EAST ANGLIAN ARCHAEOLOGY

for my beloved wife, Julia

A Late Iron Age Warrior Burial from Kelvedon, Essex

by Paul R. Sealey

with contributions from
Brian Gilmour, Peter Northover,
Penelope Walton Rogers and Jacqui Watson

illustrations by
Sue Holden

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Cover illustration:
Slaves and cattle being paraded through an Iron Age village in Essex after a raid by warriors. Commissioned by Colchester Museums and painted by Peter Froste

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At Colchester Museums a project was launched to locate all the other finds from the grave, resolve questions of ownership, establish the circumstances of discovery, provide for an exhibition of the finds and produce a published report. This work programme was managed by two successive Curators of Archaeology, Peter Berridge and Philip Wise. Both were unwavering in their belief in the importance of the project and completion would have been impossible without their support.

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Penelope Walton Rogers wishes to thank Dr Allan R. Hall, English Heritage Research Fellow, Environmental Archaeology Unit, University of York, for information on botanical evidence from prehistoric Britain.

Summary

The Kelvedon warrior was buried *c*.75–25 BC on a slope overlooking a late Iron Age village in north-east Essex. Apart from the Arras Culture of Yorkshire, warrior burials are rare in Iron Age Britain: this makes the Kelvedon discovery a find of national importance. The Iron Age village at Kelvedon lay in territory occupied by the Trinovantes in the mid 1st century BC.

Acidic soil conditions had destroyed any human remains and it is not known if the rite was cremation or inhumation. The armaments included an iron sword, made from five separate rods of metal, which had been wrapped in linen and bent at the funeral, a bronze scabbard decorated with a strip of applied tin, an iron shield boss and an iron spear blade — also bent at the funeral — with ferrule. The other grave goods were a tankard with copper-alloy fittings, a bronze bowl from the Roman world, iron fittings from a plank-built wooden structure (but which was not a coffin), and two Aylesford-Swarling pedestal urns. Kelvedon is only the third Iron Age warrior burial from Britain with pottery. The start date of Aylesford-Swarling pottery is reviewed: it is present in graves from *c*.75 BC but does not displace middle Iron Age pottery on Essex settlement sites until at least *c*.50–25 BC. A single pot buried in an adjacent pit presumably represents a satellite grave.

The spear and shield boss from the warrior burial are of continental type and show that the warrior was in close touch with developments in weaponry on the European mainland. Fighting by warriors equipped with a panoply of sword, spear and shield developed on the mainland of Europe in the 3rd century BC. There was a significant timelag before its adoption in Britain: graves with such a combination of weaponry are not attested until the 1st century BC, at Owslebury and Kelvedon. In Britain, as in much of the rest of temperate Europe, such warriors fought alongside a numerically greater corps of spear warriors. Like the Kelvedon warrior, these spearmen included fighters drawn from the social elite.

Résumé

Le guerrier de Kelvedon a été enterré, vers 75–25 av. J.-C., sur une pente dominant un village de la fin de l'Age du Fer dans le nord-est de l'Essex. Hormis celles de la Culture d'Arras dans le Yorkshire, les tombes de guerriers sont rares en Grande Bretagne à l'Age du Fer: la découverte de Kelvedon a donc une importance nationale. Au milieu du 1er siècle av. J.-C., le village de Kelvedon faisait partie du territoire occupé par les Trinovantes.

Les sols acides ayant détruit tous les restes humains, on ne sait pas si la tombe était une crémation ou une inhumation. L'armement comprenait une épée en fer forgée à partir de cinq tiges de métal, enveloppée dans de la toile de lin et pliée au moment de l'enterrement, un fourreau en bronze décoré d'une bande appliquée en étain, l'umbo en fer d'un bouclier, une lance avec son armature en fer — également repliée lors de l'enterrement — et un talon. Le mobilier comportait aussi une chope à garnitures en alliage de cuivre, un bassin en bronze d'origine romaine, les clous d'une structure construite en planches de bois (il ne s'agit pas d'un cercueil), et deux urnes à pied de type Aylesford-Swarling. Kelvedon est le troisième exemple, seulement, d'une tombe de guerrier de l'Age du Fer avec céramique que l'on ait mise au jour en Grande Bretagne. L'auteur re-examine la date d'appartition de la céramique de type Aylesford-Swarling: on la trouve dans les tombes de *c.*75 av. J.-C., mais, sur les sites d'habitats de l'Essex, elle ne remplace pas la céramique du milieu de l'Age du Fer avant 50 av. J.-C. au plus tôt. Un pot enterré seul dans un puits voisin constitue probablement une tombe adventice.

La pointe de la lance et l'umbo de bouclier de la tombe de guerrier appartiennent à des types continentaux, et prouvent que l'homme était en contact étroit avec le développement des armes en Europe. Sur le continent, l'usage de la panoplie guerrière avec épée, lance et bouclier apparaît au 3e siècle av. J.-C. Un laps de temps significatif s'est écoulé avant son adoption en Bretagne: les tombes avec cette combinaison d'armes n'y sont connues qu'au 1er siècle av. J.-C., à Owslebury et Kelvedon. En Grande Bretagne, comme dans le reste de l'Europe tempérée, de tels guerriers ont combattu aux côtés d'unités, plus nombreuses, de guerriers équipés de lances. Ces hommes armés seulement d'une lance comprenaient des combattants issus de l'élite sociale, tels que le guerrier de Kelvedon.

(Traduction: Nina Crummy and Michel Feugère)

Zusammenfassung

Der Kelvedon-Krieger wurde ca. 75–25 v. Chr. an einem Hang über einem späteisenzeitlichen Dorf in Nordost-Essex in einem von den Trinovanten besetzten Gebiet bestattet. Mit Ausnahme der Arras-Kultur in Yorkshire sind Kriegergräber im eisenzeitlichen Britannien selten — dies macht die Entdeckung in Kelvedon zu einem Fund von nationaler Bedeutung.

Durch den säurehaltigen Boden wurden sämtliche menschlichen Überreste in dem Grab zerstört; es ist nicht bekannt, ob eine Brand- oder Erdbestattung durchgeführt wurde. Als Waffen waren ein Eisenschwert aus fünf separaten Metallstäben beigelegt, die in Leinen eingehüllt und beim Begräbnis gebogen wurden, eine bronzene Schwertscheide, die mit einem Streifen Zinn verziert ist, ein eiserner Schildbuckel und eine eiserne Speerspitze, die ebenfalls verbogen war. Außerdem wurden ein Gefäß mit Bronzebeschlägen, eine importierte Bronzeschale aus dem römischen Reich, eiserne Beschläge von einer hölzernen Plankenstruktur (wobei es sich nicht um einen Sarg gehandelt haben kann) und zwei Aylesford-Swarling-Urnen in dem Grab gefunden. Kelvedon ist erst das dritte eisenzeitliche Kriegergrab in Großbritannien, in dem Tonware gefunden wurde. Das Anfangsdatum für Aylesford-Swarling-Keramik wird diskutiert: diese Keramik erscheint in Gräbern von ca. 75 v. Chr., aber in Siedlungsfunden ersetzt sie die mittel-eisenzeitliche Keramik erst ab ca. 50–25 v. Chr. In einer nahegelegenen Grube wurde ein weiteres Gefäß gefunden, das wahrscheinlich auf ein Satelittengrab hindeutet.

Der Speer und Schildbuckel aus dem Kelvedon-Grab sind kontinentalen Typs und zeigen, dass der Krieger in engem Kontakt mit der Waffenentwicklung in Europa stand. Dort setzte sich der Brauch, mit Schwert, Speer und Schild zu kämpfen, im dritten vorchristlichen Jahrhundert durch. In Großbritannien trat diese Kampftechnik erst mit großer Verzögerung auf: Gräber mit Beigaben dieser Waffenkombination erscheinen erst im 1. Jahrhundert v. Chr. in Owslebury und Kelvedon. In Großbritannien und in dem übrigen Europa kämpften diese “Kelvedon-Typ” Krieger, umgeben von einer größeren Anzahl anderer Krieger, die nur mit Speeren bewaffnet waren. Wie der Kelvedon Krieger waren aber auch diese Speerkämpfer Mitglieder der gesellschaftlichen Elite.

(Übersetzung: Hella Eckardt and Gerlinde Krug)

Chapter 1. Discovery and Context

I. Introduction

This report puts on record the discovery in 1982 of a late Iron Age warrior burial at Kelvedon, a village in north-east Essex 16km south-west of Colchester. The burial was excavated by an amateur archaeologist and the finds were dispersed soon after the discovery. Although the documentation of the grave is meagre, the rarity of warrior burials in Iron Age Britain makes the find of some significance.

II. Source material for the excavation
(Pls 1–2)

The poverty of the documentation for the discovery of the warrior burial was aggravated by the death of the excavator in 1994. Bearing this in mind, some account should be given of the source material for the find.

The only surviving contemporary records are two colour slides of the discovery found by the writer among the effects of the late H.J.D. Bennett, who dug the grave (Pls 1 and 2). With them was a piece of paper (apparently a label for an exhibition of the three pots from the site) listing the contents of the warrior burial and indicating the presence of two graves.

Eighteen years after the excavation, the writer had the opportunity to interview the two people engaged in the gravel extraction that led to the discovery of the grave: the farmer David Bunting, and his farmhand Ivan W. Taylor. Their testimony proved to be of paramount importance, not least for establishing the findspot. Shortly after the warrior burial's discovery, Bennett told Chris Going (then of the Chelmsford Archaeological Trust) about it. Going made some notes of what Bennett had to say, which he kindly made available to the writer for use here. Interviews with K.A. Rodwell and the Bennett family also proved useful.

Records of these interviews and a photocopy of the Going MS are kept in the site archive at Colchester Museums.

III. Previous notices of the discovery

Brief notices of the Kelvedon warrior burial have already appeared (Anonymous 1984; Dent 1984, 123; Stead 1985a, 36, 39; 1985b, 44; Northover and Salter 1990, 110–13; Parfitt 1995, 155; Going 1996, 103; Northover 1995, 294; Sealey 1996, 58; 2006b; Niblett 2004, 30–1; Hunter 2005, 64; Stead 2006, 177).

In some of these sources the provenance of the grave is wrongly given as the neighbouring parish of Great Braxted (sometimes spelt in error as Great Braxstead). The confusion arose because the findspot lies close to the parish boundary, at some distance from the villages of Kelvedon and Great Braxted. The point is worth making in case future surveys should treat the Great Braxted and Kelvedon warrior burials as two separate discoveries.

IV. Excavation and provenance of the finds
(Fig. 1)

The grave was discovered in February 1982 at TL 8717 1782 when David Bunting was extracting gravel from the edge of a field to repair trackways on his farm (Fig. 1). The findspot lies just above the 40m contour and nowadays commands wide open views north over the countryside towards Kelvedon village. Working with Bunting was Ivan W. Taylor, a farmhand. Taylor told me how a complete pot (one of the pedestal urns) was brought up in the bucket of the mechanical excavator but inadvertently smashed before he could rescue it. When both men examined the hole, the sword could be seen in the ground.

They took no further action themselves but contacted H.J.D. Bennett (1916–1994), a retired police officer who lived in Kelvedon village. Jim Bennett had a keen interest in field archaeology; his contribution to fieldwork in Kelvedon and neighbouring parishes is recorded elsewhere (Hull 1963, 150; Rodwell and Rodwell 1985, x, 7–8, 19; Going and Rodwell 1987, 78; Rodwell, K.A. 1988, 1, 3, 12), and it was he who excavated the grave. He apparently made no written records while the excavation was in progress, nor was a plan made of the grave, but his awareness of archaeological technique ensured that the finds were retrieved with some care: I.W. Taylor described him to me as working 'with a trowel and brush'.

By now the pit dug for gravel, along with the burial, had flooded with ground water (Pl. 1). Undaunted by the danger, Bennett had himself lowered into the pit in the bucket of the mechanical excavator and was able to retrieve more finds and make some observations on the context. The bronze bowl had been placed inverted at an angle, suggesting that it had been leant against another object or the wall of the pit. It was between about 1m and 1.5m below the modern ground surface. The pit itself, from which the finds were retrieved, was steep-sided and some 2m square. In an attempt to locate everything from the grave, Bennett inspected those stretches of the adjacent farm tracks that had received gravel from the pit, but his efforts were in vain and it is clear from the lack of such items as scabbard suspension fittings that some of the contents of the grave had apparently been overlooked.

V. The local setting

The warrior burial was discovered on the southern edge of a farm track. Over the six winters prior to the discovery, the farmer had systematically extracted gravel from both sides of the track in the vicinity of the burial over a distance of some 150m. Nothing else came to light, then or subsequently. Nor did a search of the county Sites and Monuments Record by the writer uncover reports of anything else in the immediate area: there was no cemetery on the site. It looks as if the warrior burial and its satellite companion were isolated graves, as was the case with half of the other Iron Age warrior burials from Britain (Hunter 2005, 52).

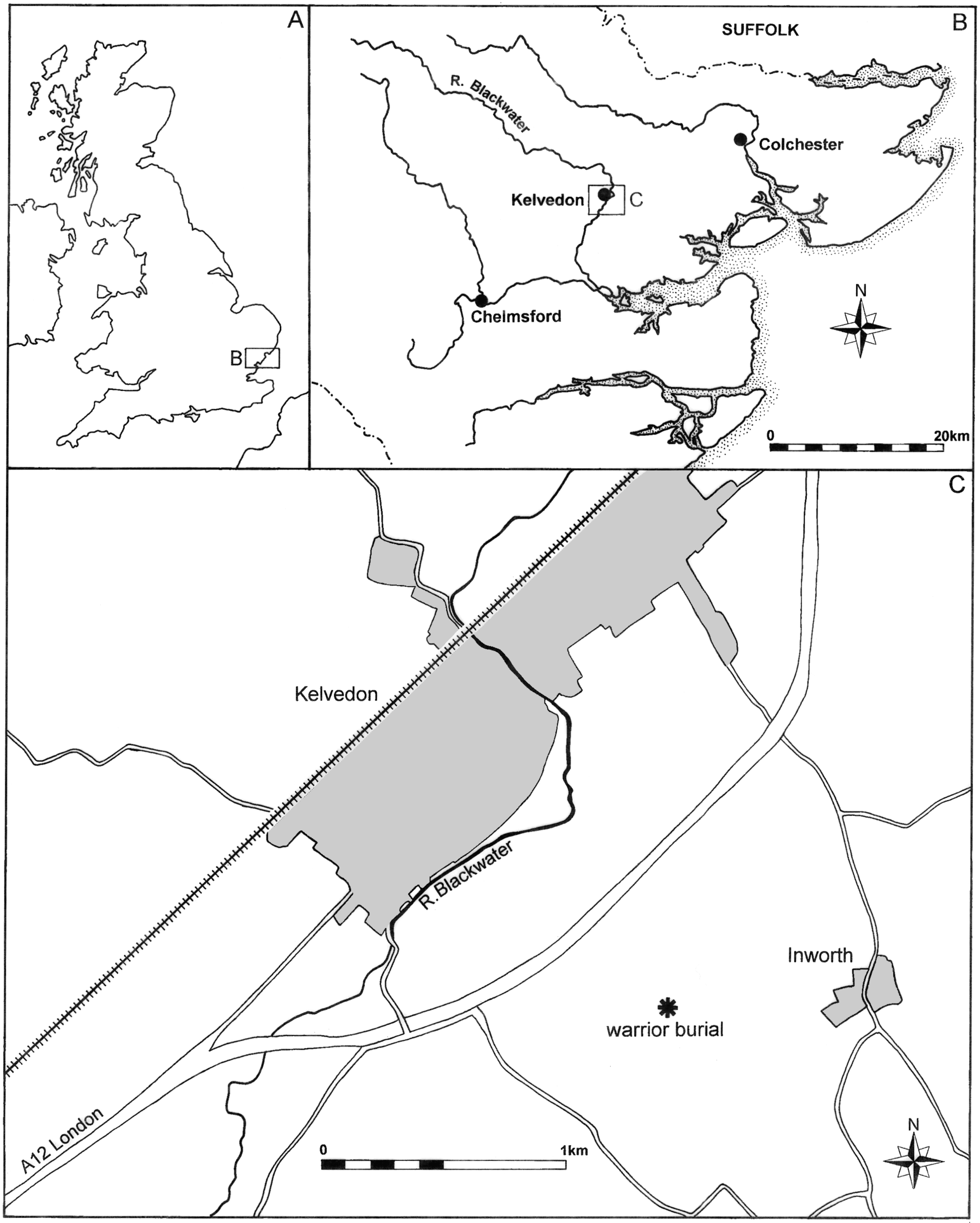


Figure 1 Location map

Plate 1 The scene when the Kelvedon warrior burial was discovered

Some 1.25km north-west of the warrior burial and beneath the modern village of Kelvedon, two roundhouses and five rectangular buildings have been excavated on a gravel and brickearth terrace above the flood plain of the river Blackwater. Some of these structures stood in ditched or palisaded enclosures. Not all these buildings are necessarily contemporary, but the impression given is one of late Iron Age occupation over an extensive area. A ditch backfilled in the Flavian period defended at least part of the settlement and marked the divide between the flood plain of the river Blackwater and the gravel terrace on which the Iron Age village was sited.

Occupation began in the first half of the 1st century BC, when middle Iron Age wares were still current. Italian wine in Dressel 1 amphoras reached the settlement and potin coins circulated in the village. Unusually for the region, there are assemblages of pottery transitional between middle and late Iron Age wares. Eventually imported Arretine and Gallo-Belgic pottery also reached the site. Finds of briquetage (fired clay salt-making equipment) point to links with the Essex coast. Activity in the decades preceding the Roman invasion is evident from coins of Cunobelin and abundant finds of developed Aylesford-Swarling pottery. The land to the south of the river has been a prolific source of Iron Age coins in recent years.

A coherent picture of settlement morphology remains elusive because of only piecemeal excavation in the area, but it is clear that Iron Age Kelvedon was a prosperous and thriving community that deserves continued exploration and research (Thompson 1982, 743–9; Eddy and Turner 1982, 6–10, 18, 26–31; K.A. Rodwell 1988; Clarke 1988; Ennis and Foreman 2002). After the Roman invasion, the site developed into the small town of *Canonium* (Burnham and Wacher 1990, 30, 48, 314, 317; Eddy 1995).

This may have been the home of the warrior laid to rest on the hillside overlooking the village. The villagers certainly took an interest in warfare: a unique late Iron Age pot from Kelvedon is decorated with at least one warrior or hunter (W.J. Rodwell 1973; 1988b *pace*; Creighton 2000, 211–12), and a graffito naming the war god Toutatis was scratched on another pot from a context dated *c*.AD 80–100 (Hassall 1988, 102 no. 1; K.A. Rodwell 1988, 127–8 no. 361).

Plate 2 The satellite grave with its pot

VI. The lack of human remains

No human remains were recovered by Bennett from the excavations. He expected them because he searched the two pedestal urns for cremated bone and established that none was present. Nor was any evidence of human remains found elsewhere in the pit. The acidic soil on the gravel terrain of the findspot is not conducive to the survival of bone and it is conceivable that none had survived, even if the grave were an inhumation. Skeletons from the Roman inhumation cemetery in Kelvedon village itself had entirely dissolved (K.A. Rodwell 1988, 26).

VII. Present location of the finds

Legal title to the finds was vested in the excavator, H.J.D. Bennett, with the consent of the landowner, David Bunting. After his death, ownership passed to his two sons, Paul R. and Robert H. Bennett. At present the finds are at Colchester Museums on long-term loan.

Chapter 2. Catalogue of Grave Goods

I. Sword

(Fig. 2, No. 1; Pls 3–4)

The sword is the La Tène III weapon defined for Gaul and Britain by Déchelette (1914, 1113–14, 1123–4). Piggott (1950, 3, 21–2) adopted the classification, and designated such weapons his Type V (Battersea) group. The diagnostic features of the group as exemplified by the Kelvedon fragments are the parallel sides to the blade. In his corpus, Stead (2006, 9, 177 no. 105) assigned the Kelvedon sword to his Type IV: weapons with blades 745–850mm long and with lenticular or flat sections and straight hilt ends. But the hilt end of the Kelvedon sword has not survived, so it could just as well be Stead Type III, weapons with lenticular or flat blades 703–870mm long with campanulate or convex hilt ends. Leaving aside these niceties of classification, a slender and lightweight sword like Kelvedon means we are dealing with a nimble weapon that could be easily handled, and deployed with some dexterity.

A commentary on the metallurgy of the sword

Very few Iron Age sword blades from Britain have been the subject of metallographic analysis because their owners and custodians are understandably reluctant to sanction a destructive analysis that must inevitably damage the weapon. In fact only about seventeen of the 283 swords in the Stead (2006) corpus have had the metallurgy of their blades examined, so the study of the Kelvedon blade by Dr Gilmour is a welcome addition to a modest database.

In the Iron Age it was standard practice to make a sword by welding together several separate lengths of metal, a technique known as piling (Lang 2006, 110). Each rod or strip of iron was produced from the sponge-like bloom of smelted metal by forging. This operation not only achieved the preliminary shaping of the metal, it also had the effect of removing slag from the bloom, making the metal less brittle (Ehrenreich 1985, 22, 74). It was easier to remove slag and work the iron if smaller, rather than larger, rods of metal were involved, and welding these rods together to make the sword evened out the effect of any localised strengths or weaknesses in each individual rod (Jones 2005, 145). Sometimes more than twenty individual strips of iron were used in the production of a single blade, as with the weapon from Waltham Abbey (Essex) (Lang and Williams 1975, 202–3; Stead 2006, 182 no. 139). Kelvedon, on the other hand, was made from only five rods of iron.

There were two ways in which an Iron Age blade was produced from its components. For some, the blade was made from thin bands of iron that ran across the sword — like a sandwich — from blade edge to blade edge (edge-to-edge layering); others were made from rods that ran from surface to surface (surface-to-surface banding) (Lang 1987, 62, fig. 1; reproduced here as Fig. 11). To begin with in Britain, Iron Age swords were made only by edge-to-edge layering; surface-to-surface banding developed later, and is first attested in the 3rd and 2nd centuries BC (Lang 2006, 113). Kelvedon has surface-to-surface banding in a blade that can be securely assigned to the 1st century BC and fits the chronology proposed by Lang.

Blades with a piled structure and surface-to-surface banding like Kelvedon would have had surfaces with a sinuous pattern that ran along the length of the weapon (McGrath 1968b, 420). In exceptional circumstances this streaky patterning is still visible on some blades (Stead 2006, 46–7). Piling was not confined to swords; it has been reported from a range of artefacts in the Iron Age, including currency bars, sickles, a spear blade and a ploughshare (Ehrenreich 1985, 65, 74; Tylecote and Gilmour 1986, 18, 22). Some of these artefacts would also have had a streaky surface finish. Although this finish was an inadvertent result of the fabrication technique, it is possible that it was deemed to enhance the attractiveness of the finished artefact as with the Orton Meadows (Cambridgeshire) and Melsonby (Yorkshire) swords (Lang 2006, 113, 93).

In my view there is no justification for describing Kelvedon and related weapons as pattern-welded; on this issue of terminology the writer reluctantly parts company with the position taken here by Dr Gilmour. When Maryon (1948, 76) coined the term pattern-welding, he reserved it for blades made from twisted rods of iron that were subsequently welded together. His usage has been followed ever since by scholars such as Anstee and Biek (1962, 71), Tylecote (1962, 250) and Pleiner (1993, 183–4). True pattern-welded blades are almost unheard of in the Iron Age; the technique does not become widespread until later centuries and presumably developed from simpler, piled structures like Kelvedon (Lang 1987, 70).

1. Two (non-joining) lengths of the iron sword blade survive; both have parallel edges. The longer of the two is 518mm long; the maximum width is 39.7mm. At one end, the pointed blade tip is discernible. Along the edge of the blade and 105mm behind the tip is a patch of mineralised textile 65mm long (Pl. 3). The far end of the blade has been bent through 30º and become detached from the rest of the sword. The blade section is lozenge-shaped, corroded in places to a more lentoid profile. Its maximum thickness at a point where it is least disfigured by corrosion is 10.6mm. All that survives of the shorter fragment is a curved length 260mm long. Midway along this fragment another patch of mineralised textile 65mm long can be seen wrapped over the blade edge (Pl. 4). Both patches of textile on the sword are linen (Chapter 4.IV). The combined length of both fragments is 778mm, so most of the sword blade is extant.

The weapon is corroded with a lumpy and uneven surface, parts of which are cracked with plate-like developments where some portions have become partially detached from the parent metal. Conservation of the weapon at Harlow Museum by R.W. Bartlett led to the identification of traces of mineralised wood (ash: *Fraxinus* sp). The wood was not present beneath the mineralised textile so it had not covered the entire blade. It cannot have been an organic component of the scabbard and was presumably another grave good that lay on part of the blade. All traces of this wood disappeared before transfer of the sword to Colchester Museums for further study.

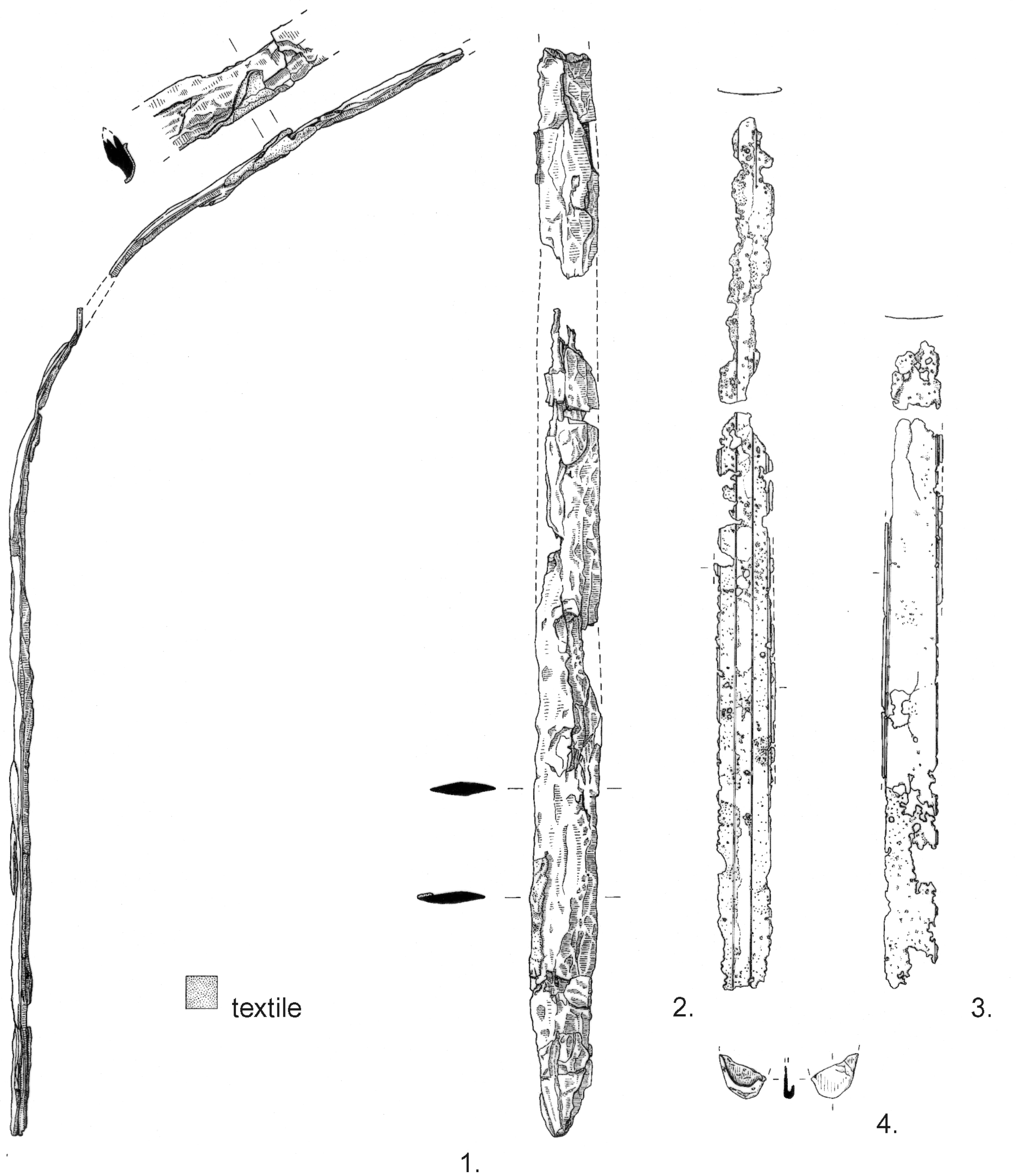


Figure 2 1, Sword blade (textile remains indicated by stippling); 2, scabbard front plate; 3, scabbard back plate; 4, chape. Scale 1:4

Plate 3 Textile impressions near the sword tip

Plate 4 Textile impressions on the sword blade

II. Scabbard and chape

(Fig. 2, Nos 2–4; Table 1)

The form of the chape and the decorative tin strip on one of the scabbard plates are without parallel in the corpus of Iron Age scabbards. As the interpretation proposed here for Kelvedon differs significantly from Stead (2006, 177), the weapon is discussed in some detail.

Iron Age metal scabbards on the mainland of Europe were made from two cambered (curved) plates (the front and back plate); one overlapped the other to effect a join between them (de Navarro 1972, 22). Metal scabbards in Britain were made in the same way (Stead 2006, 9). On some scabbards the front plate overlaps the back plate; on others, the back plate overlaps the front plate. The back plate forms the side of the scabbard from which it was suspended by a strap joining the weapon to the warrior's belt. To facilitate its suspension, the back plate was fitted with a metal loop that took the strap. This suspension loop was fixed to the scabbard plate by two metal plates (one at each end), the upper and lower loop plates. It is a matter for regret that the suspension loop and loop plates at Kelvedon have not survived. They may have been overlooked when the grave was excavated or had corroded away in the ground beforehand. As they are not present, we cannot be sure which plate at Kelvedon is the front plate and which is the back plate. Here the view is taken that the plate with the decorative tin strip was the front plate because the tin strip would be more readily seen that from standpoint, although one concedes that back plates were sometimes elaborately decorated.

To help resolve the matter, data on scabbard construction was compiled from the Stead (2006) corpus. In the cases of sixty-nine scabbards, Stead was able to decide which plate had the overlap. When the data had been assembled, the scabbards were divided into two broad geographical groups along the lines suggested by Stead himself, one (the south) for Wales and English counties south of Lancashire and Yorkshire, and another (the north) for Scotland and northern England (Table 1). The boundary between the two regions is the river Humber. Long swords were not adopted north of the river, and weapons of medium length were still in use there at the time of the Roman conquest so the boundary selected is not an arbitrary one (Stead 2006, 5).

For middle La Tène weapons at the site of La Tène itself in Switzerland, most scabbards have a front plate that overlaps the back plate (de Navarro 1972, 22). Most of the scabbards at Gournay-sur-Aronde (Oise) also have the front plate overlapping the back plate (Lejars 1994, 27). Britain followed suit because 65% of the scabbards there have a front plate that overlaps the back plate. But closer scrutiny reveals marked regional differences: exactly three-quarters of the scabbards south of the Humber have a front plate that overlaps the back; in the north, the percentage falls to 35%. It is interesting that the two major traditions of swords that Stead identified in Britain (one north of, and the other south of the Humber) are reflected in scabbard construction.

Northern scabbards with a front plate overlapping the back plate	6
Northern scabbards with a back plate overlapping the front plate	11
Southern scabbards with a front plate overlapping the back plate	39
Southern scabbards with a back plate overlapping the front plate	13

Table 1 The geography of scabbard construction (after Stead 2006)

The implications for Kelvedon, where the scabbard plate with the tin strip has an edge with an overlap, are clear. We have seen that in the south of Britain, most scabbards have a front plate that overlaps the back. This does not prove that this was the case with the Kelvedon weapon as well, but it lends weight to our suggestion that the tin strip does indeed run down the front plate of the weapon.

This leads to the issue of the tin strip itself. Stead (2006, 177) takes the view that it was solder which attached a (missing) lower loop plate to the scabbard. Were this the case, it would mean that the scabbard was unfinished or that the loop plate had been removed in antiquity. It seems unlikely that an unfinished weapon would have been placed in the grave. Nor can one find any signs of damage to the tin strip where a loop plate might have been wrenched away from the scabbard. On the contrary, the edges of the tin strip are perfectly straight and the surface is smooth. Conclusive evidence that the strip is decorative comes from metallurgical analyses which show that the surface is unreacted tin (Chapter 4.I). As such, a scabbard front plate decorated with a plain tin strip is unique in Iron Age weaponry. But two of the copper-alloy scabbards in the South Cave (Yorkshire) Flavian weapons hoard had panels of tinned decoration which were apparently designed to create a contrast between the gold of the copper-alloy panels and the white finish of the tinned surfaces (Evans 2006, 574–5) along the lines suggested for Kelvedon.

When the craftsman who made the Kelvedon scabbard decided to decorate it with the tin strip that runs the length of the weapon, he might have been influenced by the strip-like lower loop plates on scabbards like Isleham (Cambridgeshire), Bardney (Lincolnshire) and Congham (Norfolk) (Stead 2006, figs 75–77) although these loop plates are on the back plate, and the Kelvedon strip is more likely to have been on the front plate. Weapons like Little Wittenham (Oxfordshire) and Hunsbury (Northamptonshire) (Stead 2006, figs 65 and 68) have front plates with a midrib defined by flanking grooves that run the whole length of the scabbard; such scabbards may also have been one of the points of departure for the unique decoration of the Kelvedon weapon.

The scabbard chape is also without parallel, although its rounded end recalls the terminals of Stead Type E scabbards, weapons without a chape where the scabbard end is formed by amalgamating the front and back plates (Stead 2006, 11). A true chape is a separate item that fits over the end of the scabbard to hold the front and back plates together. Analysis of the Kelvedon chape shows that it is a leaded bronze, and therefore a casting; the lead was added to promote the flow of molten metal in the mould. The alloys of the scabbard plates and chape at Kelvedon are distinct, with unleaded bronze used for the plates and a bronze with lead for the chape, so we can be sure that the item described is not simply the amalgamation of the front and back plates of the scabbard. A similar distinction obtains for Iron Age mirrors where unleaded bronze was used for the mirror plates and leaded bronze for the handles (Farley 1983, 287; Craddock 1983). Confirmation that the chape was cast comes from the thickness of the metal; it is far thicker than one would expect had it simply been a union of the front and back plates. Bearing in mind the unusual form of the chape, care was taken to establish if the curved edge shown on one face just inside the end was original. Examination under binocular microscope by Dr J.P. Northover at Oxford and by Emma Hogarth and Anne-Maria Bojko at Colchester Museums showed that it was indeed an original edge rather than ancient or modern damage, presumably to expose to view more of the tin strip on the front plate.

2–3. The scabbard plates survive as six bronze fragments with an applied tin strip running along one plate, the front plate. It should be noted that the drawings of the scabbard plates show the front plate from the outside and the back plate from the inside. A full report on the metallurgy is given below (Chapter 4.I). The longer of the two lengths of the back plate of the scabbard is 35.3mm wide and 353mm long. Its surface is plain, with two parallel grooves running along the inside of each edge. What survives of the front plate of the scabbard are two lengths of plate, 358 and 177mm long respectively, giving a scabbard at least 535mm in length. Running along part of one edge are two parallel grooves; traces of a groove can also be seen in the corroded opposite edge. Along the middle of the scabbard is a raised strip 10mm wide with straight parallel sides which analysis shows to be a length of applied tin. Parts of both edges of the longer length of the front plate are curved to provide the overlap with the back plate. The presence of both curved edges allowed the original width of the scabbard to be established as 38mm. A tiny fragment of straight u-shaped copper-alloy (not illustrated) 24.4mm long has one finished edge where the front and back plates overlapped.

The condition of the scabbard is poor. Much of the edge has been eaten away by corrosion and there are holes through the front and back plates. Pitting across parts of the surface is extensive. No trace survives of any organic lining and bearing in mind the slender dimensions of the scabbard, it is unlikely to have had one. The scabbard is about 2mm narrower than the present maximum width of the sword but this discrepancy can be explained by expansion of the iron from corrosion after burial. One of the scabbards in the South Cave (Yorkshire) hoard had split as a result of the expansion of the iron blade it housed (Evans 2006, 575); and even within living memory, there have been changes in the size of some other Iron Age swords (Stead 2006, 2). There are no iron corrosion products on the inside of the Kelvedon scabbard, showing that its sword had been removed at or before the funeral. Although the front and rear plates have been slightly bent out of true, the damage is not pronounced enough to suggest the scabbard had been deliberately bent at the funeral. Nothing survived of the suspension arrangements for the scabbard.

4. The scabbard terminated in a cast leaded-bronze chape with a plain rounded tip. Its front face has a deep u-shaped aperture with an original edge. The chape is 30.9mm long, 24.1mm wide and 6.2mm deep. Its metallurgy is described below (Chapter 4.I).

III. Dagger or short sword

(Fig. 3, No. 5)

The fragment presumably came from a weapon broken when the grave was disturbed by the mechanical digger; the rest might have been destroyed or lost at the same time. It is impossible to say if the weapon was a second long sword, a short sword or a dagger, although the modest size of the surviving fragment might suggest the last (which is what the excavator thought).

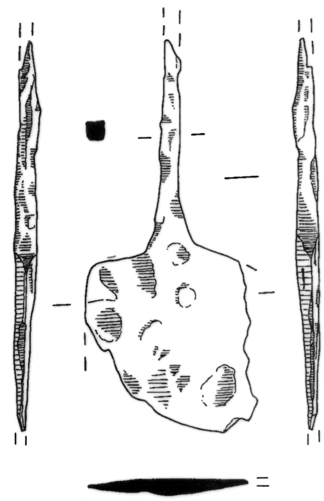


Figure 3 5, Dagger or short sword fragment
Scale 1:2

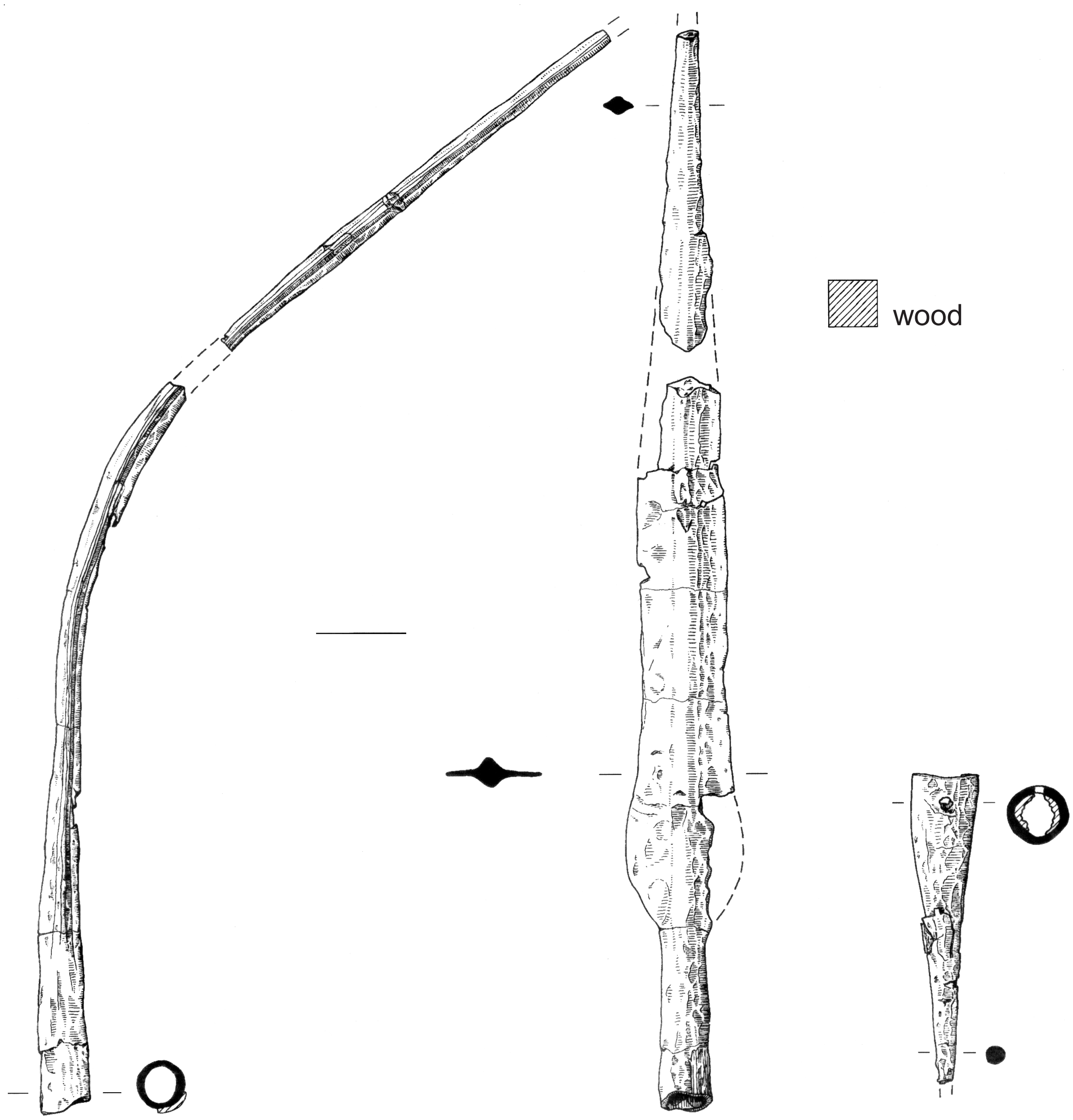
Short swords or daggers with blades some 30cm long are found in the Iron Age from the 5th century BC onwards, but they played a subordinate role to swords (Stead 1991a, 71; 2006, 5, 72–3; Jope 1993). A dagger was present in the late Iron Age weapons hoard from Essendon (Hertfordshire) (Hunter 2005, 59). It was unusual for an Iron Age warrior to be laid to rest with two or more swords. The only instance from Britain is a middle Iron Age grave from North Grimston (Yorkshire) where two swords were present, a longer and a shorter weapon (Stead 1979, 37 citing Mortimer 1905, 354–7). Across the Channel in Gaul, the *c*.20–10 BC warrior burial at Fléré-la-Rivière (Indre) had three swords (Ferdière and Villard 1993, 58, 60–1).

5. An iron fragment 103mm long has a short 55mm tang with a rectangular section, widening towards the blade end. At the base where it joins the tang, the blade is 40.2mm wide. Both wings of the blade thicken towards the middle, showing that the artefact was double-edged. The maximum width of the blade is 43.3mm.

IV. Socketed spear blade

(Fig. 4, No. 6; Pl. 5)

Spear blades from Iron Age Britain have not been the object of detailed and comprehensive study (Stead 1991a, 74). Despite a lack of standardisation in their typology, it is apparent that the field is dominated by relatively short and leaf-shaped blades, not always with a midrib to judge by the Yorkshire (Stead 1991a, 75) and Fiskerton (Lincolnshire) examples (Stead 2003, 59). By any standards the Kelvedon spear is exceptional. Not only does it have a ferrule, but the length of the spear blade (at least 529mm) and its size made it a formidable weapon quite different from the spears in general use. Spear blades of Kelvedon dimensions were rare in Iron Age Britain, although one from the Llyn Cerrig Bach (Anglesey) hoard was even longer (Savory 1976, 57 nos 17–14, fig. 26 no. 2). Another, from a hoard at Essendon (Hertfordshire), was some 550mm long (I.M. Stead, pers. comm.) Kelvedon would be more at home amongst Gaulish



6. 7.

Figure 4 6, Spear; 7, ferrule. Scale 1:3

weaponry, where spear blades are long and slender more often than not (Lejars 1996, 96). There, too, will be found parallels for the waisted profile of the Kelvedon blade. Similar spear blades have been reported from Alesia (Côte-d'Or) (Sievers 2001, pl. 55 no. 187) and, further afield, from Jutland (Hedeager 1992, 167). It is also unusual for a British spear blade to have a socket that extends into the midrib like ours; such a feature is more typical of Gaulish weaponry (Stead 1991a, 74–5; Major 1998, 83) and provides a further link between Kelvedon and the mainland of Europe. It seems reasonable, therefore, to regard this blade as the product of a mainland armourer. Kelvedon is not alone as a mainland European product: the 'flamboyant' spear blade from the hillfort on Bredon Hill (Worcestershire) (Hencken 1938, pl. 7, 13, 42, 75–6) looks like another import.

In Gaul the ancestry of the Kelvedon spear blade can be found in a group of long spears with bayonet-like blades and waisted profiles from the sanctuary at Gournay-sur-Aronde (Oise). Such blades are Rapin Type IV. On the basis of the vertical distribution of weaponry in the ditch north of the entrance at Gournay, these spear blades appeared late in the sequence and were current from *c*.225 BC (Rapin 1988, 117, 124–6, 132, 134, pl. 42 no. 424, pl. 44 no. 1372, pl. 50 no. 3814).

A commentary on the ash wood in the spear blade socket

Different woods have different properties, some of which had been discovered in prehistory through centuries of trial and error (Coles *et al*. 1978, 25–6). Ash is a tree native to Britain (Rackham 1980, 204) that gives a strong and resilient wood, well capable of withstanding sudden jolting shocks of the kind a spear shaft would suffer: this explains its role as the commonest wood for spears down to the modern cavalry lance (Edlin 1956, 182; Rackham 1980, 206; Chabal 1990, 98).

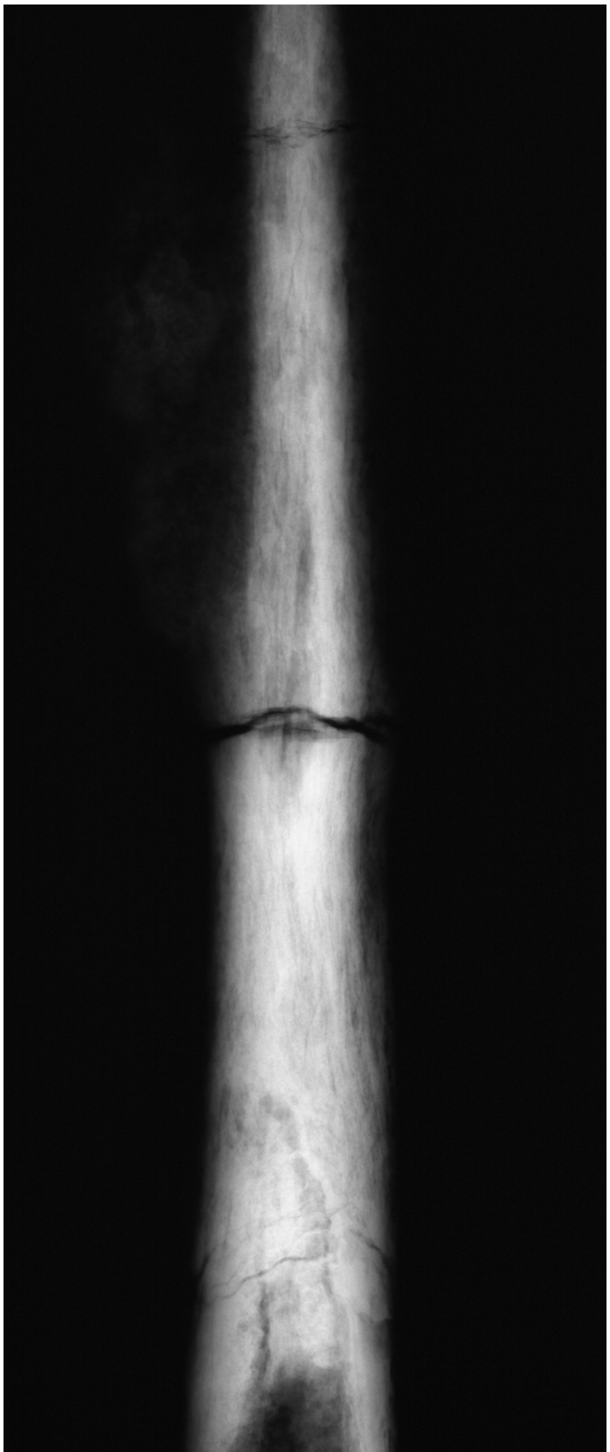


Plate 5 X-radiograph of the spear, showing the socket extending inside the blade

These properties of ash were appreciated at least as early as the middle and late Bronze Age. Sixty per cent of the Bronze Age spear blades and ferrules from Britain dated by radiocarbon had shafts of this wood (eighteen blades and ferrules out of a sample of thirty) (Needham *et al*. 1998, 61–5, 69–70). This correlates well with other evidence. Sixty-nine per cent of the prehistoric wooden spears from the British Isles were ash (twenty-seven out of a total of thirty-nine spears) (Coles *et al*. 1978, 25, 34–42). Green cites twenty Neolithic and Bronze Age spear shafts from the British Isles, nine of which are ash (being 45%). He notes, as well, that the wood was used for spear shafts on the mainland of Europe (Green 1980, 140 with refs). Taylor (2003, 45) reports ash in five of the eleven Iron Age spear blades with preserved wood from Fiskerton and notes its presence in other spears of the period. It is all the more surprising, then, that only two of the twelve spear blades with surviving wood from the Yorkshire Iron Age graves had ash (Stead 1991a, 75). Eventually its suitability for spears was celebrated in poetry in early medieval England and Wales (*Beowulf* 328–31; Fox 1945, 12).

6. The spear blade consists of two separate lengths of iron blade that do not join. The larger is 317mm long and bent; the shorter is 212mm and straight. The socket is oval in section with a maximum diameter of 22.25mm. Originally the maximum width of the blade would have been some 50mm and the length of the entire spear head would have been in excess of 529mm. At the socket end, the surviving blade wing curves in slightly towards a prominent lozenge-sectioned midrib to give a gently waisted outline. The midrib runs the entire length of the blade. Neither the end of the socket or the tip of the blade has survived. Mineralised wood inside the socket means that unaided examination cannot now establish how far the socket extended into the blade but x-ray photographs show that it runs right up into the midrib (Pl. 5). Wood preserved inside the socket and on the outside of the blade has been identified as ash (Chapter 4.III).

V. Ferrule

(Fig. 4, No. 7)

Iron ferrules like the one from Kelvedon were rare in Britain in the Iron Age (Sellwood 1984, 354), and antler ones rarer still (Britnell 2000b). No definite example of a ferrule has been reported from the Yorkshire Arras Culture graves, where spear blades were common (Stead 1991a, 74–8). The only other warrior burial from Iron Age Britain with spear blade and ferrule is Owslebury (Hampshire) (Collis 1968, 25; 1973, 126–7). At Ribemont-sur-Ancre (Somme), spears fitted with ferrules were easily outnumbered by those that were not, and they seem to have been a specifically elite weapon (Lejars 1998, 235). At Gournay-sur-Aronde (Oise) the position is rather different: as many as two out of three seem to have had ferrules (Rapin 1988, 102, 104).

Chronology

Ferrules from the 52 BC Alesia (Côte-d'Or) battlefield deposits were typically 50–110mm in length, longer than earlier, middle La Tène specimens in Gaul. In view of this, Sievers (2001, 168) suggested that ferrule length has some value as a chronological indicator. At 132.5mm, the Kelvedon ferrule is even longer, which suggests it belongs late in the sequence; this accords well with the other evidence indicating a date in the 1st century BC for the grave.

Function

It has been suggested that ferrules sometimes capped digging sticks and crowbars (Cunliffe and Poole 1991, 351), but at Kelvedon and elsewhere the associations are martial, and a weapon accoutrement is implied.

In flight the ferrule gave the spear improved balance (Ritchie and Ritchie 1985, 45). It allowed the spear to be stuck upright in the ground when not in use, while at the same time protecting the butt end of the wooden shaft from damage or damp in the ground. Polybius (*Histories* 6.25) explains how spears were fitted with ferrules in the Roman armies of the Republic so that if the shaft snapped in combat, the butt end could still be used as a weapon. Indeed, a pointed ferrule makes the spear a lethal weapon at both ends. It could kill or maim wounded opponents on the ground with a backward thrust while keeping the spear blade pointed towards the enemy line in an advance, as well as affording some defence against attack from the rear or flanks (Anderson 1991, 24; Hanson 2000, 84–5).

The pointed ferrule of the Kelvedon spear would certainly have been well-suited for warfare. It is no coincidence that some of the iron umbos at the Gournay-sur-Aronde (Oise) sanctuary had been pierced by both spear blade *and* ferrule (one could tell which from the different profiles of the cuts) (Rapin 1988, 47, 53, pl. 24 no. 1980). Damage to some of the ferrules from Alesia (Côte-d'Or) is also consistent with their use in combat (Sievers 2001, 168).

7. The iron ferrule is 132.5mm long; the socket is circular in section with a diameter of 27.2mm. Just below the mouth there is a circular hole for a (missing) rivet, peg or nail. Part of the mouth is absent and the tip has not survived. The ferrule is bent slightly out of true, presumably through use rather than as part of the funerary rituals.

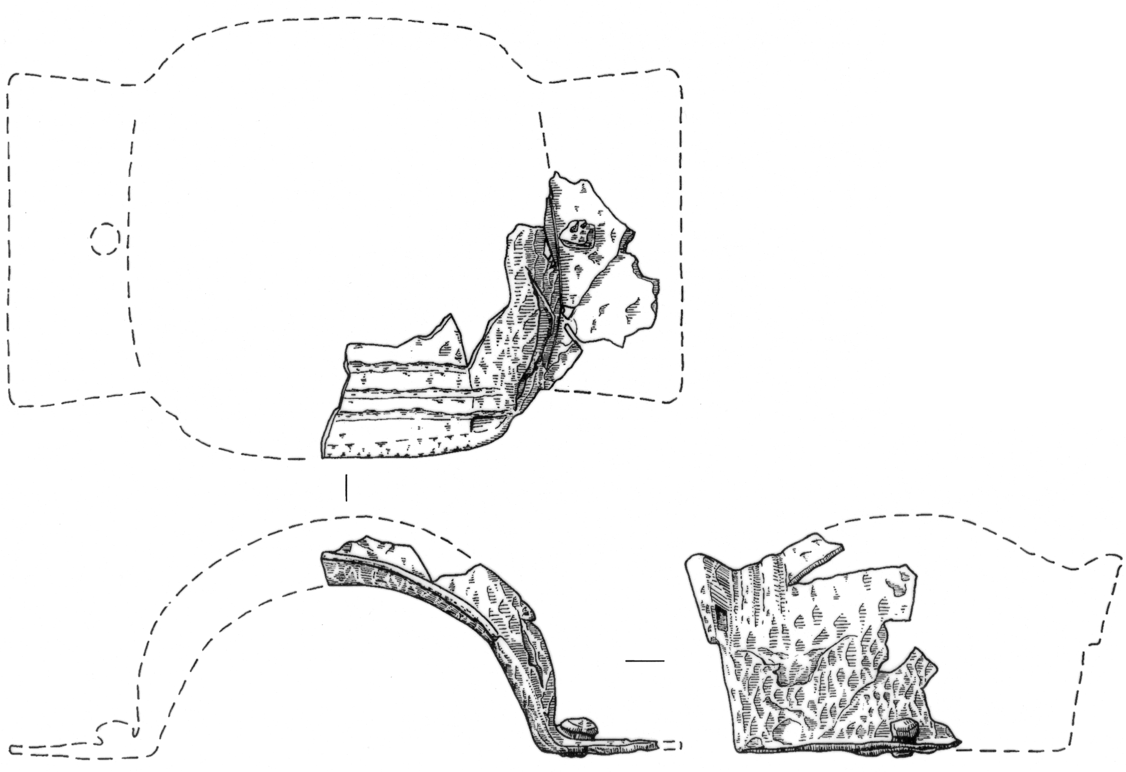
VI. Shield boss

(Fig. 5, No. 8)

The boss was examined by Dr I.M. Stead when it was at Harlow Museum and its affiliations are described by him in his discussion of the Battersea shield (Stead 1985a, 36–9). Since then our understanding of these band-shaped umbos has been transformed by the publication of the 220 or so from the Gournay sanctuary, the largest single collection from Iron Age Europe (Rapin 1988, 8–84). Most examples of band-shaped umbos are iron, but there were two copper-alloy ones in the Alesia battlefield deposits. It is clear that the Kelvedon umbo belongs at the end of the series because the flange edge to the boss is a late feature that becomes more and more pronounced with time (Sievers 2001, 143). Chronologically the last two band-shaped umbos in the Rapin classification are his Types V and VII. Kelvedon cannot belong with Rapin VII because the aperture at the edge of the boss is too big. The number and size of the rivets point to Va, although the Kelvedon boss cannot have reached the 80mm minimum height for the Va boss (Rapin 1988, 78, 81).

Band-shaped bosses were present at Gournay from the start of activity there *c*.280/260 until the cessation of weapon offerings *c*.140/120 BC. They were ubiquitous across large tracts of temperate Europe. Movements of Celtic war bands introduced them to lands further afield. Sculptures from Pergamon in Asia Minor completed by 181 BC show three different kinds of band-shaped boss on Celtic shields, even including details such as the rivets (Rapin 1988, 16, 74; de Navarro 1972, 316 for the date of the sculptures). These famous images are by no means the only representations of shields with these bosses. Band-shaped bosses remained the most common type of umbo until the time of the Gallic Wars. At Alesia, seventeen of the twenty umbos are band-shaped (Sievers 2001, 143). After the conquest of Gaul the band-shaped umbo was displaced by circular types such as the conical boss in the *c*.30–15 BC Grave A at Goeblingen-Nospelt (Thill 1967, Taf. 3 no. 6, 98), and the type seems to have been defunct by the end of the century.

Four iron band-shaped umbos have been reported from Iron Age warrior burials on Guernsey in the Channel



8.

Figure 5 8, Shield boss. Scale 1:2

Islands (Cunliffe 1996) but Kelvedon remains the only iron example from the United Kingdom. There are two copper-alloy examples in England, from the warrior burial at Owslebury (Hampshire) and the Claudian Welwyn-type burial of Stanfordbury A (Bedfordshire). Owslebury has a central spike on the boss and is a rare hybrid of the band-shaped and the circular umbo (Collis 1973, 127–9). If the fragment from the Stanfordbury grave is indeed a similar hybrid, it is a late survival (Dryden 1845, 16 no. 4; Lethbridge 1954, 29; Stead 1985a, 39).

8. All that survives of the iron shield boss is a fragment 76mm wide and 87mm long that stands 61mm high. It was attached to the shield by a single rivet placed centrally on each of the two wings, only one of which has survived. The head of the rivet is 11.7mm across. None of the wing edge is present and its form cannot now be established. The boss is a hoop of metal with open sides rising from the wing. In antiquity these hoops fitted over a wooden rib or spine that ran the length of the shield. Some way up the edge of the hoop there is a flange edge that rises steeply from the side of the umbo and splays outwards; running alongside the boss next to the flange are three parallel corrugations.

VII. Tankard fittings

(Fig. 6, Nos 9–10; Pl. 6)

The tankard is represented by a cast copper-alloy handle and two copper-alloy rim fragments.

Function

Iron Age tankards were stave-built wooden mugs with copper-alloy handles; some were covered wholly or in part with copper-alloy bands or sheeting. Tankards were used for a local drink, sometimes described as Celtic beer (Corcoran 1952, 86; Fox 1958, 108). But there was no beer until the Middle Ages when hops were used to flavour drinks, and ale (or possibly mead) are better candidates for the beverage in question; in antiquity this ale was known as *cervesia* (Sealey 1999, 123; 2004a, 30).

With a diameter of only some 90mm, the Kelvedon tankard is the smallest known and at first sight the handle almost looks like a miniature. This is consistent with the depth of the handle which is only big enough to take a single finger, unlike some others which would take two or three (Corcoran 1952, 88). With larger handles the fingers were intended to enter the handle loop and grasp the vessel wall (Jackson 1990, 45; 1996, 263).

Tankard corpora, distribution and chronology

Corpora of tankards and their handles have been compiled by Corcoran (1952) and MacGregor (1976, 147–9, 166–7). Some further examples are described by Jope (2000, 130–1); at least forty tankards (or their handles) are now known.

Tankards are found throughout Britain, with one example from Ireland. Most come from the south of England, with concentrations centred on Dorset and on a wide tract of country north of the lower Thames running from the margins of East Anglia, south and west through Essex, Hertfordshire and neighbouring counties.

They developed in the 1st century BC and survived until well into the Roman period in Wales, the north of England and Scotland, when there was a steady dilution of their original aesthetic towards plainer versions. These drinking vessels owe nothing to fashions on the mainland of Europe. The Ornavasso tankard from Italy, along with a few related pieces, such as a bronze handle from Basle,

Plate 6 Tankard handle

should now be acknowledged not as continental prototypes (*pace* Corcoran 1952, 90) but as insular products that found their way overseas (Feugère 1991, 128–9).

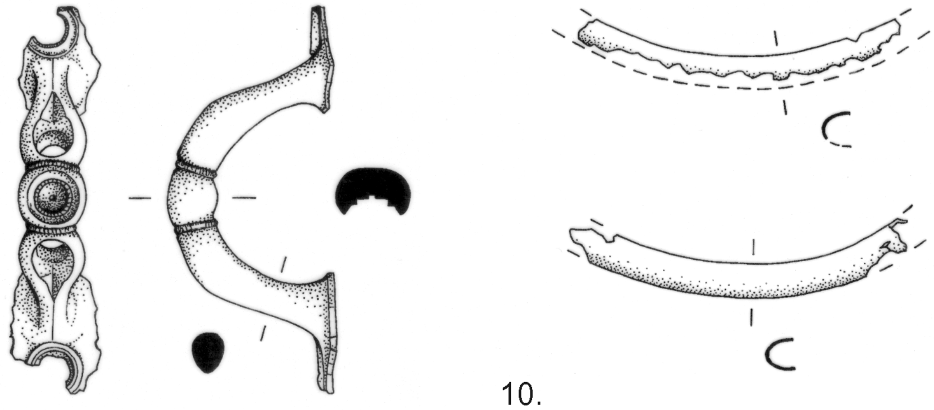
Classification

There is no satisfactory classification of tankard handles (Jackson 1990, 44–5). The difficulties of the Corcoran (1952) system were made apparent by Corcoran himself when he wrestled with the handle from Puddlehill (Bedfordshire) (Corcoran 1957). Others had the same difficulty with new discoveries (Simpson 1972, 330). The Corcoran scheme is in fact unworkable, as Spratling has explained (Davies and Spratling 1976, 133, 146 n. 51). It is not that the sample available for study is too small, rather that the originality and imagination of the smiths who made these handles was such that very few of them have much in the way of precise typological congruence. Like so many others, Kelvedon is an individual creation with only distant echoes among the tankard corpus.

The tankard handle and mirror art

The Kelvedon tankard handle exemplifies the similarities between some tankard and mirror handles (Corcoran 1952, 90; Jackson 1990, 45 citing Spratling 1972, 210–11). Although it is shorter, smaller and flexed, the Kelvedon handle is more than reminiscent of mirror handles with elongated open loops joined by transverse mouldings. Such handles are to be found amongst those of type Fox IIIb (Fox 1949, 32–4). The mirrors in question are Akenham (Suffolk) (Martin *et al*. 1998, 209, fig. 50), Aston (Hertfordshire) (Rook *et al*. 1983, 23–32; Craddock 1983), Dorton (Buckinghamshire) (Farley 1983, pls 31–6, 281–9), Colchester I (Fox and Hull 1948), Great Chesterford (Fox 1960) (both Essex) and Old Warden I (Bedfordshire) (Spratling 1970).

These links between a group of south-eastern mirrors and the Kelvedon tankard handle are a pointer to where the tankard was fabricated. Viewed from the side, the beading around the central moulding on the tankard handle runs not parallel but in converging lines. Exactly the same quirk of style is found on the handle of the copper-alloy cup in the Colchester I mirror burial (Fox and Hull 1948, 135–6). If indeed the same *atelier* was responsible for both tankard and cup, the likelihood must be that it was located in north-east Essex.



10.

9.

Figure 6 9, Tankard handle; 10, tankard rim. Scale 1:1

The date of the tankard handle
The familial relationship between the Kelvedon tankard handle and the mirror handles cited above has implications for the date of the tankard. The Akenham, Great Chesterford and Old Warden I mirrors are unassociated and cannot advance the argument, but those from the Aston, Colchester and Dorton graves are datable.

Aston was assigned to the second half of the 1st century BC on the basis of its Aylesford-Swarling pottery (Rigby 1983), although the upper limit could now be adjusted back to *c*.75 BC (p.31). The two mica-dusted flagons in the grave of the Colchester I mirror are central Gaulish products of form *Cam*.131. Such flagons are not represented at the adjacent Sheepen site, where occupation began *c*. AD 5 (Sealey 1985, 108) and where the quantity of pottery recovered gives the absence of forms a chronological significance. This suggests a date for the grave in the 1st century BC before the foundation of Sheepen. Central Gaulish ware was also present in the Dorton grave. One of the two central Gaulish flagons has a grooved rim (Rigby and Freestone 1983). Similar rims are not found in the King Harry Lane (Hertfordshire) cemetery (Stead and Rigby 1989), and their absence suggests a 1st-century BC date for the type. This grooved rim flagon is paralleled by a vessel in the Welwyn Garden City (Hertfordshire) grave (Stead 1967, fig. 9 no. 36, 14; Rigby and Freestone 1986). In both graves there are no Gallo-Belgic imports, suggesting that both funerals took place before the emergence of the Gallo-Belgic pottery industry *c*.15 BC. It is difficult to evaluate how much earlier they may be but we should think in terms of *c*.25 BC, or even *c*.30 BC (Fitzpatrick and Timby 2002, 163). There is no reason why the Colchester I mirror grave should not be contemporary. Bearing in mind the affinity between the Kelvedon tankard handle and the mirrors cited, a date for the tankard in the 1st century BC seems assured. A later date is unlikely because mirror production in the south-east had come to an end by the close of the century (Sealey 2006a, 16).

The tankard rim binding
It can be said that the two lengths of u-shaped copper-alloy binding are the rim of the tankard with some confidence because the curvature of the plates on the handle matches that of these two fragments, showing that all three items are connected.

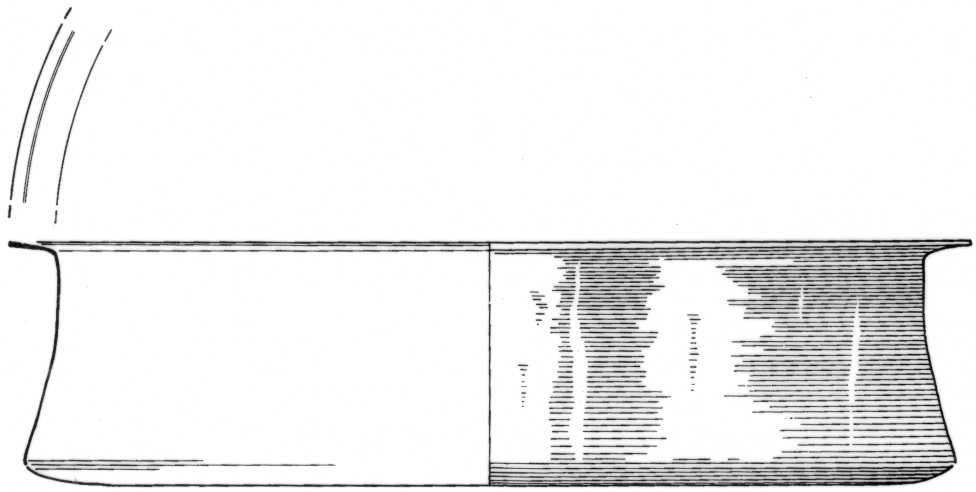
Some Iron Age tankards are covered with copper-alloy sheeting that extends over the rim to secure the staves; a few other tankard rims have separate copper-alloy bindings that are confined to the actual rim, as at Kelvedon. An example of the latter is known from Pentuan (Cornwall), where the binding extends some way down the inside of the tankard (Corcoran 1952, 96, pl. 9, 98); the same technique is found on the tankard in the *c*. AD 122–38 Corbridge (Northumberland) hoard (Allason-Jones and Bishop 1988, 83, fig. 102 no. 293). But binding of the kind found at Kelvedon (where it takes the form of a symmetrical u-shaped fitting) is only exactly matched by the Elvedon (Suffolk) tankard, although that is not made clear in the published description (Evans 1890, 358–9). A fragment of what might be another tankard rim binding like Kelvedon was present in a native warrior burial of early Roman date from Ham Hill (Somerset) (Walter 1923, 149; Clarke and Hawkes 1955, 216 for the date of the grave).

9. The length of the tankard handle (Pl. 6) at the base is 51mm, and it stands 20.5mm high. It would have been mounted vertically on the tankard by the two fastening plates with dished inner faces. Their configuration shows the tankard had straight sides. Both plates have (incomplete) circular rivet holes 5mm in diameter. Rising from both are identical lengths of metal, oval in section and widening out at the top, where they are elongated laterally with a central circular perforation. At the lower edge of each perforation is a v-shaped notch. At the summit these two lengths of metal are linked by a circular moulding demarcated by two lines of beading that run right round the handle. Its upper and outer face has a hollow setting, ringed by beading, that may have taken an inlay such as red enamel. In profile the handle is tightly flexed to give a semi-circular outline.

10. The rim fragments of the tankard consist of two arcs of u-shaped metal with a diameter of about 90mm; one is 44.6mm long, and the other 42.7mm. The more complete of the two fragments is 4.2mm wide and 3.4mm high. It has both the original lower edges, showing that the piece was semi-circular. Along the exterior base there is a slight horizontal moulding.

VIII. Roman bronze bowl
(Fig. 7, No. 11)

The Kelvedon bowl is closer to Eggers form 68 than 67, but the former is late Roman whereas the latter is an early form (Eggers 1951, taf. 8). Eggers 67 differs from the Kelvedon bowl in having straight walls and a concave (sagging) base, but Wielowiejski (1985, 168) includes



11.

Figure 7 11, Bowl. Scale 1:2

bowls with flat bases like Kelvedon in the Eggers 67 category and we too may extend the same latitude of definition to the form.

The chronology of Eggers 67 bowls

Eggers (1951, 166) placed form 67 in his Phases A to B1, which ran from the 1st century BC until the early Roman period. Karasová (1998, 22, 62) envisaged the form developing in the second half of the 1st century BC and ending under Augustus. At Pompeii there are no bronze vessels at all that correspond to the Kelvedon bowl. Flange-rimmed shallow bowls with flat bases *are* present but they always have vertical or outward sloping straight sides (Tassinari 1993 vol. 2, 174–5, 514). Their complete absence from Pompeii suggests that Eggers 67 bowls did not last much — if at all — beyond the start of the 1st century AD.

Evidence from Britain suggests the Karasová start date for the type can be revised backwards. A pair of Eggers 67 bowls was present in a rich grave at Baldock (Hertfordshire) (Stead and Rigby 1986, 53–5), where they can be dated by the associated Dressel 1a amphora. Typologically the amphora has little in common with the large assemblage of Dressel 1 amphoras from Cellar 130 at Bibracte (Saône-et-Loire), dated *c*.125–100 BC (Olmer *et al*. 1995, 299–316). Nor does it resemble the many Dressel 1b cargo amphoras from the *c*.75–60 BC shipwreck of Madrague de Giens (Var). A few Dressel 1a amphoras have now been reported from the wreck, but they remain unillustrated and were in any case only a tiny proportion of the amphoras on board the ship (Tchernia *et al*. 1978; Liou and Pomey 1985, 563–4). Typologically Baldock belongs somewhere between Cellar 130 at Bibracte and the Madrague de Giens shipwreck. It seems reasonable to assign it to the period *c*.100–75 BC, making the Baldock grave the earliest securely dated context for Eggers 67.

Function

We have no direct evidence for the function of Eggers 67 (Kunow 1983, 71). But Flavian wall paintings at Pompeii show that shallow bronze bowls with flat bases were used as trays for fruit or for other utensils (Riz 1990, 57–8, taf. 19 nos 3 and 5). Two pots placed inside an imported copper-alloy dish with a flat base in the Welwyn Garden City grave show that it had been used as a tray at the funeral (Stead 1967, 27). A connection with the world of aristocratic feasting is reinforced by the Baldock grave, where the associations of the two Eggers 67 bowls included a wine amphora, cauldron and firedogs.

The source of Eggers 67 bowls

Eggers 67 bowls are widely regarded as Italian or at least Roman, although we know next to nothing about where they were made. In fact, they are rarer in Roman contexts than in Free Germany (Kunow 1983, 71). There were important workshops for bronze utensils in Campania, particularly at Capua, which was famous for the stamped products of firms like the Ansii and Cipii (Frederiksen 1959, 109–10). Inscriptions testify to guilds of bronzesmiths at Rome and Milan (Frank 1940, 199 with refs). Pliny (*Naturalis Historia* 34.95) said that Campanian bronze was made to a different recipe than elsewhere, and attempts to relate Pliny to analyses of surviving vessels have made some, if limited, progress (Wielowiejski 1985, 150–4, 239–250). But there can be variations in composition even within Campanian products stamped by the same maker (den Boesterd and Hoekstra 1966, 105) and all we can say in the present state of knowledge is that there is nothing in the composition of the Kelvedon bowl to preclude an Italian origin, which is what one would expect at this early date (Karasová 1998, 46–7).

The trade in Eggers 67 bowls

Eggers 67 bowls are among the earliest Roman bronze vessels traded north of the Alps and are found from Norway and Sweden, through Poland and Germany to Britain. Despite the broad geographical spread, such vessels are far from common, with only seventeen examples listed by Eggers (1951, 166, Karte 25). Kunow (1983, 157) lists three more examples, from Sweden, Germany and Poland. Graves from south-eastern England (including some of the richest) show that late Iron Age Britain participated in the trade in Roman bronze utensils. Native smiths in Britain had the expertise to produce local

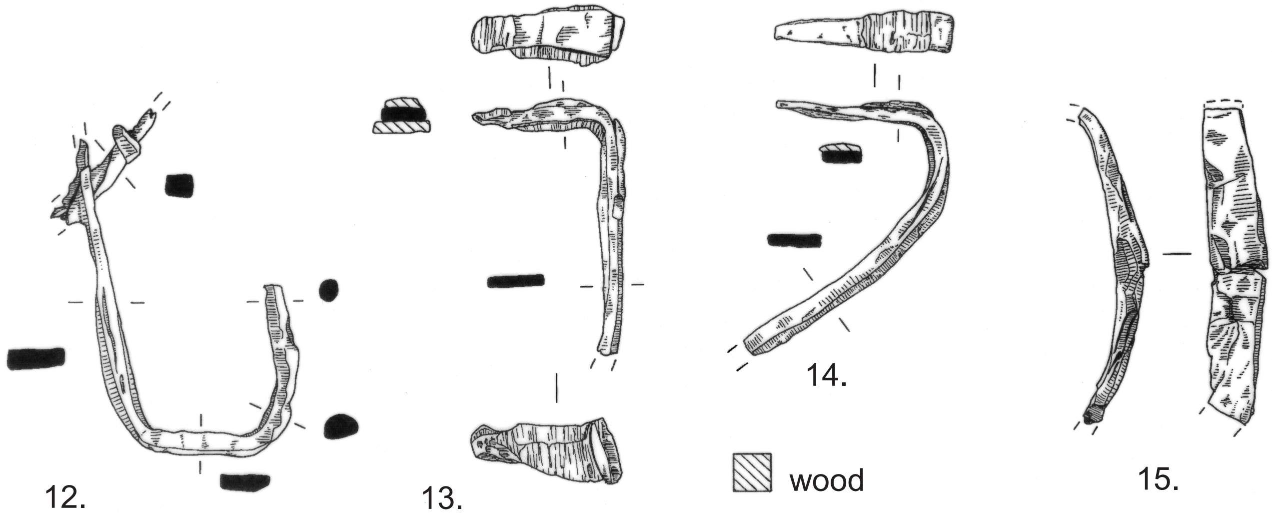


Figure 8 12, Angle bracket; 13–14, joiner's dogs; 15, iron strip. Scale 1:2

copies of imported bronzes but there is little evidence that this took place on any scale, unlike imported pottery which did inspire local copies (Willis 1994, 146–7). Haselgrove (1996, 174–5) noted the same phenomenon in Belgic Gaul and suggested that the reluctance to copy imported bronze vessels meant that their value to the Gauls lay not so much in their intrinsic worth but rather in their pedigree as rare exotica.

11. The Roman bronze bowl has survived in many fragments and the largest are big enough for the original shape to be reconstructed with confidence. The wide rim is a flange with a diameter of 255mm that slopes up and out, away from the actual bowl; just inside the edge a concentric line runs along the dished upper surface. The outer end of the rim is between 1.8 and 2.3mm thick. Below the rim the side of the bowl falls away steeply in a gentle concave wall between 0.3 and 0.5mm thick towards a flat base 245mm in diameter and 0.4mm thick. Nothing of the junction of wall and base survives but it is clear that the bowl can have been no deeper than about 60mm with a sharp angle where side and base met. There is no indication that the vessel was fitted with handles. The metallurgy of the bowl is described below (Chapter 4.I).

IX. Iron fittings

(Fig. 8, Nos 12–15)

Two (possibly three) of these four iron fragments are parts of joiner's dogs, metal clamps used to fix wooden boards together; this explains the traces of mineralised wood on them. The scale of all four fittings suggests that this composite iron and timber structure was a robust item of some size. It is unlikely to have been a coffin: those from the Yorkshire Arras Culture inhumations were made entirely of wood, without iron nails or brackets (Stead 1991a, 36).

Comparanda

The closest parallels for these fittings from a grave in Britain come from the late Iron Age inhumation Grave 123 of 2nd- or 1st-century BC date in the south-west cemetery at Deal (Kent), which also had a set of joiner's dogs. Four of them came from the feet and one from above the skull. Their position at Deal makes it difficult to visualise the original object but it was presumably an improvised plank-built wooden board that had been placed over the body. It was not a coffin or a lid for the grave (Parfitt 1995, 27, 155, 166–7; Stead 1995, 99 no. 8, 105 no. 2).

Iron clamps similar to Kelvedon were also present in the warrior burial from St Peter Port on Guernsey. It was suggested they might have held together the wooden boards of the shield, although they were only present at one, rather than both, ends (Cunliffe 1996, 88, fig. 61 nos 7–8; Burns *et al*. 1996, fig. 15). Joiner's dogs are sometimes found in La Tène I and II graves in Champagne but the structures they represent remain unclear (Stead and Rigby 1999, 139, fig. 193). Another possibility is that the Kelvedon fittings came from a couch or funeral litter of the kind reported from the *c*. AD 25–50 Snailwell (Cambridgeshire) cremation (Lethbridge 1954, 25–6), although the shape of the Kelvedon fittings does not correspond to the angle irons there.

12. Part of an angle bracket of flat rectangular section 80mm long, 16.2mm wide and ranging in thickness from 3.4 to 7.4mm. It turns through two right angles to terminate in a pointed end with a round section. At the far end of the (incomplete) flat length a nail with rectangular section has been driven obliquely through the metal; the head of the nail stands proud of the surface and towards the tip there is a collar-like feature. On the inside angle at the rounded tip end is a patch of mineralised wood.

13. Part of a joiner's dog with one arm 65mm long and 17.5mm wide; the shorter arm is 39.6mm long and tapers towards a rounded end (the tip of which is missing). Elsewhere the section is rectangular and ranges in thickness from 2.7 to 8.1mm.

14. Part of a joiner's dog 132mm long and 14.9mm wide along the straight length, ranging in thickness from 4.3 to 6.4mm. Past the sharp curve, it tapers towards a pointed end. There is a patch of mineralised wood on the outside of the point.

15. A curved length of iron 83mm long with a rectangular section 14.3mm wide, ranging in thickness from 4.4 to 8.2mm. There is split half-way along this piece running part of the way across the surface of one of the broader sides.

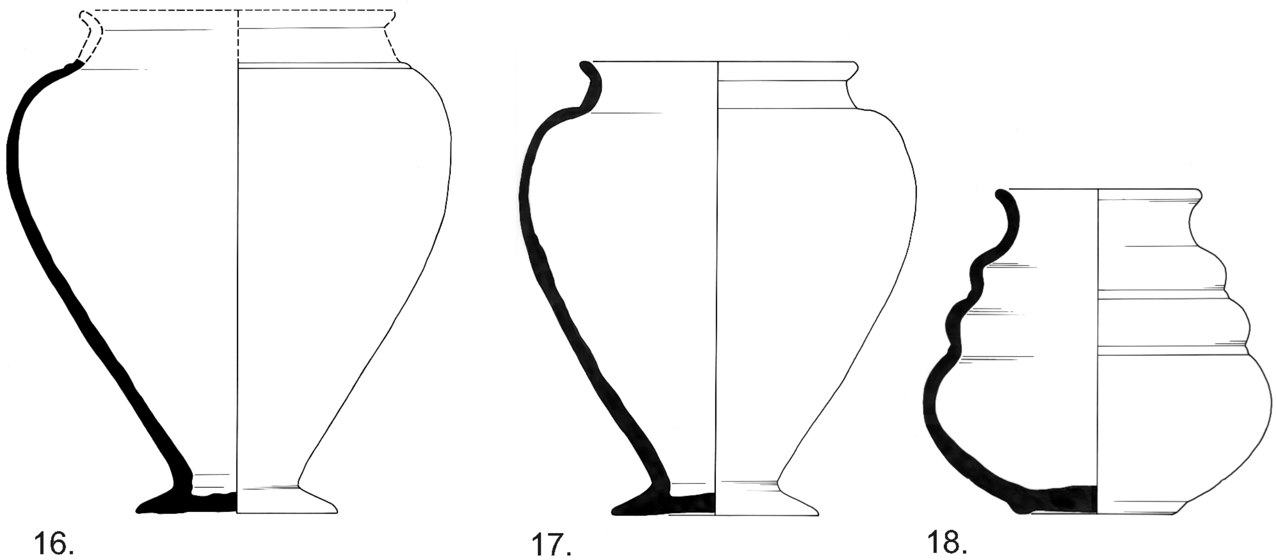


Figure 9 16–17, Pedestal urns I and II from the warrior burial; 18, jar from the satellite grave

X. Pottery

(Fig. 9, Nos 16–17)

Vessels like the two from the warrior burial with their tall inverted pear-shaped bodies and splayed bases are pedestal urns, the late Iron Age vessel form *par excellence* for much of south-east England. Thompson included vessels like the Kelvedon pots in her A1 category (Thompson 1982, 46–50). But this overlooks the anomalous form of the Kelvedon bases, with the straight upper surface to the projecting foot and the slightly dished or hollow underside. The true quoit-shaped foot of the A1 urn has a convex upper surface to the splayed base and a more emphatically hollow foot that is rising or sagging — *Cam*.202 and *Cam*.203 respectively (Hawkes and Hull 1947, 257). Rare bases such as Kelvedon first received attention from Rigby in the King Harry Lane report, where she recognised them as a separate entity to the quoit-shaped base. In her scheme the Kelvedon pedestal urns can be readily accommodated in the 3E category (Rigby 1989, 174–8).

The unusual bases of the Kelvedon pedestal urns and the configuration of their bodies put them in the Rigby 3E category. Pedestal urns with these distinctive bases are found in 1st-century BC contexts at the Aylesford (Kent) cemetery. They are also present in the Hertfordshire graves of Welwyn C and Hitchin (Birchall 1965, fig. 9 no.68, fig. 13 no. 106 and fig. 14 no. 118), where the absence of imported Roman table crockery suggests a date earlier than *c*.25 BC (see below). In the King Harry Lane cemetery the type is well represented in the first half of the 1st century AD (Stead and Rigby 1989, graves 39, 73, 76, 161, 165, 186 and 191). In Essex pedestal urns (except for the trumpet-based form, *Cam*.204) disappeared at the time of the Roman invasion, unlike the many other Aylesford-Swarling vessels that made a significant contribution to Romano-British pottery (Hawkes and Hull 1947, 258; Thompson 1982, 66; Symonds and Wade 1999, 477). The Kelvedon pots belong then to a rare category of pedestal urn attested in the 1st century BC and which became more common in the first decades AD, at least in Hertfordshire. How early they may have appeared leads one to address the start date of ‘Belgic’ pottery in Britain, a topic that is addressed in Chapter 5. It is remarkable that there are only two other Iron Age warrior burials with pottery from Britain (those from Brisley Farm in Kent) (Stead 2006, 2).

16. Pedestal urn I is the larger of the two pots. It rests on a broad splayed base with an unemphatically dished lower surface. From the base the body wall rises steeply in a more or less straight line towards a high rounded shoulder. A single cordon marks the base of the neck; nothing of the rim has survived, although it is evident that the pot would have had a wide mouth.

17. Pedestal urn II is the smaller of the two. It rests on a broad splayed base; the under surface has a flat outer band around a slightly raised centre. From the base the wall of the body rises steeply towards a high rounded shoulder. At the top of the shoulder there is a narrow flat ledge from which a short and almost straight neck rises towards an everted rounded rim; there is a wide mouth.

The condition of both vessels is identical. Surfaces are peppered with a multitude of larger and smaller holes, in some cases ranging up to 7mm across. Surfaces are mottled dark grey to black. Both pots were restored from large joining sherds by Bennett himself, and may be presumed to have been placed in their context complete. Restoration of the urns before their arrival at Colchester Museums did not allow examination of the fabric in a fresh fracture. But in the few tiny areas available for study the fabric revealed itself as tempered with fine sand and black and brown grog, with a soapy texture. Throw marks are evident on the interiors of both vessels.

Chapter 3. The Satellite Grave

I. Discovery and contents

(Fig. 9, No. 18)

In the immediate vicinity of the warrior burial a complete late Iron Age pot had been buried in a pit (Pl. 2). The plate is taken from a colour slide. Enhancement of the image at Colchester Museums shows the pot resting on the base of a pit, some 85cm below the modern ground surface, and tilted slightly out of the vertical. No humans remains were found. There is some ambiguity about exactly where the pit was situated. The Going MS says that it was 12m distant from the warrior burial. But none of the eye-witnesses of the discovery recall a second excavation nearby and the grave inventory compiled by Bennett simply says that the three pots from the site all came 'from the gravel pit' (presumably the hole shown in Plate 1). The simplest explanation of the pit is that it represents a satellite grave next to the warrior burial whose human remains had been destroyed by adverse ground conditions.

18. The pot stands on a shallow foot-ring. The lower part of the body is globular; rising from it are two deep corrugations with cordons in the troughs between them. A concave neck terminates in a plain rounded rim. Surfaces are a dark grey-brown. The pot was restored from large joining sherds by Bennett himself, and may be presumed to have been placed in its context complete. Restoration of the vessel before its arrival at Colchester Museums did not allow examination of the fabric in a fresh fracture but in the few tiny areas available for study the fabric revealed itself as tempered with fine sand and black grog, with a soapy texture. Throw marks from the wheel are evident on the interior, particularly on the base.

II. The affiliations of the satellite grave pot

Corrugations or ripples are a common feature on the shoulder and neck of Aylesford-Swarling vessels. Corrugated conical bowls of Thompson form D3–5 have deep and regular corrugations that run from rim to base, with a steep wall that splays outwards. The type is confined to Kent (Thompson 1982, 346–7). Vessels like Kelvedon, where the corrugations are present on a vessel with walls that converge to a narrow mouth, are rare, and no complete examples are known. A 'Belgic' vessel from Canterbury from a late 1st-century BC ditch has a foot-ring and corrugated sides that slope inwards (Pollard 1995, 608, fig. 271 no. 46). The late A.K. Gregory kindly drew my attention to a similar, but incomplete vessel to Kelvedon in a shell-tempered fabric from Dragonby (Lincolnshire) from a context assigned to the last decades BC and the first decades AD (Gregory and Elsdon 1996, fig. 19.31 no. 218).

Further afield, the Kelvedon pot finds closer parallels in Gaul. A vessel from a grave dated *c*.150–100 BC at Arras (Pas de Calais) is similar (Jacques and Rossignol 1996, 32, fig. 14 no. A1, 35). So too is one dated *c*.150–130 from Acy-Romance (Ardennes) (Lambot and Friboulet 1996, fig. 16, 150). Such vessels are a rare minor element in the late La Tène pottery of Belgic Gaul. The examples cited have a foot-ring base with globular body and concave neck. Unlike Kelvedon, there is only one deep corrugation (which gives both vessels shorter and broader proportions), but otherwise the correspondence is striking.

Conclusions

It is remarkable that after so many years of research and excavation, a new addition to the Aylesford-Swarling ceramic repertoire in Britain should have emerged in the shape of this Kelvedon pot. Its ultimate prototypes are 2nd-century BC corrugated jars from north-west Gaul. Corrugated vessels are not uncommon in Aylesford-Swarling contexts in Britain but none offers close parallels for the Kelvedon pot. Only one other vessel from Britain has any real affinity, an incomplete jar from Dragonby. The date and findspot of this Lincolnshire pot suggest its typology was ultimately inspired by pottery found further south, by vessels of the kind found at Kelvedon.

Chapter 4. Specialist Reports

I. The metallurgy of the scabbard, chape and Roman bowl

by J. Peter Northover
(Fig. 10; Pls 7–10; Table 2)

Sampling and analysis
A single sample was cut from each of the bowl, the scabbard front plate and the back plate with a fine jeweller's piercing saw. That from the bowl, labelled Es 301, was mounted flat, that from the back plate of the scabbard, Es 302, was cut and prepared to present a cross-section through the white metal plating, while that from the front plate, Es 303, was mounted flat. The scabbard chape was heavily corroded and so it was not possible to cut a solid sample; accordingly a single sample, Es 304, was drilled from the chape using a handheld modelmaker's electric drill with a 1mm diameter bit. The resulting drillings consisted entirely of corrosion product, but they were mounted and prepared in the same way as the other samples.

The samples were hot-mounted in a carbon-filled thermosetting resin, ground and polished to a 1μm diamond finish. Analysis was by electron probe microanalysis with wavelength dispersive spectrometry; operating conditions were an accelerating voltage of 25kV, a beam current of 30nA, and an X-ray take-off angle of 62º. Thirteen elements were sought, as listed in the accompanying table; pure element and mineral standards were used with a counting time of 10s per element. Detection limits were typically 100–200ppm, with the exception of 400ppm for gold and 0.20% for arsenic. This last was because of the means taken to avoid the well-known interference between the strongest lines for lead and arsenic in the X-ray spectrum, lead Lα and arsenic Kα. The most convenient solution was to use the relatively strong lead Mα line, but for arsenic the weak Kβ line had to be used, with a consequent degradation in performance. For the purposes of this study this was not regarded as significant; alternative routines are available for a separate, more sensitive analysis of arsenic but were not thought necessary at this stage.

Six areas, each 30×50μm, were analysed on Es 301, two on the sheet metal of the front plate, Es 302, and one on the back, Es 303. Point analyses and a linescan were made across the section through the plating. The individual compositions, normalised to 100%, and their means are shown in Table 2 with all concentrations in weight %. The linescan (Fig. 10) is annotated and presented graphically; it has previously been published in Northover and Salter (1990).

Five analyses were made on sample Es 304, from the chape, but were not normalised to 100% because they consisted of corrosion product and elements such as oxygen, carbon and chlorine had not been included in the analysis. Silicon was observed in the corrosion product but is not quantified in the table.

After analysis, all the solid samples were examined metallographically in both as-polished and etched states. The etch used was an acidified aqueous solution of ferric chloride further diluted with ethanol.

The scabbard
This section deals with the metallurgy of the scabbard plates and their decoration; the chape is discussed in a subsequent section.

Although the sword is a Piggott Group V weapon, a significant aspect of the decoration, the application of a second piece of metal to the scabbard, albeit in a novel way, would tend to link it with Piggott's Group IV. The idea of a longitudinal motif derives from Group III. Within Group IV we may cite the use of contrasting metals in the scabbard from Mortonhall (Midlothian) (MacGregor 1976, no. 150). Contrasting textured surfaces are seen in the ladder pattern of the Little Wittenham (Oxfordshire) scabbard in the Ashmolean Museum, the incised chequer pattern of the scabbard from Embleton (Cumbria), an example where added colour is provided by opaque glass inlays (MacGregor 1976, no. 145), and the Dinnington (Yorkshire) torc of the 1st century AD (Beswick *et al.* 1991), where polished and matt etched surfaces are contrasted. In this last example there is also the possibility that the polished surfaces were also coloured for further contrast. Even within this range of decorative skill the Kelvedon scabbard with its simple bi-coloured design is highly individual and must have been the property of a person to whom both the scheme and its uniqueness were important.

The two sheets of the scabbard were made from an unleaded tin bronze; it is worth noting here that the bronze is very similar to that used in the bowl, but with slightly higher levels of impurities (Table 2 and below). The tin contents were 11.93 and 11.14% (compared with 12.02% in the bowl). The principal impurities were iron (0.07%/0.04%), nickel (0.13%/0.11%), antimony (0.11%/0.10%), silver (0.07%/0.08%) and lead (0.25%/0.42%); also present were cobalt, arsenic, and bismuth. The zinc impurity in Es 303 is not an important difference when it is remembered that only one area was analysed on this sample.

The exact details of alloy content and impurity pattern can be matched elsewhere in south-east England in the late pre-Roman Iron Age but are far from diagnostic. Indeed, in metallurgical terms the bronze in the scabbard could have been made almost anywhere in north-western Europe or the western Roman Empire. While it is clear that in earlier periods bronze was produced in Britain from British resources (Northover 1995), by the mid 1st century BC the distinctive impurity patterns that supported that contention passed out of use and those that remain are not at all distinctive. However, while the origin of the bronze is uncertain it is more than likely that the scabbard was made in Britain.

The point analyses made on the plating (Es 302/3–5) show that it is composed of intermetallic copper-tin compounds with the $\alpha\delta$ eutectoid, ε and η phases being identified. Further analysis of the plating will be discussed

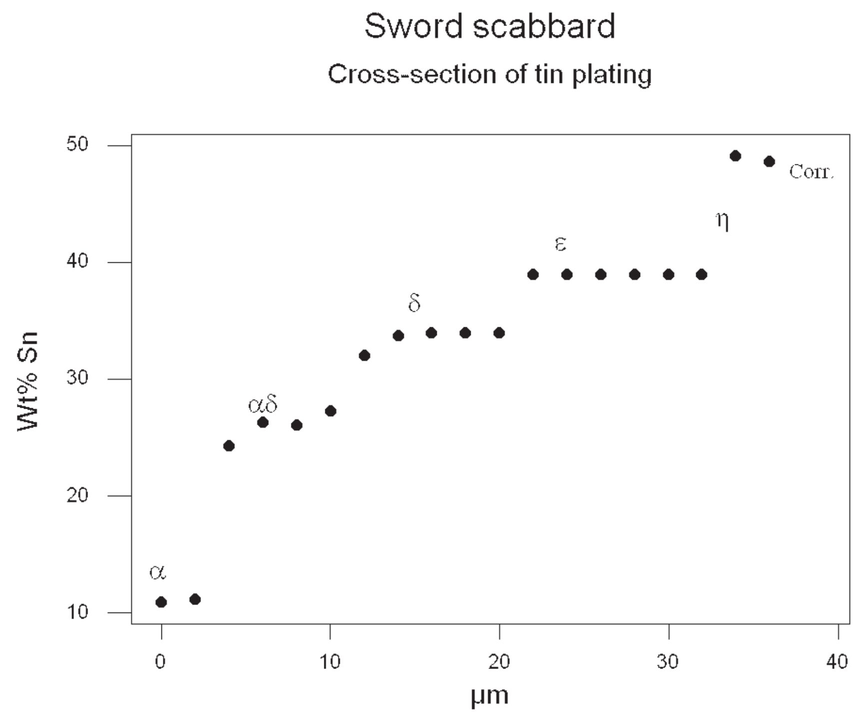


Figure 10 Linescan of point analyses for copper and tin on the scabbard plate

sample	*Fe*	*Co*	*Ni*	*Cu*	*Zn*	*As*	*Sb*	*Sn*	*Ag*	*Bi*	*Pb*	*Au*	*S*
bronze bowl: body													
Es 301/1	0.01	0.01	0.14	87.29	0.04	0.04	0.08	12.17	0.00	0.05	0.17	0.00	0.00
Es 301/2	0.02	0.01	0.04	87.34	0.01	0.04	0.11	12.24	0.00	0.05	0.16	0.00	0.00
Es 301/3	0.03	0.01	0.09	87.44	0.03	0.04	0.11	11.81	0.09	0.06	0.24	0.05	0.02
Es 301/4	0.12	0.01	0.08	86.87	0.00	0.09	0.10	12.05	0.01	0.00	0.34	0.00	0.33
Es 301/5	0.01	0.01	0.08	86.91	0.04	0.08	0.09	12.11	0.03	0.13	0.45	0.03	0.02
Es 301/6	0.06	0.00	0.05	87.10	0.00	0.04	0.08	11.77	0.03	0.02	0.82	0.00	0.01
scabbard: bronze back plate													
Es 302/1	0.08	0.03	0.12	87.41	0.00	0.08	0.11	11.69	0.09	0.13	0.20	0.06	0.00
Es 302/2	0.06	0.03	0.13	86.97	0.00	0.13	0.11	12.16	0.04	0.04	0.30	0.03	0.00
scabbard: back plate tin-plating													
Es 302/3	0.08	0.01	0.11	74.11	0.00	0.00	0.03	24.82	0.03	0.00	0.81	0.00	0.00
Es 302/4	0.18	0.00	0.05	58.42	0.02	0.03	0.01	41.03	0.02	0.00	0.24	0.00	0.00
Es 302/5	0.55	0.00	0.12	51.20	0.00	0.28	0.00	47.84	0.04	0.00	0.15	0.00	0.00
scabbard: front plate													
Es 303/1	0.04	0.03	0.11	87.82	0.08	0.17	0.10	11.14	0.08	0.01	0.42	0.00	0.00
chape: drillings													
Es 304/1	0.26	0.00	0.02	22.80	0.04	0.25	0.53	36.38	0.01	0.00	2.49	0.07	0.10
Es 304/2	0.09	0.00	0.07	83.56	0.00	0.06	0.01	3.64	0.05	0.02	0.00	0.04	0.01
Es 304/3	0.10	0.00	0.00	70.85	0.00	0.01	0.00	0.30	0.00	0.00	0.00	0.01	0.01
Es 304/4	0.13	0.01	0.15	55.43	0.02	0.12	0.60	35.52	0.12	0.02	0.41	0.00	0.02
Es 304/5	0.40	0.00	0.22	10.06	0.11	0.24	0.85	54.62	0.00	0.00	3.08	0.00	0.09
bronze bowl: body													
Es 301/mean	0.04	0.01	0.08	87.16	0.02	0.06	0.09	12.02	0.03	0.05	0.36	0.01	0.06
scabbard: bronze back plate													
Es 302/mean	0.07	0.03	0.13	87.19	0.00	0.11	0.11	11.93	0.07	0.09	0.25	0.05	0.00
scabbard: front plate													
Es 303/mean	0.04	0.03	0.11	87.82	0.08	0.17	0.10	11.14	0.08	0.01	0.42	0.00	0.00
chape: drillings													
Es 304/mean	0.20	0.00	0.09	48.54	0.03	0.13	0.40	26.09	0.03	0.01	1.20	0.02	0.05

Table 2 Metallurgical analysis of the scabbard, chape and bowl

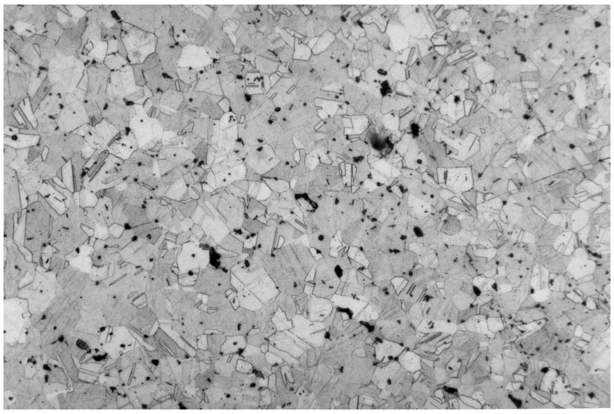


Plate 7 Metallurgical sample Es 301 of the bronze bowl, showing stain-free grain; etched, ×133

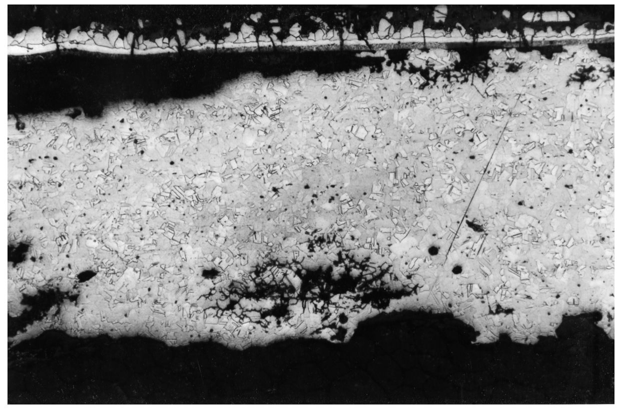


Plate 8 Metallurgical sample Es 302 of the scabbard, showing a general view of worked and annealed bronze sheet and a section through the tin plating; etched, ×67

below after a review of the metallography. A cross-section through the bronze back sheet and the plating layer is illustrated (Pls 8–10). The bronze sheet has a fully recrystallised equiaxed grain structure with twins and a grain size of about 30–40µm. There are some signs of residual coring in the structure, suggesting a slightly lower annealing temperature than was used for the bowl. Some elongated copper sulphide particles are visible, which give a measure of how much the sheet has been reduced in thickness from the original cast blank; there is no final cold work. It is noticeable that the bronze here has been much more affected by intergranular corrosion than the bowl. This need not surprise us because the micro-environment can vary sharply from point to point in a grave; indeed it is possible for two different modes of corrosion to exist on opposite faces of the same object.

Also prominent in the micrographs is the plating layer, seen in most detail in Plate 10. The plating layer has been penetrated by corrosion through cracks in some of the outer layers. Moving from the base of the plating where it abuts on the recrystallised bronze sheet (α phase) we have:

1. $\alpha\delta$ eutectoid, the α phase having been removed by corrosion; there is a thin boundary layer of δ phase at the bronze surface.

2. δ phase: at the interface with the eutectoid dendrites of δ phase formed by a solid-state process grow into the eutectoid layer; the outer surface is rather irregular.

3. A thick layer of ε phase with a well-defined grain structure and an irregular outer surface.

4. The outer surface of the ε phase is coated with a thin layer of η phase which has been partly removed by corrosion; it etches lighter than the underlying ε.

5. A thick layer of corroded, unreacted tin.

A linescan of point analyses for copper and tin at 2µm intervals was made across the plating layer and the results are shown in Figure 10.

This sequence makes it possible to reach a firm conclusion about the function of the tinned layer, and how it might have been applied. Suspension loops on scabbards of this period could be extensive affairs soldered in place with a tin-based solder, but it is not certain whether the solder would be tin metal, as used on the Gundestrup (Denmark) cauldron at the end of the 2nd century BC (Nielsen *et al*. 2005), or a tin-lead alloy as used in the Roman world, certainly by the end of the 1st century BC. In attaching a suspension loop to a scabbard plate the craftsmen would be aware of the need to make a joint with the strength to sustain the intended use. A solder joint, carefully made as it probably was here, is as thin as possible with the melted solder drawn into the joint by capillary action. A very rapid reaction between the liquid tin and the bronze produces a joint which will ultimately consist of intermetallic compounds of copper and tin which form a solid bond between the two bronze components, and which is of sufficient strength to withstand normal use. The intermetallic compounds are, initially, the ε and η phases of the copper-tin system, as in the tinning on the scabbard, but the structure can be

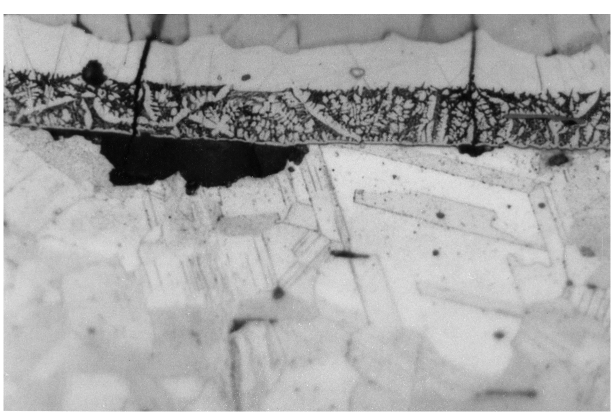


Plate 9 Metallurgical sample Es 302 of the scabbard, showing detail of the interface between the plating and bronze; etched, ×666

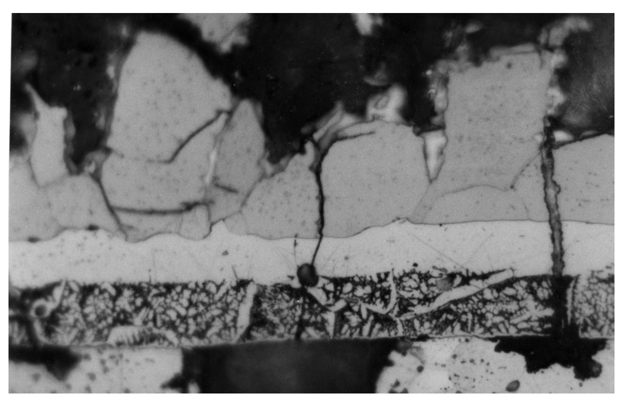


Plate 10 Metallurgical sample Es 302 of the scabbard, showing detail of the layers in the plating; etched, ×666

modified by further heating of the joint. A central layer of unreacted tin would leave the joint weak and liable to failure after a short time. This last comment also implies the other feature of a solder joint: that it is symmetrical, with the sequence of intermetallic phases having a mirror symmetry either side of the plane of the joint, and there is no trace of intermetallics attached to the outer side of the tin on the Kelvedon scabbard. The fact that the Gundestrup cauldron was assembled with massive seams of tin metal suggests that strength was not uppermost in the smith's mind. In contrast to riveted seams, it also meant that the cauldron could be easily dismantled.

The metallurgy of thermal tin platings on bronze has been discussed by Meeks (1986) and Jones (1992). Jones experimented with different methods of applying the tin to simulate the plating on this scabbard: wipe tinning a surface masked with clay to outline the stripe; applying a mixture of granulated tin and flux to a masked area; or applying a pre-prepared strip of tin. In each case the bronze surface had been fluxed with resin. The most convincing results were obtained with wipe tinning, where the fluxed substrate is heated to above the melting point of tin and wiped with a stick of tin. Several passes could build up a sufficient layer of tin. When first formed the plating consists of a thin double layer of ε and η phases covered by a thick layer of tin. Heat treatment above the eutectoid temperature of 520ºC fairly rapidly produces the multi-layer structure we see surviving on the scabbard today (*cf.* Meeks 1986). The outer layer originally would still have been tin and rather soft but, with care, could take a reasonable polish, and would form a strong colour contrast with the bronze, whether that was polished to a golden hue or patinated to another colour.

In western Europe the addition of a tin plating to bronze objects goes back to the early Bronze Age, as evidenced by the tin-plated bronze axes of Scotland (Meeks 1986; Schmidt and Burgess 1981). After that time it reappears periodically, for example on ornaments in middle Bronze Age Switzerland (Fischer 1997), but at other times the white colour of tin is matched by casting very high tin alloys (20–30% tin or white bronze). In Iron Age Britain tin as a decorative element first reappears as an inlay in an early La Tène fibula from Flag Fen (Cambridgeshire) (Rohl and Northover 1995). The use of tin in this way probably dates back to late Urnfield Europe where, for example, the heads of *Bombenkopfknadeln* were ornamented by filling their hollow heads with tin so that it appeared through the perforations in the bronze heads (Northover 2004b). In middle Iron Age Britain tin was used to decorate an iron pinhead at Llwyn Bryn-dinas hillfort (Clwyd) (Musson *et al*. 1993). Interest in the decorative use of tin seems to reappear in the 1st century BC, this scabbard perhaps being one of the earlier examples. Later, in the 1st century AD smiths working in the native tradition used tin as both decorative and structural functions in Bagendon brooches, for colour contrast in the roundels in the Tal-y-llyn (Gwynedd) hoard, and in bucket fittings from Santon (Norfolk) (Jones 1992). At the time of manufacture, though, the Kelvedon scabbard can be seen as a remarkably innovative design.

Chape

The state of corrosion of the chape means that it is not possible to define the composition accurately. The chape was cast as a lost wax casting, the standard later Iron Age method for producing complex shapes: despite the slight expansion in dimensions due to corrosion, the walls of the chape are too thick to have been wrought to their present section. It was clearly cast in a medium-tin unleaded or low-lead bronze with arsenic and antimony impurities, possibly with higher levels than in Es 301–03, and almost certainly with Sb >As. This is a pattern that has been observed already in southern Britain, in the scheme of Iron Age impurity patterns devised for the publication of the bronze from Maiden Castle (Dorset) and other Iron Age sites in southern Britain (Northover 1991). In this scheme it is Group 4 and is most common in the 1st century BC and 1st century AD, exactly consistent with the date of the burial.

The Roman bowl

The bowl is fragmentary; the surviving parts comprise large sections of the base, wall and rim of a bowl with a flat bottom, near-vertical sides, and a flat, out-turned rim. Such vessels are raised by hand but even at this date may have been finished on a lathe. There are no visible traces of any handles. The bowl is heavily corroded and has a dull green patina.

The composition of the bowl supports the attribution as the early form Eggers 67. The bowl is formed from an unleaded bronze with a tin content of 12.02%; the principal impurities are 0.08% nickel, 0.09% antimony, and 0.36% lead, together with smaller traces of iron, cobalt, zinc, silver, bismuth, sulphur and, possibly, arsenic. For comparison we have databases of vessel analyses by Beck *et al*. (1985), den Boesterd and Hoekstra (1966), Bollingberg (1995) and Rabeisen and Menu (1985). These results make it plain that in the 2nd century AD brass came to replace bronze as the preferred alloy for sheet-metal vessels as it is in fact more malleable and easier to form by hammering. That this process was already underway by the 2nd century AD is shown by the analysis of vessels from the Duck End cemetery site at Stansted Airport (Essex) (Northover 2004a). A century earlier it is decidedly unlikely that brass was used for such purposes. In its early years, say in Augustan times, brass was state controlled and employed in the coinage and in military fittings, a little later in specific brooch types. Thus, the use of bronze for the bowl is to be expected. As with the scabbard, the alloy content and impurity pattern can be matched elsewhere in south-east England in the late pre-Roman Iron Age but are far from diagnostic. Indeed, in metallurgical terms the bowl could have been made almost anywhere in the western Empire or, possibly, an immediately neighbouring territory where a smith working in the Roman tradition might have felt he had a market. This is a suggestion supported by the archaeological consideration of the bowl elsewhere in this report.

The microstructure of the bowl is presented in Plate 7. The fragment of sheet from the bowl taken as a sample was mounted flat so that the polished surface will present both the fractured edge of the sample area and sections through corrosion cavities. Both at the edge and within the cavities the surviving bronze surface is rather smooth and covered by a thick, amorphous corrosion crust which appears dark under normal incident illumination. Under plane polarised light the crust is seen to consist of a subtly laminated layer ranging in colour from dull turquoise through white to rusty brown. This is one of two principal types of long-term bronze corrosion (Robbiola *et al.* 1998). The corrosion products are mainly amorphous or nanocrystalline tin oxides and hydrated tin oxides, and are coloured by copper ions diffusing outwards to the surface and other species diffusing inwards from the burial environment. This type of patina tends to preserve archaeological detail, such as tool and wear marks, very clearly on its surface. There also tends to be a smooth interface with the underlying metal and a lack of intergranular corrosion.

Etching (Pl. 7) revealed a fully recrystallised equiaxed grain structure with annealing twins and a grain size of approximately 20μm. The metal shows no residual coring and there are no slip traces etched; the annealing time and temperature have been sufficient to homogenise the bronze and there has been little or no cold working of the bowl in the sample area after the last anneal. There is also in the microstructure a scatter of very small copper sulphide and lead inclusions and a certain amount of porosity residual from the original cast blank from which the bowl was raised. This general quality of metalworking is typical of late Iron Age and early Romano-British sheet metal production.

Editorial note

The site archive includes twelve colour microphotographs showing the details of the metallurgy of the scabbard and bowl. No opportunity presented itself for Dr Northover to revise the text to take account of the Stead (2006) corpus of Iron Age swords and scabbards.

II. The metallurgy of the sword

by Brian J.J. Gilmour

(Figs 11–14; Pls 11–13)

Summary

Although heavily corroded, enough metal survived in this sword blade to enable a detailed x-ray and metallographic investigation to be made. This revealed the blade to have been made of several different pieces of low carbon iron welded together so that the axis of the welds, and the slag ribbons within the metal, ran (at a steep angle) from surface to surface of the eventual sword. Different pieces of iron were combined in such a way that a distinctive banded pattern would have been produced when the sword blade was polished and etched. Slight variations in the forging of the finished blade, as well as the metal structure and slag content, would have resulted in a rippled appearance suggestive of water flowing down the blade. Although often not recognised as such, this form of composite construction represents an early, less formal (and less obvious) form of pattern-welding, and one which is observable on other late Iron Age sword blades.

Plate 11 X-radiograph of the sword blade, showing its striated structure

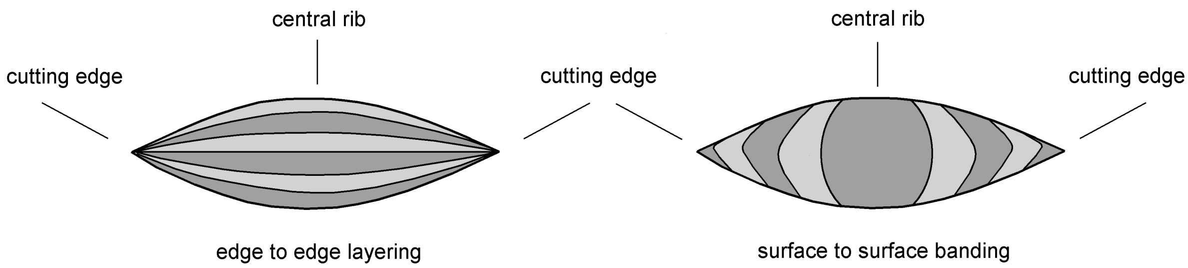


Figure 11 Diagram explaining the two different structures found in Iron Age sword blades (after Lang 1987)

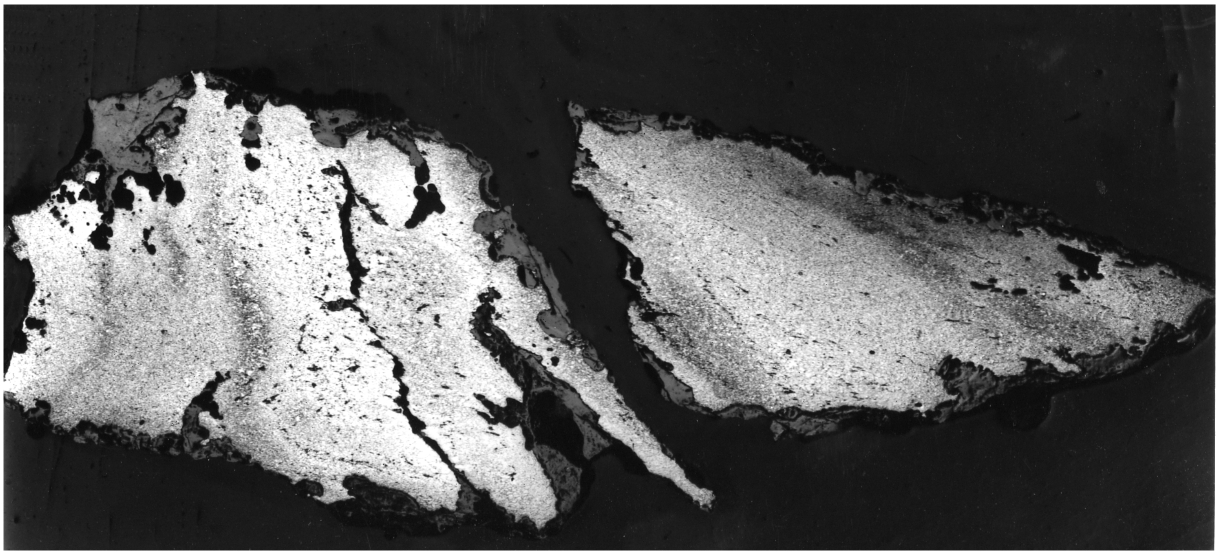


Plate 12 Photomacrograph of a mounted section of the sword blade; etched, ×10

X-ray examination
Although the blade was very heavily corroded it was clear that a fairly solid metallic core remained beneath an uneven thick surface layer of corrosion products. Radiography of the sword revealed a distinct banded fibrous appearance to the internal structure of the surviving metal of the blade, an appearance that was consistent along both fragments of the blade (Pl. 11), and is similar to the grain in some kinds of wood. This suggested a composite internal structure with different components welded together.

Metallography
A wedge-shaped section, extending halfway across the blade, was cut from the larger of the two fragments, from a point near the middle of the original blade where the metal survived rather better than elsewhere. Unfortunately even here the sample came out in two parts, divided by a narrow band of corrosion that had penetrated along a line of slag inclusions. When mounted (more or less) in their correct relative positions (Pl. 12) it became clear the blade was made of several different pieces of iron welded together so that the weld lines between them ran diagonally across the thickness of the blade, giving the appearance of scarf welds in section (these being shown as fine broken lines in Figure 12). Three pieces are represented in this mounted section (marked a–c in Fig. 12), indicating that there were five separate pieces altogether across the full width of the blade. The welds between these three parts seen in section were of good quality, being marked by intermittent lines of small (mainly) two-phase slag inclusions (Pl. 13).

None of the three pieces seen in section consisted of more than a low carbon iron but they differed considerably in their structure. The outermost piece (a in Fig. 12), the part forming the cutting edge, was variable in appearance and contained only a little carbon (0.1% or less). These relatively carbon-rich areas were visible as fairly fine grain (darker) pearlitic areas (particularly along one side of the section) contrasting with paler, medium grain ferritic (relatively carbon-free) areas in between. This uneven distribution gave this part of the section a slightly piebald appearance at low magnification. There was little slag present in this piece apart from a light scattering of small particles, both single-phase (probable silicate/glassy) and two-phase (probable mixed oxide and silicate/glassy) inclusions.

By contrast the middle piece (b in Fig. 12) was more poorly preserved, being deeply penetrated by corrosion almost certainly along lines of slag, probably ribbon-like, larger inclusions acting as foci for preferential corrosion in

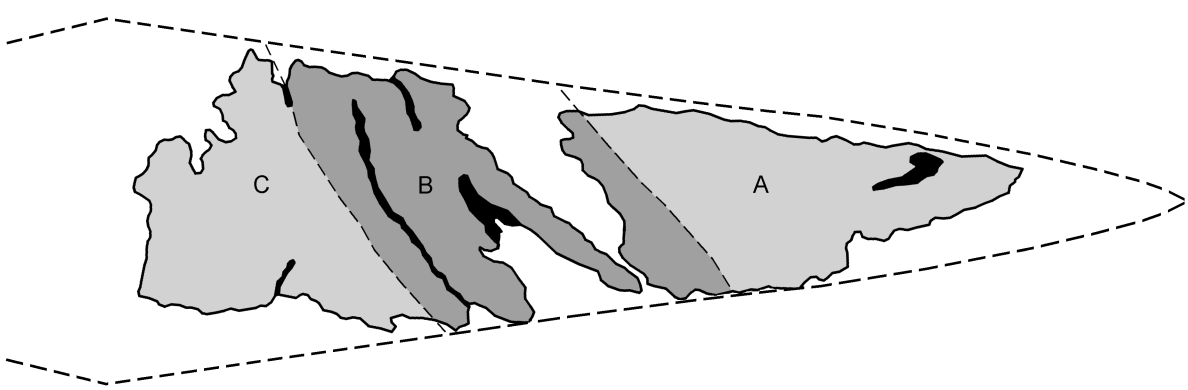


Figure 12 Diagram explaining the structure of the sword blade as shown in Plate 12, indicating the approximate original outline (heavy broken lines) and the positions of the welds between the main components (fine broken lines)

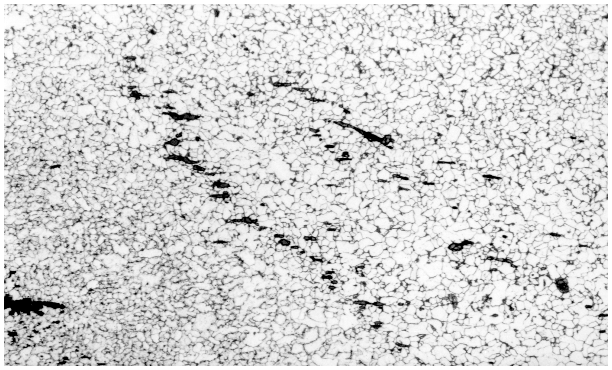


Plate 13 Photomacrograph of a section of the sword blade, showing a diagonal line of slag inclusions; etched, ×50

different parts of this piece. In some places this has resulted in a narrow band of corrosion having gone right through the thickness of the blade, as here in the middle of piece b (this being the reason the sample fell in half when it was being prepared). Overall there was very little carbon visible in this piece, which (apart from the corrosion holes around the areas formerly occupied by larger slag inclusions) consisted almost entirely of rather variable but mainly medium grain ferrite. In other words, piece b consisted of slaggy plain iron. Some of this slag was still present as smaller inclusions (spheroidal or irregular in shape).

Again by contrast, the innermost piece (c in Fig. 12) was much cleaner with only a little slag present, as small grey single-phase (probable) silicate inclusions and two-phase inclusions (both iron oxide and silicate — possibly with a glassy phase also present). This time the metal consisted mainly of a relatively fine grain low carbon iron, although the carbon content was still low, with no more than about 0.2% carbon present as pearlite.

The structure of the Kelvedon sword

Despite heavy corrosion, enough survives of the metal for a reconstruction of the structure (Fig. 13) and at least a simplified view of the original surface appearance to be made. Given that the section examined from this sword only extended across half the width, this reconstruction assumes symmetry across the full width, based on the structure visible on x-ray. It is also assumed that the structure is much the same elsewhere along the blade. Investigations of other iron sword blades would suggest that this is usually the case.

This sword blade is distinctive in that although no steel has been used in its construction it has nevertheless been carefully put together as a composite of several different pieces of iron. The striated structure seen on x-ray gives an important clue to both the original structure and appearance, and it is clear that these are interrelated. In section (Pl. 12) the overall steep angle of the lines of surviving slag inclusions, and the corrosion pits marking the former positions of larger slag inclusions, is the end result, after final forging, of several different pieces of iron having been welded together side by side. Before this welding was carried out the original orientation of the slag is likely to have been from top to bottom, this having become distorted and partially flattened — perhaps intentionally — by the final process of forging, which would have given the blade a lozenge or diamond profile.

Comparanda for the Kelvedon sword

Although not so obvious here, it is much clearer from the study of other swords that where a comparable banded construction technique has been used, then a form of pattern-welding is the end result, especially where a more formalised or developed form of the technique has been used. Similar to the Kelvedon sword is the banded structure seen in one of four swords from the late Iron Age votive deposit at Llyn Cerrig Bach (Anglesey) (McGrath 1968a and b; Gilmour 1996a, 114, fig. 3) and in a near-contemporary and recently examined sword from Orton Meadows, Cambridgeshire (Lang 2006, 97–98). A more developed form of this kind of (non-twisted) pattern-welded construction has recently been identified in one of two swords of *c*. AD 200 found during excavations at Canterbury Castle (Webster 1982, 185–7; Gilmour 1996a, 115 and forthcoming). Here the technique involved the incorporation of laminated bars welded into the blade so that the welds, and lines of slag inclusions, ran at right angles across the thickness of the blade.

Several of the better-preserved swords from the site of La Tène have been found to have fibrous or more or less formal banded patterns still surviving on the surface of their blades (for instance, De Navarro 1972, 382 no. 45a, 385 no. 49a, 397 no. 62a, pls 20, 22, 26 and 29). Similar striated structures with a fibrous appearance have been seen on the x-rays of several other Iron Age swords, but very few have yet been examined in detail in this way and many more will probably be identified once more systematic examination is carried out. One that has been looked at is the surviving blade fragment of a probable late Iron Age sword found in the River Thames at Little Wittenham (Oxfordshire) (Tylecote and Gilmour 1986, 162–4, fig. 66). In this case the structure visible on x-ray gave a clear fibrous or wood-grain appearance, but one that was less banded in appearance on x-ray than either the Kelvedon sword or that seen on the recently examined x-ray of the poorly preserved, fragmentary remains of a late Iron Age sword from Guernsey (Gilmour 1996b, 112, fig. 76).

In the case of the Guernsey sword the very poor state of preservation meant that only the x-ray examination was possible, but fortunately the metal of the Little Wittenham blade fragment survived much better and a metallographic examination was possible. This revealed another composite structure, but one which was rather different to the banded structure seen in the Kelvedon and Llyn Cerrig Bach swords. The Little Wittenham blade was found to have been made by welding together up to about eighteen overlapping and interleaved strips both of plain iron with some slag, and low carbon iron (with mainly about 0.1–0.2% carbon). Corrosion of this sword blade was limited (presumably by burial in river mud) more or less to surface corrosion and a pronounced wood-grained effect was visible on both sides. This effect was much the same right across the blade as far as the tip of the cutting edges.

Although the Little Wittenham sword fragment was quite well preserved (although it was not possible to tell whether or not it was broken when it was deposited in the river) it was not possible to say whether or not this structure would have been visible on the original sword, although this seemed highly likely. The subsequent discovery of an exceptionally well-preserved late Iron Age sword from Orton Meadows (Cambridgeshire) (Stead 2006, 174 no. 97) has demonstrated how this was the case. This sword was so well preserved that (after straightening) it could still be drawn from its bronze scabbard (M. Howe, pers. comm.) and, perhaps more importantly, the original surface detail also survived very well (Gilmour 1996a, 122, figs 1–2). An x-ray examination of this sword showed much the same fibrous (less banded and more general) wood-grain-like structure that was also evident on the Little Wittenham (Oxfordshire) sword blade, this structure most likely having been exposed by differential etching at the time of manufacture but accentuated by very slow corrosion in the largely anaerobic mud of the River Thames where this sword fragment had lain before it was dredged up recently. Very slow corrosion in the case of the Orton Meadows sword had left the original surface detail surviving largely intact. The radiograph showed this structure to be the same right across the full width of the blade.

On the surface of both sides of this sword a very clear form of pattern-welded design showed up running down the central part of either side of the blade. This central part of the blade had been very heavily etched to reveal, in relief, much the same fibrous or wood-grain appearance that could be seen on x-ray. This pattern was separated from the edges, and the semicircular end of the blade, by a plain margin, approximately 1cm wide, that stood proud of the pattern-welded design and clearly represented the original surface before the central part of the blade had been etched. This margin had clearly been protected from the effects of the etching reagent by a resist medium such as wax or grease.

The design seen on the Orton Meadows sword is free-form rather than formal and it strongly resembles water flowing between two banks (the plain margins down both edges). It is a very clear early form of pattern-welding, preceding (typologically at least) the more formal designs and methods seen in pattern-welded sword construction of the later Roman and Anglo-Saxon periods. This sword has not so far been examined technologically (and this will be difficult now that the sword has been stolen and not yet recovered) so the exact form of construction is not known. The x-ray detail, however, suggests a very similar construction to the Little Wittenham sword blade; that is, a bundle of strips of low carbon and plain iron welded together, and the blade prepared and treated so as to reveal the flowing water pattern that was the clear intention behind the sword's construction. It seems highly likely that this kind of watered pattern would have had some kind of important cultural or talismanic significance, perhaps specifically relating to swords given that it is not (at least as far as we know) on other kinds of artefacts.

An early simple form of pattern-welding

As far as the Kelvedon sword is concerned its more banded fibrous appearance on x-ray, and the structure seen in section, would suggest that this was also typologically a form of pattern-welded sword, as is suggested in the simplified reconstruction shown here (Fig. 13). The use of different types of plain slaggy and less slaggy iron, together with low carbon iron (similar to the mild steel of today) would have exploited the differing etching properties of these grades of iron, as would the method of construction with the weld lines, and the main orientation of the lines of slag filaments, not far off being at right angles to the surfaces of the sword. Heavy etching would have revealed a fibrous appearance to the slaggier metal (much as is seen in the corroded wrought iron anchors and so on of 19th-century ships) and, as for the Orton Meadows sword, this

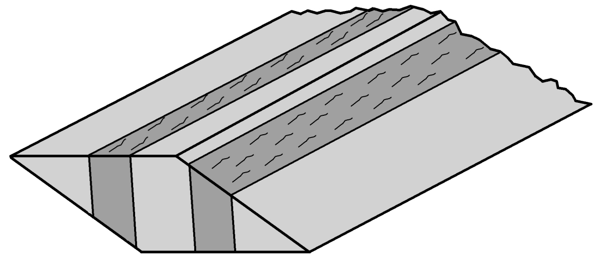


Figure 13 Diagram explaining the original structure of the sword blade

would probably have given a similar effect to that seen on x-ray.

Whether or not the edges of the Kelvedon sword were resist protected in a similar way to those of the Orton Meadows sword — to prevent them being etched with the rest of the surface of the blade — is now difficult to say because the Kelvedon sword has not survived so well. Resist protection would perhaps have been less necessary for the Kelvedon sword with its banded construction unlike the Orton Meadows sword which did not have a banded construction and therefore required resist protection in order to create the margins along the edges which are still visible on this blade. In the case of the Kelvedon sword the banded construction would have been accentuated when the blade was etched, and the less slaggy iron used for the cutting edges would have shown up as separate margins along these outer parts of the blade (see Fig 13) contrasting with the iron used for the adjacent bands. The additional use of a separate low carbon iron piece for the very central part of the Kelvedon blade suggests a slightly more formal design with a slaggy iron band running down either side of the central ridge of this sword. Thus it would have given the overall appearance of two narrow channels each with water flowing down it, as shown in the reconstruction here.

The function of pattern-welding

The occurrence, scale and significance of pattern-welding as used on early swords began to be recognised with a series of finds in the 19th century, particularly those from the great votive bog and pool deposits from Denmark. From the *c*. AD 100–400 votive deposit at Nydam alone, out of more than 100 swords recovered, over 90% were found to be pattern-welded, the surface patterns having been preserved and accentuated by the acid waterlogged burial conditions (Engelhardt 1866, 52, pls 6–7; Todd 1975, 192). The nature and purpose of pattern-welding has continued to puzzle scholars since these early finds (Lang and Ager 1989).

However, recent work on swords of the Anglo-Saxon period has shown that pattern-welding was still used on the great majority of swords, but that the pattern-welded construction had little or nothing to do with improving the physical properties of a sword, for instance by mixing iron and steel together. By this time the patterns had become more stylised, and the technique had been developed and refined so that the ferrous alloys chosen, and the ways in which these were combined, maximised the surface display potential for these swords (Tylecote and Gilmour 1986; Gilmour 1996a). In short, it is clear from their construction that Anglo-Saxon pattern-welded swords were made with appearance in mind, rather than to give them structural superiority. The choice of very specific ferrous alloys (those with certain optical properties) and the great skill shown in their construction show that this was a highly specialised craft governed by cultural perceptions, patronage and trade networks of the time.

The origins of pattern-welding

The origins of this type of sword construction and the reasoning behind it undoubtedly lie in the Iron Age, probably in central Europe sometime in the 1st millennium BC. The technique may already have been quite widely practised in a variety of forms by the mid 1st millennium BC; some of these forms were quite complex, to judge from a well-developed example of a composite pattern-welded blade found at Cleebronn (near Heilbron, south-west Germany) in a grave of early La Tène date (Pleiner 1993, 117). Engelhardt and others since the mid 19th century have suggested pattern-welding to be a Roman form of construction, but the styles and types of the swords, locations in which they are found, associated finds and so on all indicate origins outside the Roman Empire.

Conclusions

In conclusion, it seems fairly clear that the Kelvedon sword represents one of a series of early pattern-welded sword blades where a straight, simple non-twisted form of this decorative technique was used. These are slowly beginning to be recognised as early examples or forms of pattern-welding. Careful x-ray study is the key first step to recognising such blades, followed by more detailed analytical study. A double-channel pattern-welded design may have been considered particularly suitable for this narrow form of late Iron Age sword with its pronounced central ridge that would have divided the sword blade visually into two halves. Much more detailed research is required before it will be possible to identify how pattern-welded construction and design were developing for use in making swords in the mid to later Iron Age, but the cultural significance and link with water symbolism seem to be an important part of this development.

III. Wood

by Jacqui Watson

The spear blade has mineral preserved wood both inside the socket and on the outside. The wood in the socket will be the remains of the spear shaft and this was made from *Fraxinus* sp. (ash), cut from mature timber. Ash is a relatively springy wood and has commonly been used for hafting spears from the Bronze Age to the late Anglo-Saxon periods, and is the expected choice of wood in this context. The fragment of wood on the outside of the socket is also ash, with a tangential surface. This fragment of wood could be the remains of another artefact in the grave; alternatively, it could represent part of the spear shaft that had been broken and laid alongside the spear blade. The latter seems more likely as the spear blade itself has been bent. This certainly happened at the funeral of the late Iron Age warrior from Owslebury (Hampshire), because the spear blade and ferrule were aligned differently in the grave (Collis 1973, 126).

Three iron fittings with wood remains preserved on them belong to an enigmatic plank-built structure. Comparanda suggest it was not a coffin, but a board placed over the body in the grave. On close examination the wood was only preserved on the pointed terminals, which suggests that this ironwork had originally been used to join substantial pieces of wood together. Unfortunately none of the fittings are complete and very little wood remains on them, so it has not been possible to suggest what wood the structure was made from.

IV. Textile remains

by Penelope Walton Rogers

(Pls 3–4)

Two areas of textile are preserved on the sword blade. Both pieces lie close to the edge of the blade, one (67 × 8mm) a few centimetres from the tip, and the other (70 × 30mm) on the separate fragment of blade (Pls 3 and 4). The two areas seem to represent loose folds of cloth, lying over or under the blade. The two areas are the same textile, namely an evenly spun and woven tabby weave (syn. plain weave) made from Z-spun yarn, with 14–16 threads per cm in one direction and 12 per cm in the other. The remains have been heavily mineralised by the corroding iron, but a small sample crushed on to a microscope slide revealed some preserved fibres. They are 10–22μm diameter, have a smooth profile, a fine lumen (central channel) and fine cross-markings. These are a fully processed plant fibre, probably flax (or perhaps hemp), and the textile may be termed a linen tabby.

The flax plant, *Linum usitatissimum* L., has been recorded in the form of seeds and pollen in soil samples from a number of Bronze Age and Iron Age sites in Great Britain (A.R. Hall, pers. comm.). Linen textiles are, however, relatively rare, which may be due to the poor survival of plant fibres in damp, aerated or acidic soils. The textiles from late Iron Age cremations at Verulam Hills Field, St Albans (Hertfordshire) (Wild 1968, 14–16), and Westhampnett (Sussex) (Walton Rogers 1997), were almost certainly made from wool, as was a coarse, matted fragment on the handle of a late Iron Age mirror from Billericay (Essex) (Walton Rogers 2002a), while the more numerous textiles from the Arras Culture cemeteries of Yorkshire were too heavily mineralised to allow fibre identification (Crowfoot 1991). In any case, few of these were technically similar to the Kelvedon textile.

There is, however, one exceptionally well-preserved example of Iron Age linen from Westhawk Farm, Ashford (Kent), which closely resembles the Kelvedon linen. It was found on a broken fragment of patera in a late Iron Age cremation burial and it, too, was woven in tabby weave, from Z-spun yarn, with a similar thread-count to the Kelvedon textile, at 18–20 × 12–14 threads per cm (Walton Rogers 2002b). In the Ashford case, the fibre could be confidently identified as fully processed flax. To this example may be added the evidence from two late Iron Age warrior burials in Guernsey. At St Peter Port, two different textiles were preserved in association with metalwork that included an iron sword. They were both tabby weaves made from Z-spun yarn, with some sort of plant fibre as the raw material, but they were both coarser than the Kelvedon example, with thread counts of 5 × 5 and 12 × 8 per cm (Watkins and Cameron 1987; E. Cameron in Cunliffe 1996, 85, 88). The textile on the sword from Richmond (Guernsey) was also a tabby weave, but was less certainly linen and was made from S-spun yarn in warp and weft, 13 × 11 threads per cm (J.P. Wild in Cunliffe 1996, 109). The Kelvedon example, therefore, expands a very small corpus of material.

Chapter 5. The Start Date of Aylesford-Swarling Pottery

I. Introduction

The key dating evidence for the Kelvedon warrior burial is potentially the pair of pedestal urns in the grave, but there is no consensus about when such pottery first appeared in Britain. In view of the importance of the topic to the chronology of the grave, this chapter explores the start date of Aylesford-Swarling pottery.

Aylesford-Swarling was the last ceramic style current in the Kelvedon region before the Roman invasion. It was in use in north-east Kent, much of Essex, Hertfordshire, Bedfordshire and parts of neighbouring counties. It is characterised by the use of grog temper and was generally thrown on the wheel. Until fifty years ago it was thought to have been introduced from the mainland of Europe by the Belgae of north-east Gaul, and for this reason it was called Belgic pottery. It is now recognised that any linkage between this pottery and these Belgic newcomers said by Caesar (*De Bello Gallico* 5.12) to have settled in coastal parts of Britain is mistaken. It is understandable that there have been calls for the discontinuance of the term Belgic to describe the pottery, or indeed any other components of late Iron Age archaeology (Stead 1976, 401; May 1996, 620). But 'Belgic' (note the inverted commas) remains a convenient shorthand for the ceramic of the period (Martin 1988, 34; Gwilt 1997, 155), provided that presumptions of links with the Belgae are discounted.

II. The problem

Thompson (1982, 16) envisaged Aylesford-Swarling pottery emerging late in the 1st century BC, after *c*.30 BC. On the other hand, the Baldock (Hertfordshire) report puts the earliest grog-tempered wheel-thrown material there in the early to mid 1st century BC (Rigby 1986, 273–7). Haselgrove (1997, 58) and Hill (2002, 146) have gone even further and claimed that 'Belgic' pottery was current in eastern England from as early as the late 2nd century BC. In view of these divergences of opinion the topic will bear further examination.

After the arrival of the first Roman table crockery in Britain *c*.25 BC in the form of imports of central Gaulish wares, Arretine pottery and — not long afterwards — Gallo-Belgic ware (Rigby 1986, 270), the chronology of 'Belgic' pottery rests on a secure foundation because of the regularity with which it is associated with these imports in graves and on settlements. Dating 'Belgic' pottery before the arrival of these first imports of table crockery in what Stead (1976, 401) calls the Welwyn phase of the Aylesford-Swarling culture is more difficult. Birchall (1964, 22–3; 1965, 288–90) set great store on the chronological value of a few imported Roman bronze utensils, but it is now felt that this confidence was misplaced (Fitzpatrick 1997, 208). The only imported pottery in eastern England earlier than *c*.25 BC is the Italian wine amphora, Dressel 1. The form is common in Essex, but as stages in the typological history of the form cannot be dated closely, it is of limited use for dating developments in local pottery in the 2nd and 1st centuries BC.

III. Initial Aylesford-Swarling at Westhampnett

The Westhampnett cremation cemetery (Fitzpatrick 1997) lay on a low hill in the coastal plain of West Sussex, in a part of the country where Iron Age cremations are still remarkable for their rarity. Excavation of the entire cemetery brought to light 161 cremations, arranged for the most part around the south-east of a circular space which contained no burials; pyre sites were recognised around the edges of the cemetery. Most of the cremations were unurned but nearly every grave had at least one pot; these pots were new or had been made specially for the funeral.

The importance of Westhampnett lies in its early date, *c*.90–50 BC. It remains the earliest Iron Age cremation cemetery in the country. The chronology rests on brooches and other metalwork, including an Iron Age coin. Most of the pottery has comparanda in the wares current in central southern England in the middle to late Iron Age. Other typological elements were drawn from the Aylesford-Swarling repertoire. But although 39.5% of the pottery is grog-tempered, very few vessels are wheel-made and only one pot (27351 from Grave 20650) would be described as a pedestal urn if found in the Aylesford-Swarling heartlands of the south-east (Mepham 1997, 115–22, 125, 130–2). Unlike the classic areas of Aylesford-Swarling pottery in north-east Kent, Essex, Hertfordshire and parts of neighbouring counties, where 'Belgic' pottery often completely displaced middle Iron Age ceramic traditions, in West Sussex only selected elements of Aylesford-Swarling were grafted on to existing traditions. Although it is important, the 'Belgic' component of the Westhampnett cemetery can hardly be described as developed Aylesford-Swarling and is in keeping with other evidence (see below) suggesting that the tradition only emerged in the first half of the 1st century BC.

IV. The contribution of brooches

As at the Westhampnett cemetery, the most promising approach for dating the start of Aylesford-Swarling pottery involves relating the local pottery sequence to the brooch evidence. Most of the brooches found in late Iron Age Britain are ultimately of continental derivation; some are imports, while others are local copies. Similarities between the brooches found on both sides of the English Channel allow the chronology of the late Iron Age here to be integrated with the more securely based chronologies of the European mainland (Haselgrove 1997).

The Foxholes Farm brooches

From the standpoint of chronology, the most important settlement site with brooches and 'Belgic' pottery earlier than the horizon provided by imported table crockery is Foxholes Farm (Hertfordshire) (Partridge 1989).

Excavations there revealed a late Iron Age rectangular enclosure demarcated by a ditch, Feature F1. The ditch fill produced a suite of at least eight late Iron Age brooches. There may have been another (a second *Knotenfibel*), but the report is ambiguous. The primary fill (Layer 6) had grog-tempered pottery of Aylesford-Swarling type, some of it hand-made. Six of the brooches (a *Knotenfibel*, two *Drahtfibeln*, two Nauheims and a CRICIRV) were found higher up in the ditch fill, in Layer 2. Mackreth (1989, 129) argued that the Layer 2 brooches as a group dated earlier, rather than later, in the period *c*.100–25 BC. Two fragmentary brooches from Layer 3 were dated earlier than *c*.50 BC. Layers 2 and 3 produced wheel-thrown grog-tempered pottery in abundance, with no hint of earlier ceramics.

Seven of these eight brooches overlap in the period *c*.75–50 BC and it would seem that at Foxholes Farm Aylesford-Swarling 'Belgic' pottery was in regular use at least as early as the second quarter of the 1st century BC. Two imported Roman butt beakers from Layer 2 in ditch F1 (and hence later than *c*.25 BC) fit awkwardly with this otherwise consistent picture and are presumably intrusive.

Brooches in Aylesford-Swarling graves

One of the major sources of Aylesford-Swarling 'Belgic' pottery are the cremation graves that feature so conspicuously in the archaeological record for the south-east. The first brooch regularly found in cremation graves is one of the types present at Foxholes Farm, the La Tène D *Knotenfibel* or boss-on-the-bow type (Feugère 8). At least some *Knotenfibeln* equate with Almgren 65 (Stead 1976, 402–10; 1998, 345–7; Feugère 1985, 237–8). Specimens in Britain have been dated *c*.75–25 BC (Mackreth 1989, 131; 1995, 955, 964–5). Work in France supports this date range (Colin 1998, 39, 42 fig. 12). A solitary iron specimen from the King Harry Lane cemetery raises the possibility that blacksmiths continued their production long after they had passed out of the repertoire of smiths working in the precious metals and copper alloys (Stead 1989, 96–7). Fitzpatrick (1997, 96, 203–4) has proposed a minor adjustment to this chronology and assigned the lifespan of the *Knotenfibel* to *c*.70–30 BC, but this gives the chronology a precision it does not deserve and the Mackreth date of *c*.75–25 BC is preferred here.

A grave with 'Belgic' pottery from Chilham Castle (Kent) has a pair of *Knotenfibeln* with typologies reminiscent of the Nauheim brooch and possibly therefore earlier than *c*.50 BC (Stead 1998, 347). The Chilham Castle discovery leads to the question of Nauheim brooches and their bearing on the appearance of 'Belgic' pottery. Nauheims were current *c*.125–50 BC (Haselgrove 1997, 56; Colin 1998, 39, 42 fig. 12). The true Nauheim brooch is rare in Britain, unlike the situation on the European mainland (Müller and Maute 2000, 53 Abb. 91).

A brooch of Nauheim ancestry from an Aylesford-Swarling context was found in a pot from the cemetery at Aylesford (Kent) itself. Its typology sets it apart from continental Nauheims and the piece was made in Britain (Stead 1984, fig. 20 no. 6, 59; Hull and Hawkes 1987, 197, pl. S6 no. 2). Another Nauheim was present in a cremation grave from Folkestone (Kent) (Stead 1976, fig. 4 no. 2, 411).

The Wheathampstead brooch

The presence of a supposed Nauheim at Wheathampstead (Hertfordshire) has been claimed as evidence for 'Belgic' pottery there in the early 1st century BC (Haselgrove and Millett 1997, 287). The brooch came from a trench which produced considerable quantities of wheel-thrown grog-tempered pottery. But its stratigraphical relationship with this pottery is ambiguous: it was found 'at a high level in the trench which contained most of the pottery' (Wheeler and Wheeler 1936, 150, pl. 52 no. 1).

Thompson (1979, 175) also accepted the brooch as a Nauheim, adding that autopsy showed it to be closer to continental brooches than the drawing published by the Wheelers suggested. But Nauheim brooches always have a v-shaped bow with straight sides. None of those published by Feugère (1985) has a bow like Wheathampstead, with its wide rounded foot and slightly concave sides.

A more subtle evaluation of the Wheathampstead brooch is available in the unpublished corpus of brooches by M.R. Hull, housed at Colchester Museums. There it is pointed out that the form of the bow anticipates the much later Langton Down type (Hattatt 1985, 36–7 no. 268; 1987, 42–3 no. 768). The only comparable brooch from Britain with a dated context comes from West Stow (Suffolk), where it is early to mid 1st century AD (West 1990, 68 no. 149, fig. 52). The Langton Down brooch developed on the continent *c*.20/10 BC (Feugère 1985, 266–7) and so the Wheathampstead and West Stow brooches can hardly be any earlier.

Quite apart from its dubious stratigraphy, the Wheathampstead brooch cannot justify pushing the chronology of 'Belgic' pottery back towards the late 2nd or early 1st century BC.

Discussion

So what does the brooch evidence have to say about the start of 'Belgic' pottery in north-east Kent, Essex, Hertfordshire and parts of neighbouring counties?

If we take Foxholes Farm at face value, we can see that Aylesford-Swarling pottery had displaced pre-'Belgic' ceramics at least as early as *c*.75–50 BC in that part of Hertfordshire. But Foxholes Farm is exceptional: the only other published *Knotenfibel* associated with 'Belgic' pottery from a settlement context comes from Ditch 1 at Brickwall Hill (Hertfordshire), only 11.5km east of Foxholes Farm (Rook 1970, 25–7). The excavator recognised that some of the pottery was pre-'Belgic' and Thompson (1982, 646) confirms that the group is typologically early. It is a snapshot of the *start* of Aylesford-Swarling in Britain and serves as a corrective to Foxholes Farm.

Elsewhere in Hertfordshire there is evidence for an even later start for grog-tempered wheel-thrown pottery. In Ditch 41 at Gatesbury Track most of the pottery was hand-made with little sign of grog temper. There are no Roman imports, apart from a Dressel 1 amphora. Cutting Ditch 41 was the large Pit 46. Quantities of Gallo-Belgic pottery show the pit had filled no earlier than the last decades BC (Partridge 1980, 98–102, 109–10, 117–18, 130). We cannot know what interval of time separated ditch and pit, but there was no intervening stratigraphy and the sequence suggests a late start for 'Belgic' pottery there, sometime in the mid to late 1st century BC.

In the first Aylesford-Swarling cremation burials the most common brooch is the *Knotenfibel*, and so it is to the period *c*.75–25 BC that we should assign the first significant appearance of 'Belgic' pottery in graves. The two brooches of Nauheim ancestry from Aylesford-Swarling graves in Kent could be earlier, but it is just as likely that they lie towards the end of the lifespan of the type and overlapped with *Knotenfibeln*.

V. Pottery associated with coin hoards

Two coin hoards of the first half of the 1st century BC from west London and Essex also have a bearing on the start date of Aylesford-Swarling pottery. At Sunbury-on-Thames a cache of Class I potin coins was buried with three pots *c*.90–60 BC. The coins came from Kent and it is possible that the pots did as well, but none of the Sunbury vessels shows any hint of Aylesford-Swarling influence (Tyers 1996, 139–40; Haselgrove 1989a, 108–10 for the chronology of potins).

A hoard of Gallo-Belgic E staters from Southend-on-Sea was buried at the time of the Gallic Wars (Cowell *et al*. 1988, 2, pls 1–2 nos 1–33; Priddy 1987, 163) in a hand-made flint-tempered pot (Sealey 1996, 55). Again, the Southend pot is patently not Aylesford-Swarling, and is typical instead of the middle Iron Age pottery of Essex.

VI. Initial Aylesford-Swarling in Essex

Closer to the Kelvedon warrior burial, the start date of 'Belgic' pottery can usefully be explored by looking at three assemblages of Essex pottery which are transitional between the middle and late Iron Age. They are large enough for the absence of imported Roman table crockery to be significant, allowing us to place them earlier than *c*.25 BC. The three groups are those from Ditch AF1 at Woodham Walter (Rodwell 1987, 20–5, 37–8), Ditch F350 in Kelvedon village (K.A. Rodwell 1988, 103–6, 132–3), and the Airport Catering Site village at Stansted airport (Going 2004).

Woodham Walter

The Woodham Walter assemblage was associated with a fragment of an iron brooch (Major 1987). Only the head survives, but the four-coil spring and internal chord suggest a *Drahtfibel*. The type is dated *c*.80/60–20/10 BC by Feugère (1985, 203 form 4); Mackreth (1991, 124) is in broad agreement, putting a Thetford (Norfolk) specimen in the period *c*.100/75–25 BC. But this overlooks the fact that such brooches are present in early 1st-century AD graves from the King Harry Lane cemetery (Hertfordshire) (Stead and Rigby 1989, 96–7), and the type clearly lasted until at least the first decades AD (Richards 1998). Their presence in mid 1st-century AD contexts at Colchester Sheepen confirms this (Hawkes and Hull 1947, 308, pl. 89 nos 4–5 Type II). The Woodham Walter brooch can only therefore give a *terminus post quem* for its associated pottery, in the first half of the 1st century BC.

Kelvedon village

The Kelvedon assemblage had no independently datable associations, but the fills of late Roman graves in the immediate vicinity had a wealth of residual late Iron Age finds, including three *Knotenfibeln*, five Class II potin coins and a Dressel 1 rim. Collar rims like that on the Kelvedon Dressel 1 appear as early as *c*.125–100 BC (Olmer *et al*. 1995) but remained in production until the end of the form *c*.10 BC. Class II potins appeared around the 60s BC or a little earlier (see above), a date in tune with the chronology of *Knotenfibeln*. If these residual artefacts were contemporary with each other and with the fill of Ditch F350, the implication must be that Aylesford-Swarling pottery made its debut there somewhere in the decades spanning the middle of the 1st century BC.

Stansted Airport Catering Site

The third Essex site with a bearing on the start date of 'Belgic' pottery is the Airport Catering Site (ACS) at Stansted airport. This site comprised a defended village of at least ten roundhouses occupied *c*.75–25 BC, with a brief phase of renewed activity *c*.AD 40–75. It is said that 'the overwhelming bulk' of the pottery is grog-tempered (Going 2004, 141) but study of the report is hamstrung by a lack of data. There are no sherd counts and sherd weights for each of the site phases, or even figures for the total quantity of pottery analysed. There are also difficulties with the fabric categories. The statement on the fabric types makes no reference to the flint-tempered fabrics mentioned by Going in his descriptions of individual features. Nor is it clear how the flint-with-sand and flint-tempered sherds from ACS described by Brown (2004, 39) should be integrated with the Going report.

Putting these difficulties to one side, it is clear that the site saw the adoption of 'Belgic' pottery and its gradual displacement of hand-made middle Iron Age wares. Significant early groups include the 1799g of 'mostly handmade scraps' from the eaves-drip gully of roundhouse 48, the gully of roundhouse 408 with its 'substantial quantity of flint-gritted material' associated with a Stansted-type potin, and the pottery from the eaves-drip gully of roundhouse 504 associated with the hoard of fifty-one Stansted-type potin coins (Havis and Brooks 2004, 87, 98–9, 104).

Having examined the pottery from these and other early contexts for himself, the writer can report that much of the early pottery from the site is the sand-tempered ware so typical of the Essex middle Iron Age (presumably this is the Fabric 1 of the published report, although the description makes no mention of sand). In some of these early contexts, grog-tempered 'Belgic' pottery is in a minority. Quantification of the incidence of the fabrics in these groups could usefully be undertaken as a supplement to the published report.

A start date for 'Belgic' pottery at the Airport Catering Site village turns on the chronology of the Stansted-type potin coins associated with the pottery. Production took place *c*.90–50 BC, although a date towards the middle or end of the period was deemed most likely which means (let us say) *c*.70–50 BC (Van Arsdell and Northover 2004, 118). This can be taken as the *terminus post quem* for the introduction of 'Belgic' at ACS. Some support for this chronology comes from the three Nauheim brooches, although they were residual in their contexts (Major 2004b, 121, fig. 84 nos 25–7, 126).

Conclusions

None of these three sites allows us to put the introduction of 'Belgic' pottery in Essex back as early as the 2nd century BC. Grog-tempered and wheel-thrown pottery first appears on settlement sites in the county towards the middle of the 1st century BC but does not become the dominant ceramic until at least *c*.50–25 BC.

VII. Graves versus settlements

It is important to bear in mind as well that some of the earliest 'Belgic' pottery in the south-east comes from graves; contemporary pottery assemblages from settlements can be more conservative. In West Sussex, at the Westhampnett cemetery, although 39.5% of the pottery is grog-tempered the percentage on adjacent settlements falls to 2.4% and lower (Mepham 1997, 123). In south Essex, only Aylesford-Swarling pottery as a rule is found in cremations. A rare exception is a classic hand-made middle Iron Age pot from Mucking with a cremation (Elsdon 1975, 50–1).

On nearby settlements in south Essex, 'Belgic' pottery is a distinct minority element in groups dominated by south Essex shell-tempered ware (Thompson 1988; 1995, 90). Further north in Essex, at Maldon Hall Farm, a cremation grave with a silver *Knotenfibel* (and hence dated *c*.75–25 BC) has an impressive suite of eight 'Belgic' pots, including five pedestal urns (Lavender 1991, 203–8). Yet only 2.75km to the north-east, on the major late Iron Age settlement of Elms Farm at Heybridge (Atkinson and Preston 1998), the writer has seen — through the good offices of Joyce Compton and Mark Atkinson — large pottery assemblages with imported Roman table crockery (and hence later than *c*.25 BC) in which 'Belgic' pottery is outnumbered by hand-made vessels in sandy fabrics of pre-'Belgic' middle Iron Age type.

VIII. 'Belgic' pottery on the Essex borders and in East Anglia

We may begin with a clarification of the geography of the regions involved. East Anglia proper was the old kingdom of the East Angles; it embraced Norfolk, Suffolk and adjacent parts of Cambridgeshire. Essex was the kingdom of the East Saxons and should not, for that reason, be thought of as part of East Anglia. Use of the expression 'southern East Anglia' to indicate Essex and Hertfordshire should be discouraged.

In north-west Essex and south Cambridgeshire small cremation cemeteries of 'Belgic' pottery were established in the 1st century BC (Hill *et al*. 1999; Crossan *et al*. 1990) in a landscape where contemporary settlement pottery assemblages manifest striking variety. At the more conservative end of the spectrum is Wendens Ambo (Essex), where pottery of middle Iron Age type remained dominant until the early Roman period (Hodder 1982, 25). Yet, further north, at Castle Hill in Cambridge, the pottery from a late Iron Age settlement founded after *c*.15 BC has no sign of middle Iron Age material and is thoroughly Aylesford-Swarling in its typology, with imported Gallo-Belgic wares (Farrar *et al*. 2000).

Elsewhere in East Anglia late Iron Age wheel-thrown and grog-tempered pottery sometimes does not make its appearance until much later, after the Roman invasion (Gregory 1995, 93–4; Lyons and Percival 2000, 222). There pottery of middle Iron Age type lasted until the Roman invasion with only the sporadic adoption of 'Belgic' ware.

The ubiquity of 'Belgic' pottery in Hertfordshire and Essex is in sharp contrast to East Anglia; the gradient in diminishing incidence is a steep one. It is made all the more conspicuous by the presence of an unmistakable Aylesford-Swarling component in the late Iron Age pottery from Dragonby in Lincolnshire, 200km to the north (Elsdon 1996; Gregory and Elsdon 1996) and across the river Humber at Brantingham in Yorkshire (Dent 1990, 227, 229). Wheel-made pottery is also present further south, in the east Midlands; the quantities are never overwhelming but the number of sites continues to grow (Knight 2002, 134–7).

It is difficult to avoid the feeling that the adoption of wheel-thrown and grog-tempered pottery was tied up with wider issues in the various communities between the Wash and the lower Thames (Hill 2002, 157–8). We are not simply dealing with the pace at which a technological innovation could be spread by acculturation in a neutral or disinterested ideological setting. Many communities in East Anglia simply chose to reject Aylesford-Swarling; their attitude was much the same as their attitude to imported Roman ceramics. In late Iron Age south Cambridgeshire, Roman imports in general are only found in contexts where 'Belgic' pottery was also made welcome. In East Anglia this reluctance to entertain foreign pottery is most evident in the dearth of Dressel 1 amphoras from Norfolk and north Suffolk. In this case we may be dealing with a specific act of policy by a known political entity, the Iceni (Sealey 1979, 173–4; 2004b, 6). Misgivings in East Anglia about imported pottery, be it Roman or Aylesford-Swarling (let alone Mediterranean wine), reflect not the backwardness of these communities but their insularity. Traditional pottery may well have been entwined with their concepts of identity and reinforced the reluctance of these communities to embrace the wider world, even at the humble level of ceramic production and exchange.

South Cambridgeshire in particular was a region that lay uneasily between the Iceni, Catuvellauni and Trinovantes in the late Iron Age — it was border country, with all that implies. It was a place of impermanent and fluctuating allegiances (Hill *et al*. 1999, 269). So at Caldecote (for instance), an Iron Age roundhouse set in a banjo enclosure saw a period when 'Belgic' pottery was an important component of the pottery in daily use. But even *before* the Roman invasion, 'Belgic' went out of fashion and the settlement saw the reassertion of its 'middle' Iron Age ceramic identity (Sealey 2005). Caldecote may have been a community that wanted (and achieved) a loosening of ties with Hertfordshire and Essex in the decades before the Roman invasion; the renunciation of grog-tempered pottery may hint at a realignment towards regions to the north or west. The fitful and sporadic adoption of Aylesford-Swarling pottery in south Cambridgeshire articulates perfectly with our present knowledge of this land of shifting identities.

IX. Summary and conclusions

It only remains to bring these various strands together. A very few graves in Kent with 'Belgic' pottery have Nauheim brooches. Such brooches were current from *c*.125–50 BC and it is possible that these graves could be earlier, rather than later, in that time bracket.

But the most common early brooch associated with Aylesford-Swarling pottery is the *c*.75–25 BC *Knotenfibel* and it was in the lifetime of these brooches that 'Belgic' pottery first became significant. Even so, in some areas there was a timelag between the first appearance of Aylesford-Swarling pottery in graves and its later adoption and use on settlement sites. This was the case in West Sussex where pottery with Aylesford-Swarling affiliations was present in the *c*.90–50 BC cemetery at Westhampnett but where such pottery never became the dominant component of ceramic assemblages in the prelude to the Roman invasion. North of the Thames where it did, the timelag between the presence of 'Belgic' pottery in graves and settlement sites is most evident in Essex and south Cambridgeshire. In Hertfordshire, Aylesford-Swarling pottery had displaced earlier wares *c*.75–50 BC at Foxholes Farm, although such an early date is not replicated on other settlements there or elsewhere north of the Thames. In Essex, Aylesford-Swarling pottery did not significantly impact on settlement pottery assemblages until at least *c*.50–25 BC.

Further north, in Norfolk, Suffolk and Cambridgeshire, its adoption took place even later. Although some settlements there had developed a taste for this new pottery in the last decades BC and the start of the following century, wheel-thrown grog-tempered wares did not reach most parts of East Anglia until after the Roman invasion. The development of Aylesford-Swarling pottery was a protracted and piecemeal process that took place at different times in different parts of the country; the pace at which it displaced existing pottery styles also varied from region to region. We need to face up to the fact that contemporary pottery assemblages in parts of Essex and East Anglia can be quite different, even on sites not far apart: the awkward implications of this will need to be addressed more fully in the future.

The Kelvedon warrior burial cannot, therefore, be put back as early as the 2nd century BC and the weight of evidence suggests the funeral took place after *c*.75 BC. This is important because it confirms the evident delay in Britain of the adoption of a style of fighting — by elite warriors with a sword, shield and spear — that emerged on the mainland of Europe in the 3rd century BC (p.35).

Chapter 6. Discussion

I. An interpretation of the Kelvedon finds

While the excavation was in progress it was decided that the finds represented a burial, despite the absence of a body. There is no reason to challenge this interpretation now, particularly as the lack of human remains can be explained by aggressive (acidic) soil conditions. All the other graves from Iron Age Britain with two or more items of weaponry are inhumations, but we cannot prove this in the case of Kelvedon. If the grave pit was indeed square rather than the elongated pit one would have expected of an inhumation, it is possible the grave was a cremation. Cremated bones were often heaped on the floor of an Iron Age cremation and need not have been placed in the ceramic grave goods, as the excavator seems to have expected at Kelvedon (he searched both pedestal urns for bone, but in vain). In the late Iron Age cemetery at Westhampnett (West Sussex), seven features that would otherwise have been interpreted as graves had no cremated bone at all and were interpreted as memorials or cenotaphs. It is not impossible that Kelvedon was another cenotaph (McKinley 1997, 55, 57, 71–2).

The only other possibility is that the finds represent a metalwork hoard, but the two complete pedestal urns and the lack of duplication among the metal artefacts suggest otherwise. In the discussion that follows it is assumed that the deceased was an adult male.

II. Funerary rites

At the funeral the sword was removed from its scabbard and bent; the spear blade was also bent. There is a possibility that the spear shaft had been snapped in two and part of the shaft laid across the blade of the spear. The Owslebury spear had also been snapped, if only to fit in the grave (Collis 1968, 25; 1973, 126). A spear in the Claudian warrior burial at Colchester Stanway (Essex) might also have been bent at the funeral (Crummy 1993, 3) but the damage is slight and the evidence is equivocal (N. Crummy, pers. comm.). What is unusual about the Kelvedon grave is the fact that both the spear blade and sword are bent.

Only three other warrior burials in Britain have weapons that were bent at the funeral. The sword in the Acklam (Yorkshire) grave was bent (Dent 1984, 121–3); so too was a spear in one of the two warrior burials from Brisley Farm (Kent) (Johnson 2003, 17; Stevenson and Johnson 2004, 492). At Coleford (Gloucestershire) the sword in the warrior burial had been bent through 55º (Stead 2006, 180–1 no. 128). It may also be pointed out that a La Tène III sword from a pit at Springfield Lyons (only 17km south-west of the Kelvedon burial) had been bent almost into an oval (Stead 1987; 2006, 168–9 no. 80, fig. 63). Very few Iron Age swords from Britain had been bent in antiquity (Stead 2006, 51–2). Only nine of the *illustrated* weapons in the Stead corpus (which lists 283 Iron Age swords or scabbards) are bent (3%), although the actual number will have been higher because a few swords had been straightened after discovery and at least one of the bent weapons in the corpus was not drawn.

After the Kelvedon sword had been removed from its scabbard, it was wrapped in linen. In the Birdlip (Gloucestershire) warrior burial, there were also traces of textile on the surface of the sword (Stead 2006, 199 no. 231). A sword in its scabbard discovered in a former bed of the river Nene at Orton Meadows (Cambridgeshire) had been wrapped in woollen cloth (Stead 2006, pl. 28, 159 no. 31); presumably the weapon was a votive offering cast into the river. What might have been another ritual offering was the sword apparently deposited in a pond near Ripon (Yorkshire), with woollen textile around the grip (Stead 2006, 198 no. 221). It would seem that there were special occasions in the Iron Age when swords were draped in cloth before their disposal in graves or as ritual discards in watery places. At Kelvedon the use of linen sets it apart from the examples cited here. One also notes that an Iron Age warrior burial at Alloa (Clackmannanshire) included a linen shroud or garment (Pitts 2006, 9). Closer parallels for the use of linen at Kelvedon are provided by warrior burials from Guernsey in the Channel Islands, where one sword in its scabbard had been wrapped in linen, and another had apparently been placed in the linen folds of the shroud around the corpse (Cunliffe 1996, 85, 109).

The position of the grave in the landscape is not without interest. It lies on rising ground just below the brow of an unobtrusive spur, beyond which the terrain resumes its ascent towards Theobald's Farm. Several other late Iron Age cemeteries were sited in similar locations; this might not be coincidental (Fitzpatrick 1997, 228), although more research is needed before we can be sure.

III. The date of the grave

What is now known about the start date of Aylesford-Swarling pottery suggests the two pedestal urns are unlikely to be any earlier than *c*.75 BC. All the other evidence converges on a date in the 1st century BC for the grave. The iron band-shaped shield boss is a type that was passing out of fashion in the 1st century BC and the length of the ferrule suggests that it, too, is late in the Iron Age sequence. Links between the tankard handle and insular mirror handles also indicate a date before the end of the 1st century BC. Likewise, the Eggers 67 bronze bowl is a vessel form that is typically 1st century BC.

It is significant that there is no imported Roman table crockery in the grave, particularly as imported pottery was common in the Kelvedon village. Some of it there is early, such as an Arretine platter with a radial stamp that can hardly be later than *c*.10 BC (W.J. Rodwell 1988a, 93, 97; Oxé *et al.* 2000, 9 for the date). Bearing in mind that imported Roman pottery (other than amphoras) is not found in Britain until *c*.25 BC, the likelihood must be that the funeral of the Kelvedon warrior took place *c*.75–25 BC.

IV. Iron Age warrior burials in Britain

A warrior burial is defined here as a grave with an offensive weapon, an artefact for inflicting injury. In practice that means a sword, dagger or spear. Such graves are to be distinguished from those with single items of defensive equipment, such as the mail in the Lexden tumulus (Essex) or the shield boss in the Snailwell grave (Cambridgeshire) (Laver 1927, pls 53–55, 246, 248; Foster 1986, 82–7; Lethbridge 1954, 28–9, 32, pl. 5). The adult in the King Harry Lane cemetery (Hertfordshire) cremated with ten identical coins showing a mounted figure brandishing a sword could have been a warrior as well (Curteis 2005, 222–3 citing Goodburn 1989). Warriors may also be represented in the archaeological record by unaccompanied inhumation burials of the whole or incomplete skeletons of adult males with indications of violent death. Some of these may have been defeated warriors whose bodies were mutilated by the victors in acts of denigration (Craig *et al*. 2005, 175–6).

Corpora of warrior burials from Britain have been compiled by Collis (1973, 124–9), Whimster (1981, 345–53) and Hunter (2005, 64–6). Apart from the Arras Culture of Yorkshire (Stead 1979; 1991a), they are rare in England and Wales, with less than twenty-five examples as defined above. Some counties have none at all. Excluding Yorkshire, most warrior burials in England and Wales are found south-east of a line joining the Bristol channel and the Wash, although there are no real geographical clusters (Hunter 2005, fig. 4).

The date of the more recent discoveries lends weight to the view that (outside Yorkshire) warrior burials belong to the last two to three centuries of the Iron Age (Collis 1973, 129; Whimster 1981, 139–42).

V. The neglect of warfare in Iron Age studies

For the last half-century a sanitised and pacified conception of prehistory has held sway. To some extent this was an escapist reaction from the traumas of the last world war (Kristiansen 1999, 175; Mercer 1999, 143). Other relevant attitudes in the climate of opinion since the mid 20th century have been explored by Keeley (1996, 163–71). In Britain the concept of warfare as a major factor in prehistory receded in significance once it was realised that invasion did not need to be continually invoked to explain cultural change (Clark 1966).

Now warfare is popular again — at least intellectually, as a topic for discussion in prehistory (Monks and Osgood 2000, 1). But this revival of interest has largely passed by the Iron Age in Britain. There is still a widespread feeling that the role of warfare in the period was marginal and that even the massive earthworks of hillforts were not primarily defensive (Sharples 1991, 88; Haselgrove 1999, 132). Yet the accomplished La Tène decoration of so much martial equipment shows that the elites of the period cherished their weaponry, with the implication that warfare was not just condoned or treated as a course of last resort but actively celebrated at the highest level as a legitimate way of conducting relationships between communities (*pace* Millett 1990, 36).

Nevertheless, a whole raft of conference proceedings and reviews of the period over the last twenty years have shown barely a flicker of interest in the topic of Iron Age warfare (Cunliffe and Miles 1984; Collis 1994b; Fitzpatrick and Morris 1994; Champion and Collis 1996; Gwilt and Haselgrove 1997; Humphrey 2003). Even excavation reports with a substantial component of weaponry seldom broach the question of armed conflict (Stead 1991a); nor does it feature in the important 2001 research agenda for the Iron Age (Haselgrove *et al*. 2001).

Until recently, we have been in much the same position as colleagues concerned with early medieval archaeology and history were before the 1987 conference on Anglo-Saxon warfare (Hawkes 1989, 1). But there are encouraging signs that things are at last on the move: we now have the study of warrior images on coins by Hunter (2005) and of the ritual denigration of the victims of Iron Age warfare (Craig *et al*. 2005).

VI. The incidence of warfare in late Iron Age Britain

The most compelling evidence for the prevalence of warfare in Iron Age Britain is not archaeological, but documentary. Indeed, the neglect of the topic may in part be connected with the widespread reservations about such source material for the period, as expressed so trenchantly by Haselgrove (2004, 13).

It needs to be remembered that the Roman invasion of Britain was contested, and in some regions contested with real vigour: the Romans actually lost their first war against the Silures of south Wales (Tacitus *Annals* 12.38–40). The warriors who took part in these battles, and others, did not spring to life in the reign of Claudius but belonged instead to a world with its roots in later prehistory. Indeed, it is high time that the pre-Flavian campaigns were treated as source material for life in southern Britain before AD 43. Our major documentary source for Iron Age warfare in Britain is Caesar (*De Bello Gallico* 4.20–36; 5.8–23). Some of his testimony surfaces later in Strabo (4.5.2) and Pomponius Mela (*De Chorographia* 3.52). All three writers speak of the warlike tenor of life in the island. Given that this was not something routinely predicated of life on the edges of the Roman world, it deserves more attention than it is usually accorded. Diodorus Siculus (5.21.5–6) has been taken to be an exception, but the peace he said prevailed 'for the most part' was an armed one — as his reference to chariot warfare shows (*pace* Creighton 2000, 79, 216).

It is worth exploring the implications of what Caesar had to say of warfare in Britain. We may begin with the forces he thought necessary to overawe the population because that should give some idea of the numbers of warriors he expected to encounter. Caesar learnt enough on his first invasion to judge it necessary to return with no less than five of the eight legions he had at his disposal in Gaul, as well as 2,000 cavalry. This does not suggest an enemy that was defenceless or supine, let alone numerically insignificant. But what does this mean in terms of numbers? At full strength a legion had some 5,400 men, so the 54 BC invasion army might have run to 29,000 troops, including cavalry. But the legions were seldom at full strength because of casualties, desertions and sickness. The situation was particularly acute in the late Republic, at the very time when Caesar was active (Goldsworthy 1996, 22 with refs). But if we allow that the Gallic War legions were only at three-quarters strength, Caesar would still have attacked Britain with more than

20,000 troops. That he needed them is apparent from the scale of the resistance he met.

The only figure given for British forces is the 4,000 *essedarii* Cassivellaunus retained after he had disbanded the rest of his forces. *Essedarius* is usually translated in error as 'charioteer' but the word actually means the warrior who fought from a chariot (*Thesaurus Linguae Latinae* vol.5.2 *s.v. essedarius*) so the manpower represented is 8,000 (to allow for the retainer who drove the chariot). There is no need to dismiss these 4,000 *essedarii* as invention (Cunliffe 1995, 33). Nor do they seem unrealistic when viewed from the perspective of the *c*.100–50 BC bronze foundry on the otherwise unexceptional site of Gussage All Saints (Dorset), where fittings for at least fifty chariots were manufactured over a short period of time (Spratling 1979, 141).

Caesar was impressed by the expertise of the charioteers in Britain, an expertise that had been acquired through continual practice. The forces Cassivellaunus was able to deploy were not hastily-raised and improvised war bands but an army of experienced warriors that was numbered in thousands rather than hundreds: fighting in Iron Age Britain was not an exclusively elite activity (*pace* Hunter 2005, 62). The evidence reviewed here shows that at least in the late Iron Age in the south-east, a belligerent such as Caesar had to tackle veritable nations in arms.

VII. Warfare and state formation

If any doubts remain about the important part played by warfare in the late Iron Age of south-eastern Britain, we should pause to consider what these communities called themselves. Whether we think of them as tribes, chiefdoms or primitive states (Arnold and Gibson 1995) matters but little for our purposes (Collis 2003, 105, 212). Some defined themselves by reference to armed combat. Catuvellauni means 'men good in battle, battle-experts'. The name of the Trinovantes, meaning 'most lively, very vigorous', and that of the Ancalites, meaning 'hard, severe, austere, firm, tough, hardy', may also hint at something similar (Rivet and Smith 1979, 250, 305, 475–6). Another striking illustration of the same phenomenon is the *civitas* formerly known as the Corieltauvi. The correct spelling is *Corieltavi*, meaning 'the army or host (of the region) of many rivers' (Breeze 2002: endorsed by Tomlin and Hassall 2003, 382 n.84).

To judge by the distribution of their coins, the largest Iron Age kingdoms on the eve of the Roman invasion were bigger units than modern counties. These developed from smaller units attested a century earlier. Caesar mentions four kings in Kent, and north of the Thames he encountered five *gentes* never heard of again: the Ancalites, Bibroci, Cassi, Segontiaci and Cenimagni (assuming the last were not the Iceni) (*De Bello Gallico* 5.21–2). Bearing in mind that the Trinovantes then dwelt in north-east Essex and south-east Suffolk (see below), the likelihood is that at least four of these *gentes* were located somewhere between the lower Thames and East Anglia — so none of them can have occupied extensive territories. The modest scale of these principalities suggests that the incidence of warfare then would have been higher than later simply because the number of competing social units was greater (Carneiro 1990, 193). Quantified studies of the incidence of warfare in pre-industrial primitive societies show that it was a frequent and regular activity; in some cases it was the normal state of affairs (Keeley 1996, 25–33). There is no reason why Iron Age Britain should have been any different.

Indeed, aggression will have been one of the major factors in the development of the communities we glimpse at the end of the period, as it was elsewhere (Hedeager 1992, 84–5; Randsborg 1995, 62). There is much to be said for the view that the polities of late Iron Age Britain were created by energetic leaders faced by the threats and opportunities posed by war, rather than through spontaneous expressions of ethnic identity at rank and file level among the populace at large (James 1999, 94, 97–8). Such developments are exemplified by the Segontiaci, mentioned by Caesar, whose name means 'the people of Segontios' (Rivet and Smith 1979, 453–4); the Segontiaci evidently defined themselves as the companions or followers of a named leader; a leader, moreover, whose name has the element 'sego', which is cognate with Welsh and Irish words with the connotations of 'strength', 'daring', 'bold' and suchlike (Evans 1967, 254). Implicit, too, in the name of the Segontiaci is a weakening of the primacy of kinship structures that marked a step on the way towards state formation (Hedeager 1992, 87, 91; Gibson 1995, 125). Another leader who fashioned a polity in Britain in his own image was Commius of the Belgic Atrebates (Bean 2000, 115–16), even if some Atrebates had settled in the Hampshire region before the Gallic Wars (Cunliffe 1984, 19–20; Fitzpatrick 1992, 16 with refs).

Serious consideration should be given to the view that armed conflict was a major factor in the emergence of the kingdoms in south-east Britain in the late Iron Age: they were created not just *by* warfare, but *for* warfare, and peaceful relations between them were the exception, rather than the rule.

VIII. How the Kelvedon warrior fought

Putting these larger topics to one side, we may now address the question of how the Kelvedon warrior actually went about fighting, equipped as he was with sword, shield and spear (and possibly a dagger or short sword as well).

Given that there are at least four warrior burials from Britain with the same panoply (see below), it is exasperating that we have no image of such a warrior on an Iron Age coin issued here that might elucidate the style of fighting in question. But examples are known for Gaul, such as the foot soldier with sword, shield and spear on a silver issue of the Pictones *c*.60–50 BC (Rapin 1991, 324). No warrior equipped that way is shown on horseback.

It is difficult to say if any given spear was used as a javelin (*i.e.* thrown), as a lance or thrusting weapon for a warrior on horseback, or for hand-to-hand combat on foot at close quarters (Harding 1999, 164–5). But for a warrior like Kelvedon, already equipped with sword and shield, it would make sense to use the spear as a javelin at the start of hostilities. Whether or not the Kelvedon warrior fought on foot or on horseback is more difficult to establish. It was certainly not necessary to be mounted to use a spear as a javelin: a Roman military intelligence report among the Vindolanda Tablets shows that the Britons discharged javelins on foot: '…nor do the wretched Britons [*Brittunculi*] mount in order to throw javelins' (Bowman and Thomas 1994, 106–8).

Late La Tène swords with straight sides to the blade (like Kelvedon) were slashing weapons (Stead 1983, 505) and it is often claimed that they developed for use on horseback (Roymans 1990, 251; Rapin 1991, 326). This overlooks the awkward fact that for cavalry without stirrups (which were unknown in Europe until the early Middle Ages), a slashing action with a sword can unseat the warrior if he misses his target (Gordon 1953, 75): this would explain the dearth of Iron Age images of sword-wielding mounted warriors. It is significant that the Vindolanda text is explicit on the question: 'The cavalry [of the Britons] do not use swords…'. When warriors are depicted on horseback they usually bear a javelin or lance, as on the Gundestrup cauldron (Kaul 2003, 182). If he did have a horse, the Kelvedon warrior would presumably have dismounted to fight. The other possibility is that he discharged his javelin from a chariot and then alighted to continue the fight with his sword while his retainer waited in the chariot, as described for Gaul by Diodorus Siculus (5.29.1) and by Caesar (*De Bello Gallico* 4.33) for Britain.

IX. The continental background to the Kelvedon style of fighting

(Tables 3–5)

The large number of inhumation graves from the Iron Age of Champagne has allowed quantified studies of developments in styles of warfare for the region. Bearing in mind the dearth of Iron Age graves elsewhere in France, it is hoped that the Champagne evidence has a validity elsewhere. Although there are some discrepancies between different studies, the outlines of the picture are clear and consistent.

In La Tène I, most warriors were equipped only with spears. In La Tène II there was an important shift as the sword became increasingly common, although (as we shall see) most warriors were still only armed with spears. At the same time the tapered thrusting sword was gradually displaced by slashing weapons with parallel sides to the blade (Stead 1983, 499, 505). Sets of specifically elite military equipment throughout temperate Europe became increasingly standardised from the 3rd century BC around the three components that German prehistorians call *Dreierausrüstung*: the sword, shield and spear (de Navarro 1972, 74 with refs). At the same time more and more spears were regularly fitted with a ferrule (Rapin 1988, 137). It was from this 3rd-century BC milieu that the style of fighting represented by Kelvedon emerged.

The growing popularity of the sword is evident in the late La Tène I and La Tène II sanctuary at Tronoën (Finistère), where excavations in the 19th century brought to light some twenty-five to thirty swords and sixty spear blades (Duval 1990, 24–5). The subsequent importance of the sword is highlighted by the middle to late La Tène ritual site at Gournay-sur-Aronde (Oise), where swords greatly outnumbered spears. But a quite different picture is given by a contemporary sanctuary in Belgic Gaul at Ribemont-sur-Ancre (Somme) (Rapin and Brunaux 1988; Lejars 1994; 1998). There, the position is reversed, and spears greatly outnumber swords (Tables 3–4).

The discrepancy between the overall data from both sites can be explained by differences in cult practice. In particular, the Ribemont weaponry looks like a selection from a much larger body of material (Lejars 2000, 250).

weapon or item of military equipment	*minimum number of complete items*
shields (represented by the umbos)	220
swords	200
scabbards	180
scabbard suspension gear	100
spears	60

Table 3 Weaponry at Gournay-sur-Aronde (Oise) (after Lejars 2000)

weapon or item of military equipment	*minimum number of complete items*
shields (represented by the umbos)	260
swords	20
scabbards	70
spears	630

Table 4 Weaponry at Ribemont-sur-Ancre (Somme) (after Lejars 2000)

But there is one subset of material at Ribemont which does look like a representative sample of weaponry from a war band. It comes from the '*charnier*' (charnel house) outside the south-east side of the main enclosure. Details are given in Table 5. The charnel house was the remains of some seventy-five to eighty decapitated young adult males who had died *c.*250 BC; the corpses are presumably those of a defeated enemy. Their weaponry was also present. On the basis of the scabbards and belt fittings the assemblage represents the remains of swords for a minimum number of seventeen to twenty-two individuals. This figure is close to that for the shields because the minimum number of umbos is twenty-two. There were also 121 spear blades and twenty-nine ferrules. This means there are only about twenty-two sets of equipment for warriors armed with sword, spear and shield. The number of spear ferrules is close to this figure and suggests that spear shafts fitted with ferrules were elite equipment. The other two-thirds of the warrior band had to make do with one or more spears.

The picture that emerges is one of war bands in which a numerically superior component of spear men fought alongside a better-equipped minority corps armed with the more deadly combination of spear, sword and shield (Lejars 1998, 234–5, 242). Warriors in Belgic Gaul armed

warrior, weapon or item of military equipment	*minimum number*
number of bodies (decapitated young adult males)	75–80
number of swords represented by scabbards and belt fittings	17–22
number of shield bosses	22
number of spear blades	121
number of ferrules	29

Table 5 Weapons and warriors from the charnel house at Ribemont-sur-Ancre (Somme)
(after Lejars 1998 and 2000)

with the *Dreierausrüstung* of the sword, shield and spear are described by Strabo (4.4.3). A memory of expertise in fighting with spears there is preserved in Lucan (*Bellum Civile* 1.423–4), who singled out the Suessiones and Remi of Belgic Gaul for their expertise with such weapons.

Elsewhere in temperate Europe, weapon combinations in graves tell much the same story. Moving east from Gournay and Ribemont to the Treveri, analysis by Roymans (1990, 253–4) of late Iron Age and early Roman graves in the Trier region shows that warriors equipped with a spear, or with spear and shield, outnumbered those with sword, spear and shield by about three to one. His sample has ninety-five graves: 14% were *Dreierausrüstung* warriors, and 39% were graves with only a spear or a spear and a shield. These ratios tally with the data from the late La Tène and early Roman cemetery of Lamadelaine at the Titelberg where, in a much smaller sample of seven warrior burials, only one had a sword, spear and shield, and three others had a spear or a spear and shield (the remaining three graves only had shields) (Metzler-Zens *et al*. 1999, 380–3).

A survey of weapon combinations from graves in selected regions of Free Germany showed that only 16% of these warriors had a sword, spear and shield, whereas no less than 52% had a spear or a spear and a shield (Schirnig 1965, 22). A more recent study of nearly a thousand Iron Age graves from Jutland shows spear warriors in the majority, with only 10–15% of the total number of warrior burials laid to rest with sword, spear and shield (Hedeager 1992, 121). All this bears out the testimony of Tacitus, who said that most German warriors were armed only with spears (*Germania* 6).

X. The adoption of *Dreierausrüstung* fighting in Britain

In mainland Britain there are only five Iron Age warrior burials with the *Dreierausrüstung*, a complete panoply of sword, spear and shield: Grimthorpe and Rudston 154 (both Yorkshire), Owslebury (Hampshire), Kelvedon and the two from Brisley Farm at Ashford (Kent). Grimthorpe is La Tène III, and could be as late as the 1st century BC (Stead 1968, 179; 1985a, 31–3; 1991a, fig. 50 no. 6), but Rudston 154 cannot be closely dated (Stead 1991a, 205–6). The *c*.50 BC date for Owslebury originally proposed by the excavator (Collis 1968; 1973, 130) remains sound despite his subsequent attempt to put the grave earlier in the century (Sievers 2001, 143, 145 *pace* Collis 1994a, 107). Kelvedon can be assigned to *c*.75–25 BC. The Brisley Farm graves belong to the decades before the Roman invasion: B20 is *c*.10 BC–AD 50, and B19 *c*.AD 20–50 (Stevenson and Johnson 2004, 492–3; Stead 2006, 179).

If Rudston 154 and the Grimthorpe graves are taken at face value, the *Dreierausrüstung* was adopted in northern, as well as southern England. But quite apart from the dubious evidence for a shield at Rudston, the difficulty with these two Yorkshire graves is their spears. The iron spear blade from Grimthorpe was broken. The bone pegs in the same grave are now recognised as spear points (mounted on perishable wooden shafts) that had been thrown into the grave or at the corpse in a bizarre rite at the funeral, attested elsewhere in Yorkshire. The iron spear blade may have been part of this same speared corpse ritual (because it could have broken on impact). Rudston exemplifies the same rite (Stead 1991a, 33–5, 78–9). From this point of view, any connection between these two graves and the *Dreierausrüstung* is unsafe. Fighting with a panoply of sword, spear and shield is not attested in north Britain until at least the late 1st century AD, when it is encountered in a native cist grave outside a Roman fort at Camelon (Strathclyde) (Breeze *et al.* 1976, 79–80; Stead 2006, 198).

All the warrior graves in Britain with sword, spear and shield are late. They are La Tène III and belong to the 1st century BC or the first decades AD. Some support for this chronology is provided by an image of such a warrior on a brooch from the King Harry Lane cemetery (Stead 1989, 95; Stead and Rigby 1989, 336). But warriors armed with sword, spear and shield were known on the mainland of Europe from the 3rd century BC, so there was evidently a timelag before the introduction to Britain of this style of fighting. This is borne out by the La Tène II Deal (Kent) warrior, buried *c*.200–175 BC with a sword and shield (Parfitt 1995, 18–20, 155; Stead 1995, 58–95). His shield was the hide-shaped type not found on the mainland of Europe and the decorative style of the metalwork in the grave is insular, although the sword is continental in form. If anyone in Iron Age Britain was in a position to have kept in touch with developments in Gaul, it would have been the members of the community that buried their dead on the chalk ridge overlooking the Channel at Deal, but there are significant differences between the Deal warrior and combatants on the mainland. This relative isolation from the mainland of Europe is also reflected in the ceramic sequence for south-eastern England in the middle Iron Age (Collis 2003, 181).

XI. Spear warriors in Iron Age Britain
(Tables 6–7)

We have seen how in Belgic Gaul and elsewhere in temperate Europe warriors armed with sword, spear and shield like Kelvedon fought alongside a numerically superior contingent of warriors armed only with spears. To understand how a warrior like Kelvedon might have fitted into a war band in Britain, we need to see if there is any evidence for spear warriors there.

Iron Age graves in Britain with weapons are common only in Yorkshire. Table 6 gives details of weaponry, armour and knives for the cemeteries at Burton Fleming, Rudston, Garton Station and Kirkburn (Stead 1991a). The large number of graves invites confidence in the data as a reliable indicator of the relative proportions of different weapons in use. It emerges that iron spear blades and bone missile points outnumber swords by exactly five to one.

Interpretation of the Yorkshire data is complicated by the bizarre ritual of speared corpses, which involved hurling spears with iron blades or bone tips at the body of the deceased (see above). Considerable numbers could be involved; fourteen in the case of one grave at Garton Slack. These Yorkshire spears and bone missile points cannot, of course, be considered as grave goods in the conventional sense.

Bone points like those in the Yorkshire graves are not uncommon in Iron Age Britain (Britnell 2000a), and many — although not necessarily all — may have been weapons (Olsen 2003, 107–11). Those from the 4th-century BC Hjortspring canoe in Denmark certainly were, because they had shafts of ash wood for use as spears (Kaul 2003, 145). It should come as no surprise to learn that not every

grave	*spear*	*bone point*	*sword*	*scabbard*	*dagger*	*shield*	*mail*	*knife*	*significance of spears*
BF63	1							1	grave good
GS4	3					1			speared corpse ritual
GS5	4	3				1			speared corpse ritual
GS7	11								speared corpse ritual
GS10	14		1	1		1			speared corpse ritual
K3	3		1	1					speared corpse ritual
K5							1		
R24	1		1	1					grave good
R45								1	
R50	1							1	speared corpse ritual
R57	1		1	1					grave good
R87					1				
R94	1								cause of death
R107			1	1					
R139			1	1					
R140	1								speared corpse ritual
R144	1		1	1					speared corpse ritual
R146	1	1	1	1					speared corpse ritual
R148						1			
R152	1								cause of death
R153					1				
R154	2		1	1		1			grave good
R163			1	1		1			
R170	1								grave good
R174	7	2	1	1		1			speared corpse ritual
R182			1	1					
totals	**54**	**6**	**12**	**12**	**2**	**7**	**1**	**3**	

BF Burton Fleming; GS Garton Station; K Kirkburn and R Rudston (after Stead 1991a)

Table 6 Weaponry from selected Arras Culture graves

spear in antiquity had an iron blade: the Germans who faced Germanicus in AD 16 included warriors armed only with spears with fire-hardened tips (*praeusta tela*), presumably made from some organic material (Schirnig 1965, 19 citing Tacitus *Annals* 2.14).

But Stead felt that even those Arras Culture spears with iron blades might have been made solely for the burial ritual. He was reluctant to interpret them as weapons because the blades are generally small and slender, such that they would have bent on impact (Stead 1991a, 75). Bending of javelins on impact does not necessarily compromise their effectiveness in combat. Not only does it mean they cannot be thrown back, but a bent javelin stuck in a shield can render the shield useless. It used to be thought that this was the case with the javelins (*pilae*) of the Roman army (Webster 1969, 28, 39, 129 citing Caesar *De Bello Gallico* 1.25) but a consideration of all the available evidence suggests this is mistaken (Connolly 2002, 2, 6–8). Nor does the small size of the Yorkshire blades preclude their effectiveness as weapons. Some of the iron spear blades from Hjortspring are only 5cm long (Kaul 2003, 145). Contemporary experience shows that quite small blades can inflict a fatal wound, provided they are sharp enough. Tacitus says as much of the spears used by the Germans (*Germania* 6).

Interpretation of the Yorkshire spears should also take account of the wider context. Two of the individuals in the Rudston cemetery may have died from spear wounds (S. Stead 1991, 137). Injuries on other Iron Age skeletons from the region show this was a violent society. A dramatic imbalance of the sexes — 202 females and 141 males — in the Wetwang Slack cemetery in Yorkshire suggests this violence extended to actual warfare: the missing men might have been battle casualties whose bodies were not recovered for burial or prisoners taken in war who never returned home (Dent 1984, 125; 1990, 229, pl. 2). Warrior figurines from the same region (Stead 1988) add to the impression of local belligerence. There is in fact good reason to think that the Yorkshire bone-tipped and iron spears saw service in warfare and that they were not artefacts exclusively used in ritual.

Some Iron Age spears could have been used for hunting, rather than warfare (although both uses are not of course mutually exclusive). One knows the Britons hunted for sport because the documentary sources report the export of hunting dogs from the island to the Roman world in the Iron Age (Strabo 4.5.2; Grattius *Cyngetica* 174–81). Perhaps these dogs played a part in warfare in Britain, as Strabo said they did among the *Keltoi* of Gaul. That might explain the spearman buried with two dogs at Soham (Cambridgeshire), if the grave was Iron Age rather than Anglo-Saxon (Fox 1923, 81; Whimster 1981, 23, 229). But wild animals contributed little to the diet of the Iron Age communities of Britain (Maltby 1996, 24; Hambleton 1999, 14) and it seems inherently unlikely that the large numbers of spears found in Yorkshire and elsewhere can be explained away as hunting artefacts (*pace* Hunter 2005, 50, 55, 61). There is, in fact, no reason why the Yorkshire evidence should not be taken at face value to mean that fighting spears were five times more common than swords in these communities.

Weapon	*number present*
shields	1
iron swords	6
iron spear blades	11
bone missile points	55

Table 7 Weaponry from Fiskerton (Lincolnshire) (after Field and Parker Pearson 2003)

A Flavian hoard of native weapons from South Cave in Yorkshire has thirty-three spears and five swords (Fenn 2003a; 2003b; Faulkner 2003, 17–27; Paterson 2004; Evans 2006; Stead 2006, 203). With a sword to spear ratio of 1:6.6, the South Cave find corresponds closely with the picture of warfare given by the earlier Arras Culture graves and shows that the style of warfare reflected in the funerary record lasted until the Roman conquest of the region.

Moving south, into Lincolnshire, the votive finds associated with the timber causeways at Fiskerton shed light on the same topic (Table 7; Field and Parker Pearson 2003). There the ratio of swords to spears is 1:11, an even higher figure than that for Yorkshire. Wet place votive offerings in the river Thames also show spears outnumbering swords (Fitzpatrick 1984, 179–80). Hoard C at late Iron Age Essendon (Hertfordshire) has one dagger, seven swords and five spears (Hunter 2005, fig. 7; Dr J.D. Hill, pers. comm; Stead 2006, 51, 175, 178–9, 181–3 for more details). Four other spears in the vicinity might represent another, dispersed hoard. The site shows spears to be significant, but — for once — as a minority component of a weapons assemblage.

Closer still to Kelvedon, evidence for spear warriors is forthcoming from two Essex sites, Orsett and Harlow. A hoard of six iron spear blades buried in the ditch of an enclosure at Orsett about the time of the Roman invasion may be taken as typical of the spear blades current in Essex in the late Iron Age (Major 1998, 83–5). At Harlow a late Iron Age pit interpreted as a grave had part of the skull of a young adult male, a long iron spear blade, a copper-alloy ring and a British QC coin (France and Gobel 1985, 23, fig. 10b, fig. 48 no. 6, 98; Dorrington and Legge 1985, 123).

There is good reason to think that spears with iron blades or bone tips played a far more important role in Iron Age warfare in Britain than the sword. Based on a study of weapons from selected settlements in the south of Britain, Hunter (2005, 49–50) has reached much the same conclusion. This is borne out by images of warriors on coins. Most are on horseback, and many of these cavalry brandish a javelin or lance (Allen 1958, 48–50, 54–5). Indeed, spear warriors outnumbered sword bearers over much of temperate Europe. Spears have much to recommend themselves: they are more effective killing weapons than swords (Hedeager 1992, 90), and even the longest iron spear blade needed much less metal than a sword. It is significant that the spear is the only weapon deployed by the Britons mentioned by Caesar in his account of the campaigns of 55 and 54 BC (Stead 1996, 60–1). The Kelvedon warrior was not therefore a typical Iron Age combatant: he fought alongside a numerically superior contingent of warriors armed only with a spear, or sometimes a spear and a shield. Given that more casualties were caused by spears on an Iron Age battlefield than by swords, a corpus of these weapons to complement the sword corpus compiled by Stead (2006) would be a useful addition to scholarship.

XII. Ethnicity and political geography

The Celtic question

The dawning realisation that the population of the British Isles was not Celtic represents the most important shift in our understanding of Iron Age Britain since the abandonment of the invasion model forty years ago. It was an acrimonious debate, and the bruises still hurt (James 1999; Collis 2003).

But the reasons for this change of heart are obvious enough. No ancient sources credit the Celts with having settled in Britain, and no one in the British Isles defined themselves in such terms until a few hundred years ago. The language described as Celtic by philologists cannot be used to infer a migration of Celts from the mainland of Europe to the British Isles because it could have been spoken for centuries — if not millennia — on both sides of the Channel before the emergence of the historical Celts in the Iron Age.

The Belgae

Bearing in mind this renewed interest in ethnicity, it is legitimate to ask who the Kelvedon warrior was. Fifty years ago he would have been hailed as a newcomer from Belgic Gaul, an invader who illustrated the statement in Caesar that the maritime parts of Britain were raided for booty and subsequently settled by Belgae from Gaul (*De Bello Gallico* 5.12). His La Tène III sword would have been seen as an innovation brought here by these same Belgae (Piggott 1950, 21–2) and the pedestal urns of Gaulish type in the grave would have confirmed the story. It is a measure of how far we have advanced that such a view is now unsustainable.

Ultimately the type of sword present at Kelvedon *is* Gaulish in origin, but such weaponry could have reached here in the course of gift exchange; and the scabbard is likely to be British because it is made entirely of bronze, unlike the iron or iron-with-bronze scabbards that were standard among the Gauls (de Navarro 1972, 21; Stead 1981, 36; Stead *et al*. 1981, 72; Pleiner 1993, 154; Lejars 1994, 14). Although the pedestal urns are a vessel form found in Belgic Gaul, very few of the other late La Tène ceramic types there have parallels in Britain and there are no contemporary pottery assemblages from both shores of the Channel that match each other closely enough (*pace* Rigby and Freestone 1997, 57) to suggest migration. There is no doubt that the tankard handle, like the scabbard, is a local product.

The early Trinovantes

Turning to coinage, the distribution of British G delineates a kingdom that stretched from the Blackwater estuary across north-east Essex and into south-east Suffolk, as far north as Woodbridge. This distribution is compact and shows what might be styled the embryonic Trinovantes when these coins were in circulation 'perhaps during the Gallic War or in the decade or two thereafter' (de Jersey and Newman 2001). The Kelvedon warrior was laid to rest at much the same time as British G was current and the villagers at Kelvedon will have considered themselves part of the Trinovantian *civitas.*

Camulodunum (Colchester) holds a position more or less central to the British G distribution map and it is not unreasonable to suppose that the settlement there was in the ascendant from at least the time of these coins. Although we have no direct evidence that British G was issued there, it is still tempting to see Camulodunum as the *chef-lieu* of the Trinovantes at the time of British G and it would have been there that our warrior might have turned for political leadership.

The French connection

But the links with Gaul in the warrior burial will not go away: the typology of the spear and shield boss are not local but foreign, and would have been more at home in Gaul. The pot from the satellite grave has particularly close links across the Channel and, indeed, is unparalleled in Britain. Further links with the world to the south are evident in the linen wrapped around the sword. At the level of material culture, none of the other warrior burials from Britain has such close links with Gaul. Moreover, the style of fighting exemplified by the Kelvedon grave goods originated on the mainland of Europe. Closer and closer ties between Britain and Gaul in the late Iron Age are a familiar feature of the archaeological record; the Kelvedon grave is a developed expression of that contact.

The hybrid character of the grave goods gives every impression of a figure who had travelled, and this could be explained by elite mobility. A specific context for Kelvedon is provided by the Gallic Wars. We know the Britons lent military assistance to the Gauls (Caesar *De Bello Gallico* 4.20) and the many Gallo-Belgic E coins from Britain may well represent the rewards of mercenaries and adventurers recruited here to fight there (Kent 1978, 55). Indeed if the connection between the coins, mercenary service and the Gallic Wars is sound, the distribution map of Gallo-Belgic E in Britain (Fitzpatrick 1992, fig. 5) charts the whereabouts of warriors who had learnt something of warfare first-hand by travel abroad. Refugees from the Gallic Wars and from later unrest in Belgic Gaul who fled to Britain must have included warriors (Cunliffe 1996, 116). It is not beyond the realms of possibility that the Kelvedon warrior had been directly involved in these upheavals.

XIII. The social status of the Kelvedon warrior

Apart from an important essay by Hunter (2005), the status of the warriors found in the Iron Age funerary record in Britain has not yet been addressed in ways such as those attempted by Roymans for Belgic Gaul (Roymans 1990, 243–59), and there has been an understandable — if tacit — tendency to think of them as an homogeneous category often uncritically described as a warrior elite.

A stratified society

Unlike Wessex, that remains stubbornly egalitarian (Creighton 2000, 8–9), south-east Britain in the late Iron Age shows every indication of having been stratified with real differences in wealth between the components of society (Haselgrove 1989b, 17). At the apex of the social hierarchy were the dynasts who had the metal resources to mint coins. One would like to know what gold reserves a king like Cunobelin had at his disposal, but it would be misguided to try and estimate that from the number of coins that might have been struck from the dies because such a methodology is hopelessly flawed (Buttrey 1994). A better way of evaluating elite wealth is to look at the value of the metal in coin hoards. The twenty-three staters in the Great Waltham (Essex) hoard (de Jersey and Wickenden 2004) would have paid the salary of a Roman legionary for eight and half months (see the appendix).

At the bottom of the social pyramid were the slaves exported to the Roman world mentioned by Strabo (4.5.2). The men and women buried with little ceremony — and no grave goods — at Verulam Hills Field at Verulamium soon after the Roman invasion had pathological conditions and lesions associated with heavy manual labour or chronic ill-health and poverty (Anthony 1968, 18; Wells 1968, 20–1). We cannot prove they were slaves, but their remains shed a pitiful light on the plight of the downtrodden in the late Iron Age.

No doubt this was reflected in contemporary warfare: there is every reason to think that a late Iron Age war host in south-east Britain was as stratified as the society that created it, and it would be quite wrong to suppose that the social complexion of warriors was identical. If so, it might mark a stage in the evolution from a primitive and egalitarian war host towards an army with a more structured and hierarchical — and therefore more effective — command structure (Hedeager 1992, 91; Keeley 1996, 43–4).

Number of artefact types at Kelvedon

Evaluation of the Kelvedon warrior burial by the number of artefact types present (reckoned as artefacts with different functions) gives the grave a score of eight. This technique has proved useful in looking for correlations of different categories of grave good because it eliminates individual and personal conceptions of what constitutes wealth or status.

When applied to late Iron Age graves in south-eastern Britain, it emerges that there is a clear correlation between graves with Roman imports and high NAT (number of artefact type) scores. Graves with NAT scores of five or more invariably have imports (Haselgrove 1982, 82–3). With its imported Roman bronze bowl, Kelvedon conforms to the existing pattern. Indeed, the only grave from Iron Age Britain with an imported bronze utensil and a NAT score lower than five is Harpenden, with its Eggers 76 bowl — assuming the handle and bowl belong together (Freeman and Watson 1949; Eggers 1966, 69). The same correlation of high NAT scores and Roman imports has been reported from Iron Age Jutland, where the technique was pioneered by Hedeager (1992, 106, 108).

The value of the artefacts present in any grave has a direct connection with the materials used, as well as the time and labour needed to make them. There are no precious metals at Kelvedon but the novelty of a scabbard decorated with a strip of tin — at a time when most scabbards were no doubt made of organic materials — suggests our warrior had the wealth and connections to commission innovative work in armaments. He was patently better-equipped and had access to greater resources of labour and materials than warriors like Rudston 170, who was laid to rest with just a solitary spear (Stead 1991a, 205). Four warrior burials in England have craft tools (Stead 1991b, 75 with refs), suggesting the graves of artisans who could take up arms if the need arose, but there is no hint of this at Kelvedon and one doubts if our warrior toiled at a craft for a living.

The companions of the Kelvedon warrior

Most of the comrades of the Kelvedon warrior would only have been equipped with a spear, or sometimes with a shield and spear (Chapter 6.XI). Bearing in mind how little metal is needed for an effective spear compared to a sword, the weapons panoply deployed by the Kelvedon warrior would have been a visible and potent expression of his elevated station. We have already seen that evidence from Ribemont-sur-Ancre suggests that ferrules were elite items of equipment (Chapter 2.V). The poorest warriors in Britain may only have been able to deploy spears fitted with bone points, although their presence in the Hjortspring canoe suggests they were sometimes expendable supplementary weapons for use in the early stages of a battle fought by warriors who were otherwise armed to the teeth (Kaul 2003, 148).

But bone missile points are rare in Essex and East Anglia, and are not definitely attested after the middle Iron Age. There was one with early Iron Age Darmsden-Linton pottery at Darmsden (Suffolk) (Cunliffe 1968, 184). Five of the six from Stansted (Essex) are also early, with the sixth in a middle Iron Age context (Major 2004a). There are none from late Iron Age contexts in Essex and East Anglia, although three unstratified examples from the late site at Burgh-by-Woodbridge (Suffolk) should not be overlooked (Martin 1988, 65). So it is unlikely that the war bands the Kelvedon warrior saw had many of these bone spears. It is equally unlikely that many of his companions used slings because fired-clay sling stones are rare in Essex and there are no hoards of slingshot pebbles comparable to the Wessex examples (Elsdon and Barford 1996, 338).

The abandonment of the Celtic paradigm for society in Iron Age Britain (see above) means that traditional composite portraits of Celtic warfare can no longer be applied directly to Britain. This excursus on bone missile points and slings in Iron Age Essex is an illustration of the way forward: we need a recognition that there was no single style of warfare in later prehistoric Britain and that the existing evidence must be evaluated anew at a regional level.

Elite spear warriors and the infantry

But not all the spear bearers in Britain were ordinary fighters. The native warrior with spear and shield in a Claudian grave at Colchester Stanway clearly came from the higher echelons of society (Crummy 1993). Among the spear bearers there was also a corps of elite warriors who fought from horseback, using the spear as a javelin or lance (Pl. 14). The expense of feeding and maintaining horses means they are animals for elites (Cornell 1995, 250, 446 n.31). Linked to this is the evidence indicating the special status accorded the horse in Iron Age Britain, the period when for the first time horse bones are common in the archaeological record (Moore-Colyer 1995, 4, 10–13; Creighton 2000, 22–6). Nor should we forget that at Rome in AD 51 the vanquished but defiant Caratacus declared, 'I had horses, men, arms and wealth' (Tacitus *Annals* 12.37). All this explains the vogue for images showing cavalry bearing lances and javelins on Iron Age coins because numismatic art reflected *par excellence* the tastes and interests of tribal leaders (Allen 1958, 48–51).

But to suppose (as Allen did) that cavalry was the main arm of a war band in Britain is unrealistic, because cavalry in antiquity were invariably adjuncts to foot soldiers. There certainly were infantry soldiers in Britain; they are mentioned by Caesar (*De Bello Gallico* 4.34), and Tacitus (*Agricola* 12.1) said the strength of the Britons lay in their foot soldiers. Indeed, the picture of warfare given on Iron Age coins — with its emphasis on mounted warriors — is misleading in other respects as well, if only because there are no warriors like Kelvedon, equipped with sword, spear and shield. One notes, too, that the hide-shaped shields used in Britain (Stead 1993) do not feature on coins. Nor do we catch more than a glimpse of 'the poor bloody infantry' in numismatic art (Hunter 2005, 46 with refs). Even the solitary foot soldier on a coin of Cunobelin has been claimed as a copy of a Sicilian coin issued after 210 BC (Scheers 1992, 39), or a local version of Mars (Creighton 2000, 116–17), although these fanciful notions are refuted by the distinctively northern European breeches worn by the Cunobelin warrior (Allen 1958, 53; Megaw 1970, 177).

Plate 14 An Iron Age warrior depicted on the reverse of a gold stater of Verica, king of the Hampshire Atrebates. The warrior is on horseback and the reins can be seen, but there are no stirrups. He is bare-chested and there is a shield behind his back; a peaked helmet lends some protection to the head

Conclusions

No doubt status in an Iron Age war band depended on factors such as experience, courage in battle, nobility of birth or wisdom in counsel. These, of course, are not recoverable archaeologically but the material equipment of the Kelvedon warrior helps us gauge where he stood in society. He was better equipped than most warriors of the period who made do with only a spear, with or without a shield. Some few of these spear warriors — those mounted on horseback and depicted on coins of the period — were drawn from the tribal elites. To judge by the wealth represented by his grave goods, the Kelvedon warrior was also an aristocrat, although we will never know if he went to battle on horseback or in a chariot or on foot. He was in touch with fashions in armaments on the European mainland; if he had not experienced the world across the Channel at first hand, he was at least in contact with armourers who were familiar with weaponry in Gaul. The possibility that he had travelled beyond his native shores distances him still further from the rank and file. Such is the contribution that Kelvedon can make towards unravelling the social complexion of an Iron Age war band.

Appendix: the wealth represented by the Great Waltham coin hoard

It was proposed above (Chapter 6.XIII) that we could get some idea of the wealth represented by the *c*.AD 10 Great Waltham hoard by postulating that it would have paid the salary of a Roman legionary for eight and half months. This appendix explains the claim.

The hoard (de Jersey and Wickenden 2004) consists of five gold staters of Dubnovellaunos and a further eighteen of Cunobelin. The total weight is 126.9g of gold. Assuming the gold content of the coins was about 40% (Cowell 1992, 225–6), the hoard is the equivalent of 50.76g of pure gold. Late Augustan aurei have weights that peak at 7.9g (Sutherland 1984, 89) so the gold in the Great Waltham hoard is equivalent to 6.4 aurei or 160 denarii (there were twenty-five denarii to the aureus). A legionary at the time was paid 225 denarii a year (that is, 18.75 denarii a month) (Watson 1969, 89), so the gold content of the hoard would have paid a legionary for eight and a half months (160 ÷ 18.75 = 8.5).

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