Prehistoric - 60666-72, 60679-80
Undated - 60665
Roman - 60673-78
Med - 60681-86. 97/3
QMTS 4803 4804 4806

LINDSEY ARCHAEOLOGICAL SERVICES
FRANCIS HOUSE SILVER BIRCH PARK GREAT NORTHERN TERRACE LINCOLN LN5 8LG

SOURCES 41513 & 41508

Scarle Supply Zone Reinforcement Scheme:

Archaeological Monitoring in Lincolnshire and Nottinghamshire

of the

Eagle to Harby Watermain Pipeline

NGR: SK 8753 6612 - SK 8856 7143

Site Code: **SWP 96**
LCNCC Museum Accn. No. **49.96**

Report prepared for Anglian Water Services

April 1997

Lincolnshire County Council
Ap[illegible]
[illegible]
LINCOLN LN2 5AL
TEL. 0522 5[illegible]2 FAX: 0522 530724
4.4.97

Preservation by record:
Archaeologists working at the site of Iron Age ditches found on the pipeline easement near Harby

Contents

List of Figures

List of Plates

Pl. 16. Contractors helping to retrieve Iron Age pottery from ditch terminal **307** in advance of pipe-laying; ditch terminal **308** is visible as black soil (left foreground). Looking NW, scale divisions 0.1m.

Pl. 17 The dark fill of ditch terminal **307**. Machine ruts mark the line of this ditch to the end of the spoil heap. A modern ditch passes between the wooden posts. (Looking NE).

Pl. 18 A dense assemblage of animal bone fragments, some burnt, was visible at the exposed ditch terminals **307** and **308**.

Pl. 19 The pipe trench was excavated across the Iron Age ditch terminals before detailed archaeological excavation began (looking north).

Pl. 20 The NE terminal of ditch **308** was bulbous and about 4.5m broad; the NW edge was disturbed by a medieval plough furrow and a later land drain. Only part of the ditch was excavated (looking south).

Pl. 21 Post-medieval land drains had been laid in the bases of medieval plough furrows cutting across the terminal of ditch **308** (looking NW).

Pl. 22 Tiplines of fills in the terminal of ditch **308**. (Scale divisions 0.5m).

Pl. 23 Close to the base of ditch **308**, Iron Age excavators had cut through a thin seam of limestone.

Pl. 24 Yellow clay at the terminal of **308** had slumped from the ditch sides shortly after it was first dug (looking west; scale divisions 0.5m).

Pl. 25 Large sections of the new pipe trench sides cracked and slumped within days; this process replicated events when the Iron Age ditch was dug. (Looking north past ditch terminal **307**).

Pl. 26 Sequence of excavated deposits in ditch terminal **308**. Initial silting fills are fine and light grey, followed by the yellow clay slump from the ditch sides. The darkest layer **317** produced part of a split oak timber and charcoal fragments. Above this, **303** contained frequent animal bone fragments and Iron Age pottery. (Scale divisions 0.5m)

Pl. 27 After diversion of the contractors' access over **308**, trample was removed from above ditch **307** by machine. Redeposited grey clay filling the deepest ruts is still visible (looking NW from spoil heap).

Pl. 28 Sequence of soil fills in ditch **307** (scale divisions 0.5m).

Pl. 29 The light brown fill of a small gully **373** was visible at the eastern edge of ditch **307**, cut through the darker backfills of that ditch.

Pl. 30 Maisie Taylor examining and recording the oak vessel base found in **366** prior to conservation.

Pl. 31 View of one side of Iron Age wooden vessel base or lid found in **366**.

Pl. 32 The alignment of ditch **307**, looking NE from its terminal. The ditch continues beneath the spoil heap (scale divisions 0.5m).

Pl. 33 Ditch **309** (right foreground) terminated close to terminal **307** (by centre scale) leaving a small entrance between the two main ditches (looking east, scale divisions 0.5m).

Pl. 34 Section across ditch **309**, showing the fill with animal bone fragments (scale divisions 0.5m).

Pl. 35 Part-excavated posthole **310**. The small depression (centre foreground) may mark the post position within the hole (scale divisions 0.5m, 0.1m, 0.05m and 0.01m).

Pl. 36 Half-excavated posthole **311** (scale divisions 0.1m, 0.05m and 0.01m).

Pl. 37 Posthole **333**, half-excavated. (Looking east, scale divisions 0.1m).

Pl. 38 Comparison of residues from processed fills from **307** and **308**.

Pl. 39 The pipeline easement, Field 12, after topsoil stripping. The darker soil (middle distance) was interpreted as a post-medieval ditch but may have been the return of the Iron Age enclosure ditch. (Looking north from gully **101**).

Pl. 40 Fill of undated ditch crossing the deeper easement midway between gully **101** and the Iron Age enclosure entrance (looking south).

Pl. 41 A ditch crossed the easement in a dip between gully **101** (foreground) and the enclosure entrance (behind trenching machine); the depression is behind the landrover (looking north).

Pl. 42 Natural soil sequence in trench on north edge of field ditch, Field 11.

Pl. 43 Mixed natural deposits of grey clay and sand in the faces of the pipe trench, Field 10 (looking south).

Pl. 44 Air photograph of Harby, showing cropmark of part of a rounded ditched enclosure in vicinity of excavated ditches **307** and **308** (left of centre, beside curving boundary line. Regular linear marks to the east are from more recent drainage. Reproduced by permission of J. and P. Marshall.

Pl. 45 Panoramic photograph of crop growth in Field 12 close to the Iron Age enclosure entrance (looking SW).

Pl. 46 Field boundaries and topography to the east of the Iron Age enclosure entrance (looking east).

Pl. 47 Sinuous line of field boundaries to east of Harby village, probably marking extent of medieval woodland on the clay soils. Clay Lane coincides with this boundary (upper left). Looking east; reproduced by permission of J. and P. Marshall.

Pl. 48 Soil horizons beside Iron Age ditch **309** (looking west).

Pl. 49 Redeposited clay to the NW of ditch terminal **308**, possibly representing upcast from a bank on that side.

Pl. 50 Deeper achining of the easement SE of The Grange (Field 18) revealed the brown fill of a ditch (along edge beneath 1m scale; looking north).

Pl. 51 Detail of the soil change where ditch **200** cut into the natural clay (scale divisions 0.2m).

Pl. 52 Iron Age pottery sherds in the easement edge, context **204** (scale divisions 0.2m).

Pl. 53 Location of the eastern ditch of the Swinethorpe Iron Age enclosure; the SE corner is slightly right of the short scale. Looking west to Fir Tree Farm; scale divisions 0.2m and 0.5m).

Pl. 54 Section across east side of ditch **200** at the SE corner, looking north.

Pl. 55 Section across ditch **200**, looking north.

Pl. 56 Charcoal flecks in fill **216** at SE corner of ditch **200**.

Pl. 57 NE corner of ditch **200** (left) and later ditch **203** (right) distinguished by small peak of undisturbed orange sandy clay.

Pl. 58 The junction of the NE corner of ditch **200** (excavated) and ditch **203** (fill remaining). Looking south.

Pl. 59 Ditch **203** turned westward under the southern side of the farmer's access ramp (looking south).

Pl. 60 Only small amounts of the fill of ditch **203** survived (scale divisions 0.05m).

Pl. 61 Location of the enclosure ditches **200** and **203**, posthole **206** (centre of ramp) and Hobba Dyke (top right). Looking NW.

Pl. 62 Light brown fill of posthole **206** (top centre).

Pl. 63 Posthole **206** after removal of surviving fill.

Pl. 64 Light brown soil fill of feature **209** (below arrow), interpreted as a posthole. Looking east.

Pl. 65 **209** after removal of fill on southern side.

Pl. 66 Soils between posthole **206** and Hobba Dyke, probably representing an upcast bank of unknown date (looking NW).

Pl. 67 Southern side of Hobba Dyke, the county boundary south of Grange Farm. Yellow clay (mid-distance) may mark a backfilled ditch. Looking west to Fir Tree Farm.

Pl. 68 Location of hearth **401** in Field 43 , SW of Eagle (looking north, scale divisions 0.2m).

Pl. 69 Hearth **401** after surface cleaning (scale divisions 0.2m).

Pl. 70 Half-section across fill of hearth **401**, showing heat reddened clay around the edges (scale divisions 0.2m).

Pl. 71 Hearth **401** after full excavation.

Pl. 72 Fragmented fired clay object, perhaps a loomweight, Field 32A

Pl. 73 Dark fills of medieval plough furrows crossing stripped easement surface, Field 20 (looking north).

Pl. 74 Vestigial ridge and furrow in pasture, Field 39B (looking NE).

Pl. 75 Burnt soil beneath topsoil in Field 19, probably caused by medieval or later land clearance.

Pl. 76 Field 23 after topsoil stripping. Limestone rubble spread 23D is close to the nearest fence post (looking NW).

Pl. 77 Limestone rubble 23D as first seen.

Pl. 78 Cleaning of area around rubble 23D (looking E, scale divisions 0.5m).

Pl. 79 Charcoal spread 23B, with cross-section of fill removed (looking N).

Scarle Supply Zone Reinforcement Scheme:
Archaeological Monitoring
of the
Eagle to Harby Water Main Pipeline

NGR: SK 8753 6612 - SK 8856 7143
Site Code: **SWP 96**
LCNCC Museum Accn. No. **49.96**

Summary

A watching brief during groundworks for a new water main located three Iron Age sites which were subsequently partly excavated. These produced evidence for occupation and iron smelting between Harby (Notts.) and Eagle (Lincs.). Environmental evidence suggested that the sites had been at the eastern edge of open ground beside woodland. Middle and Late Iron Age pottery, including unique forms, was recovered. Teeth from house mice, among the earliest identified in Britain, were also found.

Scatters of worked flints and Romano-British pottery were also identified along the 5.5km route. Vestigial traces of ridge and furrow were recorded, indicating medieval arable expansion and later contraction.

Introduction

Anglian Water's Scarle Supply Zone provides drinking water to the communities on the western edge of Lincolnshire, including Bassingham, Aubourn, Haddington, Thorpe on the Hill, Doddington, Scarle and Eagle. In recent years, increased demand has strained the capacity of the existing network of mains and pumping facilities, and consumers at the periphery of the zone have been at risk of depleted supplies. The former RAF Swinderby site is to be redeveloped and this will eventually also require an improved mains supply.

The 1996 Scarle Supply Zone Reinforcement Scheme was designed to replace the existing mains to Eagle with a spur of the main from the Newton on Trent Water Treatment Works to Lincoln (aligned along the redundant railway line which passes north of Harby). The 5.5km new main passed to the east of Harby village and across fields to the north, east and south of Eagle; at a later date the pipe is to be extended to serve Swinderby (Fig.1).

A desk-based assessment of the proposed route identified medieval cultivation earthworks at Harby which might be affected by the works, but otherwise the pipeline route passed through an area where very few archaeological remains had been reported (Tann 1996). The Archaeology Section of Lincolnshire County Council requested a watching brief during topsoil stripping and other groundworks, and Lindsey Archaeological Services (LAS) were commissioned in March 1996 to conduct this further work.

Along part of the route, topsoil removal was preceded by land drainage. Inspection of the ploughed field surfaces and the spoil from the drain trenches started on March 18th 1996; only two pieces of pottery were recovered. Fieldwork continued until the new main had been laid and included archaeological excavation at four locations where topsoil or subsoil removal had exposed features of antiquity. At Harby, one excavation continued after the pipe had been laid in order to avoid delays to the works. Archaeological monitoring was completed on June 24th 1996.

Project Administration

Although the pipeline route crosses from Harby in Nottinghamshire into Eagle in Lincolnshire, Anglian Water's environmental consultation had been only with the Lincolnshire County Archaeology Section. The desk-based assessment had included neighbouring discoveries from Nottinghamshire, and possible archaeological constraints in that county had been highlighted. The Notts. County Archaeology Section requested that the complete pipeline route should be monitored and this was agreed in the specification agreed between LAS and Anglian Water dated March 19th 1996. This report is to be copied to the Sites and Monuments Records of both counties and their appropriate museum; the finds will be deposited at the appropriate museums after agreement from the landowners. The project paper archive will be lodged at the City and County Museum, Lincoln, using the agreed accession number 49.96.

Recording System

Each plot of land through which the pipeline route passed was allocated a Field Number before fieldwork commenced (Fig. 2). Artefacts recovered from a plot were assigned the appropriate Field Number and a suffix letter for location and recording purposes. Finds lying close together in the same field were given the same suffix letter but other finds from elsewhere in the same plot received another. This system has been used successfully by LAS on similar projects since 1992 and allows for the recording of dense scatters of similar material as well as isolated artefacts of varied date. Repeated inspection of the easement surface throughout groundworks produced additional finds and the method enabled these to be combined with initial finds where appropriate. After completion of fieldwork, an eight-figure National Grid Reference was identified for each findspot (App. 1). This information will assist the County Sites and Monuments Record staff in their updating the SMR with the results of this watching brief.

Monitoring Techniques

The watching brief was carried out by the author, visiting on foot the pipeline easement in each field on several occasions during different stages of the groundworks. Exposed deposits, whether topsoil or the underlying soil horizon, were visually inspected; any archaeological artefacts were recorded and removed for cleaning and identification. The immediate area was then checked for associated archaeological features. Metal detectors were not used.

Distinct soils differences were noted and described where possible. Extensive vestigial remains of medieval/post-medieval ridge and furrow cultivation were seen at the fringes of Harby and Eagle parishes in Fields 12-20.

Colour photographs were taken of features of possible archaeological significance both within and adjacent to the easement. A number of observations led to more intensive archaeological investigation. Geological and palaeontological observations were outside the remit of this project but noted on occasion.

Archaeological Excavation

Investigation of possible archaeological deposits ranged from a rapid surface scrape with a hoe in order to define the extent of a potential feature, to archaeological excavation by a small team of experienced archaeologists. Excavation was conducted at locations in Fields 12, 18 and 43. The standard LAS context recording system was used for these more detailed investigations. The cuts and fills of each identifiable archaeological feature were assigned a Context Number in sequential order within blocks for each site (ie. 100-199, 200-299 etc.). In order to simplify the project archive the same site code SWP 96 was used in association with the Context Numbers for all the excavations .

Sample excavation by hand, using mattocks, shovels and small pointing trowels, involved removal of part of the contents of each identified archaeological feature to investigate their form and obtain dating evidence. At least half the fill of small features and a smaller proportion of larger features was removed.

A strategy for sampling deposits with the potential to produce environmental remains was employed at the Harby Iron Age enclosure where the features were deep and water-logged. This strategy is described in Appendix 4.

A full photographic record of colour prints was taken in order to complement the written and illustrated records.

The Excavations

Harby Iron Age Gully Excavation Report
Field 12
NGR: SK 8816 7047
Contexts 100 - 166

This site was identified during monitoring of the groundworks, when a flint artefact was recovered and a localised spread of soil containing a high concentration of charcoal flecks seen on the surface of the stripped easement at 12B (Figs. 3-5). Further investigation showed that it lay within a narrow linear gully **101** extending into the western easement edge (App. 2). Unstratified finds collected from the immediate vicinity of the gully during cleaning and definition of the feature were assigned the context number **100**. They are from the same part of the field as finds 12B, 12C and 12D. In total, four Romano-British pottery sherds and three medieval sherds were found on the easement surface here. Surface cleaning of the surrounding area located a broader linear feature 3m to the south with a very different fill which, on excavation, was found to be a medieval or later plough furrow **102**, 2.46m wide and aligned east-west (Pl. 1).

The Excavation

Gully **101** extended 3.4m into the stripped easement from the western edge and then terminated abruptly; there was no indication that it had extended further east at a shallower depth. It was 0.5m wide and up to 0.22m deep beneath overlying soils. The dark fill contained frequent charcoal flecks and was visible on the easement surface after the initial stripping. The gully was half-sectioned longitudinally (Pls. 2 and 3), and then fully excavated within the easement (Pls. 4 and 5). The northern side was less defined than its southern edge but the base was identified by yellow clay patches. Patches of yellow clay were found in the fill **109**, often apparently affected by heat, and it was initially thought that the gully had a clay lining. After excavation it was concluded that the feature had been backfilled with material from another source in the near vicinity and that the heated clay had not been deliberately laid in this gully. Nine sherds of Later Iron Age pottery, 1kg of fired clay and 5.6kg of slag were recovered from the gully fill but no finds were found in the post-hole fill (Apps. 3 and 5).

A small circular stake- or post-hole **116** was found at the western limit of the excavation, in the baulk section but virtually centrally sited within gully **101** (Pl. 5). The north side was almost vertical but the south side sloped steeply (Pl. 6). The fill **117** contained charcoal and burnt clay fragments in a sandy matrix; it appeared to be identical to fill **109** in the gully.

The relationship of the post-hole to the gully was not certain but it was probably contemporary or slightly earlier; the baulk section shows both features to be sealed by a thin layer of light-coloured sand. The uneven base of the gully was shallowest beside this post-hole, as if it was respecting a

standing post. It is possible that the post-hole indicates a structure within the gully, or possibly denotes the gully as actually a beam slot, but there was no sign of occupation activity around the gully terminal as would have been expected.

The excavated gully was recorded and then left for two weeks while work progressed elsewhere on the route. Heavy rain was experienced within this period. The site was checked shortly before pipes were stacked along the easement edge and it was found that weathering had revealed fragments of fired clay in soil that had previously been identified as undisturbed. Severe silting of the excavated features had occurred and because of the scale of this silting it was decided to re-investigate the ground around gully **101** (Pl. 7).

The topsoil was a thick dark sandy deposit with lighter sand patches (Pl. 8). It overlay thin laminated lenses of lighter sand **110** which had partially covered the archaeological features backfilled in antiquity. This material was interpreted as wind-blown sand, derived from the immediate vicinity where the natural clay was overlain by sandier material.

Cleaning of the weathered surface exposed an extensive area of dirtier sand with infrequent charcoal flecks and fired clay fragments **117**. It was suspected that this could represent a feature earlier than the excavated gully and the sand was sectioned and excavated accordingly. Clay was found in places underlying the sand, apparently the sides or base of an artificial feature. Further investigation found that the clay sides could not be traced with confidence, and that the sand covered a complex of irregular holes (Pls. 9 - 11). In retrospect, the confusion of possible channels and holes is most likely to be the result of roots around a mature tree; the excavated area may have been the throw-hole from an uprooted tree. Within this hole, wind-blown sand had accumulated forming layers including **155** and **163**. A single Later Iron Age pottery sherd was found in **155**, providing an indication of nearby activity before gully **101** was in use.

Part of the easement to the north was lowered by machine in preparation for pipe laying. A second west-east aligned narrow gully **136** was revealed, filled with a dark soil **137** containing numerous charcoal flecks (Pls. 12 and 13). There was little time to investigate the gully before the trenching machine had effectively removed it, but it was recorded in plan and section.

The gully was up to 0.9m wide and 0.3m deep and located 5m north of **101**. It extended beyond either side of the deeper stripped area but was only investigated where it was revealed. The sides sloped steeply to a slightly rounded base (Pl. 14).

The size of this feature suggested that it had a similar function to gully **101** although it continued further east for an unknown distance. The dense charcoal fill may have derived from the same source as fill **109**.

Discussion

Gullies **101** and **136**, and post-hole **116**, formed a distinct cluster of archaeological features 100m south of the enclosure ditch terminals **307** and **308**. They seemed to be associated with a separate area of occupation or industrial activity probably a short distance west of the easement and sited on a slight knoll of lighter ground (Pl. 15). Pottery evidence indicates a Later Iron Age date for this activity although a slightly earlier date is possible. The slag includes both smelting and smithing products, indicating metal-working on the site.

The charcoal and fired clay found within, and close to, **109** were probably connected with the metalworking activity but no hearth or furnace was found within the examined area. Some of the fired clay retrieved may have been from furnace structures (one fragment contains a wattle impression, and another may have been a crude brick) but nothing conclusive was identified (App. 5). Iron Age furnaces were about 3m high and 0.7m external diameter, constructed with an arch at the base; beyond the arch was a shallow pit. Although firing was to temperatures of 800-1000ºC, experimental work has shown that the clay furnace structure was barely fired during the 9 hour process and that few remains can be expected to have survived (Crew 1991).

Ironstone naturally occurs within the clays in this area, and a thin exposure was noted in the terminal sides of Ditch **308** 100m to the north. The actual source of iron used may have been iron-panning deposits which are no longer present, but the smelting process is more likely to have been based around a timber and charcoal supply which would have been less easy to transport (J. Cowgill, pers. comm.). Experimental firings have suggested that 8kg of crushed iron ore required up to 40kg of charcoal (and a much greater weight of unburnt timber). The excavations 100m north of this site (see below, p. 15) produced environmental evidence for woodland on the eastern edge of this field in the Iron Age, sited on the limit of clay soils; this would seem to be the factor for the siting of this industry (App. 4).

Specialist examination of the ratio of furnace slags (those which remained in the furnace) to tapped slags (which were removed during the smelting process in order to allow the process to continue) has suggested that at the Harby site there are signs of the industry in transition between developmental stages. At Harby the proportion of furnace slags was much higher compared to tapped slags. Tapped furnaces have previously been assumed to be Roman although Middle-Late Iron Age sites (including a South Lincolnshire example) are now recorded.

In addition to smelting slags, smithing slag was found on this site, representing reworking of the smelted product. It is impossible to state what the metal-working industry at Harby was producing, or what scale activity took place. Two fragments of metal objects were found on the site but both are undiagnostic (App. 7).

The medieval finds can be readily explained as domestic waste spread on the arable field; the Roman sherds tend to suggest that a contemporary occupation site is nearby - perhaps a direct continuation of activity beside the Iron Age gully or the Iron Age enclosure 100m to the north.

The iron working site seems to have extended west of the pipeline easement and beyond the area available for investigation. This land is an arable field and despite evidence for medieval ridge and furrow ploughing archaeological deposits are likely to have survived. The relationship of this industrial activity to nearby occupation and to the Middle Iron Age enclosure identified 100m north could probably be further examined by geophysical survey; this is an important research priority.

Harby Iron Age Enclosure Entrance Excavation Report
Field 12
NGR: SK 8818 7052
Contexts 300 - 384

Introduction

This archaeological site was identified at the northern end of Field 12 (100m north of gully **101** described above) (Fig. 3). After topsoil stripping, the dark fill of medieval plough furrows had been seen but no earlier features had been apparent. A pair of opposing ditch terminals was observed during machining of the centre of the easement in preparation for contractors' excavation of the pipe trench, but at that stage there was no opportunity to investigate the site in detail as the trenching machine was very close (Pls. 16 and 17).

Iron Age pottery and a mass of animal bone retrieved from one of the terminals led to provision being made for further investigation of these features after the pipe trench had been excavated and the pipe laid (Pls. 18, 19).

Ditch terminal 308 (Figs. 6 and 7)

Definition of the NW edge of this feature was difficult as the upper fill had spread beyond the apparent original edge of the cut ditch. It was eventually found to be about 4m wide with a bulbous end about 4.5m broad (Pl. 20). Away from the terminal the ditch was obscured by the fill of a medieval plough furrow along which a post-medieval land drain had been laid; here the ditch was not defined (Pl. 21). Finds from cleaning of the surface of the SW-NE aligned ditch were assigned the context **300**; it is probable that the animal bone fragments had been derived from the exposure of fill **303** around the edges of this ditch.

Slightly under half of the terminal was excavated at the SE extremity in order to recover dating material and environmental samples as well as an indication of the depth and profile (Pl. 22). At the SE side of the terminal the ditch was found to be 1.55m deep, with steeply sloping sides and an almost flat base about 0.7m wide. 1.4m below the top of this ditch the prehistoric excavators had encountered a thin band of limestone 0.04m thick through which they had dug into the underlying grey clay (Pl. 23).

The earliest identified fill **323** was a 0.3m thick deposit of dark grey silty clay with frequent charcoal flecks. This was thickest on the eastern side but on the northern side had been overlain by a considerable slump of clay **322** in the end of the ditch (Pls. 23 and 24). No finds were recovered from this deposit. During excavation of this site it was noted how rapidly large parts of the pipe trench cracked and then fell into the trench; it is likely that a similar process had occurred when the ditch was first dug, and that the sides began to collapse a short time after the terminal was dug (Pl. 25).

The early slump from the ditch end was overlain by fill **320**, a dark blue-grey silty clay with charcoal flecks and infrequent fragments of burnt or fired clay. This layer was 0.22m thick and extended to the surface at the ditch end but only halfway up the ditch on the east side (Pls. 24 and 26).

Fill **318** post-dated **320** but was only present on the upper edges of the ditch to a thickness of about 0.2m. It was a light grey silty sand with infrequent charcoal flecks and small stones. The fill was perhaps derived from surface weathering around the immediate environs of the feature.

Fill **317** covered **318** but was also present in the centre of the ditch to a thickness of 0.25m. This charcoal-rich deposit apparently blocked the ditch but remained beneath standing water; a piece of wood was recovered from the section. This is the earliest fill containing recognisable occupation refuse.

Deposit **314** overlay **317** but pockets of similar material were also noted within the earlier fill. The two fills may have been contemporary, perhaps with refuse **317** deposited over an extended period with natural weathering of the surrounding ground producing the pale orange sandy silt **314**. These processes then continued after that phase of deliberate deposition ceased.

Further deposition of domestic refuse occurred subsequently, producing fill **303**. This thin layer (0.12m) sealed all previous deposits and was present around the sides and base of the silting terminal. An abundance of burnt animal bone with some pottery sherds characterised this fill and this had been the deposit observed when the deeper machine stripping had been monitored for the pipe trench.

Above **303** was fill **302**, a grey clay loam with infrequent charcoal flecks. The uppermost fill **301** was a brown sand. Both these fills were probably naturally deposited; the latest fill may have been wind-blown from the small zone of sandier soils to the south.

Two overlapping column samples were taken for micro-environmental remains in addition to 30-litre bulk samples taken from all suitable fills. These column samples have not been analysed as analysis of other environmental remains exhausted the available budget.

Ditch terminal 307 (Figs. 6 and 7)
The western tip of this ditch was only revealed immediately before trenching occurred, when a layer comprising dark clay loam, and frequent fragments of charcoal, animal bone and fired clay was exposed by deeper trenching. The feature was rapidly cleaned and cross-sectioned in the line of the pipe trench in order to reduce the loss of information. A soil sample was removed and pottery sherds from about three vessels were collected, mostly from the SE side of the exposed fill. Finds from this initial observation were assigned the context **306**. It is likely that **306** equates with the stratified deposits **378** and **313**.

The area was then left until archaeological excavation of the opposing terminal **308** had been completed as **307** had already been disturbed by vehicle ruts and the risk of further damage was less. Before archaeological investigation of this ditch terminal occurred, the contractors' vehicle access was diverted to the western edge of the easement over the previously investigated ditches **308** and **309**. A small area was retained on the western edge of the pipe trench so that the full extent of **307** was visible during excavation.

Vehicle wheels had deeply rutted the surface of **307** and these ruts had been filled and levelled at intervals using clay spoil from the pipe trench. In order to remove this extruded and redeposited material and to reduce the risk of contaminated deposits, up to 0.15m was machined off the area (Pl. 27).

The ditch was sectioned 4m from the terminal in order to identify its profile and depth. It proved to be of similar width to its terminal but apparently considerably narrower than ditch **308**. At the section, it was 3.1m wide and 1.4m deep, with both sides sloping at an angle of about 45° to a rounded base 0.6m wide (Pls. 28 and 29). The environmental sampling strategy used was similar to that for Ditch **308**.

The primary fill **367** was a thin layer (0.1m) of clean pale grey-brown sand, which was probably silting immediately after excavation of the ditch. This material is derived from the soils beside the top of the ditch and not from the clayey sides. It was overlain by **366**, which was slightly thicker on the western side of the ditch, but was present on both sides and across the base of the ditch. This fill was a grey silty material containing pockets of organic material. It was sealed on the eastern side of the ditch by a more substantial slump deposit **384** which probably derived from the same source. The base of a small oak vessel was recovered from the interface between **366** and **384** and this has been identified by Maisie Taylor (Pls. 30 and 31) (App. 6). Further fragments of wood were found in adhering soil and in the soil sample sent for environmental analysis. All these pieces have received initial conservation at the Lincolnshire Conservation Laboratory and will shortly be sent for freeze-drying which will ensure longer-term preservation of this rare object.

384 was succeeded by **368**, a deposit of dark brown and grey clay restricted to a small area halfway down the east edge of the ditch. This seems to have been a slump from the ditch side (which consists of similar clays). Further slump deposits were seen in section on the same side at a higher level.

Above **368** was **365**, a 0.4m thick deposit of grey silt present across the width of the ditch but highest on the eastern side (reflecting the underlying deposits. Frequent flecks and fragments of charcoal were seen in this fill, indicating human activity in the vicinity. Leaves and twigs were also identifiable, detritus from nearby woodland.

Fill **364** which overlay this was a light brown silty sand with fragments of sandstone and small stones. This material was restricted to the eastern side. A possible gully, with light brown fills was recorded at the top eastern edge of the ditch but re-interpreted during post-excavation analysis as part of this same fill layer.

A band of fill overlying **364** was distinguished as comprising three deposits **362**, **363** and **375**, all thought to have entered as a single process. This grey sandy silt deposit had apparently entered the ditch from the western side unlike almost all the other fills. Very occasional bone fragments were seen in the upper part of this fill but they may have intruded from the overlying deposit **361** which contained about 5% animal bone.

361, a grey silt with some sand content, was the same deposit as that recorded at the terminal as **313/378**. This fill was 0.1m thick and extended across the centre of the silted ditch; it had been exposed by machine truncation on the easement surface and was almost certainly the source of the finds recovered from the surface as **306**. It contained frequent flecks and fragments of charcoal, small pieces of fired clay and large quantities of animal bone fragments.

This deliberate tipping phase seems to have been short-lived. **361** was covered by a grey sandy silt layer **360** which was present across the whole width of the silted ditch. This was probably produced by natural silting.

The latest two surviving ditch fills **359** and **358** were grey sandy silts with infrequent charcoal flecks. These had possibly formed within wet conditions from natural processes of infill, perhaps including wind-blown material from the sandier soils to the south.

There were some indications from the ditch profile and the sequence of backfilling that ditch **307** had been recut at least once and possibly twice after its original excavation. The evidence was inconclusive but this feature may have continued to serve as a boundary, barrier or drainage ditch. Each possible recut produced a shallower and narrower ditch but the alignment was followed closely. The latest identified feature east of the new pipe trench was a possible narrow gully **373** aligned along the SE edge of ditch **307**. It was first recognised in the section excavated across the ditch but could then be identified in plan from its sandy fills **374** and **379**. Unfortunately this part of the easement had been severely disturbed by heavy machinery and precise definition was not possible (Pl. 32).

The surviving width of **373** was about 0.5m and it was 0.3m deep; both dimensions had been truncated by vehicle ruts and machining (Pl. 29). It apparently terminated 1m north of the ditch terminal. No finds were recovered from this feature.

Ditch terminal 309 and Layer 316 (Figs. 6 and 7)
A narrow ditch **309** with very steep sides crossed part of the stripped easement NW-SE close to ditch **307** (Pls. 33 and 34). It was 0.9m wide and 0.8m deep with a very narrow but flat-bottomed base.

Its primary fill **321** was a silty clay with sand patches, probably deposited in water when first excavated. The overlying fills of **319** (silty clay with charcoal flecks) and the later, merging, similar deposit **305** may have washed from the steep ditch sides during weathering over a relatively short period. This material is highest on the north side of the ditch and so may indicate that an upcast bank was located on the northern edge. The ditch had effectively filled by this point; only the remnant bank to the north may have emphasised the depression along the former ditch course and the carefully excavated steep profile had been lost.

The final fill within this ditch, **304**, was a dark grey sandy silt with very frequent animal bone fragments, some fired clay fragments and charcoal flecks. It was initially thought to be remarkably similar in appearance to fills **313/361/378** in ditch **307**, and **303** in **308**, as if all three had derived from the same source of domestic refuse and were closely contemporary deposits. Subsequent analysis has shown the fills to contain different elements in varying proportions and the assumptions can no longer be made (App. 4). A preponderance of pig bones from fill **304** perhaps reflects particular nearby activity, but the importance of pig in the diet confirms the other environmental indicators for woodland as acorns formed a major part in the feeding of swine. Three sherds of Iron Age pottery were found in this fill, two of which were certainly handmade and one that may have been wheel thrown. The possible wheelmade sherd is a small fragment of a vessel footring, potentially dating from the late 1st century BC or the early 1st century AD.

The upper ditch fill was sealed by layer **316** which merged with fill **305** on the northern side of the ditch. Disturbance caused by the close proximity of a post-medieval land drain made interpretation difficult, but it may have represented material from the remains of an upcast bank reworked by medieval ploughing (Pl. 34).

A sandy deposit was seen in section beneath **316** on the northern edge of the ditch. This may have been a prehistoric ground surface buried by the upcast bank when ditch **309** was excavated but the land drain intrusion was so close that it was felt that any environmental sampling might be contaminated.

The Post-holes (Figs. 6 and 7)
The surviving part of a post-hole **310** was sited between the terminals of ditches **307** and **308**, closer and central to ditch **308**. Part had been removed when the easement strip was machined deeper; a post-medieval land drain **315** had cut across its northern edge. The surviving feature was ovoid, 0.6m SW-NE and 0.17m deep. The western side sloped gently towards a rounded base (Pl. 35).

On the southern side of the base, a small sub-circular scoop **342** 0.15m diameter and 0.03m deep appeared to be the base of a slightly deeper feature, probably a small post-hole or stake-hole. It is possible that this vestigial feature represents the void left by a decaying post within the larger post-hole **310**. The contrast in size between the features is difficult to explain, and it is perhaps more likely that this spot was used at two phases for a timber upright.

Immediately west of the pipe trench at the northern end of the excavated area a circular patch of brown silty sand **329** proved to be a post-hole **311**, 0.6m diameter and with a surviving depth of 0.12m (Pl. 36). It was sited within the corner formed by ditch terminals **307** and **309**, and was the only post-hole identified in this area.

Small circular feature **330** was 0.45m diameter and 0.1m deep. It contained a grey silty sand fill **331**. The southern side had a steep side but the northern edge sloped gradually to the surface. This feature was sited immediately south of ditch **309** and may have been contemporary with it. It lay 1.6m north of post-hole **341** but there was no obvious association with it.

A sub-rectangular feature **333**, sited close to the NW side of ditch terminal **308**, was 0.45m long, 0.3m wide and 0.2m deep. The southern side was deepest, with an almost vertical face. On the northern side the face sloped more gently (Pl. 37). The fill **334** was a grey sandy silt with no stones.

The eastern end or side of feature **341** was recorded protruding from the western edge of the excavation 2m NW of ditch **309**. It was unclear whether the visible dimensions were representative of the feature and it was therefore impossible to interpret it. The revealed part was probably either the eastern tip of a narrow linear gully or most of a small sub-rectangular post-hole. The recorded dimensions were 0.4m SW-NE and 0.1m deep. The grey-brown sandy silt fill **326** contained occasional charcoal flecks, a fragment of burnt bone and two sherds of Iron Age pottery. The excavation section demonstrated that the backfilled feature predated formation of layer **316**.

A very thin deposit of silty sand **344** survived on the deeper easement strip between ditch **308** and the new pipe trench. It was sub-circular (about 0.2m diameter and 0.05m deep. This may have been the very base of a small post-hole.

A 0.15m diameter and 0.02m deep scoop **382**, with dark grey-brown sandy clay fill **383**, was seen after cleaning of the deeper easement strip beside the pipe trench. It was sited virtually central between ditch terminals **307** and **309**. It was not possible to determine whether this was a natural or artificial feature.

Discussion

The ditch terminals **307** and **308** define the 4m wide entrance to an enclosed area. Both these ditches were far too substantial to be part of an extensive field system such as the 'brickwork' patterns of Roman fields recorded on the Bunter sandstone in Nottinghamshire (Riley 1980). Ditch **309** was narrower and shallower and probably acted as a sub-division of the enclosure. There was no physical relationship between **309** and the larger ditches but, from the way it terminates with a gap of under 2m between it and **307**, the lesser ditch is probably contemporary or later than those ditches.

Although some of the fills in the enclosure ditches appeared identical, detailed analysis showed that there were distinct differences and that they had not been filled from a common source of waste (App. 4). The most obvious example of this was the fills containing large amounts of animal bone fragments in all three ditches. Pig bones predominated in Ditch 309 although cattle were an important element in the two deeper ditches. The sieved residues illustrate both the similarities of fills derived from the ditch sides or surface environs, and the differences where material has been tipped (Pl. 38).

Although the two large ditches were assumed during excavation to enclose an area to the west, this assumption cannot be confirmed without further investigation of the site. None of the indicators available are conclusive and a cogent case can be made for the enclosure lying either to the west or east of the terminals.

Despite close inspection, no return ditches for this enclosure were confidently identified crossing the pipeline easement. Darker soil of a ditch-type feature was seen crossing the easement about 40m north of gully **101** (60m to the south of terminal **308**) after the topsoil stripping, but this feature was identified as a medieval furrow or, more probably, a post-medieval field ditch (Pl. 39). No finds were recovered from the easement surface close to it. When the broad trench was cut in preparation for the trenching machine, this feature showed clearly as a NW-SE aligned band of grey-brown clay loam with a slightly higher area to the north but again no traces of occupation or dating material were revealed (Pls. 40 and 41). No material was seen when the trench was cut through this ditch but the sides were smeared and the trench width was too narrow to permit detailed investigation. This feature cannot be discounted as part of an enclosure east of the excavated entrance.

Conversely, if the Iron Age enclosure lay to the west of the terminals signs of a return ditch would have been expected to the north of ditch **307**. A return coinciding with the present field ditch 16m north of terminal **309** is possible and would have been removed or masked by the later feature; however no evidence for an older ditch was seen on the northern edge of the present ditch (Pl. 42). North of the existing field ditch the ground turned abruptly from sandy soils to clay and it is a reasonable hypothesis that the prehistoric enclosure may have respected that natural soil boundary. In the clayier

ground, the trench cut through numerous pockets of clay and sand and recognition of artificial features in the smeared faces was impossible (Pl. 43).

None of the Iron Age sites found on this pipeline have been recognised previously on air photographs. The RCHM(E) National Mapping Programme has produced a sketch plot of identified archaeological features but in Field 12 only ridge and furrow cultivation is marked. While the excavation was in progress, residents of Harby provided oblique photographs of the vicinity taken privately by a local pilot in 1995. Cropmarks of part of a sub-circular enclosure are visible in the area of the excavated terminals but the photograph is not suitable for accurate plotting (Pl. 44). Crop growth variations were sought from ground level and from the top of the topsoil heap, and faint hints were recorded, but this also failed to indicate the position of the other ditches (Pl. 45).

A geophysical survey of parts of the fields close to the excavated terminals would locate and record the positions of ditches as substantial as **307**, **308** and **309** an resolve the problem of locating the enclosure without requiring further excavation. It might then be possible to relate the gullies close to the Iron Age metal-working site to the deep-ditched enclosure.

The function of the enclosure is also unexplained by the excavations on the easement although the environmental evidence has given good indications of domestic activity and the presence of varied livestock. The quantity of domestic waste tipped into all three terminals after they had effectively silted implies that huts were sited close to the entrance, perhaps only just beyond the investigated area. This positioning of living quarters may have post-dated construction of the enclosure by several years.

The particularly exciting discovery of two house mouse teeth is a further indication of dwellings close to this entrance (App. 4). The teeth were recovered during environmental processing of bulk soil samples taken from **314** and **317**, contiguous deposits midway down ditch terminal **308**. A radiocarbon date obtained for an overlying deposit **303** (BC 380 - AD 55) places these mice in the Iron Age. Few other examples of such early house mice in England are known; there are two examples reported from Gussage All Saints (Dorset). The Harby house mice remains are among the earliest in Britain and suggest direct or indirect links with the continent as so few of these rodents are thought to have been in England at that date. The snake remains found in several of the ditch deposits may show that, before the introduction of the cat, these natural predators were tolerated or encouraged to reduce wood mice, voles and the occasional house mouse.

As previously noted the enclosure is sited at the northern extent of lighter soils and close to the eastern edge of those soils (Pl. 46). The environmental evidence indicates that the enclosure terminals were overhung by a mature oak tree, and it seems probable that oak woodland lay very close outside the enclosure (App. 4). A sinuous line of field boundaries aligned almost north-south to the west of the pipeline easement may fossilise the edge of medieval

woodland at the eastern side of the parish; Clay Lane leads from the village of Harby out to and beside this line of boundaries (Pl. 47). During the medieval period, ancient woodland may have been allowed to flourish as an exploitable commodity on the heavier soils while cultivation concentrated on the lighter soils. Prehistoric land use may have similarly reflected the underlying soils.

The preservation of wood (both the oak timber in Ditch **308** and the rare survival of an oak vessel base in **307**) demonstrates that deposits beneath about 6.9m OD have remained waterlogged since deposition in the Middle-Later Iron Age. The base is an important discovery as few Iron Age wooden objects are found and this example increases the number of items available for comparative study. The secure provenance and the radiocarbon date for deposits above and below this object further increase the significance of the base. The remainder of the enclosure ditches and any associated substantial pits could produce further preserved organic remains.

Pottery from the ditch terminals includes sherds described as "a regionally important collection of later Iron Age pottery" which extends the known range of decorative patterns and their spatial distribution (Knight, App. 3). The pottery contains clay and temper which could have been obtained locally; local production could explain the unique elements of the decoration derived from the La Tène ornamental style. Remains of fired clay loomweights were also found in **300**, **302** and **306** (the upper fills of the two large ditches).

Metal objects were found during excavation of the enclosure ditches (App. 7). A fragment of iron sheet with a perforation was found in **314** (ditch **308**) and has been identified as part of a mount or binding. A small broken nail or rivet were found in the same fill. Part of an iron strip, possibly a staple, was found in **303** and another fragment came from **304**. Slag and hammerscale were recovered during sieving of bulk soil samples from **318**, **328**, **358**. It is likely that these items and waste may have been produced from the metalworking site suspected to lie within about 100m south of these ditch terminals close to gully **101**.

No prehistoric land surface could be identified on the site but one probably survives away from disturbances caused by land drains, furrows and modern field ditches (Pl. 48). There was uncertainty surrounding the alignment of ditch **308** beyond its terminal and the position of an associated upcast bank was not established beyond doubt (although a clay deposit on the surface NW of the ditch seemed a likely candidate) (Pl. 49).

The site has been sealed by soils deposited since the Late Iron Age, probably through wind action. The enclosure lies on the edge of light soils containing pockets of sandy material; soils in this area can be eroded today during strong winds and the process seems to have continued since prehistory. Medieval ridge and furrow ploughing (west-east close to the enclosure entrance) reworked this soil cover and this provided deeper areas of protection to the archaeological features. Although soil-filled furrows were

visible on the stripped easement the ditch fills were only revealed when a further depth was machined.

The discovery of this Middle-Late Iron Age site has implications for the study of this period regionally. Together with the enclosure at Swinethorpe it represents the only evidence, to date, for Iron Age settlement between the Trent and north of the Roman Fosse Way. Instead of assuming this land to be too wet to permit settlement, research must now be directed to locating other contemporary sites which may await discovery, and plotting the distribution of occupation and trading links.

Swinethorpe Iron Age Enclosure Excavation Report
Field 18
NGR: SK 8797 8803
Contexts 200-216

Introduction

Topsoil stripping in Field 18 revealed only evidence for west-east ridge and furrow of medieval or later date and no finds or features were seen (Fig. 8). Shortly before trenching started, a machine was used by the contractors to reduce the easement level by up to an additional 0.6m on the west side, piling spoil against the western easement fence. The broad trench cut through the furrow fill and upcast ridges into a much lighter clay crossed by irregular narrow bands of orange clayey sand.

This narrower easement had been machined unexpectedly and was only inspected after work had been completed. A narrow band of brown clay against the western trench edge contrasted with light grey clay across most of the remainder of the trench (Pls. 50 and 51). The thin sandy bands were truncated by the brown clay and this indicated that it might be an archaeological rather than geological feature. Upon surface examination, a sherd of pottery dated to the Later Iron Age was recovered (18A); further sherds were visible, stratified within the trench face (Pl. 53).

The contractors were alerted to the potential existence of an archaeological site and agreed to avoid it while arrangements were made with Anglian Water and their consulting engineers for further investigation. It was agreed that a rapid excavation would be conducted by LAS staff within a particularly tight time schedule as trenching was expected to start imminently at that point. An excavation team directed by the author excavated a sample of the exposed site between April 17th and 18th (App. 2).

The archaeological features had been dug into an underlying layer of blue/grey clay criss-crossed by natural cracks filled with orange sandy clay. The grey clay may have been an alluvium deposit resulting from extensive prehistoric flooding. The cracks appeared to represent drying of the clay surface with subsequent introduction of lighter material, probably wind blown sand.

Ditch 200 (Figs. 9 and 10)

It was found that the brown clay was the eastern side of the fill of a north-south aligned feature which extended along the trench edge (Pl. 53 and 54). At its southern limit the feature turned westwards beyond the trench edge, apparently at a corner. To the north the ditch was visible for 20m before it abruptly reduced in depth, probably at an opposing corner but possibly at a ditch terminal. The ditch dimensions were not regular, partly the result of variations in machining depth, but it extended up to 0.8m east from the trench edge and its fills were visible for 0.4-0.5m beneath the sealing layer of medieval ploughsoil.

The primary ditch fill **202** was up to 0.4m thick, composed of grey/brown sandy clay with infrequent small pebbles and a very few charcoal flecks. This layer was slightly greyer close to the ditch corners. Three sherds of fired clay were recovered from this fill.

It was overlain by **201**, a light brown sandy clay with more frequent charcoal flecks. 0.2m of this layer survived; 2 animal bone fragments were collected. Towards the centre of the exposed length of the ditch, two additional later fills were present (Pl. 55). The earliest of these **212** was a dark grey loamy clay 0.12m thick with yellow clay patches and infrequent small stones. It was succeeded by **213**, a dark grey/brown sandy clay with small stones and charcoal flecks. Up to 0.40m depth of this fill survived. These two later fills occupied the centre of the ditch; although they may represent fills of a recut feature they were interpreted as further gradual silting episodes.

In places, especially at the SE corner, a layer with numerous charcoal flecks **216** was sandwiched between **202** and **201**. This deposit, usually about 0.05m thick, had no identified relationship with **212** and **213** and might have formed part of the same deposit.

The width of this ditch was not ascertained although in places the entire base was visible. Its width at the base was 0.2m west-east with gently sloping sides; the ditch was at least 0.7m wide and probably close to 1m wide at contemporary ground level. The base was at about 7.25m OD. It had been intended to trace the western edge of the feature when the spoil heap had been removed but it was decided that the priority for this was low compared with completing excavation of other sites elsewhere on the route.

No evidence for an upcast bank was recognised but a slight concentration of stonier material in fills on the western side might imply a bank there, ie. internal to the enclosure. The section at the SE corner certainly shows no slump of material from outside (Pl. 56).

Ditch **200** was the eastern side of a 20m wide enclosure of Later Iron Age date. No entrance was identified. A fill deposit with dense charcoal flecks, and pottery sherds with animal bone in a higher fill suggests that this ditch was near an occupation site. The enclosure was replaced or extended within the Iron Age after the ditches had become substantially silted but while its alignment and shape remained visible.

Ditch 203 (Figs. 9 and 10)
At the northern end of Ditch **200**, a later ditch of apparently similar dimensions had cut through its fill on the corner and extended the line directly northwards a further 11m (Pls. 57 and 58). A farmer's access gap in the adjacent spoil heap allowed investigation at the north end where the ditch was proved to turn westward (Pl. 59). At the southern end this ditch appeared to terminate where it cut **200**; its base was visible in plan slightly east of the trench face and did not curve westwards into the trench edge at that point.

Deeper machining in this area had removed virtually all of the lower fills at the ditch base although the rounded base profile could be determined at intervals (Pl. 60). Higher deposits were visible in the trench face but were separated from the ditch base (Pl. 52).

The base of Ditch **203** was 0.35m wide; although fills were evident 0.2m to the west, it was not possible to state its width at contemporary ground level as deposits to the east had been so completely removed. At the NE corner, a spread of its higher fill **204** suggested a minimum width of 1.5m. The base was at 7.26m OD - exactly level with ditch **200**. This does not seem to reflect a change in natural deposits so it may indicate a contemporary water-table when the ditches were dug.

The fills of Ditch **203** were so similar to those of the earlier ditch that no distinction was apparent before the shallower parts of each were seen at the NE corner of **200**. The earliest, primary fill **205** was up to 0.46m thick (although this measurement may include material down the edge of the ditch). It was a light grey/brown sandy clay with infrequent small stones (except for a marked cluster at the southern terminal). A very small number of charcoal flecks were present.

Above **205** was a thin intermittent layer of light grey/brown clay **211**, incorporating frequent small stones, chalk fragments, fired clay specks and infrequent charcoal flecks. This layer, where present, was 0.1m thick.

A thicker deposit of slightly darker sandy clay **204** sealed **211** and contained slightly more charcoal flecks together with small stones. Six sherds of Late Iron Age pottery (including several joining sherds of a single vessel), a fragment of fired clay and seven fragments of animal bone were collected from the trench face (Pl. 52).

Ditch **203** was originally dug after Ditch **200** had effectively silted, extending its line 11m further north but not renewing the existing length. The continuation of its alignment and depth suggests that it served a similar function, either as an extension of the enclosure defined by **200** or as another adjoining enclosure. Either way, the ditch seems to have served as a visual marker rather than an effective boundary or defensive barrier if the original enclosure continued with only a vestigial ditch.

The Post-holes (Figs. 9 and 10)
A feature thought to be the base of a post-hole **206** was identified at the NE corner of Ditch **203**, apparently cutting its upper fill **204** (Pls. 61 and 62). Only part of the base of this post-hole survived at 7.55m OD; higher levels and all the feature to the east had been removed (Pl. 63). Surviving dimensions were 0.35m depth, 1.46m north-south and 0.6m west-east.

The small amount of fill **207** surviving was a brown sandy clay with small numbers of stones and small pebbles. Flecks of charcoal were also present. The fill had been overlain by deposit **214**, possibly upcast from excavation of the existing field ditch (known as Hobba Dyke) 4m to the north.

A ramp had been made for field access at the eastern edge of the deeper stripped area. Here an ovoid feature **209**, 1.5m north-south and at least 0.6m wide, was partially revealed immediately beneath the modern ploughsoil (Pl. 64). The side was stepped as if this was a post-hole but machine damage had removed too much of the fill to confirm this (Pl. 65). The surviving depth was 0.27m. Further excavation was not possible without blocking the farmer's access.

The fill **208** was a green/grey sandy clay with a few charcoal flecks and infrequent small pebbles. It contained a single sherd of Iron Age pottery in a coarse shelly fabric.

Layer 214

A 0.65m thick deposit of grey sandy clay was seen in the west face of the trench where it sealed post-hole fill **207**. This layer was interpreted as possibly upcast from the excavation of an existing field ditch 4m to the north (Pl. 66). This ditch, called Hobba Dyke, forms the county boundary between Nottinghamshire and Lincolnshire at this point.

No recognisable features were seen in the pipe trench face to the south of the enclosures or in the field to the north. The south face and base of Hobba Dyke (the field ditch at the north side of Field 18) had been recently cleaned and the opportunity was taken to inspect the side for archaeological features. About 70m west of the easement, yellow clay could be seen sloping to the ditch base and this may mark a backfilled ditch of unknown date (Pl. 67).

Discussion

The excavation revealed what appeared to be the complete east side of two successive and adjoining Late Iron Age enclosures, defined by ditches about 0.4m deep. This were positioned close to the present course of Hobba Dyke, leaving a gap between the enclosures and the watercourse of about 4m. There was no evidence that the existing ditch was originally further to the south. It is possible that the shallower enclosure ditches utilised the adjacent watercourse as an additional barrier ditch; this would leave a passage or track around the outside of the enclosures.

Two large post-holes were identified about 3m apart close to the NE corner of the later enclosure but not apparently aligned with it. At least one of the post-holes was later than the backfilled enclosure ditch; the other post-hole **208** was not investigated. These external features may have formed part of an additional linear boundary. If the watercourse served as a second ditch boundary, these post-holes may mark an entrance controlling the 4m wide

path. This could not be resolved as no archaeological features were visible east of post-hole **208** where the easement had not been stripped so deeply.

The origin of Hobba Dyke as a watercourse or as a regional boundary is not known. The name may contain the Old English element *hob* (as in hobgoblin). There is a distinct possibility that the Hobba Dyke represents a natural feature used since the Iron Age to divide land holdings or even territories. Such an interpretation would place the Swinethorpe Iron Age site at the very northern frontier of one area.

Eagle Hearth Excavation Report
Field 43
NGR: SK 8762 6626
Contexts 400 - 404

An ovoid area of charcoal and burnt soil **401** was observed cutting the stony yellow clay on the stripped easement surface in Field 43 (Fig. 10; Pl. 68). The clay around the immediate edge had become oxidised through heat to an orange/red colour up to 0.04m thick **403**, although there was no certain evidence for a deliberate clay lining and the clay at the base was yellow (Pls. 69 and 70).

The fill **402** was a brown loam with 75% charcoal and 5% pebbles 20-40mm diameter; the charcoal was densest on the western side. The feature was sectioned longitudinally and a sample taken of the charcoal-rich fill.

The feature measured 0.6m north-south and 0.45m west-east, slightly pointed at the south end. The sides sloped unevenly to a rounded base 0.07m below the stripped easement level; the northern side was slightly steeper than to the south (Pl. 71).

No finds were recovered from the fill of **401**, although a worked flint flake was found about 8m to the south [**43B**]. No other archaeological features could be located within the stripped area and the context of this undated feature is unknown. It is assumed that the scoop acted as a small domestic hearth; it is puzzling that no further signs of occupation were visible. It is probable that the hearth is one of a complex of archaeological features which may survive on either side of the stripped easement area in the near vicinity.

The nearest known Romano-British site is 1km to the north on the outskirts of Eagle village, located during the pipeline monitoring but apparently already discovered (although not reported) by metal detector users. Other isolated Iron Age and Roman pottery sherds were found south of Eagle village.

The Watching Brief

All the land crossed by the pipeline easement was monitored throughout groundworks in order to locate archaeological features and to retrieve casual finds of flint, ceramic and metal that were revealed. Significant features were excavated and recorded by LAS personnel (see above) and the approximate locations of other observations and finds plotted (Figs. 11 - 13). Many casual finds have probably been imported onto arable land with farmyard manure in the past and serve only to indicate the extent of farmed land at each period. For the Roman period these finds are a hint of nearby occupation which may not yet have been located; the sites of most medieval settlement close to this route are already known.

Worked flints, the everyday tools of Neolithic and Bronze Age inhabitants of this area, may have been dropped some distance from a habitation site although a concentration of knapping debris often suggests a nearby settlement. Thirteen worked flints (including scrapers, blades and cores) were found (Fig. 11; App. 8).

Iron Age pottery fragments were found on the easement surface in Fields 12 and 18 close to the excavated features, and also in Fields 15, 32 and 38 (Fig. 12; App. 3). It is unusual to find such pottery in these conditions and an Iron Age site probably awaits discovery close to Eagle village. Romano-British pottery sherds were collected in Fields 12, 19, 20, 23, 31, 32 and 38 (Fig. 12; App. 9). In Field 32 one large rim sherd was identified as Trent Valley ware, in use to about the 2nd century AD. Crushed fragments of a possible loomweight were seen in the same field (Pl. 72). Metal detector users were active in that field east of the easement and there were anecdotal reports of Roman coins. There may prove to be a Iron Age - Roman site beyond the pipeline easement in this field; there are no records of other finds when the gas pipeline across this field was installed.

Medieval pottery sherds, some very small and abraded, were found in 50% of the fields along the route (Fig. 13; App. 10). Unfortunately 25% of these sherds could not be closely dated as surfaces were missing and the pattern of arable use cannot be determined. Traces of ridge and furrow cultivation were observed in Fields 12 - 21 (between Harby and Swinethorpe), 37 and 39 (behind Eagle village) (Pls. 73 - 74). Plough furrows varied in width from 4m at Eagle to about 2.5m south of Harby, where the intervening flattened ridge up to 10m wide had probably obscured the broader furrow. Although ridge and furrow undulations are evidence of horse or ox ploughing during the medieval period and into the post-medieval period, its survival shows that this land has not been intensively cultivated regularly since that date. This may have been marginal land farmed during times of population expansion and grazed at other dates. It may also reflect changes in soil condition and drainage which have resulted from climate changes.

The surface of the stripped easement in fields north of Grange Farm, Harby had been burnt; charcoal flecks and red-burnt soil were seen in numerous places, apparently in the bases of furrows (Pl. 75). It was suspected that this

extensive burning represented clearance of scrub before reuse of arable land, perhaps during the medieval period.

Undated features were found in Fields 23 and 43. The latter was excavated (see above, context **400**). A brief investigation of a limestone spread (23D) concluded that no structural remains survived although there may have been a shed or other simple structure there (Pls. 76 - 78). Slightly further north a concentration of charcoal in an ovoid shallow depression (23B) was examined but there was no evidence of datable activity (Pl. 79).

Acknowledgements

LAS was grateful to Anglian Water (especially Bill Wadsworth, Peter Willders and Mike Pues) for their sustained co-operation and interest throughout this project. Trish Tweddle prepared an illustrated feature in Anglian News [August 1996] which described the rare wooden artefact from the Harby excavation.

The Lincolnshire County Archaeology Section (Steve Catney and Ian George) and Sites and Monuments Record (Mark Bennet and Sarah Grundy) provided information and advice on request, as did the Nottinghamshire County Archaeologist (Mike Bishop), the Notts. County Heritage Team (especially Ursilla Spence) and its SMR Officer (Virginia Baddeley). The Harby excavation sites were visited by Ursilla Spence on several occasions.

Anglian Water's consultants for this project, Symonds Travers Morgan (especially Bill McDonald and Darren Hodgson), gave assistance and provided copies of maps and plans. The main contractors, Morrison Biggs Wall provided practical assistance and readily agreed to allow opportunity for archaeological remains to be investigated. The forbearance and help from their Agent (Mike West), employees, sub-contractors and machine operators was greatly appreciated.

The pottery, artefacts and environmental remains recovered during this project have required examination and identification by numerous specialists.
Post-Roman pottery: Jane Young
Roman pottery: M.J. Darling, City of Lincoln Archaeology Unit (CLAU)
Metal and other Object Finds: Jen Mann, CLAU
Prehistoric pottery: David Knight, Trent and Peak Archaeological Trust
Sheila Elsdon (Nottingham University)
Metal Slag and Fired Clay: Jane Cowgill
Animal Bones and other Environmental Remains: James Rackham (with assistance from Alison Foster), James Rackham Environmental Consultancy
Wooden Objects: Maisie Taylor, Fenland Archaeological Trust
Conservation: Rob White, Lincolnshire County Conservation Laboratory
Flint Artefacts: Ian Brooks, Engineering Archaeological Services

The excavation at Harby was directed by the author up to May 9th and by Chris Taylor after that date; Naomi Field provided useful advice. Mick McDaid

shared responsibility for excavating the Harby gully site with the author. On all the excavations different excavators were responsible for recording:
Swinethorpe Iron Age Site: Mick McDaid, Malc Otter
Harby Iron Age Enclosure: Chris Taylor, Mick McDaid, Wayne Livesey, Malc Otter
Harby Iron Age Gully: Mick McDaid, Malc Otter

Initial cleaning and processing of finds was by Jane Frost and Mick McDaid. The illustrations were prepared for this report by Mick McDaid, who was also responsible for maintaining the site archive. Throughout the post-excavation process, Naomi Field co-ordinated liaison with the specialists and gave constructive criticism. Thanks are also due to Jane Frost who collated and produced the report.

Geoff Tann
Lindsey Archaeological Services
3rd April 1997

References

Crew, P. 1991 'The experimental production of prehistoric bar iron' *Journal of the Historical Metallurgy Society* 25 no. 1, 21-36.

Riley, D.N. 1980 *Early Landscape from the Air: Studies of cropmarks in South Yorkshire and North Nottinghamshire* Sheffield.

Tann, G. 1996 *Scarle Supply Zone Reinforcement Scheme: Archaeological Desktop Assessment* (unpublished report for Anglian Water Services, January 1996).

Archive Summary

Annotated copies of Anglian Water plans
Lists of spot height levels
Context record sheets
Lists of soil samples
Environmental Report appendix with lists of data
Specialists' reports and archive lists
Field sketch sections and plans
Field scale plans and sections
Photographs: colour and monochrome prints and negatives; transparencies
Article from Anglian News, August 1996
Correspondence
Archaeological Finds: pottery, fired clay, wooden object, metal objects

APPENDIX 1

Catalogue of Finds recovered along the pipeline easement during Monitoring of Topsoil Stripping

Fields 1-3
no finds

Field 4
Clay Lane crossing; trench not observed

Field 5
no finds

Field 6.
A SK 8834 7107 3 medieval sherds

Field 7.
A SK 8833 7105 1 Martincamp post-medieval costrel sherd

Field 8.
A SK 8829 7098 1 medieval sherd

Fields 9-11
no finds

Field 12.
A SK 8816 7044 2 medieval sherds
B SK 8816 7047 1 Late Mesolithic flint core; 1 iron nail
C SK 8816 7047 1 Iron Age sherd; tapping slag; site of Iron Age gully excavation 100
D SK 8817 7048 1 Roman sherd
E SK 8818 7052 2 Iron Age sherds; site of Iron Age enclosure excavation 300
west-east ridge and furrow visible after topsoil stripping

Field 13
west-east ridge and furrow visible after topsoil stripping
no finds

Field 14/15.
15A SK 8804 7013 1 medieval sherd, 1 post-medieval sherd.
west-east ridge and furrow visible after topsoil stripping

Fields 16 and 17
west-east ridge and furrow visible after topsoil stripping
no finds

Field 18.

A SK 8797 8803 1 Iron Age sherd; 1 fragment fired clay; excavation of Iron Age enclosure ditch 200

shallow west-east ridge and furrow visible after topsoil stripping

Field 19.

A SK 8787 6964 1 Roman pot sherd
B SK 8786 6961 burnt soil in furrow
C SK 8789 6972 1 worked flint

west-east ridge and furrow visible after topsoil stripping
furrows 10m apart, 2.5m wide

Field 20.

A SK 8781 6947 1 Roman pot sherd
B SK 8785 6961 1 worked flint flake
C SK 8784 6957 1 pot sherd, undated

west-east ridge and furrow visible after topsoil stripping

Field 21.

A SK 8776 6932 2 medieval sherds
B SK 8778 6938 1 medieval sherd

Field 22.

no finds

Field 23.

A SK 8769 6909 1 Neolithic flint secondary blade
B SK 8771 6913 charcoal spread, undated
C SK 8770 6912 1 Roman pot sherd
D SK 6899 8766 spread of limestone rubble; north-south 1.3m; west-east 0.95m; 0.09m deep

Field 24.

A SK 8761 6882 ditch; no finds, probably post-medieval

Field 25.

A SK 8757 6873 1 sherd, probably medieval

Fields 26-30

no finds

Field 31.

A SK 8767 6773 fired clay
B SK 8766 6774 1 Neolithic flint blade
C SK 8764 6777 1 Roman pot sherd; 1 worked flint
D SK 8755 6790 burning: 0.25m diam fired clay in centre, linear, no feature seen
E SK 8753 6792 1 secondary flint flake

Field 32.

A SK 8786 6747	fired clay loomweight (or from hearth), fragmentary
B SK 8788 6744	1 Iron Age sherd; 2 Roman pot sherds (one Trent Valley fabric, ?2nd century AD.); 1 medieval sherd
C SK 8791 6741	1 medieval sherd

Field crossed by west-east gas main

Fields 33 and 34
no finds

Field 35.

A SK 8788 6717	4 medieval sherds; 1 secondary flint flake
B SK 8787 6722	1 medieval sherd
C SK 8795 6711	flint

Field 36.
no finds
NW-SE ridge and furrow

Field 37.

A SK 879 669	NW-SE ridge and furrow; 4m wide furrows

Field 38.

A SK 8777 6682	1 Roman sherd
B SK 8776 6681	1 Iron Age sherd
C SK 8778 6677	2 medieval sherds
D SK 878 668	NW-SE ridge and furrow

Field 39.

A SK 8777 6672	1 post-medieval sherd
B SK 878 667	NW-SE ridge and furrow

Field 40.

A SK 8775 6668	1 medieval sherd
B SK 8775 6666	5 medieval sherds; 3 post-medieval sherds

Field 41.
no finds

Field 42.

A SK 8768 6629	1 Neolithic flint end-scraper; 3 medieval sherds

Field 43.

A SK 8755 6616	daub fragment; 1 post-medieval sherd
B SK 8761 6626	1 worked flint; 1 undated sherd; 1 post-medieval sherd
C SK 8762 6626	site of undated hearth excavation 400

Context Summary

Context No.	Description
100	topsoil
101	gully
102	plough furrow
103	fill of 102
104	fill of 102
105	fill of 102
106	layer
107	natural
108	furrow?
109	fill of 101
110	layer
111	layer
112	fill of 108
113	layer/fill
114	layer
115	fill of 101
116	posthole
117	fill of 116
118	tree root disturbance?
119	fill of 118
120	fill of 118
121	fill of 118
122	fill of 118
123	layer
124	layer
125	tree root disturbance?
126	fill of 125
127	layer
128	tree dist.
129	fill of 128
130	tree root disturbance?
131	fill of 130
132	tree root disturbance?
133	fill of 132
134	fill of 144
135	fill of 140
136	gully
137	fill of 136
138	fill of 136
139	fill of 140
140	tree root disturbance?
141	fill of 140
142	fill of 140
143	fill of 140
144	tree root disturbance?
145	fill of 144
146	fill of 144
147	fill of 144
148	posthole?
149	fill of 148
150	fill of 148
151	fill
152	tree root disturbance?
153	fill of 152
154	tree root disturbance?
155	fill of 154
156	fill of 154
157	fill of 154
158	fill of 154
159	tree root disturbance?
160	fill of 162
161	fill of 159
162	tree root disturbance?
163	layer
164	tree root disturbance?
165	fill of 164
166	as 163
200	enclosure ditch
201	fill of 200
202	fill of 200
203	enclosure ditch
204	fill of 203
205	fill of 203
206	posthole
207	fill of 206
208	posthole?
209	fill of 208
210	natural clay and sand
211	fill of 203
212	fill of 200
213	fill of 200
214	ditch upcast layer?
215	natural clay
216	fill of 200

Context No.	Description
300	finds reference
301	fill of 308
302	fill of 308
303	fill of 308
304	fill of 309
305	fill of 309
306	fill of 307
307	enclosure ditch
308	enclosure ditch
309	ditch
310	posthole
311	posthole
312	topsoil
313	fill of 307
314	fill of 308
315	land drain
316	layer
317	fill of 308
318	fill of 308
319	fill of 308
320	fill of 308
321	fill of 309
322	fill of 308
323	fill of 308
324	layer
325	fill of 332
326	posthole
327	fill of 309
328	fill of 310
329	fill of 311
330	posthole
331	fill of 330
332	furrow
333	posthole
334	fill of 333
335	layer; bank?
336	layer
337	layer, buried subsoil?
338	natural clay and sand
339	natural layer
340	layer
341	posthole
342	posthole
343	fill of 342
344	posthole
345	fill of 344
346	layer
347	fill of 307
348	fill of 307

Context No.	Description
349	fill of 307
350	fill of 307
351	fill of 307
352	land drain
353	land drain
354	land drain
355	layer, coversand
356	layer, buried soil
357	layer, buried soil
358	fill of 307
359	fill of 307
360	fill of 307
361	fill of 307
362	fill of 307
363	fill of 307
364	fill of 307
365	fill of 307
366	fill of 307
367	fill of 307
368	fill of 307
369	fill of 307
370	fill of 307
371	fill of 307
372	fill of 307
373	gully
374	fill of 373
375	fill of 307
376	fill of 307
377	modern disturbance
378	fill of 307
379	fill of 307
380	fill of 307
381	fill of 307
382	?posthole
383	fill of 382
384	as 366
400	modern topsoil
401	hearth/oven
402	fill of 401
403	fill of 401
404	natural clay

APPENDIX 3

IRON AGE POTTERY FROM SITES LOCATED DURING ARCHAEOLOGICAL MONITORING OF THE EAGLE (LINCS) TO HARBY (NOTTS) WATER MAIN PIPELINE, SK87536612 - SK88567143

Author: David Knight (T&PAT)
with a contribution by Carol Allen

24th February 1997

Project Code: HAR

Filename: LAS.HAR2

Trent & Peak Archaeological Trust
University Park
Nottingham NG7 2RD
Tel (0115) 9514821
Fax (0115) 9514824

LIST OF CONTENTS

1. INTRODUCTION

This report focuses on a collection of 119 Iron Age sherds (989g) obtained during archaeological monitoring of the Eagle to Harby Water Main Pipeline, constructed in 1996 as part of the Scarle Water Supply Zone Reinforcement Scheme (Site Code SWP 96; LCNCC Accession No.49.96). The pottery was obtained during fieldwalking prior to pipeline construction and from excavations at the following sites:

Harby Iron Age gully: SK 8816 7047
Harby Iron Age enclosure: SK 8818 7052
Swinethorpe Iron Age enclosure: SK 8797 8803

The work was carried out by Lindsey Archaeological Services, with funding provided by Anglia Water. As part of the post-excavation programme, the writer was asked to provide a report on the Iron Age pottery, together with a basic archive.

Recording Methods

Each sherd or group of joining sherds was recorded individually on standard proformas. Details were recorded of context number, count, weight (g), fabric, vessel part, form (body profile), rim form, base form, diameter and surviving percentage of rim and base, surface finish of interior and exterior, decoration (type and extent), sherd condition, surface deposits, method of manufacture and cross-context joins (with comments on other points of interest). The data were entered on a computer data base, employing dBase IV software. A copy of the archive is included as an appendix to this report. The above work was carried out by Eileen Appleton, under the supervision of the writer.

Classification of Fabrics C.S.M Allen and D. Knight

The fabrics of the Iron Age pottery obtained during fieldwalking and excavation compare closely, and hence a single fabric classification was employed during analysis. This is described below, together with the descriptive conventions employed in the description of inclusion frequencies and size ranges.

The fabrics were classified by Dr. Carol Allen, in consultation with the writer, employing the following terminology:
Frequency: rare (<3%); sparse (3-10%); moderate (11-25%); common (26-40%); abundant (>40%).
Size: fine (<0.25mm); medium (0.25-1mm); coarse (1-3mm); very coarse (>3mm).

Detailed records were compiled for each fabric group of surface colour, firing, hardness, feel/texture, fracture, technology, inclusions (type, frequency, sorting, roundness, sphericity, size), possible sources, site contexts/ phases and cross-references to other fabrics. No petrological work was carried out, and hence the identification of inclusion types must be regarded as provisional. Copies of the fabric record sheets are retained in archive, and a summary is provided here.

Fabric QUSF (Sparse Fine Quartz). This fabric is characterised by sparse to moderate fine rounded or well-rounded quartz inclusions, of high sphericity; the quartz is well sorted, and may possibly have been added as temper. Very coarse milky quartz fragments may occasionally be seen in the clay matrix (<3%). Other rare inclusions, visible in some sherds, include vegetable material (indicated by well-rounded fine voids of high to low sphericity, suggesting moderately well sorted organic inclusions which may have been deliberately added to the clay matrix), flint, plate-like voids suggesting shell, and ironstone. Surface colours vary mainly from brown to grey, and imply irregular firing. Sherds of this fabric group are soft, with a sandy texture and an irregular fracture.

Fabric SHSM (Sparse Medium Shell). Sherds of this fabric group are distinguished by the presence of sparse shell inclusions, deduced from plate-like voids within the clay matrix, which have leached from the pottery during deposition. The voids imply moderately well sorted medium to coarse angular shell inclusions of low sphericity. These generally occur in combination with very well sorted sparse fine quartz inclusions, rounded or well-rounded and of high sphericity. The shell appears to have been added deliberately as temper, but the quartz could represent either deliberately added material or natural inclusions within the clay. Pots attributed to this fabric group appear generally to have been unoxidised, and possess surface colours ranging from dark brown to grey. The fabric is soft, with a sandy texture and an irregular fracture.

Fabric SHMC (Moderate Coarse Shell). Examples of this fabric group are distinguished from Fabric SHSM sherds on the grounds of the greater coarseness and frequency of their shell inclusions. The latter are indicated by a moderate frequency of plate-like voids, indicating poorly sorted angular inclusions of low sphericity, ranging in size from coarse to very coarse. In common with Fabric SHSM, shell may have been deliberately added as temper. Surfaces may be unoxidised or indicate irregular firing, and range from brown through dark grey to black. Sherds are invariably soft, have a granular feel and possess a laminated fracture.

Sources of Raw Materials. The sites at Harby and Swinethorpe are located on deposits of Lower Lias shelly limestones, mudstones and clays, immediately east of their interface with the sand and and gravel deposits of the Trent Floodplain Terrace (Geological Survey 1:50,000 Series, Sheet 114; see also Price, 1975, 2-5, 76-7; Gozzard, 1975, 48-9). All of the above inclusions, together with suitable supplies of clay, would probably have been readily available to local potters (Gozzard and Price, *op. cit.*). Hence there is no reason to consider utilisation of raw material sources beyond the immediate environs of the sites. It should be emphasised, however, that no petrological work was carried out during post-excavation analysis, and hence the above conclusions must be regarded as provisional.

2. FIELDWALKING FINDS

Seven Iron Age sherds (87g) were recovered during fieldwalking. These comprise single sherds from Fields 12C, 15C, 18A, and 38B, two sherds from Field 12E and two sherds from 32B (the larger of which fractured subsequently into four fragments). The pottery included one sherd (15g) of Fabric QUSF,

from Field 12E, single sherds of Fabric SHSM from Fields 12C (9g), 12E (4g), 15C (11g), 18A (5g) and 32B (41g), and one sherd (2g) of Fabric SHMC from Field 38B. Most fragments are plain body sherds deriving from handmade vessels of uncertain form. The only exceptions are two base angles from vessels with flat bases, pinched out around the circumference, and a slightly tapered everted rim (the latter from Field 15C). None of the pottery is closely datable, but close similarities with the fabrics of the pottery from the Harby enclosure would be consistent with a later Iron Age date. The absence of wheelmade vessels could imply activity prior to their introduction in this region in the late first century BC/earlier first century AD (*e.g.* Dragonby, Lincs., from Ceramic Stage 6: Elsdon, 1996, 402, 405; *cf* Knight, 1992, 50), but the sample from each field is clearly too small for much to be made of the absence of particular ceramic types.

3. HARBY IRON AGE GULLY (SK 88167047)

Ten sherds (152g) of Iron Age pottery were recovered from this site. Nine derived from the fill (109) of gully 101, while one (2g) was obtained from the fill (155) of a small oval pit (154). The pottery from gully 101 included a diverse range of fabrics, namely three sherds (50g) of Fabric QUSF, two sherds (39g) of Fabric SHSM, and four sherds (40g) of Fabric SHMC. The single sherd from pit 154 may be attributed to Fabric SHMC. Most of the fragments are plain body sherds deriving from handmade vessels of uncertain form, but gully 101 yielded a base angle from a flat-based vessel and the rim and upper profile of an ovoid vessel with a short everted neck and a rounded direct rim, smoothed on the outer face. Such ovoid vessels are particularly characteristic of later Iron Age ceramic assemblages, dating broadly from the fifth/fourth centuries BC to first century AD, in the Trent Valley and beyond (*e.g.* Cunliffe, 1991, 85-88, figs A22-A24; Knight, 1984, i, 99; 1992, 43, 50, fig.20), although these have an ancestry stretching well back to the earlier first millennium BC and cannot be closely dated. The other sherds from this site could easily belong to the later Iron Age, but again close dating is not possible.

4. HARBY IRON AGE ENCLOSURE (SK 88187052)

This site yielded the largest collection of Iron Age pottery from the pipeline trench, totalling 94 sherds (727g). This incorporates a remarkable group of sherds from one or possibly more handmade vessels embellished with an elaborate combination of grooved, stamped and probably rouletted designs related in general terms to the La Tène ornamental style of eastern England (*cf* Elsdon, 1975; 1986).

4.1 Contexts

The bulk of the pottery was recovered from two opposing ditch terminals, 307 and 308. 32 sherds (417g) were retrieved from the northern ditch terminal (307). 12 of these derived from layer 306, revealed during initial exposure of a small area on the SE side of this terminal. Four other sherds were recovered from 378, a stratified deposit probably equivalent to 306, and two more from a layer (313) on the NW side of the terminal; 313 was stratified

beneath 378, but could have formed part of the same depositional event. 14 sherds were obtained from lower levels within this ditch terminal, including five sherds from layer 360 and, stratified beneath this, nine sherds from layer 361. The material from the south terminal, 308, derived almost entirely from context 303: a thin layer, incorporating 54 sherds (219g) and a significant quantity of burnt animal bone, which appears to have been deliberately dumped when the ditch had silted to approximately half of its original depth. Only one other sherd (39g) was recovered from the ditch, from a layer sealed by 303 (317). In addition to the pottery from the main ditch terminals, three sherds were obtained from the final fill of ditch 309 (304) and two sherds were retrieved from the fill of post-hole 341 (326); two other sherds were recovered from the medieval/ post-medieval ploughsoil (316).

4.2 Fabrics

The pottery was manufactured from the same range of shelly and sandy fabrics as was recorded elsewhere along the pipeline. The pottery from the ditch terminals displayed no obvious bias towards particular fabric groups, including a broadly equivalent proportion of each of the main fabric groups. The remaining contexts also yielded a mixture of Fabrics QUSF, SHMC and SHSF, with no obvious spatial or stratigraphic patterning (see Appendix for list of fabrics by context).

4.3 Forms

The collection includes a variety of ovoid forms and, from layer 306, one example of a possible open bowl. Three vessel fragments preserving traces of a complex pattern of shallow grooves, open circle stamp impressions and probable roulette impressions, discussed in detail in the following section, could derive from the shoulder of one or more vessels with globular profiles comparable to several pots from Dragonby, Lincs. (fig.1.1-3; *cf* May, 1996, fig.19.54: Nos. 647, 649). The ovoid vessels included a neckless bowl or jar with a rounded lip pinched out slightly externally, from post-hole 341 (326), a neckless vessel with a tapered direct rim from layer 317 in the south ditch terminal, and part of a vessel with a high gently concave neck and rounded rim, pinched out slightly externally, from the northern ditch terminal (306). More remarkably, a probable lid fragment with a rounded direct rim was recovered from 303. The few other rims which survived are mainly rounded or flattened (with the edges occasionally pinched out internally or externally), but several examples of an unusual everted tapered rim, comparable to that noted above from layer 317, were also recovered. The only identifiable base fragment is a tiny piece of a footring base, from the terminal of ditch 309 (304); this preserves traces of burnishing on the outer face, and might conceivably derive from a wheelmade vessel.

4.4 Surface Treatment

The most striking feature of this collection is the discovery, in layer 303 of the southern ditch terminal, of 19 sherds preserving traces of a complex pattern combining shallow grooves, areas infilled with open circle stamp impressions, and rows of impressions which may have been formed by a roulette wheel. 13 of these sherds joined to form three larger fragments, conceivably from a single vessel (Fig.1.1-3). These indicate a handmade vessel with a curving profile, possibly deriving from the shoulder of a globular vessel comparable to several pots recorded at Dragonby (May, 1996, fig. 19.54: 647,

649) but insufficient survives of the pot (or pots) for the form to be established with certainty. In addition to the decorated sherds, five plain body sherds which could derive from the same decorated vessel(s) were recovered, together with burnt animal bone. All of the sherds from this context were manufactured from the coarser of the two shelly fabrics (SHMC) and most had smoothed surfaces. The shell inclusions had been leached out and the surfaces were slightly or moderately abraded, thereby obscuring some areas of decoration. The fragmentary nature of the pottery and the worn condition of some surfaces frustrate attempts to establish the pattern of decoration, and in particular the character of the probable rouletted ornament, but one possible reconstruction is outlined below.

The decoration surviving on the two larger fragments indicates at least two decorative zones, separated by a shallow horizontal groove (Fig.1.1-2). Short lengths of several arcuate grooves suggest an upper zone of pendant arcs and a lower zone of standing arcs. The 'pendant arcs' of the upper decorative zone and the spaces between the 'standing arcs' of the lower zone were infilled with a dense pattern of randomly arranged and partially overlapping open circles. These could have been formed by impressing the worked end of a piece of antler, bone or wood into the vessel surface before firing. The grooves were bordered on one side by a row of closely and uniformly spaced impressions, mainly worn and of uncertain shape. These could have been applied individually, employing the shaped end of a piece of bone, wood or some other material, but the evenness of the lines and the regular spacing of the impressions is more suggestive of rouletting. A roulette wheel is also suggested, on the least worn of the three fragments (Fig. 1.2), by the apparent truncation of a row of impressions bordering the groove of a 'standing arc' by a line of six impressions flanking the horizontal groove dividing the upper and lower decorative zones. The possible roulette impressions on this sherd are elongated, and in some cases preserve a slight central ridge orthogonal to their long axis. This could conceivably imply use of a double square-toothed roulette wheel, worn perhaps by use. This would be in keeping with the Lincolnshire tradition of Late Iron Age square-toothed rouletting (Elsdon, 1975, figs 16-17), but the evidence remains ambiguous. The possible roulette impressions appear to have been truncated by some open circles and by some of the linear grooves, suggesting that the decorative design might have been sketched out first by rouletting, and adding to the problems of identifying the character of the roulette wheel.

A third vessel fragment, formed of five joining sherds, preserves two parallel horizontal grooves, between which may be faintly discerned a row of slightly elongated impressions, similar in form to those recorded on the two other fragments and again possibly created by a roulette wheel (Fig.1.3). A shallow groove aligned obliquely to the upper groove is bordered on one side by a further row of possible roulette impressions. Faint traces may also be discerned, adjacent to these, of a single open circle. Insufficient survives for the pattern of decoration to be established with certainty, but the spatial configuration of the grooves and the relative positioning of the open circle and the row of possible roulette impressions might signify infilling of the spaces between two standing arcs and, conceivably, a lower border to the bottom ornamental zone recorded on the two other vessel fragments from this context.

The only other example of decorated pottery from the site is a tiny sherd of Fabric SHSM from a layer revealed during initial exposure of the northern

ditch terminal (306). This preserves a narrow cordon, demarcated on either side by a shallow incised line and, adjacent to this, possibly the end of a shallow groove or, conceivably, part of a shallow dimple.

4.5. Typological Affinities and Dating.

Radiocarbon dates were obtained from charcoal contained within layer 303 of ditch 308 and from two layers in ditch 307. In the latter case, dates were obtained from charcoal contained in layer 361 and, *c.*0.4m beneath this, from a waterlogged organic deposit incorporating twigs and other plant remains (366). Layer 303 yielded 54 Iron Age sherds (219g), including the decorated sherds described above and several fragments of ovoid and possibly open vessels, while layer 361 yielded nine plain body sherds (12g; details in Appendix). The dates have a wide error range when calibrated at two sigma, but nonetheless make a useful contribution to the sparse direct dating evidence for Iron Age pottery in this region.

Context 303, ditch terminal 308: measured age = 2130+/-80BP (Beta-10169; calibrated age at two sigma = cal BC 380 - cal AD 55).
Context 361, ditch terminal 307: measured age = 2030+/-70BP (Beta-10170; calibrated age at two sigma = cal BC 190 - cal AD 120).
Context 366, ditch terminal 307: measured age = 2190+/-70BP (Beta-101171; calibrated age at two sigma = cal BC 390 - 40).

Extensive parallels may be cited among later Iron Age ceramic assemblages from Lincolnshire for the decoration applied to the pottery from layer 303 of the southern ditch terminal (308), namely shallow-grooved pendant or standing arcs (*cf* Dragonby: May, 1996, fig.19.14: 1-5), lines of rouletting (*ibid.*, 428-9) and open circle stamps (*ibid*, fig.19.13: 1). These parallels imply close affinities with the Lincolnshire variant of the La Tène ornamental style (Elsdon, 1975, 26-37), as exemplified by the pottery obtained from sites such as Dragonby and Sleaford (May, 1996; Elsdon, forthcoming), but the use of multiple open circles as a space-filling device within a framework of pendant and standing arcs is at present without close parallel. Narrow horizontal cordons, as recorded on a sherd from layer 306, are also characteristic of later La Tène decorated pottery from Lincolnshire (*e.g.* Elsdon, 1975, Plate IIb), as too are dimples (*ibid.*, Plate 1a), but insufficient of the decoration survives for the affinities of this sherd to be established with certainty.

The closest parallels for the decorated sherds from Harby are with pottery from Dragonby, where typologically related vessels occur in contexts attributed to Ceramic Stage 1 and later (*e.g.* May, 1996, fig.19.5). Absolute dates cannot easily be applied to the Dragonby sequence (*ibid.*, 621-5) but discoveries in stratigraphically early contexts of stamped and rouletted vessels and pots which appear to be related typologically to vessels of the Aylesford-Swarling tradition (*ibid.*, fig.19.20) could indicate a date no earlier than the first century BC for the former (*cf* Knight, 1992, 50).

There is at present no evidence from other sites in the region that would *necessitate* a date of origin for stamped and rouletted pottery before the first or possibly the late second century BC. This sits uneasily with the evidence from the Upper Thames or Nene Valley for an origin possibly in the fourth or even fifth centuries BC for La Tène decorated pottery (Knight, 1992, 49), and a longer chronology may eventually be demonstrated. The radiocarbon evidence from Harby leaves open the possibility of an origin for pottery of

this style well before the first century BC, but additional high precision dates are required to test this hypothesis. One other site, at Helpringham, Lincs., has yielded radiocarbon dates which have been employed in the debate on the origins of the La Tène ornamental style (May, 1996, 436, 624). Two dates, of 2180+/-80BP (Har-2280) and 2330+/-90BP (Har-3102), were obtained from stratigraphically late contexts on a settlement yielding a small quantity of cordoned, stamped and rouletted pottery comparable to material from the earlier Ceramic Stages at Dragonby, but not apparently in direct association with that pottery. These dates, unfortunately, calibrate with very wide error ranges (respectively cal BC 400-2 and cal BC 766-175 at two sigma), and their significance for unravelling the origins of this style is thus limited.

Mention should be made finally of the discovery in layer 304 of ditch terminal 309 of a tiny fragment of footring base. This could derive from a wheelmade vessel, and if so a late first century BC or early first century AD date range would be appropriate. Unfortunately, this was not associated with other typologically diagnostic material, and hence does not help resolve the chronology of the stamped and rouletted pottery from the site.

5. SWINETHORPE IRON AGE ENCLOSURE (SK 87978803)

Only eight Iron Age sherds were retrieved from this site. Seven (21g) derived from a deposit of sandy clay (204) which formed the upper fill of ditch 203; six of these joined. A small abraded sherd (2g) was recovered from an ovoid feature, 209. All of the sherds from ditch 203 were manufactured from Fabric SHSM, but the sherd from feature 209 was in a coarser shelly fabric (SHMC). The six joining sherds from ditch 203 derive from a vessel with a high concave neck, terminating in a rounded direct rim and displaying on the outer face a a slight but clearly discernible angularity of profile at the junction between the shoulder and neck. All sherds seem to derive from handmade vessels, and none shows traces of decoration.

Close dating is not possible, although a later Iron Age date might be suggested on the basis of fabric comparisons with the material from the Harby enclosure. In addition, the clearly defined concave neck of the vessel from ditch 203 invites consideration of a typological link with the Late Iron Age tradition of 'necked bowls', attributable to contact with the new ceramic style which characterises the Aylesford-Swarling tradition (*cf* May, 1996, 413-4: Type Group 4). The argument is undoubtedly a tenuous one, but if accepted a date in the late first century BC to mid-first century AD should be considered.

6. SUMMARY AND CONCLUSIONS

Excavations of the Harby enclosure ditch yielded a regionally important collection of later Iron Age pottery, distinguished by the presence of vessel fragments preserving a unique combination of decorative motifs related to the Lincolnshire variant of the La Tène ornamental style. This discovery extends significantly our knowledge not only of the range of decorative patterns which were employed by potters influenced by this stylistic tradition but also the spatial distribution of this style (in Nottinghamshire, recorded previously

only at Gamston: Knight, 1992; May, 1996, 434-6, fig.19.18). Examination of the pottery fabrics suggests that local resources could have been employed for both the clay and temper; this does not rule out more extensive exchange linkages, but local production, away from the main focus of the La Tène ornamental style, might explain the idiosyncratic features of the decoration. The pottery from Swinethorpe and the Harby gully is unremarkable, but nonetheless provides a useful addition to the corpus of later Iron Age pottery within an area of the lower Trent Valley which so far has yielded little pottery of this period.

7. CATALOGUE OF ILLUSTRATED POTTERY

All sherds were recovered from layer 303 of the southern ditch terminal of the Harby enclosure. A detailed description of the decoration and vessel profile is included in the text, and in this section details are recorded only of fabric, method of manufacture, surface finish/deposits, firing conditions, colour and level of abrasion.

1. Fabric SHMC; handmade; smoothed surfaces, with no surface deposits; unoxidised throughout; all exposed surfaces slightly mottled, varying from light to dark brown; originally three joining sherds (one fractured subsequent to retrieval from context) from moderately abraded vessel (decoration worn and difficult to distinguish individual motifs).

2. Fabric SHMC; handmade; smoothed surfaces, with no surface deposits; oxidised throughout; exterior and interior surfaces slightly mottled, varying from light to dark orange, with light orange core; five joining sherds, in contrast to the other illustrated sherds only slightly abraded.

3. Fabric SHMC; handmade; smoothed surfaces, with no surface deposits; unoxidised throughout; exterior and interior surfaces light brown, with dark brown core; originally five joining sherds (one fractured subsequent to retrieval from context), from moderately abraded vessel (decoration worn and difficult to distinguish individual motifs).

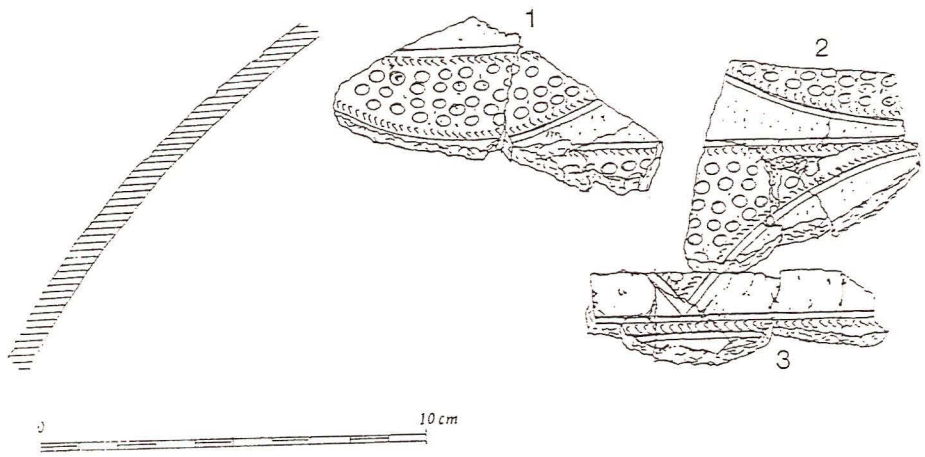


Fig.1. Decorated Iron Age sherds from layer 303, southern ditch terminal of the Harby enclosure

REFERENCES

Cunliffe, B.W. (1991) *Iron Age Communities in Britain.* London: Routledge Kegan Paul (3rd edition).

Elsdon, S.M. (1975) *Stamp and Roulette Decorated Pottery of the La Tène Period in Eastern England.* Oxford: British Arch Reports 10.

Elsdon, S.M. (forthcoming) *Old Sleaford Revealed.* Oxford: Oxbow Monograph.

Gozzard, J.R. (1975) *The Sand and Gravel Resources of the Country around Besthorpe, Nottinghamshire.* Institute of Geological Sciences Mineral Assessment Report 17. HMSO, London.

Knight, D. (1984) *Late Bronze Age and Iron Age Settlement in the Nene and Great Ouse Basins.* Oxford: British Arch. Reports 130 (2 vols).

Knight, D. (1992) 'Excavations of an Iron Age settlement at Gamston, Nottinghamshire'. *Trans. Thoroton Soc. Notts.* 96, 16-90.

May, J. (1996) *Dragonby. Report on Excavations at an Iron Age and Romano-British Settlement in North Lincolnshire.* Oxford: Oxbow Monograph 61 (2 vols).

Price, D. (1975) *The Sand and Gravel Resources of the Country around Newton on Trent, Lincolnshire.* Institute of Geological Sciences Mineral Assessment Report 15. HMSO, London.

ACKNOWLEDGEMENTS

Thanks are extended to Eileen Appleton for cataloguing the Iron Age pottery and assisting in the final production of this report, to Dr. Carol Allen for examining the pottery fabrics and other helpful comments, and to Mick Clark for drawing the pottery. Valuable comments on the decorated vessels from this site were provided by Sheila Elsdon, Ruth Leary and Jeffrey May, while James Rackham provided information on the radiocarbon-dated samples from Harby.

APPENDIX: CATALOGUE OF IRON AGE POTTERY

Abbreviations

REC record number
FLD site field number
CTXT context number
NO number of sherds
WT weight
FAB fabric
NCK neck form
DIAM diameter
SRF surface
EXT exterior
INT interior
DEC decoration
TEC technique
MOT motif
POS position
DEP deposit
MAN manufacture

PART

BAN base angle
BAS base
BDY body
GIR girth
LBDY lower body
NCK neck

FORM

OV ovoid

RIM FORM

EVT everted
FD flattened direct
RD rounded direct
RPE rounded lip, pinched out externally
RPI rounded lip, pinched out internally
TD tapered direct

NECK

C concave
E everted
N neckless
UP uncertain profile

BASE FORM

FOOT footring
FP flat, pinched out at circumference

SURFACE

BURN burnished
FM finger marks
SM smoothed

DECORATION TECHNIQUE

COR cordon
GR grooved
R rouletted
ST stamped

DECORATION MOTIF

ARC arc
ARCS arcs
O open circle(s)
LIN line
LINS lines

WEAR

A abraded
M moderately abraded
S slightly abraded
U unabraded
F flaked

DEPOSIT

BME burnt matter, on exterior
ME miscellaneous, on exterior
MEI miscellaneous, on exterior and interior
MI miscellaneous, on interior

MANUFACTURE

H handmade
W wheelmade

IRON AGE POTTERY: FIELDWALKING

SITECODE SWP96 07/02/97

REC	FLD	NO	WT (g)	FAB	PART	FORM	NCK	RIM FORM	RIM DIAM	RIM %	BASE FORM	BASE DIAM	BASE %	SRF EXT	SRF INT	DEC TEC	DEC MOT	DEC POS	WEAR	DEP	MAN	COMMENT
1	12C	1	9	SHSM	BDY														A		H	
3	12E	1	15	QUSF	BAN						FP	?	?	FM					M		H	SLIGHTLY BURNT?
2	12E	1	4	SHSM	BDY														U		H	
4	15C	1	11	SHSM	RIM			EVT	?	<10									M		H	
5	18A	1	5	SHSM	NCK														S		H	
6	32B	1	41	SHSM	BDY														S		H	4 JOINING FRAGMENTS, RECENT BREAK
7	38B	1	2	SHMC	BAS						?	?	?						M		H	CONCENTRIC ARCS ON SURFACE

TOTAL 7 87

IRON AGE POTTERY: HARBY GULLY

SITECODE SWP96 07/02/97

REC	CTXT	NO	WT (g)	FAB	PART	FORM	NCK	RIM FORM	RIM DIAM	RIM %	BASE FORM	BASE DIAM	BASE %	SRF EXT	SRF INT	DEC TEC	DEC MOT	DEC POS	WEAR	DEP	MAN	COMMENT
1	109	1	6	QUSF	BDY														M		H	
2	109	1	34	QUSF	GIR														M		H	
3	109	1	10	QUSF	NCK+		?							BURN	BURN				M	MI	H	NECK + BEGINNING OF SHOULDER. DEPOSIT POSSIBLY BURNT MATTER?
7	109	1	40	SHMC	BDY														M		H	4 JOINING FRAGMENTS
8	109	1	19	SHMC	BDY														M		H	
9	109	1	2	SHMC	BDY														A		H	
10	109	1	0	SHMC	BDY									SM	SM				M	ME	H	
5	109	1	15	SHSM	BAN						FP	?	?						M		H	
6	109	1	24	SHSM	RIM+	OV	E	RD	120-140	10				SM					M		H	RIM + NECK + GIRTH
4	155	1	2	SHMC	BDY														M		H	
TOTAL		10	152																			

IRON AGE POTTERY: HARBY ENCLOSURE

SITECODE SWP96

07/02/97

REC	CTXT	NO	WT (g)	FAB	PART	FORM	NCK	RIM FORM	RIM DIAM	RIM %	BASE FORM	BASE DIAM	BASE %	SRF EXT	SRF INT	DEC TEC	DEC MOT	DEC POS	WEAR	DEP	MAN	COMMENT
11	303	1	6	QUSF	BDY														M		H	
12	303	1	2	QUSF	BDY														M		H	
13	303	1	1	QUSF	BDY														M		H	
14	303	1	2	QUSF	BDY														M		H	
15	303	1	1	QUSF	BDY														M		H	
16	303	1	3	QUSF	BDY														M	F	H	
17	303	1	2	QUSF	BDY														M	F	H	
18	303	1	0	QUSF	BDY														M	F	H	
19	303	1	0	QUSF	BDY														M	F	H	
20	303	1	0	QUSF	BDY														M	F	H	
9	303	1	5	QUSF	LID?														M		H	
10	303	1	8	QUSF	RIM			RPI	60-80	<10									U		H	
60	303	3	28	SHMC	BDY									SM		ST;R;GR	O;ARCS	BDY	M		H	OPEN CIRCLE STAMPS; ROULETTE IMPRESSIONS; SHALLOW GROOVES
61	303	1	2	SHMC	BDY									SM	SM	ST	O	BDY	M		H	OPEN CIRCLE STAMPS. PROBABLY SAME VESSEL AS RECORD 60
62	303	1	9	SHMC	BDY									SM	SM	ST;R;GR	O;LIN	BDY	S		H	OPEN CIRCLE STAMPS; ROULETTE IMPRESSIONS; SHALLOW GROOVE
63	303	1	5	SHMC	BDY									SM	SM	ST;R;GR	O;LIN	BDY	M		H	OPEN CIRCLE STAMPS; ROULETTE IMPRESSIONS; SHALLOW GROOVE
64	303	1	5	SHMC	BDY									SM		ST;R;GR	O;LIN	BDY	M		H	OPEN CIRCLE STAMPS; ROULETTE IMPRESSIONS; SHALLOW GROOVE
65	303	1	3	SHMC	BDY									SM	SM	GR	LIN	BDY	M	MI	H	SHALLOW GROOVE

SITECODE SWP96

REC	CTXT	NO	WT (g)	FAB	PART	FORM	NCK	RIM FORM	RIM DIAM	RIM %	BASE FORM	BASE DIAM	BASE %	SRF EXT	SRF INT	DEC TEC	DEC MOT	DEC POS	WEAR	DEP	MAN	COMMENT
66	303	1	2	SHMC	BDY									SM	SM	GR	LIN	BDY	M		H	SHALLOW GROOVE
67	303	1	5	SHMC	BDY									SM					M	ME	H	
68	303	1	1	SHMC	BDY									SM	SM				M		H	
69	303	1	0	SHMC	BDY									SM					S		H	
70	303	1	3	SHMC	BDY									SM					S		H	
71	303	1	6	SHMC	BDY									SM	SM				S		H	
72	303	3	28	SHMC	BDY									SM	SM	ST;R;GR	O;ARCS	BDY	M		H	OPEN CIRCLE STAMPS; ROULETTE IMPRESSIONS; GROOVES. 3 JOINING SHERDS.
73	303	5	31	SHMC	BDY									SM	SM	ST;R;GR	O;ARCS	BDY	S		H	OPEN CIRCLE STAMPS; ROULETTE IMPRESSIONS; GROOVES. 5 JOINING SHERDS.
74	303	5	17	SHMC	BDY									SM	SM	ST;R;GR	O;LINS	BDY	M		H	OPEN CIRCLE STAMPS; ROULETTE IMPRESSIONS; GROOVES. 5 JOINING SHERDS.
8	303	1	13	SHSM	BDY														S		H	
21	303	1	6	SHSM	BDY														M	MEI	H	
22	303	1	6	SHSM	BDY									SM					M		H	
23	303	1	2	SHSM	BDY														M		H	
24	303	1	1	SHSM	BDY														M		H	
25	303	1	1	SHSM	BDY														M		H	
26	303	1	1	SHSM	BDY														M		H	
27	303	1	1	SHSM	BDY														M		H	
28	303	1	1	SHSM	BDY														M		H	
29	303	1	1	SHSM	BDY														M		H	
30	303	1	1	SHSM	BDY														M		H	
31	303	1	0	SHSM	BDY														M		H	
32	303	1	1	SHSM	BDY														M		H	

IRON AGE POTTERY: HARBY ENCLOSURE

SITECODE SWP96

REC	CTXT	NO	WT (g)	FAB	PART	FORM	NCK	RIM FORM	RIM DIAM	RIM %	BASE FORM	BASE DIAM	BASE %	SRF EXT	SRF INT	DEC TEC	DEC MOT	DEC POS	WEAR	DEP	MAN	COMMENT
33	303	1	8	SHSM	GIR														S		H	
34	303	1	1	SHSM	RIM			FD	?	<10									M		H	
3	304	1	0	SHMC	BDY														A		H	
4	304	1	6	SHMC	BDY									SM					M		H	
5	304	1	2	SHSM	BAN						FOOT	8-12	<10	BURN					S	F	W?	
40	306	1	69	QUSF	BDY										FM				U		H	PROBABLY SAME VESSEL AS RECORD 39
43	306	1	1	QUSF	BDY														V		H	
44	306	1	20	QUSF	BDY														S		H	
45	306	1	3	QUSF	BDY									SM					U		H	
46	306	1	19	QUSF	BDY									SM					U	ME	H	
41	306	1	40	QUSF	LBDY														M		H	JOINS RECORD 42
42	306	1	24	QUSF	LBDY									SM-					U		H	JOINS RECORD 41
37	306	1	17	QUSF	RIM	OPEN?		RPI	120-140	10				SM	SM				M		H	OPEN BOWL?
38	306	1	13	QUSF	RIM			RPE	100	10									U		H	
39	306	1	145	QUSF	RIM	OV	C	RPE	>200	<10					FM				U		H	GENTLY CONCAVE NECK. PROBABLY SAME VESSEL AS RECORD 40.
35	306	1	3	SHMC	BDY														M		H	
36	306	1	2	SHSM	BDY											COR			M		H	CORDON DEMARCATED BY INCISED LINE EITHER SIDE; ALSO PROBABLE DIMPLE
53	313	1	1	SHMC	BDY														U		H	
54	313	1	0	SHMC	BDY														M		H	
6	316	1	3	QUSF	BDY														M	ME	H	PROBABLY SAME VESSEL AS RECORD 7
7	316	1	0	QUSF	BDY														M	F	H	PROBABLY SAME VESSEL AS RECORD

IRON AGE POTTERY: HARBY ENCLOSURE

SITECODE SWP96

07/02/97

REC	CTXT	NO	WT (g)	FAB	PART	FORM	NCK	RIM FORM	RIM DIAM	RIM %	BASE FORM	BASE DIAM	BASE %	SRF EXT	SRF INT	DEC TEC	DEC MOT	DEC POS	WEAR	DEP	MAN	COMMENT
																						6
47	317	1	39	QUSF	RIM	OV?	N	TD	>60	?				FM	FM				U		H	
2	326	1	1	SHMC	BDY														U		H	
1	326	1	40	SHMC	RIM+	OV	N	RD	100	15				FM	FM				U	BME	H	RIM + UPPER BODY
49	360	3	18	SHSM	BDY														M		H	3 JOINING SHERDS
48	360	2	12	SHSM	RIM			EVT	80-100	10									M		H	2 JOINING SHERDS
55	361	1	3	QUSF	BDY									SM	SM				S		H	
56	361	1	2	QUSF	BDY														S		H	
50	361	5	5	SHMC	BDY														M		H	FRAGMENTING. PROBABLY SAME VESSEL AS RECORD 51.
51	361	1	0	SHMC	BDY														M		H	PROBABLY SAME VESSEL AS RECORD 50
52	361	1	2	SHMC	BDY														M		H	
59	378	2	9	QUSF	BDY									SM	SM				U	ME	H	2 JOINING SHERDS, CLEAN BREAK
57	378	1	4	QUSF	RIM		UP	RD	?	?				SM	SM				M		H	UPRIGHT OR EVERTED NECK
58	378	1	5	QUSF	RIM			EVT	?	?				SM					M		H	
TOTAL		94	727																			

IRON AGE POTTERY: SWINETHORPE ENCLOSURE

SITECODE SWP96 07/02/97

REC	CTXT	NO	WT (g)	FAB	PART	FORM	NCK	RIM FORM	RIM DIAM	RIM %	BASE FORM	BASE DIAM	BASE %	SRF EXT	SRF INT	DEC TEC	DEC MOT	DEC POS	WEAR	DEP	MAN	COMMENT
1	204	1	2	SHSM	BDY														S	F	H	
3	204	6	19	SHSM	RIM+	OV?	C	RD	>140	<10									M		H	6 JOINING FRAGMENTS. RIM + NECK + SHOULDER. cf LIA NECKED BOWLS?
1	209	1	2	SHMC	BDY														M	F	H	
TOTAL		8	23																			

APPENDIX 4

Eagle to Harby Water Main Pipeline, SWP96

Environmental Archaeology Report

J. Rackham and J. Giorgi

Figures

Eagle to Harby Water Main Pipeline, SWP96

Environmental Archaeology Report

J. Rackham and J. Giorgi

Introduction

A collection of 38 samples and some animal bone were submitted for analysis. The samples (Table 1) were taken with four different procedures in mind. 10 to 30 litre samples were collected for flotation and wet sieving for plant and animal material, eight small samples were collected for sediment description with the object of characterising the deposit and establishing if they originated as a result of alluvial deposition or soil formation processes. Three samples of wood, including one possible 'object', were sampled for identification and analysis of any evidence of working, and two 100 litre samples were taken from the bone rich layers in cuts 307 and 308 for wet-sieving for the extraction of animal bone and pottery. The majority of these samples derive from three sections of late Middle to Late Iron Age date.

Cut 307 represents a ditch terminal, whose ditch was excavated and drawn in detail four metres from the terminal. A sequence of ten samples for environmental analysis was taken from the section (see Table 1) and in addition two samples of wood from the middle fills. One large, 100lt, sample was taken of a bone rich layer, 361, in the middle fills of the section, for wet-sieving for animal bone and pottery. A monolith sample, one metre long, was also taken through section 16 on the north west side where it sampled the sequence of deposits from the lower fill 366 to the upper fill 359. A single small sample was taken from the upper fills, 306, of the ditch terminal proper.

Cut 308 defines a second, probably contemporaneous, ditch terminal. A sequence of eight samples (Table 1) for environmental analysis were taken from the deposits in this terminal, and a large piece of fragmented timber was also collected. A large, 100lt, sample of context 303, a bone rich layer in the upper middle part of the sequence, was taken for wet-sieving for animal bone and pottery. A monolith sequence was also taken from this sequence. The whole sequence was sampled using two overlapping monoliths, each of one metre, from context 323 at the base of the profile to context 301 at the top.

A short sequence of samples was also taken from the section of a small ditch, cut 309. Samples were taken for environmental analysis from each of the four fills identified within this gully.

In addition to these samples two other samples were collected for analysis. Context 109, a fill of gully 101, showed evidence of a clay deposit that had been subjected to heat and may have derived from some industrial activity and apparently of Roman date, and context 402 a charcoal rich fill of an ovoid area, 401, showing evidence of burnt soil and charcoal, suggesting a hearth, but undated.

Dating

Samples of charcoal were submitted for radiocarbon dating from the bone rich contexts 303 and 361 in each ditch terminal. In addition organic debris and wood from context 366 near the base of the sequence in ditch section 307 was also submitted for analysis.

The following results were obtained:

Cut	Context	Measured Age BP	Lab.no.	Calibrated age at 2 sigma	Intercept with calib. curve
308	**303**	**2130±80**	**Beta-101169**	**BC 380- AD 55**	**BC 165**
307	**361**	**2030±70**	**Beta-101170**	**BC 190- AD 120**	**BC 20**
307	**366**	**2190±70**	**Beta-101171**	**BC 390- BC 40**	**BC 200**

(the measured age was calibrated using Stuiver et al 1993)

Ditch 307, and presumably ditch 308 if it is directly associated, appears to have been cut in the Middle to Late Iron Age. Because some archaeological inferences can be made about the relationships between the samples it is possible to slightly reduce the calibrated range of the dates, based upon these premises.

The first archaeological premise used was that the two ditch terminals were contemporary, and cut at the same time. The second premise is that context 361 is later than 366 because of their stratigraphic relationship. While this is an obvious relationship it should be remembered that the sample from 361 was charcoal while that from 366 was small wood and organic debris. It is therefore not impossible that the charcoal in 361 could derive from wood that was formed earlier than the organic material at the base of the ditch, if so this would negate the assumption of relative age made for the statistical analysis. The third premise is that context 303 in terminal 308 is later than 366 in cut 307. This is based upon the first premise, that the ditches were contemporary, and also the second, that the charcoal used to date 303 derived from wood that grew after the organics that were dated in 366.

With these assumptions to the fore the dates were re-run by Keith Challis (Trent and Peak Archaeological Unit) using OxCal v2.18 (Oxford Archaeological Research Laboratory) and the following ranges at 2 sigma produced:

Context	Measured Age BP	OxCal v2.18 calibration at 2 sigma
303 later than 366		
303	2130±80	BC 340-280 (0.04), BC 260-60AD(0.96)
366	2190±70	BC 400-100
361 later than 366		
361	2030±70	BC 190-120 AD
366	2190±70	BC 390-60

These results (illustrated in Fig. 4.1) have perhaps more positively confirmed a Middle or late Middle Iron Age date for the primary fills of ditch 307, while pushing the bone rich layers in the middle fills of the ditches more firmly towards the Late Iron Age. For any greater definition high precision radiocarbon dates would be required.

Processing

Sample volume and weight were measured prior to processing. The samples were washed in a 'Siraf' tank using a flotation sieve with a 0.5mm mesh and an internal wet-sieve of 1mm mesh for the residue or in a bowl where the sample size was small enough. Both residue and float were dried. The residue was then re-floated, to improve the recovery efficiency of the carbonised remains, with the second flot being caught on a 0.125mm mesh. The residue and second flot were then re-dried. The dry volume of the flot was measured, and the weight of the residue recorded. Where samples included preserved organic remains the flot was kept wet and not dried, although the second flot was always dried.

The sample residue was sorted by eye, and environmental and archaeological finds picked out, noted on the assessment sheet and bagged independently. A magnet was then run through the residue to pick up any magnetised material (particularly flake and spheroidal hammerscale) after which the residue was bagged. The float of each sample was studied under a low power binocular microscope. The presence of environmental finds (ie snails, charcoal, carbonised seeds, bones etc) was noted and their abundance and species diversity recorded on the assessment sheet. The float was then bagged. The float and sorted finds constitute the material archive of the samples. The sorted residue was discarded. The flot and finds were submitted for post-excavation analysis.

The two bulk samples were wet sieved over an 8mm mesh sieve and all pottery and bone collected off this sieve.

A number of samples were submitted for a description and statement of origin or formation. These were not processed, but merely described and discarded.

The assessment sheets are attached and the results of the assessment and post-excavation analyses are summarised below.

Soil samples

Described samples

Eight soil samples were submitted with questions concerning their origin, particularly whether it was later prehistoric alluvium or not.

Sample 17, context 316. This layer sealed the upper fill of ditch 309. It was composed of a greyish brown (10YR 5/2) slightly silty fine to medium sand with strong brown (7.5YR 4/6) mottles and rare small (up to 10mm diameter) pebbles. The layer appears to represent a reworked deposit of the natural sand in the area that has undergone some soil processes and the

interpretation of the deposit as reworked material from the bank upcast is consistent.

Sample 18, context 149 and sample 19, context 150. These two samples derived from the fills of posthole 148. Context 149 is a pale brown (10YR 6/3) fine to medium sand with slight mottling and 150 is a greyish brown (10YR 5/2) fine to medium sand with some mottling and rare small pebbles. Both are typical of the natural sands in the area and do not represent alluvium.

Samples 24 (context 357), sample 23 (context 356), sample 21 (context 337 - upper) and sample 22 (context 337 - lower). These samples form a sequence beneath what is described as a 'clay bank' (335). The upper part of the sequence, 357, considered on site to be a possible palaeosol was a dark greyish brown (10YR 4/2) slightly silty fine to medium sand with frequent red brown mottles, and occasional grits and small pebbles. It appears to have some structure and root holes. In a disaggregated form it is difficult to say but it could represent part of a buried soil developed on the natural sands in the area. Context 356, in a similar stratigraphic position, is very similar being a dark greyish brown (10YR 4/2) silty fine to medium sand with some coarse grits and rare stones up to 50mm. Beneath these two was layer 337 whose upper brown (10YR 5/3) fine to medium sand with darker red brown mottles and rare small pebbles grades downwards into a yellowish brown (10YR 5/6) fine to medium sand of similar character. It is probable that this whole sequence of deposits represents a developed sedentary soil profile beneath the clay bank although the section was not seen in situ.

Sample 15, context 327. This sample was a stiff dark bluish grey (GLEY 5B 4/1) clay with some mottling around poorly preserved root fragments. This is likely to be reworked natural clay.

Processed samples

Two samples unassociated with the middle to late Iron Age sequence were processed. Context 109 a charcoal rich burnt deposit produced fragments of burnt clay, one sherd of pottery, a corroded piece of iron and 52 grammes of slag (Table 2). A few tiny fragments of burnt bone, one or two carbonised seeds and a hazel nut shell fragment. This is possibly of Roman date and associated with quantities of excavated slag. Context 402, a possible hearth, undated, produced burnt clay, fragments of hammerscale and corroded metal flakes and quantities of charcoal. This was the only sample from the whole site that produced carbonised cereal remains (see Botanical report), which included wheat and barley.

The remaining samples are associated with the Iron Age ditch terminals and ditches, 307, 308 and 309.

Ditch 309

The sequence of four samples from this ditch (Table 2) produced little material with most of the archaeological finds deriving from the upper fill, context 304 (see Fig. 4.2). The preserved botanical remains are biassed towards robust seeds (see Table 3 and botanical report) with little carbonsied material other than charcoal. The mollusc fauna from 305 is dominated by aquatic species or those favouring wet areas, including Planorbis leucostoma, Aplexa hypnorum, Succinea sp, all indicative of seasonally wet ditches (Macan, 1977) and a number of ostracods, aquatic shelled crustaceans, were also present. Charcoal and bone were richest in the upper context (Table 2) and the fauna included mice, common shrew, frog or toad and snake, the latter occuring in contexts 304 and 319, and probably grass snake, Natrix natrix (Table 6). The ditch was probably seasonally water filled but was not used as a receptacle for rubbish disposal until fairly late in the sequence of filling.

Ditch 307

The sampled series derives from the ditch section approximately four metres from the terminal. A sequence of ten samples was taken through the fills. The upper two fills, 358 and 359 contained little archaeological material, a few grammes of charcoal and bone, one sherd of pottery and a piece of slag and hammerscale (Table 2). These fills may even relate to a period after abandonment of the adjacent 'settlement'. Apart from one fragment of pig and sheep the identifiable bone from these layers (Table 6) was vole and mice material. The bulk of the archaeological finds from the profile derive from contexts 360 and 361 (see Table 2), the latter being a particularly rich layer with over 1kg of bone from the 30 litre sample and a few grammes of charcoal. The latter was submitted for a radiocarbon determination (see above). This layer contained a few preserved elder and blackberry seeds and one charred cereal grain, but preservation of organic remains was poor until layer 365 was reached (see botanical table). Charcoal and bone falls off below context 362 (Fig. 4.2), while the organic component and the mollusc remains are most frequent in the basal four samples. Little was recovered from the small sample at the very base of the sequence. The material from the ditch section is different from that recovered at the terminal of this ditch. One sample (38) was collected from an upper fill of the terminal, 306, and animal bone was hand recovered from 306, 378 and 380, the uppermost fills of the terminal. The sample from 306 produced little apart from burnt and calcined bone, burnt clay with a possible clay loomweight fragment, while the hand collected bone was composed of nearly 60% calcined fragments. This is similar to the pattern in terminal 308, and perhaps suggests that the terminals are receiving a high proportion of burnt bone, while the ditches away from the terminals receive material from a different source.

Ditch 308

A series of eight samples were taken from the fills of the terminal 308. As in ditch 307 the bulk of the archaeological finds occured in the upper middle fills, contexts 303, 314 and 317 (Table 2). These layers produced evidence of fired material and possible industrial activity in the form of burnt clay, some

metal fragments, a small piece of slag and possible hammerscale, and the bulk of the pottery. A considerable proportion of the material in these layers was burnt (see Fig. 4.2) as in the terminal of 307, suggesting a somewhat different origin for much of the debris in these terminals than the unburnt assemblages in 360 and 361 in 307. Organic remains were best preserved in the bottom two layers of the ditch fill, contexts 320 and 323 (see below).

The Plant Remains (John Giorgi)

Not all the samples were studied for their botanical remains. A number of the samples included a few seeds of elder and blackberry and little else, indicating differential preservation and a bias towards the most robust seeds. A selection of the better preserved organic flots and a few carbonised seeds from samples in which the organic component survived poorly were submitted for identification. The plant material was rapidly scanned using a binocular microscope and the frequency of individual taxa recorded.

Results

All the samples studied (Table 3) produced plant remains although there was great variability in assemblage size between individual samples, with the richest assemblages being recovered from the basal fills 323 and 320 in ditch 308, and fills 365 and 366 in ditch 307. Most of the botanical material was preserved by waterlogging and included seeds and fruits from a range of species, plus leaf, stem, bud, wood and root fragments in a number of samples. Charred remains of seeds were also present in virtually all the samples albeit in much smaller quantities and representing a much smaller diversity of taxa. A large number of small rounded seeds were found in seven of the samples but could not be identified. Flecks and small fragments of charcoal were recovered from all but one of the samples.

The Middle Iron Age Ditches 307 and 308

There was no significant variability in the species composition between the richer samples within each ditch or between the fills of the two ditches. The most notable feature of the two richest assemblages in the basal fills 323 and 366 from ditch 308 and 307 respectively, was the very large number of oak (Quercus sp.) acorn capsules and bases. Other trees and shrubs represented in the ditch fills included whole nuts and shell fragments of hazel (Corylus avellana), with charred fragments in fill 365, and seeds of downy birch (Betula pubescens) in fill 323, a tree which grows in wet soils. A single bract from a pine cone (Pinus sylvestris) was also found in 366. Large numbers of seeds of elder (Sambucus nigra) and brambles (Rubus spp.) were present in many of the samples.

The remaining seeds in the assemblages were mainly from plants of waste places, a number of which are also characteristic arable weeds, for instance chickweed (Stellaria media) and various thistles, eg. Carduus/Cirsium spp., Sonchus spp.. Other less well represented plants in the samples, typical of waste places and arable ground were black nightshade (Solanum nigrum), corncockle (Agrostemma githago), goosefoots/oraches (Chenopodium/ Atriplex spp.), and bedstraw (Galium sp.), the latter also found as charred

remains. Some of the plants also grow in woods, on wood margins, or in hedgerows, eg. stinging nettle (Urtica dioica), nipplewort (Lapsana communis), as well as in damp places or near water, for instance hemlock (Conium maculatum) and bugle (Ajuga reptans). Other indicators of wetland habitats were a few sedge (Carex sp.) fruits and evidence of duckweed (Lemna sp.) in fill 365. Seeds of Labiates were found in high numbers in several samples but have yet to be reduced to species.

The Late Iron Age Ditch 309
Only two of the samples from this ditch were studied for botanical material, of the other two only a few seeds of Chenopodium spp. were present. These samples produced a low diversity of plant remains with most of the identifiable material coming from fill 305, with seeds from plants of waste places and disturbed ground, eg. chickweed, goosefoots/oraches, docks (Rumex spp.), and knotgrass (Polygonum aviculare). A number of small charred grass seeds were found in both samples, particularly from fill 321.

The Burnt Deposit 402 (undated).
A small assemblage of charred grains was identified in this sample, including wheat (Triticum sp.), barley (Hordeum sativum), and possibly oat (cf. Avena sp.). A seed of the weed, bedstraw, was also found in this sample.

Discussion
The interpretation of the plant remains is limited by the fact that many of the identified species are catholic in their habitat requirements. Nevertheless, the botanical material, in particular that from the ditch fills, which contained the bulk of the identifiable remains, suggests a disturbed environment in the vicinity of the ditches and gully, no doubt in part as a consequence of human activities in the area.

A number of trees, eg hazel, oak, birch, and shrubs, eg. elder, brambles, would have probably been growing close by or even along the margins of these features, with some of the plants indicating a wooded environment. These plants would have provided potential human resources; acorns as fodder for livestock (pigs); hazel nuts a source of food with the wood for building and domestic crafts, eg. basketry, and the fruits of elder and brambles as potential sources of food and drink.

A damp environment within and probably on the margins of the ditches is indicated by a number of wetland plants although the virtual absence of aquatics in the samples argues against permanent bodies of water. The evidence of duckweed suggests occasional standing bodies of water, with large numbers of water flea eggs (Cladoceran ephippia) in three fills 323, 365 and 366, supporting this idea; water fleas lay down their eggs in water in the months leading up to winter.

It is more difficult to establish the character of the environment away from the ditch and gully features. There was no direct evidence for agriculture, as some of the charred weed seeds may equally be from plants of waste ground

as from the weeds of cereal crops. Charred cereal grains were only found in undatable features, except for a single unidentified grain in 361. A number of smaller rounded charred seeds, that have yet to be identified, may shed some light on this problem. Moreover, some of the insects (present in moderate to large numbers in samples from six fills 323, 320, 363, 365, 366 and 367), may provide information on the nature of the environment away from the ditch.

In summary, these preliminary findings suggest a damp ditch with seasonal bodies of water, shaded by trees and shrubs, with evidence of the residues of human activities indicated by the charred remains as well as the artefactual data. Some of these plants were probably exploited. It is possible, however, that a more detailed analysis of the plant remains, eg. the plant buds, together with the identification of the insects, may broaden our understanding of both the immediate environment and those areas way from the ditch features.

Molluscs (J. Rackham)

The basal samples of ditch 307 produced sufficient molluscs to justify analysis. A sequence of four samples (Table 4) was studied and produced a range of terrestrial and aquatic species. No major changes were observable through the sequence.

A damp or seasonally wet ditch environment is indicated by the aquatic and semi-terrestrial element of the fauna. Species such as Planorbis leucostoma, P. crista, Lymnaea truncatula, L. glabra and Succinea sp. are typical of marshes, small ponds or ditches and damp places which tend to dry up (Macan 1977). There is little indication of permanent water at the base of the ditch during its primary filling. Other species such as Ashfordia granulata and Trichia hispida also frequently occur in damp environments in association with Succinea sp (Evans 1972).

The terrestrial component of the mollusc fauna is perhaps more explicit and is dominated by members of the Zonitoidae, Carychium tridentata and Discus rotundatus. These are typically species associated with woodland (Evans 1972), and the presence of other shade loving species such as Acanthinula aculeata, Clausilia bidentata and Euconulus fulvus serves to reinforce the shaded-damp character of the local environment. The only species more commonly associated with open country is Vallonia costata which is associated with dry open places such as short turfed grassland and sand dunes, although also found in dry open woods (Cameron and Kerney 1979), but Evans (1972) records this species in a number of post-glacial and archaeological sites where woodland can be inferred. Evans (op cit) considers that drier habitats may be a controlling factor on distribution and the fact that the site here is located on sands may well be responsible for the large V. costata component, although V.costata appears to be an early coloniser of woodland areas being cleared (Evans op cit).

Animal Bones (J. Rackham)

The animal bones were recovered by hand excavation and sampling. The bulk of the recorded material (Table 5) derived from the soils samples, and all bar one bone of the smaller species were recovered from the samples washed on a 1mm mesh sieve (see Table 5). The animal bones were identified by comparison to modern known species reference material in the authors collection and recorded in the manner summarised in Appendix 1. The data catalogue is presented in this appendix. Although material has been catalogued as 'OVCA', sheep or goat, no goat bones were identified and in the discussions below the material is referred to as sheep.

The fragmentation in this collection is extremely high with a very large proportion of unidentifiable fragments (see Table 5). The fragmentation index (total no zones/total no fragments- see Rackham 1986 and Appendix 1 for zones) is 0.62 for cattle (and cattle size), 1.02 for sheep (sheep/goat and sheep size) and 1.09 for pigs. The lesser fragmentation of sheep and pig is probably due to a greater proportion of small bones, such as phalanges and carpals, which are sufficiently small to have remained unbroken. The fragmentation index for the whole collection, 0.05, is a better measure of how broken up the material is. Although cattle fragments are the most abundant the relative frequency of the most important species is not clear. The species frequency changes as the recovery procedure or sieve size changes. Cattle become relatively less frequent as the sieve size decreases while pig and sheep fragments become more abundant (Table 7). In order to remove the bias introduced by these recovery procedures only the sievd material is considered with the data from each sieve size being kept separate (Table 8 and Fig. 4.3). There is considerable variability between the bulk sieved material and that from the soil samples from the same ditch. Cattle fragments, zones and bone weight are relatively higher in the soil samples from ditch 307 than in the bulk sample from 361, the bone rich context in this ditch. In contrast in ditch 308 cattle are relatively less frequent than they were in the bulk sample from 303, the bone rich context in this trench. In ditch 309 pig dominate whatever method of quantification is used. The variability is such that no realistic estimate of the relative species proportions can be made from this data. Besides the chronology or contemporaneity of these different groups cannot be established (see above) so whether these variations reflect behavioural or chronological patterns is unknown. What is clear, however, is that all species make an important contribution to the dietary economy of the site, and the abundance of pig may in part be associated with the juxtaposition of the site to woodland.

As well as species abundance there are other major variables in the assemblages. The distribution of the bones throughout the ditch fills are presented in Figure 4.2. What is of some taphonomic interest is the very high proportion of the bone in ditch 308 which is burnt, at least 50% of the assemblage in each of the bone rich layers in this ditch (Fig. 4.2b). Although only one sample, 38, was collected from context 306 at the terminal of 307, this and the hand collected material (see above) show a similar pattern of high burnt bone content, suggesting perhaps similar origins for the material. In contrast the ditch section of 307 despite its proximity to the two ditch

terminals has very little burnt bone and is clearly receiving rubbish from a different source, both in terms of species composition and processing procedures. The context of the bone dumps, in the ditches, suggests that the fragmentation of the material took place elsewhere, before deposition. Only two bones showed evidence of dog gnawing so it is difficult to attribute the high fragmentation to scavenging activities. It seems likely since few of the bones show evidence of trampling or serious weathering that the fragmentation was part of the bone processing and one might conclude that bone is being broken up intentionally, perhaps boiled, and then discarded, some of the material being thrown on the fire. This burning is fairly indescriminate with fragments of sheep, cattle and pig being burnt with similar frequency.

The cattle bone samples from the ditches appear to be dominated by bones of the upper and lower limbs, with relatively few carpal, tarsal, metapodial and phalange fragments. The scapula, femur, tibia, radius and ulna occur most frequently (Table 9), although disassociated teeth are very common This tends to confirm that the material derives from food processing, perhaps even the smashing of the long bones for fat extraction, rather than butchery. This pattern is not so clear for the sheep bones which show the characteristic high frequency of tibia and mandibles, which seems to reflect their robustness rather than any human selection, but also a significant proportion of carpals, tarsals and phalanges. Mandibles, scapulae and metacarpals are the most frequent pig bones, but there is no indication of skeletal selection in this species (Table 9). No differences in element representation could be discerned between the bone assemblages from each ditch. If the attribution of this material to food processing is correct then the evidence suggests that the different species are being utilised in different manners. While the major meat bearing parts of the cattle, and to a lesser extent the sheep carcasses form the focus of food exploitation of these species it is possible that all parts of the pig, including trotters are being utilised rather than discarded as waste. Nevertheless the identifiable component of the assemblage is small and these constitute ideas based upon limited quantifiable data.

In order to consider the age of the animals when slaughtered it has been necessary to amalgamate all the data from these ditches, and even then the sample sizes are inadequate. The data is not presented separately and reference should be made to the catalogue (Appendix 1). There are no calves among the cattle bones, although a few immature beasts are indicated by the occurence of deciduous premolars, and molars 2 and 3 barely in wear. These probably correspond with animals in their second and third years. At least four mandibular molar 3 with no wear indicate the latter (Grigson 1982). Two or three teeth indicate the presence of adult animals in the sample. A similar pattern is suggested for the epiphyseal data, with no calves present but one or two fragments indicating second and third year animals. 23 percent of the vertebral epiphyses are fused illustrating that a proportion of the animals were fully adult, since these epiphyses usually fuse after four years (Grigson 1982). These animals are being culled at ages consistent with exploitation for meat. There are no lambs in the sample, the youngest

animals being in their second year, with the deciduous premolar 4 still present and the molar 2 only just in wear (Clutton-Brock et al 1990). Further animals were killed in their third and fourth years, but there is no indication of old individuals. A similar pattern is indicated by the epiphyseal fusion data and less than 18 percent of the vertebral epiphyses were fused, suggesting few animals lived beyond three or four years. Once again this is a pattern more typical of a meat production economy than, for instance wool or milk, although the quality of the skins of these immature and young adult animals may have been important. The pigs show a typically juvenile slaughter profile with most of the animals probably being killed in their third year, with a proportion slaughtered in their first or second year. The epiphyseal data supports this with one bone perhaps deriving from an adult animal over three years of age.

These results perhaps support the early inference that this material derives largely from food processing activities, since these age categories constitute the prime ages for culling stock exclusively for meat exploitation, although secondarily of importance for the hide and skins, however the identified component of the sample is very small and these are inferences rather than firm conclusions.

Besides the domestic animals, including a few dog bones, a range of other species were identified from among the bones sorted from the soil samples sieved on a 1mm mesh (Table 5). The roe deer bone is a small antler tine, well worn, that had been sawn from the beam and may have been utilised as a tool and the brown hare a single rib which may have derived from food debris. The remaining species are all likely to be natural deaths of the 'wild' fauna in the area. They are much less diagnostic than the plants and molluscs, although the bank vole, wood mouse and grass snake are all species that favour scrub, overgrown or wooded areas in preference to open pasture or arable land. The ditch itself would have been suitable for most of the small vertebrate species present. The house mice are of considerable interest. Harcourt (1979) reports two specimens of house mice in apparently well stratified and sealed Iron Age contexts at Gussage All Saints, one from a phase 2 context and the second from phase 3. The two specimens at Harby, both right mandibles, come from fills 314 and 317 in ditch 308, the lower two of the bone rich layers in this feature. In one specimen the M1 is noticeably larger than the M1 in the modern specimens used for comparison, a characteristic of ancient specimens (Davis pers comm.). There is good reason to treat these specimens as contemporary. The nearest human habitation is several hundred metres away, two individuals are present in the archaeologically rich layers of the ditch fill, the teeth are large and the finds were made at a depth of at least 0.8m from the present ground surface. Both these finds pre-date the horizon which was radiocarbon dated and a late-middle or late Iron Age date for the specimens is indicated. While they may not be the earliest finds in the country they suggest that the settlement at Harby is likely to have had contacts directly, or through other settlements, with the continent, individuals being imported with goods or grain from elsewhere. Settlement density at this period is unlikely to have been sufficient

to permit unassisted dispersion of the species during its early colonisation of the country.

Conclusions

The plant and mollusc assemblages from the base of the ditch (Tables 3 and 4) indicate that the local environment was probably wooded. The dominance of woodland molluscs in association with an abundance of macrofossils of oak, hazel and birch, with some shrubs indicates that the woodland was very local. Although there is some possibility that the acorns were collected it appears more likely given the context and other associated remains that these may have been naturally deposited, having fallen off a tree at the site. They were the most abundant botanical find in the basal assemblages of both ditches.

Clearly at the time of the excavation, or at least the primary filling, of the ditch the area was wooded, with an oak tree possibily overhanging the ditch terminals. The ditch remained damp enough for the organic remains to have survived and a damp environment mollusc fauna, and wetland but not truly aquatic flora to colonise. The input of archaeological debris into these early fills is small and either these fills formed very rapidly or perhaps the ditch still had some barrier function and was not used for the disposal of rubbish. The environment of the ditch at the time of the major archaeological deposits within it is not known because organic survival was poor at this level, and although elder and blackberry were still present in the fills, this may have as much to do with the survival potential of these seeds as with the local vegetation. By the time the ditch is used as a dumping ground a hedge could well have grown along its bank, perhaps making the ditch itself redundant as a barrier.

The site is located at the junction between two different soil types (Soil Survey- Sheet 4- Eastern England) with deep permeable sandy and coarse loamy soils to the west and slowly permeable seasonally waterlogged fine loamy over clayey and fine silty over clayey soils (Oxpasture soils - Hodge et al 1984) to the east. These latter soils are more suited at the present day to cereal cultivation although there is little opportunity for spring cultivation because of soil conditions and autumn grown cereals predominate (op cit). The soils to the east are lighter and sandier well drained soils with a tendency to dry out, although easily cultivated they have a low inherent fertility (op cit). The site at Harby appears to lie close to, or even on, the junction between these two soils, on a shallow well drained sandy soil over shaley Jurassic clay. The woodland environment indicated by the plant and mollusc assemblages may have been local to this soil type with the lighter soils to the west, overlying the terrace gravels of the Trent, already cleared and under agriculture. These soils still contain most of the woodland lying between the Witham and Trent rivers in this part of Lincolnshire and are more subject to waterlogging, and therefore less easily cultivated, than the soils to the east. The site may well have been placed to take best advantage of the resources of both the woodland and agricultural areas in the vicinity. The ground rises slightly to the east and the site lies just above the floodplain of

the River Trent. It may well be that arable and pastoral fields lay immediately beyond the enclosure to the west, while woodland came right up to the enclosure entrance on the north east side.

There is very little evidence of cereal within the samples and the archaeological debris relates largely to a pastoral economy with the animal cull suggesting meat and perhaps hides as the primary economic purpose of the animals. However the sample is small and exclusively from the terminals and adjacent ditch sections of an enclosure and if as has been suggested above these face woodland it may be that the agricultural processing activities took place at the opposite end of the enclosure and behavioural use of the space is responsible for the character of the assemblage. The bone assemblages studied appear to be the product of food processing, at its final stages ie cooking and boiling. They can barely be considered to be representative of the whole site. Some trade or contact with other settlements is suggested by the presence of house mouse in the fauna at what is an early date for this species in England.

Acknowledgements

I should like to thank Keith Challis (Trent and Peak Archaeological Trust) for running the radiocarbon dates through OxCal. Alison Foster processed and sorted all the environmental samples.

Bibliography

Binford, L.R. 1984 *Faunal Remains from Klasies River Mouth* Academic Press.

Cameron, R.A.D. and Kerney, M.P. 1979 *A Field Guide to the Land Snails of Britain and North-west Europe* Collins.

Clutton-Brock, J., Dennis-Bryan, K., Armitage, P.L. and Jewell, P.A. 1990 'Osteology of the Soay Sheep' *Bull. British Museum Nat. Hist. (Zool)* 56 (1): 1-56.

Evans, J.G. 1972 *Land Snails in Archaeology* Seminar Press, London and New York.

Grant, A. 1982 'The use of tooth wear as a guide to the age of domestic ungulates'. In B. Wilson, C. Grigson and S. Payne (eds.) *Ageing and Sexing Animal Bones from Archaeological Sites* BAR BR 109, 91-108.

Grigson, C. 1982 'Sex and age determination of some bones and teeth of domestic cattle: a review of the literature'. In B.Wilson, C.Grigson and S.Payne (eds.) *Ageing and Sexing Animal Bones from Archaeological Sites*, BAR BR 109, 7-24.

Harcourt, R.A. 1979 'The animal bones' In Wainwright, G.J. *Gussage All Saints: an Iron Age Settlement in Dorset* Dept of Environment Archaeological Reports 10, HMSO, 150-160.

Hodge, C.A.H., Burton, R.G.O., Corbett, W.M., Evans, R. and Seale, R.S. 1984 *Soils and their use in Eastern England* Soil Survey of England and Wales Bulletin No. 13.

Macan, T.R. 1977 *A Key to the British Fresh- and Brackish-water Gastropods*, Freshwater Biological Association.

Payne, S. 1973 'Kill off patterns in sheep and goats: the mandibles from Asvan Kale' *Anatolian Studies* 23, 281-303.

Rackham, D.J. 1986 'Assessing the relative frequencies of species by the application of a stochastic model to a zooarchaeological database' In L. van Wijngaarden-Bakker (ed.) 'Database Management and Zooarchaeology' *Journal of the European Study Group of Physical, Chemical, Biological and Mathematical techniques applied to Archaeology* Res. Volume 40.

Stuiver, M. , Long, A., Kra, R.S. and Devine, J.M. 1993 'Calibration - 1993' *Radiocarbon* 35 (1)

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

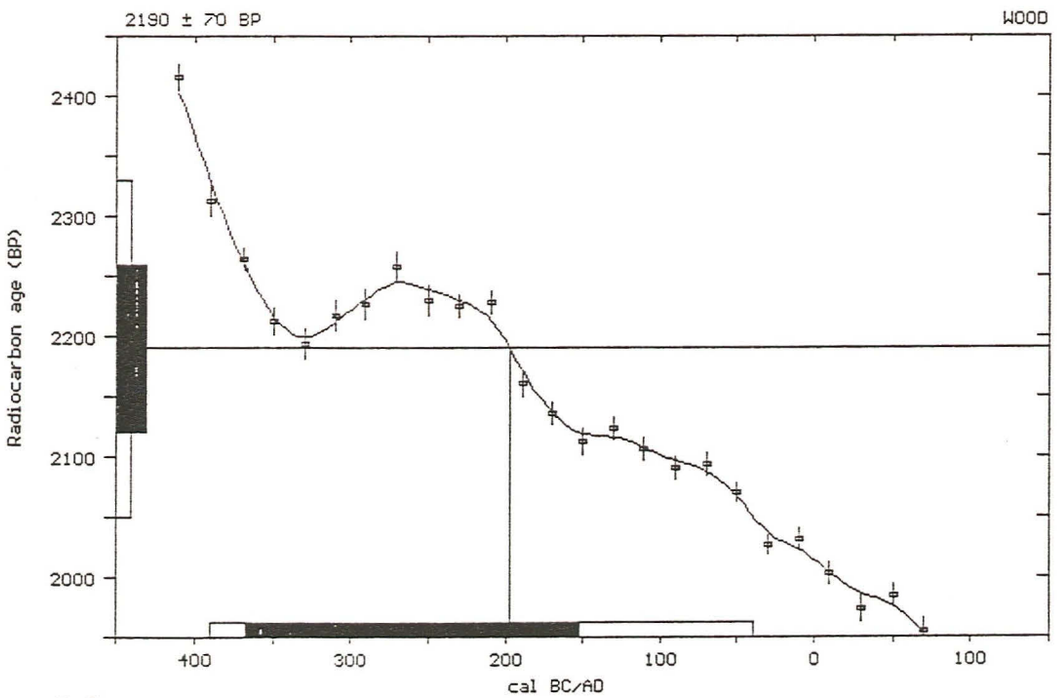
(Variables:estimated C13/C12=-25:lab mult.=1)

Laboratory Number:	Beta-101171
Conventional radiocarbon age*:	**2190 ± 70 BP**
Calibrated results: (2 sigma, 95% probability)	**cal BC 390 to 40**

* C13/C12 ratio estimated

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal BC 200
1 sigma calibrated results: (68% probability)	cal BC 370 to 150



References:

Pretoria Calibration Curve for Short Lived Samples
Vogel, J. C., Fuls, A., Visser, E. and Becker, B., 1993, Radiocarbon 35(1), p73-86
A Simplified Approach to Calibrating C14 Dates
Talma, A. S. and Vogel, J. C., 1993, Radiocarbon 35(2), p317-322
Calibration - 1993
Stuiver, M., Long, A., Kra, R. S. and Devine, J. M., 1993, Radiocarbon 35(1)

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 ■ Tel: (305)667-5167 ■ Fax: (305)663-0964 ■ E-mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

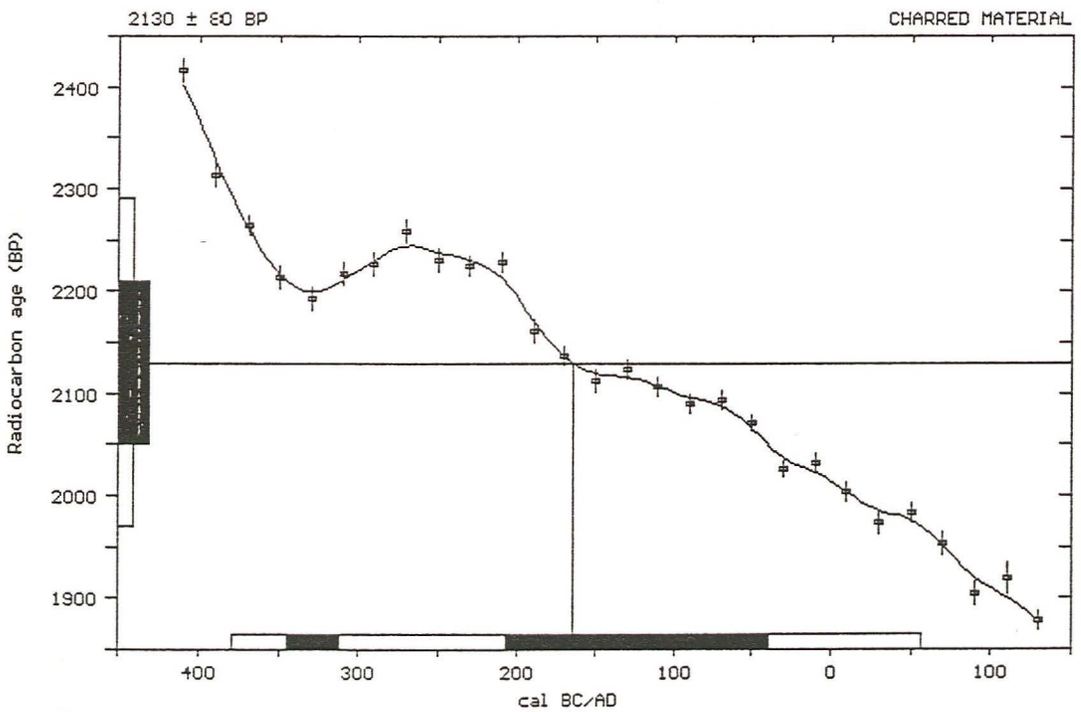
(Variables:estimated C13/C12=-25:lab mult.=1)

Laboratory Number:	Beta-101169
Conventional radiocarbon age*:	**2130 ± 80 BP**
Calibrated results: (2 sigma, 95% probability)	**cal BC 380 to cal AD 55**

* C13/C12 ratio estimated

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal BC 165
1 sigma calibrated results: (68% probability)	cal BC 345 to 310 and cal BC 210 to 40



References:

Pretoria Calibration Curve for Short Lived Samples
Vogel, J. C., Fuls, A., Visser, E. and Becker, B., 1993, Radiocarbon 35(1), p73-86

A Simplified Approach to Calibrating C14 Dates
Talma, A. S. and Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Calibration - 1993
Stuiver, M., Long, A., Kra, R. S. and Devine, J. M., 1993, Radiocarbon 35(1)

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 ■ Tel: (305)667-5167 ■ Fax: (305)663-0964 ■ E-mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

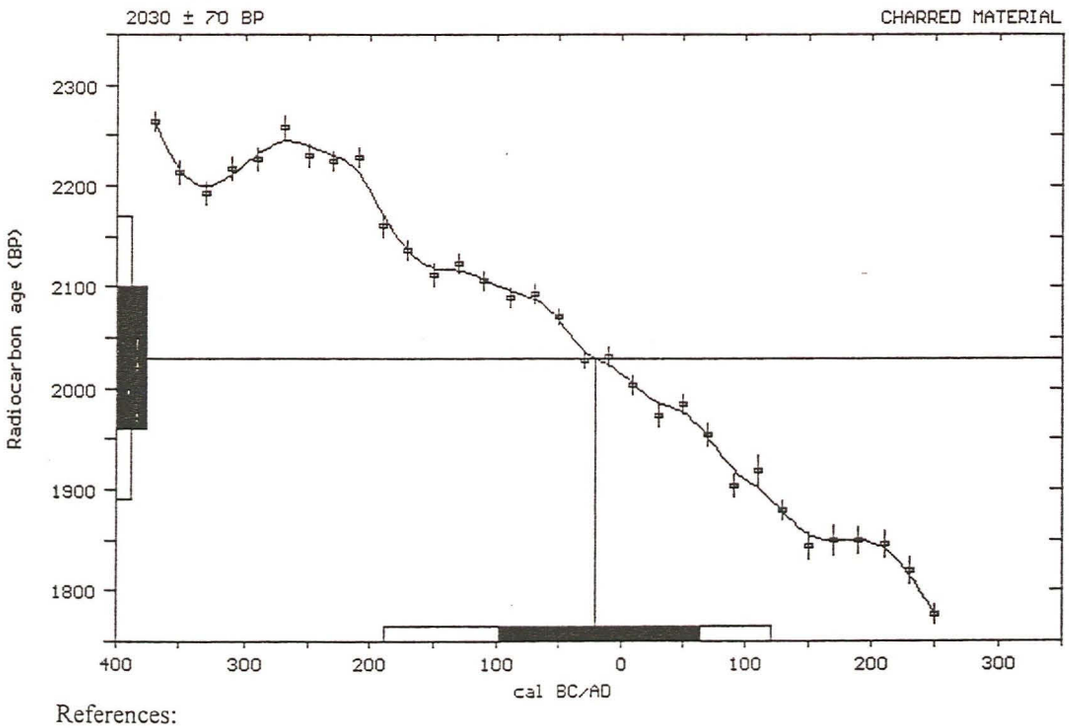
(Variables:estimated C13/C12=-25:lab mult.=1)

Laboratory Number:	Beta-101170
Conventional radiocarbon age*:	**2030 ± 70 BP**
Calibrated results: (2 sigma, 95% probability)	**cal BC 190 to cal AD 120**

* C13/C12 ratio estimated

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal BC 20
1 sigma calibrated results: (68% probability)	cal BC 100 to cal AD 65



References:

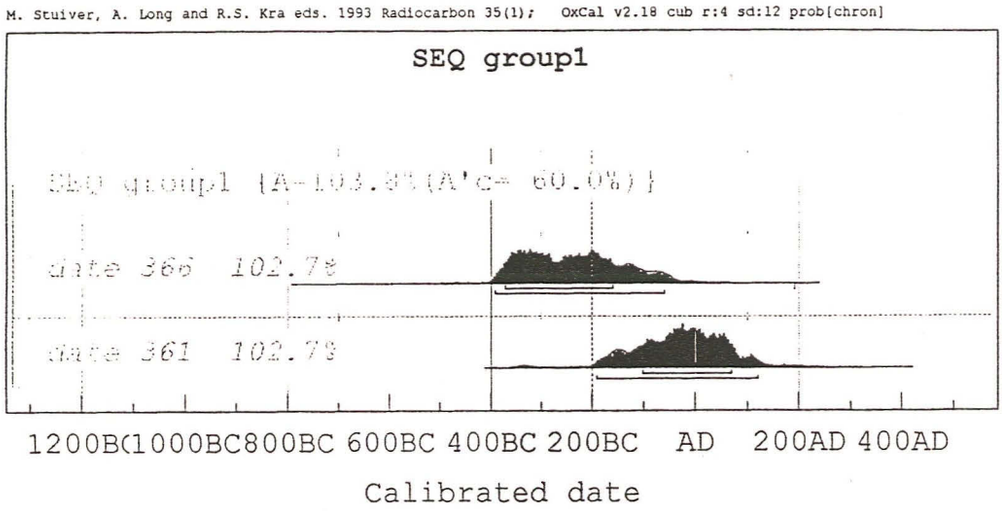
Pretoria Calibration Curve for Short Lived Samples
Vogel, J. C., Fuls, A., Visser, E. and Becker, B., 1993, Radiocarbon 35(1), p73-86

A Simplified Approach to Calibrating C14 Dates
Talma, A. S. and Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Calibration - 1993
Stuiver, M., Long, A., Kra, R. S. and Devine, J. M., 1993, Radiocarbon 35(1)

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 ■ Tel: (305)667-5167 ■ Fax: (305)663-0964 ■ E-mail: beta@radiocarbon.com



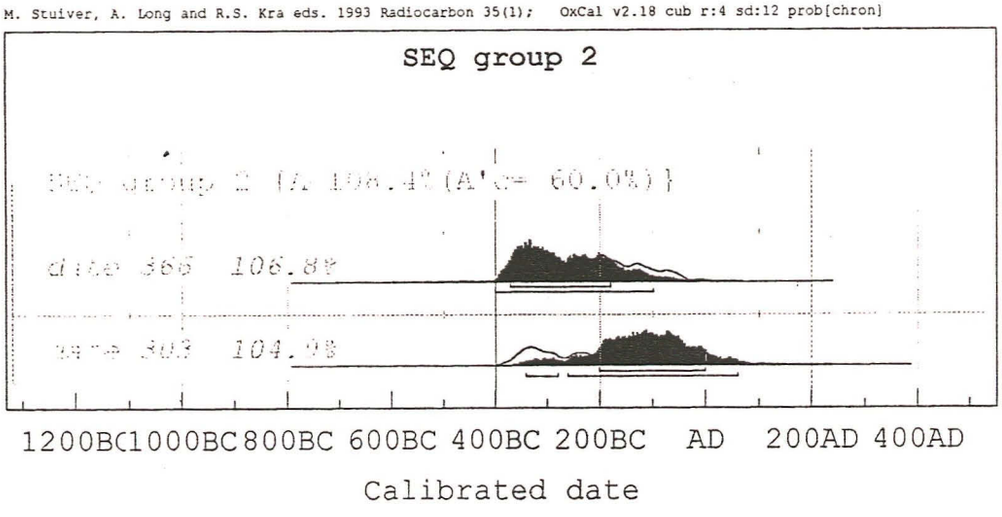


Figure 4.1: Distribution plot of the calibration using OxCal v2.18 on the samples from SWP96

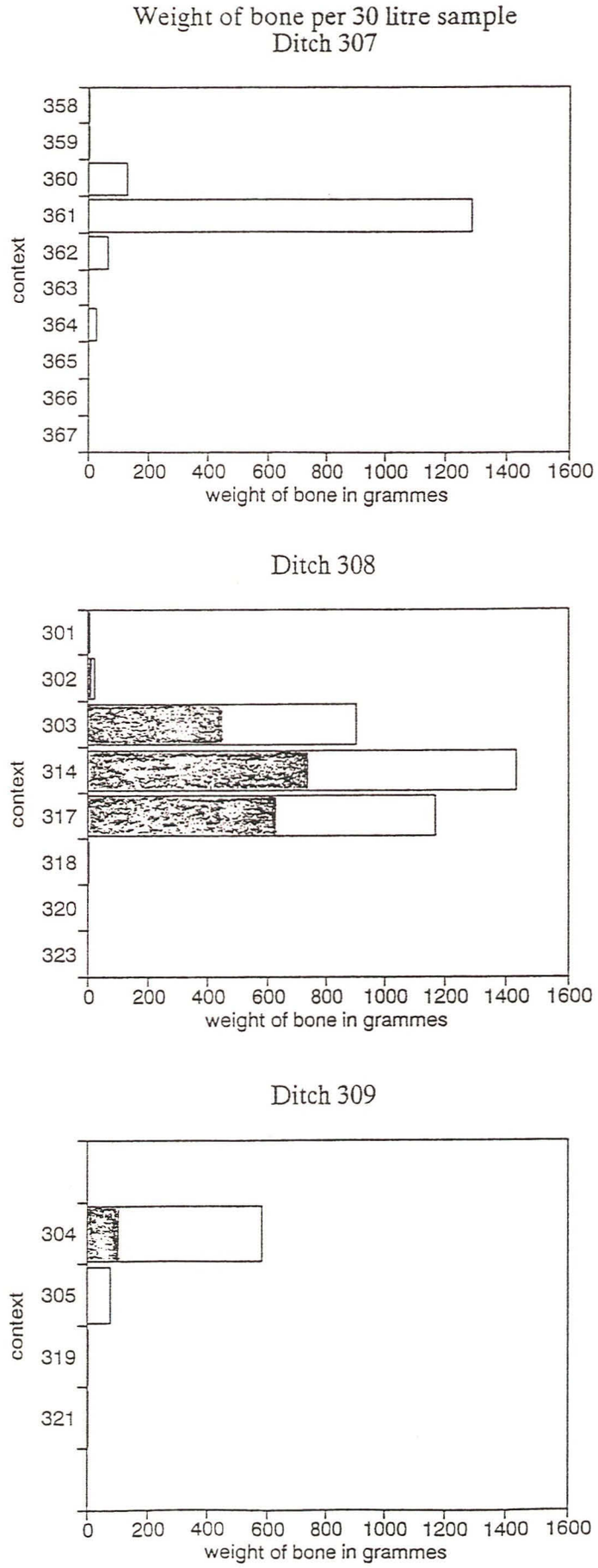


Figure 4.2: Histogram of the weight of animal bone per litre from the soil samples sieved over a 1mm mesh from the three Iron Age ditch sections. The filled portion of the histograms indicates the proportion of the material that was burnt or calcined.

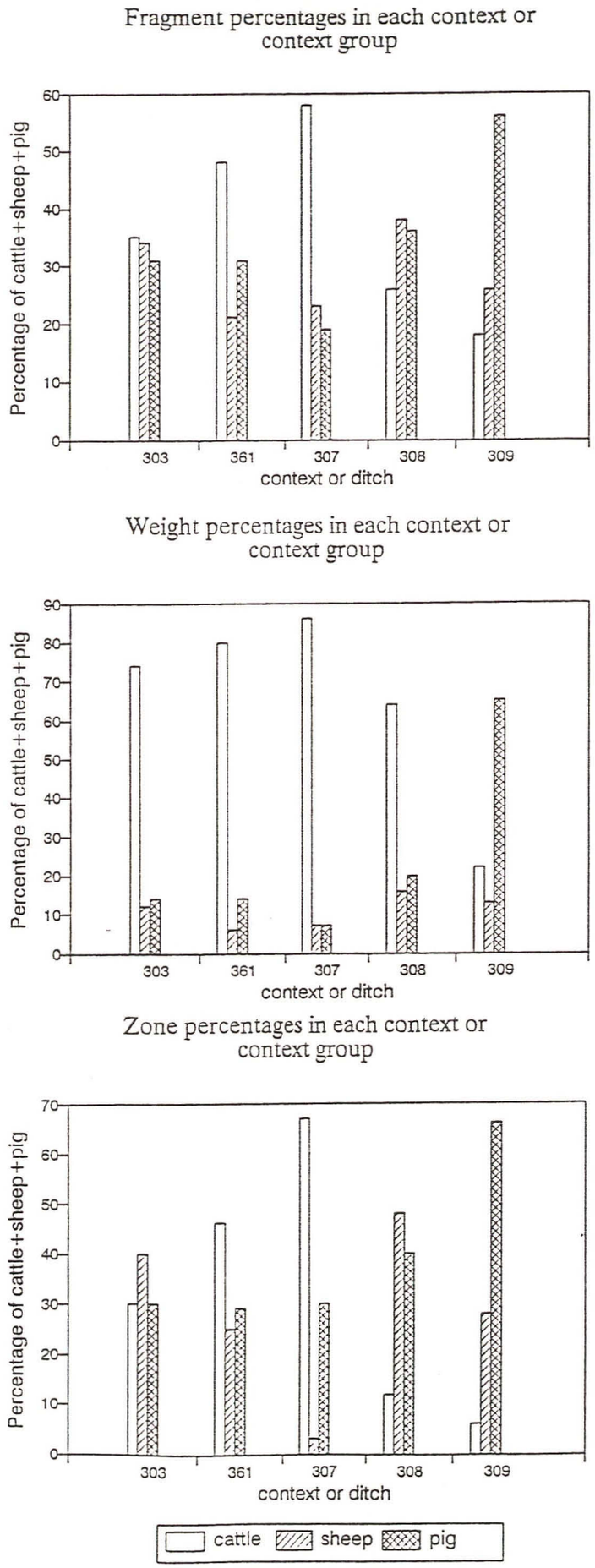


Figure 4.3: Histogram of the species proportions of identified cattle, sheep and pig bones from the bulk samples and soil samples from the three Iron Age ditch sections. a: Fragments; b: weight; c: zones. The first two groups on each histogram are the bulk samples from 303 and 361, and the last three the total collection from the soil samples from each ditch.

Table 1: Samples collected from SWP96

Sample no.	Context	Volume pro.lt	Weight kg	Context type	Processing	Date
1	109	20	21	deposit derived from furnace?	flotation	Roman
2	402	23	24	hearth material	flotation	Roman?
3	303	30	34	bone rich fill within cut 308	flotation	LIA
4	302	30	32	layer above 303 within cut 308	flotation	LIA
5	301	15	20	upper alluvial fill of 308	flotation	LIA
6	314	30	30	layer below 303 in cut 308	flotation	LIA
7	304	30	34	upper fill of cut 309	flotation	LIA
8	305	30	34	bone rich fill below 304 in cut 309	flotation	LIA
9	317	15	15	black fill below 314, cut 308	flotation	LIA
10	318	30	34	lower fill of cut 308	flotation	LIA
11	319	30	33	3rd fill below 305 in cut 309	flotation	LIA
12	320	30	35	lower fill within cut 308	flotation	M-LIA
13	323	10	11.5	primary fill of 308	flotation	M-LIA
14	321	30	30	fill below 305 in cut 309	flotation	LIA
15	327			sample of blue clay vein in natural clay	described	
16	303	100		bone rich fill of 308, bulk sample for bone extraction	wet-sieved	LIA
17	316			?alluvium, sample from easement section	described	
18	149			alluvium? from post-hole 148	described	
19	150			alluvium? from post-hole 148	described	
20	317	wood		burnt wood/plank from middle fill of cut 308	oak timber	LIA
21	337			upper, sandy material from beneath clay bank 335	described	
22	337			lower, sand just above natural	described	
23	356			upcast soil?	described	
24	357			possible buried soil?	described	
25	358	30	37	upper fill of ditch cut 307	flotation	LIA
26	359	30	34	fill below 358 in cut 307	flotation	LIA
27	360	30	31	fill below 359 in cut 307	flotation	LIA
28	361	30	29	bone rich fill below 360 in cut 307	flotation	LIA
29	361	100		bone rich fill, bulk sample for bone extraction	wet-sieved	LIA
30	362	30	30	fill below 361 in cut 307	flotation	LIA
31	363	30	32	fill below 361 in cut 307	flotation	LIA
32	364	30	36	fill below 361 and 363 in cut 307	flotation	LIA
33	365	30	36	fill below 364 in cut 307	flotation	M-LIA
34	366	20	22	fill below 365 in cut 307	flotation	M-LIA
35	367	4	5.5	primary fill of cut 307	flotation	M-LIA
36	368	wood		wood sample from middle fill of cut 307	not identified	LIA
37	365	wood		wood sample from lower fill of cut 307	not identified	LIA
38	306	3		upper fill of ditch terminal 307	flotation	LIA

Monolith sample 1 - upper fills (top metre) of 308	not studied
Monolith sample 2 - lower fills (bottom metre) of cut 308	not studied
Monolith sample 3 - fills (1 metre) of cut 307	not studied

Table 2: Summary results from the soil samples

Sample no.	Context	Volume pro.lt	Burnt clay g.	Pottery g.	Metal	Slag g.	Hammer-scale	Flint g.	Char-coal	Bone weight	Waterlogged plant	Eggshell	Molluscs
1	109	20	28	5	1	52		1	22	<1			
2	402	23	69		+		+		50	0			
Gully 309													
7	304	30	+	9	1				41	625	+	+	
8	305	30							3	86	+		+
11	319	30		<1			?		2	6			
14	321	30								4	*		
Ditch terminal 308													
5	301	15							3	5			
4	302	30	5	6					21	28	*		
3	303	30	353	30	1		?		+	950			
6	314	30	+	5	1	<1	?			1600			
9	317	15	7						+	616	*		
10	318	30					+		12	8	*		+
12	320	30					?		+	3	*	+	+
13	323	10							+	0	+		
Ditch section 307													
25	358	30		2		<1	+		3	8			
26	359	30					?		5	7			
27	360	30							7	138			
28	361	30					?		13	1350	*		
30	362	30							2	72			
31	363	30							+	1	+		+
32	364	30			+				+	32	*		+
33	365	30							+	<1	+		+
34	366	20								0	+		+
35	367	4								0	+		
Ditch terminal 307													
38	306	3	160						+	115			

Table 3: The Plant remains from Middle to Late Iron Age deposits

Species	Common name	Habitat	< FILLS - DITCH TERMINAL 308 >< FILLS - DITCH 307 >< DITCH FILLS > BURNT DEP (NOT DATED)											
		context	303	314	317	320	323	363	364	365	366	367	305	321	402
		sample no.	3	6	9	12	13	31	32	33	34	35	8	14	2
Charred remains															
Triticum sp.	wheat	FI													+
Hordeum sativum	barley	FI													+
cf. *Avena* sp.	oat	AFI													+
Cerealia	indet. cereal	FI													+
Corylus avellana L.	hazel	CF								+					
Galium sp.	bedstraw	ABCDE	+			+	+								
Bromus sp.	brome	ABD					+								
Gramineae indet.	-	ABCDEFHI											+	++	
indeterminate	-	-	+			++	+++			+++	++	++			+++
indeterminate	- wood fragments	-	++	++	++	+++	+++	+		+	++	++	++	+	+++
Waterlogged remains															
Ranunculus acris/repens/bulbosus	buttercups	ABCDEG									+				
Agrostemma githago L.	corn cockle	AB									+				
Stellaria media gp.	chickweeds	ABCDE					+++			++	++		+		
Chenopodium spp.	goosefoot etc.	ABCDFH	+				+								
Atriplex spp.	oraches	ABFGH					+								
Chenopodium/Atriplex spp.	goosefoots/oraches	ABFGH								+			+		
Rubus fruticosus/idaeus	blackberry/raspberry	CFGH				+++	+	+		++	+++				
Conium maculatum L.	hemlock	CEG					+++			+	+				
Umbelliferae indet.	-	-									+				
Polygonum aviculare agg.	knotgrass	ABG											+		
Rumex spp.	docks	ABCDEFG									+		+		
Urtica dioica L.	stinging nettle	BCDEFGH				++	+++			+	+++	+			
Betula pubescens Ehrh.	downy birch	CDH					+								
Corylus avellana L.	hazel	CF					+				++				
Quercus sp.	oak capsules, acorn bases						++++				++++	+			
Solanum nigrum L.	black nightshade	BF					+				+				
Ajuga reptans L.	bugle	CDE					+								
Labiatae indet.	-	-				+++				++	+++	+			
Galium sp.	bedstraw	ABCDE					+							+	+
Sambucus nigra L.	elder	BCFGH	+			+++		+++	++	+++	+	+			
Carduus/Cirsium spp.	thistles	ABDEG				+	++++			+	++				
Lapsana communis L.	nipplewort	BCF					+				++	+			
Sonchus asper (L.) Hill	spiny milk-/sow-thistle	AB									+				
Sonchus sp.	milk-/sow-thistle	ABE									+				
Lemna sp.	duckweed	E								++					
Carex sp.	sedge	CDEH	+								+				
Gramineae indet.	-	ABCDEFHI											+		
indeterminate	-	-			+		++		+	++	++	++			
indeterminate	- leaves	-					++				+++	+			
indeterminate	- buds	-					++				++				
indeterminate	- stems	-				+++	+++			+++	+++	+++	+	++	
indeterminate	- wood fragments	-					+++			++	+++	+++			

key: + = 1-10 items; ++ = 11-50 items; +++ = 50 + items.

A= arable weeds; B= wasteground weeds; C= plants of woods, scrub and hedgerows; D= grassland plants; E= plants of damp or marshy ground; F=edible wild plants; G=medicinal plants; H=wild plants with economic uses; I= cultivated plants

Table 4: Mollusc remains from the basal sequence of 307

context	363	364	365	366
Planorbis leucostoma	1	16	11	
Palnorbis crista		5		1
Lymnaea glabra			1	
Lymnaea truncatula			13	3
Succinea sp			2	
Succinea putris				1
Ashfordia granulata		2		1
Vitrea contracta			2	
Aegopinella nitidula			2	3
Aegopinella pura		2	1	
Oxychilus alliarus		8	12	1
Nesovitrea hammonis			3	
Carychium tridentata	9	75	26	
Discus rotundatus	2	24	22	1
Acanthinula aculeata		2	1	1
Clausilia bidentata	1	10	6	
Euconulus fulvus			2	
Cochlicopa cf lubricella	1		8	
Trichia hispida		10	12	2
Vallonia costata	1	28	22	

Table 5: Animal bone from the excavations at SWP96

Species	Hand excavated	Bulk sampled 8 mm sieve	Other soil samples 1mm sieve
Cattle	86	151	90
Cattle size	206	415	300
Sheep or goat	34	100	90
Sheep	4	2	5
Sheep size	54	125	174
Pig	37	114	107
Dog		2	8
Roe deer			1
Brown Hare			1
Field vole, *Microtus agrestis*			1
Water vole, *Arvicola terrestris*			2
Bank vole, *Clethrionomys glareolus*			1
Microtus sp.			6
Vole sp.			9
House mouse, *Mus musculus*			2
Wood mouse, *Apodemus sylvaticus*			1
Mouse sp.			21
Rodent sp.			29
Common shrew, *Sorex araneus*			3
Thrush family, Turdidae		1	1
Passerine, song bird indet.			2
Indeterminate bird			5
Snake, *cf Natrix natrix*			57
Frog or toad			19
Fish, indeterminate			1
Unidentified fragments	120	3958	9119

Table 6: Frequency of bone fragments for each species from different contexts in the ditches.

	<	Ditch 309			><		Ditch 308						><			Ditch 307				>
species name	304	305	319	321	301	302	303	314	317	318	320	323	358	359	360	361	362	363	364	366/367
cattle	35			1			91	21	9	1					1	120	2		2	
cattle size	97	3				3	192	72	16						16	378	6		1	
sheep or goat		21	1	1				84	35	15					1	4	42	1		
sheep	4						4	3												
sheep size	32			1			129	41	20							66	2			
pig	31	3				1	82	31	15		1			1	2	60	1			
dog						2									8					
roe deer							1													
brown hare									1											
field vole															1					
water vole							1											1		
bank vole			1																	
Microtus sp.						2		1								2			1	
vole sp.	1		1			1		1						1	1	3				
house mouse								1	1											
wood mouse							1													
mouse sp.	3	1				4	1	1		1				2	1	5	2			
rodent sp.	1			1		1	8	3	7	1				1	1	5				
common shrew	1							1								1				
thrush family								1	1											
passerine							2													
indeterminate bird							1	3								1				
snake sp.	2		9			3	19	3	4	1	13				1	2				
frog or toad	3	1					3	5	4	1								2		
fish						1														
unidentified	1271	256	62	50	32	157	4646	2374	1227	28		2	51	50	331	2315	206		16	4

Table 7: Frequency of the fragments of the major species in the collection for each recovery procedure

	Hand collected	Bulk sieved	Fine sieved
Cattle	53.4%	41.1%	30.8%
Sheep	26.6	27.8	32.5
Pig	23.0	31.1	36.6

Table 8: Frequency of major species in the bulk samples and soil samples

	Total no. fragments		Total no. zones		MAU		Weight g,	
Bulk samples								
	303	361	303	361	303	361	303	361
Cattle	69	82	41	53	5	4	796	1794
Sheep	67	35	56	29	4	1	132	144
Pig	62	52	42	33	2	2	155	303
Other Samples								
Ditch 307								
Cattle	33		27		3		658	
Sheep	13		1		1		52.5	
Pig	11		12		1		51.5	
Ditch 308								
Cattle	47		16		1		619.5	
Sheep	70		62		6		156	
Pig	65		52		3		195.5	
Ditch 309								
Cattle	10		3		1		39	
Sheep	14		14		1		22.5	
Pig	31		33		2		115	

Table 9: Element fragments for the main identification categories in the Iron Age ditches and the MAU (Minimum animal unit - Binford 1984)

bone name	BOS	CSZ	**CATTLE MAU**	OVCA	OVI	SSZ	**SHEEP MAU**	SUS	**PIG MAU**
horn core	10				2				
skull	19	65	**1**	18	3		**1**	32	**4**
maxilla	1								
maxillary teeth	10			6				10	
mandible	31	21	**5**	32			**9**	18	**6**
mandibular teeth	25			17				24	
tooth	17	2		12				13	
hyoid	1		**1**	1			**1**		
atlas	1		**1**	3	1		**1**	1	**1**
axis	4		**1**				**3**	1	**1**
cervical vert.	7		7		4				
thoracic vert		9		2		11		5	
lumbar vert.	2	24		1		7		1	
sacrum		1	**1**	2		2	**1**		
caudal vert.		2				2			
vertebra		17				11			
rib		271				172		4	
scapula	42	12	**12**	5		2	**2**	11	**5**
humerus	10	1	**5**	6		1	**5**	5	**4**
radius	22		**11**	11	1		**6**	6	**3**
ulna	27		**7**	12			**7**	5	**4**
carpals	11	2	**4**	12		1	**5**	10	**3**
metacarpus 3								5	**5**
metacarpus 4								4	**4**
metacarpus 5								2	**2**
metacarpus	1		**1**	4	3		**3**		
innominate	14	2	**4**	7	1	1	**4**	2	**2**
femur	15		**7**	13		1	**4**	6	**2**
patella							1	**1**	
tibia	24	2	**7**	24		2	**7**	12	**4**
fibula								4	**1**
astragalus	5		**4**	3			**3**	3	**3**
calcaneum	6		**4**	4			**3**	1	**1**
centroquartal	2		**1**	1			**1**	1	**1**
tarsals				1				5	
lateral malleolus	1		**1**	1			**1**		
metatarsus 3								3	**3**
metatarsus 4								1	**1**
metatarus 5								2	**2**
metatarsus	7		**4**					1	
metapodial	3			4				16	
phalanx 1	7		**1**	5		1	**1**	13	**1**
phalanx 2	2		**1**	5			**1**	18	**2**
phalanx 3	2		**1**	1			**1**	11	**1**
sesamoid	2			3		1			
long bone fragment		319				102			
unidentified		164				32			

BOS- cattle; CSZ- cattle size; OVCA- sheep or goat; OVI- sheep; SSZ- sheep size; SUS- pig.

APPENDIX 5

Report on the Metal-Working and Fired Clay

from the Scarle Watermain Pipeline SWP 96

by Jane Cowgill, January 1997

The slag and fired clay was recorded on standardisd recording sheets and analysed using the Microsoft Access database system. Most of the slag was collected by the field workers during excavation but this has been augmented by additional material, mostly fired clay, by finds from sample processing. The full catalogue is listed in Appendix 1.

The following quantities were recovered from the various excavated areas:

CONTEXTS	SLAG	FIRED CLAY	OTHER
100s	5884g	1196g	389g
200s		8g	
300s	9g	957g	28g
400s		66g*	

* includes 53g of probably natural iron-stained clay

The most interesting group is the smelting and smithing slags from context 109. These indicate that iron was being produced close to the excavated area in a tapped shaft furnace. It is not known when this technology was first used in this region, let alone in Britain, and although traditionally described as a Roman innovation Middle-Late Iron Age sites are known to exist. (Creeton Quarry in South Lincolnshire has a provisional Middle-Late Iron Age date.) The smelting slags recovered include ten pieces of furnace slag (slags that have cooled inside the furnace) which have large charcoal imprints indicating that mature trees were used to provide the fuel for the smelting. The presence of smithing slags indicate that the iron bloom was worked to a bar and possibly further worked to an object before being traded/exchanged.

The ratio of the different slags within the group is unusual; furnace slags form a far higher percentage in relation to the tapped slags than is normal. This may, the emphasis is on the may because we know so little about the subject and this is a small assemblage, indicate that this group represents an interim stage between untapped furnaces and tapped furnaces. A Middle Iron Age untapped iron smelting industry is well attested in a nearby region just to the north of the Humber (Halkon 1995).

Associated with the slag were six stones, three with rounded possibly polished surfaces. These could be hammerstones for crushing the roasted ore to prepare it for smelting.

The fired clay from all four excavated areas cannot be assigned to any particular type of structure or functional use. A few pieces from contexts 302 and 306 maybe from fragmented triangular loomweights but this is uncertain. The majority of the fired clay is oxidised. The character of the clays are not uniform but that maybe due to the variable nature of the local clays which were probably utilised as the source.

BIBLIOGRAPHY

Halkon Peter, 1995 Fieldwork on early ironworking sites in East Yorkshire, in Peter and Susan Crew (eds) *Iron for Archaeologists: A review of recent work on the archaeology of early ironworking sites in Europe*, Plas Tan y Bwlch Occasional Paper No 2, 17-20.

Cont	Material	Desc.	No.	Weight	Comments
12	SLAG	SLAG	4	92	CONTEXT 12C; IRON
12	SLAG	TAP	1	63	CONTEXT 12C
109	CLAY	FIRE	1	288	OXID; 1XCURVED SURFACE; 1XWATTLE IMPRESSIONS
109	CLAY	FIRE	1	29	OXID; SURFACE + FINGER IMPRINTS
109	CLAY	FIRE	1	139	OXID; ORGANIC TEMPER; L ANGLE; BRICK?
109	CLAY	FIRE	50	155	50+ PIECES; OXID; ORGANIC TEMPER
109	CLAY	FIRE	4	13	OXID
109	CLAY	FIRE	63	28	SAMPLE 1; OXID
109	CLAY	VHL	7	517	VIT CLAY
109	CLAY	VHL	1	2	SAMPLE 1
109	IRON		1	183	OBJECT?
109	SLAG	FURN	9	3847	X LGE CHARCOAL BLOCK INCLUSIONS
109	SLAG	FURN	1	4	SAMPLE 1; LGE CHARCOAL IMPRESSIONS
109	SLAG	HAMS	0	0	FEW PRESENT
109	SLAG	HB	1	442	+HL L:80; W:80; H:?75
109	SLAG	SLAG	4	51	SSL; PALE 'LEACHED'
109	SLAG	SLAG	10	131	SSL?
109	SLAG	SLAG	1	5	SAMPLE 1
109	SLAG	SLAG	1	94	?HB FRAG
109	SLAG	TAP	1	39	SAMPLE 1
109	SLAG	TAP	12	811	
109	SLAG	TAP	1	201	TAP?
109	STON		6	206	VIT/BURNT; 3XSMOOTH SURFACE ?PESTLE/HAMMER
110	CLAY	FIRE	1	5	OXID; ORGANIC TEMPER
110	SLAG	SLAG	1	98	VERY LEACHED; CREAM/GREY COLOUR
141	CLAY	FIRE	5	10	
155	CLAY	FIRE	2	8	OXID; WEDGED
163	CLAY	FIRE	6	2	CONTEXT 166/163
163	SLAG	SLAG	1	6	CONTEXT163/166; IRON
202	CLAY	FIRE	3	2	OXID; ORGANIC TEMPER
204	CLAY	FIRE	1	2	OXID
207	CLAY	FIRE	1	2	OXID; SANDY
211	CLAY	FIRE	2	2	OXID; WEDGED
300	CLAY	FIRE	3	52	OXID; WEDGED; LOOMWEIGHT?
302	CLAY	FIRE	5	4	SAMPLE 4
302	CLAY	FIRE	13	78	OXID; WEDGED; LOOMWEIGHT?; SMALL FIND 7
303	CLAY	FIRE	1	3	BRICK?
303	CLAY	FIRE	1	41	OXID; WEDGED
303	CLAY	FIRE	2	7	OXID; WEDGED?
303	SLAG	FAS	3	8	SAMPLE 16; 1X POSSIBLY CINDER
304	CLAY	FIRE	2	96	OXID; WEDGED
304	CLAY	FIRE	1	22	OXID; SANDY; ROLLED
306	CLAY	FIRE	3	52	OXID; SANDY
306	CLAY	FIRE	10	56	OXID; SANDY
306	CLAY	FIRE	7	116	OXID; WEDGED; LOOMWEIGHT?
306	CLAY	FIRE	7	101	OXID; WEDGED?; SANDY
312	CBM	TILE	1	8	MEDIEVAL PEG?
312	CLAY	FIRE	1	71	OXID; WEDGED
317	CLAY	FIRE	5	2	SAMPLE 9; BRICK?
318	SLAG	HAMS	0	0	SAMPLE 10; 1X SPHEROID
324	CLAY	FIRE	8	33	OXID; SANDY
325	CLAY	FIRE	1	41	OXID; WEDGED
328	POT		1	1	SAMPLE 25; VIT; LUTING?; VERYTHIN
328	SLAG	SLAG	1	1	SAMPLE 25
358	SLAG	HAMS	0	0	SAMPLE 25; 1X SPHEROID

Cont	Material	Desc.	No.	Weight	Comments
360	CLAY	FIRE	1	4	OXID
361	CBM	DAUB	1	19	POT?; OXID; ?SHELL TEMPER
361	CLAY	FIRE	1	5	OXID; SANDY
378	CLAY	FIRE	25	44	OXID; WEDGED
378	CLAY	FIRE	7	47	OXID; VERY SANDY
380	CLAY	FIRE	4	26	OXID; SANDY
380	CLAY	FIRE	16	56	OXID; WEDGED
402	CBM	DAUB	6	13	SAMPLE 2; 3X SURFACES; DAUB?
402	CLAY		26	53	SAMPLE 2; SANDY CLAY; PROBABLY NATURAL

APPENDIX 6

The Round Wooden Object from Harby, Notts

(*SWP 96*: Context 366)
by Maisie Taylor

Description

The plank, of oak (*Quercus* sp.) is cut from a very slow grown tree. There are possibly as many as eighty or ninety growth rings. It is the density of rings that makes them difficult to count without damaging the piece. The original log was split radially to produce thin planks. One plank has then been very finely worked, thinned on one side until it is almost parallel sided. One edge, (the one that was once nearest to the centre of the tree) has then been further thinned to make a kind of groove. The whole has then been shaped to a circle or near oval. The edge is smooth and very slightly rounded, either by careful finishing or by wear. There is some damage to the edge, with small pieces missing. This damage is quite regular around part of the edge and may represent weak spots, such as holes or notches, which have broken away.

Function

The most likely function of the piece is as the base of a vessel of some kind. There are three possible types of vessels which could have had a base such as this:

- a two-piece carved vessel
- a bentwood box
- a stave-built vessel

Two-piece carved vessels can be kegs, or buckets. They have the body carved out of one large log, and the base inserted into a carved groove near the bottom. *Bentwood boxes* are made by bending thin wooden sides around a thicker base. The sides are held in place by tiny dowels or stitching. *Stave-built vessels*, like the two-piece carved vessels, have the base inserted into a groove near the bottom. All these vessels could equally well have lids which would be very similar to the base, although sometimes of lighter construction.

Discussion

The fine quality of the wood, plus the shape and the careful finishing, suggest that the vessel was fairly small and of good quality, not a rough keg. The edge is not grooved all the way round, which is common in stave-built vessels. There are very few early stave-built vessels to compare with, however. It is possible that the groove along one side is to aid insertion of the base into a vessel, and might suggest that it is the base for a two-piece carved vessel. Once again, however, there are few early examples for comparison. The breakage of the edge could have been caused, or at least affected, by stitching or small dowel holes. This leaves us with the possibility that the edge was broken during manufacture, leading to its being discarded. A further possibility is that the piece is a lid. It is, after all, very finely made

and fairly thin. The fastening and unfastening of the lid might account for the damage on the edges.

Without the rest of the vessel it is rather difficult to be certain of the exact type of vessel that we are looking at, but whichever it is, the early date makes it of great interest.

Since this report was written in 1996, three further wood fragments thought to have broken from the object during excavation have been retrieved during sieving of soil which came from beside the findspot. The object and fragments are currently being prepared for freeze-drying. After conservation it may be possible to examine the object in further detail. - G. Tann March 1997]

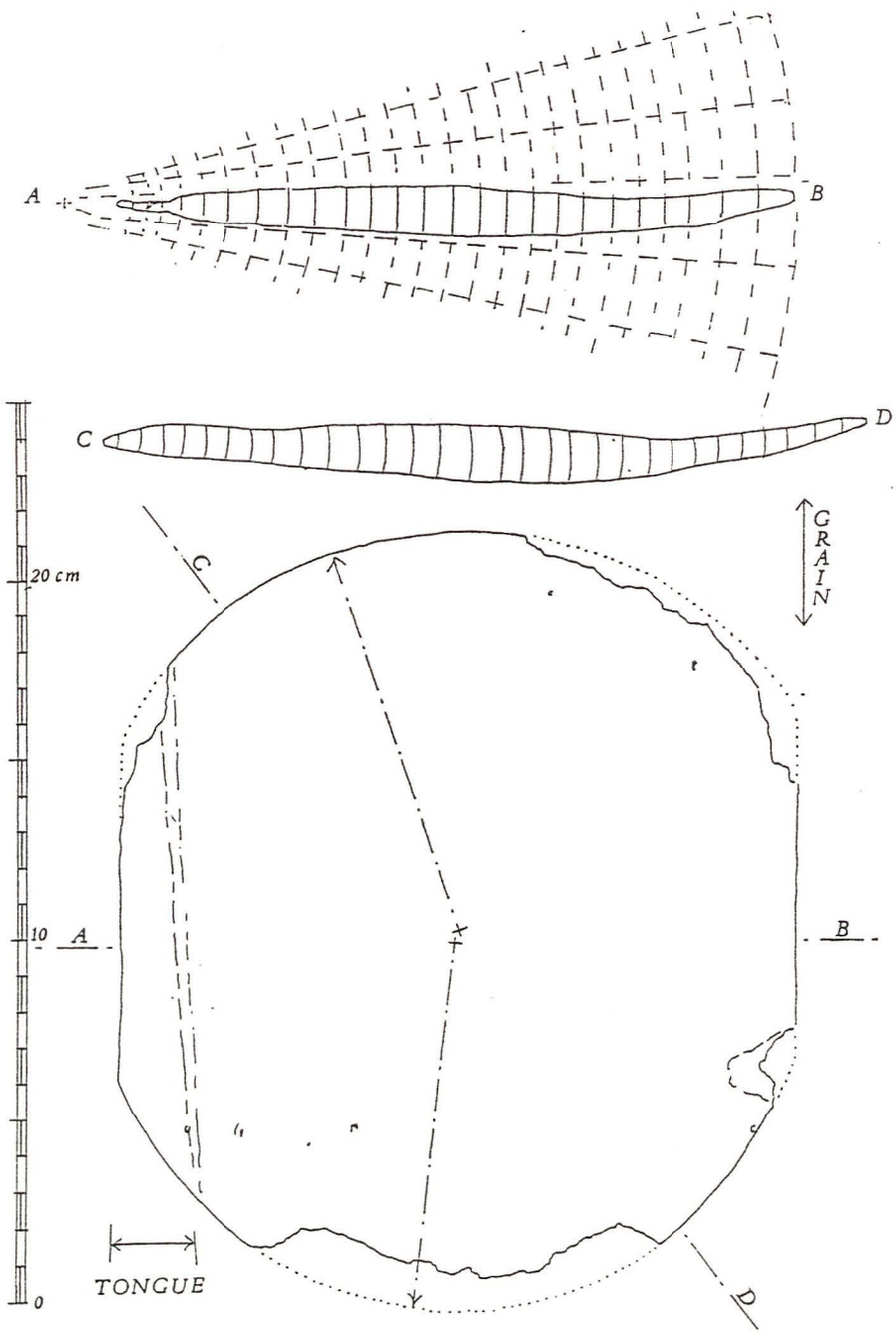


Fig. 6.1 Plan of wooden object from context 366. Cross-sections A-B & C-D show how the object was cut from the tree as a radially split plank, with schematic representation of the wood grain (M. Clark)

APPENDIX 7

Report on the Registered Finds (Metal, Antler and Fired Clay)

from the Scarle Watermain Pipeline SWP 96

This report is based on identifications and comments made by Jen Mann (City of Lincoln Archaeology Unit) in March 1997. Each registered find was allocated a Small Find number when recorded and these numbers are used in this report. Finds 1 and 8-10 (the wooden base from Context 366 described in Appendix 6, and wood fragments found near it) and Find 7 (fired clay) were not available for inspection.

The iron finds from the Iron Age ditches and gully are particularly interesting as examples of metal items used on those sites, possibly even manufactured locally.

Find 2: Red deer antler tine fragment from Context 304 (Ditch 309), presumably a handle for a small tool. This had been sawn from the shaft and perforated longitudinally to form a socket. Two transverse perforations had been drilled through opposing faces near the base, and there is a shallow depression on each side of the perforation on the outer face of the tine. The tip has been broken at a point where the outer face of the tine bears two facets. Length 84mm.

Find 3: Two iron wire fragments from Context 103 (Plough furrow 102). Originally part of same piece. Wire comprised of three strands, two twisted together and third wound around both.

Find 4: Thin iron strip fragment from Context 109 (Iron Age gully). Rectangular-sectioned strip, tapering towards one end with the ends folded in and overlapped. 29mm x 9mm.

Find 5: Fragments of fired clay from Field 18A. Possibly from daub or even part of a mould; a slight trace of hammerscale may indicate a hearth lining. 190g.

Find 6: Fragments of fired clay with a slight trace of hammerscale from Field 32A. Almost certainly from a hearth lining. 383g.

Find 11: Two joining fragments of hollow iron object from Iron Age gully 109. 36mm.

Find 12: Fragment of rectangular iron sheet from Context 314 (Ditch 308). Perforated off-centre, possibly part of a mount or binding. 45mm x 25mm.

Find 13: Fragment of tapering iron strip from Context 303 (Ditch 308). Possibly a bent staple.

Find 14: Fragment of very corroded iron from Context 304 (Ditch 309).

Find 15: Small copper alloy nail from Context 314 (Ditch 308). Possibly a rivet.

Find 16: Small fragment of iron from Context 404 (Hearth). Possibly a hobnail.

Find 17: Fragment of iron from Context 109 (Iron Age gully).

Find 18: Head and part of shaft of iron nail from Field 12B.

ANGLIAN WATER SCARLE SUPPLY ZONE REINFORCEMENT SCHEME

SWP96

Registered Finds

Context	Finds No	Material	Object	Comments
366	1	WOOD	VESS	BASE
304	2	ANTL	-	PERF SOCK
103	3	IRON	WIRE	X2 3PLY CF SAMP SLAG
103	3	SAMP	SLAG	SSL 20.5 GM CF IRON WIRE
109	4	IRON	-	STRIP
18A	5	CERA	-	X12 + HAMS? HEAR?
32A	6	CERA	HEAR	X70 + HAMS?
302	7	CERA	-	X14
366	8	WOOD	-	PART RF 1
366	9	WOOD	-	PART RF 1
366	10	WOOD	-	PART RF 1
109	11	IRON	-	X2 (= 1)
314	12	IRON	-	PERF SHEET MOUN/BIND?
303	13	IRON	-	STAP?
304	14	IRON	-	-
314	15	COPP	NAIL	RIVE?
402	16	IRON	-	HOB?
109	17	IRON	-	-
12B	18	IRON	NAIL	-

APPENDIX 8

ENGINEERING ARCHAEOLOGICAL SERVICES LTD

WORKED FLINTS FROM SCARLE WATER PIPELINE 1996

July 1996

REPORT FOR
LINDSEY ARCHAEOLOGICAL SERVICES

I.P. Brooks

Unit 2, Glanypwll Enterprise Workshops,
Ffordd Tanygrisiau, Blaenau Ffestiniog,
Gwynedd, LL41 3NW

Registered in England No. 2869678

WORKED FLINTS FROM SCARLE WATER PIPELINE 1996

Eleven flint artefacts were recovered from this project. Unfortunately they were spread over approximately 7 km and can not be regarded as a consistent assemblage. They will therefore be described separately.

The flakes were separated into three main groupings. Primary flakes with a completely corticated dorsal surface, secondary flakes with partially corticated dorsal surface and tertiary flake with an uncorticated dorsal surface. The classification of the cores followed Clark *et al* (1960), the description of the tools follows that of Inizan *et al* (1992) and the flint colours are defined by the Geological Society of America's Rock-Color Chart (Goddard *et al* 1948)

Lincolnshire is a flint rich area with a range of potential sources which could have been exploited in the past (Brooks 1989, 55-59). The chalk of the Lincolnshire Wolds contains considerable flint resources in the form of both tabular and nodular bands (Wood and Smith 1978). These are generally of poor quality, being opaque, grey and faulted. There are, however, a series of derived flint deposits in the form of tills, gravels and beach deposits. The flint in these is often of a superior quality and is the preferred source of flint for much of the flint assemblages in Lincolnshire.

12B Multi-platformed bladelet core of Clark type U with at least five platforms being exploited. The flint is a semi-translucent dusky yellowish brown (10 YR 2/2) flint of probable till source. Probable Late Mesolithic type. 26 x 26 x 22 mm 10 g

19C Proximal tertiary flake 28 x 20 x 4 mm in a moderate brown (5 YR 4/4) semi-translucent flint of derived type (either gravel or till). The platform has been deliberately reduced to a rounded point to aid in knapping.

20B Fragment of worked flint, possibly the central section of a broken flake 22 x 34 x 9 mm. The flint is an opaque dusky brown (5 YR 2/2) of derived type.

23A Secondary blade 48 x 18 x 5 mm in a semi-translucent dark yellowish brown (10 YR 4/2) flint with a worn cortex. The left hand side of the artefact has been modified by a series of abrupt scalar removals to reduce the width of the blade to 9 mm for the proximal 22 mm. The distal end of the tool is heavily damaged, possibly through use. The retouch was probably designed to enable easy hafting of this artefact. A tentative Neolithic date could be assigned to this tool. (Fig. 1.1)

31B A tertiary blade 56 x 16 x 6 mm patinated to dense grey colour. It is not, therefore possible to determine the flint type and source for the raw material used in this blade. A tentative Neolithic date could be assigned to this artefact.

31C A worked lump 35 x 29 x 17 mm with at least five flake removals up to 33 mm long. The block has been slightly heated, sufficient to cause some discolouration and crazing, but insufficient to cause the grey colour and gross crazing of truly burnt flint.

A distal tertiary flake 24 x 12 x 3 mm totally patinated to a dense orangey cream colour.

31E A secondary flake 36 x 21 x 10 mm. The flake has been slightly heated, sufficient to cause some discolouration and crazing, but insufficient to cause the grey colour and gross crazing of truly burnt flint.

35A A secondary flake 29 x 26 x 12 mm in a semi-translucent dark yellowish brown (10 YR 3/2) flint with a worn cortex. The edge damage along the right and distal edges of the artefact is assumed to be post-depositional

42A An end scraper on a secondary flake 45 x 22 x 4 mm. The distal end of this tool has a series of short, abrupt scalar removal producing the working edge. This edge has also been slightly damaged either in use or by post-depositional processes. The tool is on translucent moderate brown (5 YR 3/4) flint of probable till source. A tentative Neolithic date has been assigned to this tool. (Fig. 1.2)

306 A burnt core fragment 35 x 31 x 16 mm (10 g). Originally this was a small flake core with removal around a single platform Clark type A2.

REFERENCES

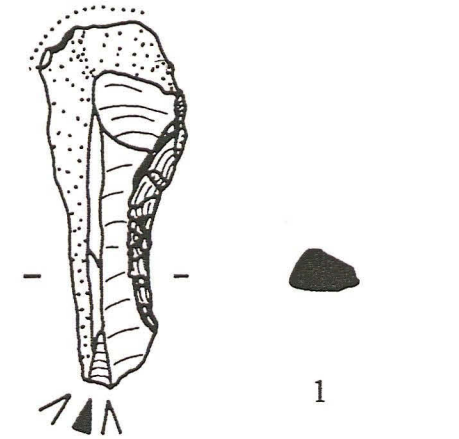
Brooks, I.P. (1989) Debugging the System: the Characterisation of Flint by Micropalaeontology. in Brooks, I.P. and Phillips, P. (eds.) *Breaking the Stony Silence. Papers from the Sheffield Lithics Conference 1988.* BAR 213, 53-72

Clark, J.D.G., Higgs, E.S. and Longworth I.H. (1960) Excavations at the Neolithic Site at Hurst Fen, Mildenhall, Suffolk, 1954, 1957 and 1958. *Proceedings of the Prehistoric Society* 26, 202-245.

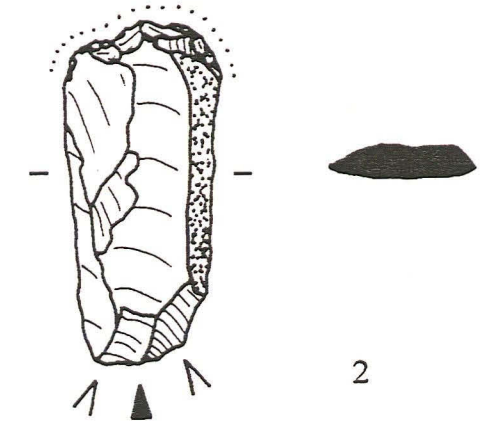
Goddard, E.N., Trask, P.D., De Ford, R.K, Rove, O.N., Singewald, J.T. and Overbeck R.M. (1948) *Rock-Color Chart.* Geological Society of America, Boulder, Colorado, USA

Inizan, M.-L., Roche, H. and Tixier, J. (1992) *Technology of Knapped Stone.* Meudon: C.R.E.P., Paris

Wood, C.J. and Smith, E.G. (1978) Lithostratigraphical Classification of the Chalk in North Yorkshire, Humberside and Lincolnshire. *Proceedings of the Yorkshire Geological Society* 42, 2: 268-287.



1



2

Figure 1

REPORT ON THE ROMAN POTTERY FROM SCARLE WATER PIPE, SWP96.

for LINDSEY ARCHAEOLOGICAL SERVICES

MARGARET J DARLING, MPhil, FSA, MIFA, 26 June 1996

QUANTITY: 8 sherds only from seven contexts, weight 270g.

All the pottery except two (23C and 31C) from contexts also containing post-Roman pottery. The two grey bodysherds from the ?Roman contexts cannot be closely dated. The only sherd giving any indication of date is the wide-mouthed bowl/cooking vessel from 32B. This is a Trent Valley fabric and type, which would appear to start in the 1st century, but almost certainly continues into the 2nd century. The best that can be said is that the group would fit into a 2nd century context; there are no sherds that need necessarily be later.

Database:

Fields: Context, Fabric, Form, Decor/Surface, Vessels, Draw?, Details, Sherds, grams

Cxt	Fab	Fm	Dec	Ves	D?	Details	Sherds	wt
12D	OX	CLSD?	-	-	-	BASE FR;GRYCORE;LT RB SURF;THINNISH	1	7
19A	GREY?	CLSD?	-	-	-	BASE;REDDISH COLOUR	1	14
20A	GREY?	CLSD?	-	-	-	BS;REDDISH COLOUR	1	11
23C	GREY	-	-	-	-	ABR BS	1	9
31C	GREY	-	-	-	-	ABR BS	1	10
32B	GREY	BWM/CP	-	-	D	RIM/SHLDR TRENT V TYPE	1	175
32B	GREY?	-	-	-	-	ABR BS;TEMPER LOSS HOLES	1	35
38A	OX	-	-	-	-	BS GRYCORE;RB SRF; LOST TEMPER	1	9

Archive List of Post-Roman Pottery

from the Scarle Watermain Pipeline SWP 96

by Jane Young

Context	Ware	Sherds	Form	Comments
6A	MED	2	-	SV; NO SURFS
6A	NOTG	1	-	?ID; NO SURFS
7A	MARTII	1	COSTREL	?ID (NEAR STONEWARE)
8A	NOTG	1	JUG	-
12A	MED	1	JUG	NO EXT SURF; ?ID
12A	MED	1	JUG	WAS A STRAP HANDLE
12D	MED	2	?	SV
12D	NOTG	1	JUG	?ID
12D	R	1	-	-
15A	LERTH	1	-	NO SURFS
15A	MED	1	JAR/BOWL	RIM
15A	MISC	1	?	NO EXT SURF; REDUCED; ?DATE
19A	MED	1	-	BASE
19A	MED	1	-	NO SURFS
19A	MED	1	-	NO SURFS
19A	MED	1	-	SCRAP
19A	R	1	-	-
20A	MISC	1	-	FINE; NO SURFS; ?PMED
20A	NOTG	1	JUG	REDUCED
20A	R	1	-	-
20C	MISC	1	?	REDUCED; ?DATE
21A	MED	1	JAR	BASE
21A	MISC	1	-	?TILE
21B	MED	1	JUG	STRAP HANDLE
23C	R	1	-	-
25A	MISC	1	-	?ID; COULD BE NOTG; SURFS WORN AWAY
31C	R	1	-	-
32B	MED	1	-	INT GLZE; ?HUMB
32B	R	2	-	-
32C	NOTG	1	JUG	SPL GLZE?
35A	HUM	1	JUG	?ID; VERY WORN
35A	MED	1	JAR	RIM
35A	MISC	1	?	NO SURFS
35A	NOTG	1	BOWL	RIM; NO SURFS
35B	MED	1	-	SCRAP
38A	HUM	4	JUG	SV
38A	R	1	-	-
38C	LMLOC	1	JUG	BS
38C	MISC	1	?	OXID; LOCAL; ?DATE
39A	STSL	1	DISH	FEATHER DEC
40A	MED	1	-	-
40B	BERTH	1	BOWL	RIM
40B	BERTH	2	BOWL	RIM
40B	LSW	3	JUG	?ID; BURNT
40B	MISC	1	?	FINE; REDUCED; ?DATE
40B	MISC	1	?	QTZ + SHELL; OXID
42A	MISC	1	-	OXID; FINE; FRAG; NO SURFS
42A	MISC	1	-	PROB NOTG; NO SURFS

42A	NOTG	1	JUG	-
43A	BL	1	JUG/JAR	17/18THC.
43A	MISC	1	?	OXID; THU BASE
43B	LMLOC	1	DRINKJUG	RIM; NO SURFS
43B	MISC	1	-	GREY FABRIC; ?DATE

	6A	7A	8A	12A	12D	15A	19A	20A	20C	21A	21B	23C	25A	31C	32B	32C	35A	35B	38A	38C	39A	40A	40B	42A	43A	43B	Total
R	.	.	.	.	1	.	1	1	.	.	.	1	.	1	2	.	.	.	1	.	.	.	.	.	.	.	8
MED	2	.	.	2	2	1	4	.	.	1	1	.	.	.	1	.	1	1	.	.	.	1	.	.	.	.	17
NOTG	1	.	1	.	1	.	.	1	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	1	.	.	7
LSW	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	3
HUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	4	.	.	.	.	.	.	.	5
MARTII	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
LERTH	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
BERTH	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	3
STSL	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1
BL	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1
LMLOC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	2
MISC	.	.	.	.	1	.	1	1	1	.	.	1	.	.	.	.	1	.	.	1	.	.	2	2	1	1	13
Total	3	1	1	2	4	3	5	3	1	2	1	1	1	1	3	1	4	1	5	2	1	1	8	3	2	2	62

Med	Medieval wares: early 13th - late 15th centuries
Notg	Nottingham green-glazed ware: early 13th-late 14th centuries
Martii	Martincamp ware type 2: early 16th- early 17th centuries
R	Roman
Lerth	late earthenwares: mid 18th/20th centuries
Misc	undated wares
Hum	Humber ware: mid 14th/late 16th centuries
Lmloc	Late medieval local fabrics: late 14th - mid 16th centuries
Stsl	Staffordshire slipware: mid 17th - mid 18th centuries
Berth	Brown earthenwares: mid 16th/early 19th centuries
Lsw	undated Lincoln fabrics: late 9th - late 15th centuries
Bl	Blackware: mid 16th - modern

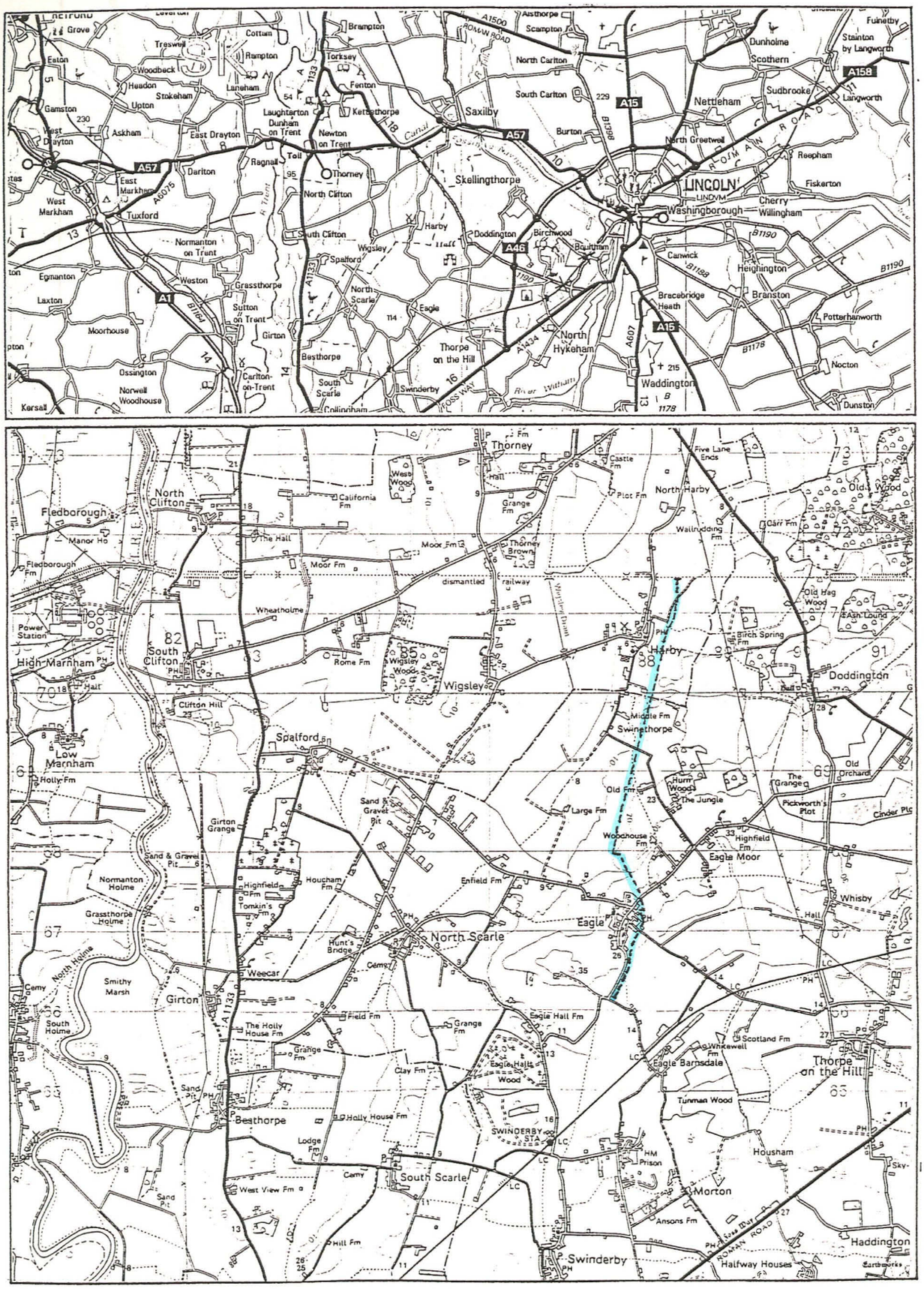


Fig. 1 Location of Harby and Eagle (based on the 1989 Ordnance Survey 1:50,000 Landranger Sheet 121; Crown Copyright, reproduced at reduced scale with permission of the Controller of HMSO. LAS Licence No. AL 50424A).

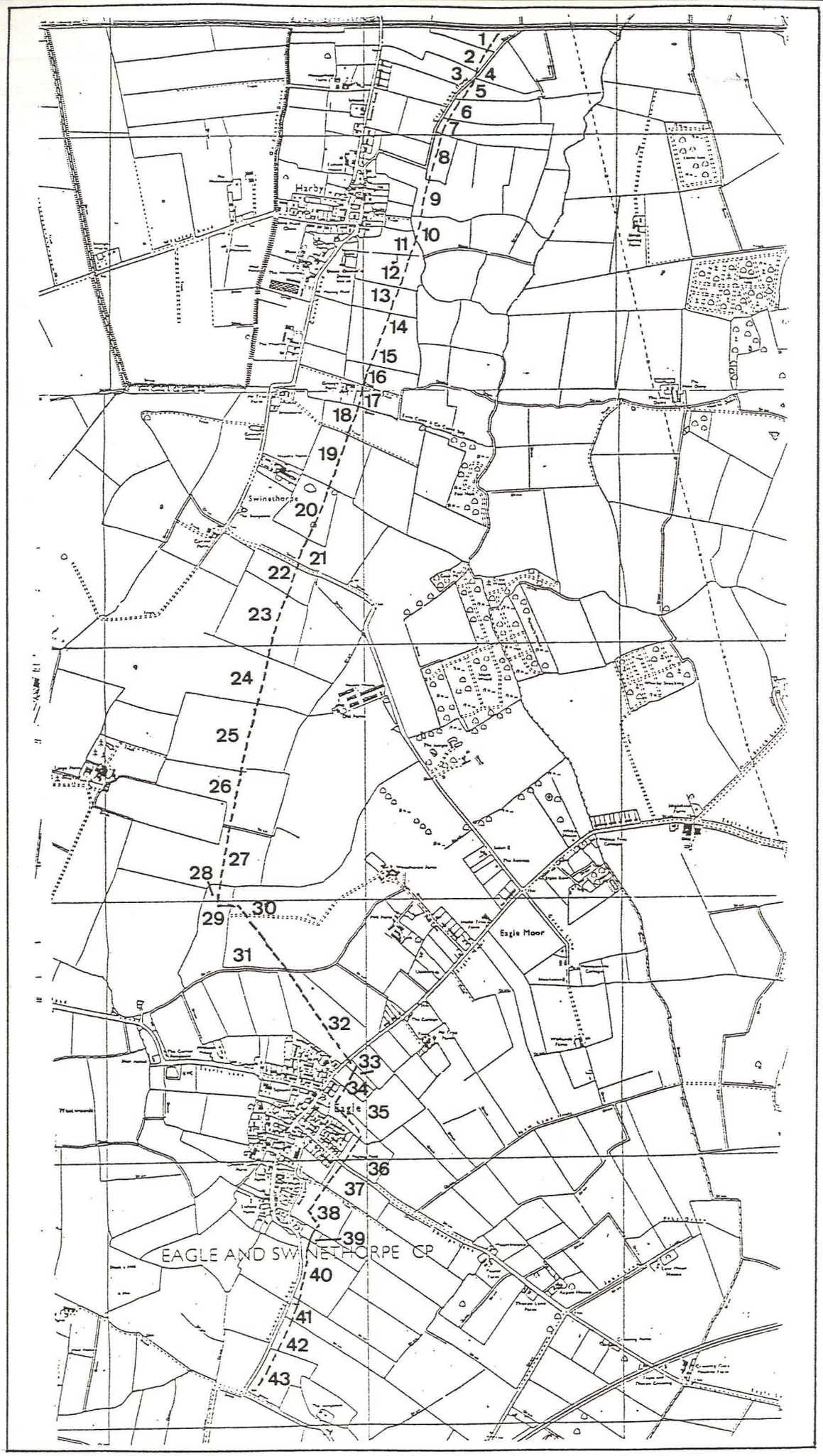


Fig. 2 The Pipeline Route and Field Numbers (based on the Ordnance Survey 1:10,000 map; Crown Copyright, reproduced at reduced scale with permission of the Controller of HMSO. LAS Licence No. AL 50424A).

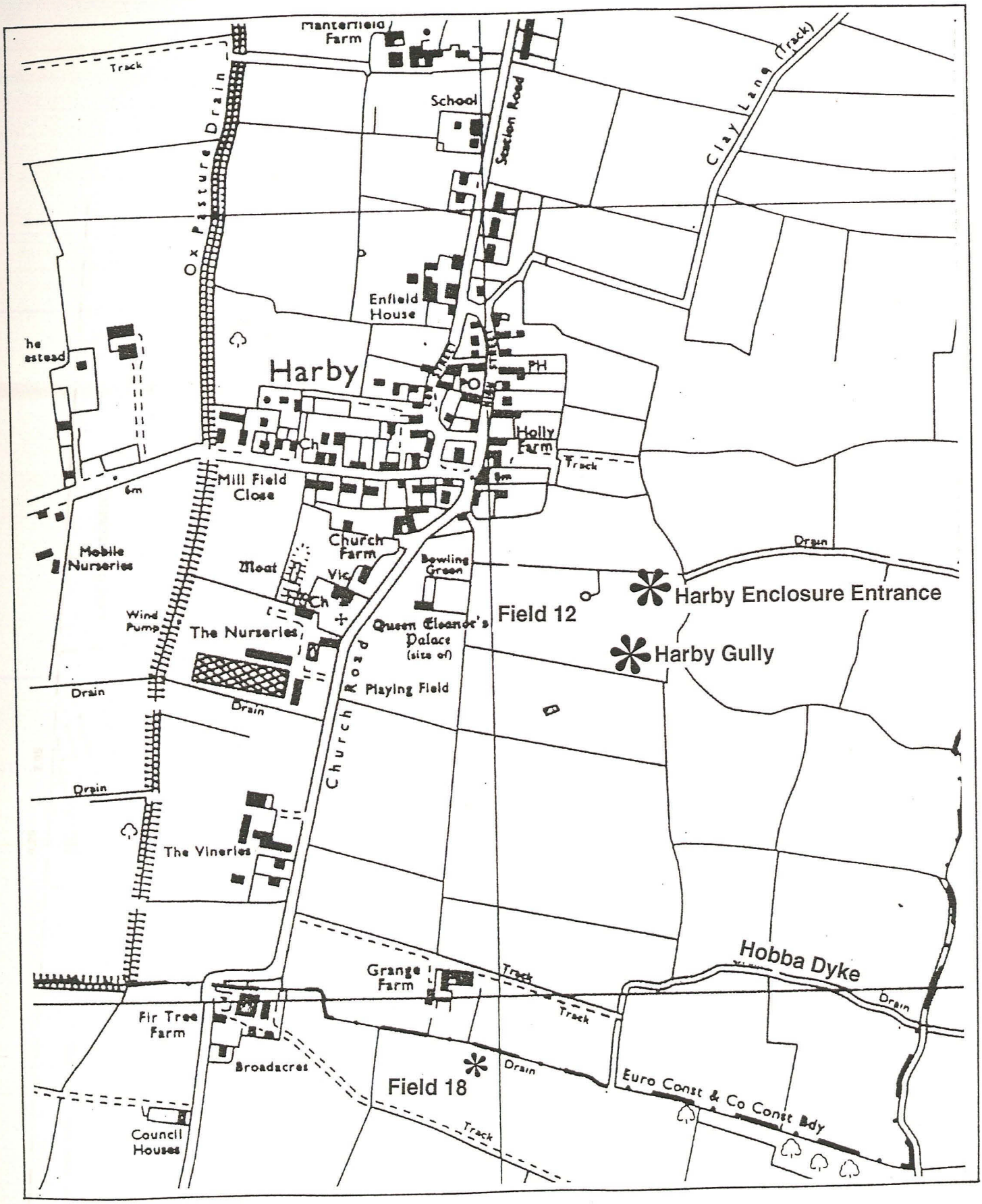


Fig. 3 Location of Excavated Features in Field 12 (based on the Ordnance Survey 1:10,000 map; Crown Copyright, reproduced with permission of HMSO. LAS Licence No. AL 50424A).

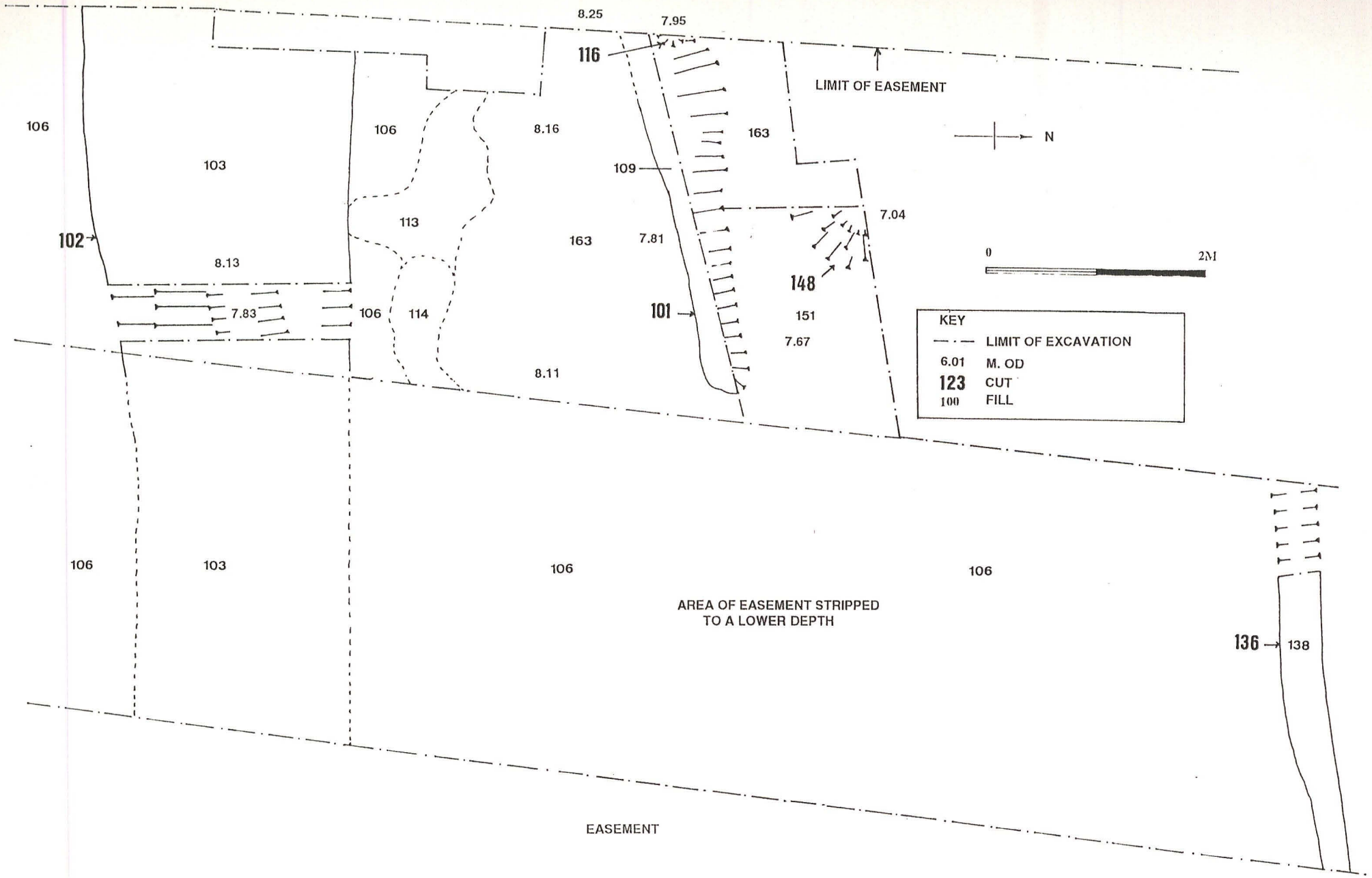


Fig. 4 Plan of Iron Age gullies 101 and 136 (McDaid)

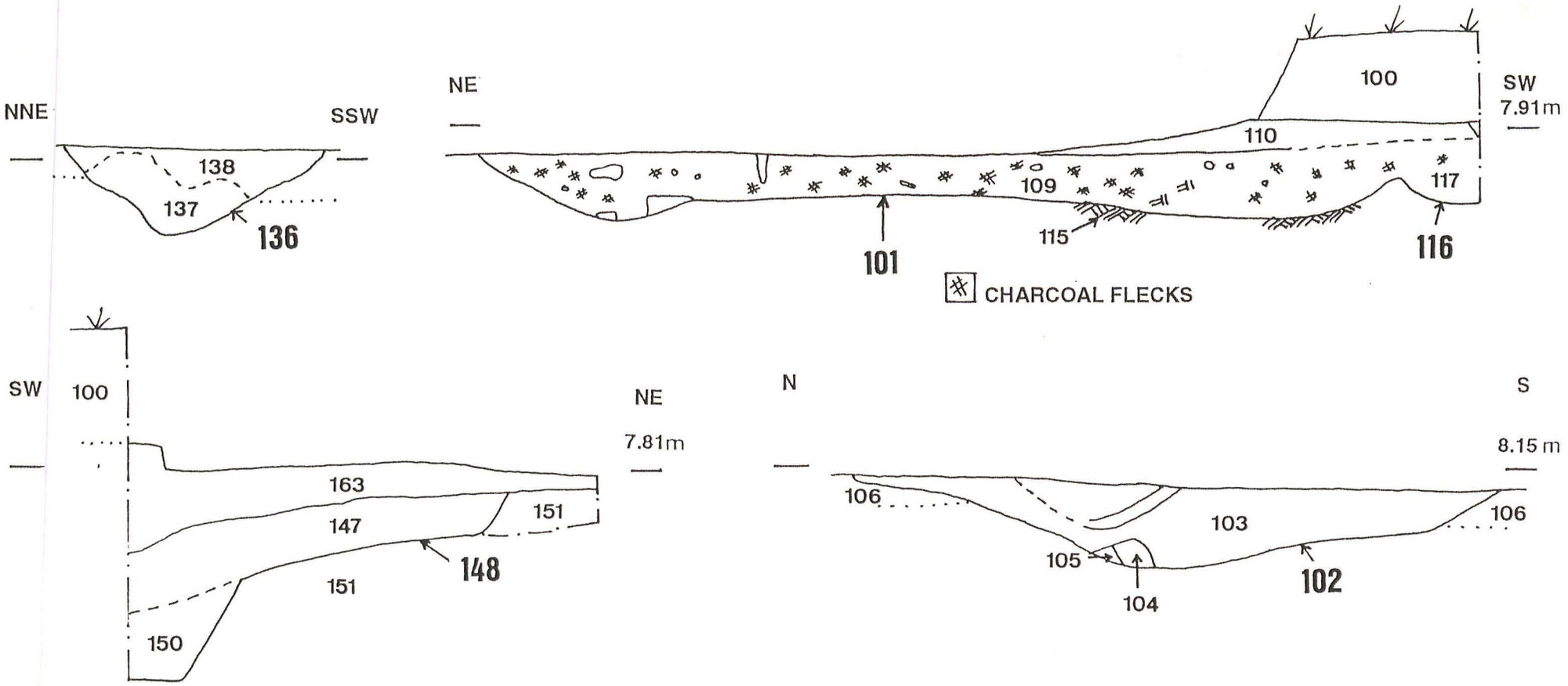


Fig. 5 Sections of features near 101 (McDaid)

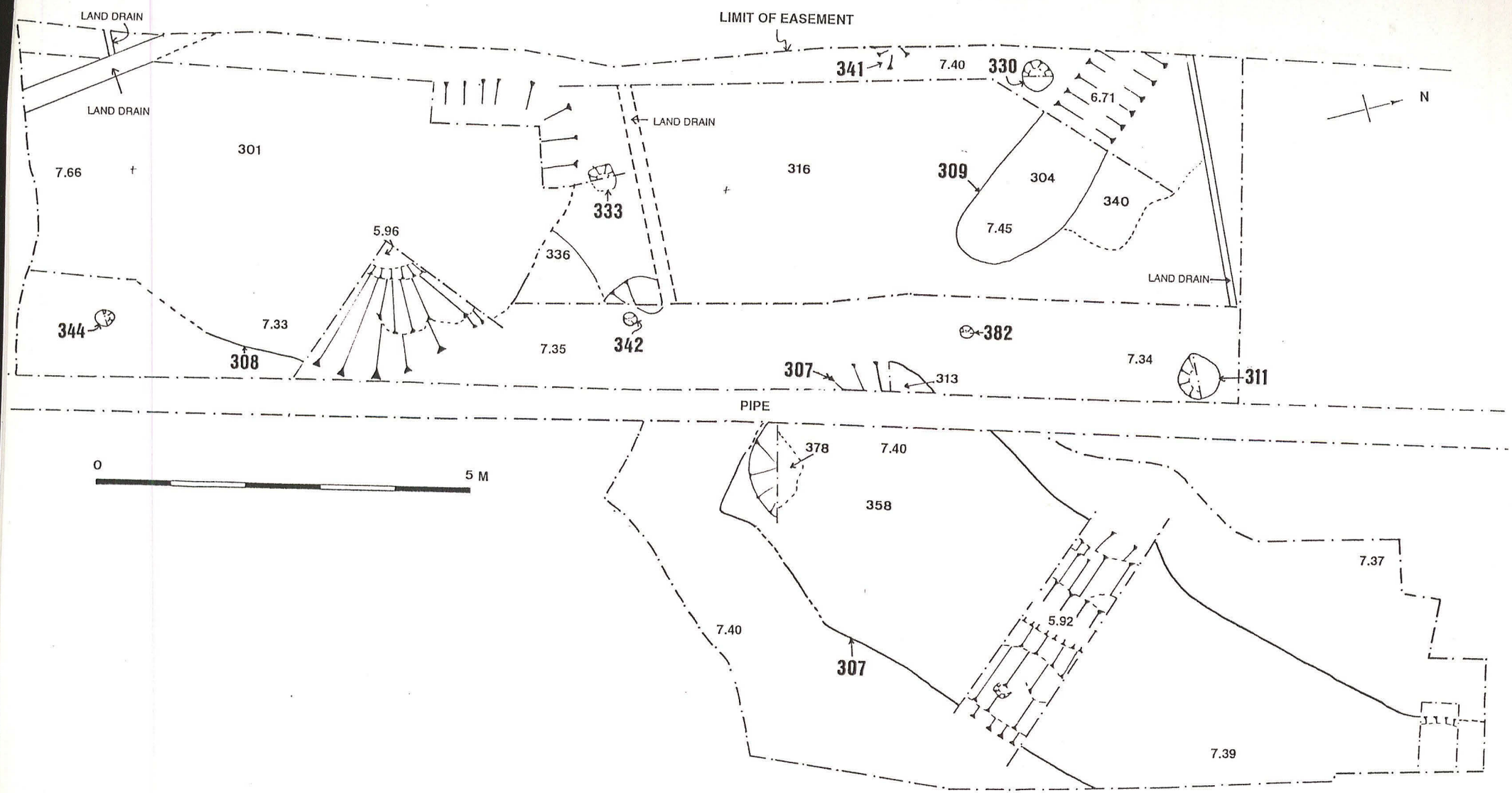


Fig. 6 Plan of the Harby Iron Age enclosure entrance (McDaid)

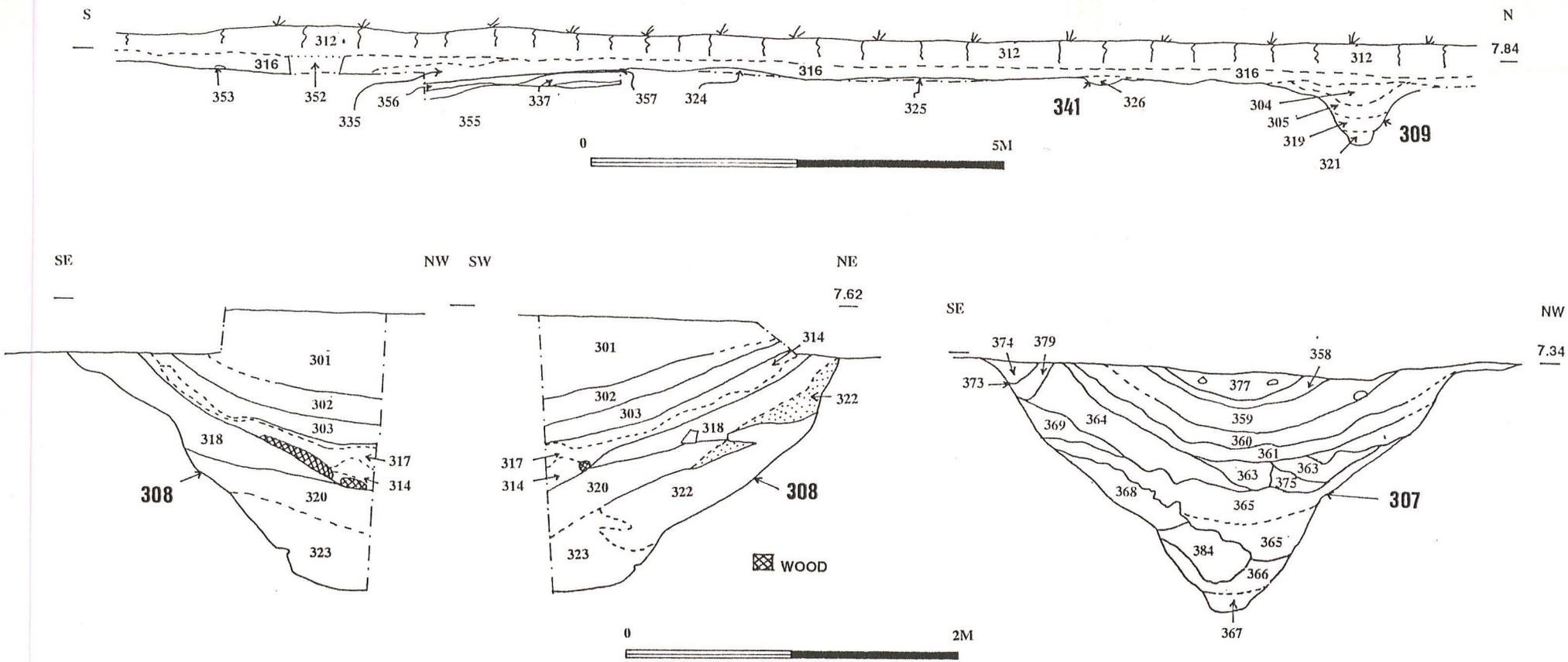


Fig. 7 Sections of Features at the Harby Iron Age enclosure entrance (McDaid, after Livesey and Otter)

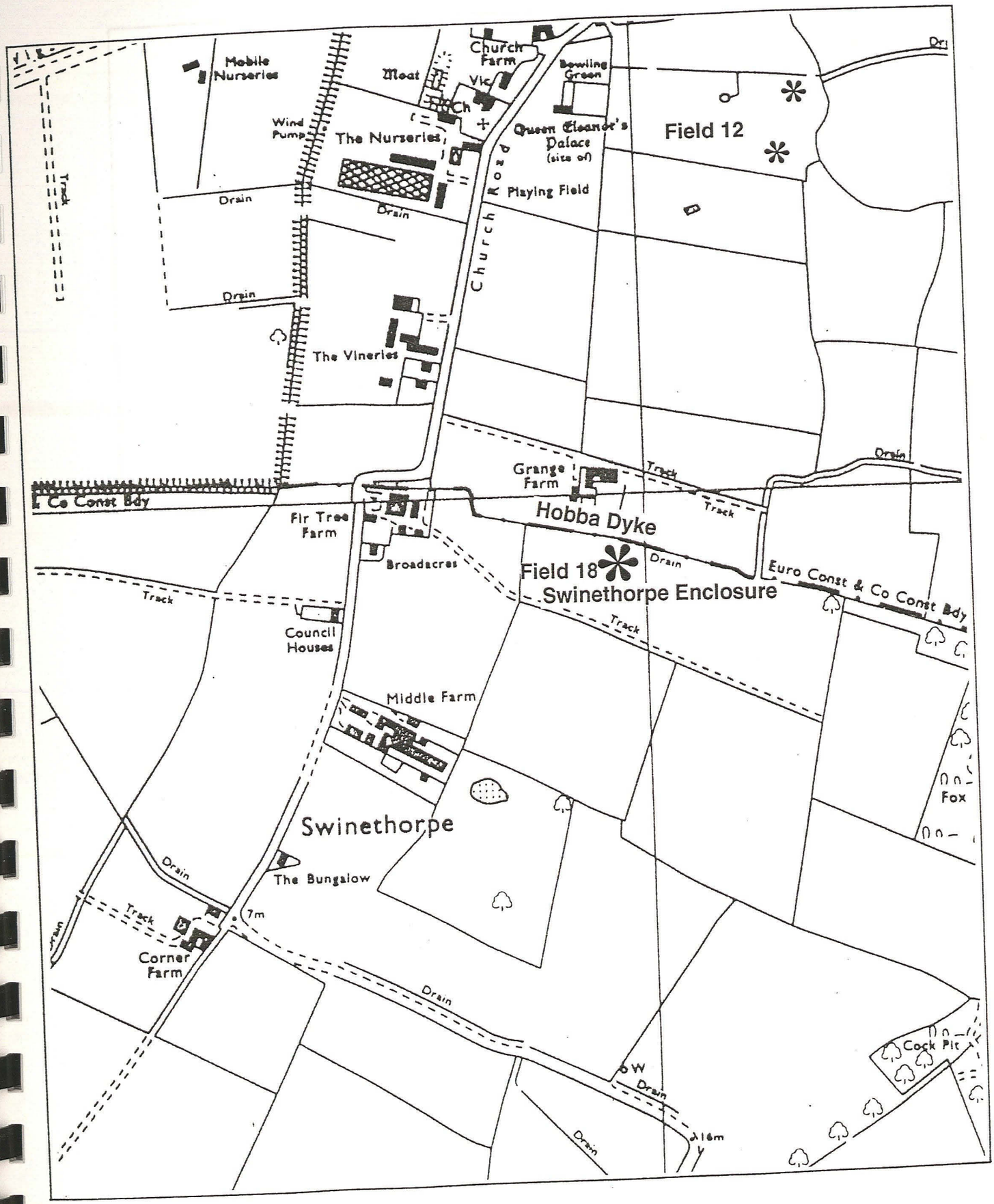


Fig. 8 Location of the Swinethorpe Iron Age Enclosure (based on the Ordnance Survey 1:10,000 map; Crown Copyright, reproduced with permission of HMSO. LAS Licence No. AL 50424A).

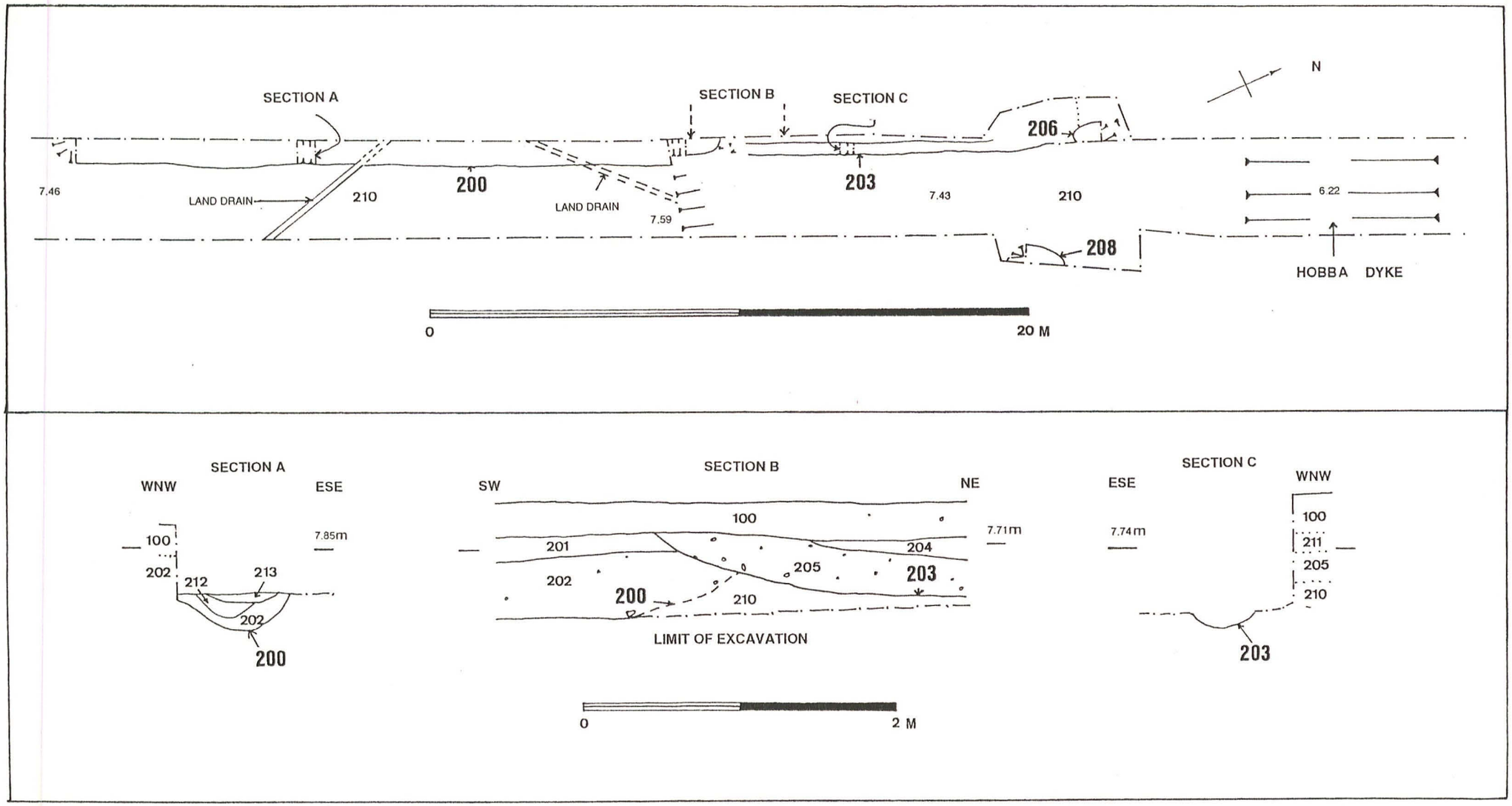
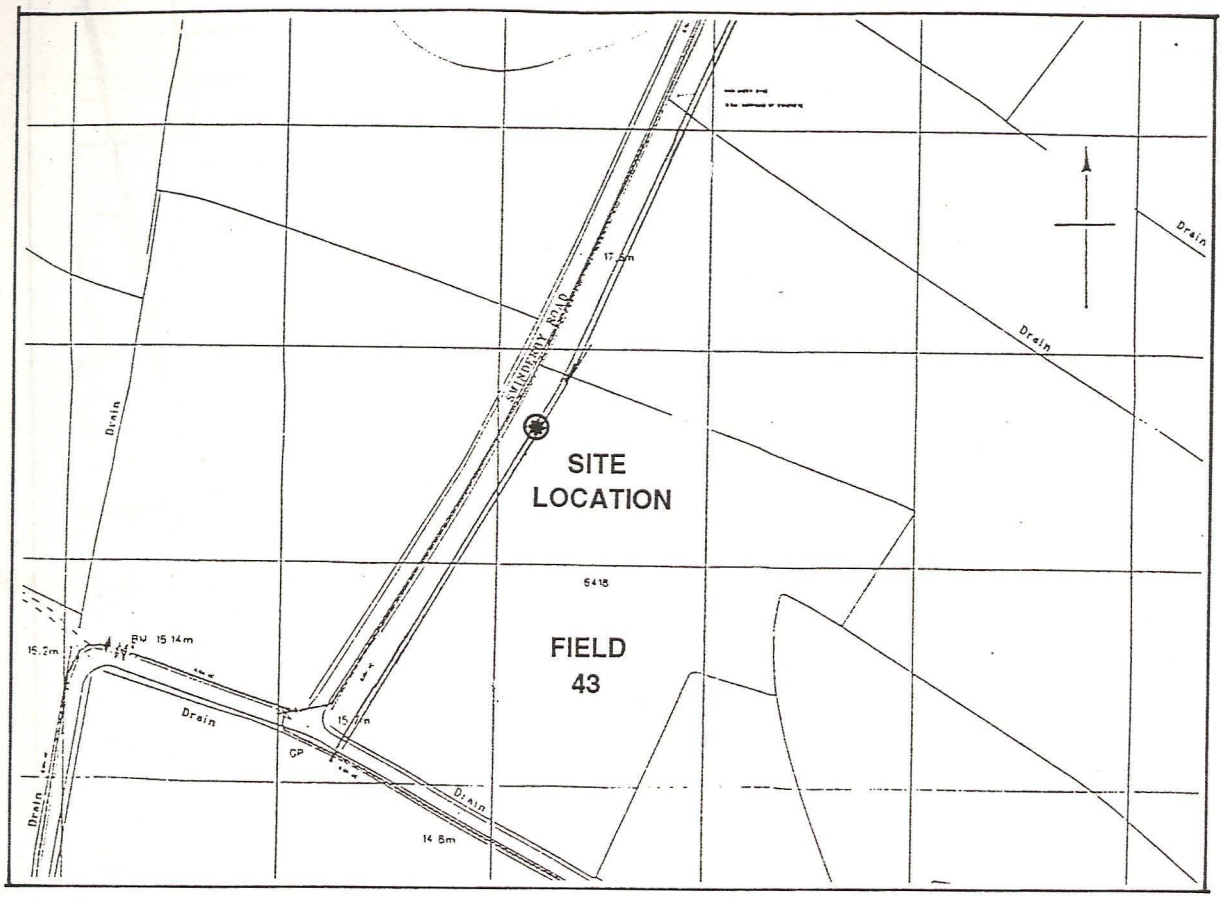


Fig. 9 Plan and Sections of the Swinethorpe Iron Age Enclosure (McDaid)



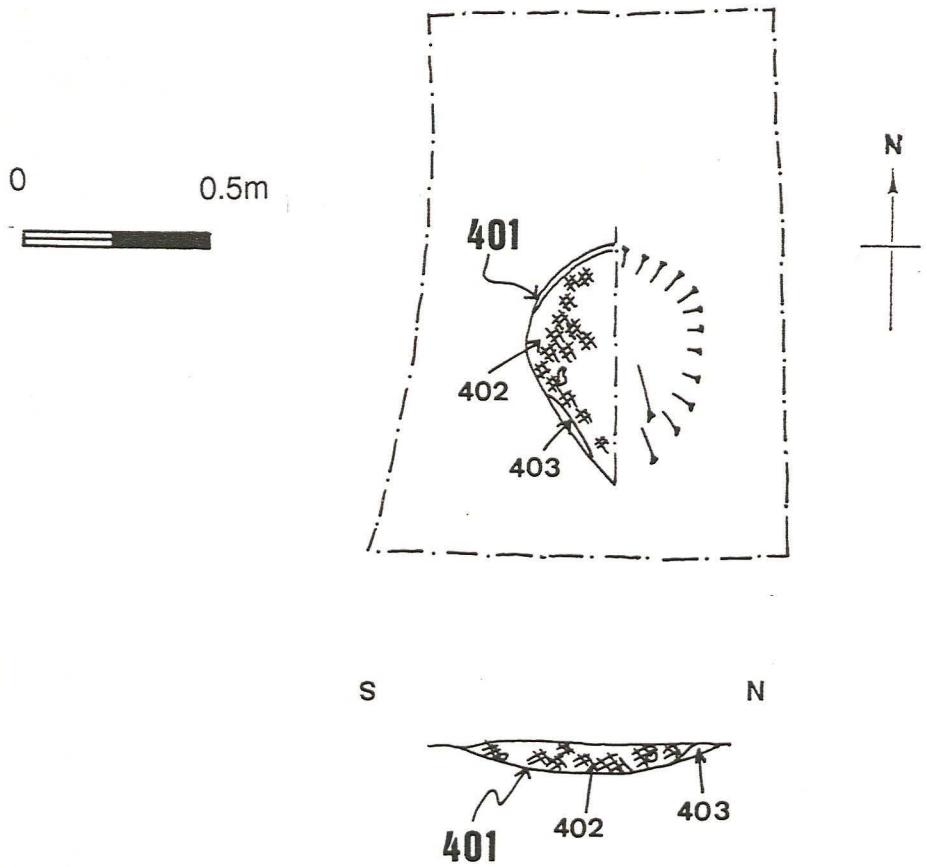


Fig. 10 Location, plan and section of hearth 401 (McDaid).

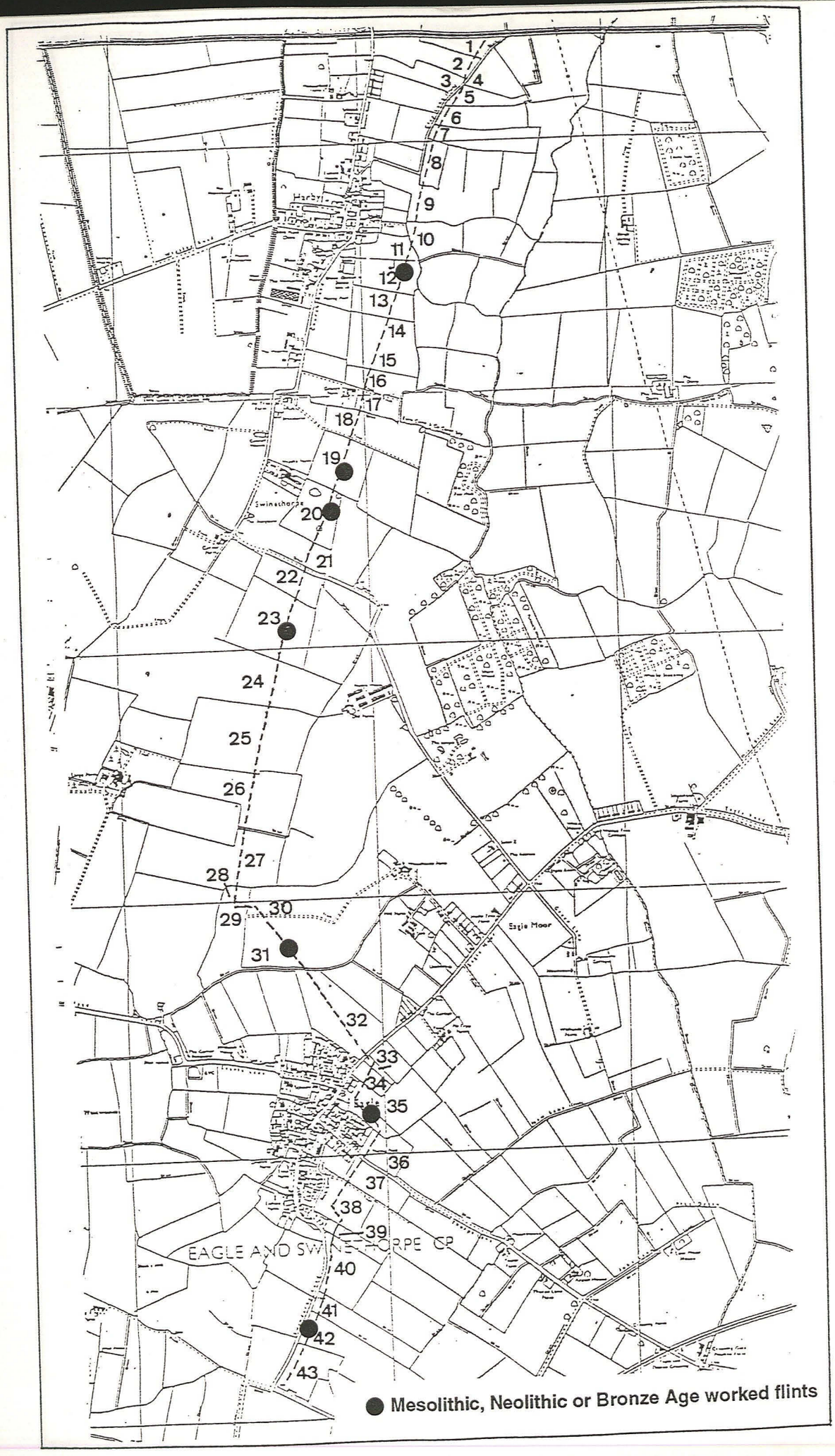


Fig. 11 Distribution of flint artefacts found on the pipeline route

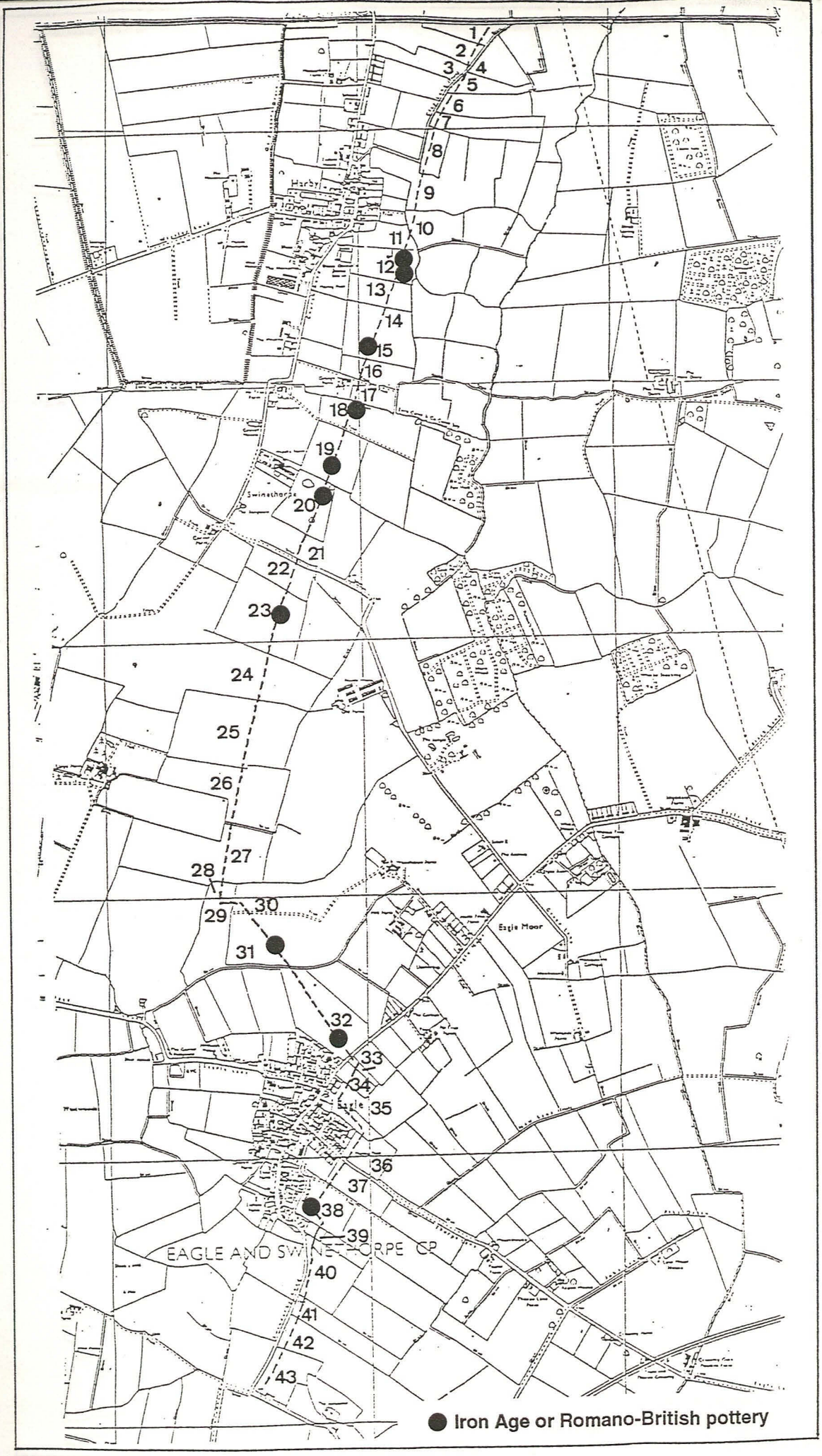


Fig. 12 Distribution of Iron Age and Romano-British finds found on the pipeline route

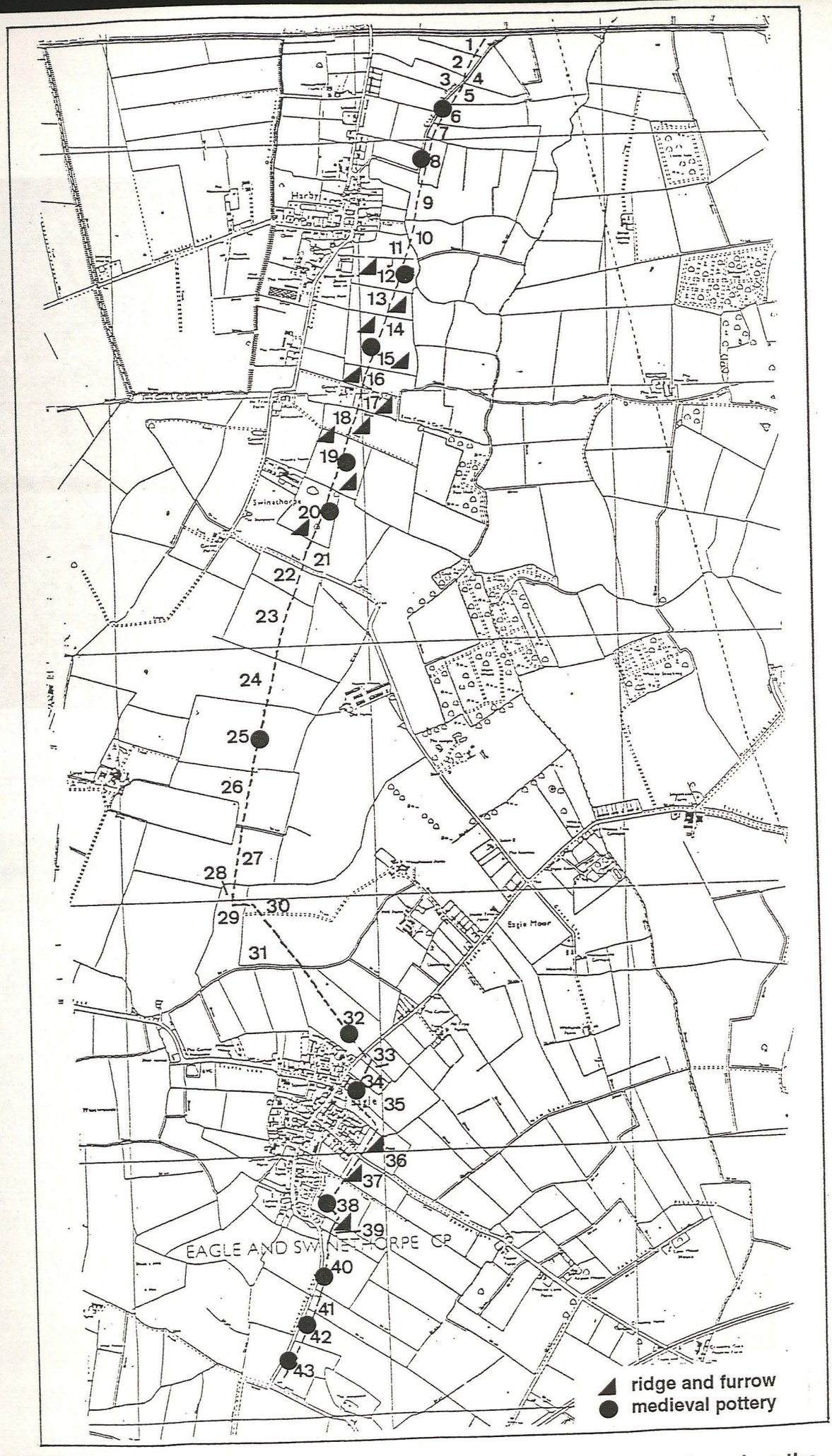


Fig. 13 Distribution of medieval finds and ridge and furrow found on the pipeline route

Pl. 1. Plough furrow 102 and Iron Age gully 101 (foreground) on the W edge of the stripped easement in Field 12, after surface cleaning.

Pl. 2. Gully 101 after partial excavation; looking W, scale divisions 0.5m.

Pl. 3. Gully 101 after excavation of its N half; looking W, scale divisions 0.5m.

Pl. 4. Gully 101 during excavation.

Pl. 5. Gully 101 after excavation within the easement area, showing the position of posthole 116. Looking west, scale divisions 0.5m, 0.1m, 0.05m and 0.01m.

Pl. 6. Detail of part-excavated posthole 116, showing the lenses of sand sealing it beneath medieval and later soils. Looking west, scale divisions 0.05m and 0.01m.

Pl. 7. Gully 101 filled with wind blown sand within two weeks of excavation.

Pl. 8. Sand lenses within the topsoil close to gully 101.

Pl. 9. Sections across a complex of features around gully 101 (centre). These features were interpreted as caused by a backfilled hole left by a wind-thrown tree. Looking west, scale divisions 0.5m.

Pl. 10. Soil lenses backfilling tree throw-hole beside gully 101.

Pl. 11. Possible posthole (right) beside gully 101 (top left); this feature may have been part of a tree root system.

Pl. 12. Gully 136 visible only in the deeper machined strip. Part of Iron Age gully 101 is visible behind the pipe, centre right. Scale divisions 0.2m.

Pl. 13. Fill of gully 136.

Pl. 14. Section across gully 136.

Pl. 15. During topsoil stripping in Field 12 a raised area of sandier soil was noted, coinciding with gullies 101 and 136 (looking N from Field 13 into Field 12; sandy soil beside machine).

Pl. 16. Contractors helping to retrieve Iron Age pottery from ditch terminal 307 in advance of pipe-laying; ditch terminal 308 is visible as black soil (left foreground). Looking NW.

Pl. 17 The dark fill of ditch terminal 307. Machine ruts mark the line of this ditch to the end of the spoil heap. A modern ditch passes between the wooden posts. (Looking NE).

Pl. 18 A dense assemblage of animal bone fragments, some burnt, was visible at the exposed ditch terminals 307 and 308.

Pl. 19 The pipe trench was excavated across the Iron Age ditch terminals before detailed archaeological excavation began (looking north).

Pl. 20 The NE terminal of ditch 308 was bulbous and about 4.5m broad; the NW edge was disturbed by a medieval plough furrow and a later land drain. Only part of the ditch was excavated (looking S).

Pl. 21 Post-medieval land drains had been laid in the bases of plough furrows cutting across the terminal of ditch 308 (looking NW).

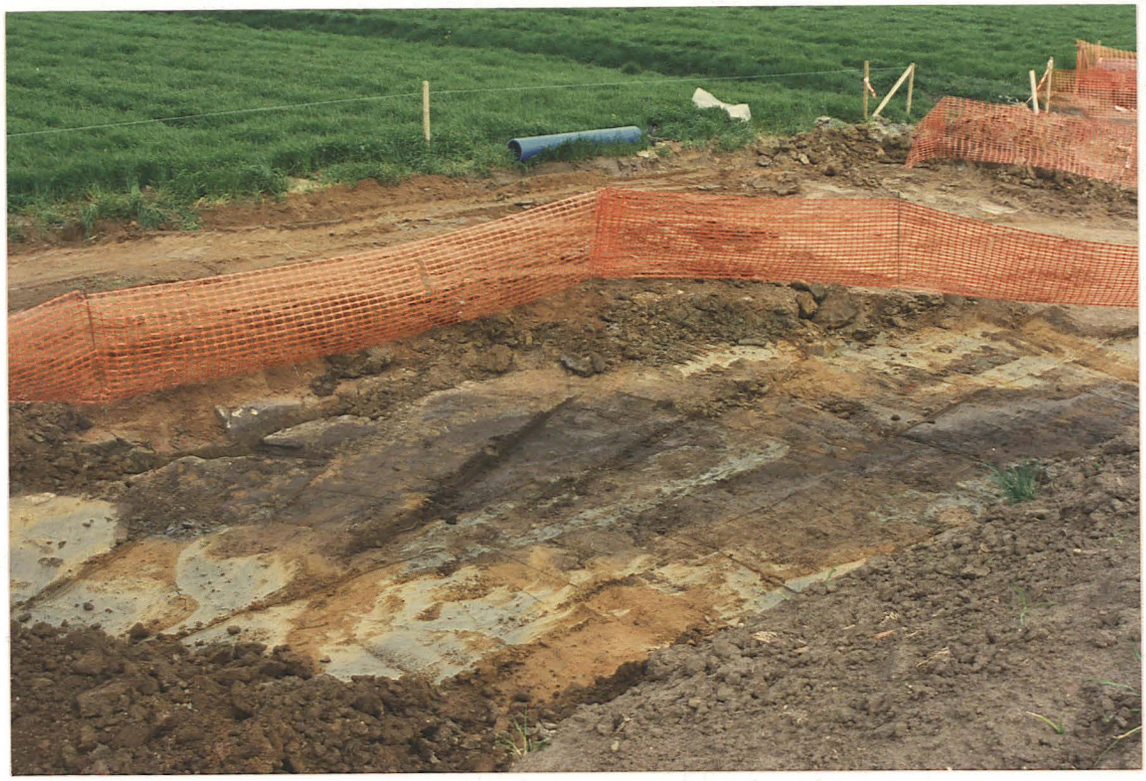
Pl. 22 Fills in the terminal of ditch 308. (Scale divisions 0.5m).

Pl. 23 Close to the base of ditch 308, Iron Age excavators had cut through a thin seam of limestone.

Pl. 24 Yellow clay at the terminal of 308 had slumped from the sides soon after it was first dug (looking W; scale divisions 0.5m).

Pl. 25 Large sections of the new trench sides cracked and slumped within days; this process replicated events when the Iron Age ditch was dug. (Looking north past ditch terminal 307).

Pl. 26 Deposits in ditch terminal 308. Initial silting fills are fine and light grey, followed by the yellow clay slump from the sides. Darkest layer 317 produced part of a split oak timber and many charcoal fragments. Above this, thin dark layer 303 contained animal bone fragments and Iron Age pottery. (Scale divisions 0.5m)

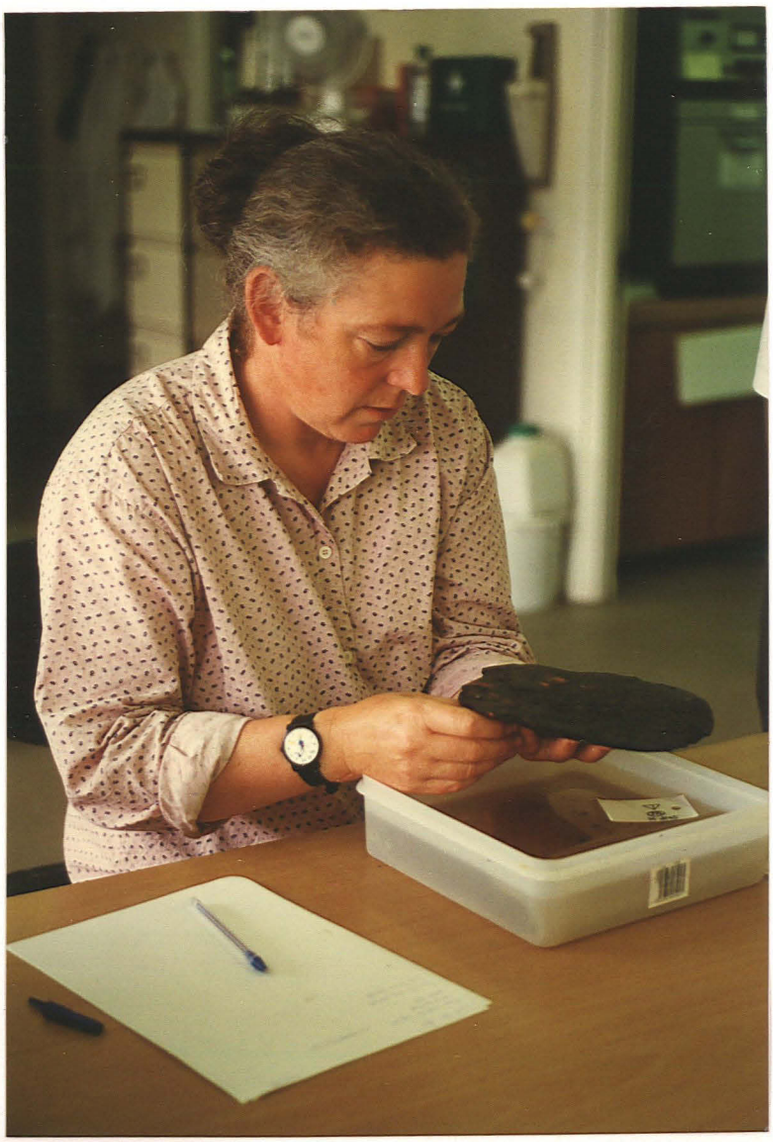


Pl. 27 After diversion of the contractors' access over 308, trample was removed from above ditch 307 by machine. Redeposited grey clay in ruts is still visible (looking NW from spoil heap).

Pl. 28 Sequence of soil fills in ditch 307 (scale divisions 0.5m).

Pl. 29 The light brown fill of a small gully 373 was visible at the eastern edge of ditch 307, cut through the darker backfills of that ditch.

Pl. 30 Dr. Maisie Taylor examining and recording the oak vessel base found in 366 prior to conservation.

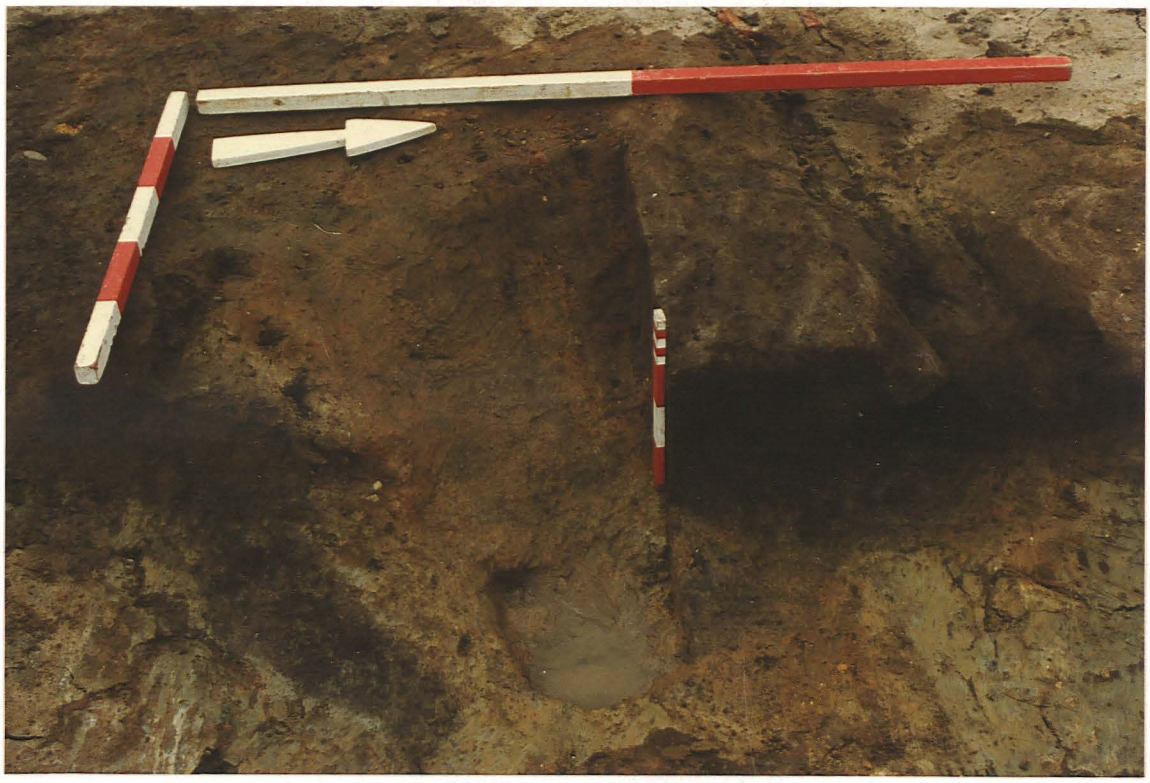


Pl. 31 View of one side of Iron Age wooden vessel base or lid found in 366.

Pl. 32 The alignment of ditch 307, looking NE from its terminal. The ditch continues beneath the spoil heap (scale divisions 0.5m).

Pl. 33 Ditch 309 (right foreground) terminated close to terminal 307 (by centre scale) leaving a small entrance between the two main ditches (looking east, scale divisions 0.5m).

Pl. 34 Section across ditch 309, showing the fill with animal bone fragments (scale divisions 0.5m).

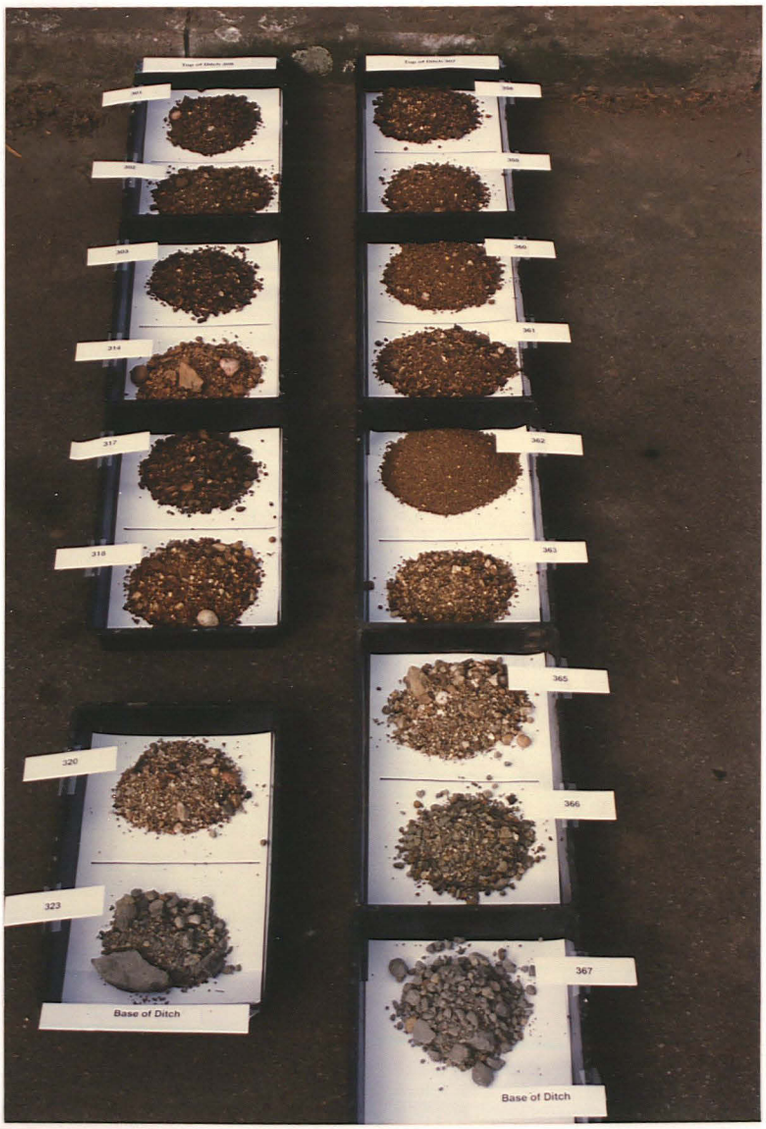


Pl. 35 Part-excavated posthole 310. The small depression (centre foreground) may mark the post position within the hole (scale divisions 0.5m, 0.1m, 0.05m and 0.01m).

Pl. 36 Half-excavated posthole 311 (scale divisions 0.1m, 0.05m and 0.01m).

Pl. 37 Posthole 333, half-excavated. (Looking E, scale divisions 0.1m).

Pl. 38 Comparison of residues from processed fill samples from ditches 307 and 308.



Pl. 39 The pipeline easement, Field 12, after topsoil stripping. The darker soil (middle distance) was interpreted as a post-medieval ditch but may have been the return of the Iron Age enclosure ditch. (Looking north from gully 101).

Pl. 40 Fill of undated ditch crossing the deeper easement midway between gully 101 and the Iron Age enclosure entrance (looking south).

Pl. 41 A ditch crossed the easement in a dip between gully 101 (foreground) and the enclosure entrance (behind trenching machine); the depression is behind the landrover (looking north).

Pl. 42 Natural soil sequence in trench on north edge of field ditch, Field 11. Note the shaley clay layer.

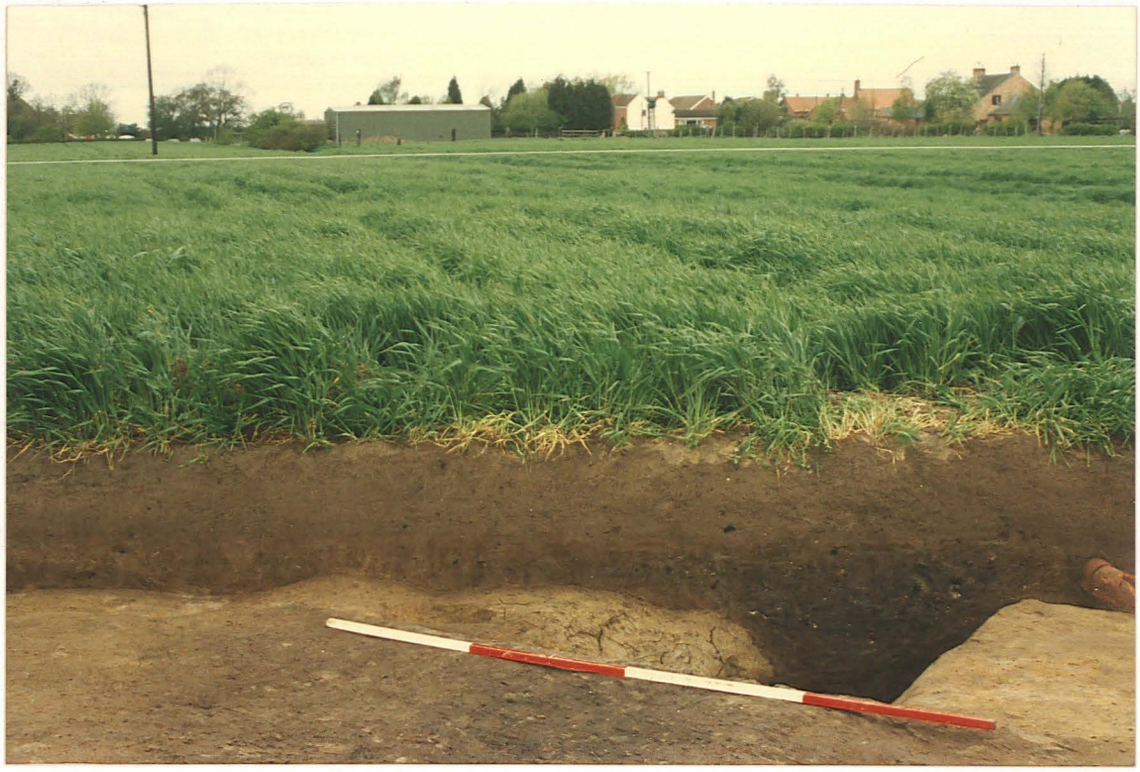
Pl. 43 Mixed natural deposits of grey clay and sand in the faces of the pipe trench, Field 10 (looking south).

Pl. 44 Air photograph of Harby, showing cropmark of part of a rounded ditched enclosure in vicinity of excavated ditches 307 and 308 (left of centre, beside curving boundary line. Regular linear marks to the east are from more recent drainage. Reproduced by permission of J. and P. Marshall.

Pl. 45 Panoramic photograph of crop growth in Field 12 close to the Iron Age enclosure entrance (looking SW).

Pl. 46 Field boundaries and topography to the east of the Iron Age enclosure entrance (looking east).

Pl. 47 Sinuous line of field boundaries to east of Harby village, probably marking extent of medieval woodland on the clay soils. Clay Lane coincides with this boundary (upper left). Looking east; reproduced by permission of J. and P. Marshall.



Pl. 48 Soil horizons beside Iron Age ditch 309 (looking west).

Pl. 49 Redeposited clay to the NW of ditch terminal 308, possibly representing upcast from a bank on that side.

Pl. 50 Deeper achining of the easement SE of The Grange (Field 18) revealed the brown fill of a ditch (along edge beneath 1m scale; looking north).

Pl. 51 Detail of the soil change where ditch 200 cut into the natural clay (scale divisions 0.2m).

Pl. 52 Iron Age pottery sherds in the easement edge, context 204 (scale divisions 0.2m).

Pl. 53 Location of the eastern ditch of the Swinethorpe Iron Age enclosure; the SE corner is slightly right of the short scale. Looking west to Fir Tree Farm; scale divisions 0.2m and 0.5m).

Pl. 54 Section across east side of ditch 200 at the SE corner, looking N.

Pl. 55 Section across ditch 200, looking north.

Pl. 56 Charcoal flecks in fill 216 at SE corner of ditch 200.

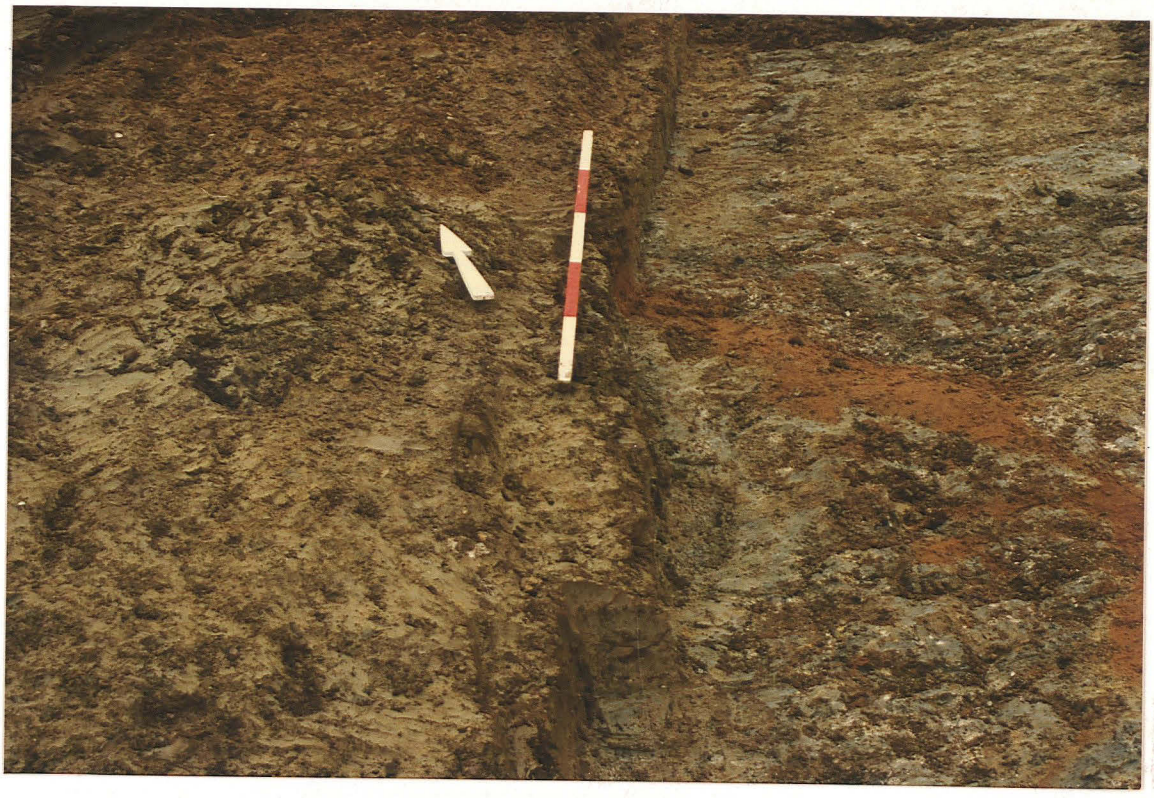
Pl. 57 NE corner of ditch 200 (left) and later ditch 203 (right) distinguished by small peak of undisturbed orange sandy clay.

Pl. 58 The junction of the NE corner of ditch 200 (excavated) and ditch 203 (fill remaining). Looking south.

Pl. 59 Ditch 203 turned westward under the southern side of the farmer's access ramp (looking south).

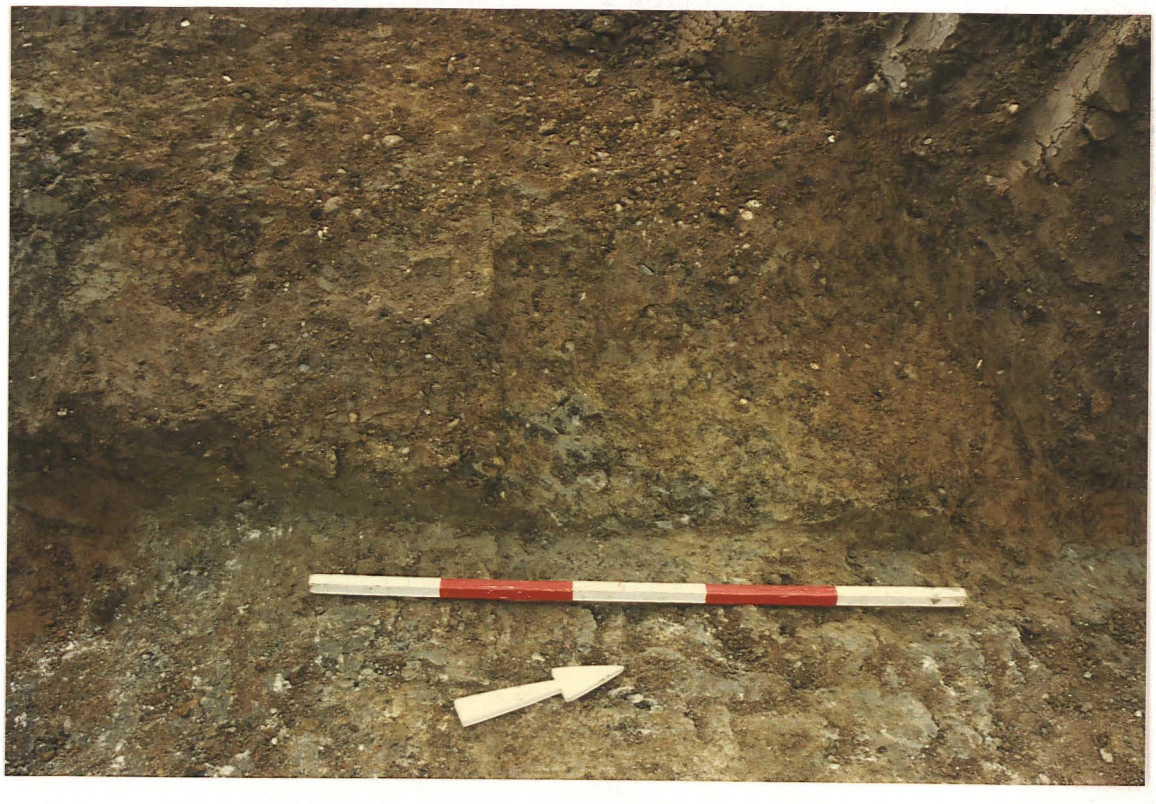
Pl. 60 Only small amounts of the fill of ditch 203 survived (scale divisions 0.05m).

Pl. 61 Location of the enclosure ditches 200 and 203, posthole 206 (centre of ramp) and Hobba Dyke (top right). Looking NW.



Pl. 62 Light brown fill of posthole 206 (top centre).

Pl. 63 Posthole 206 after removal of surviving fill.



Pl. 64 Light brown soil fill of feature 209 (below arrow), interpreted as a posthole. Looking east.

Pl. 65 209 after removal of fill on southern side.

Pl. 66 Soils between posthole 206 and Hobba Dyke, probably representing an upcast bank of unknown date (looking NW).

Pl. 67 Southern side of Hobba Dyke, the county boundary south of Grange Farm. Yellow clay (mid-distance) may mark a backfilled ditch. Looking west to Fir Tree Farm.

Pl. 68 Location of hearth 401 in Field 43 , SW of Eagle (looking north, scale divisions 0.2m).

Pl. 69 Hearth 401 after surface cleaning (scale divisions 0.2m).

Pl. 70 Half-section across fill of hearth 401, showing heat reddened clay around the edges (scale divisions 0.2m).

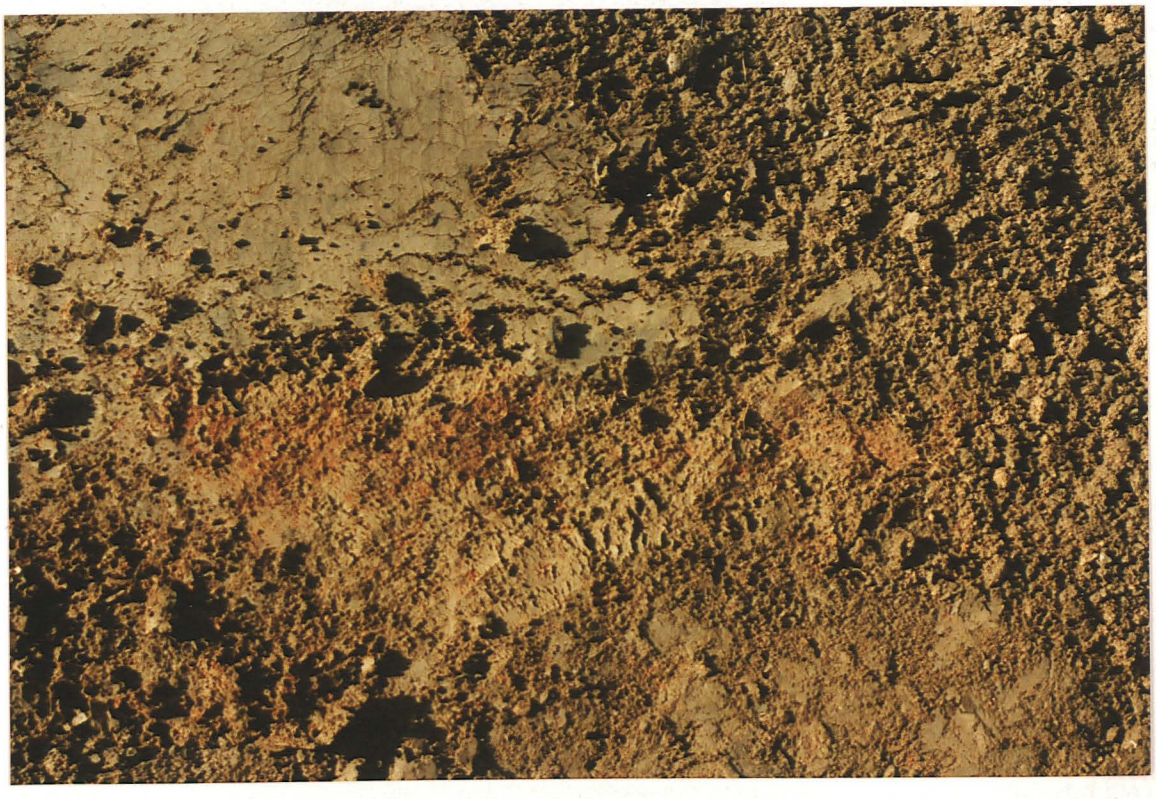
Pl. 71 Hearth 401 after full excavation.

Pl. 72 Fragmented fired clay object, perhaps a Romano-British loomweight, Field 32A

Pl. 73 Dark fills of medieval plough furrows crossing stripped easement surface, Field 20 (looking north).

Pl. 74 Vestigial ridge and furrow in pasture, Field 39B (looking NE).

Pl. 75 Burnt soil beneath topsoil in Field 19, probably caused by medieval land clearance.



Pl. 76 Field 23 after topsoil stripping. Limestone rubble spread 23D is close to the nearest fence post (looking NW).

Pl. 77 Limestone rubble 23D as first seen.

Pl. 78 Cleaning of area around rubble 23D (looking east, scale divisions 0.5m).

Pl. 79 Charcoal spread 23B, with cross-section of fill removed (looking north).