White Rose Research Online

eprints@whiterose.ac.uk
https://eprints.whiterose.ac.uk
Universities of Leeds, Sheffield and York

Deposited via The University of York.

White Rose Research Online URL for this paper:
https://eprints.whiterose.ac.uk/id/eprint/635/

Article:
Richards, J.D., Beswick, P., Bond, J. et al. (2004) Excavations at the Viking Barrow Cemetery at Heath Wood, Ingleby, Derbyshire. The Antiquaries Journal. pp. 23-116. ISSN: 1758-5309

Reuse
Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown
If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.

UNIVERSITY OF LEEDS
University of Sheffield
UNIVERSITY of York

The Antiquaries Journal, **84**, 2004, pp 23–116

EXCAVATIONS AT THE VIKING BARROW CEMETERY AT HEATH WOOD, INGLEBY, DERBYSHIRE

Julian D Richards, FSA, with contributions by Pauline Beswick, FSA, Julie Bond, Marcus Jecock, Jacqueline McKinley, Stephen Rowland and Fay Worley*

The cemetery at Heath Wood, Ingleby, Derbyshire, is the only known Scandinavian cremation cemetery in the British Isles. It comprises fifty-nine barrows, of which about one-third have been excavated on previous occasions, although earlier excavators concluded that some were empty cenotaph mounds. From 1998 to 2000 three barrows were examined. Our investigations have suggested that each of the barrows contained a burial, although not all contain evidence of a pyre. A full report of the 1998–2000 excavations is provided, alongside a summary of the earlier finds. The relationship of Heath Wood to the neighbouring site at Repton is examined, in order to understand its significance for the Scandinavian settlement of the Danelaw. It is concluded that Heath Wood may have been a war cemetery of the Viking Great Army of AD 873–8.

LOCATION

The Scandinavian barrow cemetery known as Ingleby (SK 342259) comprises fifty-nine mounds in four clusters. It is set within a small woodland block called Heath Wood on the western edge of Ingleby parish in Derbyshire. The cemetery has a northern aspect, lying between 102m and 114m above OD on and below the shoulder of a small bluff on the heavily dissected southern edge of the Trent Valley which here runs almost due east–west (fig 1). The underlying geology comprises Triassic sandstones of both the Keuper and the Bunter series.[1] The soil is acidic and sandy, leading to good drainage but poor preservation. The site is Scheduled Ancient Monument number 'Derbyshire 101'.[2] Heath Wood is currently owned by the Church Commissioners, although leased to the Forestry Agency.

* *Julian D Richards, Department of Archaeology, University of York, King's Manor, York YO1 7EP, UK.*
E-mail: <jdr1@york.ac.uk>.
Pauline Beswick, 4 Chapel Row, Froggatt, Calver, Hope Valley, Derbyshire S32 3ZA, UK.
E-mail: <Paulinebwick@aol.com>.
Julie Bond, Department of Archaeological Sciences, University of Bradford, Bradford BD7 1DP, UK.
E-mail: <J.M.Bond@bradford.ac.uk>. (JB)
Marcus Jecock, English Heritage, 37 Tanner Row, York YO1 6WP, UK.
E-mail: <Marcus.Jecock@english-heritage.org.uk>.
Jacqueline McKinley, Wessex Archaeology, Portway House, Old Sarum Park, Salisbury SP4 6EB, UK.
E-mail: <j.mckinley@wessexarch.co.uk>. (JMcK)
Stephen Rowland, Department of Archaeology, University of York, King's Manor, York YO1 7EP, UK.
E-mail: <stephenrowland@yahoo.co.uk>. (SR)
Fay Worley, Department of Archaeological Sciences, University of Bradford, Bradford BD7 1DP, UK.
E-mail: <F.L.Worley@bradford.ac.uk>. (FW)

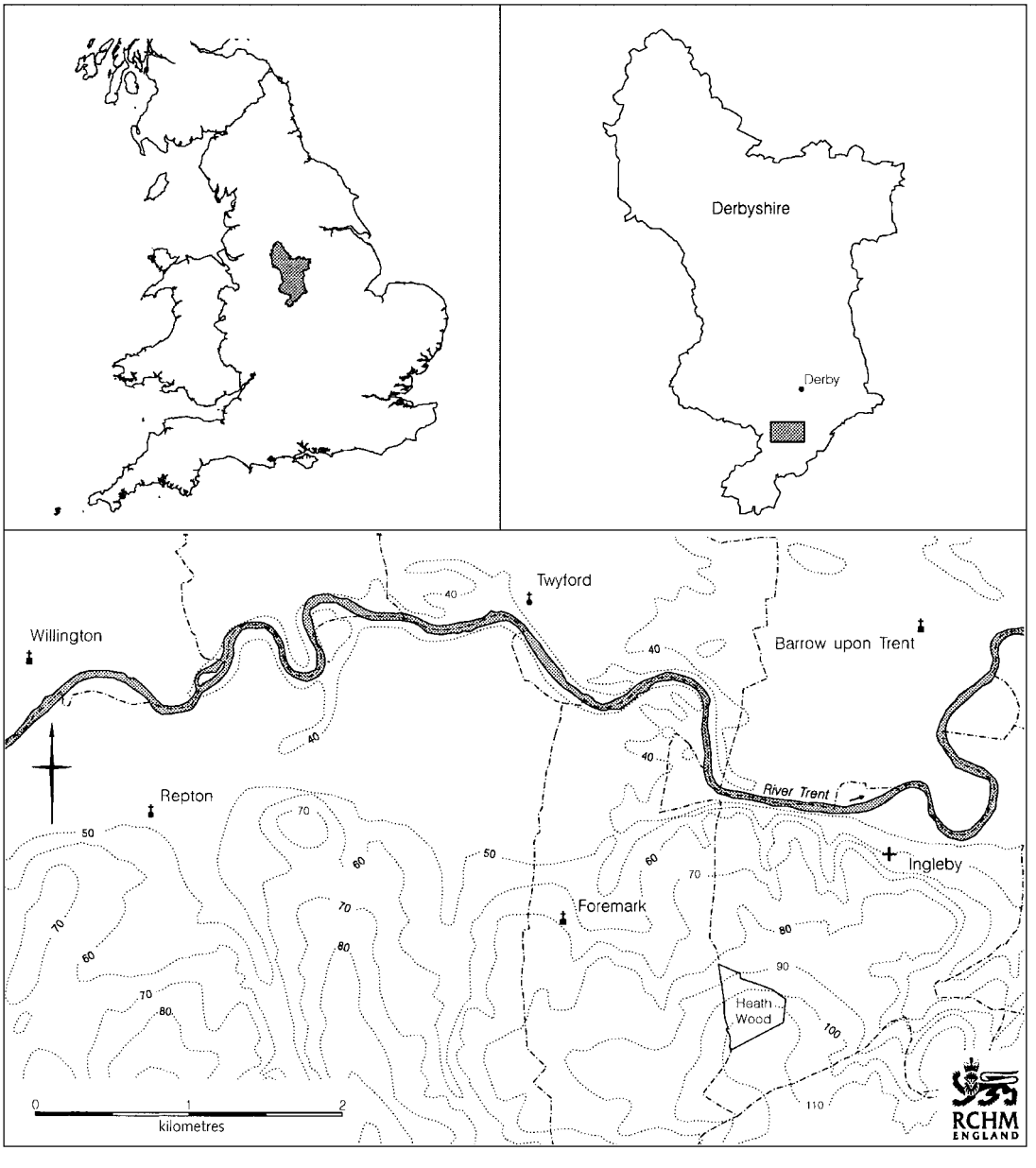


Fig 1. Location of barrow cemetery at Heath Wood, Ingleby. Boundaries shown are those of the modern civil parishes. Contours in metres. *Drawing*: NMR, Crown Copyright 1995, based on Ordnance Survey mapping with permission

Heath Wood comprises a 14ha block of mixed woodland which once formed part of the parkland setting of Foremark Hall, 1km to the north west. The present hall was built by Sir Robert Burdett from 1759 to 1761, but is known to have replaced an earlier house first documented in 1712 but whose existence from at least the middle of the seventeenth century is

implied by Sir Francys Burdett's rebuilding in 1662 of the nearby St Saviour's Church.[3] The previous hall was described by Woolley as 'large and convenient with a large well-wooded park and coney warren adjoining' and was assessed at twenty-four hearths in 1662.[4] However, in the Burdett papers Heath Wood is still referred to as 'ye Heath feild' in 1664, suggesting that at that stage it remained open heath land. Burdett's 1791 map shows the area as only lightly wooded, with several areas of open moor and heath.[5] From documentary sources, therefore, it seems probable that Heath Wood was established as part of the landscaping for the present hall in the late eighteenth century, and before that was open land, possibly even the rabbit warren mentioned in 1664. It lies en route between Foremark and the second Burdett house-cum-summerhouse at Knowle Hill and is bisected by a track connecting the two properties. The track is now in places no more than an overgrown footpath, but is well engineered and, where it passes uphill through the wood, is also metalled, suggesting it originated as a carriage drive. The date of its construction is uncertain, but it is also unlikely to be later than the middle of the eighteenth century when the Burdetts were living at Knowle whilst Foremark was remodelled. The drive passes right through the cemetery although there is no evidence to suggest that any barrows were destroyed by its construction; instead, it is possible that the drive was sited so that the cemetery became a feature to be viewed from it.

Before the plantation of the wood in the eighteenth century, the clusters of barrows therefore occupied open heath land, and appear to have been respected by agricultural activity, including medieval ridge and furrow ploughing (see below), probably because of the rocky and uneven nature of the ground. When originally constructed the barrows would have commanded impressive views northwards, across the flood plain of the Trent and taking in the site of the Viking winter encampment of AD 873–4 at Repton in the foreground, 4km to the north west. The spire of St Wystan's Church is today visible from the edge of the wood, and it seems likely that the chancel of the Saxon monastic church and the encompassing massive Danish earthwork, revealed during the 1974–93 excavations by Martin Biddle and Birthe Kjølbye-Biddle, would have been visible in the late ninth century.[6]

The cemetery has become known as Ingleby, although Heath Wood is more accurate. The present village of Ingleby lies 1km to the north east, and is assumed to be *Englaby* (1009: Sawyer 1968, 922) and *Englebi* (1086: Domesday). As a label for a Viking cemetery the use of the name Ingleby has been a source of confusion as it suggests 'a farm of the Angles', probably denoting 'an isolated survival of English inhabitants amongst a prevailing Scandinavian population'.[7] It makes much more sense when it is realized that it denotes not the cemetery but a neighbouring settlement which was named by a predominant local Scandinavian group: 'Ingleby is now merely a handful of houses standing in the shelter of steep wooded cliffs and its site would have been a suitable one to which to retreat in the face of invasion'.[8] Indeed, although Derbyshire generally has few Scandinavian names, and only ten place-names containing the Danish *-by*, these are clustered south of the Trent in the vicinity of Repton.[9] The town of Derby, one of the Five Boroughs of the Danelaw, is 10km north of Heath Wood.[10] Apart from Derby itself there is also the village of Bretby, like Ingleby distinctive as the 'village or farm of the Britons'. These names testify to the density of Scandinavian dominance in an area in which Anglo-Saxon settlement was also considerable.[11] The assimilation of the Anglo-Scandinavian population may be reflected in hybrid names such as Ravenstone, recorded as early as 942, suggesting a rapid fusion of the two groups.[12] The name Foremark is also of Scandinavian derivation. In Domesday Book it is recorded as *Fornewerke*, or the 'old fortification', the equivalent of the English *Aldwark*, although the word *verk* is not recorded in this sense in the Scandinavian homelands,[13] suggesting that the sense developed in England

under the influence of OE *(ge)weorc*, 'fortification'.[14] Only later is the second element replaced by the form *mearc*.[15]

PREVIOUS WORK

There have been three previous recorded investigations of the barrows in Heath Wood: those of Thomas Bateman in 1855, Camden Clarke and William Fraser from 1941 to 1949, and Merrick Posnansky in 1955. These have resulted in the partial or complete excavation of twenty mounds.

Excavations by Bateman, 1855

In *Ten Years' Diggings* Thomas Bateman describes more than fifty mounds, 21–30ft (6.4–9m) in diameter and 2–3ft (0.6–0.9m) high, located in a plantation known as 'The Ferns', near Foremark Hall. He opened five, on 22 May 1855, possibly whilst staying at Foremark as a guest of the Burdett family, and found that in each case:

> the mound had been raised over calcined human bones, which lay in the same place on the natural surface as they occupied when the funeral pile was smothered out by the casting up of the tumulus. The bones and black ashes of the pyre, reduced by compression to a layer about an inch thick, generally covered a space about four or five feet diameter in the centre; above were accumulated stones bearing marks of fire, which had been first thrown on the glowing embers, and over these earth was heaped to form the bowl-shaped mound.[16]

The only finds recorded by Bateman were: 'two very small fragments of iron, found with two separate interments, one only having the definite form of a very slender pin, $1\frac{3}{4}$ inches long'. Neither object is listed in the catalogue for that part of the Bateman Collection later purchased by Sheffield Museum and it is unlikely that they now survive.[17] In the context of the later finds it may be more likely that the object described by Bateman as a pin was actually an iron nail.

No record of the position of the barrows opened by Bateman survives, although the survey by the Royal Commission on the Historical Monuments of England (RCHME, see below) identified one barrow (Mound 16) which, on the basis of its earthwork form, can be inferred to have been opened by a hole dug in its centre, but which cannot be linked to an otherwise documented excavation. Modern excavation of a second (Mound 12) produced evidence of earlier peripheral disturbance but neither of these actual or possible acts of excavation can be attributed definitively to Bateman.

Bateman was uncertain of the date of the cemetery but, noting the similarity of the mounds, concluded that 'no great variation of date, if any, existed as to their age'. From the presence of iron he further concluded that the mounds were unlikely to be ancient and: 'would rather seek to connect them with the eventful period in which tradition affirms the place to have been the scene of a sanguinary conflict between the Saxons and their Danish enemies'.[18]

Excavations by Clarke and Fraser, 1941–9

The site was referred to in *VCH Derbyshire* in conjunction with pagan Anglo-Saxon cemeteries in the area, but its precise location appears to have been forgotten until rediscovered in 1941 by

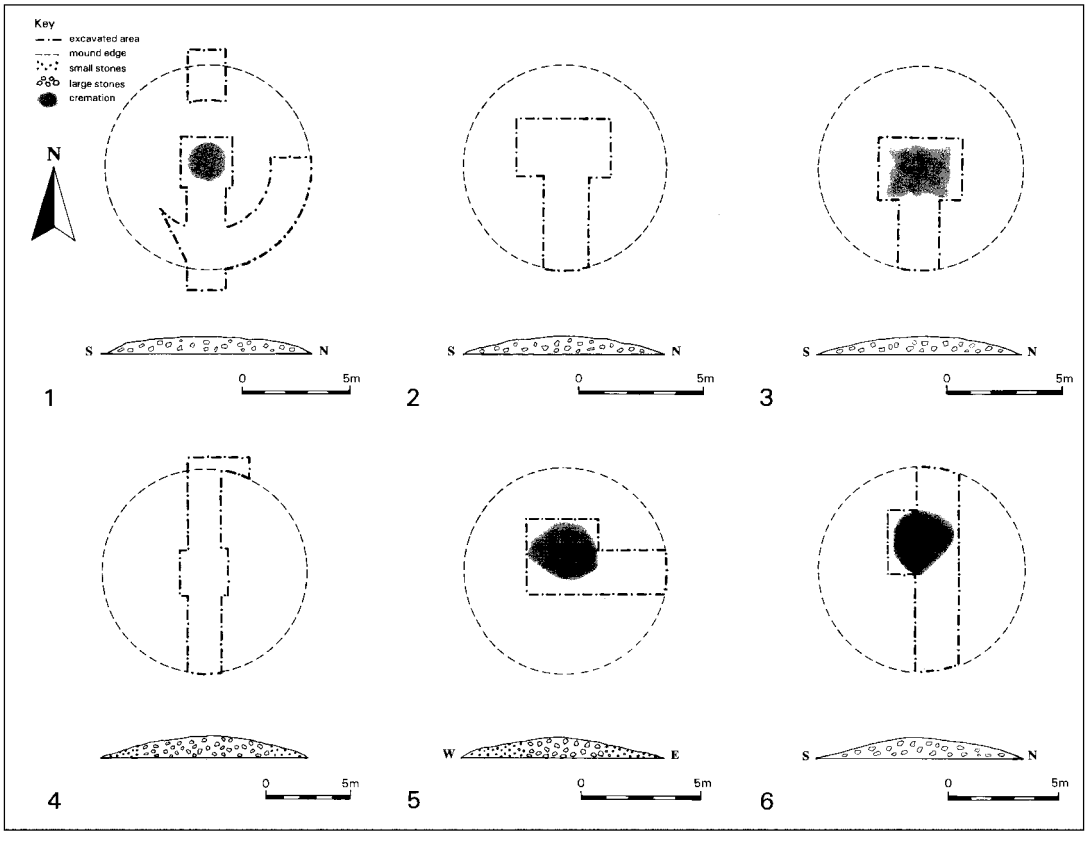


Fig 2. Mounds 1–6, showing trench outlines. *Drawing*: Frances Chaloner, after *DAJ* **66** and unpublished plans in Repton School archive

William Fraser, who also initially ascribed it to the sixth–seventh centuries AD.[19] Under the leadership of Camden Clarke and William Fraser members of the Burton-on-Trent Natural History and Archaeological Society initially excavated six barrows, digging most weekends throughout the summers of 1941 and 1942.[20] The mounds were trenched, usually by a 6ft- (1.8m-) wide trench, although in some cases the central area was widened in search of a burial deposit (fig 2). The mounds were made up of sand and stone, but all had been heavily disturbed by root and animal action and, together with the amateur nature of the excavation technique, this means that it is now impossible to know whether they possessed any kind of internal structure. Of the six, two (Mounds 2 and 4) appeared to be empty whilst another (Mound 3) produced several pieces of metalwork and had charcoal and bone distributed throughout the body of the mound but lacked any identifiable burial. The remaining three (Mounds 1, 5 and 6) all produced *in situ* central 'cremation-hearth' deposits and metalwork (see fig 15 for mound locations). The principal metal finds included a fragmentary iron sword (from Mound 1), together with iron buckles, an iron strap-slide and a bronze suspension loop. A survey of the cemetery was conducted by T A Dallman, but would appear to have been carried out at a small scale and to have been intended as no more than a location plan for the

excavations: the published plan shows a total of sixty-three mounds but only schematically as open circles.[21] The accompanying report contains no detailed discussion either of the form and inter-relationships of individual barrows or of the significance of the way the barrows are distributed across the cemetery. Only the six excavated barrows are numbered on this plan.

Unable to date their discoveries, Clarke and Fraser initially approached T D Kendrick at the British Museum, who suggested that the burials were Anglo-Saxon but counselled: 'I am afraid the proper thing to say to inexperienced diggers is to ask them to postpone the work until they can get a trained archaeologist to supervise it, for barrow-digging now is big undertaking.'[22]

It appears that Kendrick also contacted W F Grimes of the Inspectorate of Ancient Monuments and Historic Buildings. Grimes visited the site in May 1942 and confirmed that the burials must be Anglo-Saxon.[23] Both Kendrick and Grimes offered to help with publication but suggested that Clarke and Fraser also contact E T Leeds at the Ashmolean Museum for assistance with the finds. Leeds was approached in 1944 with a description of the work and immediately questioned the early Anglo-Saxon dating.[24] On full examination of the finds he wrote:

> I am convinced the finds are not Saxon though of the late Saxon period. Bateman after all was not very far from the truth ... I feel that meagre as in some respects they are, your finds illuminate some of the sepulchral darkness of late Saxon times.[25]

A short description of the mound structure, and where recorded the skeletal remains and artefacts from each mound, is presented below. A similar consistent format is also followed for the 1955 interventions. The descriptions are derived from the published reports, supplemented with additional information from archival correspondence and personal observation, in some cases involving some reinterpretation of the finds. Concordances are provided to the original reports.[26]

Mound 1

STRUCTURE

Diameter: 9.75m; height at centre: 0.86m. A trench 6ft (1.78m) wide was dug from just beyond the southern edge of the mound to 4ft (1.22m) beyond the centre; Dallman's plan and a photograph of the mound under excavation looking north indicate that this was extended into an 8ft (2.44m) square in the centre, and that the south-east quadrant of the mound was also partially removed. The report claims that the mound make-up was stratified according to vertical bands of marl and gravel with little sandstone alternating with bands with larger pieces of sandstone; however, this seems unlikely and it is more probable that the trench simply encountered variable densities of stone reflecting differences in the horizontal distribution. In the centre of the mound there was a roughly circular hearth of charcoal, *c* 1.75m in diameter and *c* 50mm thick, surrounded by a ring of burnt sandstones. Fragments of burnt bone were embedded in the charcoal surface; several burnt artefacts were also recovered from this layer. It is noted that there were also several large pieces of burnt bone outside the hearth, and that there was clean sand to a depth of 0.9m below the hearth. Major disturbance by root action and burrowing animals is recorded; this may have been responsible for the displacement of some of the burnt bone into the mound make-up.

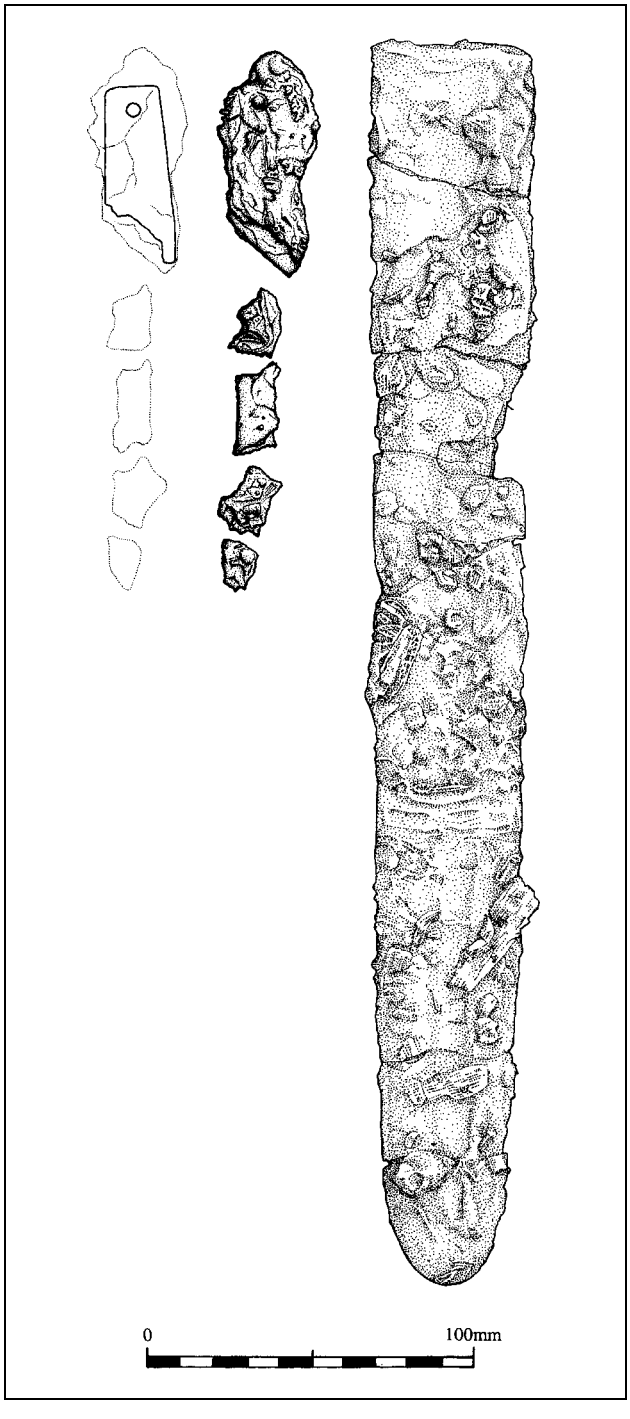


Fig 3. Mound 1: sword, surviving fragments. *Drawing*: Frances Chaloner

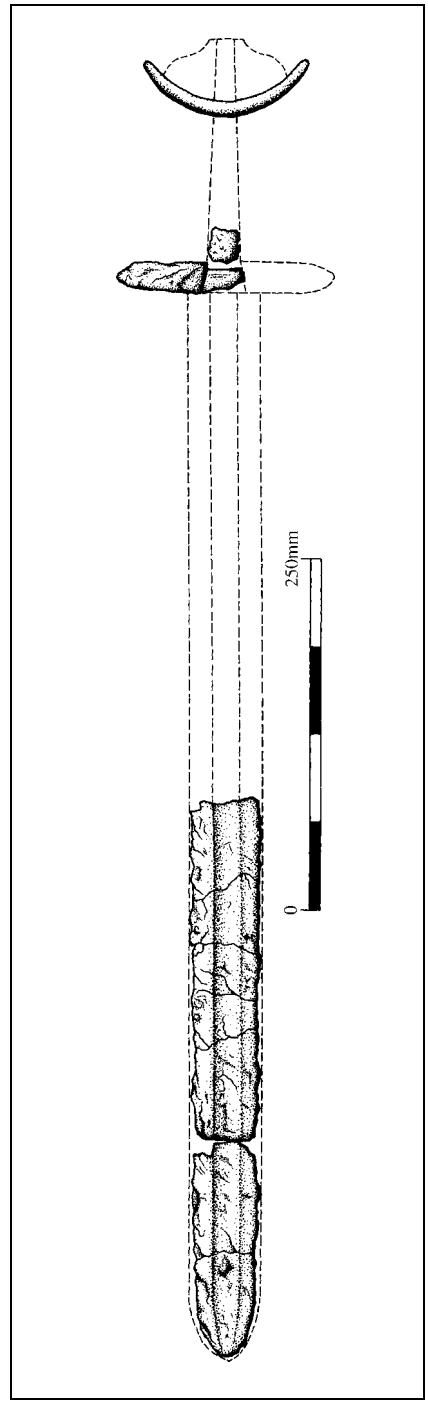


Fig 4. Mound 1: sword, reconstruction. *Drawing*: Sven Schroeder, redrawn after *DAJ* **66**, fig 5

SKELETAL REMAINS

Incomplete remains of human skeleton; age and sex unknown. Four fragments of burnt animal bone, three tentatively identified as: fragmentary shaft of sheep tibia; sheep vertebra; carnivore pre-maxilla with sockets for two teeth, perhaps of a young dog; also unburnt animal remains comprising seven teeth and skull fragment of a cow. *DAJ* **66** (1946), 20–2.

ARTEFACTS

1. Iron sword, incomplete, comprising end of channelled blade and fragments of hilt and pommel (figs 3 and 4). L385mm, W50mm. *DAJ* **66** (1946), 6, 10–11, 14–16, figure 5. In addition to the blade, four other fragments are labelled as 'Blade (1)' in an inventory dated 1985 held in Derby Museum and are grouped with the sword blade. They were used in the 1946 reconstruction drawing (fig 4) and identified in the report as comprising a portion of the pommel, a small piece of the hilt, the upper guard and half the lower guard. Leeds considered the sword, with its curved upper and straight lower guards, to be a hybrid of various forms, particularly Petersen Norwegian Types L and R, whilst noting that Type R was introduced into Scandinavia from western Europe, and dated it to 'the latter years of the ninth century'.[27] Shetelig, on the basis of the reconstruction drawing, believed 'the pommel to be of the Wallingford type, Jan Petersen Type L, and the guard narrow and flat, with a slightly humped outline, perhaps suggesting a form of the guard like Jan Petersen Type O'; he dated the sword to *c* AD 900.[28] Swords of this period were generally over 0.9m in length, including the blade and tang, implying that at least half the blade is missing and may have been removed from the pyre. The X-ray plate shows no trace of pattern welding but this was, in any case, in decline by this period. The purpose of the broad shallow groove, or 'fuller', down the centre of the blade was to reduce the weight of the sword.[29]

2. Bronze suspension loop (fig 5, no. 2). L42mm, W16mm. *DAJ* **66** (1946), 6, 16–17, figure 6. Leeds noted that it was 'stoutly made with one end looped, on which is a large nipple, and expanding to the open end; two rivets, one above the other on the median line. The jaws of the loop are set sufficiently apart to have taken a doubled strap. It might conceivably have served to suspend the scabbard from the belt.'[30] The loop may be closely paralleled by those on the strap distributor found in the Viking burial at Ballateare, on the Isle of Man, which Wilson suggests would have functioned as part of a shoulder sling for the sword. If so then it was originally one of a set of three. Wilson also notes parallels from Meols in Cheshire, Bledlow, Buckinghamshire, and St Mary's Abbey, York; he considers that the mounts were the product of an Anglo-Saxon workshop and concludes that since similar mounts are not known in association with scabbards in Scandinavian contexts this was an Anglo-Saxon method of attachment.[31]

3. Iron strap slide, oblong with an elongated oval opening (fig 5, no. 3). L26mm, W17mm. *DAJ* **66** (1946), 6, 16–17, figure 8.

4. Iron buckle, round in section, missing tang (fig 5, no. 4). L49mm, W30mm. *DAJ* **66** (1946), figure 7.

5. Bronze fragments. Two unidentifiable bronze fragments are also noted in *DAJ* **66** (1946) but are documented as missing in the 1985 inventory; one is described as 'a portion of a rounded bar, the other a thin rod, expanding and flattening in one direction, in a way reminiscent of an Anglo-Saxon toilet implement'.[32]

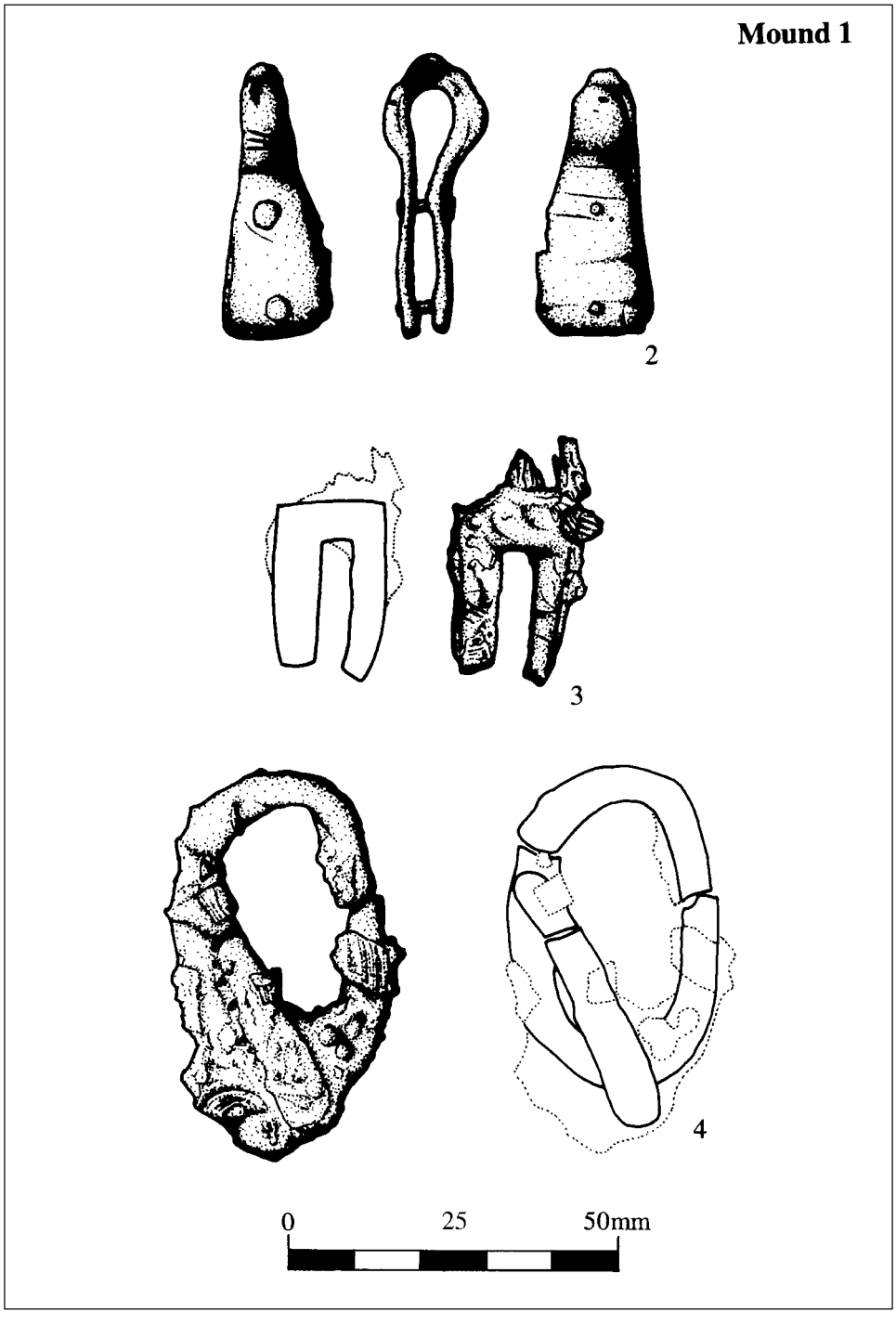


Fig 5. Mound 1: objects – bronze suspension loop, iron buckle, iron strap slide. *Drawing*: Frances Chaloner

Mound 2

STRUCTURE

Diameter: 8.5m; height at centre: 0.75m. A 6ft- (1.78m-) wide trench was dug from the south for a distance of 21ft (6.4m); the central area was increased to a rectangle 8ft (2.44m) across. No traces of a hearth or burial were found. Irregularly distributed sandstone blocks were present in large quantity; in the central area the mound was dug to below natural ground level and revealed undisturbed conditions.

Mound 3

STRUCTURE

Diameter: 8.5m; height at centre: 0.75m. A 6ft- (1.78m-) wide trench was dug from the south for a distance of 18ft (5.5m). No hearth was found, but traces of bone and charcoal were unevenly distributed throughout the excavated area. There was evidence for extensive disturbance from burrowing animals.

SKELETAL REMAINS

Incomplete remains of human skeleton; age and sex unknown.

ARTEFACTS

1. Iron buckle (fig 6, no. 1); rectangular loop with laterally projecting ends; folded backplate. L46, W20mm. *DAJ* **66** (1946), 16, figure 9.

2. Two iron nails, of different sizes, with spherical heads (fig 6, nos 2i and 2ii). (i) Large nail: L30mm, not identifiable in 1985; (ii) small nail head: D10mm; shank: L18mm. *DAJ* **66** (1946), 16, figure 10.

3. Fragments of thin sheet bronze, recorded as missing in 1985. (i) Narrow half-tubular piece of curved rim; (ii) a double piece, rounded and riveted at one end: L12mm, W9mm. Described by Leeds as possibly belonging 'to a stoup or bucket', 3in. (76mm) in diameter. *DAJ* **66** (1946), 18.

4. Fragment of bronze rod, slender and bent at one end, also noted as missing in 1985. L *c* 32mm. *DAJ* **66** (1946), 18.

Mound 4

STRUCTURE

Diameter: 13.4m; height at centre: 1.37m. A trench 6ft (1.78m) wide was dug from south to north across the mound; in the central area this was expanded to a square 10ft (3m) across, excavated to a depth of 2ft (0.6m) below the natural ground surface; the trench was widened at the north. The report notes the presence of sandstone slabs and blocks of considerable size, dispersed both across the surface of the mound and throughout the trench. No trace of an interment was encountered.

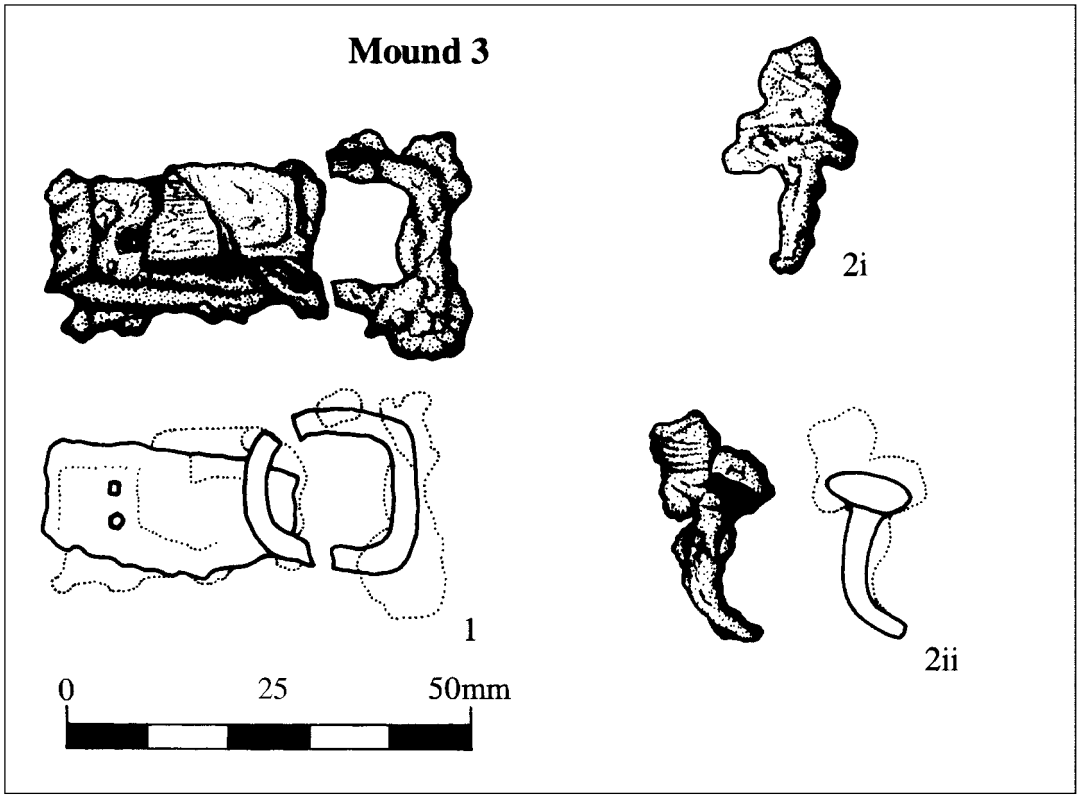


Fig 6. Mound 3: objects – iron buckle, two iron nails. *Drawing*: Frances Chaloner

Mound 5

STRUCTURE

Diameter: 8.5m; height at centre: 0.91m. A trench 6ft (1.78m) wide was dug from the east for a distance of 19ft (5.6m). Small sandstones were dispersed throughout. Traces of a charcoal hearth were revealed in the central area; trench expansion showed that this extended for 5ft (1.5m) beyond the original southern trench edge.

SKELETAL REMAINS

Considerable portion of a human adult skeleton, probably female. Also eleven fragments of burnt animal bones, tentatively identified as: parts of astragalus of cow or horse; caudal vertebra of cow; magnum of cow; atlas of cow; fragment of shank-bone of ?horse; fragment of lumbar vertebra of cow; sesamoid bone from behind the metacarpo-phalangeal articulation of cow. *DAJ* **66** (1946), 21–2.

ARTEFACTS

1. Large iron nail with discoid head (fig 7, no. 1). Head: D30mm; shank: D7mm, L62mm.

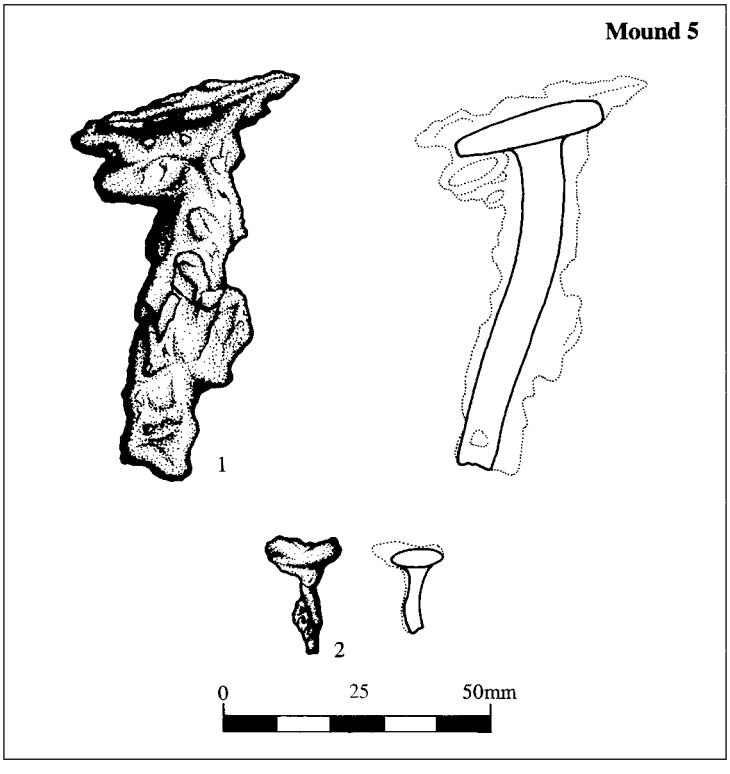


Fig 7. Mound 5: objects – two iron nails. *Drawing*: Frances Chaloner

This is a substantial nail that must have been derived from something structural; it may have been a clench nail but the headless end is broken. *DAJ* **66** (1946), 18, figure 11.

2. Small iron nail (fig 7, no. 2). Head: D8mm; shank: L14mm. *DAJ* **66** (1946), 18.

Mound 6

STRUCTURE

Diameter: 9.1m; height at centre: 0.84m. A 6ft- (1.78m-) wide trench was dug from the southern to the northern edge of the mound, its western edge following the central north–south line of the mound. A very thin charcoal layer was found in the centre, lying almost entirely in the northern half. Very few pieces of sandstone were encountered.

SKELETAL REMAINS

Incomplete remains of adult skeleton, possibly female. Also several badly preserved burnt animal bones: fragment of cow or sheep tooth; ?pig astragalus; cow ?skull; also unburnt cow metacarpal and toe-bones. *DAJ* **66** (1946), 20–1.

ARTEFACTS

1. Iron buckle, with strap slide secured between backplate and two terminal rivets (fig 8, no. 1). L52mm, W40mm. *DAJ* **66** (1946), 18–19, figure 12.

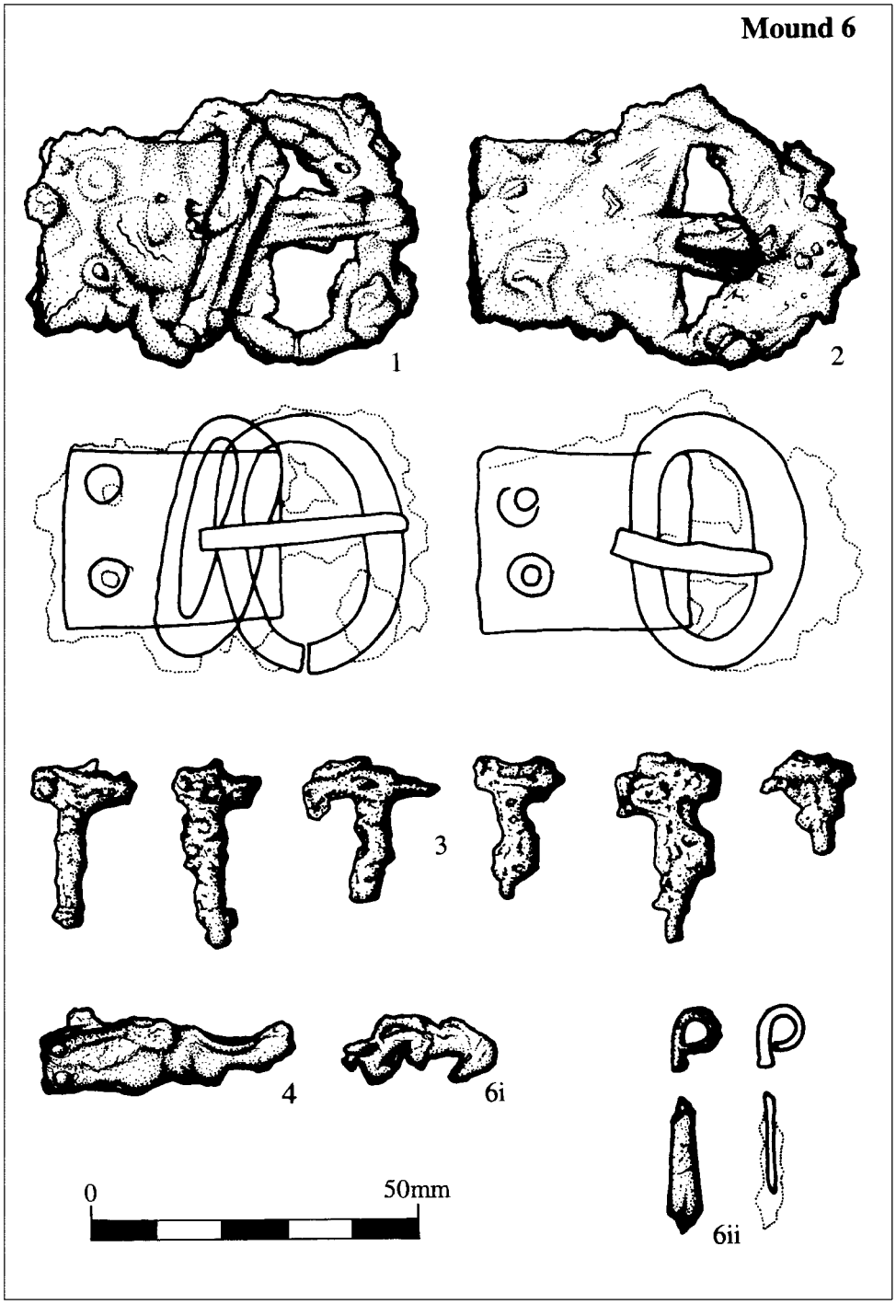


Fig 8. Mound 6: objects – two iron buckles, six nails, bronze strap-end and two other bronze fragments. *Drawing*: Frances Chaloner

2. Iron buckle, with two terminal rivets (fig 8, no. 2). L50mm, W39mm. Leeds suggests that buckles with swollen tongues can be paralleled to Scandinavia and cites an example from an inhumation grave at Stengade, Tullebolle, Svendborg, in the island of Langeland.[33] *DAJ* **66** (1946) 18–19, figure 13.

3. Six iron nails, recorded as unidentifiable in 1985 (fig 8, no. 3). L *c* 25mm with flat circular heads. *DAJ* **66** (1946), 18–19, figure 14.

4. Bronze strap-end, with two rivets; no trace of decoration (fig 8, no. 4). L38mm, W10mm. *DAJ* **66** (1946), 18–19, figure 15.

5. Bronze ?ornament. L *c* 25mm. Described by Leeds as perhaps a small brooch with divided bow, but badly crumpled by fire; missing in 1985. *DAJ* **66** (1946), 18.

6. Three bronze fragments, only two identifiable in 1985 (fig 8, no. 6). (i) Formless fragment: L24mm, W6mm; (ii) piece of thin rod with a looped end – rod: L20mm; looped end: D6mm, L10mm. *DAJ* **66** (1946), 18.

Clarke and Fraser excavated a seventh barrow in the autumn of 1948, and issued a rather summary report on it in the following year.[34] The excavation uncovered a central cremation-hearth deposit and various pieces of metalwork including a fragment of a second sword, again dated by Leeds to the ninth/tenth centuries AD, although it has never been published. In the report this barrow (Mound 7) is described as lying 'a few yards to the *west* of mound 6'.[35] No site plan was published, but a copy of Dallman's survey reproduced in a later article by Posnansky shows Mound 7 as lying a short distance *east* of Mound 6.[36] It seems likely that it is Clarke's account that is in error since no barrow exists on plan in the location he describes, and Posnansky's siting of it coincides with a barrow whose earthwork form preserves visible signs of excavation.

Mound 7

STRUCTURE

Diameter: 8.5m; height at centre: 0.9m. A trench 7ft (2.1m) wide was dug from the south west towards the centre of the mound. The report notes that the first 12ft (3.65m) was mainly marl and gravel, but at this point larger pieces of sandstone were encountered, and here a very thin layer of charcoal, interspersed with burnt bone fragments, was located. The trench was extended to reveal the whole of the charcoal hearth which was found to be well off-centre, only 2ft (0.6m) within the north-west edge of the mound. The mound was considerably disturbed by animal and root action. *DAJ* **69** (1949), 78–9.

SKELETAL REMAINS

Unrecorded.

ARTEFACTS

1. Iron sword blade, incomplete, comprising end of blade, unchannelled (fig 9, no. 1). L263mm, W50mm. As in the case of Mound 1, less than half the sword blade is present. Again, the X-ray plate of the blade shows no evidence of pattern welding. *DAJ* **69** (1949), 79–81.

2. Iron hilt guard (fig 9, no. 2). L135mm, W15mm. Found 2.5ft (0.76m) from the blade; described by Leeds as the lower guard of a sword. *DAJ* **69** (1949), 79–81. Not identified in

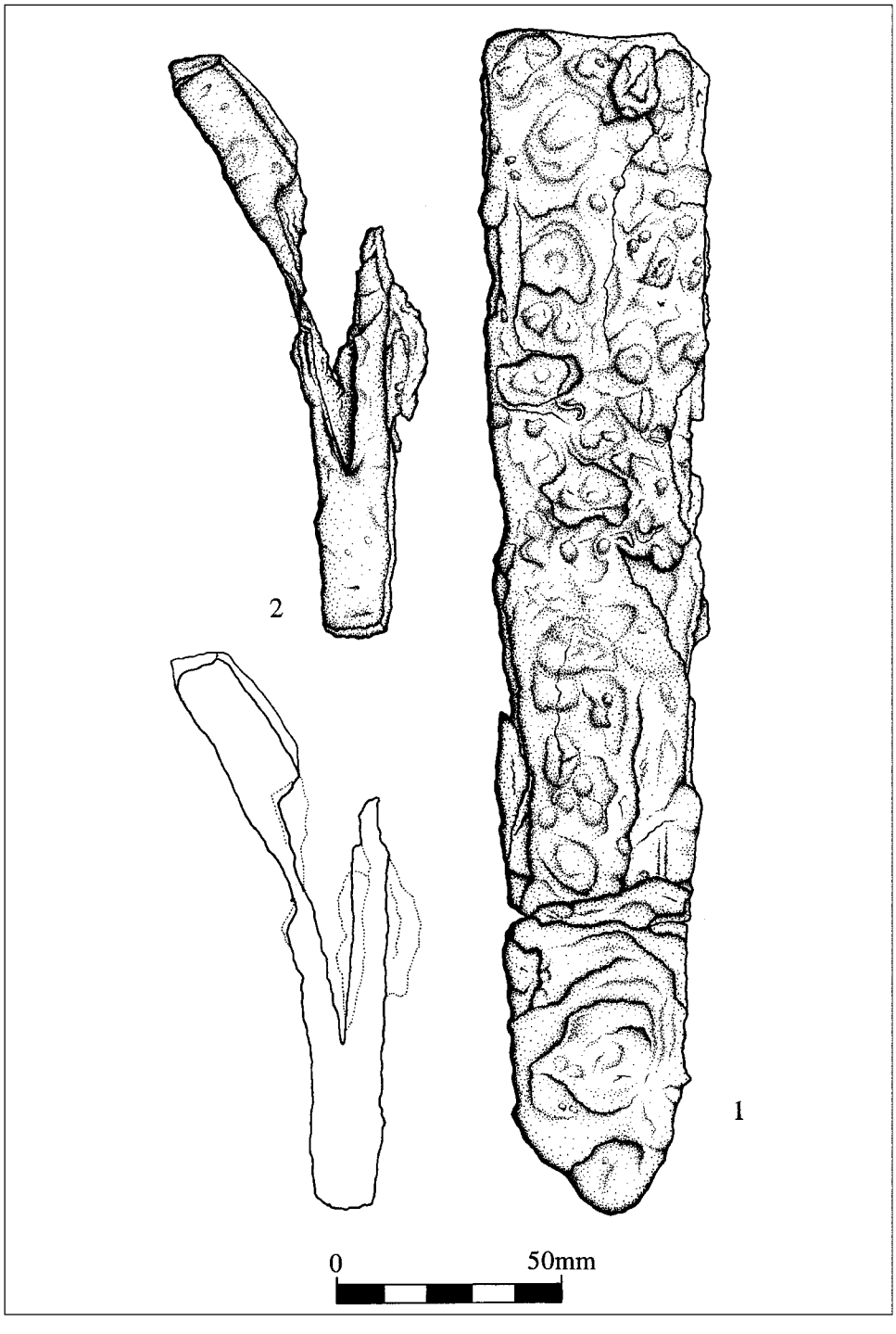


Fig 9. Mound 7: sword and hilt guard. *Drawing*: Frances Chaloner

1985, but two fragments were labelled as iron arrowheads which were said to have 'come with Viking swords'. Inspection of these fragments in 2003 demonstrated that they were conjoining and actually formed a misshapen hilt guard, as illustrated in figure 9. Leeds considered that the sword resembled Petersen Type H, which has a guard of similar shape with a triangular pommel, and was dated by Petersen to AD 800–950. Type H is the commonest Viking sword found in Norway, and it is of note that well over a quarter of Irish Viking Age swords (twenty-five out of ninety) can be classified as belonging to Petersen's Type H.[37]

3. Approximately 24 small iron nails (figs 10a and b). Heads: D *c* 7–16mm; shanks: L15–30mm. Many described as having the shank clenched over, and one had a smaller rivet attachment. Leeds suggests that the length of the nail and the depth of the turnover indicate that they were studs riveted through the leather and wood of a shield. *DAJ* **69** (1949), 79–81.

4. Iron ?spur (fig 11). L *c* 80mm, W *c* 60mm. Several larger pieces of iron are also described as having been found on the hearth; a fragment of an iron object, accessioned in the same system as other Heath Wood finds, and possibly a spur, may be one of these. Its form is similar to an example from Balladoole, on the Isle of Man.[38] *DAJ* **69** (1949), 79.

Mound 8

STRUCTURE

Posnansky's 1956 plan also indicates the position of an eighth barrow which Clarke and Fraser excavated in late autumn 1949.[39] Although Clarke never reported on this barrow and nowhere else is the excavation recorded, Posnansky had received a letter from F W Munslow – one of Clarke's collaborators – with whom he was in touch.[40] The letter includes an extract from notes made in November or December 1949 which record: 'An eighth mound was opened but results were most disappointing, especially after the numerous finds in M7. The mound had been extensively burrowed by rabbit and fox and the hearth was thin and scattered, the metal finds were negligible, and very little bone was found'. The surviving form of Mound 8 as recorded by the RCHME survey makes it clear that it had indeed been opened at some time.

Excavations by Posnansky, 1955

Following the publication of Mounds 1–7, in 1951 the cemetery was designated a Scheduled Ancient Monument by the then Ministry of Public Buildings and Works (MoPBW). Nonetheless, the mounds remained under threat from forestry operations and in 1954 F T Wainwright, who had retained an interest in the site, wrote to the Inspectorate to express his concern over reports of damage to the mounds. He was reassured by a visit to the site by the then Assistant Inspector, Stuart Rigold, and it appears that the Inspectorate was aware of the problem and contemplating further excavation.[41] In 1955 the Forestry Commission gave the MoPBW notice that they wished to fell and replant Heath Wood, and an agreement was reached whereby the Forestry Commission would clear but leave unplanted the four principal barrow concentrations in the wood defined on the basis of Dallman's survey, whilst the MoPBW excavated seven 'outlying' mounds adjudged to be those most at risk from casual damage during forestry operations. These seven were excavated over a three-and-a-half-week period by Merrick Posnansky, and the results subsequently published (fig 12), although it was really only Arbman's inclusion of a plan of the cemetery in his 1961 synthesis that rescued the

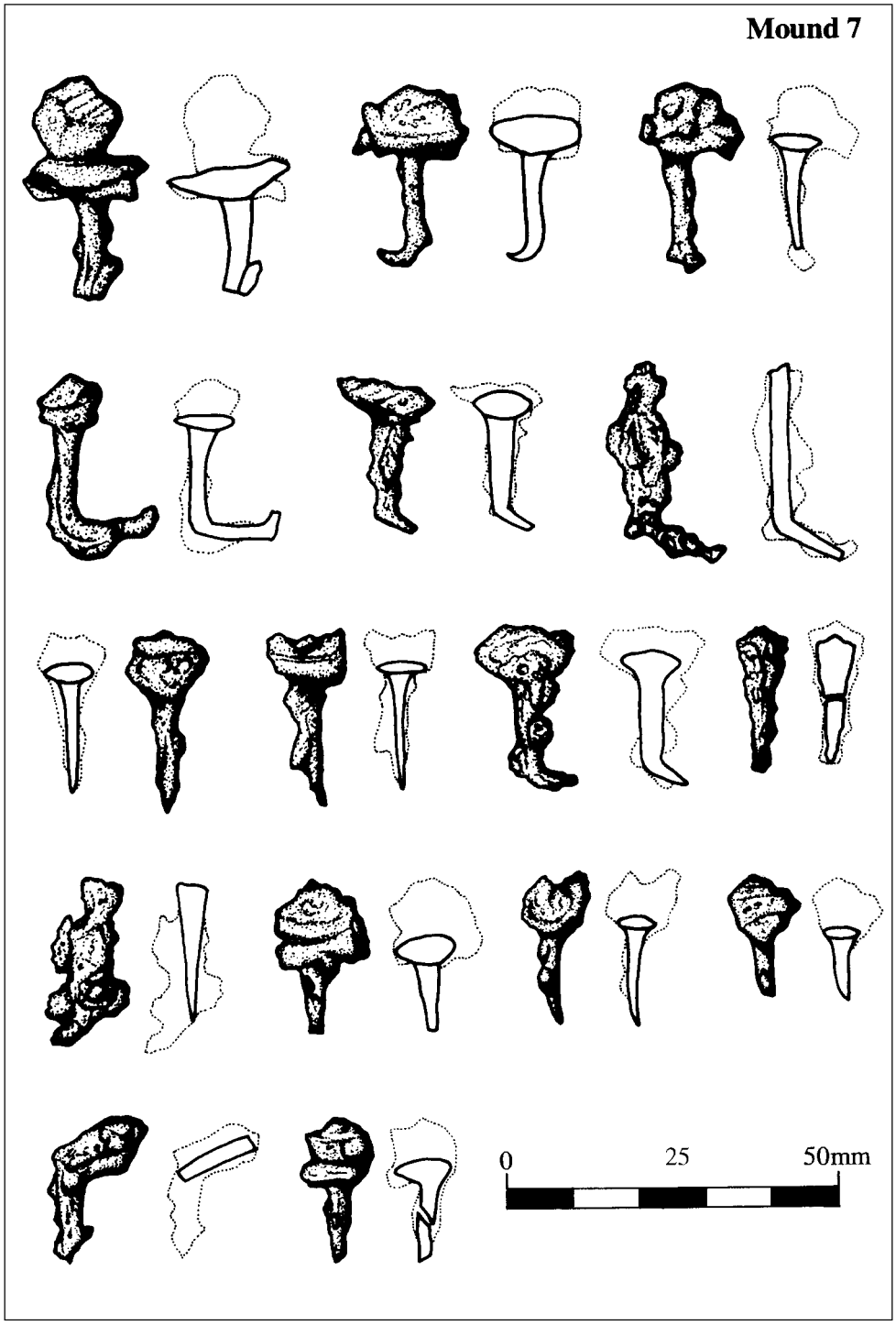


Fig 10a. Mound 7: iron nails. *Drawing*: Frances Chaloner

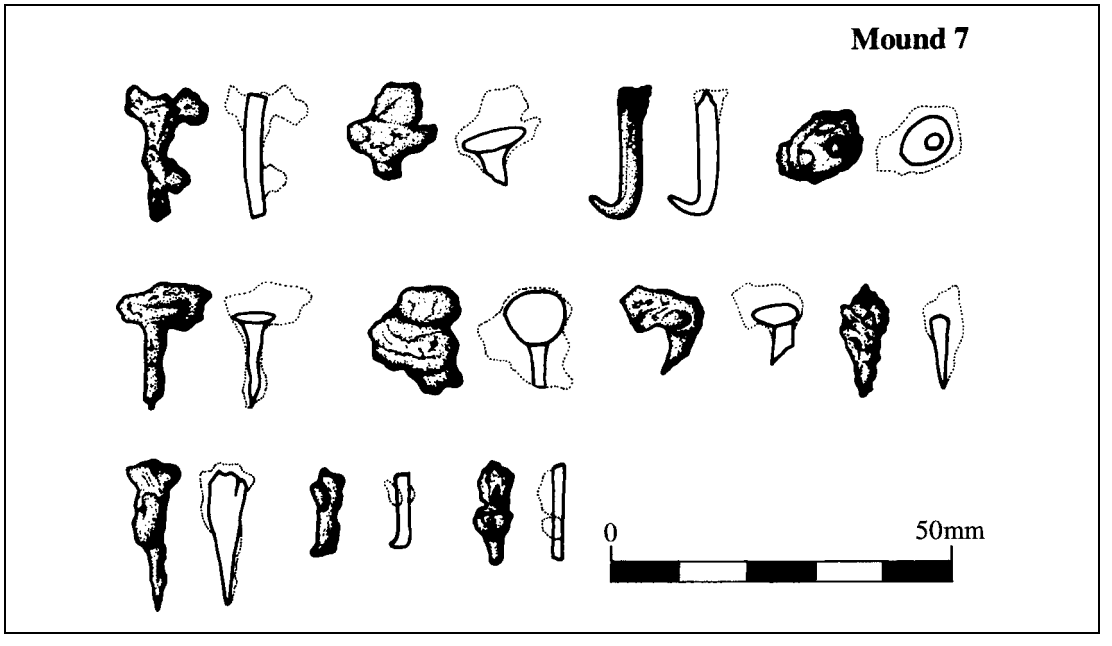


Fig 10b. Mound 7: iron nails (continued). *Drawing*: Frances Chaloner

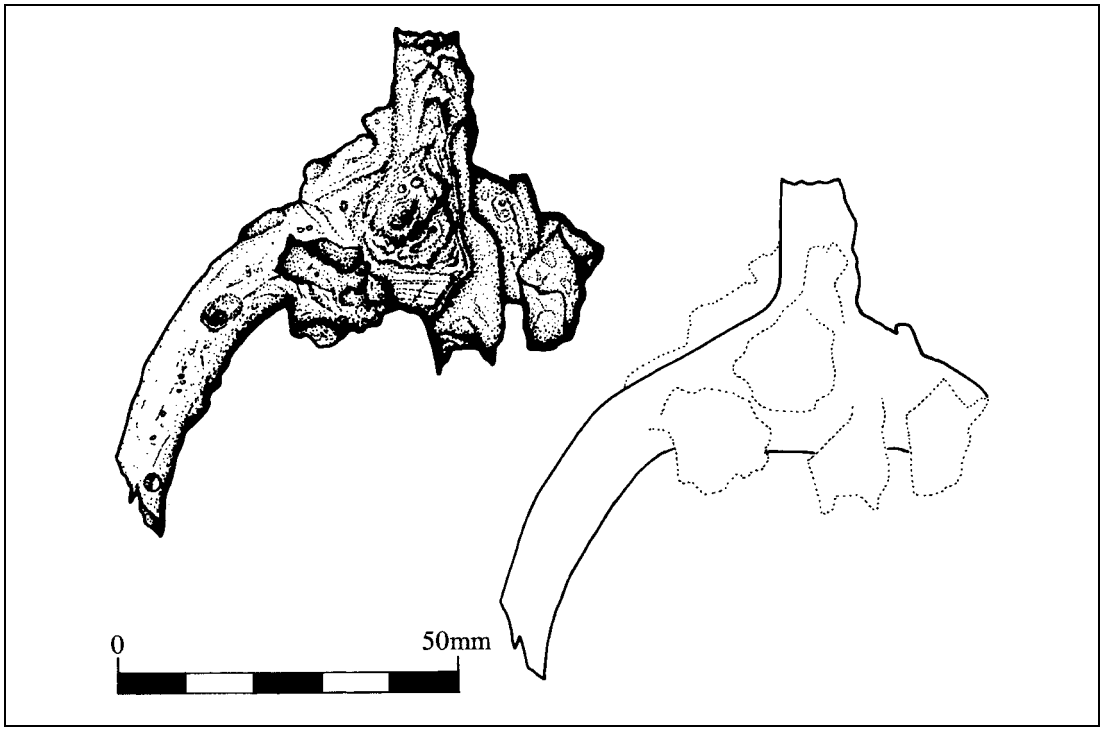


Fig 11. Mound 7: iron ?spur. *Drawing*: Frances Chaloner

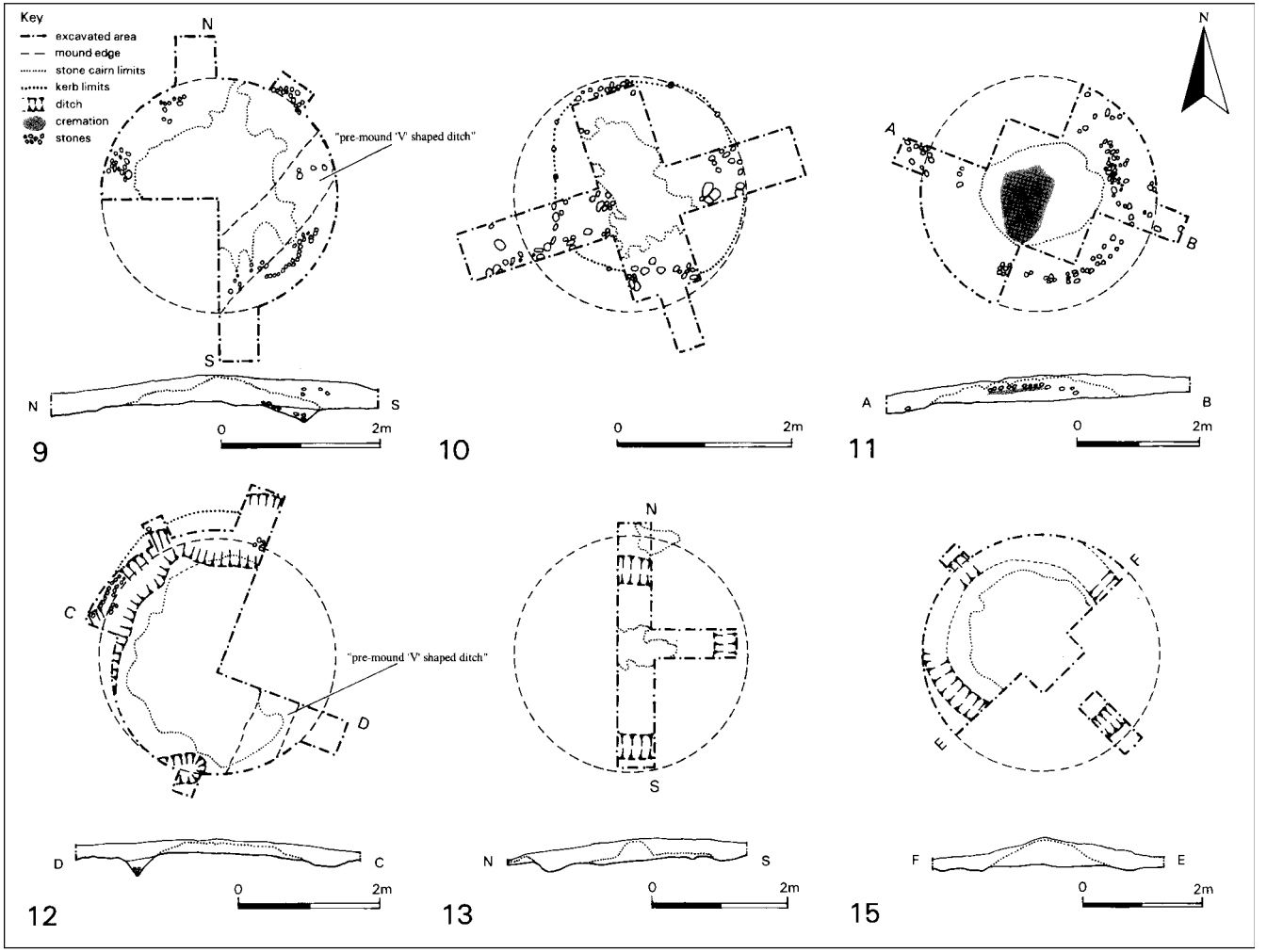


Fig 12. Mounds 9–15: plans showing excavated areas and cross-sections. *Drawing*: Frances Chaloner, after *DAJ* **76**, figs 3 and 4

site from complete obscurity.[42] Clarke and Fraser's barrow numbering system was retained and extended to cover the new excavations (Mounds 9–15). One mound (Mound 14) proved on excavation to be natural. Of the other six, only one (Mound 11) contained a cremation hearth and metalwork, the others being apparently empty and described as cenotaph burials. All the mounds were heavily disturbed by animal and root action. In Mound 11 the false cairn covered a layer of charcoal and burnt human and animal bone some 2–3in. (50–75mm) thick. The metalwork was fragmentary, but included at least one piece of ?silver-wire embroidery, compared by Elisabeth Crowfoot to parallels in ninth- and tenth-century AD Scandinavian contexts.[43] Following excavation the upstanding portions of the mounds were supposedly levelled by machine, although the RCHME survey found four at least in part still standing.[44]

Mound 9

STRUCTURE

Diameter: 4.5–6m; height at centre: 0.75m. North-west, north-east and south-east quadrants excavated; sandstone cairn overlying a mound of sandy soil, resting upon natural sand, 9in. (225mm) deep. No surrounding ditch, but possible stone kerb on south-east side. No trace of any hearth or interment. Mound overlay a V-shaped ditch.

Mound 10

STRUCTURE

Diameter: 2–4.5m; height at centre: 0.4m. Trenched along north-north-west to south-south-east and west-south-west to east-north-east axes across centre; sandstone cairn, including some very large blocks. No traces of a ditch but the report notes that a kerb was identified. No indication of an interment.

Mound 11

STRUCTURE

Diameter: 4.5–6m; height at centre: 0.4m. North-east and south-west quadrants excavated, extended to form 15ft (6m) square in centre. Dispersed stones generally less than 0.3m across, with a well-preserved 'kerb' also observed in south-east quadrant, although on the basis of later excavations this could have been bedrock appearing at the surface on the edge of a surrounding ditch. Mound comprised 0.3m of loose sand and stone, above hearth of charcoal and burnt bone, 50–75mm thick, 4m in length by 2–2.75m wide. Hearth overlay 50–75mm of compact reddish sand, resting on more than 0.3m of compact brown sandy subsoil.

SKELETAL REMAINS

Incomplete adult skeleton, sex unknown, including small pieces from the shafts of various long bones, a number of small pieces of cranial vault, some rib and vertebral fragments and a distal femoral fragment. Also fragments of burnt animal bone, possibly including a small dog and a sheep. *DAJ* **76** (1956), 55.

A small quantity of bone from Mound 11 surviving in Derby Museum was submitted to Jacqueline McKinley for re-analysis. She noted that it was well preserved, clearly having been

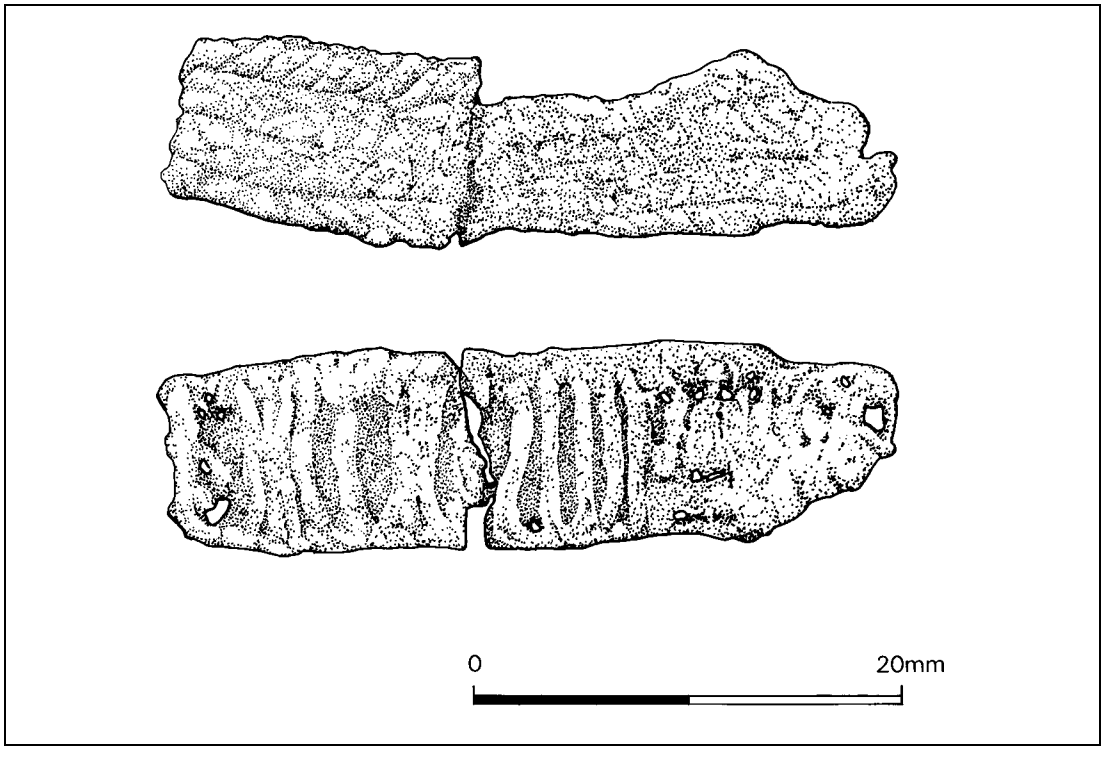


Fig 13. Mound 11: wire-wool embroidery. *Drawing*: Frances Chaloner

in a very different burial environment from Mounds 50 and 56, but was unable to determine the sex. The surviving sample comprised 44.9g of a human adult and 11.5g of animal bone. Examination of the cremated animal bone by Julie Bond and Fay Worley provided more detail about the animals that were cremated and whether they were present as whole animals or as joints of meat, and about the taphonomic history of the material.

The twenty surviving fragments of burnt animal bone contained the remains of a horse, a dog and a sheep or goat. The dog remains may all come from the left hind foot of the animal with the identification of a left astragalus and calcaneum and an un-sided metapodial fragment. The few pieces of bone remaining might suggest a partial offering, perhaps a skin, but the uncertain history of this assemblage makes this a dangerous assumption; it is more likely to be the result of partial retrieval or preservation bias. Experimental studies have shown that these elements are likely to be found in close association in the pyre debris and possibly separated from abdominal and proximal limb elements of the skeleton.[45] They could therefore be a distinct group in the pyre debris and missed during collection of the rest of the material for disposal elsewhere. A fragment of glenoid cavity from the right scapula of a sheep or goat was also identified. This may be the remains of a food offering in the form of a joint of meat, though the possibility that the whole animal was originally present cannot be totally dismissed. A further fragment of cranial bone was only identifiable to the level of sheep- or dog-sized mammal. The occurrence of this fragment does not clarify the form of inclusion for either the sheep or the dog. Horse was identified from a possible fragment of a first phalanx and a scaphoid carpal fragment. There was one further fragment, which could only be identified as from a large mammal cranium, and

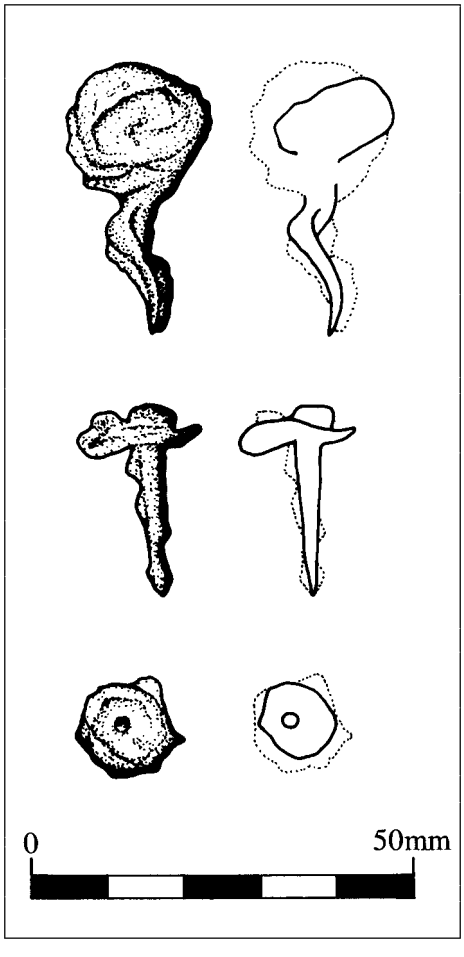


Fig 14. Mound 11: three iron nails. *Drawing*: Frances Chaloner

which might even have been human. There were a further twelve fragments which could not be identified to even an 'animal size' taxonomic class or skeletal element.

ARTEFACTS

1. Spade iron, reported as unidentifiable or missing in 1985. *DAJ* **76** (1956), 45.

2. Silver-wire embroidery, two fragments (fig 13). Traces of carbonized fibres were found between the strands of wire, indicating that it had been in contact with, and had perhaps been attached to, a piece of textile. L28mm, W8mm. *DAJ* **76** (1956), 45, 52–3. Identified by Elisabeth Crowfoot as *Ösenstich*, of which there are ten fragments from Viking graves at Birka where they are found as headbands (on women) or caps (on men).[46] There are also six other fragments from ninth- and tenth-century burials in Gotland and Småland.[47] Silver- and gold-wire decorative costume embellishments are also known from other possible high-status Scandinavian contexts. At Peel Castle, St Patrick's Isle, Isle of Man, two of the seven accompanied graves contained small balls of silver wire interpreted as decorative tassels. The graves are dated to the tenth century and are interpreted as belonging to leading members of

the Viking community on Man.[48] A gold-wire-work toggle was found in a grave in Cathedral Green, Carlisle, suggested as being that of a high-status Norse incomer, dated 900–50.[49] A silver-wire appliqué was found in excavations around the church of St Mary Bishophill Senior, York, and has been interpreted as coming from a burial.[50] Finally, some of the individuals buried on top of and around the charnel deposit at the nearby site at Repton had silver or gold embroidery in their costume.[51]

3. Several pieces of twisted and corroded metalwork, possibly part of 2. *DAJ* **76** (1956) 45, 53.

4. Three small iron nails (fig 14). (i) Head: D15mm; shank: L20mm; (ii) head: D15mm; shank: L20mm; (iii) head: D10mm; no shank. *DAJ* **76** (1956), 45–6.

Mound 12

STRUCTURE

Diameter: 6–8m; height at centre: 0.3m. North-west, south-west and south-east quadrants excavated; discontinuous cairn, overlying earth mound no more than 0.23m above natural subsoil. Shallow ditch, comprising series of irregular hollows on east, with traces of a kerb. Two irregular disturbances dug down from top of mound. No trace of any interment, but V-shaped ditch located below south-west quadrant.

Mound 13

STRUCTURE

Diameter: 1.5–3m; height at centre: 0.7m. Trench 5ft (1.5m) wide dug north–south across mound, with 5ft- (1.5m-) wide extension dug out to east. Steep and imposing cairn contained large stones; no trace of a kerb. Posnansky suggested it was surrounded by 'a discontinuous ditch', but this may relate to the presence of a causeway. No trace of any interment.

Mound 14

STRUCTURE

No details recorded; found to be natural.

Mound 15

STRUCTURE

Diameter: 6.7m; height at centre: 1.4m. North-west half excavated, with extension, 10ft (3m) wide, in centre, and small trench in south-east quadrant shown on plan. Sparse covering of stones; surrounded by a very shallow ditch, but no trace of a kerb. No indication of any interment or hearth.

The 1955 excavations also revealed that Mounds 9 and 12 overlay a substantial linear ditch of V-section, up to *c* 1m deep and *c* 2–3m wide. Some twenty pieces of hand-made pottery were found in the ditch fill under Mound 9, including two rim sherds which were drawn and published by Posnansky as well as a number of fragmentary body sherds.[52] Both rims appear to represent bowls with slightly everted rims; re-examination of the sherds suggests that one has a

groove running round the outside of the rim *c* 15mm below the lip. The fabric is gritty, with inclusions of coarse angular quartz and occasional voids. The sherds are poorly fired, dark grey-brown on the inside and buff to pinkish-brown on the outside. The finish is smooth to slightly burnished. These sherds were examined in 1955 by Gerald Dunning, David Wilson and J R C Hamilton but could not be dated.[53] A recent assessment of the evidence for Anglo-Saxon Derbyshire concludes that the sherds are unlike any Anglo-Saxon pottery from the region and are probably prehistoric.[54] However, the pottery also includes an out-turned wheel-thrown Roman rim in a cream gritty fabric with micaceous flecks. Unfortunately, since this sherd was not published in 1956, there must be some doubt about its association with the other pottery.

The RCHME Survey, 1993

In 1992 English Heritage asked the RCHME to conduct an earthwork survey of the cemetery in advance of proposed tree-thinning operations by the Forestry Commission. The survey was carried out at a scale of 1 : 1,000 between February and March 1993. Its purposes were twofold: to produce a detailed plan of the cemetery to replace that made by Dallman in the 1940s, and to attempt to define the cemetery's overall extent. The survey therefore took in the whole area of Heath Wood in order to identify evidence of past land-use that might have affected the present survival and distribution of barrows.

Before the survey only the fifteen mounds excavated in the twentieth century had been numbered, leaving forty-eight of those recorded by Dallman without a unique identifier. The existing numbering sequence was therefore extended to cover all the mounds shown on the 1946 plan plus others identified for the first time during the survey (fig 15). Of the sixty-three barrows claimed by Dallman, one (Mound 14) had already been proven by excavation to be natural. The survey threw considerable doubt on the correct identification of a further four (Mounds 29, 30, 38 and 51) and failed to locate another two (Mounds 26 and 63) whose former existence must also be doubted. The number of barrows correctly identified by Dallman, therefore, is probably fifty-six. To these can be added three barrows (Mounds 28, 42 and 45) identified for the first time in 1993; some doubt must attach to the correct identification of a fourth newly recorded mound (22). The most likely total of barrows in the cemetery is thus fifty-nine. Of these, two (Mounds 9 and 10) seem to have been totally destroyed following excavation. Detailed descriptions of all barrows and discredited mounds are included in the archive site report.[55] Full details of the survey were published in 1995; therefore only an outline summary is provided here.[56]

The fifty-nine barrows clearly cluster into four distinct spatial groups, with only a few isolated barrows lying between these groups (see fig 15). The survey indicated that the current barrow distribution is real and found no evidence for ploughed-out barrows or quarrying close to the cemetery. The survey also appeared to show that some barrows in the cemetery were constructed with an encircling ditch and some without. In the 1995 publication it was suggested that the absence of a ditch was correlated with there being a burial in the barrow. Of the eight empty mounds recorded through excavation, six had or possibly had ditches, whilst of the six barrows producing evidence of interments none seems to have had a ditch. Posnansky had suggested that the empty mounds represented cenotaph burials and this interpretation was taken up in the 1995 paper, with the proposal that the cenotaphs might represent members of the Viking Great Army who had been Christianized and were given inhumation burial at Repton. However, at that stage this idea could only be advanced as a hypothesis. When the

opportunity for further excavation in Heath Wood arose in 1998, the issue of the cenotaph mounds was therefore one of the questions chosen for examination.

EXCAVATIONS 1998–2000

Aims

Scheduled Monument Consent was granted to enable an evaluation of the site through the excavation of three trenches: (i) 10 × 20m complete open area excavation of Mounds 50 and 56 in the main group (fig 16), to establish their stratigraphic relationship and to test the hypothesis that cenotaph and cremation mounds could be distinguished on the basis of their earthwork form; (ii) 2 × 20m slit trench to examine the V-shaped ditch recorded by Posnansky and recover pottery and/or radiocarbon samples which would establish whether it was prehistoric or Viking Age; (iii) *c* 5 × 10m trench across Mound 21 in the north-eastern group to establish if this group was contemporary with the other sections of the cemetery or if these were prehistoric 'foundation' barrows.

In addition, it was hoped that the excavation would throw light on the degree of animal and root disturbance of the barrows, and their general state of preservation.

Methodology

Excavation took place over three seasons: 6–24 July 1998 (site code HW98), 4–24 July 1999 (site code HW99) and 10–29 July 2000 (site code HW00), under the auspices of the Department of Archaeology, University of York. It was directed by Julian D Richards and Marcus Jecock, with funding from the Derbyshire Archaeological Advisory Committee, the Society of Antiquaries of London and the University of York.

All sites were excavated using a combination of light and heavy tools, with sample sieving of mound make-up to 10mm. A standard context recording pro-forma was completed for each layer or cut feature. Context numbers were allocated in blocks to each area of the site, with the first digit(s) of the context number also reflecting the area number. Plans were drawn at 1 : 20 and sections at 1 : 10. A full black-and-white and colour photographic record was also maintained.

Over the first two seasons all four quadrants of Mound 50 were excavated, designated Areas 1–4. Baulks were initially maintained between each quadrant, leaving excavated areas which measured *c* 7 × 7m, 6.5 × 7m, 5 × 6.5m and 5.5 × 7m respectively. Areas 3 and 4 were coterminous with Areas 5 and 6 of Mound 56, providing a continuous section line running north east/south west across the centres of both mounds. Within the mound the cremation hearth was split into sub-contexts, each 0.5m square, in order to facilitate sieving and analysis.

Three quadrants of Mound 56 were examined over three seasons, designated Areas 5–7. Again, baulks were maintained, giving excavated areas which measured *c* 4 × 4m, 5 × 5.5m and 4 × 5m respectively; the fourth quadrant (Area 8) was left undisturbed, not least because of the presence of a tree growing on it.

The V-shaped ditch was examined over two seasons. In May 1998 a geophysical line survey was conducted across the area between Mounds 9 and 12 in an effort to pinpoint the ditch.[57] This failed to reveal any linear features, probably because of a combination of the effects of tree-root systems, light sandy soils and (it later transpired) the depth of the feature. In July 1998 a trench 1m wide × *c* 20m in length was excavated on an east–west alignment across the

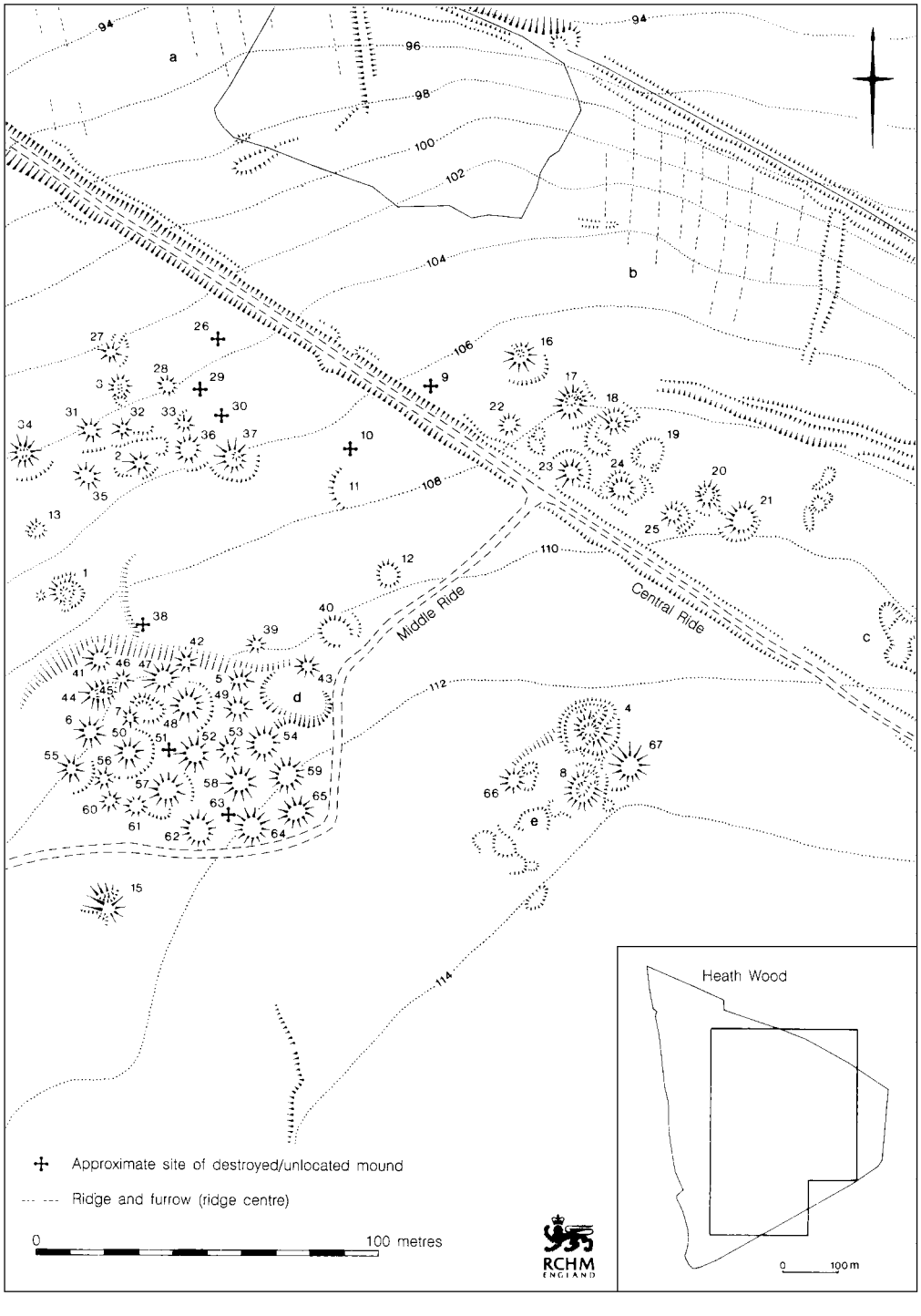


Fig 15. Extract from RCHME site survey of Heath Wood, Ingleby, including complete barrow numbering system. *Drawing*: NMR, Crown Copyright 1995

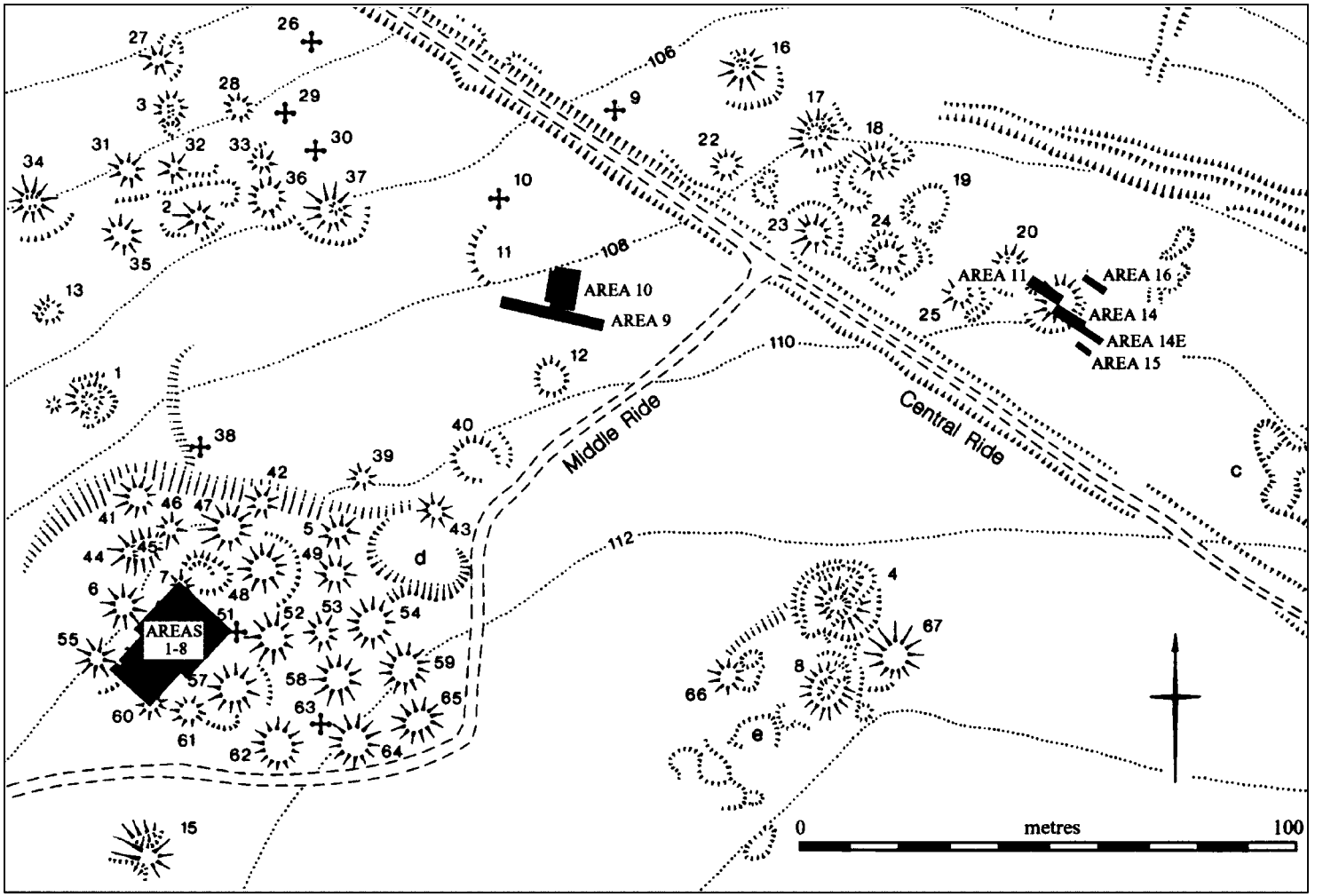


Fig 16. Plan showing excavated areas: Mounds 21, 50 and 56 and Areas 9 and 10. *Drawing*: Marcus Jecock, based on NMR, Crown Copyright 1995

area between the approximate positions of Mounds 9 and 12. This was designated as Area 9. It was extended to be 2m wide along a 5m length once the location of the ditch, running perpendicular across the trench, was established. In 2000 an adjacent area, 6 × 8m, was excavated as Area 10. Posnansky's 1955 trench, *c* 1.5 × 3m, was located within this area and was re-excavated until the ditch was bottomed; two further sections, each 2m wide, were also cut across the ditch within Area 10.

In the 2000 season, Mound 21 was examined by means of two trenches, 2 × 7.25m and 2 × 6m, located so as to provide a section 13.25m long running south east to north west across the approximate centre of the mound. The north-west trench was designated Area 11; that to the south east was Area 14 (leaving Areas 12 and 13 for any future investigation of the other quadrants). A number of areas were also cleared of forest debris and topsoil in order to investigate the line of earlier field boundaries and clarify their influence on the development of the cemetery (Areas 14E, 15 and 16).

Mound 21 (figs 17–19)

In both trenches a compact undulating surface of natural weathered sandstone with patches of reddish sand (1111, 1410) was encountered at a depth of up to 0.5–0.6m below the present ground surface. Some shattered sandstone fragments rested on this surface, possibly the result of root activity and natural frost action. Beyond the edge of the mound there was a spread of clean natural yellowish sand (1407). At the south-east edge of the mound there was a hollow in the underlying bedrock filled by a silting of grey-brown silty sand with a few charcoal fragments and small pebbles at its base (1409). The charcoal flecks suggest burning in the area at the time of deposition. The hollow lay to the south east of a jumble of large sandstone fragments, which might represent the edge of the barrow; in which case the hollow could be a remnant of the quarried ring-ditch.

The natural surface was overlain by a *c* 0.5m thick deposit of orange-brown sand (1104, 1108, 1405, 1408). This layer was heavily disturbed by rabbit burrowing and substantial tree roots (fig 18). It contained many pebbles and small sandstone fragments, and occasional charcoal flecks, as well as intrusive post-medieval pottery from the overlying layers. Although separate context numbers were allocated to this layer according to whether it was on or off the raised mound area, it was impossible to distinguish between these layers in plan or section, and there was no discernible barrow edge or surface.

The upper 0.1m below the present ground surface was consistently darker and more mixed than the underlying sand and contained occasional small pebbles and small sandstone fragments (1102, 1107, 1403, 1404), although the horizon between these layers and the underlying material was very indistinct. This layer had been badly disturbed and may represent an ancient ploughsoil. In Area 11, three Romano-British sherds were recovered from this layer. Two are in a grey ware with an iron-rich fabric; the third is a body sherd in classic Derbyshire ware. An overall date range in the mid- to late second century to mid-third century AD has been suggested recently for kilns at Lumb Brook, south Derbyshire, producing similar Derbyshire ware.[58] These sherds were abraded, however, and are undoubtedly residual. In Area 14, the equivalent horizon contained a number of potsherds in a fairly fine orange fabric with an over-fired semi-opaque oatmeal-coloured glaze, probably all from the same vessel. The potsherds are no later than the seventeenth century and must pre-date the plantation of Heath Wood. Beyond the south-east end of the mound there was a layer of larger sandstone blocks (1406). These stones may relate to a bank defining a north–south field boundary immediately to the

Fig 17. Mound 21 at end of excavation, looking north west towards centre of mound with Area 14 in foreground and Area 11 and Mounds 16–25 in the background. *Photograph*: author

Fig 18. Mound 21 illustrating extent of tree-root disturbance in Area 14. *Photograph*: author

south east of Mound 21. This was planned to the north but was not seen this far south in the RCHME survey, although a surface exploration in Area 14E found traces of it. If so, it would run approximately parallel to, and *c* 100m to the east of, the bank and ditch excavated in Area 10, dated to the Iron Age (see below).

Overlying all of the excavated area was a thin layer, *c* 50mm thick, of black humic soil (1101, 1401). This was concentrated in depressions around the mound but it was also present over the entire mound. It represents decaying vegetable matter derived from bracken, leaves and other forest vegetation, which has built up in the recent past and has not yet rotted down into the underlying sand. At the south-east end of Area 14 a small spread of disturbed orange-brown sand (1402) rested directly upon 1401 and appears to have been formed as upcast from a nearby animal burrow.

Mound 21 was unusual in that no clear mound edge was visible in section, although the surface topography indicated a clear mound, and there are traces of this, and of a possible quarry ditch, in the profile of natural. The homogenous nature of the overlying layers, and the even depth of subsoil within and beyond the mound, suggests that it had been subject to ploughing. This must have taken place before Heath Wood was planted and the late medieval potsherds found within it may be linked to this activity. There are traces of ridge and furrow in the wood to the north and this may have extended southwards, encompassing all of Mounds 16–25 although Mound 21, on the edge of the group, would have been particularly vulnerable to encroachment by ploughing. Disturbance by ploughing may explain the absence of any sign of a cremation hearth, although the two trenches would also have failed to detect any off-centre

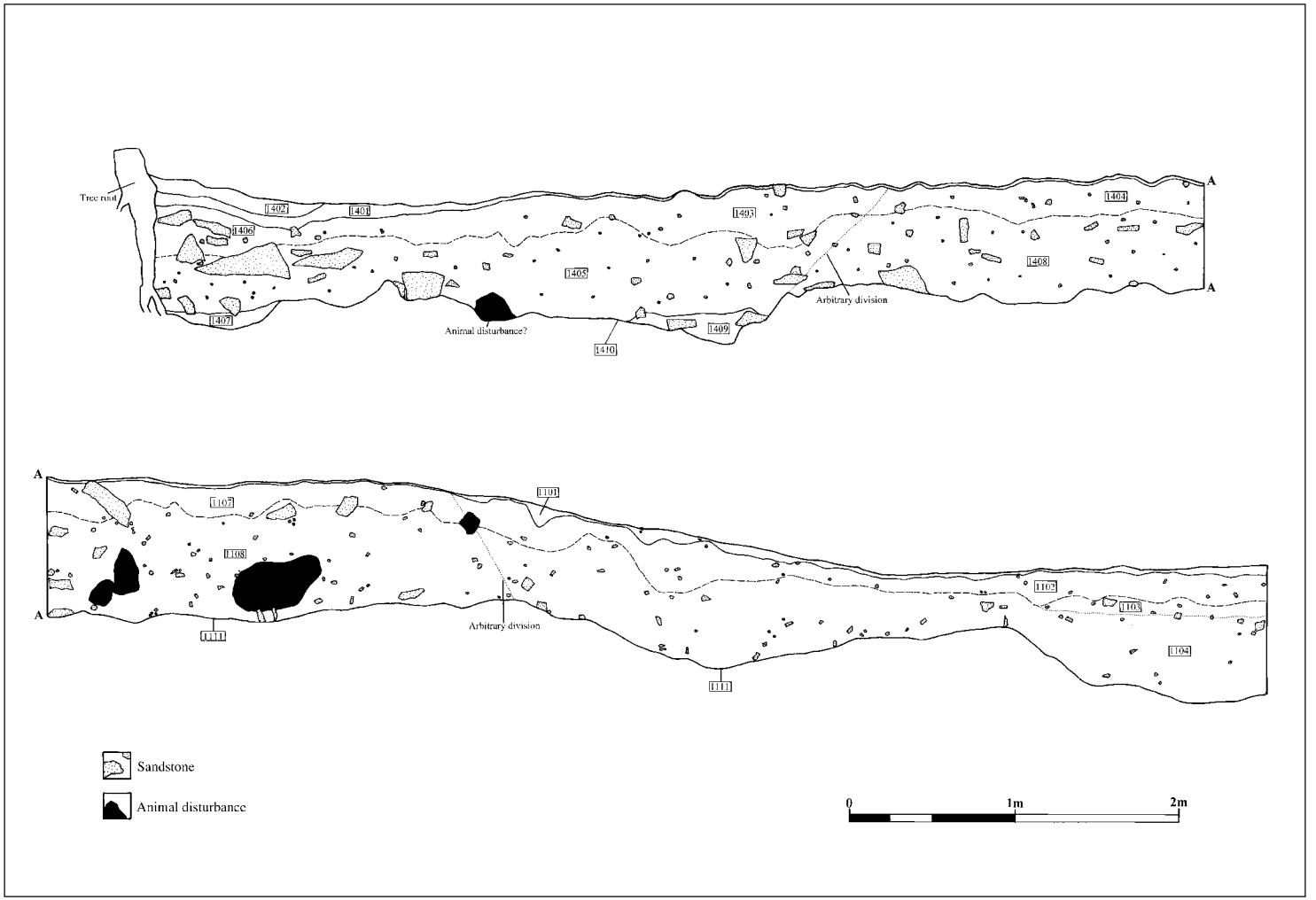


Fig 19. Mound 21: NW–SE section across mound. A–A marks the junction of two trenches at the centre of the mound. *Drawing*: Sven Schroeder

cremation deposit, as was found in Mound 56 (see below). The significant tree and animal damage might also have removed traces of a burial deposit. What is clear is that there was no prehistoric cremation vessel buried in the ground beneath the centre of the mound, and that Mound 21 is therefore unlikely to be Bronze Age. If we accept that Mound 16 was one of those tackled by Bateman that yielded iron objects (and it seems reasonable that he would investigate those mounds adjacent to the carriage ride rather than those further into the wood) then we can conclude that Mounds 16–25 belong to the Scandinavian cemetery, rather than representing primary prehistoric barrows. It is less clear, because of later ploughing, whether the mounds originally contained cremation hearths.

Mound 50 (figs 20–31)

Beneath Mound 50 bedrock comprised keuper marl-bedded sandstone, sloping downwards from north west to south east at an angle of 10–20 degrees from horizontal (122, 218, 408, 418) (figs 23, 24 and 25); in some places it was intermixed with clean yellow-brown sand (417); elsewhere there was a compacted layer of natural orange-red sandy clay and gravel (121, 217). On the south-east side of the mound this was overlain by a layer of brownish-grey silty sand with a high humic content (219, 409, 413), perhaps representing a buried soil. In the area around the mound the natural subsoil had been quarried to form a ring-ditch, in some places cutting into bedrock itself (fig 20).

These deposits were overlain by a substantial deposit of orange-red sandy clay subsoil, some 0.3–0.75m thick, with abundant rounded small and medium pebbles (120, 406, 414). This appears to have been landscaped in such a way as to provide an artificial platform, accounting for its varying thickness. North west of the mound and in the ring-ditch there were equivalent layers of orange-red brown sandy clay subsoil (123, 309) which had been retained in elevated spines running towards Mounds 6 and 7 and appear to have been landscaped in order to form two causeways leading on to Mound 50. In the centre of the mound a clean deposit of reddish-orange sandy clay (116, 215, 412), up to 0.15m in depth, appears to have been deliberately laid as part of the preparation for the construction of the pyre, providing a smooth and level surface. This was reddened beneath the pyre, possibly as a result of heat action.

The cremation deposit (119, 214, 308, 411) comprised an oval area, *c* 3 × 4m, of blackened sand and charcoal, in which fragments of burnt bone were embedded. This layer was up to 50mm thick, and sat directly upon the clean sand levelling deposit. It was excavated in blocks of 0.5sq m which were boxed in plastic tubs and then wet-sieved under laboratory conditions to separate the bone and charcoal (fig 21). The cremation hearth was buried under a thick deposit of sandy clay, up to 0.7m thick on the centre of the mound (105/106, 207/213, 303/304, 403/410). As well as rounded pebbles and gravel, this layer contained a largely random tumble of large angular sandstone blocks, concentrated towards the centre and base of the mound. The stones sloped inwards towards the mound centre, suggesting dumping from the outside inwards, or earlier disturbance in the mound centre, although there was no obvious trace of a cut to indicate the latter. There were voids between the stones, and numerous animal burrows. Root disturbance and contamination was found throughout the layer. In the north corner of Area 1 an equivalent layer of orange-red brown sandy clay make-up (115) for Mound 7 was observed in section.

Within Area 1 remains of a cow skull were recovered, close to the base of the mound, and lying immediately above the level of the cremation hearth, but offset to one side (fig 22). A horse tooth was recovered from the mound in Area 4 but carbon dating yielded a calibrated date of AD 1487–1640 (at 95.4 per cent probability) (OxA–13077), suggesting it was intrusive.

Fig 20. Mound 50, with Mound 56 in left background. Excavation of Mound 50 is at the level immediately above the cremation hearth and the stones in the mound make-up can be seen clearly. Bedrock is protruding in the base of the ring-ditch in the foreground. To the right, one of the causeways leading on to Mound 50 is visible; at the far right is the spoil heap from the 1948 excavation of Mound 7. *Photograph*: author

A number of redeposited prehistoric flints were found in the mound make-up, as well as a single small body sherd of quartz-tempered prehistoric pottery (sf101).

Around the base of the mound, and continuing up its sides at an angle of *c* 45 degrees, there was a series of interleaved layers of black humic material and reddish-brown sandy clay. The basal layer generally comprised a black humic silty loam, up to 0.15m thick (118, 306). It contained many small rounded pebbles, which were concentrated around the base of the mound, probably representing initial erosion and run-off of smaller stones from the mound surface. The layer as a whole has been interpreted as an initial build-up of turf and topsoil over the mound, although it is difficult to say whether this developed naturally or was deliberately laid. To the north west it continued into the ditch of Mound 6 (307). The layer was overlain by dark brown sandy loam (117, 209, 305, 405) which followed the same contours, and may represent a buried soil and/or phase of erosion of the upper mound surface. This layer was noticeably thicker around the immediate foot of the mound. At its base in two areas it incorporated concentrations of sandstone fragments (216, 407) which may have been eroded

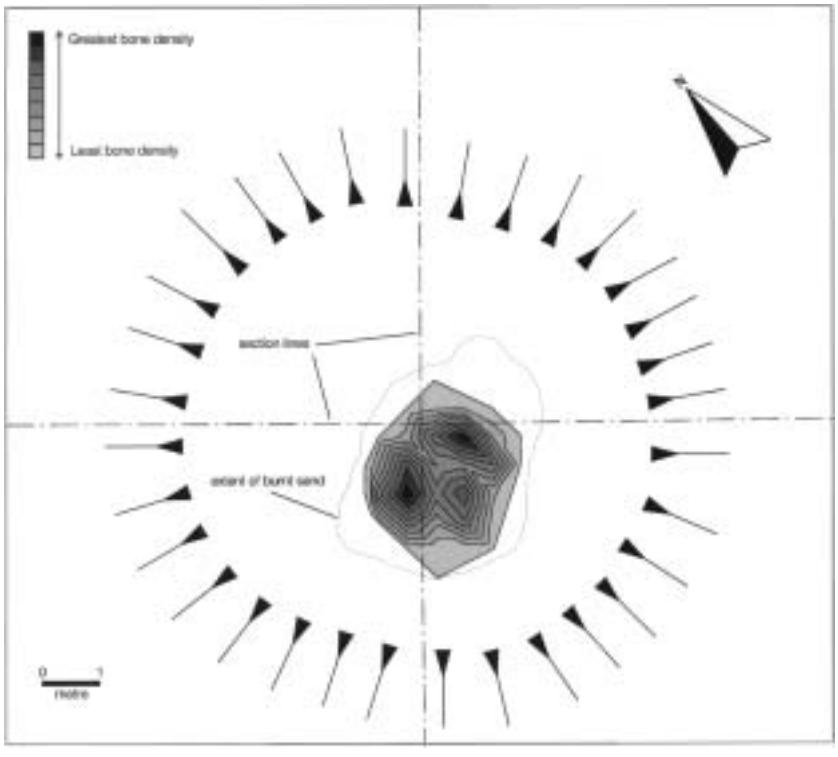


Fig 21. Mound 50: plan showing cremation hearth with density of cremated bone. *Drawing*: Marcus Jecock

Fig 22. Mound 50: on initial exposure of burial deposit with cow jaw. *Photograph*: author

from the mound at an early stage in its construction, and may even represent a trample of construction debris in specific areas. It was in turn overlain by another discontinuous layer of black humic silty loam, generally less than 50mm thick (111, 208, 302, 404), representing an upper turf layer which originally covered the mound and surrounding ditch, but had been disturbed by animal and root action. These deposits did not extend over the top of the mound from where they had presumably been eroded. A similar dark layer (114) was observed in section overlying Mound 7.

In Area 1 the original mound surface had been disturbed by a number of holes (108, 110, 113). Although circular in plan, on excavation they invariably had a number of channels running off them and are interpreted as the holes left by rotten tree trunks and their associated root systems. The fills were generally reddish-brown sandy clay with small pebbles (107, 109, 112).

The tree-root holes were generally sealed by a substantial layer of reddish-brown mixed sandy clay (104, 202, 301, 402), up to 0.2m thick, which covered the buried turf lines around the lower slopes of the mound in all areas. This deposit represents erosion from the crown of the mound mixed with some humic material, which had collected around the lower slopes and filled up the ditch. A number of large unabraded sherds of post-medieval pottery of a late type of Midlands Purple ware were incorporated in this layer, resting upon the mound surface, including at least two vessels: a pancheon and a jar. The fabric is very high-fired and is nearly stoneware. All the glazed sherds have glaze on the inside only, either a treacly dark brown, or yellow and brown. The pottery is likely to be a local product that would not have travelled far. The vessels are utilitarian storage or kitchen wares, probably dating from the late seventeenth century, or more likely the eighteenth century. This would immediately pre-date the planting of Heath Wood in the mid- to late eighteenth century, suggesting that the mounds were extant to that date and then eroded fairly rapidly.

To the north of Areas 1 and 2 there were a number of layers which appear to have been associated with the excavation of Mound 7 in 1948 (fig 24). These included a layer of reddish-brown sand and pebbles, up to 0.1m thick (102/212) which sealed a layer of black humic material with matted roots (101). The first is interpreted as spoil from the 1948 excavation trench, sealing the humic material that had been cleared from Mound 7. A pair of parallel grooves (204, 206), approximately 1.5m apart, ran from the Mound 7 trench. They were filled with black humic silty material (103, 203, 205), perhaps trample or wash-off from the excavation, which has filled hollows left by vehicle ruts. They terminated in a subrectangular feature (211), filled with orange-brown silty sand and stones (210), which cut into the underlying turf line. The feature may represent the setting for a large boulder, possibly removed during the 1948 excavation. The fill may have come from spoil from the excavation of Mound 7. In Area 2 an area of black humic silt (201) in the depression round the mound had been cut by the wheel ruts and so must represent more ancient erosion and run-off.

Finally, the whole area was covered by a general layer of loose dark brown humic material containing large amounts of matted tree roots and bracken (100, 200, 300, 400/401). This layer was thin on top of the mound but up to 0.15m thick around its base. A line of wooden posts was set into this layer, running north–south across the mound and representing the remains of a pheasant pen. There were also several tree stumps within the layer.

NON-FERROUS METAL OBJECTS

1. Sword hilt grip (fig 26). Fragment of decorated silver strip. The outer surface is decorated with the simplified, severe, geometric forms that characterize the Northern Trewhiddle style.

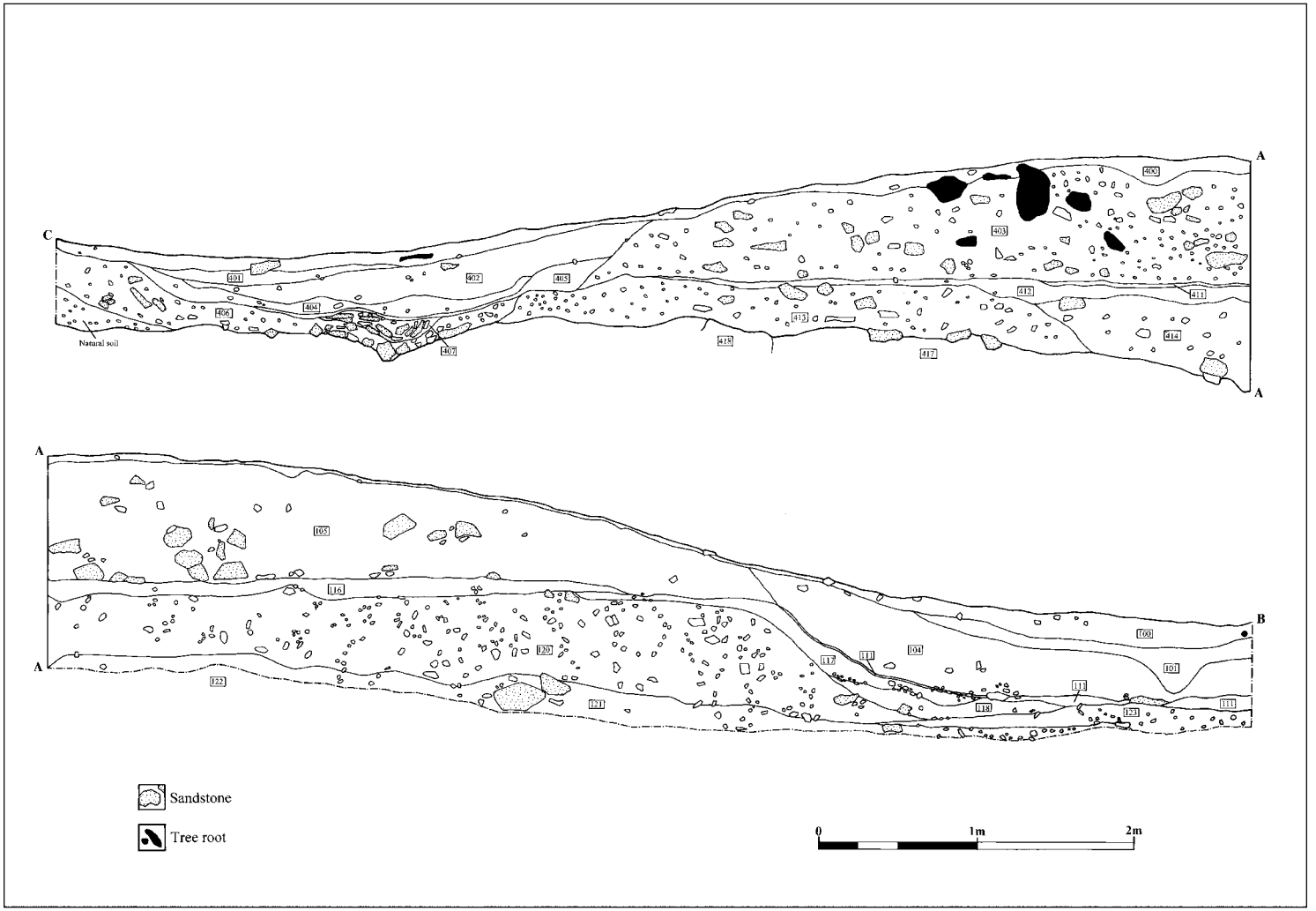


Fig 23. Mound 50: E–W section. *Drawing*: Sven Schroeder

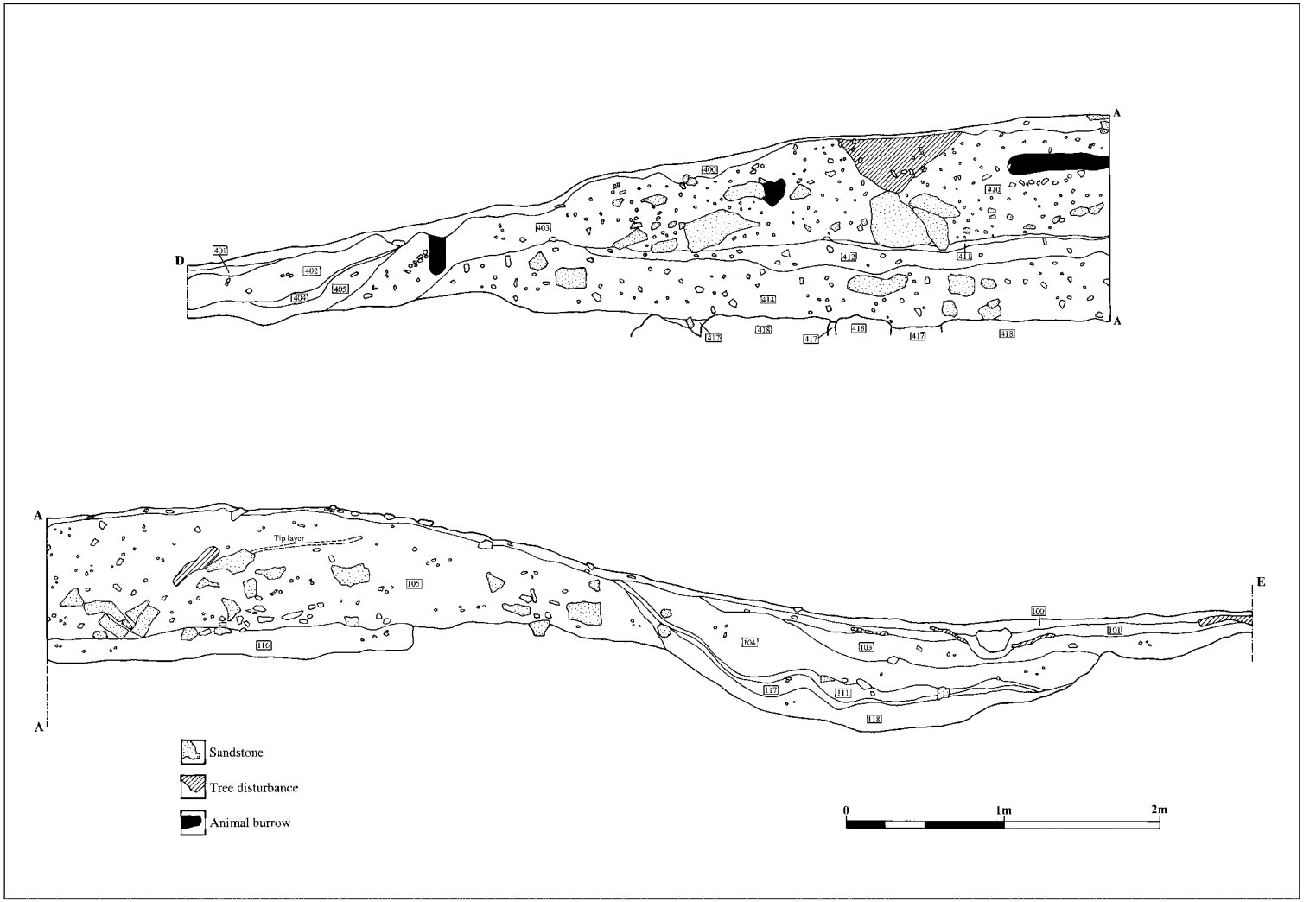


Fig 24. Mound 50: N–S section. *Drawing*: Sven Schroeder

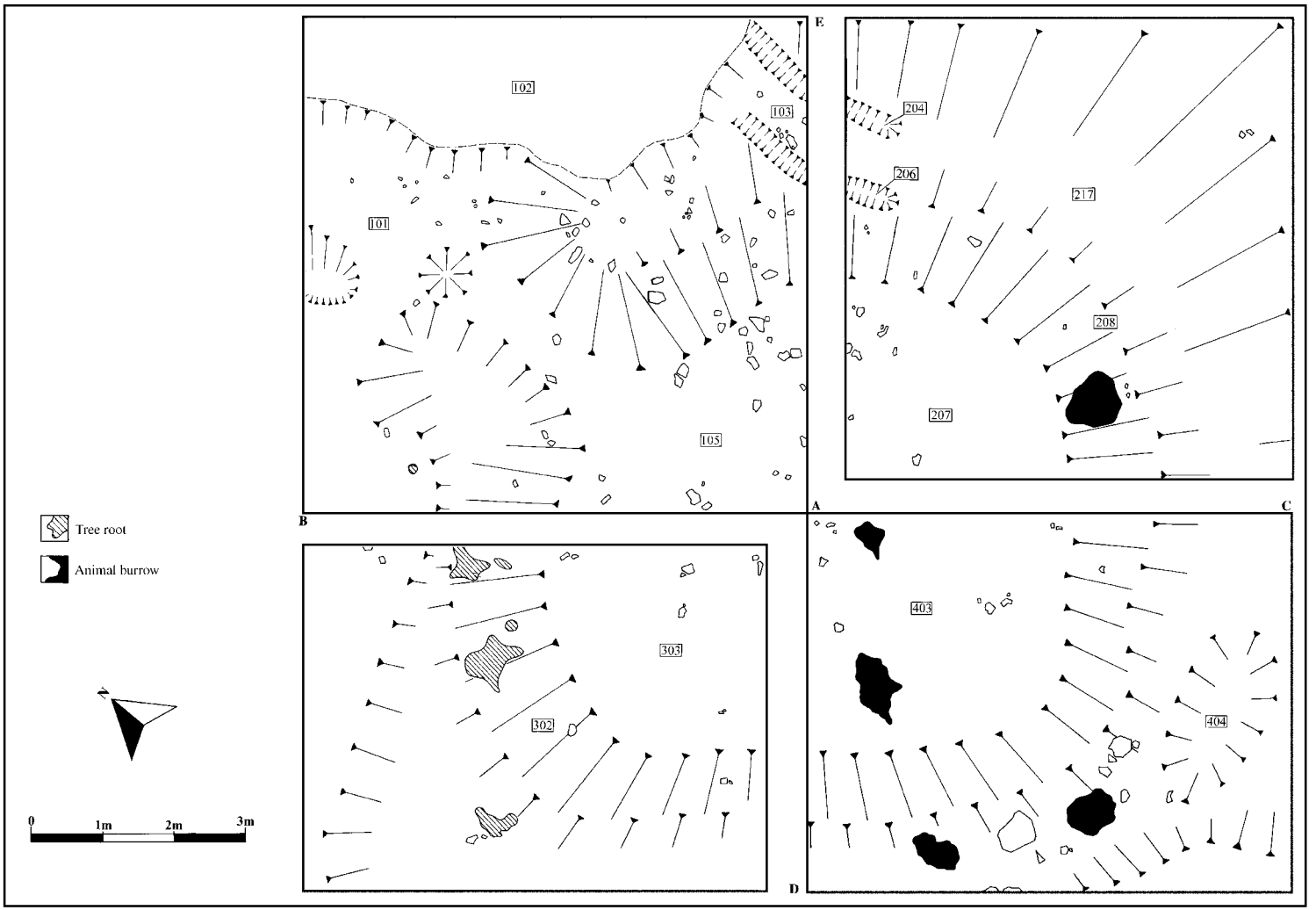


Fig 25. Mound 50: plan showing ditch and causeway and Mound 7 material to north. *Drawing*: Sven Schroeder

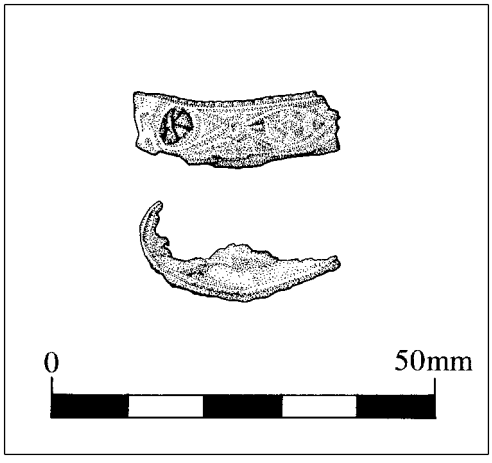


Fig 26. Mound 50: sword hilt grip. *Drawing*: Frances Chaloner

There is a Maltese-style cross in a circle at one end, a St Andrew's-style cross in the centre (with a small central cross) joined to make a diamond at the other end, with a small diamond in the centre. The edges have fine notches along their length. The reverse surface is very uneven, with a raised pointed 'mound' of metal in the middle. This uneven surface, if intentional, may have helped it to key into an organic surface if attached like a mount, but could also be due to it having started to melt under high temperature. The grainy X-ray image, the black shiny surface and the uneven raised surface on the reverse all point towards this object having undergone damage in a high temperature. Unfortunately, both ends are broken and missing so it is not possible to say how long it was. There are also no surviving forms of fixing (for example, rivet holes). The strip is curved at one end but it is unclear whether this is its original form or whether it is damage that occurred subsequently, either during cremation or burial. It is also bent out of shape along one edge and to a lesser degree at the other end. L27mm, W8mm, T1mm. HW99, 411, sf165.

This appears to be a decorative mount from a sword hilt, perhaps similar to that from the River Witham, at Fiskerton near Lincoln, or that recovered more recently from the stream bed at Gilling West, North Yorkshire.[59] The silver strips on the hilts of both swords were inlaid with niello, a black-coloured copper or silver sulphide. Unfortunately, no visible remains of black inlay survive on this fragment. Webster dates the heyday of Trewhiddle style to the middle third of the ninth century, up to *c* 875.[60] The use of Trewhiddle-style decoration might suggest that this was an Anglo-Saxon sword but Hall suggests that the production of Trewhiddle-style objects represents a continuation of pre-Viking styles among an artistically conservative group of craftsmen in Anglo-Scandinavian York seeking to redefine a Northumbrian identity.[61] Its presence at Heath Wood is another indication of the wide cultural links of those buried in the cemetery. Such swords also found their way back to Scandinavia; Anglo-Saxon swords from burial mounds at Dolven, Grønneberg and Hegge in Norway have similar lozenge-shaped Trewhiddle-style mounts on their pommels.[62] Webster suggests that these finds are likely to represent Norse Viking activity in the north of England, rather than Danes in the south.[63]

2. Tiny stud with square cross-section and a small domed head (fig 27); tip broken and missing; appears to have been plated. Head: D3mm; shank: L5mm. HW99, 411, sf168.

3. Tiny stud with square cross-section and a small flat head (fig 27); appears to have been plated with silver; similar to sf168. Head: D3mm; shank: L6mm. HW99, 411, sf271. Both this and the previous stud are too small to have held anything together but they may have been used to attach cloth or leather to a wooden object. Silver and copper-alloy tacks were found in some numbers in Winchester, occasionally in burials and mainly in late Anglo-Saxon contexts.[64]

4. Flat folded copper-alloy object which has been bent (fig 27). A round white shape with a glassy appearance is encrusted in one corner. In a matrix of sand, charcoal and burnt bone. L25mm, W14mm. HW99, 308, sf128.

5. Fragment of curled sheet, heavily mineralized and covered in green copper corrosion products with mauve staining (fig 27). L9mm, W6mm. HW99, 308, sf166.

6. Solidified fragment of molten object (fig 27). Visual inspection suggests presence of silver chloride, silver sulphide, copper and lead. XRF analysis confirmed high silver and tin peaks with traces of copper and lead. L17mm, W12mm. HW99, 411, sf131.

7. Solidified fragment of molten object (fig 27). Visual inspection suggests presence of lead sulphide and silver. XRF analysis confirmed large silver peaks with traces of copper. D10mm. HW99, 411, sf141.

8. Solidified fragment of molten object (fig 27). Visual inspection suggests presence of copper and silver chloride and possibly lead. XRF analysis confirmed a strong silver peak with traces of copper and lead. L12mm, W7mm. HW99, 308, sf154.

9. Solidified fragment of molten object; thin and brittle flat section connected with an elongated round mass (fig 27). Visual inspection suggests this was a silver object, with traces of silver chloride, silver sulphide and copper as a component of the silver alloy. XRF analysis confirmed presence of large silver peaks with traces of tin and lead. L13mm, W6mm. HW99, 411, sf156.

10. Solidified fragment of molten object, possibly silver (fig 27). D7mm. HW99, 411, sf160.

11. Solidified circular fragment of molten object, possibly silver (not illustrated). D6mm. HW99, 411, sf159.

IRON OBJECTS

Where possible measurements have been taken from the actual object as revealed on the X-ray, ignoring corrosion products.

1. Hinge pivot (fig 28). Shank and guide arm both of rectangular section. Surface blistering. L63mm, W9mm, T6mm; guide arm: L36mm. HW99, 410, sf110. Hinge pivots were generally used to hang doors or shutters, the shank being driven into the wall or jamb, and the guide arm bring slotted into the hinge eye. This example is very similar to one from Fishergate, York.[65]

2. Small knife (fig 29). Broken; complete tang and the beginning of the blade covered by organic material, perhaps horn. Blistering, especially of the tang. L48mm, W11mm, T5mm. HW99, 410, sf113. Too little of the blade survives to enable the identification of form. The length is incomplete but in any case falls within the major concentration of lengths (45–85mm) measured from the sample of 128 Anglo-Scandinavian knife blades from Coppergate, York.[66] It is unlikely to have been a weapon or hunting knife, but would have been suitable for a wide variety of domestic or craft activities.

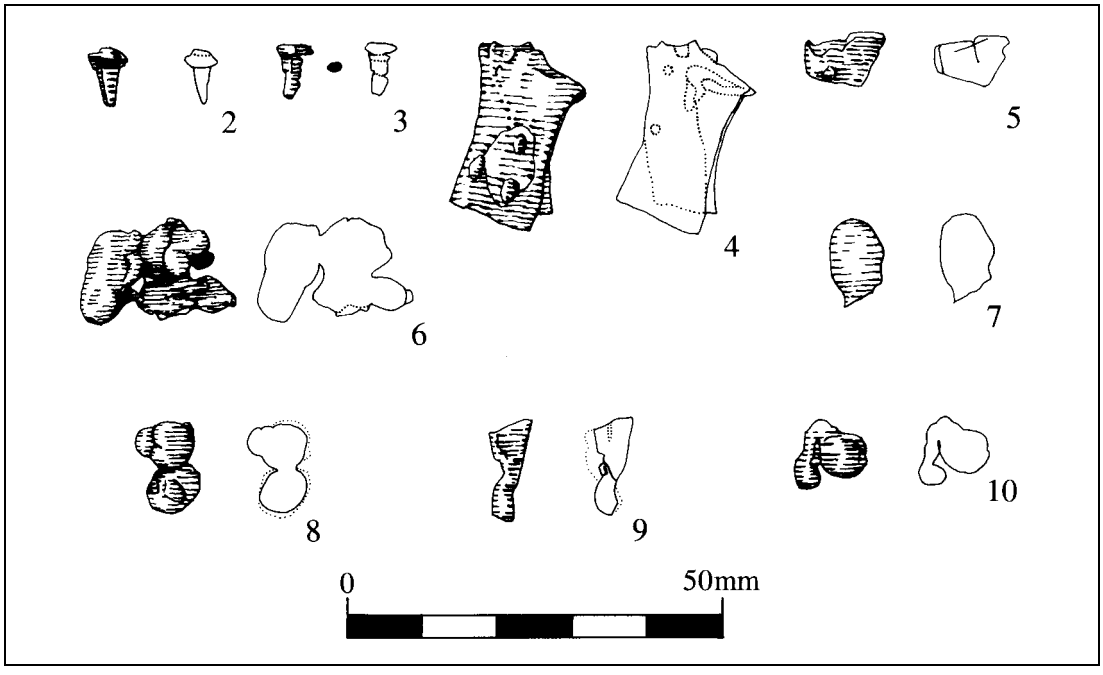


Fig 27. Mound 50: other non-ferrous objects. *Drawing*: Sven Schroeder

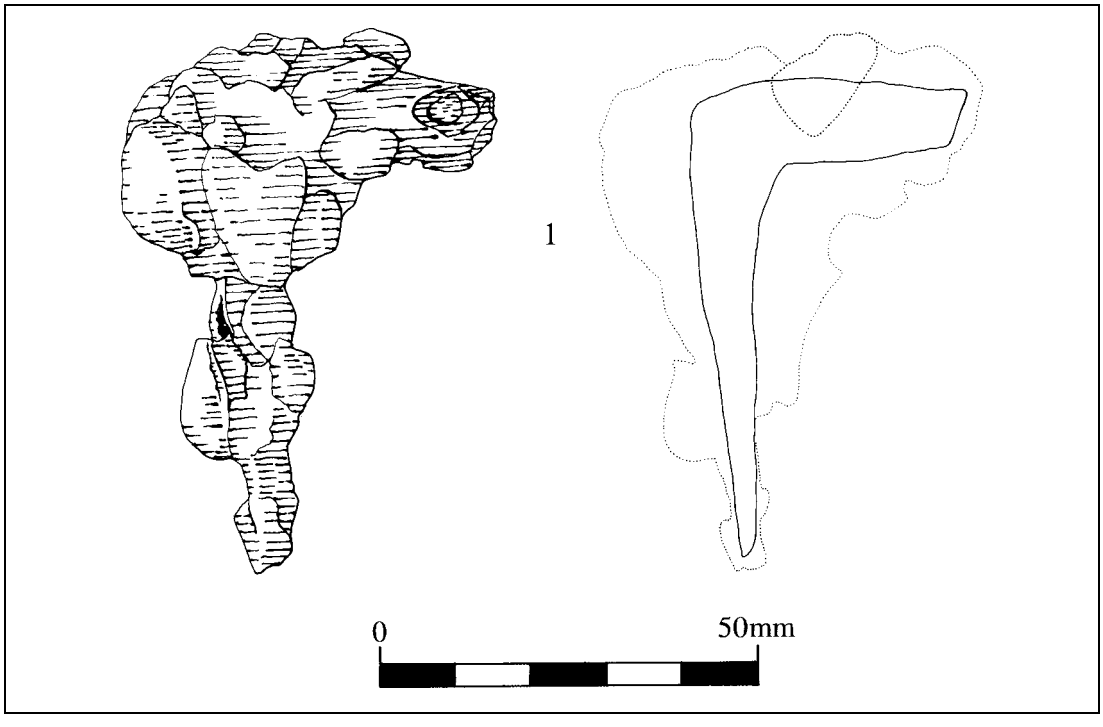


Fig 28. Mound 50: hinge pivot. *Drawing*: Sven Schroeder

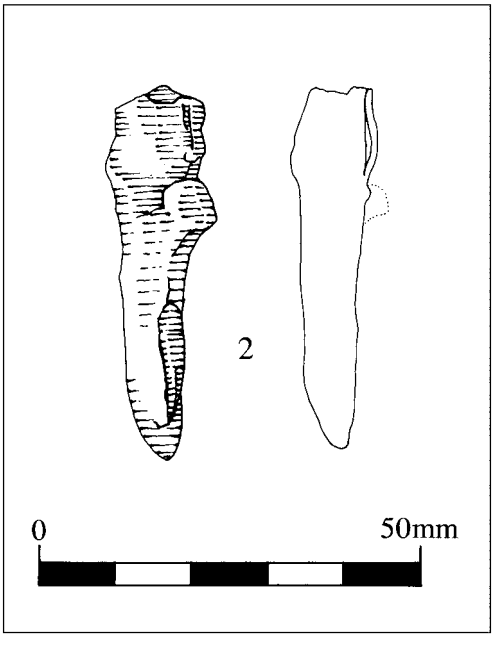


Fig 29. Mound 50: knife blade. *Drawing*: Sven Schroeder

3. Large nail with square head tapering down into the shank (fig 30). Dimensions are approximate because of the poor conservation state of the surface. Head: W11mm, T9mm, H7mm; shank: L20mm, W5mm, T4mm. HW99, 209, sf112.

4. Large nail in two fragments: a head and a shank fitting to it (fig 30). Head is probably square, tapering down into a shank of square section. Same type of nail as sf112. Head: W11mm, T9mm, H8mm; shank: L28mm, W4mm, T4mm. HW99, 118, sf114.

5. Probable nail head, extremely corroded (fig 30). W11mm, T10mm. HW99, 308, sf149.

6. Small nail, heavily oxidized (fig 30). Head: D8mm; shank: L16mm. HW99, 304, sf104.

7. Small nail, shank bent, very oxidized (fig 30). Head: D8mm; shank: L18mm. HW99, 410, sf105.

8. Small nail with round flat head and square shank (fig 30). Head is plated. XRF analysis confirmed the presence of a large amount of tin and a trace of lead. Head: D8mm; shank: L20mm. HW99, 304, sf120.

9. Small nail, very oxidized; original surface of head lifted up (fig 30). Head: D8mm; shank: L18mm. HW99, 308, sf127.

10. Small nail, bent giving a circular shape; very oxidized, cracks and original surface lifted up (fig 30). Head: D10mm; shank: 0.25mm. HW99, 411, sf129.

11. Small nail, very oxidized; seems to be plated with non-ferrous metal (fig 30). Head: D13mm; shank: L20mm. HW99, 411, sf130.

12. Small nail, end of shank missing; very oxidized, original surface lifted up; possible plating on head (fig 30). Head: D10mm; shank: L13mm. HW99, 308, sf132.

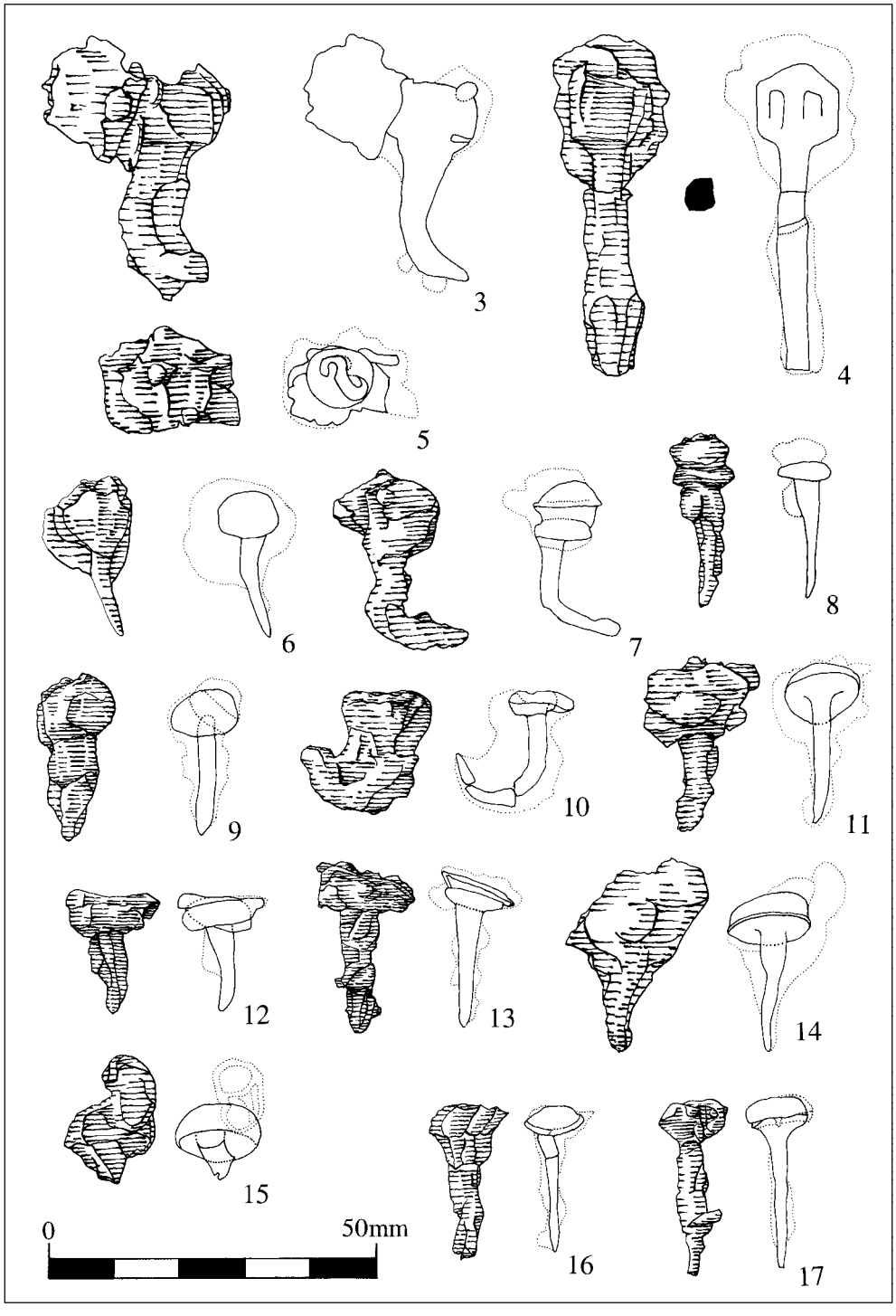


Fig 30. Mound 50: nails nos 3–17. *Drawing*: Sven Schroeder

13. Small nail, with square shank and round head, flat or slightly domed; completely oxidized; plated with non-ferrous metal (fig 30). XRF analysis revealed the presence of tin with a tiny trace of copper. Head: D10mm; shank: L18mm. HW99, 411, sf134.

14. Small nail, very oxidized; plated with non-ferrous metal (fig 30). Head: D11mm; shank: L18mm. HW99, 411, sf142.

15. Small nail, with incomplete broken shank; round flat head and square shank; completely oxidized; plated with non-ferrous metal (fig 30). XRF analysis confirmed the presence of tin. Head: D12mm. HW99, 411, sf143.

16. Small nail with domed head, very oxidized (fig 30). Head: D8mm; shank: L17mm. HW99, 308, sf145.

17. Small nail with domed head and square shank, completely oxidized; plated with non-ferrous metal (fig 30). XRF analysis confirmed the presence of tin traces. Head: D10mm; shank: L22mm. HW99, 308, sf147.

18. Small nail, very oxidized; probably plated (fig 31). Head: D11mm; shank: L21mm. HW99, 308, sf148.

19. Small nail, end of shank bent; very oxidized (fig 31). Head: D8mm; shank: L20mm. HW99, 411, sf158.

20. Small nail with square cross-section with tip broken off; small flat head, with non-ferrous plating (fig 31). XRF analysis confirmed the presence of a large amount of tin. Head: D9mm; shank: L11mm. HW99, 411, sf162.

21. Possible small nail head, heavily corroded (fig 31). D10mm. HW99, 410, sf118.

22. Small nail fragment, with square cross-sectioned shank and circular flat head; completely oxidized (fig 31). Head: D11mm. HW99, 415, sf126.

23. Small nail, incomplete, shank broken; very oxidized, head completely mineralized (fig 31). D9mm. HW99, 411, sf157.

24. Part of nail shank, completely oxidized (fig 31). L16mm. HW99, 308, sf146.

25. Fragment of nail shank with tip, very oxidized (fig 31). L14mm. HW99, 308, sf151.

26. Fragment of nail shank, very oxidized (fig 31). L11mm. HW99, 308, sf152.

27. Fragment of nail shank with tip, very oxidized (fig 31). L12mm. HW99, 308, sf153.

28. Small and completely oxidized iron fragment (fig 31). HW99, 308, sf155.

29. Fragment of ?nail shank, square cross-section, narrowing to a point; heavily corroded (fig 31). L16mm. HW99, 411, sf163.

Like the nails from Mound 7, the majority of the Mound 50 nails are flat-headed, although the large examples numbers 3–5 appear to have large solid heads, and others such as 11, 14 and 15 appear to be dome-headed. The presence of tinning and possibly soldering on some nails suggests a decorative role. Nearly 2,200 nails and tacks were recovered from Anglo-Scandinavian contexts from Coppergate, York, including 1,300 with flat heads, but only 44 with tin-plated heads. Of the complete nails recovered from Coppergate, 65 per cent are

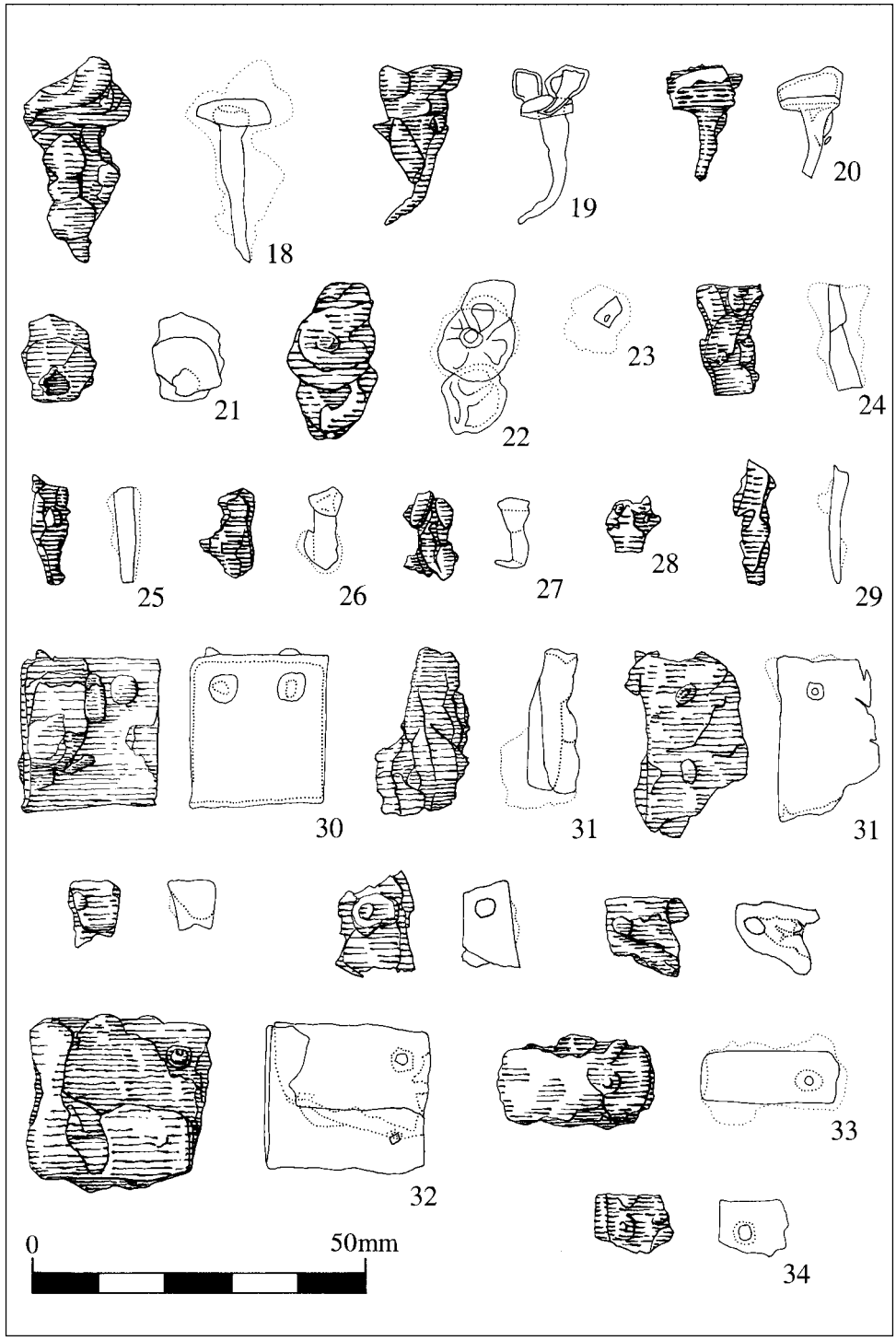


Fig 31. Mound 50: nails nos 18–29 and iron clamps nos 30–34. *Drawing*: Sven Schroeder

30–65mm long, whereas the Heath Wood nails tend to be smaller on average.[67] Ordinary flat-headed nails were in common usage in the ninth century, but were probably used for a wide variety of purposes. Nails were not seen joining the timbers in any of the Anglo-Scandinavian buildings excavated in York, and the majority were probably used in furniture. Surviving Viking Age chests and boxes were usually jointed together but their lock plates, hinge fittings, corner brackets and bindings were nailed on.[68] Examples of nailed chests of the period include two from the Oseberg ship as well as the Mästermyr tool chest.[69] Coffin nails of 15–20mm in length were found in the cemetery associated with the Viking fort at Fyrkat.[70] An adult grave from St Patrick's Isle, Peel, was placed in a wooden chest or coffin represented by seventeen nails. These were *c* 50mm in length but six smaller nails secured the sides to the base of a box that formed a coffin in a child's grave.[71] Tinned nails were used to attach the hinges and lock of a small box from one of the tenth-century Fyrkat graves, and were found on a casket from a contemporary grave at Sønder Onsild.[72] The function of these nails is discussed further below but they are clearly derived from several objects, including a possible chest that may have been used as a coffin container, as well as decorative tacks possibly used in the construction of shields. Some may simply have been attached to wood used as fuel for the pyre.

30. Iron clamp with two rivets (fig 31). The cleaned rivet shows a round head (D4mm) which was probably decorative, while the shank situated between the clamp is functional and of round shape. The surface reveals some parallel lines, which could be decorative or keying for plating. L22mm, W20mm, T8mm. HW99, 308, sf135.

31. Several fragments of iron clamp in very bad condition, with one rivet (fig 31). L24mm, W15mm, T8mm. HW99, 308, sfs136, 137, 138, 139, 140.

32. Two fragments of iron clamp, each section with a rivet; very oxidized (fig 31). L23mm, W20mm, T8mm. HW99, 411, sf144.

33. Iron clamp, with a single rivet, oxidized (fig 31). L21mm, W8mm, T7mm. HW99, 308, sf150.

34. Small fragment of iron clamp, with traces of a single rivet (fig 31), possibly related to sf135. L10mm, W8mm. HW99, 308, sf167.

A minimum of four iron clamps were present in the pyre. They appear to represent metal clamps from a shield rim. Continuous gutter-shaped metal-edge bindings were obsolete by the Viking Age but small clamps are occasionally found in graves. There are twelve cases from Birka and a single example from Lindholm Høje.[73] These may be made of iron or bronze and are generally *c* 20–25mm square. They are sometimes distributed evenly around the shield rim to fasten a leather edge binding, but may also have fastened the joins between the planks. The shield itself is likely to have been hemispherical and up to 1m across; it would have been made of wooden boards, probably covered in leather which could have been painted. A central iron boss would have been attached to the shield by nails, and would have protected the hand grip at the rear. Bosses were usually attached by broad-headed nails, the points of which were either bent over or flattened on the reverse of the shield. At Birka four is the most common number; there are occasionally six (as in the case of Gokstad), and five were sometimes used, as at Cronk Mooar.[74] Several of the nails recovered are of a type appropriate to having performed this function. The absence of the shield boss from the pyre suggests that, like the sword blade, it was collected after the cremation.

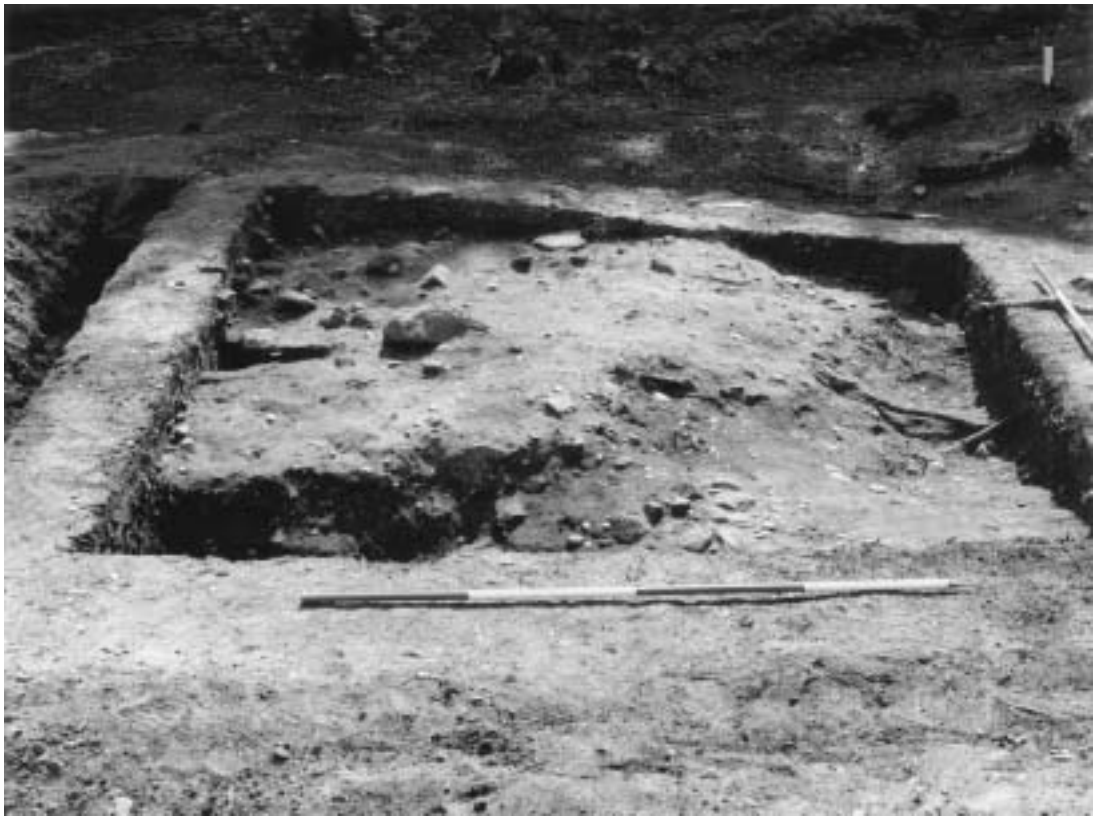


Fig 32. Mound 56 from the north, showing ditch and causeway, and location of cremated bone on mound surface at lower left. *Photograph*: author

Mound 56 (figs 32–38)

Bedrock (613, 718) was encountered in two quadrants, where it comprised alternating layers of sandstone and keuper marl sloping gently from north west to south east. Even at this depth there was evidence of root activity along the bedding plane. Lying directly on the bedrock was a sand and gravel natural subsoil (607/612, 717, 722), although this had been quarried away in the area around the mound.

In each of the three excavated quadrants the natural subsoil was overlain by a layer of orange sand, up to 0.5m thick, containing small sandstone or quartzite pebbles (509, 614, 719). This clean deposit appears to have been a deliberately dumped layer overlying natural, presumably to provide a level surface for the cremation (figs 32 and 33).

On the eastern edge of Area 5 this was overlain by a thin spread of blackened silty loam (508), *c* 1.1 × 1.2m, and 10–50mm thick, containing a few fragments of burnt bone and a ringed pin (sf245); the latter within a small scoop, *c* 0.1m across by 0.2m deep, containing blackened sand (510). The sides were not crisply defined and it sloped at an angle, suggesting the cremation had been disturbed by animal or root activity. The cremation deposit (615) was also just visible in section in Area 6, as a lens 3mm thick.

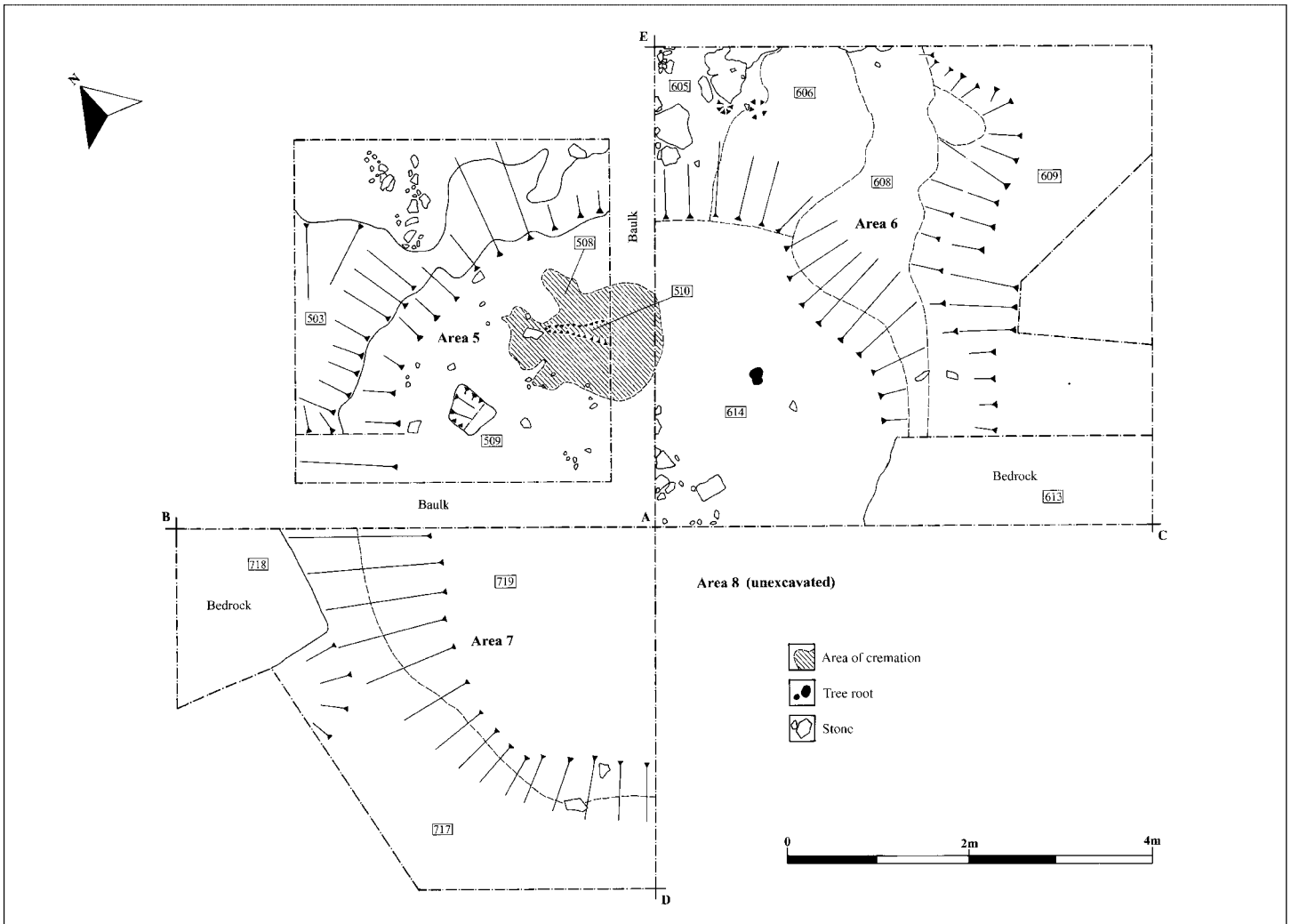


Fig 33. Mound 56: plan after excavation showing area of cremation. *Drawing*: Sven Schroeder

Fig 34. Mound 56 from the south west, with Area 7 in foreground after exposure of original mound surface on lower slopes. *Photograph*: author

The mound above the cremation deposit comprised a layer of orange-brown sandy loam (507, 602, 704) surviving up to 0.5m thick at the centre of the mound. This material contained angular sandstone slabs and large quartz pebbles, with very occasional charcoal flecks. On the western edge of Area 7 there was an equivalent layer (713) representing the make-up of the adjacent Mound 55 (fig 34).

In the ditches encircling the mound there was a succession of interleaved layers of dark orange-brown sandy silt (506, 606, 609, 611, 710, 711, 715, 716) and black humic silty loam (503, 505, 605, 608, 709, 712, 714). These are believed to represent initial erosion of the surfaces of Mounds 55 and 56 into the surrounding ditch and alternating turf lines, prior to their consolidation (fig 35). The turf layers were very discontinuous, having been disturbed by roots and animal burrows, and having been eroded away completely from the upper surfaces of the mound. To the north-west corner of Mound 56 there was evidence for a causeway, where an area of higher ground had been left across the ditch in order to provide access to the mound. A clay pipe bowl (sf 119) was found resting on the uppermost of these layers, confirming that after consolidation the mounds were then relatively stable until the post-medieval period.

At some stage there had been substantial erosion of the upper mound that filled the surrounding ditch with a reddish-brown sandy silty loam (501, 603/604, 707) containing quartz

Fig 35. Mound 56, showing profile and build-up of eroded material downslope in north-facing section in Area 6. *Photograph*: author

pebbles and occasional larger angular sandstone blocks. This layer also incorporated sherds of the same type of Midlands Purple ware as those found in the equivalent layer over Mound 50, again suggesting that erosion of the mounds only took place after the creation of the plantation in the eighteenth century. In Area 5 there were two irregular scoops in the mound surface filled with dark brown humic material (502, 504), representing tree holes or rabbit burrows. In Area 7 the erosion layer (720, 721) was darker on the lower slopes. It also merged imperceptibly into the equivalent layer of dark reddish-brown sand (706) which had eroded from Mound 55.

A spread of fragmented sandstone blocks and occasional quartzite pebbles (703/708) was found around the western side of Mound 56. A layer of fine dark brown sandy silt loam (705) lay between and under the stones, incorporating further sherds of Midlands Purple type, dating the stone capping to the late seventeenth or eighteenth centuries. Rather than being related directly to Mound 56, therefore, it appears that the stone capping may reflect field clearance from pre-plantation ploughing adjacent to the main group of mounds. Mound 56 lies at the edge of this group and stones disturbed by ploughing may have been conveniently thrown on to its surface.

Above the stones there was a general spread of brownish-grey sandy loam (702), along the edge of Area 7. This may represent a pre-forestry soil, possibly an agricultural ploughsoil at

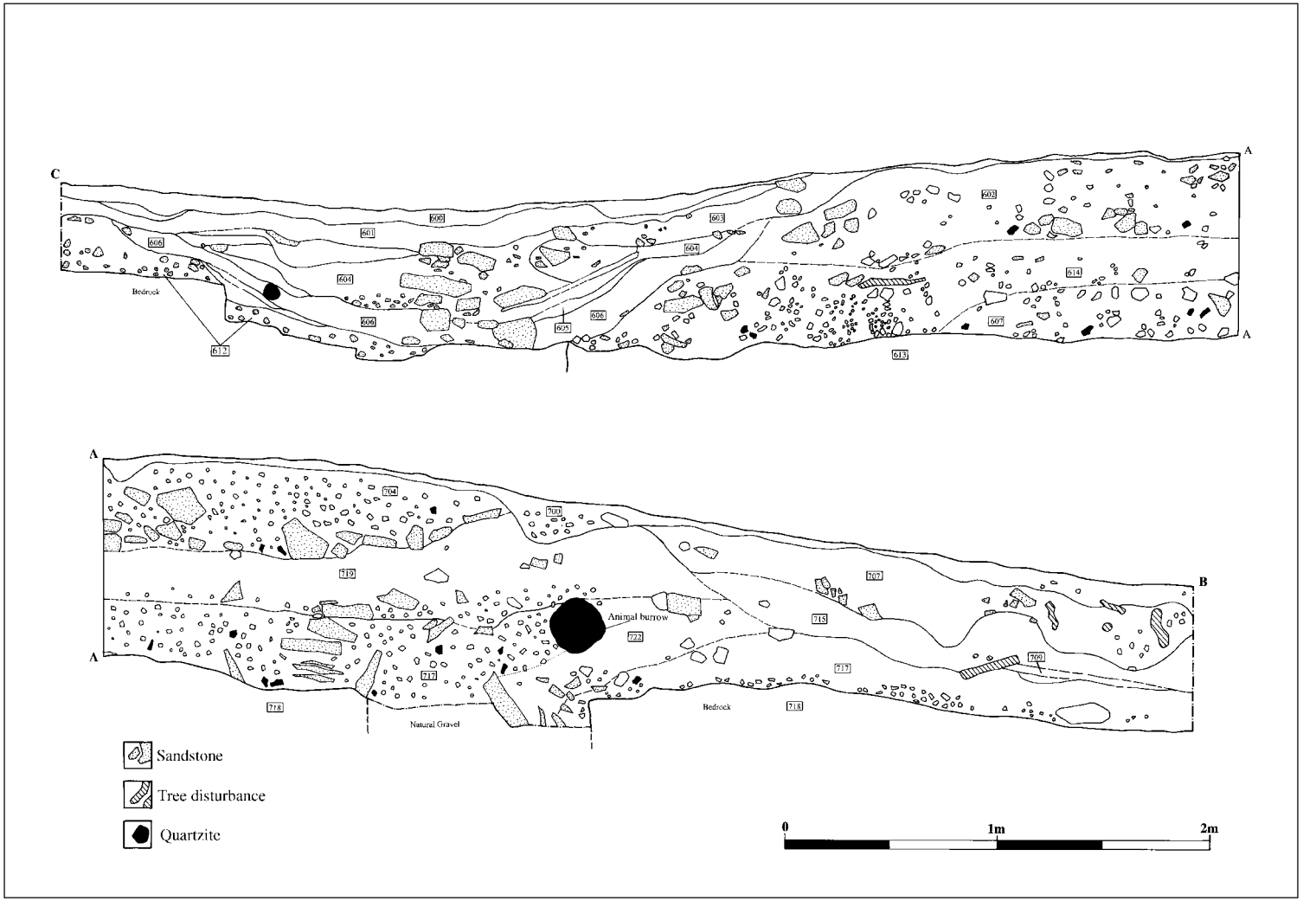


Fig 36. Mound 56: E–W section. *Drawing*: Sven Schroeder

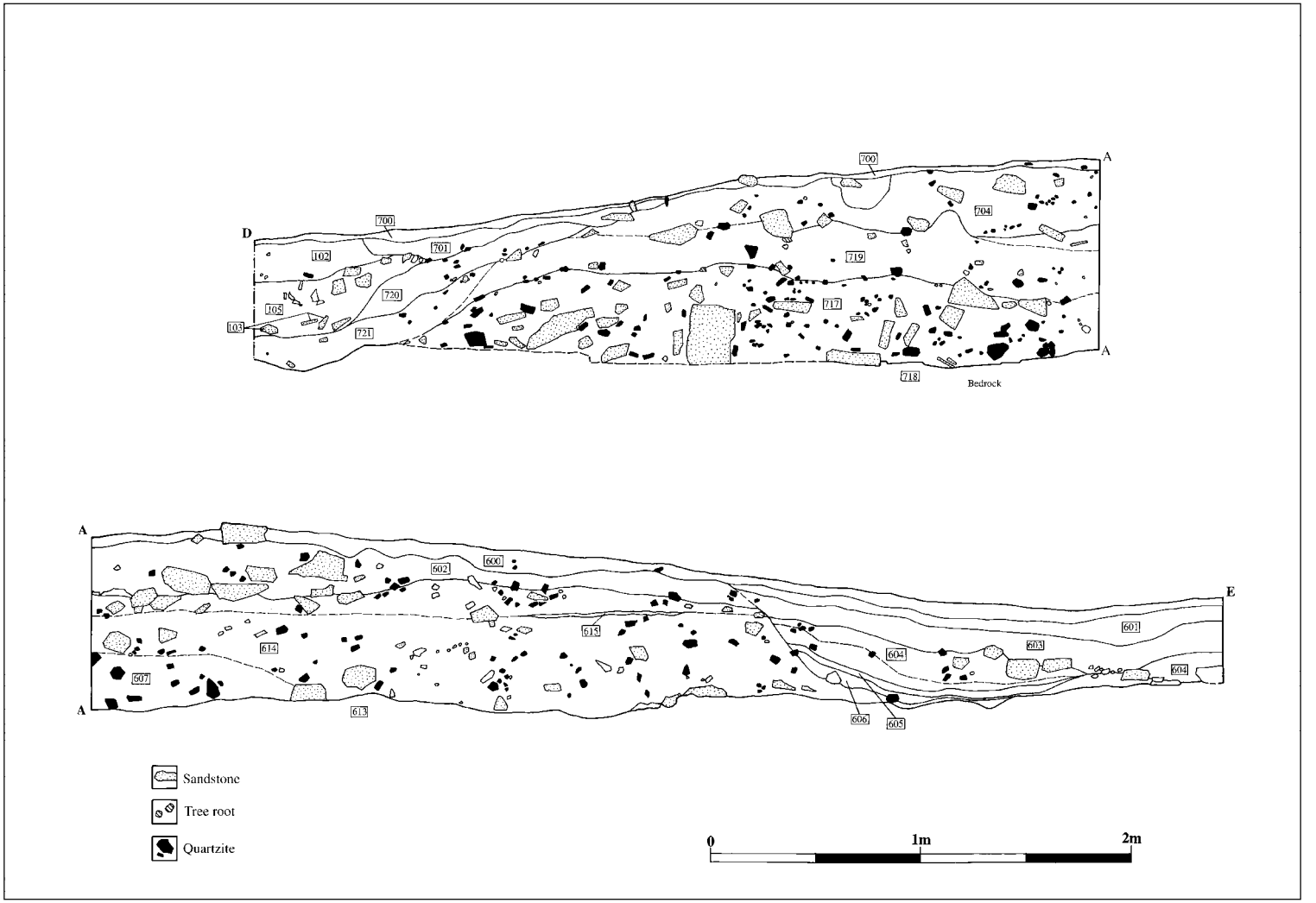


Fig 37. Mound 56: N–S section. *Drawing*: Sven Schroeder

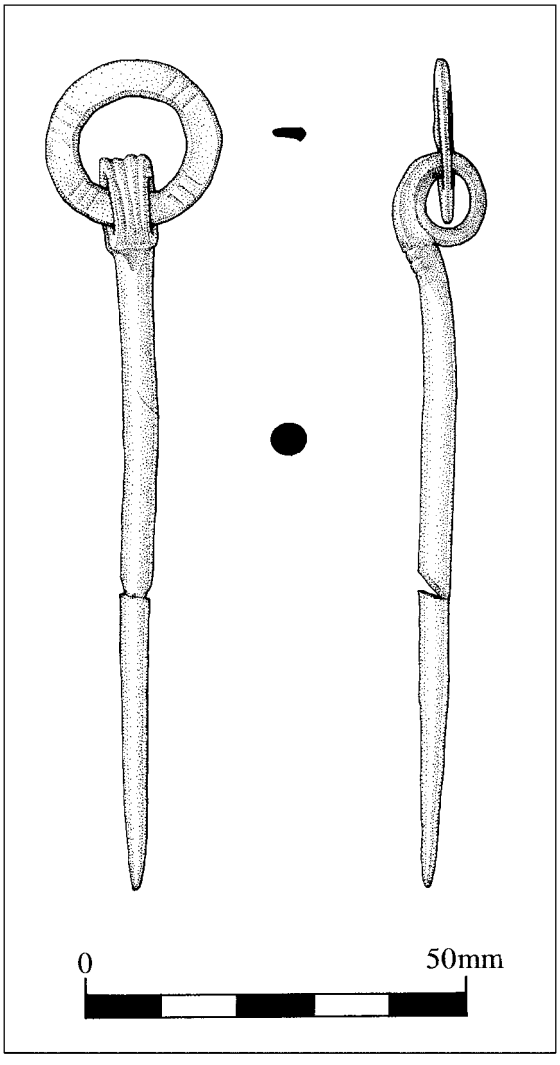


Fig 38. Mound 56: ringed pin. *Drawing*: Frances Chaloner

the edge of the barrow cemetery. Finally, the whole area was covered by a general layer of loose dark brown humic material containing large amounts of matted tree roots and bracken (500, 600/601, 700/701). This layer was thin on top of the mound but up to 0.15m thick around its base.

COPPER-ALLOY OBJECTS

Plain-ringed, loop-headed pin (fig 38). The shank is of circular cross-section with three decorative vertical grooves, just below the head. The head has been curled around to form a loop for the ring. The ring itself is of flat oval cross-section. It is decorated with four bands of parallel triple grooves radiating outwards. The pin is in poor condition; it was found in two pieces lying a short distance apart and as part of the surface is missing it is impossible to rejoin the whole pin or to be sure of its original length. The X-ray shows that extensive damage has

occurred on the shank, with internal cracking and disruption of the surface below the loop. One broken edge has blobs of copper metal spilling over the edge on to the outside surface. It is unclear whether this is redeposited metal resulting from corrosion processes or molten metal through exposure to high temperatures. Ring: 22mm; shank: L100mm. HW00, 508, sf245.

The type appears to have been adopted by Norse settlers during the ninth century and is known from burial and settlement sites.[75] There are two examples from tenth-century graves on St Patrick's Isle, Peel, on the Isle of Man, where they are interpreted as closing shrouds.[76] Three are known from the coastal trading site at Meols, and it is assumed that they relate to the Hiberno-Norse phase in the early tenth century.[77] One is known from the church at Brigham, Cumbria,[78] and an iron one was excavated from All Saints Pavement, York.[79] There are a further sixteen from Scotland, seven of which are from burials. Sixty examples are known from Viking Age levels in Dublin, the majority dated AD 925–75.[80] There are numerous examples from Scandinavia itself, including Denmark and Sweden, but especially from Viking graves in Norway,[81] where they are thought to represent the adoption of an Irish fashion in dress pins, probably post-840 when the permanent settlements had been established in Dublin. Fanning suggests that a grooved looped-over pin-head is characteristic of Scandinavian workmanship.[82] According to Petersen, the plain-ringed loop-headed form of ringed pin occurs in both male and female Viking graves in Norway.[83] The latter belong mainly to the ninth century, whilst the pins from male graves are datable to the ninth and tenth centuries. It has been demonstrated that ringed pins would have functioned as dress-fasteners, fastening the cloak at the shoulder or across the chest.[84]

Cremated Human Bone

Cremated bone from eight contexts from Mounds 50 and 56 was received for analysis. The main cremation deposit contexts were subdivided into 0.5m squares and these subdivisions were maintained within the osteological analysis to allow more detail of the distribution of the cremated bone to be ascertained. Osteological analysis followed the writer's standard procedure for the examination of cremated bone.[85] Age was assessed from the stage of skeletal and tooth development[86] and the general degree of age-related changes to the bone.[87] Sex was ascertained from the sexually dimorphic traits of the skeleton.[88]

Disturbance and Condition

The excavated deposits may have been disturbed by animal and root activity (see above), although there is unlikely to have been much loss of bone from the deposits by these mechanisms. The condition of the bone was generally rather poor. The surface morphology was often ill defined as a result of erosion – reflecting the microenvironment chiefly influenced by the groundwater and sediment chemistry.[89] The condition of the bone from the different contexts within Mound 50 varied slightly, that carried by worm or root action into the pre-pyre levelling and mound make-up being moderately heavily eroded, whilst that from the main deposit of cremated material was only slightly moderately affected. The latter was additionally obscured by an adhering substance that appears to comprise mineralized fuel ash and soil forming a hard concretion on and around some of the bone. The poor quality of the surface morphology had a detrimental effect on the quantity of bone fragments it was possible to identify to skeletal element, a maximum of 30 per cent of the assemblage – from context 410 – being identified in detail. The bone from Mound 56 was moderately eroded.

Table 1. Summary of results from osteological analysis

Mound	Deposit types	Total bone weight	Age and sex	Animal bone
50	Pre-pyre levelling; ?*in situ* pyre and burial; mound material	3,459.5g	1) Adult *c* 18–45 yrs, ?female; 2) ?infant/juvenile	544 fragments (min 284.4g): horse, dog, pig, sheep/goat, cattle
56	?*In situ* pyre site and burial	198.1g	Adult *c* 18–40 yrs, unsexed	1 fragment (0.2g): pig

A further observation is that very little trabecular bone survived, a total of only 29.9g of axial skeletal elements being identified, and there were also very few fragments of articular surface. It is known that bone porosity has a major effect on its survival and it has been demonstrated that trabecular bone is the first to be lost in acidic soil conditions, often crumbling to dust as it is excavated.[90]

Demographic Data

The remains of a minimum of two individuals from Mound 50 and one individual from Mound 56 were identified from amongst the cremated bone (table 1). Poor bone survival limited the demographic detail it was possible to obtain, there being insufficient evidence to suggest the sex of the remains from Mound 56, whilst those of the adult from Mound 50 are probably female. Comparative data from other British Viking cremation burials are relatively scarce, but both male and female adults were identified amongst the remains from the other Heath Wood mounds excavated in the 1940s and 1950s, though there is no record of any immature individuals being recovered either here or in any of the other rare cremation burials of this date.[91] It is not impossible, given the very poor condition of the bone at Heath Wood, that immature bone may have suffered preferential destruction because of the burial environment, or have passed unrecognized owing to the poor morphological definition of the bone. No pathological lesions were observed.

Aspects of Pyre Technology and Ritual

All the surviving bone was the white colour indicative of full oxidation of the organic components of the bone.[92] It should be noted, however, that trabecular bone is often amongst the last to be oxidized (being internal and often with high soft tissue coverage) and as very little of this survived we may have a biased representation.

The weights of bone recovered varied greatly between Mounds 50 and 56. The 198.1g of bone (predominantly human) from Mound 56 represents a maximum of *c* 20 per cent of the total weight of bone one would expect to find at the end of an adult cremation.[93] The 3,459.5g of bone from Mound 50, the vast majority of which (98.6 per cent) was from the *in situ* pyre site, represents a substantial quantity of bone, probably in excess of that expected from the cremation of the two human individuals identified. A considerable quantity (table 1) of the bone from this mound was identified as animal in osteological analysis and it is not unlikely that more amongst the unidentifiable material may be of animal origin rather than human. In this instance, it is likely that the pyre site also formed the place of burial for the human remains

and that of their pyre goods (the cremated animal bone). There is no published record of the weights of bone recovered from the other Ingleby mounds, nor from the few other contemporaneous British burials.

The majority of bone from most contexts was recovered from the 5mm sieve fraction, 43–66 per cent, with most from the 10mm sieve fraction in only two cases (Mound 50, contexts 304 and 410 at 60 per cent and 48 per cent respectively). The maximum fragment sizes were also relatively low, with a maximum of 49mm. A number of factors may affect the size of cremated bone fragments, the majority of which are exclusive of any deliberate human action other than that of cremation itself.[94] In this instance, the burial environment – clearly detrimental to bone survival – will have increased the level of fragmentation along the lines of the dehydration fissures formed during cremation. However, whilst there is no conclusive evidence for deliberate fragmentation of bone, and much to suggest the opposite, it cannot be totally dismissed. There are no extant comparative data from the other excavated deposits within the cemetery or from contemporaneous burials elsewhere in Britain.

The quantity of different skeletal elements recovered is heavily biased by differential bone survival (see above). Poor surface morphology also makes it difficult to distinguish individual long bones and frustrates the normal ease with which skull fragments may be recognized.[95] Meaningful comment is not really feasible, other than to observe no unexpected absences of skeletal elements.

The distribution of bone from across the main deposit of cremated material (i.e. the pyre site) in Mound 50 was assessed to try and ascertain the formation process of the deposit (see fig 21). The majority of the bone (59 per cent) was recovered from Area 4 (context 411), a substantial proportion (37 per cent) being recovered from Area 3 (context 308) and only *c* 2 per cent from Area 2 on the north-east margins. Skeletal elements from all areas of the adult were represented across all parts of the pyre site, though there were apparent concentrations within a 1 × 1.5m spread in the western half of the deposit and a 1 × 0.5m spread in the east. The identifiable fragments of the immature individual were confined to a 1 × 1m spread in the western half of the deposit, overlapping with the concentration in the adult bone. The animal remains were similarly spread across the whole of the pyre site, with apparent concentrations in a 1 × 1.5m area in the eastern half. The general impression is of a relatively random distribution of both individuals and skeletal elements across the entirety of the main deposit of cremated material. Given the way in which a pyre burns and collapses,[96] the deceased and their pyre goods generally maintain their horizontal position on the pyre relative to one another. If this deposit represented the site of a pyre that had been allowed to burn down and then had a mound raised over it to form the burial, the various remains should have shown an ordered anatomical and spatial distribution. An example of the latter may be seen in the contemporaneous Vendel warrior burial from Vallentuna.[97] That this is not the case in the Mound 50 pyre site demonstrates some deliberate human manipulation of the remains subsequent to cremation and prior to burial. The implied mixing of the cremated remains may have resulted from a thorough raking-over of the pyre site to break up any incompletely cremated soft tissues and facilitate their full oxidation, an action which would also have led to increased fragmentation of the bone itself. Though it appears that the manipulation involved a substantial movement and mixing of bone fragments from across the pyre, the relatively limited distribution of the immature remains suggests this individual was placed on the western portion. Analysis of the animal remains confirmed that the several species were distributed randomly across the pyre site, again suggesting disturbance of the remains. (JMcK)

Cremated Animal Bone

The cremated animal bone was also highly fragmented, the majority of pieces being in the 10–20mm size range, although many fragments were under 5mm. The largest fragments were *c* 30mm long. This report covers all the fragments thought to be non-human in origin; due to the nature of the material, a small number of fragments could not be definitely assigned to either human or non-human categories by McKinley. The material was extremely hard to identify even by the standards of most cremated bone, a fact reflected in the various levels of uncertainty recorded in the identifications. Nevertheless, a range of animals was identified; horse, dog and sheep or goat in Mound 11, pig in Mound 56, and horse, dog, pig, sheep or goat, and cattle in Mound 50 (table 1). It is also possible to say something about whether these animals were whole carcasses or were simply joints of meat or token offerings; this is discussed further below.

Most of the fragments were fully oxidized, light grey or white in colour, with the exception of a few fragments, notably dog phalanges. Experimental studies have shown that these distal limb elements can become detached from the carcass fairly early in the cremation.[98] They may then fall into the pyre debris away from the main concentration of heat, resulting in less complete combustion and in some cases better preservation. Such preservation, therefore, is not indicative of the animals, or particular elements of them, being put on the pyre at a late stage, or that they were necessarily particularly near to the edge of the pyre.

The fragments were carefully scrutinized for butchery marks and any pathological features, such as have previously been found in other cremations. A horse axis vertebra from the Anglo-Saxon cemetery at Sancton, Humberside, showed marks of decapitation whilst other bone from cremation cemeteries has produced evidence of the dismemberment and skinning of animals and the presence of animals with significant pathologies being used as offerings.[99] No butchery marks or pathologies were found on the Heath Wood bones.

The identified fragments were weighed for each context. It is obvious from these weights that only a small fraction of the original bone was present, and that even the largest assemblage of animal bone, from Mound 50, is only a fraction of the bone that might be expected to survive from this number of animals.

Identifications

Mound 50 produced the greatest mass of animal bone from the assemblage: 544 fragments were found, weighing a total mass of 284.4g. The mound contained the cremated remains of a horse, a dog, a pig, a sheep or goat and possibly an ox; there was no evidence for more than one of each animal. The majority of the fragments came from the horse and the dog.

The horse was represented by fragments of lower limb bones and the cranium, with elements from the right and left sides and from the fore and hind quarters of the body. Positively identified fragments came from the occipital condyle region of the cranium, the petrous bone from the cranium, left radius/ulna (fused) and tibia, carpals (three fragments: scaphoid, navicular and cuneiform), astragalus (two fragments, one left-hand side), proximal and distal sesamoids (five fragments), metapodia (three fragments, one from a right metatarsal), a lateral metatarsal and the first, second and third phalanges (five fragments of the first phalanx). There were also fragments of longbone diaphysis, tooth socket, cranial and indeterminate horse-/cattle-sized bone. This pattern of identified fragments, with elements from both sides of the body, the head and limbs, suggests that all of the horse was present on the pyre. There are no butchery marks to indicate that the head or other limbs were removed before burning, as

in the case of the Anglo-Saxon horse at Sancton, or that the animal was divided into pieces before being placed on the pyre, as in Ibn Fadlan's famous account of a boat burial amongst the Rus.[100] The fused radius/ulna fragment suggests that the animal was over three years old at death. No estimation could be made of the sex of the animal or its stature.

The identified dog bones from Mound 50 come from all regions of the skeleton and from the left and right sides of the body. The left third and fourth premolar region and the right third molar region of the maxilla and a fragment of mandible were present. All teeth had erupted, suggesting an age at death of over six months. The axis, atlas and a caudal vertebra could also be identified. From the forelimbs it was possible to recognize a fragment of scapula blade and right humerus, both right and left ulnae, right radius, the left and right third metacarpal and a fragment of third or fourth unsided metacarpal. From the hind limbs a fragment of acetabulum from the right pelvis, left tibia, astragalus and calcaneum were identified. The assemblage also contained a further metapodial fragment, a second phalanx, five first phalanges and two further phalanges, first or second, which may have come from hind or fore limbs. The generic morphology of some skeletal elements resulted in several fragments being distinguished only as coming from a medium-sized mammal although it is likely that they belong to the same dog. These include caudal and thoracic vertebrae, rib fragments, tooth roots, cranial, petrous and mandible fragments, ossified rib cartilage, cranial fragments, humerus fragments and indeterminate longbone diaphysis fragments. Fusion of the distal radius suggests that the dog was over eleven months old at its death. Although unpredictable shrinkage due to cremation precludes metric analysis of these fragments, the dog appears to have been roughly of medium size, the bones being a little smaller than a reference specimen, which in life stood *c* 0.55m tall at the shoulder.

Mound 50 also contained the remains of a pig. This animal was represented by only four fragments but these were all identified as coming from the left-hand side of the animal, introducing the possibility that only the left side was originally present as a food offering. The elements were a left astragalus and acetabulum from the hind limb and left ulna and humerus from the fore limb.

Two fragments of burnt bone were probably from a sheep or goat (a left distal tibia and lumbar vertebrae) and two fragments were probably cattle (a metatarsal and mandible). They are both from skeletally diverse areas of the skeleton so it is unlikely that they represent a partial carcass animal offering. It is possible, given that only two fragments of each animal bone were identified, that they were unintentional inclusions in the assemblage, incorporated into the assemblage from surrounding deposits, but it may simply be that the rest of the cremated bone from these animals has been removed.

Mound 50 also contained three very small bone fragments that cannot be distinguished morphologically as either bird or mammal. These fragments could be from the dog but there remains the slight possibility that they could indicate the presence of a bird on the pyre.

Mound 56 produced only one fragment (0.2g) of burnt animal bone; a pig left fifth metatarsal. The specimen was fully oxidized and its size suggested that it came from a small individual. Nonetheless, the fused proximal epiphysis indicates that the animal was over $2\frac{1}{4}$ years old at death.

Interpretation

The presence of several different animals in Mound 50 confirms earlier studies and extends the number of identified animals. Even allowing for the very comminuted nature of the cremated

bone, which made identification difficult, it was possible to show, in the case of Mound 50, that a whole dog and horse had probably been present, along with at least one side of pork and possibly parts of a sheep or goat and an ox. Even if the unidentifiable material is included, the weight of bone present is insufficient to account for the rest of these carcasses, there being only *c* 300g in total. It is suggested elsewhere in this report that human bone and artefacts have been removed from the pyre sites and the animal bone evidence implies that the animal remains were also intentionally gathered up.

Animal bone was also identified amongst four of the five pyre sites previously excavated in Heath Wood, including sheep, ox and possibly dog from Mound 1, ox and possibly horse from Mound 5, and ox and possibly sheep and pig from Mound 6. The inclusion of animals on cremation pyres, either as entire cadavers or jointed pieces, has formed a consistent element of the early medieval cremation rite, the quantity and range of species tending to increase over time.[101] A similar pattern has been observed in Scandinavia, including Sweden, culminating in *c* 80 per cent of Viking burials containing cremated animal remains. These included up to ten species per burial amongst which dog, horse and sheep or goat were the most commonly occurring species.[102] There are few parallels from Viking graves in Britain, the most famous being perhaps the burials at Ballateare and Balladoole, Isle of Man.[103] The crucial difference is that the Manx mounds covered human inhumations, and the cremated bone, which seems to have been entirely animal (including horse, dog, ox, sheep and cat), was deposited as a layer towards the top of the mound.

The number of dogs and horses in the Heath Wood cremations is an interesting feature. Horse and dog inhumations and cremations are known from all over Europe, from the Iron Age to the Viking period, and there is often a strong correlation between the two animals.[104] Perhaps the earliest account of a similar practice is in Tacitus's *Germania*, where he describes how a dead man's horse was sometimes cast into the flames of the funeral pyre.[105] In Ibn Fadlan's account of a cremation among the Rus (see above), a dog, two horses, two cows, a rooster and a hen are included among the offerings. In Swedish cremation graves from the Vendel and Viking periods, horses are common and though mainly occurring in men's graves they are also found with women.[106] Many horse cremations are now known from Anglo-Saxon England and, contrary to expectation, they are found in roughly equal numbers in male and female graves.[107] In contrast to the situation in Viking Age Sweden and at Heath Wood, dogs are curiously rare in Anglo-Saxon cremations, though present at both Spong Hill and Sutton Hoo.[108]

All the animals in the Heath Wood mounds are domestic, in contrast with some of the Swedish Viking cremations where parts of wild animals may also be present; bear (possibly in the form of bear skins), lynx and deer have been reported. Anglo-Saxon cremations have also produced evidence of wild animals, including bear, red deer and fox.[109] In view of the fragmented nature of the Heath Wood material and the relatively few Viking cremation graves known and investigated in Britain, it may be unwise to regard this fact as of any great significance. What is certain is that the identification of a range of animals in these mounds, and the observation that the animal offerings have been removed from the pyre sites along with the human bone and other funeral goods, adds another strand to our understanding of the ritual involved. (JB and FW)

Unburnt Animal Bone

Two instances of unburnt animal bones were recovered from Mound 50. (i) An upper molar, very heavily worn to leave a well of dentine surrounded by a sleeve of enamel. This is an equid

tooth, but is quite small, perhaps from a pony. HW98, 403, sf31. (ii) Fragments of skull of adult cow. HW98, 106, sfs32, 46–54, 56–59. The recovered bones were as follows: most of the right maxilla, containing the fourth premolar (P4) and the first and second permanent molars (M1 and M2); most of the right mandible, including the lower ramus, P4, M1, M2 and M3; an upper right M3; right mandibular ramus in the area of the condyle; area of temporal bone, internal surface of the auditory region; fragments of occipital bone around the foramen magnum.

Although most of the cow skull was not preserved, there are representative bones from most parts, enough to suggest that a whole head was deposited. It appears that the skull was buried on its left side and was rapidly buried before much weathering could occur. No butchery marks were observed, nor was there any evidence of cooking. Neither were any horn cores present, making it impossible to suggest the sex of the animal. There were, however, enough teeth to allow an examination of the wear patterns and suggest a rough age. The material was examined using both Grant and O'Connor's methodologies and on the basis of O'Connor the animal may have been about six years old.[110] (SR)

The Prehistoric Ditch (figs 39–43)

Natural in this area comprised a clean and loose yellow sand (902/1020/1022/1024) with occasional red mottling (possibly from chemical weathering of sandstone inclusions). It was apparently of considerable depth, at least 0.8m, and sloped from south to north, following the natural contours of the site.

A substantial linear ditch (905/1025) had been cut into natural, and ran north–south across Area 9 and for the full length of Area 10 (figs 39–42). It is presumably the same feature encountered by Posnansky beneath Mounds 9 and 12, and also observed by him in a trench cut between Mounds 9 and 12 (see below). It sloped northwards, following the natural contours, and was generally 0.7–0.8m in depth, by *c* 2.5m wide at the top, and narrowing to *c* 0.3m wide at the bottom, where it generally had a flattened base (figs 39, 40 and 41). On the west side a substantial spread of medium to large angular sandstone blocks (1004), *c* 3m wide, extended for the full length of Area 10 (but had not been observed in Area 9). There was a layer of loose orange sandy loam (1003) in and around the stones. This is interpreted as the remains of a bank, constructed from stones removed when the ditch was dug. The base of the bank indicates both the original ground surface, approximately 0.6m below the present one, and also that there had been little truncation of the top of the ditch, which had been buried under centuries of slippage of sand downslope, followed by agricultural and then forestry activity (fig 42). The whole bank and ditch feature is regarded as being a land boundary rather than having a defensive role, given that it cuts across, rather than follows, the contours. Pottery sherds support a late prehistoric date.

There were varying degrees of primary silting along the excavated sections of the ditch. In some places there was a layer of mottled red and purple sand (906, 1010, 1013, 1016, 1017, 1019) which provided a hardened crust or lining on both sides of the ditch. In some sections there was a primary fill of softer yellow or orange sand (903, 1009, 1012, 1014, 1015) beneath it, often filling the base of the ditch, and sometimes extending up the sides.

These two main distinctions in primary fills appear to represent immediate slumpage and weathering of the ditch sides followed by a phase of consolidation providing the more compact and weathered stained surface. Along the western slope of the ditch there was a spread of large angular sandstone blocks, mixed with loose light yellow sand (907, 1018/1021/1023). This is

Fig 39. Area 10 from the south, showing bank and three sections across ditch. *Photograph*: author

Fig 40. Area 10: ditch section. *Photograph*: author

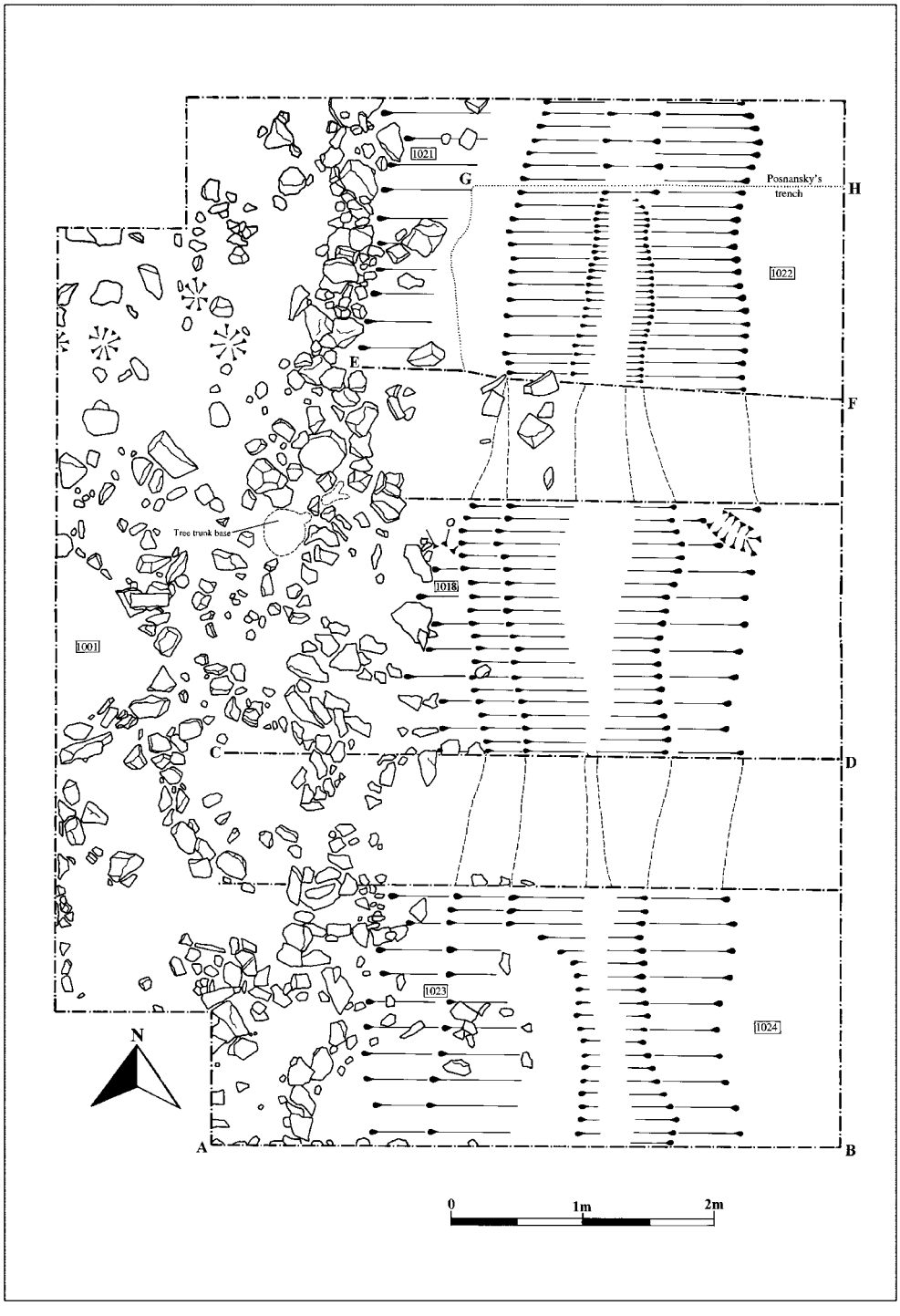


Fig 41. Area 10: plan after excavation, showing location of ditch sections in fig 42. *Drawing*: Sven Schroeder

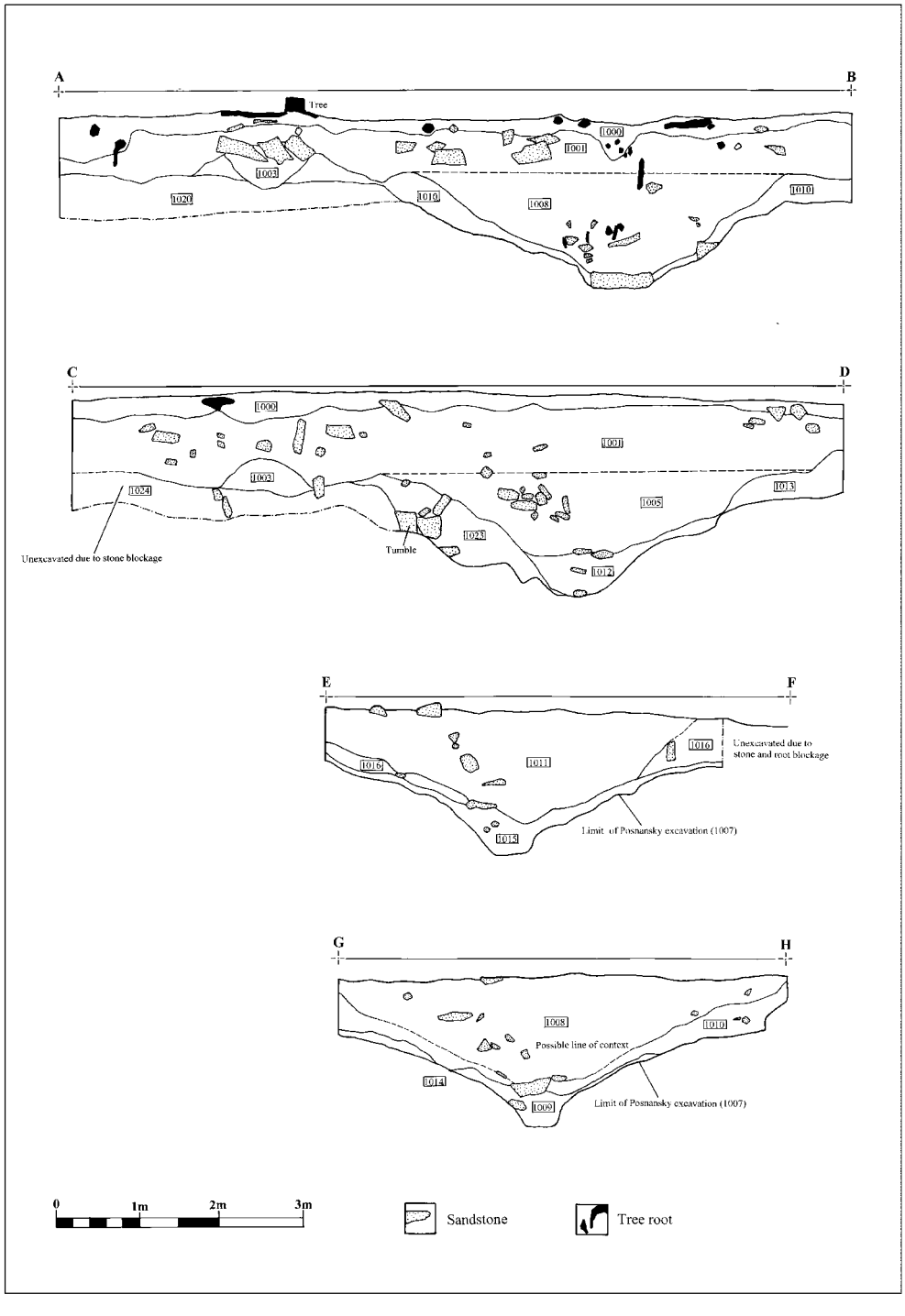


Fig 42. Area 10: ditch sections, from south to north, as indicated on fig 41. *Drawing*: Sven Schroeder

Fig 43. Area 10, showing Posnansky's trench re-excavated. *Photograph*: author

interpreted as tumble from the adjacent bank, possibly deliberately backfilled into the ditch, or displaced by animals.

The ditch had been backfilled with a homogenous layer of orange-brown sandy loam (904, 1005, 1006, 1008, 1011), up to 0.8m deep, with occasional sandstone blocks and quartzite pebbles. There was no stratification visible within the ditch fill and the backfilling may have been a single event. A small number of plain body or base potsherds were recovered from excavation and sieving of the ditch backfill. The sherds are small to medium in size (weights 1–8g) and abraded in varying degrees, which suggests they are residual. Their fabric is a coarse quartz-tempered ware, characterized by sparse, milky white, angular and poorly sorted quartz inclusions, some up to 5mm in size, in a fine sandy, iron-rich clay matrix. Dating is difficult, but on the basis of an absence of decoration and the similarity of the fabric to quartz-tempered wares from elsewhere in the Trent Valley, a first millennium BC date would appear to be likely.[111] At nearby Swarkestone Lowes, on the north side of the Trent, a vessel rim in a coarse quartz-tempered ware, from an entrance post-hole of a post-ring round house, was dated on typological grounds to the Late Bronze Age/Early Iron Age, in the date range of the ninth to fifth/fourth centuries BC.[112] Nothing of later date was recovered from any of the ditch fills, suggesting that the ditch had been backfilled by the Roman period.

The whole site was covered by a substantial layer of orange-brown sandy loam (901, 1001) up to 0.35m in depth, indistinguishable from the ditch fills which it overlay. The layer contained occasional quartz pebbles and sandstone blocks, as well as evidence for animal burrows and extensive root disturbance. The layer appears to be a subsoil, possibly created by erosion and soil creep from land further up the hill. It is notable that such a thick sandy loam layer was not found in the area of the barrows.

At the north end of Area 10 a regular rectangular cut (1007), 1.4 × 2.7m, was visible on removal of the subsoil. It was filled with a loose-mixed orange-brown sandy loam (1002), with grey and brown staining. The base of this layer coincided with the sides of the ditch as also revealed in the two new cross-sections. The backfill contained numerous sherds of modern pottery, including a porcelain teacup, and charcoal flecks. Its location allows it to be identified as Posnansky's 1955 backfilled trench, dug to investigate the V-shaped ditch (fig 43).

The whole site was overlain with a layer of accumulated and decomposed brown humic debris (900, 1000), up to 0.15m deep. This sloped northwards, following the natural contours, but was thicker in the immediate vicinity of tree stumps and roots.

DISCUSSION

Prehistoric Activity

What can be concluded, therefore, about the archaeology of Heath Wood and its barrow cemetery? The recent limited excavations do not allow much to be said about the pre-cemetery use of the site, although the hill was certainly part of a prehistoric field system in the Late Bronze Age and Iron Age. It appears to have been entirely coincidental that Posnansky found one of the field boundary ditches running under Mounds 9 and 12. The feature is clearly not associated with Scandinavian activity and is not part of a fortification. Rather, it was probably part of a rectilinear field system, such as those identified by Derrick Riley from aerial photographic evidence across the Lower Trent Valley.[113] Unfortunately, excavation of a 6m length of the ditch fill in the area between Mounds 9 and 12 yielded little new dating evidence to add to the potsherds recovered in 1955. The pottery recovered supports a late prehistoric date, and the excavation demonstrated that the ditch was associated with a parallel linear bank. Fieldwalking in the fields adjacent to Heath Wood by members of the Derbyshire Archaeological Society has also recovered evidence of prehistoric activity, including several flint clusters and sherds of similar abraded black hand-made pottery.[114] A few residual prehistoric flints were also found in several of the mound make-ups and must have been part of the general soil matrix across the site. The excavated section of ditch appears to have been backfilled at quite an early date and this ditch must have been completely level by the time the site was used as a cemetery. Elsewhere in Heath Wood, however, the survival of parallel linear banks identified in the RCHME survey may indicate that other sections of the field system were preserved, and some may even have influenced the development of the cemetery. Mounds 16–25 in particular might respect one such boundary, running north–south to the east of the barrows. Later ridge and furrow ploughing north of the cemetery certainly followed the same alignment. Possible traces of buried surfaces underneath Mounds 50 and 56 may indicate that the area was still farmed or grazed in the early medieval period, but soil conditions meant that no analysis was possible.

The Barrow Cemetery

By the time it was used as a barrow cemetery, the area of Heath Wood appears to have been open agricultural land overlooking the flood plain of the Trent. There is no evidence for any prehistoric barrows on the hilltop, but some ancient land boundaries may have survived and influenced the development of the cemetery.

There is no evidence for the chronological development of the site. As noted above, the RCHME survey suggests that the clustering of the mounds is real, but apart from the double row of Mounds 16–21 alongside the later carriage ride, they appear to be fairly randomly arranged. Apart from the isolated outliers, they are quite tightly packed within each group, with little clear space between mounds. There is considerable variation in the size of the mounds and it might be that the larger examples are the primary 'founder' burials with the smaller mounds filling in the gaps in between. However, the groups may equally have developed from one side to another, or from the centre outwards. Where adjacent mounds have been excavated there is no stratigraphic relationship visible between the construction of the mounds. Nor is there any build-up of deposits such as to suggest any great passage of time between the construction of neighbouring mounds. In the main cluster it was possible to observe the intersection of Mounds 6, 7, 50, 55 and 56. Layers of mound material eroding from the upper slopes of adjacent mounds were interleaved, but construction of the mounds appears to have started from a cleared level surface, with no overlap. The possible significance of the different clusters will be revisited below.

The construction of the cemetery would have been a very arduous process. In 1998 a team of a dozen people equipped with shovels and wheelbarrows took a full day to backfill two quadrants of a mound. Unless considerably more labour was available, construction of a barrow by spade or shovel with baskets or buckets to transport the soil must have taken several days of intense work.

It appears that each mound was built by first roughly marking the area to be used and then clearing the immediately surrounding ground down to bedrock to form a ring-ditch. In some cases this involved cutting into the bedding plane and levering up massive stones to be used in the mound. Excavation of Mounds 50 and 56 has proved that the superficial presence or absence of a ring-ditch is purely a product of differential erosion, survival and recovery. From the RCHME survey it appeared that Mound 50 had an encircling ditch, but this was not observable around Mound 56. However, excavation has demonstrated that soil had been quarried away to bedrock in the area between the two barrows, so as effectively to create a ring around each mound. This was no doubt a practical and economical way of creating mounds, rather than serving any other purpose. The subsoil was left *in situ* in the centre of the mound, and spines of subsoil were left to form causeways on to the mound: Mound 50 had two such causeways; in Mound 56 one causeway was observed, adjacent to the burial deposit. These causeways were wide enough for a single person and would have provided access during the cremation and subsequent mound building. Mounds 50 and 56 were also both built up with a dump of orange sandy clay, presumably made up of soil removed from the ditch. This levelled any unevenness in the mound and provided a level platform for the burial (fig 44). From this point onwards the practice varied between each mound, apparently reflecting different burial rites practised within the cemetery as a whole.

The excavations of 1998 to 2000 have revealed that in some cases the mound marks the site of a pyre which extended across the platform, whilst in others it appears that the cremation took place elsewhere and that only a small proportion of the cremated material was placed on

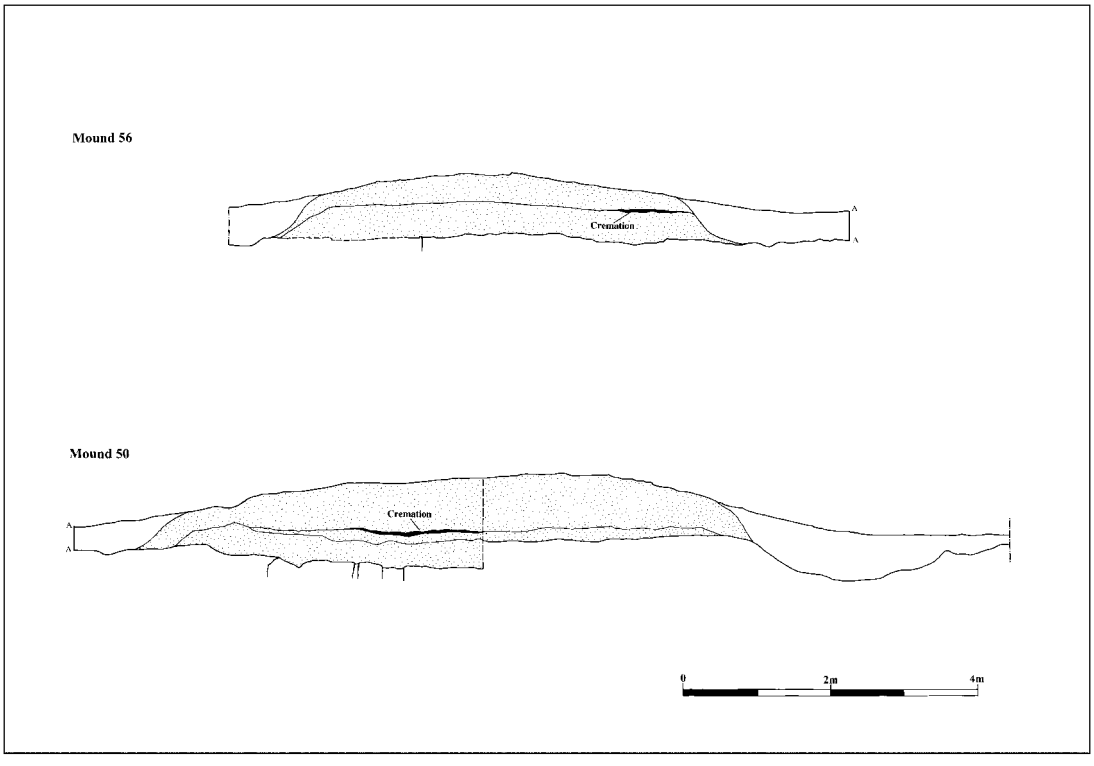


Fig 44. Profiles of Mounds 50 and 56 showing cremation deposits. *Drawing*: Sven Schroeder

the mound platform. Mound 50 contained the remains of a cremation hearth, which would have been discovered even if no more than a narrow trench had been excavated across the barrow. Mound 56, on the other hand, contained only a few grams of cremated bone, associated with the ringed pin. This material had been buried towards the edge of the mound and was only discovered when a third quadrant was examined in the final season of excavation. Because there had been no cremation hearth, there was no trace of the burial in the other quadrants, not even the charcoal flecks that had characterized the lower levels of Mound 50. All previous excavations in Heath Wood had employed trenching and had only investigated part of the mound interior. It is clear that these excavations could easily have missed such peripheral and transient traces of cremation as were encountered in Mound 56. All previous interpretations based upon the presence of cenotaphs or empty mounds are therefore now in doubt, and whilst it is accepted that these apparently empty mounds represent a different rite, it is more appropriate to see them as burials of those cremated elsewhere and marked at Heath Wood by a token burial deposit.

Cremation hearths were reported in Mounds 1, 5, 6, 7 and 11, plus the five mounds excavated by Bateman, although it is unclear whether he really found hearths in each and he certainly found few objects. Traces of a cremation, but no hearth, were found in Mound 3, but Mounds 2, 4, 8, 9, 10, 12, 13 and 15 were described as empty and interpreted as cenotaphs. These should now be reinterpreted as potentially containing small cremated offerings, as in

Mounds 3 and 56. If Mounds 50 and 56 are included, but Mound 14 is omitted as being natural, Mound 21 as difficult to determine and the five Bateman mounds as being uncertain, this gives a total of six definite cremation hearths and ten possible token cremation burials. The proportion of excavated burials with cremation hearths is therefore 38 per cent, compared with 64 per cent token burials. If this ratio were to be reflected throughout the fifty-nine barrows of the complete cemetery, twenty-two cremation hearths and thirty-seven token cremations would be anticipated. The significance of this difference will be discussed further below.

Mound 50 was used as a platform for a cremation pyre. Before the pyre was built a layer of clean yellow sand was spread in the centre of the mound. This was dissimilar to the subsoil immediately adjacent to the mound, but could have been brought from elsewhere in the area (and was similar, for example, to the very sandy soil excavated over the ditch between Mounds 9 and 12). The pyre was built upon this layer, which became reddened from the heat. McKinley has demonstrated that bodies are likely to have been placed within the pyre but towards the top, rather than resting upon the ground.[115]

The effectiveness of the cremation has left a meagre record of those objects originally placed with the body but it is clear that these included weaponry and other objects placed on the pyre and subjected to its heat. Of the six recorded mounds with cremation hearths, three were accompanied by swords or fragments of swords. In two cases (Mounds 1 and 7) parts of the blade and hilt were present; in Mound 50 there was just a mount from the hilt. The swords must have been deliberately mutilated prior to cremation; it is less clear if the complete sword was then cremated with the body but only partially recovered, or whether only a portion of it was put on the pyre. The intentional 'killing' of weapons also occurs in Viking graves at the nearby site at Repton, Derbyshire, in the cremation burial at Hesket-in-the-Forest, Cumbria, at Ballateare on the Isle of Man, at Islandbridge, Dublin, and in Scandinavia.[116]

It seems likely that at least two of the burials were also accompanied by shields. Mound 50 contained a number of shield rim clamps as well as nails which might have held a boss in place; it is likely that Leeds was also correct in interpreting the twenty-four small tacks recovered from Mound 7 as representing the nails holding the leather binding to the rim of a circular shield. The remaining objects recovered from the cremation hearths comprise buckles and other strap fittings or sword attachments from a belt. The tip of a small knife blade recovered from Mound 50 is also from a type of object that may originally have been suspended from a belt. The silver-wire embroidery from Mound 11 and the fragments of burnt bronze and silver from Mounds 1, 6 and 50 may represent small personal ornaments or dress fittings.

The various nails recovered from Mounds 5, 6, 11 and 50 may have come from other objects, but could also have come from timbers used for fuel. Mound 50, excavated completely under modern conditions, probably has the most representative collection of nails, and given that many are plated it seems likely that they originated from objects in which they had a decorative as well as a functional purpose. The two small tacks from Mound 50 are too small to have held anything together but they could have been used for attaching mounts to other objects, such as a box.

In 1995 we suggested that some of the nails recovered in earlier excavations might have come from coffins or chests which held the body, or from biers on which it was placed.[117] The hinge pivot now recovered from Mound 50 supports the idea of the body being in a chest. We also speculated whether some of the biers might have been constructed from sections of ships' planking. However, closer examination of the nails indicates that, with the possible exception of the large example from Mound 5, they are not of the clench nail type, and we are now inclined to agree with Graham-Campbell that this interpretation is unlikely.[118] The use of

chests as coffins or sections of planking as biers, however, remains likely. Throughout the Viking Age in Scandinavia chests were used primarily as furniture for storage or for travelling. They also had a secondary function as coffins. Because they possessed lids and were usually fastened by iron hinges, chests could be locked, perhaps thus combining connotations of a voyage with a theme of private property and the sanctity of personal ownership. One end of the chest found at Lejre, Sjælland, had been broken in order to facilitate the insertion of a fully extended adult corpse.[119] The Fyrkat chest had probably undergone the same alteration, whilst the body in the Forlev chest was laid out with bent knees.[120] Similar types and numbers of nails are known from the cremation graves at Birka.[121] At York, at least four instances of Viking burial in wooden, domestic storage chests have been detected.[122]

The cremation hearths apparently contained the bones of both sexes. Indeed, where it has been possible positively to determine sex, in Mounds 5, 6 and 50, the subjects have all been probable females. Mounds 5 and 6 did not contain any grave goods thought to be diagnostic of gender, but the molten remains of dress fittings and ornaments could be appropriate to a female cremation. The recovery of the sword hilt guard and shield rim clamps from Mound 50 also requires comment. Whilst it is possible that the female has been misidentified, it would be unwise to dismiss the skeletal sexing simply because it conflicts with the grave-good evidence. It is also possible that the objects have been misidentified, or even that the woman was cremated with weapons as a mark of status, although this would be highly unusual.[123] It should be noted too that the bones of a child or juvenile were also identified in Mound 50, and that children are more likely to be buried with females. It could then be that the weapons were markers of the status of the child or juvenile, rather than the adult. Härke has drawn attention to the fact that Anglo-Saxon boys of all ages were buried with weapons, although shields were generally given to boys only when they reached puberty.[124]

Where two individuals are cremated together it is also possible that one was sacrificed to accompany the other, and that a slave might have been intended to accompany his or her master to Valhalla as an item of property. The practice is documented amongst the Rus, and appears to be reflected in the pagan Viking burial at Ballateare on the Isle of Man.[125] The presence of the remains of more than one individual on the pyre of Mound 50 also reminds us that more of the cremation hearths might represent double burials. Holck has noted the presence of a number of double graves in Norwegian and Danish cremation burials, comprising forty-eight (4.4 per cent) of the total from Norway and twenty-one (1.3 per cent) of those from Denmark. Holck concludes that it is unrealistic to believe that such a large number of double graves could result from two people dying simultaneously. Whilst they may not necessarily have been cremated at the same time, Holck has also suggested the possibility of human sacrifice. Where the double graves are of adults and children he suggests an alternative and more practical explanation: because of their lower body fat ratio children take much longer to cremate than adults and it may be that the complete cremation of the child was only possible with an adult body beside as a 'heat producer': 'the child needed to be burnt in the flames from the adult'.[126]

Each of the hearth deposits also included the cremated remains of animals. The records from previous excavations are likely to be incomplete and to under-represent smaller animals. Nonetheless, sheep, cow and a possible dog were identified in Mound 1, cow and a possible horse from Mound 5, cow plus possible sheep and pig from Mound 6 and a possible small dog and sheep from Mound 11. Re-examination of the bones from Mound 11 has confirmed the presence of a dog and sheep or goat, and added a horse. In Mound 50 a variety of animal species was identified, probably reflecting the use of flotation and improvements in the

recognition and identification of cremated animal bone. These comprised horse, dog and pig, probably cow and sheep, and possibly bird. Given the variety of the species represented it is unlikely that all these animals should simply be regarded as the remains of funeral feasts, although given the weights and range of bones represented it does not seem as if complete carcasses of all animals were placed on the pyre. It is more likely that some sacrificial animals were cremated on the pyre alongside the human corpse, whilst in other cases some joints of meat were cremated and the other parts were consumed by the mourners. From the bones represented in Mound 50 it appears that the remains of a complete horse and a large hunting dog were cremated, along with joints of pork, mutton and beef. Whilst the horse and dog were to accompany their owner on the journey to Valhalla, the sheep, cow and pig were to provide food along the way.

It is impossible to speculate about the ceremonies that might have accompanied the cremation, but the pyres burning on the skyline above the River Trent must have been visible for miles, particularly against a night sky. Once the fires had died down and the hearths cooled it seems as if they were raked (on the basis of the evidence of Mound 50; see McKinley above). This would explain the degree of fragmentation of the bone and the apparent haphazard distribution of body parts across the hearth. It may also have been at this stage that some of the more obvious surviving fragments of grave goods were collected, which would explain the rather random assortment of surviving nails, as well as the missing parts of the three swords and the absence of shield bosses.

An alternative cremation rite is represented in Mound 56. In this case the equivalent of a shovelful of charcoal and burnt bone was placed on the edge of the mound, on the side adjacent to Mound 50, possibly suggesting some satellite relationship to it. This must represent only a small part of the cremated body. Care had been taken, however, to include the ringed pin as a personal ornament. This had also been burnt on the pyre, but not so completely as to destroy it. Remains of personal dress items, including a buckle and some bronze fragments, were also recovered from Mound 3, which again appears to represent a token cremation burial. In neither case was it possible to determine sex, but both were single adult burials. In Mound 3 no animal bones were identified; in Mound 56 a small fragment of pig bone was recovered, suggesting a food offering rather than an animal sacrifice. The location of the actual cremation pyre is unknown in both cases, but this issue will be returned to below.

The final stage of both cremation rites involved building up the mound to give it a domed shape. There does not appear to have been any specific method to this and no evidence for mound structure. There were no kerbs in either of Mounds 50 or 56, although the stone bedrock from the ring-ditch around the mounds at first gave the impression of a kerb, a feature that was also observed in the earlier excavations. The make-up of the mounds appears to have been determined by the material that was most easily available; in some cases this included a higher proportion of large rocks and boulders; in other cases the mound was largely composed of sand and gravel. In Mound 50 the section indicated that the mound had been built up from the outside and soil and stones tipped into the centre. Soil probably had to be brought from elsewhere in the vicinity; there is evidence of quarrying within Heath Wood.

In three of the cremation hearth burials, from Mounds 1, 6 and 50, unburnt animal bones were incorporated in the mound make-up. In Mounds 1 and 50 unburnt cow skulls were placed above the hearth and buried in the mound; unburnt cow bones were also found in Mound 6. These may also represent offerings, but could perhaps be the residue of meals eaten by those constructing the mounds.

Once the mound profiles were complete it seems as if they were fairly rapidly consolidated. There was initial run-off and silting of the ring-ditch but the mounds appear to have been quickly grassed over, certainly within a year. The excavated profiles of Mounds 50 and 56 may indicate that they were deliberately turfed to prevent erosion. They then appear to have retained their original form for several centuries. The main mound clusters would have been resistant to cultivation, although medieval ploughing may have cut into and started to level the cluster of Mounds 16–25 on the edge of the hill. The mounds in the main group, however, appear to have retained their form until the mid-eighteenth century, although they may have provided a welcome habitat for rabbits and other burrowing animals, as they do today. At that stage the landscaping of the grounds of Foremark Hall and the plantation of the wood appears to have led to substantial erosion of the mounds until the wood itself was consolidated, shrouding the barrow cemetery in trees and protecting it from the gaze of possible robbers, albeit still leaving it subject to periodic bouts of subsequent forestry activity.

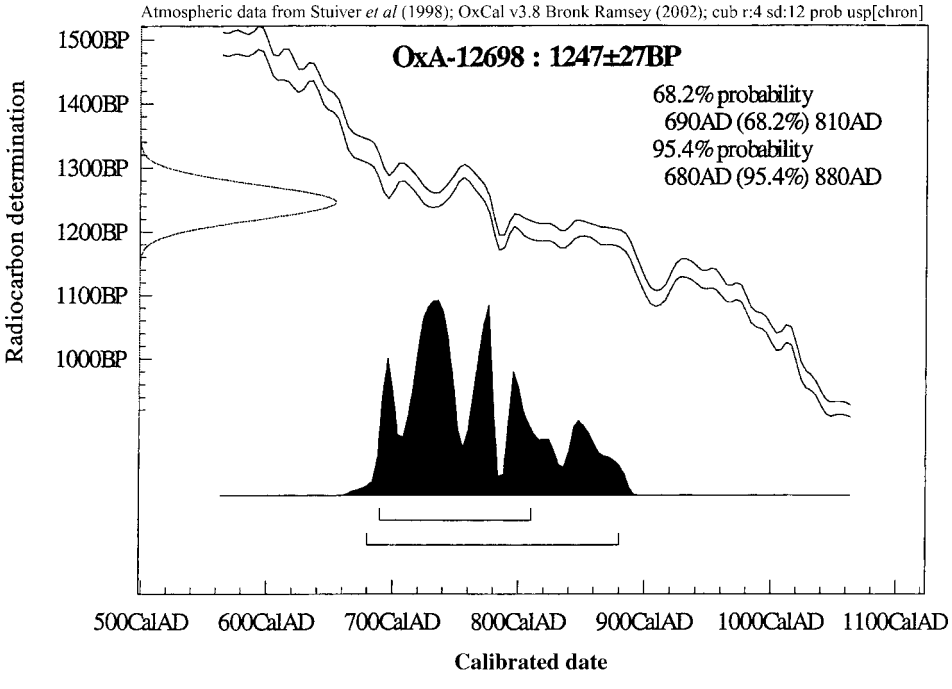
The Wider Context

The age of the Heath Wood cemetery has been debated but the recent excavations confirm that Bateman, and then Leeds, were correct in ascribing it to the period of Scandinavian raiding and settlement of England, that is, to the late ninth or early tenth centuries AD. A number of finds are particularly diagnostic, namely the two sword blades and hilts from Mounds 1 and 6, the hilt guard from Mound 50, the silver-wire embroidery from Mound 11 and the ringed pin from Mound 56. Each of these confirms a late ninth to early tenth century date for these burials but do not, unfortunately, allow the date to be tied down any more precisely. Samples of cremated human bone from Mounds 11, 50 and 56 were submitted to Oxford University Radiocarbon Accelerator Unit. These yielded uncalibrated dates of 1247 ± 27 BP (OxA–12698), 1191 ± 26 (OxA–12700) and 1163 ± 26 (OxA–12699) respectively (figs 45a–c). Once calibrated the determinations have a 95.4 per cent probability of falling between AD 680–880, AD 770–950 and AD 770–980. For the bone recovered from the 1998–2000 excavations, the sample from Mound 50 has a 68.2 per cent probability of falling between AD 780–890, and that from Mound 56 the highest probability (42.3 per cent) of falling between AD 810–900. Whilst these dates do not allow us to date the cemetery with greater precision, they are at least consistent with the period of Scandinavian activity in the ninth and tenth centuries.

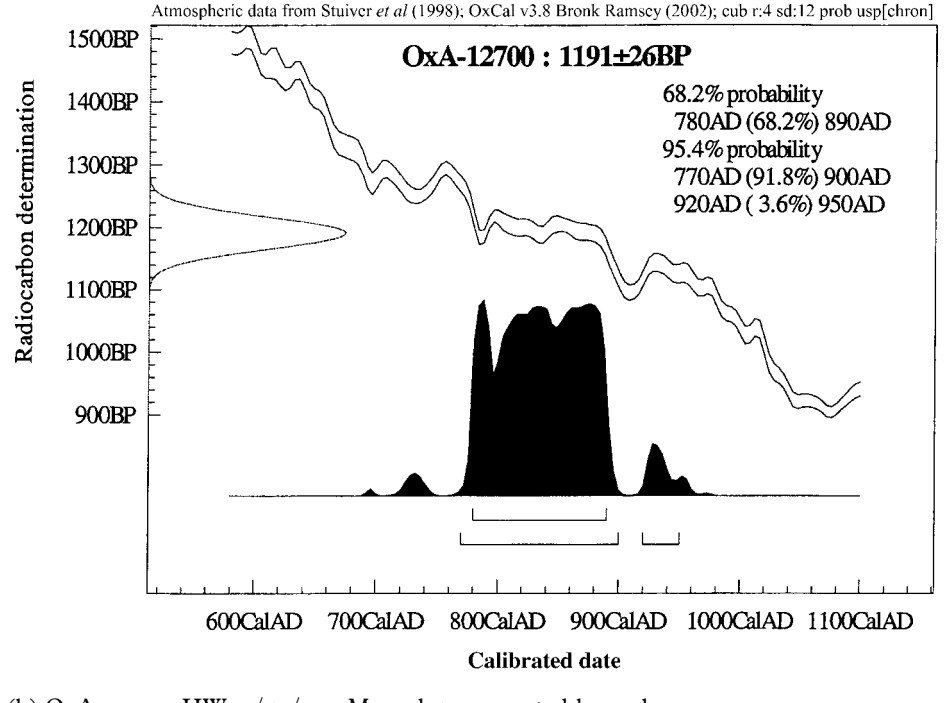
The burial rite itself is also diagnostic. By the early eighth century cremation had ceased to be employed in England and was condemned by the Church. By the ninth century most native English burials were unfurnished inhumations, often, but not exclusively, in churchyards.[127] Cremation burials within mounds are found in Late Iron Age and Viking Age Scandinavia, where they clearly represent a pre-Christian burial rite. The inclusion of weaponry on the pyre and the cremation of animals are practices also known from Viking Age Scandinavia.

Scandinavia

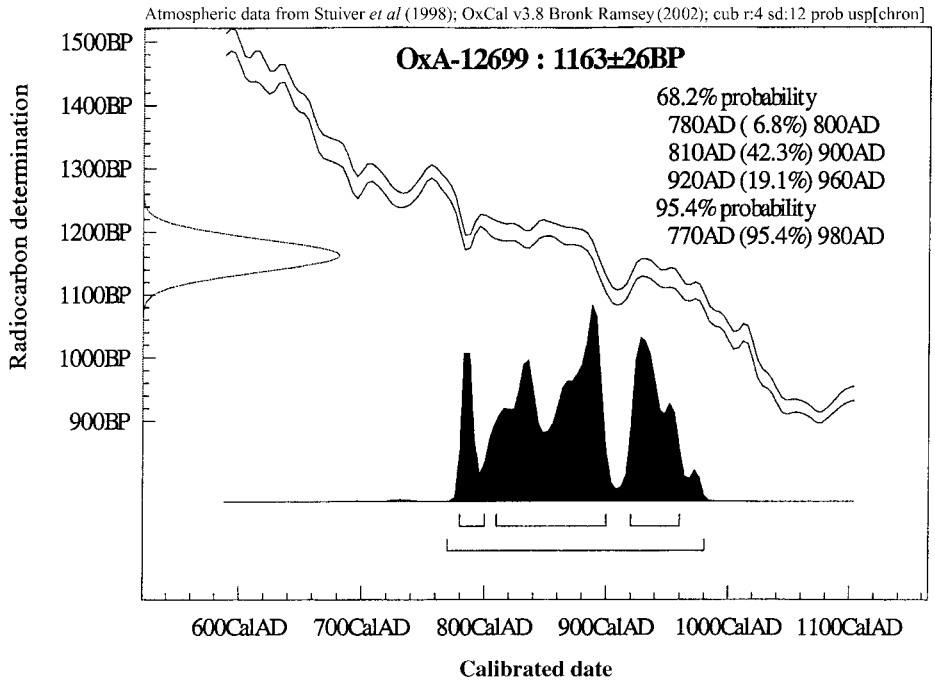
In Scandinavia cremation seems generally to have been more common in Sweden and Norway than in Denmark. In most Scandinavian cremation burials the body was clothed and adorned with jewellery and fastenings and incinerated on a pyre. The cremated bones and molten objects were then treated in a variety of ways, according to local custom and belief. In central Sweden, for instance, the burnt remains were usually separated from the ash and charcoal and placed in a pottery vessel, which was then buried in a pit; in parts of Finland they were



(a) OxA–12698 HW56/11 Mound 11, cremated bone, human



(b) OxA–12700 HW99/50/411 Mound 50, cremated bone, human



(c) OxA–12699 HW00/56/508 Mound 56, cremated bone, human

Figs 45a–c. Plots of radiocarbon results showing: (i) the radiocarbon determination on the left-hand axis; (ii) measurements on known age material as the uneven double line; (iii) the likelihood of different possible ages of the samples shown as the solid black distribution. *Graphs*: Oxcal computer program (v3.8), Oxford University Radiocarbon Accelerator Unit

scattered on the ground. The remains were then either covered by a mound or marked with arrangements of stones, sometimes in a ship setting.

In Denmark cremation cemeteries are mainly found in northern Jutland, at sites such as Åsted, Kirkelund, Ris Fattiggård, Hørby, Lindholm Høje, Øsløs and Højstrup.[128] These generally consist of upwards of around thirty barrows, but may contain some empty mounds, as well as ship settings. The grave goods include iron objects, including rivets and nails, as well as glass beads and potsherds, but weaponry is less common. The absence of prestigious, status-conferring objects from this kind of grave in Denmark has led to the view that they belong to the lower levels of Scandinavian society. However, as Roesdahl has stressed, we know relatively little of pre-Christian burial rites.[129] With 700 graves, Lindholm Høje is the largest burial ground in Denmark, although the majority of the graves date to the Germanic Iron Age. Oval and ship-shaped settings predominate, but other shapes include triangles, squares and circles. Burial pits, small mounds and cremation patches also occur. Cremation seems to have taken place on the spot; occasionally unburnt animal bones are found. The later male graves often contain buckles and rivets, and some weapons occur in the Viking period burials. It has been suggested that the cremation temperatures at Lindholm were fairly high, often more than 1000°C, whereas Swedish pyres reached 800–1000°C, and that this explains the poor artefact survival.[130]

Shetelig felt that the resemblance between Heath Wood and the north Jutland sites was so striking that those cremated at Heath Wood must have come from north of the Limfjord.[131] This view was accepted in our 1995 assessment of the site[132] but there are also parallels from both southern Sweden and Norway, where cremation was as popular as inhumation. In rural communities in Norway and eastern central Sweden cremation was the most common form of Viking Age burial. Cremation graves under mounds cluster around Viking Age farms, usually on rocky outcrops. At Birka there are about 1,600 burial mounds in Hemlanden and 400 south of the hillfort, mainly cremations. Stolpe excavated almost 560 cremations and about 550 inhumations in coffins and chambers. The cremation graves contain various fragments of molten jewellery and iron nails but traces of weaponry are also common in Birka whereas they are unusual in the north Jutland cremations.[133] Crowfoot suggested that the distinctive Scandinavian style of wire embroidery, known as *Ösenstitch*, is also a southern Swedish trait, and it is certainly found in Birka.[134] The only similar example known from England is of a related needle-binding method, or *nålebinding*, on a woollen sock recovered from a tenth-century context at Coppergate, York,[135] although silver-wire embroidery has been found in other Scandinavian-type burials in England (see above).

The ideological significance of cremation has tended to be neglected by early medieval archaeologists. Most have followed the general view that the flames release the 'soul' or identity of the deceased for the journey to an afterlife, and that this ascends to the sky on the smoke from the funeral pyre. Grave goods are provided for the use of the deceased in the next world and will therefore reflect the status to be assumed in that world. Literary support is found in *Heimskringla*, written in Iceland by Snorri Sturluson, *c* 1230. It was said that Odin:

> ordered that all the dead were to be burned on a pyre together with their possessions, saying that everyone would arrive in Valhalla with such wealth as he had with him on his pyre and that he would also enjoy the use of what he himself had hidden in the ground. His ashes were to be carried out to sea or buried in the ground. For notable men burial mounds were to be thrown up.[136]

According to Snorri Sturluson cremations were the oldest form of burials and related specifically to Odin worship whereas inhumations were a new fashion introduced by worship of Freyr. The simultaneous occurrence of each rite in the same area does not permit us to follow his chronological distinction, but the difference may relate to cult preferences.[137]

In many societies fire has a cosmological significance as an agent of transformation. It can ward off evil spirits and is entrusted with the task of presenting offerings to the gods. Fire changes a substance from one state to another and therefore helps the dead travel across boundaries.[138] Williams notes that in the story of Baldr's death, the ship, the horse and transformation by fire all serve as metaphors for changing the physical and spiritual status of the deceased.[139] In some circumstances cremation can also be seen as a way of preventing the dead from walking again. A common theme in the later Sagas is the use of cremation to get rid of dangerous corpses, those individuals who have been polluted by a 'bad death' and must be dispersed by an extreme form of disintegration of the body.[140] The ritual mutilation of swords and other weapons, seen at Heath Wood and also in several inhumation burials, might be viewed in the context of preventing a known violent individual from continuing this behaviour in the next world, or might be to protect these objects from robbers. The deposition of mutilated weaponry in Scandinavian bogs, going back to the Germanic Iron Age, is seen as a means by which thanks are given to the gods for victory in battle. Maybe the mutilation of weapons in graves performs a similar act of dedication of the weapons to the world of the gods.

The cremation of animals is also a distinctive feature of the Heath Wood cemetery, and is paralleled in other Viking Age burials.[141] Cremated animal offerings were recorded in the Scandinavian mound burial at Hesket-in-the-Forest (see below) and from mound burials with inhumed bodies at Ballateare, Balladoole and Cronk Mooar, on the Isle of Man.[142] Unburnt animal offerings are also known from other Viking graves, including inhumation burials at Knoc-y-Doonee,[143] on the Isle of Man, and from Dublin. Two inhumation graves found in Islandbridge cemetery in the mid-1930s were accompanied by animal remains. One of the skeletons was accompanied by a cattle jaw bone, while a cow tooth and a horse tooth were found in the second grave.[144] Williams has argued that the sacrifice of animals as part of mortuary ritual should be seen as part of the rite of passage: 'the killing of an animal is more than the disposal of the deceased's property, it is instead a key social, economic and cosmological statement of the relationship between the dead and the soul's journey to a perceived afterlife'.[145]

Even animals that do not bear the dead can act as guides, and no distinction is necessary between eating an animal at a funerary feast and its use in journeying with the soul of the dead: 'animals may be more than symbols of identity and wealth; in some cases they merge with, or become integral to, the changing identity of the deceased'.[146]

The British Isles

Viking burials, as defined by the presence of grave goods, are uncommon in the British Isles and particularly rare from lowland England.[147] For the period AD 800–1000 there are fewer than twenty-five burial sites in England which have been described as Scandinavian, and the majority of those are single burials. Halsall seeks to reduce the body count still further by arguing that many of those identified as Scandinavian simply on the basis of objects from the grave may have been misidentified and could well have been Anglo-Saxon.[148] Repton and Heath Wood are the only sites with identified Scandinavian burials in Derbyshire, despite the recorded settlement of a section of the Great Army in Mercia (see below). It has been suggested that a ring-ditch excavated at Foston, some 10km west of Derby, may have been a Viking burial mound but this is based solely on two radiocarbon dates from the ditch fill.[149] It is evident that the majority of Scandinavian settlers must have adopted new burial rites, such as unaccompanied burial with hogback grave markers, becoming assimilated with the native population through the adoption of churchyard burial.[150] Hadley suggests that in general Scandinavian leaders were very adept at adopting indigenous practices and forms of lordship and that in their desire to take control of parts of northern England it was inappropriate to display any sign of 'otherness'. Indeed, she argues that they may have encouraged the fashion for local churchyard burial and for local displays of status, rather than burial in Anglo-Saxon minsters whose prestige would have been undermined by attacks on their resources and the loss of their relics.[151]

Cremation burials are particularly infrequent in the British Isles, and Heath Wood is the only known Viking cremation cemetery, although a small number of single cremation burials have been recorded, mainly in antiquarian accounts. In common with other accompanied Scandinavian burials these tend to cluster around the Norse fringes.

In Orkney 'burnt bones' were recovered from a mound at Lyking, Sandwick, on Mainland in the nineteenth century, together with an iron spearhead, a buckle and an unburnt comb.[152] One of two burials from Lamba Ness, Sanday, was a cremation: 'a deposit of burnt bones was found about the centre of a mound',[153] associated with an unburnt pair of oval brooches, a

lignite arm-ring, a bronze ringed pin and an amber bead.[154] In both cases the cremation was under a mound although the presence of unburnt objects distinguishes these burials from those at Heath Wood. The artefacts must have been added to the burial after cremation as grave-good offerings. There is a third possible Orkney cremation from Knowe of Moan, Harray, where a small cist, eighteen inches square, was found associated with a Hiberno-Saxon mount and sixty-four beads, although no burnt bone was recorded.[155]

From Skye, in the Hebrides, a prehistoric cairn at Tote, Skeabost, contained a secondary Viking burial, probably a cremation, with an axe, bronze pin and ivory bead.[156] At Càrn a'Bharraich, on Oronsay, a bed of charcoal and boat rivets was discovered in the centre of a substantial mound; pieces of bronze and a stone sinker were recovered from the mound, which also incorporated a number of inhumation burials, possibly secondary.[157] At King's Cross Point, on Arran, there was the burial of a high-status woman, whose cremated remains were within a stone setting under a mound. An iron lock plate and clasp may represent a wooden chest; four rivets, an iron nail and the burnt remains of a whalebone plaque were also recovered. A styca of Wigmund (837–54) may date the burial to the mid/late ninth century.[158] At Blackerne, Kirkcudbrightshire, an eighteenth-century account notes that a 'parcel of human bones, along with several teeth, were found in the heart of a cairn'.[159] Two finds of Viking objects from mounds, but with no record of a skeleton or any bones, may also have been cremations. At Boiden, Loch Lomond, a bent sword and damaged shield boss were found in a mound[160] and at Millhill on Arran a sword and shield were recovered from a gravel mound.[161] In general, however, evidence for cremation is scarce in Scotland, despite its popularity in Norway.

The absence of Viking cremation in Ireland is even more surprising. Of an estimated seventy or eighty male burials and possibly about ten female burials in the Dublin area, there are no certain cremations. In the great cemetery at Kilmainham-Islandbridge there is no evidence for mounds and although the presence of some bent swords and spearheads has sometimes been taken as indirect evidence for cremation the bending is unlikely to have resulted from heat damage and is more likely to represent the deliberate mutilation of weaponry accompanying inhumation burials. The absence of cremation in Ireland might be attributed to the influence of Christianity.[162]

Cremation is not known from the Isle of Man, although Kristin Bornholdt Collins[163] has noted that Clay's near contemporary account of the Kirk Andreas hoard (*c* 970) hints at the possibility, for with the coins were found '... some horse teeth, bits of charred wood, and black earth, which indicated burning'.[164] On the basis of this report Dolley suggested a 'doubtful association with one or more cremation burials possibly Viking in date'[165] although Graham-Campbell rejected the idea as cremations are otherwise unknown on Man in this period and 'such material must surely represent no more than general occupation debris'.[166] If it is a cremation it is an isolated and very late example.

In England there are one probable and three possible cremation burials from the north west. At Hesket-in-the-Forest, Cumbria, a layer of charcoal, cremated bones and ashes with several grave goods was found in 1822, lying on a bed of sand under a cairn, 22ft (6.7m) in diameter.[167] The burial at the centre was covered with large stones, in turn covered by smaller ones. Shetelig argued that this was a cremation after the Norwegian fashion but Cowen disputed this, noting that all the bones were of animals and that no human skeleton was recovered.[168] Nonetheless, the burial was accompanied by extensive Viking Age grave goods, comprising a sword, two spears, a shield, an axe, a horse bit, a pair of iron spurs, an iron sickle blade, a whetstone, two small iron buckles and an antler comb and case.[169] The sword, shield

boss and bridle-bit were all burnt, suggesting that the weapons and a horse may have been placed on the cremation pyre. The sword and spears were bent; the shield had been broken in two; the sword had been deliberately bent back twice on itself, by heating and hammering, rendering it useless.

Another mound burial was also discovered in 1822 at Claughton Hall, Garstang, Lancashire, when a small sand mound was cut through in the course of road building. No skeleton was found but the objects comprised a pair of gilt copper-alloy oval brooches, apparently wrapped up back to back in cloth and encasing two beads and a molar tooth, a Carolingian silver mount reused as a brooch and various iron objects, including a sword, spear, axe and hammer. This may have been a double burial of male and female, but it is more likely that the burial was male and the brooches enclosed a ritual deposit of various amulets or keepsakes.[170] There may have been a wooden chamber below the surface but the finds also included a Bronze Age axe hammer and a pot containing a cremation, now lost, so the finds from Claughton may represent another Scandinavian cremation, or secondary usage of a prehistoric barrow in which traces of the body comprising the secondary inhumation burial had disappeared. Edwards also suggests that an urned cremation found with a Viking sword at Inskip (SD 4438), only five miles from Claughton, might represent a Viking cremation.[171] Finally, there may be a fourth Viking cremation from north-west England at Bents Hill, Crosby Garrett, Cumbria (NY 7006). In 1873 Greenwell excavated a secondary cremation in a Bronze Age round cairn, comprising the burnt remains of a juvenile male inserted close to the apex of the mound. The associated finds comprised an iron knife, an iron buckle, iron shears with an ornamented handle and an iron bridle. Greenwell ascribed it to the Anglian period but the finds make it more likely to be Scandinavian.[172]

In summary, the rarity of distinctive Scandinavian burials from England, and the particular shortage of comparable cremation burials from the British Isles as a whole, makes Heath Wood stand out as being of particular significance. In order to understand why there should be a Scandinavian cremation cemetery of some fifty-nine mounds in Derbyshire we need to consider the local context.

Heath Wood and Repton

By AD 800 Lindsey and the other Anglo-Saxon kingdoms of the Midlands had come under the control of Mercia. Nonetheless, this powerful overlord provided inadequate protection against Viking raids. In 865–6 a highly mobile Viking force landed in East Anglia. It is generally assumed that it came to England direct from Scandinavia, but Simon Keynes has suggested that it was a composite force, with elements drawn from groups that had been active in Ireland and on the Continent. It is difficult to get a clear understanding of the size of this army, beyond the fact that the compilers of the *Anglo-Saxon Chronicle* considered it to be 'Great' and that it was powerful enough regularly to over-winter in England.[173] On the basis of its success and coherence over several years, some historians have been tempted to suppose it comprised perhaps two or three thousand men, but others have suggested it may have numbered as few as three hundred.[174] The leaders included Ivar the Boneless and his brother Halfdan, both sons of Ragnar Lothbrok, as well as another king called *Bagsecg*, and several 'earls'. If Ivar is the same person as the Ímar who is recorded as raiding in Ireland in the 850s and 860s then it must be assumed that they met up in England and assumed joint leadership.

After the conquest of Northumbria in 866, and East Anglia in 869, it is believed that the Great Army was reinforced by what the *Anglo-Saxon Chronicle* describes as a 'Summer Army',

under Guthrum, before it forced Wessex to make peace in 871.[175] The army then appears to have turned its attention to Mercia, over-wintering in London in 871–2 and Torksey in 872–3. In the autumn of 873 the Great Army arrived at Repton and took over the monastic complex, driving the Mercian king Burgred into exile in Rome, and placing one of his thegns, Ceolwulf, on the throne as its puppet king. The *Anglo-Saxon Chronicle* records that the army took *wintersetl*, or winter quarters, there. Its choice had a symbolic as well as a tactical significance. By the late ninth century Repton was one of the principal ecclesiastical centres of England, and was closely associated with the power of the Mercian royal family. A monastery had been established here in the seventh century. It appears to have been a double house for men and women ruled by an abbess of noble, possibly royal, rank.[176] Several of the kings of the Mercian house were buried at Repton, including Aethelbald after his murder at Seckington in 757. In 849 Wigstan (Wystan) was brought to Repton after his murder in a struggle over the succession to the Mercian throne. Wigstan was buried in the mausoleum of his grandfather, Wiglaf (827–40). This is almost certainly the crypt, which survives beneath the chancel. Miracles took place at the tomb and the entrances to the crypt were lengthened to deal with the flow of pilgrims.[177] Before the end of the ninth century, Wigstan had come to be regarded as a saint. By this stage the church had a north and south porticus, and a chancel over the mausoleum, with burials to the south and east. The seizure of one of the holy places of Christendom could not have gone unnoticed; its continued occupation by the Viking Great Army suggests that it recognized its symbolic importance. But Repton also occupied a strategic location. The church of St Wystan was built on a prominent bluff on the south side of the flood plain of the River Trent. The river now flows on the far side of the valley, 1km to the north, but originally flowed on the Repton side, at the foot of a low cliff. Repton therefore lay at an important junction of the main routes across the Trent and along the valley. In late ninth-century England this was an important frontier and a key point for the control of the Midlands.

The Viking cemetery at Heath Wood is only some 4km to the south east of Repton. The hilltop on which it sits overlooks Repton and the Trent; the Mercian monastery and Viking winter camp would have been visible from it. Given that both Heath Wood and Repton are exceptional sites I believe that they must have been linked in some way. In an earlier paper I sought to explain Posnansky's cenotaph memorials by suggesting that pagan burial at Heath Wood might have commenced before the establishment of the Repton winter camp but that the cemetery continued in use during and maybe beyond the occupation of the winter camp. I suggested that the cenotaph burials represented a phase of Christianization, and might even represent those given Christian burial elsewhere, possibly even in the Repton churchyard.[178] However, our excavations have demonstrated that there are unlikely to be any cenotaph mounds in Heath Wood and I also accept, as Richard Hall has argued, that it is highly unlikely that there was a band of Vikings in the vicinity of Repton able to establish a pagan cemetery before AD 873–4.[179] Although I am still convinced that both sites have to be interpreted in the context of the over-wintering of the Viking Great Army I now wish to propose an alternative interpretation for the relationship between them.

Not everyone who has studied the sites in the past agrees that they need be associated. Shetelig rejected a link between Heath Wood and the winter camp at Repton because:

> ... a cemetery of some 60 graves, including persons of both sexes, can not well be ascribed to a passing occupation of the district. It must belong to the period after the peace of 878, when the Viking army had taken possession of Mercia and settled in the

> five boroughs, and the cemetery at Ingleby should be, most probably, explained as evidence for a Danish colony coming directly from the north of Jutland.[180]

F T Wainwright also argued that 'it would be unwise to forge too close a link between the Ingleby site and the known historical fact that the Danish army spent the winter of 873–4 about three miles away at Repton'.[181] The *Anglo-Saxon Chronicle* records that in 877 the army went into Mercia in the harvest season and shared out some of it, and gave some to Ceolwulf, representing a deliberate partition between an area of Mercia under Scandinavian control and an area remaining under English control.[182] Wainwright was convinced that 'there is no doubt that [the Ingleby cemetery] should be set against the settlement of 877 rather than against the wintering of 873–4'.[183] Wainwright, Shetelig and Posnansky have each concluded that one winter was too short a time span for the raising of sixty mounds. Consequently they have set Ingleby against the post-877 settlement, rather than the short-term military presence of AD 873–4. Although I would agree that it is unlikely that sixty mounds could be raised in one winter, it also seems unlikely that the cemetery at Heath Wood could belong to a separate phase of colonization.

The archaeological remains alone are unable to help us determine between these options. From the datable finds the cemetery could span between any date in the late ninth and early tenth centuries. There is little vertical stratigraphy between the establishment of those mounds excavated, although they do have individual erosion histories. However, I do not believe that the Heath Wood cemetery could have remained in use for an extended period of time, representing a settled Viking colony. No other contemporary Viking partitions of land, in East Anglia or Northumbria, are reflected in clusters of pagan burials. The general view is that the Vikings who settled in England were rapidly converted to Christianity, demonstrating their speedy assimilation into the society in which they settled.[184] Those Vikings who, after the late ninth-century partitions of land in East Anglia, Northumbria and Mercia, settled in the area later known as the Danelaw, were amongst the first Scandinavians to adopt Christianity. They were Christian at least two or three generations before Harold Bluetooth's claim to the conversion of Denmark. The rapid conversion of Scandinavian settlers, so we are led to believe, demonstrates the weakness of their own pagan religions in the face of an all-embracing Christianity, and provides another example of their eagerness to become assimilated:

> the evidence ... all points to wide acceptance of the new faith already by the end of the ninth century. In the first decade of the tenth century the Danes can still be called 'pagans' by their enemies, but this is the last indication of any continuation of heathen religion.[185]

Given the almost complete absence of cremation burial from elsewhere in the Danelaw, it is intrinsically unlikely that settled Scandinavian colonists in south Derbyshire, and they alone, would retain an alien burial rite. Pauline Stafford notes that 'by the late ninth century Christianity in the East Midlands was culturally, socially, and politically a coherent and organized religion, in a strong position to absorb and convert pagan incomers'.[186] A widespread and rapid acceptance of Christianity throughout the Danelaw by the end of the ninth century limits the chronological framework into which the strong heathen characteristics of the Heath Wood cemetery can realistically be fitted. Heath Wood is clearly very different from other, religiously ambivalent, Danelaw Viking burials. It is also unlikely that the cemetery could have remained in use after the Anglo-Saxon reconquest and the recapture of Mercia by Aethelflaed, Lady of the Mercians, in 917. This leaves a maximum period of usage of about

forty to forty-five years, or approximately two generations from 873–4 to the first decades of the tenth century.

Is it possible to refine the dating of the Heath Wood cemetery any further? In the words of Richard Hall, does it represent 'cultural assertion brought about by a single event, or an accretion of continuing feelings expressed over a longer period'?[187] Whilst accepting that the mounds are not the work of a single winter I would maintain that they have to be seen in the context of the Great Army's visit of 873–4 rather than post-877 colonization. To explore this further it is necessary to discuss the archaeological discoveries at Repton itself.

Excavations at Repton from 1974 to 1993 by Martin Biddle and Birthe Kjølbye-Biddle have revealed the remains of the Viking winter camp. Although full publication is awaited, the interim accounts provide sufficient detail to permit a provisional interpretation.[188] The Great Army invested considerable effort in remodelling the site, and the monastic church, into a defensive enclosure. A large V-shaped ditch, 4m deep × 8m across at the top, was dug to create a D-shaped enclosure, enclosing an area of 1.46ha (3.65 acres) with the church in the middle of its south side so that the doors in the north and south sides of the nave provided a defended entrance way, and the cliff of the Trent Valley provided the long, straight side of the D. Around the church and shrine of St Wystan there are a number of individual accompanied burials, including an exceptional warrior grave, as well as a large burial mound apparently incorporating a central inhumation set within a substantial charnel deposit.

There has been some debate as to how far these burials can be seen as the dead of the Great Army, as suggested by the Biddles.[189] The most obvious 'Viking' is the warrior aged at least 35–45 (Grave 511), buried immediately to the north of the chancel, within the defended enclosure. A second male, aged 17 to 20 (Grave 295), buried soon after and adjacent to the warrior, has been interpreted as his weapon bearer. The man buried in Grave 511 had met a very violent death, presumably in battle. I have noted elsewhere that despite being buried with a mutilated sword and various pagan symbols he was also inhumed on an east–west alignment immediately adjacent to a Christian shrine, and that the mausoleum to St Wystan was apparently retained intact during the Viking occupation.[190] Given the powerful associations of burial next to saintly relics, this might suggest that this was someone for whom the options were being kept open. Other burials adjacent to the chancel, described as being of 'Scandinavian type', do not contain weapons and the only grave goods comprise a few personal items.[191] Although they stand out as unusual, they are not specifically Scandinavian.

Martin Biddle and Birthe Kjølbye-Biddle also suggest that the charnel deposit from the western mortuary chapel and its central burial should be seen in the context of the 873–4 over-wintering. They present persuasive arguments that the central burial, disturbed *c* 1686, was probably that of Ivar the Boneless.[192] I have no reason to argue with that, although there is some confusion over whether Ivar was back in Ireland at the time of his death. I would, however, question their identification of the charnel deposit as comprising mainly the remains of the Viking Great Army. The dating, derived from a second packet of five coins, is consistent with 873–4, and certainly associates the general assemblage with the over-wintering, even if the precise provenance of the coins is uncertain. The critical factor about the deposit, however, is that it is very clearly derived from disinterred and reburied skeletons. The total minimum number of individuals is 264, based on 253 left adult femurs and 11 juvenile right tibias. However, the percentage of the smaller bones recovered from these individuals is much lower, with only 32 per cent of the vertebrae, for example, and fewer than 2 per cent of the finger and toe bones. When decayed bodies are disturbed and reburied it would be expected that the smaller bones would be lost. The other pertinent facts are that *c* 20 per cent of the bodies were

female, and that the sixteen radiocarbon dates show at least two populations, the first dated to the late seventh or early eighth centuries, and the second group to the later ninth century.

The Biddles propose three possibilities for the origins of the earlier bones – that they represent the primary burials in the mortuary chapel, that they are ancestral Viking remains brought with the army from Scandinavia, and that all the bodies were brought from elsewhere.[193] Although they conclude that the latter explanation is the most likely they still argue that the later bodies are those of the Great Army disinterred from their primary resting places and brought to Repton, having become contaminated with earlier burials. The principal evidence for a substantial Scandinavian component to the charnel deposit is the physical anthropological evidence, from which the Biddles conclude that 'the male bones from the mass burial are massive and suggest a selected group, such as would be the case if the cemetery of a Guards regiment was studied and compared with the contemporary local population'.[194]

However, a robust and predominantly male group need not necessarily equate with an incoming military elite, and the well-fed and aristocratic inhabitants of a Mercian monastery are also likely to have had a larger stature than the average Anglo-Saxon peasant or slave. Is there any reason to look further than the burials of the original monastic cemetery for the origins of the Repton charnel? In digging the great V-shaped ditch the Great Army cut through the established area of burial south of the chancel. It might have seemed a natural, if not particularly pagan, activity to collect the more obvious bones for reburial, and the existing mortuary chapel, outside the enclosure, would have provided a logical home. This explanation would fit the long date range of the charnel deposit and also, given Repton was a double house, the small proportion of female bones. It would also be in keeping with the general lack of weapon trauma on the charnel bones. The smaller proportions of older and younger individuals in the charnel deposit compared to the monastic cemetery might initially suggest that it was drawn from a different population, but this can again be explained by differential survival and recovery of smaller and more fragile bones.

This is not to say that the Great Army was not responsible for the Repton charnel, or that it did not choose to bury one of its leaders as the central grave. The charnel bones might still include a few remains of reinterred warriors, but this was not its primary purpose. Nonetheless, it would be a mistake to regard it simply as a rather convenient and prosaic collection point for bones disturbed in the course of earthwork construction. The symbolism of rearranging the bones of Mercian monks and aristocrats around the warrior Ivar would not have been lost on the conquering Army. It also truncated the Mercian royal mortuary chapel, levelled it with sand, gave it a stone kerb and turned it into a mound. The Biddles further suggest that four teenagers, buried together next to the mound, were sacrificed as part of the burial ritual. This may be the case, although their skeletons bear no signs of violent injury.

I am not suggesting that the Repton charnel deposit was not the work of Vikings, but would argue that it was designed to reflect a degree of accommodation with the existing establishment. This includes a continuity of purpose, and a deliberate and clear association between Mercian and Viking remains, and between the Anglo-Saxon shrine and the Viking winter camp. This continuity is also reflected by the fact that the area of the charnel mound continued in use for aristocratic burial, with a later cemetery, including burials of those with fine jewellery and costume, drawn up around it. Similarly, in 1801–2 a hogback monument was found to the west of St Wystan's Church. This is too late to be associated with the Great Army, and should date to the period 920–70. Little is known of the immediate history of St Wystan's Church after the Great Army departed, although by the first quarter of the tenth century it was an important minster church, serving a large region of south Derbyshire.[195]

Apparently those buried in association with the shrine also continued to include members of the local Danish aristocracy. Given that the Great Army gained control of Mercia not by its destruction but by putting its own candidate on the throne, none of this should be surprising. Those Vikings buried at Repton were seeking to legitimate their own succession by their association with the Mercian royal house, and whilst a few maintained some pagan trappings, the majority found it expedient to allow themselves to be converted to Christianity.

The contrasts with the neighbouring site at Heath Wood are remarkable. Whilst the Repton Vikings were inhumed next to an Anglo-Saxon shrine, the Heath Wood group were cremated and buried under traditional mounds. The Repton Vikings, apart from Grave 511, generally dispensed with weapon burial; those in Heath Wood were buried with swords and shields, joints of meat and sacrificial animals to accompany them to Valhalla. On the other hand, there are sufficient similarities to reinforce the connection between the sites. The individual in Grave 511, as those in Mounds 1, 7 and 50, was buried with a mutilated sword. At Repton the mortuary chapel was prepared for the charnel deposit by levelling it with a layer of clean sand, and a false mound was then erected over the reused Mercian mausoleum. The cremation platform in Mound 50 was also prepared by the dumping of a layer of clean sand, also perhaps representing some ritual cleansing function.

A clear commitment to paganism is demonstrated at Heath Wood by the performance of cremation rites and animal sacrifice in conjunction with mound burial. Rather than assimilation with Anglo-Saxon practices and with the Mercian royal site, the Heath Wood burials represent a deliberate and physically imposing allusion to the pagan homeland of those who produced them; a statement of religious, political and military affiliation in unfamiliar and inhospitable surroundings.[196]

The outstanding question then is why did those over-wintering at Repton react to the local circumstances in such different ways? To answer this question it is necessary to go back to the disparate composition of the army: 'the invaders cannot be treated as a large amorphous mass under the convenient label of the Great Army on the assumption that the *micel here* which arrived in 865 was the only significant body of invaders'.[197]

As noted above, the force over-wintering at Repton represented the survivors of the 865 Great Army under Halfdan, which had been campaigning in England for almost ten years, joined with Guthrum's 871 Summer Army, which had been in England for just two years. On its departure from winter quarters in Repton the army again split into two bands, reflecting the two forces, which had been combined: 'for nine years the miscellaneous Danish force had acted as a single military unit. In the autumn of 874 it fell apart into two armies which were never reunited'.[198]

This was not simply a spontaneous fragmentation because of numbers but the result of a specific agreement on the partition of England negotiated between Halfdan and Guthrum. Halfdan's army returned to Northumbria where a year or so later, in 876, he and his men 'shared out the land of the Northumbrians, and they proceeded to plough and support themselves', representing the establishment of Scandinavian settlements in northern England. Three other kings, named as Guthrum, Oscetel and Anwend, left Repton 'with a great force' for Cambridge, where it over-wintered in 874–5. Late in 875 it mounted a second invasion of Wessex, where it campaigned for two years before taking up its winter quarters in Gloucester in 877–8. In 877 the Viking army in Mercia also settled and established settlements. It must have been a reduced force under Guthrum, therefore, that drove Alfred into hiding at Athelney where he regrouped and led a campaign which culminated in the Danish defeat at Edington in 878 and the baptism of Guthrum and thirty of his leading warriors.[199]

One explanation for the different burial and conversion strategies represented at Repton and Heath Wood, therefore, might be that the two sites reflect these divisions in the Viking camp, the first group preferring legitimization through association with the Mercian site, the other preferring traditional pagan burial. If the Biddles are correct that the central burial in the Repton charnel deposit is that of Ivar the Boneless, then it is tempting also to speculate that it was Halfdan and his men, the original joint leader of the force that first arrived in 865, who were responsible for the appropriation of the mortuary chapel, whilst it was those reinforcements who had arrived in the summer of 871 under Guthrum who preferred cremation at Heath Wood. But whilst this is an attractive story, it is certainly pushing speculation too far.

Nonetheless, it does seem reasonable to associate Heath Wood and Repton but to note an ideological difference between them. Viking armies were not homogenous groups; they contained those of diverse beliefs and ideologies. Standard pagan and Christian stereotypes may be of little use if we wish to understand the nature of conversion in the Danelaw. Abrams has stressed that conversion should not be seen as a single straightforward event, and has noted that the process of Christianization may have taken much longer.[200] She also notes that physical relocation need not have weakened the Vikings' identity as pagans and wonders if, in some parts of England, 'assimilation could have been preceded by an alternative, separatist stage, which has disappeared from view'.[201] Conversion might not be so much a matter of individual conscience as a question of social and political expediency. Religion may be used actively in the process of the creation and reinvention of group identities. Furthermore, it is performed within a social and political landscape of allegiances and obligations, but it also takes place within a physical landscape, and geographical space may be used to define distinct spheres of activity.

Is it possible therefore that the Heath Wood Vikings maintained, or even reinvented, pagan sacrifice and cremation to assert their difference from the native population, or even those comrades who they saw as losing their identity? The treaty between Alfred of Wessex and the Danish leader Guthrum provides evidence for a clear demarcation of English and Danish authority (even if not of the Danelaw). It provides a context for a heightened awareness of differences in the late ninth century.[202] Looking at earlier Anglo-Saxon cremation burial, Williams has argued that 'the choice to cremate or inhume the dead was the most dramatic statement and distinction possible within the early medieval mortuary arena.'[203] It has been suggested that in the tenth century Beowulf was part of a new interest in Anglo-Saxon cremation, amongst an elite which wanted to associate itself with a pagan and Scandinavian past.[204] Cremation served both as a spectacle and as a technology for defining social distinctions among the living through observance and participation. It is a rite of passage in which the corpse is ritually transformed. Williams also cites an interesting example from twelfth-century Estonia where pagans exhumed those bodies which had been buried in Christian cemeteries: 'cremation of the dead was being employed as a powerful political and religious pagan resistance at a time of military conflict'.[205]

The presence of women and children in the Heath Wood cemetery might initially seem to contradict the interpretation of the site as a war cemetery. Nonetheless, it is quite likely that an army that had been campaigning in England for some ten years would have acquired camp followers, wives or slaves. Smyth suggests that by 873 the character of the army was changing from a band of reckless warriors to a group weary of war and anxious to settle on the estates they had won. Even at this early stage, he suggests, 'women and children from the Scandinavian homelands were joining the invading armies'.[206] The weaponry in the cemetery is consistent with a warrior group, but not one which had come straight from Scandinavia. As

noted above, the sword in Mound 50 was decorated in a northern Anglo-Saxon style; the manner of wearing the sword over the shoulder indicated by the distributor in Mound 1 suggests an Anglo-Saxon fashion. The best parallels for the Trewhiddle-style sword hilt guard are found in the graves of Vikings returned to Norway. The ringed pin in Mound 56 reflects a dress habit acquired in the Irish Sea region and taken back to Scandinavia. The overall burial rite can be as closely paralleled in southern Sweden and parts of Norway as in Denmark. Nonetheless, there is little evidence for a standard custom of Viking cremation and to some extent the Heath Wood Vikings were creating their own practices, with which they were moulding a corporate identity out of a disparate set of backgrounds and experiences.

Finally, if the cemetery at Heath Wood represents those members of the Viking army who wished to perpetuate their identity as a heathen force, how are we to explain the difference between those who were cremated *in situ* and those who were cremated elsewhere and given a token burial in Heath Wood? Again, we can only speculate, but one possibility lies in the idea of Heath Wood representing a war cemetery. It has been suggested above that approximately one-third of the occupants of the cemetery, or twenty-plus individuals, were cremated on pyres overlooking Repton. Perhaps these were those who, like the warrior in Grave 511, had been killed in the attack on the Mercian stronghold. If so, they might be regarded as founder burials for the cemetery. The remaining two-thirds, or forty-plus individuals, were not cremated on the mound sites. This does not mean that they were not cremated in an immediately adjacent area, but it would seem to involve unnecessary effort to then move their remains a short way. I would therefore prefer to regard these small groups of ashes as having been brought to the site from some distance. After leaving Repton, Guthrum's force continued to fight throughout Wessex for several years, until the battle of Edington. Nonetheless, the fact that one group of Vikings returned to Mercia to settle in 877 suggests that they regarded it as a stronghold. Ceolwulf was bound by oaths and hostages to hold himself, his followers and his kingdom, at the disposal of the army.[207] No doubt this army suffered casualties, who might prefer burial in a communal cemetery than to be left where they fell. Cremation in the field, followed by retention of some of the ashes, would provide a mechanism whereby these token offerings could be returned to Mercia.[208] War cemeteries of more recent conflicts clearly serve as places of commemoration and remembrance, 'some corner of a foreign field' where a distinctive form of burial and commemoration is maintained. Most armies operating overseas adopt some form of communal cemetery to provide a reminder of comradeship: 'The war-bands which carved up eastern and northern England were heterogeneous and often fissiparous groups of individuals of diverse origin held together by inter-personal bonds, whose group identity must have been created by common experience on the war-trail.'[209]

There is some suggestion from written sources that it was considered important for the sake of honour that the deceased should be given a proper burial. According to the Danish *Saxo Grammaticus*, prior to a Viking battle the chieftains agreed that the victor should take care of the burial of the defeated, and was obliged to give his dead enemy a proper funeral, together with weapons and equipment.[210] In cases of death on foreign soil this might include the repatriation of cremated remains. *Saxo Grammaticus* refers to an attack on the Swedish ruler Ring at Kalmar by the Danish king Harald Hildetann. The Danish leader was killed but Ring arranged for a funeral pyre to be prepared and for Hildetann's ashes to be collected, put into an urn and transported back to Lejre in Denmark.[211] Oestigaard has suggested that a tenth-century cremation urn placed under a stone slab in the large grave mound of 'Klungerhaugen' at Naterstad in Norway had been transported from afar for someone 'whose ''exotic'' voyages prompted distant cremation of those members of the family who died far from home, followed

by transport of their bones back home in an urn'.[212] Those cremated elsewhere and whose ashes were transported to Heath Wood might not represent all the battlefield casualties of the Great Army between 873–8 but a figure of forty fatalities amongst the warrior elite seems a reasonable figure to represent about five years of conflict. Bearing in mind that many of those buried at Heath Wood possessed swords, we would appear to be dealing with a warrior aristocracy.[213] The *Anglo-Saxon Chronicle* occasionally gives casualty figures for those killed in battle, but we should obviously be wary of war-time statistics and only a few references appear to be an attempt to provide precise figures. In 878 a brother of Ivar and Halfdan, leading a fleet of twenty-three ships, was killed in Devon 'with 800 men' and '40 of his army'. Brooks suggests that the strange phrasing may indicate a missing word, possibly intended to denote that the forty were of a distinguished rank; if so, the casualty figure separates a large number of rank-and-file from a much smaller proportion of high-ranking casualties.[214]

For the Vikings buried in Heath Wood pagan cremation burial with their weaponry and animal offerings was also a reminder of what set them apart from the Anglo-Saxons against whom they were fighting. Their cemetery was a national monument to an army that was defined by its victims as a heathen war-band with no respect for Christianity and the Church. It was appropriate therefore that the war-band should choose to emphasize its pagan beliefs in the commemoration of its war-dead. The meaning of the clustered distribution is less clear. Excavation has suggested that the cemetery was laid out over an abandoned co-axial field system of prehistoric date, whose boundaries were still partly visible and may have influenced the distribution of the barrows. Within each group there are apparently founder *in situ* cremations of those who died locally and mounds containing token offerings of those cremated elsewhere in each cluster. There is some evidence within the south-west group in particular that certain barrows acted as focal points around which others were sited. Perhaps they represent different bands or kinsmen within the Great Army, whom it was felt should travel to Valhalla together.

CONCLUSION

The cemetery at Heath Wood represents a rare occurrence of a pagan Viking cremation rite in the British Isles. It comprises at least sixty burials, of which a third had been cremated *in situ*, but the remaining two-thirds of which may represent people who had died at some distance and whose ashes had been brought to Heath Wood. They were cremated with items of personal dress and weaponry; the grave offerings include both sacrificial animals as well as food offerings. To understand the site we have to examine the conquest of Mercia and the over-wintering of the Viking Great Army at Repton in AD 873–4. The period of use of the cemetery must, at most, span from 873 to 917. If the interpretation proposed above is correct then it can be narrowed still further, from winter 873 to 878, and Heath Wood, and not the Repton charnel, should be recognized as the principal war cemetery of the Viking Great Army. It was probably maintained by a garrison force, which remained in Repton. As Richard Hall has suggested, a Great Army detachment may have remained in Mercia supporting Ceolwulf from 873–4 until, in 877, the Great Army partitioned Mercia between itself and Ceolwulf.[215] From 877–8 warriors became farmers; Guthrum and his leaders were baptized, and thereafter those members of the army that settled in England rather than joining raiding groups to France were given Christian burial.

If this interpretation is correct then it has a further series of implications. First, that a section of the Great Army suffered about forty fatalities in five years of mobile warfare after

873, or at least that there were forty fatalities amongst those warrior leaders worthy of commemoration in the war cemetery. Second, that it was membership of the Army that gave these Vikings their identity as pagans, and third that, once they became settled as local farmers, veterans of the army rapidly adopted a Christian identity. This may seem a lot to infer from two sites in the Midlands, and as always in archaeology, further fieldwork may lead to revised conclusions, but Heath Wood is a unique site and though long neglected it should now take its place as such in British archaeology and as one of the most important sites of Viking Age England.

ACKNOWLEDGEMENTS

The 1998–2000 excavations in Heath Wood were directed by Julian D Richards and Marcus Jecock, on behalf of the University of York. Funding was provided by the Derbyshire Archaeological Advisory Committee, the Society of Antiquaries of London and the University of York. We are grateful to English Heritage and the Department for Culture, Media and Sport for granting scheduled monument consent and to the landowners, the Church Commissioners, their agents Smith Gore, and to Forest Enterprise for permission to enter the woodland. Mr Bishop of Ash Farm kindly granted permission for us to use access routes across his farmland. Labour was provided by current and former students of the University of York, with site supervision by Tony Austin and Ruth Soames; Elizabeth Jelley was site manager. Camping facilities were provided at Foremark Hall by Jim Badger on behalf of Repton School Enterprises; we are indebted to all the staff and residents of Foremark Hall, but especially to Linda Ward.

Post-excavation conservation was provided at the York Archaeological Trust laboratory by Erica Paterson and Julie Breheret. Catherine Mortimer provided assistance with interpretation of the XRF analyses. Stephen Rowland, Don Brothwell, Jackie McKinley, Julie Bond and Fay Worley helped with aspects of the bone identifications. Pauline Beswick provided a brief report on the prehistoric and Roman pottery. Sarah Jennings and Alastair Brooks looked at the post-medieval pottery. Thanks to Kirstin Bornholdt for drawing my attention to the possible cremation burial on Man at Kirk Andreas, to Gabor Thomas for the Grønneberg and Dolven swords, and to Dagfynn Skre for bringing the work of Holck to my notice. I was directed to Crosby Garrett by Chris Fern and Nicky Toop, who found the reference in the Cumbria SMR. The archive is in the British Museum but had been wrongly catalogued; Leslie Webster has confirmed that the finds are more likely to be Viking Age.

I also wish to acknowledge the encouragement of David Barrett, Martin Biddle, James Graham-Campbell, Richard Hall and John Humble.

THE ARCHIVE

The finds from the 1941–9 and 1955 excavations went originally to Burton-on-Trent Museum, but have since been transferred to Derby Museum, accession number DBYMU: 1985-225; the two sword blade fragments are catalogued separately as DBYMU: 1987-590/1-2. However, some of the finds have gone missing since they were published, notably parts of the swords. Derby Museum does retain the pottery, flints and other metal objects, as well as some samples of cremated bone. Correspondence relating to the excavations of the 1940s, including sketch

plans of Mounds 1–6 redrawn for this report, is held in the archive of Repton School. The archive of the 1998–2000 project has been deposited with Derby Museum, apart from the digital archive, which has been lodged with the Archaeology Data Service (http://ads.ahds.ac.uk/catalogue/projArch/ingleby_soa_2003).

NOTES

1. BGS 1 : 50,000 solid and drift map, sheet 141, 1976.
2. English Heritage 1987, 20.
3. Glover and Riden 1981, 143; Pevsner and Williamson 1978, 216–17.
4. Craven and Stanley 1991, 90–1.
5. Harley *et al* 1975. Heath Wood is not marked on the 1791 map, although Formark (*sic*) Hall is shown. Nonetheless, this is not clear evidence that the plantation did not exist at this stage as it may have been considered too small to warrant attention.
6. Taylor 1987; Biddle and Kjølbye-Biddle 2001; Taylor's reconstruction of the Anglo-Saxon ninth-century chancel estimates the apex at 59.9m OD, *c* 13m above ground level. A GIS visibility analysis, undertaken by Lars Gustavsen in June 2000, suggested that anything more than 2.5m above the contemporary ground surface at Repton would have been visible from Heath Wood (copy in project archive).
7. Cameron 1959, 639.
8. Sawyer 1971, 154–5; Fellows-Jensen 1978, 20.
9. Cameron 1959, XXXV.
10. Hall 1974; 1989.
11. Unwin 1982, 22–4.
12. Cameron 1959, XXXV.
13. Fellows-Jensen 1978, 137.
14. Ibid, 148.
15. Cameron 1959, 635.
16. Bateman 1861, 92–3.
17. Howarth 1899; J W Baggaley, Director of Sheffield City Museums, wrote to Fraser that: 'It is probable that Bateman did not attach importance to them, except for record, because I cannot find the objects listed in the catalogue which he published in 1855 of the contents of his own Museum at Lomberdale House', letter from J W Baggaley to W Fraser, dated 13 February 1944, Repton School archives. A search in February 2003 of those items from the Bateman collection deposited in the Museum of Archaeology in Downing Street, Cambridge, also drew a complete blank (C Chippindale pers comm).
18. Bateman 1861, 92–3.
19. Ward 1905, 272; Fraser 1941, 19; 1943, 159.
20. Clarke and Fraser 1946.
21. Ibid.
22. Letter from T D Kendrick to Fraser, dated 31 January 1942, in Repton School archives.
23. Letter from W F Grimes to Fraser, dated 27 July 1942, in Repton School archives.
24. Letter from E T Leeds to Fraser, dated 31 January 1944, in Repton School archives.
25. Letter from E T Leeds, dated 15 February 1944, in Repton School archives. Leeds also urged Clarke and Fraser to prepare a report and assisted with it, and suggested 'that the Society of Antiquaries be approached through Mr Kendrick', although in the end Clarke and Fraser preferred the local Derbyshire journal.
26. Thus '*DAJ* **66** (1946), 6, 10–11, 14–16, figure 5', for example, refers to Clarke and Fraser 1946 in *Derbyshire Archaeological Journal* **66**, pages 6, 10–11, 14–16 and figure 5; *DAJ* **69** refers to Clarke *et al* 1949; and *DAJ* **76** refers to Posnansky 1956.
27. Leeds in Clarke and Fraser 1946, 10–11.
28. Shetelig 1954, 78.
29. Graham-Campbell 1980a, 67.
30. Leeds in Clarke and Fraser 1946, 16.
31. Bersu and Wilson 1966, 54–7.
32. Leeds in Clarke and Fraser 1946, 16.
33. Ibid, 13.
34. Clarke, Fraser and Munslow 1949.
35. Ibid, 79.
36. Posnansky 1956, 41.
37. Walsh 1998, 229.
38. Bersu and Wilson 1966, 36.
39. Posnansky 1955, 140.
40. Ibid, 143–4; Posnansky 2003 pers comm: undated letter from Munslow labelled 'extract from notes made about Nov/Dec 1949'. Mound 8 was never published and no further barrows were dug by Clarke and Fraser; it appears that some time between 1949 and 1952 William Fraser took his own

life (letter from F T Wainwright to Camden Clarke, dated 18 January 1952, in Repton School archives).
41. Copy of letter from S E Rigold to F T Wainwright, dated 19 January 1954, in Repton School archives. Rigold reported back from his visit that 'felling operators had respected them [the mounds]'. Wainwright was sceptical and underlined this phrase, annotating the copy 'Only by accident! They didn't know anything about the mounds being there!'.
42. Posnansky 1955; 1956; Arbman 1961, 66, figure 10.
43. Crowfoot 'Wire embroidery', in Posnansky 1956, 51–3.
44. RCHME 1994.
45. Worley in prep.
46. Crowfoot 'Wire embroidery', in Posnansky 1956, 51–3.
47. Ibid.
48. Freke 2002, 66–73, 88–9.
49. Tweddle forthcoming.
50. Hall 1998, 61–4.
51. Ibid, 64.
52. Posnansky 1956, 49.
53. Ibid, 49.
54. Challis and Kinsley 1995; Alan Vince pers comm.
55. RCHME 1994.
56. Richards *et al* 1995.
57. Field Archaeology Specialists 1998.
58. Gillam 1939; Leary 2003, 72.
59. Webster and Backhouse 1992, 276–7.
60. Webster 2001, 275.
61. Hall 2000a, 320–1.
62. Illustrated in Bruce-Mitford 1956, 182, pl XXIII; Shetelig 1940 (ed), 121, 124; Wilson 1965, 36, pl IIIB.
63. Webster and Backhouse 1992, 277.
64. Groves 1990, 1104.
65. Rogers 1993, 1416, no. 5206.
66. Ottaway 1992, 574.
67. Ibid, 607–11.
68. Ibid, 613.
69. Grieg 1927–8, 121–3, figures 65–67, 149, 156; Arwidsson and Berg 1983, 7–8, 26, pl 15, 132.
70. Roesdahl 1977, 130.
71. Freke 2002, 90, 94.
72. Roesdahl 1977, 96, figures 125–126, 129; 1976, 32.
73. Siddorn 2000, 43.
74. Ibid, 44–7.
75. Fanning 1994, 19.
76. Freke 2002, 69–70, 87–8, 90.
77. Bu'lock 1972; Chitty 1977.
78. Cowen 1934, 184.
79. Hall 1976, 19.
80. Fanning 1994.
81. Petersen 1928, 192.
82. Fanning 1994, 21.
83. Petersen 1928, 197.
84. Fanning 1994, 3.
85. McKinley 1994a, 5–21; 2000.
86. Beek 1983; McMinn and Hutchings 1985.
87. Iscan *et al* 1985; Brooks and Suchey 1990.
88. Buikstra and Ubelaker 1994.
89. Nielsen-Marsh *et al* 2000.
90. McKinley 1997a, 245.
91. Richards 2000.
92. Holden *et al* 1995a and b.
93. McKinley 1993.
94. McKinley 1994b.
95. McKinley 1994a, 6.
96. McKinley 1997a and b.
97. Sjösvärd *et al* 1983.
98. Worley in prep.
99. Bond 1996.
100. Sass 1995, 136.
101. McKinley 2000.
102. Sigvallius 1994.
103. Bersu and Wilson 1966.
104. Müller-Wille 1971.
105. Mattingley 1970, 123.
106. Gräslund 1980, 43.
107. Bond 1996.
108. Ibid.
109. Ibid.
110. Grant 1982; O'Connor 1988, 85.
111. Elliott and Knight 1999, 128, 133.
112. Ibid, 133.
113. Riley 1978.
114. David Budge, Derbyshire Archaeological Society, pers comm.
115. McKinley 1994a, 82–4.
116. Bersu and Wilson 1966, 87–8.
117. Richards *et al* 1995, 62–5.
118. Graham-Campbell 2001, 109.
119. Brønsted 1936.
120. Ibid.
121. Arbman 1940–3; Gräslund 1980.
122. Kjølbye-Biddle 1995.
123. Gräslund 1999, 95–7.
124. Härke 1990; Dickinson and Härke 1992, 68–9.
125. Sass 1995; Bersu and Wilson 1966, 90–1.
126. Holck 1996, 116–19.
127. Geake 1997; Halsall 2000, 262.
128. Ramskou 1950; see Richards *et al* 1995, 61–2.
129. Roesdahl 1982, 164–71.
130. Høilund Nielsen nd, 27.
131. Shetelig 1954, 91.

132. Richards *et al* 1995.
133. Ramskou (1950, 179) notes only six weapons in cremation graves from Denmark, out of a sample of 227.
134. Crowfoot in Posnansky 1956, 51–3.
135. Walton 1989, 341–5.
136. *Heimskringla*: Ynglinga Saga, chapter VIII, trans Hollander 1964.
137. Warmind 1995, 134.
138. Oestigaard 1999, 358–9.
139. Williams 2000, 59.
140. Ibid, 44.
141. Sigvallius 1994.
142. Bersu and Wilson 1966.
143. Kermode 1930.
144. Bøe 1940, 59–60; Harrison 2001, 73.
145. Williams 2000, 144.
146. Ibid, 150.
147. Richards 2000, 142–6; 2002, 156–8; Graham-Campbell 2001, 105–18.
148. Halsall 2000, 268–9.
149. Hughes and Jones 1995, 141–2. The mound, if there had been one, had been entirely ploughed out and it is also admitted that it may have been a hundred meeting place.
150. Wilson 1967, 37; Graham-Campbell 1980b, 379–82; Richards 2002.
151. Hadley 2000, 215; 2002, 228.
152. Graham-Campbell and Batey 1998, 59.
153. Hunter and Dockrill 1982.
154. Graham-Campbell and Batey 1998, 57.
155. Ibid, 59.
156. Ibid, 78.
157. Ibid, 114.
158. Ibid, 96.
159. Quoted in Graham-Campbell and Batey 1998, 108.
160. Graham-Campbell and Batey 1998, 144.
161. Ibid, 95–6.
162. O'Brien 1998; Harrison 2001, 74.
163. Bornholdt forthcoming, chapter 2.
164. Clay 1869, 43–4.
165. Dolley 1975, 147.
166. Graham-Campbell 1983, 57.
167. Cowen 1934, 174–80; 1948, 73–4; 1967, 31–3; Edwards 1992, 45–6; Richards 2000, 144–5.
168. Shetelig 1940, 20–1; 1954, 88–90; Cowen 1967, 32.
169. Cowen 1967, 32; Edwards 1998, 11–14.
170. Edwards 1998, 14–15; Richards 2000, 144.
171. Edwards 1970; 1992, 48; 1998, 20–1.
172. Greenwell 1877, 387–8, no. 173. O'Sullivan 1996, 15–17, accepts the burial as seventh century but the bridle-bit and decorated shears indicate a later date, as proposed by Leslie Webster (pers comm).
174. Keynes 1997, 54; Sawyer 1971, 121–38; Brooks 1979.
175. Smyth 1977, 240–3; Keynes 1997, 54; Stafford 1985, 110.
176. Biddle and Kjølbye-Biddle 2001, 50.
177. Ibid, 52.
178. Richards *et al* 1995, 65–7.
179. Hall 2000b, 151.
180. Shetelig 1954, 91.
181. Wainwright 1947, 96.
182. Stafford 1985, 111; Keynes 1997, 56.
183. Wainwright 1947, 119.
184. Wilson 1967, 37.
185. Whitelock 1941, 175.
186. Stafford 1985, 118.
187. Hall 2000b, 151.
188. Biddle and Kjølbye-Biddle 1992; 2001. At the time of writing new analysis of the Repton charnel bone assemblage has led to the suggestion that there may, after all, be evidence of weapon injury; there has also been a fresh programme of radiocarbon dating which, it is argued, demonstrates that the bodies were drawn from a single population (Martin and Birthe Kjølbye-Biddle pers comm). Final publication of Repton may lead to a revised interpretation of the Repton charnel deposit but should not affect the current author's view of Heath Wood as a possible war cemetery of the Viking Great Army.
189. Biddle and Kjølbye-Biddle 1992; 2001; Hadley 2000, 204, Halsall 2000, 263; Welch 2001, 156.
190. Richards 2003, 388.
191. Biddle and Kjølbye-Biddle 2001, 65; Richards 2003, 388–9.
192. Biddle and Kjølbye-Biddle 2001, 81–4.
193. Ibid, 79.
194. Ibid, 78.
195. Ibid, 53.
196. Richards 2001.
197. Smyth 1977, 241.
198. Stenton 1943, 250–1.
199. Keynes 1997, 56–7; Smyth 1977, 240–54.
200. Abrams 2000; 2001.
201. Abrams 2000, 148.
202. Kershaw 2000, 45–7.
203. Williams 2000, 67.
204. Niles 1991.
205. Williams 2000, 87.
206. Smyth 1977, 252.
207. Wainwright 1947, 99.
208. In this context it is worth noting that although it is a small sample all the remains identified as females or young people were recovered from

the cremation hearths of those it is proposed were buried from the initial 873–4 overwintering, rather than from those burials of warriors which it is suggested may have been brought from elsewhere.

209. Innes 2000, 78.
210. Horn 1985, 85.
211. Ibid, 312–16.
212. Oestigaard 1999, 355.
213. Brooks 1978.
214. Brooks 1979, 4 n 13.
215. Hall 2000b.

BIBLIOGRAPHY

Abrams, L 2000. 'Conversion and assimilation', in Hadley and Richards (eds) 2000, 135–53

Abrams, L 2001. 'The conversion of the Danelaw', in Graham-Campbell *et al* (eds) 2001, 31–44

Arbman, H 1940–3. *Birka I: Die Gräber*, Stockholm

Arbman, H 1961. *The Vikings*, London

Ardwisson, G and Berg, G 1983. *The Mästermyr Find: A Viking Age Tool Chest from Gotland*, Stockholm

Bateman, T 1861. *Ten Years' Diggings in Celtic and Saxon Grave Hills, in the Counties of Derby, Stafford, and York, from 1848 to 1858*, London

Beek, G C van 1983. *Dental Morphology: An Illustrated Guide*, Bristol

Bersu, G and Wilson, D M 1966. *Three Viking Graves in the Isle of Man*, Soc Medieval Archaeol Monogr Ser 1, London

Biddle, M and Kjølbye-Biddle, B 1992. 'Repton and the Vikings', *Antiquity*, **66**, 36–51

Biddle, M and Kjølbye-Biddle, B 2001. 'Repton and the "great heathen army", 873–4', in Graham-Campbell *et al* (eds) 2001, 45–96

Bond, J M 1996. 'Burnt offerings: animal bone in Anglo-Saxon cremations', *World Archaeol*, **28**, 76–88

Bornholdt, K forthcoming. 'Viking-Age coin finds from the Isle of Man: a study of coin circulation, production and concepts of wealth', unpublished PhD thesis, Cambridge

Bøe, J 1940. 'Norse antiquities in Ireland', *Viking Antiquities in Great Britain and Ireland* III (ed H Shetelig), Oslo

Bronk Ramsey, C 2002. *OxCal Program 3.8*, Oxford

Brønsted, J 1936. 'Danish inhumation graves of the Viking Age. A survey', *Acta Archaeologica*, **7**, 81–228

Brooks, N 1978. 'Arms, status and warfare in late Saxon England', in *Ethelred the Unready: Papers to the Millennium Conference* (ed D A Hill), BAR, Brit Ser 69, 81–103, Oxford

Brooks, N 1979. 'England in the ninth century: the crucible of defeat', *Trans Roy Hist Soc*, 5th ser, **29**, 1–20

Brooks, S T and Suchey, J M 1990. 'Skeletal age determination based on the os pubis: a comparison of the Acsádi-Nemeskéri and Suchey-Brooks methods', *Human Evolution*, **5**, 227–38

Brown, M P and Farr, C A (eds) 2001. *Mercia: An Anglo-Saxon Kingdom in Europe*, Studies in the Early History of Europe, Leicester

Bruce-Mitford, R L S 1956. 'Late Saxon disc-brooches', in *Dark Age Britain* (ed D B Harden), 171–201, London

Buikstra, J E and Ubelaker, D H 1994. *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archaeological Survey Research Series 44

Bu'lock, J D 1972. *Pre-Conquest Cheshire, 383–1066*, Cheshire Community Council

Cameron, K 1959. *The Place-Names of Derbyshire*, Engl Place-Name Soc 27, Cambridge

Challis, K and Kinsley, G 1995. *Early Anglo-Saxon Derbyshire: Interim Report on the First Two Seasons of Derbyshire Archaeological Advisory Committee Research*, Trent and Peak Archaeological Trust, unpublished report

Chitty, G 1977. 'Ancient Meols: finds from the Cheshire shore: the metalwork', *J Merseyside Archaeol Soc*, **1**, 23–33

Clarke, C and Fraser, W 1946. 'Excavation of pagan burial mounds: Ingleby, Derbyshire', *Derbyshire Archaeol J*, **66**, 1–23

Clarke, C, Fraser, W and Munslow, F W 1949. 'Excavation of pagan burial mounds at Ingleby. Second report', *Derbyshire Archaeol J*, **69**, 78–81

Clarke, H B, Ní Mhaonaigh, M and Ó Floinn, R (eds) 1998. *Ireland and Scandinavia in the Early Viking Age*, Dublin

Clay, C 1869. *Currency of the Isle of Man*, Manx Society XVII, Douglas

Cowen, J D 1934. 'A catalogue of objects of the Viking period in the Tullie House Museum, Carlisle', *Trans Cumberland Westmorland Antiq Archaeol Soc*, **34**, 166–87

Cowen, J D 1948. 'Viking burials in Cumbria', *Trans Cumberland Westmorland Antiq Archaeol Soc*, **48**, 73–6

Cowen, J D 1967. 'Viking burials in Cumbria: a supplement', *Trans Cumberland Westmorland Antiq Archaeol Soc*, **67**, 31–4

Cox, M and Mays, S 2000. *Human Osteology in Archaeology and Forensic Science*, London

Craven, M and Stanley, M 1991. *The Derbyshire Country House*, Derby

Crumlin-Pedersen, O and Munch Thye, B (eds) 1995. *The Ship as Symbol in Prehistoric and Medieval Scandinavia*, Studies in Archaeology and History I, Copenhagen

Curle, A O, Olsen, M and Shetelig, H 1954. *Viking Antiquities in Great Britain and Ireland, Part VI*, Oslo

Dickinson, T and Härke, H 1992. *Early Anglo-Saxon Shields*, *Archaeologia*, **110**

Dolley, M 1975. 'Some preliminary observations on three Manx coin-hoards appearing to end with pennies of Edgar', *Spink's Numismatic Circular*, **83**, 146–7, 190–2

Edwards, B J N 1970. 'The Claughton burial', *Trans Hist Soc Lancashire Cheshire*, **121**, 109–16

Edwards, B J N 1992. 'The Vikings in north-west England: the archaeological evidence', in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (ed J Graham-Campbell), National Museums and Galleries of Merseyside Occas Pap Liverpool Museum, No. 5, 43–62

Edwards, B J N 1998. *Vikings in North-West England: The Artifacts*, Lancaster

Elliott, L and Knight, D 1999. 'An early Mesolithic site and first millennium BC settlement and pit alignments at Swarkestone Lowes, Derbyshire', *Derbyshire Archaeol J*, **119**, 79–153

English Heritage 1987. *County List of Scheduled Monuments: Derbyshire*, London

Fanning, T 1994. *Viking Age Ringed Pins from Dublin*, National Museum of Ireland, Medieval Dublin Excavations 1962–81, Ser B, vol 4, Royal Irish Academy, Dublin

Fellows-Jensen, G 1978. *Scandinavian Settlement Names in the East Midlands*, Copenhagen

Field Archaeology Specialists 1998. *Geophysical Line Survey. Heath Wood, Ingleby, Derbyshire*, unpublished report

Fraser, W 1941. 'Location of the alleged Anglian cemetery at Foremark', *Derbyshire Archaeol J*, **62**, 19–21

Fraser, W 1943. 'Note: Anglian pagan cemetery at Ingleby, South Derbyshire', *Antiq J*, **23**, 159

Freke, D 2002. *Excavations on St Patrick's Isle, Peel, Isle of Man, 1982–88: Prehistoric, Viking, Medieval and Later*, Centre for Manx Studies Monogr 2, Liverpool

Geake, H 1997. *The Use of Grave-goods in Conversion Period England, c 600–c 850*, BAR, Brit Ser 261, Oxford

Gillam, J P 1939. 'Romano-British Derbyshire ware', *Antiq J*, **19**, 429–37

Glover, C and Riden, P (eds) 1981. *William Woolley's History of Derbyshire (down to 1712)*, Derbyshire Record Society VI, Chesterfield

Graham-Campbell, J 1980a. *Viking Artefacts: A Select Catalogue*, London

Graham-Campbell, J 1980b. 'The Scandinavian Viking-Age burials of England: some problems of interpretation', in *Anglo-Saxon Cemeteries 1979* (eds P Rahtz, T Dickinson and L Watts), BAR, Brit Ser 82, 379–82, Oxford

Graham-Campbell, J 1983. 'The Viking-Age silver hoards of the Isle of Man', in *The Viking Age in the Isle of Man* (eds C Fell, P Foote, J Graham-Campbell and R Thomson), Viking Society for Northern Research, 53–80, London

Graham-Campbell, J 2001. 'Pagan Scandinavian burial in the central and southern Danelaw', in Graham-Campbell *et al* 2001, 105–23

Graham-Campbell, J and Batey, C 1998. *Vikings in Scotland: An Archaeological Survey*, Edinburgh

Graham-Campbell, J, Hall, R, Jesch, J and Parsons, D (eds) 2001. *Vikings and the Danelaw. Select Papers from the Proceedings of the Thirteenth Viking Congress, Nottingham and York, 21–30 August 1997*, Oxford

Grant, A 1982. 'The use of toothwear as a guide to the age of domestic ungulates', in *Ageing and Sexing Animal Bones from Archaeological Sites* (eds B Wilson, C Grigson and S Payne), BAR, Brit Ser 109, 91–107, Oxford

Gräslund, A-S 1980. *Birka IV: The Burial Customs*, Stockholm

Gräslund, A-S 1999. 'Is there any evidence of powerful women in Late Iron Age Svealand?', in *Völker an Nord- und Ostsee und die Franken* (eds U von Freeden, U Koch and A Wieczorek), Kolloquien zur Vor- und Frühgeschichte, Band 3, 91–8, Bonn

Greenwell, W 1877. *British Barrows: A Record of the Examination of Sepulchral Mounds in Various Parts of England*, Oxford

Grieg, S 1927–8. 'Kongsgaarden', in *Osebergfundet 2* (eds A W Brøgger and H Shetelig), Oslo

Groves, M 1990. 'Silver and copper alloy tacks', in *Object and Economy in Medieval Winchester* (ed M Biddle), Winchester Studies 7, ii, 1102–14, Oxford

Hadley, D M 2000. 'Burial practices in the northern Danelaw, *c* 650–1100', *Northern Hist*, **36**, 199–216

Hadley, D M 2002. 'Burial practices in northern England in the later Anglo-Saxon period', in Lucy and Reynolds (eds) 2002, 209–28

Hadley, D M and Richards, J D (eds) 2000. *Cultures in Contact: Scandinavian Settlement in England in the Ninth and Tenth Centuries*, Studies in the Early Middle Ages II, Turnhout

Hall, R A 1974. 'The pre-conquest burgh of Derby', *Derbyshire Archaeol J*, **94**, 16–23

Hall, R A 1976. 'Keyhole archaeology, Bootham Bar and All Saints Pavement', *Interim*, **4**, 17–19

Hall, R A 1989. 'The Five Boroughs of the Danelaw: a review of present knowledge', *Anglo-Saxon England*, **18**, 149–206

Hall, R A 1998. 'A silver appliqué from St Mary Bishophill Senior, York', *Yorkshire Archaeol J*, **70**, 61–6

Hall, R A 2000a. 'Anglo-Scandinavian attitudes: archaeological ambiguities in late ninth- to mid-eleventh-century York', in Hadley and Richards (eds) 2000, 311–24

Hall, R A 2000b. 'Scandinavian settlement in England – the archaeological evidence', in *Vikings in the West* (eds S S Hansen and K Randsborg), *Acta Archaeologica*, **71**, 147–57

Halsall, G 2000. 'The Viking presence in England? The burial evidence reconsidered', in Hadley and Richards (eds) 2000, 259–76

Härke, H 1990. 'The Anglo-Saxon weapon burial rite', *Past and Present*, **126**, 22–43

Harley, J B, Fowkes, D V and Harvey, J C (eds) 1975. *Burdett's Map of Derbyshire 1791*, Derby

Harrison, S 2001. 'Viking graves and grave-goods in Ireland', in *The Vikings in Ireland* (ed A-C Larsen), 61–75, Roskilde

Holck, P 1996. *Cremated Bones. A Medical-Anthropological Study of an Archaeological Material on Cremation Burials*, Anthropologiske skrifter nr.1b, Anatomical Institute, University of Oslo

Holden, J L, Phakley, P P and Clement, J G 1995a. 'Scanning electron microscope observations of incinerated human femoral bone: a case study', *Forensic Sci Int*, **74**, 17–28

Holden, J L, Phakley, P P and Clement, J G 1995b. 'Scanning electron microscope observations of heat-treated human bone', *Forensic Sci Int*, **74**, 29–45

Hollander, L M (trans) 1964. *Snorri Sturluson: Heimskringla: History of the Kings of Norway*, Austin, Texas

Horn, W (trans) 1985. *Saxo Grammaticus*, Copenhagen

Howarth, E 1899. *Catalogue of the Bateman Collection of Antiquities in the Sheffield Public Museum*, London

Høilund Nielsen, K nd. 'The burial ground', in *Lindholm Høje: Burial Ground and Village* (eds E Johansen and A Leriche Trolle), 27–38, Ålborg

Hughes, G and Jones, L 1995. 'The excavation of a ring-ditch at Foston in the Dove Valley, 1993', *Derbyshire Archaeol J*, **115**, 136–42

Hunter, R J and Dockrill, S J 1982. 'Some Norse sites on Sanday, Orkney', *Proc Soc Antiq Scotl*, **112**, 570–6

Innes, M 2000. 'Danelaw identities: ethnicity, regionalism and political allegiance', in Hadley and Richards (eds) 2000, 65–88

Iscan, M Y, Loth, S R and Wright, R K 1985. 'Age estimation from the ribs by phase analysis: white females', *J Forensic Sci*, **30**, 853–63

Kermode, P M C 1930. 'A ship-burial on the Isle of Man', *Antiq J*, **10**, 126–33

Kershaw, P 2000. 'The Alfred–Guthrum Treaty: scripting accommodation and interaction in Viking Age England', in Hadley and Richards (eds) 2000, 43–64

Keynes, S 1997. 'The Vikings in England, *c* 790–1016', in *The Oxford Illustrated History of the Vikings* (ed P Sawyer), 48–82, Oxford

Kjølbye-Biddle, B 1995. 'Iron-bound coffins and coffin-fittings from the pre-Norman cemetery', in *Excavations at York Minster. Volume 1: Roman to Norman* (eds D Philips and B Heywood), 489–521, London

Leary, R S 2003. 'The Romano-British pottery from the kilns at Lumb Brook, Hazelwood, Derbyshire', *Derbyshire Archaeol J*, **123**, 71–110

Lucy, S and Reynolds, A (eds) 2002. *Burial in Early Medieval England and Wales*, Soc Medieval Archaeol Monogr Ser 17, London

Mattingley, H (trans) 1970. *Tacitus: The Agricola and the Germania*, Harmondsworth

McKinley, J I 1993. 'Bone fragment size and weights of bone from modern British cremations and its implications for the interpretation of archaeological cremations', *Int J Osteoarchaeol*, **3**, 283–7

McKinley, J I 1994a. *The Anglo-Saxon Cemetery at Spong Hill, North Elmham. Part VIII: The Cremations*, E Anglian Archaeol Rep 69

McKinley, J I 1994b. 'Bone fragment size in British cremation burials and its implications for pyre technology and ritual', *J Archaeol Sci*, **21**, 339–42

McKinley, J I 1997a. 'The cremated human bone from burial and cremation-related contexts', in *Archaeological Excavations on the Route of the A27 Westhampnett Bypass, West Sussex, 1992, Volume 2* (ed A P Fitzpatrick), Wessex Archaeol Rep 12, 55–72, Salisbury

McKinley, J I 1997b. 'Bronze Age "barrows" and the funerary rites and rituals of cremation', *Proc Prehist Soc*, **63**, 129–45

McKinley, J I 2000. 'The analysis of cremated bone', in Cox and Mays 2000, 403–21

McMinn, R M H and Hutchings, R T 1985. *A Colour Atlas of Human Anatomy*, London

Müller-Wille, M 1971. 'Pferdegrab und Pferdeopfer im Frühen Mittelalter', *Berichten van de Rijksdienst voor het Oudheidkundig Bodermonderzoek*, 20–1, 119–248

Nielsen-Marsh, C, Gernaey, A, Turner-Walker, G, Hedges, R, Pike, A and Collins, M 2000. 'The chemical degradation of bone', in Cox and Mays 2000, 439–54

Niles, J D 1991. 'Pagan survivals and popular beliefs', in *The Cambridge Companion to Old English Literature* (eds M Godden and M Lapidge), 126–41, Cambridge

O'Brien, E 1998. 'The location and context of Viking burials at Kilmainham and Islandbridge, Dublin', in Clarke, Ní Mhaonaigh and Ó Floinn (eds) 1998, 203–21

O'Connor, T P 1988. *Bones from the General Accident Site, Tanner Row*, The Archaeology of York 15/2, London

Oestigaard, T 1999. 'Cremations as transformations: when the dual cultural hypothesis was cremated and carried away in urns', *European J Archaeol*, **2**/3, 345–64

O'Sullivan, D 1996. 'A group of pagan burials from Cumbria?', *Anglo-Saxon Stud Archaeol Hist*, **9**, 15–23

Ottaway, P 1992. *Anglo-Scandinavian Ironwork from Coppergate*, The Archaeology of York 17/6, London

Petersen, J 1928. *Vikingtidens smykker*, Stavanger

Pevnser, N and Williamson, E 1978. *The Buildings of England: Derbyshire*, London

Posnansky, M 1955. 'The pagan Danish barrow cemetery at Heath Wood, Ingleby: a preliminary excavation report', *Derbyshire Archaeol J*, **75**, 140–4

Posnansky, M 1956. 'The pagan Danish barrow cemetery at Heath Wood, Ingleby: 1955 excavations', *Derbyshire Archaeol J*, **76**, 40–56

Ramskou, T 1950. 'Viking Age cremation graves in Denmark. A survey', *Acta Archaeologica*, **21**, 137–82

RCHME 1994. *Heath Wood, Ingleby, Derbyshire. Archaeological Survey Report*, unpublished report

Richards, J D 2000. *Viking Age England*, Stroud

Richards, J D 2001. 'Boundaries and cult centres: Viking burial in Derbyshire', in Graham-Campbell *et al* (eds) 2001, 97–104

Richards, J D 2002. 'The case of the missing Vikings: Scandinavian burial in the Danelaw', in Lucy and Reynolds (eds) 2002, 156–70

Richards, J D 2003. 'Pagans and Christians at a frontier: Viking burial in the Danelaw', in *The Cross Goes North. Processes of Conversion in Northern Europe, AD 300–1300* (ed M Carver), 383–95, Woodbridge

Richards, J D, Jecock, M, Richmond, L and Tuck, C 1995. 'The Viking barrow cemetery at Heath Wood, Ingleby, Derbyshire', *Medieval Archaeol*, **34**, 51–69

Riley, D 1978. 'An early system of land division in South Yorkshire and North Nottinghamshire', in *Early Land Allotment in the British Isles* (eds H C Bowen and P J Fowler), BAR, Brit Ser 48, 103–8, Oxford

Roesdahl, E 1976. 'Otte Vikingatidsgrave i Sdr. Onsild', *Aarboger for Nordisk Oldkyndighed og Historie*, 22–51

Roesdahl, E 1977. *Fyrkat, en Jysk Vikingeborg 2: Oldsagerne pg gravpladsen*, Copenhagen

Roesdahl, E 1982. *Viking Age Denmark*, London

Rogers, N S H 1993. *Anglian and Other Finds from Fishergate*, The Archaeology of York 17/9, London

Sass, T (trans) 1995. 'The funeral of the Rus-chief' from §87–92 of the work of Ibn Fadlan, in Crumlin-Pedersen and Munch Thye (eds) 1995, 136–7

Sawyer, P H 1968. *Anglo-Saxon Charters: An Annotated List and Bibliography*, London

Sawyer, P H 1971. *The Age of the Vikings*, 2nd edn, London

Shetelig, H 1940. 'Grave finds', in Shetelig and Bjørn (eds) 1940, 9–26

Shetelig, H 1954. 'The Viking graves', in Curle, Olsen and Shetelig 1954, 67–111

Shetelig, H (ed) 1940. *Viking Antiquities in Great Britain and Ireland. Part V: British Antiquities of the Viking Period, found in Norway*, Oslo

Shetelig, H and Bjørn, A (eds) 1940. *Viking Antiquities in Great Britain and Ireland. Part IV: Viking Antiquities in England*, Oslo

Siddorn, J K 2000. *Viking Weapons and Warfare*, Stroud

Sigvallius, B 1994. *Funeral Pyres: Iron Age Cremations in North Spånga*, Osteological Research Laboratory, Stockholm University

Sjösvärd, L, Vretemark, M and Gustavson, H 1983. 'A Vendel warrior from Vallentuna', in *Vendel Period Studies 2* (eds J P Lamm and H-Å Nordström), Stockholm

Smyth, A P 1977. *Scandinavian Kings in the British Isles 850–880*, Oxford

Stafford, P 1985. *The East Midlands in the Early Middle Ages*, Leicester

Stenton, F M 1943. *Anglo-Saxon England*, Oxford

Stuiver, M, Reimer, P J, Bard, E, Beck, J W, Burr, G S, Hughes, K A, Kromer, B, McCormac, F G, van der Plicht, J and Spurk, M 1998. 'INTCAL98 radiocarbon age calibration 24,000–0 cal BP', *Radiocarbon*, **40**, 1041–83

Taylor, H M 1987. 'St Wystan's church, Repton, Derbyshire. A reconstruction essay', *Archaeol J*, **144**, 205–45

Tweddle, D forthcoming. 'The decorated metalwork', in *Excavations at Castle Green, Carlisle*

Unwin, P T H 1982. 'The Anglo-Saxon and Scandinavian occupation of Nottinghamshire and Derbyshire', *J English Place-Name Soc*, **14**, 1–31

Wainwright, F T 1947. 'Early Scandinavian settlement in Derbyshire', *Derbyshire Archaeol J*, **67**, 96–119

Walsh, A 1998. 'Viking Age swords in Ireland', in Clarke, Ní Mhaonaigh and Ó Floinn (eds) 1998, 222–35

Walton, P 1989. *Textiles, Cordage and Raw Fibre from 16–22 Coppergate*, The Archaeology of York 17/5, London

Ward, J 1905. 'Anglo-Saxon remains', in *VCH Derbyshire Vol 1* (ed W Page), 265–77, London

Warmind, M L 1995. 'Ibn Fadlan in the context of his age', in Crumlin-Pedersen and Munch Thye (eds) 1995, 131–5

Webster, L 2001. 'Metalwork of the Mercian supremacy', in Brown and Farr (eds) 2001, 263–77

Webster, L and Backhouse, J (eds) 1992. *The Making of England, Anglo-Saxon Art and Culture*, London

Welch, M 2001. 'The archaeology of Mercia', in Brown and Farr (eds) 2001, 147–59

Whitelock, D 1941. 'The conversion of the eastern Danelaw', *Saga-Book*, **12**/3, 159–76

Williams, H 2000. '"The burnt Germans of the age of iron": early Anglo-Saxon mortuary practices and the study of cremation in past societies', unpublished PhD thesis, Reading

Wilson, D M 1965. 'Some neglected late Anglo-Saxon swords', *Medieval Archaeol*, **9**, 32–54

Wilson, D M 1967. 'The Vikings' relationship with Christianity in northern England', *J Brit Archaeol Ass*, 3rd ser, **30**, 37–46

Worley, F L in prep. 'Taken to the Grave. An archaeozoological approach assessing the role of animals as crematory offerings in first millennium AD Britain', unpublished PhD thesis, Bradford