Chapter 5: Discussion and Interpretation

INTRODUCTION

The Ridgeway Hill mass grave is a remarkable discovery of unparalleled international significance. Early medieval mass graves and contexts of violence are known from the archaeological record (see Chapter 1), but Ridgeway Hill is unique in being the single largest context of multiple decapitations ever found from this period. In the preceding chapters the patterns and extent of trauma on the skeletons has been described and an attempt made to explore the circumstances of the individuals' deaths through detailed archaeological, osteological and isotope analyses (see Chapters 2, 3 and 4). Here, the results of these analyses are consolidated with a discussion about the identity of the people who were buried in the grave, the wounds that they sustained, the weapons which might have been used and the manner in which their bodies were treated immediately before and after death.

WHO WERE THE PEOPLE BURIED IN THE GRAVE?

Origins

Isotope studies provide compelling evidence for Scandinavian origins for at least many of the grave's occupants, with childhood residence outside Britain in colder and very cold areas such as the Arctic and sub-Arctic areas of Scandinavia, northern Iceland, the Baltic States, Belarus and Russia (see Chenery *et al*. in Chapter 3 and Appendix 3). The evidence also suggests that the individuals had varied diets and migratory histories, with most, if not all of them having been living outside the British Isles about three years prior to their deaths, probably in Northern Europe (ibid.). As discussed by Abrams (Chapter 1), the wide geographic origins suggested by this evidence is consistent with current knowledge of viking armies, the number of individuals being compatible with a ship's crew (Bill 2008). The burial is perhaps linked to events during the reign of Æthelred (978-1016), such as the ravaging of Portland in 982, or viking attacks on Dorset in 998, 1015 and 1016. However, if the skeletons represent a raiding party, they must have been relatively inexperienced warriors considering the lack of healed combat wounds combined with the predominantly young age of this all male group (see below). Although it seems very likely that these were vikings executed by the English, the possibility that they were a group of mercenaries fighting for the English and executed by vikings cannot be entirely ruled out. Other scenarios are also worth considering; judicial execution by the English authorities is also a possibility. Alternatively, the individuals could have been merchants or recent settlers in England, who were victims of the St Brice's Day massacre that took place in 1002, when Aethelred ordered all Danes (here thought to refer to all Scandinavians) in England to be killed. Finally, it is also possible that the grave relates to an event during the reign of Cnut (1016-35), with the individuals either hostages or combatants engaging in reprisals against previous enemies (see Abrams, Chapter 1).

When excavated the skeletons were not found with any items of clothing or other artefacts, and therefore further information relating to the individuals is limited to that which has been derived from osteological and palaeopathological analyses of their bones, detailed in Chapter 3. These may be summarised under the broad headings of physical attributes and health status.

Physical attributes

As previously discussed, all of the skeletons were males and most were adolescents or young adults, although individuals over 45 and 50 years old were also identified. Some of them were physically robust, with pronounced muscle attachment sites, robusticity indices which are similar to professional groups, and above average statures for the period. In their description of individuals from the Viking Age mass grave at Repton, Yorkshire, Biddle and Kjølbye-Biddle (1992, 45) state that the group was '….of a massively robust non-local population type, parallels for which can be found in Scandinavia', although anthropological data to support this has not yet been published. Certainly, in the case of the Ridgeway Hill skeletons this does not apply to all of the individuals, some of whom were unremarkable in terms of their build and physique. In addition, the average stature for the group is similar to that for other contemporary British populations and the same as the average calculated for males from early medieval Britain (172cm; Roberts and Cox 2003,

195). The distribution of statures was generally mixed and may indicate a fairly heterogeneous group, although factors such as bias caused by the small sample size should be considered. It is perhaps worth mentioning again here that the range of estimated statures 163–184 cm matches data from Viking Age Denmark very closely (see Chapter 3).

Robusticity, both in terms of calculated indices and muscle attachment sites, was more marked in the upper limbs and shoulder girdles than the lower limbs, suggesting that these individuals had engaged in activities that placed greater mechanical stress on the upper body. This finding was also supported by a high prevalence of pathological conditions in the upper body which could be caused, at least in part, by strenuous activity; these conditions include *osteochondritis dissecans* and *os acromiale* (see below and Chapter 3).

Owing to fragmentation, osteoarchaeological assessment of ancestry was limited to one skull only (3761) and a facial reconstruction has been undertaken for this individual by Danielle Schumaker and Professor Caroline Wilkinson (see Fig. 5.1). There is a high degree of genetic control over the size, shape and appearance of the cranium, and different world populations differ in cranial form (Mays 2010, 95–106), so studying cranial morphology has the potential to provide information about an individual's ancestry. In the present case, the cranio-facial morphology was found to be consistent with individuals of white ancestry and metrical assessment applied to CRANID (Wright 2012) indicated that the individual showed closest affinity to Danish populations. However, the CRANID result should be viewed with caution because the database has patchy geographic and temporal coverage and, more specifically, the Danish data relates to material from Neolithic tombs only and may therefore not be relevant to Viking Age skulls, especially since cranial form has changed over time in Denmark (S. Mays pers comm. 2013).

The modified dentition (or possibly dentitions) belonging to skull 3736, in the form of grooves/files cut deeply into the incisor teeth of the maxilla, provides another dimension to the physical attributes of this group. Deliberate modification such as this is rarely observed osteologically and is direct evidence of cultural practice. In addition, it provides yet further evidence in support of the Scandinavian identity of the group, because contemporary examples of grooved/filed teeth have been reported among individuals from Sweden and Denmark (Arcini 2005), but there are none known from the UK (the origins of skull 3736 cannot be explored at the present time as this was not one of the skulls selected for isotope analysis). This is a rare, if not unique, example of deliberate dental modification from Britain and is therefore highly significant.

Figure 5.1 Facial reconstruction of Skull 3761 (created by Danielle Schumaker and Professor Caroline Wilkinson, University of Dundee)

Since 2005, over 90 examples of deliberate dental modification have been identified in Scandinavian assemblages (Arcini pers. comm.). Typically, the modification is identified as a single, or more often multiple, horizontally filed furrow or furrows on the frontal upper part of the tooth crown of the anterior maxillary dentition (Arcini 2005). Published examples include 24 male skeletons described by Arcini (2005) which had come from four different cemeteries in Sweden and Denmark dating from AD 800-1050. In all cases, one or both of the medial incisors showed filing marks, and in a third of cases these were also found on the lateral incisors. All were made in more or less the same area of the teeth in all of the individuals and in several cases the furrows were identical, even though the skeletons came from different parts of Sweden. Most of the individuals had two or three furrows while a few had only one. Given the depth and precision of the filing marks, they are likely to have been created by a skilled person, although the motivation behind their creation is unclear; the associated archaeological contexts and finds do not provide any clues. They may have been created in reference to a person's occupational status, or they may simply have been pure decoration (Arcini 2005, 727). It is noteworthy that the individuals would have had to smile quite broadly to display the modification (Arcini 2005, 6).

Health status

There is no doubt that the injuries sutained immediately before death (the peri-mortem trauma) had caused the deaths of the Ridgeway Hill individuals and therefore, unlike most archaeological populations, the assemblage provides the opportunity to explore pathology and trauma in individuals who had not died as a result of poor health or disease. Further, given the young ages of most of the individuals, it is an opportunity to explore the skeletal health of men who died in their prime of life.

Several conditions were observed to a greater or lesser extent in the Ridgeway Hill skeletons when compared with a number of other assemblages, including groups of individauls who had died together, suddenly (catastrophic groups) and groups of individuals who had died over a long period of time (attritional groups). It is important to caveat here the effect that age will have had on these results, attritional groups generally living longer and therefore having accumulated a greater number of health-related conditions than catastrophic groups, such as Ridgeway Hill. That said, it would seem that the Ridgeway Hill individuals had a high prevalence of lesions that have a bio-mechanical stress related cause, including *os acromiale*, navicular fractures, and *osteochondritis dissecans*. Although not exclusively caused by physical stress, the combination gives the overall impression of a group of athletic individuals who had been performing repetitive strenuous activities from a young age. *Osteochodritis dissecans* was prevalent and was significantly higher in the Ridgeway Hill group than other comparative professional groups, specifically the 18th–19th Royal Naval skeletons from Greenwich, Plymouth and Haslar (9/130 compared with 19/858 affected humeri and femurs from Ridgeway Hill and Royal Naval assemblages respectively; X^2=8.31, p=0.0039, d.f.1). The Ridgeway Hill prevalence (8/40 individuals) was also higher than that reported for soldiers killed in battle during the Wars of the Roses (AD 1461) from Towton, North Yorkshire (1/39 individuals). Other conditions seen in the assemblage include Schmorl's nodes and possibly also Scheurmann's disease, both consistent with chronic mechanical stresses on the spine. In addition, some of the recorded non-metric traits support this interpretation (see Chapter 3).

Somewhat paradoxically, given the suggested physically active profile of the group, other pathological indicators suggest that some of the men were not in the best state of health. The spectacular example of osteomyelitis, evidence of long-standing infection, is a clear demonstration of this (see Fig. 3.88). The individual will have lived with this disease for many years, starting in childhood, and will have experienced unpredictable latent and active episodes, with symptoms which can include tiredness, local swelling and a temperature, in addition to impaired mobility and a leg that would have oozed smelly pus. Other examples of impaired mobility/limb useage were also evident, including a deformed right leg caused by a fracture to the femur (thigh bone) and an un-united clavicle (collar bone) fracture. Bladder or kidney disease was also evidenced by a calculus (stone), found amongst the disarticulated bones. Further, evidence for bone inflammation (periostitis) was relatively frequent, being much higher than has been recorded in other catastrophic assemblages/professional groups, including those from Towton and St Andrew's Fishergate, and attritional groups such as St Helen on the Walls. The changes often involved multiple elements, implying that systemic disease and not necessarily mild trauma was an important causal factor among these individuals. The chronic bone changes seen on the spines of three skeletons are of interest here, because if the diagnosis – brucellosis – is confirmed, it indicates a highly contagious infectious disease that is passed from animals to humans, either by the ingestion of unsterilised milk or meat or by coming into close contact with secretions from infected animals.

The presence and extent of infectious disease among the individuals is also important, because it tells us something about the environment in which they lived. High levels of infection are typical of close contact societies where poor sanitation and over-crowding, common in urban contexts, facilitate the spread of disease (Larsen 1997). In this respect the sinusitis, observed on one skull, is interesting because it may have been caused by environmental pollution, particularly since associated dental disease cannot be demonstrated.

The suggested relatively high burden of disease amongst the Ridgeway Hill skeletons need not necessarily imply that the men had weak constitutions, however. Rather, chronic, long-standing disease is arguably an indicator that the individuals were 'survivors', who had robust constitutions and were not particularly susceptible to ill health and acute deaths (Duray 1996; Lewis and Roberts 1997). The absence of evidence for growth arrest, which would be indicated by enamel hypoplasia and iron deficiency anaemia in childhood, may be considered to support this interpretation.

Perhaps a key consideration for these individuals is the evidence for ante-mortem trauma. More specifically, there is a distinct lack of evidence to indicate that the men had engaged in combat before they met their fate on the Ridgeway. This may indicate that they were not professional soldiers, or that perhaps they were but, because they were predominantly young individuals, they had experienced little combat. Only one injury to a rib and one injury to a clavicle could conceivably be attributed to inter-personal violence, and these need not have occurred in battle related contexts. No healed weapon injuries or defence injuries were identified amongst the articulated and disarticulated remains, with the exception of one possible blade wound on a distal femur.

Kjellström's study of the skeletons from Uppsala, Sweden, believed to have been warriors who were killed in the 16th century Battle of Good Friday, also identified limited ante-mortem trauma – just two skulls with weapon related lesions – indicating limited experience of battle (Kjellström's 2005). The author's interpretation of this finding may be of relevance to Ridgeway Hill: the Uppsala warriors could have been Swedes, because Swedish troops largely consisted of peasants who had limited experience of previous combat (ibid., 43). Interestingly, of all the data considered, the Ridgeway Hill ante-mortem fracture rates were closest to those for the Towton soldiers, although the patterns of element involvement were clearly different. Falys (2010) concluded that three cases of ante-mortem trauma (including one blade wound) on late Saxon skeletons from St John's, Oxford were not necessarily battle-related, but Pollard *et al*. (2012) have more recently argued that the individuals are likely to be a group of raiders, possibly professional soldiers of Scandinavian origins, because of the presence of healed blade injuries combined with oxygen and strontium isotope values consistent with origins in this area. An integrated approach to the analysis of such contexts is paramount to understanding the question of the individuals' experience of battle, and indeed other, similar, questions (ibid. 2012, and discussed further below).

WEAPONS AND ARMOUR *by Gareth Williams*

Different weapons inflict different types of injuries, while the character of armour and other defensive equipment defines which parts of the body have some degree of protection, and thus where injuries are likely to occur. It is therefore important to consider the different types of weapons and armour that were in use at the time of the Ridgeway Hill burial before discussing the pattern and extent of trauma on the skeletons, as described in Chapter 3.

A limited range was available in the 10th and 11th centuries, with similar equipment used by both Anglo-Saxons and vikings. The evidence partly comes from archaeology, but also from contemporary written sources, including poetic accounts of battles. These seldom provide reliable or even useful information about how different types of weapons were used, but they do provide a contemporary record of their existence. Contemporary representations of weapons and armour – from carvings, metalwork and manuscripts as well as the slightly later Bayeux Tapestry – are also important sources of information, especially since the abandonment of furnished burial means that we have relatively little direct and closely dateable evidence of later Anglo-Saxon weapons and armour compared with the period to the 7th century. By contrast, weapons and to a lesser extent armour are better known from Viking Age contexts, but here the fact that so much of the evidence does derive from burials may mean that our perception of how common different items were may reflect burial practice more than the use of different types of military equipment on the battlefield.

Bows

The bow appears to have been used as a weapon of war by both the Anglo-Saxons and vikings. Arrows feature in the Old English poems describing the battles of Brunanburh (937) and Maldon (991) (ASC (A) 937; Scragg 1991, 22-3). They also feature prominently in later saga accounts of the battles of Fitjar

and Svǫldr, as well as in accounts of the death of Harald Hardrada at the hands of an English archer at Stamford Bridge in 1066 (Hollander 1964, 123, 237-8, 655-6; Finlay 2004, 72, 229). Pictorial evidence for the use of the bow in battle includes the Franks Casket (Fig. 5.2) and the Bayeux Tapestry, which includes one English archer as well as 28 Norman archers (Bradbury 1985, 33-6). Although it has been argued that the bows portrayed in illustrations of early medieval warfare are relatively small (and consequently of very limited power), and that the longbow was introduced only after the Norman Conquest (Bradbury 1985, 71-5), a longbow with an estimated draw-weight of 45kg is recorded from Hedeby (Elsner 1992, 42) and other complete and partial longbows are recorded from viking contexts in Ireland (Halpin 2008, 35-74). While the leaf-shaped arrowheads most commonly found in viking graves may have served either as hunting arrows or for use in war, arrowheads with narrow tapering points of triangular or square section are also known, and are interpreted as armour-piercing arrows (Elsner 42-3; Halpin 2008, 79-81; Pedersen 2008), forerunners of the medieval bodkin. These were probably specifically designed to split apart and penetrate the links of a mail shirt, whereas the leaf-shaped heads would cause damage to exposed flesh, but were of more limited value against mail, shields or helmets with the weight of bow thought to be typical of the period.

Spears

Old English poetry also refers to the use of spears as missile weapons (Brooks 1991, 210), and this is reinforced by the aerodynamic shape of some Anglo-Saxon and viking spearheads, which are long and narrow, and which seem to have been designed primarily for throwing (Fig 5.3). Not all spears were designed for throwing, and a variety of different

Fig. 5.2 Panel from the Franks Casket, showing the use of the bow in combat, 8th century. BM 186,0120.1 (© Trustees of the British Museum)

Fig. 5.3 Spearhead, with decorative inlay on socket, from River Thames, London, late 9th–10th century. The slender shape of the spearhead is well suited for throwing. BM 1893,0715.2 (© Trustees of the British Museum)

Fig. 5.4 Spearhead , with decorative inlay on socket, London, 11th century. The broad head is designed for thrusting rather than throwing. BM1856,0701.1452 (© Trustees of the British Museum)

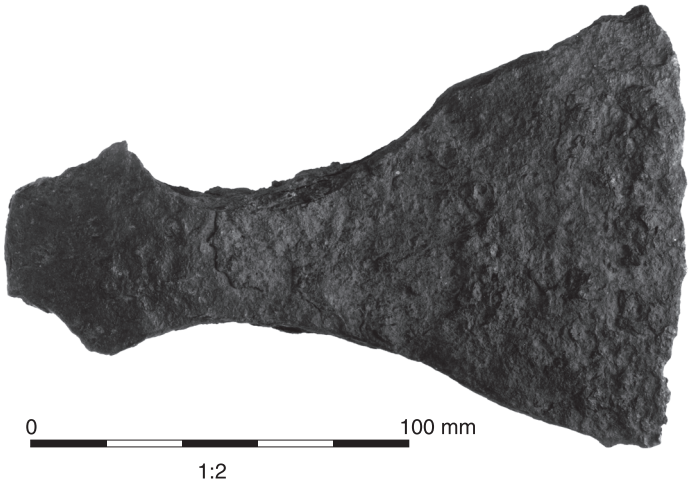

Fig. 5.5 Axe-head for a single-handed axe from Hof, Hedmark, Norway, L. 18cm. BM 1873,1219.227 (© Trustees of the British Museum)

shapes of heavy spearheads for thrusting spears (lances) survive (Fig 5.4) (Brooks 1991, 211; Pedersen 2008, 206), although spearheads of the late 10th and 11th centuries rarely come from contexts which permit close dating. As a weapon which was relatively cheap and simple to produce, and which was effective when used in formation, the spear was probably the most widely-used weapon on the battlefield in the late Anglo-Saxon period. Both thrown and thrust, the spear was capable of delivering a concentrated penetrating blow of some force. Although the edge of a spearhead could probably also cut if suitably sharpened, it was not primarily a cutting weapon.

Axes

The axe is also known from a variety of Old Norse sources, and appears in a number of forms, although it is not always possible to distinguish archaeologically between axes as tools and axes as weapons. Surviving examples dated to the 10th and 11th centuries include axe-heads small enough to suggest an axe wielded with one hand, probably in conjunction with a shield (Fig 5.5). Others, notably the broad-bladed Petersen type M, are so large that they must have been wielded two-handed, as depicted on the Bayeux Tapestry (Pedersen 1919, 36-47; Pedersen 2008, 206). There is no doubt that such a weapon could behead a man in a single stroke, although they may have been developed specifically for use against horses. Axe-heads of this type are recorded from England as well as Scandinavia (Fig 5.6), and their inclusion in the Bayeux Tapestry as well as written accounts of the battle of Hastings makes it clear that they formed part of the Anglo-Saxon armoury of the mid-11th century. However, it is uncertain whether their use by the Anglo-Saxons predates the period of Danish influence under Cnut and his sons (1016-42). Axes are not mentioned either in the *Battle of Brunanburh* or the *Battle of Maldon*, nor do they appear alongside swords and spears in Anglo-Saxon wills and heriots of the period (1991, 209), while surviving examples from England are difficult to date precisely, and may be linked with viking rather than Anglo-Saxon activity.

Fig. 5.6 Large axe-head from River Thames, Hammersmith, London, 10th–11th century. 21.5 x 20.7cm. BM 1909,0626.8 (© Trustees of the British Museum)

Swords

The sword features widely, not only in Anglo-Saxon literature and pictorial representations, but also in wills and legal documents (Brooks 2000, *passim*). Swords underwent a number of developments in the course of the Viking Age, and a wide variety of different types are recorded (Pierce 2002). Early viking swords could be either single- or double-edged (Fig 5.7) (Gale 1989, 78; Jones 2002, 20-24; Pedersen 2008, 204-5), and many of the finer examples up to the 9th century had pattern-welded blades, made up of multiple bars hammered and twisted together to create a distinctive pattern on the blade (Fig 5.8). Although older literature on the subject tends to suggest that pattern welding was functional, providing an ideal combination of strength and flexibility (eg Davidson 1962, 121-52; Bone 1989, 68; Brooks 1991, 212), more recent commentators (informed by more detailed examination of the blades themselves, and by more extensive modern experimentation with pattern welding) have argued that this process actually produced a weaker blade than one made of a single piece of good steel, and that the purpose was primarily decorative (Tylecote and Gilmour 1986; Land and Ager 1989, 109). Although pattern welded blades are not unknown from the late 9th and 10th centuries, they are more unusual than earlier, and pattern welding had largely been superseded by decorative inlay by the late 10th century. This in part derives from an international trade in inscribed Frankish blades, which apparently inspired widespread imitation throughout the late Viking Age, often resulting in blades of inferior quality (Williams 2009). A typology of Anglo-Saxon and viking swords, largely based on the design of hilt fittings, was developed as long ago as 1919 by Jan Petersen, and Petersen's classification remains widely used today, although more recent work by Menghin (1980), Geibig (1991) and Jakobsson (1992) offers further refinements. The various types can be

Fig. 5.7 (left) Single edged sword blade from Digeråkeren, Øverli, Oppland, Norway, 8th–9th centuries. BM 1891,1021.27 (© Trustees of the British Museum)

Fig. 5.8 (facing page, left) Pattern-welded sword, with hilt fittings decorated with copper alloy and silver, possibly from the River Thames at Temple Church, London, 10th century. BM 1887,0209.1 (© Trustees of the British Museum)

Fig. 5.9 (facing page, right) Anglo-Saxon sword with inscribed blade and guard inlaid with silver and copper alloy, from River Witham, near Lincoln, Lincs., 10th century. BM 1848,1021.1 (© Trustees of the British Museum)


0
250 mm
1:4


0
250 mm
1:4

arranged chronologically, and most can be assigned as being of Anglo-Saxon, Frankish or Scandinavian character. However, some types are more ambiguous, with decoration in both Anglo-Saxon and Scandinavian art styles found on different examples of the same basic hilt type, and examples found in both England and Scandinavia (Fig 5.9). Such swords point to interaction between Anglo-Saxons and vikings and the 10th century saw a growing combination of Anglo-Saxon and Scandinavian features (Bone 1989, 67). By the time of the Ridgeway Hill burial many Anglo-Saxon and viking swords were essentially similar, with blades often around 90cm long and relatively slender (Geibig blade type 5), in contrast to earlier blade types which were typically shorter and broader (around 70-85cm) although some later viking blades were also short (around 63-76cm) and relatively wide (Geibig blade type 4) (Geibig 1991; Jones 2002).

Although the length of the blade coupled with heavy hilt fittings gave a significant total weight, this weight could be beautifully balanced, and the sword could be much more than just a crude chopping weapon. Nevertheless, late Anglo-Saxon and viking swords are typically better balanced for cutting than thrusting, although thrusting with swords of that weight is by no means impossible, and numerous examples have relatively pointed tips. Despite their relatively slight appearance, and the fact that they were designed to be used one handed, the total weight of such swords meant that they could be used to inflict blows with a considerable impact, either cutting into or slicing across the flesh of the opponent. The sword could inflict a longer, straighter trauma than an axe blade, but even the heaviest swords of this period are unlikely to have been able to deliver quite such a concentrated impact as the larger axes. Nevertheless, it is interesting that the famous account of the execution of the Jómsvikings by Earl Håkon of Norway (see Abrams, Chapter 1), although late and possibly anachronistic, specifies the use of sword rather than axe for the purpose of beheading (Nelson 1962, 40-41). A sword was capable of beheading but might well require repeated blows, corresponding with the multiple injuries on some of the bodies (see Chapter 3 and below).

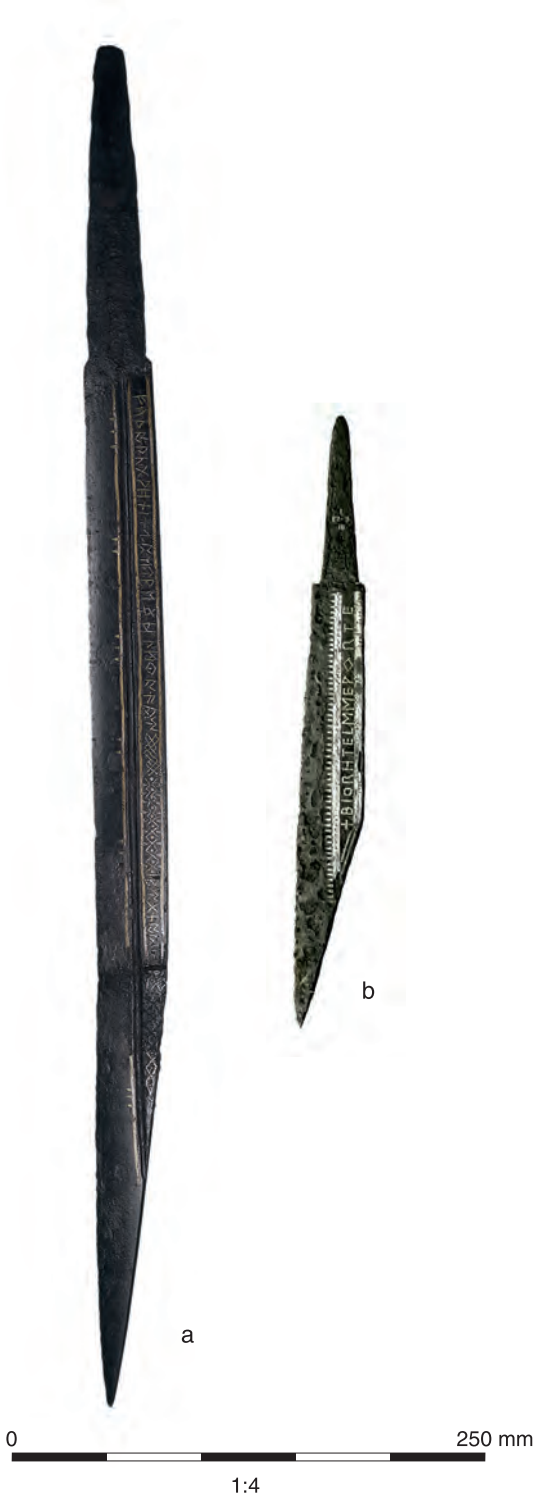

*Fig. 5.10 A) Large seax from River Thames, Battersea, London, inscribed withe futhorc (runic alphabet) and the runic name **beagnoth**, 10th century, L. 72.1cm. BM1857,0623.1. B) Short seax from Sittingbourne, Kent, with the inscriptions + BIORHTELM ME PORTE (Biorhtelm made me) and + S[I]GEBEREHT ME AH (S[i]gebereht owns me), 10th century, L. 32.10cm. BM 1881,0623.1 (© Trustees of the British Museum)*

Seax

The final weapon used in this period was the fighting-knife or *seax*. The *seax* typically had one edge sharpened all the way along, a sharp point, and only a small part of the back edge of the blade sharpened, although both the size and shape of blades varied considerably (Fig 5.10) (Gale 1989).

The seax can be observed as a secondary weapon worn across the waist both on a carving of a mounted warrior from Repton in Derbyshire and on a tenth-century Anglo-Scandinavian cross from Middleton in North Yorkshire (Fig. 5.11) (Bailey 1980, 209-13; Gale 1989, 80-81). The presence of a knife together with sword and spear is noted in an Arabic account of viking warriors in the Caucasus in 943-4 (Lunde and Stone 2012, 147) and the seax also occasionally appears alongside sword and spear in late Anglo-Saxon heriots (Gale 1989, 79-80). Although in earlier times longer examples of the seax are recorded, like the single-edged sword these seem to have gone out of fashion by the 10th century, and only the smaller version, used only as a secondary weapon, appears likely to have been used in combat by this time. It has been suggested that the seax may only have been used for hunting, rather than as a battlefield weapon (Gale 1989, 80), but this is hard to reconcile with the illustrations on the Repton and Middleton carvings. The sharp point typical of many surviving examples is ideal for thrusting at close quarters, and while much smaller and lighter than other weapons, the seax still had the weight to inflict serious cutting injuries on the body if unprotected, even if a seax was less likely to penetrate through shield and/or armour. However, a seax could probably be used more flexibly than sword or axe in circumstances where the warriors were too tightly packed for the latter to be wielded effectively, as in the shield wall of Anglo-Saxon and Old Norse literature.

Fig. 5.11 Warrior fig. from Middleton Cross B, St Andrew's Church, Middleton, North Yorkshire, 10th century (© Gareth Williams)

Armour

The most widespread form of defence available in the period appears to have been the shield. Shields normally only survive in the form of the metal boss used to protect the hand (Fig 5.12), but thirty-two shields were found with the Gokstad ship, deposited *c* 910, and a later shield has recently been discovered near the Viking Age fortification of Trelleborg. While the relatively slight construction of the Gokstad shields has led to the suggestion that they were only symbolic shields, designed for the grave rather than for the battlefield, the similarities between these and the Trelleborg shields means that they be more typical after all. The Gokstad shields have diameters of 94cm, and are of a simple plank construction, reinforced with wooden stringers on the back. Small holes around the edge suggest that either a leather reinforcement around the rim or a leather surface was fastened to the shields. The fact that the fronts of the shields were painted may indicate that rim reinforcement is more likely. Metal rim reinforcements are also known from some other shields where the wood has not survived, and the use of leather facings may have been widespread (Arwidsson 1986, 39-43; Clarke 1999, 44; Stephenson 2002, 40-41; Pedersen 2008, 207).

Fig. 5.12 Shield Boss from Barrow 1, Bolstad, Sogn og Fjordane, Norway. BM 1891,1021.44 (© Trustees of the British Museum)

The Trelleborg shield had a maximum diameter of 85cm, with a thickness of 8mm towards the centre, down to 4-5mm at the edge. Again, holes around the edge, together with fragments of leather on the front of the shield close to the edge point to a leather facing and/or rim reinforcement. Since there is no surviving evidence of paint on the front, a full leather facing is perhaps more likely in this instance than for the Gokstad shields. Both rim and facing would help to hold the planks of a shield together under the impact of a blow, while a leather facing would help to absorb the impact of blows to the front of a shield. With or without such a facing, it has been noted that the shield would have offered only limited protection against the heavy blows of sword or axe, and was probably primarily designed for defence against spears and arrows (Dobat 2013, 163-70).

The typical shield depicted in the late 10th and early 11th centuries was round. However, the kite-shaped shield familiar on the Bayeux tapestry and later was also depicted on an early 11th century psalter produced at Canterbury, so such shields may already have been in use in England by the time of the Ridgeway Hill burial (Kiff 1985, 182-6; Brooks 1991, 214-5). There is no evidence, however, for the use of the kite-shaped shield as early as this in Scandinavia.

Helmets are widespread in pictorial representations, but much rarer as archaeological finds. Apart from fragments of helmet decoration, only a single example is preserved from a 10th century viking grave in Britain or Scandinavia, in this case from Gjermundbu in southern Norway. The helmet is to some extent a throwback to the pre-Viking Age helmets from Vendel and Välsgärde in Sweden, as it has a rounded shape, spectacle-shaped fitting at the front to protect the eyes and nose. Rings around the lower edge at the back suggest an aventail or neck guard of mail and/or leather was suspended from the helmet, providing some protection for the neck (Grieg 1947; Pedersen 2008, 207). This style of helmet does not appear to have been particularly typical of the Viking Age, as a variety of pictorial representations show pointed or conical helmets, which protected the upper part of the head, but offered no protection for the face apart from a nasal (nose-guard). Representations of such helmets on the coins of Cnut (1016-35) could be taken to imply some sort of extended protection to the back of the neck (Fig 5.13), but the design of these coins is somewhat stylised and cannot be assumed to be more accurate than other contemporary representations. Conical helmets of varying forms have been found around northern Europe, including the remains of a helmet from the River Witham in Lincolnshire, and another without a firm provenance said to have been found near Stamford

Fig. 5.13 Silver penny of Cnut (1016–35), Pointed Helmet type, 1020s. BM E.4353.A (© Trustees of the British Museum)

Bridge in North Yorkshire (Nicholas Reeves, pers comm), although the continued use of conical helmets long after the Anglo-Saxon period means that it is difficult to date such finds precisely without context. Helmets are certainly not a typical feature of late Viking graves, but this may say more about burial practice than about how common they were. It is also possible that boiled leather was used as an alternative to metal, and simply has not survived in the archaeological record (Clarke 1999, 44; Pedersen 2008, 207). Despite the lack of direct evidence, leather would have been considerably cheaper, and experimentation shows that a helmet of leather boiled in beeswax can be completely rigid and able to offer some resistance to blows, while also being both lighter and cooler (and therefore less tiring) to wear than a metal helmet, so the possibility cannot be ruled out.

Both Old English and Old Norse accounts make it clear that the main form of body armour in the period was the byrnie, or mail shirt. Again, these are rare in the archaeological record, which may again to some extent reflect burial practice rather than battlefield usage. An example was found in the same grave as the spectacle helmet at Gjermundbu, reinforcing the exceptional character of this particular grave. Surviving fragments indicate that such shirts were made of thousands of links of relatively light gauge, riveted or welded together to hold them closed (Fig 5.14) (Ehlton 2003). This would provide some defence against most of the weapons of the period, but while it would stop the direct cutting power of a weapon, it would do little to absorb the force of the blow, and mail must have been worn over padded under-armour, like the later medieval gambeson, to be effective. Without this, a heavy blow would simply drive the rings into the body. Depictions of mail shirts suggest that they protected the torso, upper arms and thighs, but not

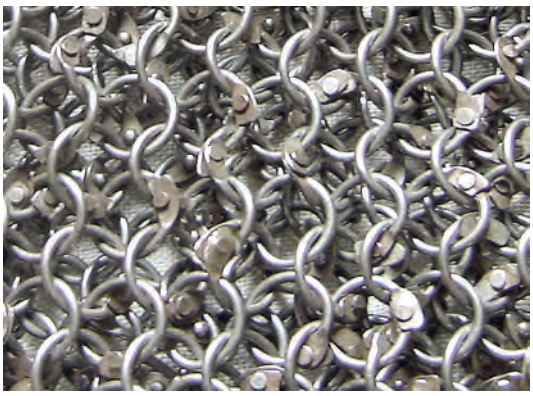

Fig. 5.14 Modern replica of riveted mail. Private collection (© Gareth Williams)

necessarily the lower arms or lower legs, although later saga evidence suggests that longer mail shirts were known, if not common. The Bayeux Tapestry also depicts the use of mail coifs to provide additional protection for the head and neck, but there are no depictions or references from the late 10th or early 11th century to suggest that these had been introduced to England or Scandinavia by this time. The Bayeux Tapestry may also depict warriors wearing mail leg protection, although opinion is divided by those who follow this interpretation and those who see it as a misrepresentation of the divided skirts of mail shirts (Brooks 1991, 148-9).

Finds from the garrison site at Birka in Sweden show that lamellar armour was not unknown in Sweden in this period. This was made up of overlapping plates laced together. However, this needs to be seen in the context of other military equipment (and other objects) at Birka pointing to contacts with and influences from the eastern Baltic and beyond (Hedenstierna-Jonson 2006). There is no evidence that lamellar armour was worn in western Europe at this time. It has also been suggested that leather armour may have been worn, perhaps reinforced by bone plaques (Clarke 1999, 44). There is no direct evidence for this, although such evidence would not necessarily survive for organic materials, and the possibility must be regarded as conjectural.

The combination of helmet, shield and mail shirt thus offered protection for much of the body. The helmet protected the upper head, while the mail shirt protected the torso and limbs at least to mid-thigh and possibly below, and to the elbow. The shield offered good protection to the hand and lower arm holding it, but much more limited protection to the weapon arm. The shield also gave additional protection to the torso and, since it could be moved, also to both head and upper legs. However, the diameter of the Gokstad and Trelleborg shields suggest that shields were of limited use in protecting the lower leg, since this could only be defended by exposing the head and upper body completely, while also bending over. The parts of the body on a fully armoured individual which were thus most vulnerable in combat to direct trauma from edged weapons were the lower head and neck, the lower arm on the weapon side, and the lower legs. This does not mean that injuries to other parts of the body were impossible, especially in the case of those areas protected only by the shield. Even mail and padding would be unlikely to absorb the full force of a heavy blow from sword, axe or spear sufficiently to prevent severe injuries. They might provide enough protection to prevent these weapons penetrating deeply enough to cause skeletal trauma directly diagnostic of individual weapons, but it is likely that the heavier weapons would have enough force to cause less diagnostic fractures to bones in armoured areas, not to mention serious or even fatal soft tissue injuries which would leave no trace in the skeletal remains.

However, the combination of helmet, shield and mail represents the upper level of protection available to the late Anglo-Saxon or viking warrior, and we cannot assume that all warriors were so well equipped. The Anglo-Saxon Chronicle records that in 1008 Æthelræd II ordered that a helmet and a mail shirt should be provided from every eight hides of land across the kingdom (ASC 1008), and it is likely that this represents the level of equipment expected of a warrior in the late Anglo-Saxon *fyrd*. This is reinforced by the evidence of the combination of helmet, mail (and sometimes shield) in law codes and heriots in contexts which imply that these were typically associated with thegnly rank. There is some evidence for a similar level of equipment prior to this date, as helmets and byrnies are included in the heriots in the will of Ealdorman Æthelmær (971 x 983) and the will of Archbishop Ælfric (1003 x 1004) (Brooks 2000, 149-51). However, the fact that Æthelræd found it necessary to order this level of equipment in 1008 means that it is unlikely to have been universal before this date. Nicholas Brooks (2000, 149-51, 155) has noted that helmets and byrnies are typical of heriots dating from the 11th century, but not in the 10th century, and that the so-called Helmet type of Æthelræd probably dates from around the same time as Ælfric's will and Æthelræd's ordinance of 1008. Even in the 11th century, the laws of Cnut and the Bayeux tapestry suggest that lightly armed warriors accompanied more heavily armed thegns to battle (Brooks 2000, 142-8).

If the warriors of the wealthy late Anglo-Saxon state were not all equipped with mail shirts before the first decade of the 11th century, how likely is it that the vikings were better armoured? As

mentioned above, while there is no doubt that mail shirts existed in Scandinavia in the late Viking Age, there is neither archaeological nor pictorial evidence to indicate that their use was widespread, while such little written evidence as there is refers only to the elite. Much depends on the interpretation of the underlying military organisation of the raids of the late tenth and early 11th centuries, especially those led by Svein Forkbeard who, as king of the Danes, might be expected to command considerable resources. Post-Viking regional law-codes from all three of the Scandinavian kingdoms refer to levy systems (*leiðangr, leding, leþung*) designed to provide ships and men for military service at the king's command, but the level of personal equipment specified for each man varies between different law codes, and helmets and mail do not appear in all of the codes. In any case, the detailed provisions of the law-codes are almost certainly anachronistic, representing the later periods in which they were written down, and the extent to which even the existence of such levy systems can be projected back to the Viking Age remains the subject of debate (Lund 1985; 1996; Malmros 1985; 2010; Crumlin-Pedersen 1988; 2002; Gelting 1999; Varenius 1998; 2002; Williams 2002; 2008; Larsson 2007). Niels Lund has argued that such levies were entirely a post-Viking development, and while Lund's position has not been universally accepted, it is difficult to disagree with his conclusion that the armies of even Svein Forkbeard and Cnut essentially represented warbands (if on a massive scale) rather than national armies, even if well-equipped personal households may formed the core. Other documented leaders, such as Olaf Tryggvasson, Olaf Haraldsson, and Thorkell the Tall are even less likely to have commanded the resources to equip all of their men with mail, even if the Yttergärde runestone, which commemorates Ulf, who took three gelds in England under Tosti, Thorkell and Cnut respectively, suggests that even some of the followers were men of some wealth and standing (Jesch 2001, 73). A mixture of personal households and speculative adventurers seems likely. A mixture of personal households and speculative adventurers seems likely.

THE EXECUTION

Method of decapitation

As discussed in Chapter 3, the pattern and extent of the wounds associated with head removal, coupled with incapacitating and defence injuries, would indicate that decapitation was the most likely mechanism of death for the individuals (Fig. 5.15), rather than having occurred post-mortem as has been observed in some archaeological contexts. Overall, multiple blows, consistent with hacking trauma, were common, indicating that it had taken several attempts to remove the heads. In many cases numerous wounds were inflicted from a variety of angles, reflecting great variation in the number of blows, point of severance and relative position of the perpetrator to their victim. This, coupled with the high number of assaults delivered to many of the individuals, could suggest that more than one executioner was involved, which would be supported by the fact that the bodies appear to have been deposited in the grave from all sides, in no particular order. Injuries to the arms and hands are consistent with defensive posturing to ward off blows and to protect the head, although these injuries are not frequent among the group as a whole. It is possible that many of them accepted their fate – perhaps because they were greatly outnumbered by their captors – and had watched and waited while their comrades were executed in front of them. However, the lack of consistency both in the direction of blows and in the vertebrae involved, give the impression that the posture of the individuals (with the exception of one or two) had not been very controlled and the process not very formalised; perhaps to some extent some of the men had been moving targets when they were decapitated. These patterns give the overall impression that decapitations were careless, 'messy' and excessively violent affairs in which blows intended for the neck were delivered to the head and as low down as the shoulder blades (as suggested elsewhere by Cessford *et al*. 2007, 212).

Generally, wound characteristics suggest that heavy, long blades, such as swords had been used, because of associated radiating fractures and the tendency for lesions to cross adjacent bones or bone regions. Exceptions might include the shorter, fine incisions seen on some skeletons which may suggest the use of shorter blades, such as the smaller version of the seax (see Williams, above). In addition, sharp cuts and chops with 'v'-shaped profiles, as well as broad lesions and scoop defects, could suggest a combination of thin and thick edged blades, although force and angle of delivery will have also influenced these features. The wounds tended to lack the crushing and bluntness that is associated with an axe and there is no suggestion that other weapons used by vikings and Saxons, such as bows and spears (see Williams, above) featured at Ridgeway Hill. Although the use of other weapons, in particular axes, cannot be ruled out entirely (for difficulties inherent in relating features of injuries to

Fig. 5.15 (facing page) Artist's impression of the executions by Mark Gridley

specific weapons see Chapter 3, methodology), it would seem that the sword was the favoured instrument of decapitation. Swords were apparently widely employed by both Anglo-Saxons and vikings (see Williams, above) and historical evidence, including the account of the Jómsvikings execution (Hollander 1955, 107-114) and the Harley Psalter (London, British Library Harley 603, fo. 67r) attests to its use in beheadings (see Abrams in Chapter 1). This may have extended beyond mere practicality because, according to Knüsel (2005, 61), the sword is a highly symbolically charged weapon and its use in execution, a symbolic act in itself, may suggest a high-profile and public event, '…..when the purpose is to demonstrate that a particular individual is dead and that the death was carried out by decree of a higher authority'.

It was noted that many vertebrae and/or fragments of vertebrae were missing from the articulated infra-cranial skeletons and skulls as a result of bone loss caused by the decapitations, but these were found among the disarticulated bones from the grave. While the disarticulated vertebrae could have been transported away from their respective skeletons in the grave by water percolation, from rain and/or body fluids (see Chapter 3), the majority had blade marks), suggesting that the act of decapitation is a more likely explanation for their separation (see Appendix 2). If this was the case, it suggests that the men had been executed on the spot, in keeping with Reynold's observations (see Abrams, Chapter 1). This contrasts with other decapitations in the archaeological record, for example, those at Little Keep, Dorchester, Dorset (McKinley 2009, 32), where missing vertebrae/fragments of vertebrae have often been noted. In these cases the fragments have not been found either with the skeletons or in the respective graves, suggesting that the decapitations had been performed somewhere other than at the graveside.

Generally speaking, considerable skill on the part of the executioner must have been required to sever the head at the neck (a relatively precise location), considering the weight of the sword and the heavy force required (but see Williams, above). The multiple blows evident on the Ridgeway skeletons reinforces the impression of botched attempts to do this. Skeleton 3715 is puzzling in this context because a mandible (sf 10420) was found directly over its right hand. The anterior base of the displaced mandible had been removed by a blow and all of the cervical vertebrae from the neck were present with the torso. It is perhaps possible that the lower jaw had been detached as part of a crude decapitation attempt and buried with the body, either by placing the item on the hand or throwing it into the grave with the body. There were also other blade injuries inflicted around the time of death of this individual, to the neck (the first, second and third cervical vertebrae), the left shoulder (scapula) and the left collar bone (clavicle), again suggestive of unskilled attempts at decapitation. Finally, additional evidence that suggests botched attempts at decapitation include a few blade wounds to other body parts inflicted at around the time of death, perhaps the result of decapacitating and defence blows (see Chapter 3 for details).

One of the Ridgeway Hill individuals (skull 3738), is of particular interest with regard to the method of execution, because he had sustained four injuries to the head which were not directly related to the act of the decapitation, including what is perhaps the most vivid wound seen amongst the assemblage – a large oval penetrating lesion on the cranium, associated with the removal of a roundel of bone (Fig. 3.31 and see Chapter 3 for a full description). Whether 3738 sustained these cranial injuries during combat, capture, or as he was struggling to escape prior to execution, will never be known. What is clear from the angle and position of the cuts, is that the cranial vault injuries had been delivered prior to decapitation and it is conceivable that, despite his injuries, the man was still alive when his head was removed. He would certainly have been severely incapacitated by the inevitable trauma to the brain caused by penetration of the endo-cranial surface and removal of such a large roundel of bone. He could not have survived the cranial injuries for any length of time, so the act of decapitation is likely to have had significance beyond mere execution.

The absence of any artefacts relating to clothing may suggest that the men were stripped prior to execution/burial in the grave, although it is also worth considering that dress fittings were not common at this time (Pitts *et al.* 2002). Organic residue analysis of soil samples taken from the immediate vicinity of some of the skulls and skeletons also failed to detect any compounds indicative of clothing (such as lanosterol from sheep's wool), or to find evidence, micromorphologically, of any textiles, possibly providing support for the former interpretation. It is, however, important to remember that the absence of signatures for clothing in the soil samples is not unequivocal evidence for an absence of textiles; it could equally result from a lack of preservation (see Pickering *et al.* in Chapter 2 and Appendix 1). Other observations from the soil analyses provide further indications of possible events around the time of the executions, including the observation that they may have eaten a meat-rich meal 48 hours prior to their deaths. If correct, this would argue against the men having being kept as hostages by their executioners and would perhaps

indicate that their executions had taken place fairly soon after their capture.

There is no evidence that any of the men were bound, which is perhaps surprising considering modern contexts of ethnic violence and war crimes where execution has been suggested by the presence of a combination of cranial trauma and binding (Haglund 2002). When the decapitated Saxon burials were excavated from the post-Roman linear earthwork at Bran Ditch, Cambridge, it was observed that their hands had not been bound and it was suggested that they had been untied, and the corpses stripped prior to their deposition (Lethbridge and Palmer 1929, 82). The same scenario may explain the lack of evidence for binding at Ridgeway Hill, although this does seem impractical and unlikely, particularly considering the number of individuals involved. The binding of hands has been observed in the archaeological record in a number of instances, including Saxon burials, by the identification of crossed hands/wrists behind the back, in front, and even above the head, which had presumably been secured with organic materials (Reynolds 2009, 163-4). These distinctive patterns were not seen among the Ridgeway Hill skeletons, whose hands and arms occupied a variety of positions, but none that suggested restraint. The lack of evidence for bound hands is also in contrast with several contemporary execution cemeteries (Reynolds 2009, and see Chapter 1), but according to Pitts *et al*. (2002) only 20% of decapitations from late Anglo-Saxon execution cemeteries have the hands tied. This is also in keeping with the probable Icelandic Jómsviking Saga, which describes the execution by beheading of a number of warriors captured by the forces of the Norwegian jarl Hakon and who did not have their hands tied, but were roped together (Hollander 1955, 107-114; see Abrams in Chapter 1 for a detailed discussion). It seems hard to believe that some form of restraint had not been used at Ridgeway and perhaps this had been the method that was employed.

PATTERNS OF DECAPITATION IN A BROADER ARCHAEOLOGICAL CONTEXT

The patterns of decapitation observed on the Ridgeway Hill skeletons share some similarities with Romano-British and Anglo-Saxon decapitation burials, but there are also some clear differences. Romano-British examples have been observed at a variety of urban and (more common) rural cemeteries, and unlike Ridgeway Hill involve adult males, females and, to a lesser degree juveniles (for example, Harman *et al*. 1981; Philpott 1991; Tucker 2013). In addition, once removed, the head is usually buried with the rest of the body in the same grave, often at the foot end (Philpott, 1991). In terms of the pattern and distribution of cut marks, these show precise, incised cuts, delivered from the front to the top of the neck, although there are variations that are more in keeping with Ridgeway Hill. Examples of precise cuts have been observed at the late Roman attritional cemetery at Lankhills, Hampshire. Here, the predominant trend was for removal of the head from the front at the level of the third, fourth and fifth cervical vertebrae by cuts rather than chops (Clough and Boyle 2010, 369; Watt 1979, 343). These and other similar examples are generally considered to have been performed after death (Harman *et al.* 1981), although in his discussion of the Lankhills examples Clarke suggested a sacrificial context for their occurrence, the patterns being reflective of a precision and uniformity that '….points to a well defined ritual' (Clarke 1979, 193).

In their synthesis of Romano-British and Anglo Saxon decapitation burials, Harman *et al*. (1981, 165) also observed the overall tendency for injuries to be delivered from the front and to involve the upper part of the neck. In addition, other patterns, including variation in direction and location of injury, evidence for multiple blows and evidence for perimortem trauma elsewhere on the skeletons, were consistent with to those seen on the Ridgeway Hill skeletons, although not as frequent. Similarly, Boylston *et al*. (2000) describe six burials from the Romano-British rural cemetery at Kempston, Bedfordshire that had been decapitated at the level of the third and fourth cervical vertebrae, although no definite cut marks were present. In contrast to this, and more in keeping with Ridgeway Hill, a further five decapitated individuals from Kempston showed less uniformity, with '...more unusual, traumatic cut marks' (Boylston and Roberts 1996, 26), in varying positions (either higher or lower than the third and fourth vertebrae), sometimes multiple and in some cases involving clavicles and mandibles. The majority, if not all of the decapitations had been performed from the front with the victim in a supine position (Boylston and Roberts 1996, 16).

A total of 120 Romano-British examples from rural and urban attritional cemeteries are considered by Tucker (2013), including those with incised cuts, but also those with chops, in the majority of cases delivered from behind and associated with the mechanism of death, possibly as a result of live sacrifice or judicial execution. The latter are of particular interest because they share a number of features with examples from Ridgeway Hill. Included in Tucker's study are: a young adult male from Driffield Terrace, York, with a single chop through the fourth and fifth cervical vertebrae in addition to defensive injuries to the ulna; a 36-45 year-old male from Little Keep, Dorchester, with

chops on his cervical vertebrae, right clavicle and mandible, as well as defensive injuries to a hand; and two adult males from Driffield Terrace, York and St Martin's Close, Winchester, Hampshire, with chops to their cervical vertebrae in association with non-decapitation related peri-mortem injuries including stab wounds, blunt force wounds and chops, possibly to incapacitate the individuals (McKinley 2009, 32; Tucker 2013, 227). In addition, multiple chops appear to have been inflicted on some individuals, suggesting that complete removal of the head was important, with as many chops as necessary performed if the initial decapacitating blow had been unsuccessful (Tucker 2012, 2013).

As observed at Ridgeway Hill, chopping blows are a predominant feature of Anglo-Saxon decapitations and have been observed at execution cemeteries, attritional cemeteries and among burials associated with settlements (Reynolds 2009; Buckberry and Hadley 2007; Buckberry 2008; Cessford *et al.* 2007; Tucker 2012). Similar to Ridgeway Hill, the blows vary in their direction, tend to be from the posterior (especially among execution cemetery examples), are either single or multiple, and involve the cervical and thoracic vertebrae, often with associated trauma to scapulae, clavicles, crania and mandibles (ibid.). In these contexts, the decapitated skulls have been found either in the correct anatomical position, placed elsewhere in the grave, buried on their own, or have been missing (Reynolds 2009) The decapitated individuals tend to be young adult males, particularly in execution cemeteries, and are rarely older adults (45+ years) (Reynolds 2009). In contrast to the mass grave on Ridgeway Hill, Tucker (2012) did not find any decapitations among older adults from a sample of 389 Anglo-Saxon burials from 129 attritional, execution and settlement type sites. The Ridgeway Hill skeletons would also seem to stand apart from other Anglo-Saxon examples in having wounds inflicted around the time of death which were not directly associated with decapitation, skeleton Q1, from Maiden Castle, (discussed in Chapter 1) and St John's College, Oxford (discussed in Chapter 1 and below) being among the few exceptions.

Examples of Anglo-Saxon decapitation include burials from Wolkington Wold, Yorkshire, where two individuals had been decapitated from behind, with the sword or axe cutting through parts of the mandible (Buckberry 2008; Buckberry and Hadley 2007). In two further cases decapitation had been attempted from behind, with the back of the cranium being hit, at least initially. In one case, one blow had penetrated the right occipital while a second had clipped the base of the cranium and probably succeeded in decapitating the individual. Another individual had suffered three blows to the back of the head, none of which would have caused decapitation. Presumably a further blow succeeded in removing the head. Perhaps most importantly for the interpretation of events at Ridgeway, Buckberry suggested that 'these two cases of repeated blows to the back of the head may indicate that the victim was struggling, the executioner mis-aimed or a combination of both of these situations' (Buckberry 2008, 164). No other injuries were present on the front of the crania or elsewhere on any of the skeletons from Walkington Wold, suggesting that they had not died in battle but rather were execution victims (Buckberry and Hadley 2007, 322).

At Chesterton Lane Corner, Cambridge, where five, or possibly six individuals had been decapitated, all blows had been delivered from behind, although it was not always clear whether or not the head would have been completely severed (Cessford *et al.* 2007). This contrasts with Ridgeway Hill where complete separation of the head from the body was evidently important. Cessford *et al.* distinguish three different types of execution at Chesterton Lane Corner, including: (a) a single blow to the neck from behind, not necessarily removing the head, which was left in roughly the correct anatomical position; (b) multiple blows from behind to the neck and sometimes to the jaw/skull, again not necessarily removing the head which was left in roughly the correct anatomical position; (c) no evidence of any blows to the neck or head, but hands tied and body sometimes placed in a prone position. It could of course be argued that multiple blows are no more than a botched version of the single blow, consistent with the observation that Anglo-Saxon decapitations were untidy and excessively violent (Cessford *et al*. 2007). At Old Dairy Cottage, Winchester, the sixth cervical vertebra of skeleton 565 had been cut through, with the head placed above the shoulders and the top of the cranium in contact with the top of the neck (Winchester Museums Service archive ODC89; Cherryson 2005, 379). Lastly, at St Andrew's, Fishergate, York, seven of the individuals had sustained injuries to their cervical vertebrae, of which six had probably been decapitated, at least two (possibly three) of these by a blow from the front rather than from behind (op. cit. 237, fig. 78). The fifth cervical vertebra of burial 7053 had a cut in the anterior surface of the body. The inferior facets were also sliced through, possibly representing a second, more successful attempt at decapitation at a slightly lower level. Three individuals (1589, 1893, 6321) had cuts to the mandible though these are not discussed in any detail in the report.

NON-DECAPITATION RELATED INJURIES: SIGNIFICANCE AND INTERPRETATION

Indirect fractures were observed on a humerus, femur and possibly also a fibula belonging to three of the Ridgeway Hill skeletons. These are interesting because they are the only evidence for other types of peri-mortem trauma besides those attributed to sharp force. The trauma to the femur is particularly interesting because a fracture of this nature (see Chapter 3) requires considerable force. These fractures may have arisen due to accidental falls or, especially in the case of the humerus, as a result of being heavily restrained. Further interpretations are provided by Armit *et al.* (2011, 274-5) in their discussion of a spiral fractured tibia from a prehistoric cave deposit. These include the breaking of limbs in the context of torture, inter-personal violence, or even post-mortem violence and, unlikely in the case of the Ridgeway Hill skeletons, a rock fall. It is conceivable that the lesions on the Ridgeway skeletons relate to entirely different traumatic events to the sharp force wounds (presumed, but not proven, to have been sustained during one event) because peri-mortem lesions generally do not show macroscopic evidence for healing for at least a week following an incident (Sauer 1998, 332). This could be explored further by examining the bones histologically for signs of healing, which may be detected between five and seven days after an incident, and/or by high powered microscopy, which enables osteoclastic acitvity, associated with healing, to be detected about one week following an insult (Boylston 2000).

The comparatively small number of sharp-force skeletal wounds that were not necessarily directly associated with decapitation – observed on five skulls in addition to hands (five individuals), lower arms (six individuals), an innominate bone and, possibly, a sternum – are too few in number to discern any patterning in their distribution and appearance, other than at an anecdotal level. Sharp force injury on the sternum suggests face-to-face attack, whilst attack from behind is demonstrated by that on the back of the pelvis. The latter could have been delivered once the individual had already been struck down and was lying on the ground. This interpretation is supported by the depth of the lesion, which would have been difficult to achieve on this lower body region (the buttocks) with the victim in a standing position.

It is conceivable that, rather than being entirely related to the single act of decapitation, some of the peri-mortem trauma was combat related, or was the result of less formalised inter-personal violence leading to capture and the subsequent executions. For example, the individuals could have been beheaded following an early defeat in battle, thereby sustaining combat injuries that were limited in number and extent. Further, combat injuries may have been primarily sustained to the head and neck regions, the most vulnerable areas, considering the protective equipment of the time (see Williams, above). In particular, hands and forearm lesions could arguably support inter-personal violence/conflict because these generally arise when the arms are raised for protection or when warding off a blow with a raised weapon or object (Novak 2000; Schmidt 2010). They were the next most frequent skeletal region to have sustained peri-mortem wounds after the neck and shoulder in the Ridgeway skeletons. Here, wounding patterns were similar to sharp force defence injuries that have been observed in modern forensic contexts. These involve cuts, stab wounds and sometimes perforations that are localised on the extensor sides of the forearms and hands or, more common, on the palms of the hands, the flexor sides of the fingers and the inter-digital spaces, primarily in the region of the thumb, the index finger and the first and second metacarpals, the first intermetacarpal space in particular (Schmidt 2010, 2). Incidentally, perpetrators may also sustain wounds to their own hands when delivering assaults, for example if their hand slips off the hilt, particularly if the blade is abruptly decelerated when it hits solid resistance (Schmidt 2010). The clinical pattern of wounding in these cases tends to be lesions that run more or less transverse to the longitudinal axis of the fingers on the flexor side of the hand, with predominant involvement of the little finger (Schmidt 2010, 2). Other patterns noted in association with perpetrators are lesions that show a predilection for the radial side of the left thumb, the left thenar and the (proximal and) distal interphalangeal joint of the right index finger (Schmidt 2010, 2). Broadly speaking, the examples for Ridgeway Hill would seem to be more consistent with the clinical patterns of defence, rather than those of attack.

Like Ridgeway Hill, a high proportion of peri-mortem defence wounds were observed on the forearms and hands of the soldiers from the Towton mass grave, killed in battle during the Wars of the Roses in AD 1461 (Novak 2000). These primarily involved the right side, commonly the fighting arm, suggesting that most defence injuries had been sustained to the arms that were wielding the weapons (Novak 2000, 93). If this logic is applied to the Ridgeway skeletons, it suggests that the individuals had not used weapons or objects to defend themselves, because lefts were more frequently involved than rights (assuming right handed dominance). Interestingly, according to a recent study of modern autopsy cases, approximately two

thirds of individuals killed in knife attacks sustain defence injuries to their left arms and hands (Schmidt 2010), although it is not stated whether they had weapons or not. Injuries sustained to the left side are consistent with assaults made by a right-handed attacker, presumably because this part of the body is closer (Schmidt 2010; Novak 2000; Wenham 1989).

Besides the defence wounds, Ridgeway Hill shares little else in common with military / battle related contexts in terms of the pattern and distribution of peri-mortem injury. Generally speaking, penetrating injuries suggestive of thrusting actions (such as stab wounds), and trauma to areas of the skeleton that would not have been protected by body armour, are lacking. Both of these would be expected in a battle related context (G. Williams, pers comm.) despite the fact that the extent of body armour available to viking warriors at this time is not clear (see Williams, above). There is no reason to suppose that the individuals, if they had been warriors, had access to the maximum level of protection that was available at the time. If they were a group of inexperienced warriors (see above), they may not have had the personal wealth to equip themselves well, or the experience to have earned themselves equipment from their leaders (G. Williams pers. comm.). Thus, if any or all of them had engaged in battle prior to their executions, combat wounds might be expected in areas protected by mail and perhaps also helmet, as well as areas that would be exposed on a well-armoured warrior (see G. Williams, pers comm.).

Further observations may be made by comparison with skeletal assemblages from known battle-related contexts. Examples include the 6th or 7th century battle victims from Heronbridge, possibly associated with the Battle of Chester, and assemblages that are later in date, including victims of the Battle of Wisby (Visby, Sweden) in AD 1361, as well as the aforementioned skeletons from Towton and Uppsala. Peri-mortem cranial wounds, inflicted using bladed weapons '...of long leverage…' such as long-swords (Davies 1933, 47), were observed among 22 males from Heronbridge, in addition to blunt force depressed fractures (Davies 1933; Holst 2009). However, unlike Ridgeway Hill, blade wounds were located on the top of the crania, possibly a result of having being delivered by individuals on horseback (Davies 1933, 47).

At Towton and Visby the side dominance of wounds, suggestive of formalised single combat (Kjellström 2005; Knüsel and Boylston 2000; Wenham 1989) is not seen at Ridgeway Hill. Further, a much higher frequency of dental trauma was seen among the Ridgeway Hill skeletons than those from Towton, suggesting that most of this had resulted directly from the decapitation, rather than combat-related assaults. The fact that dental trauma may arise as a direct consequence of decapitation, in which blows to the neck can cause forced occlusion (Glendor *et al*. 2007), is worth noting here. Lastly, although a lower frequency of infra-cranial wounds than cranial wounds was observed at Towton (43 compared with 113; Novak 2000,99) Uppsala (18% compared with 60%; Kjellström 2005, 42) and Ridgeway Hill, the neck was clearly not the primary target at the former two sites, unlike the last. Rather, at Towton and Uppsala decapitation would generally seem to be an incidental part of a suite of peri-mortem lesions sustained by battle victims (Tucker 2013, 230).

One individual from Uppsala appears to have been deliberately decapitated and it is suggested that, given the direction of the blow and the orientation of the cut, this had been an execution, rather than a battle-related decapitation (Kjellström 2005). Interestingly, according to Kjellström (ibid. 44), the close proximity of the decapitated skull to the infra-cranial skeleton, although out of correct anatomical position, argues in favour of execution because decapitation during battle is less likely to be followed by the respectful placement of the skull and skeleton together for burial. On the other hand, Tucker (2013, 230) suggests a combat related explanation for a number of Iron Age, early medieval and medieval decapitation burials where complete head removal had not been achieved, because the cut marked skulls and mandibles were in their correct anatomical position, suggesting that decapitation had not been complete at the time of death.

The extent to which the dearth of infra-cranial peri-mortem trauma to bones other than those from the neck and shoulder region of the Ridgeway Hill skeletons reflects reality is worth considering. The lesions observed probably reflect only a fraction of the injuries sustained by the men, because many will not have fully penetrated soft tissues through to the bone. The fact that other bones besides those from the neck and shoulder regions *are* involved suggests that more could have been affected, but the evidence has not survived owing to a preservational bias in the sample towards more robust bones. In particular, those bones that are trabecular rich with thin cortices, especially sternums and pelves, survived less well than the denser long bones. The only two examples of wounds involving the sternum and pelvis had only just survived, the affected regions being especially fragile because the blow had impaired the bone structure, making it even more susceptible to loss and damage. However, it is unlikely that preservation has made a significant difference to the survival of evidence for peri-mortem trauma because other trabecular rich

bones, namely thoracic and lumbar vertebrae, survived and were in good enough condition to identify pseudo blunt force lesions. Care has been taken to describe these because they highlight the difficulty in identifying peri-mortem trauma in individuals recovered from complex burial contexts, namely mass graves. The lesions reflect all the properties of a 'green' bone response and, given their shape, could conceivably be attributed to an assault with a blunt object. In fact, their appearance is similar to a lesion that has been attributed to a musket ball, observed on a thoracic vertebra from the 18th century massacre at Fort William Henry, New York, (Liston and Baker 1996, 38 fig, 10). However, in the case of the Ridgeway Hill skeletons, the lesions do not make sense logistically as weapon injuries. As site records (plans and photographs) showed, these are more likely to have occurred as a result of slow loading pressure over a long period of time on the contact between two bones (see Figure 3.87). A full understanding of peri-mortem trauma cannot be gained without detailed consideration of the burial context.

Like Ridgeway Hill, the pattern of cranial wounds at St John's College, Oxford differed from what would be expected in face-to-face combat. In total, 19 out of 29 cranial remains displayed peri-mortem sharp-force trauma (17 discrete burials and two disarticulated contexts). Linear wounds were most common and the majority of wounds penetrated through both skull tables, with some removing large portions of bone; very few were superficial incisions or glancing blows. Forty blade wounds were identified on 18 crania with individuals exhibiting up to nine blade wounds each with an average of 2.2 per individual. The right and left sides (26.3%) were most frequently affected, followed by the back of the head (23.7%). The frontal bone was only affected in 7.9% of affected crania. With the exception of the lower jaw, sharp force trauma was not recorded on any facial bones. A total of five mandibles displayed eight injuries (seven blade injuries and one puncture wound). Four of the five had injuries to the ascending rami (two blade wounds to the right side, four to the left and one puncture wound to the left side). One individual (skeleton 1951) had a blade wound across the front of the left side of the chin across the mental eminence. Three of the five also had injuries to cervical vertebrae, probably caused by the same blow. In the infra-cranial skeletons a total of 106 blade, puncture and projectile wounds were present on a total of 93 different elements. The most frequent wound location was the back (49% of all wounds), followed by the legs (13.2%). Peri-mortem injuries involving arms/hands and necks accounted for 12.3% of all wounds and the stomach and chest, 8.5% and 4.7%, respectively. Falys (2010) considers patterns such as these to be more consistent with a massacre than a combat; injuries that predominantly involve the back and side of the skeleton reflect a less formalised pattern arising from assaults delivered to those fleeing their attackers (Larsen 1997, 157; Wenham 1989, 137). According to Inglemark (1939) blows from the back and the sides are in keeping with victims who were retreating, had fallen or were attacked from behind.

Ridgeway Hill is similar to St John's in this respect because a number of wounds (cranial and post-cranial) had been delivered from behind and some, (for example, the innominate wound and possibly also the cranial wounds not directly associated with decapitation), could refer to victims who had fallen. However, there is little indication in the wound patterning of individuals who were fleeing, unlike St John's where the leg wounds may reflect being 'cut down'. At St Andrew's Fishergate, the upper part of the leg (femur) was also a particular target and possibly reflects a deliberate attempt to sever the muscles of the leg and cause the individuals to fall (Stroud and Kemp 1993). No convincing leg wounds were seen among the Ridgeway skeletons.

Also of relevance here is Inglemark's (1939) observation on the Wisby trauma, that horizontal wounds, particularly on the cranium (as seen at Ridgeway), probably refer to blows delivered to victims lying on the ground, because they are difficult to deliver to upstanding individuals. Further, the concentration of deep penetrating wounds on single bones, with no side bias, delivered from any angle, is consistent with attackers standing over their fallen, defenceless, victims (Inglemark 1939; Preston 2010). Conversely, more superficial, isolated, wounds, showing a tendency towards the right side, are consistent with assaults delivered to upstanding and defending victims (Inglemark 1939; Preston 2010). The concentration of heavy, penetrating, wounds to the head and neck region on the Ridgeway Hill skeletons, in addition to their varied angles and directions, would certainly be consistent with defenceless individuals.

DISPOSAL OF THE BODIES

Method of burial

That the individuals had been buried in one event was clear from the outset of the investigations of the grave (see Chapter 2), but the manner in which this was performed is worth considering. Burial had probably taken place fairly soon after the executions, at least before body decomposition had set in, because there was no evidence for any animal

scavenging in the form of tooth pits and/or scores (Binford 1981; Blumenschine 1995) and disarticulation patterns do not match those that have been recorded for bodies exposed to scavengers (Blumenschine 1988, Haglund *et al*. 1988; and see discussion in Chapter 3). The skeletons showed a distinct lack of stratification, as was also the case in a Roman mass grave from London Road, Gloucester, where this pattern was interpreted as evidence that the bodies had been dumped into the pit together, perhaps from a cart (Simmonds *et al.* 2008, 16). If the same had been the case at Ridgeway Hill, this would suggest that the executions had taken place somewhere else, and that the bodies had been transported to the grave for disposal. However, the clear separation of the skulls from the skeletons may suggest otherwise. The jumbled nature of the deposit could just as easily be explained by the fact that bodies had been thrown in from all sides of the grave. Further, the limbs of some skeletons (for example, skeletons 3786, 3781 and 3778) were lying spread apart, a posture that is similar to those identified among the skeletal remains of First World War soldiers buried in mass graves in Fromelles, France. Here, the patterns are reflective of recorded practices in which soldiers were either lifted into the grave by holding them under their arms, or by two individuals, one holding their legs and the other, their arms (Loe *et al.* forthcoming).

The haphazard fashion in which the skeletons were lying may also suggest a distinct lack of care, with no attempt to bury the heads with the corresponding bodies. This was also seen at St John's, where the individuals had been erratically placed in a hollow (Falys 2010). The graves at both Ridgeway Hill and St John's contrast with the much more organised mass burial at Towton (Fiorato *et al*. 2000). Here, the grave was not a re-used pit, but had been purposefully dug and had been filled from west to east, probably with the aim of maximising the use of available space. The skeletons mostly observed east-west orientations, were either prone or supine and were fully articulated at the time of burial. They were tightly packed, one man wide and three men long, indicating a conscious effort to fill the space. All of these features, the regular orientations in particular, point to the fact that '…..the dead were certainly laid in the grave as opposed to being simply thrown in' (Sutherland 2000, 40). Other mass grave contexts, besides those associated with battle, also reflect a level of organisation, unlike that seen at Ridgeway Hill and St John's. Some examples include the post-medieval mass burial from the Barbican, York (Chamberlain 2009), some mass graves of victims of epidemics (for example, Spitalfields; Connell *et al.* 2012) and six mass graves of First World War Australian and British soldiers, who were buried by German soldiers (Loe *et al. f*orthcoming).

The lack of care shown in the burial of the Ridgeway Hill individuals strongly suggests they had been buried by their executioners, rather than by their own people whose funerary practices typically comprised furnished inhumation and cremation within burial chambers, coffins, ships or biers (Hadley 2006). However, there are a number of caveats that should be considered. The organisation (or lack of) of bodies in a mass grave may refer to respect (or lack of) for the dead, but as Sutherland (2000, 43) states: 'Even if deposition does not conform to a preconceived regular pattern, one should not automatically assume that the procedure reflects disrespectful intent on the part of those who buried them'. For example, disposal in some contexts may be hurried and therefore disorganised if the grave is located in an area exposed to attack from the enemy (for example, Loe *et al.* forthcoming), or because there was a perceived risk of catching disease (for example, Simmonds *et al.* 2008), or because it was being done to conceal a crime (for example, Cox *et al.* 2009; Haglund 2002*)* (although there was no evidence to suggest any of these scenarios at Ridgeway Hill). Further, organised burials may be primarily determined by a requirement to make the best use of the space, in order to reduce the amount of labour involved.

For the Ridgeway Hill executioners it was perhaps fortunate that they did not have to dig the grave entirely from scratch, it being one of seven quarry pits that had probably been dug in the late Iron Age/Roman period for chalk and had partially infilled by the 10th century AD (see Figures 1.2 and 1.3). It is worth mentioning here that, compared with the other six pits, the cut for this one showed the greatest irregularity, although the relevance (if any) is not apparent. The lower deposits were similar in their make-up and inclusions to the other pits. The mass grave was certainly not the largest of the quarry pits which measured more than 12m across (the smallest was around 5m in diameter), but it would seem to have been the deepest measuring up to 1.66m, compared with between around 1.0m and 1.5m for the others, although it appears that the pits (including the one which later became the mass grave) were partly silted up or otherwise infilled by the time the execution took place.

Missing skulls and *heafod stoccan*?

Apparently fewer individuals were represented by skulls than by infra-cranial skeletons (47 for skulls compared with 52 for skeletons, and see discussion in Chapter 3) suggesting that not all of the heads

had been buried. Although it is possible that the mechanical excavator that had originally disturbed the deposit had recovered and subsequently dumped skulls on the spoil-heap, this is thought to be very unlikely because the disturbed part of the grave was not the area where the other skulls were found. Further, the fact that skulls have survived in the deposit would suggest that the missing ones simply could not have disappeared completely as a result of disintegration or extreme fragmentation from soil pressure and decay (as can happen in some contexts, although this is unlikely in chalk soils).

Trophy skulls are known from the Anglo-Saxon period and this activity may account for the absence of skulls from the grave. Reynolds (2009) has highlighted several Anglo-Saxon contexts of missing skulls, skulls buried later than their associated corpses and skulls with indications of weathering or damage, and considers this to reflect the archaeology of the *heafod stoccan* (head stakes), recorded in certain charter bounds. References to *heafod stoccan* have been interpreted in a variety of ways including 'stakes set up to mark the bounds of a ploughland' or as 'a stock post on which the head of a criminal was fixed after beheading' (Grundy 1919, 178; Reaney 1960, 158; Reynolds 2009, 31). The excavated execution burials at Old Dairy Cottage were shown to be coincident with the *heafod stoccan* mentioned in three independent sets of charter bounds, while at Bran Ditch and Roche Court Down, heads were buried without mandibles indicating long-term display. At Wor Barrow eight out of 17 bodies were buried without their heads (Reynolds 2009). There is, however, no conclusive evidence for this practice at Ridgeway Hill and therefore the absence of skulls from the deposit lacks a clear explanation.

The location of the grave

While the existence of the pit may be regarded as fortuitous for the executioner, it is certain that the choice of location was deliberate and was of great significance, as one where justice was dispensed. In keeping with other Anglo-Saxon execution cemeteries (see Chapter 1), proximity to a major road, a boundary and visible early prehistoric activity, and a view of the prehistoric monument, Maiden Castle, would all seem to have been important. It is also perhaps no coincidence that Maiden Castle is the burial location of a mutilated Anglo-Saxon skeleton ('Q1', see Chapter 1). Considering these points it is quite conceivable that the executions had taken place in front of a large crowd of spectators and as a formal event. The setting of the grave (and the executions) probably served to make an example of the victims and emphasise their exclusion, summed up by the term 'deviant burial', which has been used to describe the different treatment of individuals in burial relative to others in their society (Murphy 2008, xii).

The proximity of two earlier Saxon graves, found during the same archaeological programme of works (see Brown *et al.* 2014) is probably significant and suggests that, by the time of the mass burial, there was an established tradition of deviant burial on Ridgeway Hill. However, other than the location of these earlier graves there was nothing particularly unusual (for example, prone positions, decapitation) about the burials themselves.

CONCLUSIONS AND FURTHER WORK

The evidence considered in this report leaves many unanswered questions, not least precisely what events led to the execution and burial quite extraordinary to our modern eyes, of so many individuals at once. However, the following interpretations may be concluded based on the evidence as it presently stands. First, not all of the men were particularly healthy; some had conditions that had caused physical impairment and deformity and some had chronic disease. There was also a marked absence of healed injuries that could be attributed to combat, thus no evidence for previous battle-related experiences. In this respect these findings are more in keeping with a civilian (possibly peasant) population than a warrior group; they certainly do not fulfil ideas of an elite fighting class, although an inexperienced group of raiders is conceivable.

Isotope analyses suggest that the individuals did not share the same origins or migratory histories, although they had spent most of their lives in Northern European countries. This would seem to be supported by the osteological findings, in particular for stature, dental modification and ancestry. Conditions resulting from repetitive strenuous activity from a young age were frequent and in some cases exceeded the frequencies observed among highly professional groups.

The peri-mortem sharp-force lesions are more consistent with death by execution than with some other kind of mass killing followed by decapitation. The high concentration of wounds to the head and neck would suggest that most, if not all of the assaults, were intended to execute the individuals by decapitation in which complete removal of the head was important, no matter how many attempts were required. Wounds would seem to lack the patterning and distribution known from battle-related contexts and this suggests a lack of formalised assault, but they are not consistent with the pattern of assaults expected in massacre related situations, in which the

the back of the skeleton and the legs are primarily involved. Thus, there is no convincing evidence for battle, or other form of inter-personal violence, prior to execution. Yet despite this, it is hard to believe that the individuals had not resisted their fate and that, at the very least, some sort of skirmish or struggle had not taken place. While it shows no compelling pattern, non-decapitation related trauma *is* nevertheless present, the true extent of which will never be known because many wounds will have involved soft tissues only.

Other evidence may support this proposition. For example, it could be argued that the perpetrators did not have complete control of their victims, implying some form of struggle, because of the varied angles of the injuries in neck regions. However, although no evidence for restraint was found, historical evidence suggests that they could have been roped together. Considering the sheer scale of the violence concentrated in the region of the neck some form of restraint must surely have been used? This being the preferred interpretation, the varied angles of the wounds are perhaps surprising; could they therefore simply reflect the heightened frenzy in which the executions took place?

Certainly, the appearance of the wounds leaves little doubt that the executions had been performed in a messy, careless and violent manner, often involving several attempts to sever the head, causing severe, but not necessarily always fatal, injuries. This, on the whole, seems to contrast with Romano-British and Anglo-Saxon decapitation burials, where cuts tend to be more pre-meditated/focussed and suggests that the Rideway executions were disorganised or less ritualised. Considering the earlier discussion on the significance of the location of the executions and subsequent burial (see above), which implies, to some degree, an organised event, it is perhaps more appropriate to suggest that the executions had been less ritualised. In fact, the overall impression is that many of the wounds which have no meaningful placement were altogether adventitious/unnecessary, both in terms of disabling the individuals and in causing their deaths. Defence wounds and some superficial wounds (perhaps incapacitating injuries) would suggest that the victims were conscious for at least some of the time during which they were assaulted. The locations and depths of many lesions indicate that they were delivered to individuals who had succumbed to their attackers, some perhaps whilst they were lying on the ground. This would have been the case for at least one individual, because he had sustained a severe peri-mortem fracture to his leg and could not have been standing (at least not unaided).

The Ridgeway Hill grave bears all the hallmarks of an Anglo-Saxon execution cemetery (see above and Chapter 1), with significant factors including the location of the grave, the haphazard body positions and, not least, the decapitations. However, some features are less typical, such as untied hands, injuries not directly associated with decapitation, the older ages of some of the victims and, in particular, multiple individuals buried at the same time. Although multiple, contemporaneous, burials feature in Anglo-Saxon execution cemeteries (for example, Walkington Wold), the number of individuals from Ridgeway Hill far exceeds all known examples excavated to date.

While many early medieval sites have produced evidence of violence, particularly through cut marks to the skull, nothing quite so dramatic as Ridgeway Hill has been encountered before in Britain. Further afield there are parallels, for example in Sweden, but on a lesser scale. There is no doubt that the Ridgeway Hill mass grave is a remarkable discovery that will continue to hold the attention of archaeologists, osteologists, historians and others for decades to come. Indeed, this is by no means the last word on this extraordinary assemblage and there will, no doubt, be many more fascinating discoveries made about it in the future.

The work presented herein is intended to lay the foundation for further research on the assemblage. For example, further radiocarbon dates, with full statistical testing, could be beneficial in order to further refine the date of the deposit. While the isotope work undertaken to date is perhaps one of the most in-depth studies on a single archaeological assemblage, more analysis of this nature would be useful, particularly considering continuing efforts to advance our understanding of the turnover rates of different bones with reference to different life stages (Pollard *et al.* 2012). In addition, DNA analysis, to further explore the origins of the individuals, would be informative. Some of the pathological conditions that have been identified require further research – macroscopic, radiological, histological and DNA based – to explore diagnoses, particularly with reference to the possible cases of brucellosis. Other aspects of the skeletal biology of the group that could be explored are cross-sectional analysis using computed tomography of the limbs to investigate useage (for example, see Knüsel 2000) and metrical assessment and analysis to explore ancestry. High-power microscopic analysis would provide further information on the surface structure of the cut surfaces, furthering our present understanding of the weapons that created them. Additional work on the historical context has been mentioned above and could also consider hagiography, which may provide further useful evidence on how hostages, prisoners and traitors were dealt with. A survey of the methods of execution and the

representation of warfare in art might also be relevant. Lastly, the analyses presented here are among a small number to have been undertaken on execution burials to date, many having received limited or no osteological study (see Chapter 1). Therefore, detailed osteological and isotopic analyses of other execution burials, besides Ridgeway Hill, would greatly benefit current interpretations and, indeed, further present understanding of this funerary rite.