Spain in 75 BC, held by men loyal to Sertorius. Bitter street fighting ensues before the Sertorian legionaries are defeated and the survivors tortured and massacred. Here, legionaries and cavalry in the two armies are using the long *gladius Hispaniensis* both to thrust and to chop. The equipment of the opposing forces was virtually identical, and the widespread use of body armour and helmets meant that limbs and faces were most vulnerable to the sword.


LEPIDA

very effective. Thus, striking one blow after another on the breast or face, they slew the greater part of their adversaries' (Polybius 2.33.6). The passage refers to combat against the Insubres in 223 BC – a time when the *xiphos* was supposedly still in use by the Romans. It is possible that Polybius was projecting back contemporary use into the past, however, this being something ancient historians were prone to doing. A dual usage of the sword can be seen in a later passage, where Polybius is describing the spacing of a legionary battle line and the style of fighting employed:

> Now in the case of the Romans also each soldier with his arms occupies a space of three feet [89cm] in breadth, but as in their mode of fighting each man must move separately, as he has to cover his person with his long shield, turning to meet each expected blow, and as he uses his sword both for cutting and thrusting it is obvious that a looser order is required, and each man must be at a distance of at least three feet from the man next him in the same rank and those in front of and behind him, if they are to be of proper use. (Polybius 18.30.6–8)

This, from Polybius' own time, in the middle of the 2nd century BC, was well after the adoption of the *gladius Hispaniensis*. Livy was writing much later, under the Emperor Augustus, but the problem of backward projection with him is even greater. His history of Rome was compiled entirely from earlier writers, when dealing with the Republican period. His graphic description of the effect of the *gladius* (see above, p. 4) evokes its psychological, as well as actual, effect. Excavations at the Spanish sites of Cerro de la Cruz (150–125 BC) and Valencia (75 BC) have borne out Livy's account, with skeletons at both sites showing clear evidence of the brutal attacks to which the victims had been subjected, including limbs hacked off. They are all-too-obviously evidence of the sword having been used for cutting blows.

At Cerro de la Cruz, two articulated skeletons (UE 1401 and 1402) were found face down in the street with clear signs of trauma. Skeleton 1401, a young male in his 20s, had had his right shoulder blade sliced through cleanly by a blade, possibly the result of a failed attempt at decapitation. There was another injury to his spine, inflicted from behind and probably with a downward motion (Quesada Sanz *et al.* 2014).

At Valencia, the excavated skeletal evidence was even more graphic and almost certainly the result of post-combat atrocities, rather than indicative of combat itself. One individual had been spitted lengthwise on a *pilum* and then had all four of his limbs hacked off. Another had had his severed head placed between his legs. There seems little room for doubt that these incidents were the handiwork of the *gladius Hispaniensis* (James 2011: 100).

Writing under Augustus, but describing events in the 4th century BC, Dionysius of Halicarnassus describes the use of the Roman sword:

> For while their foes were still raising their swords aloft, they would duck under their arms, holding up their shields, and then, stooping and crouching low, they would render vain and useless the blows of the others, which were aimed too high, while for their own part, holding

> their swords straight out, they would strike their opponents in the groins, pierce their sides, and drive their blows through their breasts into their vitals. And if they saw any of them keeping these parts of their bodies protected, they would cut the tendons of their knees or ankles and topple them to the ground roaring and biting their shields and uttering cries resembling the howling of wild beasts. (Dionysius *Rom. Antiq.* 14.10.2)

It is likely that Dionysius too is anachronistically describing contemporary use of the *gladius* and simply projecting that back into the past. The long blade of the *gladius Hispaniensis*, together with the flat neckguards of contemporary helmets of the Montefortino and Coolus types, have even been suggested as indicative of a crouched style of fighting among the infantry, something the passage from Dionysius could be taken as supporting (Connolly 1991b). The use of a longer blade would certainly have suited cavalry as well as infantry.

We are reminded again of Plutarch relating how Cassius Scaeva, one of Caesar's most experienced centurions, lopped off the shoulder of an opponent with his sword, despite being grievously wounded.

The Early Imperial period: the Mainz type

One of the most important sources for the way in which the *gladius* was used within the Imperial Army is the Late Roman writer Vegetius. However, it is necessary to understand that, as an epitomator, he primarily gathered and reproduced earlier sources to form his work. This helps explain why his text is sometimes contradictory, particularly when describing how the sword should be used. In his first book of the *De Re Militari*, originally a stand-alone document intended to persuade a Late Roman emperor to re-adopt the old Roman ways of waging war, we may recall the injunction that 'they learned to strike by stabbing, not by cutting' (Vegetius, *DRM* 1.12 trans. author). It has been argued that this passage derives from a lost portion of the work of the Early Imperial encyclopaedist Celsus, who would presumably have been using other writers in turn. That the comment was nevertheless applicable to his time is a not unreasonable deduction to make, given his likely audience – Romans of the senatorial and equestrian classes, many of whom would have seen service as officers in the Army, so unlikely to have been impressed by inaccuracies.

The Mainz-type blade retained the long point of the *gladius Hispaniensis* but was much smaller in overall size. It seems likely that this reflected a desire to change some of the less desirable characteristics of the bigger, earlier swords, most notably the weight. There was a price to pay for this, however, as the shorter weapon was of less use to a cavalryman, who needed a long reach, hence the adoption of the *spatha*. This was simply a Romanized version of the long Iron Age blades used by the Gallic and Iberian cavalrymen opposing and in the service of the Roman Army. This new, shorter *gladius* could still be used for chopping where necessary, but was now becoming much better suited to an economical and less open

A Mainz-type *gladius* from one of the Bay of Naples sites, possibly Pompeii (Italy), probably the latest datable example (AD 79). (Miks A588) (Photo: © Salvatore Ortisi)

Dacia, AD 101–02 (previous pages)

An encounter during the first Dacian War of AD 101–02 sees legionaries in hand-to-hand combat with Dacian warriors, who have been driven back to their baggage train. The Romans are using their *gladii* (mostly of the newer Pompeii type but with a few Mainz types visible) in a variety of ways – thrusting, chopping, and stabbing like a dagger. All of these poses are depicted on the Tropaeum Traiani at Adamclisi, a monument probably produced by the Army, unlike the more formal (and arguably more fanciful) helical frieze on Trajan's Column in Rome. The Adamclisi monument shows the reality behind the cut/thrust debate evident in the Roman literary sources: in the field, the Army employed whatever technique suited their purpose.

style of hand-to-hand combat centred around stabbing. Shorter blades and deeper neckguards on helmets may be indicative of a more upright fighting stance for infantrymen.

A fine series of tombstone reliefs from the Rhineland make it plain that both auxiliary infantrymen and legionaries used the Mainz type of sword.

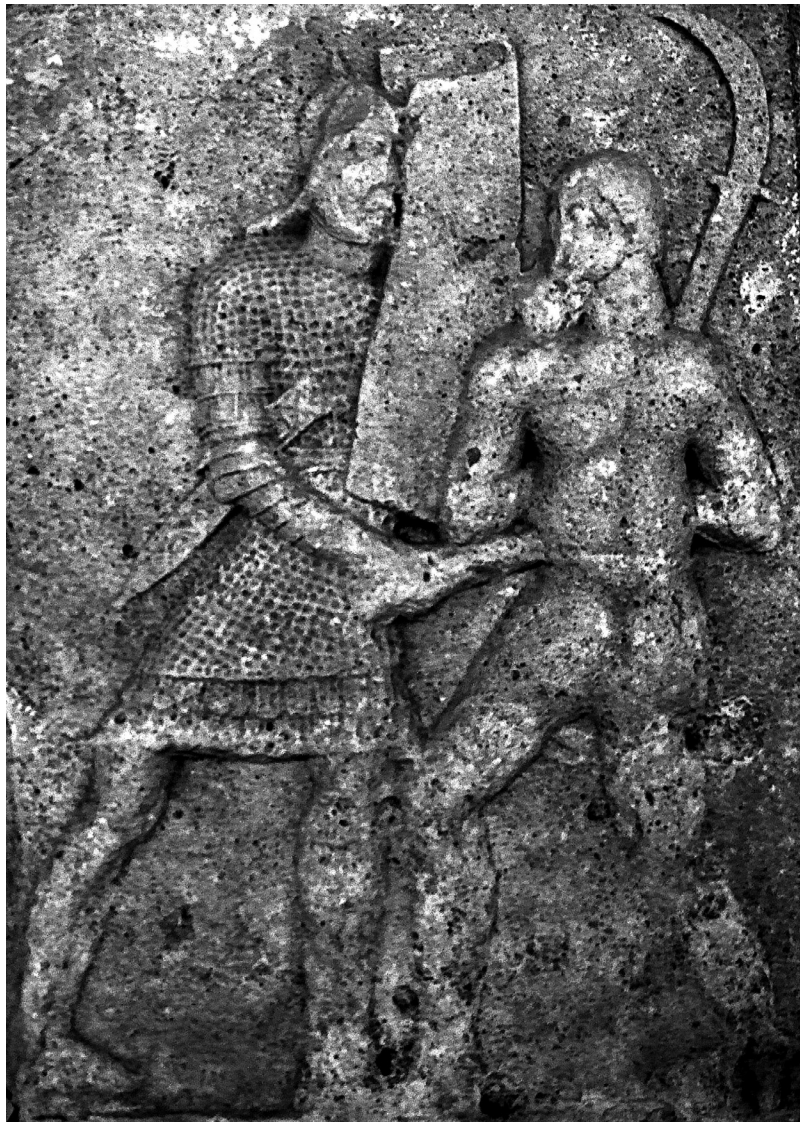
The High Imperial period: the Pompeii type

The classic fighting stance of the *gladius*-wielding legionary is depicted on a sculpted column base from the headquarters building of the legionary fortress at Mainz-Mogontiacum and dating to the second half of the 1st century AD. One man stands with his shield raised in front of him and his left foot advanced, while his Pompeii-type *gladius* is held horizontally at the ready by his side, poised to strike. In another passage in Vegetius – almost certainly derived from the writings of Iulius Frontinus, who commanded armies in both Britannia and Germania Inferior (Pliny the Younger said he was one of the two most respected men of his time) – we find troops being drilled in swordplay for 'stabbing and cutting' (*DRM* 3.4). Frontinus was writing in the same period as the Mainz sculpted relief, but appears not to have favoured a change in the style of Roman fighting. He clearly felt that the chop was as good as the stab, but in this he may have been old-fashioned (and possibly influenced by writers describing the Republican period).

The Pompeii-type sword was the result of this evolution in fighting styles. Parallel-edged and with a short point, it was clearly influenced by the form of the *spatha* and hence the last vestiges of the old Celtiberian sword encountered in Spain were evolved out.

Arguably one of the most important conflicts for the Romans of this period culminated in Trajan's two wars in Dacia (AD 101/02 and 105/06), where the interface between Celtic, Germanic and steppe peoples made for some interesting opponents. Ironically, the monument that so aptly epitomizes the Dacian Wars – Trajan's Column, in his forum in Rome – is of little value to the study of the short sword and its use. Most such weapons depicted on the Column were evidently supplied as metal attachments, now long since vanished, and what remains was largely generically depicted, and of dubious evidential value anyway. Fortunately, the other monument related to this conflict, the Tropaeum Traiani at Adamclisi in the Dobruja

OPPOSITE Adamclisi Metope 9 depicting a short sword ready to stab. (Photo: © J.C.N. Coulston)



Adamclisi Metope 32 depicting a short sword stabbing. (Photo: © J.C.N. Coulston)

(Romania), is far more useful. Probably produced by military craftsmen, rather than the metropolitan sculptors responsible for Trajan's Column, it is the nearest thing we have to eyewitness depictions of the frontier troops involved in these wars. Here the short sword is depicted stabbing, chopping and even employed for an inverted (thumb upward) dagger-like thrust from above (similar to that used by gladiators to despatch defeated opponents in the arena who had unsuccessfully asked for mercy). This last action might seem somewhat implausible, were it not for the fact that a cherub is shown using exactly the same grip on a relief from the Temple of Venus Genetrix in the Forum Iulium in Rome (now in Naples Museum, Italy).

The men depicted on the Adamclisi metopes all fight in a truly upright stance, but one incidental detail reflects upon the style of fighting of Rome's opponents: the legionaries all wear the articulated armguard (*manica*). Armguards had been used in gladiatorial combat since at least

The swords of Pompeii

It is worth asking why so many swords have been found in Pompeii and other Bay of Naples sites when many Roman military bases produce very few by comparison. Much depends on understanding what these finds represent: are they a snapshot of everyday life, forever frozen in time by the eruption of Vesuvius, or do they reflect the unusual circumstances surrounding that natural disaster? One possibility is that the weapons may have belonged to inhabitants within the towns and villas, while another refines this to focus on veterans who may have retired to the area and kept their weapons.

One of the more intriguing aspects of the official Roman response to the disaster, however, was the deployment of the nearby fleet at Misenum under its commander, Pliny the Elder. Every ship in the fleet would have had its own contingent of marines, equipped in much the same way as land-based infantry and commanded by a centurion. Indeed, on at least two occasions, legions (*I* and *II Adiutrix*) were raised from marines, since they provided a ready-trained, ready-equipped fighting force.

The Bay of Naples swords may therefore have come from marines active in the area during the eruption (Ortisi 2015). One at least – the sword on the beach at Herculaneum – was found with its owner, who was also carrying a bag of tools and whose physique suggested he rode horses and had well-developed musculature in his right arm. If just a craftsman, then why was he carrying the sword and other military equipment? We will never know for sure, but it is at least possible that he was a marine from the Misenum fleet.

The sword (and other military equipment, including helmets) found at the gladiator barracks in Pompeii suggests that the site may have been used as a focus for the marines' activities while assisting the town in its time of need.

the first half of the 1st century AD and are depicted in graffiti from Pompeii. Clearly the fear of injury to or even loss of that sword arm had led to the adoption of this type of armour by the Army around the middle of the century, as evidenced by tombstones, but armguards were certainly known before and used after the Dacian Wars, so it is not true that (as the archaeologist Sir Ian Richmond once suggested) they were a particular countermeasure adopted against the Dacian *falx*. Indeed, the largest single find of armguards to date comes from a Hadrianic deposit in the fort at Carlisle (Cumbria, England), on the northern British frontier.

Both ferrous and brass plates were used for armguards (although they were not mixed), riveted to an underlying base of (usually three or four) longitudinal leather straps to provide an extremely flexible defence. Just as the hand guard plate caught stray weapons blows to the sword blade, so the armguard deflected blows off the forearm. Because the armour sat on top of the arm, where it offered the most protection when the sword was employed for the thrust, its plates overlapped upwards from the wrist, and – due to natural bunching – were at their most concentrated over the inside of the elbow joint, a blow to the wearer's sword arm would skip up to the elbow where it was stopped dead. Roman soldiers clearly felt that their sword arms were vulnerable and the articulated armguard was equally obviously a neat solution to their concerns. Thus, while the Adamclisi reliefs show that legionaries were still quite happy to raise their sword arms to deliver a cut, the *manica* subtly encouraged them to keep the arm down and thrust instead.

The Carlisle armguards had all been repaired several times and at least one was a 'cut'n'shut' formed from two donor defences. Such repairs suggest that Roman soldiers in Britain during the early 2nd century AD were only too happy to have their sword arms protected in this way.

THE *GLADIUS* IN SERVICE

Ownership

Roman soldiers were expected to provide their own equipment for service. This could be bought from the Army (some new; most probably bought back from retiring soldiers) or from private suppliers (most of whom were presumably retired military craftsmen). This meant that soldiers were keen to indicate their ownership on equipment, and swords were no exception to this. While manufacturers tended to stamp blades, owners would mark their possessions in a different manner. The classic means of indicating a soldier's place within the Roman military system was by giving his centurion's name and his own name. On some equipment this might be done by scratching the letters into the metal, but the most common method was by forming the letters out of a series of dots using a punch, a technique nowadays known as *punctim*. The first technique is found on part of a Mainz-type scabbard found at Kalkriese and associated with the defeat of Varus in AD 9 (or, some argue, its aftermath, when Germanicus 'cleaned up' the site), naming a Doxitus or Roxitus as centurion. The second technique was used on the Pompeii-type sword from the Rhine at Mainz now in the Royal Armouries in Leeds. The name of C. Valerius Primus occurs four times on the blade (at least two of them with the centurial symbol >) and C. Ranius once (Schoppa 1974). This suggests that Primus was not only the centurion but also the owner of the sword at one stage, perhaps selling it on to Ranius, a member of his century. The ownership of weapons is reflected in Roman military law, too, for the *Digest* records (49.16.3.14) that theft of another's weapons resulted in reduction in rank. Discarding body armour, shield, helmet or sword were treated as desertion (49.16.14.1). On this point, Frontinus (*Stratagems* 4.5.17) relates how the loss of his sword drove Marcus Cato, son of Cato the Censor, to wade back into the midst of the enemy to retrieve it in order to avoid disgrace. Despite being wounded, he succeeded in doing so.

Since swords were the personal property of soldiers and not owned by the Army, it is worth pondering why so many intact swords and scabbards come from rivers, while excavations on sites tend only to produce components. Such riverine deposits, like those in the Rhine at Mainz, occur at locations that have long traditions of deposition from prehistory right up until the early medieval period. Many archaeologists see these deposits as having ritual origins, and there is certainly indisputable evidence for the dedication of weaponry and equipment in a religious context during the Roman period (as happened in Germany and Gaul with supposed examples of Julius Caesar's swords, or at the temple at Klein-Winternheim already mentioned). These deposits would

also seem to imply that a soldier offering a sword had already purchased a replacement, if he were not to fall foul of Roman military law. Indeed, model swords were sometimes offered in place of the real thing. In any contract religion, it is of course cherished items that tend to be offered, so the finds from rivers tell us how much these weapons mattered to their owners. In the same way, the detailed representations of swords and scabbards on tombstones of the 1st century AD reflect the soldiers' pride in their appearance and their military equipment.

Information on the cost of swords is sparse, to say the least. A papyrus letter (*P. Giss.* 47) dating to the second decade of the 2nd century AD from an unknown individual to Apollonios, a *strategos* (local governor) in Egypt, records a price of 80 *drachmae* (equivalent to 20 *denarii*) for an 'Italian sword', this being just under a quarter of the price of a brass cuirass he mentions in the same letter. Our anonymous correspondent, possibly an officer, clearly viewed these as bargains, presumably offered by a private craftsman in Koptos. At that time, a Roman legionary could expect to earn 300 *denarii* per annum. While this Egyptian price may have reflected the market value for a sword, we might anticipate that (as with other equipment) a soldier buying his sword directly from the Army would have paid less, since the price would have been nominal (and, effectively, subsidized).

Front and rear views of a Mainz-type sword and scabbard from the Rhine at Mainz (Germany) (Miks A481). (© GDKE-Landesmuseum Mainz; photo: Ursula Rudischer)

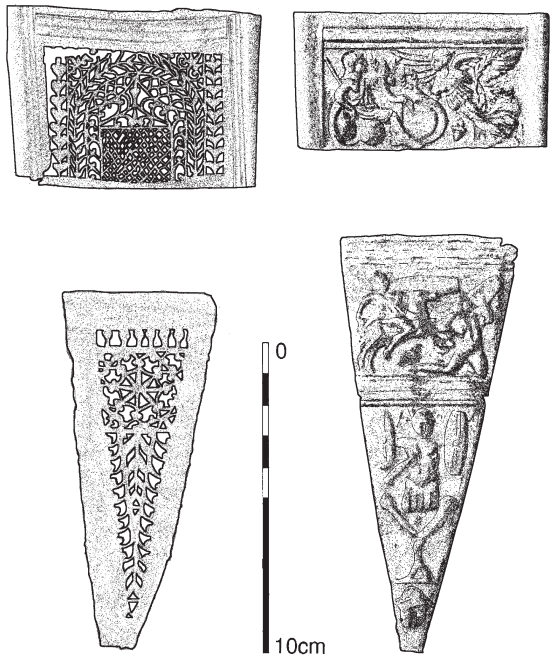
The quality of the scabbards of 1st-century AD swords has often led modern commentators, swayed by art-historical considerations, to suggest them to be officers' weapons, the Sword of Tiberius being the classic example of this. However, analysis of the materials used (tinned brass plate) and the methods of production (stamping) suggest that even ordinary soldiers boasted fine weapons; and this is supported by both the tombstone evidence and comments from various writers, including Pliny the Elder.

Carriage

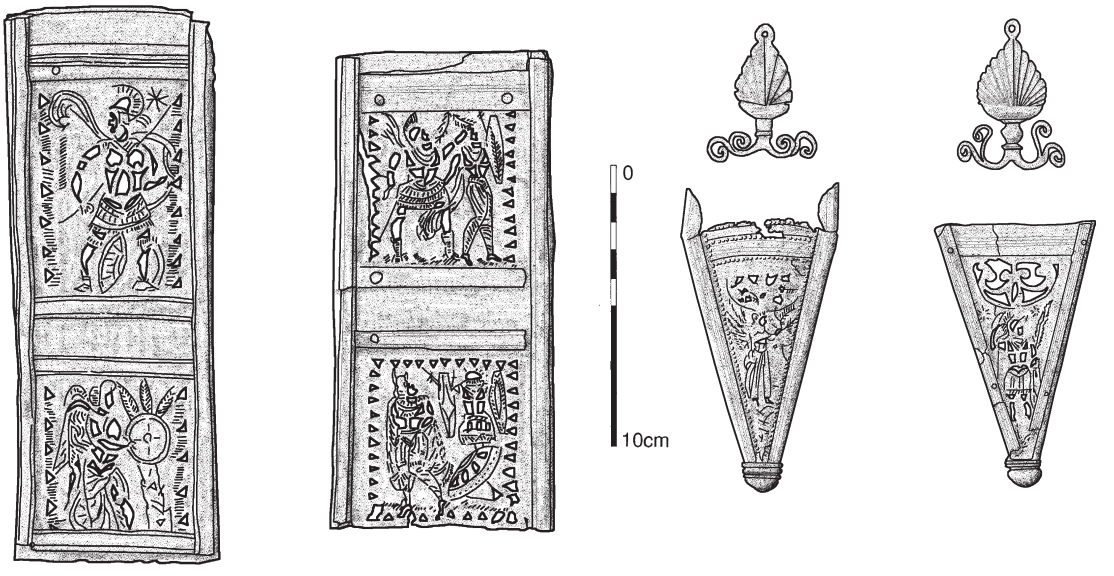
For most of its period of use, the short sword was carried in a scabbard on the wearer's right-hand side. Scabbards were generally positioned so that the mouth was above the level of the waist, and reliefs such as the Adamclisi metopes frequently show the pommel at near-armpit level. This led at least one modern commentator to complain that it would not have been possible to draw a sword worn thus – an assertion bemused re-enactors have always been only too happy to disprove. In fact, the *gladius* can be easily drawn by inverting the right hand, thumb downwards, then grasping the handgrip and pulling straight upwards. It is a quite natural progression to continue this movement forwards to bring the sword down to the side, point forwards, in the characteristic 'at the ready' position depicted on relief sculpture. It should not be overlooked, however, that the actual process of drawing the sword presents different aspects of the weapon to its user: first, as the sword emerges, there is the pommel, with its 'skull-crusher' top nut; then comes the raised blade for a quick chop; finally, as the blade comes down to the side and is drawn back, it is ready for a more leisurely and considered thrust.

One of the ways in which centurions distinguished themselves from lesser infantrymen was by wearing their swords on the left. They merely had to draw the weapon across themselves to achieve the same end. Neither technique presented any problems. The sword and its belt could, however, prove to be a liability at times. The Herculaneum 'soldier' was carrying his decorated sword belt wrapped around his sword, for some reason, while Trajan's Column depicts a legionary fording a river with his body armour, tunic and sword belt held aloft on his shield to keep them dry.

In the Republican and Early Imperial periods, the *gladius* scabbard always seems to have been suspended from a waist belt. Although Roman belt plates are common in the Imperial period, from the Republican era there is a marked dearth of them. This may be partly explained by the tombstone of the centurion Minucius, which shows a sword belt with no plates; and in this it is matched by the (arguably more stylized and perhaps less reliable) so-called Altar of Domitius Ahenobarbus relief, with its depiction of a military levy of the Late Republican period under way. Minucius' tombstone provides further detail of the manner of sword suspension, with three straps wrapped once around the scabbard below the upper suspension band. It is unclear how this was then attached to the belt, but the dagger worn next to it is suspended by means of surplus material from the belt terminal wrapped around it and tucked back over the belt itself. Since the suspension loops are not prominent on the sword or the dagger, they



Scabbard fittings belonging to Mainz-type swords. (Drawings: M.C. Bishop)

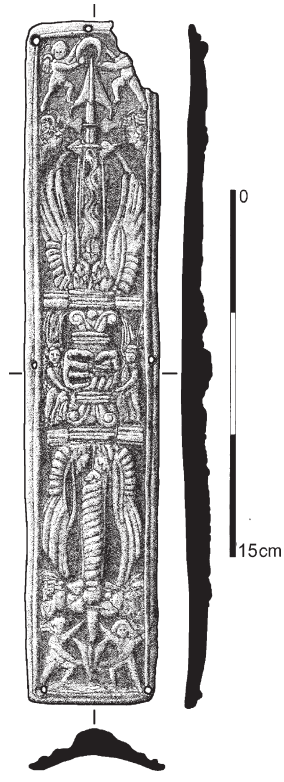


A variety of Pompeii-type scabbard fittings. (Drawings: M.C. Bishop)

were presumably held flat against the scabbard by the wrapping process, while the straps must also have threaded through them in order to secure the weapons.

The more familiar use of the four-ring system of suspension is found in depictions of the Early Imperial period. Here, as shown by tombstones and finds from Windisch and Herculaneum, large decorated buttons attached to the belt evolved into frogs that formed an integral part of belt sets. Initially two belts were needed, one for the sword and another for the dagger, frequently worn crossed ('cowboy-style') or one above the other. By the end of the 1st century AD, it seems to have become common to see only one belt being worn, with the sword now suspended from a baldric. The baldric, sometimes studded if tombstone depictions are to be believed, was looped over the left shoulder (right, if a centurion). Re-enactors have discovered that, if it is left unfettered, the baldric has an alarming tendency to move and runs the risk of the scabbard becoming entangled in the users' legs. Their solution is often to secure the baldric under the waist belt, but whether the Romans used a similar approach is unknown (and probably unknowable). No fasteners were used with the baldric (it just slipped over the head) and objects sometimes identified as 'baldric fasteners' in fact come from cavalry harness.

Since both the Delos and Herculaneum swords were found with small buckles, this has led to attempts to work out precisely how the suspension rings were used to attach the scabbard to the belt (Connolly 1991a). It has long been known that sets of belt fittings included frogs, but precisely how the sword was attached to these has remained uncertain. To the rear of some surviving Pompeii-type scabbards, there is often an arched fitting between the upper and lower suspension bands, ostensibly just holding together the side guttering, but it is in fact raised in such a way that suggests it had another function and that straps could be looped under it. Since frogs were fixed to the belt, in some cases riveted as belt-plates were, any adjustment had to be provided for in the way the scabbard was



Possible die for stamping decorated scabbard plates from Nijmegen. (Drawing: M.C. Bishop)

Mainz-type scabbard from the Rhine at Mainz (Germany) (Miks A479). (© GDKE-Landesmuseum Mainz; photo: Ursula Rudischer)

attached to the frogs, and that could allow for a simple loop to pass through the rear scabbard plate, through the rings, and around the frogs. Some of the Mainz-type scabbards have small loops in this position, and these may have been used in combination with the suspension rings to secure the scabbard to the belt or baldric. Tombstones clearly show that the top pair of suspension rings were the ones attached to the belt during the early 1st century AD; but the four-ring system potentially allowed a lot of flexibility for sword suspension, and no one system need have been in use all the time or even everywhere at the same time.

Pliny the Elder described how soldiers liked to personalize both their swords and their scabbards: 'But of what use is it to collect all these instances, when our very soldiers, holding ivory even in contempt, have the hilts of their swords made of chased silver? When, too, their scabbards are heard to jingle with their silver chains, and their belts with the plates of silver with which they are inlaid?' (Pliny the Elder, *Natural History* 33.152). The silvered hilt on the Rheingönheim sword springs instantly to mind, as do the elaborate chains on the Herculaneum sword scabbard (also depicted on Rhineland tombstones).

The fact that Roman historians liked to highlight the unusual can serve to underline normal usage. A splendid example of this can be found in the account of some Roman legionaries creating a diversion during the siege of a fortress by Marius during the Jugurthine War (112–106 BC), doing so by strapping their shields and swords to their backs in order to make it easier for them to climb (Frontinus, *Strat.* 3.9.3). These were, the subtext runs, not normal things for Romans to do, and thus worthy of note.

Once the *gladius* was replaced by the *spatha* during the 2nd century AD, sword carriage was universally switched to the left hip, because the longer blade could not so easily be drawn from the right (although cavalrymen, who had been using the weapon for longer and wore it lower on the right hip, had coped). The four-ring system of suspension was at the same time replaced by a scabbard slide on the front of the sheath, through which the baldric passed before looping around the scabbard.

Care and maintenance

Even the finest sword needs regular attention to keep it in peak form. As Fronto, tutor to and friend of the joint emperors Marcus Aurelius and Lucius Verus, observed: 'If one must fight with a *gladius*, it makes a difference whether it be rusty or bright' (Fronto, *On Eloquence* 1.16).

Decoration and display

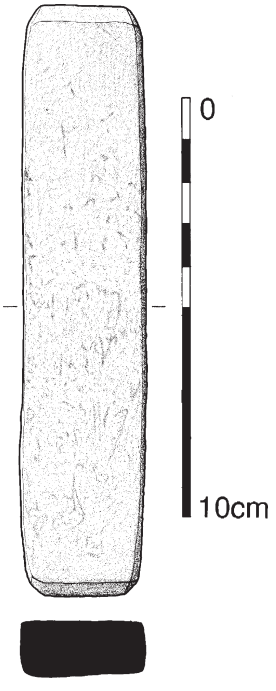
The advent of the principate, founded by Augustus, saw new forms of display introduced into state art and into the decoration of Roman military equipment; and nowhere was this more evident than in the adornment of sword scabbards. The Sword of Tiberius is perhaps the most obvious example of this, with an embossed scene depicting Tiberius receiving a triumphant Germanicus on its locket plate, a head of Tiberius on a medallion lower down, near the centre of the sheath, and at the bottom a chape with two more embossed scenes. One of the latter scenes represents the shrine of the standards in a legionary headquarters building containing an eagle standard (Germanicus had recovered two of the three eagle standards lost in the Varian disaster of AD 9); the other shows an axe-wielding female figure thought to be a personification of Vindelicia (the area around Augsburg, now in southern Germany), recalling Tiberius' and his brother Drusus' suppression of the region in 15 BC. Germanicus, Tiberius' nephew, was revered by the Army – so much so that his birthday was still celebrated two centuries after his death – while Tiberius himself was a successful general under Augustus. Standards were viewed as sacred within the Army and the place where they were kept and displayed was the focus of every military base. All of the images on this one sword scabbard reflected, and perhaps were designed to engage, the loyalty of the soldier. Such decorative schemes have often been viewed as crude state propaganda, but this perhaps underestimates the role of the tastes of the soldiers themselves.

The Imperial family features on other Mainz-type scabbard fittings, with locket plates depicting Augustus' daughter Julia and her two sons, Gaius and Lucius (Augustus' chosen but doomed heirs), as well as Tiberius addressing assembled troops. There are also scenes of kneeling captives on locket plates, as well as trophies of captured arms and horsemen trampling barbarians on chapes, to inspire the soldier idly inspecting his scabbard. The she-wolf and the twins Romulus and Remus from the foundation myth of Rome helped bolster the general feeling of military success on the Fulham Sword (along with further more fragmentary examples), while unit identity and perhaps even *esprit de corps* were evoked by depictions of the thunderbolt-and-lightning rods on scabbards from Windisch and Strasbourg; devices used to adorn the faces of legionary shields. Many of these designs are echoed on contemporary belt plates, reminding us how important the sword and belt were to the identity of the soldier.

The focus of Imperial imagery had shifted subtly by the time Pompeii-type scabbards were being produced. The Imperial family were no longer central to the decorative themes, but rather Roman military might and mythological scenes. Mars and Victoria are frequently depicted, with captives and trophies also being among the familiar motifs.

ABOVE Detail of the tombstone of Annaius Daverzus from Bingen (Germany) showing his Mainz-type sword and scabbard with chain (*catena*) ornament. (Photo: M.C. Bishop)

It is unlikely that these state-derived images were imposed upon the troops from on high – there was no discernible centralized control of Roman weaponry in the period when the *gladius* dominated – and they almost certainly reflect the aesthetic tastes of the troops themselves. That they were receptive to both the subtle and not-so-subtle messages is possibly a measure of the success of the Imperial 'project'.



Hone or whetstone from Carlisle (Cumbria, England). (Drawing: M.C. Bishop)

We do not know for sure how blades were maintained, although some combination of sand and olive oil may have been used as an abrasive to keep them clean and polished. Mineral oil was certainly known of, Pliny the Elder mentioning that smiths applied it to exposed nail heads and that it had 'many other applications' (Pliny the Elder, *Nat. Hist.* 35.182). We are better informed about how their edges were kept sharp, however, because hones or whetstones survive from many Roman military sites. Normally rectangular in shape and of a size to fit comfortably in the hand, they were also rectangular in section and made of fine-grained stones. Excavated examples frequently have concave faces caused by long use. Repeated sharpening of a blade with a hone would inevitably lead to some erosion of the steel edges. It is possible that this to some extent enhanced the waisted shape of Mainz-type blades, but there seems little doubt that the basic shape was a product of the forge and not a result of over-enthusiastic sharpening, not least because the broadest part of the blade above the point might be the bit to do the cutting.

Blades could also be blunted or nicked and might require repair at the forge, while those that are found without any apparent defect may well have been set aside to have their organic handle components renewed or repaired. Those organic components would themselves have required light care, in the form of cleaning and drying after use in order to prevent them drying out or rotting, and occasional oiling. Encased hilts, like that of the silvered Rheingönheim example, may have been more problematic in this respect.

Training

Training was key to the success of the Roman Army and practice with the sword was a fundamental part of the process. In 209 BC, having captured Carthago Nova, Scipio Africanus introduced new training methods for his army on campaign in Spain that included characteristic gladiatorial components such as sword drill with wooden and blunted weapons (Polybius 10.20.1–7; Livy 26.51). The use of buttons to blunt the wooden swords is mentioned by Polybius and implies first that they were shaped to include a pointed tip and second that stabbing was practised even then. It is important to note that these were not raw recruits and no mention is made of sparring against the stake.

A similar ploy was used by Publius Rutilius Rufus in 105 BC, using instructors from a gladiatorial school to teach his legionaries to be more flexible in parrying and delivering blows (Valerius Maximus 2.3.2). Soon after, Marius employed soldiers trained by those same instructors to suppress the Cimbri, so it seems there is a pattern to this (Coulston 1998: 2–3).

Moreover, the implication to be drawn from this close relationship with gladiatorial sword-handling skills is that, in battle, legionaries actually fought hand-to-hand in a similar manner to gladiators. It was not identical, however, since gladiators generally only fought in matched pairs and were intended to provide an entertaining display and not a quick kill. Nevertheless, they needed to know which parts of an opponent's body

OPPOSITE Column base from the legionary headquarters building at Mainz (Germany) depicting two legionaries, one with a drawn Pompeii-type *gladius* in the classic stance. (Photo: © M.C. Bishop)

were the most vulnerable in order to avoid them until a kill was required. The impression of similarity is further reinforced when it is noted that the pose depicted in the reliefs on both the Mainz column base and the metopes of the Tropaeum Traiani is in fact echoed on numerous representations of gladiatorial combat, both in sculpture and in mosaics: left foot advanced, shield held close to the body, sword held horizontally at the ready by the side. Roman military specialist Adrian Goldsworthy (himself a fencer) noted that this pose placed the weight of the soldier behind his shield and not behind his sword arm, which may seem counter-intuitive to a modern swordsman.

Vegetius preserves more than one account of the type of sword training that was undertaken by recruits and known as *armatura* (Vegetius, *DRM* 1.11–12; 2.23; 3.4). The common theme is that new recruits must practise at the stake (*palus*) using a double-weight wooden sword or singlestick (*rudis*) and carrying a double-weight wicker shield. Why double-weight? The logic was simple: 'Moreover, they are given that double-weight shield frame and singlestick, so that when a recruit took up real, lighter, weapons – as if freed from the heavier weight – he therefore fought more safely and more quickly' (Vegetius, *DRM* 1.12 trans. author).

Even in the 20th century, the advantage of a weight differential in training weapons was not lost on singlestick swordsmen (Allanson-Winn & Phillipps-Wolley 1905: 60). This methodology is borrowed directly from gladiatorial training, so by the Imperial period, the Republican experiments had clearly become embedded in the military system. This sword drill taught specific aspects of combat:

> The ancients, as is recorded in the books, trained recruits in this way. They wove rounded shields of wicker like basketry, in such a way that the frame should be double the weight of a battle shield. And likewise they gave the recruits wooden foils, also double weight, in place of swords. And next they were trained at the stakes, not only in the morning, but also in the afternoon. For the use of stakes is particularly advantageous not only for soldiers but also for gladiators. And neither arena nor field ever proved a man invincible in arms, unless he was carefully taught training at the stake. However, single stakes were fastened in the ground by each recruit, in such a way that they did not wobble and protruded for six feet. The recruit practised against this stake with the wicker shield and singlestick as though with a sword and shield against an enemy; so, he might aim for the head or face, then he is threatened from the sides, then he strained to cut down at the hams and shins; he retreated, attacked, leaped in, as if the enemy were present; he assaulted the stake forcefully, fighting skilfully. In doing this, care was taken that the recruit rose up in this way in order to wound, but did not lay himself open to a blow anywhere. (Vegetius, *DRM* 1.11 trans. author)

OPPOSITE Relief from Pula (Croatia) depicting a Pompeii-type sword in its scabbard. (Photo: © J.C.N. Coulston)

Three principal target areas are defined in this passage: the head and face, the sides (or upper body) and the lower limbs. There is more, however, on how this must be done:

The *gladius* in the arena

The curious two-way relationship between the Roman Army and the world of the gladiator is more than just the stuff of fiction. For just as gladiatorial training made a huge contribution to the operations of the Roman Army, so studying their equipment can help fill in missing details for the military use of the *gladius*.

No certain example of a gladiatorial short sword has ever been recovered. One of the Pompeii swords certainly came from the gladiatorial barracks in that city, but since (like the others) it was found with its sheath, it is unlikely to have belonged to a gladiator; they had no need of a scabbard, after all. There is, however, a rich variety of depictions of the short sword in use in the arena on stone, metalwork, ceramics, in graffiti and mosaic, as fresco, and even painted onto glass.

One of the most impressive 1st-century BC sculpted reliefs comes from Lucus Feroniae in Italy. Part of this shows one man administering the *coup de grâce* with a dagger in his left hand, while resting a *gladius Hispaniensis* on his right shoulder. A lanyard, which is tied around his arm, is clearly visible attached to the top nut on the pommel of the sword. This was presumably a measure to prevent him accidentally losing the weapon during combat.

It is interesting to note that one type of top nut from military Mainz-type *gladii* features loops on either side for small rings, possibly for the attachment of a thong or strap, while the Rheingönheim sword is said to have had a loop attached to the pommel when it was first found in the 19th century. This was subsequently removed during rather heavy-handed conservation of the weapon.

Another set of reliefs from Rome, now in the Munich Glyptothek, shows an armoured gladiator with his sword (with a fluted pommel and hand guard) raised above his head to deliver a downwards chop. This clearly implies that gladiators, just like the Roman Army, were as happy to cut as they were to stab.

Finally, a few depictions of gladiators (including funerary reliefs and a mosaic) provide us with a detail that is lacking from military iconography: depictions of the *palus*, the man-sized stake against which sword drill was carried out.

> Further, they learned to strike by stabbing, not by cutting. For the Romans not only easily conquered those who fought by cutting but mocked them too. For a cut, should it be delivered with any force whatsoever, frequently does not kill, when the vital parts are defended by equipment and bone. On the contrary, a point brought to bear is fatal at two inches [49mm]; for it inevitably penetrates whatever vital parts it is stuck into. Next, when cutting, the right arm and flank are exposed, but the point is delivered with the protection of the body and wounds the enemy before he sees it. (Vegetius, *DRM* 1.12 trans. author)

Clearly, the emphasis here is on stabbing, not cutting, but elsewhere (probably using another source) Vegetius is less fussy: 'It is also appropriate to be trained at the stake or with singlesticks, when they should learn thoroughly to attack with a stab and a cut to the sides, the feet, or the head' (Vegetius, *DRM* 2.23 trans. author).

The issue of continual training is even raised as one way of keeping troops gainfully employed prior to battle: 'They are very frequently occupied in striking with wooden singlesticks in place of swords, stabbing

OPPOSITE Gladiators from Lucus Feroniae (Italy). While the victor executes his victim with a dagger in his left hand, he rests a *gladius Hispaniensis* (which is attached to his wrist by a thong) on his right shoulder. (Photo: © Sophie Hay)

and cutting for many days until they sweat' (Vegetius, *DRM* 3.4 trans. author). Here Vegetius is almost certainly using Julius Frontinus' lost work on military science (to which Frontinus' surviving *Strategemata* was intended as an appendix).

The attention to striking the face of the victim is found elsewhere in Roman literature. It occurs in Polybius (2.33.6) and in the tales of Cassius Scaeva in *Caesar* (and several other writers), who struck an opponent full in the face with his sword (Plutarch, *Caesar* 16.4) while incidentally hacking the arm off another! Another of Caesar's centurions, Crastinus, was found dead on the field at Pharsalus having similarly been stabbed in the face (Caesar, *BC* 3.99). We also find it mentioned in Tacitus' accounts of battles on the Weser (Tacitus, *Annals* 2.14) and at Mons Graupius (Tacitus, *Agricola* 36.2), and it inevitably caused the victim to flinch and could force them off-balance even if the weapon did not strike home.

Attacking the torso was of course harder, since even unarmoured enemies normally tended to fight with shields. Nevertheless, the Roman soldier would have looked for opportunities, particularly when a foe raised an arm to strike overarm with a sword, as this area provided the greatest chance of a fatal wound. The feet offered an unexpected and vulnerable target which, when struck, could distract sufficiently to allow a mortal blow elsewhere.

The second form of training was for the more experienced soldiers and this was the mock battle, still using wooden staves instead of swords (Onasander, *Strategikos* 10.4–6). Once the basic moves had been learnt, this second stage obviously introduced a more dynamic element, with moving opponents who could and would strike back.

No wooden training equipment has survived from the Roman period. A *gladius*-shaped wooden sword was excavated from the Roman fort at Carlisle, but it was certainly not double the weight of a battle sword and is often explained as a child's toy (Caruana 1991), although a votive substitute weapon is also possible. The *rudis* presented to a gladiator upon retirement seems to have been just such a double-weight training stave.

Into battle

We do not possess any first-hand accounts of using the *gladius* in combat. Such insights as we do have come mainly from historians whose experience of battle, let alone familiarity with the weapon, may have been limited at best. A few writers, most notably Julius Caesar, wrote detailed accounts of their military activities and were obviously extremely well acquainted with the short sword and its use. That very familiarity can be problematical, however, as the writers often overlook providing information which they (and their readers) may have taken for granted. In Caesar's case, he often only mentions details when they are unusual. A well-known example is the story of the centurion Pullio who, having thrown his *pilum*, is then struck in the belt by an enemy missile, preventing him from drawing his sword (Caesar, *Gallic War* 5.44).

The classic sequence that led to hand-to-hand combat for Roman legionaries from the time of the Punic Wars onwards involved two clear

phases. In the first phase, a *pilum* salvo was used at close range to break up the opposing formation. The second phase then saw the *gladius* drawn and the surviving attackers engaged. It goes without saying that the sword could not be drawn until the *pilum* had been discharged. The timing required was therefore crucial to success, since the shortest possible interval between a charging enemy being struck by the *pila* and then meeting the swords of the front rank would obviously be more advantageous for the Romans, as it would maximize disorganization at a key moment. Livy neatly summarized the contrast between the two phases: 'When they drew their swords after hurling their darts and javelins, then the battle, so to speak, took on new life. For they no longer received unexpected random wounds from a distance, but closing foot to foot put all their hope in courage and in strength' (Livy 34.14.10–11).

Adamclisi Metope 37 depicting a short sword chopping. (Photo: © J.C.N. Coulston)

The style of hand-to-hand combat encouraged by the gladiatorial system of training meant that a Roman battle line was effectively a series of individual combats carried out in formation; and Polybius says as much, describing how the line opened up from a 3Rfoot to 6Rfoot (0.89m to 1.78m) spacing to give room for sword fighting (*Hist.* 18.30.68). In the same vein, Plutarch describes how Scipio Aemilianus ordered his legionaries at Pydna in 168 BC not to fight one battle against the Macedonian phalanx, but rather multiple individual duels with its members (Plutarch, *Aemilius Paullus* 20.8). At one dramatic point in the Battle of the Sabis against the Nervii in 57 BC, Caesar personally ordered his front-rank legionaries into open order 'so they could use their swords more easily' (*Gallic War* 2.25); but, remembering Caesar's eye for the unusual, does this mean that there had been a change in tactics in recent years and that legionaries were now more accustomed to fight in close order? Vegetius seemingly confirms this, stating (in a passage thought to derive from Iulius Frontinus) that

> However, each armed man in a straight line would have three feet between each of them, that is, one thousand six hundred and sixty-six infantry arranged in a line occupied one thousand paces [5,000Rft], so

> that there was no light between them and there was space for levelling arms; between one rank and the one behind it, however, they wanted a space of six feet, so that the fighters had space for advancing and retreating. (Vegetius, *DRM* 3.14)

The Roman soldier actually fought with two weapons: the sword in his right hand and his shield – used offensively (punching with the boss or shield rim to force the opponent off balance) as well as defensively to parry blows – in the left hand. At around 7.5kg in the Imperial period (and considerably larger and heavier under the Republic), its effect should not be underestimated when used as an adjunct to the sword. Tacitus has Suetonius Paulinus tell his legionaries to use the shield in this way prior to the final battle with Boudica: 'Only, keeping their order close, and, when their javelins were discharged, employing shield-boss and sword, let them steadily pile up the dead and forget the thought of plunder' (Tacitus, *Ann*. 14.36).

The combination of sword and shield was particularly effective against foes who were not accustomed to fighting in this way. Describing an encounter between Roman infantry and Sarmatian cavalry who were bogged down in snow, Tacitus shows us the system in operation: 'The Roman soldier in his body armour moved readily about, attacking the enemy with his *pilum*, which he threw, or with his javelins; when the situation required he used his light *gladius* and cut down the helpless Sarmatians at close quarters, for they do not use the shield for defensive purposes' (Tacitus, *Histories* 1.79).

The association between sword and shield is also made by Cassius Dio in his account of the night-long Second Battle of Bedriacum where there were reportedly pauses for 'meal breaks' and even enemies sharing food:

> Comrade, take and eat this; I give you, not a sword, but bread. Take and drink this; I hold out to you, not a shield, but a cup. Thus, whether you kill me or I you, we shall quit life more comfortably, and the hand that slays will not be feeble and nerveless, whether it be yours that smites me or mine that smites you. (Dio, *Roman History* 44.12.4)

This coordinated use of the sword and shield is very different from a 'shield wall' style of battle line, where each man's shield partly covered his neighbour to the right. The Roman system was at once dynamic and static, avoiding the temptation for combat to turn into a shoving match where the combat skills so carefully drilled into the infantryman would have been largely superfluous.

Facing the gladiators (opposite)

In AD 21, the Revolt of Florus and Sacrovir saw an army of Gallic rebels, fronted by heavily armoured gladiators called *crupellarii*, march north out of Augustodunum (Autun) to take on Roman legionaries in open battle. The armour successfully negated the *pila* and *gladii* of the legions, but the legionaries merely resorted to their pioneer tools – axes and mattocks – to hack their way to victory over the gladiators.

Battle reportage

Roman writers were surprisingly reluctant to describe combat in detail. The phenomenon of recording the unusual has been mentioned, but the process of describing hand-to-hand combat was almost ritualized in its use of euphemism and figures of speech. This of course served to highlight those few instances when the use of weaponry was actually described. A fine example of this is Tacitus' account of the Second Battle of Bedriacum/Cremona (historians differ on what to call it) in AD 69. This passage is typical of what is often found: 'The battle lasted the entire night with varied fortune, uncertain as to its outcome, savage, and fatal now to one side, now to the other. Neither courage nor arms, nor even their eyes, which might have foreseen danger, were of any avail' (Tacitus, *Histories* 3.22).

This was a battle that was unusual in its duration, and because hand-to-hand combat, rather than exchanges of missiles, was key to the outcome. A large Vitellian artillery piece was disabled by two Flavian soldiers who cut its torsion springs, although whether they used daggers, swords or axes to achieve this is not recorded. Similarly, the story of how a father was killed by his son is related, but again how it was done is glossed over in favour of describing the horror of relatives fighting on different sides. The combatants were forced to take breaks to recover during the battle, and the whole slogging match only ended when the Flavian forces turned to greet the rising sun – a habit they had picked up when based in the East – which the Vitellians mistook for their greeting the arrival of reinforcements and subsequently lost heart.

It also helps to explain the wraparound nature of the Roman legionary's curved body shield (again, the word *scutum* so often associated with this type of shield is just a generic term for shield in Latin). Both the legionary and the gladiator used the same type of shield and the evolution of its form, from oval to rectangular, was matched in both professions.

In the battle line – the same word, *acies*, was tellingly applied to both the formation and the edge of a weapon – the reality was probably seldom as neat as the drills may have made it seem. Most of the time the *gladius* was the superior close-contact weapon on the battlefield, but there were occasions when it was effectively neutralized. Facing Crassus' legionaries at Carrhae in 55 BC, the Parthians simply refused to be brought into contact and used horse-archers to render the legionary weapons ineffective. A different, and almost as effective, tactic was used against the Romans during the Gallic uprising of AD 21, led by Florus and Sacrovir, when heavily armoured gladiators were sent into battle against the legionaries from Germania Superior (which probably included *legio II Augusta*, later employed in the invasion of Britain). Finding their short swords ineffective, the Romans simply resorted to using their mattocks (*dolabrae*) and axes (*secures*) to hack their way through the gladiators (Tacitus, *Ann.* 34.6). In times of civil war, the compromises inevitably made between armour and manoeuvrability when equipping Roman troops became most apparent, since opposing forces were then more evenly matched. In such cases, Roman infantrymen were only too aware of their (and their opponents') weaknesses and strengths and how to exploit them.

It is important to remember that Roman swords were never intentionally used for 'fencing', blade parrying blade, Hollywood-style.

The *gladius* was not designed to withstand the forces of metal-on-metal contact in this manner, although the metal plate beneath the hand guard was there to stop another blade sliding up to damage the handle assembly. The Roman soldier instinctively fought with his shield as a complementary weapon to the sword, as well as a parrying defence. He would punch with the boss or the rim of the shield to put his opponent off-balance before finishing him off with an economical blow from the sword. This dependence upon the shield is highlighted by incidents where Roman soldiers were caught shieldless and were forced to improvise by wrapping cloaks around their shield (left) arms (Caesar, *Civil War* 1.75.3; Tacitus, *Hist.* 5.22). Tests have suggested that a wrapped cloak would have been sufficient to stop a sword cut and dull blunt force trauma to the extent of it just bruising (David Sim, pers. comm.). Regardless of how effective this would actually have been, the reaction of the shieldless soldiers is telling and clearly in part psychologically based.

Adamclisi Metope 31 depicting a short sword stabbing with an inverted grip. (Photo: © J.C.N. Coulston)

CONCLUSIONS

It can thus be seen that the dual nature of the *gladius*, as both a chopping and stabbing weapon, evolved into one primarily intended for stabbing. It is not unreasonable to see this change in use reflected in the change in the form of the blade, although which came first is a matter for debate. The development of the Pompeii-type sword in the second half of the 1st century AD was aimed at producing the best weapon for thrusting while still retaining the ability to chop; an assertion that the Roman Army-produced reliefs on the Tropaeum Traiani seem to support.

Whether the *gladius* was a stabbing or a cutting weapon is therefore probably far too binary a way of reviewing the matter. The short sword could always, from its first adoption right through to its abandonment in favour of the *spatha*, be used to both cut and stab. Over time, preferences, fashions and even training may have shifted the emphasis one way or the other within (and outside) the Roman Army, but the fact remained: the *gladius* was as good at stabbing as it was at chopping.

IMPACT

The sword that conquered an empire

The *gladius* is, and was, one of the archetypal Roman weapons, alongside the *pilum* and the curved, rectangular body shield, recognizable to many who know little else about the Roman Army. Tacitus produced arguably the most memorable – if not the most accurate – description of the Roman short sword in use. Describing the Roman assault on Britons led by the rebel Caratacus holed up on a hilltop, Tacitus contrasts the Roman auxiliary and legionary weaponry: 'if they offered a resistance to the auxiliaries, they were struck down by the *gladii* and *pila* of the legionaries; if they faced against the legionaries, they fell under the *spathae* and *hastae* of the auxiliaries' (Tacitus, *Ann.* 12.35).

In order to make a nice rhetorical point, the historian was economical with the truth, since *spathae* were at this time only used by auxiliary cavalry, while both legionary and auxiliary infantry used the *gladius*. Nevertheless, the contrast worked and the reader understood that the Britons were caught between the hammer and the anvil. In doing so, he associated legionaries with the short sword.

The dual nature of the *gladius*, as both a thrusting and chopping blade, is all too apparent from the sources. Vegetius appears muddled over which form of attack was to be used, but in reality there was clearly an ongoing debate throughout the Roman period as to the best way to use a sword that could comfortably fulfil both functions. Indeed, it seems likely that some commanders may have trained their troops to cut, others to thrust, and others still to do both, which would go a long way to explain the mixed messages coming from the written sources. The beauty of the *gladius* was that, in all its forms, it was perfectly adapted for both types of blow.

Polybius was convinced that the *gladius* dictated the nature of the Republican Roman battle line and in particular the spacing allowed to each legionary of 36 square Rfeet (1.78m by 1.78m). This allowed each

soldier enough space to wield his weapon and defend himself with his shield without getting in the way of his comrades on either side. In other words, his training provided him with exactly the right conditions to enable him to use his sword in the most effective way.

USING THE *GLADIUS*

There are no surviving first-hand accounts of using the Roman short sword, nor are there any technical manuals on the finer points of its use. All we have, besides the few general texts included within this volume, almost invariably not written by specialists, are the weapons themselves. Many are broken in some respect and most are now extremely fragile. This means that we are reliant upon experimental archaeology to reconstruct the short sword and evaluate its efficacy at first hand. This in turn means that the results from such experiments have to be hedged around with caveats, since experimental archaeology can only ever show what might have been possible, not what definitely happened – a fact that a few re-enactors occasionally forget. In the case of the *gladius*, much depends upon the accuracy of the reproduction for assessing qualities that a present-day swordsman might take for granted. In other words, the closer a reproduction is to the original sword, the more accurately it can be assessed. Any temptation on the part of the modern sword smith to simplify or improve a design will invariably detract from the value of the experiment.

A reconstruction of the Castellammare di Stabia Pompeii-type sword and scabbard. (Photo: © M.C. Bishop, courtesy of the Ermine Street Guard)

The crucial element of control over the sword for the soldier was supplied by the handle, which – in the case of the Imperial *gladius* – was extremely ergonomically designed. The hand grip was always organic for the Mainz and Pompeii types (as it was for their Republican predecessor) and normally made out of a length cut from a cow metapodial bone, although horse bone was also occasionally used, as was ivory or even occasionally wood. This hand grip, which was usually between 75mm and 94mm long (averaging 84mm, close to the average width of the modern male hand), was shaped in two respects, for in most cases it was given a slightly flattened hexagonal cross-section as well as three ridges running around its circumference which served to provide the four concave finger grips. About a third of surviving examples have a rounder cross-section and there are even some earlier grips that are simply carved with an incised spiral pattern and no finger mouldings. A flatter cross-section had

the advantage of helping to orientate the blade in the hand of its user. The hexagonal cross-section reflected the knuckle-joints and how they shaped the inside of the hand when gripping, thereby providing a more natural shape to hold and helping to prevent the sword twisting in the hand during combat. This was enhanced by shaping the top of the hand guard and base of the pommel to be convex, so that they effectively squeezed the hand onto the handle. The thumb rested against the top surface of the hand guard to ensure the firmest of grips. Thus, by using the shaped pommel and hand guard, together with the contoured hand grip, an extremely secure grip was produced, allowing the soldier to feel that the sword was a true extension of his arm. Moreover, the variation in lengths of surviving hand grips suggests that swords were to some degree fitted to the individual. Some leeway was obviously tolerable, but too small a hand grip would tend to crush the user's hand, while too large a grip would reduce the precision of the soldier's control of the weapon, for lack of contact with the hand guard and pommel would tend to cause the weapon to pivot about the hand when it was swung.

A limited range of types of blow were available to the soldier once he was behind his shield, the presence of which naturally ruled out any sort of backhand cut. Stabbing (*punctim*) was obviously appreciated for its economy of effort, potential for dealing fatal wounds, and the protection it afforded to the user. As Hainsworth has commented, writing of knife crime: 'just 20mm of knife penetration gave a 41% chance of puncturing the lungs, over a 60% chance of liver or femoral artery rupture, and even a 6% chance of heart penetration' (Hainsworth 2008). Even the short points of Pompeii-type blades were still in the range of 60–80mm long, perhaps reflecting Vegetius' comment that a wound two *unciae* (49mm) deep was all that was required to ensure fatality (Vegetius, *DRM* 1.12). Stabbing was thus economical, but it nevertheless had its limitations. The stance adopted in Roman hand-to-hand combat, with the left foot and shield advanced and the right foot and sword held back, meant that the effective range of the weapon was limited. Indeed, as the limit of the reach of the individual was approached during a stabbing blow, so the force that could be brought to bear would have decreased dramatically. By stepping forward with the right leg to deliver a blow this situation could easily be resolved, however, for then the maximum range came from the sword shoulder being forward of the shielded side. This means that judging the distance for an effective blow would be key to the success of the weapon, and it is here that practice at the stake had such an important role to play. It was (at least in part) designed to familiarize the soldier with his most efficacious distance from an opponent during combat, which would provide the perfect compromise between effective reach and minimum risk.

Besides the stab, the most obvious blow was the downward cut or chop (*caesim*). Despite Vegetius' observation that this exposed the side of the infantryman delivering it, it had the advantage of being aided by gravity as well as not unbalancing the user sideways. It also meant that, with the arm raised, the pommel of the sword could be brought down rapidly if need be to strike with the top nut, should an opponent get too close. A skull found during excavations at Balkerne Lane, in the legionary

The *gladius* handle allowed for a secure grip, with the aid of the hand guard, shaped hand grip, and the pommel. (Photo: © T. Hayter)

fortress ditch at Colchester (Essex, England), dated to before the Boudican Revolt of AD 60/61, bore 'a small spherical compressed fracture' near the crown (R. Luff in Crummy 1984: 94–97) – precisely the sort of wound that could be inflicted by a sword pommel. Oblique and lateral chops were theoretically possible, but ran the risk of placing the swordsman off balance, while the lateral chop could also end up impacting the man's own shield! An upward cut was unlikely, since it was against gravity and not capable of carrying much force, but would undoubtedly have been employed if no alternative presented itself.

The overall mass of the weapon depends upon the amount of metal in the blade and tang, as well as the materials used: any combination of wood, bone or ivory with additional brass components and perhaps even a foil coating. Its balance then in turn depends upon the distribution of those components. One might think that a waisted Mainz-type blade with a long tip may feel very different to a parallel-edged Pompeii-type weapon with a short tip, but that could be subtly altered if one or other blade has distal taper or a pronounced 'bullet-tip' swelling. Distal taper is evident on some blades (the Fulham Mainz-type and Baena Pompeii-type swords, for instance), but by no means all, and it is an unfortunate truism that detailed measurements of blade thickness are lacking for too many Roman swords. All too often, corrosion is a major factor preventing accurate measurements being taken.

The many intangibles of blade form could doubtless be formed into a complex computer model, but they have not yet been and, until they are, any assessment of the 'feel' of a sword remains as subjective to us as it did to the Romans. It is not even possible to be certain that what feels well

balanced to a modern swordsman would necessarily meet with the approval of a Roman legionary.

That is not to say that some performance data could not be quantified by means of experiment. Even so, it would inevitably be a measure of what weapons similar to the *gladius* (but which might vary in slight – but perhaps important – details) could achieve. An alternative way of looking at the problem is to see how much damage the weapon could do in more practical terms. Against unprotected flesh substitutes, such as ballistic gel or plastilina, there is little doubt of the *gladius*' abilities to penetrate and sever in the ways our ancient sources describe. The picture is altogether more complex once other materials are brought into play, most notably (but not just) armour of varies kinds. Scale, mail and plate of both copper alloy and steel can all be extremely effective against sword blows, as might be expected from Tacitus' description of the legionaries' encounter with the heavily armoured *crupellarii* in AD 21. Against this must be balanced accounts like that of Plutarch, describing the battle of Pydna (168 BC), where he relates how the Macedonians, confronted by legionaries, could only 'oppose light wicker shields to their swords, which, such was their weight and momentum, penetrated through all their armour to their bodies' (Plutarch, *Aem. Paull.* 20.10).

In the end, before becoming too obsessed with details of the way the sword handled, it must be remembered that the Roman infantryman trained with a double-weight stave so that virtually any true sword was going to feel better than that – which was, of course, the whole point of the exercise!

PSYCHOLOGICAL AND PHYSICAL IMPACT

It has become common to see modern recreations of Roman battles, whether by re-enactors or Hollywood filmmakers, in which the troops rattle their swords against their shields prior to making contact with the enemy. Polybius certainly mentions this in the context of the battle of Zama (202 BC) in the Second Punic War: 'When they came within distance the Roman soldiers charged the enemy, shouting as usual their war-cry, and clashing their swords against their shields' (Polybius, *Histories* 15.12). Polybius' description of the combined physical and psychological effects of the *gladius* upon Macedonian troops is telling. It would be misleading, however, to suggest that it was the weapon alone that produced this effect, because the nature of the training was so clearly key to its efficacy. For this reason, it is interesting to note that, by 167 BC, if we are to believe Livy, the Macedonians had adopted sword practice with wooden staves:

> When the purificatory rite was completed it was the custom for the army to go through maneuvers and after being formed into two divisions to engage in a sham-fight. The two princes were appointed to command in this mimic contest, but there was no make-believe about the fighting, it looked like a struggle for the crown, so fiercely did they engage. Many wounds were caused by their staves and nothing was wanting but swords to give the actual appearance of war. (Livy 40.6.5–6)

Funerary relief from Milan showing a gladiator exercising at the *palus*, which has a helmet (his?) placed on top of it. (Photo: © G. Dall'Orto)

The 'legionary package' of *pilum*, short sword and shield was to remain effective right through the Republic and well into the Empire so long as there were unarmoured opponents willing to take the field against the Romans. Paradoxically, the only way to confront the *gladius* on the battlefield was not to do so. Insurgency was the Achilles' heel of the Roman frontier armies once they were established around the periphery of their Empire, and unarmoured foes gradually (but often too late) learned the lesson.

In Germania, the eradication of Varus' three-legion army by Arminius in AD 9 depended on his avoiding formal battle but instead ambushing the Roman force when it was vulnerable, on the march, and unable successfully to deploy. In Britannia, the Britons were ultimately unsuccessful in open battles such as the Medway crossing and the attack on Camulodunum following the invasion of AD 43. Vespasian's campaign into the south-west was unstoppable and it was only when Caratacus switched to guerrilla tactics – a policy also adopted by the Silures in what is now south Wales – that the Romans began to experience difficulties. Even then, they were slowed down, but not actually stopped. The Boudican rebellion of AD 60/61 saw a return to open battle, the Britons sufficiently emboldened by initial successes, including the defeat of a legionary force commanded by Petillius Cerealis, to accept battle with Suetonius Paulinus' army at a place of his choosing. This handed the Romans the perfect opportunity to deploy that legionary package, which they duly did. The insurgency lesson was not learned when Agricola moved into northern Britain and the Caledonians confronted his force in open battle at Mons Graupius with predictable results. This time the short swords were wielded by his auxiliary infantry, but the effect was the same:

> Agricola encouraged four Batavian and two Tungrian cohorts to bring matters to the decision of close fighting with swords. Such tactics were familiar to these veteran soldiers, but were embarrassing to an enemy armed with small bucklers and unwieldy weapons. The swords of the Britons are not pointed, and do not allow them to close with the foe, or to fight in the open field. No sooner did the Batavians begin to close with the enemy, to strike them with their shields, to disfigure their faces, and overthrowing the force on the plain to advance their line up the hill, than the other auxiliary cohorts joined with eager rivalry in cutting down all the nearest of the foe. (Tacitus, *Ag.* 36)

Twenty years later, it was the same story with the Dacians when Trajan invaded their kingdom. Wherever the Roman Army was afforded the opportunity to force an open battle or lay siege then they were in their element. Repeatedly, we see the insurgency solution discovered and then forgotten – and so long as that was the case, there was still going to be a role for the *gladius*.

WORDS AND WEAPONRY

Given that the vocabulary of the Latin language was comparatively small (around 20,000 words), the Romans had great fun with puns and wordplay because multiple meanings were common. The very phrase *gladius Hispaniensis* contains a virtually untranslatable pun, since *ensis* was a noun used (mainly by poets) as an alternative word for sword; the orator Quintilian even comments upon their interchangeability (Quintilian, *Institutions of Oratory* 10.1.11). There is a hint of the pun too about the use of the same word, *acies*, for both the edge of a blade and a battle line. Unsurprisingly, *gladius* is also used to comic effect for phallic innuendo, while the earliest occurrence of the word for scabbard (*vagina*) being applied euphemistically to the female anatomy is to be found in a play by Plautus, the comic playwright of the late 3rd/early 2nd century BC (Plautus, *Pseudolus* 4.7.80).

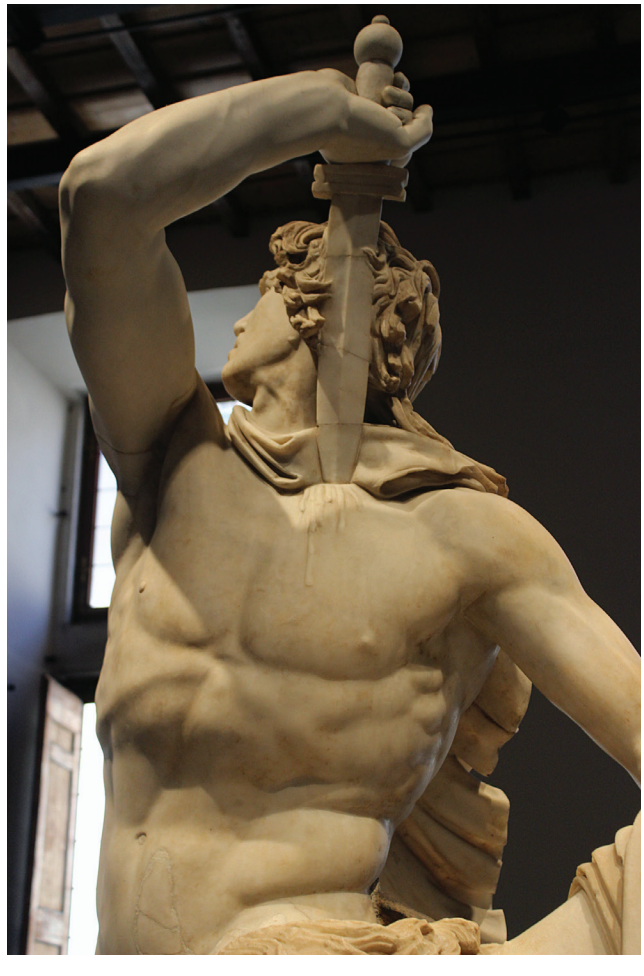
Joking aside, the language employed by writers can be quite instructive about the wider public reception of the short sword. One word, *mucro*, was mainly used for the point or tip of a sword (although it could also more rarely mean edge) but came to be used synonymously for sword. This association may have had something to do with the increasing but, as we have seen, by no means exclusive use of the *gladius* for stabbing. Most nouns could be more closely defined by the use of epithets: hence *gladius* 'sword' becomes *gladius Hispaniensis* 'Spanish sword', while the *gladius pugnatorius* distinguishes a combat weapon from a practice one in a letter from a Roman legionary to his father asking for equipment. The word *gladius* itself does not survive into the Romance languages associated with swords, for it is the *spatha* that gives us the *espada* of Spanish, the *spada* of Italian, and the *épée* of French. English is left with only the gladiolus, a plant whose spike-like flowers resemble diminutive swords.

POLITICS AND THE SWORD

Julius Caesar had no doubts about the ultimate source of his political might:

> So he tried to retain his power until he should be elected consul, and asked the Senate to grant him a little more time in his present command of Gaul, or of a part of it. Marcellus, who succeeded Pompey as consul, forbade it. They say that when this was announced to Caesar, he clapped his hand on his sword-hilt and exclaimed, 'This shall give it to me.' (Appian, *Civil Wars* 2.25)

It is perhaps trite to point out that the *gladius* could have a significant political impact in a world dominated by edged weapons, but it nevertheless remains true. When Antony used the proscriptions of the Second Triumvirate to condemn Cicero to death in 43 BC, it was with the edge of a *gladius* that the deed was done. (Antony's grandfather, it should be remembered, had perished at the hands of Marius' soldiers at the command of Marius and Cinna.) Death by sword – as opposed to by means of the axe carried by a magistrate's *lictor* – was one of the standard forms of judicial capital punishment, but it was one that was to be extended under the emperors to the sort of removal of opponents that was all too reminiscent of those earlier proscriptions. Thus not only did Caligula die by the sword after a court conspiracy, but so too did his wife and child. Such a potential fate was alluded to by Trajan when, presenting a sword to his new Praetorian Prefect, he said 'Take this sword, in order that, if I rule well, you may use it for me, but if ill, against me' (Dio, Roman History 68.16.2).



The Ludovisi Gaul. A Roman marble copy of a Hellenistic original. (Photo: © M. Hermoso Cuesta)

In a measure probably designed as much to minimize the risk of rowdy as of seditious behaviour, Roman soldiers visiting Rome were forbidden to wear arms within the sacred boundary (*pomerium*) of the city. This did not apply to the Praetorian Guard although, when on palace duty, they (like other urban military formations in Rome) would wear their swords concealed beneath their clothing (Tacitus, *Ann.* 16.27).

The *gladius* was also a preferred means of ending one's own life for soldiers, particularly officers. Caesar's assassin, Brutus, used the point of his to do it, albeit left-handedly (Velleius

Roman wooden sword from a well at the Saalburg (Germany), possibly made as a votive substitute. (Photo: © C. Rusalen)

Paterculus, *Roman History* 2.71). When Poenius Postumus, the all-too-hesitant *praefectus castrorum* of *legio II Augusta*, killed himself for refusing to participate in the suppression of the Boudican revolt, he did it with his sword (Tacitus, *Ann.* 14.37). Perhaps one of the most famous '*gladius* suicides' is depicted in the sculpture known as the Ludovisi Gaul, plunging the tip of a short sword downwards into his chest from just above the collar bone. Given the likely late-3rd-century BC date for the original, this Roman sculptor may have subtly changed the sword to resemble the *gladius Hispaniensis*, thereby loading extra meaning onto the act. Not only politicians and soldiers ended their days on the wrong end of the *gladius*. Archimedes, Syracusan mathematician and engineer, tried to brush aside a Roman soldier brandishing 'his sword above his head' (Valerius Maximus, *Factorum et Dictorum Memorabilium* 8.7.7) to finish one of his diagrams; he was famously unsuccessful – and this despite an order to spare his life.

The *gladius* could even assume a symbolic role. When Aulus Vitellius attempted to seize power in AD 68, one of the (alleged) swords of Julius Caesar was retrieved for him from a nearby temple and he brandished it when being paraded around (Suet., *Vitellius* 8). Julius Caesar himself was aware of this symbolism: when told the Gallic tribe of the Arverni kept another of 'his' swords in a temple, he merely smiled (Plutarch, *Caesar* 26.7).

As much a sign of the failings of both the Republic and the Empire as of their successes, the *gladius* was always at the heart of Rome.

DERIVATIVES

The stereotype of north-western European warriors – who might loosely be termed 'barbarians' by the Romans, at least – is that they were all equipped with inferior-quality, long 'slashing' swords or even thrusting spears, but this is far from the truth. There was little homogeneity among the Gallic, Germanic and Danubian peoples and this was reflected in their weaponry. There was quite clearly a taste for Roman swords and other military equipment in the area to the north of the frontier, indicated by extensive votive deposits, including the so-called 'bog' finds from watery contexts in what are now northern Germany and Denmark from the 2nd and 3rd centuries AD. Whether Roman material from these sites was a result of booty or trade (or even both) is hotly debated by scholars, and reference is frequently made to an inscription from Mainz naming an Army veteran who was a *negotiator gladiarius*. Although it is often suggested that he was trading swords across the frontier, he could equally just as well merely have sold them to the Army: the inscription is too vague to allow a satisfactory conclusion about his activities to be drawn.

As early as the 1st century AD, Mainz-type swords are known from southern Scandinavia, some of which may well have found their way north in the aftermath of the Varus disaster of AD 9. Moreover, a series of finds from the Early Imperial period from what are now parts of Sweden and Denmark reveals swords with characteristics that are not only heavily influenced by Roman *gladius* blades, but also by their handle assemblies

and their scabbards. These weapons may have been indigenously manufactured outside the borders of the Roman Empire, yet they were still very clearly influenced by Roman prototypes. Two examples in particular are striking; both are from burials, and both are extremely well preserved.

The first sword was found in a cist burial at Stenstugu on the island of Gotland (Sweden). The 715mm-long sword had a blade which was 582mm long and 44mm wide and which gradually tapered towards a swelling just above the short, pointed tip. It had a copper-alloy top nut on its bone or horn pommel, hints of a wooden hand grip, a bone or horn hand guard, and an iron hand guard plate. The scabbard was mostly organic (leather-covered wood) but with iron suspension bands and rings and an iron chape finished with a copper-alloy terminal knob. The second sword also came from a cist burial, but this time from Tyrvalds (also on Gotland). The sword was 626mm long with a blade length of 488mm, the width tapering from 36mm to 24mm. Both sword scabbards only have two of the possible four suspension rings, showing that a particular method of suspension was preferred. A sword from another burial, this time at Møllerup (Denmark), likewise seems only ever to have had two of its four suspension rings attached.

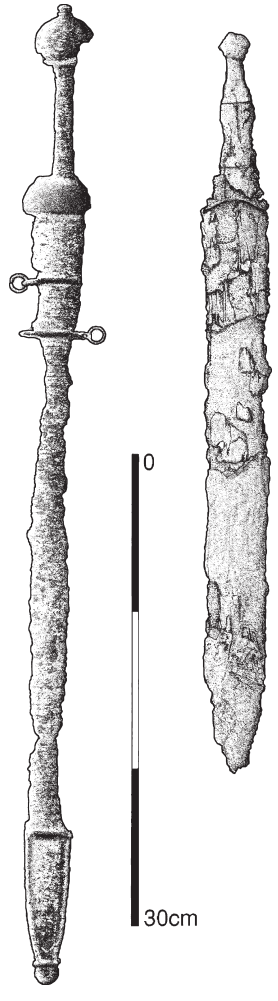
Similar fittings to those complete examples come from a number of sites in Gotland, Öland (another island off the coast of Sweden) and East Jutland (Denmark), allowing some idea of the distribution of the *gladius*-like swords to be determined.

In general, the shape of the hilt components and in particular the scabbard chape of these Scandinavian *gladius*-like swords, bear a closer resemblance to the Pompeii-type swords than they do to the Mainz types.

How they were used is unknown, but Tacitus tells us that the Goths fought with round shields and short swords; and it seems that some German tribes could be both disciplined and organized in warfare (Tacitus, *Germania* 43.6). Could training regimes similar to those of the Romans have been used by them? It seems unlikely; and it could well be that it was the look and feel of the weapon that mattered, perhaps as a status symbol and expression of power by association with Roman-style weaponry.

A number of other swords from the periphery of the Roman Empire have been recognized as being influenced to a greater or lesser degree by the Roman short sword. As such, these usually represent a fusion of classic indigenous features with the external influence of the *gladius*. Blade shape and length are the most common borrowings, but in the case of a group of Scandinavian swords, the scabbard fittings also seem to have been influenced by the Roman system.

In Palmyra, a caravan city in the Syrian desert, local gods were depicted with Roman-style swords and scabbards. The swords shown on Palmyrene reliefs closely resemble that on the gravestone of Minucius, in both the framed scabbards with suspension rings and the knobbed pommels on the sword handles. (These are in turn echoed on the sword from Soknopaiou Nesos in Egypt.) Palmyra had long been a cultural sponge, absorbing elements from Parthian, Hellenistic and Roman traditions and then adding their own Arab 'spin' to the mix. Hence the Palmyrene gods are



Camelon (left; UK) and Tyrvalds (right; Sweden) *gladius*-type swords (Miks A93 & A745). (Drawings: M.C. Bishop)

French *coupe-chou* fascine knife with a Pompeii-type blade (unprovenanced) for comparison. (Private collection; photo: © A. Pangerl)

shown wearing lamellar armour (not used by the Romans until the Byzantine period) and baggy Parthian leggings, and carrying *gladii* on their left hips (just like Roman centurions). See page 1.

Soon after the invasion of Britain in AD 43, indigenous-style swords – many of them found on Roman military sites – show signs of external influence in their design and decoration. An almost complete sword from Hod Hill is one of the best examples, although it may in fact have been closer to a *spatha* in length, but characteristic hand guards associated with such swords come from a number of 1st-century AD sites as far north as what is now Scotland. A sword in a late-1st-century AD burial outside the Roman fort at Camelon (Stirlingshire, Scotland) – found together with spearheads and a shield boss – is of a similar length to a Pompeii-type *gladius*, although it lacks the distinctive angular tip. Whether these were Britons serving with (or even manufacturing weapons for) the Romans is unclear, but there is no mistaking the mark of the *gladius*.

THE SINCEREST FORM OF FLATTERY

The *gladius* inevitably attracted scholarly and artistic interest from the Renaissance onwards, but one of its most surprising manifestations came in the 19th century. In 1816, French infantry and artillery units were issued with a new fascine knife supposedly modelled on the Roman short sword and, inevitably, called the Gladius, although its unofficial nickname was *coupe-chou* or 'cabbage chopper'. Used less for combat (it was thought to be too heavy) than as a handy knife, its steel blade was 480mm long and had a diamond cross-section, so it certainly bore a superficial resemblance its Roman predecessor. However, the tip was much less pronounced than either the Mainz or Pompeii types of sword, although it is not too different from some of the *gladius Hispaniensis* models. The handle, however, is completely unlike any real Roman sword and appears to have been influenced by some of the less accurate sculptural representations of swords. The handle was also made of brass, so in no way similar to the organic components of a Roman weapon. A new version was produced by the French in 1831 and copied by the Americans in 1832. Spread across Europe and Russia as a result of 19th-century campaigns, they were occasionally captured as booty during World Wars I and II and some were subsequently buried. Excavated in suitably corroded condition in recent years, they have occasionally been mistaken for the real thing (Fischer 2014: 68)!

Modern engraved presentation *rudes* modelled on the Mainz-type *gladius*. (Photo: © Christian Darce)

MODERN RECONSTRUCTIONS

It has probably never been easier to buy a *gladius*. With mass-produced replicas from the Indian subcontinent, modern Taiwanese *gladius*-inspired machete blades, as well as wooden and polypropylene martial arts training swords, today the Roman short sword is everywhere. These are put to good use in online videos slicing and stabbing a variety of 'victims', including the carcasses of turkeys, plastic water bottles, and even rolled-up wooden matting. Most of the weapons carried by re-enactors are ground replicas from India and almost invariably deficient in detail by comparison with the original swords upon which they are based. There are a number of small craftsmen willing to forge a more authentic blade for the right price and their products tend to be much more closely based upon the archaeological evidence. Some of the more rigorous re-enactment groups also insist upon weapons they have made themselves to a particular level of authenticity – but these are typically given no edge for safety reasons. There is a clear differentiation between such lookalike weapons used for display purposes and those that are used in earnest in some form of sword play, whether in live-action role-play (LARP) combat or even gladiatorial-style bouts. Finally, there are large numbers of cinematic props from various Hollywood epics which tend to get recycled between productions but can occasionally be found on the market. Such props have also arguably played a major role in maintaining the modern public's awareness of the Roman short sword as a weapon to be respected.

The persistent modern perception of the use of the Roman short sword in both military and gladiatorial combat helps explain why it is possible to buy wooden *rudes* in the form of a Mainz-type sword, both as practice weapons and as engraved presentation souvenirs. The martial arts potential inspired by that public awareness of the Roman short sword is catered for with both wooden and polypropylene practice *gladii*, both the same weight as an original sword, but the latter more resilient than the former (as the blurb has it). This is perhaps why it is even possible to buy a *gladius* letter-opener! However one interprets the legacy of the Roman short sword, it is clear that the *gladius* still has significance beyond its original useful life.

Modern polypropylene practice *gladius* manufactured by Cold Steel (L: 800mm) together with a *gladius* souvenir letter-opener (L: 125mm). (Photo: © M.C. Bishop)

CONCLUSION

SUCCESSORS

Ultimately, the short *gladius* was replaced by the longer *spatha* (Bishop & Coulston 2006: 154–55). With a lineage descended from Celtic long-bladed swords, through the cavalry *spatha* of the 1st century AD, it was destined to be the sword of Late Rome. With a completely new method of carriage – on the left hip by means of a broad baldric that dispensed with the familiar suspension rings – it and its associated accoutrements sweep into the depositional record during the middle of the 2nd century AD. Why did this change occur so thoroughly within the Roman Army? Fighting styles had always been evolving, albeit slowly, but there were new cultural influences at play too; and the same cultural influences that introduced the ring-pommel sword into the Roman Army were soon shown to be even more pervasive. Profound change was widespread, affecting not only weapon design but also the decorative styles and manufacturing processes of peripheral equipment and even swords themselves. Part of the reason for the adoption of the *spatha* for infantry may have harked back to one aspect of the original Roman *gladius Hispaniensis*: the reach afforded by a longer blade. As we have seen, the left-foot-forward fighting stance disadvantaged shorter blades, especially when delivering a thrust; and the longer *spatha* blade, which could be 150–200mm longer than a Mainz-type *gladius*, would inevitably have been superior in such situations, as well as providing more force (through leverage, in part) for chopping blows. It is even possible that this change should be viewed, together with the adoption of the oval shield for both legionaries and auxiliaries, as indicative of a move towards a more close-order style of fighting for infantry. This is pure speculation, however, and there is little else to support such an observation, beyond references in inscriptions to legionary *lanciarii* and *phalangarii*. Nevertheless, the fact remains that there must have been a good reason for such a radical change in the equipment of the infantry during the 2nd and 3rd centuries AD.

OPPOSITE The 'Guttmann' Pompeii-type sword and scabbard components from the Rhine at Mainz, undated (Inv. No. IX.5583; Miks A467). Whether it was because of a Roman cultural affinity for the short sword or, as seems more likely, the sheer practicality of using a short sword in hand-to-hand combat, the legacy of the *gladius* lived on in the *semispathae*, as we suspect they were called, and perhaps too in larger *pugiones*. (Photo: © Royal Armouries IX.5583)

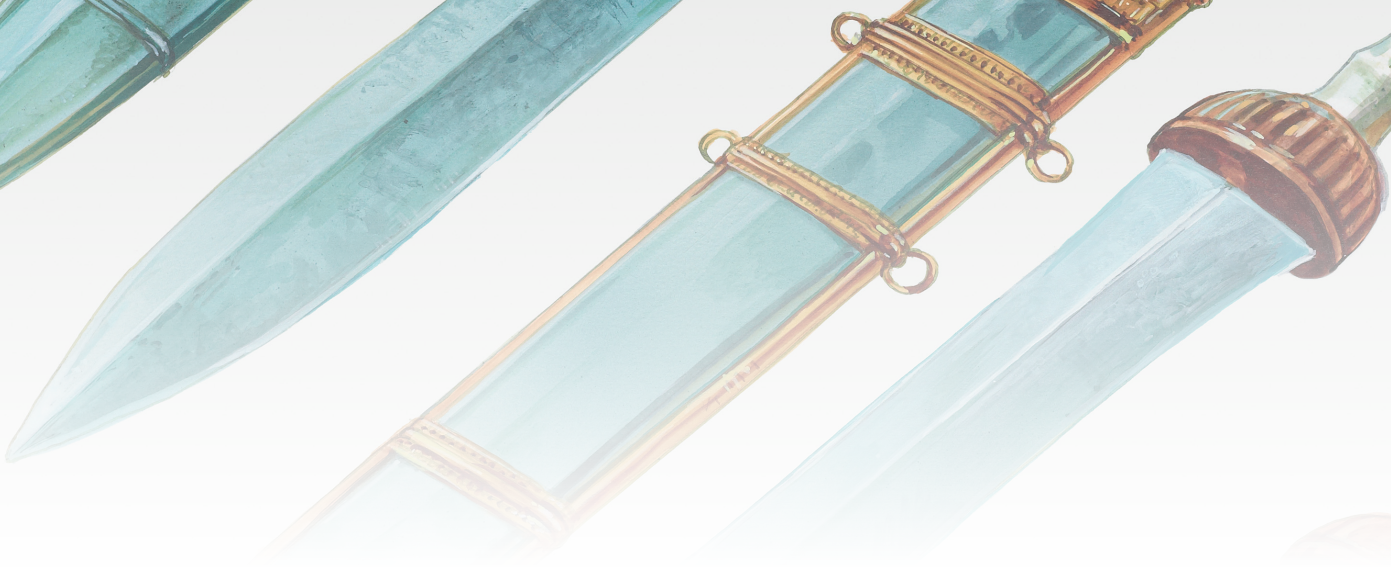
At any rate, it seems clear that the developments that saw the dual-purpose infantry and cavalry *gladius Hispaniensis* replaced by the Mainz-type sword and the 'Celtic' cavalry *spatha*, were in turn superseded by changes that led to them being reunited in the later *spathae* of the Lauriacum/Hromówka and Straubing/Nydam traditions.

The triumph of the *spatha* was far from complete, however. The longer blades were evidently more vulnerable than their shorter predecessors and occasionally broke. As has been discussed, many were then 'repurposed' as short swords, being given a new tip at the point of fracture. These swords have not unreasonably been identified with the *semispatha* mentioned by Vegetius, who describes them as shorter than *spathae*. Moreover, Thomas Fischer has pointed out that it may be no accident that it was during the 2nd century AD that a new, larger dagger (*pugio*) makes an appearance, continuing in use well into the 3rd century (Fischer 2014: 184). The angular, iron handles of such daggers were far less ergonomically designed than those of either the *gladius* or *spatha* and would be unsuitable for prolonged use in combat, but they may nevertheless have filled a gap left by the disappearance of the *gladius*.

SURVIVORS

Although there are only a handful of true *gladii Hispanienses* surviving, there are far more examples of the Mainz and Pompeii types of sword, the majority of which come from riverine deposits. Most of the major European museums along the Roman frontiers have at least one *gladius* and many have more. In Britain, the British Museum has two (the 'Sword of Tiberius' and the Fulham Sword, which actually came from Putney), as well as the Pevensey ring-pommel sword, while the Royal Armouries at Leeds has a fine example of a Pompeii-type sword, originally in the Guttmann Collection. The museums at Nijmegen, Xanten, Bonn, Strasbourg, Budapest and Zagreb can all boast one or more *gladii* each; but it is Mainz that has the finest collection, both in terms of originals (in the Landesmuseum) and facsimiles (in the Römisch-Germanisches Zentralmuseum). The Bay of Naples swords and fittings reside, appropriately enough, in Naples Museum. If the reader perceives that to be an uneven distribution around the Roman Empire, then that is indeed the case. It is unlikely that the southern and eastern provinces were not equally well provisioned with swords, but their survivors – with a few exceptions like that from Es Soumâa – still await discovery.

It is tempting to characterize the *gladius* as the sword that won Rome her empire and the *spatha* as the sword that lost it for her, but to do so would be a gross over-simplification of events. Complex forces were at work and it is just as plausible, and now quite fashionable, to see the Late Roman period as an evolutionary step towards the medieval world, rather than a 'decline' as such. For its part, the *gladius* had become irrelevant, reduced to being idolized by backward-looking commentators like Vegetius, who thought all the ills of his day could be solved by a return to past virtues. He would not be the last to think that way.



GLOSSARY

baldric strap for suspending a scabbard from one shoulder.

blade forged in one with the tang, that part of the weapon not enclosed within the handle.

caesim a cutting or chopping blow with a blade.

chape the bottom of the scabbard, where the point of the sheathed weapon rested.

cross guard bar below the hand grip and above the blade.

distal taper thinning of a blade from tang to tip.

falcata a 19th-century term for a single-edged Celtiberian sword.

forge welding heating separate pieces of ferrous metal and forging them together into one piece; also known as fire welding.

frame scabbard edged with guttering (q.v.) and held together with lateral bands that included suspension bands (q.v.).

frog button for attaching a scabbard to a belt.

fuller a longitudinal corrugation of the blade that both strengthens it laterally and lightens it. Sometimes (incorrectly) referred to as a 'blood channel'.

gladiarius sword smith.

guttering U-sectioned strips that bound the edge of a scabbard.

hand grip usually hexagonal-sectioned and shaped to receive the user's four fingers; made of organic material (wood, bone or ivory).

hand guard expansion below the hand grip that protects the hand of the user; made of organic material (wood, bone or ivory).

hand guard platemetal plate beneath the hand guard designed to protect it from blows.

handle the hand guard plate, hand guard, hand grip, and pommel assembly, fastened onto the tang by means of the peen block.

hollow ground whereby (in order to lighten it) a blade is given a convex surface between edge and midrib by means of grinding.

locket plate metal plate on the front and at the top of the scabbard (just below the mouth), often decorated.

machaira a Greek word for a cutting sword (Xenophon contrasted it to the *xiphos*), but which by the Roman period was used for any sword.

midrib the thickest part of the blade when viewed in section.

mouth the uppermost part of the scabbard.

mouth platevery top of the scabbard that opposed the hand guard plate when a sword was sheathed.

opus interrasile openwork decoration.

pattern welding forge-welding ferrous strips together and twisting them to form a blade.

peen block moulded copper-alloy knob used to fasten the handle components onto the tang; so called because the tip of the tang is peened over the block.

piling forge-welding ferrous strips (often of differing degrees of hardness) together longitudinally to form a blade.

point that part of the blade that narrows to the tip.

pommel swollen counterweight above the hand grip to provide balance for the sword; made of organic material (wood, bone or ivory).

punctim a stabbing blow with a blade; also a technique for making ownership inscriptions in dots with a punch.

Rfoot Roman foot of 296mm or 0.971 Imperial feet.

rudis double-weight wooden sword (singlestick) used to practise combat.

scabbard metal and organic sheath designed to contain and protect the blade when not in use.

shoulder the abrupt expansion from the tang to the blade.

singlestick wooden practice sword.

suspension band metal band that attached the suspension rings to the scabbard. The *gladius* invariably had two suspension bands, each with one suspension ring on either side.

suspension ring the point of attachment for the scabbard to a belt or baldric, fixed to the scabbard by means of a suspension band.

tang forged in one with the blade, that part of the weapon covered by the handle.

terminal knob a cast, bulbous fitting that united the guttering at the bottom of the chape.

tip the end of the blade.

top nut brass cap over (or acting as) the peen block.

waist the narrowing of the blade width on some earlier *gladii*.

xiphos Greek word just meaning sword, but which has come to mean a specific type of short sword used by the Romans before the *gladius*.

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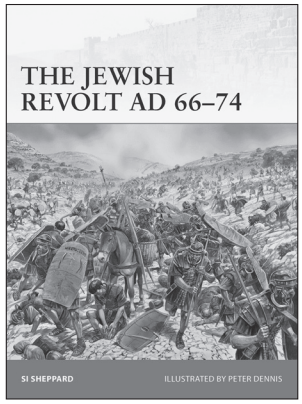

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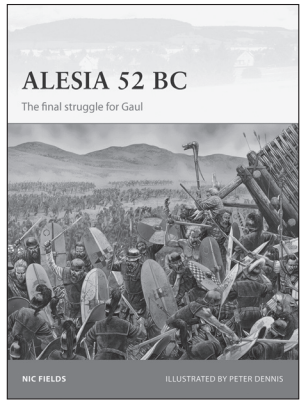

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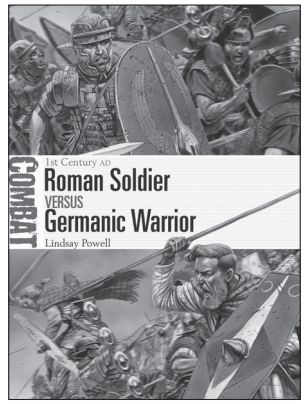

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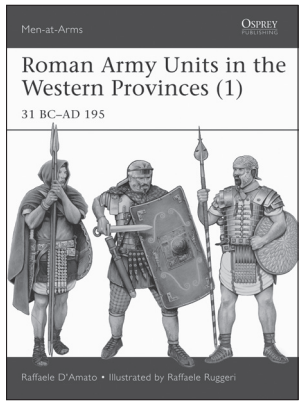

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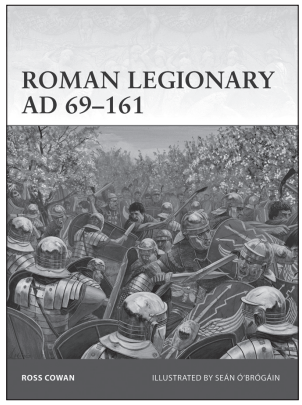

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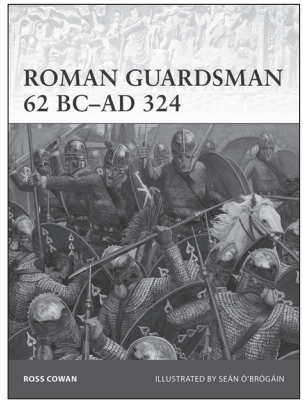

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