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SCHIPLUIDEN

A NEOLITHIC SETTLEMENT ON THE DUTCH NORTH SEA COAST *c.* 3500 CAL BC

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AND PETER F.B. JONGSTE

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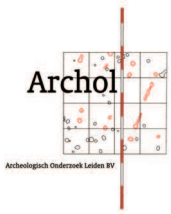

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16 Molluscs

Wim Kuijper

Shell samples were collected from several clastic deposits in the sections and borings. They inform us about the salinity and dynamics of the environment before and shortly after the period of occupation, and in the Gantel system. Shell pottery temper was identified as mainly crushed cockle.

16.1 Introduction

In the archaeological investigation special attention was paid to the occurrence of molluscs as they could have provided information on the local environment before, during and after the period of occupation and on the part played by molluscs in the occupants' diet. In actual fact, however, molluscs were encountered in only small quantities.

Shell fragments were only sporadically encountered in the settlement area, but part of the pottery was tempered with ground shells. A very small number of tiny shell fragments were found in the zoological analysis of sieve residues.

Shells were found in several deposits in the borings. The overlying Dunkirk I deposits in particular were found to contain dense concentrations of shells. The sediments of the boring samples were rinsed with water through a sieve with a mesh width of 0.25 mm. The residues were then microscopically examined.

See chapters 2 and 14 for information on the stratigraphy and the physical geography of the excavated settlement and its surroundings.

16.2 Results

16.2.1 The settlement

Virtually no molluscs were found in the actual settlement area or in the surrounding deposits. As far as the dune itself is concerned, this could be attributable to dissolution in the decalcified dune sand, in which bone had indeed also survived in only very small quantities and in a poor state of preservation. This does however not hold for the peripheral zone. The conclusion must hence be that species such as edible mussel and edible cockle, which are commonly – and often in large quantities – encountered in coastal settlements, did not feature on the occupants' menu.

At Schipluiden only 16 tiny fragments of marine mollusc species were encountered in 11 find assemblages. Grouped according to phase they are as follows:

phase 1	mussel (*Mytilus edulis*)
phase 1-2a	mussel, peppery furrow shell (*Scrobicularia plana*)
phase 2a	peppery furrow shell, lagoon cockle (*Cerastoderma glaucum*)
phase 3	peppery furrow shell.
phases 1-3	mussel, edible cockle (*Cerastoderma edule*), peppery furrow shell

These four species and the small numbers in which they were found do not yield any information suggesting changes in the local environment in the course of the investigated period. They do probably not represent the remains of consumed molluscs. The fragments have thin walls and appear to derive from small specimens. They may have been brought to the site by humans (whether or not deliberately) or deposited there during high tides. The encountered species may well have lived in a marine environment with a reduced saline content (brackish).

One of the samples (phases 1-2a) contained a few fragments of the shells of land snails: an amber snail and the shell of the beautiful snail. Both species may have occurred naturally at the site; they are common species characteristic of a wide range of open terrestrial environments, including high-lying salt marshes and damp dunes.

There will undoubtedly have been other snail and mussel species both on land and in the water, though the mollusc fauna may have been poor due to extreme conditions, for example extreme temperatures or saline contents.

16.2.2 Borings in the surrounding area

In the boring research that was conducted in the site's surroundings with the aim of reconstructing the former landscape (see chapter 14) a few small shell-containing samples were collected of several successive deposits (table 16.1). The majority had a volume of only 10 cm^3.

The plant and animal remains contained in these very small samples (table 16.1) yielded the following environmental evidence.

The Early Holocene clay was deposited in a coastal area under saline and brackish conditions. The area was shielded from the open sea and was a kind of tidal-flat area or a lagoon.

boring	68	68	73	173	174	68	181	151	181
depth in cm below surface	645	460	370 - 377	460 - 470	470	317 - 320	370 - 375	413 - 424	260 - 270
sediment	sandy cl.	sandy cl.	wd/sand	cl. sand	cl. sand	sandy cl.	cl. sand	clay	clay
Unit	Earl. Holo.	R-Z	R-Z	R-Z	R-Z	40/19	40/20	2	2
volume in cm^3	10	10	5	10	10	10	10	100	50
molluscs									
Barnea candida	–	–	1	–	–	–	–	–	–
Cerastoderma edule	–	1	1	x	–	–	–	x	–
Mytilus edulis	x	x	x	x	x	1	1	–	x
Littorina saxatilis	x	–	–	–	–	–	–	–	–
Macoma balthica	–	–	1 doublet	–	–	–	–	x	x
Scrobicularia plana	–	1 doublet	–	x, 1 doublet	1 doublet	1 doublet	–	–	1
Spisula subtruncata	–	1	–	–	–	–	–	–	–
Hydrobia ulvae	xx	1	x	x	x	x	–	x	x
Hydrobia ventrosa	xx	–	–	–	–	–	–	xx	–
other animal remains									
foraminifers	–	–	x	x	x	–	–	xxx	xx
ostracods	–	–	x	xx	x	x	–	xxx	xx
Nereis sp. (a ragworm) jaws	x	–	–	1	–	1	–	x	–
Echinocardium cordatum spines	–	x	x	x	x	x	–	–	x
sea-mats	–	–	1	–	–	–	–	–	–
sponges spicula	–	–	–	–	–	–	–	x	–
plant remains (seeds)									
Agrostis sp.	–	–	–	–	–	–	–	–	1
Aster tripolium	–	–	–	–	–	–	–	–	1
Atriplex sp.	–	–	–	–	–	–	–	–	1
Bolboschoenus maritimus	–	–	–	–	–	–	1	–	–
Carex sp.	–	–	–	–	–	–	–	x	1
Chenopodium glaucum/rubrum	–	–	–	–	–	–	–	–	2
Mentha sp.	–	–	–	–	–	–	–	4	–
Suaeda maritima	–	1	–	–	–	–	16	–	–
Scirpus sp.	–	1	–	–	–	–	–	–	–
charcoal	–	x	–	–	–	–	–	–	–

x = 2 - 20 cl = clay, clayey
xx = 20 - 50 wd = wood
xxx = hundreds R-Z = Rijswijk-Zoetermeer sands

Table 16.1 Identifications of molluscs from bore hole samples.

The Rijswijk-Zoetermeer sands originated in a saline (marine) environment (tidal-flat area) that was connected to the open sea. One sample (boring 73) contained a piece of wood with drill holes and a white paddick shell.

Unit 40/Unit 19 originated in a saline tidal-flat area.

Unit 2 was deposited in a brackish (or saline) coastal area: a calm tidal-flat area or a lagoon.

Unit 0 (Dunkirk) was formed in the Gantel system (see section 2.2.3). Molluscs characteristic of marine, brackish, freshwater and terrestrial environments were all represented. The total picture is indicative of sedimentation in an estuary: a transitional area between land and sea where freshwater flowed into the sea; see also section 16.2.4.

16.2.3 Pottery temper

Some of the prehistoric pottery was tempered with shells fragments (chapter 6). Six sherds from phase 2a were microscopically examined to see whether any of the employed species could be identified. The shell remains were burned and visible in the clay matrix as a fragment or an impression. The small dimensions (at most a few mm^2) and damage made it very difficult to determine the species,

but some information was nevertheless obtained. The shells were found to derive from cockle (edible or lagoon cockle), a mudsnail (*Hydrobia ulvae*/*Hydrobia ventrosa*) and an unknown bivalve.

In addition, some foraminifers, large diatoms, fine sand grains and fine plant matter (carbonised) were recorded. One of the sherds contained a carbonised rough club-rush seed.

Both the shells and the clay indicate that the pottery was made from material deposited in a saline or brackish environment. The latter option is the most likely. And both the shells and the clay were probably easily accessible in the site's surroundings. The clay will have been formed in the period preceding the occupation phase concerned (2a). The most likely source of the clay is Unit 19.

16.2.4 Unit 0 (Dunkirk I deposits)

A large sample was taken from the base of the Dunkirk I deposit, which was laid down in the (estuarine) area of the tidal inlet/river Gantel and covered the dune. It dates from approximately 500 to 0 cal BC. Long grooves were observed at the base of this deposit (see section 2.2.3). A sample of one litre of sand mixed with layers of clay was taken from the fill of one of those grooves. This sample was studied for the presence of molluscs. In addition, another 5 litres of sand was studied to see whether it would yield comparable evidence. That was indeed found to be the case.

The molluscs encountered in the sample (table 16.2) proved to derive from different environments. Seven of the represented species favour a marine environment and three prefer brackish conditions. Some marine species, such as the mussel, Baltic tellin, peppery furrow shell, mudsnail and periwinkle, can tolerate reduced saline contents and are hence encountered in brackish environments, too. The represented range of species is indicative not of open saline water (the North Sea) but of a calm saline, tidal-flat kind of coastal area. The assemblage includes both poorly preserved and well-preserved shells.

The freshwater shells were all well preserved. They represent a fairly narrow faunal range, which nevertheless includes some remarkable species, in particular the swollen spire snail – a mollusc favouring freshwater tidal areas that tolerates slightly elevated saline contents. The dwarf pond snail and the ram's-horn tolerate desiccation of their biotope. They occur in shallow ponds surrounded by vegetation and at the edges of larger areas of water. The marsh snail can also survive in such environments. Finally, two terrestrial species were also encountered. Both species are encountered on damp banks.

As far as the reconstruction of the former environment is concerned there are two possibilities. The deposit may have been formed in a coastal area where freshwater flowed into the sea. In such an area, a mixture of saline and freshwater will have led to the formation of a brackish environment in which all of the encountered molluscs could have lived. The shells will then have been washed some distance away from their original positions by currents. The second possibility is an area with alternating periods of strong and less strong marine influence. In that case the freshwater species will have lived here in periods with strong discharge of freshwater and the marine species will have colonised the area in periods of pronounced marine influence. The brackish sediments will have been laid down in the transitional periods.

The majority of the other represented animal species favour a saline environment. The seeds contained in the same sample derive from plants that grow on the banks of areas of freshwater (some also in brackish water) and in swamps. The few aquatic plants encountered are characteristic of freshwater and brackish water. These results agree well with those of the mollusc analysis.

Species characteristic of a marine environment (poorly to well-preserved)	
Cerastoderma edule	some valves and fragments
Cerastoderma glaucum	some valves and fragments
Mytilus edulis	several dozen doublets and valves and some fragments
Spisula subtruncata	some valves and fragments
Macoma balthica	some doublets, valves and fragments
Scrobicularia plana	1 valve and some fragments
Hydrobia ventrosa	several dozen
Hydrobia cf acuta	a few
Hydrobia ulvae	a few
Littorina sp.	1
Species characteristic of a freshwater environment (well-preserved)	
Mercuria confusa	11
Valvata piscinalis	1
Stagnicola palustris	25
Galba truncatula	5
Radix ovata	2
Anisus leucostoma	1
Species characteristic of a terrestrial environment (well-preserved)	
Oxyloma sp.	5
Vallonia pulchella	1
barnacle, plates	some
Echinocardium cordatum	some fragments, dozens of spines
ostracods, shells	dozens
foraminifers	
plant remains	small quantities

Table 16.2 Molluscs from the lower part of Unit 0. The sample, consisting of one litre of sand mixed with thin layers of clay, was sieved through a 0.25-mm mesh width.

16.3 Conclusion

All the investigated deposits were laid down in a marine coastal area shielded from the open sea. In some periods the environment was saline due to a good connection with the open sea (Rijswijk-Zoetermeer sands), in others it was characterised by a reduced saline content (brackish), represented by the Early Holocene clay and Unit 2. During the deposition of the Dunkirk I sediment by the Gantel the area was an estuary. The environments in this coastal area ranged from tidal gullies in open connection with the sea to calm tidal flats and salt marshes.

Deposits from the period of the excavated settlement on the dune contained few mollusc remains. The small quantities encountered point to a calm saline or brackish environment.

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scientific	English	Dutch
Mollusca	molluscs/shells	mollusken, weekdieren, schelpen
Anisus leucostoma	button ram's-horn	geronde schijfhoren
Barnea candida	white piddock	witte boormossel
Cerastoderma edule	edible cockle	gewone kokkel
Cerastoderma glaucum	lagoon cockle	brakwaterkokkel
Galba truncatula	dwarf pond snail	leverbotslak
Hydrobia cf acuta	mudsnail	vergeten brakwaterhoren
Hydrobia ventrosa	spire mudsnail	opgezwollen brakwaterhoren
Hydrobia ulvae	mudsnail	wadslakje
Littorina sp.	periwinkle	alikruik
Macoma balthica	Baltic tellin	nonnetje
Mercuria confusa	swollen spire snail	getijdenslak
Mytilus edulis	edible mussel	gewone mossel
Oxyloma sp.	amber snail	barnsteenslak
Radix ovata	common pond snail	ovale poelslak
Scrobicularia plana	peppery furrow shell	platte slijkgaper
Spisula subtruncata	cut trough shell	halfgeknotte strandschelp
Stagnicola palustris	marsh pond snail	moeraspoelslak
Vallonia pulchella	smooth grass snail	fraaie jachthorenslak
Valvata piscinalis	common valve snail	vijverpluimdrager

Table 16.3 Glossary of the scientific, English and Dutch names of the species mentioned in the text.