

Evaluation of biological remains from excavations on land to the north of Boston Road, Sleaford, Lincolnshire (site code: EPBR08)

by

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Summary

Five bulk sediment samples, recovered from deposits encountered during excavations on land to the north of Boston Road, Sleaford, Lincolnshire, were submitted for an evaluation of their bioarchaeological potential. The site consisted mainly of ditches, gullies, pits and postholes of Roman date, with a small number of features dated to the late Iron Age-Conquest period, and some medieval ridge and furrow and post-medieval field boundaries.

Ancient plant remains recovered from four of the subsamples, all pit fills, were largely restricted to charcoal fragments which were mostly too small to be identifiable. A small, poorly preserved, charred grain assemblage, with some chaff, was recovered from a Roman pit fill (Context 1108) and represented human food waste but was too small to be of any real interpretative value. Each of these samples also gave small assemblages of land and freshwater snails which provided some limited insights into the environments surrounding the features.

A moderate amount of slightly decayed waterlogged plant material was recovered from the fifth sample, from a Roman ditch fill, and there were also some invertebrate remains (including cladoceran ephippia and beetle sclerites). The ephippia suggested non-permanent freshwater within the ditch at the time of the formation of this fill and the plant remains implied areas of grassland, waste ground, wet places and hedges in the surroundings – the beetle remains provided supporting evidence for some of these habitats and a more detailed study of these would undoubtedly provide additional information to refine the interpretation of the past environment.

The charred cereal remains and waterlogged seeds and fruits could provide suitable material for radiocarbon dating, if required.

A full analysis of the invertebrate remains, particularly the beetles, from the ditch fill Context 1112 would allow a more detailed reconstruction of the ecological conditions within and around ditch 1111 in the Roman period. No further study of the biological remains from the other deposits is warranted.

KEYWORDS: BOSTON ROAD; SLEAFORD; LINCOLNSHIRE; EVALUATION; ROMAN; PLANT REMAINS; CHARRED PLANT REMAINS; CHARRED CEREAL REMAINS; INVERTEBRATE REMAINS; BEETLES; LAND SNAILS; FRESHWATER SNAILS; VERTEBRATE REMAINS

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Introduction

An archaeological evaluation excavation was carried out by Pre-Construct Archaeology (Lincoln) on land to the north of Boston Road, Sleaford, Lincolnshire (NGR TF 0868 4586), in the first half of 2008.

The site consisted of several large pits, boundary and ?enclosure ditches, gullies and postholes (?structural), possible 'working hollows' and furnace or oven pits dated to the Roman period (mid 1st to late 3rd centuries AD). Furthermore two inhumation burials of Roman date and a possible truncated/disturbed cremation burial were identified. The excavations also revealed two features dated to the late Iron Age-Conquest period, medieval ridge and furrow agriculture and post-medieval field boundaries.

Five bulk sediment samples ('GBA'/'BS' *sensu* Dobney *et al.* 1992) were submitted to Palaeoecology Research Services Limited (PRS), County Durham, for an evaluation of their bioarchaeological potential.

Methods

Sediment samples

The sediment samples were inspected in the laboratory and their lithologies were recorded using a standard *pro forma*. Subsamples were taken and processed, broadly following the techniques of Kenward *et al.* (1980), for the recovery of plant and invertebrate microfossils. Prior to processing the subsamples were disaggregated in water and their volumes recorded in a waterlogged state.

Biological remains in the processed subsample fractions (residues and washovers) were recorded briefly by 'scanning' using a low-power microscope (where necessary), identifiable taxa and other components being listed on paper. One of the washovers contained appreciable quantities of waterlogged remains and was examined wet. All of the residues and the four other washovers were primarily mineral in nature and were dried and weighed prior to recording.

During recording consideration was given to the identification of material suitable for submission for radiocarbon dating by standard radiometric technique or accelerator mass spectrometry (AMS).

Nomenclature for plant species follows Stace (1997) and charcoal identifications follow Schoch *et al.* (2004). Nomenclature for insects follows Kloet and Hincks (1964-77) and molluscs follow Kerney (1999).

Results

The results are presented in context number order by trench. Archaeological information, provided by the excavator, is given in square brackets. A brief summary of the processing method and an estimate of the remaining volume of unprocessed sediment follows (in round brackets) after the sample numbers.

TRENCH 9

Context 949 [primary fill of pit 903; unknown date]

Sample 16/T (9 kg/6 litres sieved to 300 microns with washover; no unprocessed sediment remains)

Wet, mid grey (with patches of mid grey-yellow to mid yellow-grey), unconsolidated, very stony (stones of 2 to 6 mm were abundant, of 6 to 60 mm were common and of over 60 mm were present), slightly silty sand. There was a minor component which was made up of indurated clay, similar to that seen in Context 1519 (see below); these areas were brittle to crumbly.

The small washover (34 g, dried) was mostly of sand and stones (to 15 mm), with a little coal (to 5 mm), charcoal (to 5 mm) and modern rootlets. Identifiable botanical remains were restricted to a single seed of orache/goosefoot (*Atriplex/Chenopodium*) – probably a modern contaminant.

There were also some freshwater and terrestrial snails present, mostly the latter. Many of the shell fragments were unidentified but the land snails included approximately 100 *Carychium* spp. (both *C. minimum* Müller and *C. tridentatum* (Risso) were present), four *Vertigo* ?*pygmaea* (Draparnaud) (and some apex fragments of *Vertigo* sp., possibly further *V. pygmaea* but perhaps another species), four *Vallonia* ?*costata* (Müller), two *Discus rotundatus* (Müller) and two *Cochlicopa* sp. (all represented by apex fragments) and single records of *Punctum pygmaeum* (Draparnaud) and ?*Ena obscura* (Müller) (just an apex fragment). The smaller group of freshwater snail taxa included apex fragments of at least eight *Valvata cristata* Müller, two planorbids (possibly two different species) and three small ?*Lymnaea* sp.

The large residue (dry weight 6 kg) was mainly of stones (to 62 mm), with some sand, charcoal (to 7 mm; <1 g) and numerous shell fragments (to 17 mm; 1 g). The last consisted of approximately 100 fragments most of which were of unidentified snail shell. The small number of identifiable fragments included remains of one *Lymnaea* ?*palustris* (Müller) and a small succineid. There was also a single conical unidentified fossil snail shell fragment.

TRENCH 11

Context 1108 [fill of pit 1107; Roman]

Sample 26/T (3 kg/2 litres sieved to 300 microns with washover; approximately 5 litres of unprocessed sediment remain)

Moist, mostly dark grey (with some areas of mid to dark yellow-brown), stiff to crumbly (working soft and very slightly plastic), slightly clay sandy silt. Modern rootlets and stones (20 to 60 mm, including rotted sandstone) were present.

The small washover (47 g, dried) was mainly charcoal (to 10 mm), with some sand, sediment concretions and a little cinder and modern rootlet. In addition, there were a few charred vegetative plant parts, including twiglets and rhizomes/rootlets. Some of the larger pieces of charcoal could be identified as alder/birch/hazel (*Alnus/Betula/Corylus*). There were small numbers (approximately 20 in total) of mostly poorly preserved (distorted, puffed and fragmented) charred cereal grains, some of which could be identified as spelt wheat (*Triticum spelta* L.), together with traces of chaff such as glume bases and spikelet forks which were also of spelt wheat. Occasional remains of arable weeds, such as brome (*Bromus*) and dock (*Rumex*) were noted.

There was a small assemblage of land snails which included at least two *Pupilla muscorum* (L.), 12 *Vallonia* ?*excentrica* Sterki and six *V. ?costata*, three *Trichia* sp., two *Cochlicopa* ?*lubrica* (Müller) and single representatives of *Punctum pygmaeum*, *Carychium* ?*minimum* and *Vertigo pygmaea*. A small number of remains of freshwater taxa were also noted – two small ?*Lymnaea* sp. apex fragments and another of an unidentified planorbid – and there were some unidentified shell fragments.

The small residue (dry weight 1.02 kg) consisted of stone (to 67 mm), with some sand, bone (to 42 mm; 14 g), pottery (to 21 mm; 2 g), charcoal (to 10 mm; 2 g), glass (to 14 mm; 1 g) and shell fragments (to 9 mm; <1 g). The last totalled approximately 12 fragments, some of which were of unidentified land snails but others appeared to be of eggshell.

Bone (34 fragments) recovered from this sample was of reasonable preservation, although fresh breakage was noted throughout. Seventeen of the fragments were burnt – some were partly white in colour but tinged with blue or black. Several of these were probably part of the same bone as most had sharp, freshly broken edges. Several larger fragments possibly represented large mammal rib and mandible fragments and there was a single caprovid incisor.

Context 1112 [primary fill of ditch 1111; Roman]

Sample 25/T (3 kg/3 litres sieved to 300 microns with washover; approximately 5 litres of unprocessed sediment remain)

Moist to wet, mid to dark yellow-brown to dark brown to dark grey-brown (with a blue-ish cast internally and black flecks throughout), brittle and fibrous (the latter probably from rootlets) to crumbly and somewhat compressed (working soft and slightly sticky), slightly humic, slightly sandy slightly clay silt. Small stones (2 to 6 mm, 'pea grit') were common and larger stones (6 to 20 mm) and twigs were present.

The medium-sized washover (300 ml) was mostly of decayed plant material (rootlets – to 25 mm, unidentifiable plant fibres, bud scales, small twig and wood fragments), with a little sand and a moderate assemblage of invertebrate remains. In addition, a moderate number of waterlogged seeds and fruits was recovered from this deposit, largely representing plants growing in hedges (e.g. blackberry/raspberry – *Rubus fruticosus* L. agg./*R. idaeus* L., cherry/plum – *Prunus*, dwarf elder/elder – *Sambucus ebulus* L./*S. nigra* L., elder – *Sambucus nigra* L., raspberry – *Rubus idaeus* L., rose – *Rosa*, rose/bramble – *Rosa/Rubus* and sloe – *Prunus spinosa* L.) and waste ground or grassland (e.g. chickweed – *Stellaria media* (L.) Vill., common nettle – *Urtica dioica* L., red/bladder campion – *Silene dioica* (L.) Clairv./*S. vulgaris* Garcke and thistle – *Carduus/Cirsium*). Remains of gypsywort (*Lycopus europaeus* L.) and sedge family (Cyperaceae) indicated damp/wet areas nearby.

The invertebrate remains included a few earthworm egg capsules, which almost certainly represented recent intrusions into the deposit, but there were also beetle sclerites, cladoceran (water flea, including *Daphnia*) ephippia (resting eggs), very many mites (Acarina), some ostracods and a few apex fragments of freshwater planorbid snails. The vast majority of the adult beetle remains could not be identified as fragmentation was severe. However, there was very little chemical erosion of the remains so more intact sclerites were very well preserved. Identifiable remains included weevil (*Otiorhynchus* sp.) heads, pronota and elytra, *Cercyon analis* (Paykull) elytra, *Helophorus* sp. pronota and elytral fragments, and other elytra of at least three staphylinids. Closer determination of these remains and the identification of additional taxa would certainly be possible with time.

The small residue (dry weight 0.754 kg) was mostly stones (to 30 mm), with some sand, bone (six well preserved fragments to 27 mm; 2 g) and shell fragments (approximately 50 larger pieces, to 9 mm, separated; <1 g – mostly unidentified fragments of terrestrial or freshwater snail shell but including single apex fragments of *Trichia* sp. and a planorbid). None of the bone could be identified to species but one fragment was probably a piece of medium-sized mammal skull.

TRENCH 15

Context 1518 [single fill of pit 1517; Roman]

Sample 10/T (11 kg/6 litres sieved to 300 microns with washover; no unprocessed sediment remains)

Just moist, light to mid yellow-brown to mid orange-brown to mid grey-brown (with occasional grey and red patches), unconsolidated (the lumps were indurated and crumbly), slightly silty sand. Stones (2 to 20 mm, including denuded sandstone) were present.

The small washover (43 g, dried) was mostly of sand, with a little coal (to 5 mm), charcoal (to 5 mm) and some snails. There were also several waterlogged seeds of orache/goosefoot and one seed of clover (*Trifolium*) present but these were probably modern contaminants.

Identifiable remains within the small snail assemblage included land snails (three *Pupilla muscorum*, three *Vertigo pygmaea*, six *Carychium* sp?p., four *Cochlicopa* sp., one *Punctum pygmaeum*, six *Trichia* sp., 15 *Vallonia ?excentrica* and two *V. ?costata*) and freshwater forms (a small *Lymnaea* sp. apex fragment, two *Valvata cristata* apices, four planorbid apices – representing at least two different species – and two operculae of *Bithynia ?leachii* (Sheppard)). There were also many unidentified shell fragments and some of the remains, of both terrestrial and freshwater taxa, were discoloured blue-grey/black – probably by charring.

The relatively small residue (dry weight 3.6 kg) was of small stones (to 6 mm) and sand.

Context 1520 [single fill of pit 1519; Roman]

Sample 11/T (11 kg/8 litres sieved to 300 microns with washover; no unprocessed sediment remains)

Dry, mostly light grey to light to mid orange in parts (occasionally blue grey in clasts), brittle and indurated to crumbly, slightly sandy clay (slightly silty in the orange parts). Small stones (2 to 6 mm) were present

The tiny flot (6 g, dried) was mostly of sand and tiny unidentified snail shell fragments (though there was also a small assemblage of identifiable remains – see below), with a little coal (to 5 mm), very small amounts of cinder (to 5 mm) and charcoal (to 3 mm), a few modern rootlets and some earthworm egg capsules (probably modern too). Identifiable botanical remains were largely restricted to several seeds of orache/goosefoot and a few achenes of knotweed (*Persicaria*), but these were also probably modern contaminants. A single charred caryopsis of grass family (Poaceae) was also noted.

The small assemblage of identifiable snails was, again, predominantly of terrestrial taxa but also included some freshwater forms. Land snails present included single records for *Pupilla muscorum*, *Acanthinula aculeata* (Müller), *Punctum pygmaeum* and *Cecilioides acicula* (Müller) (this last is a burrowing species and almost certainly intrusive to the deposit), together with two *Cochlicopa ?lubricella* (Porro), four *Cochlicopa* sp. (apex fragments), seven *Vertigo ?pygmaea*, six *Oxychilus* sp. (apices only), three *Trichia* sp., two *Vallonia ?costata*, five *Vallonia ?excentrica* and approximately 120 *Carychium* spp. (both *C. minimum* and *C. tridentatum* were represented). Freshwater taxa included eight *Valvata cristata*, at least two species of planorbid (represented by fifteen apex fragments) and a single *Bithynia* sp. (an operculum was noted). As seen in the previous sample from Context 1518, some of the snail remains, of both terrestrial and freshwater taxa, were discoloured blue-grey/black probably as a result of burning.

The relatively small residue (dry weight 4 kg) was of stones (to 55 mm) and sand, with some additional snail shell (to 9 mm; <1 g). Of the last only one of the 40 or so fragments could be identified – as a *Vallonia ?excentrica* – and, on closer examination, some were fossil shell fragments.

Discussion and statement of potential

Ancient plant remains recovered from four of the five processed subsamples were restricted to charcoal and a small charred cereal grain assemblage with some chaff from Context 1108. Where identifiable, the cereals remains were predominately of spelt wheat and indicated food waste and human activity at the site, but were too few to be of any further interpretative value. However, Context 1112, the primary fill of ditch 1111, produced a moderate number of slightly decayed waterlogged plant remains of taxa of waste ground, grassland, wet places and hedgerow, reflecting the vegetation growing in the vicinity of this feature at the time of the formation of this fill.

The identifiable invertebrate assemblages were, generally, fairly small but a little more informative. Snail assemblages were recovered from the samples from pit fills (Contexts 949, 1108, 1518 and 1520) and all were dominated by terrestrial taxa but also included small numbers of remains of freshwater forms. The land snail groups from Contexts 1108 and 1518 (Roman fills of pits 1107 and 1517, respectively) were very similar and predominantly of dry, open ground taxa suggesting little vegetation in the vicinity of these features, perhaps no more than short grass on a calcareous soil. The assemblages from Contexts 949 and 1520 (primary and single fills of pits 903 and 1519, respectively) gave hints of more substantial vegetation in the form of far larger numbers of *Carychium* species – indicative of wetter and more sheltered conditions, and suggesting at least longer grass that remained permanently damp at the base or moist leaf litter under woodland – and also other taxa such as *Discus rotundatus* (Context 949) and *Acanthinula aculeata* (Context 1519) associated with leaf litter under hedgerow or deciduous woodland. However, it is possible that these remains were introduced via the

disposal of resources gathered from such habitats elsewhere – remains from kindling, for example, as some of the remains from Context 1520 appeared charred. It is certainly, most likely that the small numbers of aquatic snails recorded from each of the pit fills were introduced with waste water (or perhaps by flooding, although, in this case, the numbers of individuals might be expected to be higher) rather than indicating standing water within the features as *Valvata cristata* (Contexts 949, 1518 and 1520) and *Bithynia* species (Contexts 1518 and 1520) are restricted to well-oxygenated waters and would be improbable inhabitants of a water-filled pit.

In contrast, the invertebrate assemblage from Context 1112, primary fill of Roman ditch 1111, did suggest standing water within this feature, though probably not on a permanent basis. Cladoceran ephippia imply temporary freshwater as ephippia are formed as a response to environmental stress, such as may result from over-crowding during drying out or reduced water quality caused by pollution, for example. There was little evidence to suggest the latter and it seems probable that this ditch was intermittently, perhaps seasonally, wet. A range of beetle taxa was present which supported the evidence of the plant remains for wet/waterside habitats (*Cercyon analis* and *Helophorus* sp.) and local vegetation (plant feeders, e.g. weevils – *Otiorhynchus* sp.). A more detailed study of these remains would undoubtedly reveal additional information regarding the local environments at the time of the formation of this deposit.

Small numbers of animal bone fragments, some of which were burnt, were recovered from two of the deposits, the Roman pit fill Context 1108 and the Roman ditch fill Context 1112. These remains almost certainly represent human food waste but were too few to be of any interpretative value.

The charred cereal remains recovered from Context 1108 and waterlogged seeds and fruits from Context 1112 would provide suitable material for radiocarbon dating (via AMS), if required.

Recommendations

With the exception of the invertebrate remains from Context 1112, all of the assemblages of biological remains recovered from the evaluation subsamples were rather small and of no interpretative value beyond that reported above. Consequently, no further work is recommended on the remains from the pit fills.

A full analysis of the invertebrate remains, particularly the beetles, from the ditch fill Context 1112 would allow a more detailed reconstruction of the ecological conditions within and around ditch 1111. However, this would only be worthwhile if the dating of the deposit could be refined – this might be attempted via radiocarbon dating if no other evidence were available but there are calibration issues in dating material of this period that may result in inconclusive results. If further study is undertaken then all of the remaining sediment from this deposit should be processed and paraffin flotation should be employed to separate the invertebrate remains from the more substantial plant component and so facilitate their recording and identification.

Retention and disposal

Unless required for purposes other than the study of the biological remains, or the recovery of additional material for submission for radiocarbon dating (bearing in mind the *caveat* expressed above), the remaining sediment samples from the deposits other than Context 1112 may be discarded.

Archive

All material is currently stored by Palaeoecology Research Services (Unit 8, Dabble Duck Industrial Estate, Shildon, County Durham), along with paper and electronic records pertaining to the work described here.

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