AML Report 4195

(Norwich)

Alms Lane (302N): Plant remains

Introduction

The site at Alms Lane was more extensively sampled than any other site excavated by the Norwich Survey. 244 samples, predominantly bulk samples, were processed by Andrew Jones. Of these 178 contained remains of crops and wild plants, but only 152 came from dateable contexts. Deposits were in general well-drained, and preservation conditions were therefore poor compared to those prevailing in water-logged deposits at valley floor sites in Norwich (c.f. Ayers and Murphy 1983, 40). Consequently the range of plant taxa preserved is limited, but sampling was on a sufficiently large scale to ensure recovery of abundant macrofossils of staple food crops, mainly carbonised cereals and pulses but also some mineralised fruitstones and seeds. On the basis of this large collection of material it proved possible to relate changes in the composition of plant macrofossil assemblages of successive site phases directly to changes in the utilisation of the site. For these reasons the plant remains from Alms Lane require more detailed discussion than those from most other Norwich Survey excavations.

Sampling, recovery and identification

Samples were taken from a representative range of contexts, including ditches, refuse pits, cess pits, wells, ovens and hearths, floor deposits and general occupation layers. A standard 15 litre sampling unit was used for most of the bulk samples, which were processed by Andrew Jones using a bulk sieving/flotation tank (Kenward et al 1980) with 1mm meshes to retain the residue and collect the flot. Recovery of material smaller than 1mm was therefore incomplete. Smaller samples were also examined from a number of contexts in order to assess the contents of these deposits before undertaking full-scale bulk-sieving, or to determine whether significant numbers of macrofossils smaller than 1mm were being overlooked by bulk sieving. Plant remains were extracted from these small samples by manual water flotation with a 0.25mm collecting mesh. The concentration of botanical remains in the soil was usually so low that these samples did not in general produce useful 'seed' assemblages.

Plant remains extracted and identified are listed in Tables and , and Table (fiche).

Preservation

Fruitstones and seeds of cultivated fruits and a proportion of the seeds from wild plants were preserved by mineralisation - impregnation or replacement with poorly crystalline calcium phosphate (Green 1979). There were many mineralised fruits and seeds which were deformed or incompletely replaced and could not be determined even to family level. Amongst the cultivated and edible wild plants seeds and fruitstones of Ficus, Vitis, Rubus spp and Malus were mostly specifically identifiable, but the genus Prunus was represented only by mineralised internal casts of endocarps. Seeds of Sambucus nigra were ubiquitous and often extremely abundant. Most of these do not appear to be mineralised and their survival is presumably attributable to their extreme durability. They have not been counted, but the presence of S. nigra seeds is noted in Table .

The remaining plant remains, mainly cereal caryopses, but also some culm, rachis and spikelet fragments, pulse seeds, weed seeds and capsules, buds and bulbs are carbonised. This material is generally in a poor state of preservation, showing the deformation, 'puffing' and porous surfaces characteristic of plant material carbonised rapidly, perhaps in open hearths. Consequently many specimens could not be closely identified. There are, however, a few samples of exceptionally well-preserved cereals and pulses, notably sample 130 (925) and these will be considered in more detail below.

Cereals and pulses

Full lists of identifications are given in Table (fiche). The results are summarised in Fig in the form of a 'seed concentration analysis' (Green 1982, 44). This diagram was produced as follows. For each site period the total numbers of cereal grains and pulse seeds were calculated, though cereal rachis fragments, being generally rare, were excluded from the totals. By dividing these totals by the total soil volumes processed from deposits of each period absolute concentrations of grains and seeds have been obtained. In Fig numbers of grains and seeds per 10 litres of soil are plotted, in order to permit direct comparison with Green's results. Cross-hatched sections of the histogram refer to two contexts which produced large cereal samples (925 and 1492). The 'total cereal' diagram includes unidentified cereal grains. At the base of Fig soil volumes processed per period are shown in order to provide a basis for assessing the reliability of the results: for some periods only small and probably unrepresentative volumes were processed.

The diagrams show several conspicuous features:

1. Ignoring fluctuations for the moment, there is a long-term increase in grain

concentrations, from under 2 grains per 10 litres of soil in period 1 to a peak of 17.5 grains per 10 litres by period 10. Due to the small sample volume for period 10 this figure may not be wholly reliable, but nevertheless even in period 9 a concentration of 12.2 grains/10 litres is reached. It is probable that this trend is related largely to increased density of occupation, with consequent increased losses of grain by charring during food preparation, malting etc. Re-working of earlier deposits containing residual cereal grains from earlier phases may perhaps also be a factor influencing this trend. It is notable that after period 10 (i.e. post-1700) there is a sharp decrease in the concentrations of all cereals. It is possible that charred cereals were no longer being discarded in any quantity and that the cereals from deposits of the latest site periods are largely residual.

2. Consistently at all periods barley grains were carbonised more frequently than grains of other cereals. This result is in very marked contrast to Green's results from medieval pits at Winchester (1982, Fig 21), in which wheat grains were slightly more abundant than barley and oats occurred generally at lower concentrations. These results from Winchester, however, are derived from a large number of sites, and direct comparison with results from Alms Lane may not be valid. A probable explanation for the predominance of barley at Alms Lane is that it was the only cereal commonly in use as whole grain for human food - for malting and for use in soups and stews. Other grains (wheat, rye, oats) would probably have been consumed mainly as flour or meal. Much of the milling in the city seems to have been done from an early date at watermills in the Westwick area. The earliest documentary references are of the 13th century, although mills may have existed in the area before that date (Blomefield 1806, iv, 505; Helen Sutermeister pers comm). This being so it seems probable that cereals other than barley reached the consumer mostly as flour or meal and obviously in this form they would only be represented as plant remains in archaeological deposits in exceptional circumstances. The relatively small numbers of wheat , oats and rye grains recovered may represent accidental charring in domestic hearths during the preparation of such foods as groats or toasted grain (c.f. Hillman 1981, Fig 7).

3. There are peaks in total cereal grain and barley grain concentrations in periods 4 (1275-1400) and 10 (1650-1700). The period 4 peak is partly, but not wholly, due to two large deposits of barley (925 and 1492; cross-hatched in Fig). These two deposits are particularly informative. Moreover the cereal deposits from period 4 are associated with structural evidence clearly indicating some form of cereal processing on site. It is therefore worth considering the cereal deposits of period 4 in some detail.

Cereals from period 4 deposits

1. 925 (Sample 130)

This context was a
Carbonised cereals, crop weeds and other plant remains from sample 130 are listed in Table .

Hordeum spp (caryopses)	84
Hordeum spp (rachis internodes)	160 (approx)
Triticum aestivum L (caryopses)	5
Triticum aestivum L (rachis internodes)	2
Secale cereale L (caryopses)	4
Secale cereale L (rachis internodes)	8
Avena sp (caryopsis)	1
Pisum sativum L	6
Pteridium aquilinum (L) Kuhn (frond frags)	+
Papaver sp (stigmatic disc)	1 fragment
Brassica sp	1
Raphanus raphanistrum L (siliqua joints)	2
Silene sp	2
Stellaria cf. media (L) Vill	1
Agrostemma githago L	1
Atriplex patula/hastata	19
Rumex sp	5
Vicia sp	1
Fraxinus excelsior L	2
Menyanthes trifoliata L	1
Convolvulus arvensis L	3
Veronica hederifolia L	7
Galium sp	1
Sambucus nigra L	5
Centaurea sp (inflorescence)	+14 cypselas
Eleocharis sp	4
Gramineae indet.	12
Indet. (capsule fragment)	1
Indeterminate seeds etc.	14

Table : Carbonised plant remains from 925 (Sample 130).
(Taxa are represented by fruits or seeds except where indicated.)

This deposit consists largely of barley. The grains are all hulled and many retain

their lemmas and paleas intact. Symmetrical grains predominate but there are a few examples which could be from lateral spikelets of six-row barley, though deformation makes certainty difficult. Many grains are under-developed and there are some completely undeveloped spikelets consisting of empty lemmas and paleas. Some of these are still attached to rachis segments. The lemma bases are mainly shallow bevels. Short - medium rachellas with straight hairs, up to 3mm in length, predominate. Fig 1e shows a typical grain from this deposit. Sections of rachis comprising up to six internodes are present. The internodes are variable in size and pubescence. A typical length of rachis is illustrated in Fig 1a, showing pubescent margins and glume bases and sterile lateral spikelets. The first rachis segments are of both short, angular and long, slender forms, but the collars are abraded. From these spikelet and rachis features it appears that a genetically diverse barley crop is represented. Two-row barley predominates, with some possible six-row. Both lax- and dense-eared forms are represented, though internodes from lax ears are more common.

The wheat rachis internodes (Fig 1c) are relatively slender and clearly represent a variety of bread wheat (Triticum aestivum L). The grains are undeformed and some retain apical brushes of hairs, but they are nevertheless short forms with maximum widths just above the embryo and with very rounded ventral cheeks. Rapid carbonisation of such grains would result in near-spherical forms and indeed such grains are common in other deposits from the site, where they are described as Triticum aestivum sensu lato.

The grains of rye (Secale cereale L) are slender with abruptly truncated apices and sharply triangular cross-sections. Short sections of rachis comprising up to two internodes were also recovered (Fig 1b).

Two leguminous seeds are definitely identifiable as peas, Pisum sativum var. arvense (L) Poir. In overall form they are extremely irregular with deep surface depressions. The hilums are small and ovate. Their dimensions are length 4.0mm, 6.0mm; breadth (across cotyledons) 5.4mm, 2.9mm; hilum length 1.2mm, 1.0mm (Fig 1d). The large size of the illustrated specimen is notable. Other seeds and isolated cotyledons from the deposit which have lost their testas and hilums are probably also peas. In other samples from the site near-spherical leguminous seeds and cotyledons with no testas or hilums and frequently with abraded and encrusted surfaces are common. These are described as Pisum-type in Table .

The sample consists of charred residue from a batch of mainly two-row barley which still included sections of rachis, fragmentary ears of contaminant cereals, and occasional seeds of pea with infructescences, capsules and seeds of arable weeds. Other contaminants are likely to have been introduced after harvesting. These

include bracken frond fragments, elder seeds, ash keys and remains of two wetland plants, spike-rush (Eleocharis sp) and bog-bean (Menyanthes trifoliata). This batch of barley had not been winnowed or sieved when it became carbonised: it is a largely unprocessed crop. This may suggest that the barley had been grown in the vicinity and had been brought to Alms Lane for 'cleaning'. Long-distance transportation of bulky uncleaned cereals would have involved wasted effort in moving unwanted crop contaminants along with the grain, and local production therefore seems likely. There is no way of determining how this barley became carbonised, but an accidental rick fire is a possibility.

2. 1492 (Sample 226) and similar deposits

Sample 226, a 15 litre bulk sample, from the fill of oven 2226 produced a relatively large assemblage of cereals and weed seeds (Table).

Cereal indeterminate	179
Hordeum sp	126
Triticum aestivum s.l.	2
Avena sp	9
Secale cereale L	2
Sambucus nigra L	+
Brassica sp	4
Agrostemma githago L	1
Chenopodium album L	1
Centaurea sp	1
Carex sp	1
Bromus mollis/secalinus	1
Lolium temulentum-type	1
Indeterminate seed	1

Table : Plant remains from oven 2226 (Sample 226).

(All taxa represented by fruits or seeds.)

This assemblage is composed largely of cereal grains which had been deformed as a result of germination before carbonisation. Amongst the better-preserved grains hulled barley predominates. The remains of developing 'sprouts' are visible on many of the barley grains (Fig 1f) and some contaminants of the barley (oat caryopses and a corn-cockle seed) had also germinated before being carbonised. The context of the sample - an oven fill - leaves little doubt that this carbonised assemblage was produced as a result of poor temperature control whilst barley malt was being dried in the oven. The 'sprouts' on the grain generally extend up to

two-thirds of the grain length, but there is much variability and some grains show only incipient sprouting. A similar variation in sprout lengths is report by Krzywinski et al (1983, 153) in carbonised malt from medieval fire destruction debris at Bryggen, Bergen, Norway. Uneven sprouting at both sites is likely to be in part a consequence of wide physiological variability in the barley used for malting, matching the morphological variability noted above in sample 130 at Alms Lane. Methods of malting used may, however, also have had an effect, for medieval malting appears to have been poorly controlled by modern standards (Corran 1975, 28). Incomplete turning, for example could have resulted in a temperature gradient in piles of malt.

This deposit from oven 2226 was associated with burnt lining and represents collapsed material related to the last use of the oven. A second oven, 1479, had only a clean loam fill. However, just to the east of this oven a further sample (287 from 2166) contained germinated barley grains. This unfortunately was a small sample but it appears to have contained a similar concentration of grains to 1492 and is thought to represent charred malt cleaned out from oven 1479. A third context (1803) adjacent to a clay floor in the north-western part of the site contained a much lower concentration of germinated barley grains.

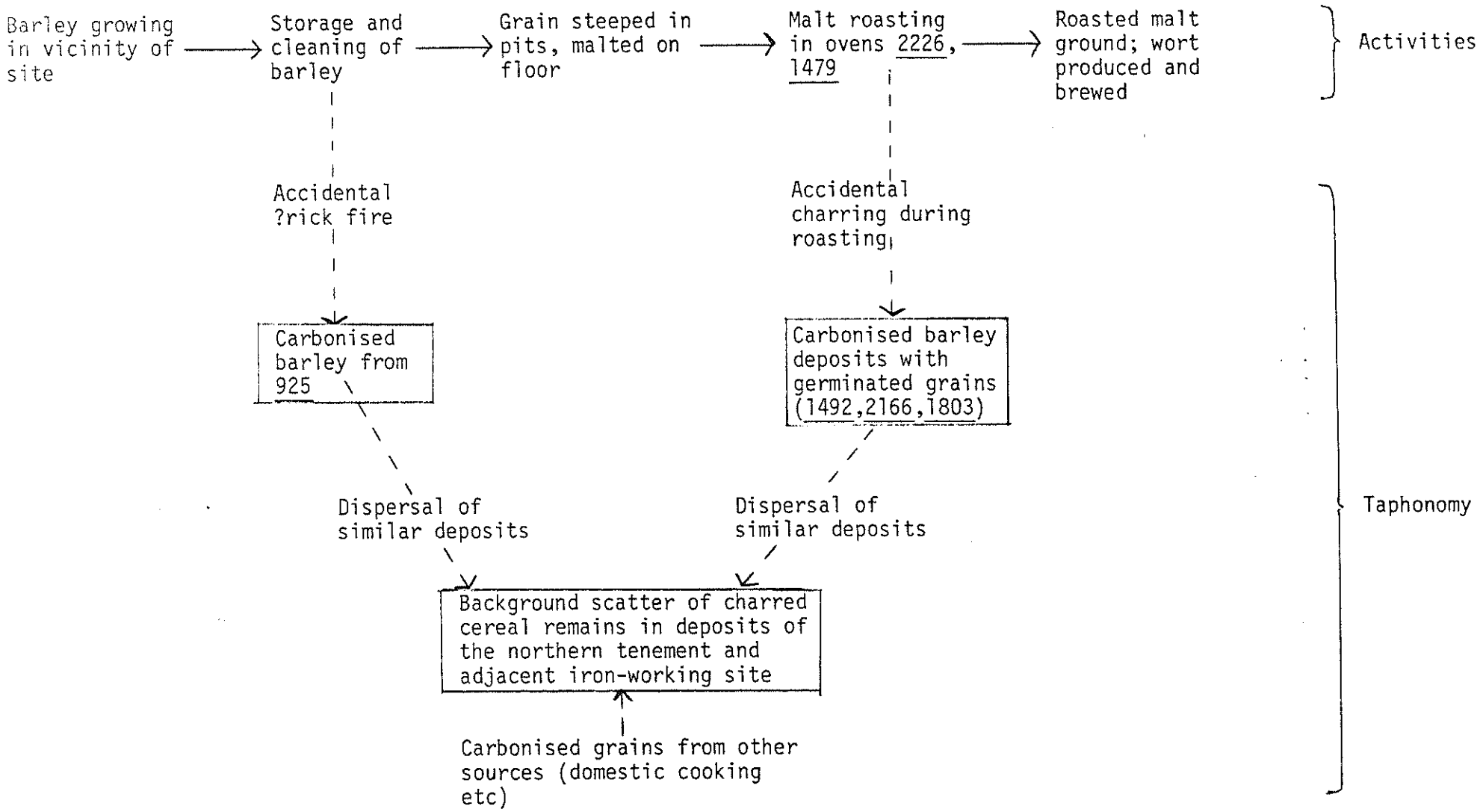
At Bryggen layers producing carbonised malt contained high frequencies of Myrica pollen. Myrica gale (bog myrtle) is known to have been used as a flavouring in medieval ale (Krzywinski et al, ibid). At Alms Lane conditions were unsuitable for pollen preservation and no macrofossils from flavouring plants were identified. Macroscopic remains of hops (Humulus lupulus), including fruits and bracts, have been identified at other sites in the city, however. At Whitefriars Street, 421N, hop macrofossils were common in early medieval waterfront deposits, though there is a strong possibility that fruits from wild plants were brought to the site by the river (Ayers and Murphy 1983, 42). More recently, a few fruits and bracts have been recovered from waterlogged 11th century cess pits at the Magistrates' Courts, 450N, but again, natural dispersal from wild plants cannot be excluded (Murphy, forthcoming). A charred hop fruit from a late 15th century cess pit at Pottergate, 149N, well away from the river, is thought to provide more reliable evidence for the use of hops (Murphy, this volume). Thus although there are grounds for thinking that hopped beer may have been produced in Britain from the tenth century (Wilson and Connolly 1978, 148) there is no firm botanical evidence for the use of hops before the later Middle Ages.

3. Period 4 deposits: a general discussion

The distribution of cereals in samples from period 4 deposits is shown in Fig . Deposits interpreted as carbonised malt are confined to the northern part of the site, and in general samples with high grain concentrations tend to also group in this area. Cereals are conspicuously rare in the south-eastern area, where iron-working was the main activity. Structural and artefactual evidence for grain-processing activities including malting cones from the nothern area; this is discussed further below but includes clay-lined pits, a clay floor, the two ovens discussed above and a millstone. The features interpreted as steeping pits for grain, a possible malting floor, malt roasting ovens and the millstone could have been used for crushing the malt before making the wort for brewing.

An interpretation of the combined botanical and archaeological evidence is presented in Fig . If this interpretation is accepted then the results appear to indicate a close linking between local agriculture and industry so as to minimise the costs and effort of transportation from the arable fields to the brewery and on to the consumer.

Fig : An interpretation of the botanical and archaeological evidence for malting and brewing at site 302N, Period 4.



Cereals from period 9 and 10 deposits

Deposits of period 10 (1650-1700), and to a lesser extent period 9 (1600-1650), also contain high grain concentrations, notably of barley. Moreover at least one deposit (1204) from period 10 contained germinated barley grains. The botanical evidence is less strong than for period 4, and there is no supporting structural evidence, but it is possible that there was also some brewing on the site in the 17th century. The deposit from 1204 need not necessarily indicate malting on site: it could merely represent discarded charred grains from malt imported to the site from elsewhere.

Other cultivated and wild plant foodstuffs

Because of the minimal preservation conditions at Alms Lane, and also perhaps because of the modest social status of the occupants during most site phases, the range of plant foodstuffs identified other than cereals is very limited. The only fruits identified were fig (Ficus carica), grape (Vitis vinifera), elderberry (Sambucus nigra), bramble (Rubus fruticosus), raspberry (Rubus idaeus), Prunus sp and apple (Malus sylvestris/domestica). No nuts were identified. 727 (sample 69) produced a carbonised clove of garlic (Allium sativum) or another species of the Liliaceae,* though this context cannot be dated closely.

Almost all the fruitstones and seeds are mineralised, though there are a few carbonised specimens. Mineralisation involves impregnation of plant tissue with calcium phosphate. Phosphates derived from faeces or other decaying organic material react with calcium salts in groundwater, ~~or from~~ lime used as a sterilising agent or with biogenic calcium. Consequently this form of preservation occurs most frequently in cess pits and other contexts with a high proportion of organic material (Green 1979). As would be expected, most of the mineralised plant remains from 302N were recovered from cess pits of the later site periods: remains of fruits are rare in deposits up to period 6, and only become common in period 9 (Table : fiche). This distribution does not therefore reflect consumption, but rather differential preservation.

Wild plants

The seeds of wild plants fall into several distinct groups: mineralised weed seeds, carbonised weed seeds, seeds of wetland plants and scrub/woodland plants, mostly those with edible fruits which have already been discussed.

*This specimen was kindly identified by Dr G.C. Hillman.

The mineralised weed seeds comprise Chelidonium majus (greater celandine), Silene sp (campion), Chenopodium album (fat hen), Malva sp (mallow), Corium maculatum (hemlock), Aethusa cynapium (fool's parsley), Euphorbia helioscopia (sun-spurge), Hyoscyamus niger (henbane), Atropa bella-donna (deadly nightshade), Veronica hederifolia (ivy-leaved speedwell), Stachys sp (woundwort) and Ballota nigra (black horehound). These plants are all strongly associated with the disturbed, nutrient-rich soils of human settlements, and represent part of the weed flora on site. Several of these species have pharmaceutical uses, but there is no direct evidence that these properties were exploited. Seeds of elder (Sambucus nigra) were present in most samples, sometimes in very large numbers. They do not appear to be mineralised: seeds of this species are extremely durable and survive in a recognisable state for very long periods in aerobic soils. Like the mineralised seeds, however, these elder seeds are derived from the vegetation of disturbed ground on site.

Carbonised weed seeds occur sporadically in association with small samples of carbonised cereals. In such samples large seeds and fruits generally predominate, though of course recovery of material smaller than 1mm was incomplete at this site. Species represented include Brassica sp, Raphanus raphanistrum (wild radish), Agrostemma githago (corncockle), Vicia sp (vetch), Polygonum aviculare (knotgrass), Rumex spp (docks), Lithospermum arvense (corn gromwell), Convolvulus arvensis (bindweed), Galium aparine (cleavers), Chrysanthemum segetum (corn marigold), Centaurea sp (?cornflower), Bromus mollis/secalinus (brome grass) and other grasses including Lolium temulentum-type (?darnel). These fruits and seeds are thought to represent contaminants in batches of cereals imported to the site which were removed by sieving and hand sorting before consumption. Charring of a proportion of these seeds presumably occurred when the waste was thrown into domestic hearths. Carbonised weed seeds associated with an unprocessed batch of barley from 925 have been listed above.

There are a few identifications of seeds and nutlets of wetland plants including Menyanthes fritoliata (bog bean), Eleocharis sp (spike-rush) and Carex sp (sedges). These presumably relate to the gathering of rushes, sedges and other wetland plants for use as litter and thatch. Apart from seeds and fruitstones of edible wild fruits, remains of scrub and woodland plants are rare, but they include carbonised fruitstones of holly (Ilex aquifolium), part of a carbonised acorn cupule (Quercus sp) and carbonised buds. These macrofossils are likely to be derived from firewood.

Conclusions

Seed concentration analysis of 152 dated samples from Alms Lane shows a long-term increase in the concentration of carbonised cereal grains in deposits of periods 1-10, related probably to increasing density of occupation, and a marked drop in cereal grain concentrations in later periods, when there may have been little or no further disposal of charred cereals. Carbonised barley grains were consistently discarded in greater quantities than grains of other cereals. This is believed to be a consequence of methods of consumption: wheat, oats and rye probably reached the site largely as meal or flour, whereas barley was used as whole grain in cooking and malting.

There is a marked peak of cereal grain concentrations in deposits of period 4 (1275-1400), and this is thought to relate to crop processing and barley malting. A single large deposit of unprocessed two-row barley was recovered, probably the remains of a crop accidentally burnt whilst in store awaiting cleaning. Two deposits of carbonised barley including germinated grains and associated with ovens are interpreted as malt accidentally carbonised during roasting. Structural and artefactual evidence provides supporting evidence for malting on the site at this time. Some barley deposits from periods 9 and 10 (1600-1700) may perhaps also be related to malting or brewing.

Other carbonised crop plants include peas, from most site phases, and a single clove probably of garlic. Mineralised fruitstones and seeds of fig, grape, elderberry, bramble, raspberry, Prunus sp and apple occurred mainly in cess deposits in the later site phases. Weed seeds derived from the local weed flora and from batches of cereals imported to the site were identified together with rare remains of wetland and scrub/woodland plants.

Sampling at Alms Lane has produced useful information on the processing and use of plant foodstuffs and other raw materials in the medieval and post-medieval city. The assemblages of plant remains recovered are quite typical of those from sites in well-drained situations in Norwich. Individually, most of these assemblages are uninformative, containing few seeds of a very restricted range of taxa. In order to produce useful results from such sites it is necessary to sample on a large scale, both to provide statistically valid collections of plant remains from each site period and also to ensure recovery of rare large deposits such as those from period 4 which can prove critical for the interpretation of activities involving crops and other plants. It seems doubtful whether there is any value in small-scale sampling at sites of this type. Large-scale sampling is, however, very time-consuming and should probably be undertaken in future only where there is a prospect of gaining

information on specific areas of interest, such as, for example, the transition in mid- to late-Saxon Norwich from a self-sufficient farming economy to a truly urban economy.

Captions to figures.

Fig 1: Site 302N. Concentration analyses for cereal grains and pulse seeds.

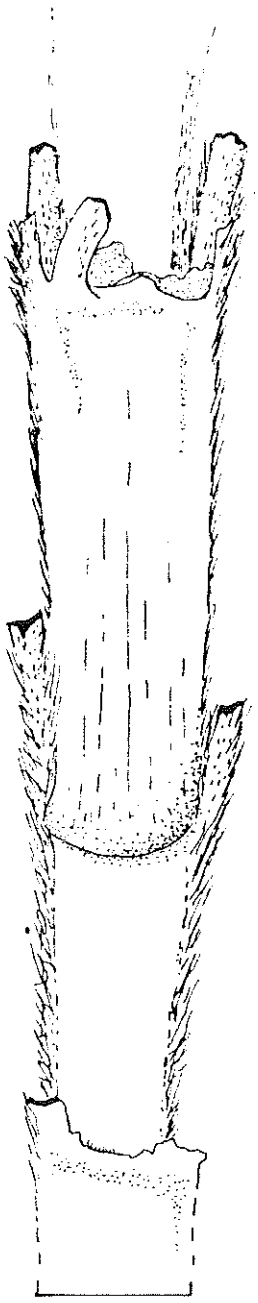
The horizontal axes show site periods 1-13.
The diagram at the base of this figure shows total soil volumes processed for each site period. The vertical axis here refers to litres of soil.
In the remaining diagrams the vertical axes show numbers of grains or seeds per 10 litres of soil processed.
Cross-hatched portions of the histograms refer to contexts 925 and 1492.

Fig 2: Selected crop plant remains from period 4 contexts.

a. Section of barley rachis (Hordeum distichum) 925.
b. Rachis node and fragmentary internodes of rye (Secale cereale) 925.
c. Section of wheat rachis (Triticum aestivum) 925.
d. Pea (Pisum sativum) 925.
e. Grain of barley (Hordeum cf. distichum) 925.
f. Germinated barley grain (Hordeum sp) 1492.

Millimetre scale beneath each drawing.

Fig 3: The distribution of carbonised cereals in deposits of period 4.



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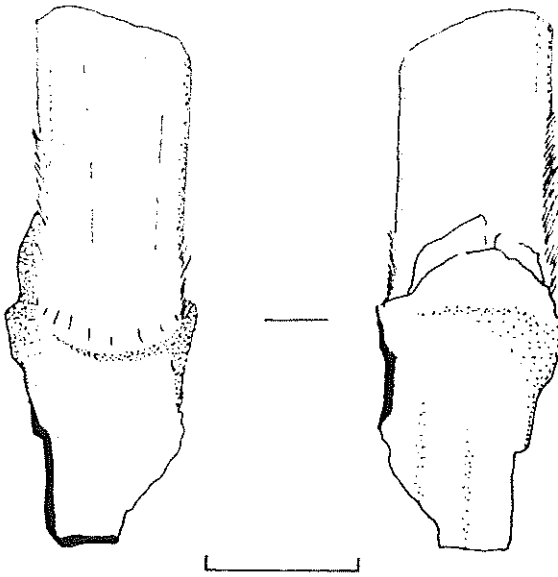

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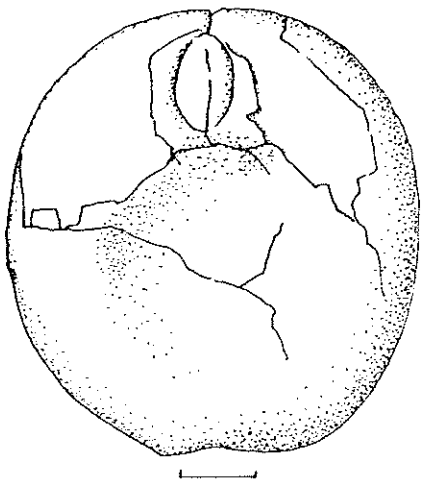

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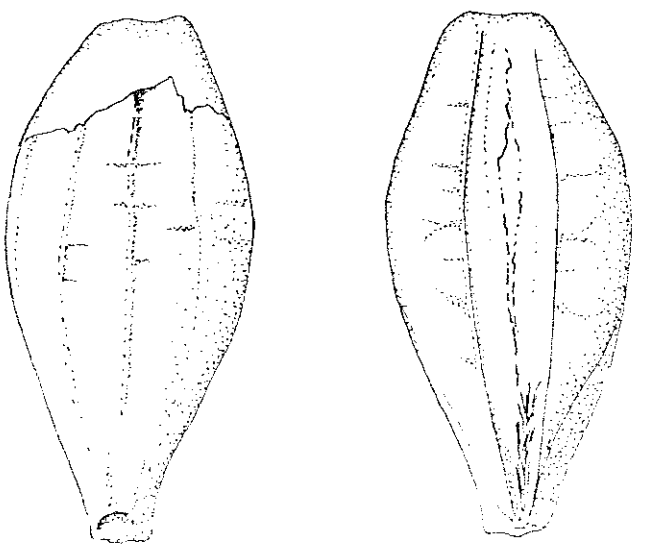

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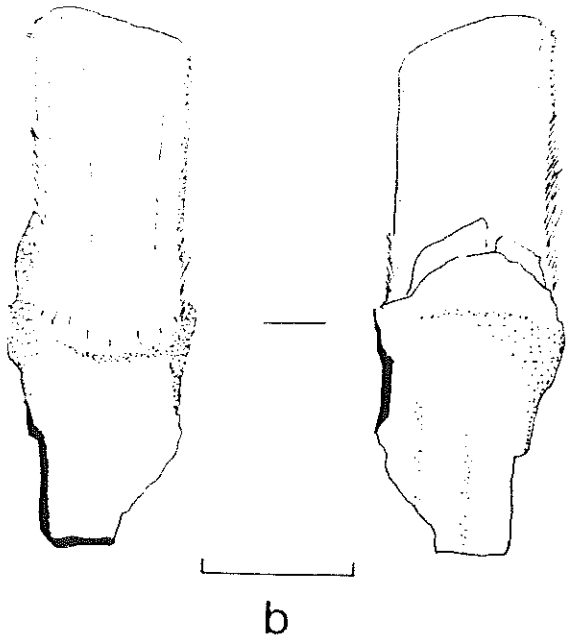

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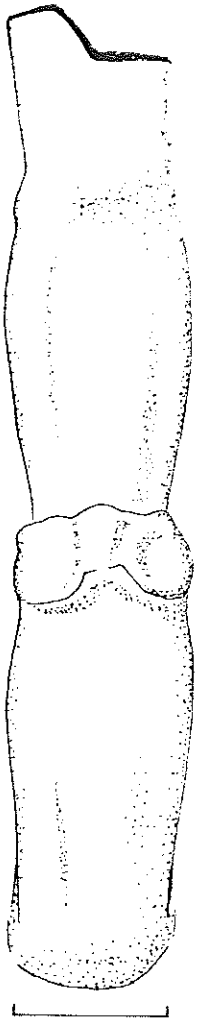

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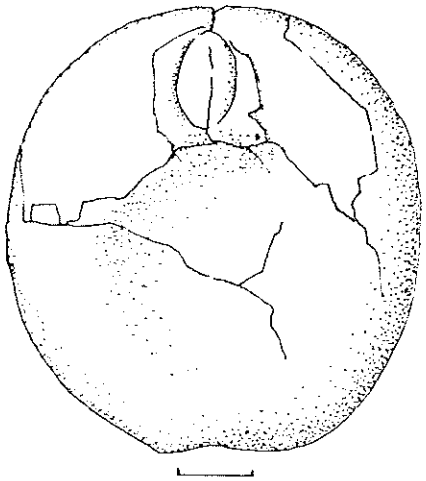

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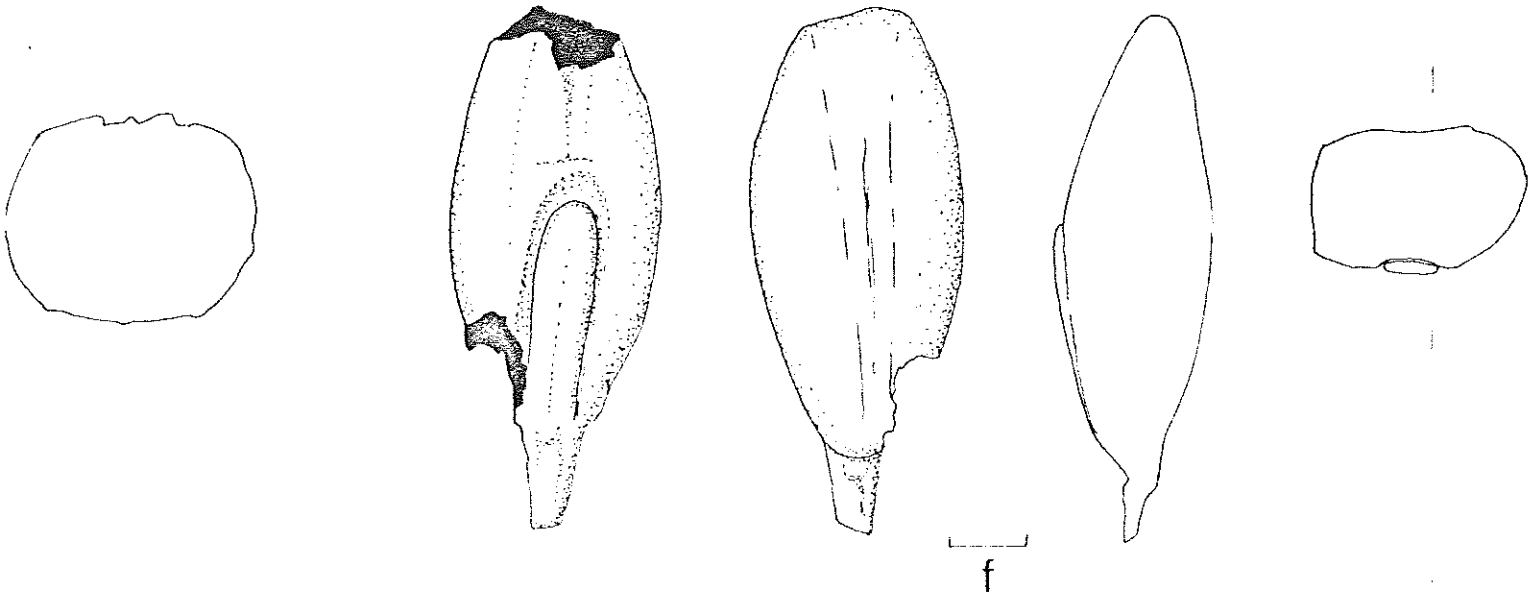

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Table : Fruits, seeds and other plant macrofossils from Alms Lane (Site 302N). Taxa represented by fruits or seeds except where indicated.

Site 502N Phase 1.1 – 1.2 (c.1000 - 1050) Sheet 1

	Context no.	771	834	873	920	966	966	1378
	Sample no.	84	89	104	132	142	187	257
Cereals	Cereal indet.		2	■			1	
	Hordeum vulgare L.							
	Hordeum sp.		1			2		
	Triticum aestivum s.l.		■	2				
	Avena sp.			2		1		1*
	Secale cereale L.			3				
	Cereal indet. (rachis)							
Pulse	Pisum-type	1		1				
Fruits	Ficus carica L.							
	Vitis vinifera L.							
	Sambucus nigra L.	+	+	+	+	+	+	+
	Rubus fruticosus agg							
	Rubus idaeus L.							
	Rubus sp.							
	Prunus sp.							
	Malus sylvestris Miller							
Wild	Chelidonium majus L.							
plants	Papaveraceae indet.							
	Brassica sp.							
	Raphanus raphanistrum L.							
	Silene sp.							
	Agrostemma githago L.							
	Chenopodium album L							
	Chenopodiaceae indet.							
	Malva sp.							
	Ilex aquifolium L.							
	Vicia sp.							
	Conium maculatum L.							
	Aethusa cynapium L.							
	Umbelliferae indet							
	Euphorbia helioscopia L.							
	Polygonum aviculare agg							
	Rumex sp.							
	Polygonaceae indet							
	Menyanthes trifoliata L.							
	Lithospermum arvense L.							
	Convolvulus arvensis L.							
	Hyoscyamus niger L.							
	Atropa bella-donna L.							
	Solanaceae indet							
	Veronica hederifolia L							
	Stachys sp.							
	Ballota nigra L.							
	Labiatae indet.			1				
	Galium aparine L							
	Chrysanthemum segetum L							
	Centaurea sp.							
	Compositae indet.							
	Eleocharis sp.							
	Carex sp,							
	Cyperaceae indet							
	Bromus mollis#secalinus							
	Lolium temulentum-type							
	Gramineae indet	1		3				
	Gramineae indet (culm node)							
	Indet (seeds, fruits etc)		1					
	Indet. capsule							
	Indet. bud			1				
	Indet. bulb							
	Sample volume (litres)	15	15	15	15	15	15	1

Site 302N Phase 3 Sheet 1

	Context no.	882	884	849	849	1039	866-884	1039	1086	884	1078	108
	Sample no.	120	131	136	144	162/3	164	166	180	183	196	198
Cereals	Cereal indet.	2		1	1	3		7	17	2		
	Hordeum vulgare L.							8	10*			
	Hordeum sp.	5		1	1	7				1		
	Triticum aestivum s.l.					1		1	1	1	1	
	Avena sp.	7				7	1	4	3	1	2	1
	Secale cereale L.					1	1	2				
	Cereal indet. (rachis)											
Pulse	Pisum-type		1									
Fruits	Ficus carica L.											
	Vitis vinifera L.											
	Sambucus nigra L.	+	+	+	+	+	+	+	+	+	+	
	Rubus fruticosus agg				1							
	Rubus idaeus L.											
	Rubus sp.			1								
	Prunus sp.											
	Malus sylvestris Miller											
Wild	Chelidonium majus L.											
plants	Papaveraceae indet.											
	Brassica sp.											
	Raphanus raphanistrum L.											
	Silene sp.											
	Agrostemma githago L.											
	Chenopodium album L								1			
	Chenopodiaceae indet.											
	Malva sp.											
	Ilex aquifolium L.											
	Vicia sp.											
	Conium maculatum L.											
	Aethusa cynapium L.											
	Umbelliferae indet											
	Euphorbia helioscopia L.											
	Polygonum aviculare agg											
	Rumex sp.											
	Polygonaceae indet								1			
	Menyanthes trifoliata L.											
	Lithospermum arvense L.								1			
	Convolvulus arvensis L.											
	Hyoscyamus niger L.											
	Atropa bella-donna L.											
	Solanaceae indet								4			
	Veronica hederifolia L											
	Stachys sp.											
	Ballota nigra L.											
	Labiatae indet.											
	Galium aparine L											
	Chrysanthemum segetum L											
	Centaurea sp.											
	Compositae indet.											
	Eleocharis sp.											
	Carex sp,											
	Cyperaceae indet											
	Bromus mollis#secalinus	1										
	Lolium temulentum-type		1				1	1				
	Gramineae indet	1							1			1
	Gramineae indet (culm node)											
	Indet (seeds, fruits etc)					3	1	1				
	Indet. capsule											
	Indet. bud											
	Indet. bulb											
	Sample volume (litres)	75	15	15	15	30	15	15	15	15	8	1.1

Site 302N Phase 3 Sheet 2

	Context no.	1454	1497	1504	1511	1536
	Sample no.	207	229	242	243	246
Cereals	Cereal indet.				3	
	Hordeum vulgare L.					
	Hordeum sp.		1			
	Triticum aestivum s.l.					
	Avena sp.					
	Secale cereale L.					
	Cereal indet. (rachis)					
Pulse	Pisum-type				1	
Fruits	Ficus carica L.					
	Vitis vinifera L.					
	Sambucus nigra L.	+	+	+	+	+
	Rubus fruticosus agg					
	Rubus idaeus L.					
	Rubus sp.					
	Prunus sp.					
	Malus sylvestris Miller					
Wild	Chelidonium majus L.					
plants	Papaveraceae indet.					
	Brassica sp.					
	Raphanus raphanistrum L.					
	Silene sp.					
	Agrostemma githago L.					
	Chenopodium album L					
	Chenopodiaceae indet.					
	Malva sp.					
	Ilex aquifolium L.					
	Vicia sp.					
	Conium maculatum L.					
	Aethusa cynapium L.					
	Umbelliferae indet					
	Euphorbia helioscopia L.					
	Polygonum aviculare agg					
	Rumex sp.					
	Polygonaceae indet					
	Menyanthes trifoliata L.					
	Lithospermum arvense L.					
	Convolvulus arvensis L.					
	Hyoscyamus niger L.					
	Atropa bella-donna L.					
	Solanaceae indet					
	Veronica hederifolia L					
	Stachys sp.					
	Ballota nigra L.					
	Labiatae indet.					
	Galium aparine L					
	Chrysanthemum segetum L					
	Centaurea sp.					
	Compositae indet.					
	Eleocharis sp.					
	Carex sp,					
	Cyperaceae indet					
	Bromus mollis#secalinus					
	Lolium temulentum-type					
	Gramineae indet					
	Gramineae indet (culm node)					
	Indet (seeds, fruits etc)					
	Indet. capsule					
	Indet. bud					
	Indet. bulb					
	Sample volume (litres)	15	30	15	15	15

Site 302N Phase 4.1-4.7 Sheet 1

	Context no.	869	272	470	481	917	925	275	987	986	1007	492
	Sample no.	102	106	111	113	126	130	138	143/5	148	149	150
Cereals	Cereal indet.	3	10	2	2	4	*	6	31	2		2
	Hordeum vulgare L.		12									
	Hordeum sp.	4				3		4	7			1
	Triticum aestivum s.l.		1						3		1	
	Avena sp.	5	1	1					1			
	Secale cereale L.		3			1		1	2			
	Cereal indet. (rachis)											
Pulse	Pisum-type		2	1		1		3	2	1		
Fruits	Ficus carica L.											
	Vitis vinifera L.											
	Sambucus nigra L.	+	+	+	+	+		+	+	+		+
	Rubus fruticosus agg											
	Rubus idaeus L.											
	Rubus sp.											1
	Prunus sp.											
	Malus sylvestris Miller											
Wild plants	Chelidonium majus L.											
	Papaveraceae indet.											
	Brassica sp.								2			
	Raphanus raphanistrum L.											
	Silene sp.											
	Agrostemma githago L.		1									
	Chenopodium album L											
	Chenopodiaceae indet.											
	Malva sp.											
	Ilex aquifolium L.											
	Vicia sp.		1									
	Conium maculatum L.											
	Aethusa cynapium L.											
	Umbelliferae indet											
	Euphorbia helioscopia L.											
	Polygonum aviculare agg											
	Rumex sp.											
	Polygonaceae indet											
	Menyanthes trifoliata L.											
	Lithospermum arvense L.								1			
	Convolvulus arvensis L.											
	Hyoscyamus niger L.											
	Atropa bella-donna L.											
	Solanaceae indet											
	Veronica hederifolia L											
	Stachys sp.											
	Ballota nigra L.											
	Labiatae indet.											
	Galium aparine L											
	Chrysanthemum segetum L											
	Centaurea sp.											
	Compositae indet.											
	Eleocharis sp.											
	Carex sp,											
	Cyperaceae indet											
	Bromus mollis#secalinus											
	Lolium temulentum-type											
	Gramineae indet	1										
	Gramineae indet (culm node)											
	Indet (seeds, fruits etc)	1							1			
	Indet. capsule											
	Indet. bud											
	Indet. bulb											
	Sample volume (litres)	15	15	30	15	15	15	15	30	12	0.1	15

* Botanical remains from 925 (sample 130) are listed separately in Table

Site 302N Phase 4.1-4.7 Sheet 2

	Context no.	492	1146	1405	1406	1803	1487	1488	1489	1490	1479	148
	Sample no.	156	174	195	206	29	220	221	222	223	224	22
Cereals	Cereal indet.	2	2		2	15	10	23	1	2	11	1
	Hordeum vulgare L.	5				11*						
	Hordeum sp.		4	1	1		3	11		3	4	
	Triticum aestivum s.l.	2	1			1		3	1		1	1
	Avena sp.								1			
	Secale cereale L.		2			2						
	Cereal indet. (rachis)											
Pulse	Pisum-type	2	1								1	
Fruits	Ficus carica L.	1						1				
	Vitis vinifera L.											
	Sambucus nigra L.	+	+	+	+	+	+	+	+	+	+	+
	Rubus fruticosus agg											
	Rubus idaeus L.						1					
	Rubus sp.											
	Prunus sp.											
	Malus sylvestris Miller											
Wild	Chelidonium majus L.							1				
plants	Papaveraceae indet.											
	Brassica sp.		1									
	Raphanus raphanistrum L.											
	Silene sp.											
	Agrostemma githago L.											
	Chenopodium album L											
	Chenopodiaceae indet.											
	Malva sp.					1						
	Ilex aquifolium L.											
	Vicia sp.	1										
	Conium maculatum L.											
	Aethusa cynapium L.											
	Umbelliferae indet											
	Euphorbia helioscopia L.											
	Polygonum aviculare agg											
	Rumex sp.							2				
	Polygonaceae indet											
	Menyanthes trifoliata L.											
	Lithospermum arvense L.											
	Convolvulus arvensis L.											
	Hyoscyamus niger L.							1				
	Atropa bella-donna L.						82	24		2		
	Solanaceae indet					1						
	Veronica hederifolia L											
	Stachys sp.											
	Ballota nigra L.							1				
	Labiatae indet.											
	Galium aparine L	1										
	Chrysanthemum segetum L											
	Centaurea sp.											
	Compositae indet.											
	Eleocharis sp.											
	Carex sp,											
	Cyperaceae indet							2				
	Bromus mollis#secalinus											
	Lolium temulentum-type							1				
	Gramineae indet					2				1		
	Gramineae indet (culm node)											
	Indet (seeds, fruits etc)	1	1					1		2	1	
	Indet. capsule											
	Indet. bud											
	Indet. bulb											
	Sample volume (litres)	15	15	15	1.1	15	15	15	15	15	15	1.

Site 302K Phase 4.1-4.7 Sheet 3

	Context no.	1492	1486	1520	552	1535	1563	552	1639	1527	2165	216
	Sample no.	226	228	241	244	245	248	249	251	252	283	28
Cereals	Cereal indet.	179		2	1	2						11
	Hordeum vulgare L.											
	Hordeum sp.	126*		5				3			2	12
	Triticum aestivum s.l.	2		1								
	Avena sp.	9*										
	Secale cereale L.	2		1		1						
	Cereal indet. (rachis)											
Pulse	Pisum-type			1				1				
Fruits	Ficus carica L.											
	Vitis vinifera L.											
	Sambucus nigra L.	+	+	+	+	+	+	+	+	+	+	
	Rubus fruticosus agg										1	
	Rubus idaeus L.											
	Rubus sp.											
	Prunus sp.											
	Malus sylvestris Miller											
Wild	Chelidonium majus L.							1				
plants	Papaveraceae indet.											
	Brassica sp.	4										
	Raphanus raphanistrum L.					1						
	Silene sp.											
	Agrostemma githago L.	1*										
	Chenopodium album L	1										
	Chenopodiaceae indet.											
	Malva sp.											
	Ilex aquifolium L.											
	Vicia sp.											
	Conium maculatum L.										3	
	Aethusa cynapium L.											
	Umbelliferae indet											
	Euphorbia helioscopia L.											
	Polygonum aviculare agg											
	Rumex sp.											
	Polygonaceae indet											
	Menyanthes trifoliata L.											
	Lithospermum arvense L.											
	Convolvulus arvensis L.											
	Hyoscyamus niger L.											
	Atropa bella-donna L.											
	Solanaceae indet											
	Veronica hederifolia L											
	Stachys sp.											
	Ballota nigra L.											
	Labiatae indet.										3	
	Galium aparine L			1								
	Chrysanthemum segetum L											
	Centaurea sp.	1										
	Compositae indet.											
	Eleocharis sp.											
	Carex sp,	1						1				
	Cyperaceae indet											
	Bromus mollis#secalinus	1										
	Lolium temulentum-type	1										
	Gramineae indet								1			
	Gramineae indet (culm node)											
	Indet (seeds, fruits etc)	1		1		2		1	1			
	Indet. capsule											
	Indet. bud											
	Indet. bulb											
	Sample volume (litres)	15	1.1	15	15	15	1	1	1	1	1	1

Site 302N Phase 4.1–4.7 Sheet 4

	Context no.	2172	2191	2195	2172
	Sample no.	288	290	291	293
Cereals	Cereal indet.		1	1	
	Hordeum vulgare L.				
	Hordeum sp.		7		
	Triticum aestivum s.l.		1	1	1
	Avena sp.		1		
	Secale cereale L.				
	Cereal indet. (rachis)				
Pulse	Pisum-type				
Fruits	Ficus carica L.				
	Vitis vinifera L.				
	Sambucus nigra L.	+	+		+
	Rubus fruticosus agg				
	Rubus idaeus L.				
	Rubus sp.				
	Prunus sp.				
	Malus sylvestris Miller				
Wild	Chelidonium majus L.				
plants	Papaveraceae indet.				
	Brassica sp.				
	Raphanus raphanistrum L.				
	Silene sp.				
	Agrostemma githago L.				
	Chenopodium album L				
	Chenopodiaceae indet.				
	Malva sp.				
	Ilex aquifolium L.				
	Vicia sp.		1		
	Conium maculatum L.				
	Aethusa cynapium L.				
	Umbelliferae indet				
	Euphorbia helioscopia L.				
	Polygonum aviculare agg				
	Rumex sp.				
	Polygonaceae indet		1		
	Menyanthes trifoliata L.				
	Lithospermum arvense L.				
	Convolvulus arvensis L.				
	Hyoscyamus niger L.				
	Atropa bella-donna L.				
	Solanaceae indet				
	Veronica hederifolia L				
	Stachys sp.				
	Ballota nigra L.				
	Labiatae indet.				
	Galium aparine L				
	Chrysanthemum segetum L				
	Centaurea sp.				
	Compositae indet.				
	Eleocharis sp.				
	Carex sp,				
	Cyperaceae indet				
	Bromus mollis#secalinus		1		
	Lolium temulentum-type				
	Gramineae indet				
	Gramineae indet (culm node)				
	Indet (seeds, fruits etc)				
	Indet. capsule				
	Indet. bud				
	Indet. bulb				
	Sample volume (litres)	1	1	1	1

Site 302N Phase 5 Sheet 1

	Context no.	208	281	213	729	732	213	694	428	896	896	936
	Sample no.	29	36	63	71	72	77	94	105	127	134	135
Cereals	Cereal indet.			20	2	3			8	1	1	4
	Hordeum vulgare L.						1					
	Hordeum sp.		1	7		3			4		1	3
	Triticum aestivum s.l.			5	2	1	1	1	5			1
	Avena sp.		1	1						1		1
	Secale cereale L.		1	5	2	1						
	Cereal indet. (rachis)											
Pulse	Pisum-type	1	1	4	8	1	1	1	2			1
Fruits	Ficus carica L.				1				2			1
	Vitis vinifera L.											
	Sambucus nigra L.	+	+	+	+	+	+	+	+	+	+	+
	Rubus fruticosus agg											1
	Rubus idaeus L.											
	Rubus sp.											
	Prunus sp.											
	Malus sylvestris Miller											1
Wild	Chelidonium majus L.											
plants	Papaveraceae indet.											
	Brassica sp.											
	Raphanus raphanistrum L.											
	Silene sp.											
	Agrostemma githago L.											
	Chenopodium album L											
	Chenopodiaceae indet.											
	Malva sp.											
	Ilex aquifolium L.											
	Vicia sp.			1								
	Conium maculatum L.											
	Aethusa cynapium L.											
	Umbelliferae indet											
	Euphorbia helioscopia L.											
	Polygonum aviculare agg											
	Rumex sp.											
	Polygonaceae indet											
	Menyanthes trifoliata L.											
	Lithospermum arvense L.											
	Convolvulus arvensis L.											
	Hyoscyamus niger L.											
	Atropa bella-donna L.											
	Solanaceae indet								1			
	Veronica hederifolia L											
	Stachys sp.											
	Ballota nigra L.											
	Labiatae indet.				1							
	Galium aparine L											
	Chrysanthemum segetum L											
	Centaurea sp.											
	Compositae indet.											
	Eleocharis sp.											
	Carex sp,											
	Cyperaceae indet											
	Bromus mollis#secalinus											
	Lolium temulentum-type											
	Gramineae indet											
	Gramineae indet (culm node)											
	Indet (seeds, fruits etc)		1*				1					2
	Indet. capsule											
	Indet. bud											
	Indet. bulb											
	Sample volume (litres)	15	15	15	10	15	15	15	15	15	15	15

Site 302K Phase 5 Sheet 2

	Context no.	975	478	1080	1083	1291	2167	2168
	Sample no.	140	157-8	182	197	200	284	285
Cereals	Cereal indet.		13		1	1	9	
	Hordeum vulgare L.							
	Hordeum sp.	2	8		5	–	4	
	Triticum aestivum s.l.		3			1	1	
	Avena sp.		2					
	Secale cereale L.		1		1	1	7	
	Cereal indet. (rachis)							
Pulse	Pisum-type		2					
Fruits	Ficus carica L.							
	Vitis vinifera L.							
	Sambucus nigra L.	+	+	+	+	+	+	+
	Rubus fruticosus agg							
	Rubus idaeus L.							
	Rubus sp.							
	Prunus sp.							
	Malus sylvestris Miller							
Wild plants	Chelidonium majus L.		1					
	Papaveraceae indet.							
	Brassica sp.					3		
	Raphanus raphanistrum L.		1					
	Silene sp.							
	Agrostemma githago L.							
	Chenopodium album L							
	Chenopodiaceae indet.							
	Malva sp.							
	Ilex aquifolium L.							
	Vicia sp.							
	Conium maculatum L.							
	Aethusa cynapium L.							
	Umbelliferae indet							
	Euphorbia helioscopia L.							
	Polygonum aviculare agg							
	Rumex sp.							
	Polygonaceae indet							
	Menyanthes trifoliata L.							
	Lithospermum arvense L.							
	Convolvulus arvensis L.						1	
	Hyoscyamus niger L.							
	Atropa bella-donna L.							
	Solanaceae indet							
	Veronica hederifolia L							
	Stachys sp.							
	Ballota nigra L.							
	Labiatae indet.							
	Galium aparine L							
	Chrysanthemum segetum L							
	Centaurea sp.							
	Compositae indet.							
	Eleocharis sp.							
	Carex sp,							
	Cyperaceae indet							
	Bromus mollis#secalinus		1					
	Lolium temulentum-type		2		2		3	
	Gramineae indet						5	
	Gramineae indet (culm node)							
	Indet (seeds, fruits etc)		4				2	
	Indet. capsule							
	Indet. bud		1					
	Indet. bulb							
	Sample volume (litres)	15	30	15	15	0·1	1	1

Site 502N Phase 6 Sheet |

	Context no.	402	820	832	429	472	494	472	1267	1788	1781	178
	Sample no.	38-9	87	88	110	115	151	168	201	211	218	238
reals	Cereal indet.		3	1	1	1		3	5	6	16	4
	~~Hordeum vulgare~~ L.											
	Hordeum sp.	1	1		1		2		3	3	1	4
	Triticum aestivum s.l.			1		1				1	4	
	Avena sp.			1				1				
	Secale cereale L.							1				
	Cereal indet. (rachis)											
ulse	Pisum-type	2	3		1						2	
ruits	Ficus carica L.											
	Vitis vinifera L.									1		
	Sambucus nigra L.	+	+	+	+	+	+	+		+	+	+
	Rubus fruticosus agg											
	Rubus idaeus L.											
	Rubus sp.											
	Prunus sp.											
	Malus sylvestris Miller											
ld	Chelidonium majus L.	1						1				
plants	Papaveraceae indet.											
	Brassica sp.									1		
	Raphanus raphanistrum L.											
	Silene sp.											
	Agrostemma githago L.											
	Chenopodium album L											
	Chenopodiaceae indet.											
	Malva sp.											
	Ilex aquifolium L.											
	Vicia sp.											
	Conium maculatum L.											
	Aethusa cynapium L.											
	Umbelliferae indet											
	Euphorbia helioscopia L.											
	Polygonum aviculare agg											
	Rumex sp.											
	Polygonaceae indet											
	Menyanthes trifoliata L.											
	Lithospermum arvense L.											
	Convolvulus arvensis L.											
	Hyoscyamus niger L.											
	Atropa bella-donna L.	6										
	Solanaceae indet											
	Veronica hederifolia L											
	Stachys sp.											
	Ballota nigra L.											
	Labiatae indet.							1				
	Galium aparine L											
	Chrysanthemum segetum L											
	Centaurea sp.											
	Compositae indet.											
	Eleocharis sp.											
	Carex sp,											
	Cyperaceae indet											
	Bromus mollis#secalinus											
	Lolium temulentum-type											
	Gramineae indet									1	1	2
	Gramineae indet (culm node)								2			
	Indet (seeds, fruits etc)			1								
	Indet. capsule											
	Indet. bud											
	Indet. bulb											
	Sample volume (litres)	30	15	15	15	15	15	15	1	15	15	1

Site 302N Phase 6 Sheet 2

	Context no.	1788	2043	2128	2160	2126
	Sample no.	253	272	281	286	294
Cereals	Cereal indet.	1	1	1		1
	Hordeum vulgare L.					
	Hordeum sp.	1	1	1	1	3
	Triticum aestivum s.l.					
	Avena sp.					
	Secale cereale L.					2
	Cereal indet. (rachis)					
Pulse	Pisum-type		1		2	1
Fruits	Ficus carica L.					
	Vitis vinifera L.				1	
	Sambucus nigra L.	+	+		+	
	Rubus fruticosus agg					
	Rubus idaeus L.					
	Rubus sp.					
	Prunus sp.					
	Malus sylvestris Miller					
Wild	Chelidonium majus L.					
plants	Papaveraceae indet.					
	Brassica sp.	1				
	Raphanus raphanistrum L.					
	Silene sp.					
	Agrostemma githago L.					
	Chenopodium album L					
	Chenopodiaceae indet.					
	Malva sp.					
	Ilex aquifolium L.					
	Vicia sp.			1		
	Conium maculatum L.					
	Aethusa cynapium L.					
	Umbelliferae indet					
	Euphorbia helioscopia L.					
	Polygonum aviculare agg					
	Rumex sp.					
	Polygonaceae indet					
	Menyanthes trifoliata L.					
	Lithospermum arvense L.					
	Convolvulus arvensis L.					
	Hyoscyamus niger L.					
	Atropa bella-donna L.					
	Solanaceae indet					
	Veronica hederifolia L					
	Stachys sp.					
	Ballota nigra L.					
	Labiatae indet.					
	Galium aparine L					
	Chrysanthemum segetum L					
	Centaurea sp.					
	Compositae indet.					
	Eleocharis sp.					
	Carex sp,					
	Cyperaceae indet					
	Bromus mollis#secalinus					
	Lolium temulentum-type					
	Gramineae indet					1
	Gramineae indet (culm node)					
	Indet (seeds, fruits etc)					
	Indet. capsule					
	Indet. bud					
	Indet. bulb					
	Sample volume (litres)	1	1	1	1	1

Site 502X Phase 7.1-7.2 Sheet 1

	Context no.	373	375	382	338	373	349	467	474	487	113	178
	Sample no.	10	11	14	15	20	23	90	91	114	175	209
cereals	Cereal indet.	6	5	2	6	1		1	1	1	17	1
	~~Hordeum vulgare L.~~											
	Hordeum sp.	4	7	3	14				1	3	11	
	Triticum aestivum s.l.			1	2				2		8	
	Avena sp.	1	3	1	3			1	1		4	
	Secale cereale L.										1	
	Cereal indet. (rachis)											
pulse	Pisum-type	2	1	1	5			12		3	6	
fruits	Ficus carica L.					1					21	
	Vitis vinifera L.											
	Sambucus nigra L.	+	+	+	+	+	+	+	+	+	+	+
	Rubus fruticosus agg										3	
	Rubus idaeus L.											
	Rubus sp.											
	Prunus sp.											
	Malus sylvestris Miller										1	
wild plants	Chelidonium majus L.	5										
	Papaveraceae indet.											
	Brassica sp.		1			2						
	Raphanus raphanistrum L.											
	Silene sp.											
	Agrostemma githago L.											
	Chenopodium album L											
	Chenopodiaceae indet.											
	Malva sp.											
	Ilex aquifolium L.											
	Vicia sp.											
	Conium maculatum L.											
	Aethusa cynapium L.											
	Umbelliferae indet											
	Euphorbia helioscopia L.											
	Polygonum aviculare agg											
	Rumex sp.											
	Polygonaceae indet											
	Menyanthes trifoliata L.											
	Lithospermum arvense L.											
	Convolvulus arvensis L.											
	Hyoscyamus niger L.											
	Atropa bella-donna L.	81		3		23	1					
	Solanaceae indet											
	Veronica hederifolia L											
	Stachys sp.										1	
	Ballota nigra L.											
	Labiatae indet.		1									
	Galium aparine L											
	Chrysanthemum segetum L											
	Centaurea sp.											
	Compositae indet.											
	Eleocharis sp.											
	Carex sp,											
	Cyperaceae indet	2										
	Bromus mollis#secalinus											
	Lolium temulentum-type											
	Gramineae indet											
	Gramineae indet (culm node)											
	Indet (seeds, fruits etc)		13	1	1						1	
	Indet. capsule											
	Indet. bud											
	Indet. bulb											
	Sample volume (litres)	15	15	15	15	15	15	15	15	15	15	10

Site 302N Phase 7.1-7.2. Sheet 2

	Context no.	1790	1800	1792	1301	1296	1998	2060	480
	Sample no.	213	214	215	236	240	269	297	116
Cereals	Cereal indet.		2	2	3	32		1	
	Hordeum vulgare L.								
	Hordeum sp.				2	39			
	Triticum aestivum s.l.					7			
	Avena sp.					6	1		
	Secale cereale L.					1			
	Cereal indet. (rachis)								
Pulse	Pisum-type					3	1		
Fruits	Ficus carica L.								
	Vitis vinifera L.								
	Sambucus nigra L.			+		+	+	+	+
	Rubus fruticosus agg								
	Rubus idaeus L.								
	Rubus sp.								
	Prunus sp.								
	Malus sylvestris Miller								
Wild	Chelidonium majus L.								
plants	Papaveraceae indet.								
	Brassica sp.								
	Raphanus raphanistrum L.								
	Silene sp.								
	Agrostemma githago L.								
	Chenopodium album L	2							
	Chenopodiaceae indet.								
	Malva sp.								
	Ilex aquifolium L.								
	Vicia sp.				1				
	Conium maculatum L.								
	Aethusa cynapium L.								
	Umbelliferae indet			1					
	Euphorbia helioscopia L.								
	Polygonum aviculare agg								
	Rumex sp.								
	Polygonaceae indet								
	Menyanthes trifoliata L.								
	Lithospermum arvense L.								
	Convolvulus arvensis L.								
	Hyoscyamus niger L.			7					
	Atropa bella-donna L.			1		1			
	Solanaceae indet								3
	Veronica hederifolia L								
	Stachys sp.								
	Ballota nigra L.					1			
	Labiatae indet.					1			
	Galium aparine L								
	Chrysanthemum segetum L								
	Centaurea sp.								
	Compositae indet.								
	Eleocharis sp.								
	Carex sp,								
	Cyperaceae indet								
	Bromus mollis#secalinus								
	Lolium temulentum-type								
	Gramineae indet					3		1	
	Gramineae indet (culm node)								
	Indet (seeds, fruits etc)					9			
	Indet. capsule								
	Indet. bud								
	Indet. bulb					1			
	Sample volume (litres)	1.1	1.1	15	1.1	150	1	1	15.

Site 302N Phase 8 Sheet 1

	Context no. / Sample no.	652 / 49	1225 / 167	1830 / 254
Cereals	Cereal indet.	1	14	
	Hordeum vulgare L.			
	Hordeum sp.	3	6	
	Triticum aestivum s.l.			
	Avena sp.	1		
	Secale cereale L.			
	Cereal indet. (rachis)			
Pulse	Pisum-type	1		
Fruits	Ficus carica L.			
	Vitis vinifera L.			
	Sambucus nigra L.	+	+	+
	Rubus fruticosus agg			
	Rubus idaeus L.			
	Rubus sp.			
	Prunus sp.			
	Malus sylvestris Miller			
Wild plants	Chelidonium majus L.		3	
	Papaveraceae indet.			
	Brassica sp.			
	Raphanus raphanistrum L.			
	Silene sp.			
	Agrostemma githago L.			
	Chenopodium album L			
	Chenopodiaceae indet.			
	Malva sp.			
	Ilex aquifolium L.			
	Vicia sp.			
	Conium maculatum L.			
	Aethusa cynapium L.			
	Umbelliferae indet			
	Euphorbia helioscopia L.			
	Polygonum aviculare agg			
	Rumex sp.			
	Polygonaceae indet			
	Menyanthes trifoliata L.			
	Lithospermum arvense L.			
	Convolvulus arvensis L.			
	Hyoscyamus niger L.			
	Atropa bella-donna L.			
	Solanaceae indet			
	Veronica hederifolia L			
	Stachys sp.			
	Ballota nigra L.			
	Labiatae indet.			
	Galium aparine L			
	Chrysanthemum segetum L			
	Centaurea sp.		1	
	Compositae indet.			
	Eleocharis sp.			
	Carex sp,			
	Cyperaceae indet			
	Bromus mollis#secalinus			
	Lolium temulentum-type			
	Gramineae indet			
	Gramineae indet (culm node)			
	Indet (seeds, fruits etc)			
	Indet. capsule			
	Indet. bud			
	Indet. bulb			
	Sample volume (litres)	15	15	1

Site 302X Phase 9:-9.3 Sheet 1

	Context no.	344	93	610	221	724	225	688	761	822	862	937
	Sample no.	3	13	51	54	68	68(3)	68(4)	81	86	101	141
Cereals	Cereal indet.	21	3	4		11	6	21	22	7	5	16
	Hordeum vulgare L.					18	14		21			
	Hordeum sp.	6	1	9				13		1	2	20
	Triticum aestivum s.l.			1		1	1	1	3	5		3
	Avena sp.						2	1	2	3		
	Secale cereale L.			1					1	1		1
	Cereal indet. (rachis)	1										
Pulse	Pisum-type	6	1			3			1	20		2
Fruits	Ficus carica L.	1		3		9	3	62				
	Vitis vinifera L.											
	Sambucus nigra L.	+	+	+	+	+	+	+	+	+	+	+
	Rubus fruticosus agg			21		5	3	3			8	
	Rubus idaeus L.											
	Rubus sp.	2										
	Prunus sp.											
	Malus sylvestris Miller	1		1							1	1
Wild plants	Chelidonium majus L.	1										
	Papaveraceae indet.											
	Brassica sp.				1							
	Raphanus raphanistrum L.						1					
	Silene sp.											
	Agrostemma githago L.											
	Chenopodium album L											
	Chenopodiaceae indet.	1										
	Malva sp.											
	Ilex aquifolium L.											
	Vicia sp.					1						
	Conium maculatum L.											
	Aethusa cynapium L.			1								
	Umbelliferae indet											
	Euphorbia helioscopia L.											
	Polygonum aviculare agg											
	Rumex sp.	5										
	Polygonaceae indet											
	Menyanthes trifoliata L.	1										
	Lithospermum arvense L.											
	Convolvulus arvensis L.											
	Hyoscyamus niger L.											
	Atropa bella-donna L.	2										
	Solanaceae indet							1				
	Veronica hederifolia L					1						
	Stachys sp.											
	Ballota nigra L.											
	Labiatae indet.							2				
	Galium aparine L									1		
	Chrysanthemum segetum L							3				
	Centaurea sp.											
	Compositae indet.											
	Eleocharis sp.											
	Carex sp,											
	Cyperaceae indet											
	Bromus mollis#secalinus									1		
	Lolium temulentum-type						1					
	Gramineae indet					1						3
	Gramineae indet (culm node)											
	Indet (seeds, fruits etc)	5					2	1				1
	Indet. capsule											
	Indet. bud									1		3
	Indet. bulb											
	Sample volume (litres)	15	15	15	15	30	15	15	15	15	15	15

Site 302N Phase 9.1-9.3 Sheet 2

	Context no.	221	1314	1869	864
	Sample no.	165	237	300	97
Cereals	Cereal indet.	21	6		
	Hordeum vulgare L.				
	Hordeum sp.	2	3	1	1
	Triticum aestivum s.l.				
	Avena sp.				
	Secale cereale L.	1			
	Cereal indet. (rachis)				
Pulse	Pisum-type				
Fruits	Ficus carica L.				
	Vitis vinifera L.				
	Sambucus nigra L.	+			
	Rubus fruticosus agg				
	Rubus idaeus L.				
	Rubus sp.				
	Prunus sp.				
	Malus sylvestris Miller				
Wild	Chelidonium majus L.				
plants	Papaveraceae indet.				
	Brassica sp.				
	Raphanus raphanistrum L.				
	Silene sp.				
	Agrostemma githago L.				
	Chenopodium album L				
	Chenopodiaceae indet.				
	Malva sp.				
	Ilex aquifolium L.				
	Vicia sp.		1		
	Conium maculatum L.				
	Aethusa cynapium L.				
	Umbelliferae indet				
	Euphorbia helioscopia L.				
	Polygonum aviculare agg				
	Rumex sp.				
	Polygonaceae indet				
	Menyanthes trifoliata L.				
	Lithospermum arvense L.				
	Convolvulus arvensis L.				
	Hyoscyamus niger L.				
	Atropa bella-donna L.				
	Solanaceae indet				
	Veronica hederifolia L				
	Stachys sp.				
	Ballota nigra L.				
	Labiatae indet.				
	Galium aparine L				
	Chrysanthemum segetum L		3		
	Centaurea sp.				
	Compositae indet.				
	Eleocharis sp.				
	Carex sp,	2			
	Cyperaceae indet				
	Bromus mollis#secalinus				
	Lolium temulentum-type				
	Gramineae indet		2		
	Gramineae indet (culm node)		2		
	Indet (seeds, fruits etc)		1	2	
	Indet. capsule				
	Indet. bud	1			
	Indet. bulb				
	Sample volume (litres)	15	1	1	0·1

Site 502K Phase 10 Sheet 1

	Context no.	147	287	1205	1204	226
	Sample no.	46	47	153	154	25
Cereals	Cereal indet.		8	3	8	1
	Hordeum vulgare L.	5		4		
	Hordeum sp.		10		55*	2
	Triticum aestivum s.l.	6	1			
	Avena sp.		1		3	
	Secale cereale L.					
	Cereal indet. (rachis)					
Pulse	Pisum-type				3	1
Fruits	Ficus carica L.	7	1			
	Vitis vinifera L.					
	Sambucus nigra L.	+	+	+	+	
	Rubus fruticosus agg	182		274	202	
	Rubus idaeus L.					
	Rubus sp.					
	Prunus sp.					
	Malus sylvestris Miller	1			1	
Wild	Chelidonium majus L.					
plants	Papaveraceae indet.					
	Brassica sp.					
	Raphanus raphanistrum L.					
	Silene sp.					
	Agrostemma githago L.					
	Chenopodium album L					
	Chenopodiaceae indet.					
	Malva sp.					
	Ilex aquifolium L.					
	Vicia sp.					
	Conium maculatum L.					
	Aethusa cynapium L.					
	Umbelliferae indet				1	
	Euphorbia helioscopia L.					
	Polygonum aviculare agg					
	Rumex sp.					
	Polygonaceae indet					
	Menyanthes trifoliata L.					
	Lithospermum arvense L.					
	Convolvulus arvensis L.					
	Hyoscyamus niger L.					
	Atropa bella-donna L.					
	Solanaceae indet					
	Veronica hederifolia L					
	Stachys sp.					
	Ballota nigra L.					
	Labiatae indet.					
	Galium aparine L					
	Chrysanthemum segetum L					
	Centaurea sp.					
	Compositae indet.					
	Eleocharis sp.					
	Carex sp,					
	Cyperaceae indet					
	Bromus mollis#secalinus					
	Lolium temulentum-type				1	
	Gramineae indet					
	Gramineae indet (culm node)					
	Indet (seeds, fruits etc)	1			5	
	Indet. capsule					
	Indet. bud				1	
	Indet. bulb					
	Sample volume (litres)	15	15	10	15	15

Site 302K Phase II Sheet 1

	Context no.	189	372	214	34	243	222/212	1230
	Sample no.	5	12	21	25-8	32-3	42	176
Cereals	Cereal indet.		11	1	18	4	3	2
	Hordeum vulgare L.				16	5		
	Hordeum sp.		4		7		3	1
	Triticum aestivum s.l.		2	3	1	4	6	
	Avena sp.							
	Secale cereale L.				26	2	1	
	Cereal indet. (rachis)							
Pulse	Pisum-type				1		4	
Fruits	Ficus carica L.		1		124	284		
	Vitis vinifera L.				5	5		
	Sambucus nigra L.	+	+	+	+	+	+	
	Rubus fruticosus agg	1	14		86	58	3	
	Rubus idaeus L.	1						
	Rubus sp.			1				
	Prunus sp.				1			
	Malus sylvestris Miller				3	5		
Wild plants	Chelidonium majus L.							
	Papaveraceae indet.							
	Brassica sp.							
	Raphanus raphanistrum L.							
	Silene sp.							
	Agrostemma githago L.							
	Chenopodium album L							
	Chenopodiaceae indet.							
	Malva sp.							
	Ilex aquifolium L.		1					
	Vicia sp.							
	Conium maculatum L.							
	Aethusa cynapium L.							
	Umbelliferae indet							
	Euphorbia helioscopia L.							
	Polygonum aviculare agg							
	Rumex sp.							
	Polygonaceae indet							
	Menyanthes trifoliata L.							
	Lithospermum arvense L.							
	Convolvulus arvensis L.							
	Hyoscyamus niger L.							
	Atropa bella-donna L.							
	Solanaceae indet							
	Veronica hederifolia L							
	Stachys sp.							
	Ballota nigra L.							
	Labiatae indet.							
	Galium aparine L							
	Chrysanthemum segetum L							
	Centaurea sp.							
	Compositae indet.							
	Eleocharis sp.							
	Carex sp,		1					
	Cyperaceae indet							
	Bromus mollis#secalinus							
	Lolium temulentum-type							
	Gramineae indet							
	Gramineae indet (culm node)							
	Indet (seeds, fruits etc)				3	1		1
	Indet. capsule							
	Indet. bud							
	Indet. bulb							
	Sample volume (litres)	7	15	5	175	30	60	15

Site 302X Phase 12 Sheet 1

	Context no.	95	97
	Sample no.	1	2
ereals	Cereal indet.	1	1
	Hordeum vulgare L.		
	Hordeum sp.		
	Triticum aestivum s.l.		
	Avena sp.		
	Secale cereale L.		
	Cereal indet. (rachis)		
Pulse	Pisum-type		
Fruits	Ficus carica L.		
	Vitis vinifera L.		
	Sambucus nigra L.	+	
	Rubus fruticosus agg		
	Rubus idaeus L.		
	Rubus sp.	1	
	Prunus sp.		
	Malus sylvestris Miller		
ild	Chelidonium majus L.		
plants	Papaveraceae indet.		
	Brassica sp.		
	Raphanus raphanistrum L.		
	Silene sp.		
	Agrostemma githago L.		
	Chenopodium album L		
	Chenopodiaceae indet.		
	Malva sp.		
	Ilex aquifolium L.		
	Vicia sp.		
	Conium maculatum L.		
	Aethusa cynapium L.		
	Umbelliferae indet		
	Euphorbia helioscopia L.		
	Polygonum aviculare agg		
	Rumex sp.		
	Polygonaceae indet		
	Menyanthes trifoliata L.		
	Lithospermum arvense L.		
	Convolvulus arvensis L.		
	Hyoscyamus niger L.		
	Atropa bella-donna L.		
	Solanaceae indet		
	Veronica hederifolia L		
	Stachys sp.		
	Ballota nigra L.		
	Labiatae indet.		
	Galium aparine L		
	Chrysanthemum segetum L		
	Centaurea sp.		
	Compositae indet.		
	Eleocharis sp.		
	Carex sp,		
	Cyperaceae indet		
	Bromus mollis#secalinus		
	Lolium temulentum-type		
	Gramineae indet		
	Gramineae indet (culm node)		
	Indet (seeds, fruits etc)	2	
	Indet. capsule		
	Indet. bud		
	Indet. bulb		
	Sample volume (litres)	30	15

Site 562K Unphased samples Sheet 1
Also samples from context with much residual/intrusive pottery

	Context no.	601	689	715/729	929	727	728	742	753	851	852	924
	Sample no.	48	65	68(5)	68(6)	69	70	75	76	93	99	129
Cereals	Cereal indet.	16	3	7	4	109	42	10	15	4		7
	~~Hordeum vulgare~~ L.											
	Hordeum sp.	61*	3	5		4	43	5	3	1	1	3
	Triticum aestivum s.l.	8	2			1	4	9	2			
	Avena sp.	6	1			2			2	2	1	
	Secale cereale L.	7					17					
	Cereal indet. (rachis)						1					
Pulse	Pisum-type				1	2	1	2		1	1	
Fruits	Ficus carica L.	1		1	1	5						
	Vitis vinifera L.	1										
	Sambucus nigra L.	+	+	+	+	+	+	+	+	+	+	+
	Rubus fruticosus agg											
	Rubus idaeus L.											
	Rubus sp.				1							
	Prunus sp.											
	Malus sylvestris Miller											
Wild	Chelidonium majus L.											
plants	Papaveraceae indet.											
	Brassica sp.									1		1
	Raphanus raphanistrum L.											
	Silene sp.				11							
	Agrostemma githago L.											
	Chenopodium album L											
	Chenopodiaceae indet.				2							
	Malva sp.				1							
	Ilex aquifolium L.											
	Vicia sp.	2										
	Conium maculatum L.	1			3							
	Aethusa cynapium L.			1								
	Umbelliferae indet						1					
	Euphorbia helioscopia L.				1							
	Polygonum aviculare agg											
	Rumex sp.											
	Polygonaceae indet											
	Menyanthes trifoliata L.											
	Lithospermum arvense L.											1
	Convolvulus arvensis L.											
	Hyoscyamus niger L.											
	Atropa bella-donna L.											
	Solanaceae indet											
	Veronica hederifolia L											
	Stachys sp.											
	Ballota nigra L.											
	Labiatae indet.				3							
	Galium aparine L											
	Chrysanthemum segetum L											
	Centaurea sp.											
	Compositae indet.											
	Eleocharis sp.				2							
	Carex sp,											
	Cyperaceae indet											
	Bromus mollis#secalinus											1
	Lolium temulentum-type											
	Gramineae indet				2	1	2					
	Gramineae indet (culm node)											
	Indet (seeds, fruits etc)			2	10			1				⁂
	Indet. capsule											1
	Indet. bud					⁂						
	Indet. bulb					1						
	Sample volume (litres)	15	15	15	15	15	15	15	15	15	15	15

	Context no.	929	891	272	884	1157	1097	1238	1460	1458	1457	1494
	Sample no.	133	137	164(2)	164(4)	173	181	191	202	204	205	227
Cereals	Cereal indet.	3					10				2	
	Hordeum vulgare L.											
	Hordeum sp.			3		2	4					
	Triticum aestivum s.l.											
	Avena sp.		1				6					
	Secale cereale L.			1			7					
	Cereal indet. (rachis)											
Pulse	Pisum-type											1
Fruits	Ficus carica L.	1				15						
	Vitis vinifera L.	3										
	Sambucus nigra L.	+	+	+	+	+	+		+	+	+	+
	Rubus fruticosus agg											
	Rubus idaeus L.											
	Rubus sp.			3								
	Prunus sp.											
	Malus sylvestris Miller					2						
Wild	Chelidonium majus L.											
plants	Papaveraceae indet.											
	Brassica sp.											
	Raphanus raphanistrum L.											
	Silene sp.											
	Agrostemma githago L.											
	Chenopodium album L											
	Chenopodiaceae indet.											
	Malva sp.											
	Ilex aquifolium L.											
	Vicia sp.						1					
	Conium maculatum L.	1										
	Aethusa cynapium L.											
	Umbelliferae indet											
	Euphorbia helioscopia L.											
	Polygonum aviculare agg											
	Rumex sp.											
	Polygonaceae indet											
	Menyanthes trifoliata L.											
	Lithospermum arvense L.			1			1					
	Convolvulus arvensis L.											
	Hyoscyamus niger L.											
	Atropa bella-donna L.											
	Solanaceae indet											
	Veronica hederifolia L											
	Stachys sp.	2										
	Ballota nigra L.											
	Labiatae indet.											
	Galium aparine L											
	Chrysanthemum segetum L											
	Centaurea sp.											
	Compositae indet.											
	Eleocharis sp.	1										
	Carex sp,	1										
	Cyperaceae indet										1	
	Bromus mollis#secalinus											
	Lolium temulentum-type			2								
	Gramineae indet								2			
	Gramineae indet (culm node)											
	Indet (seeds, fruits etc)	1						1				
	Indet. capsule											
	Indet. bud											
	Indet. bulb											
	Sample volume (litres)	15	15	15	15	15	15	1	0·1	1	1	0·1

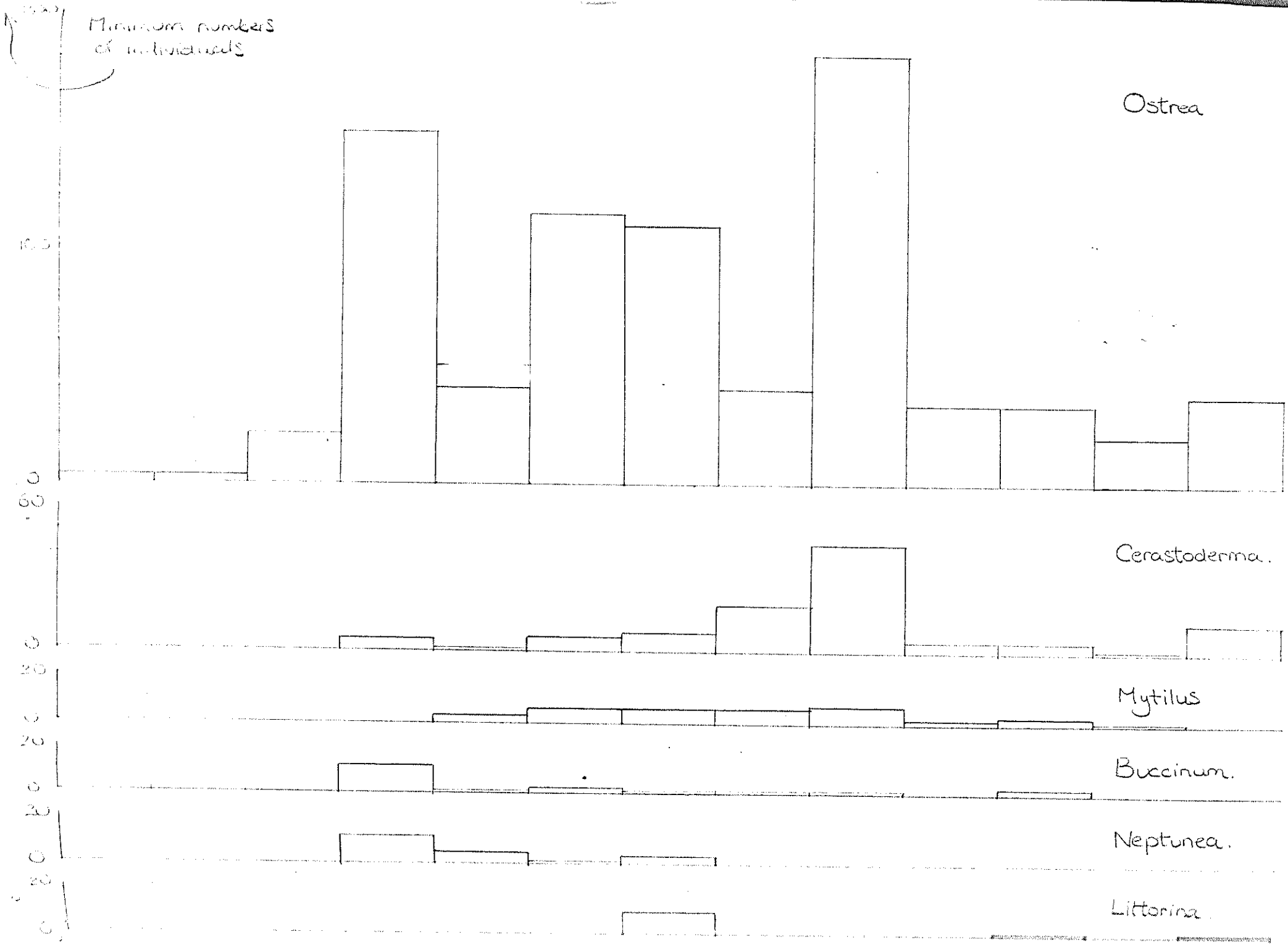
Site 302N Unphased samples. Sheet

	Context no.	1913	1999	2209	116
	Sample no.	259	270	292	1640
Cereals	Cereal indet.	2	9	4	
	Hordeum vulgare L.				
	Hordeum sp.		1	1	2
	Triticum aestivum s.l.		1		
	Avena sp.				
	Secale cereale L.				1
	Cereal indet. (rachis)				
Pulse	Pisum-type				1
Fruits	Ficus carica L.				
	Vitis vinifera L.				
	Sambucus nigra L.	+	+	+	+
	Rubus fruticosus agg				
	Rubus idaeus L.				
	Rubus sp.				
	Prunus sp.				
	Malus sylvestris Miller				
Wild	Chelidonium majus L.				
plants	Papaveraceae indet.				
	Brassica sp.				
	Raphanus raphanistrum L.				
	Silene sp.				
	Agrostemma githago L.				
	Chenopodium album L				
	Chenopodiaceae indet.				
	Malva sp.				
	Ilex aquifolium L.				
	Vicia sp.				
	Conium maculatum L.				
	Aethusa cynapium L.				
	Umbelliferae indet				
	Euphorbia helioscopia L.				
	Polygonum aviculare agg				
	Rumex sp.				
	Polygonaceae indet				
	Menyanthes trifoliata L.				
	Lithospermum arvense L.				
	Convolvulus arvensis L.				
	Hyoscyamus niger L.				
	Atropa bella-donna L.				
	Solanaceae indet				
	Veronica hederifolia L				
	Stachys sp.				
	Ballota nigra L.				
	Labiatae indet.				
	Galium aparine L				
	Chrysanthemum segetum L				
	Centaurea sp.				
	Compositae indet.				
	Eleocharis sp.				
	Carex sp,				
	Cyperaceae indet				
	Bromus mollis#secalinus				
	Lolium temulentum-type				
	Gramineae indet				
	Gramineae indet (culm node)				
	Indet (seeds, fruits etc)				
	Indet. capsule				
	Indet. bud				
	Indet. bulb				
	Sample volume (litres)	1	1	1	7

Site 302N: Marine molluscs.

Shells collected by hand during excavation are listed in Table (fiche) and the results are summarised in Fig . In all site periods the predominant species is the oyster (Ostrea edulis L). Valves of cockle (Cerastoderma edule (L)) and mussel (Mytilus edulis L) and shells of whelks (Buccinum undatum L and Neptunea antiqua (L)) and winkle (Littorina littorea (L)) occur at lower frequencies. Winkles are absent before period 7 (1500-1575). As with all hand-collected shell assemblages it is probable that the smaller shells and those more prone to fragmentation are under-represented. Shell assemblages with very similar species composition were collected at most Norwich Survey excavations. (cf. Pottergate, 149N; this volume).

Fig : Site 302N, Marine mollusca.


Minimum numbers of individuals
Ostrea
Cerastoderma.
Mytilus
Buccinum.
Neptunea.
Littorina
0
60
20
20
20
20

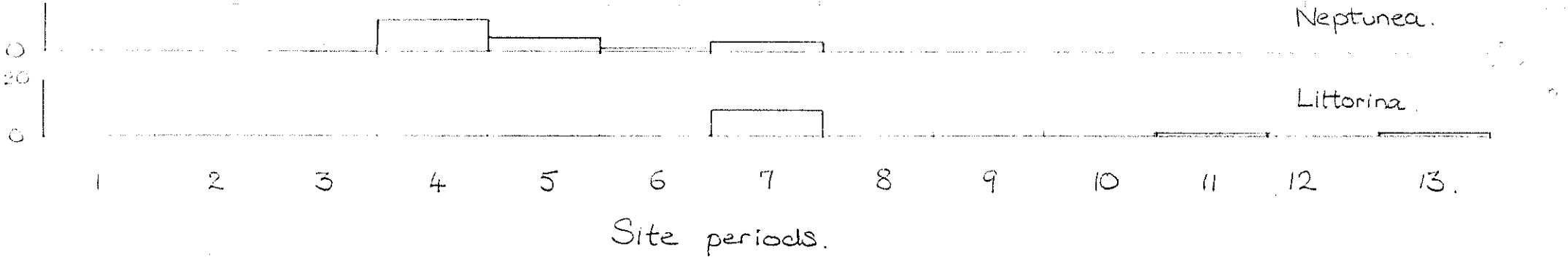

Neptunea.
Littorina.
1
2
3
4
5
6
7
8
9
10
11
12
13.
Site periods.

Table : Alms Lane (Site 302N): Marine molluscs.

	Ostrea	Cerastoderma	Mytilus	Buccinum	Neptunea	Littorina	Helix
Period 1							
865	1	-	-	-	-	-	-
880	5	-	-	-	-	-	-
Period 2							
1542	5	-	-	-	-	-	-
Period 3							
849	2	-	-	-	-	-	-
882	4	-	-	-	-	-	-
992	1	-	-	-	-	-	-
1039	4	-	-	-	-	-	-
1079	2	-	-	-	-	-	-
1086	1	-	-	-	-	-	-
1410	1	-	-	-	-	-	-
1434	2	-	-	-	-	-	-
1495	6	-	-	-	-	-	-
1496	2	-	-	-	-	-	-
1498	17	-	-	-	-	-	-
Period 4							
272	1	-	-	-	1	-	-
275	14	-	-	-	-	-	-
292	54	-	-	-	-	-	-
427	10	2	-	-	-	-	-
489	-	-	-	3	-	-	-
490	1	1	-	3	5	-	-
492	5	-	-	-	-	-	-
493	4	-	-	-	-	-	-
542	6	-	-	1	-	-	-
545	3	-	-	-	-	-	-
554	7	-	-	-	-	-	-
571	2	-	-	-	-	-	-
617	1	-	-	-	-	-	-
734	4	-	-	-	-	-	-
869	1	-	-	-	-	-	-
871	1	-	-	-	-	-	-
917	33	-	-	-	-	-	-
926	1	-	-	-	-	-	-
1005	3	2	-	-	-	-	-
1087	3	-	-	-	-	-	-
1088	2	-	-	-	-	-	-

	Ostrea	Cerastoderma	Mytilus	Buccinum	Neptunea	Littorina	Helix
Period 4 (contd)							
1089	5	-	-	-	-	-	-
1405	60	5	-	2	5	-	-
1406	1	-	-	-	-	-	-
1407	6	-	-	-	-	-	-
1439	4	-	-	-	-	-	-
1442	1	-	-	-	-	-	-
1477	5	-	-	-	-	-	-
1479	14	-	-	-	-	-	-
1481	7	-	-	1	-	-	-
1484	17	-	-	-	-	-	-
1485	8	-	-	-	-	-	-
1486	3	-	-	-	-	-	-
1487	3	-	-	-	-	-	-
1488	1	-	-	-	-	-	-
1490	1	-	-	-	-	-	-
1518	2	-	-	-	-	-	-
1519	2	-	-	-	-	-	-
1528	1	-	-	-	-	-	-
1761	-	-	-	1	-	-	-
1803	1	-	-	1	-	-	-
1886	-	-	-	-	1	-	-
Period 5							
208	3	-	(1)	-	-	-	-
271	1	-	-	-	-	-	-
355	1	-	-	-	-	-	-
424	3	-	(1)	-	-	-	-
428	7	-	-	-	1	-	-
443	4	-	-	-	1	-	-
478	30	-	4	-	-	-	-
656	3	-	-	-	-	-	-
665	1	-	-	-	-	-	-
670	1	-	-	-	-	-	-
679	2	-	-	-	-	-	-
694	-	-	-	-	2	-	-
738	3	-	-	-	-	-	-
742	2	-	-	-	-	-	-
760	1	-	-	-	-	-	-
971	2	-	-	-	-	-	-
1083	5	-	-	-	-	-	-
1291	-	-	-	-	1	-	-

	Ostrea	Cerastoderma	Mytilus	Buccinum	Neptunea	Littorina	Helix
Period 5 (contd)							
1293	2	-	-	-	-	-	-
1303	1	-	-	-	-	-	-
1416	4	-	-	-	-	-	-
1861	1	-	-	-	-	-	-
2117	1	-	-	-	-	-	-
1808	-	-	-	(1)	-	-	-
1765	4	1	-	-	-	-	-
1766	1	-	-	-	-	-	-
Period 6							
352	1	-	-	-	-	-	-
402	60	2	1	2	-	-	-
405	3	-	1	-	-	-	-
422	3	-	-	-	-	-	-
429	1	2	4	-	-	-	-
437	1	-	-	-	-	-	-
472	28	-	1	-	1	-	-
538	3	-	-	-	-	-	-
553	1	-	-	-	-	-	-
932	1	-	-	-	-	-	-
1237	16	-	2	-	-	-	-
1244	8	-	-	-	-	-	-
1246	7	-	-	-	-	-	-
1254	4	-	-	-	-	-	-
1256	27	-	-	-	-	-	-
1260	23	-	(1)	-	-	-	-
1267	13	-	(1)	-	-	-	-
1268	5	-	(1)	-	-	-	-
1270	1	-	-	-	-	-	-
1271	7	-	-	-	-	-	-
1274	1	-	-	-	-	-	-
1290	1	-	-	-	-	-	-
1781	5	7	-	-	-	-	-
1784	1	-	-	-	-	-	-
1788	3	1	-	-	-	-	-
1801	1	-	-	-	-	-	-
2130	4	-	-	-	-	-	-
Period 7							
309	4	-	-	-	-	-	1
338	28	-	1	-	-	3	-
339	-	-	-	-	-	5	-

	Ostrea	Cerastoderma	Mytilus	Buccinum	Neptunea	Littorina	Helix
Period 7 (contd)							
349	10	1	1	-	-	-	-
356	1	1	-	-	-	1	-
362	19	-	-	-	-	-	-
373	1	-	-	-	-	-	-
374	1	-	-	-	-	-	-
375	9	-	-	-	-	-	-
373	7	-	-	-	-	-	-
416	1	-	-	-	-	-	-
442	4	-	-	-	-	-	-
467	31	-	2	1	-	-	-
471	2	-	1	-	-	-	-
474	21	-	-	-	1	-	-
475	23	1	(1)	-	-	-	-
480	1	-	-	-	-	-	-
561	3	1	-	-	1	-	-
657	-	-	(1)	-	-	-	-
736	1	-	-	-	-	-	-
1216	8	-	(1)	-	-	-	-
1221	1	-	-	-	-	-	-
1226	4	1	-	-	-	-	-
1227	5	1	-	-	-	-	4
1236	4	-	-	-	-	-	2
1239	1	-	-	-	-	-	-
1241	6	1	-	-	-	-	-
1249	1	-	-	-	-	-	-
1250	1	5	-	-	-	-	-
1251	1	2	-	-	-	-	-
1253	1	-	-	-	-	-	-
1759	2	-	-	-	-	-	-
1772	1	-	-	-	-	-	-
1791	1	-	-	-	-	-	-
1792	5	-	-	-	-	-	-
1793	3	1	1	-	-	-	-
1820	2	-	-	-	-	-	-
1862	2	-	-	-	1	-	-
1870	3	1	1	-	-	-	-
195	-	-	1	-	-	-	-
Period 8							
322	39	1	1	-	-	-	-
329	5	(1)	1	-	-	-	-

	Ostrea	Cerastoderma	Mytilus	Buccinum	Neptunea	Littorina	Helix
Period 8 (contd)							
331	15	-	(1)	-	-	-	-
342	-	-	(1)	-	-	-	-
381	2	-	-	-	-	-	-
382	5	1	-	-	-	-	-
411	6	2	2	-	-	-	-
1225	5	-	5	1	-	-	-
1763	3	-	-	-	-	-	-
1769	2	1	1	-	-	-	-
1770	1	-	-	-	-	-	-
1771	-	32	-	-	-	-	-
Period 9							
89	24	1	-	-	-	-	-
93	10	1	1	-	-	-	-
116	3	-	-	-	-	-	-
118	4	-	-	1	-	-	-
137	6	5	4	-	-	-	-
191	3	-	-	-	-	-	-
202	3	-	-	-	-	-	-
217	3	-	-	-	-	-	-
221	1	-	-	-	-	-	-
228	-	1	-	-	-	-	-
267	7	-	-	-	-	-	-
279	4	-	1	-	-	-	-
284	7	-	-	-	-	-	-
288	4	1	-	-	-	-	-
296	116	1	(1)	-	-	-	-
343	-	1	1	-	-	-	-
344	24	74	-	-	-	-	2
363	5	-	-	-	-	-	-
609	5	-	-	-	-	-	-
610	2	-	-	-	-	-	-
686	-	-	1	-	-	-	-
688	3	-	-	-	-	-	-
761	1	-	1	-	-	-	-
828	2	-	1	-	-	-	-
829	3	-	2	-	-	-	-
835	1	-	-	-	-	-	-
856	1	-	-	-	-	-	-
857	3	2	-	-	-	-	-
863	1	-	-	-	-	-	-

	Ostrea	Cerastoderma	Mytilus	Buccinum	Neptunea	Littorina	Helix
Period 9 (contd)							
862	5	-	-	-	-	-	-
867	1	1	-	-	-	-	-
874	1	-	-	-	-	-	-
909	1	1	-	-	-	-	-
912	7	1	-	-	-	-	-
937	5	-	-	-	-	-	-
1041	2	-	-	-	-	-	-
1737	1	-	-	-	-	-	-
1835	17	2	-	-	-	-	-
Period 10							
32	36	-	1	-	-	-	-
110	1	-	-	-	-	-	-
112	3	-	-	-	-	-	-
147	10	-	-	-	-	-	-
692	2	-	-	-	-	-	-
1218	10	7	3	-	-	-	-
1714	8	-	-	-	-	-	-
Period 11							
34	1	1	-	-	-	-	1
134	1	-	1	-	-	-	-
138	1	-	-	-	-	-	-
140	1	-	-	-	-	1	-
185	1	2	1	-	-	-	-
214	3	-	1	-	-	-	-
222	1	-	-	-	-	-	-
306	-	1	-	-	-	-	-
345	1	-	1	-	-	-	-
351	34	1	1	2	-	-	-
353	1	-	-	-	-	-	-
372	5	-	-	-	-	-	-
671	1	-	-	-	-	-	-
682	1	1	-	-	-	-	-
1211	1	-	-	-	-	-	-
1809	1	-	-	-	-	-	-
1811	15	1	-	-	-	-	-
Period 12							
43	1	-	-	-	-	-	-
52	5	-	-	-	-	-	-
53	1	-	-	-	-	-	-
74	2	-	-	-	-	-	-

	Ostrea	Cerastoderma	Mytilus	Buccinum	Neptunea	Littorina	Helix
Unstratified etc. contd.							
648	2	-	-	-	-	-	-
651	2	-	-	-	-	-	-
674	3	-	-	-	-	-	-
675	6	-	-	-	-	-	-
677	13	-	1	-	-	-	-
678	5	-	-	-	-	-	-
693	1	-	-	-	-	-	-
723	4	-	-	-	-	-	-
725	7	-	-	-	-	-	-
733	3	1	-	1	-	-	-
754	21	1	3	-	-	-	-
763	1	-	-	-	-	-	-
764	1	-	-	-	-	-	-
881	1	-	1	-	-	-	-
978	10	-	-	-	-	-	-
1208	4	2	-	-	-	-	-
1257	1	-	-	-	-	-	-
1261	23	-	1	-	-	-	-
1263	9	-	1	-	-	-	-
1264	5	-	1	-	-	-	-
1265	5	-	1	-	-	-	-
1272	8	-	-	-	-	-	-
1408	1	-	-	-	-	-	-
1409	-	-	-	1	-	-	-
1429	1	-	-	-	-	-	-
1773	1	100	-	-	-	-	-
1807	-	1	-	-	-	-	-
1829	2	-	-	-	-	-	-

	Ostrea	Cerastoderma	Mytilus	Buccinum	Neptunea	Littorina	Helix
Period 12 (contd)							
106	1	-	-	-	-	-	-
209	4	-	-	-	-	-	-
254	4	-	-	-	-	-	-
145	17	-	1	-	-	-	-
357	-	-	-	-	-	-	-
613	2	-	-	-	-	-	-
1782	2	-	-	-	-	-	-
1785	1	1	-	-	-	-	-
95	1	-	-	-	-	-	-
Period 13							
7	-	1	-	-	-	-	-
33	-	1	-	-	-	-	-
46	1	-	-	-	-	-	-
47	6	4	-	-	-	-	-
48	2	4	-	-	-	-	-
35	1	-	-	-	-	-	-
65	1	-	-	-	-	-	-
66	4	1	-	-	-	-	-
67	4	-	-	-	-	1	-
71	2	-	-	-	-	-	-
73	5	-	-	-	-	-	-
96	1	1	-	-	-	-	-
105	1	-	-	-	-	-	-
320	3	11	-	-	-	-	-
361	29	-	-	-	-	-	-
365	12	-	-	-	-	-	-
1219	2	-	-	-	-	-	-
1708	1	-	-	-	-	-	-
Unstratified etc.							
149	1	-	-	-	-	-	-
153	1	-	-	-	-	-	-
165	1	-	-	-	-	1	-
224	5	-	-	-	-	-	-
244	2	-	-	-	-	-	-
318	3	8	-	-	-	-	-
440	1	-	-	-	-	-	-
495	3	-	-	-	-	-	-
614	1	-	-	-	-	-	-
615	1	-	-	-	-	-	-
619	10	-	-	-	-	-	-