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An Early Neolithic Grave at Bjørnsholm, North Jutland

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INTRODUCTION

Since 1979 extensive archaeological research has taken place in NW-Himmerland in the central Limfjord area. Here, at a distance of only c.8 km from each other, lie the two largest Late Mesolithic/Early Neolithic Danish "køkkenmøddinger": Ertebølle and Bjørnsholm (fig. 1). Between 1979 and 1984 investigations took place at the *"locus classicus"* Ertebølle, from which a preliminary report was published in 1987 (Andersen & Johansen 1987). Between 1985 and 1989 the køkkenmødding Bjørnsholm was the main subject of this research[1].

The main purpose of the new investigations at Ertebølle and Bjørnsholm was to answer a series of questions such as: What was the size of the middens, how long a timespan did they cover, what types of sites were they, were they similar or different, what was the chronological range of the middens, and last, but not least, – was there any relationship between these two large "køkkenmøddinger", and if so, what was the nature of this relationship? Finally, an up-to-date sample of the artefact assemblage and faunal remains was required in association with well-defined stratigraphy and the cultural and chronological context.

Prior to the new excavations, the Bjørnsholm site had only once been the subject to research, in 1931, when the National Museum conducted an excavation[2]. Subsequent to this an area 30×30 m of the best preserved southern and southwestern part of the køkkenmødding was protected by law. As was the case with Ertebølle, the "old" excavation at Bjørnsholm produced a large number of artefacts, but lack of information as regards stratigraphy etc. was evident. This problem was very relevant in the Bjørnsholm-case, as the 1931 excavation produced both Late Mesolithic (Ertebølle culture), Early Neolithic (Funnel Beaker culture), and Iron Age material (Late Pre-Roman/Early Roman period)[3]. The records gave the impression that the site was archaeologically very "mixed", and this is probably the main reason why this site has only played a minor role in descriptions and discussions of the Ertebølle culture, and why it has only been mentioned in secondary connections in the literature, (Brøndsted 1938: 98,333; Mathiassen 1940:40-41; Mathiassen et al. 1942:54-56; Becker 1947:99,145,149).

Preliminary results from the new investigations indicate that the occupations of these two køkkenmøddinger were contemporary in an archaeological sense, but despite their close geographical position they differ in artefact style and also to some degree in their economies. Such a situation poses some very interesting questions regarding settlement patterns, population density, and environmental productivity within this part of the Limfjord.

In parallel with the new excavations, a large-scale reconnaissance of the whole coastal region of NW-Himmerland was begun in order to obtain information on the Late Mesolithic-Early Neolithic settlement pattern in the region, i.e. to see the two køkkenmøddinger as parts of a larger social structure in this area rather than separate and individual settlement sites.

A preliminary report on the results of the excavations at the Bjørnsholm køkkenmødding will soon follow in this journal. The present article deals only with a minor aspect of the Bjørnsholm excavations, that of an Early Neolithic grave, and serves as the archaeological background for the article by Sv.Th.Andersen (Sv.Th.Andersen 1992, this volume).

THE BJØRNSHOLM KØKKENMØDDING

The køkkenmødding is situated along the northern shoreline of a former fjord opening up into the modern Limfjord (fig. 2). Today the site is positioned between the contours 5-6.50 m above present sea level, hereby giving an impression of the geological uplift in this region since the Stone Age (Strand Petersen 1985:19). In the Stone Age the fjord was larger, it was orientated NE-SW and was c.8 km long and between c.0.7 and 2.5 km wide (fig. 1). The shell midden is c.160 m long, c.10-30 m wide, and up to 1.20 m thick. The actual settlement area (as defined by flint scatter on the modern surface) is however, much larger – c.200 m long, c.30-50 m wide and it continues to

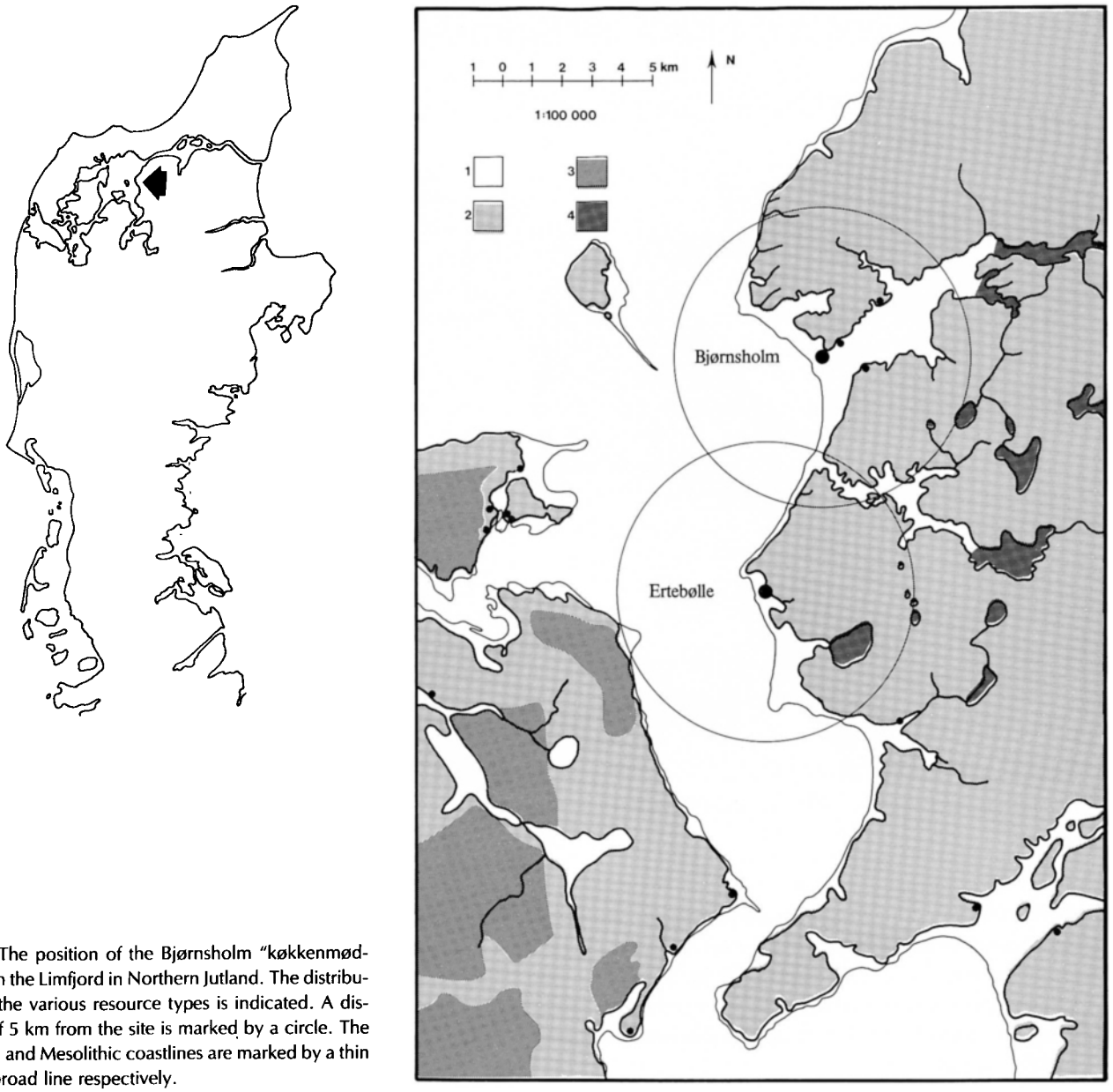

Fig. 1. The position of the Bjørnsholm "køkkenmødding" on the Limfjord in Northern Jutland. The distribution of the various resource types is indicated. A distance of 5 km from the site is marked by a circle. The modern and Mesolithic coastlines are marked by a thin and a broad line respectively.

the northeast into the Åle køkkenmødding which is 150 m long and 25 m wide (fig. 3).

The Bjørnsholm complex (the Bjørnsholm and Åle køkkenmøddinger) is, therefore, the largest preserved shell midden in Denmark today.

The Bjørnsholm køkkenmødding is a stratified shell midden with a lower, Late Mesolithic level belonging to the Ertebølle culture capped by an Early Neolithic horizon from the Funnel Beaker culture.

The Ertebølle layer is radiocarbon dated to the period 4140±100 b.c. (K-5304) – 3350±90 b.c. (K-5068) – while the Early Neolithic phase is dated to 3160±95 b.c. (K-5516) – 2810±90 b.c. (K-5721) (see below); all dates are for oyster shells *(Ostrea edule)* and given in conventional radiocarbon years. The Neolithic horizon is characterized by the dominance of shells of cockle *(Cerastoderma edule)*, black sandy earth with flints, pottery, bones, and firecracked stones. The maximum thickness of this layer is c.50 cm and the maximum extension (E-W) is c.10 m.

The new excavations consisted of a 27 m long and 1 m

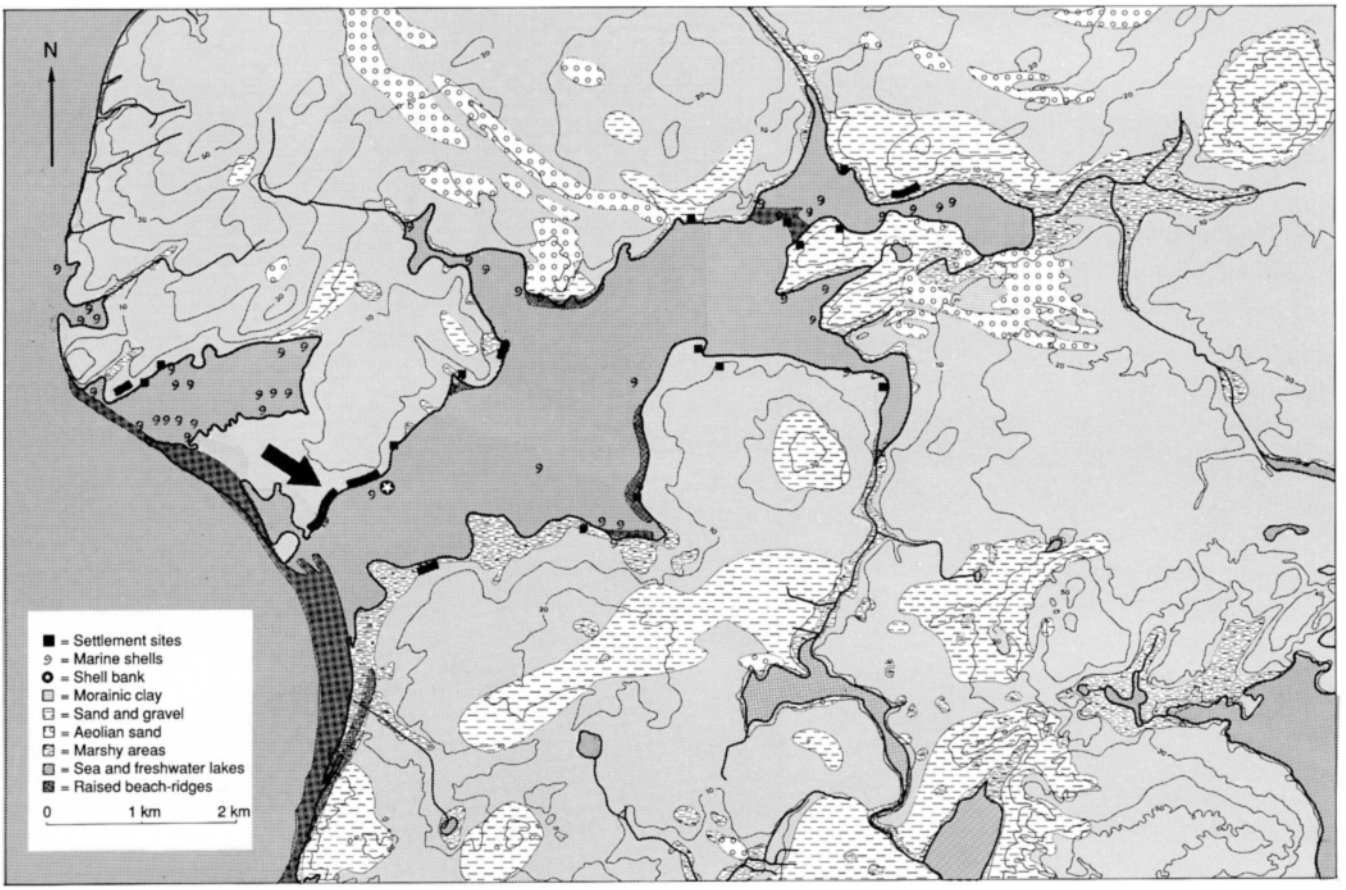

Fig. 2. Topography and geology of the Bjørnsholm area in the Late Mesolithic.

wide NW-SE section through the midden in the protected area followed by several smaller sections and test squares, both in the midden and to the rear of the shell deposits. The area to the rear of the shell midden was very carefully investigated in order to find traces of a distinct habitation area (Fig. 3 and 17).

THE BURIAL STRUCTURE

In 1988 a large stone-lined pit (2911 AAYU) was found in one of the test squares to the rear of the **køkkenmødding**, and the subsequent trial excavation revealed that the pit was connected to a ditch aligned in a northerly direction. The ditch ended in another large stone-lined pit (see below).

A group of three vessels of typical Early Neolithic type were found only c.l m to the north (fig. 11). The structure was found only c.12 m from the western border of the midden; in an area which today is a ploughed field. In connection with the excavation of the pit 2911 AAYU an E-W section was established through it and the surrounding area, and a series of soilsamples were taken for pollen analysis (fig. 5).

The combination of two large pits, a ditch and three intact Early Neolithic pots was interpreted as the remains of the east end of a long barrow with a timber facade set in a trench, as known from other Danish Early Neolithic long mounds (Madsen 1979; Liversage 1981; Kaul 1987; Kjær Kristensen 1991). Several new finds have been excavated and published in the last few years (Kjær Kristensen 1991).

If the interpretation was correct, then the barrow and any potential grave(s) should lie in the area west of the pits and ditch. Therefore, in 1990 two large areas measuring 13×11 m, around and to the W of the ditch system were excavated. Apart from the Norsminde settlement

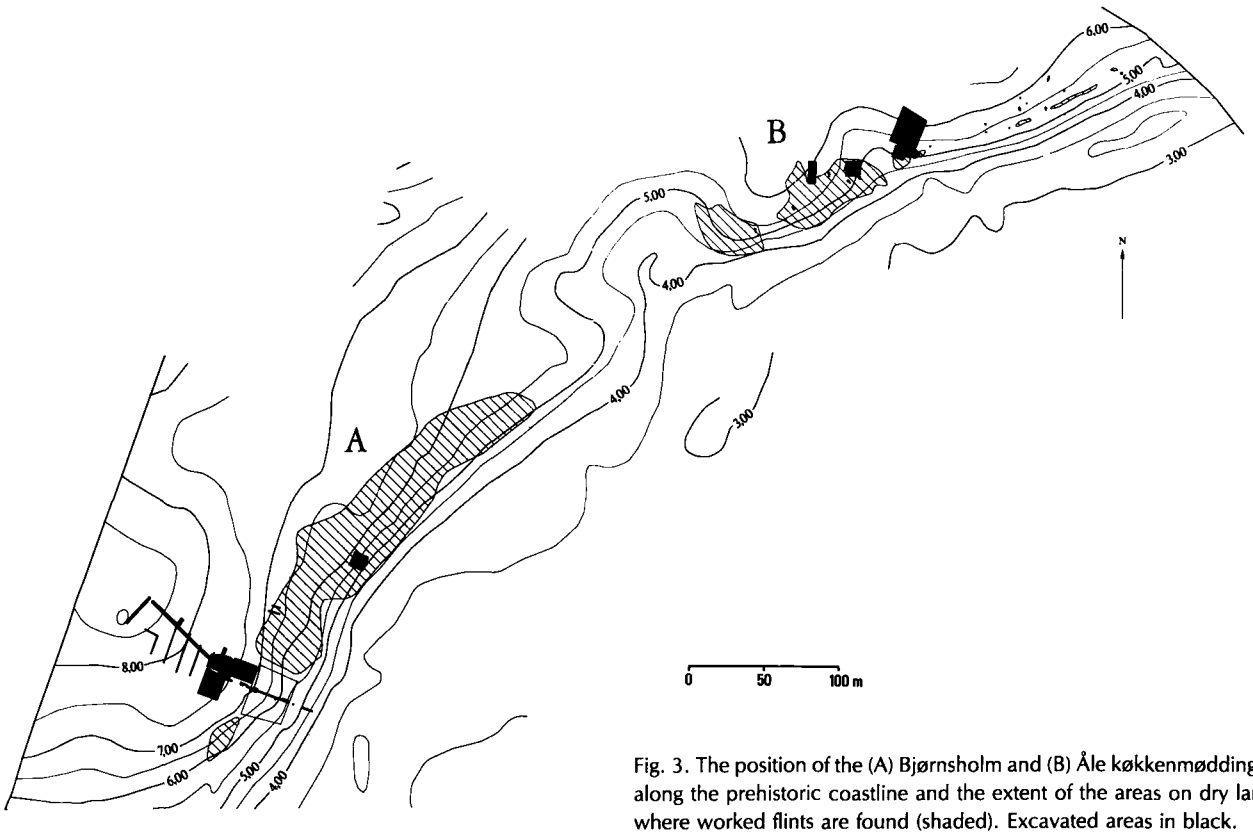

Fig. 3. The position of the (A) Bjørnsholm and (B) Åle køkkenmøddinger along the prehistoric coastline and the extent of the areas on dry land where worked flints are found (shaded). Excavated areas in black.

site (S.H.Andersen 1991, pp. 13–40) this was the first time that a large area had been excavated to the rear of such an Early Neolithic midden.

A stone-lined grave was found only c.8-9 m west of the ditch, from which it was evident that an Early Neolithic burial structure had been identified. By analogy with other Danish finds of this type, there was a possibility that more graves could be found further to the west. Therefore, a 57 m long NW-SE trench and a system of 5 parallel 10 m long trenches aligned NE-SW were excavated to the west of the grave, but without revealing any traces of other burials[4].

The proximity of the grave and ditch structure – and the lack of other graves in the area – suggests that this grave belongs with the timber structure, and that they are two parts of the same unit.

The Bjørnsholm structure is thus one of the few fully excavated long barrows with timber facade and ditch, which has not been disturbed by later megalith chambers. The individual elements will be described below.

THE GRAVE

The grave (2911 ACRS) was dug into the top of a very low, natural hill of yellow, sandy morainic clay which slopes gently to the E-SE, i.e. towards the prehistoric shoreline. Its position is c.20 m west of the shell midden (fig. 17), and it appeared undisturbed just below the ploughed soil horizon.The orientation was ESE-WNW, the maximum dimensions were 4 m (SE-NW), 1.75 m (NE-SW) and the depth below the prehistoric soil surface was 0.60 m. The outline was rectangular with slightly rounded corners, and it was built of large stones (morainic boulders and flint nodules of uniform size, 20-30×20-30 cm). The flint boulders are a local raw material and their presence indicates that the stones were collected in close proximity to the site. At the beginning of the excavation the grave was only indicated by a "bathtub-like" outline of stones with a central area filled with fine grey, homogeneous sand with charcoal flecks (fig. 6). The long sides were slightly concave indicating some movement of the stones, and this was especially clear on the north side of the grave. The long sides were built vertically with c.2-3 courses of stone, while the short ends

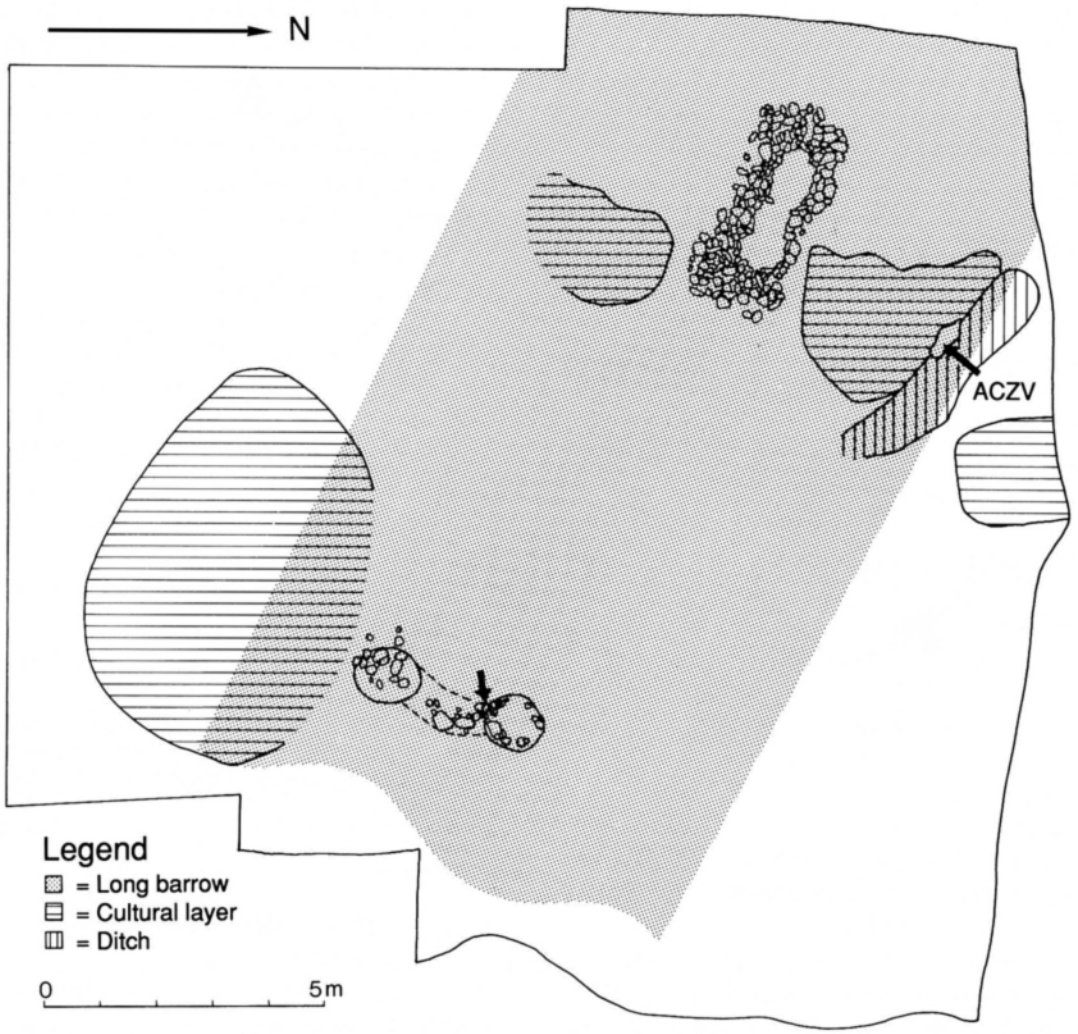

Fig. 4. Plan of the area excavated behind the midden. The positions of the grave, the grave ditch, timber structure and the small Early Neolithic settlement area are indicated. The position of the large lugged jar no. 2911 ACZV is indicated with an arrow.

sloped and had up to 6-8 courses. In the east end of the grave a single transverse arrowhead (2911 ACUM) made from a thin, irregular flintflake was found; one corner of the edge has been broken off, probably as a result of use (Fischer et al. 1984:23). After removing the grave fill of the central depression (caused by the collapse of a wooden coffin) it was possible to follow the stone lining down to the bottom. When the stone layer was removed it was possible to distinguish the outline of a rectangular (wooden) coffin which measured 2.20 m (ESE-WNW) × 0.6 m (NE-SW). The concave outline of the sides demonstrates that the grave originally was built of planks, most probably lying horizontally, but at an angle against the longsides. No traces of such wooden planks or posts were however observed.

The grave floor consisted of a 2-4 cm thick black horizontal layer – probably a secondary precipitation of manganese and/or charcoal dust; but nothing remained of the corpse. However, the position of the grave goods showed that a body had been buried, probably with the head at the west end.

In the centre of the grave, lying on the grave floor, were the grave goods: a thin-butted polished flint axe (2911 ACYK), a flat, thin-butted diabase axe (2911 AGAK) and three transverse arrowheads (2911 AGAJ) (fig. 8-10). The flint axe was positioned perpendicular to the long

axis of the grave with the blade pointing north, while the diabase axe lay obliquely and closer to the southern side of the grave, with the blade pointing south (fig. 6). The butt ends of the two axes lay very close (fig. 7) and the three arrowheads lay near to the northern side of the grave (fig. 8) (see below). These finds indicate that the grave contained a man armed with a flint axe, ceremonial axe, bow and arrows.

The large burial-pit had a volume of c 4.2 m^3, but where was all the fill? One answer to this question is probably a 5-10 cm layer of sterile, yellow sand covering a greyish cultural layer just north of the grave. The yellow sand is most probably a remnant of the fill from the grave. If this interpretation is correct, the stratigraphy indicates that the grave is younger than the cultural layer (see below).

The Bjørnsholm grave has no direct parallels among the group of published Early Neolithic graves (Madsen 1979; Kjær Kristensen 1991). It is a new variant within this group, but it shows some similarities to the Konens Høj type (Stürup 1966; Madsen 1979). However, the Bjørnsholm grave differs from the main group of these burials by the absence of large wooden posts in the grave (Madsen 1979:309); at the same time it is larger and deeper than most of the others.

The thin-butted flint axe (2911 ACYK) (fig. 9) is of a grey-greyish-black flint with embedded small fossils, and is probably of local senonian-type flint. The narrow sides are almost flat, while the broad faces are convex; the butt is partially sharp and partially blunt. The sides narrow towards the butt, and one has a small nick which increases its angle (fig. 9). It is 26 cm long, 7.6 cm wide across the edge, 5.2 cm across the butt, which is 2.0 cm thick. The greatest thickness is 3.0 cm. The width of the narrow sides is 1.5 cm. The angle between the sides is 5° (all measurements according to Nielsen 1978:63). It is very highly polished all over and does not have any trace of resharpening or use. According to Nielsen's classification it is a type IV-axe, with its main distribution around the western Limfjord (Nielsen 1978:126). In addition it is also the most common type found in the so-called "earth-graves" (Nielsen 1978:108). This type of flint axe is dated to the Early Neolithic, phases B and Early C (Nielsen 1978:108-109).

The thin-butted diabase axe with splayed edge (2911 AGAK) (fig. 10): The raw material is a light-brown, fine-grained, slightly-banded diabase. The axe is very well preserved and all faces are highly polished, but due to secondary erosion one of the faces has become coarse. The edge is blunt, but as it does not show any trace of

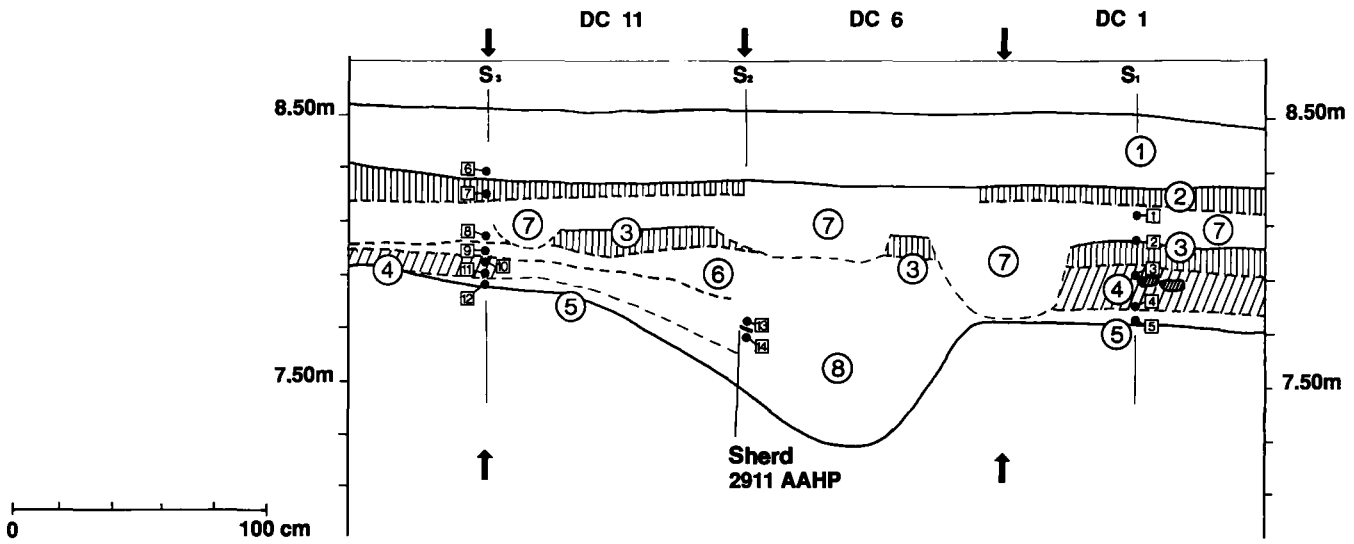

Fig. 5. Section of the southern posthole in the ditch at the eastern end of the long barrow. Soil samples taken for pollen analysis are indicated. Legend: 1, grey-brown sand with humus, present topsoil. 2, dark brown sand with charcoal, burnt clay, and potsherds; Iron Age level. 3, dark-brown sand. 4, black-greyish sand with scattered flints, charcoal, and fire-cracked stones; Stone Age level. 5, light-yellow, fine sand, subsoil. 6, light-yellow, fine sand; material from the posthole (layer 8). 7, brown, sterile sand and secondary Iron Age pits. 8, Stone Age posthole no. 2911 AAYU.

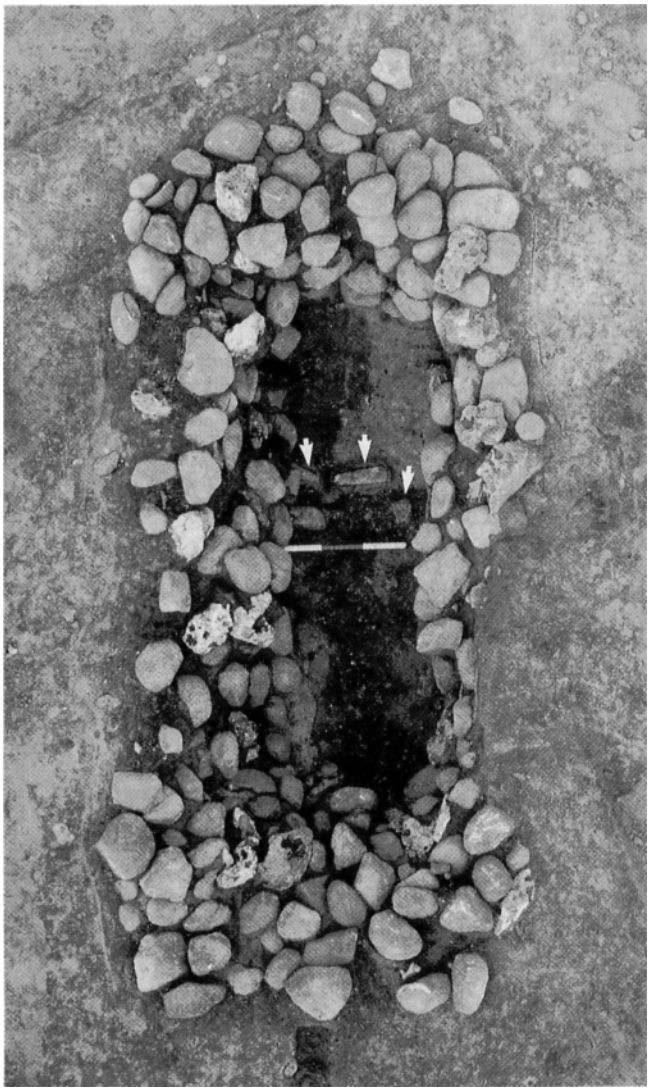

Fig. 6. Vertical photo of the Early Neolithic grave. Grave goods are indicated by white arrows. Photo E.Johansen.

Fig. 7. The thinbutted flint axe and the symbolic diabase axe *"in situ"* on the grave floor. Photo E.Johansen.

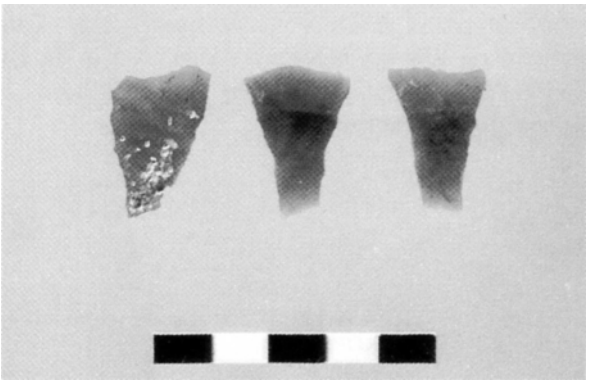

Fig. 8. The transverse arrowheads nos 2911 AGAJ 1–3. 3:4. Photo P.Dehlholm.

wear or resharpening, it is evident, that this axe was never intended for any real use. The broad faces are convex and the narrow sides slightly concave in section. The sides converge towards the butt which is blunt, then become very concave close to the edge which is splayed. The axe's measurements are: length 16.3 cm, width across the edge 6.3 cm, across the butt 3.5 cm, and the thickness is 2.7 cm.

The axe belongs to the group of slender thin-butted diabase axes with splayed edge, Danske Oldsager II, no.110 (Glob 1952) or Ebbesens type IV B (Ebbesen 1984:127, fig.2.9). Axes of this type are extremely rare, only half a dozen have provenience, most of them from Northern Zealand (Ebbesen 1984:127). The closest parallel, geographically, to this Bjørnsholm axe comes from Torup Mark in Dronninglund parish (Ebbesen 1984:148 and note 21). None of the Danish pieces are found in dated contexts, but one axe comes from an uncharacteristic undated stone-built cist from Mejls, north of Varde in Western Jutland (Ebbesen 1981:21, note 9). With this information, the new axe from Bjørnsholm is very important as it is the first from a sealed context. In his survey Ebbesen dates this type to the

Fig. 9. The thin butted flint axe. 3:4. Photo P.Dehlholm.

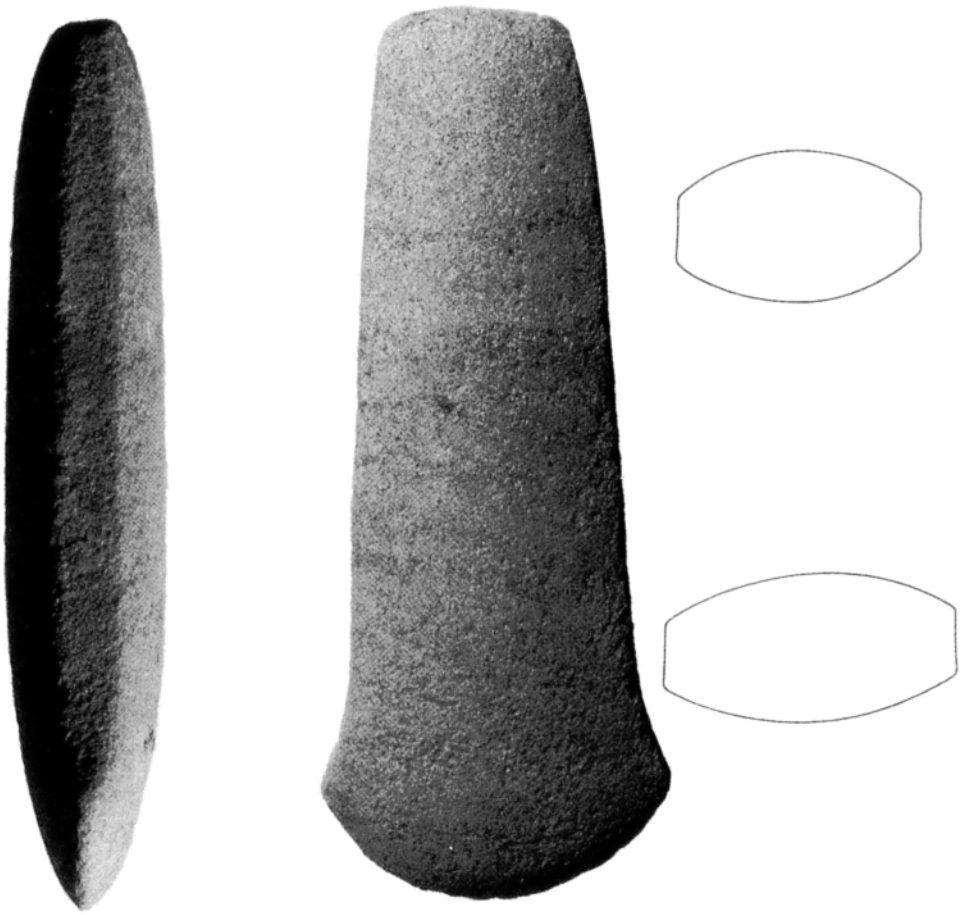

Fig.10. The diabase axe. 3:4. Photo P.Dehlholm.

Middle Neolithic Ia-II (Ebbesen 1984:127,131). This dating is exclusively based on typological similarities between these axes and the axe-shaped amber pendants, Danske Oldsager II, nr.299–300 (Glob 1952) and the copper axes in the Bygholm hoard (Reinecke 1933).

Both the light-brown colour and the form clearly indicate that the diabase axes with a splayed edge are imitations of Central European copper axes. The dating of these stone axes is, therefore, closely connected with the presence of such metal axes in Southern Scandinavia. The Bygholm hoard is dated to the Fuchsberg phase of the Funnel Beaker culture (end of the Early Neolithic). However, no Danish finds give any clue as to how long a period such axes, in reality, were circulating in Denmark. In a wider European perspective these copper axes seem to be present in Central Europe contemporary with the transition Mesolithic-Neolithic and Early Neolithic in Denmark (Müller-Karpe 1974, Kibbert 1980, Menke 1989). There is, therefore, every reason to believe that similar copper axes could also have been present in Denmark during a long period of the Early Neolithic. The dating of their imitations, the diabase axes, might, thus, be much wider than previously supposed. Therefore, the thin-butted stone axes with splayed edge should simply be dated within the period Early Neolithic-Early Middle Neolithic.

That the Bjørnsholm axe really is an imitation of a metal axe is further supported by the absence of a cutting edge which clearly demonstrates that this is a ceremonial axe or a "symbolic axe".

The three transverse arrowheads (2911 AGAJ) (fig. 8) were found close together in the centre of the grave, indicating the presence of bow and arrows. All three are typical Neolithic arrowheads; both their form and the raw

material of irregular flint flakes is characteristic and demonstrates their chronological and cultural affinity, e.g. Danske Oldsager II nr. 263 (Glob 1952). Two of the arrowheads (2911 AGAJ 2 and 3) are symmetrical with slightly expanded edges with an irregular outline and are made from thin flakes. Their lengths are 2.6 and 2.7 cm respectively and the width across the edge of both of them is 1.8 cm.

The third arrowhead (2911 AGAJ 1) is different. It was manufactured from a very irregular flint flake partially covered by cortex, and the edge is oblique and concave. However, the dimensions are almost identical to the others, the length is 2.9 cm and the width 1.7 cm. This arrowhead is very interesting because it is badly damaged. Both corners of the edge exhibit fractures and the tip of the base has been broken off, producing a "step terminating fracture" (Fischer et al. 1984:25,fig.7,B,D and 32,fig.18). This indicates that the arrowhead was in this damaged state when it was placed in the grave. An explanation for this is that the arrowhead had been used, but still was fixed in its shaft at the time of the burial.

Traces of the mound

Was the grave covered by a mound, and if so, what was the outline and size of this mound? Around the burial was a thin (20–25 cm) horizon of fine, grey sand. This sand layer which is best interpreted as the remains of mound material could be followed 5–6 m to the north and south of the grave, an indication of the width of the prehistoric mound. The presence of the same grey sand in the grave indicates that originally such a layer must also have been deposited above the grave. An estimation of the width of the barrow is given by the fact that scattered potsherds of Middle-Neolithic II type were found on the old ground surface just 5 m S of the grave – a position which would have been impossible if the mound had extended that far. Together with the extension of the grey sand layer this observation indicates a width for the barrow of c.10 m. Towards the W no traces of a mound were found, but this is probably a result of modern ploughing as the area is the highest point on the natural hilltop. To the E it was possible to follow the grey layer to the ditch, and from here only 2–3 m further to the E where it disappeared. No form of structure (i.e. grass or turf) was observed in the greyish layer, and it contained only very small amounts of scattered flint debris and pottery.

To summarize: There are several indications pointing to the presence of a covering mound of sand, but there is no definite information as to its shape or outline and size although most observations point in the direction of an E-W oriented rectangular/elongated mound, with a width of at least 10 m. In contrast to other Danish Early Neolithic long barrows no traces of posts along the perimeter of the mound were observed (Madsen 1979; Kjær Kristensen 1991).

The facade at the E end of the mound

The pit (2911 AAYU), which was found in 1988, was oval in outline and measured 1.40 m (N-S) × 1.20 m (E-W). It was discovered c. 8.5 m from the east end of the grave, and the bottom of the pit was c.80 cm below the prehistoric soil surface. The sides, which were lined with stones (20–30×20–30 cm) all the way to the base, were sloping, especially on the west side. The excavation revealed that the sides must, originally, have been more vertical, but they then collapsed causing the stones to slide down to the bottom. The filling of the pit consisted of fine, homogeneous sand with flecks of charcoal, and apart from a single potsherd of Stone Age type and a blade scraper no further cultural remains were found. A charcoal sample from this pit has been identified as oak *(Quercus sp.)*[5].

The ditch: To the north the pit was connected to a c.1 m long curved ditch running c.8–9 m from the east end of the grave and perpendicular to the long axis of the grave, i.e. N-S (fig. 11). The ditch was 100–120 cm wide at the top (from the ancient soil surface), 20–40 cm wide at the bottom, and only c.20 cm deep. The ditch was U-shaped in section and the east side was almost vertical and lined with stones, some as large as 25×40 cm. They were positioned with their flat sides facing the center of the ditch, indicating that the stones served as support for posts or a timber structure standing in the ditch (fig. 11). The fill contained a great deal of powdered charcoal within a matrix of black-grey, homogeneous sand, darker in colour than the fill both of the pit mentioned above and the large pit mentioned below. Only a few scattered potsherds, mainly belonging to one of three pots (see below), were found in the fill. In both the ditch and the pits, darker colourations were observed, which were probably vestiges of wooden posts, but it was not possible to tell how many there were and with what shape.

The ditch ended in another large pit (2911 ACTH) with a semi-circular outline measuring 110 cm (N-S) × 100 cm (E-W) and 85–90 cm in depth (fig. 12). This pit

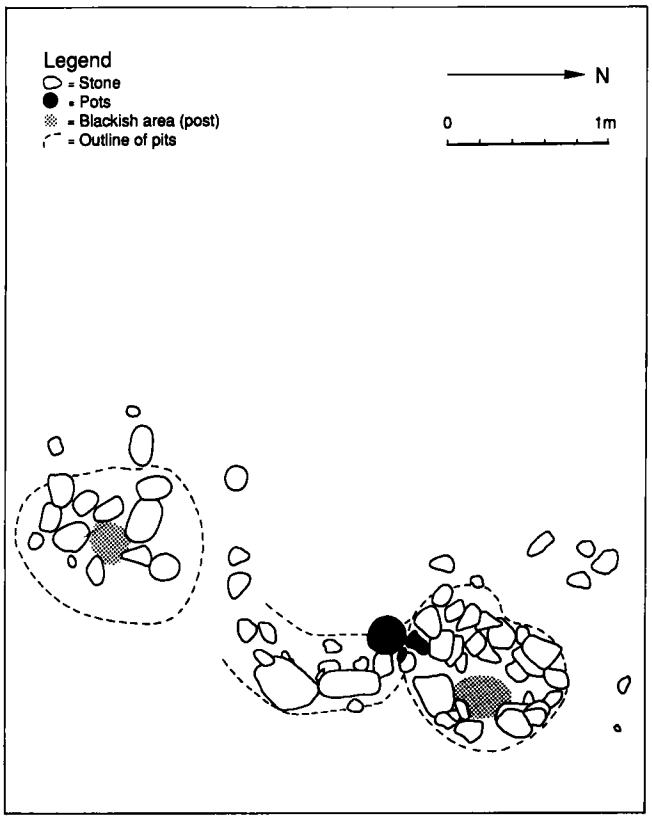

Fig.11. Plan of the ditch and the two large post holes. The position of the three ornamented Volling pots is indicated.

had vertical, stone-lined sides, well built with 3–4 horizontal courses of large stones (of the same size as in the southern pit and the grave) and the bottom was flat and with no stones. The arc-shaped outline of the pit reflected a split tree trunk with the flat side towards the barrow, and the fact that the sides were still vertical indicated that the post, which had been standing in the pit, had not collapsed with resulting destruction of the sides as was the case in the southern pit. The fill was a fine greyish-black homogeneous sand without any finds. A darker colouration was observed in the pit, probably the vestiges of the wooden post (fig. 13).

Judging from the outline of the northern pit the two large pits were most likely prepared for large wooden posts. The posts were probably diagonally-split tree trunks with a diameter of c.100–110 cm. The two post holes are very similar, the only difference being that the west side in the southern pit had slipped, probably as a result of the collapse of the post. The two post holes and the ditch together formed a N-S oriented timber facade at the eastern end of the mound; a feature known from most of the recent excavations of such mounds (Kjær Kristensen 1991). The facade does not seem to have been deliberately burned down as known from other contemporaneous mounds (Madsen 1979). Neither stones, the earth, or the finds show any evidence of fire.

Three ornamented Volling pots (2911 AAVT, AAVW, and AAVX) were found in the ditch, where it connected with the northern pit (fig. 11 and 14a-c). The pots lay together in the northern end of the ditch and very close to the prehistoric soil surface. This position indicates that the pots originally were deposited together as a group. They may have stood on the old soil surface at the edge of the ditch and later fallen down into it, or alternatively were deposited in the top of the ditch fill. This position also explains why the largest pot (2911 AAVT) was eroded and broken near the rim and down one side, the side which was closest to the surface, and therefore most exposed. The large pot lay at an angle with its rim to the east while the second (2911 AAVW) lay on its side, just to the north of the former and with its mouth to the southwest. Finally, several fragments of a third pot (2911 AAVX) were found between the other two (fig. 14b). During the excavation several sherds of this pot were found scattered within a few square metres and all observations point to this pot also having been originally intact (see below).

The three pots are most probably ritual deposits (offerings) in connection with burial rites for the dead in the grave. Apart from a few small flint flakes and two rimsherds of a decorated funnel beaker no other cultural remains were found in this area.

To summarize: About 8–9 m east of the grave a system of two large stone-lined post holes – foundations for wooden posts – were encountered. The pits were connected by a 1 m long curved ditch partially lined with stones and in which traces of wooden posts also were observed. The ditch and posts are arranged symmetrically across an E-W axis running through the centre of the grave. In this ditch three Early Neolithic pots which belong to the Volling style were found.

1) *Large lugged beaker (like Danske Oldsager II,nr.26) (2911 AAVT), fig. 14a.* This vessel is nearly complete with only a part of the rim and one side missing due to secondary erosion. The vessel is thin-walled with a cylindrical neck, globular body, and round base. The transition from neck to body is sharply defined and accentuated by a single narrow horizontal groove. At the transition are three small applied lugs; (a fourth had been positioned on the missing part of the side). The surface

is completely covered with decoration from the rim to base and the composition of the neck and body is very similar (fig. 14a).

Immediately below the rim is a single, horizontal row of short vertical stabs, followed by 4 horizontal rows of small paired semi-circular stabs and spaces arranged alternately. The lower part of the neck is decorated by large vertical fields filled with random vertical lines of stab impressions, separated by narrow plain bands. Each band is bordered by one or two parallel and continuous lines formed of stab-and-drag impressions (fig. 14a). The upper part of the body is ornamented with a single, horizontal row of vertical lines in stab-and-drag technique followed by a series of large vertical fields filled with rows of stab impressions like the neck. The fields are separated by narrow, plain bands, each edged with two parallel lines in stab-and-drag technique. The composition of the decoration on both neck and body is somewhat displaced to give variation to the composition. The height of the vessel is 16.6 cm, the diameter of the rim is 17.6–19.5 cm, and the maximum diameter of the body is 18.3 cm, while the neck is 8.4 cm high.

2) *Lugged jar (2911 AAVW), fig. 14c (like Danske Oldsager II, no 63–64).*

This is a thin-walled vessel with a cylindrical neck and globular-oblong body with 4 small lugs at the round base. The transition between neck and body is distinct and like the above vessel has a narrow horizontal groove between the two. The whole surface is covered with ornamentation in stab-and-drag technique similar to the above vessel. Immediately below the rim is a single horizontal row of short, vertical stabs followed by three horizontal lines of small paired semi-circular impressions with spaces. These lines are arranged alternately on the collar. Below, are vertical fields filled with short stab-and-drag strokes, separated by narrow and vertical, blank bars bordered by parallel, vertical lines in stab-and-drag technique. The top of the body is ornamented by a single horizontal row of short, vertical lines in stab-and-drag impressions. The rest of the body is covered by a composition of vertical fields filled with stab-and-drag technique, in an alternating

Fig. 12. The ditch and part of the northern post hole seen from the NW. Photo E.Johansen.

pattern separated by narrower vertical bands edged with one or two parallel lines with impressions in stab-and-drag technique. These vertical bands are filled by offset and paired stab-and-drag impressions and spaces of the same type as below the rim. The composition of the ornamentation of neck and body is also displaced relative to each other. The height of the vessel is 14 cm, the diameter of the rim is 8.5–9 cm and the maximum diameter of the body is 12.3 cm. The diameter of the neck is 4.7 cm and the height of the neck is c.4.5 cm. A very similar, but smaller vessel is known from Kappelhage, Stagstrup s., Thisted county (Mikkelsen 1989:130). This vessel was also found in an Early Neolithic

Fig. 13. Vertical view of the northern post hole and the ditch (left) and the northern post hole seen from the north (right). Photo E.Johansen.

structure with timber construction. In a ditch belonging to this structure three funnel beakers were found. Decorated lugged jars are also known from other Early Neolithic graves, i.e. the graves from Rimsø and Skivum (Madsen & Nielsen 1977:29, fig. 4 and 32, fig. 8 A and C).

3) *The "small" beaker (2911 AAVX), fig. 14b (like Danske Oldsager II, no 17–18).*

A large fragment of this pot was found in close association with the other two, while more sherds were encountered in the immediate vicinity. Although, this vessel is rather fragmented it has, however, been possible to reconstruct it, even though the rim and bottom are not present[6].

It is a thin-walled funnel beaker with a cylindrical neck, round base and body, a type well known from northern Jutland, (i.e. Becker 1947:144, fig. 31; Ebbesen & Mahler 1980:31, fig. 15). The surface is totally covered with decorations in stab-and-drag technique like the other vessels. At the top of the pot is a single horizontal row of vertical impressions, followed by vertical fields filled with short stab-and-drag lines, separated by narrow vertical bands (fig. 14b). The transition between neck and body is marked by a horizontal groove (fig. 14b). The composition on the neck and body is identical, but the decorative bands are offset in relation to each other in order to give variation to the ornamentation (fig. 14b). The height of the vessel is c.12–13 cm and the maximum diameter c.12 cm.

As already mentioned the position of the three vessels indicated that they originally were deposited together as a group. This observation is further substantiated by the ornamentation. Their style is very similar, and this similarity goes as far as to suggest that the individual tooling on the two larger vessels is identical (compare the rim decoration of the two large pots (fig. 14a+c)). They must have been ornamented by one person using one and the same tool.

The grave structure belongs to the oldest Neolithic graves found in Denmark and is one of the richest: Firstly, there are the three beautiful decorated vessels from the ditch system, and secondly the thin butted flint axe – the symbol of the farmer, the ceremonial axe -symbol of male power, bow and arrows – symbol of the hunter in the grave. To this is added the investment and labour of the whole construction: the very large, deep grave pit, two large pits with posts, the mound, and finally the large collection of stones of the same size.

THE CULTURAL LAYER

Bordering the north side of the grave structure, a grey, sandy cultural horizon rich in flint debris, flint artefacts, and potsherds was found (fig. 4). The layer was roughly circular in outline and had maximum dimensions of c.6×6 m, but its main concentration only measured 3.5×2 m. The layer was very confined and outside its perimeter almost no cultural debris was found. Below this horizon was a curved, 0.75 cm wide, 4 m long, and 15–20 cm deep, "U"-shaped ditch also filled with a similar grey homogeneous sand with many flint artefacts and potsherds. On the bottom of this ditch a lugged jar (2911 ACZV) was found (fig. 4 and 15). The ditch followed the outline of the north- and east side of the grave with a distance of c.4 m (fig. 4).

The find material from the cultural layer is uniform in character and belongs to the Funnel Beaker culture (fig. 16). A closer analysis of the material gives a clear date in the earliest part of the Early Neolithic, i.e. the "North-Jutland non-megalithic C-group" according to Becker (Becker 1947) or the Volling group (Ebbesen & Mahler 1980; Madsen & Petersen 1984). The finds from the ditch below the grey cultural layer also point to the Volling group (fig. 15), and it is reasonable to assume that the ditch and the covering cultural layer are more or less contemporary. A similar cultural layer and an associated ditch were not found south of the grave.

The occurrence of flint debris, flint artefacts, and potsherds indicate a settlement. It is reasonable to interpret the ditch as the remains of a structure – probably a foundation trench for a hut wall. The rather confined culture layer and the small number of cultural remains indicate a very small settlement site and/or a short lived duration of occupation at the site.

The Neolithic layer in the køkkenmødding – only c.30 m away – contains similar types of flint artefacts and pottery decorated in typical Volling style (fig. 16). Stratigraphic observations, homogenity of flint types, ceramics, and the topographic situation, indicate contemporanity. We may assume, therefore, that the grey cultural horizon is the habitation area proper on higher, dry ground contemporaneous with the køkkenmødding at the seashore.

At the north side of the grave, the grey cultural layer was partially covered with a c.10 cm, sterile layer of yellow-brownish sand which is most probably morainic material derived from the excavation of the grave. These observations give a clear picture of the relative order of these findings. Firstly, some kind of building and a small settlement must have been situated here. After the destruction of the building and levelling of the cultural layer the grave was then constructed.

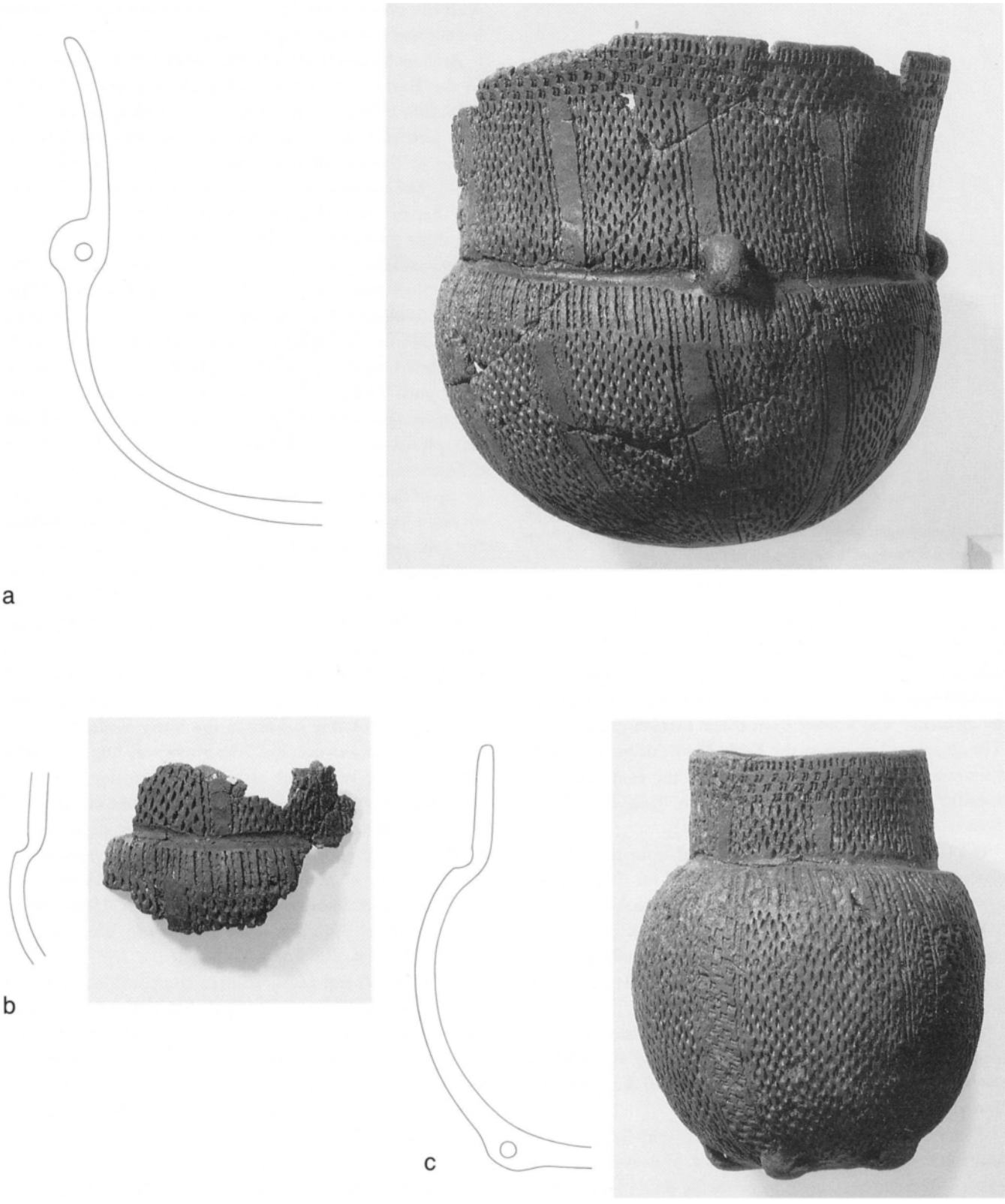

Fig. 14. The three Volling pots from the ditch. C. 1:2. Photo P.Dehlholm.

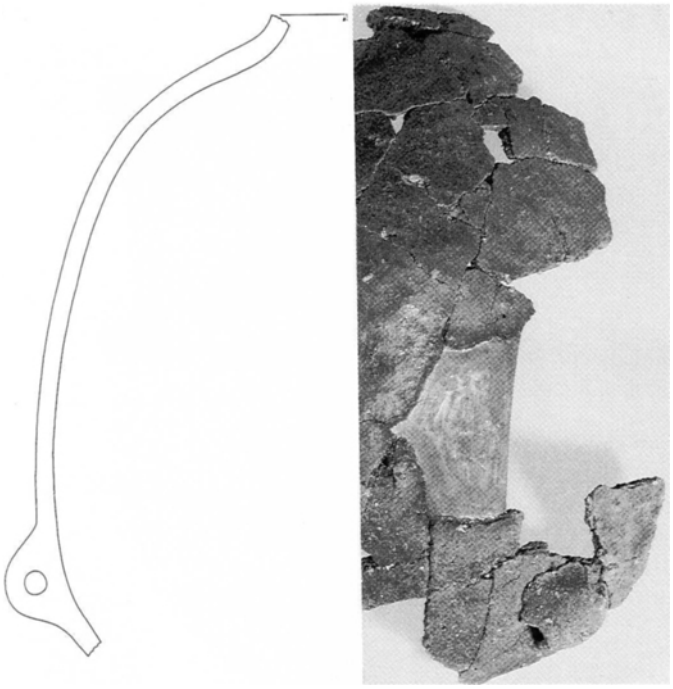

Fig. 15. Large lugged undecorated jar from the ditch below the cultural layer around the grave 1:3. Photo P.Dehlholm.

DATING AND CULTURAL CONTEXT

The grave, mound, and timber structure from Bjørnsholm may be looked upon as one synchronous event constituted by elements well known from other Danish excavations. The structure belongs to the Early Neolithic group of long barrows with timber constructions at the east end. This specific type of grave is only known from the Funnel Beaker culture (Kjær Kristensen 1991).

C-14 date: Two samples of charcoal from the foundation of the timber facade were submitted for AMS-dating at the Institute of Physics, University of Aarhus:

1) Excavation sample no. 2911 AAYW (*Quercus sp.*) was found 1 m below the surface at the very bottom of the southern pit of the timber facade, *c.f.* fig. 4. It was dated to 3100±160 b.c. (uncalibrated) (AAR-802).

2) Excavation sample no. 2911 ACSY (*Alnus sp.*) came from the area between the two posts and only 40 cm below the surface and was dated to 1100±100 b.c. (uncalibrated) (AAR-803).

The second date is clearly too young (mid-Bronze Age), and must represent a later intrusion. However, the first date, 3100±160 b.c., gives at probable date of the timber facade which is structurally and stratigraphically related with the grave. This date is in good accordance with the archaeological-typological dating.

Archaeological date: The thin-butted flint axe belongs to the Early Neolithic B and Early C-periods (Nielsen 1978:108–109) corresponding to the Volling group. The thin butted diabase axe with splayed edge can only be dated to the period Early Neolithic-Early Middle Neolithic. The transverse arrowheads are of a Neolithic type, but they do not give a narrower dating. Finally, there are the three pots from the ditch. Both their type and decoration clearly place them in the regional group of the Early Neolithic of N Jutland, that of the "non-megalithic C" or Volling group (Becker 1947; Ebbesen & Mahler 1980; Madsen & Petersen 1984). This group, which is well dated by C-14, covers a 300–400 year period from 3100 until 2800/2700 b.c. in C-14 years, or c.500 years when using calibrated dates. It is possible to subdivide this phase into shorter phases in North Jutland. Some differences in ornamentation and composition within this group of material has been observed and seem to indicate an older Volling and a younger Volling phase out of which the younger phase probably was influenced by the southern Danish Fuchsberg-group (Andersen & Madsen 1978; Madsen 1975:146,148; Madsen & Petersen 1984:99; Andersen 1979:14,fig 9 and note 15). However, as the relevant material is still too sparse and geographically scattered, it is impossible to decide whether such observed differences are chronological. If so, the three pots from the ditch most probably belong to the Early Volling.

As previously mentioned, the grave was dug through a cultural layer with flint artefacts and pottery of Early Neolithic character. Several of the sherds are ornamented in Volling-style and no younger or older objects were found (fig. 16). This stratigraphical observation suggests that the grave is younger, but probably not very much so, than the cultural horizon and the finds in it. However, no scientific dates from this layer were made. The artefacts date the layer to the Early Volling.

From the central Limfjord-area comparable settlement material is known from a small shell midden at Vojel Kær on the island Fur (Becker 1947:148), the shell midden Aggersund (S.H.Andersen 1979:22–23) and the long barrow at Tolstrup (esp. the Tolstrup III) (Madsen 1975:129, 138–139), but these finds do not help solve the dating problems.

The Neolithic layer in the nearby køkkenmødding contained similar types of flint artefacts and pottery deco-

rated in typical Volling-style (fig. 16). This horizon has been C-14 dated: 3160±95 (K-5516), 3100±90 (K-4790), 3010±90 (K-4796), 2940±95 (K-5515), 2890±95 (K-5720) and 2810±90 (K-5721) (all datings on oyster shells). As these datings are taken at different positions and levels within the Neolithic horizon, together they indicate that this occupation belongs to the earliest Funnel Beaker culture and that the habitation seems to have taken place over a chronologically very short period. These results fit with the archaeological material which only reflect "pure" Volling-types, and no younger types were found.

There is a close similarity with respect to type and ornamentation between the three pots from the ditch system of the mound and the material from the top horizon in the midden as well as from the grey cultural layer. This observation indicates that the mound and grave should most probably be dated to a very early stage of the Early Neolithic – probably about c.3100–2800 b.c. This dating is comparable to the material in the grave. However, it must be stressed that it is not possible to exclude a later date within the Early Neolithic, but still within the "pure" Volling and definitely earlier than the Fuchsberg-influenced "Late Volling" in North Jutland. In conclusion the grave belongs to the Earliest Funnel Beaker culture and most probably to the period 3100–2800 b.c. (Conv.C-14 years).

Danish long barrows with timber facades have been C-14 dated in 6 cases: Storgård IV: 2875±140 bc (UA-441), 2840±115 bc (UA-443) and 2760±115 bc (UA-442) (Kjær Kristensen 1991:79). Rustrup I: 3030±100 and 3010±100 bc (K-2254), and 2960±100 bc (K-2253). Rustrup II: 2970±100 bc (K-2355) (Fischer 1976:40,61). Lindebjerg: 3060±100 bc (K-1659) (Liversage 1981:97). Rude: 2960±90 bc (K-3124) and 2860±70 bc (K-3125) (Madsen 1980:95-96), and Konens Høj: 2900±100 bc (K-919) (Stürup 1966:16). A similar structure, partially destroyed by a younger megalith, is the long barrow at Mosegården. This feature gave a C-14 dating of 3130±90 bc (K-3463) and 2940±90 bc (K-3464) (Madsen & Petersen 1984:75). All these datings correspond well with the datings from Bjørnsholm.

THE RELATIONSHIP BETWEEN THE SETTLEMENT AND THE MIDDEN

As already mentioned, the grave was discovered only c.20 m west of the midden. At present it is not possible to determine exactly where the prehistoric shore line was located during occupation of the site, but it, probably, lay only c.40 m away from the grave and the grey cultural layer.

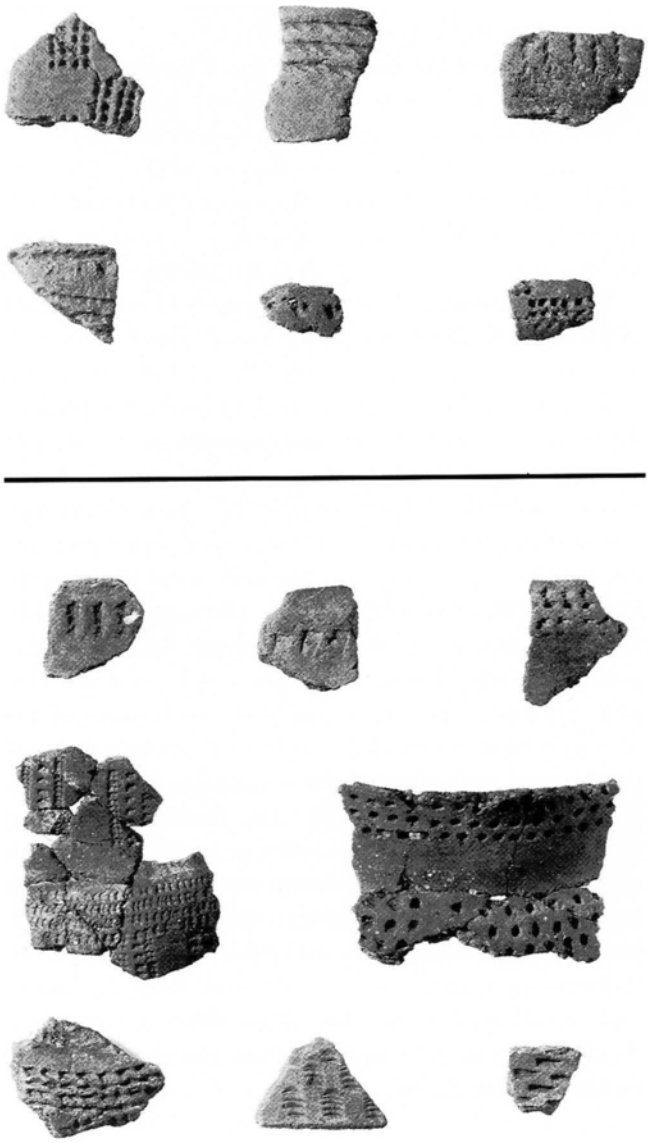

Fig. 16. Ceramics from the cultural layers on dry land (above) and the top horizon of the køkkenmødding (below). 1:2. Photo P.Dehlholm.

Exact contemporanity of the grey cultural horizon and the køkkenmødding cannot be proved, but stratigraphic observations, the flint type inventory, the ceramics, and the topographic position make it a reasonable assumption, that the grey cultural layer is the habitation area

used at the time when the Neolithic part of the køkkenmødding was deposited.

The pattern of the Bjørnsholm site, therefore, indicates a settlement area with an associated køkkenmødding c.20–40 m away, situated on the seashore (fig. 17).

A similar pattern has been documented at the stratified, Early Neolithic Funnel Beaker site Norsminde in E Jutland; here the distance between settlement area and midden was c.50 m (S.H.Andersen 1991:13–40).

These two independent observations indicate that some of the Early Neolithic coastal settlement sites include both a habitation area proper on high dry land and an associated midden separated by an area with very few finds of debris and artefacts. As the køkkenmøddinger is the most archaeologically visible part of such settlements it is understandable why "the other part" has been overlooked. The shell mound is only a part of the total settlement area and is not the site itself, as it normally is expressed in the literature (Madsen 1982:203–205; Skaarup 1982:40,45). This new perception of a group of the Early Neolithic settlements (the coastal ones) has only been made possible because of the new large scale excavations of the area(s) behind the middens. At present our knowledge of the size and time-range of the occupation on such Early Neolithic settlements is still very limited, but if the Bjørnsholm and Norsminde settlements are typical, such settlement sites are very limited in extent and limited with regards to the amount of debris they contain; the combined effects of both factors make these sites very difficult to locate by reconnaissance. The only structure which makes such sites "archaeologically visible" is the midden (s) – a point to bear in mind in connection with analysis of settlement patterns etc.

THE RELATIONSHIP BETWEEN THE GRAVE AND THE SETTLEMENT

The location of a grave directly on a settlement site proper is typical of many of the oldest Danish Early Neolithic mounds, i.e. Konens Høj (Stürup 1966), Barkær (Glob 1949), Stengade (Skaarup 1975), Lindebjerg (Liversage 1981), Mosegården (Madsen & Petersen 1984), Rustrup (Fischer 1976), Moesgård Skovmølle (Madsen & Petersen 1984), Tolstrup (Madsen 1975), and Søgaard (Sterum 1980) – just to mention a few. All these (and several more) examples clearly demonstrate a very direct association between grave(s) and settlement – both coastal and inland – and therefore suggest a close association between the living and the dead by a visual consolidation of the surrounding land or territory. The reason for burying the deceased on the site must reflect a wish to legitimize the site location and the surrounding exploited territory.

Based on the new observations it seems reasonable to assume that similar graves may have been present at several other settlements. With another excavation technique – and an excavation concentrated on the midden alone, such graves would never have been found, especially if the habitation area lay some distance from the midden as was the case at Bjørnsholm and Norsminde.

The association of grave and settlement at Bjørnsholm is further substantiated by the fact that this grave was not only situated in the settlement proper, but was obviously located upon an old house foundation. An identical situation seems to have been present at the Bygholm Nørremark site (Rønne 1978; 1979).

These observations indicate that such sites must have been essential sites and/or settlements of a high level of social importance and economic value for the population and the society as a whole. Settlement sites like Bjørnsholm are normally classified as "catching sites" in contrast to the "residential sites" (Madsen 1982:203–205; Skaarup 1982:39–42) – the distinction very often purely based on the topographic positioning and/or the presence of a shell midden. The new information from Bjørnsholm indicate that these sites must represent settlements essential for the social-economical structure of the society. It seems reasonable, therefore, to argue, that such sites could not only have been short term seasonal or ad-hoc catching sites.

This observation does not fit with the current model of settlement in the Early Neolithic, which distinguishes between "catching sites" and "residential sites". Instead, we should speak of "settlement sites", which sometimes are located at the sea shore and sometimes inland. At some of these small sites settlement continuity from the Late Mesolithic to the Early Neolithic can be demonstrated.

ECONOMY

Soil samples from the mound filling and the fill of the two vessels 2911 AAVT and AAVW were investigated for pollen (see Sv.Th.Andersen this volume). The result of this analysis demonstrated birch *(Betula sp.)* woodland

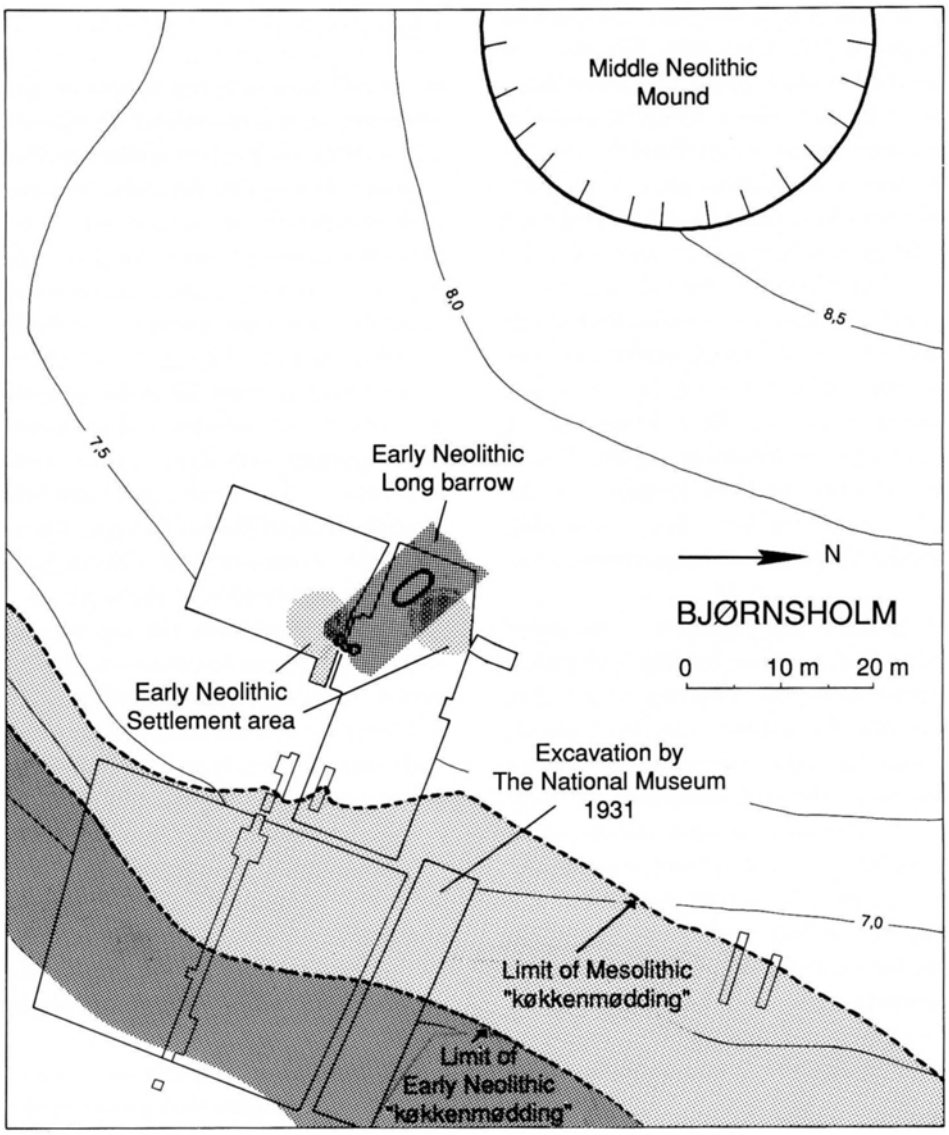

Fig.17. Plan of the settlement and the associated køkkenmødding.

growing in the neighbourhood. Many of the birch pollen showed signs of heating or burning which indicates that the birch woodlands were intentionally worked and used for swidden cultivation.

Traces of agriculture are indicated by the presence of pollen of wheat and pollen likely to belong to barley *(Hordeum sp.)*. This "birch-maximum" is a well known (second) stage of the "Landnam-phase" of Denmark (Iversen:1941:11). The pollen analytical results demonstrate that the "birch-maximum" at Bjørnsholm is contemporary with the Early Volling and thereby with a very early phase of the Early Neolithic Funnel Beaker culture i.e. c.3100–2800 b.c. It is very important to emphasize that at Bjørnsholm it has been possible to link the botanical and archaeological results directly.

Wheat *(Triticum sp.)* and club wheat *(Triticum compactum)* have also been identified from impressions in a potsherd from the Early Neolithic level of the køkkenmødding (Mathiassen 1940:41. Det. H.Helbæk).

As the top horizon of the køkkenmødding is most probably contemporary with the small settlement on higher, dry ground, the bone material from the midden also gives

information about the economy of the site. The preliminary identification of the bones includes domesticated animals such as sheep *(Ovis aries)*, cattle *(Bos taurus dom.)*, pig *(Sus scrofa dom.)*, and dog *(Canis fam.)*. As could be expected at such a mixed habitat as the Bjørnsholm area, hunting, fowling, gathering, and fishing played an important role in the economy. Bones of grey seal *(Halichoerus grypus)*, wild boar *(Sus scrofa)*, fox *(Vulpes vulpes)*, red deer *(Cervus elaphus)*, roe deer *(Capreolus capreolus)*, wild cat *(Felis silvestris)*, red throated diver *(Gavia stellata)*, ducks *(Anas sp.)*, and crane *(Grus grus)* were found in the køkkenmødding[7]. The fish bones have not yet been analyzed[8], but stingray *(Dasyatis pastinaca)* was found in this layer (Rosenlund 1985:23–24). Shells of cockle *(Cerastoderma ed.)* dominate the Early Neolithic horizon, but also oyster *(Ostrea edulis)*, mussel *(Mytilus edulis)*, periwinkle *(Littorina littorea)*, and whelk *(Buccinum undatum)* were identified.

The available information clearly point to a very mixed economy based on farming, hunting, fishing, and gathering, but it is not possible to say anything about their relative importance. The Bjørnsholm site demonstrates how dangerous it is to determine the economy of a site purely from the existence of a shell midden or the topographic positioning. At this site, swidden cultivation of wheat and barley took place combined with stock breeding of goat, cattle, and pig. This subsistence aspect was combined with hunting, fishing, and gathering in the surrounding habitat which included primeval forest, the Bjørnsholm fjord and the open sea (Limfjord) with all their possibilities for fishing and hunting of sea mammals as well as collecting shell fish on the nearby banks in the fjord.

A similar and contemporary settlement is the small shell midden Aggersund – also with a mixed economy comprising both cattle breeding, hunting, fishing, and collecting. From this site bones of aurochs *(Bos primigenius)*, domesticated oxes *(Bos taurus dom.)*, wild boar *(Sus scrofa)*, pig *(Sus scrofa dom.)*, roe deer *(Capreolus capreolus)*, red deer *(Cervus elaphus)*, sheep/goat *(Ovis/Capra)*, dog *(Canis familiaris)*, swan *(Cygnus sp.)*, duck *(Anas sp.)*, and vertebrae of cod *(Gadus morhua)* as well as man *(Homo sapiens sapiens)* are recorded (S.H.Andersen 1979:13–14 and note 16).

CONCLUSION

In connection with excavations in the Bjørnsholm køkkenmødding an area behind the midden was investigated. C.20 m west of the shell midden an Early Neolithic grave was discovered. The Bjørnsholm grave was covered by a E-W orientated long mound with two large timber posts and a ditch with a timber structure at the east end. In this ditch three funnel beakers ornamented in stab and drag technique were encountered – probably positioned there as ritual offerings. The grave, which has no exact parallel in the group of Early Neolithic graves, is very large and has contained a wooden coffin containing the body of a man equipped with a flint axe, a symbolic axe, and bow and arrows. The whole structure belongs to the Early Neolithic Funnel Beaker culture. The pottery in the ditch places the monument in the North Jutland Volling group. Based on similarities in the ceramics between the ditch and the material from the top horizon from the nearby køkkenmødding at the seashore, the grave is dated to the period 3100–2800 b.c. (uncalibrated C-14 years).

The grave structure was located directly upon a small settlement site representing a very short occupation, also belonging to the Volling phase of the Early Neolithic Funnel Beaker culture. This settlement seems to represent the habitation area proper on high dry land corresponding to the køkkenmødding along the seashore. The results of the Bjørnsholm excavation indicate that such Early Neolithic coastal sites comprised both a habitation area on dry land and an associated kitchen midden at the coast.

The location of a grave on a settlement is typical of many Early Neolithic sites – both coastal and inland. This observation indicates that such sites had a high social and economical value in the settlement system. This does not fit with our present models of settlement patterns according to which such a site as Bjørnsholm would have been termed "catching site" and thereby indirectly giving it a lower rank than the (farming) "residential sites". The results from Bjørnsholm indicate that the model of the Early Neolithic settlement system need modification. The authors prefer only to use the term "settlement sites" – sometimes located at the coast and sometimes inland. Such a modified settlement model fits very nicely with the very mixed economy of the Bjørnsholm settlement site.

Birch woodland occurred near the site. Pollen of wheat and probably barley have been identified and indicate agriculture, and the presence of burned pollen document

swidden land use. At Bjørnsholm it has been possible to make a direct correlation between an early "Landnam" phase and the Volling phase of the Early Neolithic Funnel Beaker culture, i.e. c.3100–2800 b.c.

The faunal remains of the køkkenmødding included bones of cattle, domesticated pig, and sheep/goat as well as bones of species hunted in the surrounding forest and on the open sea, along with fishing and gathering.

The Bjørnsholm site complex is an Early Neolithic coastal settlement with a very mixed economy – highly adapted to the mosaic-like biotope with its many ressources.

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NOTES

1. The new excavations at Bjørnsholm are part of a joint research project by the Department of Prehistoric Archaeology, University of Aarhus and Ålborg Historiske Museum. The scientific aim is to investigate the Late Mesolithic and Early Neolithic settlement system and subsistence basis in the NW-Himmerland area. The Bjørnsholm køkkenmødding has Sb.nr.20 Ranum s., Slet h., Ålborg County. After the excavation in 1931 an area measuring 30×30 m was protected by law. The project has been sponsored by Ålborg Historiske Museum, The State Antiquary, *G.E.C. Gads Fond,* The Danish Research Council for the Humanities, *Dronning Margrethe d.II's Arkæologiske Fond* and *Aarhus Universitets Forskningsfond.*
2) The excavation by the National Museum in 1931 was conducted by H.C.Broholm. Report in the archives of The National Museum, j.nr.356/30 og 361/31. An area of c.77 m^2 was investigated. Later smaller excavations have been performed west and southwest of the Bjørnsholm køkkenmødding by C.L.Vebæk (a Late Neolithic grave, The National Museum j.nr.1107/57. Sb.no.26 and museum no.NM 1.A 48150) and C.L.Vebæk (an Early Middle Neolithic grave), The National Museum j.nr.1107/57 = Sb.no.25 of Ranum s. The finds have no.NM 1.A 48151–59 og C 27501.
3) All three occupation periods are well represented at Bjørnsholm. They form a clear stratigraphic sequence; the Early Neolithic horizon superimposing the eastern part of the Late Mesolithic Ertebølle midden while the Iron Age (Late Pre-Roman period) is clearly separated from the Stone Age layers by a c.10–40 cm thick sterile sand/humus horizon.
4) The C.L.Vebæk's excavation was positioned c.90 m from the westborder of the køkkenmødding.
5) The charcoal sample has been identified by Claus Malmros, The National Museum, Natural Sciences Research Unit, Copenhagen. Verbal communication by C.Malmros.
6) Even though several large fragments of this pot do not fit, it is, however, possible to reconstruct the relevant measurements of the pot.
7) The animal bones are in the process of being identified by stud.lic. Bodil Bratlund. Dept.of Preh.Arch., University of Aarhus, Moesgård, 8270 Højbjerg.
8) The fish bones are being analyzed by cand.scient. Inge B. Enghoff, The Zoological Museum, Copenhagen. The results are forthcoming.

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