

# Kainsbakke and Kirial Bro

## The two main sites of the Pitted Ware culture on Djursland

*Lisbeth Wincentz*

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### **1 Introduction**

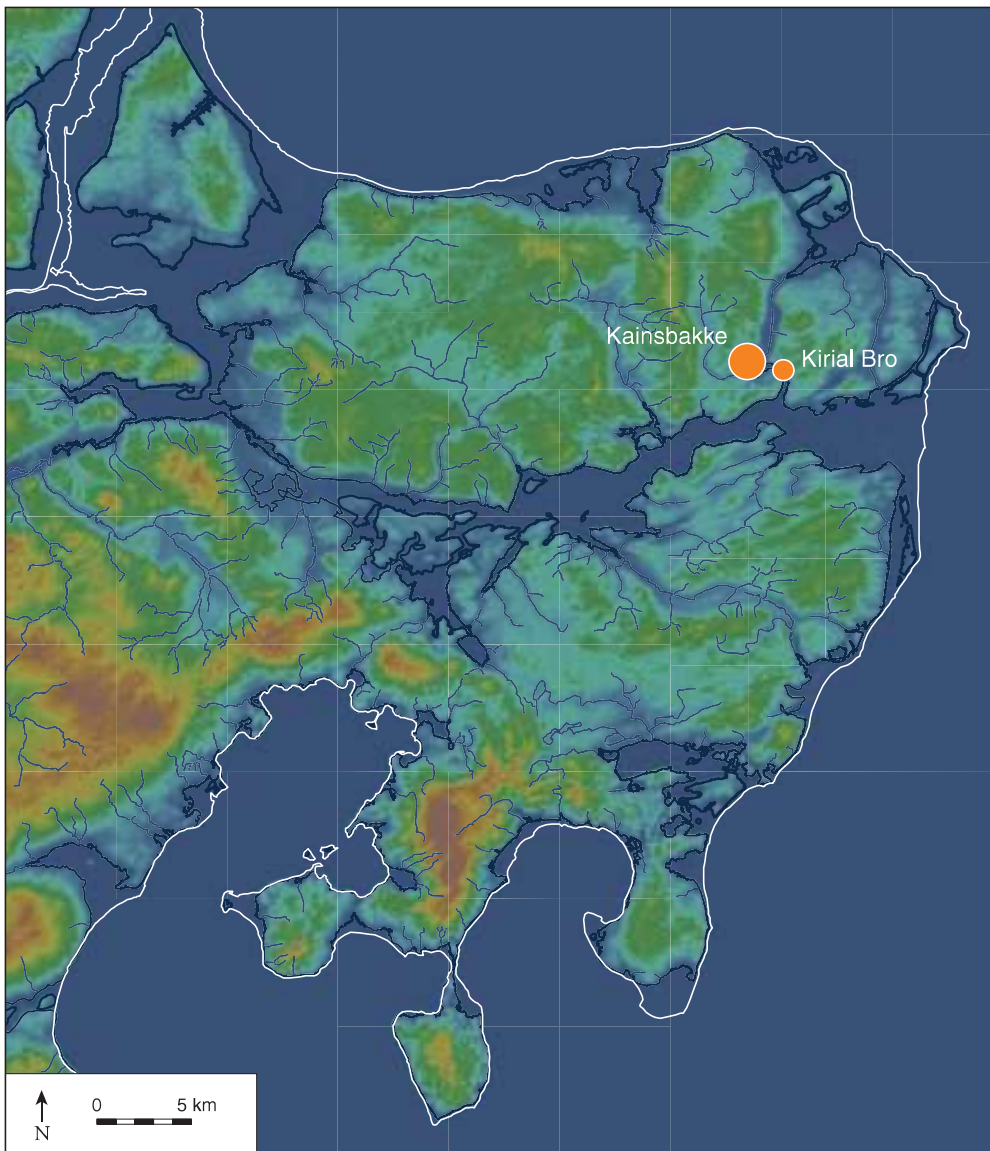
In the 1980s, archaeological investigations were undertaken at two previously known prehistoric sites, Kainsbakke and Kirial Bro, near the village of Kirial in northeast Djursland, eastern Jutland (Fig. 1). These sites proved to encompass cultural deposits and features in the form of shell layers, settlement pits and at least one ritual feature. The excavations yielded large finds assemblages of flint, pottery and faunal remains (mostly bones) from the Pitted Ware culture (PWC). Together with the results of preliminary scientific investigations, these have already been partially presented in a number of publications (Wincentz Rasmussen/Boas 1982; Wincentz Rasmussen 1984; 1986a; 1986b; 1991; Richter 1986; 1987; 1989; 1991). The finds bear witness to more permanent PWC settlement in the area than that perceived previously, which was seen as representing the short-duration activities of itinerant bands of Scandinavian hunters who were possibly looking for flint (Becker 1951, 243, 255). Further excavations were subsequently undertaken at both Kainsbakke and Kirial Bro, the findings of which have not previously been

published. These excavations also gave rise to several scientific analyses, now supplemented by more recent ones (various contributions to this vol.), the archaeological contexts for which are described and documented here.

### **2 Kainsbakke**

#### *2.1 Landscape and topography*

Kainsbakke and Kirial Bro (see below) are located only 1 km apart in northeastern Djursland (Fig. 1). The area is characterised by deeply-cut valley systems, which follow underlying tectonic faults in the bedrock and have in some places been eroded down to the underlying chalk (Schack Pedersen/Strand Petersen 1997, 15-20). Late Glacial meltwater and subsequent marine erosion, together with actions of watercourses and wetlands, have further contributed to the formation of these valley systems. The Kainsbakke locality (site no. 140105-118 in the Danish national Sites and Monuments database; East Jutland Museum archive numbers DJM 2000 (surface finds from fieldwalking) and DJM 1900 (archaeological



**Fig. 1** | *The modern coastline (white) and the coastline in the early part of the Subboreal (black). Due to isostatic and eustatic movements since the end of the ice age, the fossil coastline now lies between c. 2.8 m (southwestern part) and 5.5 m (northeastern part) above sea level. Kainsbakke and Kirial Bro, which were coastal settlements in the Middle Neolithic, now lie between 8 and 10 km inland. Map background after Klassen (2014).*

excavations – referred to as Kainsbakke II)) is situated on a low, delimited plateau, referred to on old maps as “Holmen”, with an area of about 35-40 ha (Fig. 2). The plateau, the highest point of which lies around 11 m a.m.s.l., is surrounded by a 200-400 m wide wetland area. To the southwest, west and north, this wetland area is bounded by hills rising to 30 m a.m.s.l. To the northeast, the ridge Kainsbakke (or Kains Banke) extends out as a promontory, separated from the plateau by a watercourse (known today as Holme Rende). Road cuttings and aggregate extraction precisely here have unfortunately disturbed the original topography. From the range of hills along Skærvad Å, both to the east and west of Kainsbakke, there are records of at least ten dolmens or passage graves (Vedsted 1986, finds list B), and a demol-

ished long dolmen was demonstrated during the excavation on the eastern part of the “holm” itself (see Ch. 2.3.1.4).

At the time of its occupation, the Kainsbakke settlement lay at the head of a narrow fjord, which cut inland from Kolindsund to the south, following a deep valley formed by ice age meltwater and bordered by high slopes (Fig. 3; cf. the general description of the landscape in Djursland in Ch. 1 of this book). The head of the fjord lay directly to the south of the site, where marine sediments have been demonstrated at 5 m a.m.s.l. (unpublished investigations by Claus Malmros during the excavation of Kainsbakke). The northern and western sides of the holm, or islet, were bordered by wetlands, now the bogs of Svinekær and Havdal which, in turn, are bounded by rela-



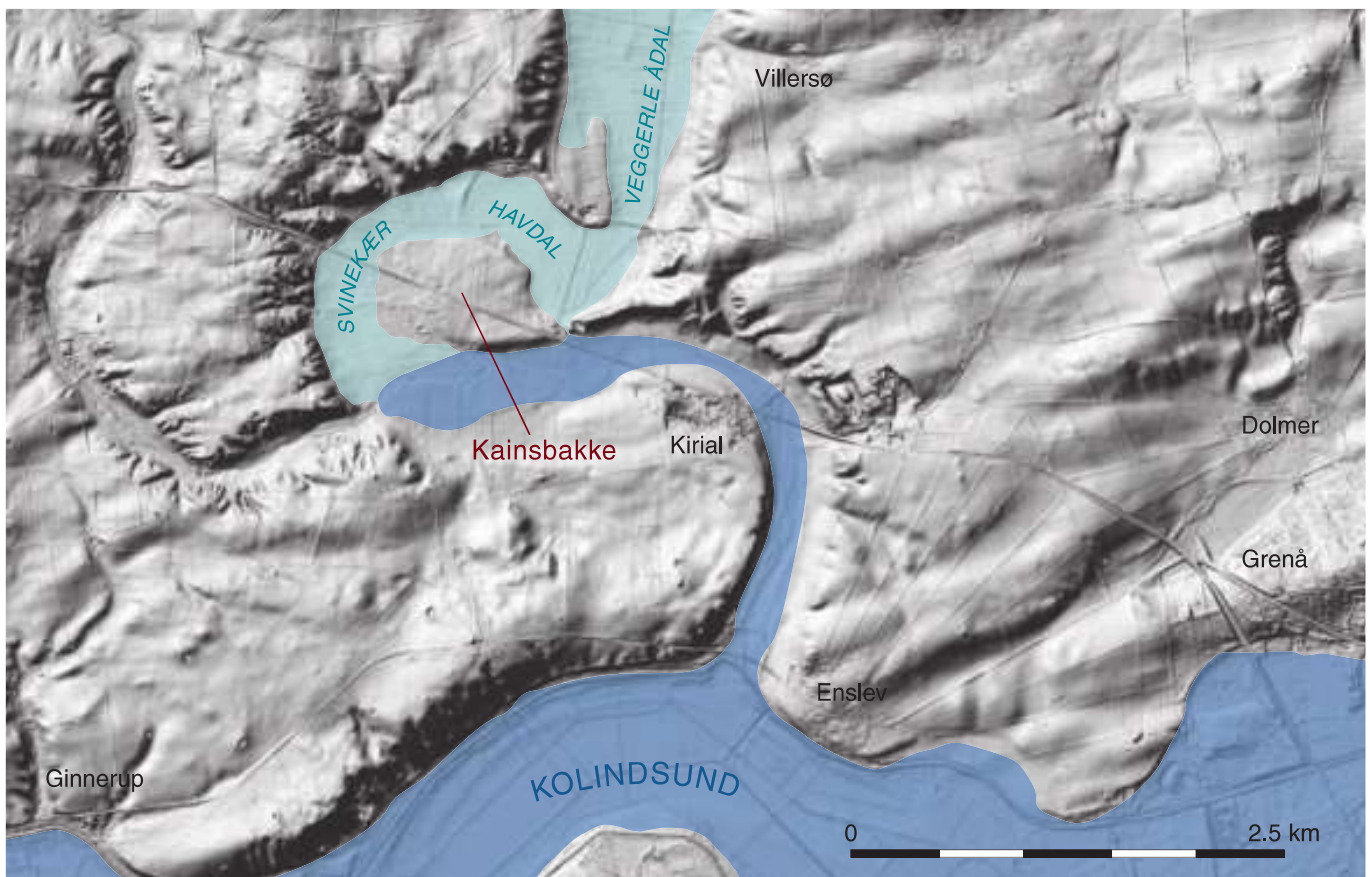


**Fig. 2** | *First edition 1:20,000 map (1842-99) for northeast Djursland. Wetland areas are marked in bluish-green. The recently drained Kolindsund and the boggy valley extending north of Kainsbakke are clearly shown.*

tively steep slopes. A valley system extends out to the north, hosting Skindbjerg, Villersø, Dalstrup, Emmelev and Veggerslev bogs, as well as watercourses which empty into Gjerrild Bay. In Middle Neolithic times this valley system was already a boggy wetland area, and it is known for its many votive finds from the Early Funnel Beaker culture (TRB) in the form of numerous thin-butted axes and pottery vessels (i.e. bog pots) (Becker 1947, 53-60; Vedsted 1986, finds list C, 110f.; Klassen et al. this vol.). Consequently, there is unlikely to have been direct access by water from Kainsbakke to the Kattegat to the northeast, or to the flint occurrences in the Gjerrild and Karlby cliffs. To reach the Kattegat by water it was necessary to sail south to Kolindsund and from here towards the east and north. There may have been a track or path along the margins of the bog. This path would have linked Kainsbakke with the flint occurrences in the coastal cliffs.

## 2.2 Investigation history and settlement size

Amateur archaeologists have been aware of the Kainsbakke locality for at least a century, as a favourite site for collecting flint, especially from the PWC. Initially, collection was rather random, but in the 1970s, in collaboration with the then Djursland Museum, amateur archaeologists' fieldwalking became more systematic. In addition to the collection areas on the actual holm (Kainsbakke I-III), fieldwalking was also undertaken in the immediate vicinity. This led to the discovery of the locality Kainsbakke IV, located 100-150 m NNE of the scheduled burial mound Fuglhøj on the actual Kainsbakke hill crest. Elongate features containing dark-coloured cultural deposits with a little PWC flint were observed here which possibly represent segmented ditches from a causewayed enclosure (see Rasmussen et al. this vol. for a more comprehensive account of the PWC settlement around the Kainsbakke locality).



**Fig. 3** | Lidar map of Kainsbakke (“Holmen”) and surroundings. The extent of the Littorina Sea and wetlands is marked in blue and green, respectively. The Kainsbakke holm was surrounded by the fjord and wetlands and consequently had an island-like character.

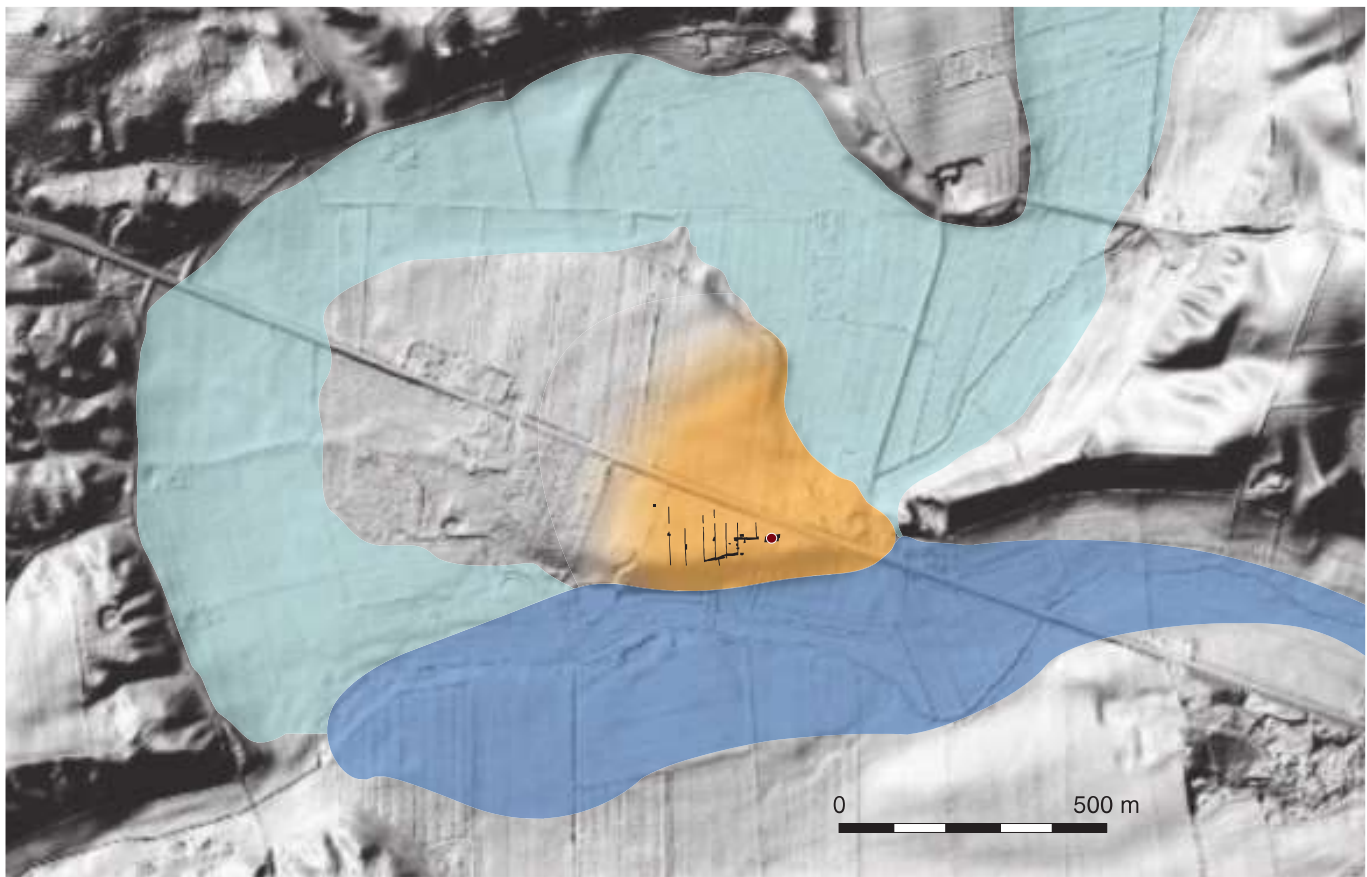
Two large private collections, amassed by N.O. Boas and E. Øbom, are now held at East Jutland Museum (DJM 2000). These collections contain no less than c. 6000 scrapers, 300 tanged arrowheads and 300 cylindrical blade cores. Based on the presently available information, an area of around 7 ha with a very high density of finds can be identified, extending out to both sides of the modern highway on the eastern side of the holm. The finds density decreases towards the west, while the situation in the area further to the north and northwest on the holm is currently not fully known, because modern usage of the area does not permit fieldwalking. However, there are reports from here of finds of PWC character. It can therefore be established, that the core area of the PWC settlement extended over at least 7 ha but that its total areal extent was significantly greater than this (Fig. 4). The total activity area in the Neolithic extended over about 15 ha.

Kainsbakke is therefore one of Denmark’s largest Neolithic localities, and settlements of comparable size are often located on the sites of earlier causewayed enclosures.

### 2.3 Archaeological investigations

The first archaeological investigation, a small trial trench on the southeastern part of the holm, was launched in 1979, when dark patches, both with and without shells, were ploughed up. In the next couple of years an area of c. 526 m<sup>2</sup> was uncovered, extending out from this first trench and across the visible features. The latter included a 5 x 6 m pit, A47, the southern half of which was excavated in 1982 with financial support from the Danish Research Council for the Humanities. In 1998-99, 480 m<sup>2</sup> of cultural deposits were investigated on the far eastern part of the holm. These deposits proved to have accumulated around the stone pavement in





**Fig. 4** | Lidar map of the Kainsbakke holm showing the c. 15 ha area with PWC surface finds and the location of the excavation trenches. The highest density of surface finds occurred in the easternmost c. 7 ha of the area. The location of the demolished long dolmen is also marked.

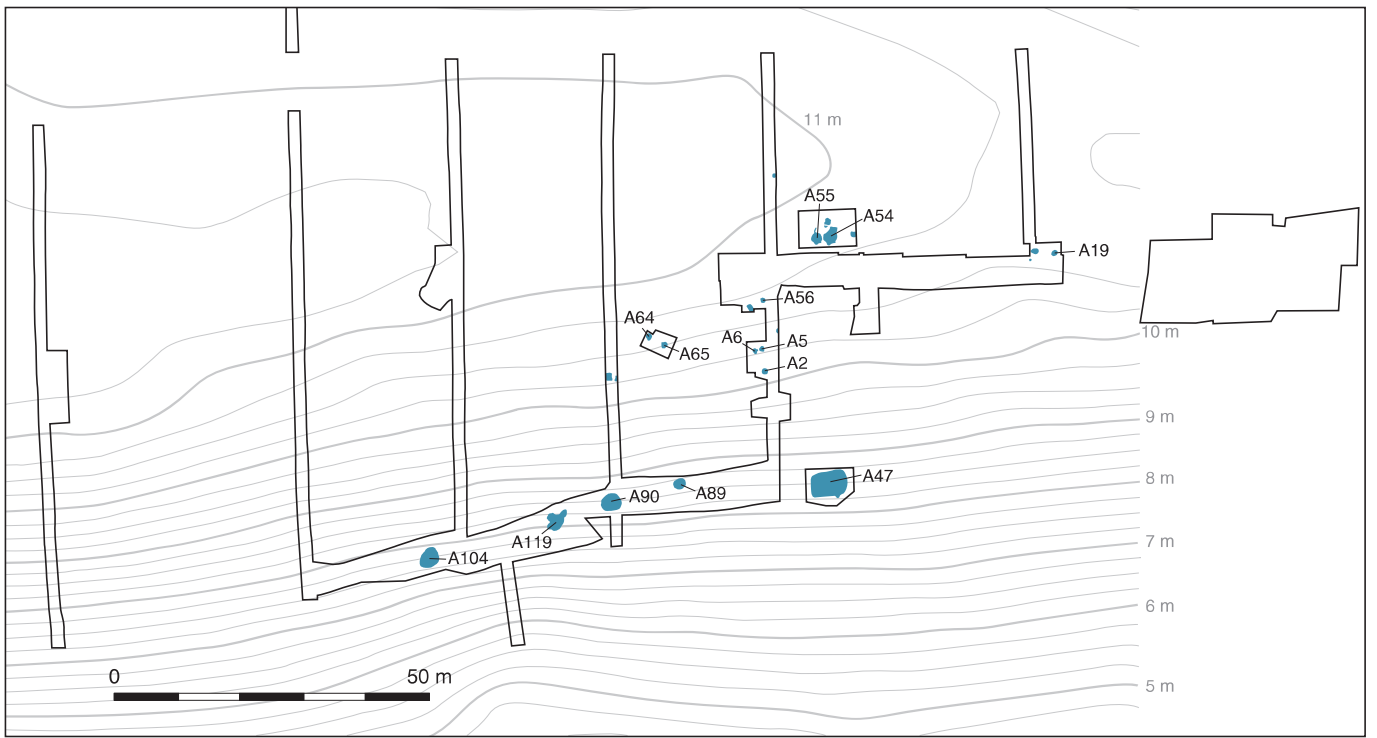
the kerbstone area of a demolished long barrow (see Ch. 2.3.1.4), which must therefore have stood on the actual settlement (Fig. 4).

In 2001, in a collaboration between the then Djursland Museum and the National Museum of Denmark, a systematic trial excavation was undertaken to the west of the area in the southeast where the sporadic investigations had been carried out previously (Fig. 5). The aim was, in particular, to investigate whether pit A47 could be part of a Neolithic causewayed enclosure. A total area of 1675 m<sup>2</sup> was uncovered, revealing what proved to be four large pits in a row, extending out from A47, and no more than 60 m to the southwest: Like pit A47, these lay around 8-9 m a.m.s.l. Further to this pit row, several smaller pits and features were recorded on the surface of the trial trenches (Østergård Sørensen/Boas 2002). In 2002-3, the northern part of pit A47 was excavated with support from the Danish Research Council for the Humanities and

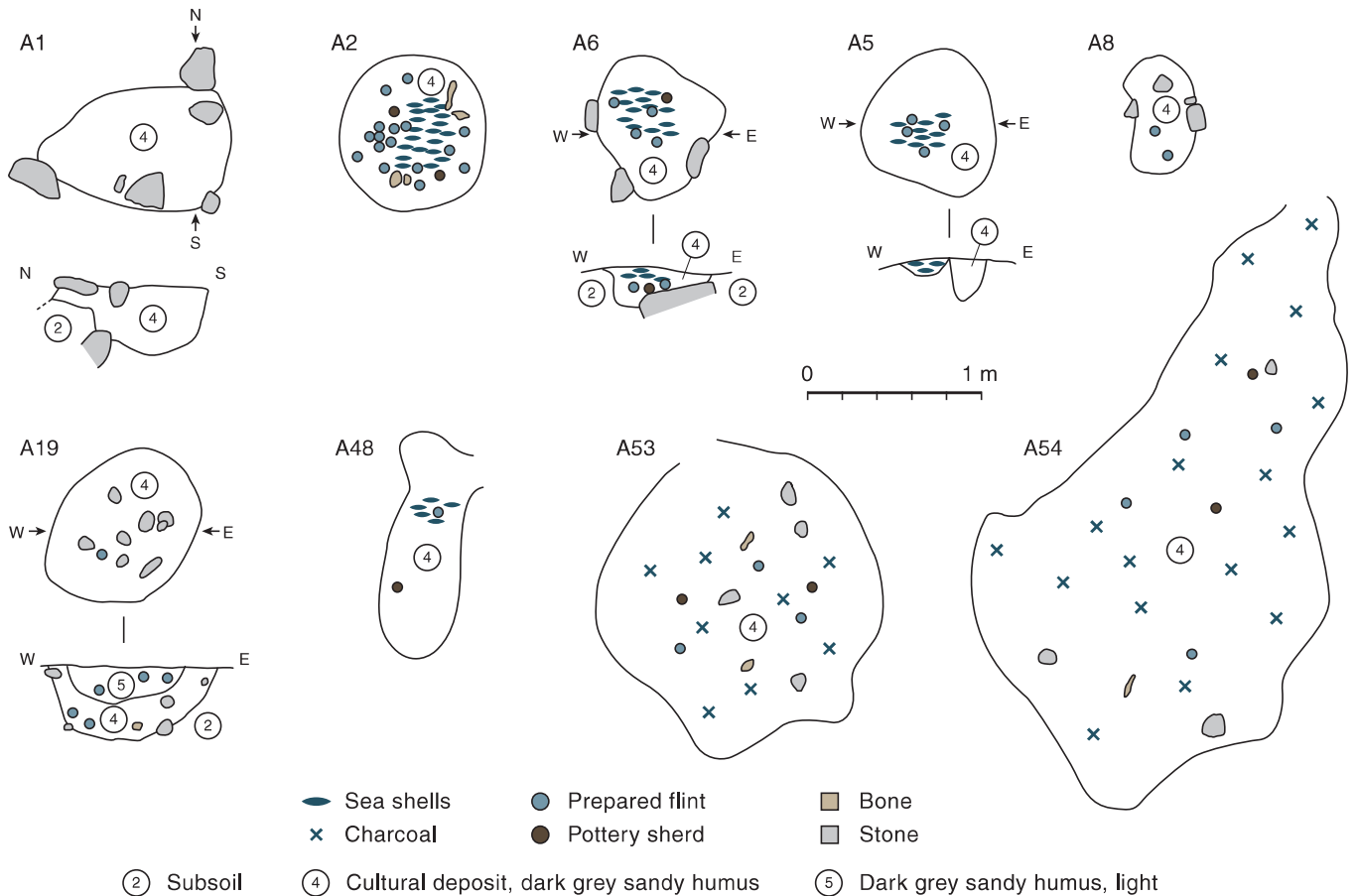
Djursland Museum. Finally, in connection with the laying of a sewage pipe in 2009, 20 test pits were investigated along its route, which ran along the foot of the holm to the south of the site. A thick sequence of cultural deposits was encountered here which contained abundant flint material.

The subsoil in the study area consists mostly of gravel and partly of clay, with major portions mixed with hand-sized and larger stones, including many of chalk and flint. To the far west, the subsoil is pure yellowish sand.

In total, c. 2700 m<sup>2</sup> of the Kainsbakke settlement was excavated, which corresponds to less than 4% of the settlement's core area, as indicated by the massive amount of material picked up from the field surface. Within the excavated area, 18 pits of varying size, and sporadic remains of cultural deposits containing finds from the PWC, were investigated. Further to these, there were undated minor features, numerous postholes and



**Fig. 5** | The location of the excavation trenches on the southeastern part of the Kainsbakke holm. Secure PWC features are highlighted in blue.



**Fig. 6** | Outline and section drawings for small and less complex pits at Kainsbakke, and an outline drawing of pit A2.

parts of fence ditches from the Early Iron Age. These were concentrated in the eastern part of the plateau where, in the Pre-Roman Iron Age, several solitary farms apparently lay close together out towards the southern edge of the hill (Østergård Sørensen/Boas 2002). Finds from the TRB on the holm are, on the other hand, conspicuous by their absence. Apart from two sherds found during the excavation of the demolished long dolmen (Ch. 2.3.1.4) and probably also a fragment of a greenstone/diabase axe found in pit A47 (Ch. 2.4.3.1), not a single find from the TRB was recovered during the excavations. The entire extensive body of material collected from the field surface includes only three possible, but uncertain, flakes from thin-butted axes as potential testimony to TRB activity on the holm.

### *2.3.1 Features from the Neolithic*

Only the eastern part of the holm to the south of highway 16 has been subjected to investigation as it is here that the greatest number of visible features and artefacts have been recorded on the field surface. Remains from the Neolithic are found c. 7-11 m a.m.s.l. The highest part of the holm, south of the highway, forms a flat plateau, before the terrain again falls relatively sharply down towards the surrounding wetland area to both the south and east, which was a branch of the fjord during the Neolithic. There are traces of Iron Age occupation everywhere across this plateau, and this has disturbed the Neolithic remains. A few Iron Age potsherds were found at the surface of one or two of the Neolithic features, whereas there was Neolithic material in almost all the Iron Age features. These finds are considered to derive from the general cultural deposits at the site, as it was only rarely possible to distinguish definitively between cultural deposits from the Neolithic and the Iron Age. Areas of preserved cultural deposits on the plateau had a maximum thickness of 0.3 m. One of these to the northwest extended over about 100 x 40 m and contained finds from both the Iron Age and the Neolithic (PWC). Moreover, two features appeared below the Iron Age deposits that could be

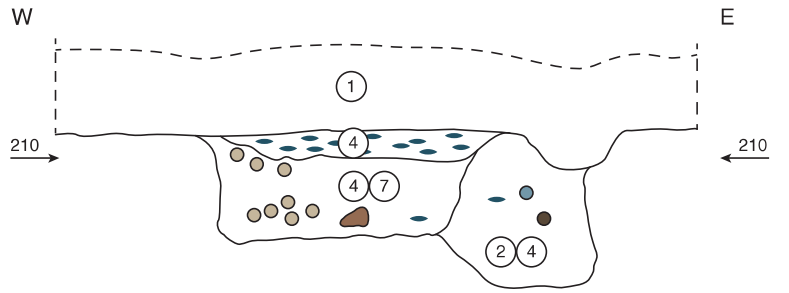
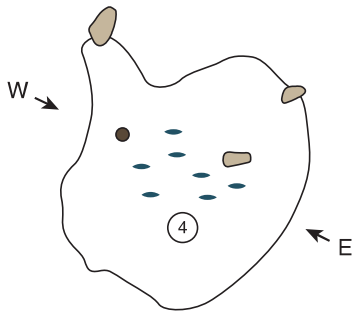
from the Neolithic. These were only recorded at the surface in plan and were not investigated further. They probably represent two small pits. No hearths or features other than pits were recorded as being of Neolithic date. Cultural deposits rich in flint, pottery and bones that had accumulated at the margin of the southern foot of the hill were though considerably more massive, with a thickness of up to 1.3 m. Several investigations revealed that these deposits were not obviously stratified and overlay beach sand. They must therefore be seen as secondary, i.e. formed by the deposition of material eroded down from parts of the site located higher up.

In addition to the thin, partially disturbed cultural deposits from the Neolithic, 13 circular, rounded or oval pits of varying size were investigated; these had an average diameter of 1.2 m and a depth of rather more than 0.3 m. Pit A47, and three of the four pits in a row to the west of it, were though generally larger. In addition, a number of small pits and minor features were recorded in plan but not excavated during a trial excavation in 2001. These remnants of cultural deposits were found to contain artefacts of the same character as those in the pits though, in the case of the pottery and the bones, in smaller quantities (Tab. 1, page 60-61). Finds of typical flint artefacts or pottery from the early Middle Neolithic were completely absent from the cultural deposits, and this was also the case for the surface finds and – with the aforementioned exceptions – the material from the excavated features.

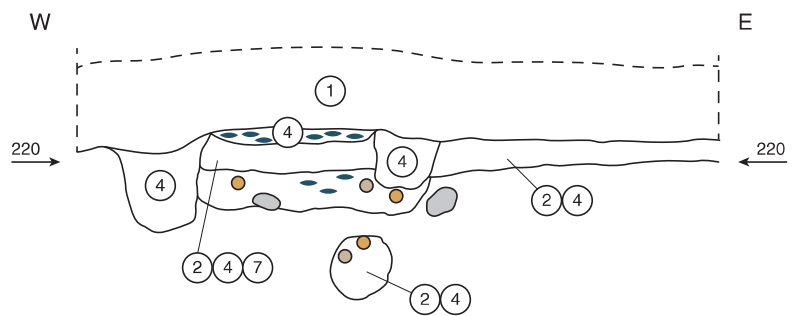
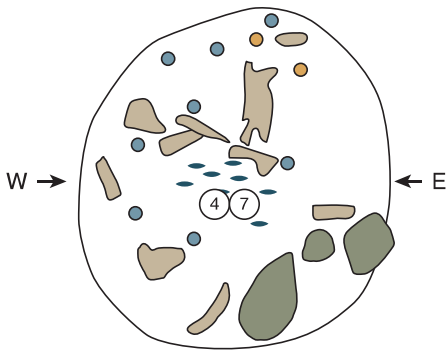
#### *2.3.1.1 Small pits*

A total of 13 small pits, which lay randomly scattered across the excavated area at Kainsbakke, were investigated. Nine of these were of relatively simple character, while four displayed a complex stratigraphy. The outlines and cross-sections of the less complex pits are shown in Figure 6, while Figure 7 shows the complex sections through three of the four remaining pits. There is only an outline drawing of complex pit A2, as it was taken up intact in a block of soil and excavated at the museum without a section being recorded separately.

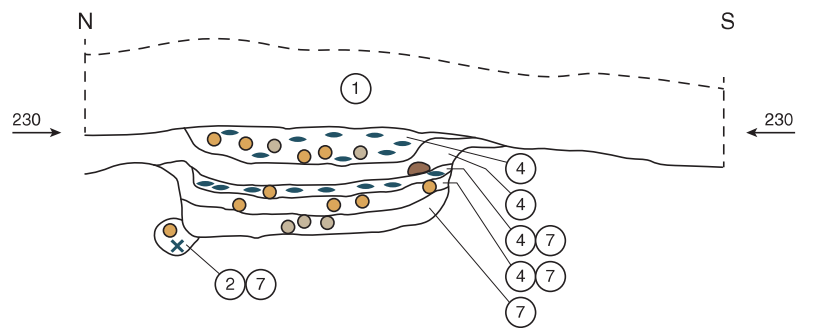
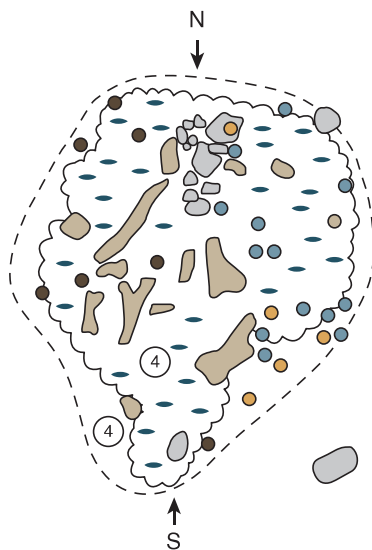
A55



A56



A64



- |              |   |                  |                 |               |
|--------------|---|------------------|-----------------|---------------|
| × Charcoal   | ■ Stone                                   | ■ Prepared flint | ■ Bone          | ■ Flintflakes |
| ● Sea shells | ■ Cleft stone                             | ■ Cooking stone  | ■ Pottery sherd |               |
| ① Ploughsoil | ④ Cultural deposit, dark grey sandy humus |                  |                 |               |
| ② Subsoil    | ⑦ Light brown humus                       |                  |                 |               |



Fig. 7 | Outline and section drawings for the more complex small pits A55, A56 and A64.



The 13 pits can be described as follows:

A1: Oval, bathtub-shaped pit. Surface dimensions: 1.1 m E-W and 0.4 m N-S; depth 0.4 m. The pit contained a fill of blackish-grey, sandy soil mixed with numerous flint flakes and potsherds. The pit was located immediately next to a stone of more than 0.5 m in diameter.

A2: Circular pit with evenly rounded base and straight sides. Diameter 0.9 m, depth 0.3 m. The pit was taken up intact in a block of soil in 1980 and excavated indoors. In its upper, central part lay a 0.05 m thick layer of mollusc shells. Other mollusc shells were scattered throughout the remainder of the pit fill, which was greyish-black in colour and rich in humus. Bones, pottery, flint, charcoal fragments and charred hazelnut shells were also found scattered, together with a few concentrations, everywhere in the pit fill. The finds included more than 100 scrapers and 92 blades (Tab. 1). From 0.05-0.1 m above the base of the pit, across its entire extent, there was a greyish-black, humus-rich layer containing a particularly large number of fishbones, including several examples of articulated sections of vertebrae.

A3: Circular pit with a slightly conical cross-section, a diameter of 0.4 m and a depth of 0.3 m. It had a uniform, greyish-black fill which contained large parts of two pottery vessels, a little flint and a fragment of a polissoir.

A5: Circular pit with a diameter of 0.8 m, a depth of 0.1 m and a greyish-black, humus-rich fill. In the middle of the pit there was a darker area of 0.4 x 0.3 m containing shells of oysters, cockles and mussels, as well as snail shells. It also contained a little flint debitage, a scraper and a few bones.

A6: Rounded pit measuring 0.7 x 0.8 m and with a depth of 0.3 m. The pit had a fill of greyish-black sandy soil with a darker part in the middle containing shells of oysters, cockles and mussels. Mixed between the shells were flint, pottery and

bones. The pit had a flat, rounded base, and its southeastern part lay over a large stone in the subsoil. The shell-rich part was concentrated in the upper 0.1 m. Around the edge of the pit lay a few hand-sized stones. The frequency of large fragments of mammal and bird bones increased in its lower part, and a collection of 16 scrapers was encountered.

A8: Oval pit with a rounded base, measuring 0.7 x 0.4 m, with a depth of 0.4 m. The pit fill comprised sandy soil containing a little flint, including a scraper.

A19: Circular pit with straight-cut sides and a flat base. Diameter 0.9 m, depth 0.5 m. Dark-brown fill, darker in the central 0.25 m through the pit's total depth. Contained a good quantity of flint, including 44 blades. Seven stone (non-flint) crushing-/hammerstones and numerous potsherds can also be highlighted.

A48: An irregular, elongate feature measuring 1.3 x 0.55 m and 0.2 m in depth. It possibly represents a feature associated with the Iron Age settlement at the site, established over a Neolithic pit, which was evident as an accumulation of mollusc shells and a concentration of Neolithic finds in redeposited soil.

A53: Rounded pit measuring 1.8 x 1.7 m and with a depth of 0.2 m. The pit's fill comprised uniform, slightly soot-blackened soil containing flint and pottery.

A54: Irregular pit measuring 3.8 m NE-SW and 2 m E-W, and with a depth of 0.3 m. Fill of homogeneous, slightly soot-blackened soil containing flint, pottery and bones.

A55: Circular pit with a diameter of 1 m and a depth of 0.35 m. It had straight-cut sides and a flat base. At the surface of the pit fill was a shell-rich area, 0.6 m in diameter. The upper 0.09 m of the pit fill consisted of dark-grey, shell-rich sandy soil containing a number of

artefacts. Below this, and partly out towards the sides of the pit, was a brownish-grey sandy deposit containing fewer flint and pottery finds but a greater number of bones. At the eastern side of the pit there was a lighter, diffuse layer containing a few bone fragments.

A56: Circular pit with a diameter of 0.8 m and a depth of 0.25 m with straight-cut sides and a flat base. The pit had been disturbed at one side by a fence ditch from the Iron Age and at the other by a posthole from the same time. Uppermost in the pit was a 0.05 m thick layer of shells mixed with soil and artefacts. Below this was a 0.1 m thick layer that consisted of sandy soil, light-brown humic material and subsoil. The lowermost 0.1 m comprised subsoil material and light-brown humic material in which were scattered oyster shells, flint, pottery and bones.

A64: Rounded pit with straight-cut sides and a rounded to flat base, measuring 1 x 0.9 m and a depth of 0.35 m. Uppermost in the pit was a 0.12 m thick layer of shells and cultural deposit, and below this a 0.06 m thick cultural deposit without shells or artefacts. This was followed by a 0.05 m thick layer of shells mixed with lighter-coloured soil than in the uppermost layer, and then a 0.06 m thick layer of light-brown humus-

rich cultural material. The lowermost 0.06 m comprised light-brown humic material. The pit contained numerous blades and scrapers but few other artefacts.

In summary, it can be concluded that rather more than half of the excavated smaller pits had a fill containing mollusc shells, while these were absent from the remainder. Bones were, however, preserved in both categories of pits due to the chalk-rich subsoil. The pits typically had straight-cut sides and a flat or slightly rounded base. Most contained flint tools and waste flakes, potsherds, bones and bone/antler tools in varying quantities and varying relative frequencies. Pit 64 was very clearly stratified into layers, with and without shells, and rich in flint, pottery and animal bones, especially fragments of jaws and feet (Fig. 8). Given the remarkable concentrations of selected skeletal parts in this pit, it is possible that it, and some of the other smaller pits, had a ritual function, perhaps during a secondary phase of use. In general, however, the pits appeared to be ordinary settlement pits with an unremarkable fill and artefact content.

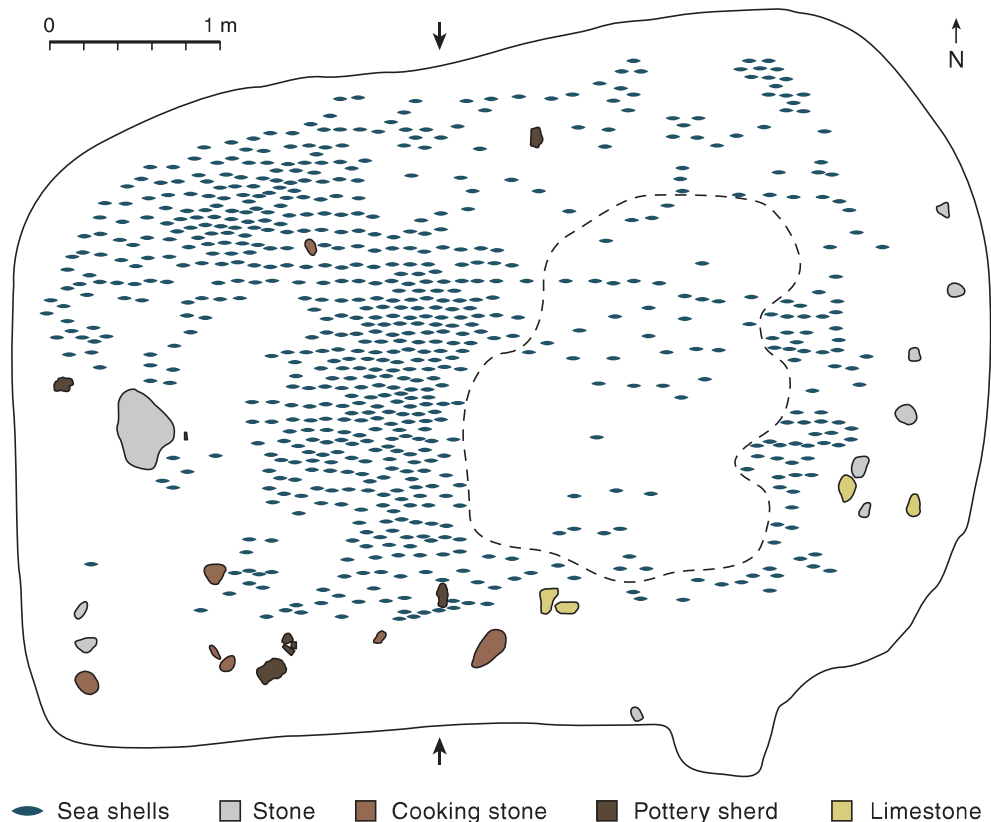
#### 2.3.1.2 Pit A47

Pit A47 occupies a central place in the account of the Kainsbakke locality due to its special character and the large finds assemblage it yielded (Tab. 1).



**Fig. 8** | *Pit A64 under excavation showing exposed bones. Photo: Lisbeth Wincentz.*

**Fig. 9** | *Outline drawing for pit A47.*



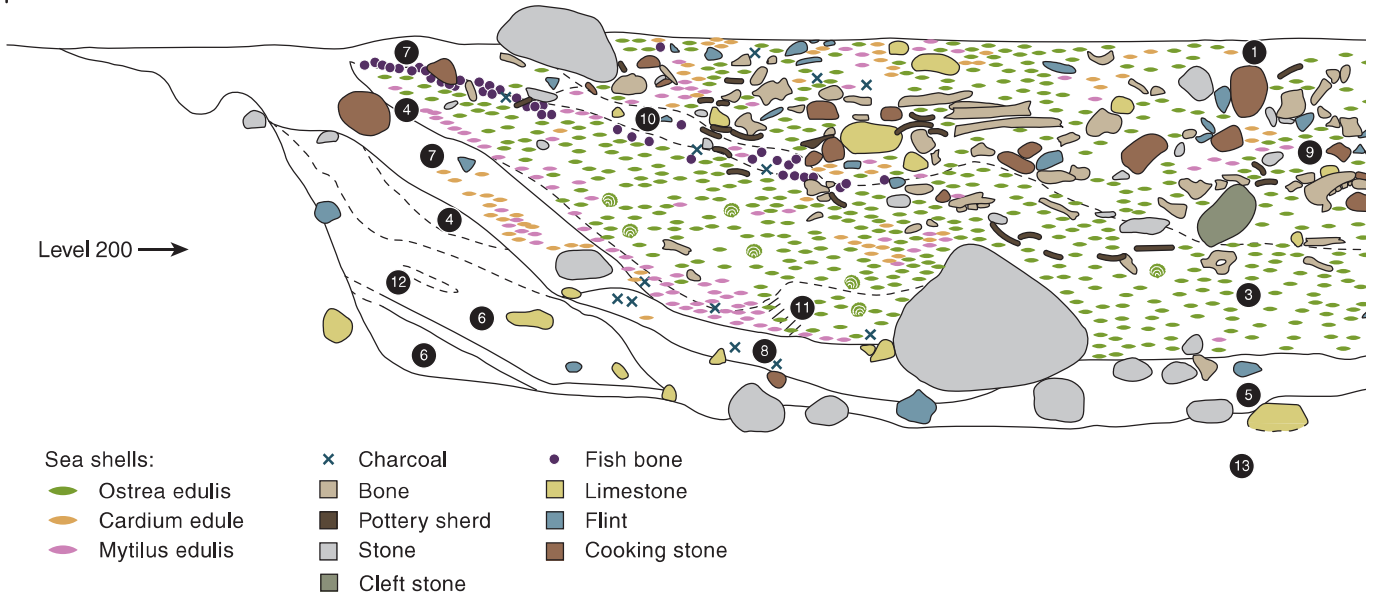
The pit was located on sloping terrain to the south of the site, between 8 and 9 m a.m.s.l. It was, like many other features at the site, discovered due to finds of ploughed-up material on the surface, where it measured 5.7 m in diameter W-E, and 4.5 m N-S (Fig. 9). Even at the surface, the artefact distribution was dense and extensive, and organic material was preserved due to the presence of mollusc shells.

Finds from the pit were recorded in 0.25 m<sup>2</sup> squares of 10-30 cm in thickness, i.e. the excavation was undertaken in artificial layers, termed excavation phases. The top of each excavation phase was drawn and recorded, as considered necessary. Apart from scrapers, the tools and a few intact pots or larger pot fragments were recorded individually, being plotted both horizontally and vertically. The northern part of the pit was recorded by excavated layer, termed excavation phases I-IX, with levels taken for each phase. The southern part, on the other hand, was excavated by archaeological layer, with the nature and composition of the deposit and the depth being recorded for each find. Phases (northern part) and archaeological layers (southern part) can therefore easily be matched. The excavat-

ed soil was wet-sieved through a 1 mm mesh. Soil samples were taken from each excavation phase in the central part of the pit, and otherwise as considered necessary. A longitudinal section through pit A47 shows that its sides were slightly sloping (Figs. 10-11). The original pit sides are estimated to have had a slope of 120-140° relative to the fairly flat base, the length of which, i.e. 5 m, is only 0.7 m less than the length of the pit at the surface. In cross-section, the south side of the pit was seen to be steeper, with a slope of 100-110° (Fig. 12). The original pit was therefore rounded rectangular in plan with steep sides and a relatively flat base at a depth of at least 1.1 m below the surface. The pit's stratigraphy, comprised of a series of clearly distinguishable layers, is evident from the sections. Layer 6, which consisted of light-coloured sand with a slight admixture of topsoil/humic material, is interpreted as subsoil that collapsed from the sides and upper edge of the pit during its primary phase. Layer 5 may represent backfill following a recut that extended slightly below the original base of the pit. This layer consisted of sand mixed with topsoil/humic material, in which there were a very few finds of pottery, flint, bones, cooking



W



▲► Fig. 10 | Longitudinal section (W-E) through pit A47.



Fig. 11 | Longitudinal section through pit A47, seen from the south. Excavation in 1982. Photo: Lisbeth Wincentz.

S

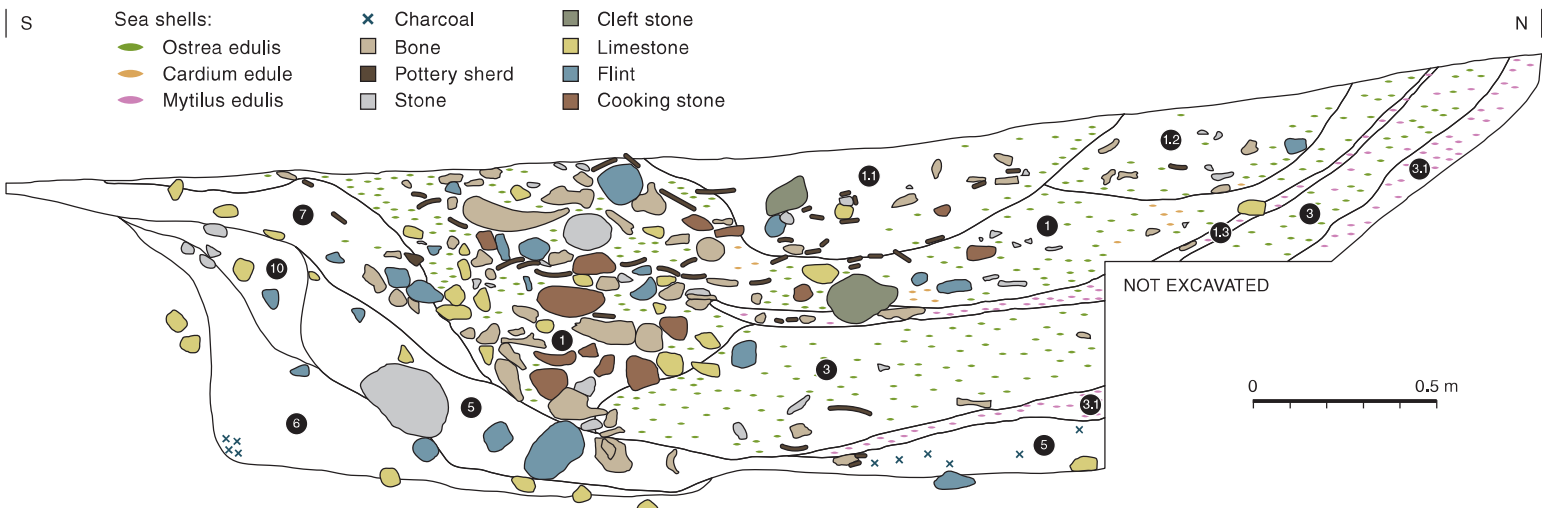
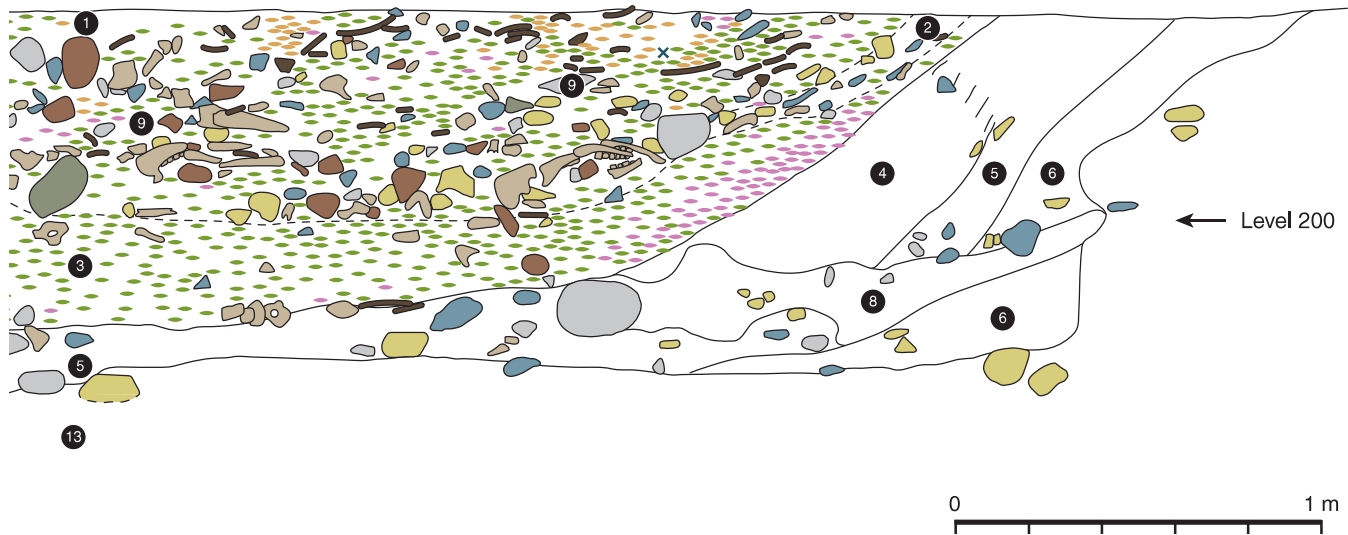


Fig. 12 | Cross-section (S-N) through pit A47.



stones and shells. It was partially covered by the dark, soot-blackened layer 8, which extended symmetrically out to all sides. Both layer 5 and layer 8 contained several large stones, some up to 1 m in diameter, one of which was the lower stone for a saddle quern. In the eastern side of the pit, layer 8 was irregularly delimited, probably due to disturbance by animals. On excavation in plan, a 10-15 cm wide charcoal border, which also contained red-burnt clay, was observed lowermost in layers

5-8 at the western side of the pit (Fig. 13). It could not be securely determined whether burning had taken place in the pit, or this material had been added to it. The pit had apparently subsequently stood open long enough for a new, almost humus-free sand layer, layer 4, to slip down or be added around the sides. At the western side of the pit, over the humus-rich cultural deposit, layer 7, which contained a few mussel shells, there was a thin stripe of sand, resembling layer 4, which also

**Fig. 13** | Layers 5-8 in pit A47, showing traces of burning. Photo: Lisbeth Wincentz.







**Fig. 14** | *In situ oyster shells in pit A47. Photo: Lisbeth Wincentz.*

contained a layer of mussel shells. A concentration of mussel shells was also found over layer 4 along the eastern side of the pit. A recut through layer 4 possibly took place before layers 3 and 1 were deposited in the pit. Layers 1 and 3 were characterised by a substantial content of oyster shells and shells of molluscs and snails; among the shells were major deposits of bones, flint and pottery. Layer 1 contained a substantial proportion of tools, pottery, bones etc., while layer 3 comprised a more compact shell deposit with fewer tools, pottery and bones. The ordered, horizontal deposition of mollusc shells gave this layer the character of a coating. Due to their substantial mixing with artefacts and bones, the shells in layer 1 had, at least in parts, a less horizontal orientation than those in layer 3. The transition between the two shell layers was very even without any intervening soil. There were no signs of disturbance or later digging activities that had led to crushing of the shells or

modified their horizontal positions (Fig. 14). Oysters were the dominant species, but mussels and cockles were also numerous. Further to these were a number of marine/brackish-water gastropods (Richter 1987).

Layer 1 had a particular abundance of large bones, including at least five collections of specially selected skeletal elements which reflect structured depositions (Figs. 15-17). In most cases these took the form of three to seven intact or partial lower jaws (mandibles) laid in a row. The jaws are of elk, red deer, ox and pig (Fig. 15.1-3). Similar collections of in particular pig lower jaws are known from PWC graves on Gotland (Janzon 1974, 282). Horn cores, of domesticated cattle judging from their size, were found in a heap, which also suggests a structured deposition (Fig. 16.1). A complete set of horn cores of enormous dimensions (i.e. of aurochs) must be interpreted similarly (Fig. 16.2). In another case, the skull of a brown bear



**Fig. 15** | *Pit A47: Three in situ heaps of lower jaws. Photos: Lisbeth Wincentz.*



1



2



3





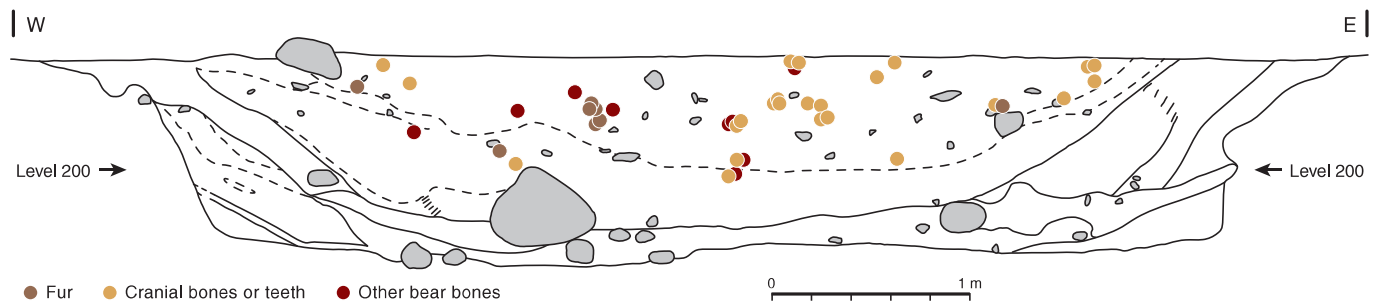
1



2



**Fig. 17** | *Pit A47: Deposition of a brown bear skull on an ox horn core in layer 1. Photo: Lisbeth Wincentz.*



**Fig. 18** | *Pit A47: Distribution of bones of brown bear. The bones occur in different concentrations, typically dominated by parts from either the head or the paws. A small concentration consists exclusively of bones from other parts of the bear's body.*

had been deposited on a bovine horn core (Fig. 17). The abundant remains of bear occurred in several concentrations, typically dominated by parts of either the animals' heads (skulls, jaws or loose teeth) or their paws. The latter probably indicate the deposition of bear skins with a few intact metacarpals or metatarsals, i.e. from the front and rear paws. Bones from other parts of the bear were relatively scarce, although in one case they similarly occurred in a minor concentration (Fig. 18). Bear bones were only found in pit A47 at Kainsbakke.

The wing bones of a Dalmatian pelican found in pit A47 represents a remarkable and exotic element that, itself, provides evidence of a special deposition. The bone has the latest date of any find of its kind from Denmark and is one of only three examples of this species from the Danish Neolithic: It occurs a little more frequently in Ertebølle culture (EBC) assemblages from the western Baltic (Nikulina/Schmölcke 2015). There are three examples approximately coeval with the Kainsbakke bone from, respectively, the Netherlands, northwestern Germany and eastern Germany. The Dalmatian pelican is a bird with an enormous wingspan, and it was probably extremely rare at the time. The deposition in pit A47 of part of a wing, or a few disarticulated bones from it, is therefore unlikely to reflect waste deposition, but rather an intentional act.

Human bones (skull, jaw, pelvis and shoulder blade) from at least two individuals were found in the lower part of layer 1 and the upper part of layer 3, within a 1 m<sup>2</sup> area extending from the centre of

the pit towards the west. These do not represent complete skeletons and their presence must reflect an intentional ritual act. It is conceivable that they were encountered during the digging up of previous depositions in the pit (see below) or were brought from elsewhere, for example the nearby megalithic monument (see Ch. 2.3.1.4). The dating of the bones (Philippsen et al. this vol.) indicates that they do not come from near-contemporary individuals who had been buried directly in pit A47, i.e. they had been buried elsewhere first, prior to deposition in the pit. This was the only context at Kainsbakke in which human bones occurred.

Several concentrations of tools were observed which also clearly give the impression of structured depositions. These included a remarkable concentration of so-called strangulated blades (Fig. 19), and large fragments of pottery vessels. The latter were especially prominent in the upper part of layer 1, where they formed extensive horizontal spreads (Fig. 20). Numerous tanged arrowheads lay in the western side of the pit, in association with a 5 cm thick layer of fishbones that extended along the surface of layer 3 and about 1 m into the pit.

In the longitudinal section through pit 47, two to three minor, curved shell layers, representing single isolated depositions, could be observed uppermost in layer 1. These deposits, together with the structured depositions of both animal bones and artefacts, show that layers 1 and 3 had not been disturbed to any significant degree after their deposition. Jaws showing several fractures were still articulated, indicating that these breaks took



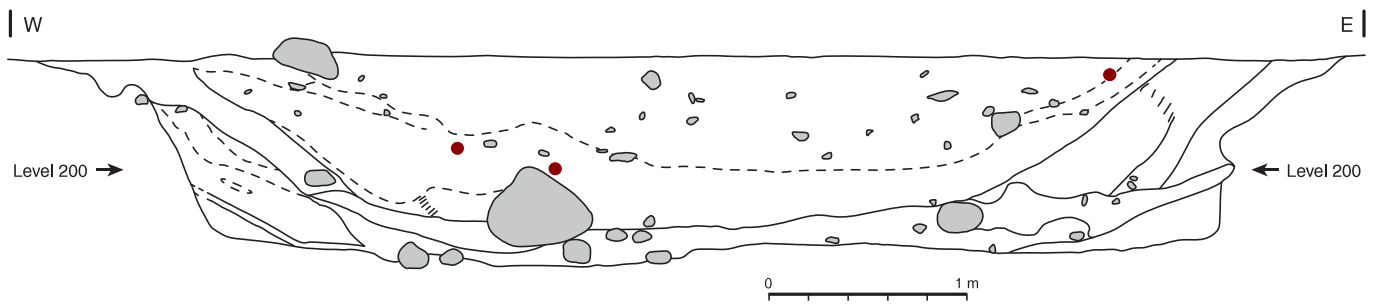


**Fig. 19** | *Pit A47:*  
*Layer containing fish-*  
*bones, with in situ*  
*strangled pieces*  
*and tanged arrow-*  
*heads. Photo: Lisbeth*  
*Wincentz.*



**Fig. 20** | *Pit A47: Parts of pottery vessels from*  
*the upper part of the pit (layer 1). Photos: Lisbeth*  
*Wincentz.*





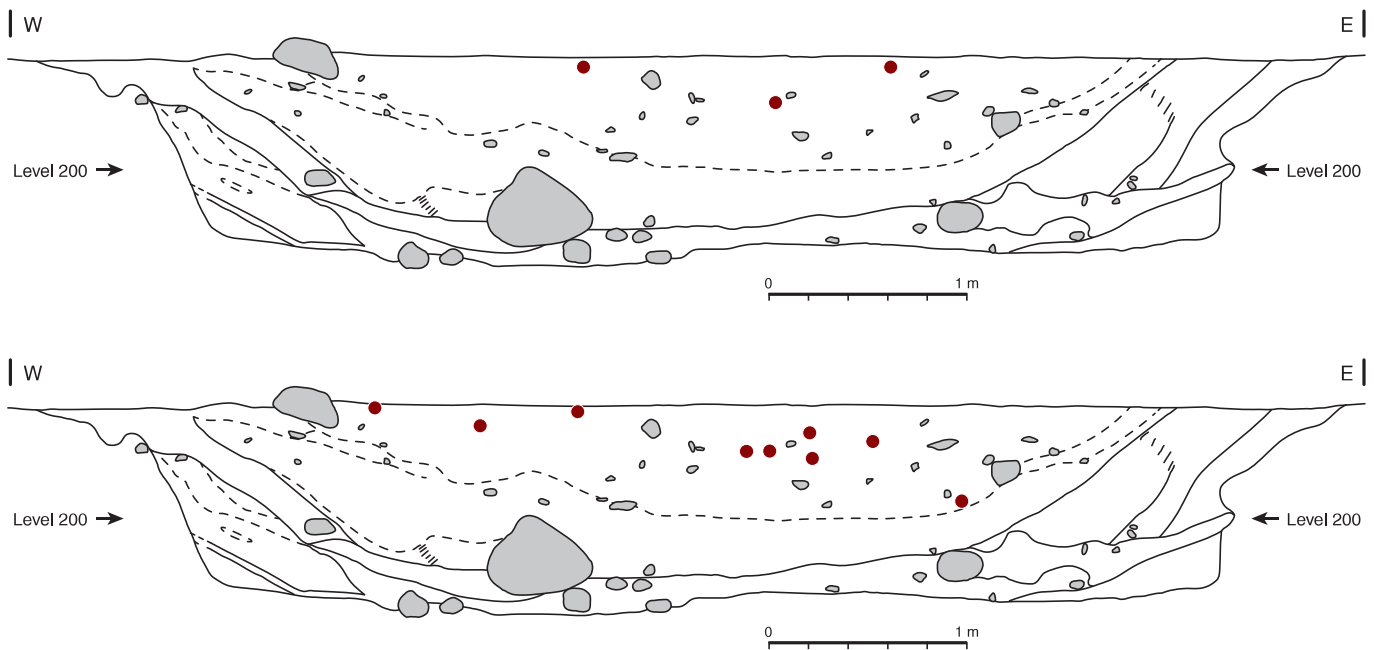
**Fig. 21** | *Pit A47: Location of three fragments from the same whetstone.*

place close to the time of deposition, when flesh and sinews still held the bones together. A polissoir found in three pieces in three separate locations in the pit also suggests that the stratigraphy was undisturbed. Two of the pieces were encountered respectively 0.5 and 1 m to the west of the transition between layers 1 and 3, while the third lay almost 2.5 m to the east of the centre of the pit, at a somewhat higher level but also at the transition between layers 1 and 3 (Fig. 21). This shows that infilling of (i.e. deposition) the pit took place simultaneously from each end of it, and because the layers were curved, artefacts deposited at the same time could lie at different levels (Fig. 22).

Investigations of the surfaces of the very large quantities of fragmented bone material indicate that it had lain on the surface for some years prior

to deposition in layer 3 and especially in layer 1, and consequently had the character of refuse (Makarewicz/Pleuger this vol.). The same is not, however, true of the bones in the structured depositions described above. It is not possible to determine whether the ordinary flint and pottery remains also reflect the disposal of waste. It should though be noted that these finds from pit A47 are generally less fragmented than the corresponding finds from the cultural depositions.

Pit A47 has many similarities with the segmented ditches associated with the causewayed enclosures of the TRB but is the only feature of its type yet demonstrated at Kainsbakke. A row of medium-sized pits extending westwards from pit A47 (see Ch. 2.3.1.3) does, however, suggest, that A47 formed part of a larger structure of a slightly differ-



**Fig. 22** | *Pit A47: Two examples of the distribution of potsherds from the same vessel.*



ent character to the typical causewayed enclosures. In recent years, structures of this kind have been identified in several places within the distribution area of the TRB in southern Scandinavia (Klassen 2014, 33). In relation to Kainsbakke, it is especially the localities of Sarup Gammel Skole on Funen (Andersen, N.H. 2009) and Triwalk in Mecklenburg (Jantzen 2005; Müller/Staude 2012) that are of interest. Here too, isolated rows of segmented ditches/pits have been demonstrated which – unlike the typical causewayed enclosures – do not enclose or delimit a specific area. These structures are completely equivalent in date to the typical causewayed enclosures (c. 3700/3500-3300 BC).

The primary cut of pit A47 was only preserved at its outer margins (layer 6), although the preserved remains of this primary activity phase suggest that the initial pit had a flat base. Together with the preserved steep sides, the overall impression gained of pit 47 corresponds to that of the ditch segments at for example Sarup (Andersen, N.H. 1999, 69-73). There was apparently then an early phase of



**Fig. 23** | Pit A47. Surface of the finds-poor layer 5 carefully exposed below a shell deposit (layer 3). Photo: Lisbeth Wincentz.

recutting and backfilling, which extended down through the original base, represented by layers 5 and 8. These layers only contained a few finds of pottery and other artefacts, which could not be distinguished typologically from those found in the layers above (Fig. 23). Where these finds were identifiable, they could be assigned to the PWC. The shell layers 1 and 3, located above layers 5 and 8, must be considered as two separate but relatively contemporaneous fills, formed in a further recut of the pit (Fig. 24). These layers gave no indication of having been disturbed by later activities, thereby supporting the interpretation of pit A47 as a segmented ditch (Andersen, N.H. 1999, 61). Similarly, the compact, relatively uncontaminated lower shell layer had the character of a segmented-ditch fill. The layer gave the impression of being a kind of covering over the base of the pit. A covering of this kind, with shells or a layer of birch bark, has been observed in several instances in definite segmented ditches (Klassen/Knoche 2019). As indicated by the basal layers of white-burnt flint evident in megalithic tombs, it may have been the whiteness of the material that was important in this respect.

Due to the lack of archaeological artefacts and organic material suitable for  $^{14}\text{C}$  dating, it is not possible to date the primary establishment phase of pit A47 securely. Dates around 3400 BC have, however, been obtained from layer 5 (Philippsen et al. this vol.), which clearly indicates activity during the TRB. The earliest dates correspond to the time of construction for most Danish segmented-ditch structures. That these dates come from layers containing a PWC tool inventory must be due to mixing together with earlier material when the pit was recut. Of special importance in this respect are the dates for the lower shell layer, layer 3, which fall around 3300-3050 BC – corresponding to MN A I-II (Philippsen et al. this vol.). This layer contains a limited but typologically characteristic artefact assemblage from the PWC which is identical to that from layer 1 above it. These  $^{14}\text{C}$  dates are unlikely to correspond to the PWC activity phase, as they are 100-250 years earlier than all the dates for the PWC in Denmark (Philippsen et al. this vol.). Furthermore, there is an extensive body of finds



**Fig. 24** | *Pit A47. The base of layer 3, with cylindrical core and clay disc. Photo: Lisbeth Wincentz.*



from northeastern Jutland, which clearly indicates that the TRB, and not the PWC, was widespread there at this specific time. The mollusc shells and cereal grains from layer 3 that were dated must therefore originate from material that had accumulated during an earlier TRB activity phase in the pit and was subsequently reused in connection with cladding of the later recut. That the only find from the excavations or the field surface at Kainsbakke which can be ascribed to the TRB (apart from those related to the dolmen site) was recovered specifically from layer 3 (i.e. a fragment of greenstone/diabase axe, see Ch. 2.4.3.1), further supports this conclusion.

In summary, a series of observations indicate that pit A47 had the character of a ditch segment and that it was established during the Late Early Neolithic TRB. This is indicated by its form and size, by the <sup>14</sup>C dates obtained from it and by the fact that it forms part of a row involving several other pits. The (almost) total lack of finds from the TRB does not contradict this interpretation, as several of this culture's causewayed enclosures have proved to have either a total lack of finds in the ditch segments (possibly Esesfeld – Klatt 2009, 110), or a great scarcity of finds in the primary establishment phase (Sarup I – Andersen, N.H. 1997, 53). It is first in the secondary phase of use

that deposition of greater quantities of material becomes evident, for example at Sarup. This latter observation corresponds fully to the situation at Kainsbakke and is yet a further indication that pit A47 represents a ditch segment from the TRB which was recut and reused during the PWC. At the same time, this situation shows that the activities around the ditch segment during the PWC, at least on a general level, corresponded to those observed for segmented ditches that have been located throughout the distribution area for the TRB. The fact that the recutting activities in pit A47 at Kainsbakke respected the original outline of the pit is remarkable and shows that people during the PWC must have had a memory of, or an observed tradition relating to, the site's significance as a special structure or monument (see also N.H. Andersen (1997, 25) with regard to the TRB).

From a study of the fishbones from the pit, J. Richter (1987) has concluded that it must, at some point, have been flooded and that the fishbones there represent natural deposits. This interpretation is based on her investigations of collagen fibres which showed no indications of having been heated. It is, however, untenable for several reasons. In contradiction to Richter's (1987, 116) statement that pit A47 lay at 7 m a.m.s.l., as described above, it actually lay 8-9 m a.m.s.l. As the maximum level of

the Stone Age sea in the area was c. 5 m a.m.s.l., it is therefore considerably less likely that the pit could have flooded. A flooding event of this kind would have been of such a violent character that fish remains are unlikely to have been the only things deposited in the pit, there would also have been sand and gravel deposits. Material of the latter kind was, however, not observed during the very detailed excavation. Consequently, the assumption that the fish remains cannot represent food waste, because they show no signs of having been heated, is incomprehensible. The consumption of raw, air-dried, cold-smoked or salted fish is still widespread to the present day and would certainly also have been so in the Stone Age. It can therefore be concluded that the fish remains in the pit represent human food waste which was deposited there. The detailed analysis of these remains is described by Pleuger/Makarewicz (this vol.).

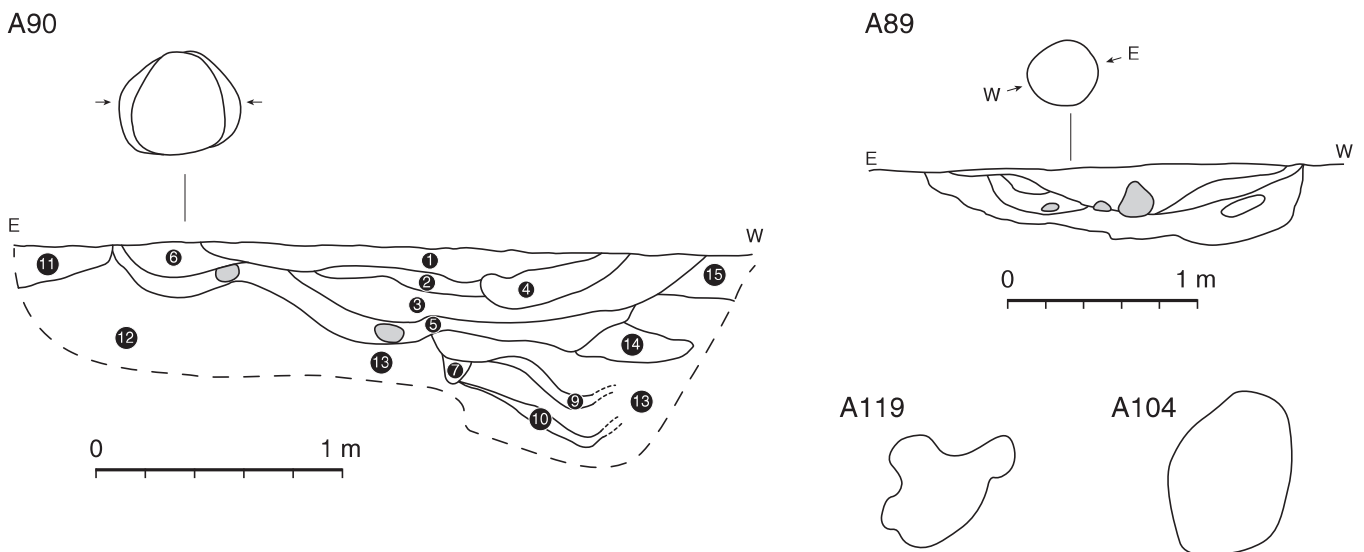
In summary, it can be concluded that pit A47 probably represents a ditch segment that was established during the TRB. This presumably took place at the end of the Early Neolithic and therefore at the same time as many of the TRB's causewayed enclosures and related monuments were constructed. Several phases of activity, with associated recutting, could be observed in the pit. The extensive PWC artefact assemblage derives from the shell deposits: layer 3 and, first and foremost,

layer 1. These two layers probably belong to the same phase of activity in the pit, as the artefacts they contain are typologically identical and the transition between them is blurred. Layer 3 had the character of a shell covering for a recut in the pit, on which most of the artefacts and faunal remains were subsequently deposited in layer 1, in one major event.

### 2.3.1.3 Row of pits west of pit A47

As mentioned above, pit A47 formed part of a row with four other features that lay at the same level (8-9 m a.m.s.l.; Fig. 5). These four definite or probable pits were significantly smaller than pit A47 but larger than the small pits described above, and of a different form (Ch. 2.3.1.1). The four pit-row features can be described as follows (Fig. 25):

A89: Circular pit with a diameter of 2 m, a depth of 0.4 m and a relatively flat base. The western side of the pit was cut straight, while the eastern side was more sloping. The pit fill was stratified into curved layers. Uppermost was a dark, 0.2 m thick layer containing a little flint debitage and several large stones. Below this were 0.1-0.2 m thick layers of light- and dark-coloured sand, while at the base there was a layer of light greyish-brown sand. The pit was sectioned, but not fully excavated.



**Fig. 25** | Outline and section drawings for the four medium-sized pits that formed a row to the west of – and together with – pit A47.