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**An assessment of 'environmental' samples and bone from excavations on the route of the Leven-Brandesburton by-pass (site code LEV92)**

by

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**Summary**

Samples of sediment representative of the range of deposits encountered during excavation of prehistoric and Roman features along the course of the Leven-Brandesburton by-pass were examined for their content of plant and animal remains. A small assemblage of hand-collected bone was also reviewed.

Deposits from prehistoric features were mostly barren, apart from a little charcoal and other charred plant material, but two layers of Roman date from deeper features gave good assemblages of plant and insect remains preserved by waterlogging. These pointed to the presence of disturbance and probably nitrification in the area, no doubt as a result of human activity, including perhaps the keeping of livestock.

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## An assessment of 'environmental' samples and bone from excavations on the route of the Leven-Brandesburton by-pass (site code LEV92)

### Sediment samples

A series of eight samples of deposits of prehistoric and Roman date from excavations along the course of the Leven-Brandesburton by-pass, N. Humberside, were submitted for an assessment of their value as a source of biological remains (on the basis of which a costing for further analysis was to be prepared). In addition, a small assemblage of hand collected bone was provided for assessment.

All the samples were examined in the laboratory and a description of the sediment made using a standard *pro forma*. Subsamples were removed for processing and the remainder of each sample retained as a voucher. In the case of four samples, in which charcoal for dating by radiocarbon assay was to be sought, subsamples of 5 kg were taken; for the rest, 2 kg subsamples were used.

The subsamples were disaggregated and sieved (to 300  $\mu\text{m}$ ) following methods of Kenward *et al.* (1980, as modified by Kenward *et al.* 1986) and in all but two cases a 'washover' was performed, in which lighter material was decanted from the disaggregated material. For two subsamples, paraffin flotation was employed to extract invertebrate macrofossils (*ibid.*), and this was followed by a washover. After checking under the microscope, washovers were returned to the residues and oven dried. Dry residues were then quickly checked for their composition. The insects from the two subsamples subjected to paraffin flotation were 'assessment recorded' (Kenward 1992).

The samples are considered in context number order, with archaeological information in brackets:

### Context 13, sample 14 [fill of pit/large post-hole; Iron Age]

Dark grey-brown to brown, locally pale orange-brown, moist, plastic, sticky sandy silty clay, locally more silty or clayey. The clay component of this sample hindered disaggregation, so dilute sodium pyrophosphate solution was used after an initial soaking in water to facilitate processing.

The washover from this 2 kg subsample consisted mainly of modern roots, and a little charcoal to 20 mm (mostly < 2 mm). On closer inspection, the latter was found to consist of charred herbaceous plant material rather than woody tissue. This included some fragments of rhizome or root. It is most likely to represent burnt grass, perhaps from turves or tussocks. The presence of rather frequent water-blinks (*Montia fontana*) seeds perhaps also suggests burning of short grass turf. The residue consisted mainly of quartz sand and a little gravel (to 10 mm), with a trace of iron-rich concreted material (?iron pan).

**Context 52, sample 61** [fill of prehistoric (?neolithic) pit]

Dark to mid brown, moist, crumbly sand with stones 2-20 mm. A total of 5 kg of this sample was sieved to 300  $\mu\text{m}$  to obtain charcoal for  $^{14}\text{C}$  dating.

The washover was found to contain, in addition to some charcoal fragments to about 10 mm, several fragments of hazel (*Corylus avellana*) nutshell. The latter were recovered for dating purposes (along with some of the charcoal, in case the sample of nutshell was too small). The charcoal included oak (*Quercus*) and ?rose family (Pomoideae). The washover also contained some germinating grass fruits, roots, several goosegrass (*Galium aparine*) fruits and single specimens of chickweed (*Stellaria media*) and corn spurrey (*Spergula arvensis*), all clearly modern. The charred material is not thought to be of recent origin, however. The residue consisted of sand and a little gravel.

**Context 70, sample 71** [pit fill; Romano-British]

Mid grey-brown to brown (?mottled), moist, crumbly to plastic, silty clay with a little burnt bone and a cobble to 150 mm; traces of modern roots and some fine charcoal.

The small washover from the 2 kg subsample consisted of modern roots together with charred 'seeds' of corn spurrey (2), buttercup (*Ranunculus* Section *Ranunculus*; 1) and sedge (*Carex* sp.; 1). The residue included modest amounts of very fragmentary bone and a little burnt ?daub. For the most part, though, the residue was of quartz sand and flints to 20 mm. Preservation of the bone was poor and specific identification was not possible. As with the hand-collected material (see below) a number of the fragments showed evidence of iron staining with an even larger number showing evidence of burning, most being heavily calcined (and coloured white or blue). Processing a larger sample is unlikely to produce a useful assemblage.

**Context 173, sample 242** [upper fill of Bronze Age pit]

Light-mid yellow-grey-brown, moist, unconsolidated, slightly silty or clay sand with abundant angular flints. A 5 kg subsample was processed to obtain charcoal (in the event, sufficient was found from sample 243, see below, and no washover was taken).

The residue was mostly quartz sand with a little angular flint to 30 mm and rather a lot of iron-rich concretions in the > 2 mm fraction (these appeared to have no organic content and may be 'pan').

**Context 173, sample 243** [lower fill of Bronze Age pit]

Mottled grey-brown/pale orange-brown, moist, 'crisp' (brittle), slightly silty clay sand with abundant flints to 30 mm, and a trace of charcoal. Some localised small lumps of clay.

Charcoal for <sup>14</sup>C dating was sorted from the small washover from the 5 kg subsample; it included fragments of probable willow (cf. *Salix*), ash (*Fraxinus*) and oak, the largest being about 15 mm. The residue was sand and gravel, with a single fruit of annual knawel (*Scleranthus annuus*), a cornfield weed of sandy soils and perhaps a modern specimen.

**Context 351, sample 352** [from base of ditch/ditch junction; Romano-British]

Mid-dark brown (with paler ± gingery to orange-brown patches), moist, crumbly, slightly clay sand with very decayed wood, flints to 15 mm, and pot to 20 mm.

The rather large flot from paraffin flotation was rich in well-preserved floating seeds of elderberry (*Sambucus nigra*), with abundant stinging nettle (*Urtica dioica*) achenes and modest numbers of seeds of chickweed and henbane (*Hyoscyamus niger*). The remaining plant taxa from this and from the washover (which otherwise consisted largely of very decayed wood) were mostly also weeds of disturbed and cultivated soils (very few of them typical cornfield weeds, however) with a small proportion of plants from wet habitats. No true aquatics were recorded, however.

Deposition does, nevertheless, appear to have occurred in water, which may have been only temporary; there were abundant resting eggs (ephippia) of water fleas (*Daphnia*) and a small number of aquatic beetles. The terrestrial insects indicated the presence of at least some decaying matter, which may only have been natural fallen vegetation and dung. Although there were some weakly synanthropic species, they offered no evidence for human dwellings. There was some evidence for disturbance, as with the plant assemblage, with beetles typical of waste ground and bare soil. The plant-feeders indicated the presence of nettles and crucifers. Insect preservation was rather good and a useful assemblage would be recovered from a larger subsample.

The residue was of quartz sand and gravel to 20 mm.

**Context 336, sample 442** [ditch fill; Romano-British]

Dark grey-brown, moist, crumbly to plastic (when worked), slightly sandy clay silt with small stones to 20 mm (mostly flints), occasional patches of grey silt or clay, and areas of rather paler brown colour with a sandier texture; elsewhere more clay (i.e. the texture rather heterogeneous). On disaggregation, a considerable humic content was apparent. The 2 kg subsample was subjected to paraffin flotation followed by washover.

The flot was very rich in well-preserved seeds, especially goosefoot (*Chenopodium* Section *Pseudoblitum*), and stinging nettle, with modest numbers of chickweed, henbane, hemlock (*Conium maculatum*), black nightshade (*Solanum nigrum*), deadnettle (*Lamium* Section *Lamiopsis*), oraches (*Atriplex* sp(p).), prickly sow-thistle (*Sonchus asper*) and a range of other taxa, most of which are indicators of disturbed and cultivated soils, especially places with nitrification from organic waste, e.g. in farmyards or near dung-heaps. A few marsh and other wetland taxa were present, but no good indicators of standing water as such.

The insect assemblage from this subsample was broadly similar to that from sample 352 (context 351), with a rich, varied and well-preserved group of beetles. Aquatic invertebrates, including *Daphnia ephippia* (of which there were 'many') and a second water flea, were sufficiently numerous to indicate deposition in water, and an assortment of decomposers likely to have originated in litter and dung was also recorded. The few plant-feeders present may have originated from disturbed weedy ground of the kind suggested by the plant remains.

The residue consisted of quartz sand and gravel to 25 mm.

**Context 358, sample 367** [fill of a small pit of uncertain date]

More or less mottled, pale orange-brown/mid grey-brown, moist, crumbly (unconsolidated) clay sand with modest amounts of charcoal and stones to 30 mm.

The tiny washover comprised modern roots with a few seeds, apparently of modern origin (1 fat-hen, *Chenopodium album*; several *Brassica* testas, ?rapeseed). The residue contained a little charcoal to 20 mm, but was mostly sand and gravel, the latter with rounded sandstones and angular flints.

**Context 778, sample 779** [fill of a neolithic pit]

Dark gingery-brown, moist, unconsolidated sand with moderate numbers of stones to 25 mm. A 5 kg subsample was disaggregated to locate charcoal for <sup>14</sup>C dating.

The washover contained rather little charcoal (including probable hazel charcoal) and some fragments of hazel nutshell (submitted for dating). There were also some modern fumitory (*Fumaria*) and speedwell (*Veronica*) seeds. The residue was of quartz sand and gravel to 15 mm.

## Implications

Samples from these excavations have been assigned by the excavator to one of five groups: (a) 'deep, organic fills'; (b) 'average depth, organic fills'; (c) 'average depth, not visibly organic'; (d) 'burnt material'; (e) 'Neolithic/Bronze Age fills'; and (f) 'other'. The samples examined in this assessment fell into these groups as follows:

- (a) 14, 352, 442 (of a possible 20 samples recovered in this category)
- (b) none (three recovered)
- (c) 71 (16 recovered)
- (d) 367 (12 recovered)

- (e) 61, 242, 243, 779 (all four examined, primarily to extract material for <sup>14</sup>C dating)
- (f) none (two recovered)

From the results obtained in this assessment, it would seem to be most important to examine all the samples in groups (a) and (b) and then to make a brief inspection of the remaining samples, processing a selection on the basis of their likely bioarchaeological value. For the purposes of recording, it is assumed that the group (a) samples will in general contain substantial quantities of remains, and that the rest of the material will usually be more or less barren, with five or less of these samples producing more than a few identifiable remains.

The times and costs for processing and recording these samples are as follows:

- (i) *Examination and description of all remaining samples* 12 hours RF1
- (ii) *Processing 23 group (a), (b) samples and an estimated 10 from groups (c), (d) and (f)* 2 weeks Tech.
- (iii) *Recording plant and insect remains* 4 weeks RF1
- (iv) *Computer data entry and analysis, technical report writing* 3 weeks RF1
- (v) *Publication report writing, editing, etc., if required* 2 weeks RF1

## Bone

The animal bone assemblage recovered by hand-collection during excavation amounted to only four standard-sized boxes. Bone was recovered from 57 contexts but only five produced more than 20 fragments, the great majority yielding less than five fragments.

All material was provisionally dated to the Roman period, although four contexts yielded material of supposed Iron Age date. Almost the entire collection came from ditch fills.

Preservation was somewhat variable, ranging from extremely poor and fair, with most bone extremely poorly preserved. Where identifiable bones were present they were often very badly weathered, friable and very fragmented. Many showed signs of both chemical as well as physical weathering. A single context (378) gave fragments of a metacarpal with characteristic 'onion-skin' weathering, which may be indicative of boiling for a prolonged period.

Colour was also variable, ranging from black to ginger. Numerous fragments were stained orange and red, indicative of the presence of iron oxides. Two shaft fragments from context 321 were, in fact, quite literally coated with what appeared to be iron slag.

Because of the poor preservation, very little of the material could be identified, but the assemblage appeared to be largely composed of the remains of cattle, with some sheep/goat, pig and horse elements also present. The dominance of cattle-sized fragments and the complete absence of the remains of birds and small mammals in the assemblage is not surprising, since on-site sieving was not undertaken. However, the extremely poor preservation of the bulk of the assemblage suggests that very little of this smaller material would have survived in the ground.

Of a total of 258 bone fragments recorded from 33 contexts, only 76 fragments could be identified. Not surprisingly, isolated teeth and slivers of enamel were the most common element identified, since tooth enamel is the most durable calcified tissue. Most were from cattle but context 468 gave ten isolated horse teeth, all probably from the same individual.

### Implications

The small size of the assemblage, broad dating framework and generally very poor state of preservation, linked with the paucity of identifiable and measurable fragments, renders the bone assemblage of little zooarchaeological value. The preservational regime strongly indicates that additional material from any further excavations would also be of very low priority. The main task in a post-excavation project on this material would be to check quickly for any interesting specimens.

Costs for further work:

*Examination of bone, technical report writing and work on publication report*

*2 days RF2*

### References

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