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Biological remains from a medieval 'pond' at Higher Lane, Fazakerley, Merseyside (site code FAZ94)

by

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Summary

A sequence of humic silts from a feature interpreted archaeologically as probably having been dug as a pond have been examined bioarchaeologically. Dating of the sequence by radiocarbon assay suggests that the feature filled over the period between the end of the 12th century and the 18th century. Analysis of pollen, plant macrofossils and insect remains shows an initial phase of aquatic deposition with probable slumping from the pond sides, followed by a prolonged phase of stable aquatic conditions with a rich insect fauna, this in turn giving way to a phase of terrestrialisation, again with a substantial input of mineral sediment. Few plants and animals indicative of intensive occupation were recorded, apparently contradicting the excavation evidence for a structure within 30 m of the pond. This may have been a result of the presence of a boundary between the pond and the building, and perhaps also of prevailing wind direction at times when insects were migrating. The wider area around the site may have been largely arable land with mature hedges or patches of trees.

Keywords: HIGHER LANE, FAZAKERLEY; MERSEYSIDE; MEDIEVAL; POST-MEDIEVAL; POND FILL; SEDIMENTS; POLLEN; PLANT MACROFOSSILS; INVERTEBRATES; ENVIRONMENTAL HISTORY

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Background

Excavations in 1994-5 by the Lancaster University Archaeological Unit at a site in Higher Lane, Fazakerley, Merseyside revealed some evidence for medieval and post-medieval occupation (Wright and Fletcher 1995). A modest program of assessment of biological remains from selected contexts was undertaken by Dobney *et al.* (1995), who recommended that further analysis be carried out on the fills of a putative pond (M1162, referred to sometimes as M1262).

This feature, which was adjacent to a domestic enclosure in use through 500 years in the medieval and post-medieval periods, was about 20 x 11 m in size and sub-rectangular in shape (Wright and Fletcher 1995, 17). In that portion of its fills excavated by machine and by hand to natural, it was found to have a maximum depth of about 2 m. The lower half of the fills were observed in the field to have good preservation of plant remains (including wood) by anoxic 'waterlogging'.
Two series of samples were recovered from this feature: samples for pollen analysis were taken (by AH) in two columns, one near the centre, the other nearer the margin of the fills, from the open section. Samples for analysis of plant and insect macrofossils (originally designated GBA and BS, *sensu* Dobney *et al.* 1992) were collected by the excavators from the same section. The sequence available for this investigation was as follows (in stratigraphic order, uppermost first, with the subsample weights used):

Context	Sample	Wt (kg)
1035	3	2.0
1036	4	1.0
1037/1078	7*	2.0
1065	9	3.0
1073	11	3.0

(* note that the sample provided from context 1037 has latterly been reported by the excavator as having come from anywhere within contexts 1037 and 1078; unfortunately, 1037 lay above 1065 and 1078 beneath it. However, the results from this middle part of the sequence generally do not show great differences and the data for '1037' are therefore useful).

For the analyses reported here, financial constraints have dictated that a much more limited programme of work than that originally recommended by Dobney *et al.* (1995) was undertaken. However, it is felt that a useful picture of the environmental history of the pond and its infilling has been obtained.

Methods

Samples for pollen analysis were processed according to customary methods, using sequential treatments with dilute sodium hydroxide, dilute hydrochloric acid, hydrofluoric acid, and an acetolysis mixture (concentrated sulphuric acid and acetic anhydride) to remove unwanted mineral and organic matter. Treated samples were stained with 0.1% safranin, suspended in silicone oil (2000 cs) and examined under a transmission microscope at magnifications of x400 and x1000. Identifications were made by reference to keys and photographs published by Moore *et al.* (1993) and to reference slides in the Environmental Archaeology Unit. For this work, no attempt was made to count whole slides; sufficient evenly-spaced traverses were made to obtain a sum of land pollen and spores of at least 250.

Plant macrofossils and insect remains were examined by means of subsamples of raw sediment from the GBA and BS samples, disaggregated and sieved to 300 :m, following methods described by Kenward *et al.* (1980; 1986).

Plant remains were recorded semi-quantitatively on a four-point scale of abundance from 1 (one or a few remains only) to 4 (very abundant, or making up a large proportion of the sample).

Insect and other arthropod macrofossils were identified in industrial methylated spirits or

(mostly) on damp filter paper in dishes. The material was 'scan-recorded' (*sensu* Kenward 1992), although an effort was made to identify as many of the rarer species as possible within time constraints.

Results

Dating

Dating was undertaken by Beta Analytic Radiocarbon Dating Laboratory, Miami, Florida, USA, using accelerator mass spectrometry. Three samples of terrestrial plant remains (mainly seeds) were sorted from initial 1 kg subsamples from three levels (contexts 1073, 1065 and 1036), for these dates, which were as follows:

1036 cal. AD 1440-1665 (Beta-88454)

1065 cal AD 1180 to 1310 or 1365 to 1375 (Beta-88455)

1073 cal AD 1055 to 1090 or 1150 to 1295 (Beta-88456).

These dates are in chronological order, the lower two dates each having two possible ranges because there are two matches of the radiocarbon ages and calibrated dates along the calibration curve; statistically, the more likely date ranges are: for 1065—cal AD 1180-1310, and for 1073—cal AD 1150-1295. As a crude measure of the rate of silting, we might use the midpoints of the 2-sigma ranges of the calibrated radiocarbon dates in relation to the stratigraphic sequence and show that the sediment in the 50 cm or so between contexts 1073 and 1065 accumulated in only about 30 years, the 30 or so centimetres between 1065 and 1036 taking about 300 years. A slowing of the sedimentation rate might be expected as the pond infilled, though a difference of this magnitude is rather large and perhaps suggests that the wide ranges of the dates at 2-sigma significance should be taken into account.

Because the material for dating was taken *post hoc* from GBA/BS samples, it represents a longer vertical, and thus presumably temporal, sequence of sediment, at least in the case of Contexts 1036 and 1073, than would normally have been desirable.

Sediments

Sediment descriptions were made during inspection of the GBA/BS samples in the laboratory, prior to processing of subsamples. The degree of humification of sediments was noted subjectively during pollen analysis.

Context 1073: Mid-dark grey cheesy-brittle (working crumbly, then plastic) humic, slightly sandy silt with coarse herbaceous detritus, including some straw-like fragments. (A separate sample of this context examined during the assessment phase contained twig and wood fragments and lumps of pinkish-brown, stiff, slightly stony natural clay.) Degree of humification variable: high at -99 cm and low at -90 cm and -85 cm.

Context 1065: Mid grey-brown (with paler mottling), cheesy-brittle silty clay, working very plastic and slightly sticky. Very humic.

Context 1037/1078: Dark brown layered silty clay with leaf and twig fragments. Very humic.

Context 1036: Dark brown, layered, fibrous, silty herbaceous detritus. Very humic.

Context 1035: Mid brown, slightly sandy silty clay with traces of decayed organic material; local reddening was perhaps a result of the presence of lumps of till or other mineral sediment.

Pollen

The results of the pollen analyses are given in Table 4 and Figure 1, the latter showing histograms for selected taxa, as well as a composite histogram for woody and non-woody land taxa. Depths marked with an asterisk (*) indicate samples examined during the assessment.

It is very evident from these data that tree/shrub pollen formed a large proportion of the pollen input to these deposits at all phases represented by the analysed samples. Even at -30 cm, there was still a little more than 50% tree pollen. At most levels, the largest component within the tree/shrub pollen category was *Corylus/Myrica* (hazel/bog

myrtle), the former likely to be from woodland, scrub or hedges, the latter a species of peat bogs and certain fens; in this location, it possible that either or both taxa were present.

The other important trees were *Betula* (birch), *Quercus* (oak) and *Alnus* (alder), with a consistent level of *Ilex* (holly) in the lower two-thirds of the sequence. *Salix* (willow) and *Fraxinus* (ash) became important in the uppermost third of the sequence (and to a lesser extent the third sample from the top). The large fluctuations in willow may perhaps be seen as a result of the effects of input from extremely local vegetation (there is macrofossil evidence for willow at this stage, see below). Note, however, that the analysed pollen samples towards the top of the sequence are widely spaced. The very low levels of *Pinus* (pine) may represent far-travelled grains, though these, and some of the specimens of *Ulmus* (elm) and *Tilia* (lime), were rather corroded and may have originated in soil washed into the pond.

The depression of tree pollen in the upper levels is balanced by an increase in non-arboreal taxa, particularly Gramineae (grasses). The very large increase in NAP at -30 cm (Context 1037) is largely a result of the presence at nearly 15% of ?Cannabiaceae (if this is the pollen type present, this could be *Cannabis* (hemp) or *Humulus (*hop); the pollen of these taxa is very difficult to distinguish) and more than 6% of *Urtica* (nettles).

The presence of modest amounts of pollen of Ericales (Ericales type and *Calluna* (heather)) and spores of *Pteridium* (bracken), through most of the sequence, as well as the rare spores of *Sphagnum*, perhaps suggests that heathland or raised bog vegetation lay within the pollen recruitment catchment of the pond. However, some small fragments of sandy humic sediment, perhaps peat or mor humus, were isolated from the macrofossil samples from the upper- and lowermost samples examined. These may represent inwashed soil, and thus have a circumjacent origin, or have been reworked from imported peat/turves. The test subsample from Context 1073 gave a single rather poorly preserved weevil elytron which *may* have been of *Micrelus ericae*, associated with heaths and heather, but the identification is very uncertain.

The other very noticeable feature of the pollen diagram is the restriction of pollen of aquatics to the uppermost four samples. This is consistent with the increase in non-arboreal land pollen taxa and perhaps suggests a phase in which the removal of shade cast by trees near the pond permitted the growth of aquatic taxa, too. It should be remembered, of course, that some of the NAP pollen identified only to family, including Gramineae and Cyperaceae, may well have originated in aquatic or waterside taxa.

Plant and invertebrate macrofossils

The results of analyses of plant and invertebrate macrofossils are given in Tables 1 (complete list of taxa recorded), 2 (lists of plant remains and some other components of the subsamples), 3 (some basic statistics for the plant macrofossil assemblages), 5 (lists of adult beetles and bugs in rank order) and 6 (statistics concerning the beetle and bug assemblages).
The macrofossil assemblages are discussed in stratigraphic order, from the base of the sequence upwards.

Context 1073, Sample 11

The most striking feature of the plant macrofossil assemblage from this, the lowermost sample examined, is the predominance of taxa of weed communities (groups CHEN, SECA and BIDE, cf. Table 3) and the presence of moderate numbers of whole and fragmentary achenes (‘seeds’) of hemp, *Cannabis sativa.* Most frequent amongst the weeds are *Atriplex*, *Chenopodium album*, *Chrysanthemum segetum* and *Stellaria media*, with several other plants of cultivated and waste land also contributing small numbers of remains. In view of the large numbers of *Cenococcum* sclerotia present (these are resting bodies of a soil-dwelling fungus), as well as abundant earthworm egg capsules, and bearing in mind the nature of the lithology, it seems most likely that the whole suite of remains entered with soil from waste ground or arable land. (It may be significant here that the pollen sample from the

lowermost part of 1073, at -99 cm, was rich in fungal hyphae.)

The insect remains strongly support the evidence from plant macrofossils, with an appreciable component indicating disturbed ground and weedy or other herbaceous vegetation. There are also indications from species belonging to decomposer communities of dung and plant litter in modest quantities.

The hemp remains may have been from a crop on the land adjacent to the pond or have grown as a ruderal with the other weeds. Another possibility is that the hempseed originated in plants which had been 'retted' in the pond. Retting involves the steeping of bundles of mature plants in a body of water for days or weeks till the soft outer tissues have decayed, permitting the bast fibres in the cortex to be extracted for use in rope-making or cloth manufacture. It is not perhaps too far-fetched to suggest that the soil and weed seeds in the deposit were thrown into the pond along with the hemp plants, since it is normal practice for hemp plants to be pulled rather than cut.

The remainder of the assemblage from 1073 consists of plants which might have been growing in the vicinity (the oak and alder bud-scales tally with the presence of these taxa in the pollen record, though their numbers are hardly commensurate with the very high tree pollen values observed). The presence of a small number of insects associated with dead wood suggests that this habitat was available close to the pond.

The records from this subsample of some small (<10 mm) fragments of sandy humic sediment which might have been peat are of interest. If these were, indeed, peat, they might account for the records of ericaceous pollen seen in the pollen sequence, and perhaps also for the record of heath rush, *Juncus squarrosus*, amongst the plant macrofossils. One possibility is that turves from heathland were used as a manure on nearby fields, and that soil from these fields subsequently found its way into the pond. It is notable that aquatic plant taxa were absent, although modest numbers of aquatic beetles were recorded (far fewer than in the higher parts of the sequence, however, cf. Table 6); it is possible that the former had not had time to colonise the newly-dug pond by this stage, whereas aquatic beetles may colonise in a day or two.

The macrofossil fauna and flora of Sample 11 indicate considerable human influence on the surroundings. This sample gave a far higher proportion of insects able to exploit artificial habitats (synanthropes) than the rest of the sequence (Table 6), but the proportion was still small relative to deposits from occupation sites, and the synanthropic insects noted might all have lived in natural conditions. There is nothing from the insect fauna to suggest the presence of buildings or other extremely modified habitats close to the deposit (i.e. within tens of metres).

Context 1065, Sample 9

The subsample from Context 1065, a thin band of very organic material, gave very much the largest plant assemblage of the five examined (46 taxa), as well as substantial numbers of invertebrates. Again, weeds were the most abundant plant groups represented, though the numbers of remains were mostly smaller (scores of '2' rather than '3'). Most of the same taxa as those recorded from 1073 were present here. There was, however, a small but noticeable component of aquatic and waterside taxa, mostly present in very small numbers: *Alisma*, *Lemna*, and *Potamogeton.*

That deposition took place under water is indisputable on the basis of the invertebrate remains. A fifth of the taxa and well over a quarter of the individuals of adult beetles and bugs were aquatics (Table 6). The *Daphnia* ephippia and caddis larva cases recorded also point to an aquatic community having developed at this stage, perhaps because the water was less fouled by sediment (or decayed products generated by retting hemp, if such occurred, cf. Sample 11). The most likely habitat for the aquatic insects would be still water, eutrophic (nutrient-rich), but not heavily polluted, and with an appreciable submerged vegetation.

Remains of *Cannabis* were present again, but in small numbers; the only other 'useful' plant recorded was flax, *Linum usitatissimum*, of which a single capsule fragment was observed. This is scarcely sufficient evidence to suggest

that flax, too, was being grown and processed in the area. Certainly it appears that soil was still being washed or (less probably) thrown into the pond at this time, for *Cenococcum* sclerotia and earthworm egg capsules were well-represented and there was a large component of sand in the sample.

The small component of remains from woody plants must represent debris falling from the trees whose pollen was becoming less important in the spectrum for this horizon (level -39 cm in Figure 1). Terrestrial insects included decomposers able to exploit dung and natural/semi-natural plant litter. A variety of plant-feeders suggested a developing vegetation rather than a flora of newly-exposed soils.

Context 1037/1078, Sample 7

By contrast with those from the lower levels, the plant macrofossil assemblage from Sample 7 was dominated by aquatic and woodland plants (groups POTA, ISNA, PHRA and WOOD, Table 3), although rather a small range of taxa, mostly in small numbers, was recorded, perhaps diluted by an abundance of twig and leaf fragments. Thus, 'seeds' of pondweeds *(Potamogeton* spp.), water crowfoot *(Ranunculus* Subgenus *Batrachium*), and water-plantain (*Alisma*) were all present in moderate numbers, but the bulk of the organic component consisted of twig fragments of willow (*Salix*) and it is probably willow whose leaves were recorded as fragments in quantity from this sample. Weeds were almost absent from the assemblage.

The invertebrate fauna was dominated by aquatics, which contributed almost half of the individuals (Table 6); the three most abundant taxa were aquatic species (two *Helophorus*, one of them represented by at least 25 individuals, and *?Anacaena* sp.). The absolute numbers of terrestrial insects were not large, but the range of habitats represented was essentially as for Context 1065.

Context 1036, Sample 4

In the assemblage from 1036, wetland taxa again predominated, with *Alisma*, *Eleocharis palustris*, *Glyceria*, *Potentilla palustris*, *Ranunculus* Subgenus *Batrachium*, *Solanum dulcamara* and *Sparganium* all recorded in large numbers, at an abundance of '3', and *Lythrum portula* at '2'. As the AIVs in Table 3 show, reedswamp/marsh taxa (PHRA) were here more important that plants of open water (POTA), in contrast to the evidence from Sample 7. However, weeds of cultivated land and other disturbed places were present in significant numbers (including the arable weeds *Chrysanthemum segetum* and *Spergula arvensis* at '3' and *Galeopsis* Subgenus *Galeopsis*, *Sonchus asper*, and *S. arvensis* at '2'). In contrast to the lower samples, though, plants of trampled places (PLAN) were not present. As in the lowermost samples, *Cannabis* was again present, but only as two half-achenes.

The enrichment of the flora was mirrored by the large and diverse insect assemblage (140 taxa and 341 individuals from only a 1 kg subsample, six times as high a concentration as any other sample in this series, Table 6). There was a large and diverse aquatic community indicating still water, remaining nutrient-rich but by no means polluted, with an abundant aquatic flora—a well-established pond biota. Waterside insects were also well represented, and two of the most abundant species (Aleocharinae spp. B and C, not assigned ecological codes, Table 5) may have belonged in this component, as may a number of the rarer uncoded taxa. Plant-feeders were represented by a large number of species and contributed about a fifth of the fauna. They indicated herbaceous vegetation, although some of the species might also have lived on trees or shrubs. Dung-feeders were present in small but appreciable numbers, but offered no evidence of the presence of grazing land in the immediate vicinity.

All of the large number of beetles and bugs and most of the plants recorded as macrofossils could have found habitats within the pond or on its banks.

Context 1035, Sample 3

The uppermost sample examined, from Context 1035, gave moderate numbers of remains of a variety of wetland and terrestrial taxa, the most abundant being *Alisma*, *Lythrum portula*, and *Ranunculus* Subgenus *Batrachium*, together with several rush (*Juncus*) species, suggesting the presence of both areas of open water and extensive muddy pond margins, or even wet trackways or paths. A few weed taxa were present, but only henbane (*Hyoscyamus niger*) was recorded in more than very small amounts. Intriguingly, some small (<10 mm) ?peat fragments were recorded from this level, along with a single small (10 mm) charred peat fragment, perhaps debris from the occupation site nearby.

Reflecting the marked change in lithology (including organic content), there is a striking drop in the concentration of insect remains between the material from Context 1036 and the present layer (more than seven-fold, Table 6). While this probably represents a movement towards terrestrialisation as the pond filled up, a number of aquatic insects were noted, albeit in small numbers from 1035. On balance, the evidence is interpreted as indicating a gradual ecological change rather than a sudden episode of infilling such as dumping. Human activity—perhaps cultivation of land at the pond edges—seems the most likely trigger for the increased rate of deposition of mineral sediment into the basin, however,

Discussion

The evidence from the biota recorded from these deposits strongly supports the impression gained in the field of deposition in a body of standing water, largely under natural conditions. Apart from the records of hemp and flax and the weeds and insects associated with cultivated and other disturbed soils, there is almost no evidence for human activity; in particular, no strongly human-associated insects were noted. This fits well with the paucity of artefactual evidence obtained during excavation of M1162 (Wright and Fletcher 1995), as does the extreme sparseness of charcoal—there were merely traces in Samples 3, 9, and 11 (and traces were noted from the pollen samples from lowermost part of Context 1073).

The rarity of artefacts, lack of strongly synanthropic insects and of a plant assemblage typical of an occupation site, and rarity of charcoal are somewhat surprising given the proximity of the pond to contemporaneous structures—a feature interpreted as a byre was only 23 m to the east of the pond (Wright and Fletcher *op. cit.*). The explanation for this apparent anomaly may lie in the presence of a feature interpreted as a ditch and bank between the pond and the nearby toft. If the two lay in separate properties, dumping of rubbish may have been inhibited. If the ditch was accompanied by a hedge, this would have decreased the flow of material from the occupation area to the pond even further. Another consideration concerns the likely wind direction at times when insects are migrating in large numbers; gentle breezes on warm days, and particularly on humid evenings, are likely to be from the south-west, carrying insects migrating from habitats in the settlement away from rather than towards the pond. A hedge close to the pond would, of course, provide a protected place for tree and shrub growth and account for the remains of leaves and other debris recorded. One further explanation for the rarity of synanthropic insects may be that few such species had been able to invade this small and rather isolated farmstead.

The earliest recognisable context (1073) appears to represent an initial phase during which fairly gradual deposition of silt and mud (in the sense of fine organic detritus) was accompanied by slumping from the steeply-sloping sides of the basin.

Following this, there was a prolonged episode of fairly stable conditions, during which aquatic vegetation became established and a rich insect fauna developed. There was certainly no evidence from the lithostratigraphy for episodes of increased disturbance in the immediate surroundings, and infill seems to have been gentle and gradual (this conclusion is supported by the long timescale indicated by the two upper radiocarbon dates). The fauna gives no evidence for pollution resulting from, for example, animal dung (had the pond served for the watering of cattle) or the processing of fibre through retting. The palynological evidence for Cannabiaceae pollen in the uppermost samples might, if it represents

Cannabis rather than *Humulus*, be taken to indicate the cultivation of hemp locally, although the nature of the sampling for macrofossils may mean that short-lived episodes of dystrophy resulting from retting of hemp were overlooked. No evidence for dumping of any materials into this feature was observed.

The uppermost context examined indicates movement towards terrestrialisation, with a greatly increased mineral content indicating either reduced input of organic matter or destabilisation of the surrounding land surfaces leading to increased run-off.

It is clear that most of the evidence recovered from these deposits relates to the pond and its immediate surroundings (perhaps up to a few tens of metres). There was herbaceous vegetation including, at various times, wetland taxa and weeds of disturbed ground (including tilled or otherwise broken soils—perhaps just the destablised steeply-sloping banks surrounding the pond). There must also have been trees close to the basin for at least part of the time recorded by the sediments examined. Leaf fragments were present in quantity in Contexts 1065 and 1037/1078, although it is interesting that rather few fruits and seeds or buds/bud-scales of the woody plants were observed (except for remains of willows in 1037/1078) and there were no insects which *certainly* originated from living trees (some scale insects from Context 1037/1078 may have had such an origin, but could not be identified within project constraints). Perhaps willows grew around the pond but were not colonised by a rich insect fauna because of their isolation. Willows are insect-pollinated, so the large peaks of *Salix* pollen observed in the upper layers examined (Figure 1) strongly support the presence of trees extremely close to the site of deposition.

Bearing these arguments in mind, the abundance of tree pollen in the lower contexts is very striking. In isolation from the other biological evidence it might be taken to indicate that trees predominated (in terms of pollen production, perhaps) in the surroundings of the pond, or at least in the direction from which the prevailing wind blew. One possibility is that the landscape consisted of a mixture of cultivated ground, producing little pollen, and established hedgerows with mature trees, or maybe copses of woodland.

A note on the archaeobotanical record of *Lythrum portula*

Seeds of the marsh plant, water purslane (*Lythrum portula* (L.) D.A. Webb) were recorded from the uppermost two contexts examined; they were abundant in Sample 3 (Context 1035) and moderately common in Sample 4 (Context 1036). The seeds are highly distinctive, being no more than about 0.6 mm long and 0.5 wide, with a roughly triangular outline and triangular section, more or less pointed at the proximal (hilar) end and rounded at the distal. One face is more or less flat, the other two being rounded in a kind of hump A black spot is easily seen within the fossil seeds at the distal end. The testa surface has a fairly coarse reticulum, best seen in drying specimens. Seeds of *L. portula* differ from the somewhat similar *L. hyssopifolia* in being smaller (about half the size of *L. hyssopifolia)* and in having a coarser reticulum.

L. portula has been widely recorded within the British Isles (Perring and Walters 1962; Stace 1991), although it could not be described as common; there are several records of it, mostly pre-1900, for S. Lancashire (Savidge *et al.* 1963). For a plant with such a widespread distribution, it is remarkable that it does not appear to have been recorded previously as a subfossil in the British Isles. There are no records for it in Godwin's (1975) compilation, nor in the more up-to-date database of Tomlinson (1993), though the latter does not include many reports published after 1991.

It seems unlikely that seeds of *L. portula* would be overlooked by archaeobotanists; they have a similar size to rushes (*Juncus* spp.) which are regularly recorded from 'waterlogged' archaeological deposits; moreover, the fact that this plant grows in wet places, particularly on muddy tracks, might increase the likelihood of its being incorporated into the fossil record of these kinds of deposits.

Recommendations for future research

Although the analyses described here have been successful in reconstructing the environmental history of feature M1162 and to some extent its surroundings, project constraints have limited the scope for detailed investigation of some aspects of the biological remains. Conditions during excavation effectively precluded sampling for macrofossils by means of a continuous column at 5 or 10 cm intervals, which in view of the results of the analyses would have been desirable (not all of the samples would have been examined in detail, but the ability to work on material from precisely-known locations chosen to address particular problems would have been preferable).

In the laboratory, not all of the samples that *were* taken could be examined; in particular, the upper part of the sequence of pollen samples was not analysed (there were samples from the 14 cm of sediment above the highest sample shown in Figure 1, as far as the top of Context 1035). Recording of the rich insect assemblages had to be carried out rapidly and not all of the more critical identifications could be pursued. While these identifications would not significantly amplify the archaeological interpretation, they would be of value in providing records in time and space and in describing more precisely the insect communities represented. Perhaps the most interesting remains in this respect are some of the water beetles and plant-feeders, and fossils of what may be the beetle *Oxylaemus variolosus* from Sample 11. This rare beetle is associated with dead wood and there are no modern British records for it further north than Worcestershire (Hyman 1992).

There is also a need to examine further material from the basal sample (11, Context 1073) to pursue the possible presence of vegetative plant remains of hemp or other crop plants and to carry out pollen analyses on the lumps of peaty sediment recovered from Contexts 1073 and 1035.

The diverse and informative flora and fauna of this pond serve to emphasise the value of excavating and sampling features of this kind in terms of landscape reconstruction and accumulation of records of plants and animals in time and space.

Archive

All data, fossils, and paper and electronic archives relating to the work described here are currently stored at the Environmental Archaeology Unit, University of York.

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Table 1. Complete list of plant and invertebrate remains and other components recorded from GBA subsamples. Taxonomic order and nomenclature follow Tutin et al. *(1964-80) for vascular plants and Smith (1978) for mosses. Insect nomenclature and order follow Kloet and Hincks (1964-77). Vernacular names for vascular plants are given in parenthesis and parts recorded from these samples in brackets. In the list of invertebrates, * indicates taxa not used in the calculation of statistics in Table 6. Ecological codes for the invertebrates follow those used by Hall and Kenward (1990, 377-8), with the addition of: sf—facultative synanthrope and st—typical synanthrope.*

Mosses

Polytrichum juniperinum Hedw. [shoot fragment(s)]
cf. *Barbula* sp(p). [shoot fragment(s)]
Campylium elodes (Lindb.) Kindb. [shoot fragment(s)]
cf. *Drepanocladus* sp(p). [shoot fragment(s)]
Eurhynchium sp(p). [shoot fragment(s)]

Vascular plants

Salix sp(p). (willows) [bud(s), fruit(s), leaf fragment(s), twig fragment(s)]
Alnus sp(p). (alder) [bud(s) and/or bud-scale(s), male catkin fragment(s)]
Quercus sp(p). (oak) [bud(s) and/or bud-scale(s)]
Cannabis sativa L. (hemp) [achene(s) and fragments]
Urtica urens L. (annual nettle) (achene(s)]
Polygonum aviculare agg. (knotgrass) [nutlet(s)]
P. hydropiper L. (water-pepper) [nutlet(s)]
P. persicaria L. (persicaria/red shank) [nutlet(s)]
P. lapathifolium L. (pale persicaria) [nutlet(s)]
Bilderdykia convolvulus (L.) Dumort. (black bindweed) [nutlet(s), fragments, and perianth fragments]
Rumex sp(p). (docks) [nutlet(s)]
R. acetosella agg. (sheep's sorrel) [nutlet(s)]
Chenopodium album L. (fat hen) [seed(s)]
Atriplex sp(p). (oraches) [seed(s)]
Stellaria media (L.) Vill. (chickweed) [seed(s)]
S. cf. *neglecta* Weihe in Bluff & Fingerh. (?greater chickweed) [seed(s)]
Cerastium sp(p). (mouse-ear chickweeds) [seed(s)]
Spergula arvensis L. (corn spurrey) [seed(s)]
Ranunculus Section *Ranunculus* (meadow/creeping/bulbous buttercup) [achene(s)]
R. flammula L. (lesser spearwort) [achene(s)]
R. Subgenus *Batrachium* (water crowfoots) [achene(s)]
Capsella bursa-pastoris (L.) Medicus (shepherd's purse) [seed(s)]
Brassica rapa L. (turnip) [seed(s)]
Rubus sp(p). (blackberries, etc.) [seed(s), prickle(s)]
R. idaeus L. (raspberry) [seed(s)]
R. fruticosus agg. (blackberry/bramble) [seed(s)]
Potentilla sp(p). (cinquefoils, etc.) [achene(s)]
P. palustris (L.) Scop. (marsh cinquefoil) [achene(s)]
P. cf. *reptans* L. (?creeping cinquefoil) [achene(s)]
cf. *Crataegus* sp(p). (?hawthorns) [immature fruit(s)]
Crataegus monogyna Jacq. (hawthorn) [pyrene(s)]
Crataegus sp./*Prunus spinosa* (hawthorn/sloe) [thorn(s)]
Linum usitatissimum L. (cultivated flax) [capsule fragment(s)]
Viola sp(p). (violets/pansies, etc.) [seed(s)]
Lythrum portula (L.) D.A. Webb (water purslane) [seed(s)]
Epilobium sp(p). (willow-herbs, etc.) [seed(s)]
cf. *Apium* sp(p). [mericarp(s)]
Menyanthes trifoliata L. (bogbean) [seed(s)]

Myosotis sp(p). (forget-me-nots) [nutlet(s)]
cf. *Callitriche* sp(p). (?water-starworts) [seed(s)]
Galeopsis Subgenus *Galeopsis* (hemp-nettles) [nutlet(s)]
Mentha sp(p). (mints) [nutlet(s)]
Hyoscyamus niger L. (henbane) [seed(s)
Solanum dulcamara L. (woody nightshade) [seed(s)]
Veronica beccabunga-type (brooklime/water/marsh speedwells) [seed(s)]
Plantago major L. (greater plantain) [seed(s)]
Bidens sp(p). (bur-marigolds) [achene(s)]
Matricaria maritima/*perforata* (sea/scentless mayweed) [achene(s)]
Chrysanthemum segetum L. (corn marigold) [achene(s)]
Carduus/*Cirsium* sp(p). (thistles) [achene(s)]
Leontodon sp(p). (hawkbits) [achene(s)]
Sonchus asper (L.) Hill (prickly sow-thistle) [achene(s)]
S. oleraceus L. (sow-thistle) [achene(s)]
S. arvensis L. (corn sow-thistle) [achene(s)]
Lapsana communis L. (nipplewort) [achene(s)]
Alisma sp(p). (water-plantains) [carpel(s)]
Potamogeton sp(p). (pondweeds) [pyrene(s)]
Juncus inflexus/*effusus*/*conglomeratus* (hard/soft/compact rush) [seed(s)]
J. squarrosus L. (heath rush) [seed(s)]
J. bufonius L. (toad rush) [seed(s)]
J. cf. *acutiflorus* Ehrh. ex Hoffm. (?sharp-flowered rush) [seed(s)]
J. cf. *articulatus* L. (?jointed rush) [seed(s)]
Gramineae (grasses) [caryopsis/es]
Glyceria sp(p). (sweet-grasses) [caryopsis/es]
Lemna sp(p). (duckweeds) [seed(s)]
Sparganium sp(p). (bur-reeds) [fruit(s)]
Scirpus setaceus L. (bristle club-rush) [nutlet(s)]
Eleocharis palustris sl (common spike-rush) [nutlet(s)]
Carex sp(p). (sedges) [nutlet(s)]

Nematoda
**?Heterodera* sp. (cyst) u

Annelida
*Oligochaeta sp. (egg capsule) u

Crustacea
**Daphnia* sp. (ephippium) w
*Ostracoda sp. w

Insecta

DERMAPTERA
*Dermaptera sp. u

HEMIPTERA
Aneurus sp. l
Pentatomoidea sp. oa-p
Coreus marginatus (Linnaeus) oa-p
Lygaeidae sp. oa-p
Anthocoris ?limbatus Fieber oa-p
Anthocoris sp. oa-p
Orius sp. oa-p
Cimicidae spp. oa-p
Saldula sp. oa-d
Gerris sp. oa-w
Corixa sp. oa-w
Corixidae sp. oa-w
Conomelus anceps (Germar) oa-p
Auchenorhyncha spp. oa-p
Psylloidea sp. oa-p
*Aphidoidea sp. u
*Coccoidea sp. u

DIPTERA
*Diptera sp. (adult) u
*Diptera sp. (larva) u
*Diptera sp. (pupa) u
*Diptera sp. (puparium) u

SIPHONAPTERA

*Siphonaptera sp. u

HYMENOPTERA
*Formicidae sp. u
**Apis mellifera* Linnaeus u
*Hymenoptera Aculeata sp. u

TRICHOPTERA
*Trichoptera sp. (larval case) w

COLEOPTERA
Nebria brevicollis (Fabricius) oa
Notiophilus aquaticus (Linnaeus) oa
Loricera pilicornis (Fabricius) oa
Clivina fossor (Linnaeus) oa
Trechus obtusus or *quadristriatus* oa
Trechus micros (Herbst) u
Bembidion lampros (Herbst) oa
Bembidion ?guttula (Fabricius) oa
Bembidion (*Philochthus*) sp. indet. oa
Pterostichus melanarius (Illiger) ob
Pterostichus nigrita (Paykull) oa-d
Pterostichus oblongopunctatus (Fabricius) oa
Pterostichus (*Poecilus*) sp. oa
?Pterostichus sp. indet. ob
Agonum ?moestum (Duftschmid) oa-d
Agonum sp. indet. oa
Amara aulica (Panzer) oa
Amara spp. oa
Harpalus rufipes (Degeer) oa
Harpalus sp. oa
?Bradycellus sp. oa
Dromius linearis (Olivier) oa
Dromius melanocephalus Dejean oa
Carabidae spp. ob
Haliplidae sp. oa-w
Hydroporinae spp. oa-w
Agabus bipustulatus (Linnaeus) oa-w
Agabus sp. oa-w
Ilybius fuliginosus (Fabricius) oa-w
Ilybius sp. oa-w
Agabus or *Ilybius* sp. indet. oa-w
Colymbetes fuscus (Linnaeus) oa-w
Acilius ?sulcatus (Linnaeus) oa-w
Dytiscus sp. oa-w
Helophorus ?aquaticus (Linnaeus) oa-w
Helophorus grandis Illiger oa-w
Helophorus spp. oa-w
Coelostoma orbiculare (Fabricius) oa-w
Sphaeridium ?bipustulatum Fabricius rf
Cercyon analis (Paykull) rt-sf
Cercyon lateralis (Marsham) rf
Cercyon ?pygmaeus (Illiger) rf-st
Cercyon sternalis Sharp oa-d
Cercyon ?terminatus (Marsham) rf-st
Cercyon tristis (Illiger) oa-d
Cercyon ustulatus (Preyssler) oa-d
Cercyon sp. u
Megasternum obscurum (Marsham) rt
Cryptopleurum minutum (Fabricius) rf-st
Hydrobius fuscipes (Linnaeus) oa-w
Anacaena sp. oa-w
Laccobius biguttatus Gerhardt oa-w
Helochares sp. oa-w
Enochrus spp. oa-w
Cymbiodyta marginella (Fabricius) oa-w
Berosus ?affinis Brulle oa-w
Hydrophilinae spp. indet. oa-w
Ochthebius minimus (Fabricius) oa-w
Ochthebius sp. oa-w
Hydraena testacea Curtis oa-w
Hydraena spp. oa-w
Limnebius truncatellus (Thunberg) oa-w
Limnebius sp. oa-w
Ptenidium sp. rt
Acrotrichis sp. rt
Ptiliidae sp. u
?Catops sp. u
Catopinae sp. u
Aclypea opaca (Linnaeus) ob-rt
Acidota crenata (Fabricius) oa
Lesteva longoelytrata (Goeze) oa-d
Lesteva sp. oa-d
Acrolocha sulcata (Stephens) rt
Omalium caesum or *italicum* rt-sf
Omalium ?rivulare (Paykull) rt-sf
Omaliinae sp. rt
Coprophilus striatulus (Fabricius) rt-st
Carpelimus pusillus group u
Carpelimus sp. u
Aploderus caelatus (Gravenhorst) rt
Platystethus arenarius (Fourcroy) rf
Anotylus complanatus (Erichson) rt-sf
Anotylus nitidulus (Gravenhorst) rt-d
Anotylus rugosus (Fabricius) rt
Anotylus sculpturatus group rt
Anotylus tetracarinatus (Block) rt
Oxytelus ?sculptus Gravenhorst rt-st
Stenus spp. u
Euaesthetus sp. oa
Paederus sp. oa
Lathrobium sp. u
Othius ?myrmecophilus Kiesenwetter rt
Othius sp. indet. rt
Gyrohypnus angustatus Stephens rt-st
Gyrohypnus fracticornis (Muller) rt-st
Xantholinus longiventris Heer rt
Xantholinus linearis or *longiventris* rt
Xantholinus sp. indet. u
Erichsonius cinerascens (Gravenhorst) oa-d
Philonthus spp. u
Philonthus or *Gabrius* sp. indet. u
Quedius sp. u
Staphylininae spp. indet. u
Habrocerus capillaricornis (Gravenhorst) rt
Mycetoporus spp. u
Tachyporus spp. u
Tachinus laticollis or *marginellus* u
Tachinus ?signatus Gravenhorst u
Aleochara sp. u
Aleocharinae spp. u

Pselaphidae sp. u
Geotrupes spp. oa-rf
Aphodius ?ater (Degeer) oa-rf
Aphodius contaminatus (Herbst) oa-rf
Aphodius granarius (Linnaeus) ob-rf
Aphodius ?prodromus (Brahm) ob-rf
Aphodius spp. ob-rf
Onthophagus sp. oa-rf
Phyllopertha horticola (Linnaeus) oa-p
Melolonthinae/Rutelinae/Cetoninae sp. oa-p
Cyphon sp. oa-d
Dryops sp. oa-d
Hypnoidus riparius (Fabricius) oa-p
**Melanotus erythropus* (larva) (Gmelin) l
**Athous haemorrhoidalis* (larva) oa-p
Agriotes lineatus (Linnaeus) oa-p
Elateridae spp. indet. ob
Cantharis lateralis Linnaeus ob
Cantharis sp. ob
Cantharidae sp. indet. ob
Grynobius planus (Fabricius) l
Anobium ?punctatum (Degeer) l-sf
Kateretes rufilabris (Latreille) oa-p-d
Brachypterus sp. oa-p
Meligethes spp. oa-p
Rhizophagus bipustulatus (Fabricius) l
Rhizophagus sp. indet. u
Monotoma picipes Herbst rt-st
Cryptophagus sp. rd-sf
Atomaria spp. rd
Phalacridae sp. oa-p
Cerylon histeroides (Fabricius) l
Orthoperus sp. rt
Coccidula rufa (Herbst) oa-p-d
Rhyzobius litura (Fabricius) oa-p
Lathridius minutus group rd-st
Lathridiinae sp. rt
Corticaria spp. rt-sf
Corticarina or *Cortinicara* sp. rt
?Oxylaemus variolosus (Dufour) l
Bruchidae sp. u
Donacia sp. oa-w-p
Donaciinae sp. indet. oa-w-p
Chrysolina sp. oa-p
Prasocuris phellandrii (Linnaeus) oa-p-d
Chrysomelinae spp. oa-p
Galerucella sp. oa-p
Phyllotreta spp. oa-p
Longitarsus spp. oa-p
Altica sp. oa-p
Chaetocnema arida group oa-p
Chaetocnema concinna (Marsham) oa-p
Halticinae spp. oa-p
Cassida sp. oa-p
Apion spp. oa-p
Phyllobius oblongus (Linnaeus) oa-p
Barynotus sp. oa-p
Sitona hispidulus (Fabricius) oa-p
Sitona lineatus (Linnaeus) oa-p
Sitona spp. indet. oa-p
Hypera sp. oa-p
Tanysphyrus lemnae (Paykull) oa-w-p
?Bagous sp. oa-w
Notaris acridulus (Linnaeus) oa-d-p
Ceutorhynchus ?contractus (Marsham) oa-p
Ceutorhynchus spp. oa-p
?Phytobius sp. oa-d
Ceuthorhynchinae sp. oa-p
?Gymnetron sp. oa-p
Curculionidae spp. oa
Coleoptera spp. u
*Coleoptera sp. indet. (larva) u
*Insecta sp. (larva) u
*Insecta sp. (pupa) u

Arachnida
*Acarina sp. u
*Aranae sp. u
*Opiliones sp. u
*Pseudoscorpiones sp. u

Other remains recorded from GBA subsamples

bark fragments
Cenococcum (sclerotia)
charcoal
coal
dicotyledon leaf fragments (from trees/shrubs)
fish scale
gravel
herbaceous detritus
iron-rich concretions
leaf abscission pads
moss
peat fragments (chatted)
?peat fragments
sand
stones
twig fragments
wood fragments
woody root fragments

ble 2. Lists of plant taxa and other components (in context number order) recorded during analysis of plant macrofossils from M1162 at Higher Lane, Fazakerley. The figures on the right hand side are abundance scores on a four-point scale, from 1 (one or a few remains) to 4 (abundant remains or a major component of the sample).

Context: 1035, Sample: 3/T

Alisma sp(p).	3
cf. Apium sp(p).	1
Carex sp(p).	1
Eleocharis palustris sl	2
Galeopsis Subgenus Galeopsis	1
Glyceria sp(p).	2
Hyoscyamus niger	2
Juncus bufonius	2
Juncus cf. articulatus	2
Juncus inflexus/effusus/conglomeratus	2
Lythrum portula	3
Menyanthes trifoliata	1
Polygonum persicaria	1
Potamogeton sp(p).	1
Potentilla cf. reptans	1
Potentilla palustris	1
Potentilla sp(p).	1
Ranunculus Section Ranunculus	1
Ranunculus Subgenus Batrachium	3
Ranunculus flammula	1
Rubus cf. idaeus	1
Sparganium sp(p).	1
Veronica beccabunga-type	1
bark fgts	1
caddis larva cases	1
charcoal	1
coal	1
Daphnia (ephippia)	1
earthworm egg caps	1
gravel	1
insects	1
iron-rich concretions	1
?peat fgts	1
peat fgts (ch)	1
sand	2
wood fgts	1

Context: 1036, Sample: 4/T

Alisma sp(p).	3
cf. Apium sp(p).	2
cf. Callitriche sp(p).	1
Cannabis sativa	1
Carex sp(p).	1
Chrysanthemum segetum	1
cf. Drepanocladus sp(p).	1
Eleocharis palustris sl	3
Galeopsis Subgenus Galeopsis	1
Glyceria sp(p).	3
Juncus cf. acutiflorus	1
Lemna sp(p).	1
Leontodon sp(p).	1
Lythrum portula	2
Mentha sp(p).	1
Menyanthes trifoliata	1
Potamogeton sp(p).	1
Potentilla palustris	3
Ranunculus Section Ranunculus	1
Ranunculus Subgenus Batrachium	3
Ranunculus flammula	1
Rubus fruticosus agg.	1
Sonchus asper	1
Sparganium sp(p).	3
Spergula arvensis	1
bark fgts	1
caddis larva cases	1
Daphnia (ephippia)	1
dicot lf fgts	1
earthworm egg caps	2
herbaceous detritus	4
insects	1
ostracods	1
sand	1
twig fgts	1
wood fgts	1

Context: 1037/1078, Sample: 7/T

Alisma sp(p).	2
Alnus sp(p). (mc fgts)	1
Bidens sp(p).	1
cf. Callitriche sp(p).	1
Campylium elodes	1
Carduus/Cirsium sp(p).	1
Chenopodium album	1
Crataegus monogyna	1
cf. Drepanocladus sp(p).	1
Epilobium sp(p).	1
Eurhynchium sp(p).	1
Juncus bufonius	2
Lemna sp(p).	1
Leontodon sp(p).	1
Potamogeton sp(p).	2
Ranunculus Section Ranunculus	1
Ranunculus Subgenus Batrachium	2
Rubus cf. idaeus	1

Salix sp(p). (b)	2
Salix sp(p). (fr)	1
Salix sp(p). (tw fgts)	3
Sparganium sp(p).	1
caddis larva cases	1
Daphnia (ephippia)	1
dicot lf fgts	3
earthworm egg caps	1
moss	2
sand	1

Context: 1065, Sample: 9/T

Alisma sp(p).	2
Atriplex sp(p).	2
cf. Barbula sp(p).	1
Bidens sp(p).	1
Brassica rapa	1
Cannabis sativa	1
Capsella bursa-pastoris	1
Carduus/Cirsium sp(p).	1
Carex sp(p).	1
Cerastium sp(p).	1
Chenopodium album	2
Chrysanthemum segetum	1
cf. Crataegus sp(p). (imm fr)	1
Crataegus sp./Prunus spinosa (thorns)	1
Daphnia (ephippia)	1
Galeopsis Subgenus Galeopsis	1
cf. Glyceria sp(p).	1
Juncus bufonius	2
Lapsana communis	1
Lemna sp(p).	1
Linum usitatissimum (caps fgts)	1
Mentha sp(p).	1
Myosotis sp(p).	1
Plantago major	1
Polygonum aviculare agg.	2
Polygonum hydropiper	1
Polygonum lapathifolium	1
Polygonum persicaria	1
Polytrichum juniperinum	1
Potamogeton sp(p).	1
Quercus sp(p). (b/bs)	1
Ranunculus Section Ranunculus	1
Ranunculus Subgenus Batrachium	1
Rubus idaeus	1
Rubus sp(p). (prickles)	1
Rumex acetosella agg.	1
Rumex sp(p).	1
Rumex sp(p). (flg st fgts)	1
Salix sp(p). (b)	1
Salix sp(p). (lf fgts)	1
Sonchus arvensis	1
Sonchus asper	1
Sonchus oleraceus	1
Spergula arvensis	2
Stellaria media	2
Urtica urens	1
Viola sp(p).	1
caddis larva cases	2
Cenococcum (sclerotia)	3
charcoal	1
dicot lf fgts	2
earthworm egg caps	2
fish scale	1
herbaceous detritus	2
Heterodera (cysts)	1
insects	1
sand	3
stones	1
twig fgts	2
wood fgts	2

Context: 1073, Sample: 11/T

Alnus sp(p). (b/bs)	1
Atriplex sp(p).	3
Bilderdykia convolvulus	2
Cannabis sativa	3
Capsella bursa-pastoris	2
Carduus/Cirsium sp(p).	1
Carex sp(p).	1
Chenopodium album	3
Chrysanthemum segetum	3
Galeopsis Subgenus Galeopsis	2
Gramineae	1
Juncus bufonius	2
Juncus squarrosus	1
Lapsana communis	1
Matricaria maritima/perforata	1
Myosotis sp(p).	1
Polygonum aviculare agg.	1
Polygonum lapathifolium	1
Polygonum persicaria	1
Quercus sp(p). (b/bs)	1
Rubus fruticosus agg.	1
Rubus idaeus	1
Rumex sp(p).	1
Sonchus asper	2
Spergula arvensis	2
Stellaria cf. neglecta	1
Stellaria media	3
Urtica urens	1
bark fgts	1
Cenococcum (sclerotia)	3
charcoal	1
earthworm egg caps	3
fly puparia	1

gravel	1	sand	3
herbaceous detritus	3	twig fgts	1
leaf ab pads	1	woody root fgts	1
?peat fgts	1		

*Table 3. Numbers of plant taxa recorded as macrofossils from M1262, Higher Lane, Fazakerley, and their abundance-indicator values (AIV, cf. Hall and Kenward 1990). Within each of the categories (Unclassified, Mosses, etc.), groups are presented in descending order by AIV. An explanation of the group codes is given by Hall and Kenward (*op cit.*).*

Context: 1035, Sample: 3/T, No. taxa: 23

Group	No. taxa	AIV
Unclassified		
UNCL	5	0
Edaphic		
FUGE	1	2
Useful		
FOOS	1	3
Vegetation		
PHRA	5	18
ISNA	3	15
MOAR	6	15
POTA	3	13
CHEN	4	9
LITT	3	9
ARTE	3	7
EPIL	3	7
SCCA	3	6
MOCA	1	3
SECA	2	3
BIDE	1	2
FEBR	1	2
OXSP	1	1
QUFA	1	1
RHPR	1	1

Context: 1036, Sample: 4/T, No. taxa: 30

Group	No. taxa	AIV
Unclassified		
UNCL	6	0
Edaphic		
FUGE	2	5
Mosses		
UNCL	1	0
Useful		
FIBR	1	3
FOOO	1	3
FOOS	1	3
WOOD	1	1
Vegetation		
PHRA	6	30
POTA	4	16
SECA	6	13
ARTE	4	11
ISNA	4	11
MOAR	4	11
SCCA	4	11
CHEN	6	10
LITT	4	10
CAKI	2	8
ALNE	1	6
LEMN	1	3
MOCA	1	3
QUFA	2	3
EPIL	1	2
FEBR	1	2
NACA	1	2
RHPR	1	2
OXSP	1	1

Context: 1037, Sample: 7/T, No. taxa: 22

Group	No. taxa	AIV
Unclassified		
UNCL	3	0
Mosses		
FENS	1	2
MARS	1	2
UNCL	2	0
Useful		
WOOD	4	13
FOOS	2	5
Vegetation		
POTA	4	14
ISNA	3	9
PHRA	3	9
CHEN	2	4
ALNE	1	3
BIDE	1	3
LEMN	1	3
QUFA	2	3
RHPR	2	3
FEBR	1	2

LITT	2	2
MOAR	1	2
MOCA	1	2
ARTE	1	1
EPIL	1	1
SECA	1	1

Context: 1065, Sample: 9/T, No. taxa: 46

Group	No. taxa	AIV
Unclassified		
UNCL	10	0
Edaphic		
FUGE	2	8
Mosses		
HEMO	1	2
OLIT	1	2
UNCL	1	0
Useful		
FIBR	2	6
FOOS	2	6
FOOO	3	5
WOOD	4	4
Vegetation		
CHEN	19	50
SECA	10	28
BIDE	6	18
PLAN	4	13
ARTE	5	9
ISNA	2	7
PHRA	2	7
CAKI	2	6
EPIL	3	6
POTA	2	6
RHPR	4	6
MOAR	2	4
QUFA	4	4
LEMN	1	3
FEBR	1	2
NACA	1	2
SESC	1	2
MOCA	1	1
QUER	1	1

Context: 1073, Sample: 11/T, No. taxa: 28

Group	No. taxa	AIV
Unclassified		
UNCL	6	0
Edaphic		
FUGE	3	14
Useful		
FIBR	1	9
FOOO	1	9
FOOS	2	6
WOOD	2	2
Vegetation		
CHEN	15	56
SECA	8	37
BIDE	5	17
ARTE	4	9
PLAN	2	7
CAKI	1	6
EPIL	2	6
ISNA	1	6
RHPR	3	6
NACA	2	4
ALNE	1	3
QUFA	2	3
OXSP	1	2
QUER	1	1

*Table 4. Pollen and spore percentage values and total land pollen sums for samples from pond M1162 at Higher Lane, Fazakerley. For each group of taxa, the sum used to calculate percentages was Total Land Pollen + the sum of the group concerned. * indicates samples counted during the assessment stage.*

Context	**1073**	**1073**	**1073**	**1078**	**1078**	**1078**	**1078**	**1078**	**1065**	**1037**	**1036**
Depth (cm)	-99	-95*	-90	-85	-75	-65*	-55	-45	-39*	-30	-10
Trees/Shrubs											
Betula	16.06	18.30	12.17	9.63	9.56	11.27	5.78	10.70	11.49	6.27	3.65
Pinus	-	-	0.20	0.31	-	0.25	0.46	0.33	-	0.66	-
Quercus	14.46	16.18	18.26	10.56	15.03	10.54	10.05	8.36	3.40	3.30	1.99
Fraxinus	0.40	-	-	0.62	-	-	-	-	2.13	0.66	3.32
Ulmus	1.61	-	-	-	-	0.25	0.30	0.33	0.85	-	-
Tilia	0.40	0.53	0.41	-	-	-	0.30	-	-	-	-
Ilex	2.01	1.06	1.22	2.17	2.73	0.98	1.52	1.00	-	-	-
Alnus	18.47	14.06	13.79	16.46	12.02	16.91	13.70	17.39	8.51	9.24	4.65
Salix	-	-	-	-	0.27	-	-	0.67	14.04	0.33	40.53
Corylus/*Myrica*	36.95	27.06	33.67	36.96	44.26	43.38	42.62	30.43	17.45	30.36	8.31
Betula/*Corylus*/*Myrica*	1.61	1.59	4.87	5.90	4.64	0.49	3.65	5.69	-	0.99	1.00
Other woody plants											
Hedera	-	0.27	-	-	-	-	-	1.00	-	-	0.33
Calluna	3.21	0.53	2.43	2.80	1.91	3.19	4.26	3.34	0.85	0.66	-
Ericales	0.40	1.59	-	1.24	1.09	1.23	0.61	-	0.85	0.99	0.33
Land herbs											
Gramineae	2.01	10.08	8.11	7.76	3.55	6.37	6.70	9.70	24.26	11.55	21.59
Cyperaceae	-	0.53	0.41	0.31	0.82	0.49	1.22	2.01	1.28	0.66	
?Cannabiaceae	0.40	-	-	0.31	-	-	-	0.67	-	14.85	0.33
Caryophyllaceae	0.40	1.06	-	0.62	0.55	1.23	0.91	0.67	0.85	1.32	-
Compositae: Lactuceae	-	2.12	0.41	0.93	0.82	0.74	1.22	1.00	0.85	1.98	3.32
Anthemis type	0.40	2.92	2.43	1.86	1.37	1.23	1.83	2.01	4.68	2.64	3.99
Artemisia	-	0.27	-	-	-	-	-	-	-	0.33	0.66
Centaurea cyanus	0.40	-	-	-	0.27	-	0.61	-	-	-	-
C. nigra	-	-	-	-	-	-	-	-	-	0.66	
Cirsium/Carduus	-	-	-	-	-	-	-	0.33	-	-	-
?Convolvulus arvensis	-	-	-	-	-	-	-	-	-	-	0.33
Cruciferae	-	-	-	-	0.27		0.91	0.67	1.70	2.64	0.33
Succisa pratensis	-	-	-	-	-	0.25	-	-	-	-	-
Leguminosae	0.40	0.27	-	-	-	-	0.61	-	0.43	-	-
Labiatae	-	-	-	-	-	-	0.30	0.33	-	-	-
Plantago cf. *lanceolata*		0.27	0.41	0.62	0.55	0.74	0.30	0.33	2.13	1.32	2.33
cf. *Polygonum aviculare*	-	-	-	-	0.31	-	-	-	-		0.33
Polygonum *persicaria* t.	-	0.27	0.41	-	-	-	0.30	-	-	-	
Rumex	-	-	-	-	-	-	0.61	0.33	1.28	0.33	
Ranunculus type	0.40	0.53	-	-	0.27	0.49	0.30	1.67	2.98	0.99	2.99
Rubiaceae	-	0.27	-	-	-	-	-	0.33	-	-	-
Filipendula	-	0.27	0.81	0.62	-	-	0.30	0.67	-	-	-
Umbelliferae	-	-	-	-	-	-	0.61	-	-	-	0.33
Urtica	-	-	-	-	-	-	-	-	-	6.60	-
Total Land Pollen	249	377	246	322	366	408	328	299	235	303	301

% AP	91.97	78.78	84.58	82.61	88.52	84.07	78.39	74.92	57.87	51.82	63.46
%Other Woody Plants	3.61	2.39	2.43	4.04	3.01	4.41	4.87	4.35	1.70	1.65	0.66
%NAP	4.42	18.83	12.98	13.35	8.47	11.52	16.74	20.74	40.43	46.53	35.88
Aquatics											
Alisma	-	-	-	-	0.27	-	-	1.57	0.80	0.32	-
Lemna									4.00	0.64	5.25
cf. *Potamogeton* Sect. *Potamogeton*	-	-	-	-	-	-	-	-	-	1.60	1.23
cf. *Potamogeton* Sect. *Coleogeton*	-	-	-	-	-	-	-	4.40	1.20	0.32	0.62
Sparganium/ *Typha latifolia*	-	-	-	-	-	-	-	-	-	0.32	-
%Aquatics	-	-	-	-	0.27	-	-	5.97	6.00	3.19	7.10
Spores											
Filicales	2.21	0.26	0.78	1.69	2.04	0.69	1.94	1.83	0.79	0.93	0.95
Polypodium	6.25	1.04	1.17	7.02	3.56	3.70	4.98	3.36	5.16	4.02	3.16
Pteridium	-	1.04	2.33	0.84	1.27	1.16	1.94	3.36		0.93	0.63
Sphagnum	-	-	-	-	-	-	0.28	-	0.79	0.31	-
%Spores	8.46	2.33	4.27	9.55	6.87	5.56	9.13	8.56	6.75	6.19	4.75
Indeterminable											
Broken	0.35	-	1.85	0.51	0.62	-	-	-	1.00	0.26	-
Concealed	3.50	0.65	-	0.25	1.04	0.43	1.49	1.05	2.33	1.02	2.08
Corroded	0.70	1.51	2.77	0.51	0.41	0.22	0.74	3.68	7.67	2.30	0.30
Crumpled	6.64	16.59	18.49	16.24	20.70	10.65	15.86	16.05	10.67	16.58	6.25
Unknown	1.75	-	0.92	0.76	1.45	-	0.50	0.53	-	2.55	1.79
%indet.	12.94	18.75	24.04	18.27	24.22	11.30	18.59	21.32	21.67	22.70	10.42
%?Cerealia	-	0.53	-	-	-	0.49	0.61	0.33	1.70	0.99	1.33
%NAP - Gramineae	2.41	8.75	4.87	5.59	4.92	5.15	10.05	11.04	16.17	34.98	14.29

Table 5. Lists of adult beetles and bugs from samples from Higher Lane, Fazakerley, in rank order of abundance and taxonomic order within ranks. Number—minimum number of individuals; Ecodes—ecological codes (cf. Hall and Kenward 1990 and caption to Table 1).

Context: 1035, Sample: 3/T

Taxon	Number	Ecodes
Anotylus rugosus	5	rt
Aleocharinae sp. A	3	u
Megasternum obscurum	2	rt
Aneurus sp.	1	l
Corixidae sp.	1	oa-w
Carabidae sp. A	1	ob
Carabidae sp. B	1	ob
Carabidae sp. C	1	ob
Haliplidae sp.	1	oa-w
Hydroporinae sp.	1	oa-w
Agabus bipustulatus	1	oa-w
Ilybius sp.	1	oa-w
Cercyon sp.	1	u
Hydrobius fuscipes	1	oa-w
Cymbiodyta marginella	1	oa-w
Hydraena testacea	1	oa-w
Ptiliidae sp.	1	u
Lesteva longoelytrata	1	oa-d
Acrolocha sulcata	1	rt
Carpelimus sp.	1	u
Stenus sp. A	1	u
Stenus sp. B	1	u
Xantholinus sp.	1	u
?Erichsonius sp.	1	u
Philonthus sp. A	1	u
Philonthus sp. B	1	u
Aleocharinae sp. B	1	u
Aleocharinae sp. C	1	u
Aphodius sp. A	1	ob-rf
Aphodius sp. B	1	ob-rf
Elateridae sp.	1	ob
Cryptophagus sp.	1	rd-sf
Coccidula rufa	1	oa-p-d
Donaciinae sp.	1	oa-w-p
Chrysomelinae sp.	1	oa-p
Apion sp.	1	oa-p
Sitona sp.	1	oa-p
?Tanysphyrus lemnae	1	oa-w-p
Notaris acridulus	1	oa-d-p
Ceutorhynchus sp.	1	oa-p
Curculionidae sp. A	1	oa

Context: 1036, Sample: 4/T

Taxon	Number	Ecodes
Helophorus sp. A	40	oa-w
Aleocharinae sp. B	14	u
Helophorus aquaticus or grandis	13	oa-w
Aleocharinae sp. C	12	u
Anacaena sp.	10	oa-w
Cyphon sp.	9	oa-d
Tanysphyrus lemnae	8	oa-w-p
Ochthebius minimus	7	oa-w
Anotylus rugosus	7	rt
Kateretes rufilabris	7	oa-p-d
Limnebius truncatellus	6	oa-w
Agriotes lineatus	6	oa-p
Longitarsus sp. A	6	oa-p
Agabus bipustulatus	5	oa-w
Enochrus sp. B	5	oa-w
Cymbiodyta marginella	5	oa-w
Stenus sp. D	5	u
Auchenorhyncha sp. A	4	oa-p
Cercyon sternalis	4	oa-d
Hydraena sp. A	4	oa-w
Philonthus sp. B	4	u
Philonthus or Gabrius sp.	4	u
Aphodius ?prodromus	4	ob-rf
Saldula sp.	3	oa-d
Bembidion ?guttula	3	oa
Hydrobius fuscipes	3	oa-w
Aleocharinae sp. A	3	u
Sitona sp. B	3	oa-p
Hydroporinae sp. B	2	oa-w
Agabus sp.	2	oa-w
Coelostoma orbiculare	2	oa-w
Cercyon analis	2	rt-sf
Enochrus sp. A	2	oa-w
Ochthebius sp.	2	oa-w
Hydraena sp. B	2	oa-w
Limnebius sp.	2	oa-w
Aclypea opaca	2	ob-rt
Paederus sp.	2	oa
Lathrobium sp.	2	u
Tachinus ?signatus	2	u
Aleocharinae sp. F	2	u
Pselaphidae sp.	2	u
Atomaria sp. B	2	rd
Lathridius minutus group	2	rd-st
Corticarina or Cortinicara sp.	2	rt
Prasocuris phellandrii	2	oa-p-d
Chaetocnema concinna	2	oa-p
Apion sp. A	2	oa-p
Apion sp. B	2	oa-p
?Bagous sp.	2	oa-w
Notaris acridulus	2	oa-d-p
Aneurus sp.	1	l
Pentatomoidea sp.	1	oa-p
Coreus marginatus	1	oa-p
Lygaeidae sp.	1	oa-p
Pentatomoidea sp.	1	oa-p
Cimicidae sp. A	1	oa-p

Cimicidae sp. B	1	oa-p
Corixidae sp.	1	oa-w
Auchenorhyncha sp.	1	oa-p
Auchenorhyncha sp. B	1	oa-p
Auchenorhyncha sp. C	1	oa-p
Auchenorhyncha sp. D	1	oa-p
Psylloidea sp.	1	oa-p
Psylloidea sp.	1	oa-p
Nebria brevicollis	1	oa
Notiophilus aquaticus	1	oa
Loricera pilicornis	1	oa
Clivina fossor	1	oa
Trechus obtusus or quadristriatus	1	oa
Bembidion lampros	1	oa
Pterostichus melanarius	1	ob
Agonum ?moestum	1	oa-d
Agonum sp.	1	oa
Amara sp.	1	oa
Amara sp. A	1	oa
Harpalus sp.	1	oa
?Bradycellus sp.	1	oa
Dromius linearis	1	oa
Haliplidae sp.	1	oa-w
Hydroporinae sp. A	1	oa-w
Hydroporinae sp. C	1	oa-w
Ilybius sp.	1	oa-w
Colymbetes fuscus	1	oa-w
Dytiscus sp.	1	oa-w
Sphaeridium ?bipustulatum	1	rf
Cercyon ?pygmaeus	1	rf-st
Cercyon ?terminatus	1	rf-st
Cercyon tristis	1	oa-d
Cercyon ustulatus	1	oa-d
Cercyon sp.	1	u
Ptiliidae sp.	1	u
?Lesteva sp.	1	oa-d
Omaliinae sp.	1	rt
Carpelimus sp.	1	u
Anotylus nitidulus	1	rt-d
Anotylus tetracarinatus	1	rt
Stenus sp. A	1	u
Stenus sp. B	1	u
Stenus sp. C	1	u
Stenus sp. E	1	u
Euaesthetus sp.	1	oa
Xantholinus sp.	1	u
Erichsonius cinerascens	1	oa-d
Philonthus sp. A	1	u
Quedius sp.	1	u
Staphylininae sp. A	1	u
Staphylininae sp. B	1	u
Mycetoporus sp. A	1	u
Mycetoporus sp. B	1	u
Tachyporus sp.	1	u
Aleocharinae sp. D	1	u
Aleocharinae sp. E	1	u
Aleocharinae sp. G	1	u
Aleocharinae sp. H	1	u
Aleocharinae sp. I	1	u
Aleocharinae sp. J	1	u
Aphodius ?ater	1	oa-rf
Aphodius sp.	1	ob-rf
Phyllopertha horticola	1	oa-p
Melolonthinae/Rutelinae/Cetoninae	1	oa-p
Elateridae sp.	1	ob
Anobium ?punctatum	1	l-sf
Meligethes sp.	1	oa-p
Cryptophagus sp.	1	rd-sf
Atomaria sp. A	1	rd
Atomaria sp. C	1	rd
Atomaria sp. D	1	rd
Phalacridae sp.	1	oa-p
Donacia sp.	1	oa-w-p
Donaciinae sp.	1	oa-w-p
Chrysolina sp.	1	oa-p
Chrysomelinae sp.	1	oa-p
Galerucella sp.	1	oa-p
Longitarsus sp. B	1	oa-p
Halticinae sp.	1	oa-p
Apion sp. C	1	oa-p
Barynotus sp.	1	oa-p
Sitona sp. A	1	oa-p
Sitona sp. C	1	oa-p
Coleoptera sp.	1	u
Coleoptera sp. A	1	u

Context: 1037/1078, Sample:7/T

Taxon	Number	Ecodes
Helophorus sp. A	25	oa-w
?Anacaena sp.	5	oa-w
Helophorus aquaticus or grandis	3	oa-w
Hydroporinae sp. A	2	oa-w
Helophorus sp. B	2	oa-w
Megasternum obscurum	2	rt
Ochthebius sp.	2	oa-w
Anotylus rugosus	2	rt
Aleocharinae sp. A	2	u
Aphodius ?prodromus	2	ob-rf
Agriotes lineatus	2	oa-p
Sitona hispidulus	2	oa-p
Ceutorhynchus ?contractus	2	oa-p
Anthocoris ?limbatus	1	oa-p
Orius sp.	1	oa-p
?Corixa sp.	1	oa-w
Corixidae sp.	1	oa-w
Auchenorhyncha sp. A	1	oa-p
Auchenorhyncha sp. B	1	oa-p
Bembidion (Philochthus) sp.	1	oa
Agonum sp.	1	oa
Amara aulica	1	oa
Dromius melanocephalus	1	oa
Carabidae sp.	1	ob

Haliplidae sp.	1	oa-w
Hydroporinae sp. B	1	oa-w
Agabus bipustulatus	1	oa-w
Ilybius sp.	1	oa-w
Acilius ?sulcatus	1	oa-w
Dytiscus sp.	1	oa-w
Cercyon sp.	1	u
Hydrobius fuscipes	1	oa-w
Hydraena testacea	1	oa-w
Hydraena sp.	1	oa-w
Limnebius truncatellus	1	oa-w
Limnebius sp.	1	oa-w
Acidota crenata	1	oa
Acrolocha sulcata	1	rt
Anotylus sculpturatus group	1	rt
Stenus sp.	1	u
Lathrobium sp.	1	u
Xantholinus sp.	1	u
Philonthus sp. A	1	u
Philonthus sp. B	1	u
Aleochara sp.	1	u
Aleocharinae sp. B	1	u
Aleocharinae sp. C	1	u
Aphodius sp.	1	ob-rf
Onthophagus sp.	1	oa-rf
Phyllopertha horticola	1	oa-p
Cantharis lateralis	1	ob
Anobium ?punctatum	1	l-sf
Meligethes sp.	1	oa-p
Monotoma picipes	1	rt-st
Cryptophagus sp.	1	rd-sf
Atomaria sp.	1	rd
Phalacridae sp.	1	oa-p
Rhyzobius litura	1	oa-p
Corticaria sp. A	1	rt-sf
Corticaria sp. B	1	rt-sf
Donaciinae sp.	1	oa-w-p
Chrysomelinae sp.	1	oa-p
Phyllotreta sp.	1	oa-p
Longitarsus sp.	1	oa-p
Chaetocnema concinna	1	oa-p
Halticinae sp. A	1	oa-p
Halticinae sp. B	1	oa-p
Apion sp.	1	oa-p
Phyllobius oblongus	1	oa-p
Sitona ?lineatus	1	oa-p
Tanysphyrus lemnae	1	oa-w-p
Ceuthorhynchinae sp.	1	oa-p
?Gymnetron sp.	1	oa-p

Context: 1065, Sample: 9/T

Taxon	Number	Ecodes
Helophorus sp. C	13	oa-w
Anotylus tetracarinatus	6	rt
Helophorus ?aquaticus	4	oa-w
Chaetocnema concinna	4	oa-p
Helophorus sp. A	3	oa-w
Megasternum obscurum	3	rt
Laccobius biguttatus	3	oa-w
Xantholinus linearis or longiventris	3	rt
Aphodius sp.	3	ob-rf
Sitona sp.	3	oa-p
Bembidion lampros	2	oa
Amara sp.	2	oa
Haliplidae sp.	2	oa-w
Agabus bipustulatus	2	oa-w
Ilybius fuliginosus	2	oa-w
Helophorus grandis	2	oa-w
Helophorus sp. B	2	oa-w
Anotylus rugosus	2	rt
Gyrohypnus angustatus	2	rt-st
Tachyporus sp. B	2	u
Aleocharinae sp. B	2	u
Hypnoidus riparius	2	oa-p
Cantharis sp.	2	ob
Phyllotreta sp. A	2	oa-p
Altica sp.	2	oa-p
Sitona ?lineatus	2	oa-p
Ceutorhynchus ?contractus	2	oa-p
Lygaeidae sp.	1	oa-p
Anthocoris sp.	1	oa-p
Gerris sp.	1	oa-w
Corixidae sp.	1	oa-w
Corixa sp.	1	oa-p
Conomelus anceps	1	oa-p
Auchenorhyncha sp. A	1	oa-p
Auchenorhyncha sp. B	1	oa-p
Auchenorhyncha sp. C	1	oa-p
Psylloidea sp.	1	oa-p
Psylloidea sp.	1	oa-p
Nebria brevicollis	1	oa
Clivina fossor	1	oa
Trechus ?micros	1	u
Bembidion (Philochthus) sp.	1	oa
Pterostichus melanarius	1	ob
Pterostichus nigrita	1	oa-d
Pterostichus (Poecilus) sp.	1	oa
Harpalus rufipes	1	oa
Harpalus sp.	1	oa
Hydroporinae sp. A	1	oa-w
Hydroporinae sp. B	1	oa-w
Hydroporinae sp. C	1	oa-w
Agabus or Ilybius sp.	1	oa-w
Dytiscus sp.	1	oa-w
Cercyon sp.	1	u
Cryptopleurum minutum	1	rf-st
Hydrobius fuscipes	1	oa-w
Helochares sp.	1	oa-w
Berosus ?affinis	1	oa-w
Limnebius truncatellus	1	oa-w
Limnebius sp.	1	oa-w
Ptenidium sp.	1	rt

Acrotrichis sp.	1	rt
Catopinae sp.	1	u
Aclypea opaca	1	ob-rt
Lesteva sp.	1	oa-d
Omalium caesum or italicum	1	rt-sf
Coprophilus striatulus	1	rt-st
Carpelimus pusillus group	1	u
Carpelimus sp.	1	u
Aploderus caelatus	1	rt
Platystethus arenarius	1	rf
Anotylus nitidulus	1	rt-d
Lathrobium sp.	1	u
Othius sp.	1	rt
Gyrohypnus fracticornis	1	rt-st
Philonthus sp.	1	u
Philonthus sp. B	1	u
Habrocerus capillaricornis	1	rt
Tachyporus sp. A	1	u
Tachinus ?signatus	1	u
Aleocharinae sp. A	1	u
Aleocharinae sp. C	1	u
Aleocharinae sp. D	1	u
Aleocharinae sp. E	1	u
Aphodius granarius	1	ob-rf
Onthophagus sp.	1	oa-rf
Dryops sp.	1	oa-d
Elateridae sp. A	1	ob
Elateridae sp. B	1	ob
Cantharis lateralis	1	ob
Meligethes sp. A	1	oa-p
Meligethes sp. B	1	oa-p
Rhizophagus sp.	1	u
Cryptophagus sp.	1	rd-sf
Phalacridae sp.	1	oa-p
Orthoperus sp.	1	rt
Coccidula rufa	1	oa-p-d
Corticaria sp.	1	rt-sf
Corticarina or Cortinicara sp.	1	rt
Bruchidae sp.	1	u
Phyllotreta sp. B	1	oa-p
Longitarsus sp.	1	oa-p
Chaetocnema arida group	1	oa-p
Cassida sp.	1	oa-p
Apion sp.	1	oa-p
Hypera sp.	1	oa-p
Curculionidae sp.	1	oa
Coleoptera sp.	1	u

Context: 1073, Sample: 11/T

Taxon	Number	Ecodes
Anotylus nitidulus	11	rt-d
Aleocharinae sp. F	7	u
Megasternum obscurum	6	rt
Gyrohypnus ?angustatus	6	rt-st
Anotylus rugosus	4	rt
Aphodius ?prodromus	3	ob-rf
Cryptophagus sp.	3	rd-sf
Nebria brevicollis	2	oa
Trechus obtusus or quadristriatus	2	oa
Trechus micros	2	u
Lathrobium sp.	2	u
Othius ?myrmecophilus	2	rt
Xantholinus longiventris	2	rt
Tachinus laticollis or marginellus	2	u
Phalacridae sp.	2	oa-p
Corticaria sp.	2	rt-sf
Sitona lineatus	2	oa-p
?Phytobius sp.	2	oa-d
Auchenorhyncha sp.	1	oa-p
Bembidion lampros	1	oa
Bembidion ?guttula	1	oa
Pterostichus oblongopunctatus	1	oa
?Pterostichus sp.	1	ob
Carabidae sp.	1	ob
Hydroporinae sp.	1	oa-w
Helophorus aquaticus or grandis	1	oa-w
Helophorus sp. A	1	oa-w
Helophorus sp. B	1	oa-w
Cercyon analis	1	rt-sf
Cercyon lateralis	1	rf
Cryptopleurum minutum	1	rf-st
Hydrophilinae sp.	1	oa-w
Limnebius sp.	1	oa-w
Acrotrichis sp.	1	rt
?Catops sp.	1	u
Catopinae sp.	1	u
Omalium caesum or italicum	1	rt-sf
Omalium ?rivulare	1	rt-sf
Aploderus caelatus	1	rt
Anotylus complanatus	1	rt-sf
Anotylus tetracarinatus	1	rt
Oxytelus ?sculptus	1	rt-st
Stenus sp. A	1	u
Stenus sp. B	1	u
Paederus sp.	1	oa
Philonthus sp. A	1	u
Tachyporus sp.	1	u
Tachinus ?signatus	1	u
Aleocharinae sp. A	1	u
Aleocharinae sp. B	1	u
Aleocharinae sp. C	1	u
Aleocharinae sp. D	1	u
Aleocharinae sp. E	1	u
Aleocharinae sp. G	1	u
Pselaphidae sp.	1	u
Geotrupes sp. A	1	oa-rf
Geotrupes sp. B	1	oa-rf
Aphodius contaminatus	1	oa-rf
Aphodius sp.	1	ob-rf
Elateridae sp.	1	ob
Cantharidae sp.	1	ob
Grynobius planus	1	l

Brachypterus sp.	1	oa-p	Chaetocnema concinna	1	oa-p
Rhizophagus bipustulatus	1	l	Halticinae sp.	1	oa-p
Cerylon histeroides	1	l	Sitona ?lineatus	1	oa-p
Orthoperus sp.	1	rt	Sitona sp.	1	oa-p
Lathridiinae sp.	1	rt	Notaris acridulus	1	oa-d-p
?Oxylaemus variolosus	1	l	Ceutorhynchus sp.	1	oa-p
Chrysomelinae sp. A	1	oa-p	Ceutorhynchus sp. B	1	oa-p
Chrysomelinae sp. B	1	oa-p	Ceuthorhynchinae sp.	1	oa-p
Longitarsus sp.	1	oa-p	Curculionidae sp.	1	oa

Table 6. Selected main statistics of the assemblages of adult beetles and bugs from samples from Higher Lane, Fazakerley. Most of the abbreviations are explained by Hall and Kenward (1990); in addition, SSA—number of synanthropic taxa; PSSA—percentage SSA—number of synanthropic individuals; PNSA—percentage NSA; SSF—number of facultative synanthropic taxa; PSSF—percentage SSF; NSF—number of facultative synanthropic individuals; PNSF—percentage NSF. The attribution of synanthropic codes to species is provisional (Kenward, in preparation).

Context	**1073**	**1065**	**1037?**	**1036**	**1035**	
Sample	**11/T**	**9/T**	**7/T**	**4/T**	**3/T**	
Wt processed (kg)	3	3	2	1	2	
S	80	106	73	140	41	
N	124	159	113	341	48	
MNI/kg	41	53	57	341	24	
ALPHA	97	139	89	89	131	
SEALPHA	17	22	16	8	52	
SOB	38	67	53	90	24	
PSOB	48	63	73	64	59	
NOB	45	107	90	241	24	
PNOB	36	67	80	71	50	
ALPHAOB	113	76	54	52	0	
SEALPHAOB	45	14	10	5	0	
SW	6	21	21	28	10	
PSW	8	20	29	20	24	
NW	6	45	54	131	10	
PNW	5	28	48	38	21	
ALPHAW	0	15	13	11	0	
SEALPHAW	0	4	3	2	0	
SD	3	5	0	12	3	
PSD	4	5	0	9	7	
ND	14	5	0	33	3	
PND	11	3	0	10	6	
SP	15	25	24	36	8	
PSP	19	24	33	26	20	
NP	17	36	27	71	8	
PNP	14	23	24	21	17	
SM	0	0	0	0	0	
PSM	0	0	0	0	0	
NM	0	0	0	0	0	
PNM	0	0	0	0	0	
SL	4	0	1	2	1	
PSL	5	0	1	1	2	
NL	4	0	1	2	1	
PNL	3	0	1	1	2	
SRT	25	24	12	19	6	
PSRT	31	23	16	14	15	
NRT	55	37	15	33	11	
PNRT	44	23	13	10	23	

Context	**1073**	**1065**	**1037?**	**1036**	**1035**	
ALPHART	18	30	0	19	0	
SEALPHART	4	10	0	6	0	
SRD	1	1	2	6	1	
PSRD	1	1	3	4	2	
NRD	3	1	2	8	1	
PNRD	2	1	2	2	2	
SRF	7	5	3	6	2	
PSRF	9	5	4	4	5	
NRF	9	7	4	9	2	
PNRF	7	4	4	3	4	
SSA	9	7	5	6	1	
PSSA	11	7	7	4	2	
NSA	17	8	5	8	1	
PNSA	14	5	4	2	2	
SSF	6	3	4	3	1	
PSSF	8	3	5	2	2	
NSF	9	3	4	4	1	
PNSF	7	2	4	1	2	