Palaeoecology Research Services

Technical report: plant, invertebrate and fish remains from excavations at 25 Bridge Street, Chester (site code: CHE/25BS'01)

PRS 2004/46

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by

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Summary

An archaeological excavation was carried out at 25 Bridge Street, Chester, between October 2001 and March 2002. Deposits of Roman to early modern date were revealed and extensively sampled for the recovery of biological remains.

The deposits revealed exhibited a variable content of plant, invertebrate and fish remains, with some sediments very rich, whilst others were barren of recognisable material. While most of the insect remains were preserved by anoxic waterlogging, plant material included specimens preserved by charring, mineral replacement and waterlogging. The earlier deposits (Roman to early medieval) tended to have only charred material surviving, whilst mineral replacement was, not surprisingly, prevalent in the deposits of the earlier post-medieval phases where most of the contexts examined gave evidence for food waste, probably largely from faeces. Assemblages of plant remains from the late medieval to later post-medieval periods tended to be dominated by small fruit seeds, but also included frequent remains of gorse and other elements of domestic waste. Abundant hop remains, probably from brewing, were encountered in one sample from the later period. There are a few hints of plants that might have been grown in gardens, and evidence for the changing use of raw material for fuel. Insect remains were rather scant and generally very decayed. The assemblages were remarkable for their low diversity; this undoubtedly reflects a restricted insect fauna, which in turn indicates a very restricted range of habitats locally in the phases examined for invertebrates. The presence of species which are certainly (the 'oriental' cockroach) or probably (the golden spider beetle) of exotic origin reflects the increasing level of overseas trade and the ever more artificial and protected nature of the urban living environment.

Small subsamples from two 16th century deposits and six coprolites from Phases III, V, VI, VII and IX were examined for the eggs of intestinal parasitic nematodes. Trichurid eggs wre found in both of the subsamples, clearly indicating a faecal content to these deposits but unable to definitely determine the source of this waste – though it is almost certainly either human or pig (or pehaps both).

Most of the recovered shell was of edible shellfish from deposits of mid/late 17th to 20th century date but remains were recovered from most phases of the site. Oyster was the most commonly represented taxon, with other edible marine taxa (e.g. cockle, mussel, and periwinkle) present in small numbers. The bias of the recovered shell towards edible taxa (particularly oyster), together with the evidence of shells having been opened using tools, strongly suggests that these assemblages derive almost exclusively from human food waste – though it appears that shellfish never formed a significant component of the inhabitants' diet.

A moderate-sized assemblage of fish remains was recovered from all of the archaeological phases represented, although more than 60% of the remains were from deposits of late 15th to early 18th century date. Throughout, mostly marine or migratory fish were identified, with flatfish, herring and eel remains forming the bulk of the fish bones from most periods. Numerical dominance between these taxa fluctuated between phases, but they appear to form the basis of the fish component of the diet of the inhabitants of Bridge Street from the late Roman period through to the 20th century. Gadidae, although never present in any great quantities, became more prolific from the early post-medieval period, whilst rays consistently occurred throughout albeit in quite small numbers. Remaining taxa, with the exception of smelt, were represented by relatively few remains. Worthy of note from deposits of Roman date were several fragments identified as Spanish mackerel. Generally, the fish remains from all phases represented waste from the food. Some of the deposits produced refuse that was likely to be from the preparation of fish for cooking, whilst other deposits provided direct evidence for consumption. No material was recovered which was indicative of commercial waste from the processing of fish.

KEYWORDS: 25 BRIDGE STREET; CHESTER; TECHNICAL REPORT; ROMAN TO EARLY MODERN; PLANT REMAINS; CHARRED PLANT REMAINS; INVERTEBRATE REMAINS; INTESTINAL PARASITIC NEMATODE EGGS; INSECTS; SHELLFISH; OYSTER; SNAILS; FISH BONE

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22 June 2004

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Introduction

An archaeological excavation was carried out by Gifford and Partners Ltd at 25 Bridge Street, Chester (NGR SJ 4060 6615), between October 2001 and March 2002.

Deposits excavated at this site were generously sampled for the purposes of finds recovery and for the retrieval of biological remains. A series of 120 samples from 115 contexts, varying in size from 5 to 100 litres (71 of which were of either 30 or 60 litres), was processed by 'bulk-sieving'(to 1 mm) on site; they yielded a heavy fraction ('residue') and lighter material ('washover' or 'flot'). A parallel series of unprocessed samples for many of these contexts was retained for subsequent examination of a 'GBA' subsample where deemed appropriate on the basis of the evidence from the BS samples (terminology follows Dobney *et al.* 1992).

The extensive sampling programme employed at this site produced a moderate-sized assemblage of fish remains. A smaller number of fragments were retrieved by hand during excavation, but these were mainly restricted to large vertebrae or single large elements. A couple of deposits also produced groups of bones representing articulated remains, mostly fins. Only a limited suite of species were present within the hand-collected material. Details regarding the fish assemblages are, therefore, mostly concentrated on information provided by the sieved assemblage.

Dating gave Roman to early modern dates for the encountered deposits and the phasing has been assigned as follows:

Phase I – Roman: late 1st to early 4th century
Phase II – late Roman/Dark Age: 4th century to *circa* AD 900
Phase III – late Saxon: *circa* AD 907 to *circa* AD 1066
Phase IV – early medieval: 'Norman hiatus' (AD 1066) to 14th century
Phase V – late medieval: 14th to late 15th century
Phase VI – late medieval/early post-medieval: late 15th to mid 17th century
Phase VII – post-medieval: mid/late 17th to early 18th century (*circa* AD 1720)
Phase VIII – post-medieval: mid to late 18th century (*circa* AD 1720 to *circa* AD 1780/1800)
Phase IX – late post-medieval: late 18th (*circa* AD 1780/1800) to late 19th century
Phase X – early modern: late 19th to 20th century

Methods

Small numbers of plant remains (mainly charcoal) were sorted by excavation staff from the residues during on-site work and examined during the assessment, when 118 of the 'washovers', together with a small proportion of the residues, were inspected. Subsamples from a group of 12 samples for which unprocessed sediment had been retained and for which insects were considered to be worth investigating (on the basis of inspection of the washovers from bulk-sieving) were selected for laboratory processing. Their lithologies were recorded, using a standard *pro forma*, prior to processing, following the procedures of Kenward *et al*. (1980; 1986), for recovery of plant and invertebrate macrofossils. In each case, only part of the washover could be inspected closely for insect remains; to examine all of the material would have required a prohibitive amount of time.

Following recommendations made during the assessment (Hall *et al*. 2002a), the washovers from a group of 12 of the bulk-sieved samples were re-examined for plant remains during the main 'analysis' phase. A selection of five of the samples processed for insect remains was, likewise, revisited (with paraffin flotation being applied to the washovers in an attempt to reduce the volume of material to be sorted).

Plant remains

Lists of plant remains and other components of the samples examined were recorded semi-quantitatively (using a simple, three-point scale from 1—one or a few remains, through 2—moderately frequent remains, or a component representing between about 1 and 10% by volume of the original sample, to 3—abundant remains or a component representing more than about 10% of the original sample volume), the data being entered, during inspection, to a computer database using *Paradox* software.

Insect remains

A record of the preservational condition of the insect remains was made using scales given by Kenward and Large (1998). This scheme provides scales for chemical erosion and fragmentation (0.5-5.5, the higher figure representing the greatest degree of damage), and colour change (0-4), in each case giving a range and a value for the position and strength of the mode (Kenward and Large 1998, tables 2, 3 and 5-7).

Insects were identified by comparison with modern reference material and using the standard works. Adult beetles and bugs, other than aphids and scale insects, were recorded fully quantitatively and a minimum number of individuals estimated on the basis of the fragments present. Other invertebrate macrofossils were recorded semi-quantitatively using the scale described by Kenward *et al.* (1986) and Kenward (1992), again using estimates for extremely abundant taxa. Data pertaining to invertebrate remains were transferred from a paper record to computer databases (using *Paradox* software) for analysis and long-term storage.

The interpretative methods employed in this study were essentially the same as those used in work on a variety of sites by Hall, Kenward and co-workers (see Kenward 1978, with modifications outlined by, for example, Kenward 1988; Hall and Kenward 1990; and Kenward and Hall 1995). For the insect remains, interpretation rests primarily on a number of 'main statistics' of whole assemblages of adult beetles and bugs, and on the recognition of ecologically-related groups of species.

Parasite eggs

Small subsamples from two Phase VI, 16th century, contexts (806–a ?garderobe fill, and 1697–the primary fill of a cess pit) were examined for the eggs of intestinal parasitic nematodes using the 'squash' technique of Dainton (1992). Six coprolites from deposits in Phases III, V, VI, VII and IX were also examined. Where possible egg measurements were taken using a calibrated eyepiece graticule at 600x magnification.

Shell

Nine boxes of hand-collected shell (representing material from 202 contexts) were submitted. All of the remains were identified as closely as possible during the assessment. The weight (in grammes) of shell from each context was noted and its preservational condition recorded using two, subjective, four-point scales for erosion and fragmentation—scale points were: 0 – none apparent; 1 – slight; 2 – moderate; 3 – high.

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

The shell data were initially recorded on paper and later entered into a *Paradox* data table for subsequent interrogation.

Fish bone

The assessment of the fish remains recommended that all well-dated fish assemblages from the samples should be recorded in detail, with the objective of providing basic information regarding species and body part representation, size range of species and some interpretation concerning the exploitation of past fish stocks.

Where applicable, fragments were identified to species or species group, using the reference collections of Palaeoecology Research Services Ltd (PRS), County Durham, and of the Royal Museum for Central Africa, Tervuren, Belgium. Wim Van Neer and Wim Wouters (of the Royal Museum for Central Africa) also advised on some identifications. Selected elements were recorded (see Appendix for details), however, where other elements not in this list or fragments, such as ribs, spines and pterygiophore could be identified to species or family group, these were noted and counted but not included in the tables of total fragment counts. These were recorded for their potential to provide additional information regarding skeletal element representation within certain context types.

Several methods of quantification were employed to calculate the significance of different species or groups within the assemblage. The simplest method used was to count the number of identifiable fragments for each species or group. Additionally, species were ranked on the basis of their frequency of occurrence, i.e. the number of contexts in which they were identified. It must be noted, however, that the relative abundance of different fish species in an archaeological assemblage is always difficult to ascertain. Differences in the number of identifiable elements for each species and differential preservation of certain bones are just two factors which can create an over- or under-representation of individual species.

Skeletal elements representing the olfactory, orbital, otic, oromandibular, hyoid and branchial regions of the fish skeleton were classified as being part of the fish head for interpretation purposes, whilst those from the appendicular region, vertebral column and caudal skeleton were classified as the body.

It was originally suggested that biometrical data be collected, however, measurable fragments were not numerous and many fragments were too incomplete or battered to provide biometrical data. Where size of fish is noted in the text, this was estimated by comparison of the remains with those of modern reference specimens of known size. Tail lengths (TL) rather than standard length (SL) was used.

Radiocarbon dates

Three samples of remains extracted from the sediment samples were submitted to Beta Analytic, Miami, Florida, for dating via Accelerator Mass Spectrometry (AMS). The results obtained are presented in the relevant sections following.

Results

Tables 1 and 2 present complete species lists of plant and insect (and some other invertebrate) remains recorded from this site, with (for the plant remains) an indication of the phases from which each taxon was recovered. Table 1 also includes records of other components of the washovers noted during examination of plant remains. Data concerning the insect assemblages are presented in Tables 3 and 4.

The assessment revealed that plant remains were often quite abundant in the deposits examined and preservation was variously by charring, anoxic waterlogging, and (less often) mineral-replacement.

Sometimes all three modes of preservation were noted in the material from a single washover. Many of the deposits yielded only very small amounts of charcoal and perhaps a few other charred remains (such as cereal grains). In no case was there a very high organic content without the presence also of much other material, typically coal cinders. (Naturally, some constraints on recording the 'waterlogged' plant remains were imposed by the examination of dried washovers but, given the broad chronological range of the deposits and the presence of large concentrations of cinders, it was thought important to concentrate on the bulk-sieved material to hand rather than to undertake extensive processing of further raw sediment.)

Paraffin flotation of some of the samples from Bridge Street failed to recover a significant proportion of the insects. This is not unknown for suites of very decayed remains; a case in point is presented by remains of *Trox scaber* in Anglo-Scandinavian and post-Conquest deposits at the Layerthorpe Bridge site, York (Hall *et al.* 2000). A very large proportion of the fossils of *T. scaber* from that site were recovered during botanical analysis from the residues from paraffin flotation, perhaps having failed to float because hydrophobic layers in the cuticle (to which paraffin normally attaches) had been modified or destroyed in the unusual environment of a tan pit: the *Trox* fossils were certainly in an unusual state of decay, and this was regarded as significant evidence regarding their pathway to the deposit. Further examples are offered by more conventionally decayed remains in samples from Cooper Farm, Long Riston, East Yorkshire (Jaques *et al.* 2002) and peat from the Guardian Glass site, Goole (Hall *et al.* 2003). In the present case, many of the remains in the washover from Sample 5161 were better preserved than those listed from the flot, perhaps contradicting the hypothesis that advanced decay was responsible for the failure of fossil remains to float. However, the same range of taxa was present in (subjectively) the same proportions. There was not time within project constraints to fully sort the washovers and identify the remains from them, but interpretation will not have suffered as a result. Notes on the insect remains from samples assessed but not examined further are given in Table 7 together with sediment descriptions for all 12 of the subsamples processed in the laboratory.

It seems likely that the organic remains in at least the more superficial deposits at this site have undergone recent decay *in situ*. Uniform decay of organics to red, orange or brown colours has been argued to be an indicator of gross decay of recently de-watered sediments, in contrast to the heterogeneous decay likely during deposit formation (Kenward and Hall 2000; in press; forthcoming).

Measurements of the trichurid parasite eggs from Contexts 806 and 1697 are presented in Table 6.

Small fragments of mostly marine shell were recovered from many of the BS samples which occasionally also gave a few fragments of eggshell (Contexts 37, 353, 671, 785, and 1513). Only four of the contexts (see text following) gave more than the barest traces of highly fragmented shell and even these gave very few remains from large samples.

Hand-collected shell was recovered from 202 contexts (2 of which remained unphased). Preservation was generally poor with erosion and fragmentation scores for most contexts being recorded as either 2 or 3. Much of the shell was notably 'soft' and that the remains had continued to degrade post-excavation was evidenced by the many fragments and flakes of shell (mostly of oyster) present in almost all of the contexts. All of the material was examined and the taxa identified as closely as possible. Table 8 shows the total numbers of contexts assessed by phase. Table 9 gives a summary of the recorded shell by phase. The molluscs from almost all of the contexts included oyster shell and summary information (again by phase) for this material is presented as Table 10.

The importance of the fish remains recovered from excavations at Bridge Street was their potential for providing information from a sequence of deposits covering a broad chronological period. They were recovered from Phase I through to Phase X, although 43% of all identified fish fragments were from Phase VI deposits, with a further 20% of the assemblage from contexts assigned to Phase VII. Material from samples representing 101 contexts was examined, resulting in the identification of 3638 fish bones to species or family group (Table 11 and Figure 1). Additionally, over 200 fragments were recovered by hand-collection from 46 deposits, although Table 12 only shows those remains included in the recording protocol (Appendix). Unless otherwise stated all comments, frequencies and total identified fragment counts refer to material recovered from the samples.

Results by phase

The contexts listed for each of the phase summaries presented below are those for which plant remains from the bulk-sieved washovers were examined in the assessment. Those underlined were re-examined for plant remains in 'main phase', those examined in detail for insects via GBA subsamples being italicised.

No further study of the parasite eggs remains or hand-collected shell was undertaken post-assessment. However, the assessment results have been revised for inclusion in this report (by phase), with additional comments, in light of finalisation of the site phasing and further consideration.

PHASE I – ROMAN: LATE 1ST TO EARLY 4TH CENTURY

For the assessment, plant remains in washovers from samples from 12 contexts (142, 143, 157, 161, 276, 1026, 1148, 1242, 1243, 1250, 1388, and 1392) dated to this phase were examined (although two of the separately numbered contexts are thought to represent the same deposit). All five of the sub-phases of Phase I and a variety of context types—fills of features and surface-formed layers—were represented. All twelve samples yielded at least a trace of charcoal, but otherwise the plant remains noted were restricted to uncharred seeds or seed fragments of elder (*Sambucus nigra*) in four samples, charred wheat (*Triticum*) grains in four samples, and charred hazel (*Corylus avellana*) nutshell in two. There was also a single tentatively identified charred plum (*Prunus domestica sensu lato*) fruitstone. The charcoal, where identified, was ash (*Fraxinus*) or oak (*Quercus*). These results are consistent with occupation in which accumulation of organic material was rare in the area excavated—not at all unusual for a Roman fortress.

No hand-collected shell was recovered from deposits of this phase.

Fish remains were recovered from samples from five deposits (Contexts 1148, 1242, 1243, 1250 and 1392) assigned to Phase I. A single fish bone was recovered by hand-collection. The largest collection of bones (56 fragments) was produced by Context 1148 (a primary silt in a substantial sandstone sewer, possibly of mid 3rd/4th century date); the remaining deposits all produced less than ten fragments. Most of the bones from Context 1148 were of good preservation, but those from the other deposits were rather battered.

The identified bones totalled 69 fragments and included the remains of eel, herring, flatfish (a few of which were more closely identified as flounder and plaice), salmon, sea bass and mullet. Additionally, several pre-caudal vertebrae from Context 1242 were identified as being possibly the remains of Spanish mackerel. During the Roman period this Mediterranean species was commonly salted and transported in amphorae to all parts of the Roman Empire (Van Neer and Lentacker 1994).

Although the remains of mullet appear to be the most numerous, these fragments represent the part skeletons of just two separate fish (one being smaller than the other), with a range of elements suggesting that originally, whole fish had been deposited (Context 1148). Skeletal elements from the other fish identified within the assemblage were almost entirely restricted to vertebrae (both pre-caudal and caudal). Unidentified elements did, however, include fragments of spine, finray and pterygiophore.

The assemblage from this phase was small but somewhat different to that recovered from later phases. Fish are comparatively rare from deposits of Roman date in Britain, however, mullet and ?Spanish mackerel are not unusual for this period.

PHASE II – LATE ROMAN/DARK AGE: 4TH CENTURY TO *CIRCA* AD 900

Plant material from a total of ten contexts (75, 98, 121, 126, 1040, 1138, 1179, 1219, 1220, and 1221) from this phase was investigated for the assessment (again, two contexts probably being the same layer, from the 'dark earth' deposits); seven of the remainder came from deposits interpreted as feature/cut fills. All three sub-phases were represented. Again, all ten samples yielded at least a little charcoal, and seven also some elder seed material. Charred cereal grains were occasionally present—barley (*Hordeum*), oats (*Avena*, including cultivated oats, *A. sativa*) and wheat (including bread/club wheat, *Triticum 'aestivo-compactum'*)—were all noted, and there were rare records of charred hazel nutshell. A pit fill (in cut 1139, Phase IIb), described by the excavator as having a midden-like character proved to contain traces of mineral-replaced material, including at least one apple (*Malus sylvestris*) seed, and did therefore perhaps contain some organic waste of faecal origin—mineral-replacement usually being observed where there is other evidence for faeces.

Only three very poorly preserved oyster valves were recovered from a total of five contexts from this phase. For two of the deposits the remains amounted to no more than small fragments and flakes of shell.

Nine deposits (Contexts 98, 121, 126, 1040, 1138, 1179, 1219, 1220, 1221) produced the fish assemblage from this phase. A range of context types were represented, including pit and posthole fills and occupation deposits. The overall total of identified fish remains was 186 fragments, of which 132 bones were recovered from just two of the deposits—Context 1138 (92 fragments), a pit fill and Context 1220 (40 fragments), a fill from the secondary silting of sewer 1182.

Flatfish remains (including flounder and plaice) were predominant, forming just over 50% of the assemblage. Herring bones were also numerous, whilst smelt and eel were present in small quantities. Very few gadid remains were identified, but fragments of both whiting and cod were recorded. Other bones present included the remains of shad, sea bass, salmon (and salmonid) and ray. Vertebrae recovered by hand-collection were identified as herring and ?trout.

Residual material from an earlier phase may be suggested by the presence of ?Spanish mackerel and mullet (possibly thin lipped grey mullet) in Context 1138 (fill of pit 1139). Pit 1139 cut through the fill of another pit which had been dug to retrieve stone from the sewer 1182 (Phase I). Context 1148, the Phase I fill of the sewer, produced bones identified as mullet and ?Spanish mackerel. The presence of remains of these fish in Context 1138 suggests that this deposit may contain reworked material that had originally been deposited in the sewer.

Most of the deposits produced too few fragments for detailed analysis of their content. Where sufficient data were available from pitfill, e.g. from Context 1138, it was evident that fragments representing the vertebral column and the appendicular skeleton of the fish were prevalent. Individual taxa, such as herring and flatfish were represented by cranial elements, but for both vertebrae were the most commonly occurring bone. For herring from Context 1138, otic bullae from very small fish were also quite numerous, together with vertebrae and some cranial elements.

Fish remains from these deposits appear to be waste from food preparation and consumption and possibly fish sauce or fish imported from the Mediterranean. When the fish were being prepared in the kitchen, the fish heads were likely to be chopped off and disposed of, whilst the waste from the meal would mainly consist of vertebrae and would perhaps be discarded elsewhere. However, the presence of both types of waste was noted here, which suggests that domestic refuse from the table and from the kitchen was all deposited together.

PHASE III – LATE SAXON: *CIRCA* AD 900 TO *CIRCA* AD 1066

All eight samples (Contexts 272, 278, 279, 280, 281, 973, 1022, 1175) yielded at least some charcoal at the assessment stage. Four of them (underlined above), from a series of fills of a single feature, were considered worthy of further examination. The feature from which they came has been interpreted as a hearth pit and, with the exception of some elder seeds and some cereal 'bran' and cereal caryopses, all the plant material recovered was charred or partly so. In a few cases, fossils were reduced to silica (cf. Robinson and Straker 1991)—through the same combustive processes. At the assessment stage, these deposits were thought to contain charred peat fragments and, indeed, the presence of charred sedge (*Carex*) nutlets in all four assemblages was thought to be consistent with this. However, closer examination revealed that most if not all of the fragments thought to be charred peat in fact contained fragments of seed coat (testa) of pea (*Pisum*), or in some cases bean (*Vicia faba*—both were certainly represented by the specimens of the diagnostic hila or seed attachment scars), together with some uncharred wheat/rye (*Triticum/Secale cereale*) and oat 'bran', and they should therefore be seen as charred food debris, presumably from cooking of food consisting in large part of pulses and whole or milled grain. More 'conventional' remains of food plants were the charred grains of oats (including cultivated oats), barley, rye and bread/club wheat, as well as charred seeds of blackberry, field bean and perhaps also pea.

It may be, in fact, that peat *was* being used as a fuel (hence the sedge nutlets), but was almost completely consumed, leaving only some fragments which consisted of pale yellowish material on one side and brownish material on the other (seen in the washover from the sample from Context 278, the uppermost fill). Some of the charcoal identified as coming from hazel roundwood, may also represent fuel used in the cooking which evidently occurred at this hearth. The presence of grassy, non-woody material—perhaps tinder—may be indicated by some of the charred and 'silicified' herbaceous material noted in at least two of these hearth samples, but very little other plant material was recognised, merely a few charred weed seeds.

The remaining samples from contexts assigned to this phase yielded only small amounts of charred plant material: a few cereal grains, hazel nutshell. There was one record of traces of uncharred seeds of fig (*Ficus carica*)—from a deposit (1175) described as a 'cessy' fill of cut 1176 (found in a small assemblage with a few other probable plant food remains). If truly pre-Norman Conquest, this represents a very rare record for fig, a species well-known from Roman and from post-Conquest medieval (and later) deposits. In view of its abundance in later deposits at this site, the possibility of contamination in the ground, during sampling, or during processing should all be considered.

Charred plant remains from two samples from this phase were subjected to radiocarbon dating. Charred cereal grains, mainly bread/club wheat and a little oats, with a trace of barley, from Context 272 and bread/club wheat and a little oats from Context 278 gave (2 sigma calibrated) AMS dates as follows:

Context 272:	cal. AD 785 to 1040 (lab. no. Beta -170531)
Context 278:	cal. AD 795 to 1000 (lab. no. Beta - 170532)

Hand-collected shell was recovered from one occupation deposit (Context 1022) but amounted to only 4 grammes of small unidentified fragments and flakes.

Fish remains from this phase were recovered from six deposits, Contexts 272, 279, 280, 973, 1022 and 1175, mainly representing pit fills, cess and occupation deposits. In total, 148 fragments were identified, with the largest concentrations of remains being recovered from Context 272 (a layer with a 'cess-like' appearance) and Context 1175 (the fill of a cess pit), and an occupation layer, Context 1022.

Preservation of the remains from this phase was mostly quite good, however fragments from Contexts 272 and 1175 were of rather battered appearance, with a couple of vertebrae from Context 1175 showing characteristic damage associated with their possible consumption and subsequent passage through the digestive system (probably human). This deposit also included several burnt fragments.

The identified assemblage consisted primarily of flatfish remains, with herring, eel and small quantities of ray, smelt, gadid and ?trout. Although the predominance of flatfish was apparent in all of the larger assemblages, some variations were noted between the different context types.

Those deposits with a component that probably derived from cess (Context 272 and 1175) had lower frequencies of flatfish (43% in both cases) and quite high proportions of herring (37% and 29% respectively). In contrast, the occupation deposit (Context 1022) had a higher frequency of flatfish remains (68%), although similar frequencies of herring (26%). The larger quantities of the latter may be a result of the inclusion of cess within Contexts 272 and 1175; the herring bones (and probably the eel and smelt vertebrae from Context 272), almost exclusively represented by vertebrae, probably derive from faecal matter. Flatfish remains, although represented chiefly by vertebrae, also included other elements from the oromandibular (e.g. dentary, premaxilla, quadrate and articular) and hyoid (e.g. hyomandibular and preopercular) region of the head, together with fragments from the appendicular skeleton (e.g. cleithrum). These remains suggest the disposal of more general domestic refuse which could be either kitchen or table waste.

A coprolite recovered from Context 1022 (occupation deposit) was examined. It contained numerous small bone fragments and no parasite eggs were seen in the 'squash' subsample. It was thought most likely to be of dog.

PHASE IV – EARLY MEDIEVAL: 'NORMAN HIATUS' (AD 1066) TO 14TH CENTURY

The six contexts (266, 1015, 1030, 1033, 1034 and 1041) from this phase for which bulk-sieved samples were examined for plant remains were, with one exception, fills of pits or post-holes. Again, all samples yielded at least some charcoal (including, again, oak and ash), and usually also uncharred elder seeds, but ancient remains representing human activity were restricted to a few charred cereal grains (mostly wheat, with some barley, and perhaps also rye). Very few other remains were noted. They therefore offer comparatively little insight into this phase of occupation of the site—and are at least consistent with the generally limited archaeological evidence for the medieval period overall.

Charred plant material from Context 1034 was used for dating by AMS. It consisted of a few barley grains, one wheat and one ?rye; the 2 sigma calibrated date returned was:

Context 1034: cal. AD 1055 to 1085
and AD 1150 to 1270
(lab. no. Beta - 170530)

No hand-collected shell was recovered from deposits of this phase.

None of the fish bone assemblages examined from Phase IV were particularly productive and few identified fragments were recovered. However, material (a total of 56 fragments) was recorded from six deposits (Contexts 266, 1015, 1030, 1033, 1034 and 1041), although only Contexts 1030 and 1033 produced more than ten identified fragments (13 and 18 respectively). The deposits were mostly pit and posthole fills, and a single cultivation soil.

Overall, preservation of the bone was described as good, although the small assemblage from Context 1034 (a posthole fill) was of rather battered appearance. Burnt fragments were noted from Context 266, the cultivation soil. Most (64%) of the remains identified represented flatfish (including flounder), with 25% of the bones being herring. Additionally, remains of eel, ?trout, conger eel and gadid were recorded. Most of the fragments (80%) were vertebrae.

PHASE V – LATE MEDIEVAL: 14TH TO LATE 15TH CENTURY

The thirteen contexts (131, 261, 264, 490, 768, 770, 888, 992, 1021, 1130, 1162, 1585 and *1632*) for which plant material was investigated included three associated with oven 767 and one with oven 1568. Three others were pit fills and two came from fills of two culverts. Again plant remains were rather restricted in their range and diversity, with charcoal (including oak and ash, but also willow/poplar/aspen, *Salix/Populus*) being recorded from all the samples. There were small numbers of charred cereal grains in several assemblages, but they were not noticeably more frequent in the deposits associated with the ovens; indeed, one deposit from oven 767 yielded traces of charred bean and pea seeds, whilst oven 1568 yielded only traces of wheat grains. The only sample revisited during the main analysis stage was 1632 (upper fill of pit 1455) in which moderate numbers of fig and blackberry seeds were present, along with traces of mineral-replaced grape (*Vitis vinifera*) pips and some fragments of material (to 10 mm) which may well have been very decayed faecal concretions; there seems little doubt that this deposit, at least, contained food waste of faecal origin. It also, however, contained moderate amounts of cinders, indicating the first clear evidence for the use of coal as a fuel at the site.

The insect assemblage recovered from Context 1632 was also recorded in some detail. The flot was fairly small and contained generally very decayed insect remains, with rather numerous uncountable scraps of various taxa, especially *Cercyon* (E 3.5-5.5, mode 4.5 weak; F 2.5-5.5, mode 3.0 weak; trend to pale 2-4, mode 4 distinct). The washover was checked and found to contain very large numbers of remains, suggesting a serious failure of flotation, something occasionally noted in other samples with decayed remains (see above). In the present case, many of the remains in the washover were better preserved than those listed from the flot, though the same range of taxa was present in (subjectively) the same proportions. There were tens of *Cercyon depressus* and many histerines in the washover; including body sclerites of the latter, which were only represented by legs in the flot. There was not time within project constraints to fully sort the washover and identify these remains, but interpretation will not have suffered as a result. There were large numbers of remains (19 individuals at least in the flot) which appeared certainly to be *Cercyon depressus*, a surprising species in an occupation site pit fill since it is normally confined to stranded wrack and other salt-soaked litter. It may be that the pit fill included some salt waste (e.g. from brining), or that conditions in some other way mimicked those of wrack. *Aglenus brunneus* was also abundant, but may have been a post-depositional invader (Kenward 1975). Overall, most of the assemblage consisted of either 'house fauna' (e.g. six *Xylodromus concinnus* and four *Tipnus unicolor*) or species typically found together in fairly foul decaying matter (e.g. eight *Ptenidium* sp., four histerines, and two *Oxytelus sculptus*). The latter doubtless invaded the pit (though give little evidence of breeding in any numbers—fly puparia were rare, too), while the former may have strayed in or been dumped in rubbish from a house or other building. There were rare grain pests (*Oryzaephilus* ?*surinamensis* and *Sitophilus granarius*), probably strays or brought in floor sweepings, and certainly too few to suggest disposal of spoiled grain.

There was a small assemblage of hand-collected shell from this phase representing material from 13 contexts. A total of 464 g of poorly preserved shell (average erosion: 2.75; average fragmentation: 2.38) was recovered, mostly oyster valves (13), with a few remains of other edible shellfish (two valves each of mussel and cockle). Five of the oyster valves (38%) showed evidence of having been opened using a knife or similar implement. The small amount of remains were thinly and fairly evenly distributed through the layers and fills of this phase.

Thirteen Phase V deposits produced a small assemblage of identified fish remains totalling 205 fragments. Only four contexts, 261, 490, 768 and 1162, produced more than ten identified bones, however. Several of the deposits were associated with (or backfilled) two different ovens (Contexts 768, 770, 888, 1579 and 1585), whilst a number [of the contexts] were pit fills (Contexts 1021, 1162 and 1632). The largest concentration of fish remains (99 identified fragments) was recovered from Context 261, a cultivation soil which appeared to have accumulated through the disposal of rubbish or midden spreading. Preservation of the remains varied between contexts, but generally, those fragments from the oven and flue fills were of reasonable preservation, whilst material from the pit fills and cultivation layers were less well preserved and rather fragmented and battered in appearance.

There was still a fairly restricted suite of species represented; numerically, herring and flatfish were predominant. Remains of eel, smelt, gadid, whiting, elasmobranch and salmonid were also identified. Taking the assemblage as a whole, the pattern (using frequency of total fragment counts) from the previous phases was reversed, with herring remains becoming dominant, forming 50% of the assemblage, and flatfish decreasing in significance to 35%. Frequency of occurrence, however, suggested that flatfish were still important being found in 85% of the deposits examined from this phase, in comparison to 69% for herring. This technique increased the importance of gadid remains, the few fragments being recovered from 7 of the 13 deposits (i.e. 54%).

An examination of skeletal element representation for all fish from this phase showed that 81% of all the identified fragments represented the body of the fish i.e. were either vertebrae (the majority) or skeletal elements representing the appendicular region of the skeleton. It can be seen from a closer examination of the two main groups (herring and flatfish) that whilst both were primarily represented by vertebrae (90% and 56% respectively), flatfish remains also include a wide range of elements from all parts of the head and appendicular skeleton.

Results from this phase were clearly influenced by the assemblage from Context 261 which produced almost 50% of the identified fragments. The prevalence of herring vertebrae can perhaps be attributed to the incorporation within this deposit of material deriving from night soil or cess, but the inclusion of other, more general refuse is indicated by the presence of the flatfish remains.

Comparison of the flatfish remains with modern reference specimens suggested that the flatfish represented were quite small, ranging in overall length from 20 to 25 cm. Evidence from the whiting vertebrae from Context 261 indicated that the individuals represented were about 20 cm in overall length. Hand-collected material from this phase was restricted to just two fragments; one was a cod pre-caudal vertebra from a fish of approximately 1 metre in length (TL).

Context 992 (drain fill) gave a single coprolite which the presence of numerous small bone fragments, and absence of parasite eggs within the 'squash' subsample, identified as most probably being of dog.

PHASE VI – LATE MEDIEVAL/EARLY POST-MEDIEVAL: LATE 15TH TO MID 17TH CENTURY

Almost all the 21 deposits investigated for plant remains (Contexts 37, 113, 429, 431, 442, 467, 493, 566, 608, 671, 765, 777, 785, 791, 797, 798, *806*, 1556, *1635*, *1697* and 1702) came from pits, with five (785, 791, 797, 798 and 806) being fills of garderobe 487, 429 and 442 being fills of pit 430, and 566 and 608 being fills of pit 614. (In addition to the material examined by AH, samples from Contexts 806 and 1697 were also studied by Fiona Johnson and David Shimwell, Palaeoecological Research Unit (PERU), School of Geography, University of Manchester. Comments on records additional to those made in the main study are included below.)

Plant macrofossil assemblages from this phase were generally richer than in any previous deposits at the site, though cinders were frequent or abundant in a third of the washovers, indicating the regular use of coal as a fuel. Four samples were selected for re-examination after the assessment. The more frequent plant remains were seeds of fig (in two-thirds of the assemblages) and other probable food remains included blackberry, raspberry (*Rubus idaeus*) hazel nut, and grape. Strawberry (*Fragaria* cf. *vesca*) was rather frequent in one of the assemblages rich in fig seeds (from Context 806) but the range of foods represented is still quite limited: other edible taxa, usually only found in small amounts in one or two samples, included linseed (*Linum usitatissimum*), apple, sloe (*Prunus spinosa*); there was also a single record of charred field bean remains.

The other prominent component of the assemblages from the Phase VI deposits was a variety of remains of gorse (*Ulex*, perhaps all *U. europaeus*). The parts recorded were charred (and partly-charred) flower-buds, charred, uncharred and mineral-replaced leaves (i.e. spines), and charred pods and twig fragments. Clearly dried flowering stems of gorse were being used at this time, most probably as fuel, the uncharred and mineral-replaced material representing that which had not been burnt prior to deposition in the pit concerned. Remains of gorse were most abundant in Context 785 (from garderobe 487), and recorded from two of the other fills of this feature, but were also found in the fill of pit 1703 (Context 1702) and the fill of cut 38 (Context 37). Other plant remains in these deposits were a mixture of weeds of various kinds, perhaps largely arriving with cereal crops or straw, or growing in the vicinity of the deposits as they formed, but none was ever present in more than small numbers.

The samples from Contexts 806 and 1697 studied at PERU yielded much the same taxa represented by plant macrofossils as those investigated by AH, both assemblages consisting almost exclusively of remains of foodplants. The group from 806 was very largely fig seeds with single apple, pear, ?cherry and medlar seeds or fruitstones. Neither pear (*Pyrus communis* L.) nor medlar (*Mespilus germanica* L.) was recorded by AH but neither is unexpected at this period.

Context 806 and 1697 were also examined (via 'squash' subsampls) for the eggs of intestinal parasitic nematodes during the assessment. For Context 806, the 'squash' was mostly organic detritus with some inorganic material. Seven rather poorly preserved *Trichuris* eggs (all missing both polar plugs) were seen as were many pollen grains and some ?fungal spores. Maximum lengths (though obviously not including polar plugs) and widths were recorded for five of the eggs. A maximum length (including polar plugs) was calculated for these eggs, by extrapolation from data from other archaeological records, and their size range determined to be 52-64 microns long by 24-28 microns wide (Table 6). The 'squash' from Context 1697 was also mostly organic detritus with some inorganic material. Twenty-one rather poorly preserved *Trichuris* eggs (again, all missing both polar plugs) were seen. Maximum lengths (not including polar plugs) and widths were recorded for 11 of the eggs. A maximum length including polar plugs was calculated (as before) and their size range determined to be 49-60 microns long by 24-30 microns wide (Table 6). A single ?*Ascaris* egg was also noted.

The insect remains from three of the deposits (italicised above) were recorded in detail. Context 806 (Sample 5081) gave a moderate-sized flot composed of bright to pale orange plant tissue and insect fragments. There were many pale filmy remains which floated and migrated in the dish during sorting, and insects were consequently hard to see and to catch. Preservation was recorded as E 3.5-5.0, mode 5.0 strong; F 1.5-3.5, mode 2.5 weak; trend to orange (then pale) 3-4, mode 4 strong. Insect remains were fairly numerous (141 individuals of 30 taxa of adult beetles, though their concentration was quite low, this assemblage being from a subsample of 5 kg). Three species dominated: *Omalium ?allardi* (45 individuals), *Aglenus brunneus* (21) and *Tipnus unicolor* (17). The first of these is a likely invader of foul matter in the pit itself. On the other hand, *T. unicolor* is regarded as characteristic of long-lived somewhat damp buildings (it is discussed further below). The species is regarded as a typical component of 'house fauna'. It may have been attracted to the odour of faeces, however, and many of the other beetles found in this deposit may also have been drawn to the smell, their small numbers suggesting that they did not establish breeding populations. Many are also components of 'house fauna' (notably *Mycetaea hirta*, *Xylodromus concinnus*, *Atomaria* species., *Anobium ?punctatum*, *Ptinus ?fur*, *Cryptophagus* species: Kenward and Hall 1995; Carrott and Kenward 2001), so they may alternatively have been introduced in floor sweepings, together with a flea (represented by a head which was too decayed to name, but quite probably *Pulex irritans* Linnaeus, the human flea). The blind, burrowing *Aglenus brunneus* may have been a post-depositional invader (Kenward 1975), together with *Trechus ?micros* and *Rhizophagus* sp. (quite possibly *R. parallelocollis* Gyllenhal). This deposit yielded single specimens of the saw-toothed grain beetle *Oryzaephilus surinamensis* and the grain weevil *Sitophilus granarius*. Fly puparia, often very abundant in latrine deposits, were not particularly common. A characteristic *Ptinus* (spider beetle) pronotum could not be matched to any of the British species, having characteristics reminiscent of a cross between *P. fur* (Linnaeus) and *P. sexpunctatus* Panzer, but with very strongly developed lateral processes.

A smallish flot was obtained from Context 1635. It yielded quite large numbers of insect remains, including 196 adult individuals of 44 beetle taxa. Many remains were very decayed and typically pale orange, however, although in some cases with the wings of beetles still in place on the underside of the elytra: this sort of preservation suggests recent *in situ* decay of fossils which were formerly in excellent condition. Preservation was recorded as: E 3.5-5.5, mode 4.5 strong; F 1.5-3.5, mode 2.0 weak; trend to orange (then pale) 2-4, mode 4 strong. One taxon dominated the assemblage, an aleocharine staphylinid (111 individuals, although perhaps a compound taxon since Aleocharinae are very difficult even to divide into types when poorly preserved). This cannot be ecologically categorised, though many aleocharines are found in decaying matter of one kind or another. Of the remaining species, *Carpelimus bilineatus* (12) is rather typical of cess pit fills (although found in other kinds of deposits and in nature found in waterside litter, Kenward and Allison 1974; Kenward and Hall 1995). As in the case of the other deposits discussed here, *Aglenus brunneus* (9) may have invaded post-depositionally, an hypothesis supported by records of *Trechus ?micros* and *Rhizophagus* sp. Most of the remaining fauna was composed of house fauna (e.g. *Xylodromus concinnus*, *Tipnus unicolor* and a *Cryptophagus* species, all with five individuals) and a few species found in fairly to very foul matter, although their numbers were small. There was a single grain weevil, *Sitophilus granarius*. A notable record was of the weevil *Apion ?genistae*, found in Britain on *Genista*, usually *G. anglica*, according to Morris (1990), but just possibly brought with the gorse recorded during the botanical analysis. The *Micrambe* recorded may be *M. villosus* Heer; Coombs and Woodroffe (1955) give no ecological data for this species, but the closely related *M. vini* Panzer is usually found on broom and gorse.

Context 1697 gave a quite large flot which contained moderate numbers of insect remains (though at a low concentration in the original sample material), many of which were strongly decayed and orange or pale (E 3.0-5.0, mode 4.0 weak; F 2.0-5.0, mode 2.5, weak; trend to pale/orange 2-4, mode 3 weak). The paraffin floatation process appears to have failed (cf. Sample 5161, Context 1632) as when part of the washover was checked it was found to contain appreciable numbers of fossils. It was, however, impractical to recover and record all of these remains, but the listed assemblage reflects the character of the whole well enough. Here, *Omalium ?allardi* (11 individuals) appears to have colonised the pit fill, with a few other beetles which may have been attracted to foul matter and very large numbers of fly puparia of various kinds, doubtless breeding in rotting waste. The only other abundant species were house fauna components: *Tipnus unicolor* (17) and *Xylodromus concinnus* (11). How these entered the pit fill is not clear, though *T. unicolor* has occasionally been found in cesspits in abundance, perhaps living in the structure above the pits or attracted by faecal odours (see below). There was a single grain weevil, *Sitophilus granarius*, and one *Oryzaephilus surinamensis*. *Cercyon depressus*, typically found in stranded wrack and similar salt-soaked material, but also found in a sample from Phase V at this site, was represented by at least three individuals in this subsample.

Three Phase VI deposits gave traces of eggshell – Contexts 37, 671 and 785.

A small assemblage (total weight 500 g) of hand-collected shell rather similar to that from Phase V and, again, thinly an evenly distributed through 21 contexts, was recovered. The remains were rather poorly preserved (average erosion: 2.5; average fragmentation: 2.43) and mostly of oyster valves (22, seven of which, 32%, showed evidence for having been opened by humans), Small amounts of mussel (11 valves) and cockle (6) were also recorded.

In total, nineteen deposits, mainly fills of rubbish or cess pits and garderobes, produced 1551 identified fish bone fragments. The largest accumulations of fish bone were from a series of 16th century fills from garderobe 487, Contexts 785, 791, 797, 798, 806, and from Context 1697, described as the primary fill of a 16th century cess pit. The latter produced the greatest quantity of identified remains from all phases from a single deposit. Two other pit fills from this phase, Contexts 1635 and 1702 were also notable for their fish bone content.

Preservation of the fish remains was varied, and, in general terms, reflected the type of deposit from which they were recovered. Bones from cess pit and garderobe fills tended to be quite fragmented and of rather battered appearance; this was particularly noticeable within the material from Context 1697. The assemblages from garderobe 487, however, were less fragmented and the remains from Context 798 were of good preservation and included quantities of fish scales. Several herring and flatfish vertebrae recorded from Contexts 791, 798 and 1697 were crushed, characteristic damage associated with ingestion and passage through the human gut. These remains are likely to originate from faecal material.

For this phase, numerically, eel provided a large component of the assemblage (39%), but both flatfish (including flounder, plaice, sole and turbot) and herring remains were numerous (30% and 21% respectively). On the basis of frequency of occurrence, flatfish become the most significant group, occurring in 17 of the 19 samples examined, whilst herring were present in 13 and eel were recovered from ten. Other taxa present within the assemblages from this phase were gadid (mostly whiting), thornback ray, smooth hound, smelt, anchovy, conger eel, salmonid, cyprinid, stickleback and weever. Only the first three groups provided more than a few fragments.

Figure 2 shows that the relative frequencies of the various species or family groups differed between deposits, and some correlation with particular context types was observable. Eel remains were strongly represented in Contexts 806 and 1697. These were both primary cesspit/garderobe fills and the predominance of eel may be the result of the presence of a large component of faecal material within these deposits. The prevalence of flatfish remains representing all parts of the fish skeleton within contexts such as 791, 1635 and 1702 may suggest that these deposits were formed by the accumulation of more general domestic refuse, including kitchen and/or table waste. Context 1635 also included a larger number of gadid remains (mostly whiting) than seen from other deposits, represented by elements other than just vertebrae, again suggesting domestic waste. In contrast to these deposits, the assemblage from Context 785 was dominated by herring. Vertebrae were abundant but not exclusive and a range of other skeletal elements was represented. A detailed examination of skeletal representation for herring suggested that there was an absence of cleithra and other fragments representing the appendicular skeleton. This may suggest that the herring had been gutted and the remains represent cured rather than fresh fish. The profusion of herring vertebrae may indicate the presence of faecal matter within this deposit but, given that skeletal elements representing the head were also recorded this may not necessarily be the case.

Most of the fish represented in these deposits were small, with flatfish ranging between 20 and 35 cm in overall length. Whiting and small gadid remains represented individuals between 10 and 25 cm in length, with a larger whiting, of approximately 55 cm recorded from Context 37. Larger fish, including ling and cod (with estimated overall lengths of around 1 metre) were also identified, mainly from the hand-collected material. The latter also included several flatfish bones from bigger individuals.

A single coprolite recovered from Context 442 (primary cess pit fill) contained substantial amounts of small bone fragments and was most probably of dog. No parasite eggs were recorded from the 'squash' subsample supporting this theory. However, crushed fish bone was noted within this cess pit fill and the possibility that the coprolite was of human faecal material cannot be excluded.

PHASE VII – POST-MEDIEVAL: MID/LATE 17TH TO EARLY 18TH CENTURY (*CIRCA* AD 1720)

A total of twenty contexts (26, 31, 237, 245, 455, 463, 464, <u>489</u>, 670, 1505, 1513, <u>1515</u>, <u>1516</u>, 1558, 1599, 1607, <u>1608</u>, 1695, <u>1699</u> and 1881) was examined for plant remains by means of bulk-sieved samples, and five were selected for post-assessment re-examination. Almost all were fills of pits or other features, with three samples representing each of pits 465, 1494, 1696 and 1807.

There was a moderate range of identifiable taxa in washovers otherwise largely dominated by cinders, with coal and charcoal. Some assemblages rich in small fruit seeds, mainly fig, elder and blackberry, were noted, and there were several records for remains of charred (and sometimes also uncharred) remains of gorse, as for the previous phase. Some of the deposits evidently contained an element deriving from faecal material, having some mineral-replaced plant macrofossils (but only one case with tentatively identified faecal concretions). Small numbers of charred cereals were also noted and there was a modest variety of weed seeds. A plant likely to have been cultivated or used as an ornamental locally was box (leaf fragments from the primary fill of pit 1506), other 'useful' plants including hops (moderately frequent in a fill in pit 1807, some of the material being mineral-replaced). The remains of hop seem unlikely to represent anything other than brewing, though they were found together with remains of fruits which otherwise suggest the deposition of food or faecal waste. There was also a tentatively identified specimen of a seed which appeared to be purslane (*Portulaca oleracea*), a non-British plant introduced from warm temperate or tropical areas and perhaps cultivated (presumably as the subspecies *sativa*) as early as 1200 (reference in Preston *et al.* 2002). Clement and Foster (1994) list it as an alien brought with bird-seed, wool, cotton, or tan-bark, when occurring in parts of the British Isles other than Scilly, today. The fossil, if correctly named, probably represents an imported seed rather than a seed originating in a plant which grew in the city. Intriguingly, this plant has also been recorded, tentatively, from post-medieval ($17^{th}/18^{th}$ century) deposits in Dublin (Hall *et al*. in prep.) and would perhaps come to be a typical plant for the period were more deposits with good preservation to be examined.

Context 1513 gave traces of eggshell. The same deposit, as well as Contexts 237 and 1607, also gave small amounts of other shell remains. The ?midden deposit (Context 1513) gave the greatest quantity of shell (340 g of heavily eroded and fragmented oyster) from a 60 litre sample. Context 1607(pit fill) yielded a single oyster valve (again heavily eroded and fragmented) from 30 litres. The ?cultivation deposit (Context 237, Sample 5006) gave remains of two rather poorly preserved (the shell being heavily eroded and soft) oyster valves (one left and one ?right) and small shell fragments (including one fragment identifiable as cockle) from an 80 litre sample. In addition, a trace of unidentified land snail shell was recovered from Context 464.

Just over six kilogrammes of hand-collected shell were recovered from Phase VII deposits. Preservation was poor (average erosion: 2.86; average fragmentation: 2.59) and the remains were predominantly of oyster (171 valves, 30% of which showed evidence of having been opened by humans). Other edible marine taxa included periwinkle (6 individuals) and cockle (5 valves) and two flat periwinkles and a single top shell were also recorded. A little evidence of damage to the oyster valves by other marine taxa was noted in the form of polychaet worm burrows (on 14 valves) and encrusted barnacles (on 5 valves). The remains were, in the main, rather thinly distributed between the forty-two shell-bearing deposits of this phase. Concentrations of remains were apparent in several pit fills, however. Contexts 463 and 464 (fills of pit 465), Context 1560 (a fill of pit 1560) and Contexts 1601 and 1604 (fills of rubbish pit 1807) all gave larger numbers of edible shellfish valves indicating disposal of food waste into these features.

Most of the nineteen deposits from which fish remains were recovered were from the fills of cess and rubbish pits, with some remains from two cultivation soils. Identified fish bone from this phase amounted to 719 fragments, the greatest quantities of remains coming from four groups of deposits; Contexts 237 and 663, cultivation soils, Contexts 463, 464 and 489, fills of cess pit 465, Contexts 1505, 1513 and 1558 fills from sandstone cess pit 1494 and the fills associated with horncore pit 1807 and pit 1696, Contexts 1599, 1607, 1608, 1695, 1699 and 1881.

As with material from the previous phase, preservation was, to some extent, determined by context type. Material from the cultivation soils was recorded as being of fair preservation, although the bones were somewhat fragmented. Fish bones from the cess and rubbish pit fills were mostly very fragmented and battered in appearance. This was particularly true for the remains from Contexts 1513 and 1558, whilst material from Context 1607 was described as being of poor preservation. However, fish bones from the fills of cess pit 465 were well preserved, although the remains were not as numerous.

Distortion of some of the smaller vertebrae (including herring, smelt, small gadid, small conger and flatfish) was noted from several of the deposits (Contexts 31, 1513, 1588 and 1607) including the cultivation soil Context 237. This damage is likely to be evidence of ingestion and passage through the digestive system and indicates the probable presence of faecal material within this deposit.

A quite diverse range of species was recovered from this phase, with many similarities to the assemblages recovered from Phase VI deposits. Overall, proportions of the main species (flatfish, eel and herring) were also similar to Phase VI, although remains of eel decreased from 39% to 27%. Flatfish formed the largest component of the assemblage (30%), with herring providing 22%. Additionally, an increase in the remains of both gadidae and smelt was apparent. Gadidae remains were largely composed of whiting, mostly small individuals.

Flatfish were identified from all 19 of the samples examined; this corresponds with the numerical dominance of this taxa. Although eel remains were the next most numerous species represented, both herring and gadids occurred more frequently, in 17 and 15 of the deposits respectively. This perhaps gives a more accurate picture of the importance of the main species, given that eels are probably over represented since they have approximately twice the number of vertebrae of other fish.

Anchovy, first recorded in the previous phase, were slightly more numerous from these deposits, whilst salmonid remains including trout and salmon, although not common, were also present. Other taxa identified included thornback ray, conger eel and Cyprinidae, together with a single fragment identified as weever. The hand-collected assemblage produced a further 147 fragments (including ribs, finrays, spines and pterigiophores) which included the remains of at least two cyprinids, of which some skeletal elements showed similarities with those of roach. Cod, ling, sea bass, salmon, turbot and carp were also present within this assemblage typically representing larger individuals than found in the sieved material.

When considered in more detail, some similarities were apparent between assemblages from the different context types (Figure 3). Generally, eel remains dominated the larger cess pit fill assemblages, e.g. Context 489, although different fills from the same feature varied and eels were not prevalent in all fills. Eel bones also provided 52% of the identified remains from Context 1607, one of the fills (described as being a ‘green cessy’ fill) within rubbish pit 1696. The high concentration of eel vertebrae (also herring and smelt in some of the deposits such as cess pit fill 1513) is likely to indicate that these deposits contained a component originating from faecal matter. Crushed and distorted vertebrae, as seen in these deposits and in the cultivation deposits, are also suggestive of faecal material. In the case of the cultivation soils, this component may perhaps derive from night soil.

It is clear that cess was not the only source of the fish remains. Within the two cultivation soils (Context 237 and 663), flatfish remains were the most frequently occurring fragments and this was also the case for several of the fills (Contexts 1695 and 1699) associated with the ‘horncore’ pit and pit 1696, although these deposits only produced quite small assemblages. Flatfish remains were also recorded from the cess pit fills. These remains and those of thornback ray and larger flat fish (turbot) and gadids (as recorded from the hand-collected assemblages from Contexts 1601 and 1604) are likely to suggest the presence of more general rubbish from food preparation and [table] waste from consumption. Similarly, garden soil, Context 455, rubbish pit fill Context 682 and cess pit fills 1193 and 1504 also produced [hand-collected] remains of larger specimens of fish such as turbot, ling, cod and salmon.

Skeletal element representation for the different species showed that, overall, vertebrae were the commonest element recorded. Regardless of context type, where herring, eel and smelt were identified, these taxa were almost exclusively represented by vertebrae, as were the small gadids, whiting and anchovy. However, for flatfish, cranial and appendicular elements were also relatively abundant and in some deposits (e.g. Context 237), flatfish head bones were present in almost equivalent numbers to the vertebrae and, in one case (Context 1607), greater quantities.

Fish sizes varied but, generally, most of the fish represented in the deposits were small, including whiting and cod bones from individuals of an estimated tail length of between 15 and 20 cm. However, from Context 1513, there were several cod caudal vertebrae (probably from the same fish) which represented a far larger fish that must have been greater than a metre in overall length. Hand-collected remains included several cod and ling vertebrae that were from fish of a similar size (Contexts 682 and 1504), together with a number of large gadid finrays and ribs from Context 1107. Flatfish ranged in size from around 20 cm to around 40 cm in length, with those fragments from the cultivation soil representing individuals between 18 and 25 cm. Turbot remains [hand-collected] from Contexts 455, 1601 and 1604, although rather fragmented, were clearly from somewhat larger fish, probably in the region of 100 cm in overall length.

A coprolite was also recovered from the midden deposit, Context 1513. In common with the other coprolites recovered from the site, this was rich in small bone fragments and void of parasite eggs, and thought most likely to be of dog. See the *caveat* for the coprolite in Phase VI, however.

PHASE VIII – POST-MEDIEVAL: MID TO LATE 18TH CENTURY (*CIRCA* AD 1720 TO *CIRCA* AD 1780/1800)

Plant material from seven contexts (207, 223, 341, 515, 520, 559, and 1437) was investigated via bulk-sieved samples. Two were layers, the rest fills of features, with pit 519 being represented by two samples. None were thought worthy of further analysis subsequent to the assessment. Overall, the washovers had a rather similar composition to those from Phase VII, with cinders predominating, some coal and charcoal, and plant remains mainly comprising seeds of fig, elder and blackberry with small numbers of charred cereals.

Traces of unidentified land snail shell were recovered from Context 341.

This phase gave the largest hand-collected shell assemblage (total weight 6536 g), once again mostly of oyster valves (118) with traces of other edible taxa (including periwinkle, mussel, scallop and cockle; the last represented by 25 valves). Preservation was rather poor (average erosion: 2.6; average fragmentation: 2.28), but evidence of polychaet worm burrowing was visible on 13 of the oyster valves and eroded barnacles visible on four. Evidence of the oysters having been opened using a knife (or similar) was recorded on 23 (19%) of the valves. A single *Helix* sp. land snail was also recovered. Concentrations of remains were noted in two of the pit fills (Contexts 1406 and 1645) and in two levelling layers (Context 1636 and 1837), but otherwise shell was rather sparsely distributed between 35 contexts.

Seven deposits produced a fish bone assemblage that amounted to 341 identified fragments. Of these remains, 40% were recovered from Context 1437, a fill of pit 1438, whilst smaller assemblages came from Contexts 207, 223, 341, 515, 520 and 559; these included pit fills, occupation and cultivation deposits.

Preservation of the remains from this phase was, in general, good. Material from Contexts 207 and 1437 was somewhat fragmented and all the bone fragments from these deposits were small in size. Several vertebrae (of smelt, herring and eel), mainly from Context 1437, but including one from Context 559, had a crushed appearance, damage indicative of ingestion.

Taken as a whole, 43% of the identified fish assemblage was flatfish remains, with herring providing 24% and eel 18%. Other than the three main species, a number of other taxa were identified. These included gadid (mainly whiting), thornback ray, anchovy, cyprinid, conger, bass (Context 559) and perch (Context 314). A small number of scales that were probably perch were also recovered from this deposit. Additional species included ling (Context 341), cod (Context 1684) and salmon (Context 1871); all identified from the hand-collected assemblage.

Individually, most of the smaller assemblages followed this general pattern, with flatfish remains occurring most frequently. However, a somewhat different pattern was observed from the material from Context 1437. Eel bones dominated (34%) this assemblage, although flatfish were almost as numerous forming 29% of the remains. Herring decreased from the overall frequency of 24% to 17%, whilst whiting and smelt contributed 11% and 6% respectively. The presence of high frequencies of eel vertebrae (and to a lesser extent, herring and smelt), and given that a number of these vertebrae showed evidence of having been eaten, it is likely that this deposit was composed largely of cess or faecal material.

Over 70% of the fragments from this phase were vertebrae. However, flatfish were typically represented by a range of skeletal elements, although generally vertebrae were prevalent. The flatfish bones from Context 1437 were the exception, with 70% of fragments representing the head or appendicular skeleton rather than the vertebral column.

The fish represented in the deposits were again all fairly small with several herring vertebrae being from young individuals. Some of the whiting vertebrae, once compared with modern reference specimens, were from fish with a tail length of approximately 15 cm. Flatfish varied in size from 25 to 40 cm.

PHASE IX – LATE POST-MEDIEVAL: LATE 18TH (*CIRCA* AD 1780/1800) TO LATE 19TH CENTURY

Although fifteen contexts (*206*, 208, 217, 325, 352, 353, 375, 384, 451, 507, 545, 546, 547, 1387, and 1486) were represented by samples for this phase, only one was thought appropriate for further analysis of plant remains following the assessment (but the washover from it could not, in the event, be relocated). All but three of the fifteen contexts were feature fills, with a slot (544) being represented by three of the samples. Washovers were rich in cinders and charcoal (both oak and ash being identified), and contained quite a diversity of identifiable plant remains, especially elder, fig and blackberry seeds, though usually in small numbers. There were also a few charred remains of hazel nutshell, barley, oat and wheat grains (including cultivated oat and bread/club wheat) and a single record of rather large numbers of tomato (*Lycopersicon esculentum*) seeds (from pit fill Context 451). Other probable food plants present in very small numbers were strawberry, field bean, sloe and ?pea, with some part-charred rye rachis fragments perhaps originating in straw rather than grain. Fragments of heather shoot, some of them charred, from fireplace Context 208 might represent the use of this plant in various ways, perhaps most likely as fuel given the context; one other possibility (given the later date and city centre location) is that these fragments were debris from heather besoms (brooms). Also in this deposit were traces of tentatively identified box leaves, whilst Context 206 (fill of pit 205) yielded traces of tentatively identified holly leaf. A single large solanaceous seed tentatively identified as thorn-apple, *Datura stramonium*, from Context 352, is perhaps simply from a plant growing as a weed or garden plant.

The insect assemblage from Context 206 was fully recorded. The flot was of moderate size, but consisted primarily of yellow scraps of cuticle, brown 'felt' which consisted of fungal hyphae and 'char'. The fossils were generally very poorly preserved, and tended to disintegrate when handled (E 3.5-5.0, mode 5.0 distinct; F 2.5-5.5, modes 3 and 5, distinct; trend to orange 3-4, mode 4 strong). The washover contained a few beetle remains, and abundant cuticular fragments which were probably mostly of cockroach (although no good diagnostic parts were seen, in contrast to the remains from the flot). Rather few adult beetles were found (22 individuals of 12 taxa). There were also some insect larvae. Much the most numerous beetle was the golden spider beetle, *Niptus hololeucus* (probably a fairly recent introduction, see below – Discussion), and the only other species represented by more than one individual was a *Cryptophagus*. This limited fauna appears to point to a protected situation with direct access to a building. Such a conclusion is supported by the presence of remains of at least two individuals of the 'oriental' cockroach, *Blatta orientalis*, a warmth-demanding alien, again discussed below.

A trace of eggshell was recovered from Context 353 and the ash pit fill (Context 208) gave a small amount of cockle shell representing perhaps as many as five individuals and a single fragment of mussel shell from a 60 litre sample. Additionally, traces of unidentified land snail shell were recovered from Context 353 and Context 375 gave a single *Vitrea* sp.

A total of 3763 g of hand-collected shell was recovered from the phase IX deposits. The remains were almost entirely of poorly preserved (average erosion: 2.38; average fragmentation: 2.28) edible shellfish: oyster (126 valves), cockle (44 valves) and mussel (17 valves). A little damage from polychaet worm burrowing was noted on six of the oyster valves, with eroded barnacles noted on another. Evidence of the oysters having been opened by humans was recorded on one-third of the valves. Forty-eight deposits from this phase gave some hand-collected shell, mostly as a few oyster valves (and occasional other remains) per context. Slightly larger quantities of shell were recovered from three layers (Contexts 344, 1096 and 1187) and from one fill of a ?boundary ditch (Context 553).

Material from 12 deposits (mostly pit fills) was examined, and 320 fish bone fragments were identified. Most remains from this phase were well preserved, although material from Contexts 352, 1387 and 1486 was rather fragmented and of battered appearance. Approximately 10% of all the fish bone recovered from Context 352 was burnt. This phase included material from a number of deposits which possibly included reworked material. These included the fills of two features that had been dug for the specific purpose of burying animals (i.e. two cats and a dog). Most of the fish bones were recovered from Contexts 217, 352, 507, 545 and 1486.

Total fragment counts for this phase showed that flatfish were the predominant species (44%), followed by herring (29%), eel (14%), smelt (9%) and gadid (4%). As seen from other phases, taxa such as eel, smelt and herring were typically well represented in cess pit fills and often they were represented almost entirely by vertebrae. Material from Context 1486 (fill of a cess pit) shows these characteristics; eel and smelt remains contributed 78% of the assemblage from this deposit and were predominantly vertebrae. Very few fragments of other species were present, but a few flatfish and herring remains were identified, together with several vertebrae recorded as cyprinid, ?perch and ?whiting. Other deposits (e.g. Contexts 352, 507 and 545) which produced assemblages of any size were mainly dominated by flatfish, including both plaice and flounder. One exception to this was the assemblage from Context 217 which consisted almost entirely of herring bones.

Overall, 69% of the skeletal elements identified were vertebrae. However, as seen throughout most of the medieval and post-medieval phases, flatfish were generally represented by a range of skeletal elements and this was also the case for this phase. In contrast to the herring remains where 75% were vertebrae, flatfish vertebrae amounted to 56% of the assemblage. Just over half of the flatfish remains from pit fill 545 were bones representing the oromandibular and hyoid region of the skeleton. There were fewer fragments from the appendicular skeleton and the branchial region– however, two cleithra were recovered by hand-collection.

Again, fish represented in these deposits were fairly small, with flatfish ranging in size from 25-40 cm, with one smaller individual of 15-20 cm.

A single coprolite was recovered from each of Contexts 441 (?tree bole pit fill) and 545 (pit fill). The presence of numerous small bone fragments and absence of parasite eggs within these, together with the context types of the deposits from which they were recovered, suggested that they were most probably of dog.

PHASE X – EARLY MODERN: LATE 19TH TO 20TH CENTURY

Plant material from three contexts (60, 424, and 583) dated to this phase was examined: a cess pit fill (from the evaluation stage of the field project), a drain fill, and the fill of a negative feature. Cinders were prominent in each of the washovers but identifiable plant remains were restricted to a few specimens of fig, grape, blackberry and raspberry, and with one record of tomato seeds.

A small assemblage of land snails was recovered from Context 424 (drain fill). Most of the shells were too poorly preserved to be identifiable but the better preserved remains were tentatively identified as *Oxychilus* sp. A few or single unidentified land snails were also recovered from Contexts 341, 353, and 464, and Context 375 gave a single *Vitrea* sp. shell.

A little over five kilogrammes of hand-collected shell were recovered from deposits of this phase. The remains were poorly preserved (average erosion: 2.61; average fragmentation: 2.45) and mostly of oyster (178 valves) with a few other edible shellfish represented (mussel – 6 valves; cockle – 13 valves). Damage to the oyster valves cause by opening using a knife (or similar) was noted on 21% of these remains. There were traces of damage from polychaet worm burrowing on four of the oyster valves and of eroded barnacles on a fifth. The remains were mostly evenly distributed between thirty-five contexts but two concentrations of were apparent in Contexts 301 and 1503.

Fish bone of early modern date was recovered from five deposits (Contexts 60, 424, 443, 583 and 599). Identified remains totalled 43 fragments, most of which were from Context 599. Preservation of these remains was mostly good. The three main species, flatfish, herring and eel, were identified, together with three fragments recorded as whiting. Herring and eel were predominantly represented by vertebrae, whilst a wide range of skeletal elements were recorded for flatfish. Similar flatfish remains were present within the hand-collected assemblage recovered from Context 443. Material from this deposit probably represents a single fish. The assemblage from this phase was too small to be of much interpretative value.

Discussion

The deposits at Bridge Street exhibited a very variable content of plant and invertebrate remains, with some sediments very rich, others barren of recognisable material (other than, for example, wood charcoal). While most of the insect remains were preserved by anoxic waterlogging, plant material included specimens preserved by charring, mineral replacement and waterlogging. The earlier deposits (Roman to early medieval) tended to have only charred material surviving, whilst mineral replacement was, not surprisingly, prevalent in the deposits of the earlier post-medieval phases where most of the contexts examined gave evidence for food waste, probably largely faecal. Preservation in some of the more superficial deposits appears to have been excellent until recently, decay probably having been initiated in the past decades by a falling water-table consequent upon development.

The post-medieval groups of plant and invertebrate remains from Bridge Street are particularly valuable as rare examples of usefully large assemblages from a period all too rarely sampled, yet in which major changes in resource utilisation and trade resulted in the appearance of many new species, often from tropical or subtropical regions (the cockroaches at the present site, for example). The importance of the material makes the possibility that it is currently decaying *in situ* particularly disturbing.

Assemblages of plant remains where there was good waterlogged preservation—from the late medieval to later post-medieval periods—tended to be dominated by small fruit seeds, especially grape, fig, and apple, but the deposits in which they occurred often contained a variety of other remains that had clearly *not* been eaten—such as the frequent remains of gorse!—and which probably represent domestic waste. Although not always charred, such remains from combustible raw material of this kind seem likely to have arrived, with the abundant coal and cinders, from hearths and fireplaces, if not ovens. The abundant hop remains in one sample are not unexpected in a context of this later period—there are a few examples from other post-medieval towns and, indeed, hop has been recorded from late deposits in other parts of Chester (Hall *et al*. 2002b). There are a few hints at the kinds of plants that might have been grown in gardens—notably box, holly and columbine, the shortness of the list perhaps reflecting the density of occupation in this part of the city at this period, i.e. these are stray remains from gardens further afield. Another feature of the deposits that emerges from the long chronological sequence available is the changing use of raw material for fuel reflected in the charred plant remains (as well as the coal and cinders from the sediment matrix in the later contexts). Thus there is some evidence for use of peat in the early medieval period, whilst later on, when coal is clearly important, gorse is also being brought into the town in quantity.

The insect assemblages from Bridge Street are remarkable for their low mathematical and ecological diversity. This may partly be a result of the generally poor preservation and consequent difficulty of identification of species represented by only few remains, but undoubtedly primarily reflects a restricted insect fauna, in turn indicating a very restricted range of habitats locally in the phases examined for invertebrates. This is very much in accord with the limited evidence from other towns yielding post-medieval deposits (e.g. at sites in Coffee Yard and The Bedern, York: Robertson *et al.* (1989) and Hall *et al.* (1993a-c)). The presence of species which are certainly (the 'oriental' cockroach) or probably (the golden spider beetle) of exotic origin reflects the increasing level of overseas trade and the ever more artificial and protected nature of the urban living environment.

The records of *Cercyon depressus*, normally confined to the sea shore, are surprising. A parallel is provided by *Ptenidium punctatum*, a small beetle primarily also associated with seaweed on the strandline, but found in large numbers in some Anglo-Scandinavian layers at 6-8 Pavement, York by Hall *et al.* (1983, 191-2; see also Kenward 2000), who discuss its significance at length, concluding that it probably exploited some specialised kind of decaying matter on the site. Rather remarkably, the species was not found at the nearby (and one would have imagined very similar) 16-22 Coppergate site (Kenward and Hall 1995, 747).

Niptus hololeucus is rare in the archaeological record and deserves discussion. There are records from Roman and other pre-modern deposits (Buckland 1976a; b), but these appear to relate to contexts where there was clear evidence, or at least a distinct possibility, of recent contamination. The record given by Roeder (1899) is perhaps suspect, too, in view of its antiquity and subsequent nomenclatural changes. The beetle's biology and possible geographical origins are discussed by Howe and Burgess (1952) and Buckland (1976b). It is common today and particularly likely to occur as a contaminant in archaeological samples which have been stored poorly sealed (e.g. in polythene bags) since it is often found in the sort of building typically used for sample storage; HK has noted several such contaminants. It may be that *N. hololeucus* was only brought to Britain in the past few hundred years. Alternatively, as appears to have been the case for the grain pest taxa, it may have been introduced on more than one occasion, starting in the Roman period, and only have become firmly established in modern, often permanently, heated buildings. Records of numerous individuals from securely dated and sealed Roman deposits would allow the early introduction to be accepted, though whether or not it later became extinct rather than just very rare would be hard to establish. There are several records of *N. hololeucus* from deposits of mid 17th century or later date at The Bedern, York, where is was found in company with the bedbug, *Cimex lectularius*, and an unidentified cockroach (Hall *et al.* 1993a-c), so it appears to have become well established by this stage. From Germany there are records of the golden spider beetle from the 15th-16th century (Cymorek and Koch 1969; Koch 1970; 1971), providing a source for its spread to Britain.

Although entomologists have regarded its introduction as rather recent (perhaps during the sixteenth century according to Ragge 1965), the oriental cockroach *Blatta orientalis* has been found in late Roman deposits at Lincoln, a discovery of considerable significance (Carrott *et al.* 1995; Dobney *et al.* 1998). It probably died out after this, however. A much later record from The Bedern, York (mid 17th century or later, Hall *et al.* 1993c, 32) appears to be the only other from an archaeological deposit in Britain. This specimen was unfortunately not identified closely when it was originally discovered, and it has proved impossible to locate the material in store. It was probably *B. orientalis*.

The spider beetle *Tipnus unicolor* is often present in insect death assemblages recovered from archaeological sites in Britain, occasionally forming a substantial proportion of the fauna. There are marked inter-period differences in its abundance, however, for *T. unicolor* is frequent in Roman and later medieval (post-Conquest) assemblages, but barely known from the intervening periods. This time distribution may have considerable importance in relation to changing urban conditions, and conversely the beetle may be a significant indicator species. The present records fit neatly into the established pattern of abundance. It is hard to believe that the beetle would have *lived* in a moist cesspit, as suggested by Osborne (1981); specimens in such situations are considered by the present author to be likely to be strays from the closet above in the case of latrines, or introduced in floor sweepings, a view shared by Girling and Robinson (in Hayfield and Greig 1989, 58-59). It may, of course, have been attracted to the odour of faeces, which in its natural habitats would not have been so hazardous as in a cess-pit!

The *Trichuris* eggs seen in the 'squash' samples examined from Contexts 806 and 1697 were all rather poorly preserved (all were lacking both polar plugs). Comparison of the calculated size ranges for these eggs with data for modern trichurids indicated that the eggs seen were almost certainly of either *Trichuris trichiura* or *T. suis*, the whipworms of humans and pigs respectively, or perhaps of both. It is particularly difficult to distinguish these two species purely by examination of their eggs as the normal size range for the eggs of *T. trichiura* is a wholly contained subset of that for *T. suis*.

Only a single ?ascarid egg was seen in the 'squash' from Context 1697. A low ration of ascarid to trichurid eggs has been interpreted as indicative of human rather than pig faeces (Taylor 1955), but this is not conclusive. Context 806 was interpreted as a ?garderobe fill and, as such, rather more likely to contain eggs of human parasites than those of pigs, though both it and the cess pit fill (Context 1697) could perhaps contain faecal material of mixed origins.

The presence of the parasite eggs clearly indicates that faecal material formed a component of these deposits. However, their fairly poor state of preservation, together with the difficulties of identification outlined above, rendered a definitive determination of the source of the faecal content impossible – though the range of possible hosts indicated was limited to only humans and pigs.

No parasite eggs were found in the six coprolites examined via 'squash' subsamples. This, together with the presence of numerous bone fragments, suggested that the coprolites may be of dog faeces. However, in two cases the coprolites were recovered from a cess pit feature (Context 442, Phase VI) and a midden (Context 1513, Phase VII) which also contained fish bone exhibiting damage characteristic of having passed through the human gut; for these the possibility that the coprolites may be of human origin cannot be excluded.

Most of the recovered shell was of edible shellfish from deposits of mid/late 17th to 20th century date (Phases VII to X) but remains were recovered from most phases of the site. Oyster was, by far, the most commonly represented taxon with other edible marine taxa (e.g. cockle, mussel, and periwinkle) present in small numbers, again mostly concentrated in the later phases of the site. The other marine invertebrates represented were, with a few exceptions, other edible species commonly occurring off the coasts of Britain.

The bias of the recovered shell towards edible taxa (particularly oyster), together with the evidence of shells having been opened using tools, strongly suggests that these assemblages derive almost exclusively from human food waste—though this apparently never formed a significant component of the diet of the inhabitants of this site through the ages.

The most likely sources for the oysters from Phase VI and later are perhaps beds around the coast of Wales. Large quantities of both oyster and cockle were taken off Caernarfonshire in 1712, oysters were abundant on the east coast of Angelsey by the middle of the 18th century, there was a healthy trade oyster trade at Pwllheli (Cardigan Bay) and the oyster beds of Mumbles (Swansea Bay) were among the most prolific in Britain by the late 17th century (Starkey *et al*. 2000, pp. 88-9). Another relatively nearby supply of oysters would be Cornwall, though they have been traded widely from the Roman period so sources further afield (e.g. the Kent, Essex or Sussex coasts) are not necessarily ruled out. Most of the remains are from deposits of mid/late 17th to 20th century date and certainly by the mid 19th century oysters were being dredged in huge numbers all along the Sussex coast (to the point of exhausting the beds).

It seems likely that all of the remains of other edible marine taxa were also derived from human food waste—the extremely small number of non-edible species having been collected accidentally. All of these taxa are common off the coast of Britain today.

The land snail remains recovered were too few to be of any interpretative value.

Throughout, mostly marine or migratory fish were identified, with flatfish, herring and eel remains forming the bulk of the fish bones from most periods. Numerical dominance between these taxa fluctuated between phases, but, on fragment counts alone, they appear to form the basis of the fish component of the diet of the inhabitants of this area of Chester from the Late Roman period through to the 20th century. Gadid, although never present in any great quantities, became more prolific from Phase VI onwards, whilst rays consistently occurred throughout albeit in quite small numbers. These fish are cartilaginous and are almost certainly under-represented (such tissue rarely surviving). Remaining taxa, with the exception of smelt, were represented by relatively few remains.

Generally, the fish remains from all phases represented waste from the food. Some of the deposits produced refuse that was likely to be from the preparation of fish for cooking, whilst other deposits provided direct evidence for consumption. No material was recovered which was indicative of commercial waste from the processing of fish.

The fish remains are discussed further by period below.

ROMAN PERIOD – PHASES I AND II

The fish assemblages from Phases I and II were rather small for detailed interpretative analysis, from only a few deposits and are not necessarily a representative sample from which to extrapolate the dietary preferences of the inhabitants of Chester during the Roman period. However, some of the remains are worthy of note.

The presence of the remains of Spanish mackerel is of some interest. During the Roman period, this Mediterranean fish was typically salted and transported in amphorae throughout the Roman Empire (Van Neer and Lentacker 1994). Its presence, therefore, suggests the import into Chester of a Roman delicacy that would imply either a Mediterranean origin for some of the inhabitants or local residents adopting expensive Roman tastes. Confirmation of the import of such fish comes from an inscription on the side of an amphora recovered from Chester. This stated that the content was a sauce from Baetica [Southern Spain] made from mackerel tails (Alcock 2001). Although not common, this species has been identified from other sites in Britain. Some examples include six Spanish mackerel heads identified from a 1st century amphora from excavations at Winchester Palace, Southwark (Locker 1994), whilst several pre-caudal vertebrae were identified from a late 3rd century well deposit at Great Holts Farm, Boreham, Essex (Murphy *et al.* 2000).

Another species found only in Phases I and II was mullet, those fragments from Phase II possibly being more closely identified as thin lipped grey mullet. This marine fish has also been recovered from Roman deposits at Colchester (Alcock 2001), Silchester (Boon 1974) and Dorchester (Hamilton-Dyer 1993), although the remains at the latter were identified as golden grey mullet. Whether these fish and those recovered from Chester arrived as fresh fish or had been salted/pickled can not be established.

ANGLO-SAXON AND EARLY MEDIEVAL – PHASES III AND IV

Deposits of late Saxon and early medieval date did not produce particularly large assemblages of fish. The range of species represented was small, with flatfish remains being predominant. The flatfish, eels and smelt could have been caught in estuarine waters, whilst the few gadid remains, mainly small whiting, could also have been caught in inshore waters. It is not impossible that herring were of local origin, although there is some evidence from other sites of Anglo-Saxon date e.g. Fishergate, York (O'Connor 1991) of small scale trade in herring. However, in general, assemblages of this date appear to represent the exploitation of local fish resources in rivers and estuaries (e.g. Flixborough, North Lincolnshire – Dobney *et al.* in prep.; Melbourne Street, Southampton – Bourdillon and Coy 1980) with little evidence for extensive trade in fish during the 8th -11th centuries (Enghoff 2000). Trade in fish within Chester during the Anglo-Saxon and early medieval periods, therefore, was possibly not well established or not particularly important for the economy of the settlement.

MEDIEVAL – PHASE V

Phase V shows many similarities with the previous phases (III and IV) with a limited suite of species and very few gadid remains. In contrast to the previous periods, and indeed to the later ones, this period was dominated by the remains of herring. However, although herring was identified from nine of the 13 deposits examined, over 60% of the bones were from a single deposit and its importance in this assemblage may therefore be somewhat exaggerated.

LATE MEDIEVAL/EARLY POST-MEDIEVAL – PHASES VI AND VII

The late medieval and early post-medieval deposits produced the greatest accumulation of fish bones and, as for the earlier periods, herring, eel and flatfish were well represented. However, the contribution of both herring and eel to the late medieval/early post-medieval diet, is likely to be biased since a large proportion of the fish bones were recovered from cess pit fills. Remains from this type of deposit can potentially represent material that has been subject to highly selective disposal processes. Within some of these deposits, herring and eel remains were represented almost exclusively by vertebrae—a small proportion of which showed characteristic damage associated with ingestion and passage through the gut. These remains most likely derive from faecal material. The presence of other species also appeared to be linked to the occurrence of cess. These tended to be small fish such as smelt, or in one or two cases, small gadids such as whiting, which were, perhaps, eaten whole. Anchovy was also identified, although not in any great quantities. Again these species were typically represented by vertebrae. The preponderance of this element is probably a taphonomic factor related to preservation, i.e. only the most dense and robust elements are capable of surviving the rigours of mastication and digestion. Despite this concentration of small fish remains, some of the cess and garderobe deposits clearly contained waste of a more general domestic nature from the preparation of fish for consumption and table refuse. This is represented by the remains of flatfish and small fragments of bones probably from larger gadids. The numerous spines, finrays, pterigiophores and other remains which mostly could not be identified more closely also represent waste from filleting and trimming and removing fins and tails.

A similar assemblage was recovered from the fill of a 17th century cesspit in Antwerp (Veeckman *et al.* 2000). The range of species identified was somewhat more diverse than that recovered from the site at Bridge Street, but included the remains of herring, eel, smelt, anchovy and flatfish. Characteristic of the assemblage was the presence of small individuals, although some cod bones from larger fish, probably from stockfish, were also present. Additionally, marine shell and remains of crustaceans, such as shrimp and prawn, a few bird and mammal bones (mainly small shaft fragments) were identified. The researchers concluded that these were remains from a variety of sources which included household refuse, faecal material and possibly from cleaning fishing nets (Veeckman *et al. op. cit.*). It was suggested that large organic remains (which take time to rot down) were not deposited in the cess pit so that the contents could be more easily reused as compost. Given that a number of the cultivation soils from Bridge Street contained remains that appeared to derive from faecal matter then the reuse of cess pit and garderobe fills may also have occurred here.

Gadidae, both large (e.g. ling and cod), and small (e.g. whiting and small cod) also provided components of the fish assemblage, with whiting generally providing the bulk of these remains. Their contribution in the earlier phases is small, but an increase in the frequency of gadids and other off shore marine species (e.g. thornback ray) can be seen from Phase VI, although their relative abundance appears small in comparison to the three main fish taxa.

Bones from larger gadids, such as cod and ling, were mainly restricted to the hand-collected material from this period and were not particularly numerous. Large cod and ling are found in more northerly deeper offshore waters and the remains identified as these species are likely to represent imported fish that had been dried and salted, pickled or smoked or a combination of these. Since all the ling bones and most of the larger cod bones identified from the site were vertebrae, this strongly suggests that these fish represent stockfish (i.e. cured). The absence of cranial elements, as found here, is usually an indicator of stored rather than fresh fish; the heads of fish would have been removed at the processing site, prior to salting or drying. Several of the vertebrae and neural spines had been chopped and knife marks were also occasionally evident on these bones. The increased presence of gadid remains at this period probably reflects the growth of coastal fisheries and the expansion of trading networks.

Archaeological evidence from other sites, mainly on the east coast of Britain, suggests that the market for cod and related fish gradually increased from the 11th century onwards (Enghoff 2000) and a large proportion of this was likely to be imported stock/store fish (Locker 2001). The fish remains from Bridge Street suggest that the importation of cod and ling from deep sea fisheries occurred at a slightly later period (i.e. late 15th - mid 17th centuries) than evinced from sites on the east coast of England, such as King's Lynn (Wheeler 1977), Yarmouth (Wheeler and Jones 1976) and Newcastle (Nicholson 1989), where remains of large gadids were identified from deposits of 11th - 13th century (for the first two sites) and 13th and 14th century date. Assemblages of 12th - 17th century date recovered from tenements in Bristol (Locker 2001) are similar to those from Chester, with large gadids appearing in the late 14th century deposits. However, it may be that large gadids were consumed (or traded) in Chester earlier, but that it was not until the early post-medieval period that they became more readily available and, perhaps, less expensive. The data from Chester correlate well with documentary evidence showing that, whilst other more prosperous centres were struggling in the late medieval period, Chester's trade and population were expanding and the quantity of fish imported during this period surpassed all other imports (Kermode 1996). Ships from Ireland provided much of this, with records showing trade in cod, ling, whiting, dogfish, eel, herring and salmon (Starkey *et al.* 2000; Kermode 1996 *ibid*). More extensive evidence is available from port and custom records of the 14th and 15th centuries from Bristol, a similar, although somewhat larger port, which suggest the importation of a vast array of fish including a variety of dried and salted gadids (Carus Wilson 1967).

Herring remains from this period probably also represent imported fish, given that documentary evidence indicates tons of herring from Irish Sea fisheries (Kermode 1996) were shipped into Chester from Cumbria, Wales and Ireland. Irish herring were particularly important at Chester, although it was Bristol which was the key port for Irish fish in the late medieval period (Starkey *et al.* 2000). In the late 16th and 17th centuries, the Welsh fishing industry used Chester more and more as a market and source of salt for curing herring (Starkey *et al. op. cit.*). From the archaeological remains, however, distinguishing bones from processed herring that have been imported and from herring eaten fresh is not easy, particularly since herring were typically processed whole. Sometimes they were gutted prior to processing but this depended on the manner of curing. Where an under-representation of skeletal elements representing the appendicular region (i.e. cleithrum, supracleithrum and coracoid) is detected, then this may point to remains of herring that have been gutted and probably represent salted rather than fresh fish. The taphonomic bias in favour of vertebrae seen from the cess pit deposits, and those other contexts that possibly contained a high proportion of faecal matter, mostly obscured any attempts at interpretation of the skeletal element representation. A single Phase VI deposit, however, produced an assemblage that suggested that the herring represented may have been gutted.

Another significant import from Ireland into Chester during the 15th and 16th centuries was salmon (Starkey *et al.* 2000). Salmonid remains, including some more specifically identified as salmon, were recovered from several deposits but were few in number. Salmon bones do not preserve very well and this species may be under-represented. Alternatively, imported salmon may have been destined for other markets or distributed throughout the region and not consumed within this area of the city— it was a valuable commodity which attracted twice the custom that was charged for herring imports (Kermode 1996) and may have been too expensive for most of the people in this part of Chester.

When one considers evidence for status at this period, besides the few salmon and turbot remains, there is little evidence of high status occupation. Large gadids were becoming increasingly available during this period, and the importation of stock fish was more commonplace, however, they still represented a resource that was not necessarily available to all (Woolgar 1999). It is also evident from the increased diversity of the species represented in this period that at least some of the inhabitants of Bridge Street in the late medieval/early post medieval period were relatively affluent. The prevalence of flatfish (likely to be primarily flounder and plaice) in the assemblage, however, suggests that inshore fishing provided a greater contribution to the diet than imported fish. Local fisheries were probably supplying fresh flatfish, smelt, whiting and other species which commonly frequented estuarine and shallow inshore waters. Estuarine and river weirs were common and evidence of fish traps is widespread around the welsh shores (Godbold and Turner 1994). These are likely to represent a cheaper resource than imported fish. Evidence for the exploitation of freshwater resources was scarce but, in the medieval period, the supply of freshwater fish was carefully controlled and their consumption was restricted to the wealthy aristocracy (Dyer 1988). Although small numbers of cyprinid remains were identified from deposits of this period, these contributed less than 1% of the entire assemblage.

On balance, the evidence suggests that the inhabitants of Bridge Street were sufficiently affluent to purchase imported large fish (sometimes in excess of a metre in overall length), such as ling and cod, but relied more on the cheaper products, such as herring, flatfish, eel and whiting.

LATER POST-MEDIEVAL AND EARLY MODERN – PHASES VIII, IX AND X

The fish assemblages from the later period were smaller but showed a similar range of species to those seen in Phases VI and VII. Overall, despite a slight reduction in the frequency of eel remains, flatfish, herring and eel were the most commonly occurring species. Data from Phases VIII and IX, generally, show a continuation of trends noted for the previous phases, but the remains from Phase X are few and insufficient for detailed analysis.

Despite the decline in trade through Chester as a result of the emerging dominance of the port at Liverpool (Kermode 1996), fish were still being imported, especially from the Welsh fisheries. Historical evidence suggests that during the 19th century fishing activity around the northern coasts of Wales was considerable and, in one case, it is documented that at various times of year a fleet of boats from Flintshire sailed up the River Dee to Chester with cargos of mackerel, turbot, whiting and sole (Matheson 1929).

Acknowledgements

The authors are grateful to Dan Garner, Geoff Couling, Anthony Martin and Tim Malim, of Gifford and Partners Ltd, for providing the material and the archaeological information, and for their hospitality and support during site visits and project meetings.

Deborah Jaques would like to express particular thanks to Wim Van Neer and Wim Wouters of the Royal Museum for Central Africa, Tervuren, Belgium, for the generous manner in which they gave up their time and their help with identifications. DJ is also grateful to Alison Locker for supplying a number of her unpublished reports.

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Table 1. Complete list of plant taxa (and other components) recorded from the deposits at 25 Bridge Street, Chester, with numbers of contexts in which each was recorded by archaeological phase. Taxa marked '' were only recorded in one or both of the samples from PhaseVI deposits examined at PERU (see text). Numbers are underlined where at least one of the records for that phase yielded more than trace amounts of the taxon/material concerned. Material was uncharred unless otherwise indicated. Nomenclature and taxonomic order follow Tutin* et al. *(1964-80). Abbreviations: fgts—fragments; '?' indicates cases where the taxon was recorded tentatively; 'f' indicates cases where only one or more fragments was recorded; 's' for some records of charred cereal grains indicates that material included specimens showing evidence of sprouting.*

							Phase					
Taxon	**Vernacular**	**parts recorded**	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**
No. contexts examined			12	10	8	6	13	21	20	7	15	3
Coniferae	conifer	charcoal fgts	-	-	-	-	-	-	1	-	-	-
Coniferae	conifer	wood fgts	-	-	-	-	1	-	-	-	-	-
Taxus baccata L.	yew	leaves	-	-	-	-	-	-	1+?1	-	-	-
Salix sp(p).	willow	buds	-	-	-	-	-	-	1	-	2	-
Salix/Populus sp(p).	willow/poplar/aspen	charcoal fgts	-	-	-	-	1	-	-	-	-	-
Alnus glutinosa (L.) Gaertner	alder	charcoal fgts	-	-	-	-	-	-	-	1	-	-
Corylus avellana L.	hazel	charred nuts and/ or nutshell fgts	2	1	2	-	2	6	3	1	3	-
		charred roundwood fgts	-	-	3	-	-	-	-	-	-	-
		nuts and/or nutshell fgts	-	-	-	-	-	-	-	-	1	-
Quercus sp(p).	oak	charcoal fgts	1	1	4	1	5	3	3	2	7	-
		charred roundwood fgts	-	-	-	-	-	1	1	-	-	-
Ficus carica L.	fig	seeds	-	-	1	-	3	14	18	6	9	3
Humulus lupulus L.	hop	achenes	-	-	-	-	-	-	1	-	-	-
		mineralised achenes	-	-	-	-	-	-	1	-	-	-
Cannabis sativa L.	hemp	achenes	-	-	-	-	-	-	2	-	-	-
Urtica dioica L.	stinging nettle	achenes	-	-	-	-	-	1	-	-	4	-
Polygonum aviculare agg.	knotgrass	charred fruits	-	-	-	-	-	-	1	-	-	-
		fruits	-	-	-	-	-	-	-	1	-	-
P. persicaria L.	persicaria/red shank	charred fruits	-	-	1	-	-	-	1	-	1	-
P. persicaria/lapathifolium	persicarias	charred fruits	-	-	1	-	-	-	-	-	-	-
Bilderdykia convolvulus (L.) Dumort.	black bindweed	charred fruits	-	1	2	-	-	-	1	-	-	-
		fruits	-	-	-	-	-	-	3	-	-	-
Rumex acetosella agg.	sheep's sorrel	charred fruits	-	-	-	-	-	-	1	-	-	-
		fruits	-	-	-	-	-	1	-	-	-	

Phase

Taxon	**Vernacular**	**parts recorded**	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**
No. contexts examined			12	10	8	6	13	21	20	7	15	3
Rumex sp(p).	docks	charred fruits	-	-	-	-	-	1	1	-	-	-
Chenopodium album L.	fat hen	charred seeds	-	-	3	-	-	-	1	-	-	-
		seeds	-	-	-	-	1	1	-	-	2	-
Atriplex sp(p).	oraches	charred seeds	-	-	2	-	-	-	1	-	-	-
		seeds	-	-	-	-	-	1	2	1	1	-
cf. *Portulaca oleracea* L.	?purslane	seed	-	-	-	-	-	-	1	-	-	-
Stellaria media (L.) Vill.	chickweed	seeds	-	-	-	-	-	-	-	-	1	-
Spergula arvensis L.	corn spurrey	charred seeds	-	-	-	-	-	-	1	-	-	-
		seeds	-	-	-	-	-	1	-	-	-	-
Agrostemma githago L.	corncockle	charred seeds	-	-	3	-	-	-	-	-	-	-
		mineralised casts/ moulds of seed fgts	-	-	-	-	-	1	-	-	-	-
		seed fgts	-	-	-	-	-	-	1	-	-	-
Silene gallica L.	small-flowered catchfly	seeds	-	-	-	-	-	-	1	-	-	-
Ranunculus Section *Ranunculus*	meadow/creeping/ bulbous buttercup	achenes	-	-	-	-	-	1	-	1	2	-
		charred achenes	-	-	-	-	-	-	1	-	-	-
Aquilegia cf. *vulgaris* L.	columbine	seeds	-	-	-	-	-	-	-	-	1	-
Fumaria sp(p).	fumitories	seeds	-	-	-	-	-	1	3	-	-	-
Brassica rapa L.	'turnip'	charred seeds	-	-	-	-	-	-	1	-	-	-
		seeds	-	-	-	-	-	1	1+?1	-	-	-
Brassica sp./*Sinapis arvensis* L.	brassica/charlock	charred cotyledonss	-	-	-	-	-	-	1	-	-	-
Raphanus raphanistrum L.	wild radish	pod segments and/or fgts	-	-	-	-	-	-	-	1	-	-
Rubus idaeus L.	raspberry	seeds	?1	-	-	-	-	6	6	2	5	1
R. fruticosus agg.	blackberry/bramble	charred seeds	-	-	2	-	-	-	-	-	-	-
		seeds	-	1	2	-	1	9	13	4	9+?1	1
Rubus/Rosa sp(p).	blackberry, etc./rose	charred prickles	-	-	-	-	-	-	1	-	-	-
Fragaria cf. *vesca* L.	(?wild) strawberry	achenes	-	-	-	-	-	2	-	-	1	-
Malus sylvestris Miller	(crab) apple	endocarp	-	-	-	-	-	-	1	-	-	-
		immature seeds	-	-	-	-	-	-	1	-	-	-
		limpet-shaped structures at seed base	-	-	-	-	-	-	1	-	-	-
		mineralised seeds/embryos	-	1	-	-	-	2	3	1	-	-
		seeds	-	-	-	-	-	1	3	-	-	-
**Mespilus germanica* L.	medlar	seed	-	-	-	-	-	1	-	-	-	-

Phase

Taxon	**Vernacular**	**parts recorded**	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**
No. contexts examined			12	10	8	6	13	21	20	7	15	3
Crataegus sp(p).	hawthorns	thorns	-	-	-	-	-	1	-	-	-	-
Prunus spinosa L.	sloe	charred fruitstones	-	-	-	-	-	-	-	-	1	-
		fruitstones	-	-	-	-	-	1	1	-	-	-
cf. *P. spinosa* L.	?sloe	charred thorns	-	-	2	1	-	-	-	-	-	-
Prunus domestica ssp. *insititia* (L.) C. K. Schneider	plums, etc.	fruitstones	-	-	-	-	-	1	-	-	-	-
**Prunus* cf. *avium*	?gean, wild cherry	fruitstones	-	-	-	-	-	1	-	-	-	-
Prunus sp(p).	sloe/plum/cherry, etc.	charred fruitstones	-	-	-	-	-	-	1	-	-	-
		mineralised seeds	-	-	-	-	-	1	-	-	-	-
Leguminosae	pea family	charred cotyledons	-	-	-	-	-	-	1	-	-	-
		charred seeds	-	-	2	-	-	-	1	1	-	-
Ulex sp(p).	gorses	charred flower buds	-	-	-	-	-	2	2	-	-	-
		part-charred flower buds	-	-	-	-	-	1	-	-	-	-
		charred leaf/leaves (spines)	-	-	-	-	-	9	9	-	1	-
		charred pods and/or pod fgts	-	-	-	-	-	1	-	-	-	-
		charred twig fgts	-	-	-	-	-	7+?1	5+?1	-	-	-
		leaf/leaves (spines)	-	-	-	-	-	3	3	-	-	-
		leafy shoot fgts	-	-	-	-	-	-	1	-	-	-
		mineralised spines	-	-	-	-	-	1	-	-	-	-
		mineralised twig fgts	-	-	-	-	-	1	-	-	-	-
		pods and/or pod fgts	-	-	-	-	-	-	1	-	-	-
		twig epidermis fgts	-	-	-	-	-	-	1	-	-	-
Vicia faba L.	field bean	charred cotyledons	-	-	-	-	-	1	-	-	1	-
		charred hilum/a	-	-	1	-	-	-	-	-	-	-
		charred seeds	-	-	1	-	2	-	-	-	-	-
		charred testa fgts	-	-	2	-	-	-	-	-	-	-
cf. *Vicia* sp(p). (*non faba*)	?vetches, etc.	charred seeds	-	-	1	-	-	-	-	-	-	-
Pisum sativum L.	garden/field pea	charred seeds	-	-	?1	-	1	1	-	-	?1	-
cf. *P. sativum*		charred cotyledons	-	-	1	-	1	-	1	-	-	-
		charred hilum/a	-	-	1	-	-	-	-	-	-	-
		charred testa fgts	-	-	4	-	-	-	-	-	-	-
Medicago minima (L.) Bartal.	bur medick	pods and/or pod fgts	-	-	-	-	-	-	1	-	-	-
cf. *Trifolium* sp(p).	?clovers, etc.	charred seeds	-	-	1	-	-	-	-	-	-	-
Linum usitatissimum L.	cultivated flax	seeds	-	-	-	-	-	1f	1	-	-	-
Euphorbia helioscopia L.	sun spurge	charred seeds	-	-	-	-	-	-	1	-	-	-

Phase

Taxon	**Vernacular**	**parts recorded**	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**
No. contexts examined			12	10	8	6	13	21	20	7	15	3
		seeds	-	-	1	-	1	4	3	2	5	-
Ilex aquifolium L.	holly	charred leaf fgts	-	-	-	-	-	1	-	-	?1	-
		charred seeds	-	-	-	-	-	-	1	?1	-	-
Buxus sempervirens L.	box	leaf epidermis fgts	-	-	-	-	-	-	1	-	-	-
Vitis vinifera L.	grape	mineralised seeds	-	-	-	-	1	4	5	1	1	-
		seeds	-	-	-	-	-	4	3+1f	1	3	1
Viola sp(p).	violets/pansies, etc.	seeds	-	-	-	-	-	3	4	3	4	-
Bryonia cretica ssp. *dioica* (Jacq.) Tutin	white bryony	charred seeds	-	-	1	-	-	-	-	-	-	-
		seeds	-	-	-	-	-	-	-	-	1	-
Coriandrum sativum L.	coriander	seeds (fr interiors)	-	-	-	-	-	-	1	-	-	-
Aethusa cynapium L.	fool's parsley	mericarps	-	-	-	-	-	1	5	2	6	-
Conium maculatum L.	hemlock	mericarps	-	-	-	-	-	1	1+1f	-	-	-
Calluna vulgaris (L.) Hull	heather, ling	charred shoot fgts	-	-	-	-	-	-	-	-	1+?1	-
		shoot fgts	-	-	-	-	-	-	-	-	1	-
		shoot tips	-	-	-	-	-	-	-	-	1	-
cf. *C. vulgaris* (L.) Hull	?heather, ling	charred root and/ or basal twig fgts	-	-	1	1	-	-	1	-	-	-
		root and/or basal twig fgts	-	-	-	-	-	-	-	-	1	-
Fraxinus excelsior L.	ash	charcoal fgts	1	-	1	1	2	1	1	-	2	-
Boraginaceae	borage family	nutlets	-	-	-	-	-	-	1	-	-	-
Buglossoides arvensis (L.) I. M. Johnston	corn gromwell, 'stone-hard'	nutlets	-	-	-	-	1	-	-	-	-	-
Lamium Section *Lamiopsis*	annual dead-nettles	nutlets	-	-	-	-	-	-	-	-	1	-
Stachys sp(p).	woundworts	nutlets	-	-	-	-	1	-	-	1	-	-
Prunella vulgaris L.	selfheal	nutlets	-	-	-	1	-	-	-	-	1	-
Atropa bella-donna L.	deadly nightshade	seeds	-	-	-	-	-	2	1	1	-	-
Hyoscyamus niger L.	henbane	seeds	-	-	-	-	-	2	1	-	-	1
Solanum nigrum L.	black nightshade	seeds	-	-	-	-	-	-	-	1	1	-
Solanum sp(p).		seeds	-	-	-	-	-	-	1	-	-	-
Lycopersicon esculentum Miller	tomato	seeds	-	-	-	-	-	-	-	-	1	1
Plantago cf. *media* L.	?hoary plantain	charred seeds	-	-	-	-	-	-	1	-	-	-
P. lanceolata L.	ribwort plantain	charred seeds	-	-	4	-	-	1	1	-	-	-
Sambucus nigra L.	elder	charred seeds	-	-	-	-	-	1	-	-	-	-

Phase

Taxon	**Vernacular**	**parts recorded**	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**
No. contexts examined			12	10	8	6	13	21	20	7	15	3
		seeds	4	7	4	5	10+1f	12	19	5+1f	9	1
Anthemis cotula L.	stinking mayweed	charred achenes	-	-	-	-	-	-	1	-	-	-
Matricaria maritima L./ *M. perforata* Mérat	sea/scentless mayweed	charred achenes	-	-	-	-	-	-	1	-	-	-
Chrysanthemum segetum L.	corn marigold	charred achenes	-	-	-	-	-	-	1	-	-	-
Carduus/Cirsium sp(p).	thistles	achenes	-	-	-	-	-	1	1	-	-	-
Taraxacum officinale sensu lato	dandelions	achenes	-	-	-	-	-	-	-	-	1	-
Lapsana communis L.	nipplewort	charred achenes	-	-	-	-	-	-	1	-	-	-
Gramineae	grasses	charred caryopses	-	-	3	-	1	2	1	1	1	-
		spikelets/spikelet fgts	-	-	-	-	-	-	-	-	1	-
cf. Gramineae		charred culm nodes	-	-	1	-	-	-	-	-	-	-
Gramineae/Cerealia	grasses/cereals	charred culm fgts	-	-	1	-	-	-	-	-	-	-
Cerealia indet.	cereals	charred caryopses	-	2	-	-	-	1	1	1	1+?1	-
		mineralised caryopses	-	-	-	-	-	-	-	-	1	-
Bromus sp(p).	bromes, etc.	charred caryopses	-	-	-	1	-	-	-	-	-	-
Triticum 'aestivo-compactum'	bread/club wheat	charred caryopses	1+?1	1	5+?1	1	?1	3+?2	6	2	3	-
Triticum sp(p).	wheats	charred caryopses	2	1	6	4	5+?1	2	3	2	2	-
Triticum/Secale	wheat/rye	waterlogged caryopses	-	-	1	-	-	-	-	-	-	-
		waterlogged periderm fgts	-	-	3	-	-	-	-	-	-	-
Secale cereale L.	rye	charred caryopsis/es	-	-	2+?1	?3	1	-	1+?1	-	-	-
		part-charred rachis fgts	-	-	-	-	-	-	-	-	1	-
Hordeum sp(p).	barley	charred caryopsis/es	-	2	4	3	4	3+1s	8	2s+?1	4	1
Avena sativa L.	cultivated oat	charred spikelets/spikelet fgts	-	1	2	-	-	?1	-	-	1	-
Avena sp(p).	oats	charred awn fgts	-	-	-	-	-	-	1	-	-	-
		charred caryopsis/es	-	2	6	-	3+1s	8+?2	11	2+1s	5	-
		part-charred caryopsis/es	-	-	1	-	-	-	1	-	-	-
		charred chaff	-	-	-	-	-	-	1+?1	-	-	-
		waterlogged caryopsis/es	-	-	-	-	-	-	-	-	1	-
		waterlogged periderm fgts	-	-	1	-	-	-	-	-	-	-
Lemna sp(p).	duckweeds	fronds	-	-	-	-	1	2	-	-	-	-
Eleocharis palustris sensu lato	common spike-rush	charred nutlets	-	-	1	-	-	-	-	-	-	-
		nutlets	-	-	-	-	1	-	-	-	-	-
		silicified nutlets	-	-	3	-	-	-	-	-	-	-
Carex sp(p).	sedges	charred nutlets	-	-	4	-	-	1	-	-	1	-
		nutlets	-	-	-	1	4	7	4	3	2	-

Phase

Taxon	**Vernacular**	**parts recorded**	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**
No. contexts examined			12	10	8	6	13	21	20	7	15	3
		silicified nutlets	-	-	2	-	-	-	-	-	-	-
Sphagnum sp(p).		leaf/leaves and shoot tips	-	-	-	-	-	-	1	-	-	-

Other components (recorded during examination of washovers and residues for macroscopic plant remains); excludes any material which was clearly modern.

Abbreviations: ch—charred; fgts—fragments; min—mineralised; sil—'silicified'

					Phase					
Component	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**
No. contexts examined	12	10	8	6	13	21	20	7	15	3
artefactual materials										
brick/tile	1	-	5	1	2	-	2	1	6	-
?daub	-	-	-	-	-	-	-	1	-	-
?glassy slag	-	-	-	-	-	-	-	-	1	-
iron objects	-	-	-	-	-	1+?1	-	-	-	-
leather fgts	-	-	-	-	-	-	1	1	3	-
mortar	1	-	-	1	2	-	2	2	3	-
paper fgts	-	-	-	-	-	-	1	1	-	-
textile fgts	-	-	-	-	-	-	1	-	-	-
textile fgts (ch)	-	-	-	-	-	-	-	-	1	-
yarn fgts	-	-	-	-	-	-	2	-	-	-
yarn fgts (ch)	-	-	-	-	-	1	-	-	-	-
plant materials										
bark fgts	-	-	-	-	-	-	1	-	-	-
bark fgts (ch)	-	-	-	-	1	2	-	-	-	-
catkin fgts	-	-	-	-	-	-	-	-	1	-
charcoal	12	10	8	6	13	19	19	7	12	1
dicot leaf fgts	-	-	-	-	-	-	-	1	-	-
herbaceous detritus (ch)	-	1	4	2	1	6	4	1	2	-
herbaceous detritus (sil)	-	-	2	-	-	-	-	-	-	-
indet. seed(s) (?sil)	-	-	-	-	-	-	1	-	-	-
mineralised seeds/embryos	-	1	-	-	1	3	6	1	2	-
?peat ash	-	-	1	-	-	-	-	-	-	-
?peat fgts (ch)	-	-	-	-	-	-	-	1	-	-

Phase

Component	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**
No. contexts examined	12	10	8	6	13	21	20	7	15	3
root/rhizome fgts (ch)	-	-	-	1	-	-	-	-	-	-
twig fgts	-	-	-	-	-	-	1	-	1	-
twig fgts (ch)	-	1	1	1	1	10	4	2	3	-
wood fgts	-	-	-	-	1	2	2	1	6	-
wood fgts (min)	-	-	-	-	-	3	2	-	-	1
part-burnt wood	-	-	-	-	-	-	1	-	-	-
woody root fgts	-	1	-	-	-	-	-	-	-	-
animal materials—invertebrate										
beetles	-	-	1	-	1	6	6	2	4	1
beetles (ch)	-	-	1	-	-	-	1	-	-	-
bivalve periostracum	-	-	-	-	-	2	2	-	-	-
earthworm egg caps	-	-	-	-	-	-	2	1	1	1
earthworm egg caps (min)	-	1	-	-	-	-	-	-	1	-
fly pupae (min)	-	-	-	-	-	1	1	-	-	-
fly puparia	-	-	-	-	1	3	2	2	1	1
fly puparia (ch)	-	-	3	-	-	-	-	-	-	-
fly puparia (min)	-	1	1	-	-	2	6	1	1	-
insect cuticle	-	-	-	-	-	-	1	-	1	-
insects	-	-	-	-	-	-	1	-	-	-
marine mollusc shell fgts	-	-	-	-	-	-	1	-	-	-
mussel shell ‘fibres’	1	-	-	-	-	2	1	-	-	-
mussel shell fgts	-	-	-	-	-	-	-	-	1	-
oyster shell fgts	-	-	-	-	-	-	1	-	-	-
snails	-	-	-	-	-	-	1	1	2	1
woodlouse fgts	-	-	-	-	-	4	1	-	-	-
animal materials—vertebrate										
amphibian bone	-	-	-	-	-	-	-	1	-	-
animal hair (matted)	-	-	-	-	-	-	1	-	-	-
bird bone	1	2	-	-	-	2	3	-	1	-
bird claw bone	-	-	-	-	-	-	1	-	-	-
bird tracheal ring	-	-	-	-	-	1	-	-	-	-
bone fgts	4	4	4	2	4	16	18	6	10	2
burnt bone fgts	-	-	1	-	1	3	-	1	6	-

Phase

Taxon	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**
No. contexts examined	12	10	8	6	13	21	20	7	15	3
burnt fish bone	-	-	-	-	-	2	-	-	-	-
burnt small mammal bone	-	-	1	-	-	-	-	-	-	-
cancellous bone fgts	-	-	-	-	1	2	-	-	1	-
eggshell fgts	-	-	-	-	-	2	1	-	2	-
eggshell membrane fgts	-	-	-	-	-	1	1	-	1	-
fish bone	1	3	3	1	3	8	9	4	5	-
fish scale	-	2	1	-	-	7	7	4	6	1
percid scale	-	-	-	-	-	-	1	-	1	-
rodent droppings (min)	-	-	-	-	-	1	1	1	-	-
small mammal bone	-	-	-	-	1	2	2	-	2	-
small mammal tooth	-	-	-	-	-	-	-	-	1	-
mineral component										
chalk/lime	-	-	1	-	-	-	-	-	-	-
cinders	1	3	2	2	8	18	20	7	14	3
coal	1	1	3	2	4	11	15	6	9	1
coal ‘char'	-	-	-	-	-	1	1	-	-	‘
?lime	3	1	1	-	1	1	-	-	-	-
part-burnt coal	-	-	-	-	-	-	1	1	1	-
gravel	1	-	5	1	1	-	1	-	2	-
quartzite	-	-	-	1	-	-	1	-	-	-
sand	1	-	5	1	2	-	2	2	4	-
sandstone	-	-	1	-	-	-	-	-	-	-
Triassic sandstone	1	-	3	1	2	-	2	2	3	-
slate	-	-	-	-	1	-	2	2	3	-
unwashed sediment	-	-	-	-	-	-	1	-	-	-
other inclusions										
ash concretions	-	-	-	-	-	1	-	-	1	-
Cenococcum (sclerotia)	-	-	-	-	-	-	-	1	2	-
charred organic material	-	-	4	-	-	-	-	-	-	-
concretions	-	-	-	-	-	-	1+?1	-	?1	-
faecal concretions	-	-	-	-	?1	2+?1	?1	-	-	-
fungal perithecia	-	-	-	-	-	1	-	-	-	-
glassy ash	-	-	4	-	1	-	-	1	-	-

Phase

Component	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**
No. contexts examined	12	10	8	6	13	21	20	7	15	3
glassy slag	-	-	1	1	-	-	-	-	-	-
mineralised material	1	-	-	-	-	-	-	-	-	-
plant ash silica	2	1	5	2	2	3	2	3	2	-
Pre-Quaternary megaspores	-	-	-	-	-	1	-	1	2	-

*Table 2. Complete list of invertebrate remains recorded from samples from 25 Bridge Street, Chester. Order and nomenclature follow Kloet and Hincks (1964-77) for insects. Where both secure and tentative identifications for a given taxon were recorded, only the former are listed here. Ecological codes used in calculating statistics (Table 3) are given (ec); they are explained in Table 5. * = not used in calculating assemblage statistics. The remains were of adults unless stated. 'Sp.' indicates that record was probably an additional taxon, 'sp. indet.' that the material may have been of a taxon listed above it.*

Taxon	ec
*?*Ascaris* sp. (egg)	-
**Trichuris* ?*trichiura* (Linnaeus) (egg)	-
* *Trichuris* ?*suis* (Schrank) (egg)	-
*Oligochaeta sp. (egg capsule)	u
**Blatta orientalis* Linnaeus	rt-ss
*Syrphidae sp. (larva)	u
*Diptera sp. (adult)	u
*Diptera sp. (puparium)	u
*Siphonaptera sp.	u
Trechus obtusus or *quadristriatus*	oa
Trechus ?*micros* (Herbst)	u
Carabidae sp.	ob
Cercyon ?*analis* (Paykull)	rt-sf
Cercyon depressus Stephens	rf
Cercyon ?*terminatus* (Marsham)	rf-st
Cercyon sp. indet.	u
Gnathoncus sp.	rt-sf
Histerinae spp.	rt
Ptenidium sp.	rt
Catops sp.	u
Lesteva ?*longoelytrata* (Goeze)	oa-d
Phyllodrepa floralis (Paykull)	rt-sf
Dropephylla ioptera (Stephens)	u
Omalium ?*allardi* Fairmaire & Brisout	rt
Omalium sp.	rt
Xylodromus concinnus (Marsham)	rt-st
Carpelimus bilineatus Stephens	rt-sf
Anotylus rugosus (Fabricius)	rt
Anotylus tetracarinatus (Block)	rt
Oxytelus sculptus Gravenhorst	rt-st
Leptacinus sp.	rt-st
Gyrohypnus ?*angustatus* Stephens	rt-st
Gyrohypnus fracticornis (Muller)	rt-st
Neobisnius sp.	u
Philonthus spp.	u
Quedius sp.	u
Staphylininae sp.	u
Tachyporus sp.	u
Cypha sp.	rt
Falagria sp.	rt-sf
Falagria or *Cordalia* sp. indet.	rt-sf
Aleochara sp.	u
Aleocharinae spp.	u
Pselaphidae sp.	u
Trox scaber (Linnaeus)	rt-sf
Aphodius sp.	ob-rf
Dermestidae sp.	rt-sf
Anobium punctatum (Degeer)	l-sf
Niptus hololeucus (Falderman)	rd-ss
Tipnus unicolor (Piller & Mitterpacher)	rt-ss
Ptinus ?*fur* (Linnaeus)	rd-sf
Ptinus sp.	rd-sf
Brachypterus sp.	oa-p
Meligethes sp.	oa-p
Rhizophagus sp.	u
Monotoma ?*picipes* Herbst	rt-st
Monotoma spinicollis Aube	rt-st
Oryzaephilus surinamensis (Linnaeus)	g-ss
Cryptophagus scutellatus Newman	rd-st
Cryptophagus spp.	rd-sf
Micrambe sp.	u
Atomaria spp.	rd
Mycetaea hirta (Marsham)	rd-ss
Lathridius minutus group	rd-st
Enicmus sp.	rt-sf
Dienerella sp.	rd-sf
Corticaria sp.	rt-sf
Corticarina sp.	rt
Aglenus brunneus (Gyllenhal)	rt-ss
Blaps sp.	rt-ss
Anthicus sp.	rt
Halticinae sp.	oa-p
Apion (Exapion) ?*genistae* Kirby	oa-p
Apion spp.	oa-p
Sitophilus granarius (Linnaeus)	g-ss
Gymnetron sp.	oa-p
Curculionidae sp.	oa
Coleoptera sp.	u
*Coleoptera sp. indet. (larva)	u
*Hymenoptera Parasitica sp.	u
*Ponerinae sp.	u
*Hymenoptera sp.	u
*Insecta sp. (larva)	u

Taxon	ec
*Pseudoscorpiones sp.	u
*Acarina sp.	u
**Patella vulgata* Linnaeus	-
*Trochidae sp.	-
**Littorina littorea* (Linnaeus)	-
**Littorina* ?*obtusata* (Linnaeus)	-
*?*Turritella communis* Risso	-
**Nucillea lapillus* (Linnaeus)	-
**Neptunea antiqua* (Linnaeus)	-
**Mytilus edulis* Linnaeus	-
*Pectinidae sp.	-
**Ostrea edulis* Linnaeus	-
**Cerastoderma edule* (Linnaeus)	-
*?Tellinidae sp.	-
Vitrea sp.	-
Oxychilus sp.	-
Helix sp.	-

Table 3. Main statistics for assemblages of adult beetles and bugs (excluding aphids and scale insects) from samples from 25 Bridge Street, Chester. For explanation of abbreviations, see Table 5.

Context	**206**	**806**	**1632**	**1635**	**1697**	**Whole site**
Sample	**5001**	**5081**	**5161**	**5166**	**5172**	
Ext	/T	/T	/T	/T	/T	
S	12	30	41	44	24	89
N	22	141	116	196	72	547
ALPHA	11	12	23	18	13	30
SEALPHA	4	2	3	2	2	2
SOB	1	0	3	9	0	12
PSOB	8	0	7	20	0	13
NOB	1	0	3	11	0	15
PNOB	5	0	3	6	0	3
ALPHAOB	0	0	0	0	0	0
SEALPHAOB	0	0	0	0	0	0
SW	0	0	0	0	0	0
PSW	0	0	0	0	0	0
NW	0	0	0	0	0	0
PNW	0	0	0	0	0	0
ALPHAW	0	0	0	0	0	0
SEALPHAW	0	0	0	0	0	0
SD	0	0	1	0	0	1
PSD	0	0	2	0	0	1
ND	0	0	1	0	0	1
PND	0	0	1	0	0	0
ALPHAD	0	0	0	0	0	0
SEALPHAD	0	0	0	0	0	0
SP	0	0	1	6	0	7
PSP	0	0	2	14	0	8
NP	0	0	1	8	0	9
PNP	0	0	1	4	0	2
ALPHAP	0	0	0	0	0	0
SEALPHAP	0	0	0	0	0	0
SM	0	0	0	0	0	0
PSM	0	0	0	0	0	0
NM	0	0	0	0	0	0
PNM	0	0	0	0	0	0
ALPHAM	0	0	0	0	0	0
SEALPHAM	0	0	0	0	0	0
SL	0	1	1	1	1	2
PSL	0	3	2	2	4	2
NL	0	2	1	1	1	5
PNL	0	1	1	1	1	1
ALPHAL	0	0	0	0	0	0
SEALPHAL	0	0	0	0	0	0
SRT	7	19	28	23	15	91
PSRT	58	63	68	52	63	102
NRT	17	117	92	60	62	348
PNRT	77	83	79	31	86	64
ALPHART	0	7	14	14	6	40
SEALPHART	0	1	2	3	1	3

Context	**206**	**806**	**1632**	**1635**	**1697**	**Whole site**
Sample	**5001**	**5081**	**5161**	**5166**	**5172**	
SRD	4	9	5	9	5	32
PSRD	33	30	12	20	21	36
NRD	14	22	7	15	9	67
PNRD	64	16	6	8	13	12
ALPHARD	0	6	0	0	0	24
SEALPHARD	0	2	0	0	0	5
SRF	0	0	2	2	1	5
PSRF	0	0	5	5	4	6
NRF	0	0	20	2	3	25
PNRF	0	0	17	1	4	5
ALPHARF	0	0	1	0	0	2
SEALPHARF	0	0	0	0	0	1
SSA	4	18	20	18	14	38
PSSA	33	60	49	41	58	43
NSA	14	66	50	54	49	233
PNSA	64	47	43	28	68	43
ALPHASA	0	8	13	10	7	13
SEALPHASA	0	2	3	2	2	1
SSF	3	9	9	8	5	20
PSSF	25	30	22	18	21	22
NSF	4	13	11	26	9	63
PNSF	18	9	9	13	13	12
ALPHASF	0	0	0	4	0	10
SEALPHASF	0	0	0	1	0	2
SST	0	3	7	6	3	10
PSST	0	10	17	14	13	11
NST	0	7	14	11	13	45
PNST	0	5	12	6	18	8
ALPHAST	0	0	0	0	0	4
SEALPHAST	0	0	0	0	0	1
SSS	1	6	4	4	6	8
PSSS	8	20	10	9	25	9
NSS	10	46	25	17	27	125
PNSS	45	33	22	9	38	23
ALPHASS	0	2	1	0	3	2
SEALPHASS	0	1	1	0	1	0
SG	0	2	1	1	2	3
PSG	0	7	2	2	8	3
NG	0	2	1	1	3	7
PNG	0	1	1	1	4	1
ALPHAG	0	0	0	0	0	0
SEALPHAG	0	0	0	0	0	0

Table 4. Species lists in rank order for invertebrate macrofossils from samples from 25 Bridge Street, Chester. For each sample assemblage the adult Coleoptera (beetles) are listed first, followed by the remaining invertebrates. Headers: ReM:D – recording method: detailed; weight is in kilogrammes; E - erosion; F - fragmentation (following Kenward and Large 1998); ec - ecological codes; n = minimum number of individuals; sq = semi-quantitative (e = estimate; - = fully quantitative, m = 'many', translated as 15 individuals; s = several, translated as 6). For translation of ecological codes, see Table 5. Note: it has not been practical to italicise specific epithets in this table.

Context: 206 Sample: 5001/T ReM: D
Weight: 5.00 E: 5.00 F: 3.50

Notes: Entered HK 9/3/04. Four dish flot, yellow cuticle scraps, brown 'felt' (fungal mycelium) and char. Fossils tended to fall apart when handled. E 3.5-5.0, mode 5.0 distinct; F 2.5-5.5, modes 3 and 5, distinct; trend to orange 3-4, mode 4 strong. Washover contained a few beetle remains, and lots of scraps which were probably cockroach (no good diagnostic parts seen). Parts of at least one male and one female B. orientalis in flot.

taxon	n	sq	ec
Niptus hololeucus	10	-	rd-ss
Cryptophagus sp. B	2	-	rd-sf
Carabidae sp.	1	-	ob
Anotylus tetracarinatus	1	-	rt
Philonthus sp.	1	-	u
Staphylininae sp.	1	-	u
Cypha sp.	1	-	rt
Aleocharinae sp.	1	-	u
Cryptophagus sp. A	1	-	rd-sf
Atomaria sp.	1	-	rd
Corticaria sp.	1	-	rt-sf
Coleoptera sp.	1	-	u
*Coleoptera sp. (larva)	15	m	u
*Blatta orientalis	2	-	rt-ss
*Insecta sp. (larva)	1	-	u

Context: 806 Sample: 5081/T ReM: D
Weight: 5.00 E: 5.00 F: 2.50

Notes: Entered HK 6/3/04. Four dish flot, bright to pale orange plant tissue and insect fragments. Many pale filmy remains which floated and migrated in the dish: insects hard to see and to catch. E 3.5-5.0, mode 5.0 strong; F 1.5-3.5, mode 2.5 weak; trend to orange (then pale) 3-4, mode 4 strong. Peculiar Ptinus pronotum to own tube, sketch on sheet. Flea head too decayed to name.

taxon	n	sq	ec
Omalium ?allardi	45	-	rt
Aglenus brunneus	21	-	rt-ss
Tipnus unicolor	17	-	rt-ss
Aleocharinae sp. A	8	-	u
Philonthus sp.	5	-	u
Atomaria sp. B	5	-	rd
Mycetaea hirta	5	-	rd-ss
Xylodromus concinnus	4	-	rt-st
Atomaria sp. A	3	-	rd
Histerinae sp.	2	-	rt
Catops sp.	2	-	u
Phyllodrepa ?floralis	2	-	rt-sf
Anobium ?punctatum	2	-	l-sf
Ptinus ?fur	2	-	rd-sf
Cryptophagus sp. B	2	-	rd-sf
Lathridius minutus group	2	-	rd-st
Trechus ?micros	1	-	u
Tachyporus sp.	1	-	u
Aleochara sp.	1	-	u
Aleocharinae sp. B	1	-	u
Trox scaber	1	-	rt-sf
Dermestidae sp.	1	-	rt-sf
Ptinus sp.	1	-	rd-sf
Rhizophagus sp.	1	-	u
Oryzaephilus surinamensis	1	-	g-ss
Cryptophagus scutellatus	1	-	rd-st
Cryptophagus sp. A	1	-	rd-sf
Enicmus sp.	1	-	rt-sf
Blaps sp.	1	-	rt-ss
Sitophilus granarius	1	-	g-ss
*Diptera sp. (puparium)	15	m	u
*Insecta sp. (larva)	15	m	u
*Diptera sp. (adult)	6	s	u
*Oligochaeta sp. (egg capsule)	1	-	u
*Siphonaptera sp.	1	-	u
*Coleoptera sp. (larva)	1	-	u

Context: 1632 Sample: 5161/T ReM: D
Weight: 5.00 E: 4.50 F: 3.00

Notes: Entered HK 9/3/04. Two dish flot. Identified in flot and on filter paper. Remains very decayed, with quite a lot of uncountable scraps of various taxa, especially Cercyon. Washover checked and contained very large numbers of remains, suggesting gross failure of flotation. Many of these remains better preserved than those listed below, though the same range of taxa present in (subjectively) the same proportions. Tens of Cercyon depressus and many histerines in washover; including body sclerites of latter, which were only represented by legs in flot. Not time within project constraints to sort the washover and identify these remains. E 3.5-5.5, mode 4.5 weak; F 2.5-5.5, mode 3.0 weak; trend to pale 2-4, mode 4 distinct.

taxon	**n**	**sq**	**ec**
Cercyon depressus	19	-	rf
Aglenus brunneus	19	-	rt-ss
Aleocharinae sp. B	10	-	u
Ptenidium sp.	8	-	rt
Omalium ?allardi	6	-	rt
Xylodromus concinnus	6	-	rt-st
Histerinae sp. C	4	-	rt
Tipnus unicolor	4	-	rt-ss
Phyllodrepa ?floralis	2	-	rt-sf
Oxytelus sculptus	2	-	rt-st
Gyrohypnus ?angustatus	2	-	rt-st
Philonthus sp. B	2	-	u
Staphylininae sp.	2	-	u
Cryptophagus sp.	2	-	rd-sf
Atomaria sp. A	2	-	rd
Carabidae sp.	1	-	ob
Cercyon ?analis	1	-	rt-sf
Cercyon ?terminatus	1	-	rf-st
Gnathoncus sp.	1	-	rt-sf
Histerinae sp. A	1	-	rt
Histerinae sp. B	1	-	rt
?Catops sp.	1	-	u
Lesteva ?longoelytrata	1	-	oa-d
Carpelimus ?bilineatus	1	-	rt-sf
Anotylus tetracarinatus	1	-	rt
Gyrohypnus fracticornis	1	-	rt-st
Philonthus sp. A	1	-	u
Philonthus sp. C	1	-	u
Quedius sp.	1	-	u
Falagria sp.	1	-	rt-sf
Aleocharinae sp. A	1	-	u
Trox scaber	1	-	rt-sf
Anobium ?punctatum	1	-	l-sf
Brachypterus sp.	1	-	oa-p
Monotoma spinicollis	1	-	rt-st
Oryzaephilus ?surinamensis	1	-	g-ss
Atomaria sp. B	1	-	rd
Mycetaea hirta	1	-	rd-ss
Lathridius minutus group	1	-	rd-st
Corticaria sp.	1	-	rt-sf
Anthicus sp.	1	-	rt
*Insecta sp. (larva)	15	m	u
*Diptera sp. (puparium)	3	-	u
*Coleoptera sp. (larva)	3	-	u
*Oligochaeta sp. (egg capsule)	2	-	u
*Diptera sp. (adult)	2	-	u
*Pseudoscorpiones sp.	1	-	u
*Acarina sp.	1	-	u

Context: 1635 Sample: 5166/T ReM: D
Weight: 5.00 E: 4.50 F: 2.00

Notes: Entered HK 6/3/04. Two dish flot. Recorded in flot and on filter paper. Many remains very pale orange, though in some cases with wings still in place on elytra: suggests recent in-situ decay. E 3.5-5.5, mode 4.5 strong; F 1.5-3.5, mode 2.0 weak; trend to orange (then pale) 2-4, mode 4 strong. Micrambe may be villosus.

taxon	**n**	**sq**	**ec**
Aleocharinae sp. A	111	-	u
Carpelimus bilineatus	12	-	rt-sf
Aglenus brunneus	9	-	rt-ss
Xylodromus concinnus	5	-	rt-st
Tipnus unicolor	5	-	rt-ss
Cryptophagus sp.	5	-	rd-sf
Falagria or Cordalia sp.	4	-	rt-sf
Micrambe sp.	3	-	u
Anotylus rugosus	2	-	rt
Aleocharinae sp. B	2	-	u
Mycetaea hirta	2	-	rd-ss
Lathridius minutus group	2	-	rd-st
Halticinae sp.	2	-	oa-p
Apion sp. B	2	-	oa-p
Trechus obtusus or quadristriatus	1	-	oa
Trechus ?micros	1	-	u
Cercyon ?terminatus	1	-	rf-st
Cercyon sp.	1	-	u
Gnathoncus sp.	1	-	rt-sf
Histerinae sp.	1	-	rt
Dropephylla ioptera	1	-	u
Omalium sp.	1	-	rt
Leptacinus sp.	1	-	rt-st
Neobisnius sp.	1	-	u
Aleocharinae sp. C	1	-	u
Pselaphidae sp.	1	-	u
Aphodius sp.	1	-	ob-rf
Anobium ?punctatum	1	-	l-sf
Ptinus ?fur	1	-	rd-sf
Ptinus sp.	1	-	rd-sf
Meligethes sp.	1	-	oa-p
Rhizophagus sp.	1	-	u
Monotoma ?picipes	1	-	rt-st
Cryptophagus scutellatus	1	-	rd-st
Atomaria sp. A	1	-	rd
Atomaria sp. B	1	-	rd

Dienerella sp.	1	-	rd-sf
Corticarina sp.	1	-	rt
Apion (Exapion) ?genistae	1	-	oa-p
Apion sp. A	1	-	oa-p
Sitophilus granarius	1	-	g-ss
Gymnetron sp.	1	-	oa-p
Curculionidae sp.	1	-	oa
Coleoptera sp.	1	-	u
*Acarina sp.	15	m	u
*Diptera sp. (puparium)	6	s	u
*Hymenoptera Parasitica sp.	6	s	u
*Oligochaeta sp. (egg capsule)	2	-	u
*Diptera sp. (adult)	1	-	u
*Coleoptera sp. (larva)	1	-	u
*Pseudoscorpiones sp.	1	-	u

Context: 1697 Sample: 5172/T ReM: D
Weight: 5.00 E: 4.00 F: 2.50

Notes: Entered HK 6/3/04. Five dish flot recorded in flot and on filter paper. Many remains strongly decayed. E 3.0-5.0, mode 4.0 weak; F 2.0-5.0, mode 2.5 weak; trend to pale/orange 2-4 mode 3 weak. Washover checked and found to contain appreciable numbers of insects: impractical to recover and record them.

taxon	**n**	**sq**	**ec**
Tipnus unicolor	17	-	rt-ss
Omalium ?allardi	11	-	rt
Xylodromus concinnus	11	-	rt-st
Phyllodrepa floralis	4	-	rt-sf
Cercyon depressus	3	-	rf
Mycetaea hirta	3	-	rd-ss
Aglenus brunneus	3	-	rt-ss
Cryptophagus sp. B	2	-	rd-sf
Atomaria sp.	2	-	rd
Sitophilus granarius	2	-	g-ss
Histerinae sp.	1	-	rt
Gyrohypnus fracticornis	1	-	rt-st
Philonthus sp.	1	-	u
Staphylininae sp.	1	-	u
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Aleocharinae sp. C	1	-	u
Aleocharinae sp. D	1	-	u
Trox scaber	1	-	rt-sf
Anobium punctatum	1	-	l-sf
Oryzaephilus surinamensis	1	-	g-ss
Cryptophagus sp. A	1	-	rd-sf
Lathridius minutus group	1	-	rd-st
Blaps sp.	1	-	rt-ss
*Diptera sp. (puparium)	100	e	u
*Insecta sp. (larva)	15	m	u
*Coleoptera sp. (larva)	6	s	u
*Ponerinae sp.	4	-	u
*Oligochaeta sp. (egg capsule)	3	-	u
*Pseudoscorpiones sp.	3	-	u
*Acarina sp.	2	-	u
*Diptera sp. (adult)	1	-	u
*Syrphidae sp. (larva)	1	-	u
*Hymenoptera sp.	1	-	u

Table 5. Key to ecological codes (lower-case codes in parentheses) assigned to insect taxa and used in Tables 1, 3 and 4. Indivs - individuals (based on MNI); No – number.

No taxa	S	Percentage of RT taxa	PSRT
Estimated number of indivs (MNI)	N	No RT indivs	NRT
Index of diversity ()	ALPHA	Percentage of RT indivs	PNRT
Standard error of ALPHA	SEALPHA	Index of diversity of RT component	ALPHART
No 'certain' outdoor taxa (oa)	SOA	Standard error	SEALPHART
Percentage of 'certain' outdoor taxa	PSOA	No 'dry' decomposer taxa (rd)	SRD
No 'certain' outdoor indivs	NOA	Percentage of RD taxa	PSRD
Percentage of 'certain' outdoor indivs	PNOA	No RD indivs	NRD
No OA and probable outdoor taxa (oa + ob)	SOB	Percentage of RD indivs	PNRD
Percentage of OB taxa	PSOB	Index of diversity of the RD component	ALPHARD
No OB indivs	NOB	Standard error	SEALPHARD
Percentage OB indivs	PNOB	No 'foul' decomposer taxa (rf)	SRF
Index of diversity of the OB component	ALPHAOB	Percentage of RF taxa	PSRF
Standard error	SEALPHAOB	No RF indivs	NRF
No aquatic taxa (w)	SW	Percentage of RF indivs	PNRF
Percentage of aquatic taxa	PSW	Index of diversity of the RF component	ALPHARF
No aquatic indivs	NW	Standard error	SEALPHARF
Percentage of W indivs	PNW	No synanthropic taxa (sf + st + ss)	SSA
Index of diversity of the W component	ALPHAW	Percentage of synanthropic taxa	PSSA
Standard error	SEALPHAW	No synanthropic indivs	NSA
No damp ground/waterside taxa (d)	SD	Percentage of SA indivs	PNSA
Percentage D taxa	PSD	Index of diversity of SA component	ALPHASA
No damp D indivs	ND	Standard error	SEALPHASA
Percentage of D indivs	PND	No facultatively synanthropic taxa	SSF
Index of diversity of the D component	ALPHAD	Percentage of SF taxa	PSSF
Standard error	SEALPHAD	No SF indivs	NSF
No strongly plant-associated taxa (p)	SP	Percentage of SF indivs	PNSF
Percentage of P taxa	PSP	Index of diversity of SF component	ALPHASF
No strongly P indivs	NP	Standard error	SEALPHASF
Percentage of P indivs	PNP	No typical synanthropic taxa	SST
Index of diversity of the P component	ALPHAP	Percentage of ST taxa	PSST
Standard error	SEALPHAP	No ST indivs	NST
No heathland/moorland taxa (m)	SM	Percentage of ST indivs	PNST
Percentage of M taxa	PSM	Index of diversity of ST component	ALPHAST
No M indivs	NM	Standard error	SEALPHAST
Percentage of M indivs	PNM	No strongly synanthropic taxa	SSS
Index of diversity of the M component	ALPHAM	Percentage of SS taxa	PSSS
Standard error	SEALPHAM	No SS indivs	NSS
No wood-associated taxa (l)	SL	Percentage of SS indivs	PNSS
Percentage of L taxa	PSL	Index of diversity of SS component	ALPHASS
No L indivs	NL	Standard error	SEALPHASS
Percentage of L indivs	PNL	No uncoded taxa (u)	SU
Index of diversity of the L component	ALPHAL	Percentage of uncoded indivs	PNU
Standard error	SEALPHAL	No indivs of grain pests (g)	NG
No decomposer taxa (rt + rd + rf)	SRT	Percentage of indivs of grain pests	PNG

Table 6. Measurement of trichurid eggs taken during the assessment from Contexts 806 and 1697 from 25 Bridge Street, Chester, with calculated total length measurements. All measurements in microns.

Context 806			**Context 1697**		
Sample 5081			Sample 5171		
Measured length (without polar plugs)	Calculated plug to plug length	Measured width	Measured length (without polar plugs)	Calculated plug to plug length	Measured width
50.2	52.9	24.4	55.6	58.4	29.9
48.9	51.6	27.1	51.6	54.3	27.1
51.6	54.3	25.8	46.1	48.9	29.9
61.1	63.8	27.8	54.3	57.0	27.1
49.5	52.3	26.5	54.3	57.0	27.1
			54.3	57.0	29.9
			51.6	54.3	24.4
			51.6	54.3	27.1
			51.6	54.3	29.9
			57.0	59.7	26.5
			51.6	54.3	25.1

Table 7. Summary notes on invertebrate remains for the GBA samples examined from 25 Bridge Street, Chester, including sediment descriptions. Preservation notes follow Kenward and Large (1998). Processed subsamples were of 5 kg of sediment with the exception of Sample 5027, which was 4.25 kg.

Context	Sample	Phase	Sediment description	Notes for macro-invertebrates
206	5001	IX	Dry, light to mid grey-brown, unconsolidated, ?ashy, silty sand. Stones (2 to 20 mm), cinder, rotted mortar/plaster, coal and a ?copper alloy pin were present.	See main text.
208	5002	IX	Dry, light to mid brownish grey to mid grey-brown, unconsolidated, slightly silty sandy ash. Stones (2 to 6 mm), clay pipe fragments, pot, ?lead, wood (including ?worked chips) and cockle shell were present, coal was common, and cinder was abundant.	Some charred ?insect fragments. No identifiable invertebrates seen.
245	5008	VII	Moist, mid to dark grey-brown, crumbly to unconsolidated, ashy sandy silt with occasional lumps of light to mid brown clay (to 15 mm). Charcoal and ?burnt mortar and shale were present.	Traces of decayed cuticle.
424	5027	X	Moist, mid to dark grey-brown, unconsolidated, ?ashy, ?slightly clay sandy silt. Glass, mortar/plaster, brick/tile, pot, cinder, rotted wood, and cockle shell were present.	Small numbers of pale insect fragments including *Anobium punctatum* (Degeer) and several fly puparia; one landsnail.
429	5031	VI	Moist, mid grey-brown, unconsolidated (working more or less soft), slightly clay sandy silt. Stones (2 to 60 mm), coal, cinder, and bone (including ?bird bone) were present.	earthworm egg capsule and fragments. No other invertebrates seen.
464	4046	VII	Moist, mid to dark grey-brown, crumbly (working soft), slightly sandy clay silt. Stones (6 to 60+ mm, including slate to 80 mm), mortar/plaster, brick/tile, cinder, rotted charcoal, and bone were present.	A few, very decayed, insect remains; *Omalium* sp., ?*Coprophilus striatulus* (Fabricius).
670	5056	VII	Moist, mid to dark brown to mid to dark grey-brown, stiff and sticky to crumbly (working soft), slightly gritty sandy clay silt.	Traces of cuticle including a dermestid beetle and some other beetle scraps, often unidentifiable. One *Coprophilus striatulus*, less pale and perhaps intrusive. Preservation: E4 F4 change to yellow 4
797	5077	VI	Moist, mid to dark grey-brown, stiff and sticky (working soft and somewhat plastic), silty clay sand with some rotted charcoal present.	Traces of cuticle, including some earthworm egg capsules.
806	5081	VI	Moist, mid brown to mid grey-brown (lighter in places), crumbly and slightly sticky (working soft), sandy clay silt. Stones (2 to 20 mm), charcoal and some ?humic patches were present.	See main text.
1632	5161	V	Moist, mid brown to mid grey (internally), crumbly to unconsolidated (working soft), sandy clay silt (more clay in places) with some coal present.	See main text.
1635	5166	VI	Moist, mid to dark grey-brown to mid brown, crumbly to unconsolidated (working soft), sandy clay silt. Stones (2 to 60 mm), mortar/plaster, coal, cinder and bone were present.	See main text.
1697	5172	VI	Moist, mid brown to mid grey-brown, crumbly (working soft), sandy clay silt. Cinder and charcoal were present.	See main text.

Table 8. Number of contexts containing hand-collected shell from 25 Bridge Street, Chester, by phase.

Phase	**Number of contexts**
unphased	2
I	0
II	5
III	1
IV	0
V	13
VI	21
VII	42
VIII	35
IX	48
X	35
Total	202

Table 9. Hand-collected shell counts by phase from 25 Bridge Street, Chester. Counts for bivalve taxa are minimum numbers of whole valves. Counts for other taxa are minimum numbers of individuals.

	Phase										
Taxon	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**Total**
Limpet (*Patella vulgata* L.)	-	-	-	-	-	-	-	1	1	-	2
Top shell (Trochidae sp. indet.)	-	-	-	-	-	-	1	-	-	-	1
Periwinkle (*Littorina littorea* (L.))	-	-	-	-	-	-	6	1	-	-	7
Flat periwinkle (*Littorina* ?*obtusata* (L.))	-	-	-	-	-	-	2	-	-	2	4
?Auger shell (?*Turritella communis* Risso)	-	-	-	-	-	-	-	-	-	1	1
Dog whelk (*Nucella lapillus* (L.))	-	-	-	-	-	-	-	4	-	-	4
Red whelk (*Neptunea antiqua* (L.))	-	-	-	-	-	-	-	-	-	1	1
Mussel (*Mytilus edulis* L.)	-	-	-	-	2	11	-	5	17	6	41
Scallop (Pectinidae sp. indet.)	-	-	-	-	-	-	-	1	-	-	1
Oyster (*Ostrea edulis* L.)	-	3	-	-	13	22	171	118	126	178	631
Cockle (*Cerastoderma edule* (L.))	-	-	-	-	2	6	5	25	44	13	95
?Tellin (?Tellinidae sp. indet.)	-	-	-	-	-	-	4	2	-	-	6
Total (marine taxa)	-	3	-	-	17	39	189	157	188	201	795
Weight (grammes)	-	158	-	-	464	500	6083	6536	3763	5086	22589
Average erosion score for shell	-	3.0	-	-	2.75	2.5	2.86	2.6	2.38	2.61	
Average fragmentation score for shell	-	3.0	-	-	2.38	2.43	2.59	2.28	2.28	2.45	
Helix sp.	-	-	-	-	-	-	-	1	-	-	1

Table 10. Additional notes on oyster valves from 25 Bridge Street, Chester, summarised by phase. ***Key:*** *'Right valves' = number of right (or upper) valves; 'Left valves' = number of left (or lower) valves; 'Indet. valves' = number of valves of indeterminate side; 'Knife marks' = number of valves showing damage characteristic of the oyster having been opened using a knife or similar implement; 'Measurable?' = estimated number of valves intact enough to be measured; 'Worm burrows' = number of valves showing damage by polychaet worms; 'Barnacles' = number of valves with barnacles; 'Dog whelk' = number of valves showing damage from dog whelk boring.*

Phase	Left valves	Right valves	Indet. valves	Knife marks	Measurable?	Worm burrows	Barnacles	Dog whelk
I	-	-	-	-	-	-	-	-
II	1	3	-	-	-	-	-	-
III	-	-	-	-	-	-	-	-
IV	-	-	-	-	-	-	-	-
V	7	5	1	5	3	-	-	-
VI	6	14	2	7	3	1	-	-
VII	85	64	22	51	18	14	5	-
VIII	58	56	4	31	23	13	4	-
IX	52	62	12	42	26	6	1	-
X	74	80	24	38	11	4	1	-
Total	**283**	**284**	**65**	**174**	**84**	**38**	**11**	**0**

Table 11. Fish remains recovered from selected sediment samples from 25 Bridge Street, Chester, by phase.

Species		**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**Total**
Mustelus sp.	smooth hound	-	-	-	-	-	1	-	-	-	-	1
Elasmobranch	ray/shark/skate	-	1	-	-	1	2	3	-	-	-	7
Rajidae	ray	-	1	4	-	2	26	2	2	1	-	38
Raja clavata L	thornback ray	-	-	-	-	-	12	2	1	3	-	18
Engraulis encrasicolus (L.)/*Clupea harengus* L.	anchovy/herring	-	-	-	-	-	1	-	-	-	-	1
Engraulis encrasicolus (L.)	anchovy	-	-	-	-	-	1	13	1	1	-	16
Alosa alosa (L.)/*Alosa fallax* (Lacepede)	shad	-	2	-	-	-	-	-	-	-	-	2
Clupea harengus L.	herring	3	51	49	14	102	319	153	82	89	14	876
Salmonidae	salmon family	-	3	-	-	2	2	4	-	2	-	13
Salmo salar L.	salmon	2	3	-	-	-	1	2	-	-	-	8
Salmo trutta L.	trout	-	-	-	-	-	-	1	-	-	-	1
cf. *Salmo trutta* L.	?trout	-	-	1	1	-	-	-	-	-	-	2
Osmerus eperlanus (L.)	smelt	-	14	3	-	6	49	67	12	27	-	178
cf. *Osmerus eperlanus* (L.)	?smelt	-	-	-	-	1	-	1	-	-	-	2
Cyprinidae	cyprinid	-	-	-	-	-	6	1	1	7	-	15
Anguilla anguilla (L.)	eel	10	8	16	2	13	586	187	62	43	10	937
Conger conger (L.)	conger	-	-	-	1	-	5	3	1	-	-	10
Gadidae	cod family	-	-	-	2	2	9	10	3	1	-	27
Small gadidae	small gadid	-	1	1	-	-	15	4	2	2	-	25
cf. Gadidae	?cod family	-	-		-	1	-	-	-	-	-	1
Merlangius merlangus (L.)	whiting	-	1	2	-	5	39	41	24	5	3	120
cf. *Merlangius merlangus* (L.)	?whiting	-	-	-	-	-	7	7	1	3	-	18
Gadus morhua L.	cod	-	1	-	-	-	2	7	-	-	-	10
cf. *Gadus morhua* L.	?cod	-	-	-	-	-	3	1	-	1	-	5
Molva molva (L.)	ling	-	-	-	-	-	2	-	1	-	-	3
Dicentrarchus labrax (L.)	bass	1	1	-	-	-	-	-	2	-	-	4
Perca fluviatilis L.	perch	-	-	-	-	-	-	-	1	-	-	1
cf. *Perca fluviatilis* L.	?perch	-			-	-	-	-	-	1	-	1
Trachinus sp.	weever	-	-	-	-	-	1	1	-	-	-	2
cf. *Scomber japonicus*	?spanish mackerel	3	1		-	-	-	-	-	-	-	4
Mugilidae	mullet family	34	2	-	-	-	-	-	-	-	-	36
cf. *Liza ramada* (Risso)	?thin lipped grey mullet	-	1		-	-	-	-	-	-	-	1

Species		**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**Total**
Gasterosteidae	stickleback	-	-	-	-	-	1	-	-	-	-	1
Bothidae	flatfish (turbot, brill, megrim etc)	-	-	1	-		-	-	-	-	-	1
Scophthalmus maximus (L.)	turbot	-	-	-	-	-	1	-	-	-	-	1
Pleuronectidae	flatfish (plaice, flounder, dab etc)	15	89	70	35	69	429	197	140	126	16	1186
Platichthys flesus (L.)	flounder	1	2	1	1	1	17	5	-	6	-	34
cf. *Platichthys flesus* (L.)	?flounder	-	1	-	-	-	1				-	2
Pleuronectes platessa (L.)	plaice	-	3	-	-	-	11	4	4	1	-	23
Solea solea (L.)	sole	-	-	-	-	-	1	2	1	1	-	5
cf. *Solea solea* (L.)	?sole	-	-	-	-	-	1	1	-	-	-	2
Total		**69**	**186**	**148**	**56**	**205**	**1551**	**719**	**341**	**320**	**43**	**3638**
number of contexts examined		5	9	6	6	13	19	19	7	12	5	101

Table 12. Hand-collected fish remains excluding spines, finrays, pterigiophore and ribs from 25 Bridge Street, Chester, by phase.

Species		**II**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**Total**
Raja clavata (L.)	thornback ray				1				**1**
Clupea harengus L.	herring	1			2				**3**
Salmonidae	salmonid	2							**2**
Salmo salar L.	salmon				2	1			**3**
Cyprinidae	cyprinid				1				**1**
Anguilla anguilla (L.)	eel				1				**1**
Gadidae	gadid			1	1	1			**3**
Gadus morhua L.	cod		1	6	6	3		4	**20**
Melanogrammus aeglefinus (L.)	haddock						1		**1**
Molva molva (L.)	ling			2	2	1	1		**6**
cf. *Molva molva* (L.)	?ling				1				**1**
Dicentrarchus labrax (L.)	bass				1				**1**
Scophthalmus maximus (L.)	turbot				7				**7**
Pleuronectidae	flatfish			12	11	2	7	8	**40**
Total		**3**	**1**	**21**	**36**	**8**	**9**	**12**	**90**

Figure 1. Frequency of the main fish species identified from the samples from 25 Bridge Street, Chester, by phase.

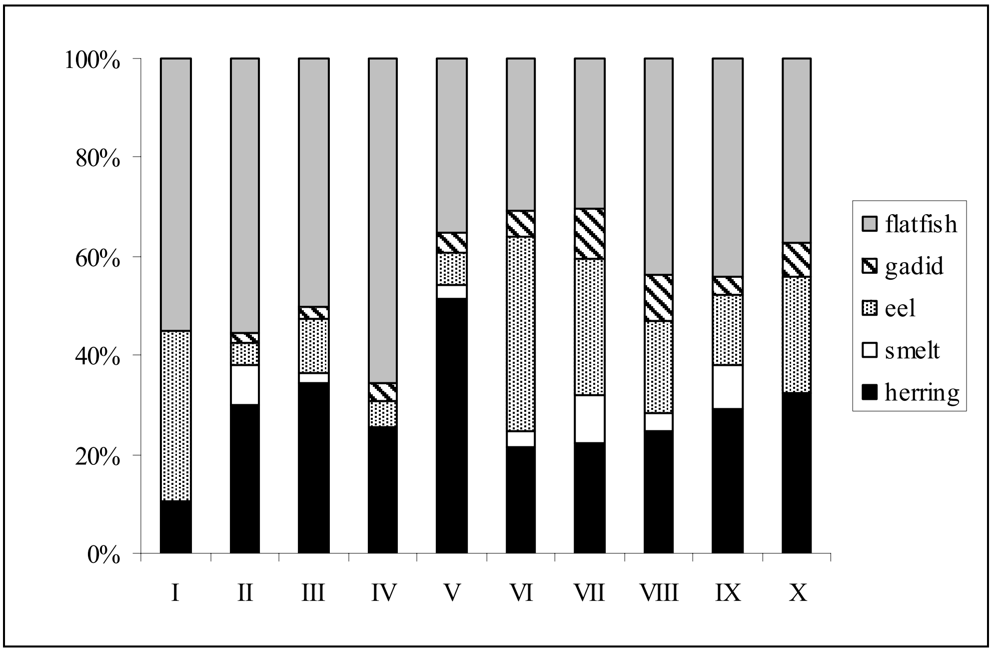


Figure 2. Frequency of the main species identified from selected Phase VI deposits from 25 Bridge Street, Chester.

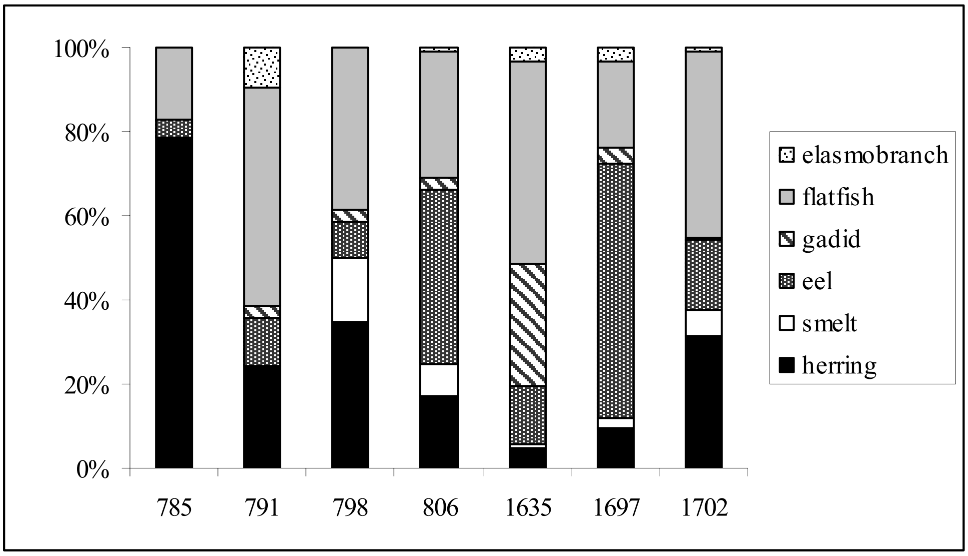
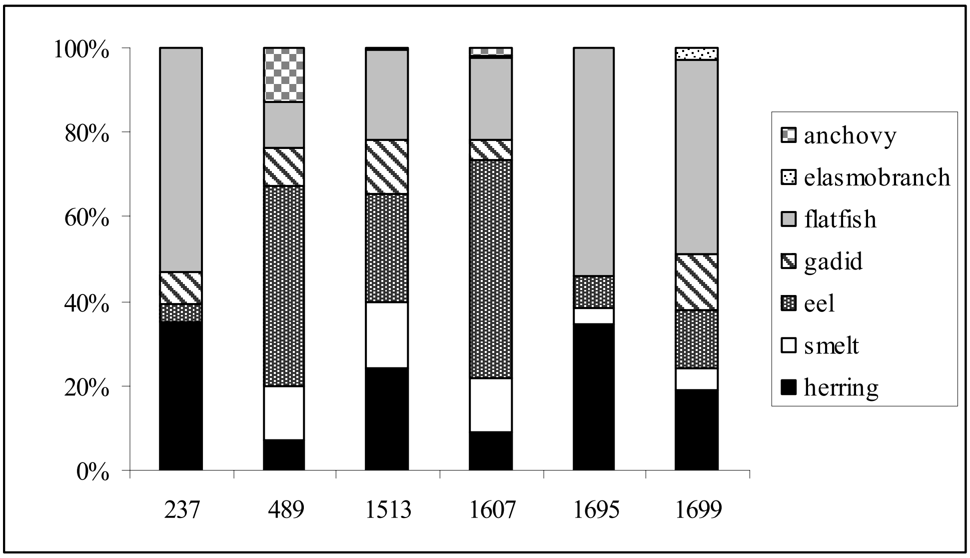


Figure 3. Frequency of the main species identified from selected Phase VII deposits from 25 Bridge Street, Chester.



Appendix: List of fish skeletal elements identified to species or family group where possible.

anal pterygiophore
articular
basioccipital
basipterygium
branchial fragments
caudal vertebra
ceratohyal
cleithrum
coracoid
dentary
dermal denticle
ectopterygoid
epihyal
frontal
hyomandibular
lower hypohyal
maxilla
opercular
otic bulla
otolith
palatine
parasphenoid
pharyngeal
pharyngobranchial
post temporal
precaudal vertebra
premaxilla
preopercular
prevomer
quadrate
scapula
scute
subopercular
supracleithrum
symplectic
upper hypohyal
urohyal
vertebra
vomer