

Evaluation of biological remains from the former Normanby Park Steelworks, North Lincolnshire (site code: NPQ2000)

by

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Summary

A series of samples and small quantities of hand-collected shell and vertebrate remains, from deposits revealed at the site of the former Normanby Park Steelworks, North Lincolnshire, were submitted for an evaluation of their bioarchaeological potential. Sixteen of the samples had been processed on site and the material submitted as residues and washovers. Eight samples of raw sediment were also submitted for possible processing in the laboratory for the recovery of finer plant and invertebrate remains.

The well-preserved plant remains in moat fills offer an opportunity to reconstruct habitats and environment and may give some indication of human activity in places or at certain times. The small amounts of charred material from one context suggest that occupation deposits on the moat platform may be worth investigating further, too. The invertebrate assemblages from three of the deposits studied were of useful size, and included a mixture of aquatic and terrestrial forms which would provide a detailed reconstruction of conditions in the moat and in its immediate surroundings. The disparities between the implications of the plant and invertebrate assemblages are unusual and may be significant.

If no other work takes place on this site and more material is therefore not recovered, a proper investigation of the existing plant and invertebrate material recovered from the samples should be made. Ideally (in the event of further excavation) further study should be based on a series of continuous columns of samples right through the sequence of fills, with numerous radiocarbon dates to provide a chronological framework.

The hand-collected shell and bone assemblages were too small to be of any great interpretative value and no further work is recommended on them. However, preservation of the vertebrate remains was reasonably good and any further excavation may yield a larger and more valuable assemblage.

KEYWORDS: FORMER NORMANBY PARK STEELWORKS; NORTH LINCOLNSHIRE; EVALUATION; PLANT REMAINS; CHARRED PLANT REMAINS; INVERTEBRATE REMAINS; SHELL; VERTEBRATE REMAINS

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Introduction

An archaeological evaluation excavation was carried out by Humber Field Archaeology (HFA) at the site of the former Normanby Park Steelworks, North Lincolnshire, over a five week period commencing 30 October 2000.

Sixteen of the samples (representing five contexts) were processed by bulk sieving prior to delivery to the EAU and submitted as residues and washovers. Eight samples of raw sediment were submitted for possible laboratory processing to recover finer plant and invertebrate remains. Small quantities of hand-collected shell (from four contexts) and bone (a total of 32 fragments recovered from seven contexts) were also submitted.

Methods

Sediment samples

All of the submitted material was examined in the laboratory and the lithologies of all the raw sediment samples recorded. Brief notes were made on the pre-processed washovers. Using the washovers as a guide to the organic content of the deposits, four of the raw sediment samples were selected for processing (as 'GBA' samples *sensu* Dobney *et al.* 1992), following the procedures of Kenward *et al.* (1980; 1986), for recovery of plant and invertebrate macrofossils.

Preservational condition of the invertebrate remains was recorded using the scheme of Kenward and Large (1998). In summary,

preservation is recorded as chemical erosion (E) and fragmentation (F), in each case on a scale from 0.5 (superb) to 5.5 (extremely decayed or fragmented).

Hand-collected shell

A very small quantity of hand-collected shell from four contexts was submitted. Brief notes were made on the preservational condition of the shell (using 4-point scales for erosion and fragmentation: 0 - none; 1 - slight; 2 - moderate; 3 - high) and the remains identified to species where possible.

For oyster (*Ostrea edulis* L.) shell additional notes were made regarding: numbers of left and right valves; evidence of having being opened using a knife or similar implement; measurability of the valves; damage from other marine biota (polychaet worms and dog whelks).

Hand-collected vertebrate remains

All of the material was scanned and, where possible, fragments were identified to species or species group, using the reference collection at the Environmental Archaeology Unit, University of York.

Results

The results for the laboratory processed subsamples are presented in context number order by trench. Archaeological information provided by the excavator is given in square brackets.

Sediment samples

Notes on the pre-processed washovers and those raw sediment samples not investigated further are presented in Table 1.

TRENCH 1

Context 1002 [black anaerobic layer]

Sample 1/T (3 kg sieved to 300 microns with paraffin flotation)

Black, oxidising to mid to dark grey-brown, crumbly (working plastic), ?humic silt (?waterlain) with some plant detritus.

This subsample yielded a small to moderate-sized residue of about 350 cm³, of which only about 50 cm³ formed a washover of less dense material, the rest being clean grey quartz sand with some angular gravel (to 50 mm), *Gryphaea* shell fragments (all, presumably, from the local Jurassic rocks) and nine small fragments of unidentified bone. There were also a few freshwater snails. The washover consisted mainly of herbaceous roots, mostly dark-stained (with iron sulphide), amongst which were well preserved remains of plants and some snails (all freshwater taxa—mostly valves of *Pisidium* sp(p), with a single fragment of an unidentified planorbid). The plant remains were a mixture of terrestrial and aquatic forms, the latter group including fool's watercress (*Apium nodiflorum* (L.) Lag.), watercress (*Nasturtium microphyllum* (Boenn.) Reichenb.), the former being mainly woody taxa likely to have lived in a hedge or scrub close to the site of deposition. Such an assemblage is typical of a ditch or moat fill with woody vegetation in the vicinity, perhaps overhanging in places and consistent with the archaeological interpretation that this deposit was the fill of a leat.

The flot included moderately large numbers of insect remains, together with numerous crustaceans and mites. Chemical preservation of invertebrates was fairly good, but variable, while many fossils were highly fragmented (E 2.0-4.0, mode 3.0, distinct; F 1.5-4.0, mode 3.0, weak). The assemblage was unusual in including abundant, well preserved, remains of homopterous bugs ('froghoppers' in the broad sense), including some heads and pronota, perhaps including ten or more species.

Aquatics were abundant, and included many ostracods and traces of cladocera, some *Helophorus* water beetles, and other insects in smaller numbers. These remains did not suggest a rich aquatic environment, however, in contrast to the fauna of some of the other moat fills. There were indications of waterside shallows, mud or swamp from *Carpelimus* spp., *Dryops* sp., *Coelostoma orbiculare* (Fabricius) and *Anacaena ?globulus* (Paykull). Remains of the froghopper *Conomelus anceps* (Germar) were rather common, and these (and smaller numbers of a range of other homopterous bugs of the families Cicadellidae and Delphacidae) presumably lived in swamp; *C. anceps* is associated with *Juncus*. Much of the rest of the fauna may also have lived on or amongst wet-ground vegetation.

Terrestrial forms were present but rather rare. There were several species of weevils and ground bugs, some indicating fairly well drained conditions (e.g. *Calathus* sp.). A few dung-associated beetles were noted, offering a hint as to what may have lay beyond the water margins. Insects associated with trees were conspicuous by their absence.

Detailed analysis of these plant and insect remains would provide a better picture of ecological conditions, but this would be refined by processing a larger subsample to allow recovery of more evidence about terrestrial conditions.

TRENCH 2

Context 2004 [moat fill]

Sample 23/T (1.8 kg sieved to 300 microns with paraffin flotation)

Moist, dark brown, soft (working plastic), humic silt with stones (20 to 60 mm).

The moderate-sized residue of about 300 cm³ consisted of roughly equal volumes of organic material (woody and herbaceous detritus, mostly <2 mm) and pale bluish-grey vesicular slag (?intrusive from above), perhaps with some limestone, and trace of sand. Amongst the organic material were abundant well preserved plant remains showing some sulphide blackening. The more abundant were aquatic or waterside forms, such as water-crowfoot (*Ranunculus* Subgenus *Batryachium*), water-plantain (*Alisma* sp(p).), sweet-grass (*Glyceria* sp(p).), and parsley water-dropwort (*Oenanthe lachenalii* C. G. Gmelin), with other taxa clearly indicating clean

standing water, e.g. duckweed (*Lemna*) and horned pondweed (*Zannichellia palustris* L.), but there was a wide range of woody taxa, too, mostly represented by small numbers of fossils. Only oak (*Quercus*) bud/bud-scales were moderately common. The woody component included hawthorn (*Crataegus monogyna* Jacq.), field maple (*Acer campestre* L.), and ash (*Fraxinus excelsior* L.), variously represented by fruits and seeds. Some other taxa must have formed an understorey to the woody plants, but there was no obvious component of weeds indicative of disturbance or human activity.

There were abundant invertebrate remains in the flot, crustaceans being particularly common. The remains showed little chemical degradation but many insects were very fragmented (E 2.0-3.0, mode 2.0, strong; F 1.5-4.0, mode 2.5, weak).

Aquatics predominated, for there were several hundred ephippia of at least two *Daphnia* species, perhaps a hundred or more ostracods, and smaller numbers of some other cladocerans. Water beetles included numerous *Ochthebius* sp. and *Helophorus* spp., several *Cymbiodyta marginella* (Fabricius), and smaller numbers of a few others. Some caddis larval cases and traces of adult wing added to this picture. Perhaps surprisingly in view of the botanical evidence, insects indicating open water were rare (although there were remains of some large dytiscids), and overall a weed-choked environment, or water round the bases of emergent plants, was indicated. A range of species indicated swamp vegetation and mud, but none were abundant.

Terrestrial habitats were represented fairly well, by dung beetles (among them *Aphodius* and *Onthophagus* species), beetles and bugs exploiting herbaceous vegetation, and some beetles which probably came from artificial habitats (including accumulations of decaying matter). The latter included *Gyrohypnus* sp., *Lathridius minutus* group and *Monotoma* sp. The grain weevil *Sitophilus granarius*, very strongly dependant upon stores of grain, was present.

The only indication of trees came from a fragment of a shieldbug, perhaps one of the tree-associated species.

A hint of temperatures above those of the present day came from a single *Platystethus ?nodifrons* (Mannerheim); the climatic significance of this

species and its relatives has been discussed by Kenward (2001).

A wholly unfamiliar elytron of a beetle was observed, slightly resembling a *Helophorus* water beetle but with irregular patches of large and small punctures. If not a developmentally abnormal *Helophorus*, this specimen may prove to be of considerable interest.

This assemblage should be fully recorded, and further sediment processed for a review of large numbers of remains for climatic data.

Context 2005 [black layer on moat platform]

Sample 5/T (3 kg sieved to 300 microns with paraffin flotation)

Moist, mixture of black and light reddish and yellowish brown, crumbly (working plastic), ?silt and ash with stones (20 to 60 mm) present and some patches of yellowish brown clay.

There was a rather large residue of about 450 cm³, mainly sand and angular limestone (to 60 mm), with a very small washover of a few cm³ of mainly charred plant material, including some puffy and poorly-preserved charred cereal grains of which the majority appeared to be bread/club wheat (*Triticum 'aestivo-compactum'*). There was a little charcoal, to 20 mm, and a few other charred seeds. In the finest fraction were some unusual 'blue'-coloured silicified cereal awn ('beard') fragments, probably also from wheat. A very much larger sample would be required to examine the nature of this charred material in more detail, but it seems likely that this deposit included a component of ash from burning of, for example, straw, or threshing debris. No significant invertebrate remains were observed.

TRENCH 4

Context 4003 [fill of moat]

Sample 19/T (2 kg sieved to 300 microns with paraffin flotation)

Moist, very dark grey-brown, firm to crumbly (working more or less plastic), slightly sandy ?humic silt

There was a moderate-sized residue of about 350 cm³, mainly granular black (sulphide-rich) organic

debris, with only about 100 cm³ of this volume comprising clean quartz sand. Well-preserved plant remains were abundant and the more frequent were aquatics, especially water-crowfoot, but also duckweed, and bur-reed (*Sparganium* sp(p)). As in the sample from 2004, woody taxa were also well represented, the list again including hawthorn, ash, and maple. There was some evidence for human activity in the form of a single seed of fig (*Ficus carica* L.) and a few remains of some cornfield weeds.

The invertebrate assemblage was effectively identical to that from Context 2004, though perhaps with a larger terrestrial component. The latter included some synanthropes (e.g. *Ptinus* sp., *Sitophilus granarius* and *Mycetaea hirta*). A bark beetle and *Rhizophagus* sp. may have originated from trees nearby. A few freshwater snail remains were also present including single valves of *Pisidium* sp. and *Sphaerium corneum* (L.) and two *Planorbis planorbis* (L.). A single fragment of a terrestrial snail *Cochlicopa* sp. was also noted.

Remains of the ground beetle *Pterostichus madidus* (Fabricius) deserve remark, since this species, common at the present day, is extremely rare in archaeological deposits. The timing of its expansion, as well as the reasons, require investigation.

Hand-collected shell

Four contexts (2004, 2016, 2022, and 2023) gave small amounts of hand-collected shell. All the remains were either of shellfish (oyster or ?mussel, ?*Mytilus edulis* L.) or else of one of two catholic terrestrial snails (*Helix aspersa* Müller or *Cepaea/Arianta* sp.). Preservation was rather poor with considerable fragmentation of the remains. Four of the five oyster valves recovered showed evidence of having been opened by humans. Notes on the remains are given by context in Table 2.

Hand-collected vertebrate remains

Preservation was mainly recorded as good, with only some bones from Contexts 2015 and 2016 being described as 'battered' in appearance. Some surface damage was noted on the rib from Context 2002. Bones from Contexts 1002, 2002 and 2004 were dark brown in colour suggesting that they were retrieved from waterlogged deposits. The remains from Context 1002 also appeared to be covered in some

sort of concretion, which may have been faecal in origin. Butchered fragments were noted from Contexts 1002 and 2004 and included heavily chopped scapulae (only the glenoid region of the bones remaining) representing both cattle (Context 2004) and fallow deer (Context 1002).

Table 3 shows the taxa recovered by context. The usual range of domestic mammals (cattle, caprovid and pig) were identified. Additionally, two fallow deer scapulae (probably representing both legs of a single individual) were identified from Context 1002, whilst a shed fallow deer antler was recorded from Context 2015. A rabbit pelvis was also identified from Context 2021.

Discussion and statement of potential

Sediment samples

The well-preserved plant remains in the moat fills offer an opportunity to reconstruct habitats and environment and may give some indication of human activity in places or at certain times (compare the evidence within the assemblages from Contexts 2004 and 4003). The small amounts of charred material from Context 2005 suggest that occupation deposits on the moat platform may be worth investigating further, too.

The invertebrate assemblages from three of the deposits studied were of useful size, and included a mixture of aquatic and terrestrial forms which would provide a detailed reconstruction of conditions in the moat and in its immediate surroundings. The disparities between the implications of the plant and invertebrate assemblages are unusual and may be significant. In particular, the rarity of tree-associated insects requires explanation; one possibility is that the trees were at a little distance from the basin (perhaps tens of metres), since evidence currently being obtained from modern studies suggests that tree-dwellers

do not appear in large numbers in deposits much removed from their hosts.

A substantial proportion of the invertebrate remains showed more fragmentation than normal in archaeological material. The reason for this is uncertain, but one possibility is that they were crushed in the ground prior to excavation, for example by heavy machinery. This fragmentation would limit the identification of a proportion of the remains, but would not invalidate further study.

Hand-collected shell

The very few remains are of no interpretative value other than to indicate the importation of shellfish to the site as food.

Hand-collected vertebrate remains

The small size of the vertebrate assemblage severely limits any discussion of its potential, and, as it stands, it is of little interpretative value. However, the recovered remains suggest the presence of butchery waste within the deposits and the fallow deer scapulae indicate the presence of possible high status occupation in the vicinity. The reasonable bone preservation suggests that deposits at this site show some potential for the survival of vertebrate remains and further excavation may produce a far greater assemblage.

Recommendations

Sediment samples

If no other work takes place on this site and more material is therefore not recovered, a proper investigation of the existing material should be made (with a larger subsample of the material from Context 2005).

Ideally further study should be based on a series of continuous columns of samples right through the sequence of fills, with numerous radiocarbon dates to provide a chronological framework (if this cannot be established by other means). A useful adjunct to archaeological reconstruction using the invertebrates would be a survey of remains from large subsamples in order to recover any species with climatic significance (cf. Kenward 2001), and to time the arrival of species (e.g. *Pterostichus madidus*, see above).

Hand-collected shell

No further work is recommended.

Hand-collected vertebrate remains

No further work is warranted on the present assemblage.

Retention and disposal

All of the current material should be retained for the present.

Archive

All material is currently stored in the Environmental Archaeology Unit, University of York, along with paper and electronic records pertaining to the work described here.

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Table 1. Notes on washovers processed prior to delivery to the EAU and raw sediment samples not examined further in the laboratory.

Context	Sample(s)	Washover(s)	Raw sediment descriptions	Notes
1012	2		Mid olive grey-brown, stiff (working plastic), sandy clay with darker patches and stones (2 to 6 mm)	
2004	4, 7, 17, 18, 21, 22, 23, 24	Small washovers varying from a few cm ³ to about 200 cm ³ of plant detritus with duckweed (<i>Lemna</i>) seeds, <i>Daphnia</i> ephippia and insects	Description in main text	
2004	25		Patch containing organic detritus and blue vivianite within a clay silt	SPOT sample
2016	8, 9, 10	Small washovers of less than 50 cm ³ of woody and herbaceous roots		
2025	11, 12, 13	The 'flot' had small fragments of wood, twig and modest numbers of woody fruits and seeds: elder (<i>Sambucus nigra</i> L.) and hawthorn (<i>Crataegus monogyna</i> Jacq.) with some recent woody roots. The hawthorn fruits (which were whole) and wood fragments all gave the appearance of having dried out (presumably at or before the point of deposition) and therefore of having become rewetted only during processing	Moist, mid to dark grey-brown, somewhat indurated, brittle (working crumbly), silty sand with some modern woody roots and patches of darker ?sulphide staining	
2029	14, 15, 16	Small washovers of a few cm ³ of ?modern roots	Moist, very dark brown to black, brittle (working crumbly) slightly clay ?humic sand in a matrix of mid to dark grey-brown, crumbly slightly silty slightly clay sand with limestone (60+ mm) and ?limestone/mortar (2 to 6 mm)	
4003	19, 20	Small washover of about 100 cm ³ of herbaceous detritus with some freshwater snails	Description in main text	

Table 2. Hand-collected shell.

Context	Shellfish	Terrestrial taxa
2004	Two oyster (<i>Ostrea edulis</i> L.) valves. One right oyster valve fragment and one left valve—both knife marked, both ?burnt, no barnacle or dog whelk damage, neither measurable, very little erosion (1) but fragmentation high (3)	One <i>Helix aspersa</i> Müller
2016	Three oyster valves—two right and one left, erosion low (1), fragmentation moderate to high (2 to 3), knife marks on the left valve and one of the right valves, some measurements possible on the knife marked valves, no damage from other marine biota	None
2022	None	One <i>Helix ?aspersa</i> and two <i>Cepaea/Arianta</i> sp.
2023	Two ?mussel (? <i>Mytilus edulis</i> L.) valve fragments	None

Table 3. Hand-collected vertebrate remains.

Taxon	Context	Context							
		1002	2002	2004	2015	2016	2021	2023	
<i>Oryctolagus cuniculus</i> (L.)	rabbit	-	-	-	-	-	1	-	
<i>Sus</i> f. domestic	pig	-	-	1	-	-	-	-	
<i>Dama dama</i> (L.)	fallow deer	2	-	-	1	-	-	-	
<i>Bos</i> f. domestic	cow	-	-	1	-	3	-	-	
Caprovid	sheep/goat	-	-	3	-	-	-	-	
Unidentified bird		-	-	1	1	-	-	-	
Unidentified		-	1	13	1	1	-	2	
Total		2	1	19	3	4	1	2	