

# Summary

Between the end of the 1950s and the beginning of the 1960s, the polder Oostelijk Flevoland in the former Zuiderzee (later Lake IJsselmeer) was reclaimed and brought under cultivation. Research showed that in the northwest of the polder, in the area of the present-day village of Swifterbant, river dunes and a system of creeks with natural levees had been preserved in the subsoil. At a depth of 5–6 m below mean sea level (Amsterdam Ordnance Datum: NAP), prehistoric settlements were discovered on these levee deposits and river dunes, dating from the Mesolithic and Neolithic periods. During the latter period, a transition occurs from a hunter-gathering way of life to one partly based on agriculture. A new phenomenon in the material culture is the production and use of pottery.

A number of settlement locations were excavated between 1962 and 1978. This study is a detailed description and analysis of the pottery sherds found during the excavations. The study also considers the distribution of the sherds within the settlements in order to establish their character and changes during the habitation. We also seek to answer the following questions:

- when and why did man first use pottery?
- what was the role of neighbouring Neolithic cultures?
- which pottery was produced locally, and which was ‘imported’?
- how did the Swifterbant culture – to which the pottery is ascribed – spread?
- were there contacts with other cultures in the vicinity or further away?

## *Landscape and habitation phases*

The Swifterbant area is situated in a glacial bed of the Overijssel Vecht and IJssel, which became wetlands and were eventually flooded. The area has probably been inhabited since the beginning of the Mesolithic period. However, the surface level of that time has been covered by younger sediments. The earliest established Mesolithic occupation dates from 6550–5500 BC. At that time the landscape consisted of wooded sandy ground with broad river valleys bordered by dunes. As the sea level rose, and with it the ground water level in the hinterland, the hunter-gatherer communities who lived there between 5300 and 5100 BC witnessed their environment becoming wetter and

wetter. In the immediate vicinity they must have seen the development of peat bogs. Gradually, the sea penetrated, a lagoon of mud flats was created, and clay was deposited. In approximately 4500 BC, in the area around Swifterbant, a more stable landscape evolved with creeks, levees and swampy backlands bordered by dunes. The landscape became covered with vegetation and can be compared to the former Biesbosch marshlands, but with less tidal amplitude. The hunter-gatherers used the dune tops as a base to hunt and fish in the surrounding marshes, probably with logboats as their means of transport.

From approximately 4450 BC, in the Neolithic period, the levees became the preferred location for settlements close to fishing waters. By this time, and as a result of prolonged contact with farming communities much further south, the hunting communities had begun to grow crops and to keep livestock as a supplement to hunting-gathering and fishing. Complete households inhabited these settlements in the spring, summer and autumn. It is possible that, in winter, the sites were only visited for short hunting trips. In this Neolithic period, occupation of the river dunes became more sporadic and must have been of a different nature. The wetlands continued to spread and human occupation in this area, after approximately 3800 BC, was no longer possible.

## *The excavations at Swifterbant*

In the 1960s, G.D. van der Heide, of what was then the RIJP, the IJsselmeerpolders Development Authority, began research into the area. In the 1970s, the project was taken over by J.D. van der Waals of the former BAI, Biological-Archaeological Institute of the University of Groningen, now the Groningen Institute of Archaeology. Two river-dune excavations were carried out by the University of Michigan (Ann Arbor) and the University of Wisconsin (Madison), led by R. Whallon and T.D. Price.

Nine Neolithic sites were identified on the levees. Two of the sites have been extensively studied. Other sites have been examined in trial excavations and by means of test pits. The majority of the pottery finds come from sites S2 and S3. S2 is located on the large levee along the main creek consisting of compact ripened clay with the culture layer defined by a dark colour. A burial site with nine skeletons was found in the

settlement. At the S3 site, located on a lower levee where a number of creeks intersect, the remains of posts and postholes have been found in addition to the archaeological artefacts, and hearths made of more or less fired clay slabs. The finds were recorded three-dimensionally so that the information can be combined with information from site plans to provide insight into the use of space within the site and the nature of the occupation. The soil was wet-sieved for botanical and zoological research, and for small finds such as beads and flint splinters.

In addition to the settlement finds on the levees, finds were made on five river dunes. However, at these sites the Neolithic and Mesolithic remains are mixed. In terms of structures, only the Mesolithic hearths and the graves with skeletal remains are distinct. Due to the rate at which skeletons disintegrate in sandy soil, these must date from the younger period. Dates from the hearths (5300–5100 BC) should not be automatically attributed to the pottery. When dated, charred food remains proved to be from a much later period (4300–4000 BC). This, however, does not exclude the possibility of the presence of pottery from an earlier stage. However, according to the stratigraphy at site S61, pottery associated with habitation from the earlier period is unlikely.

#### *Scatter of the finds within the settlements*

Large amounts of pottery were found at the levee sites. Some 18,000 sherds were collected at S3, originating from 900–1,000 pots. The habitation layer was so complex that it was not possible to make scatter maps for the different phases. Deeper levels had a layered structure, which means that the levee must have flooded frequently. Few finds were made there, due to rapid sedimentation and/or less dense habitation. In places, the surface had been raised with reeds and bundles of vegetation. This could have been done to provide insulation against damp. Initially, this site was probably used occasionally – and for relatively short periods – for fishing or hunting. The scatter of charred cereal grains indicates that cereal crops were processed or prepared from the time of the earliest habitation onward. The upper section of the culture layer is more homogeneous; habitation was denser and had taken on a more permanent character.

S3 can be divided into a southern subsite and a northern subsite. In the southern subsite, a configuration of posts and postholes indicates a rectangular hut with a central hearth. The hut and hearth appear to have been repaired more than once, when the inhabitants returned from a winter location. They may have left some of the pottery there to use on their return.

Other pottery may have been taken with them as they moved around. Large sherds and pot bases were found in trampled areas, but also seem to have found their way into the areas protected by the hut walls. Many small sherds were found to the east and west of the central hearth and outside the rectangle of posts, indicating trampling and dumping around the hearth and/or trampling outside the hut. Outside the permanent hut, there is also evidence of activity around hearths that were not renewed. The northern section of the site probably contains a second, comparable unit that has only been partly excavated.

Sherds from individual pots were found scattered over areas of up to 30 metres. From a vertical perspective, the difference in levels can be as much as 40 cm, and sherds from the same pot have been found in the uppermost as well as the lowermost layer. This should be taken into account when dating a particular layer of a settlement. The vertical displacement of pottery and bones is different to that of stone and flints. The composition and quantities of all the finds – together with the general lay-out of the site – indicates that this was a base settlement.

At site S2 on the large levee, three concentrations of finds can be distinguished, with a series of graves in the northern and middle locations. It is still not clear whether the burials were contemporary or from an earlier period. The number of sherds (7,000, i.e. approx. 300 individual pots) points to the existence of a base camp. There are no posts, postholes or hearths. The number of bone finds was also considerably smaller. This is probably due to the different preservation conditions at this levee, among other things.

At the river-dune sites, the sherds were situated between a large amount of flints, most of which date from the preceding Mesolithic period. This means that these sites remained attractive for occupation for many centuries. However, the number of sherds found was so low as to indicate that the dunes were only used for special purpose camps during the later periods.

#### *The pottery*

The large quantity of sherds found at the S3 levee site has been determinative for the characterizing of the pottery. A quantitative analysis of rim sherds and decorated sherds is presented here. The style of the pottery from the other levees is similar to that from S3. The vessels have a characteristic S-shaped profile and a point or knob base. Some pots also have round bases, but these are difficult to identify from the sherds. Variations on this basic shape were also found. Bowls with a slightly curved profile are rare. Although 90% of the body sherds are undecorated, the number of

individual pots without decoration is between 26 and 32%. The minimal decoration consists of one and sometimes several rows of impressions on the neck or shoulder, one or more rows of impressions on the inside of the pot below the rim, or a row of impressions on the outside of the pot below the rim. Often, the neck/shoulder *and* the rim are decorated. The most common types of impressions are long, drop-shaped impressions formed by pressing a reed or stalk of grass obliquely into the clay. Less common is body decoration consisting of impressions all over the surface or roughening, which can be combined with an undecorated neck and decorated rim.

The pottery has been made using the coiling technique. Most common is thick-walled pottery with a wall thickness of approximately 10 mm, with a temper of rough organic material mixed with varying amounts of grit and/or sand. The organic material often consists of the crushed stalks of grass and other plants. Finer material is also used, for example ash or powdered charcoal. Less common is a temper made only of grit, crushed quartz or sand. The bodies of the vessels are simply finished by smoothing to various degrees, or polishing.

The frequent occurrence of charred food remains and soot on the vessel walls indicate that the vessels were used mainly for cooking. The volume of the vessels varies from less than 1 litre to more than 15 litres. Small pots are rare. The 'standard'-size of cooking vessel, between 1 and 5 litres, is most common, but larger vessels of between 10 and 15 litres are no exception. The larger pots were probably used for celebrations or preserving food. They may also have been used as storage vessels. The various types of pot have different wall thicknesses and decoration, and were made using different types of temper. It does not appear, therefore, that the vessels were produced according to a standard method. The few bowls probably had another use. Repair holes in a pot are an indication that it was re-used.

The differentiation within settlement S3 was studied. The surface decoration is clearly a later feature, occurring mainly in the uppermost layer and in the younger occupation layer that has redeposited into the bed of the creek. Decoration in the form of a row of impressions under the outer rim appears to be a later trend. The occasional perforated knobs occur mainly in the upper section of the vessels, while special decoration and brushmarks occur mainly in the lower section. Pottery in the lower layer generally has thinner walls. This is combined with a slight preference for temper made from fine organic material and grit or sand.

Generally speaking, the features of the pottery

from the river dunes differ in several respects from that found in the levees. The vessels found at the dune sites have a thinner wall thickness and a more refined finish. The characteristic decoration of the levee pottery, and of the thick-walled pottery made with organic temper, is not wholly absent but, relatively speaking, is far less common. Decoration in the form of impressions on the rim occurs more frequently, but decoration on the inside of the rim is less common. This could be explained by differences in date, site function and tradition. The surface decoration, a feature of the later phase at site S3, only occurs in dune site S22–23. This supports the argument for a later date for that site.

Although the pottery is basically uniform in shape, it varies in terms of material, technique, finish and decoration. External influences are present in the pottery from the Swifterbant sites, for example, the few perforated and nose-shaped knobs, and perhaps the bowls that may be associated with the Rössen-Bischeim pottery tradition. Several carinated pot profiles and a single pinched fingerprint on the shoulder of some pots are consistent with this.

#### *Technological research*

Some thirty thin sections from sherds as well from clay samples were examined under the microscope and an X-ray diffraction analysis was carried out. A sample of twenty sherds was also chemically analysed. Diatom analysis was carried out on four sherds. Thermal colour testing was also used to determine the firing temperature.

Four types of temper can be distinguished: temper of mainly organic material (more than 60%), mixed temper (30–60% organic material), temper of mainly grit and/or sand (less than 30% organic material) and temper consisting only of sand and/or grit. Chamotte and/or 'clay balls' were sometimes visible. Different types of clay were used. The pottery was probably fired for a short period of time in an open fire, with the temperature not exceeding 600 °C.

Local clay was used, particularly for the levee pottery. This is an additional indication that the settlement functioned as a base camp. The choice of temper depended on the intended use of the vessel and the availability of raw materials. For pottery produced on site, organic material must have been a more obvious choice for temper than crushed rock. Rock does not occur naturally in the area, which means that either the pot itself or the rock used for the temper came from elsewhere.

The composition of the clay in some of the sherds examined was so unusual that it must have originated outside the region, either in the neighbouring higher

Pleistocene grounds or elsewhere in the Holocene sedimentation area. Vessels probably imported from other locations in the IJsselmeer basin and those from the coastal area are difficult to identify because the clay used in their production will not be demonstrably different from the clay in the Swifterbant area.

Pottery produced from non-local clay is usually of a different type and better quality than the pottery that typically occurred at the levee sites. The difference in quality is due to the fact that the temper contained little or no coarse organic material. Non-local clay occurred more frequently at the river-dune sites. This means that the river-dune sites imported more pottery from outside the area and used relatively little pottery from the local area. This underlines the fact that the dune sites had a fundamentally different position in the settlement system. These differences in the pottery can also be explained by a difference in age. The earlier pottery of the dune sites with no equivalent in S3 may date from a period with an insufficient development of the clay levees, at that time not yet suitable for habitation. The question is whether the levee pottery can be considered representative of the Swifterbant culture as a whole, or whether it reflects some adaptation to local circumstances. From a technical point of view at least, the latter option is supported by the frequent use of grass and reeds as temper and as instruments for making impressions in the clay.

#### *The Swifterbant culture in the Netherlands*

The Swifterbant culture is mainly found in coastal and river areas. The Pleistocene sandy soils have as yet only yielded up some material finds. Three periods can be distinguished: an early period (5100/5000–4600 BC), a middle period (4600–3900/3800 BC) and a late period (3900/3800–3400 BC). In the IJsselmeer basin, finds from the early period originate from the Hoge Vaart site in Flevoland. Settlements from the early period may be present on the Swifterbant river-dune sites, but there are no datings to support this. In the Rhine-Maas area, finds from this period have been made at Hardinxveld-Giessendam, where pottery production began around 5000 BC, but is certainly not older than 5100 BC. Clear southern ‘connections’ are present in the form of Blicquy pottery.

The oldest type of vessel from the Swifterbant culture is the S-shaped pot, sometimes decorated with a row of impressions on top of the rim. The rare nose-shaped knobs and pinched impressions on the shoulder may also belong to this category. Point or knob bases belong to this type of pottery, and round bases may also have been used. The walls are not very thick, and the temper consists mainly of grit.

The middle period is represented in the IJsselmeer area (Swifterbant area and the North-East Polder, P14), and in the Rhine-Maas area at Hazendonk, Brandwijk and Bergschenhoek. Pots dating from this period are mostly decorated with one or more rows of impressions on the neck/shoulder, and/or a row inside the rim, sometimes with impressions on the rim itself. The walls are slightly thicker, and large amounts of organic material are used in the temper. Towards the end of the levee occupation at Swifterbant, around 4000 BC, pottery was decorated all over the surface with impressions or roughening. The interior was highly smoothed, and quartz and grit were used in the temper. This can be seen as an indication of contacts with southern cultures, since these features are also characteristic of the Hazendonk group and southern Swifterbant culture. The transition to this style is evident at Swifterbant in Flevoland, as well as in the Rhine-Maas area. However, the environment in Flevoland became too wet for habitation and the style only developed further in the Rhine-Maas area. A new culture group, Hazendonk 3, developed there in the late period in which features of the Michelsberg culture and the Swifterbant culture were combined. In both geographic and cultural terms, the Vlaardingen group succeeded this group.

Sites from the late period, such as Schokkerhaven, are rare. The pottery is characterised by minimal decoration and the vessels have a more carinated profile. A new feature is the funnel-shaped neck which was the precursor of the Funnel Beaker (TRB) culture. The sherd of Weerdingen, found in the sandy soils of Drenthe, is consistent with this. The Wetsingermaar site in Groningen is a recently discovered site consisting of a sandy elevation under Holocene sedimentation. Sherds found at this site are indistinct, but date from the late Swifterbant or early Funnel Beaker period from approximately 3500–3400 BC. During this period, the Swifterbant levees became virtually uninhabitable, and were at best suitable for special seasonal activities. Communities had to move onto higher dunes or to another area.

#### *Pottery of neighbouring cultures*

Apart from the sedentary farming communities of the Linear Pottery and Rössen settlements, there were also groups descended from nomadic Mesolithic hunter-gatherer groups. As a result of cultural exchange, they gradually adopted a (semi-)sedentary way of life partly based on agriculture. All these groups produced pottery with an individual style, but also with common features such as the point or knob base. The common features suggest contact or ‘ethnic’ relationships between the groups. This pottery occurs in the Ertebølle

culture in Denmark, at Ellerbek/Rosenhof and Húde on the Lake Dümmer in North Germany, and further east in the river and lake areas of northern Poland and Russia. ‘Ceramic Mesolithic’ pottery has been found in Belgium at rare sites, including Weelde Paardsdrank and Doel ‘Deurganckdok’, of which that of Doel ‘Deurganckdok’ is comparable to early Swifterbant pottery. Swifterbant pottery also shows similarities with Roucadour pottery, a Meso-Neolithic culture in Southwestern France situated inland next to the Cardium communities on the Atlantic coast.

The idea of producing pottery may have been communicated from the Linear Pottery culture. However, the very different shape, decoration and production method point to independent development. The production method is probably based on basketry and is completely different to Linear Pottery. The S-shaped vessels with point bases differ from the range of shapes used in the Linear Pottery culture and its successors. This may be inherent to the production method, but may also be just a ‘symbol’. Point-base vessels appear to be the best shape for transporting in a logboat. Apart from the La Hoguette pottery, and in contrast to the rich decoration of Linear Pottery, the ‘choice’ was made in favour of no decoration at all, or minimal decoration in the form of several rows of impressions on the body or rim. This may be related to the decorative bands in basketry, and may have a symbolic meaning as well.

Swifterbant pottery is a regional variant that apparently combines features of Ertebølle with some from Rössen-Bischheim pottery. The pottery of the Ertebølle culture is characterised by the same type of point-base vessel with minimal decoration in the form of impressions on the rim, and is also made of clay coils. However, pottery with particular decoration was also used in this culture. The following features possibly derive from Rössen-Bischheim ware: better quality and polished pottery with impressions on the rim, the single ‘pinched’ fingerprints on the shoulder and the appliqués. The row of impressions on the shoulder occurs in both cultures. The idea of introducing decoration under the rim is also present in the Rössen culture, and is even a common feature of bowls. The question is whether the introduction of this simple form of decoration required an external influence or whether, as mentioned above, this idea evolved spontaneously within the culture. The influence of the Michelsberg culture extended to the area south of the main rivers.

At the Húde I site on the Dümmer in North Germany, a ‘Húde-Swifterbant horizon’ has been distin-

guished with characteristic point-base vessels and decorative impressions on the rim. However, the situation there is very complicated due to the diffuse stratigraphy with remains of different cultures, which means that this pottery cannot be distinguished in stratigraphic terms from the Rössen, Bischheim and Funnel Beaker pottery. The characteristic decoration from the Swifterbant levees and the characteristic temper of organic material occur very rarely. Other similar sites in northern Germany include Rosenhof and Hamburg-Boberg. At the latter site, amid Rössen and Ertebølle finds, surface decoration has been discovered that is reminiscent of sherds from late-period Swifterbant sites.

In Denmark and northern Germany, the cultures were evolving towards the Funnel Beaker culture. It is not possible to trace the successor of the groups from Flevoland. It is nevertheless a fact that pottery from more southerly sites has more features that are consistent with contact with the Michelsberg, and that the Hazendonk 3 and Vlaardingen cultures evolved there. To the north of Flevoland, there are incidental indications that Swifterbant pottery was evolving towards the Funnel Beaker culture. Finds from this period are so rare in the sandy soils of Drenthe that the question remains as to precisely what happened before the more developed West Group of the Funnel Beaker culture appeared.

### *Conclusion*

Most of the pottery of the hunter-gatherer communities that adopted an agrarian and/or more sedentary way of life was used for cooking. Eating patterns must have been transformed by the introduction of agricultural crops and by cooking in pottery vessels. When food is cooked, fats and other nutrients in the food are retained and the food is more digestible. It was now possible to use a wider range of food sources. Pottery can also be used for the preservation of food. Another advantage is that pottery vessels were better for storing foodstuffs. Once communities had made the transition to a more sedentary way of life, and began to use pottery for a variety of purposes, more flat-based vessels were produced, possibly because there were now more flat surfaces in houses, which meant that point-base vessels were impractical. However, point-base vessels were still found in some cultures, such as the Michelsberg culture. It is possible that the idea that vessels with point bases were easier for transport by logboat was transmitted from the hunter-gatherer period.

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