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Terrestrial and freshwater mollusca from Anglo-Scandinavian levels at 16-22 Coppergate, York (1976-81.07)

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1. Introduction

1.1 The site

The excavations at 16-22 Coppergate followed the demolition of Messrs Craven's sweet factory, south-east of the centre of the medieval city. Earlier excavations in the immediate area had proved the presence of deep, waterlogged deposits dating back at least to the 9th century A.D. The aim of the Coppergate excavation was to expose a large area of the south side of Coppergate and to investigate medieval and Anglo-Scandinavian buildings fronting onto the street.

The results of the excavation have been described by Hall (1984) and need not be detailed here. Anglo-Scandinavian deposits (late 9th to early 11th century A.D.) evidenced a phase of pit-digging and glass-working (Period 3) succeeded by the construction of wicker buildings (Periods 4a and 4b). After a brief interlude of abandonment (Period 5a), these wicker buildings were replaced, probably late in the 10th century, by substantial plank-walled and sunken-floored structures (Periods 5b and 5c). Occupation was both domestic and craft/industrial.

At the time of writing (December 1985) the division of the deep and complex stratigraphy of the site into these periods is still not finalised. Although most soil samples have now been phased, some may be re-phased and existing periods could still be subdivided or amalgamated. For this reason, and because the number of records of mollusca from these deposits is relatively small, this report deals with the whole of the Anglo-Scandinavian period at Coppergate (roughly A.D. 870 to 1050) as one unit.

An earlier report in this series (O'Connor, 1984) has described larger species (principally marine molluscs exploited for food) collected by hand during the excavation at Coppergate.

1.2 Materials and methods

A total of 102 samples of Anglo-Scandinavian date yielded identifiable land or freshwater mollusca, usually in very small numbers (1 to 5 specimens per sample). This poor yield can be attributed in part to the relatively fast accumulation of the sediments, which militated against the accumulation of substantial death assemblages, and in part to the non-alkaline nature of the deposits.

Most records were obtained from large soil samples (ca. 50kg) which were wet-sieved on a 1mm nylon mesh in a modified Sirāf tank (Williams, 1973; Jones, 1983). The residues were air-dried then sieved through a 2mm mesh. The 2mm+ fraction was sorted for biological and cultural finds. This procedure differs appreciably from that normally used to recover snail shells from archaeological deposits (i.e. wet-sieving to 0.5mm). However, it would have been impracticable to sieve large samples to 0.5mm and to sort the masses of residue which would have resulted. The bulk-sieving procedure was used to allow a coarse survey to be made of the occurrence of mollusc shells in a large number of contexts, and in this it was highly successful. In addition to the bulk-sieved specimens, a few records (less than 10) were obtained from samples sieved to 0.3mm for plant macrofossils.

These results are thus not quantitatively comparable with conventional mollusc analyses, and taxon occurrence should be considered more on a presence/absence basis than in terms of any detailed analysis of relative abundance. Small taxa (in particular *Carychium* and *Vertigo* species) will have been under-represented, but given that the average concentration of shells in these samples was of the order of one specimen per 5-10kg, it is difficult to see what procedure might better have been adopted.

Data were accumulated on the University of York KL-10 computer system and information was extracted using the 1022 database management system.

1.3 The archive

All finds and records pertinent to this site will be archived at the Yorkshire Museum, York, under the York Archaeological Trust and Yorkshire Museum accession code 1976-81.07.

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2. Results

2.1 Distribution of taxa

Table 4.1 lists the number of records and number of specimens of terrestrial and freshwater molluscs, and clearly shows the paucity of the data. The most frequent taxon (Succinea putris) was present in less than one quarter of the samples, and 30 of the 41 taxa were each recorded in less than 5% of those samples from which at least some identifiable shells were recovered. The majority of the taxa are terrestrial gastropods, and the presence of 15 freshwater taxa is readily explained by the proximity of the River Foss and the regular traffic of people and other animals which probably went on between the river and the occupation site.

Considering just the five most frequent taxa (Succinea putris, Oxychilus alliarius, Helix aspersa, Discus rotundatus, Cepea sp.), these account for 59% of records and 72% of specimens, and were the only taxa present in sufficient numbers to be confidently described as having lived and bred on the site. Anisus leucostoma and Trichia hispida were quite frequent, though not abundant, and may also have bred nearby. Given the archaeological evidence for large-scale importation of organic materials such as timber and dye-plants onto the site, it is highly probable that small numbers of snails were brought onto Coppergate from an appreciable distance, and this point will be returned to in section 3 of this report.

2.2 Ecology of taxa

This section will summarise the present-day habitats occupied by the most common species in these samples.

Succinea putris - this marshland and river bank species is common in the York area today (Kerney, 1976) and appears to be quite tolerant of human disturbance. Ellis (1926, 140)and Boycott (1934, 13) describe it as being less markedly hygrophile than the other common succineid Oxyloma pfeifferi. S. putris feeds on green plants and organic detritus of various kinds (Adam, 1960, 196).

Oxychilus alliarius - although common in old woodlands and damp wild places generally, this zonitid is occasionally recorded in gardens (Kerney and Cameron, 1979, 125). Like all Oxychilus species it shows a wide dietary range and is at least intermittently carnivorous (McMillan, 1968, 129-30).

Helix aspersa - this, the familiar garden snail, is strongly syanthropic in Britain, and omnivorous. Ellis (1926, 236-7) quotes E. W. Swanton on the subject of the edibility of H. aspersa and the possibility that it might have been exploited as a foodstuff during the Roman period and subsequently. However, there is no evidence that the status of this species at Coppergate was as anything other than an opportunistic detritivore exploiting the debris of human settlement.

Discus rotundatus - Ellis (1926, 171) and Adam (1970, 247) concur in the matter of the ubiquity of this species. It requires a small damp refuge during the day, such as leaf litter, moss, bark or rocks, and feeds nocturnally on fungal and plant debris. The present author's observations have shown the species to be very common in gardens around York today, often accompanied by Oxychilus alliarius and Helix aspersa.

Cepea sp(p). - only one specimen could confidently be ascribed to species level, as most records of this genus were based on damaged apices and juveniles. Both British species, C. hortensis and C. nemoralis, are widely distributed in damp habitats today, where they feed on a variety of herbaceous plants (Ellis, 1926, 227-30).

Trichia hispida - Kerney and Cameron (1979, 191) and Ellis (1926, 208-10) stress the great morphological variability of this species and its widespread distibution in all but the driest habitats. Although Ellis (1926, 209) says that it is seldom found in gardens, Kerney and Cameron report that T. hispida becomes markedly synanthropic near the northern limit of its range in southern Scandinavia.

Anisus leucostoma - this common planorbid is generally distributed in ponds and ditches, and is tolerant of stagnant conditions and intermittent drought (Rimmer, 1907, 41; Beedham, 1972, 92; Boycott, 1936, 129-30).

Amongst the less common species are some which are typical of dry grassland (Vertigo pygmaea, Vallonia excentrica), arable fields (Helicella itala, Candidula intersecta) and shaded habitats such as woodland (Aegopinella pura, Vertigo pusilla). The two commonest lymneids (L. truncatula and L. palustris) are both species of rather slummy habitats, often being found out of water on wet mud.

In sum, detritus feeders are in the majority. Table 4.2 quantifies the terrestrial taxa in four ecological categories. Even if allowance is made for under-representation of small Vertigo and Carychium species, the shade and pasture elements of the assemblage are relatively unimportant, at least numerically.

3. Discussion and conclusions

3.1 Conditions on the site

The appearance of the Anglo-Scandinavian deposits at Coppergate suggested that they had originally formed as a sort of 'compost' of plant and animal debris, and the range of mollusc species found very much confirms this impression. Conditions were evidently fairly damp, with sufficient undisturbed loose detritus to afford refuges for populations of several species. Although Cepea species commonly graze living plants, most of the snails in Table 4.1 feed on fungus or dead plant matter, and some (Oxychilus alliarius, for example) probably exploited animal tissues on discarded bones and oyster shells.

The vicinity of the river appears to have had a wide marshy margin, perhaps with seasonal pools. Places where land gave way abruptly to river would be expected to have favoured Oxyloma pfeifferi rather than Succinea putris, and the predominance of the latter species would seem to indicate that the edge of the river was poorly defined and variable. It should be noted, however, that botanical remains from these deposits are poor in waterside taxa (A. R. Hall, pers. comm.).

The shade or woodland element in the assemblage is very small and readily explained. Moss was used as a raw material for various processes, and several woodland mosses have been identified on the site, together with wood sorrel (Oxalis acetosella), holly (Ilex aquifolium) and many other woodland plants. Importation of woodland moss would certainly have resulted in small numbers of woodland snails being brought into the town. A similar mechanism probably accounts for the few records of pasture and arable species, which were presumably imported with loads of hay or straw.

3.2 Discussion of methodology

Using a 2mm mesh to sieve small numbers of snails from large soil samples is far from ideal, hence the rather broad terms in which the results have been discussed. However, some sensible analysis of the mollusc fauna of the site has been possible, and the alternative was to have no information at all on this subject. No single deposit on the site contained shells in sufficient concentration to permit the more conventional use of a 0.5mm mesh for total recovery from a small (1-2kg) sample. If mollusc remains are to be used in urban environmental archaeology, then bulk-sieving procedures will have to be accepted as a recovery technique and the limitations of the procedure will need to be researched and defined. In the case of Coppergate, the excellent preservation of arthropod fossils will permit detailed ecological reconstruction, but these are unusual burial conditions, and in more oxygenated or alkaline sediments it will be necessary to use molluscs as ecological indicators in the absence of, say, beetles or mites. Thus there is an argument for extending archaeological snail studies into the urban environment, with the result that assemblages obtained by bulk-sieving will provide the majority of the data.

Table 4.1. Frequency and abundance of molluscs from Anglo-Scandinavian levels at 16-22 Coppergate

	records	abundance
Terrestrial gastropoda		
Carychium minimum Muller	2	2
Succinea putris (Linn.)	24	34
Succinea oblonga Drap.	2	2
Oxyloma pfeifferi (Rossmassler)	1	1
Cochlicopa lubrica (Muller)	7	7
Vertigo pygmaea (Drap.)	3	3
Vertigo antivertigo (Drap.)	3	4
Vertigo pusilla Muller	2	2
Pupilla muscorum (Linn.)	1	1
Lauria cylindracea (da Costa)	1	1
Vallonia excentrica Sterki	3	3
Discus rotundatus (Muller)	13	17
Nesovitrea hammonis (Strom)	1	1
Aegopinella pura (Alder)	2	2
Aegopinella nitidula (Drap.)	2	2
Oxychilus cellarius (Muller)	3	8
Oxychilus alliarius (Miller)	23	67
Limacidae sp. indet.	3	3
Euconulus alderi (Gray)	1	1
Clausilia bidentata (Strom)	9	12
Candidula intersecta (Poiret)	2	2
Helicella itala (Linn.)	1	1
Trichia hispida (Linn.)	11	13
Cepea hortensis (Muller)	1	1
Cepea sp.	12	13
Helix aspersa Muller	15	47
Freshwater gastropoda		
Bithynia tentaculata (Linn.)	1	1
Bithynia leachi (Sheppard)	1	1
Valvata piscinalis (Muller)	1	1
Lymnaea stagnalis (Linn.)	1	1
Lymnaea truncatula (Muller)	6	6
Lymnaea palustris (Muller)	4	4
Lymnaea peregra (Muller)	1	1
Planorbis planorbis (Linn.)	3	3
Anisus leucostoma (Millet)	11	18
Bathyomphalus contortus (Linn.)	1	1
Freshwater bivalvia		
Anodonta sp.	1	1
Unio tumidus Philipsson	4	4
Unio pictorum (Linn.)	3	4
Unio sp.	9	9
Pisidium amnicum (Muller)	1	2

Table 4.2. Terrestrial snails grouped by ecological preference.

	n.taxa	n.records	n.shells
catholic detritivores, potentially urban	11	99	190
marshes, river margins	6	33	44
pasture, arable	5	10	10
woodland	4	6	6

Key:

Detritivores - *Cochlicopa lubrica*, *Discus rotundatus*, *Aegopinella nitidula*, *Oxychilus cellarius*, *O. alliarius*, Limacidae, *Clausilia bidentata*, *Trichia hispida*, *Cepea* sp., *C. hortensis*, *Helix aspersa*

Marshes - *Carychium minimum*, *Succinea putris*, *S. oblonga*, *Oxyloma pfeifferi*, *Vertigo antivertigo*, *Euconulus alderi*

Pasture and arable - *Vertigo pygmaea*, *Pupilla muscorum*, *Vallonia excentrica*, *Candidula intersecta*, *Helicella itala*

Woodland - *Vertigo pusilla*, *Lauria cylindracea*, *Nesovitrea hammonis*, *Aegopinella pura*

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