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Assessment of biological remains from excavations at 12-18 Swinegate, 8 Grape Lane, and 14, 18, 20 and 22 Back Swinegate/Little Stonegate, York (YAT/Yorkshire Museum sitecodes 1989-90.28 and 1990.1)

by

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Summary

Samples of raw sediment, sieved residues and vertebrate remains obtained from sieved samples and by hand-collection from Roman to early modern deposits in the Swinegate area of York have been assessed to establish what further bioarchaeological work may be required.

A programme of selected analyses is recommended, concentrating on organic levels in the early post-Conquest period and on a limited number of bone groups.

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Introduction

Excavations by York Archaeological Trust in a total of 15 trenches in the Swinegate/ Back Swinegate/Grape Lane area of York, took place in 1989-90, mainly through 3 x 3 m test pits, but (in the case of areas 1, 3 and 4) through large trenches or open areas.

Deep stratified sequences of urban archaeological deposits were exposed in all areas. There was evidence for late medieval tenements fronting Swinegate and Grape Lane, a series of 11th-12th century burials from the graveyard of St Benet's church (both church and burial ground were abandoned in the medieval period), and Roman occupation including remains of structures and 'surfaces'.

The deposits exposed during these excavations were generally very heavily sampled, adopting a policy then advocated by the EAU and latterly formalised by Dobney *et al.* (1992). The breakdown of samples by type is given in Appendix Table A1, and the breakdown by trench, period and sample type in Table A2. Numbers of samples by period and area are given in Table A3. Note that Areas 1 (fronting Grape Lane) and 4 (fronting the W end of Back Swinegate) have not been closely dated; in Area 1, excavation did not extend below late-medieval levels, but in Area 4, a small area was opened to examine underlying Roman stratigraphy.

Methods

Samples for assessment were selected in consultation with the site director, N. F. Pearson.

'General biological analysis' (GBA) samples

The 77 selected first priority GBA samples were all from areas 1-4. In the event, it was only possible to assess 40 of these, representing areas 1-3 (a list of those examined appears in Table A6 and their distribution through the areas and periods in Table A4).

The GBA samples were examined in the laboratory and a description of the lithology made using a standard *pro forma*. Two were found to be too small to process further. From the remaining 38, 1 kg 'test' subsamples were taken and processed following methods of Kenward *et al.* (1980; 1986). The quality and quantity of preservation of insect remains was assessed from inspection of the 'flots' or 'washovers' from these test subsamples, whilst plant remains and other components of the deposits were recorded briefly from the residues (with examination of the flot or washover only in cases where there was very little plant material in the residue and it was thought that these would offer additional information). Parasite eggs were examined for 20 of the selected samples, using 'squashes' made following the method of Dainton (1992).

Bulk-sieved (BS) samples

The selected BS residues had been sorted by staff and visitors to the Archaeological Resource Centre, York Archaeological Trust, and assessment involved making a brief record of the components extracted and the nature of the remaining matrix. A total of 45 of 57 first priority BS samples were examined. Fifteen of these were selected for a more detailed assessment of their content of bone. Some results of these investigations are presented in Table A7.

SR and hand-collected bone

Almost all of the SR samples examined for this assessment produced small quantities of animal bone and only seven samples (from three contexts: 2160, 2178 and 2190, all dating to the late 2nd century) were considered worth recording in detail.

However, most of the bone from these excavations was hand-collected material, inherently biased towards larger species and elements. Most of the larger groups came from deposits dated to the 12th to 14th centuries. Seven of these larger groups were selected for more detailed recording, one (2190) from late 2nd, two (3204, 3217) from 12-13th and four (3118, 3147, 3161 and 3170) from 13-14th centuries.

Results

Details of the results of examination of GBA and BS samples and of the bone are given in the appendix text and tables. In particular, Table A6 includes a very brief summary of the content of the GBA samples, whilst some results for BS samples are given in Tables A7 and A8. Hand-collected bone is considered in Tables A9-A11.

Discussion and potential

Plant and invertebrate remains

Microfossils and plant and invertebrate macrofossils in quantities sufficient for any reliable interpretation were distributed very unevenly through samples from the different phases. Roman and late/post-medieval deposits examined contained almost none, although it cannot be assumed that all of the samples are entirely barren. The 11th-14th century deposits, by contrast, often contained substantial quantities of plant and invertebrate remains, with potential for archaeological interpretation at the level of context, feature, period, site and higher synthesis.

The main interest of the macrofossils lies in their potential for determining activity and use of structures at the site. Although most of the fossiliferous layers were apparently deposited in yards in the open, the insect remains indicate that the material of which they were composed had lain within buildings before final deposition. Insect remains and, more cogently, plant macrofossils, argue that much of this material was stable manure. The material differs somewhat from stable manure of the Roman period (with which AH and HK are most familiar). Stable manure deposits have been recognised at 24-30 Tanner Row and 12 Rougier Street, York (Hall and Kenward 1990), Ribchester (Large *et al.* 1994) and some sites in Carlisle (e.g. Kenward *et al.* 1992a-c). At each of these sites there were greater or lesser numbers of deposits which undoubtedly included substantial quantities of stable manure,

indicated by (a) plant remains and insects of kinds which would be expected in hay, (b) cereals and associated grain beetles, and (c) a characteristic suite of beetles from fairly foul open-textured organic matter. At least some of the Swinegate 'litter' deposits failed to conform to this typical pattern and it is conceivable that pigs rather than horses were involved or that they were middens of a mixed nature.

A particular question which needs to be addressed concerns the concretions recorded from many of these organic deposits. They appear not to have an origin in human faeces, since parasite eggs were rare in the matrix surrounding them. It will be important to establish whether they could have formed in herbivore dung, for example.

Insect remains from the site included many groups which are poorly preserved, being reddish or yellowish in colour and often highly fragmented. In a number of cases, it was noted that differential preservation many have occurred, and these samples appear to provide an opportunity to examine stages in the decay of insect assemblages. Information concerning differential decay in urban insect assemblages will be of considerable value in the interpretation of poorly preserved groups generally. In particular, is the predominance of spider beetles and woodworm beetles in many medieval urban deposits a result of a very restricted fauna or of the preservational robustness of these insects?

A surprisingly large number of the deposits of medieval date from Swinegate contained at least a few, and sometimes very many, resting eggs (ephippia) of Cladocera. At least three kinds were present. A few deposits also contained water beetles in numbers subjectively a little too large for them to have arrived accidentally. It is conceivable that there was an area of wet ground near to the Swinegate sites, and that these aquatics originated in 'naturally' occurring pools. Another possibility deserving careful consideration is that the aquatics arrived in the faeces of livestock, having been ingested with drinking water from troughs or pools. The rarity of aquatic marginal plants argues for an origin of this kind, rather than in imported wetland plants used for litter or fodder.

The medieval material is important for comparison with that from Coffee Yard (Robertson *et al.* 1989) and The Bedern (Hall *et al.* 1992a-c); it is also hoped that data for this period will be available from 16-22 Coppergate in the near future. A strong pattern is emerging in the insect assemblages from later (and post-) medieval deposits in York and it is most desirable to make an objective characterisation of this typical fauna and to relate it to the problems of differential preservation discussed above.

Another intriguing aspect of some of the deposits at Swinegate is the evidence they offer for very foul conditions in an area a mere 150 m from York Minster.

Vertebrate remains

Remains of small mammals, birds and fish were identified from the 15 selected BS samples. Overall, fish were most common (Table A8); species diversity was high and the taxa included some from freshwater habitats (trout, dace and perch), marine waters (herring, haddock, saithe, mackerel, bas, cod, conger eel, sea bream, whiting, thornback ray, garfish and gurnard), some tolerant of a range of salinities (mullet and flatfish) and some which are migratory (eel

and salmon). Small mammals included black rat, voles and mice, as well as red squirrel (context 3217). Birds were represented mostly by domestic fowl and geese, but there were also remains of small passerines, blackbirds, and a single bone which was possibly from a wader.

All the bones from the SR samples were relatively heavily fragmented and were, for the most part, unidentifiable. From the four largest samples, only 112 identifiable and approximately 500 unidentifiable fragments were present, making up a total weight of 3990 gm. Not surprisingly most of the bones were from domestic mammals, with wild birds (Corvidae) and fish represented by a few fragments. The small size of the SR assemblages and the limited range of species and elements represent renders this material of little interpretative value apart from providing a approximate check of recovery and species representation.

Hand-collected bone from this site was relatively well preserved from all major periods. However, those from 12-13th and 13-14th centuries showed mostly excellent preservation, characterised by black to dark brown coloration (usually indicative of anoxic conditions resulting from waterlogging). The bones in these assemblages exhibited a variety of colours from fawn to dark brown. However, the condition of the fragments did not suggest the presence of residual material. Fragmentation was 'average', with the most of the bones falling in the range 5-20 cm; dog gnawing was recorded on only 0-10% of the assemblage.

A wide range of species was noted from both 12-13th and 13-14th century contexts. Most common were cattle, sheep, goat, pig (present in relatively high numbers), domestic fowl and goose. In addition, remains of dog, cat, hare, fallow deer, duck and fish were also represented along with several human bones, obviously reworked.

Of particular interest were a number of goat and cattle horncores from contexts 3147, 3217 and 3118 (all of medieval date). A proportion showed butchery in the form of chop- or knife- marks around their base, all obviously having been deliberately removed from the skull. A single large goat horncore (from context 3147) had a large circular hole drilled into the lateral side near its base. A single goat metacarpal was also identified from context 3217.

Although deposits dating to both the Roman and medieval periods were excavated, only those from 11th-14th centuries produced animal bone assemblages of sufficient size to be of zooarchaeological relevance. However, once the medieval assemblage is subdivided into more tightly-dated groups, assemblage size becomes a limiting factor here, too. The excellent state of preservation, relatively wide range of species and preponderance of measurable fragments and mandibles with teeth, renders the material of some zooarchaeological importance, however.

Since well-dated medieval assemblages from York are uncommon, useful basic information (particularly biometrical and age-at-death data) will be recovered. The lack of substantial SR samples means that any detailed statistical analyses of species and element representation would be of little value, although the presence of small mammals, birds, and particularly fish, in the BS samples would allow additional species to be identified and information to be gleaned regarding medieval fisheries and the

local environment.

The presence of numerous cattle and goat horncores from post-Conquest and medieval Swinegate may indicate the deposition of waste from local hornworking. Similarly dated assemblages interpreted as horners' and tanners' waste have been noted previously from 24-30 Tanner Row (O'Connor 1988) and from a site in North Street, York (Dobney and Jaques 1993). Another large assemblage which should be incorporated into a wider study of these periods is that from post-Conquest deposits at 16-22 Coppergate.

Recommendations

This assessment has been carried out without pre-defined research objectives formulated by the excavator. The approach to the main phase of bioarchaeological investigation can thus only be based on established research agendas together with topics highlighted by the present assessment. The following recommend-ations are offered:

Plant and invertebrate remains

It is recommended that a programme of inspection of the samples is carried out, choosing material for processing on the basis of likely preservation and archaeological value. A second selection stage after processing should be based on the potential of the extracted material to provide information of archaeological relevance. The proportion of samples to be recorded in detail will vary with period, context types represented in each period, and the nature of the deposits. In addition, it is recommended that the choice of macro-invertebrate assemblages for full recording is made with reference to topics outlined above, namely the differential preservation of insects, 'stable manure' and wetland forms. A survey of selected deposits for their content of parasite eggs should be carried out, at least a proportion of the groups being measured to allow identification of the *Trichuris*. The concretions from BS samples should be surveyed systematically for any content of parasite eggs and for any plant remains which may give evidence for the material from which they have formed. The larger plant remains from a selection of BS samples with good preservation of organic material should also be examined to provide evidence of foodplants and litter/fodder components.

Vertebrate remains

It is recommended that selected material is recorded in detail from BS samples and the corpus of hand-collected bone.

Time estimates

Table 1 offers guestimates for the contact time required to record plant and invertebrate remains from selected samples. The proportion of samples from each period to be examined has been based on the data in Tables A6 and A7, as has the average time for recording material from each sample for each phase.

For GBA samples, an allowance has been made for reviewing more samples than are selected for processing, and for processing more samples than are recorded. The proportion selected at each stage varies by period according to the nature of the material already seen. Where a period was

poorly represented in the assessment, the estimates are based on what is thought to be similar material from other periods. For parasite eggs, time has been allowed for examination of the selected GBAs by means of a 'squash', plus an allowance for more detailed work, including measurements, on a small proportion rich in eggs. Time has been allocated for examination of concretions from BS samples for parasite eggs.

Table 2 presents estimates of the actual time required for work on plant and invertebrate remains. Estimates for time required for further work on vertebrate remains are given in Table 3.

Estimated duration of project

Of the estimated total 137.5 days of RF time, 71 days is work allocated to AH. This will be the critical task, since the technician time can be divided between two or more personnel. Allowing a maximum effort of 30%, the minimum duration of the project is 237 days (48 weeks, including leave).

Consumables

Consumables required are listed in Table 4.

Retention and disposal

All material from these excavations should be retained for the present.

Archive

All flots and washovers and dried residues from examination of GBA samples in this assessment are currently stored, together with all paper and electronic archives relating to the biological remains from the site, at the EAU, York. Samples, other residues and bones are currently stored by YAT.

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(If not attached, copies of the Appendix may be obtained from the EAU.)

*Table 1. Time estimates for processing and recording plants and invertebrates from GBA and BS samples and for reviewing SPOT samples. These estimates **exclude** ancillary tasks, data handling, and reporting.*

Period	Sample type	Number taken	Number selected for processing	Processing/sorting selected samples	Projected recording time (hours)			
					Plants	Parasites	Insects	Other
1 (natural deposits)	GBA	1	0	0	0	0	0	0
2 (initial use of site, including first phase of building in stone: 3rd quarter of C1)	?	2	0	0	0	0	0	0
	BS	9	0	0	1.5	0	0	0
	GBA	122	20	40	5	1.67	1.67	0
	OTHER	(1)	0	0	0	0	0	0
	SPOT	6	0	0	0	0	0	1.5
3 (second phase of building in stone; creation of ‘open area’: 1st half of C2)	BS	28	0	0	4.67	0	0	0
	CS	2	0	0	0	0	0	0
	GBA	71	10	20	2.5	0.83	1	0
	OTHER	(4)	0	0	0	0	0	0
	SPOT	7 (1)	0	0	0	0	0	1.75
	SRS	1	0	0	0	0	0	0

Period	Sample type	Number taken	Number selected for processing	Processing/sorting selected samples	Projected recording time (hours)			
					Plants	Parasites	Insects	Other
4 (continued use of Period 3 building: 2nd half C2)	BS	63	0	0	11	0	0	0
	GBA	199	20	40	5	1.67	1.67	0
	OTHER	(5)	0	0	0	0	0	0
	SPOT	3	0	0	0	0	0	0.75
	SRS	33	0	0	0	0	0	0
5 (Final phase of use of Period 3/4 stone building: late C3/C4)	BS	17	0	0	2	0	0	0
	GBA	52	10	20	2.5	0.83	1	0
	OTHER	(1)	0	0	0	0	0	0
	SPOT	1	0	0	0	0	0	0.25
	SRS	5	0	0	0	0	0	0
6 (demolition: C11/12)	BS	2	0	0	0	0	0	0
	GBA	8	0	0	0	0	0	0
	SPOT	1	0	0	0	0	0	0
7 (burials: C11-12)	?	1	0	0	0	0	0	0
	BS	3	0	0	0.5	0	0	0
	GBA	47	0	0	0	0	0	0

Period	Sample type	Number taken	Number selected for processing	Processing/sorting selected samples	Projected recording time (hours)			
					Plants	Parasites	Insects	Other
	OTHER	1	0	0	0	0	0	0
	SPOT	43	0	0	0	0	0	10.75
8 (site-wide accumulation, evidence for cultivation, and demise of cemetery: C11/12)	BS	4	0	0	1.33	0	0	0
	CS	1	0	0	0	0	0	0
	GBA	28	10	20	10	2.5	3.33	0
	SPOT	8	0	0	0	0	0	2
9 (division of site into separate tenements and associated organic accumulation: late C11/12)	?	1	0	0	0	0	0	0
	BS	21	0	0	7.5	7.5	0	0
	GBA	43	20	40	25	4.67	8	0
	SPOT	9	0	0	0	0	0	2
10 (further organic accumulation: C12/13)	BS	10	0	0	3	4	0	0
	GBA	35	10	20	22.5	3	5.5	0
	SPOT	7	0	0	0	0	0	1.75
11 (further organic accumulation and buildings at street frontage:	BS	5	0	0	0.5	0	0	0

Period	Sample type	Number taken	Number selected for processing	Processing/sorting selected samples	Projected recording time (hours)			
					Plants	Parasites	Insects	Other
C13-C14)								
	GBA	150	40	80	32.5	9	24	0
	GBA/ SPOT	1	0	0	0	0	0	0.25
	OTHER	(3)	0	0	0	0	0	0
	SPOT	5	0	0	0	0	0	1.25
12 (continued organic accumulation: C14-C15)	BS	3	0	0	1.5	1.5	0	0
	GBA	29	10	20	10	3	6.67	0
	SPOT	1	0	0	0	0	0	0.25
13 (machine clearance; C16-modern)	GBA	8	1	2	0.5	0.5	1	0
	SPOT	1	0	0	0	0	0	0.25
Undated (Areas 1 and 4; late medieval and later only)	?	2	0	0	0	0	0	0
	BS	9	0	0.5	2	1	0	0
	GBA	152(1)	40	80	5	8.33	10	0
	OTHER	8(7)	0	0	0	0	0	0
	SPOT	10	0	0	0	0	0	2.5
	SRS	5	0	0	0	0	0	0

Period	Sample type	Number taken	Number selected for processing	Processing/sorting selected samples	Projected recording time (hours)			
					Plants	Parasites	Insects	Other
Total times (hours)				382.5	156	50	63.84	25.25

Table 2. Tasks, resources required and time estimates for work on plant and invertebrate micro- and macrofossils. Note: recording times are based on those given in Table 1 but with the addition of a component for ancillary tasks

Task	**Staff**	**Contact time** (days)	**[Cost]**
Databases, liaison with YAT	Tech. RF	2 3	
Handling samples, selecting material	Tech RF	6 3	
Process selected GBA samples	Tech	60	
Record plant remains	RF	25	
Record parasite eggs	Tech RF	10 1	
Record insect remains	Tech RF	6 6	
Record spot samples	Tech RF	2 5	
Data input and processing	Tech RF	5 20	
Technical Report preparation	RF	12	
Preparation of publication report	RF	10	
Sub total	Tech RF	91 85	
Contingency	Tech RF	9 9	
Sub total	Tech RF	100 94	
Leave earned	Tech RF	13 12	
Grand total	Tech RF	113 106	

Table 3. Estimated time and resources required for work on vertebrate remains from Swinegate, including a component for ancillary tasks.

Task	**Staff**	**Contact time (days)**	**[Cost]**
[Sort 30 BS samples]	Tech.	6	
Record fish from BS samples	RA	4.5	
Record other vertebrate remains from BS samples	RF	3	
Record hand-collected and SR bone	Tech. RF	17 12	
Prepare Technical Report	RA RF	2 10	
Prepare Publication Report	RF	2	
Contingency	Tech. RF	1 1	
Sub total	Tech. RA RF	24 6.5 28	
Leave earned	Tech. RA RF	3 1 3.5	
Grand total	Tech. RA RF	27 7.5 31.5	

Table 4. List of consumables required for further investigation of bioarchaeological remains from Swinegate.

Item	**Cost**
Reagents	
Glass specimen tubes	
Microscope slides and cover slips	
Computer consumables	
Beatson jars	
Stationery	
Telephones/fax	
Polyethylene bags	
Labels and markers	
Miscellaneous	
Total	