ANCIENT MONUMENTS LABORATORY

REPORT

3329

SERIES/No CONTRACTOR

AUTHOR Peter Murphy Mar 1981

TITLE Little Shelford, Foulness, Essex; Environmental Studies

Site	:	Little Shelford
Parish	:	Foulness
County	:	Essex
Site Codes	:	A, G and Q
Director	:	H.R. James
Type of site	:	Occupation layers including shell midden-type deposits
Period	:	Roman
Geology	:	Holocene intertidal sediments
Type of material	:	Sediments; mollusca; miscellaneous faunal remains; charred cereals.

Shelford, Foulness, Essex

This group of Roman sites, currently being excavated by the Foulness (A.W.R.E.) Archaeological Society, was visited in July 1980. In a single visit only very limited investigations were possible, though the area has great potential for the study of former coastal environments, and for the reconstruction of the economy of the Roman settlement. Three main aspects of the sites are considered below: the nature of the 'natural' sediments beneath the occupation layers, the composition of shelly midden-type deposits, and evidence for cereal production.

Sediments

The section at Site Q showed the following deposits

0-20 cm	Disturbed modern topsoil including a surface clinker layer: sharp boundary.
20-30 cm	Slightly moist dark greyish-brown (10 YR 4/2) silty clay loam with yellowish-brown patches; abundant whole and fragmentary shells; abundant roots; merging boundary.
30-37 cm	Slightly moist mixed yellowish-brown (10 YR 5/3.5) and dark greyish-brown (10 YR 4/2) silty clay loam; abundant whole and fragmentary shells; abundant roots; merging boundary.
37-45 cm	Slightly moist yellowish-brown (10 YR 5/3.5) very fine sandy loam to very fine sandy clay loam with common distinct dark yellowish-brown and strong brown mottles: dark greyish-brown infilled root channels; abundant fine fibrous roots; some shells; merging boundary.
45-80 + cm	Moist to wet yellowish-brown (10 YR 5/3.5) very fine sandy loam; clay and silt content higher in upper 5 cm; common faint greyish-brown and strong brown mottles; small shell fragments; rare fine fibrous roots.

Near the base of the shelly deposit most oyster valves lay horizontally; above this shell orientation appeared to be random. The shelly layers are discussed further below.

The sediments below 45 cm are evidently of intertidal origin: they contained rare shells of Hydrobia, Mytilus, Cerastoderma, Ostrea and other bivalves (see Table 1) as well as abundant Foraminifera and Ostracods. The small fragments

of charcoal and bone, and the charred seed of Tripleurospermum (see Table 3), from these deposits may have been introduced after their deposition, via root channels, but it is possible that these biological remains indicate nearby human activity while the sediments formed. The higher clay and silt content in the upper 5 cm of the deposit may indicate a change in the sedimentary environment from lower to upper tidal flats. The date of deposition is unknown, but by at least the second century A.D. the area was sufficiently free from tidal flooding to be suitable for settlement. (James and James 1978). Boreholes from this part of Foulness Island show Holocene silts and silty clay landwards, interdigitating with medium/fine sands seawards (Greensmith and Tucker 1971); the sediments at site Q are thus part of an extensive spread of fine-textured Holocene intertidal sediments broadly comparable to sediments on the present day Maplin and Foulness Sands.

It is surprising that only 20 cm of 'topsoil' is present above the Roman shelly deposits: a greater depth of flood deposits might have been expected.

Mollusca

Shelly deposits at sites A, G and Q were examined. In the field clear differences in the composition of these deposits were apparent; in particular the site Q deposit obviously contained a high proportion of molluscs not normally considered suitable for human consumption. Samples were taken in order to investigate these deposits more closely.

Methods

Methods of sampling shell middens are discussed by Bailey (1975). Ideally, sampling should involve random selection of shell blocks within a three dimensional grid, in order to study variation within the midden deposit. At this site only limited time was available and it was therefore only possible to take a few samples giving some crude impression of vertical and lateral variation. At Site Q, Trench I, a column sample was taken through the shelly layer and subjacent sediments in Area A. Two further samples were taken from the upper part of the shelly deposit in Areas Y and Y2. Shell layers at sites A and G were also sampled.

The silty and clayey matrix of these deposits proved difficult to disaggregate. The samples were partly broken down under slow running water in a 0.5 mm mesh sieve, and large intact bivalves and gastropods were extracted. The residue

Site	A	G	Q	Q	Q	Q	Q	Q	Q	Q	Q
Trench	IV	-	I	I	I	I	I	I	I	I	I
Area	-	-	A	A	A	A	A	A	A	Y	Y2
Depth (cm)	-	-	20-30	30-37	37-45	45-50	50-60	60-70	70-80		
Gastropod sp.	-	1	2	-	-	-	-	-	-	2	5
Littorina littorea L.	-	-	2	-	-	-	-	-	-	2	4
Littorina sp.	-	-	-	1	-	-	-	-	-	3	3
Hydrobia ulvae (Pennant)	-	1	7	3	-	-	-	-	-	26	23
Hydrobia ventrosa (Montague)	-	1	-	-	-	-	-	-	-	-	-
Hydrobia sp.	1	7	-	-	2	1	-	4	(+)	-	-
Rissoa sp.	-	-	1	-	-	-	-	-	-	-	1
c.f. Buccinum undatum (Linné)	-	-	-	-	1	-	-	-	-	-	-
Retusa sp.	-	1	-	-	-	-	-	-	-	2	-
Phytia myosotis (Draparnaud)	-	-	-	-	-	-	-	-	-	-	1
Vertigo pygmaea (Draparnaud)	-	-	-	-	-	-	-	-	-	2	-
Pupilla muscorum (Linné)	1	-	-	-	-	-	-	-	-	-	-
c.f. Acanthinula aculeata (Muller)	-	-	-	-	-	-	-	-	-	1	-
Vallonia pulchella/excentrica	1	3	1	-	-	-	-	-	-	1	-
Bivalve sp.	-	-	-	-	-	-	-	3	1	2	(+)
Mytilus edulis Linné	2	11	1	6	3	(+)	-	-	-	6	20
Ostrea edulis (Linné)	54	80	11	14	6	(+)	(+)	(+)	-	41	53
Cerastoderma edule Linné	-	3	11	1	-	2	-	-	-	4	10
Cerastoderma sp.	14	9	31	3	5	-	(+)	1	(+)	37	37
Tellinidae cf. Macoma balthica (Linné)	6	5	15	2	-	-	-	-	-	16	24
Scrobicularia plana (da Costa)	-	-	1	-	-	-	-	-	-	2	4
Sample wt (kg)	2	2	1	1	1	0.5	0.5	0.5	0.5	2	2

Table 1 : Mollusca from sites A, G and Q.

In this table the numbers of lammelibranch valves are given. Incomplete identifications refer to very

was then air-dried, re-immersed in hot water and washed once more through the sieve. The dried residue was sorted under a binocular microscope, extracting smaller molluscs and hinge apex fragments.

Shells were identified using Tebble (1966) McMillan (1968) and Macan (1969) and identifications were confirmed by comparison with shells in the writer's reference collection and in the Holmes Collection at Norwich Castle Museum. Counts were made of gastropod apices and bivalve hinges. Specimens identified are listed in Table 1.

Discussion

On the basis of the present samples, the shelly deposits can be divided into two groups. The frequencies of the main taxa in the larger assemblages are summarised in Fig. 1.

The assemblages from sites A and G contain a high proportion of Ostrea edulis (oyster): 66% and 58% respectively. Other edible shellfish from these deposits include Mytilus edulis (mussel) and Cerastoderma edule (cockle). There is also a small proportion of molluscs not suitable for human consumption - principally small Hydrobiid snails, Tellinid bivalves (probably Macoma balthica, though badly abraded) and a few terrestrial snails. Overall, however, these deposits appear to consist predominantly of food debris - mainly oyster shells.

In the assemblages from site Q Ostrea is less abundant (Area A 12%; Y 22%; Y2 24%), and Cerastoderma more common (A 42%; Y 22%: Y2 21%). Mytilus and Littoria littorea (winkle) are present at low frequences. The proportion of inedible species is markedly higher than at sites A and G; Hydrobia ulvae is particularly abundant (A 14%; Y 28%; Y2 20%). The ratio of edible:inedible molluscs is, in fact, still lower than a simple consideration of species composition would suggest, since many shells of the edible species are of very immature specimens (e.g. Mytilus valves under 10 mm. in length), which are clearly too small have been worthwhile collecting for food.

There are at least three plausible explanations for the high proportion of 'inedible' molluscs in the site Q assemblages.

1. These shells were deposited in regurgitated pellets and faeces by gulls or other scavenging birds. It is quite likely that some of the smaller and fragmentary specimens were deposited by this means, but this does not explain the presence of the larger unabraded shells of 'inedible' species, nor the silty clay matrix of the shelly deposits, which differs considerably from the subjacent sediments.

2. These shelly deposits are, in part, natural deposits in situ. Flooding episodes during storm surges might have deposited some intertidal shells at the site, but the homogeneity of the shelly deposits suggest that this was not an important contributory factor.

3. Intertidal sediments, containing shells, were artifically imported to the site. The matrix of the shell deposits has the appearance of an intertidal mud, and most of the molluscs with the exception of the terrestrial snails and oysters, are intertidal species (Table 2). It is quite possible that intertidal sediments (either from the littor al of the Roman period or from inland shelly intertidal deposits of earlier Holocene date) were imported to the site and used, together with midden material, to raise the ground level. Settlements and buildings constructed on raised platforms (eg. the Dutch terps) are well known on the North Sea coasts of the Continent and it therefore seems worthwhile considering, during future excavation, whether the shelly deposits at site Q are in fact structural features and not merely middens.

		Epifauna	Infauna
Tidal Zone to Supralittoral	On higher parts of saltings	Phytia myosotis	
	Rocks (also as self-supporting clumps in sheltered inter-tidal areas)	Mytilus edulis	
		Littorina littorea	
Tidal Zone	Sand and mudflats (esp. reduced salinity)	Hydrobia ulvae	Scrobicularia ~~Scrobiaulana~~ plana c.f. Macoma balthica
	Sand (reduced or normal salinity)		Cerastoderma edule
Sublittoral	Low water to 15-45 fathoms on firm immobile bottoms	Ostrea edulis	

Table 2 : Ecological groups of marine mollusca from site Q
Habitat details from Tebble (1966), McMillan (1968), Funnell et al (1979).

Other faunal remains

Most of the samples from the shelly deposits contained small fragments of mammal bone and fishbone, mainly vertebral centra. Too little fishbone was recovered for specialist examination to be worthwhile. It is clear that very large-scale wet-seiving would be required for the recovery of useful collections of fishbone. Foraminifera, Ostracods, Cirripedia and Bryozoa were present in the shelly deposits.

Plant remains

Charred plant remains were present in all samples examined. (Table 3). The charcoal was too fragmentary for determination. All identified cereal remains were of Triticum spelta L. (spelt wheat). A single weed seed of Tripleurospermum maritimum (scentless mayweed) was identified.

Discussion

The small assemblages of cereal remains recovered consist mainly of chaff - rachis internodes and glume bases - and appear to represent threshing debris. This suggests local cultivation.

Arable farming is possible soon after the embankment of newly reclaimed land, whilst the soil is still slightly saline, as in the Dutch polders. Experimental work in the Netherlands and Germany has also shown that crops can be grown on unprotected salt-marsh. On low-lying areas of marsh, salt-water flooding has been found to result in almost total crop failure but on the higher parts of marshes, where flooding is generally of shorter duration, crops can survive. (Korber-Grohne 1967; Van Zeist 1974).

Whether the entire cereal requirements of the settlement were met ny local cultivation is a question which could only be settled by further work, in particular by an examination of weed seeds associated with charred cereals.

Site	A	G	Q	Q	Q	Q	Q	Q	Q	Q	Q
Trench	IV	-	I	I	I	I	I	I	I	I	I
Area	-	-	A	A	A	A	A	A	A	Y	Y2
Depth (cm)			20-30	30-37	37-45	45-50	50-60	60-70	70-80		
Charcoal fragments	+	+	+	+	+	+	+(c)	+(c)	+(c)	+	+
Cereal indet (caryopses)(a)	-	3	1	1	-	-	-	-	-	-	1
Triticum sp.(rachis internodes)(b)	-	2	-	-	-	-	-	-	-	-	9
Triticum sp. (glume bases)	-	12	-	-	-	-	-	-	-	-	9
Triticum sp. (spikelet bases)	-	3	-	-	-	-	-	-	-	-	4
Triticum spelta (glume bases)	2	14	1	1	-	-	-	-	-	-	29
Tripleurospermum maritimum (cypsela)	-	-	-	-	-	-	1	-	-	-	-
Sample wt (kg)	2	2	1	1	1	0.5	0.5	0.5	0.5	2	2

Table 3 : Charred plant remains

Notes (a) Distorted/fragmentary
(b) Brittle-rachis wheat
(c) Rare, very small fragments

References

Bailey, G.N. (1975) 'The role of molluscs in coastal economies: the results of midden analysis in Australia' Journal of Archaeological Science 2, 45-63

Funnell, B.M., Norton, P.E.P. and West, R.G., (1979) The Crag at Bramerton near Norwich, Norfolk. Phil. Trans. Roy. Soc. B, 287, 489-533.

Greensmith, J.T., and Tucker, E.V., (1971) 'The Effects of Late Pleistocene and Holocene Sea-level Changes in the Vicinity of the River Crouch, East Essex.' Proc. Geologists Association 82, 301-321.

James, D.J., and H.R., (1978) 'Roman burials at Little Shelford, Foulness, Essex, 1972' Essex Archaeology and History 10, 227-230.

Korber-Grohne, U., (1967) Geobotanische Untersuchungen auf der Feddersen Wierde. Wiesbaden

Macan, T.T., (1969) A Key to the British Fresh- and Brackish- water Gastropods. Freshwater Biological Association, Scientific publication No. 13.

McMillan, N.F., (1968) British Shells Warne, London

Tebble, N., (1966) British Bivalve Seashells, B.M. (Nat. Hist.) London

Van Zeist, W., (1974) Palaeobotanical Studies of Settlement Sites in the Coastal Area of the Netherlands Palaeohistoria XVI, 223-371.

Figure 1: Frequencies of principle molluscan taxa.