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Assessment of biological remains from excavations at 22 Piccadilly (ABC Cinema), York (YAT/Yorkshire Museum sitecode 1987.21)

by

John Carrott, Keith Dobney, Allan Hall, Michael Issitt, Deborah Jaques,
Harry Kenward, Frances Large, Annie Milles and Tom Shaw

Summary

This report presents the results of the assessment of plant, invertebrate and vertebrate remains from deposits of Roman to late 15th century date at 22 Piccadilly, York, a site adjacent to the River Foss and close to major Anglo-Scandinavian occupation sites previously investigated bioarchaeologically. Many of the deposits were highly organic dumps with a substantial content of biological remains preserved by anoxic waterlogging, as well as abundant well-preserved bone and marine shell.

Biological remains from certain phases of the stratigraphy at this site have considerable potential for reconstruction of depositional regimes, local ecology (including the relationship to the River Foss), and identification of the nature of dumped material and its implications concerning resource utilisation, craft activities (including dyeing and horn working), diet and living conditions.

Another major focus for further investigation should be the investigation of the relationship of this area of the town to the nearby occupation sites in Coppergate and Pavement, particularly in respect of the differential disposal patterns of the supposed production and dumping areas.

Full investigation of this bioarchaeologically rich material would be expensive and a carefully targeted programme of limited analysis is recommended.

Keywords: 22 PICCADILLY; ABC CINEMA SITE; YORK; ASSESSMENT; ROMAN; MEDIEVAL; OCCUPATION DEPOSITS; SEDIMENTS; MICROFOSSILS; PLANT REMAINS; INVERTEBRATE REMAINS; PARASITIC WORMS; INSECT REMAINS; VERTEBRATE REMAINS; HORN WORKING

Authors' address:

Environmental Archaeology Unit
University of York
Heslington
York YO1 5DD

Telephone: (01904) 433843-51
Fax: (01904) 433850

Prepared for:

York Archaeological Trust
Piccadilly House
55 Piccadilly
York YO1 1PL

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Introduction and background

Excavations at the ABC Cinema site at 22 Piccadilly, York, were undertaken by York Archaeological Trust in 1987. Four trenches were opened, which revealed a deep stratified sequence of deposits of Roman to medieval date, many layers being rich in organic remains preserved by anoxic waterlogging—typical for this area of York and not unexpected, given the proximity of the site to the present course of the River Foss and its probable former course. The elucidation of the history and precise course of the Foss was a major reason for carrying out this excavation, as was an exploration of the sequence of occupation in this part of York, lying, as it does, to the riverward end of the intensively investigated area at 16-22 Coppergate and close to the Anglo-Scandinavian site at 6-8 Pavement (Lloyds Bank). These latter two sites have been the subject of detailed bioarchaeological analysis (Hall *et al.* 1983; Kenward and Hall 1995).

Much of the archaeological sequence has been interpreted provisionally as the result of 'deposition at the water's edge either by natural agencies or perhaps as a result of deliberate dumping' (Finlayson 1988), with the effect of moving the waterfront west from its supposed pre-occupation course. There were two main series of structural elements: occasional linear features which may have assisted drainage across the site, and 'many examples of timber and wattle features running both at right-angles and parallel to the river' (*ibid.*). These wooden structures were not associated with any deposits interpreted as floors or occupation build-up and may thus have been boundary markers and/or revetments on the river slope. Some of the structures 'may have actually revetted the river's edge itself, although they could not be described as having formed a sophisticated waterfront' (*ibid.*). The duration of 'dumping by the river' is dated (provisionally) to the Roman to early post-Conquest periods, with the main phase being in the 10th and 11th centuries (Periods 3 and 4-1). For the later medieval period, 'the only feature of any consequence ... was a fine example of a barrel-lined well containing two complete barrels' (*ibid.*), the topmost barrel and the remainder of the medieval deposits having been truncated when the cinema (which occupied the site from the early part of the 20th century) was constructed.

The deposits encountered were subjected to extensive sampling, including a large-scale sieving programme for the recovery of bones, large plant remains and artefacts. Subsamples from most substantial contexts were taken for (a) site-riddling (SR *sensu* Dobney *et al.* 1992) to 11 mm (using a cement-mixer as an experimental means of disaggregating the material); (b) bulk-sieving (to 1 mm); and (c) as a GBA sample for the laboratory analysis of plant and invertebrate remains.

Material available and methods

Table 1 shows the numbers of sediment samples of different kinds by period and phase and indicates the provisional dating currently available.

BS subsamples were usually of about 50 kg in weight (91 of the samples were between 40 and 60 kg, the range being 12-80 kg) whilst SR samples were in a range from 18-1843 kg (with a mean of about 450 kg).

BS residues had (mostly) been stored wet in 10 litre plastic tubs in a cool, dark environment and (with one exception, where the tub had become cracked) had apparently undergone very little decay during the eight-year storage period. In a few cases white mould had developed on the surface and in a few others the softness of some of the wood indicated probable post-excavation decay. However, many of the samples were poorly disaggregated and those in this category which were chosen for a more detailed examination were rewashed and oven-dried. A few samples from the early stages of excavation had been dried and sorted by volunteers at the EAU or the Archaeological Resource Centre, York Archaeological Trust.

Records of major components in all the 137 BS residues located were made on a three-point scale of abundance. This is obviously a cruder record for those 86 samples where the residue was wet and not dried either prior to the assessment (11 residues) or after rewashing during the assessment (the remaining 40 residues).

GBA and SPOT samples were stored in similar tubs to the BS samples and, again, few showed more evidence of change during storage than a little efflorescence of salts at the surface. For the purposes of assessment, 107 of the 164 GBA samples were chosen to represent the range of archaeological deposits and periods at this site. All of these were inspected and 40 (listed in Table 6) selected for further analysis by means of a 'test'

subsample (following techniques of Kenward *et al.* 1980 and Kenward *et al.* 1986). Microfossils were assessed using the 'squash' technique of Dainton (1992). The SPOT samples, although recovered from store, could not be located at the EAU during the assessment; some comments from the information available on the sample record sheets are given in Table 2.

For the assessment, plant remains from the GBA 'test' subsamples were examined from the 'flot' from paraffin flotation, and from the residue. Only a small amount of the latter was inspected from each sample and no systematic attempt was made to record remains semi-quantitatively. In a few cases, where interesting and unusual remains were encountered, rather more of the residue was checked. The presence of components other than plant remains was noted during this exercise. Insects (and other macro-invertebrates) were assessed by means of inspection of the flots from paraffin flotation. For most samples, preservation was recorded in the subjective manner normally employed for assessment but a selection of the flots (Table 7) was recorded in more detail as part of a trial for an experimental preservation recording scheme.

Six standard (31 x 31 x 22 cm) boxes of hand-collected shell had been recovered from the site (and there was also some material from those BS residues which had been sorted, see above). The shell was stored in one of three sizes of bag ('small', 'medium' and 'large'). A record of the range of species of mollusc present was made by scanning the contents of each of the bags. An assessment of the amount of oyster shell in the 'small' and 'medium-sized' bags from each context was made by counting the number of oyster shells in each of 10 well-filled bags of shell, 10 'averagely-filled' bags, and 10 bags containing smaller amounts of shell in bags otherwise chosen at random. These counts were averaged. The shell in each of the 'large' bags was counted, and averaged (Table 9).

There were five standard boxes of wood samples containing an estimated 250 individual samples (the samples consisting of one to several specimens). Most of the material consisted of fragments less than 20 cm in largest dimension. There was a mixture of samples 'hand-collected' from contexts during excavation and pieces of wood retrieved from SR samples during sieving on site. For the assessment, a few bags from each box were inspected to ascertain the state of preservation of the material.

A total of 65 boxes of animal bones (including both SR and hand-collected material) and 137 BS residues were available for this assessment. The hand-collected bones, and those from SR and BS samples, were selected to represent the range of periods and context types outlined in the Level III archive. Table 13 shows the extrapolated quantities of material (in standard boxes) that exist for each period (this includes both hand-collected and SR material combined), as well as the numbers of boxes and proportion of material recorded during the assessment. It can be seen that approximately 44% of the entire SR and hand-collected vertebrate assemblage has been assessed.

Thirty-one BS residues were identified as first or second priority, based on a semi-quantitative judgement of the quantity of bone viewed in an initial scan of 111 residues. Of these 31, a total of 14 were recorded in more detail, though none of these residues was sorted. For the purposes of this assessment, the bone component of each of the 14 residues was recorded using a simple abundance scale (i.e. 1—<10 fragments, 2—10-49 fragments, 3—50-99 fragments, and 4—∃100 fragments).

Results

Sediment samples

Plant and animal remains were usually present and often extremely abundant in the deposits from this site (Tables 3 and 6). The only contexts examined during the assessment by means of a test subsample in which biota were extremely sparse were some of the early ?natural layers (e.g. Contexts 4010 and 4011, interpreted archaeologically as possible river flood silts, and 1086, perhaps disturbed 'natural'). Of those BS residues poor in plant and animal remains, the highest proportions were in the earliest and latest deposits (Periods 0, 1 and 6); deposits of C10th-14th date (Periods 3-5) were generally rich in fossils and many were composed almost entirely of wood debris. Thus, of the 33 BS samples for which wood fragments were recorded at '3' (Table 3), 23 (70%) were from Period 4-1 (early-mid C11th) and a further 5 (15%) were from other phases of Period 4. Not surprisingly, where biota were present in abundance they were usually extremely well preserved; few fossils in most of the deposits showed much evidence of severe decay except for the woody and herbaceous plant debris forming the bulk of some of the sediments.

The shell (both from BS samples and hand-collection) was almost all oyster (*Ostrea edulis* L.), with a small number of cockles (*Cerastoderma* sp.) and mussels (*Mytilus edulis* L.). Fragments of winkle (*Littorina* sp.), limpet (*Patella* sp.), whelk (*Buccinum* sp.) and freshwater mussel (probably *Anodonta* sp.) were also noted as rare components and fragments of the shells of the land snails *Cepaea* sp. and *Helix aspersa* (Müller) were also

observed (Table 11). Most, but not all of the shell, was clean and most of it appeared to be reasonably well preserved. The largest groups of oysters were recovered from 11th century contexts, with other large groups from Roman and from 11th-12th century contexts (Table 10). Most of the oysters were recovered from contexts described as build-up or dumps.

Wood

Although double-bagged, a large proportion of the wood samples had become desiccated in store. In other cases, some mould growth was evident but the specimens were still firm. This material is nearly all identifiable, though no longer in as good a state of preservation as at excavation and requiring a longer mean time per specimen for identification as a result of the inadequate storage. However, it is doubtful whether identification of more than a small selection of the material needs to be undertaken. If there are contexts for which the identification of wood will enhance archaeological interpretation or specimens where further inspection indicates some possible archaeobotanical interest (there were some specimens which appeared to be elder, *Sambucus*, twigs, for example), then identification could be pursued. Clearly, if further work is not anticipated in the next year or two, action to prevent further decay will be necessary.

Bone (Tables 12-30)

Not surprisingly, bone was most commonly recovered from deposits described as dumps or build-ups, with only small amounts coming from the fills of linear features, ditches, pits and wells. By far the largest assemblages were recovered from contexts of Periods 4-1 and 6, with moderate amounts also present in contexts of Period 3 date. Extrapolated numbers of bones regarded as 'A' (*sensu* Payne 1991), which include measurable elements and mandibles with teeth), are shown for these periods in Table 15. Bones from Periods 1, 4-2, 4-3, and 5 were few and in the case of SRs represent material from only 13 contexts. Since Period 2 deposits were undated, the bones from contexts assigned to this period were not assessed. Material from deposits of all these periods is regarded as being of limited interpretative value and is not referred to further except in Table 13.

Discussion and potential of the material by period

This section should be read in conjunction with Tables 3 (BS residues), 6 (GBA test subsamples) and 12-30 (bones).

Period 0 (natural)

The two BS samples of this period were almost devoid of biological remains (one was completely barren, the other contained traces of bone and charcoal). Similarly, the GBA sample assessed produced only traces of remains and was not considered to have any potential for further work. The presence of bone and charcoal indicates some of these deposits not to have been pure 'natural'

Period 1 (Roman)

The deposits sampled were a mixture of 'build-up' layers (some of which were thought to be river silt), and sediments possibly dumped into the river. There was only a single feature fill (from a linear cut); the BS sample from this gave only traces of bone and shell together with mineral material (stone, gravel and sand) so it appeared to have little bioarchaeological potential. The BS samples from the other deposits were similarly poor in obvious biological remains, although some planorbid snails and a water vole tooth were noted from Context 2311 (one of the possible 'dumps into the river'). The GBA samples (two were assessed) suggested that there was some preservation of plant and invertebrate micro- and macrofossils and that at least a few of the ten samples would provide some interpretative information (concerning local vegetation and the means of deposition) if sufficiently large subsamples were investigated. In this case there may be some value in undertaking a review of all the remaining GBAs by means of 1 kg subsamples in order to determine those likely to be of value. It is worth noting that the 'squash' for Sample 369, from Context 2312 gave sufficient *Trichuris* eggs to warrant a full investigation of these remains.

Period 2 (undated)

The three deposits assigned to this period comprised the backfill of a pit, a build-up/dump layer and a deposits interpreted as 'disturbed natural'. The pit fill appeared, on the evidence of plant remains, probably to be of Anglo-Scandinavian date and the presence of immense numbers of cladoceran resting eggs (ephippia) strongly suggests that the cut was filled with water for some time (the abundant diatoms probably also reflect this). There were sufficient parasite eggs to suggest some faecal contamination. On the assumption that it can be dated, this fill deserves further investigation, although the low concentration of insect remains demands the

investigation of a very large subsample.

The build-up/dump layer was not assessed by means of a GBA and this sample deserves to be reviewed to determine whether it provides further dating and other evidence. The third deposit had a very small content of biological remains, not inconsistent with the archaeological interpretation as disturbed natural.

Period 3 (C10th/11th)

Most of the large number of sampled deposits dated to this period were build-ups and/or dumps. There were also a few cut fills of various kinds. The BSs showed many of the deposits to be rich in decayed wood fragments, and in nearly half, there were appreciable amounts of bone. The GBA subsamples assessed mostly contained useful quantities of plant and insect remains preserved by anoxic waterlogging, although in each case larger subsamples would be required for a reliable interpretation of the insects. These dumps appeared to have had varied origins, the components including ?hay, occupation material from within or around buildings, and perhaps flood deposits. In some cases, the 'outdoor' insect fauna and some of the weedy plant taxa appeared to be of local origin, however. For some samples, diatoms, phytoliths, mites, cladocerans or fly puparia were variously regarded as worthy of detailed study (diatoms and cladocerans to investigate water regime and quality, phytoliths to test for the presence of more completely decayed remains of certain plants, mites and fly puparia to augment data concerning ecology and the nature of dumped material).

The single cut fill assessed by means of a GBA contained 'bran', together with a trace of *Trichuris* eggs, perhaps indicating the presence of faeces.

For this period, it would appear worthwhile to carry out a review of the GBA samples by means of 'test' subsamples (and further 'squashes', since some of the samples contained small numbers of parasite eggs) before selecting material for detailed analysis.

There appeared to be considerable variation of preservation, colour and the appearance of broken surfaces of the bones between the two SR samples examined, as well as in the frequency of butchered and fragmented material (Table 16). This may indicate differences in refuse disposal or dumping, or point to the presence of at least some residual material within the context.

The range of identified species is shown in Table 20, together with total numbers of fragments, numbers of measurable bones, and numbers of mandibles with teeth *in situ*. Tables 25 and 26 show the range and number of skeletal elements for mammals and birds respectively. From these, it can be seen that the remains of cattle were most common, with dog bones also present in high frequencies. Material of some other common domesticates was also present, which included some elements of goat and, interestingly, several dog and cat bones showing chop and knife marks (possibly associated with skinning for pelts).

Although a very small amount of hand-collected bone was noted from contexts of this period, none was worthy of further recording.

Four BS residues were recorded in some detail (Table 18). Large mammal bones were present in moderate frequencies, although numbers of measurable bones were again limited. Of note was Sample 227 (Context 3115) which contained numerous fish bones (mostly clupeids and eel, clearly food remains).

Period 4-1 (early-mid C11th)

Again, most of the deposits for this period were richly organic dumps and/or build-ups and most of the BS residues contained moderate or large amounts of decayed wood, often with appreciable amounts of bone and sometimes of charcoal. The GBA subsamples examined mostly contained significant numbers of 'waterlogged' plant and invertebrate remains, representing dumping of materials probably including turf (in Contexts 2230 and 2278), stable manure (e.g. Context 2170 and 2204), dyeplants (in several samples) and perhaps even food waste (there were some records for *Prunus* fruitstones in at least two of the BS residues and traces of *Trichuris* in some squashes). The numerous phytoliths present in some samples might help to confirm the presence of quantities of grasses or sedges in these deposits.

There was also evidence for aquatic organisms, suggesting possible deposition of overbank sediments. A further component present in 2166 (in both the BS and GBA samples) and in the BS from 2189 was the remains of some plant stems provisionally identified as the coastal/estuarine *Scirpus maritimus* ('sea club-rush'), whose accurate identification and presence here need careful consideration, as do the other plant remains and the insect fauna from these samples. The possibility of marine incursion must be allowed for, although the simplest explanation for the presence of the ?club-rush is that it was imported as litter or for some other 'domestic' purpose. Analysis of the abundant diatoms in this and some other samples in this sequence could well elucidate the question.

Undoubtedly a substantial amount of information about local conditions, the material dumped, and its origin would be obtained by detailed investigation of selected material from Period 4-1. Again, the most sensible approach would be through a review of the remaining GBAs prior to selection.

It seems likely that this complex series of dumps originated from properties up-slope, fronting onto Coppergate/Pavement and their investigation has particular relevance in relation to the later Anglo-Scandinavian periods (5B and 5C) at 16-22 Coppergate.

The few fill deposits for this period were mostly of types regarded as having little potential for bioarchaeological investigation, although two pit fills (unassessed by a GBA) deserve at least review.

Vertebrate material from all the three contexts assessed by means of an SR sample seemed similar in general appearance, with preservation recorded as 'fair', colour and angularity of all broken surfaces both being recorded as 'variable' (Table 16). There was extensive evidence of heavy and systematic butchery: scorching and longitudinal splitting of cattle long-bones and caprine and cattle vertebrae and crania (the last broken to allow access to the brain).

The range of species is similar to that for Period 3, with the remains of cattle being most common (Table 22). Pig and sheep fragments occurred in moderate numbers, with dog, cat chicken, goose and fish also present. A single roe deer phalanx was identified (from Context 2280, Tables 22 and 27).

Three Period 4-1 contexts (2087, 2089 and 2291) produced large quantities of hand-collected bone (Table 21). Interestingly, material from all three was similar in quality of preservation (recorded as 'good'), angularity of broken surfaces (recorded as 'spiky') and colour (recorded as 'dark to light brown'). There was an obvious difference between the SR and hand-collected material from Context 2291 which may be explained by the use of a cement-mixer for the initial disaggregation of material for sieving.

Perhaps the most interesting aspect of the hand-collected assemblage from Period 4-1 was the presence of numerous (and often worked) goat horncores (especially from Context 2089). These had often been sawn through their base and sometimes across the tip, presumably to aid the removal of the hornsheath. There were, in addition, several horncores of rams (most, again, having been sawn through the base) and several sheep crania with evidence of horn removal. Material from other smaller contexts, which was provisionally scanned but not recorded, also contained goat and sheep horncores. Very few goat post-cranial elements were identified, despite careful use of comparative criteria for differentiation of sheep and goat. Further possible evidence for craft activity was a large (possibly wild) cat mandible from Context 2087 which showed skinning marks on the buccal (outer) surface of the corpus. It would therefore be reasonable to conclude that at least some contexts from Period 4-1 contained specialised horn working waste as well as evidence (similar to that for Period 3) of possible pelt preparation.

The range and frequency of species are similar to those noted from the SRs, although some additional taxa were identified (Table 21). These included hare, black rat, red deer (a single worked antler tine) and raven. The bones of cattle and chicken exhibited a wide range of sizes, whilst all the geese fragments were of greylag-size, except for one identified as ?barnacle goose. A single human distal tibia fragment was identified from Context 2089 and was probably residual.

Four Period 4-1 BS residues were recorded in some detail (Table 18). Large mammal bones were present in low or moderate frequencies in three samples, with the material from Context 3088 containing proportionally higher numbers. Measurable bones were present only in very low frequencies. Material from Context 2089 appeared very battered and highly comminuted (with numerous fresh breaks), probably a direct result of processing the sample using a cement-mixer. A range of fish species was recorded from all samples (Table 18) but were mostly present in low frequencies (i.e. 10-50 fragments per sample). However, the sample from Context 2089 produced a higher concentration (50-100 fragments), most being provisionally identified as clupeid and gadid, obviously food remains.

Period 4-2 (late C11th/early C12th)

This phase represents further dumping and/or build-up and the BS residues for samples from it were essentially rather similar to those from the preceding phase; there were often moderate or large amounts of wood and/or bone. Two contexts yielded planorbid snails in small numbers. Two of the GBA samples assessed appeared to contain food waste or faecal matter—worm eggs were only detected in one of these but the 'squash' technique may, of course, have missed local concentrations. Phytoliths were abundant in two of the samples and diatoms present in small numbers in all three.

Insects were sufficiently abundant in these samples to have interpretative potential if larger subsamples

were processed, and ostracods were present in modest or large numbers in two samples. The latter offer an opportunity to investigate water quality, including any marine influence. The remaining GBA samples would usefully be reviewed before selection for detailed recording.

Three BS residues from Period 4-2 samples were recorded in some detail (Table 18). All contained low frequencies of fish remains, with a range of taxa which included eel, clupeid, pike, and cyprinid (Table 19).

Period 4-3 (C12th/early C13th)

Further dumps, including some demolition deposits, were assigned to this phase. Plant and animal remains were not especially frequent in the BS residues, although a few again contained moderate or large amounts of wood debris. Of the two GBA samples assessed, one gave an insect fauna suggesting rather foul conditions and deserves further work (including analysis of fly puparia and also diatoms); the other contained few remains of any kind.

Period 5-1 (late C13th)

The deposits examined from this phase of the site were a mixture of build-ups and fills of linear cuts. Most had a moderate amount of wood and some also had quite large amounts of charcoal. The BS sample from Context 3015 was unusual for this site in yielded moderate numbers of well-preserved charred cereal grains, of which a good proportion were recognised as rye, *Secale cereale.* Amongst the GBA samples, charred grains were a prominent feature of the 'test' sample from the same context, and grain was present in smaller amounts in the sample from Context 3016 (which was a cut fill sealed by 3015). Both of the samples from cut fills were poor in remains of plant and invertebrate macrofossils preserved by anoxic waterlogging. The build-up deposits gave variable amounts of these remains but one of them is regarded as having interpretative potential (subjectively indicating stable manure or other foul material), providing a larger subsample is processed. Some of the samples contained appreciable numbers of phytoliths or diatoms, and parasite eggs were present in small numbers in two.

Period 5-2 (C14th)

Biological remains other than charcoal were sparse in the BS samples examined. The GBA sample assessed had poor preservation of plant and invertebrate remains, though there were some phytoliths and traces of diatoms and parasite eggs.

For the bone, a single BS residue was all that was thought worth recording amongst the material from Period 5-2 (Tables 18 and 19). Sample 64 (Context 3071) contained large numbers of fish remains (>100 fragments). These included the remains of mostly small fish (clupeid and ?cyprinid), but also haddock and cod.

Period 6 (C14th/15th)

The residues from the BS samples from the backfills of the well of this period were predominantly brick/tile and mortar/plaster, indicating a large component of probable demolition debris. Biological remains were generally sparse. Some of the GBA samples produced interesting assemblages of plant and invertebrate remains, notably the samples from Contexts 2008 and 2114, which contained some evidence for plants and invertebrates associated with textile working (dyeplants—weld, woad and dyer's greenweed—and a sheep ked). Indeed, one of the samples appeared to consist very largely of the waste from a woad vat. Insect remains were present in appreciable numbers and each of the four samples assessed would provide an interpretable assemblage given the examination of larger subsamples. The insects were ecologically rather mixed. Amongst the microfossils, the squashes from two samples gave parasite eggs and diatoms and one of these also contained a few phytoliths. Rather remarkable fossils were remains of woodlice, preserved apparently by anoxic waterlogging rather than 'mineralisation'—although the high content of lime from the abundant mortar/plaster in these deposits may account for this unusual phenomenon.

The fills of this well appear to contain the remains of organisms pointing to a variety of activities and perhaps also a component originating from the immediate surroundings. Providing the dating of the deposits is reasonably tight (i.e. within about a century) and it can be established that the fine deposits did not infiltrate voids amongst coarse clasts at a much later date (using micromorphological studies of undisaggregated blocks of sediment from the GBA samples), these remains deserve detailed investigation.

The fills of the various cuts mostly gave BS residues with few organic remains other than charcoal. One, however (cut fill 2011), consisted largely of compressed herbaceous detritus (?stable manure) with concretions which may have formed as a result of evaporation-condensation cycles within the tub during storage rather than having formed in the ground prior to sampling. The

presence of coal and cinder in several samples seems noteworthy; these materials do not in the authors' experience often occur in medieval deposits in York at such an early date. The single GBA sample representing these cut fills gave plant and invertebrate remains in modest quantities; both would be recovered in interpretable quantities from a larger subsample. The abundant phytoliths in this deposit may be useful as evidence of a component in the plant remains which had otherwise decayed.

The '?stable manure' seen in the last group was also a major component of the BS residue from one of the build-up/dump deposits of this Period (Context 2082); again, the formation of concretions in this residue is thought to have occurred in store. Otherwise, the BS samples had a rather low content of organic material other than charcoal. The GBA samples yielded variable quantities of plant and invertebrate macrofossils, including evidence for stable manure (Context 2082 again) and burnt and unburnt peat (2010). The subsamples from the latter context also gave some possible food plant remains. Parasite eggs were present in all three samples assessed by squashes, and there were variable quantities of phytoliths and diatoms.

Preservation of bone from most of the samples from Period 6 deposits was similar (usually recorded as 'fair'), whilst the angularity of the broken surfaces and the colour varied considerably between assemblages. This may suggest differences in refuse disposal or indicate the presence of residual material. Again, the bones appeared to be quite heavily comminuted, with moderate and high proportions of large mammal fragments of less than 5 cm in maximum length. Butchery was also commonly noted, particularly in the form of longitudinal chopping of sheep and cattle vertebrae (indicating the splitting of carcases into 'sides').

The range of species appears more limited than for earlier periods (Table 23). In common with the material from Period 4-1, raven is again present.

A total of only 88 identifiable fragments was recovered, which included 23 measurable fragments, but no mandibles with teeth. It is envisaged that a total of 240 'A' bones, including 60 measurable and perhaps five mandibles with teeth, would be available for study from the whole Period 6 SR assemblage.

A single context (well-cut backfill 2042) produced enough hand-collected bone to be worthy of more detailed recording (Table 24). The range of species was similar to that for the SRs, with similar low counts of fragments (Tables 29 and 30). Butchery was again extensive, and similar in nature to that already described for the SRs. Goat was identified on the basis of a single radius fragment. A fragment of human scapula was also identified and is probably residual material.

In addition to material from Context 2042, bones from several contexts (build-ups/dumps 2041, 2047 and 2048) were briefly scanned since there appeared to be numerous large bird bones. On closer inspection, they were identified as parts of the skeleton of a single mute swan. Both of the humeri from this bird showed knife marks on the distal articulation, with one being chopped at the proximal end. Both tibiotarsi had also been chopped through their distal ends.

Two BS residues were recorded in some detail (Tables 18 and 19). Large mammal bones and birds were present in low or moderate frequencies in both samples, although the sample from build-up Context 2082 produced moderately large numbers of fish bones (i.e. 50-100 fragments) and these also showed a high diversity of species (i.e. >4 taxa), including Gadidae, haddock, herring and salmonid. The fish species from Context 2079 included large gadid, flatfish (?Pleuronectidae) and herring. Some fish scales were also noted.

General discussion: the site and its potential

As mentioned above, much of the archaeological sequence has been interpreted as having formed by deposition at the water's edge by natural means or as a result of deliberate dumping. Both the nature of the deposits and the results of the biological analyses strongly indicate that this is so. The dumps appear to include components representing a variety of activities and materials, amongst which were stable manure, dyeplants, debris from woodworking and horn working, cereals and other foods, and butchery waste. It seems likely that most of the dumped materials originated from properties fronting onto Coppergate/Pavement (the nearest road today, Piccadilly, being an early 20th century insertion). Evidence from the analysis of these dumps would be complementary to the results from work at sites in Coppergate and Pavement, since it might be speculated that this is the area in which ejectamenta 'missing' from the parts of the properties close to buildings would be deposited.

The mineral component of these dump and build-up deposits may include material dropped by flooding: many of the samples contained small to large numbers of diatoms and a considerable proportion had more aquatic insects than seem likely to have entered by chance. A few contained quite large numbers of water-flea resting-eggs or of ostracods which undoubtedly stand as evidence of water. Diatoms have not been sought routinely

from other sites in York, so it is not known whether they are present in a wide range of deposits or confined to those containing a waterlain component. Analysis of these microfossils will thus be worthwhile firstly to determine whether they are aquatic or soil-dwelling forms and secondly (and if they *are* aquatic) to establish water quality, including salinity. A second line of approach would be the use of thin sections of blocks of sediment in order to establish whether the voids between coarse particles such as plant debris in dumped layers had been infilled with water-borne fine material, indicating deposition in water or at least flooding onto waterside dumps or accumulations.

Thus, although the bulk of the deposits at this site are 'secondary' they have the potential to yield considerable amounts of useful archaeological information.

A small number of cut features were identified at various stages in the sequence of dumps and build-ups. The several linear features may have assisted drainage across the site. In general, however, their fills appeared to be broadly similar to the dumps, and it seems likely that these 'drains' became infilled incidentally to dumping and were presumably occasionally replaced at higher levels in response to need. The fills of the rare non-linear cuts similarly had a general resemblance to the other deposits at the site—certainly none of those seen during the assessment appeared to consist of a concentration of primary waste material such as human faeces or dyeplant waste.

It thus appears that the site was used in a very different way from the areas identified as yards associated with the buildings at 16-22 Coppergate, where waste disposal was concentrated in pits and to a lesser extent in gullies. Whether dumping was carried out informally or as part of an organised programme to raise levels is not certain. The presence of the timber structures tentatively identified as revetments perhaps suggests that there was at least occasionally a deliberate campaign to concentrate waste as infill along the river's edge. The nature of the material and the fairly restricted ranges of artefacts included and activities indicated suggest that, if this was so, then dumps originated from a limited area which may well have been just the adjacent properties.

The later medieval barrel-lined well stands out as containing fills with some unusual components, although even this material appeared as a whole not to represent any one kind of activity. Indeed, several characteristic ecological or activity groups could be recognised: indicators of food waste, woodland litter, and possibly hay or stable manure; one context seems to have contained material from a woad vat. It is likely that the well was quickly infilled with currently available waste from nearby, including demolition debris, and thus that the biota are likely to have been roughly contemporaneous.

Plant and invertebrate remains from BS samples

Although a large proportion of the BS residues consisted in large part of plant remains, much of this was wood and charcoal whose further analysis is probably of limited value. In a few cases there were 'chips' from working, however, and identification of the species involved may shed some light on the kind of activity generating the debris—chips from oak being more likely to represent working of larger structural timbers, for example, with hazel or willow perhaps from small structures such as wattle or wickerwork. A few BS samples gave other remains whose further investigation maybe of value; at least one contained modest numbers of well-preserved charred cereal grains, apparently mostly rye; others included some trigonous plant stems (see above) whose secure identity ought to be established.

All the marine shell is considered below; land and freshwater molluscs were present in limited numbers in some of the BS samples.

Bones

This excavation yielded moderately large assemblages of animal bone, the largest, and hence, most useful, bodies of material coming from deposits dated to Periods 3, 4-1 and 6. Those assemblages from well dated early-mid 11th century (Period 4-1) and 14th-15th century (Period 6) deposits are perhaps the most interesting in that they are from periods which are poorly represented in the archaeological record of the city. Material from this site also provides one of several groups from York that have been sampled extensively (by means both of site riddling and bulk-sieving); we can therefore be assured that recovery bias is small.

The extensive use of a cement-mixer for disaggregating large amounts of sediment as part of the on-site recovery procedures has certainly led to a degree of erosion and fragmentation of bone in both the SRs and BS residues. Many of the bones recovered using this technique were quite different in appearance from their hand-collected counterparts from the same context. Some had a very rounded and eroded appearance which, at first glance, might be interpreted as evidence of water transportation. However, the presence of numerous fresh breaks, combined with the almost complete absence of these characteristics in the hand-

collected material, clearly indicate a different origin. Use of the cement-mixer may also have had a detrimental affect on the small bird and fish bone assemblages, and perhaps resulted in the wholesale destruction of certain taxa.

The limited size of the assemblage from the site as a whole renders any very detailed analytical study of somewhat limited value. However, a biometrical study of cattle bones from Period 4-1 deposits may throw further light on the apparently wide size range observed during the assessment, providing information about possible stock improvement and husbandry regimes. Detailed recording of species and element distribution from a variety of context types of differing date will provide important evidence for the pattern of refuse disposal, as well as possible socio-economic differentiation. Particularly important comparative assemblages in this respect are the groups of bone from deposits of Anglo-Scandinavian (mid-late C11th) date (Periods 5B and 5C) from 16-22 Coppergate (O'Connor 1989).

The nature and extent of the butchery seen on some of the material from this site indicate the presence of commercial butchery waste at all periods, whilst the range of elements and species (including chicken) suggests a significant domestic refuse component. Of perhaps more interest is the evidence for specific craft and industrial activities from Period 4-1 deposits. Numerous goat (and some sheep) horncores, which have obviously been worked, indicate the presence of horn workers' waste. The very limited numbers of post-cranial elements identified as goat perhaps indicate that horncores were imported into the city specifically for this trade. Similar assemblages of early medieval date have previously been identified from 12th-13th century contexts from several York sites: the General Accident site, Tanner Row (O'Connor 1988), 9th-12th century deposits at North Street (Dobney and Jaques 1993), and post-Conquest deposits at Skeldergate (O'Connor 1984), Petergate (Ryder 1970) and Swinegate (Carrott *et. al.* 1994).

In addition to the horn workers' trade, there is some possible evidence of small-scale pelt preparation (specifically of dog and cat) in the material from both Period 3 and Period 4-1 assemblages. More detailed study would elucidate the nature of both these specialised activities.

Some BS samples from all those periods for which material was assessed produced moderately high concentrations of fish remains, but only very limited numbers of small mammal, bird and amphibian bones. Most of the fish were marine species, supporting the view that domestic refuse or kitchen waste was regularly being dumped in this part of the city throughout the medieval period. (The possibility that fish bone in these riverside deposits represents waste from fish processing *in situ* must be considered, although there was no obvious bias towards elements likely to have been discarded at this stage). Well-dated fish assemblages from the early-mid 11th centuries and the later medieval period would provide important additional information regarding the medieval northern fisheries and trade to inland towns.

Recommendations and resource requirements (cf. Table 31)

Sediments

Material from selected samples should be examined to investigate depositional regimes. This should involve inspection of whole sediments 'in the hand' and a limited programme of thin section work specifically aimed at determining whether there is evidence of infilling of voids in dumped material by water-borne fine particles. Since no orientated block sediment samples were taken, it will be necessary to use lumps of undisaggregated sediment from GBA samples for preparation of thin sections; it is considered that this will be acceptable in addressing the specific question of infiltration.

Plant and invertebrate micro- and macrofossils from GBA samples

Tables 4 and 5 show the huge investment which would be needed to analyse all of the first and second priority plant and invertebrate material from the GBA samples, assuming that a direct extrapolation can be made from the material assessed to the samples as a whole (a total of over seven years contact time just to record and enter data for detailed analysis of the full range of remains, for example). The sample material and range of context types were remarkably uniform throughout the site and care was taken to be representative during selection of samples for assessment, so that this estimate appears at first sight to be a reasonable one; however, it can be substantially reduced for a number of reasons.

One of the period-phase combinations (4-1) is represented by a very large amount of material and there are quite large numbers of samples from Period 3 (see Table 4). Analysis on this scale cannot, of course, be justified for a site of this kind, particularly because the deposits cannot be directly related to the conditions and activity responsible for much of the biota in them, and indeed because of the uniformity already remarked upon. *It is thus recommended that a stage of selection by means of a review is carried out prior to the main stage of analysis.* It will certainly not be necessary to make

a detailed record of the biota of all samples and it is suggested that *time requirements can be reduced by employing a range of recording methods (from 'assessment' to 'detail')* to provide a general view of the material together with objective support for interpretations. The numbers of analyses suggested in Table 5b reflect the need to provide at least minimum representation of each dated phase.

The estimates for recording times for some of the groups (particularly the insects and minor invertebrates) from individual GBA samples used during calculation of resource requirements included an allowance for familiarisation with unusual material which perhaps should not form the basis for a direct extrapolation. For this reason, the average recording times have been further reduced. The time estimates for work on insect remains in Table 31 take account of savings through both the use of rapid recording techniques and a reduced allowance for the difficulty of working on some assemblages.

It is recommended that, in addition to the customary analyses of plant macrofossils, parasite eggs and remains of beetles and bugs, there should be carefully targeted limited investigations of diatoms, phytoliths, cladocerans, ostracods, mites and fly puparia.

The resource requirements given in Table 31 assume that only selected GBA samples will be analysed more closely following review; the numbers of analyses by period for each class of remains on which these figures are based on those given in Table 5b.

Plant remains from BS samples

It is recommended that 10 selected BS samples are examined in further detail for plant remains, with emphasis on the samples alluded to above in which material of particular archaeobotanical interest has been observed. The assessment record will suffice for the remaining samples.

Shell

Very little is currently known about oyster exploitation outside Hampshire and London. *Therefore it is recommended that a fuller record should be made of the oysters recovered from contexts from Roman to 12th century* to allow comparison to be made of the oyster trade within York between Roman practices and post-Roman practices, and with other communities outside York, both locally and nationally. This will involve recording up to 20 features on each selected shell. It is estimated that there will be about 3208 measurable valves, so that *subsampling will be necessary. It is recommended that a minimum of 50 upper and 50 lower valves in good condition from each phase is measured, or all of the suitable valves if there are fewer than this.*

Non-marine shell from four selected BS samples should also be examined to provide information concerning depositional environments of the sediments in which they occur.

Bones

It is recommended that all SR and hand-collected assemblages from Periods 3, 4-1, 4-2 and 6 be recorded in detail. All BS samples of Priority 1 and 2 (a total of 31) should be sorted for fish bone and other small vertebrates, the remainder (80 of Priority 3) being rapidly scanned for additional species.

Particular attention should be paid to biometrical analyses of cattle from Period 4-1, and of goat horncores from Periods 3 and 4-1, analysis of the skeletal element distribution amongst differing context types from Periods 3, 4-1 and 6, and careful examination of dog, cat or wild mammal material for further evidence of skinning

The study of the Anglo-Scandinavian period (represented here by material from Periods 3 and 4) has been highlighted as one of a number of high priority academic objectives by English Heritage (1991, 37), as has the theme 'Patterns of Industry and Craftsmanship' (*ibid.*, 42).

Retention and storage

All material should be retained for the present, pending an application for funding for further investigations. A decision concerning the retention (and if so, preservation) of the wood samples needs to be made urgently, however.

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Table 1. Numbers of samples taken (with the contexts they represent in parenthesis) from 22 Piccadilly, by period and phase. A single SR sample (274) from Context 3136 remains unphased (there is no record of the use of this context number other than in the on-site sieving records). One BS residue (Sample 26, Context 2010) was not located.

Period (and date)	Phase	BS	GBA	SPOT	SR
0 (natural)	-	2 (2)	6 (6)	-	2 (1)
1 (Roman)	-	10 (10)	10 (10)	-	9 (9)
2 (undated)	-	3 (3)	4 (3)	-	1 (1)
3 (C10/11)	-	16 (16)	24 (24)	4 (3)	11 (10)
4 (early-mid C11)	1	56 (56)	69 (69)	3 (3)	20 (18)
4 (late C11/early C12)	2	9 (9)	12 (12)	-	2 (1)
4 (C12/early C13)	3	6 (6)	7 (7)	-	1 (1)
5 (late C13)	1	5 (5)	5 (5)	-	-
5 (C14)	2	4 (4)	3 (3)	-	1 (1)
6 (C14/15)	-	27 (22)	24 (22)	1 (1)	26 (15)
Total		138 (133)	164 (161)	8 (7)	74 (59)

Table 2. SPOT samples from 22 Piccadilly: excavator's notes from sample sheets together with some interpretative comments.

Period	Phase	Context	Sample	Context type	Comments
3	0	1031	129	dump/build-up (structured and amorphous peat/woody material)	[no information on sample sheet; GBA, BS and SR also available for this context]
		2293	356	build-up (gritty clay)	'?insect gall from tree'
		3130	272	build-up/dump(compact black/grey clay)	[no information on sample sheet]
		3130	300	ditto	'Gryphaea' [i.e. if correctly identified, merely a Jurassic fossil from drift or stone]
4	1	2142	135	build-up (peat with structured organic matter)	'clumps of laminated organic matter from 2142' [Sample 128 from same context recorded as 'very organic, reddish' during selection of GBAs but not chosen for further investigation at this stage]
		2186	299	build-up (loose gritty silt with many ?cow long-bones)	'mollusc (oyster) with lichen attached...' [very likely simply to be epibiont such as bryozoon, annelid worm shell or calcareous alga]
		2278	327	build-up (friable silt with black matted organic material)	'charred grain for id.' [this context examined by means of a test subsample; possible evidence for 'turves' but no charred grain observed]
6	0	2001	21	backfill in well 2002 (loose loam)	'holly leaf?'

Table 3. Some results of assessment of BS residues from the ABC Cinema site. The numbers of scores (for samples) in each of four categories of abundance (from 0 to 3) are given for selected components. No. contexts = 133, no. samples = 137 (one residue, Sample 26, Context 2010, was not located; a second sample from the same context was, however, examined).

Component	No. 0 scores	No. 1 scores	No. 2 scores	No. 3 scores
bark fragments	122	11	3	1
twig fragments	109	25	3	0
wood fragments	32	32	40	33
charcoal	43	53	38	3
moss fragments	131	4	2	0
hazel nutshell fragments (and some whole nuts)	114	22	1	0
concretions (?faecal)	135	0	0	2
bone	26	80	28	3
shellfish	55	79	3	0
snails	131	6	0	0
eggshell	130	7	0	0
brick/tile	42	76	10	9
mortar/plaster	120	5	6	6
pottery	74	61	2	0

*Table 4. Numbers of GBA samples available, and samples examined in the assessment (numbers of contexts are in brackets) The 'X factor' is used in Table 5 to extrapolate times needed for further work on plant and insect remains (other than fly puparia) from this material. Figures marked * might well be excluded from further analysis if they represent archaeological periods or deposits which are not thought worthy of inclusion in the project. The minimum numbers of samples for analysis following review (last two columns) are considered to be the smallest number of samples likely to be representative. P1, P2 are explained in the caption to Table 6.*

Period (and date)	Phase	Available	Examined	X factor	Plant P1+P2	Extrapolated plant P1+P2	Insect P1+P2	Extrapolated insect P1+P2	Minimum plant analyses	Minimum insect analyses
0 (natural)	-	6 (6)	1(1) 17%	6.0	0	0	0	0	0	0
1 (Roman)	-	10 (10)	2(2) 20%	5.0	1	5	2	10	4*	4*
2 (undated)	-	4 (3)	2(2) 50%	2.0	1	2	1	2	2*	2*
3 (C10/11)	-	24 (24)	6(6) 25%	4.0	5	20	6	24	6	6
4 (early-mid C11)	1	69 (69)	11(11) 16%	6.3	10	63	10	63	10	10
4 (late C11/early C12)	2	12 (12)	3(3) 25%	4.0	3	12	3	12	6	6
4 (C12/early C13)	3	7 (7)	2(2) 29%	3.5	2	7	1	3	4	3
5 (late C13)	1	5 (5)	4(4) 80%	1.3	4	5	1	1	4	1
5 (C14)	2	3 (3)	1(1) 33%	3.3	1	3	0	0	3	0
6 (C14/15)	-	24 (22)	8(8) 33%	3.0	8	24	6	18	8	8
Total		164 (161)	40(40) 24%		35	141	30	133	41+6*	34+6*

Table 5. Times for further analysis of plant and invertebrate macrofossils from GBA samples. (a) direct extrapolation from assessed material to entire body of samples; (b) extrapolated times for recommended minimum programme. See text for exaplanation of modifications to these figures adopted for Table 31.

Key: X factor - multiplication factor based on proportion of samples available that were assessed ; PT - processing time (includes sorting for insects); RA - research assistant; RF - research fellow; par - parasite eggs ; phy - phytoliths; dia - diatoms; pup - fly puparia; mte - mites; cld - cladocerans; ost - ostracods (for explanation of P1/P2 and R, see key to Table 6).

(a)

Per.	Phase	Total PT	Total R for plant P1+P2		Total R for microfossils, P1+P2					Total R for insects (general), P+P2		Total R for other groups, P1+P2					
			RA	RF	RA par	RF par	RA phy	RF phy	Cons dia	RA	RF	RA pup	Cons pup	Cons mte	RA cld	RF cld	Cons ost
0	-	0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	-	62.2	12.7	0.8	18.8	1.1	0	0	0	54.0	3.0	0	0	0	0	0	0
2	-	6.8	15.3	1.0	7.5	0.4	24.5	2.5	25.4	16.2	0.9	0	0	0	30.0	30.0	0
3	-	94.9	122.0	8.1	18.0	1.0	101.7	10.2	203.4	626.4	34.8	108.0	18.0	45.0	45.0	45.0	0
4	1	270.5	480.5	32.0	18.9	1.1	800.9	80.1	400.4	1547.9	86.0	170.1	28.4	141.8	70.9	70.9	0
4	2	58.8	61.0	4.1	12.0	0.7	156.6	15.3	152.6	324.0	18.0	0	0	0	0	0	180.0
4	3	11.5	25.9	1.7	5.1	0.3	43.2	4.3	43.2	45.9	2.6	45.9	7.7	0	0	0	0
5	1	4.4	29.7	2.0	3.9	0.2	66.1	6.6	49.6	14.0	0.8	0	0	0	0	0	0
5	2	0	16.8	1.1	5.0	0.3	42.0	4.2	42.0	0	0	0	0	0	0	0	0
6	-	79.1	156.6	10.4	21.0	1.2	178.0	17.8	178.0	385.6	21.4	0	0	31.5	0	0	0
Total (hrs)		588.2	920.5	61.2	110.2	6.3	1413.0	141.0	1094.6	3014.0	167.5	324.0	54.1	218.3	145.9	145.9	180.0
Total (days)		79.5	124.4	8.3	14.9	0.85	190.9	19.1	147.9	407.3	22.6	43.8	7.3	29.5	19.7	19.7	24.3

Table 5. (b)

Per.	Phase	Total PT	Total R for plant P1+P2		Total R for microfossils, P1+P2					Total R for insects (general), P+P2		Total R for other groups, P1+P2					
			RA	RF	RA par	RF par	RA phy	RF phy	Cons dia	RA	RF	RA pup	Cons pup	Cons mte	RA cld	RF cld	Cons ost
0	-	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0
1	-	62.2	10.2	0.7	18.8	0.9	0.0	0.0	0.0	21.6	1.2	0	0	0	0	0	0
2	-	6.8	15.3	1.0	7.5	0.4	22.5	2.3	22.5	16.2	0.9	0	0	0	30.0	30.0	0
3	-	94.9	36.6	2.4	18.0	0.9	67.5	6.8	67.5	156.6	8.7	108.0	18.0	45.0	45.0	45.0	0
4	1	270.5	76.3	5.1	18.0	0.9	90.0	9.0	90.0	245.7	13.7	170.1	28.4	141.8	70.9	70.9	0
4	2	58.8	30.5	2.0	12.0	0.6	67.5	6.8	67.5	162.0	9.0	0	0	0	0	0	180.0
4	3	11.5	15.3	1.0	4.5	0.2	33.8	3.4	33.8	40.5	2.3	45.9	7.7	0	0	0	0
5	1	4.4	22.9	1.5	4.5	0.2	56.3	5.6	33.8	10.8	0.6	0	0	0	0	0	0
5	2	0	15.3	1.0	4.5	0.2	33.8	3.4	33.8	0.0	0.0	0	0	0	0	0	0
6	-	79.1	55.9	3.7	21.0	1.1	67.5	6.8	67.5	183.6	10.2	0	0	31.5	0	0	0
Total (hrs)		588.2	278.3	18.4	108.8	5.4	438.9	44.1	416.4	837.0	46.6	324.0	54.1	218.3	145.9	145.9	180.0
Total (days)		79.5	37.6	2.5	14.7	0.7	59.3	5.9	56.3	113.1	6.3	43.8	7.3	29.5	19.7	19.7	24.3

Table 6. Results of analyses of 'test' subsamples for selected GBAs in period, phase, and sequence order. See Table 8 for key to abbreviated context types. Very brief notes on the sediments were made during selection for assessment and some are referred to here. Flots of normal size unless noted. Key: M-f = microfossils; Ins = insects; CN = context number; Per = period; Ph = phase; Seq = Sequence; SN = sample number. In Priority column: Pn = priority; +3 = process larger subsample (in this case 3 kg); S = sorting time; R = recording time; LPn = priority for larger subsample (if different); LW = time for processing recommended larger subsample (3.0 hours if no figure is given); LR = time for recording recommended larger subsample. In M-f column, Par = parasites; Phy = phytoliths; Dia - diatoms; PF = time needed for full investigation of parasites, PS = time needed for further investigation of parasites through 'squashes'. In Ins, etc. column, Cld = Cladocera; Lva = larva; Mte = mites; Ost = Ostracoda; Pup = puparia; Wdl = woodlice. Times are only for specified tasks, and do not include allowances for ancillary activities, data analysis and reporting.

Per	Ph	Seq	CN	SN	Context	Matrix and biota	Priorities and times		
							Plants	M-f	Ins, etc.
0	-	4.02.01	4011	383	?FLD	The sediment had the character of a river silt. The tiny residue consisted mainly of iron-concreted silt with some root channel casts. There was a single stinging nettle (*Urtica dioica*) achene in the flot, along with a trace of plant detritus and charcoal <1 mm and a few very decayed fragments of insect cuticle. No significant microfossils were noted in the 'squash'.	P0 R0	P0	P0 R0
1	-	2.01.02	2312	369	?DUM	The sediment was described as silty clay. The residue for this subsample was very small and consisted mainly of sand and fine-gravel-grade iron-concreted silt; there were traces of brick/tile to 5 mm and of bone, wood and charcoal all less than 10 mm. Stinging nettle achenes were abundant but otherwise there were few identifiable plant remains (all essentially weeds). The flot contained a few insects of various ecological affinities, but a much larger subsample would be needed to give even an approximate interpretation. Three *Trichuris* eggs were noted in the 'squash'.	P2 R0.5	Par P1 PF2.5	P3 R0.2 LP1-2 +>5 kg LR2.0

1	-	4.03.01	4010	377	?FLD	The sediment was described as clay. There was a small residue which included a large potsherd and some sand and gravel, much of the mineral component consisting of iron-concreted silt pellets. There was a little herbaceous detritus in the form of root/rootlet fragments, together with a small range of identifiable plant taxa exhibiting moderate to good preservation. These included weeds and waterside/aquatic taxa but are not particularly diagnostic of the conditions which may have led to the formation of the deposit. There were several *Daphnia* ephippia in the flot, but only traces of other invertebrates. An extremely large subsample might provide some information. No significant microfossils were noted in the 'squash'.	P3 R0.5	P0	P3 R0.2 LP2 +>>5 kg LW5 LR2.0
2	-	1.02.01	1086	210	DNAT	The small residue consisted of sand and gravel with traces of brick/tile fragments to 5 mm. There was <5% charcoal (to 10 mm) and a single large fragment of ?freshwater mussel shell. The flot contained only a trace of unidentifiable arthropod cuticle. No significant microfossils were noted in the 'squash'.	P3 R0.5	P0	P0 R0
2	-	2.02.02	2308	365	PIBF	The residue was about 50% sand and gravel with traces of brick/tile, the remainder being organic material, including some roundwood fragments to 30 mm diameter (perhaps from decayed wattle or wickerwork); most of the rest was very decayed wood. There was also much fine charcoal. The presence of two dyeplants (clubmoss, *Diphasium*, and madder, *Rubia tinctorum*) suggests that this fill is probably Anglo-Scandinavian). Other taxa included several mosses likely to have grown as epiphytes on wood and some further 'useful' plants (hemp and apple). Cladoceran ephippia of at least three kinds were immensely abundant in the flot (suggesting still shallow water *in situ*, perhaps?), and there was a small insect group with no predominant ecological component. A much larger subsample might provide an interpretation from the insect remains. There were abundant diatoms, some phytoliths, and three *Trichuris* eggs in the 'squash'.	P1 R1.5	Par P1 PF2.5 Dia P1 Phy P2	P2 R1.5 LP1-2 LR3.0 Cld P1 R20.0

3	-	1.06.01	1058	156	BUDU	The sediment appeared to consist largely of amorphous organic material, but the moderately large residue from the test subsample comprised about equal proportions of organic and inorganic material, the former component including quite large amounts of wood and bark fragments to 30 mm. Seeds were well preserved and there were moderate concentrations of identifiable remains. Some herbaceous detritus was present and there were hints from the flora that wet grassland habitats were represented, either as part of the local vegetation or in the form of cut material (such as hay or herbivore dung). Insects were moderately abundant in the flot, with numerous *Anobium punctatum* (woodworm). Subjectively, the assemblage can be interpreted as representing dumps from indoors mixed with an outdoor aquatic and disturbed ground component. There was a small group of puparia. A larger subsample would be desirable. There were some phytoliths in the squash, with traces of diatoms and *Trichuris* eggs.	P2 R1.0	Par P1 PS1.0 Dia P2 Phy P2	P1 R3.0 +3 kg LR6.0 Pup P2 R7.5 LP1 LR7.5
3	-	1.08.03	1042	146	BUDU	The sediment was a silt with a distinctly 'cheesy' texture, suggesting slow deposition in water. This small residue was mainly sand and gravel. There was a small amount of very decayed wood (<10%) and some small pellets (top 1 mm) of undisaggregated (concreted) grey silt. The few identifiable plant remains were of little use in elucidating the origin of this deposit. Insects were not very abundant in the flot and mixed origins seemed likely: background fauna/dumping/local fauna/river. The occupation site component appeared more decayed than others. A sheep ked, *Melophagus ovinus*, was noted. A larger subsample would give an assemblage of borderline size. No significant microfossils were noted in the 'squash'.	P3 R0.5	P0	P3 R1.0 LP2 +6 kg LW5.0 LR4.0 Mte P1 R7.5
3	-	3.03.04	3174	301	CUTF	The sediment was described as clay. Wood fragments (including some chips) made up a large proportion of the small residue (the matrix having mainly passed the sieve); there was variety of other occupation debris, including charcoal and bone (some of it burnt). 'Bran' was moderately common, but other evidence for plant foods was sparse. There were, however, rather large numbers of celery-leaved crowfoot and stinging nettle 'seeds' indicative of substrates with an enhanced nutrient status. Some twig fragments somewhat similar to (but apparently not) *Genista tinctoria* were present; these might repay further examination. A smallish group of insects was noted in the flot, with a large proportion of outdoor forms; although there were some aquatics the fauna was subjectively considered probably to reflect local ecology rather than flooding. A larger subsample would be desirable. The 'squash' contained traces of diatoms and *Trichuris* eggs.	P1-2 R1.0	Par P1 PS1.0 Dia P2	P1 R3.0 +3 kg LR10.0

3	-	3.03.13	3138	291	BUUP	The sediment was described as silty organic material. The rather small residue was about 60% organic matter: wood (mostly very decayed) and some herbaceous detritus. Seeds of celery-leaved crowfoot (*Ranunculus sceleratus*)and goosefoot (*Chenopodium* Section *Pseudoblitum*) were rather frequent, and these, together with some of the other taxa recorded, suggest that this deposit may have formed in a damp place receiving a high nutrient input. There was a modest-sized group of insects in the flot, probably reflecting local conditions (some aquatics, a range of waterside and some disturbed ground forms). Cladocerans were rather numerous. A large and characteristic beetle larval apex was noted. Some similarities to fauna of S. 301, C. 3174. Larger subsample desirable. Phytoliths were abundant in the 'squash' and there were also traces of *Trichuris* eggs.	P2 R1.0	Par P1 PS1.0 Phy P1	P1 R6.0 +3 kg LR15.0 Cld P1 R15 Lva P1 R3.0
3	-	3.04.01	3130	265	BUDU	The sediment was described as organic silt with woody and herbaceous detritus. The small- to moderate-sized residue was mainly woody detritus with a little sand and gravel, and bone and oyster shell fragments. There were also moderate amounts of calcareous concretions, apparently merely of amorphous organic matter, to 10 mm. There was quite a diverse assemblage of plant remains, including a variety of weeds and some probable useful plants, including woad (*Isatis tinctoria*), clubmoss (*Diphasium*—a few charred shoot fragments) and linseed *(Linum usitatissimum*); some dark-coloured yarn fragments, apparently of uncharred plant fibres, were also recorded. The flot gave an insect assemblage of modest size and rather poor preservation (although some very delicate remains were preserved - dual origin?). There was a mixture of outdoor forms (including aquatics) and species typical of occupation sites, the latter in fairly small numbers. Cladocera were very abundant (at least two taxa), and there were useful numbers of fly puparia. Many diatoms were present in the 'squash'.	P1+ R1.0 +3kg R2.0	Dia P1	P1 R4.0 +3 kg R8 Pup P2 R7.5 LP1 LR7.5
3	-	3.05.03	3112	233	BUDU	The sediment was observed to be very sandy and 'jumbled'. About 80% of the rather small residue was sand and gravel, with traces of bone and brick/tile and moderate amounts of rotted mortar. The remainder was very decayed wood and bark with some charcoal. Preservation of identifiable plant remains was variable (from fair to good). The taxa present included weeds and some probable useful plants (hazel nut, linseed) but no very clear interpretative character emerged. The flot gave an insect assemblage of modest size and very varied ecological origins. It may have reflected local ecology or have a transported origin, something which might be clarified by examining a larger subsample. Some very delicate remains were preserved. Diatoms were abundant in the 'squash'.	P2-3 R1.0	Dia P1	P1 R6.0 +3.0 R15.0

4	1	2.06.01	2280	333	BUDU	The sediment was described as silty organic detritus. The moderate-sized residue was approximately 50% organic, this component consisting mainly of very decayed wood with some charcoal and a little herbaceous detritus. A small assemblage of weeds and waste ground taxa was present with some hints of food waste. A modest number of beetles were present in the flot, together with numerous cladoceran ephippia. Aquatic deposition in quiet shallow water seems likely. There were some terrestrial outdoor and occupation site beetles. A larger subsample would be useful. Phytoliths and diatoms were abundant in the 'squash' and there were traces of *Trichuris* and ?*Ascaris* eggs.	P1-2 R1.0	Par P1 PS1.0 Phy P1 Dia P1	P1 R4.0 +3 kg LR10.0 Cld P1 R15.0
4	1	2.09.01	2278	325	BUUP	The sediment was described as consisting of matted moss and amorphous organic material in a sandy matrix. This richly organic residue (about 90% woody and herbaceous detritus) included a variety of ground-living mosses and several other indicators of the presence of turves (*Danthonia* cleistogenes/chaff, *Juncus squarrosus*, *Potentilla* cf. *erecta*, and *Montia fontana* ssp. *chondrosperma* seeds); there were almost no identifiable remains which did not accord with this interpretation, though the amount of material examined, as with the other samples, was rather small. The modest-sized insect assemblage from the flot included outdoor forms (aquatic and terrestrial) and some occupation site decomposers. This mixture probably originated from dumping and local fauna. A single *Melophagus ovinus* and a charred beetle were noted. A 'turf' component was not obvious. Larger subsample desirable. Abundant diatoms and a few phytoliths were recorded from the 'squash'.	P1+ R2.0	Dia P1 Phy P1	P2 R2.5 LP1 +3 kg LR6.0
4	1	2.14.02	2230	269	BUUP	The sediment was described as amorphous organic material with moss. About 10% of the residue was sand with a trace of gravel; the rest consisted of markedly 'fibrous' plant detritus, including many moss shoots (especially *Hylocomium splendens* and several taxa likely to be indicative of grassland). A similar suite of taxa to that in Sample 325 was present, suggesting that this context, too, included much turf (indeed, some lumps of undisaggregated sediment with rootlets and grass-like culm-bases or rhizome fragments were recorded). Insects were not abundant, although preservation was good. The assemblage appeared to be predominantly natural; in view of plant data, a much larger subsample should be processed. There were abundant fragments of plant tissue and some phytoliths in the 'squash'.	P1+ R2.0	Phy P1	P2 R1.0 LP1 +>5 kg LW4.0 LS4.0 LR6.0

4	1	2.17.02	2204	234	BUUP	The sediment was described as 'peaty'. There was a large residue, almost wholly composed of herbaceous detritus, with a little wood debris. The concentration of identifiable remains was consequently low but preservation was good. It is very likely that this context included some litter, perhaps from a stable or byre, but there were weeds and also remains of dyer's greenweed and perhaps also clubmoss. The flot contained a small group of beetles apparently from stable manure or a similar material; a larger subsample would confirm this. There were abundant and varied fly puparia and mites. The 'squash' contained abundant phytoliths, some plant tissue fragments, and a single ?*Ascaris* egg.	P1-2 R2.0	Par P1 PS1.0 Phy P1	P1 R2.0 +3 kg LW4.0 LR6.0 Mte P1 R7.5 Pup P1 R7.5
4	1	2.17.03	2216	262	BUUP	The sediment was described as humic silt with sand clasts. The large residue was about 90% woody and herbaceous detritus, the wood fragments up to 40 mm and including some twig fragments and wood chips; the remainder was sand and gravel. There was a low concentration of identifiable plant remains (mostly weed taxa) of low diversity; there was perhaps a hint of the presence of grass-like material (from hay?). Traces of clubmoss (*Diphasium*) were also recorded. The flot gave modest numbers of insects with variable preservation, perhaps through decay *in situ* in a shallow deposit? Larger subsample required. Plant tissue fragments were abundant in the 'squash' and some phytoliths were also noted.	P1-2 R1.5	Phy P1	P1 R3.0 +3 kg W4.0 R8.0
4	1	2.17.04	2252	290	BUDU	The sediment was described as being rich in wood and twigs. The large residue included much wood, including some ?chips. About 10% was mineral matter—sand, gravel and pottery. The identifiable plant remains included a variety of different taxa, amongst them weeds and mosses of widely differing habitats. There were some also epidermis fragments which might repay closer examination. Insects in the flot were not very abundant and reflected aquatic habitats (well represented), with some from terrestrial decomposer and outdoor habitats. Preservation was very good, but a larger subsample would be needed. Diatoms were abundant in the 'squash'.	P1-2 R1.5	Dia P1	P1 R6.0 +3 kg W4.0 R12.0

4	1	2.18.01	2194	215	BUUP	The sediment was described as compressed 'peat'. The large residue was mainly composed of herbaceous detritus with a little wood to 25 mm, and small amounts of sand. Most of the seeds were weed taxa but there was some evidence for the presence of grassland taxa, perhaps from hay or herbivore dung. Preservation was generally very good, though there was some pyrites deposition on some of the plant fragments. Amongst the identifiable remains were stem fragments of clubmoss and dyer's greenweed, likely to have originated in dyebath waste. Putative 'stable manure' insects were present in modest numbers; a larger subsample would clarify interpretation. Mites were not seen, so were not available as confirmation. Many phytoliths, fungal spores and fragments of plant tissue were observed in the 'squash'.	P1 R1.5	Phy P1	P1 R3.0 LW4.0 LR5.0
4	1	2.21.01	2170	193	BUUP	The large residue contained about 10% sand, the remainder being herbaceous detritus with a little wood and charcoal. The concentration of 'seeds' was low (probably as a result of dilution by the herbaceous detritus; most identifiable taxa were weeds. It seems very likely that the compressed detritus was stable manure, something strongly supported by the substantial 'stable manure' insect component in the flot (and according with the subjective impression from the raw sediment). A larger subsample would be useful in order to provide a 'type' assemblage. Puparia deserve recording. The 'squash' gave abundant phytoliths.	P1-2 R1.0	Phy P1	P1 R3.0 +2 kg LW4.0 LR6.0 Pup P1 R7.5
4	1	2.23.01	2166	154	BUDU	The sediment was described as a very organic silt with herbaceous detritus. The large residue was about 80-90% organic material and included some black trigonous cyperaceous stems provisionally identified as sea club-rush (*Scirpus maritimus*). There were large numbers of moderately to well preserved seeds, including large numbers of celery-leaved crowfoot (*Ranunculus sceleratus*). Rare charred clubmoss (*Diphasium*) shoot fragments were also present and other useful plants were represented by charred oats and a possible hemp (*Cannabis*) seed. The flot contained quite large numbers of arthropod remains, although they were rather fragmentary in many cases. Aquatic and waterside habitats were represented, together with terrestrial decomposer and outdoor ones. Some difficult identifications of putative waterside chrysomelids. Presumably dumping in/by water. Mites were rather abundant. Diatoms were abundant in the 'squash' and there were also some phytoliths.	P1+ R2.0	Dia P1 Phy P1	P1 R20.0 Mte P1 R7.5

4	1	2.26.02	2086	73	BUUP	About 80% of this smallish residue was inorganic material—sand and gravel, with some brick/tile, pottery, mortar, oyster shell and bone. The organic material consisted of very decayed wood and moderate amounts of charcoal; identifiable plant remains were rather sparse. Although well preserved, some of the plant detritus showed evidence of pyritisation. The taxa recorded were not especially characteristic. The flot contained abundant traces of well rotted arthropod cuticle (consistent with the description of the sediment as 'apparently slowly accumulated') but almost none was identifiable. The 'squash' contained some phytoliths.	P3 R0.5	Phy P1	P3 R0.5
4	1	3.05.07	3118	243	?RNA	The smallish residue was about 5% organic (mostly very decayed wood), the rest being sand and gravel. 'Seeds' were few and rather eroded; most were probably weed taxa. The flot contained a modest number of well preserved insects. Species from natural or semi-natural habitats were present but there were clear (albeit rare) signs of human influence. If this was reworked 'natural' it had become mixed with later material. There were a few phytoliths and diatoms in the'squash'.	P2-3 R0.5	Phy P2 Dia P2	P2 R6.0 LP1-2 LR12.0
4	2	3.06.04	3073	174	BUUP	The sediment was described a black organic (clay) silt. About 90% of the rather small residue consisted of very decayed wood and other organic material, mainly herbaceous detritus. The presence of wheat/rye 'bran', apple endocarp, corncockle seed fragments and eggshell membrane points to the probability that this deposit included some food waste or perhaps faecal matter. The flot contained a small group of insects, indicating the fauna of decaying matter (transported or *in situ*?). Much larger subsample needed to clarify. The 'squash' contained many phytoliths and fungal spores, together with a few diatoms.	P1-2 R1.0	Phy P1 Dia P2	P2 R2.0 LP1-2 +5 kg LR5.0
4	2	3.06.04	3074	173	BUUP	The sediment was described as being 'very organic'. About 60% of the rather large residue was sand and gravel, the remainder very decayed wood fragments and herbaceous detritus. The presence of food waste was suggested by the presence of apple endocarp and eggshell membrane fragments, but otherwise the plant assemblage consisted mainly of weed taxa. There was a mixed insect fauna of modest size in the flot, whose the most striking characteristic was the large number of ostracods. Presumably aquatic deposition. Larger subsample needed for clarification from insects. The 'squash' gave abundant phytoliths, some diatoms, and traces of *Trichuris* eggs.	P2 R1.0	Par P1 PS1.0 Phy P1 Dia P1	P1 R8.0 +3 kg LW4.0 LR15.0 Ost P1 R15

4	2	3.06.04	3081	189	BUUP	The sediment was described as an organic silt. The residue was about 80% wood fragments and woody detritus; the rest comprised sand and gravel. Although there were some taxa suggestive of the presence of grassland material (?hay), none was very abundant. Linseed, charred cereal grains and some very eroded hazel nutshell represented the only overtly 'useful' plant taxa. Insects were present in modest numbers in the flot; there were hints of 'stable manure'. Ostracods were present in modest numbers. Probably represents dumping in water. The 'squash' gave some phytoliths and traces of diatoms and *Trichuris* and ?*Ascaris* eggs.	P2 R1.0	Par P1 PS1.0 Phy P1 Dia P2	P1 R5.0 +3 kg LR10.0 Ost P2 R15
4	3	3.07.05	3053	155	BUUP	The sediment was described as very organic detritus, perhaps a river silt. About 70% of the rather small residue was made up by organic material—decayed wood and herbaceous detritus; the remainder was sand and gravel. Weed taxa were the most abundant types in this assemblage, but most were present in rather small numbers. In the flot, insects indicating rather foul conditions were present, but together with representative of various other habitats; outdoor forms may have been less well preserved. A larger subsample would probably clarify matters. Fly puparia were abundant. The 'squash' contained abundant diatoms, some phytoliths, and a trace of *Trichuris* eggs.	P2 R1.0	Par P1 PS1.0 Dia P1 Phy P1	P1 R1.5 +3 kg LR5 Pup P1 R7.5
4	3	4.04.02	4005	337	BUDF	The sediment was described as having the character of a possible river silt. The very small residue consisted of sand and a little gravel, with some brick/tile; the organic fraction consisted of very decayed wood and herbaceous detritus. Preservation was poor and there is some suggestion that the deposit included inwashed soil (not surprising if it were a ditch fill). The flot contained only small numbers of well-decayed remains. No significant microfossils were noted in the 'squash'.	P2-3 0.5	P0	P3 R0.5
5	1	3.10.04	3016	79	LCUF	The residue was of moderate size and about equal proportions of organic and inorganic material were present. The organic component was rich in charcoal, with some very decayed wood and a trace of herbaceous detritus. Charred oats (*Avena*) and barley (*Hordeum*) grains were present in very small numbers and there were also some weed taxa (as uncharred seeds). Invertebrate remains were rare in the flot and preservation rather poor. The 'squash' contained some diatoms and traces of phytoliths and *Trichuris* eggs.	P2-3 1.0	Par P1 PS1.0 Dia P2 Phy P2	P3 R0.25

5	1	3.10.05	3015	72	BUUP	The high charcoal content of this deposit was noted during an inspection of the raw sediment. About 60% of the moderate-sized residue consisted of charcoal, with the remainder sand and gravel. There were moderate numbers of charred oat (*Avena*) and barley (*Hordeum*) grains whose state of preservation was rather variable (from moderate to good); in some cases, charring was not complete. Some of the *Avena* grains were in spikelets and some appeared to be partly germinated. No chaff was observed. The flot gave only a few, mostly well decayed, invertebrate remains. There were traces of phytoliths and diatoms in the 'squash'.	P1 1.0 +3kg R2.0	Phy P2 Dia P2	P3 R0.5
5	1	3.11.02	3013	80	LCBF	The sediment was described as organic clay silt. The moderately large residue was very 'gritty' reflecting the presence of much sand. About half of the material was charcoal with a little very decayed wood and herbaceous detritus; a few charred oat grains and some poorly preserved unidentifiable cereals were also present. The insects in the flot comprised only a few decomposers of no clear character. Some phytoliths were present in the 'squash'.	P2-3 0.5	Phy P1	P3 R0.25
5	1	4.04.03	4004	297	BUUP	The sediment was described as being 'very sandy'. About 30% of the rather large residue was organic matter, mainly woody and herbaceous detritus; the remainder was sand and gravel, with some pottery, brick/tile and ?daub. A large proportion of the identifiable plant taxa were probably weeds (notably the moderately large numbers of weld, *Reseda luteola*, seeds) but some wetland taxa (including the raised-bog moss *Sphagnum imbricatum*, ?derived secondarily from peat). The rather small group of beetles in the flot gave hints of stable manure (including grain pests and weevils perhaps originating in hay). A larger subsample would probably define the material more reliably. The 'squash' gave some diatoms, and traces of phytoliths and *Trichuris* eggs.	P2 1.0	Par P1 PS1.0 Dia P1 Phy P2	P2 R1.0 LP1 +3 kg R4.0
5	2	3.12.06	3007	59	LCUF	The sediment was described as 'clayey'. The smallish residue was about 15-20% organic, the remainder being sand and gravel (including limestone chips and brick/tile). The organic component comprised very decayed wood, herbaceous detritus and charcoal. The assemblage of seeds included several weed taxa, but was undistinguished and rather poorly preserved. Insects from the flot included modest numbers of very poorly preserved remains of taxa associated with intensive occupation. The 'squash' gave some phytoliths and traces of diatoms and *Trichuris* eggs.	P2-3 1.0	Par P1 PS1.0 Phy P1 Dia P2	P3 R2.0

6	-	1.11.02	1001	10	BUDU	The sediment was described as a silt.The moderate residue consisted of about equal proportions of sand and gravel *versus* very decayed wood and charcoal. There were large numbers of weld seeds and some calcareous material reminiscent of that seen in Sample 11 (see Context 2008, below). Other plant remains (mainly weed seeds) were rather sparse. The flot contained only a small mixed insect fauna, poorly preserved. The squash yielded some phytoliths and traces of diatoms and *Trichuris* eggs.	P2-3 1.0	Par P1 PS1.0 Phy P2 Dia P2	P3 R1.0
6	-	2.30.01	2082	71	BUUP	The sediment was described as 'peaty'. On processing, about 30% of the moderate-sized residue was found to be sand and gravel with a little brick/tile. The remainder was woody and herbaceous detritus with some charcoal. There were also some concretions of 'strawy' material but the identifiable remains observed did not offer particular clues as to its origins: most taxa were weeds. The flot was rather large and contained few insects; a much larger subsample would be needed for interpretation but this may have been stable manure. The 'squash' contained abundant phytoliths and traces of diatoms and *Ascaris* and *Trichuris eggs.*	P2 1.0	Par P1 PS1.0 Phy P1 Dia P2	P3 1.0 LP1-2 +>5kg LW5.0 LS4.0 LR3.0
6	-	2.37.01	2010	57	BUDU	The sediment was reminiscent of some 'dark earths'. About 25% of the residue was organic (herbaceous detritus, charcoal and lumps of burnt and unburnt detritus peat up to 25 mm). Identifiable plant remains were sparse and included some possible food plants (amongst them, ?mulberry, *Morus*). The flot contained only a trace of fragmentary insect remains. Some phytoliths and a trace of *Trichuris* eggs were noted from the 'squash'.	P1-2 1.0	Par P1 PS1.0 Phy P1	P3 R0.5
6	-	2.40.01	2045	38	WEBF	Mortar fragments made up a large proportion of the large residue, together with traces of brick/tile. The organic component made up about 30% and consisted of wood to 40 mm and smaller decayed wood fragments. There were hints from the identifiable plant remains of the presence of hay-like material, but the only taxon present in moderate amounts was weld (as seeds). This may have been a dyeplant, but is more likely perhaps to have grown as a weed in the vicinity and to have entered the well with the rubble-rich backfill. The flot gave a smallish group of well preserved insects, mostly typical occupation site taxa (including grain pests). A rather clean area may be indicated, so a larger subsample should be processed. The 'squash' yielded only a few plant tissue fragments.	P1-2 1.0	P0	P3 R3.0 LP1 +5 kg LW4.0 LR10.0

6	-	2.40.01	2090	90	WEBF	The moderate-sized residue was mostly (80-90%) wood fragments with a little herbaceous detritus; there was a marked black iron sulphide staining on the organic material. Notable in this subsample was the presence of some unusual twig fragments (probably a leguminous shrub, but not *Genista tinctoria*) and moderate numbers of woodlouse carapace fragments.Most characteristic, however, were the remains of plant likely to have been introduced with woodland floor litter: woodland mosses, tree leaf fragments and leaf abscission pads. Preservation was excellent. The flot contained a modest-sized assemblage of very well preserved insects, possibly a mixture of pitfalls and background fauna from a fairly clean area. Mites abundant. Does not (subjectively) suggest fauna of dumped rubbish or soil. Larger subsample needed. The 'squash' gave some diatoms and traces of *Trichuris* eggs.	P1 1.5	Par P1 PS1.0 Dia P2	P1 R6.0 +3 kg R10.0 Mte P1 R7.5
6	-	2.40.01	2114	113	WEBF	The moderately large residue was nearly all wood fragments and other plant debris, including some twig fragments to 35 mm. A little grit/sand was present. Amongst the plant fragments were wood chips and what appeared to be vegetative remains of grass culms or leaves. Weld seeds were fairly common and there was at least one fruit of teasel, perhaps the wild species (*Dipsacus sylvestris*). The presence of 'bran' might indicate that food waste or faeces were a component of this deposit. The flot contained a (subjectively) unusual group of remains; some decomposers and outdoor forms (including aquatics) and some probably post-depositional invaders. There were some remains of woodlouse, apparently preserved by anoxic waterlogging (a very rare phenomenon for this group). A larger subsample should be investigated if this material is well dated. There were abundant diatoms, some phytoliths, and a trace of *Trichuris* eggs in the 'squash.	P1-2 1.5	Par P1 PS1.0 Dia P1 Phy P1	P1 R6.0 +3 kg R12.0 Wdl P1 R4.0

6	-	2.40.02	2008	11	WEBF	The sediment was described as ?cess. The largish residue was unusual for this site in consisting of lumps of very calcareous material mixed with fine plant detritus, much of the latter 'bran' (which explains the 'cessy' character observed in the raw sediment). There were several pod fragments of woad (*Isatis tinctoria*) and the clumps of xylem spiral thickenings observed in quantity in the residue are likely to be remains of the leaves of this plant—strong evidence that this was a dyebath residue (woad, bran and lime would be a very likely combination in this context). Further evidence for dyeing is afforded by the presence of dyer's greenweed (*Genista tinctoria*) stem epidermis fragments and weld (*Reseda luteola*) seeds. The flot gave a fairly small group of insects, many fragmentary. It was ecologically mixed, with a small but distinctive component of urban synanthropes. A sheep ked noted. Larger subsample takes P1 in view of plant evidence. No significant microfossils were noted in the 'squash'.	P1+ 1.5 +4kg LR3.0	P0	P2 R2.0 LP1 +4kg LR8.0
6	-	3.12.09	3003	54	LCUF	The residue was about 80% sand and gravel, with a little brick/tile. The rest was mainly very decayed wood fragments and some 'fibrous' remains, perhaps from a plant stem. Leaves of bog-moss (*Sphagnum*) were moderately common. Most of the other identifiable plant remains were weeds, some of the specimens being slightly worn, though preservation was generally very good. A small group of well decayed insect remains was recorded, including grain pests and a sheep ked. A larger subsample should be recorded if a clear archaeological question is perceived. Abundant phytoliths and a few diatoms were noted in the 'squash'.	P1-2 1.0	Phy P1 Dia P1	P2 R2.5 LP1? LR8.0

Table 7. Samples for which a detailed preservation recording form has been filled out for insect remains.

Sample	Context
11	2008
54	3003
73	2086
79	3016
80	3013
146	1042
155	3053
156	1048
193	2170
233	3112
265	3130
297	4004
301	3174

Table 8. Key to context type codes in Table 6.

?DUM	?dump
?FLD	?river silt (flooding)
?RNA	?reworked natural
BUDF	build-up/dump/flooding deposit
BUDU	build-up/dump
BUUP	build-up
CUTF	cut fill
DNAT	disturbed natural
LCBF	backfill of linear cut
LCUF	fill of linear cut
PIBF	backfill of pit
WEBF	backfill of well

Table 9. An estimate of the numbers of oyster shells by phase. Numbers have been calculated by averaging (see text), so results are not whole numbers.

Date	Estimated numbers of measurable left valves	Estimated number of measurable right valves
Roman	212.5	322.5
10th-11th	110.5	167.7
11th	466.8	705.2
11th-12th	228.8	344
12th	119	180.6
13th	8.5	12.9
13th-14th	0	0
14th	34	51.6
14th-15th	42.5	64.5
15th	54.9	81.7
Unknown	68	103.2
Total, excluding unknown	0.00	1930.7

Table 10. Estimates of the numbers of oyster shells by period and context type (where this information was available).

	Period										
Context type	Rom.	C10-11	C11	C11-12	C12	C13	C13-14	C14	C14-15	C15	Total
?revetment	0	0	0	0	23	0	0	0	0	0	23
amorphous organic material	0	0	0	0	0	0	0	0	0	8	8
backfill	0	0	0	363	0	27	0	0	104	0	494
build-up/dump	344	300	1265	313	331	0	12	66	27	125	2783
dump/ destruction deposit	0	0	0	4	8	0	0	0	0	0	12
fill	0	39	92	0	0	8	0	4	4	23	170
fill/dump	0	0	0	0	0	0	0	4	0	0	4
levelling	0	0	0	0	0	0	0	0	0	31	31
packing clay	0	0	4	0	0	0	0	0	0	0	4
pit fill	0	0	69	0	0	0	0	0	0	0	69
structure	4	0	23	0	0	0	0	0	0	0	27
wattle levelling	0	0	4	0	0	0	0	0	0	0	4
well fill	0	0	27	12	0	0	0	78	0	20	137
disturbed natural	23	0	0	0	0	0	0	0	0	0	23
ditch fill	151	0	0	0	0	0	0	0	0	0	151
ditch fill/natural	115	0	0	0	0	0	0	0	0	0	115
river silting	58	0	0	0	0	0	0	0	0	0	58
Total	695	339	1484	692	362	35	12	152	135	207	4113

Table 11. Mollusc shell from selected BS samples.

Context	Sample	oyster	cockle	mussel	Other taxa
1001	20	+			*Helix aspersa*
2003	6	+			
2006	15	+		+	*Helix aspersa*
2009	24	+	+		*Helix aspersa*, *Oxychilus* sp.
2012	30	+		+	*Lymnaea* sp., Succineidae, *Trichia* sp.
2012	32	+			
2042	39	+		+	*Helix aspersa*, *Discus rotundatus* (Müller)
2042	67	+		+	*Valvata* sp.
2280	371	+	+		*Lymnaea* sp., *Bithynia* sp.
2313	385	+			

Table 12. BS samples with planorbid snails recorded during assessment. Ro = Roman, ASc = Anglo-Scandinavian.

Context	Sample	Period	Phase	Context type
2311	361	1	0	?dumping into river (Ro)
3081	249	4	2	build-up (ASc)
3086	205	4	2	build-up (ASc)
3115	227	3	0	fill of 'linearish' cut 3120 (ASc)

Table 13. Extrapolated numbers of boxes of SR and HC bone and percentage of bone recorded.

Period	Not recorded	Recorded	% recorded
1	2.5	0	0
2 (not dated)	2.5	0	0
3	11.5	3	21
4-1	14.5	12.5	46
4-2	5.25	0	0
4-3	2.25	0	0
5-1	1.5	0	0
5-2	1.0	0	0
6	4.5	4.5	50
Total	45.5	20.0	44

Table 14. Numbers and weights of SRs available and for which the bone content has been recorded.

Period	Phase	No. SRs available	Weight range	No. >500 kg	Total weight of SR samples (kg)	Nos. SR samples (contexts) assessed	Weight of SRs assessed (kg)	Proportion of SRs assessed (%)
3		11	42-1225	5	6479	2 (1)	2138	33
4	1	20	18-1843	5	7935	3 (2)	4390	55
4	2	2	90-335	0	425	0	0	0
4	3	1	462	0	462	0	0	0
5	2	1	550	1	550	0	0	0
6		26	67-1500	14	10425	5 (1)	3880	37
Total		61	18-1843	25	26276	10(4)	10408	40

Table 15. Extrapolated numbers of 'A' bones for periods for which useful assemblages exist. Also shown are numbers of measurable elements and mandibles with teeth. SR—site-riddled; HC—hand-collected.

Category	Period	Phase	SR	HC	Total
'A'	3		305	200	505
	4	1	415	815	1230
	6		240	320	560
Measurable	3		85	60	145
	4	1	125	300	425
	6		60	120	180
Mandibles with	3		5	5	10
	4	1	12	40	52
	6		5	5	10

Table 16. Notes on recorded SR bone material. Key: Per/ph—Period/phase; Pres/ang/col—preservation/angularity/colour.

Per/ph	Context	Sample	Pres/ang/col	Notes	Wt (kg)
3	3130 (BUDU)	256	Variable Variable Variable	50+% of fragments butchered. *Goat* - ?cranium, radius *Dog* - range of sizes, knife and chop marks present *Cat* - ulna - knife marks *Chicken* - 1 tarsometatarsus - spurred, pathological, with perhaps evidence of tethering; 2 femora (1 has massive fracture) *Sparrowhawk* - humerus *Fish* - gadid and salmonid *Unid*. - vertebrae - mainly chopped transversely, a few lumbar vertebrae chopped longitudinally, sacrum trimmed	1225
		279	Excellent Spiky Fawn-ginger	20-50% >20 cm fragments, 0-10% butchered *Horse* - left fore-limb, also ribs and vertebrae (some vertebrae butchered) *Sheep* - ram's horncore *Goat* - metacarpal *Roe deer* - 'greasy' first phalanx, and metatarsal *Unid*. - cow-sized vertebrae chopped transversely; some sheep-sized vertebrae also chopped longitudinally	913
4-1	2280 (BUDU)	335	Fair Variable Variable	*Sheep* - 2 crania, horncores removed, back of skull removed for access to brain *Roe deer* - first phalanx *Goose* - greylag-sized *Fish* - gadid vertebrae *Unid*. - most cow-sized vertebrae, chopped transversely	1320
		363	Fair Variable Variable	Heavy butchery, evidence of scorching and breaking of large mammal bone *Sheep* - ram's horncore *Fish* - salmonid vertebrae *Unid* - cow and sheep-sized vertebrae split transversely and longitudinally	1227
	2291 (BUUP)	338	Fair Variable Variable	*Cattle* - split crania, split shafts; mostly phalanges and carpals/tarsals *Sheep/goat* - acid etched phalanx, horncore chopped *Pig* - mostly phalanges and carpals/tarsals *Dog* - short, robust individual *Fish* - gadid (cf. cod) articular	1843

6	2042 (WEBF)	34	Fair Variable Variable	50+% of fragments <5 cm; 20-50% butchered *Fish* - gadid vertebrae *Unid* - sheep-sized vertebrae chopped longitudinally	500
		52	Variable Variable Brown	10-20% of fragments <5 cm; 20-50% butchered *Raven* - ulna *Unid*. - sheep cranium chopped on under side; some vertebrae chopped longitudinally and transversely	750
		66	Fair Battered Variable	10-20% of fragments <5 cm; 10-20% butchered *Horse* - lateral metapodial *Goose* - greylag-sized *Fish* - small gadid vertebrae	380
		102	Fair Spiky Variable	20-50% of fragments <5 cm; 50+% butchered *Fish* - salmonid vertebrae *Unid*. - cow-sized vertebrae, mostly chopped transversely; some sheep-sized vertebrae chopped longitudinally	750
		119	Fair Spiky Variable	*Raven* - ulna *Goose* - greylag-sized humerus and radius; barnacle-sized coracoid *Fish* - gadid vertebrae *Unid*. - vertebrae chopped longitudinally and transversely	1500

Table 17. Notes on recorded hand-collected bone. Abbreviations as for Table 16.

Per/ph	Context	Pres/ang/col	Notes
4-1	2087 (BUUP)	Good Spiky Dark brown	*Cattle* - range of sizes represented *Goat* - 2 horncores, 1 sawn through tip *Sheep* - 2 ram's horncores, 1 sawn through tip *Cat* - large mandible with skinning marks on buccal surface of tooth row
	2089 (BUUP)	Good Spiky Dark brown	20-50% <5 cm fragments *Cattle* - mostly small individuals represented *Goat* - 13 horncores, no post-cranial elements *Sheep* - 1 cranium, both horncores removed *Red deer* - worked antler *Canid* - slender, gracile *Rat* - black rat mandible *Chicken* - range of size: bantam to male gamebird *Goose* - barnacle-sized radius, remainder are greylag-sized *Fish* - Gadidae *Human* - distal fibula - not shown in Table 27 *Unid*. - some vertebrae chopped longitudinally and transversely
	2291 (BUUP)	Good Spiky Light brown	Better preserved than SR sample, not as battered *Cattle* - wide size range *?Goat* - radius and ulna *Sheep* - 2 crania with horncores removed and chopped at back of skull for brain removal; 4 horncores (3 are rams) *Dog* - cranium with healed depressed fracture; at least three individuals, including long bones of a shortish, squat dog; mandible with aberrant wear and ante-mortem tooth loss *Unid*. - sacrum trimmed, humeri, etc., scorched and broken, some cow-sized vertebrae chopped transversely
6	2042 (WEBF)	Not recorded	Heavily butchered - some vertebrae (mostly sheep-sized), split longitudinally, some cow-sized shafts split *?Goat* - radius *Sheep* - 2 crania split longitudinally, horncores removed *Goose* - barnacle-sized scapula, remainder are greylag-sized *Raven* - carpometacarpus Columbidae - coracoid *Human* - scapula fragment - not shown in Table 29

Table 18. Bone from assessed BS samples: amounts of different groups.

Key: 1 = <10 fragments, 2 = 10 to 50 fragments, 3 = 50 to 100 fragments, 4 = >100. Numbers and letters in parentheses: For large mammals (LM), (1) = <10 measurable bones. For small mammals (SM), birds, fish and amphibian (Amp), (L) = low diversity (i.e. 1 species present), (M) = moderate (2-4 species) and (H) = high (>4 species). Wgt= weight of sample processed (kg).

Period/ phase	Context	Sample	LM	SM	Bird	Fish	Amp	Wgt
3	1029	106	2(1)	1(L)	-	1(L)	-	50
	1042	142	3(1)	1(L)	1(L)	-	-	64
	2293	342	2(1)	-	1(L)	2(L)	-	46
	3115	227	2	-	1(L)	4(M)	1	49
4-1	2089	87	2(1)	1	1(M)	3(M)	1	50
	2160	164	1(1)	-	-	2(M)	-	54
	2167	163	2(1)	-	-	2(M)	-	59
	3088	213	4(1)	-	1(L)	2(M)	-	54
4-2	1011	107	2(1)	-	1(L)	2(M)	1	50
	1014	101	2(1)	-	1(L)	1(M)	-	50
	3071	167	1(1)	1(L)	1(L)	2(M)	-	49
5-2	3010	64	2(1)	-	1(M)	4(M)	-	50
6	2079	61	1	-	1(L)	2(M)	-	50
	2082	84	1(1)	-	2(M)	3(H?)	-	50

Table 19. Notes on bones from BS samples. Abbreviations as in Table 16.

Per/ph	Context	Sample	Pres/ang/co	Notes
3	1029 (BUDU)	106/BS	Fair Battered Brown	*Large mammal* - including red deer antler fragments, cattle and sheep; very fragmented, battered and some burnt *Bird* - chicken sized vertebrae *Small mammal* - murine incisor and metatarsal
	1042 (BUDU)	142/BS	Good Spiky Brown	*Small mammal* - mouse-sized pelves and tibia *Fish* - small spine
	2293 (BUUP)	342/BS	Fair Battered Brown	Very eroded bone *Large mammal* - number of isolated teeth; horse scapula *Fish* - only just scored as abundance category 2 (i.e. only 10-15 fragments), including herring
	3115 (LCUF)	227/BS	Good Spiky Variable	*Large mammal* - sheep and cattle, very fragmented *Bird* - chicken phalanx *Fish* - large gadid, but mostly herring and eel; also a single otolith *Amphibian* - toad? - humerus and pelvis
4-1	2089 (BUUP)	87/BS	Fair Variable Dark brown	Mostly rounded and battered *Bird* - chicken; passerine tarsometatarsal *Fish* - herring and gadid
	2160 (BUUP)	164/BS	Fair Spiky Brown	Material fragmented, little bone present *Fish* - mostly herring
	2167 (BUUP)	163/BS	Good Variable Variable	*Fish* - gadid, salmonid and clupeid (and some scales)
	3088 (BUUP)	213/BS	Good Spiky Fawn	*Large mammal* - mostly cattle-sized fragments; heavily fragmented - numerous fresh breaks *Bird* - chicken *Fish* - herring, eel, and large gadid - almost all in 2-4 mm fraction
4-2	1011 (BUDU)	107/BS	Fair Variable Dark brown	*Large mammal* - mostly unid rib and vert. *Small mammal* - only shaft fragments. *Fish* - eel, clupeid and pike.

	1014 (BUDU)	101/BS	Good Spiky Brown	*Large mammal* - mostly unidentified although a small number of sheep fragments present *Bird* - chicken *Fish* - well preserved, small skull fragments, few small vertebrae - herring, cyprinid
	3071 (BUUP)	167/BS	Not recorded	*Small mammal* - rat astragalus *Fish* - eel, ?cyprinid
5-2	3010 (LCUF)	64/BS	Fair Variable Brown	*Bird* - goose and chicken *Fish* - large gadid, haddock and cod, clupeid and ?cyprinids - mostly small fish
6	2079 (BUDU)	61/BS	Fair Battered Dark brown	*Medium mammal* - N.B. cat metacarpal not recorded in Table 18 *Fish* - large gadid, pleuronectid and herring vertebrae (also some scales); mostly unid. spines
	2082 (BUUP)	84/BS	Not recorded	*Bird* - goose, chicken and passerine *Fish* - eel, gadid, haddock, herring, salmonid

Table 20. Animal bone from SR samples: Period 3.

Taxon		No. fragments	No. measurable	No. mandibles
Canis f. domestic	dog	20	8	-
Felis f. domestic	cat	4	-	-
Equus f. domestic	horse	9	3	-
Sus f. domestic	pig	13	3	2
Capreolus capreolus (L.)	roe deer	2	-	-
Bos f. domestic	cattle	35	7	-
Caprinae	sheep/goat	11	1	-
Anas spp.	duck	2	-	-
Accipiter nisus (L.)	sparrowhawk	1	1	-
Gallus f. domestic	chicken	9	5	-
Fish		6	-	-
Subtotal		*112*	*28*	*2*
Indeterminate bird		1	-	-
Unidentified		317	-	-
Subtotal		*318*	-	-
Total		430	28	2

Table 21. Hand-collected animal bone: Period 4.

Taxon		No. fragments	No. measurable	No. mandibles
Lepus sp.	hare	3	1	-
Rattus rattus (L.)	black rat	1	-	-
Canis f. domestic	dog	7	6	2
Canid	dog family	3	1	1
Felis f. domestic	cat	4	3	3
Sus f. domestic	pig	70	9	3
Cervus elaphus L.	red deer	1	-	-
Bos f. domestic	cattle	204	73	8
Caprinae	sheep/goat	65	20	3
Anser sp.	goose	12	6	-
Gallus f. domestic	chicken	31	25	-
Corvus corax L.	raven	3	3	-
Fish		3	-	-
Subtotal		*407*	*147*	*20*
Indeterminate bird		6	-	-
Unidentified		743	-	-
Subtotal		*749*	-	--
Total		1156	147	20

Table 22. Animal bone from SR samples: Period 4.

Taxon		No. fragments	No. measurable	No. mandibles
Canis f. domestic	dog	9	7	-
Felis f. domestic	cat	1	-	-
Sus f. domestic	pig	50	8	2
Capreolus capreolus (L.)	roe deer	1	-	-
Bos f. domestic	cattle	87	31	1
Caprinae	sheep/goat	42	9	3
Anser sp.	goose	1	-	-
Gallus f. domestic	chicken	11	8	-
Fish		6	-	-
Subtotal		*208*	*63*	*6*
Indeterminate bird		7	-	-
Unidentified		646	-	-
Subtotal		*653*	-	-
Total		861	63	6

Table 23. Animal bone from SR samples: Period 6.

Taxon		No. fragments	No. measurable
Equus f. domestic	horse	1	-
Sus f. domestic	pig	17	4
Bos f. domestic	cattle	25	1
Caprinae	sheep/goat	18	4
Anser sp.	goose	6	4
Gallus f. domestic	chicken	11	8
Corvus corax L.	raven	2	2
Fish		8	-
Subtotal		*88*	*23*
Indeterminate bird		1	-
Unidentified		327	-
Subtotal		*328*	-
Total		416	23

Table 24. Hand-collected animal bone: Period 6.

Taxon		No. fragments	No. measurable	No. mandibles
Felis f. domestic	cat	2	1	-
Sus f. domestic	pig	14	7	1
Bos f. domestic	cattle	69	13	-
Caprinae	sheep/goat	12	7	1
Anser sp.	goose	11	8	-
Gallus f. domestic	chicken	8	7	-
Columbidae	pigeon	1	1	-
Corvus corax L.	raven	1	-	-
Subtotal		*118*	*44*	*2*
Indeterminate bird		3	-	-
Unidentified		252	-	-
Subtotal		*255*	-	-
Total		373	44	2

Table 25. Skeletal elements, by taxon, for mammal bones from SR samples: Period 3.

Taxon	Cattle	Sheep/ goat	Pig	Horse	Dog	Cat	Roe deer
Horncore	1	1	-	-	-	-	-
Cranium	-	1	-	-	-	3	-
Maxilla	1	-	-	-	-	-	-
Mandible	-	-	2	-	2	-	-
Isolated teeth	2	-	1	-	-	-	-
Scapula	-	2	-	1	1	-	-
Humerus	1	1	1	1	2	-	-
Radius	6	2	-	2	1	-	-
Ulna	2	-	1	1	-	1	-
Metacarpal	2	2	-	1	-	-	-
Pelvis	-	-	-	-	2	-	-
Femur	2	1	-	-	1	-	-
Tibia	2	-	1	-	4	-	-
Calcaneum	1	-	2	-	-	-	-
Astragalus	1	-	1	-	-	-	-
Metatarsal	2	-	-	-	-	-	1
Metapodial	-	-	-	-	-	-	-
Phalanx	7	-	3	-	-	-	1
Carpal/tarsal	3	1	1	3	-	-	-
Cuboid	1	-	-	-	-	-	-
Patella	1	-	-	-	-	-	-
Fibula	-	-	-	-	1	-	-

Table 26. Skeletal element, by taxon, for bird bones from SR samples: Period 3.

Taxon	Chicken	Duck	Sparrowhawk
Skull	-	-	-
Beak/bill	-	1	-
Coracoid	-	-	-
Scapula	-	-	-
Humerus	-	-	1
Radius	-	-	-
Ulna	-	-	-
Carpometacarpus	2	1	-
Digit	-	-	-
Sternum	-	-	-
Pelvis	1	-	-
Femur	2	-	-
Tibiotarsus	3	-	-
Tarsometatarsus	1	-	-
Phalanx	-	-	-

Table 27. Skeletal elements, by taxon, for bones of larger mammals from Period 4. HC = hand-collected, SR = site-riddled samples.

Taxon	Cattle		Sheep/ goat		Pig		Dog		Cat		Roe deer	
	HC	SR	HC	SR	HC	SR	HC	SR	HC	SR	HC	SR
Horncore	15	2	19	2	-	-	-	-	-	-	-	-
Cranium	-	-	-	-	-	-	1	-	-	-	-	-
Maxilla	6	-	3	-	4	2	-	2	-	-	-	-
Mandible	15	3	5	5	7	2	3	1	3	-	-	-
Isolated teeth	17	2	4	1	4	1	-	-	-	-	-	-
Scapula	13	6	4	-	3	2	-	-	-	-	-	-
Humerus	14	6	2	2	4	1	-	-	-	-	-	-
Radius	17	7	7	6	1	3	1	-	-	-	-	-
Ulna	6	-	2	-	3	2	-	1	1	-	-	-
Metacarpal	10	6	4	-	11	7	-	-	-	-	-	-
Pelvis	11	1	1	1	2	2	-	-	-	-	-	-
Femur	16	4	3	2	-	2	1	1	-	-	-	-
Tibia	17	4	3	5	4	2	-	1	-	-	-	-
Calcaneum	7	6	1	2	1	3	-	-	-	-	-	-
Astragalus	4	5	1	1	1	1	-	1	-	-	-	-
Metatarsal	13	6	1	-	16	2	-	2	-	-	-	-
Metapodial	2	1	-	-	6	2	-	-	-	-	-	-
Phalanx	19	9	-	3	7	8	-	-	-	-	-	1
Carpal/tarsal	1	11	-	3	1	1	-	-	-	-	-	-
Cuboid	-	4	-	-	-	-	-	-	-	-	-	-

Table 28. Skeletal elements, by taxon, for bird bones for Period 4. HC = hand-collected, SR = site-riddled samples.

Taxon	Chicken		Goose	
	HC	SR	HC	SR
Skull	1	-	-	-
Beak/bill	-	-	1	-
Coracoid	2	2	-	-
Scapula	1	-	-	-
Humerus	4	1	1	1
Radius	2	1	2	-
Ulna	3	2	-	-
Carpometacarpus	1	-	1	-
Digit	-	-	1	-
Sternum	-	-	1	-
Pelvis	-	1	-	-
Femur	7	2	-	-
Tibiotarsus	8	2	2	-
Tarsometatarsus	2	-	1	-
Phalanx	-	-	1	-

Table 29. Skeletal elements, by taxon, for large mammal bones from Period 6. HC = hand-collected, SR = site-riddled samples.

Taxon	Cattle		Sheep/ goat		Pig	
Element	HC	SR	HC	SR	HC	SR
Horncore	-	-	-	-	-	-
Cranium	-	-	-	-	-	-
Maxilla	4	-	-	-	-	-
Mandible	1	-	1	-	1	-
Isolated teeth	5	2	-	8	-	2
Scapula	3	-	1	-	1	-
Humerus	5	1	1	1	-	1
Radius	5	2	3	1	-	-
Ulna	-	-	1	1	-	-
Metacarpal	6	1	-	1	4	4
Pelvis	4	-	-	-	1	-
Femur	8	1	4	1	-	-
Tibia	3	2	-	-	2	2
Calcaneum	-	-	1	2	-	1
Astragalus	2	1	-	-	-	-
Metatarsal	9	-	-	-	4	-
Metapodial	1	2	-	-	1	4
Phalanx	11	5	-	7	2	2
Carpal/tarsal	2	3	-	1	-	-

Table 30. Skeletal elements, by taxon, for bird bones from Period 6. HC = hand-collected, SR = site-riddled samples.

Taxon	Chicken		Goose	
	HC	SR	HC	SR
Skull	-	-	-	-
Beak/bill	-	-	-	-
Furcula	-	-	1	-
Coracoid	-	2	-	2
Scapula	-	1	1	1
Humerus	2	-	3	2
Radius	1	1	1	1
Ulna	-	-	2	-
Carpometacarpus	-	1	1	-
Digit	-	-	-	-
Sternum	-	2	-	-
Pelvis	1	-	-	-
Femur	2	1	4	-
Tibiotarsus	1	2	-	-
Tarsometatarsus	1	1	-	-
Phalanx	-	-	1	-

*Table 31. Time estimates (**in hours**) for recommended programme of investigation of biological remains from 22 Piccadilly. Recording includes data entry. Costs will be provided separately when appropriate.*

Key to staff initials: Cons dia = Consultant - diatoms = to be established; Cons mte = Consultant mites = Jaap Schelvis; Cons ost = Consultant ostracods = to be established; Cons pup = Consultant fly puparia = Peter Skidmore; RAb = DJ = Deborah Jaques; RAi = FL = Frances Large; RApa = JC = John Carrott; RFb = KD = Keith Dobney; RFi = HK = Harry Kenward; RFm = AM - Annie Milles; RFp = AH= Allan Hall; RFs = RU = Raimonda Usai; Tech = Technician = to be established.

Task	***Staff***	***Total time***
General		
Project planning	RFs	4.2
	RFp	8.4
	RFi	8.4
	RFm	4.2
	RFb	8.4
General laboratory tasks, sample movement, etc.	Tech	100.3
Maintain databases	RAb	20.1
Administration	RFi	16.7
	RAi	20.1
Project meetings (four internal and two with YAT team)	RFs	16.7
	RFp	16.7
	RAp	20.1
	RAi	20.1
	RFi	16.7
	RFm	16.7
	RAb	20.1
	RFb	16.7
Obtain and organise archaeological information	RFp	16.7
	RApa	20.1
Soils and sediments		
Prepare thin sections	RFs	8.4
	Tech	10.0
Record thin sections	RFs	22.6

GBA Sample review		
Arrange delivery of samples	RFp	1.1
Examine 161 samples, describe and select samples before processing for	RFp	17.0
	RAp	6.8
	RFi	17.0
	RAi	6.8
	RFs	17.0
	Tech	13.6
Process 100 samples for review (additional to those already assessed)	Tech	250.9
Undertake rapid review of macrofossil plant remains and matrix	RFp	22.6
	RAp	27.1
Undertake rapid review of parasite eggs	RApa	22.6
Undertake rapid review of insects and other invertebrate macrofossils	RFi	11.3
	RAi	13.6
Undertake rapid review of non-marine molluscs	RFm	5.7
GBA samples		
Select 40 samples for processing of larger subsamples	RFp	1.1
	RFi	1.1
Undertake specialist sediment descriptions/analyses	RFs	17.0
Process 40 larger subsamples	Tech	217.0
Undertake standard recording of plant remains and matrix components	RFp	18.5
	RAp	333.7
Undertake standard recording of parasite eggs from 37 subsamples	RFi	5.4
	RApa	130.6
Undertake standard recording of insects and other invertebrate	RFi	46.5
	RAi	501.7
Contingency for recording non-marine molluscs	RFm	42.4

Recording and reporting microfossils		
Arrange diatoms contract and supply material	RFp	1.1
	RAp	10.2
Record diatoms from 18 selected samples	Cons dia	222.0
Record phytoliths from 24 selected samples	RFp	25.1
	RApa	301.0

Recording and reporting other groups		
Arrange ostracod contract and supply material	RFi	2.3
	RAi	10.2
Record ostracods from 8 selected samples	Cons ost	90.0
Record cladocerans from 10 selected samples	RFi	41.8
	RAi	100.3
Arrange mites contract and supply material	RFi	1.1
	RAi	10.2
Record mites from 9 selected samples	Cons mte	111.0
Record fly puparia from 22 selected samples	Cons pup	33.7
	RAi	273.8
Record mineralised/charred invertebrates	RFi	8.5
BS samples		
Arrange for delivery of samples	RFp	1.1
Select from 137 samples for further inspection	RFp	3.4
	RFb	3.4
Sort 10 selected samples for plant remains	RAp	50.2
	RFp	4.2
Sort 4 selected samples for non-marine molluscs	Tech	10.0
Sort 31 selected samples for bone	Tech	50.2
	RAb	10.0
Review 40 of the P3 samples for bone	RAb	20.1
	RFb	8.4
Record plant remains from 10 selected samples	RAp	20.1
	RFp	8.4
Record bone from 31 selected samples	RAb	100.3
	RFb	16.7
SR and hand-collected bone		
Record selected ‘A’ bone material (35 boxes)	RAb	150.5
	RFb	41.8
Marine shell		

Record measurements and other characters for not more than 1000 oyster valves	RFm	100.3
Wood		
Identify and report on 50 selected wood samples	RFp	33.9
Data analysis and reporting		
Analyse data	RFs	41.8
	RAp	50.2
	RFp	16.7
	RApa	20.1
	RAi	50.2
	RFi	20.9
	RFm	16.7
	RAb	13.6
	RFb	41.8
Synthesise external contributions into technical report	RFp	33.4
	RFi	33.4
Prepare Technical Report	RFs	41.8
	RAp	80.3
	RFp	33.4
	RAi	80.3
	RFi	33.4
	RFm	16.7
	RAb	50.2
	RFb	11.3
Finalise EAU Report	RFi	8.4
Produce EAU Report	Tech	5.0
Prepare publication report	tbe	
Revise and edit text	tbe	
Deal with proofs	tbe	
Contingency		
(includes unpredictable critical identifications and museum visits)	RFs	50.2
	RAp	50.2
	RFp	50.2

	RAi	50.2
	RFi	50.2
	RFm	16.7
	RAb	50.2
	RFb	50.2
	RApa	50.2
	Tech	50.2
Totals		
	RFp (AH)	313.1
	RFi (HK)	323.1
	RFs (RU)	219.6
	RFm (AM)	219.4
	RFb (KD)	198.7
	RApa (JC)	544.5
	RAi (FL)	1137.30
	RAb (DJ)	435.0
	RAp	648.7
	Tech	707.2
	Cons dia	222.0
	Cons ost	90.0
	Cons pup	33.7
	Cons mte	111.0