

Kainsbakke A47:

A Settlement Structure from the Pitted Ware Culture

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INTRODUCTION

Since the 1950s the Pitted Ware Culture has been important to research on Danish Neolithic cultures, especially with regard to the debate about the relationships between the Funnel Beaker and Single Grave Cultures (Becker 1950 and 1954). The basis for any evaluation of the Pitted Ware Culture in Denmark has almost exclusively been the type objects, the cylindrical blade cores and the tanged points. The coastal distribution of these types, and parallels with Swedish finds, have led to the Danish Pitted Ware Culture being regarded as a pure forager culture – either a foraging facies of local

farming cultures, or a “foreign” intrusion from the Swedish group of the Pitted Ware Culture (Nielsen 1979, Malmros 1979, Davidsen 1980 p. 39).

The various views of the culture are closely bound up with the unsolved chronological problems the culture presents. There are no certain finds enabling cross-dating between the Pitted Ware and Funnel Beaker Cultures, and the contacts between the Pitted Ware and Single Grave Cultures all relate to the later phases of the Pitted Ware Culture. The Funnel Beaker Culture sites that have produced Pitted Ware points of earlier types have mainly produced material from the Funnel Beaker Middle Neolithic (III) IV – V, and various ceramic

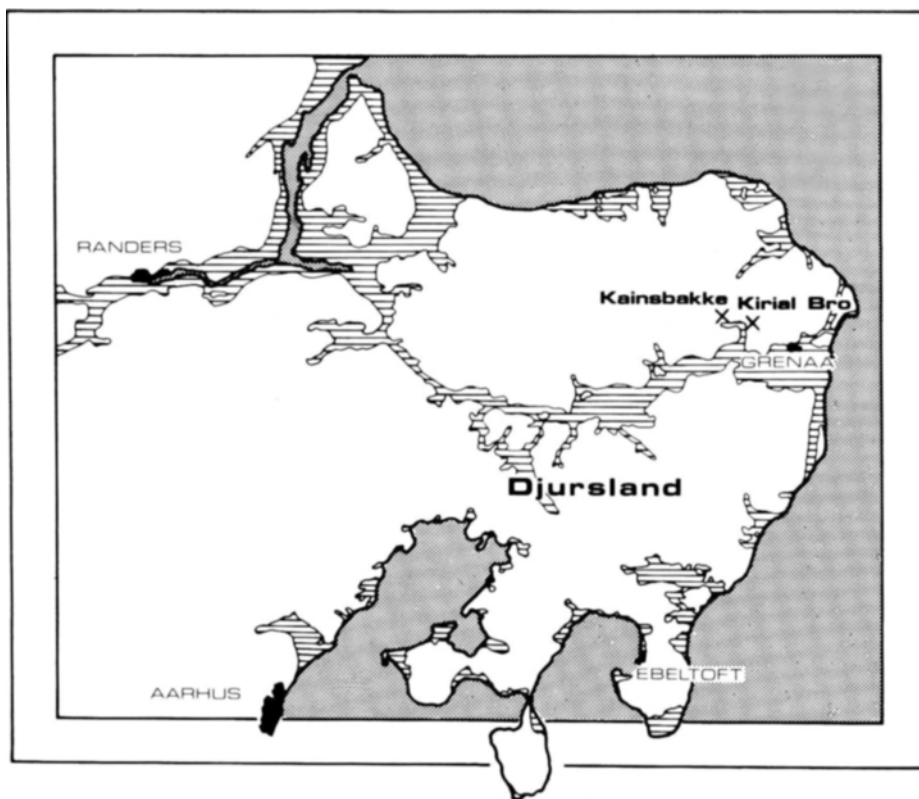


Fig. 1. The location of the sites Kainsbakke and Kirial Bro. The extent of the sea in the Stone Age is indicated by the hatching.

parallels seem to point in the same direction. The most widely held view today is that the Pitted Ware intrudes at that time, and continues until about the Ground Grave period of the Single Grave Culture (Becker 1980 fig. 6).

This view is mainly based on finds in which the Pitted Ware appears as only one element among several others from both the Funnel Beaker and Single Grave Cultures. So far, none of the finds from the earlier part of the Pitted Ware have been "pure" settlements permitting a general view of the culture, and where organic remains have been preserved it has not been possible to use them to evaluate the subsistence base of the culture. It follows that it has not been possible to obtain radiocarbon dates from material definitely belonging to the Pitted Ware Culture.

The basis for discussion and debate has thus often been uncertain and speculative, the subject being taken up from time to time without a solution being any nearer. One of the more recent contributions states that conclusive information about the Pitted Ware Culture will only be obtained from pure settlements with well preserved faunal material (Becker 1980 p. 28ff).

Such a settlement has now been discovered on the Djursland peninsula in eastern Jutland. A varied Pitted Ware assemblage has been recovered in sealed pits. The new, conclusive information available from this material will be exemplified in the following through the presentation of one of the excavated features.

THE SETTLEMENT SITE

The Kainsbakke settlement lies near Kirial town, about 5 km west of Grenå (1). It lies on a low rise about $\frac{1}{2}$ km² in extent, which in the neolithic was partly surrounded by water, in the form of a branch of the recent Kolindsund, to the south. Besides this, waterborn access to the Kattegat would have been possible through an inlet approaching from the north east (fig. 1). Traces of settlement activity were observed from the highest point of the rise at 11 m above sea level down to the 7 m contour. Beach deposits were observed at about 4.5 m.

The settlement has been known for several years, due to the very large number of artifacts on the surface. The surface collections show no admixture of other neolithic elements, either older or younger, and 86% of the tanged points are of A types. The surface finds thus showed that the settlement must be chronologically

limited to the older part of the Pitted Ware Culture.

Repeated excavations have been carried out on Kainsbakke since 1979 (2). These have been concentrated in a small area on the southeast side of the rise, because the ploughsoil here showed concentrations of cultural remains and small patches of shell (Rasmussen and Boas 1980). 526 m² have been excavated in all. This revealed a cultural layer, preserved in patches, 13 large and small pits, a large number of postholes, and a single fireplace. The postholes did not form any evident structure, and some of them could possibly derive from later iron age settlement on the site.

The largest pit so far found was that furthest to the south on the gently sloping ground surface. This pit (feature 47) is so far only half excavated, but has already produced a large and varied cultural material. It must be emphasised that the objects from it have only been subject to preliminary analysis. The material, in particular the large amounts of pottery, is however of such importance that the preliminary results may contribute to the continuing debate (3).

PIT NO. 47

The pit is rectangular, measuring 5.7 m east-west, 4.5 m north-south, and about 1.1 m in depth. Even on its surface, a dense scatter of finds was visible, and it could be seen that organic material was preserved because of the presence of shells.

All finds were recorded within $\frac{1}{4}$ m² units and measured in vertically. Artifacts, apart from the large number of scrapers, were measured in both horizontally and vertically. All the earth was wet sieved through a 1mm mesh.

The sides of the pit were cut vertically down (fig. 2). The basal layer consisted of mixed sand and soil (layer 5). Out toward the sides, this was partly covered in a symmetrical manner by a dark layer containing charcoal (Layer 8 – possibly collapsed, burnt wood). In and on this layer were several stones up to a metre across – one of these turned out to be the lower stone of a large quern. Above layer 8 and towards the sides were layers of pale material consisting in part of the subsoil material (layers 5 and 6). Layer 6, which had only a slight admixture of earth, is interpreted as collapse from the side and upper edge of the pit. Layer 5 consisted here of pale sand with a little soil. Together with the rather darker

part of layer 5 (the basal layer proper) it formed one continuous layer with very few cultural remains (pottery, flint, bones, cooking stones, and a few cockles and mussels in its western part).

The primary function of the pit must be determined from the layers described here. The flat bottom, vertical sides and rectangular shape suggest that the feature may represent a sunken hut. Layers 5 and 7 must have formed in the period between collapse of the possible house and its secondary re-use as a rubbish pit. Layer 4, which like layer 6 was nearly pure sand, could be a part of the material originally dug out to make the pit; possibly this was thrown back in immediately before the final infilling, because neither humus formation nor infallen soil was observed between this layer and the shell layer above it.

The settlement material, in the form of bones, antler, shells, pottery, flint etc., was deposited above this in two compact layers with almost no soil (layers 1 and 3). This rubbish seems to have resulted from several different depositional events – which were not, however, sufficiently separated in time for layers of fill to accumulate between the layers. In other words, deposition seems to have taken place relatively fast.

In layer 3 the shells were very dense. Mussels (*Mytilus edulis*) were concentrated in the lower part along the east and west sides, while oysters (*Ostrea edulis*) were visually predominant in the rest of the shell material. A layer of fishbones was found in the western part of the pit, in the upper part of layer 3 and in the bottom of the sand and soil layer 10; the layer was about 5 cm thick, projecting 1.5 m into the pit.

Layers 3 and 1 differed from each other only in that the earth in layer 1 was darker, and the shells here were not so densely deposited. The transition between them was formed by a 20 cm deep layer of sand and humus, with a concentration of larger bone fragments particularly towards the centre of the pit. Parts of several large storage vessels lay in the upper part of layer 1.

It is evident from the foregoing that no infilling of earth took place between the formation of layers 1 and 3 (the rubbish layers). No typological difference was observed during excavation between the finds from the top and the bottom of the pit. The bones did not seem to have been eroded before burial. The broken edges of the potsherds were sharp showing that they had not lain on the surface (where they would be subject to erosion) before deposition in the pit.

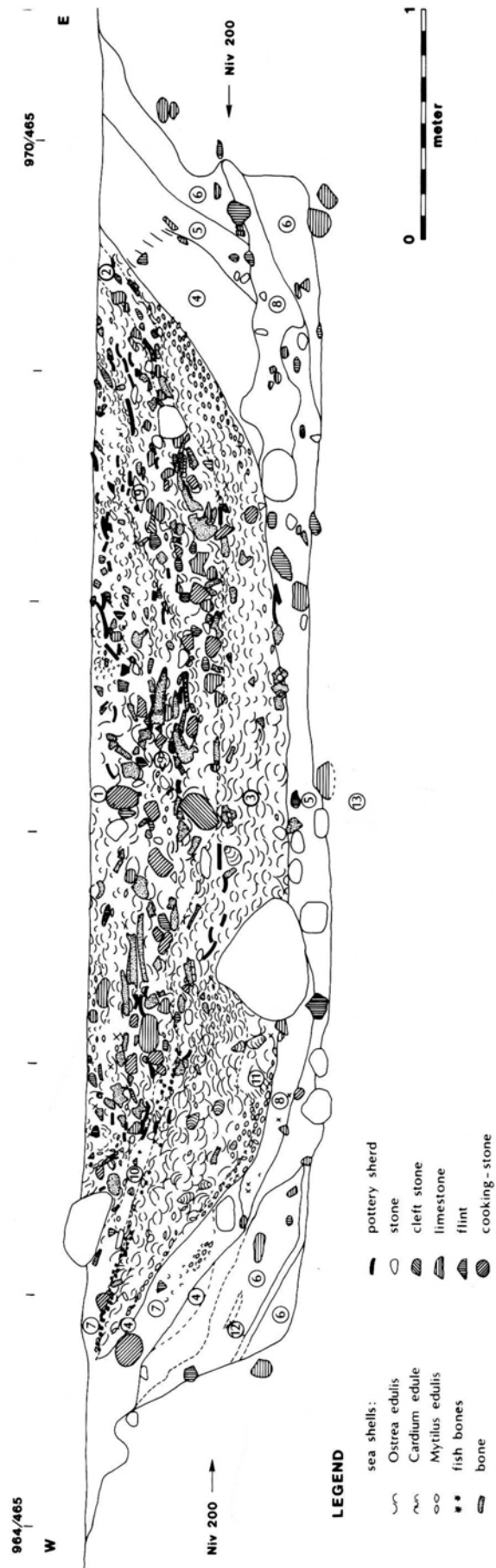


Fig. 2. Cross-section of the pit A 47. Description of layers in the text.

Everything suggests, therefore, that the pit was quickly filled, so that the finds can be regarded as a pure assemblage and the rubbish layers as closed finds.

THE FINDS

Pottery: About 5000 potsherds were recovered from the half pit. About 250 pots are represented by larger fragments or rims, 200 of them ornamented. To this must be added fragments of 3 clay discs and 2 modelled objects.

The raw material may be described as hard and compact. The surface is usually smooth, with a yellowish or reddish colour. A single sherd had a shiny, bright red surface. The tempering is crushed granite, sometimes relatively large pieces. The surface of only a few of the pots shows any trace of the tempering by e.g. being uneven. Some sherds are blackened, and several have carbonised food residues on their inner surfaces.

The rims are straight or evenly rounded. About 20 basal sherds were found over and above those in complete pots. The bases usually have a small flat or convex standing surface.

The commonest pot type has a weakly concave upper part. The transition from neck to belly may be sharp or rounded, and the diameter of the pot at this point is usually a little greater than that at the mouth. The height of the lower part is generally greater than that of the upper, and the basal standing surface is relatively small and flat or slightly convex (fig. 3-4).

At least 50 pots of this type are definitely present. They are found in sizes ranging from under 0.20 m to 0.60 m in diameter at the mouth. More than half are ornamented. Two small pots can be seen as representatives of the type with a so-called smoothed profile (Malmer 1969 p. 82, Welinder 1969-70 fig. 13) (fig. 5:6).

Apart from this pot type some examples of bowls are also present. At least 3 bowls had convex sides (fig. 5:5). One of these is ornamented (fig. 4:8). There are also a few sherds from open bowls with straight sides.

Single examples of the following pot types are also present in the material: S-profile beaker with mouth diameter greater than that of the belly (fig. 5:4); beaker with conical sides and a cordon forming a foot around the base (fig. 5:2). Both these pots are ornamented.

Ornamentation: the provisional grouping of ornament types follows Malmer's system so far as is possible (Malmer 1969).

Pits are present on sherds from at least 100 different pots, including 2 large and 1 small of which large portions are preserved. The pits may be: *Finger pits*, which occur on at least 4 different pots (fig. 3:1). They appear in single rows, double, offset horizontal rows, or in 3 rows forming inverted triangles, immediately under or a little under the rim, at the transition from neck to belly, or in combination with these as a single row on the middle of the neck. *Impressed pits* may be made by a twig, bone or snailshell, and occur on about 80 different sherds and larger sections of pots. The pits may be superficial, or up to 0.5 cm deep. They occur most commonly in double, offset hori-

zontal rows immediately under the rim or at the transition between neck and belly. Besides this, a few sherds have single or double rows a little below the rim. The pits can also form part of complicated designs, also in combination with other forms of ornamentation, but most commonly as horizontal rows midway up the neck.

A group of 16 sherds has small impressed pits, under 0.3 cm in diameter. They form double or multiple horizontal rows, inverted triangles or other complex designs (fig. 3:4; 4:3, 9). Two of these belong to the category Malmer calls "comb stamp with two branches" (Malmer 1969 fig. 24).

Oval impressions occur on sherds from about 25 different pots. They may be short and wide or long and narrow, and sometimes set at an angle. They are arranged in offset, double horizontal rows under the rim and at the belly/neck transition. They also occur in multiple rows and forming complicated designs, as well as in multiple rows in combination with pits (fig. 4:4).

Triangle impressions occur on sherds of at least 13 different pots. They are arranged in offset, double horizontal rows immediately under the rim and around the belly/neck transition (fig. 3:3).

Crescent shaped/vertical curved impressions occur on sherds of at least 14 different pots. They are arranged in simple (at times offset) horizontal double rows immediately under the rim and around the belly/neck transition. They can be combined with rows of pits midway up the neck (fig. 4:1).

Horizontal curved impressions appear on 8 sherds. They are arranged in double rows. The impressions usually nearly join up so that the ornamentation forms wavy lines immediately under the rim. A few approach horizontal zigzag in appearance (fig. 4:4).

Horizontal zigzag appears on sherds of at least 7 different pots. They form connecting horizontal single rows immediately under the rim and at the neck/belly transition, as well as complicated horizontally and vertically arranged designs. One pot has a combination of vertical and horizontal zigzag (fig. 4:2). This ornamentation can be carried out using a *Cardium* shell.

Vertical zigzag appears on sherds of at least 30 different pots. The decoration is often divided into three, forming a reverse Z, and is applied with a *Cardium* shell. It is arranged in single or multiple horizontal rows immediately under the neck and around the belly/neck transition. A single row appears a little below the neck on a few sherds. On 3 sherds it forms a complicated design (fig. 5:3). On the pot in fig. 5:2, the cordon surrounding the base has vertical zigzag.

Other ornamental types. About 25 sherds and 2 nearly complete pots have decorations which do not immediately fit into any of the above categories. Rows of lozenges in which each alternate one is filled with oblique lines of triangle impressions, appear on one pot (fig. 5:2), where they form a surface-covering decoration, combined with vertical zigzag on the cordon surrounding the base. The pot in fig. 5:4 is decorated with horizontally arranged rectangles, placed in double rows one above the other, from immediately under the rim to somewhat below the belly/neck transition. On the pot in fig. 4:5, the individual pits midway up the neck have been embellished with arms, so

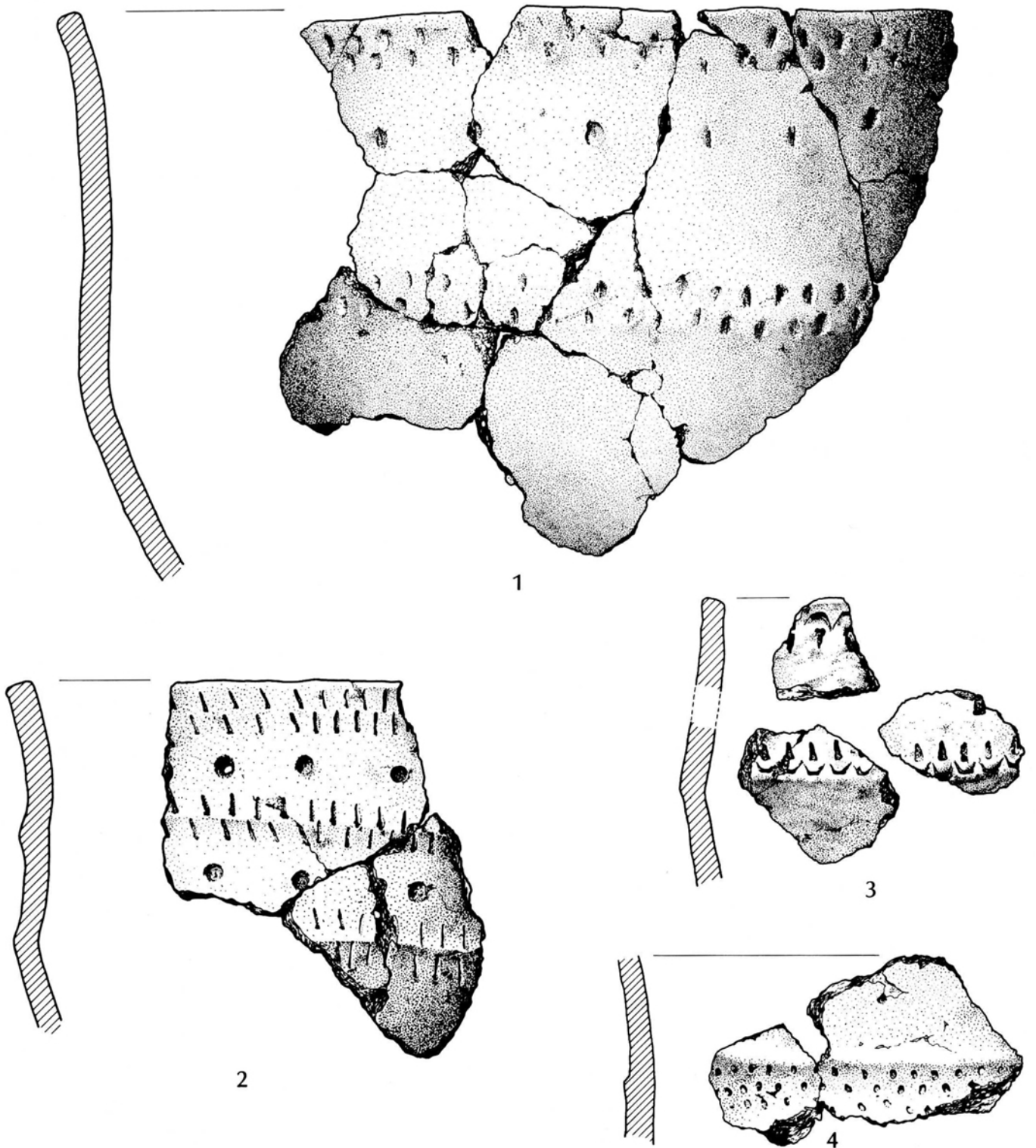


Fig. 3. Kainsbakke A 47. Pottery (drawn by Jack Bacher). 2:5.

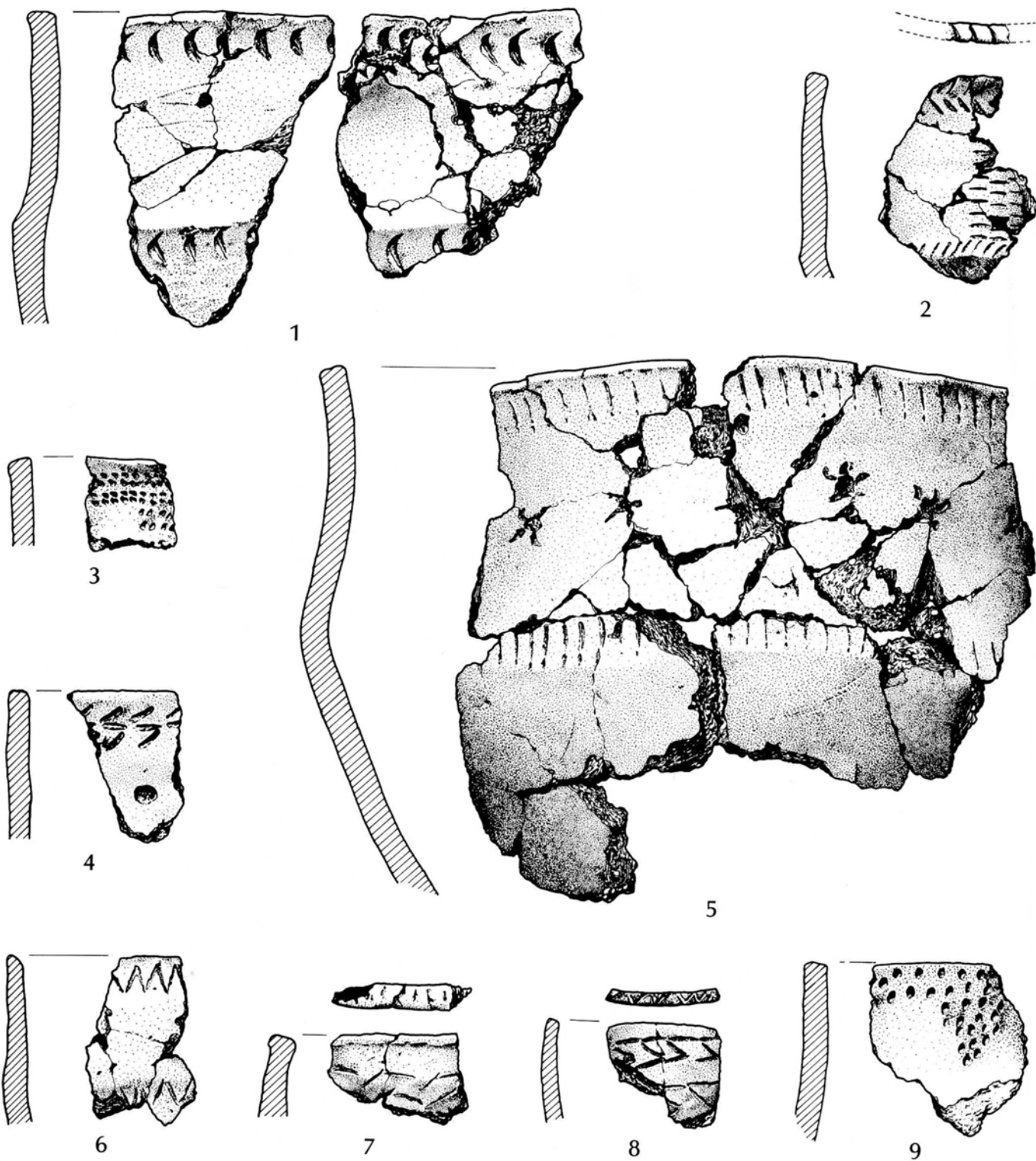


Fig. 4. Kainsbakke A 47. Pottery (drawn by Jack Bacher). 2:5.

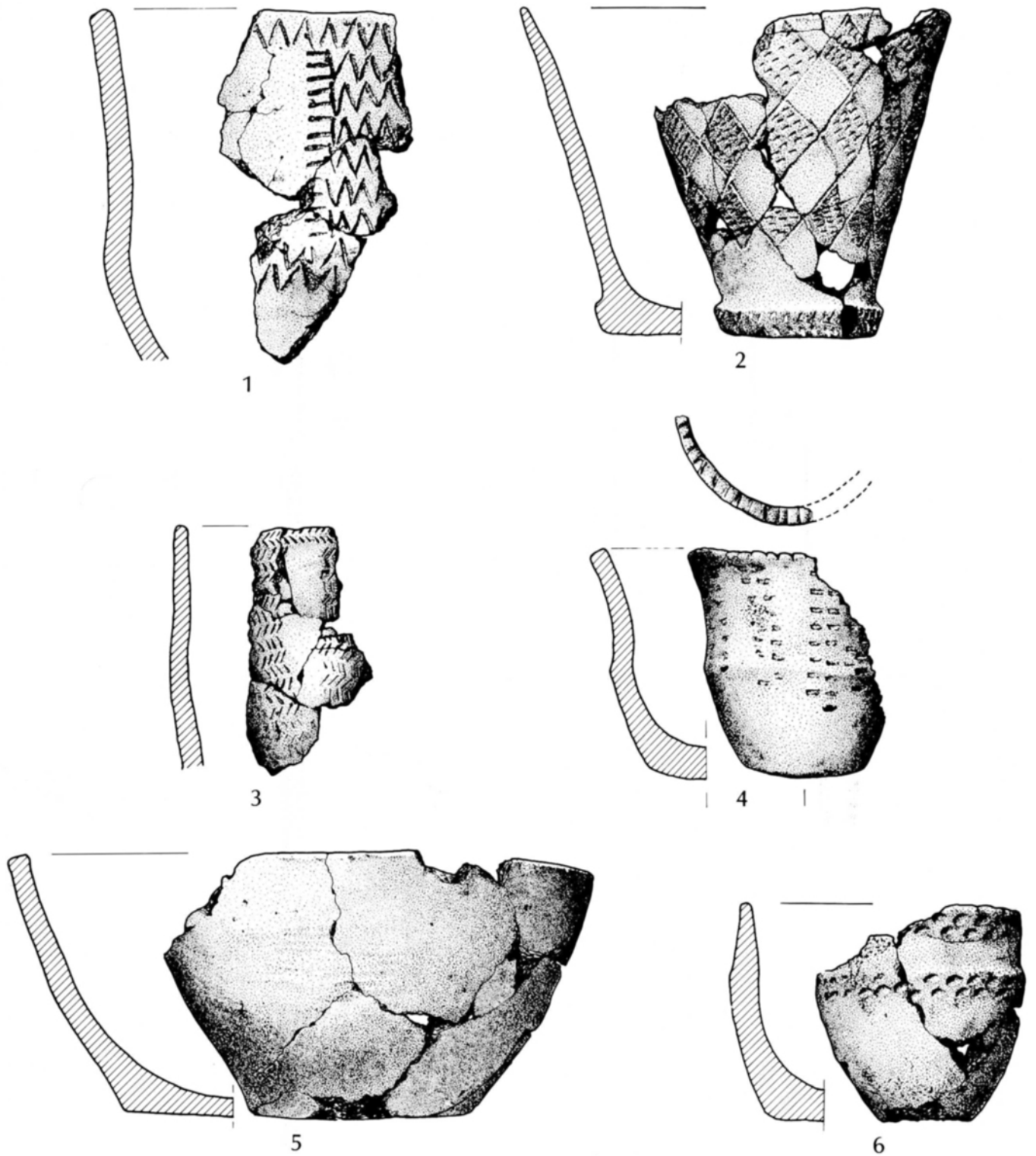


Fig. 5. Kainsbakke A 47. Pottery (drawn by Jack Bacher). 2:5.

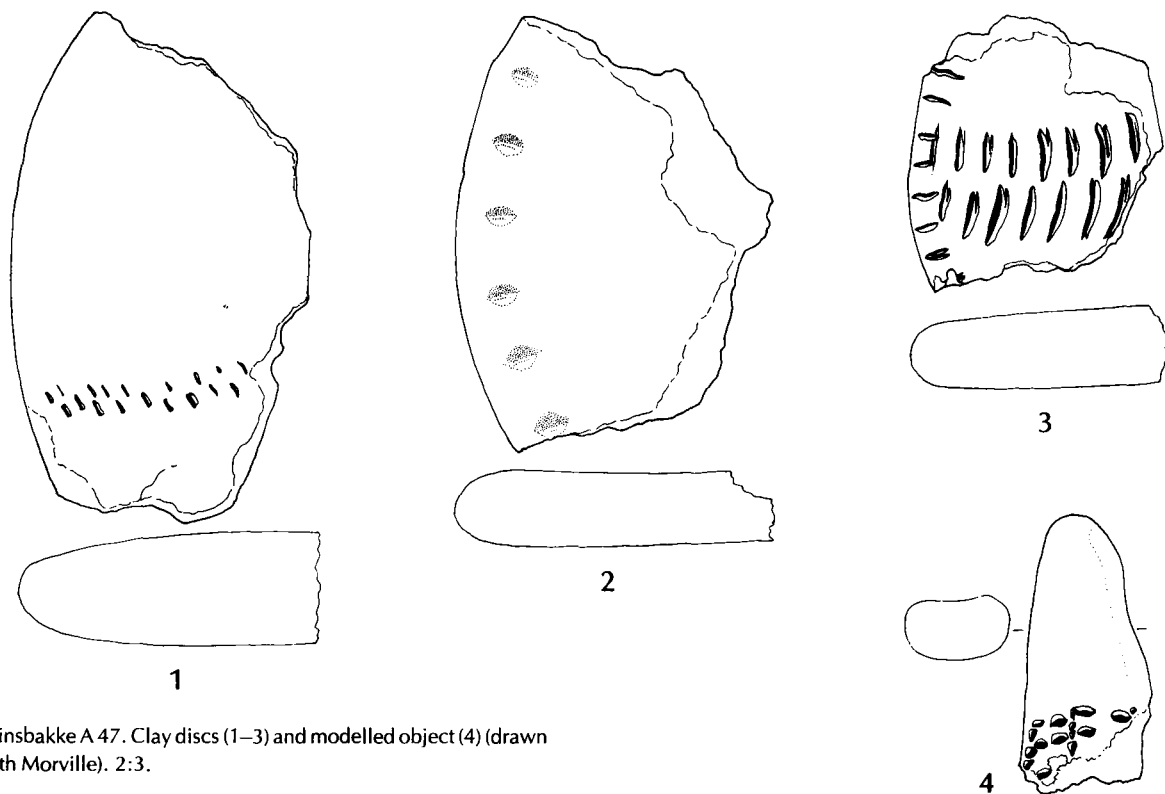


Fig. 6. Kainsbakke A 47. Clay discs (1–3) and modelled object (4) (drawn by Elsebeth Morville). 2:3.

that a swastika-like design results. Finally, one sherd has a faintly scratched rectangle in combination with a double pricked line under the rim.

Rim ornamentation appears on several rim sherds, in the form of straight, oblique and crescentic impressions, and also as zigzag and finger impressions.

The most common ornamental type is therefore round pits. Together with oval and triangular impressions (also relatively common), they are the most frequent decoration on large pots with rim diameters of over 0.30 m. Furthermore, pits are often combined with other motifs.

Next to these decorations vertical zigzag forms the most common type. Both vertical and horizontal zigzag are common on pots of medium (rim diameter 0.20–0.30 m) and small size (rim diameter under 0.20 m).

With the exception of the special cases mentioned above, all the ornamental types occur on pots with lightly concave neck, more or less prominent neck/belly transition, and relatively high lower part with small standing surface. Most commonly, the decoration forms horizontal rows immediately under the rim, and again immediately above and/or below the neck/belly transition. Apart from this it is also common for a row of quite widely spaced pits to occur on the most constricted part of the neck in addition to the above-mentioned types. Almost all decorative types also form parts of more complicated motifs such as inverted triangles, vertical and horizontal conjoined rows etc. Complicated motifs are mainly found on medium and small pots.

There is thus a distinction between coarse and fine pot types in the form of large, less decorated pots on the one hand and smaller, more decorated pots on the other.

Clay discs: Parts of at least 3 clay discs were found. The one shown in fig. 6:1 has a diameter of 0.22 m, a maximum thickness of 2.2 cm, and an edge thickness of 1.1 cm. There are traces of a hole, placed off-centre. The disc has a radial ornamentation consisting of two offset, slightly curved rows of short, oval impressions. The one in fig. 6:3 has a diameter of about 0.14 m, and a thickness of 1.6 cm. This also has a radial decoration, consisting of two offset rows of slightly curved impressions. Along the edge is a row of short, oval impressions. Fig. 6:2 has a diameter of about 0.16 m, and a thickness of 1.4 cm. Along the edge is a row of faint finger impressions.

Modelled objects: Two fragments of fired clay can be interpreted as such. One is an object with two slightly flattened sides, one of which is decorated (fig. 6:4). The other is an irregular hemispherical fragment with oblique strokes on one slightly flattened surface. The first-mentioned could be interpreted as an animal head, or as the pointed lower end of a clay idol. The second one could be part of a clay bead (Janzon 1983 fig. 8).

Flint: The excavation produced a large quantity of so far unsorted blades and waste flakes. The worked material is dealt with along the lines suggested by Malmer (1969). Tool types are distinguished as follows:

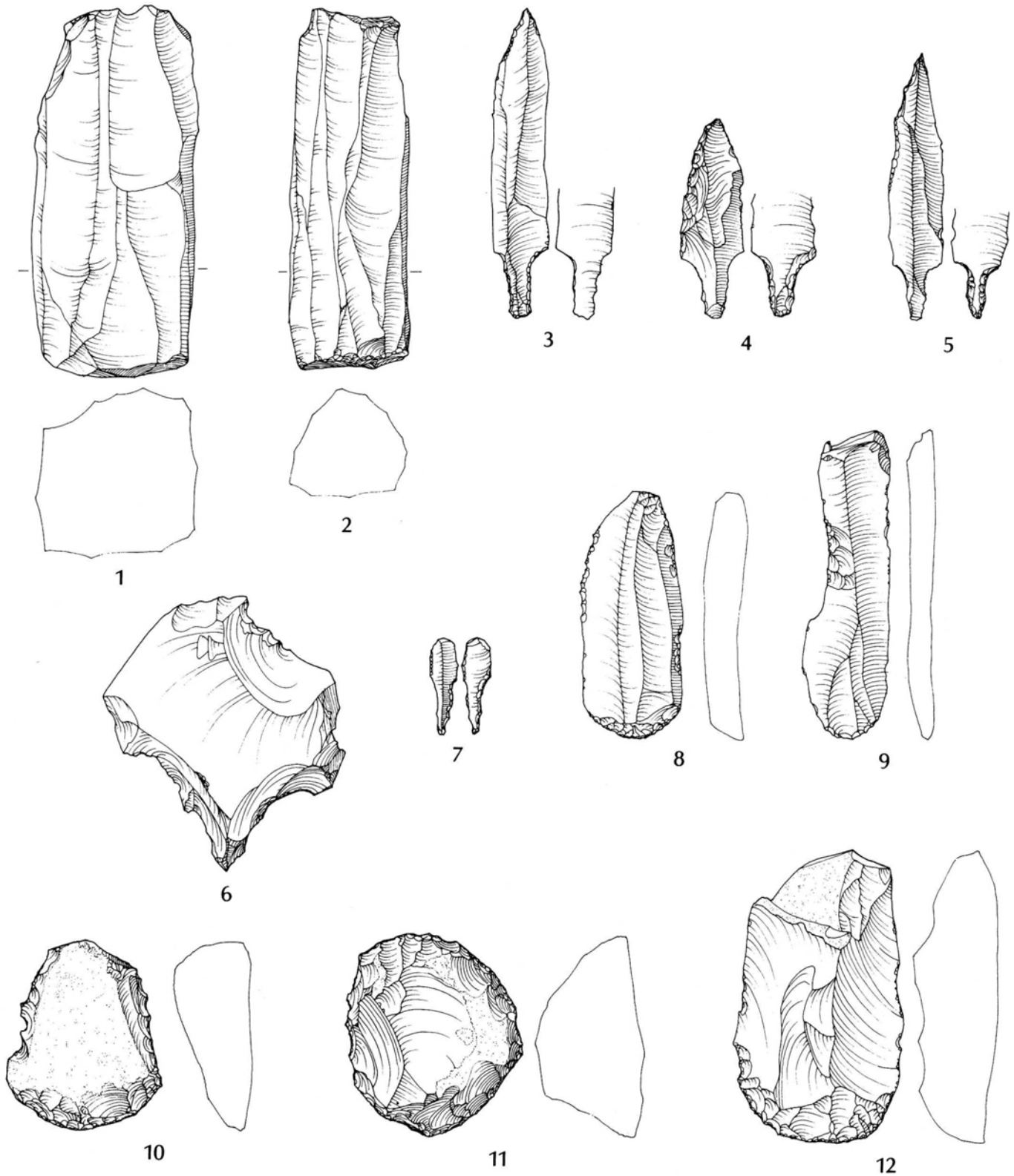


Fig. 7. Kainsbakke A 47. Flint tools: Cylindrical blade cores (1–2), tanged points type A1 (3) and A3 (4–5), flake borer (6), drill point (7), blade scraper (8), blade burin (9), and flake scrapers (10–12) (drawn by Elsebeth Morville). 2:3.

Cylindrical blade cores	46 examples
Tanged points	14 examples
type A1	3 examples
type A2	2 examples
type A3	5 examples
Blade borers	1 examples
Burins	3 examples
Scrapers	244 examples
Flake borers	3 examples
Drill points	2 examples
Polished thick-butted axes, fragments	6 examples
Axes roughouts	7 examples
Chisels	1 examples

The tanged points (fig. 7:3–5) are formed by 30% type A1, 20% A2 and 50% A3. Four points cannot be more precisely determined within type A. A3 type points are thus predominant.

Of the scrapers, 42% are round, 48% oval and 9% are on blades. Oval scrapers are thus slightly predominant, while blade scrapers are in a minority. Both oval and round scrapers typically have steep edges and angled surfaces.

The three burins are all angled burins on breaks.

The six fragments of thick-butted axes are all polished on the broader sides. Butt indices of 76% and 79% fall within the limits for Valby axes (Becker 1957 p. 15). The fragments are unfortunately in such bad condition that measurement of the angle of the narrow sides is difficult, so they cannot be placed in relation to types A and B (Nielsen, P.O. 1977). The same holds for the 7 axe roughouts.

Stone: Large numbers of hammer stones occur (these have not yet been counted). One whetstone has been reconstructed from three fragments, found in different places in the pit in the lower part of layer 1.

Two fragments of greenstone axes were found. One of them (fig. 8:3) has sharp corners between the broad and narrow surfaces; the narrow surfaces are concave but the butt is not. It corresponds to Malmer's type A2 (Malmer 1975, p. 84). The other also has sharp corners between the broad and narrow surfaces, but neither narrow sides nor butt are concave. This corresponds to Malmer's type B (Malmer 1975 p. 84).

Bone and antler artifacts:

Bone:

Harpoon, fragment of basal end	1 example
Points	3 examples
Cylindrical beads	8 examples and 20 fragments
Antler:	
Pressure flakers	3 examples
"Knives"	2 examples

Part of a red deer antler was also found; all the tines have been removed, some by ring cuts and some by blows. The harpoon fragment is made from a cow metatarsal, is 6 cm long, 2.5 cm wide at the base and 3.2 cm wide across the hole for attaching the line. It has a biconical cross section with a diameter of from 0.7 to 1.2 cm. The indentation (cut to make the barb) forms a

shoulder at the point of transition from the base. The hole for the line is next to this, bored through from the flat surfaces, asymmetrically in relation to the midline (fig. 9:3).

One of the points is made on a red deer metatarsal with part of the articulation preserved. It has a length of 8.4 cm. The two others are made on chance fragments.

The cylindrical bone beads are on average 5 cm long, and are made of bird bone. There is a clear difference between finished and unfinished examples, in that the former have polished surfaces. The 20 fragments were found together with a fragment of a bird limb bone.

The two "knives" are 13.1 and 16 cm long, and both have a diameter of 2.7 cm. They are made of red deer antler tines, and are both curved. The edge is formed by flattening the concave edge to form sharp angles and a sort of chisel edge. The other ends of both show traces of ring cutting, and one also has a hole bored in the flat end surface (fig. 9:1).

The three pressure flakers are all tines of red deer antler. They have lengths of 14.7 cm, 15.1 cm and 14 cm, and diameters between 2.6 cm and 3.4 cm. They all have traces of ring cutting at the basal end. One is hollow along most of its length; this fragment was in very bad condition at the time of excavation, so this may be due to natural causes (fig. 9:2).

Worked shells: 2 cockle shells, one of them fragmentary, are perforated, and might have been used as personal ornaments (fig. 9:4).

Unworked bone: 20,000 fragments were recovered, including relatively many large fragments, and about 5 litres of bones of fish and small animals.

The analysis now in progress has demonstrated the presence of domestic cow and pig, sheep, dog, horse, roe deer, red deer, aurochs, brown bear, wild pig, grey seal, greenland seal, fox, beaver, badger, water rat, mouse, human being, various birds, herring, eel, garfish, cod, thin-lipped grey mullet, mackerel, plaice or flounder, 8 marine and 5 terrestrial snail species, oysters, cockles and mussels (4).

Many of the bones have cut marks. Almost all the bones are deliberately broken, many of them for their marrow.

Particularly noteworthy are three crania, four lower jaws and a humerus of brown bear, which form what is so far the latest find of this animal from a settlement (Richter in prep.). Concentrations occurred in several cases of particular bones from particular species, such as horn cores from domestic and wild cattle, and lower jaws of pig.

The largest bone elements were most concentrated near the centre of the pit between layers 1 and 3.

Unworked antler was represented by only one half of a roe deer antler.

The remains of probably two humans lay in the middle of the pit, immediately east of a large granite boulder in near the section near the bottom of layer 3. The bones were to some extent grouped together; further parts may lie in the unexcavated part of the pit.

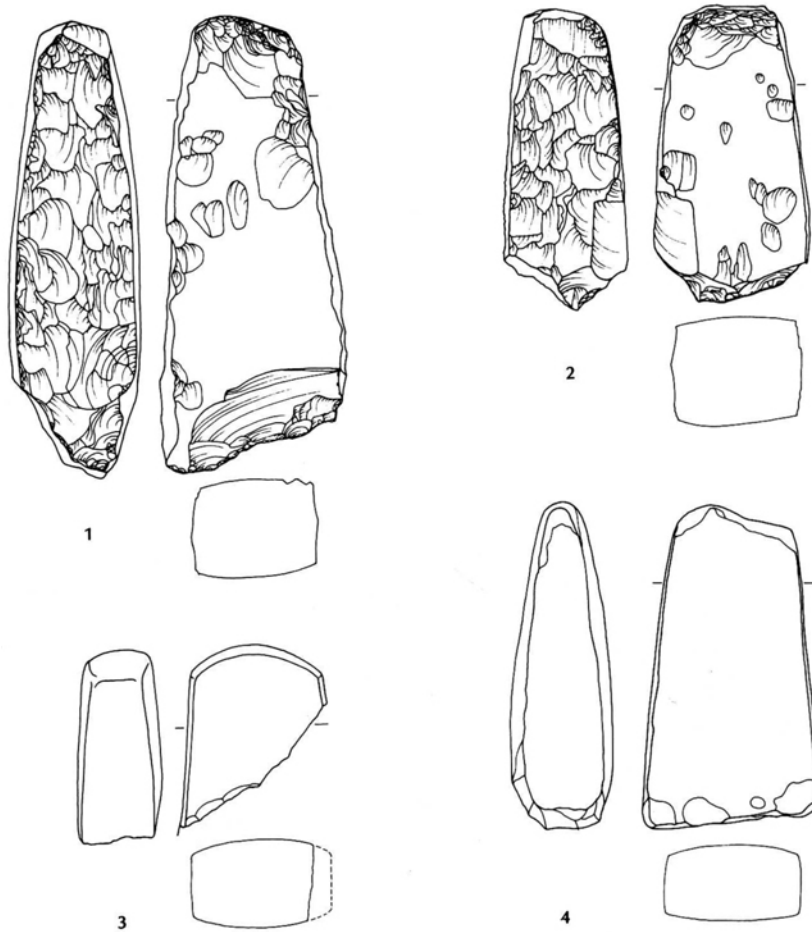


Fig. 8. Kainsbakke A 47. Flint axes (1–2) and greenstone axes (3–4) (drawn by Elsebeth Morville). 2:5.

RELATIVE DATING WITHIN THE PITTED WARE CULTURE

The proportions of scrapers and points from feature A 47 differ from those in material from other parts of Kainsbakke. The other settlement material had a strong predominance of type A3 tanged points, round scrapers were more frequent than oval ones, and blade scrapers were rare (Rasmussen L.W. and Boas 1980). In feature A 47 type A3 tanged points predominate only slightly, and oval scrapers slightly outnumber round ones. The rarity of blade scrapers agrees with the other material. The small number of tanged points means that more finds from the other half of the pit could easily change the proportions. The division of scraper types may reflect particular activities, the results of which would inevitably be more clearly visible in a pit than in a widespread cultural deposit.

With these reservations, a comparison with the Jonstorp settlements in Sweden reveals the following: there are more A3 tanged points in feature A 47 than at RÄ, but no B or C points as at the later M2 and M3. The scraper proportions correspond to RÄ in the slight predominance of oval types, but not as concerns the proportions between round and blade scrapers which are present at RÄ in equal numbers (Malmer 1969 pp. 28 and 47).

All the determinable axe fragments from A 47 are of Valby type with polished broad surfaces. All over polished thick-butted axes with oblique butts were found at the settlement of Livø on the Limfjord, but not at the typologically older site of Smedegårde (Marseen 1962 pp. 126 and 130). These axes also predominate only on the later sites at Jonstorp, together with hollow ground thick butted axes (Malmer 1969 p. 16).

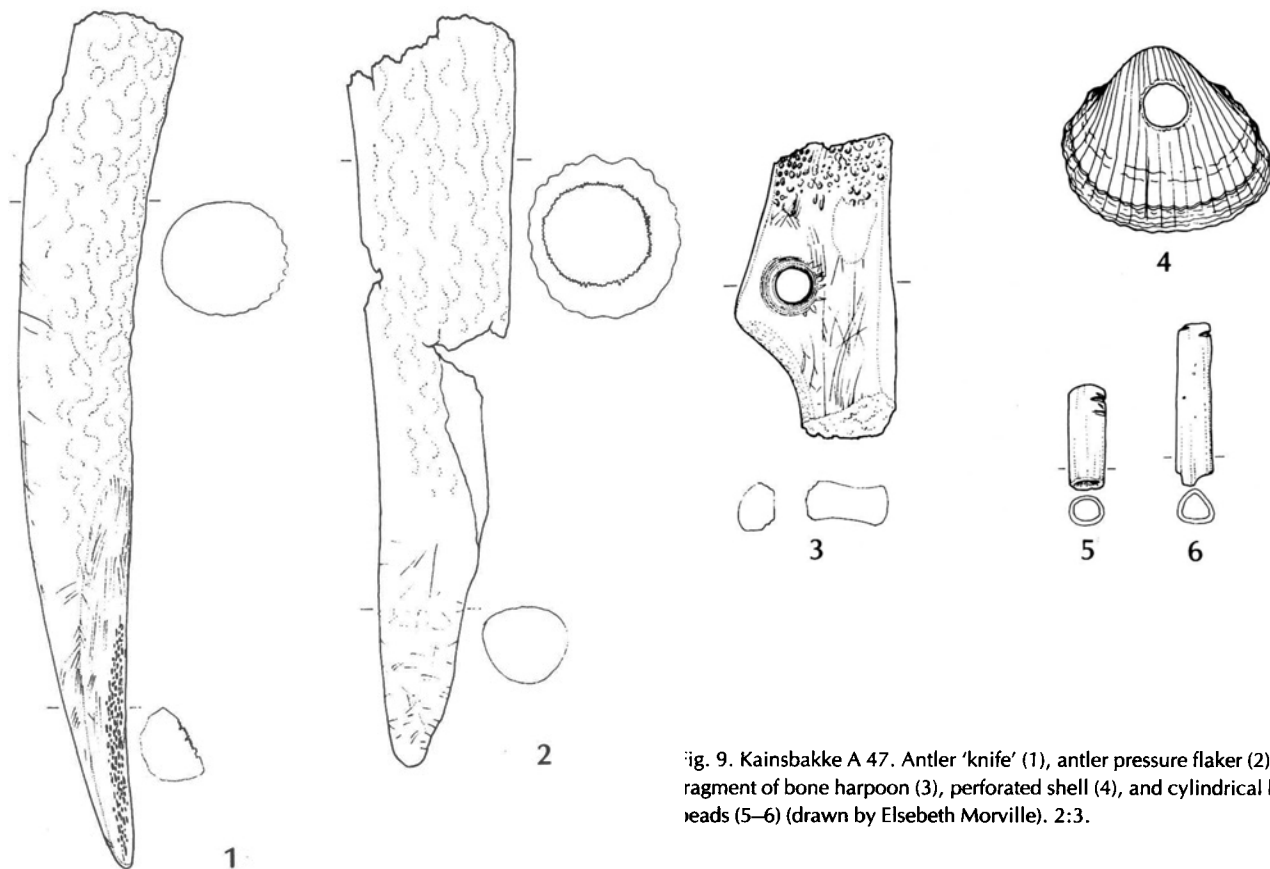


fig. 9. Kainsbakke A 47. Antler 'knife' (1), antler pressure flaker (2), fragment of bone harpoon (3), perforated shell (4), and cylindrical bone beads (5-6) (drawn by Elsebeth Morville). 2:3.

In terms of decoration, the pottery from A 47 can be compared with that from the lower levels of RÄ. Zig-zags are, for example, common, a trait reminiscent of the earlier MH phase. Comb impressions are furthermore almost entirely lacking from A 47. This ornamentation occurs particularly in RÄ's upper layer, and in the later M2 and M3. Most of the pots from A 47 have a marked shoulder at the transition from neck to belly, but some smoother profiles are also present. This also agrees with the lower layer of RÄ (Malmer 1969 p. 78 ff).

Feature A 47 therefore seems typologically most similar to Jonstorp RÄ, the proportions of tanged points suggesting a slightly younger date but still older than M2 and M3.

COMPARATIVE ANALYSES

The typical and most common pot types from A 47 are similar to those from the west Swedish Pitted Ware, but

do not have direct parallels within the Funnel Beaker culture. The closest to any formal parallels are the large storage vessels from MN III/IV (Davidsen 1978 fig. 52).

The A 47 pottery has no handles or lugs, also a trait of the Funnel Beaker MN V. On the other hand there are no signs of typical Funnel Beaker MN V bucket shaped pots in the material so far recovered from A 47. Furthermore, there is none of the variation in pot types associated with the latest phases of the Funnel Beaker culture (Ebbesen 1975 pp. 16-17, Davidsen 1978 p. 100).

Inverted triangles occur on several of the pots from A 47; this is one of the elements in Ebbesen's Funnel Beaker IVb style, which is only known from two sites in Jutland (Ebbesen 1975 fig. 29,6 and fig. 57). The style is more widely distributed in Denmark in MN V, however. The fact that the trait occurs at Kainsbakke and also in the west Swedish Pitted Ware, lends some support to Davidsen's suggestion that this and other MN IVb motifs have their origin in the Pitted Ware (Davidsen 1978 p. 163-164, note 395). The complicated designs

composed of zigzags also have some ornamental principles in common with (but are not identical to) Funnel Beaker MN IV pottery from the Danish islands (Ebbesen 1975, see among others fig. 83,4 and fig. 40,3). The pot in fig. 5:2 has formal and ornamental parallels with the pot from Ørum (Davidsen 1978 fig. 57g).

The Ørum pot's lozenge design is however carried out in comb-impressions a technique of ornamentation almost lacking at A 47. Davidsen places the Ørum pot in Funnel Beaker MN IV on purely typological grounds (Davidsen 1978 p. 116).

A few pots have the same decorative principles as Funnel Beaker MN V, with rows of decoration placed a bit below the rim. In only one case does this involve finger pits, which are in any case not common in the assemblage. Grooves made with a finger are also a common Funnel Beaker MN V element, but do not appear at all in the A 47 material.

The frequent occurrence of rim ornamentation is a feature the assemblage has in common with the late Funnel Beaker Culture (Davidsen 1978p. 109).

The clay discs are a purely Funnel Beaker tradition. The thickness of the three from A 47 is suggestive of the later part of the Funnel Beaker Culture. As far as the ornamentation is concerned, only the finger pits have close parallels in the Funnel Beaker MN V (Davidsen 1973 p. 28).

Objects modelled in clay are known in Denmark only from the early neolithic settlement of Stengade on Langeland (Skaarup 1975 pl. 36 and 68). They are, however, common on Swedish Pitted Ware settlements, which have also produced beads of fired clay. Both categories may be decorated (Welinder 1969–70 p. 75 ff, Janzon 1983).

It has been suggested that tanged points of type A form part of the late Funnel Beaker inventory (Ebbesen 1980 p. 54 ff). One argument for this is the find of a tanged point made as a secondary product from a blade sickle. Blade sickles made on A blades are, however known from several of the other pits from Kainsbakke, where they occur together with Pitted Ware material. The piece in question does not therefore prove that either the primary nor the secondary artifact definitely belongs in Funnel Beaker contexts. Neither is the presence of tanged points on late Funnel Beaker settlements and in passage graves seen as proof of their belonging to this cultural context.

Recent re-examination of thick-butted axes has led

to the suggestion that type A axes belong to the Funnel Beaker Culture, and type B axes to the Pitted Ware Culture; that the middle neolithic can on this basis be divided into an earlier A phase and a later B phase; and that the Pitted Ware and Single Grave Cultures should belong in phase B (Nielsen P.O. 1977 p. 54 ff, Malmros 1979 p. 62). As pointed out above, however, type A axes belong to an older phase of the Pitted Ware, type B axes to a younger phase. In the Västerbjers cemetery type B axes were found in a later Pitted Ware context. The transition from A to B type axes seems rather to take place within the Pitted Ware, so that type A axes belong to the phase with type A tanged points, and type B axes to the phase with type B/C tanged points. It must be added that local variations may be involved in the introduction of type B axes (Nielsen P.O. 1977 pp. 57 and 60).

The two greenstone axes are both types dated to period 1–3 of the Swedish/Norwegian Battle Axe Culture (Malmer 1975 p. 84). The type with concave narrow surfaces also occurs in the Single Grave Culture of Jutland, but is usually referred to the Single Grave Culture of the Danish Islands (Glob 1944 p. 129).

Such observations as can be made about the harpoon fragment correspond to characteristics earlier described as neolithic (Andersen S.H. 1975). The fact that it is made of a cow's bone links it with the example of presumed neolithic date from Livø. The same applies to a number of Swedish harpoons (Andersen S.H. 1975 pp. 21–22). Close typological parallels are known from Gotland, and harpoons with a shoulder and an asymmetrically placed line hole (although made of antler) are known from three locations in Denmark (Janzon 1974 pl. 15, 51 and 48; Andersen S.H. 1971 fig. 23 and fig. 22,8). Harpoons are a well-known type within the Pitted Ware, while none are known from the Funnel Beaker Culture.

Bone points made of metatarsals with preserved articular end are known in several late Funnel Beaker finds, although they are made from sheeps' bones (Davidsen 1978 p. 138, Ebbesen 1975 fig. 244,12, fig. 42,2,3,5). From one of the other pits on Kainsbakke came a similar point made of a sheep's bone.

Cylindrical beads made of bird bone are a wellknown Pitted Ware type, but are also known from other neolithic contexts (Janzon 1974 p. 67, Becker 1950 p. 203). A single settlement find seems to link the type to Funnel Beaker MN V (Davidsen 1978 p. 138).

Pressure flakers and the objects here called knives, made of red deer antler tines, are also known from the funnel Beaker MN V settlements Alrø and As Vig. The example from the latter locality differs by not being made on a curved tine (Davidsen 1978 pl. 61,g and 81,e). A pressure flaker of the same type comes from the Pitted Ware settlement Kirial Bro (Rasmussen and Boas 1980).

Personal ornaments made of cockle shells have parallels in Pitted Ware graves from Gotland (Janzon 1974 p. 99).

Although the Pitted Ware Culture as it appears at Kainsbakke has close similarities with the Swedish Pitted Ware Culture, it can in several respects be said to have a material culture tradition rooted in the late Funnel Beaker Culture. There is, however, no suggestion of any such link with the Single Grave Culture. Only the two greenstone axes suggest any connection with the Single Grave and Swedish/Norwegian Battle Axe Cultures. It is difficult on the basis of the material presented above to see Kainsbakke as a Single Grave Settlement, along the lines of the interpretation of Malmros (1979).

There is however a chronological connection between the Pitted Ware and Single Grave cultures according to C14 dates, which also agrees with the above-mentioned typological observation. At the time of the completion of this manuscript, no radiocarbon dates were available from feature A 47, but a total of 15 dates is available from other features on Kainsbakke and nearby Kirial Bro. These range from 2230 – 2000 bc, with a concentration around 2200 and 2100 (5). The datings overlap the latest Funnel Beaker MN V dates, correspond with those for the Undergrave phase of the Single Grave Culture, and partly overlap with those for the Groundgrave phase (Nielsen P.O. 1977 fig. 25). The phase in which type A3 tanged points predominate must thus largely correspond in time with the Undergrave phase of the Jutland Single Grave Culture.

This raises a series of problems with regard to the traditional placing of the Pitted Ware phases in relation to the Single Grave Culture. According to the traditional view, type C tanged points should be contemporary with the Undergrave/early Groundgrave phases (e.g. Sterum 1978 p. 66 ff). If the graves on which this is based are to be linked with the evidence from the settlements, then there would have to be a contemporaneous

use of both type A and type C tanged points – which the settlements by themselves do not suggest was the case! It must, however, be born in mind that the C14 dates from the Single Grave Culture are mainly from wood samples. The actual age of these samples must therefore be regarded as greater than those of the Pitted Ware samples, which are shell or bone (Malmros and Tauber 1975 p. 81). The date of 2080 bc from Sølager layer 4 must be mentioned here. A tanged point of type B occurred in this layer, which harmonises well with the Kainsbakke and Kirial Bro dates (Skaarup 1973 p. 117).

INTERPRETATION

In the following, we will present some preliminary considerations about the function of pit A47. It is necessary to distinguish between primary function and secondary function:

Primary use: It has already been suggested that the pit may originally have been a hut structure. Finds of human bones in the lower part of the refuse deposit could furthermore indicate the presence of a burial like the Swedish settlement graves (Welinder 1969–70:85).

Secondary use: The refuse layer is regarded as a simultaneous deposit, which means that it was either accumulated over a short period of time or all at once. The voluminous faunal material does, however, hardly reflect the normal consumption of the settlement population. The large amount of meat represented by the bones of wild cattle, bears, deer, pigs, and domesticated cattle, presumably deposited at one and the same time, can only testify to the presence of a large number of people on one occasion. The occurrence of oysters, and the presence of garfish which passes the coast in shoals around August, indicate that the event took place during the summer season. The many different animal species make it unlikely that the reason for the congregation was the exploitation of a single wild resource.

The more likely interpretation is that people gathered at a favourable time of the year to participate in activities of a social nature. There are good reasons for supposing that Kainsbakke was a site of central importance. Even without postulating a direct link with the 'central sites' of the earlier Funnel Beaker Culture (Madsen 1982), the settlement shares with these the accentuated geographical setting, the large occupation area, and the wealth of find material.

There are in fact indications of a settlement pattern including central sites at the time of the Pitted Ware Culture in the area. Within a distance of 10 km from Kainsbakke there are at least two smaller, contemporary settlement sites situated along the adjoining waterways. Just 1 km from Kainsbakke lies the site of Kirial Bro. It has been revealed by excavation that this settlement had quite a different character (Rasmussen & Boas 1982).

In relation to the environment the large Kainsbakke settlement lies both protected and in a central position. It must be regarded as a permanently settled residential site and/or 'central site', being the scene of ritual and social gatherings where settlers of the whole area shared a selection of the great variability of food resources.

From the faunal contents of Kainsbakke A47 it would be unwise to try to determine whether the economy of the inhabitants was primarily foraging or farming and stock-raising. That there was a mixed economy is, however, beyond doubt. One is allowed to expect a more complex social system in a society with a mixed economy than in one based exclusively on hunting and gathering (cf. Tilley 1981–82).

Settlements with a mixed economy such as Kainsbakke are to be regarded as the continuation of an older tradition, because they are known from the later Funnel Beaker Culture. Coastal areas have yielded pits from this culture containing shells, bones of seals, and wild and domestic terrestrial mammals (Davidsen 1978 pp. 42 ff and 55 ff). These sites do not however provide a specialised artifactual inventory. The settlement type continued after the Pitted Ware, as is shown by the site of Kalvø, where the Single Grave Culture is represented by Groundgrave material and type D points (Andersen S.H. 1982, 1983).

CONCLUSION

Kainsbakke represents a "pure" Pitted Ware settlement in the sense that the material is distinct from that of other neolithic cultures, and corresponds closely with finds from particularly the West Swedish Pitted Ware Culture.

The finds from the half-excavated feature A 47 comprise one of the largest Pitted Ware assemblages from southern Scandinavia. The chronologically significant

types show that the find derives from a limited phase towards the end of the earlier part of the culture.

The preserved faunal material shows a mixed economy, insofar as both wild and domestic, marine and terrestrial animals were exploited, and shells collected to a considerable degree.

The radiocarbon dates place the settlement after the end of the Funnel Beaker Culture, contemporary with the Undergrave phase of the Single Grave Culture.

There are elements within nearly all the artifactual categories which must be understood as being in the tradition of the late Funnel Beaker Culture. The settlement type, with its mixture of faunal elements, also has its roots in the later Funnel Beaker Culture. There are on the other hand very few traits in the material which could derive from the Single Grave Culture.

On the basis of this and other Pitted Ware finds from Denmark, it appears that two different but contemporary material "cultures" existed side by side in Denmark in the middle of the neolithic: the Pitted Ware to the northeast, with roots partly in the Funnel Beaker Culture; and the Single Grave to the southwest, with roots in continental groups.

Kainsbakke must be considered as a central or main residential site within a settlement system whose outlines are beginning to emerge. This pattern, and the special character of pit A47 and its contents, points to the existence of a complex social system within the Pitted Ware Culture in the area.

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NOTES

1. Djurslands Museums No. 1900, Kainsbakke II, Ginnerup parish, Djurs Nr. herred, Randers county. National Museum sb. no. 118.
2. The excavation was carried out for Djurslands Museum, Grenå, by the author and N.A. Boas. Financial support was received from Fredningsstyrelsen in consequence of § 49, and from The Danish Research Council for the Humanities.
3. The analysis of the material from feature A 47 was supported by Dronning Margrethe II's arkæologiske fond. Drawings of the finds were paid for by The Danish Research Council for the Humanities. The material from Kainsbakke will be included in a larger research project by the author, based at Aarhus University.

4. Analysis of the faunal material is being carried out by Jane Richter. The work was supported financially by the Carlsberg Foundation. It is part of a research project by Jane Richter of Copenhagen University.

5. The radiocarbon dates are as follows:

Kirial Bro:

K-3683	shells	2090+80 bc
K-3684	shells	2070+80 bc
K-3685	shells	2150+75 bc
K-3720	bone	2150+55 bc

Kainsbakke:

K-3686	shells A2	2230+80 bc
K-3687	shells A6	2200+80 bc
K-3719	bone A2	2190+85 bc
K-3929	shells A64	2100+85 bc
K-3930	shells A64	2120+85 bc
K-3931	shells A64	2120+85 bc
K-3932	shells A64	2020+85 bc
K-3933	shells A64	2080+85 bc
K-3934	shells A56	3290+95 bc (disturbed in the iron age)
K-3935	shells A56	2000+90 bc
K-3936	shells A55	2090+75 bc

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