

# Kalvø – A Coastal Site of the Single Grave Culture

by SØREN H. ANDERSEN

During the study of the archaeology of Norsminde Fjord (south of Aarhus in eastern Jutland – S.H. Andersen 1976) a significant number of flint artifacts of Middle Neolithic types were collected on the surface of the large, sandy holm called Kalvø (fig. 1).

This led to the excavations carried out in 1963, 1968, and 1975, which showed that there on the flat top and NE slope was a mixed occupation layer with finds from both the Store Valby phase of the Funnel Beaker Culture (MN V) and from the Single Grave Culture.

On the top of the holm the settlement layers were much compressed, but the different occupations became easier to separate when followed down the slope (fig. 2). At the foot of the slope the occupation layer continued as a small and clearly demarcated shell midden with finds of the Single Grave Culture (layer 3 in fig. 2). Under the midden came a black sandy occupation layer with animal bones, flint, and pottery from the Store Valby phase of the Funnel Beaker Culture (layers 5 and 7 in fig. 2). The site thus shows a stratigraphical sequence with final Funnel Beaker occupation overlain by Single Grave Culture.

The site aroused interest, as settlements of the Single Grave Culture are still very uncommon, and this one also offered favourable conditions for the preservation of bone, a fact which might give important information about this cultural phase.

Kalvø is a prominence measuring about 100 × 200 m, built up of outwash sand. Today it is surrounded by drained low-lying grazing land, but in the Stone Age it was an island with shallow water on the south and east but deeper water on the north, west, and south-west. Old erosion cliffs are seen on the northern, western, and south-western sides, but there is a gentler slope on the east and south. The highest point of the flat top is 10.7 m over D.N.N. Today there is no fresh water on the island.

The actual Single Grave settlement lay on the flat top of Kalvø and spread down the north-eastern slope. This area has been subjected to fairly extensive excavations, and from the distribution of characteristic artifacts it is judged that this particular settlement may have occupied an area of about 10 × 40 m but was hardly larger. At the foot of the slope, on the shoreline of the period, was found a little shell midden taken to belong to this not very large settlement higher up. It measured 8 × 8 m with a thickness of up to 40 cm and a volume of about 12.8 m<sup>3</sup>.

The shells were 68% oysters (*Ostrea edulis*), 20% mussels (*Mytilus edulis*), 4.5% clams (*Cardium edule*), and 2.5% periwinkles (*Littorina littorea*). A few shells of dog whelk (*Nassa reticulata*) were also found. Mixed with the shells lay charcoal, flint tools and chipping debris, numerous animal bones, artifacts of bone and antler, potsherds, and burned stones (cooking stones). There was no clear or consistent stratification within the midden. The small size of both settlement layer and midden and the fact that sherds belonging to only a small number of pots were found at all levels in the latter, show that the settlement was what may be called unitary, being the rubbish either of a single household or of a limited number of short visits – perhaps both. Also in agreement with this is the observation that only a few rather scattered Single Grave finds were made on the plateau.

## THE FINDS

### *Tools of flint and stone*

The following material was systematically measured in during excavation. There were also less characteristic objects with more random flaking, wear, or retouch. At the present moment the chipping debris has not been

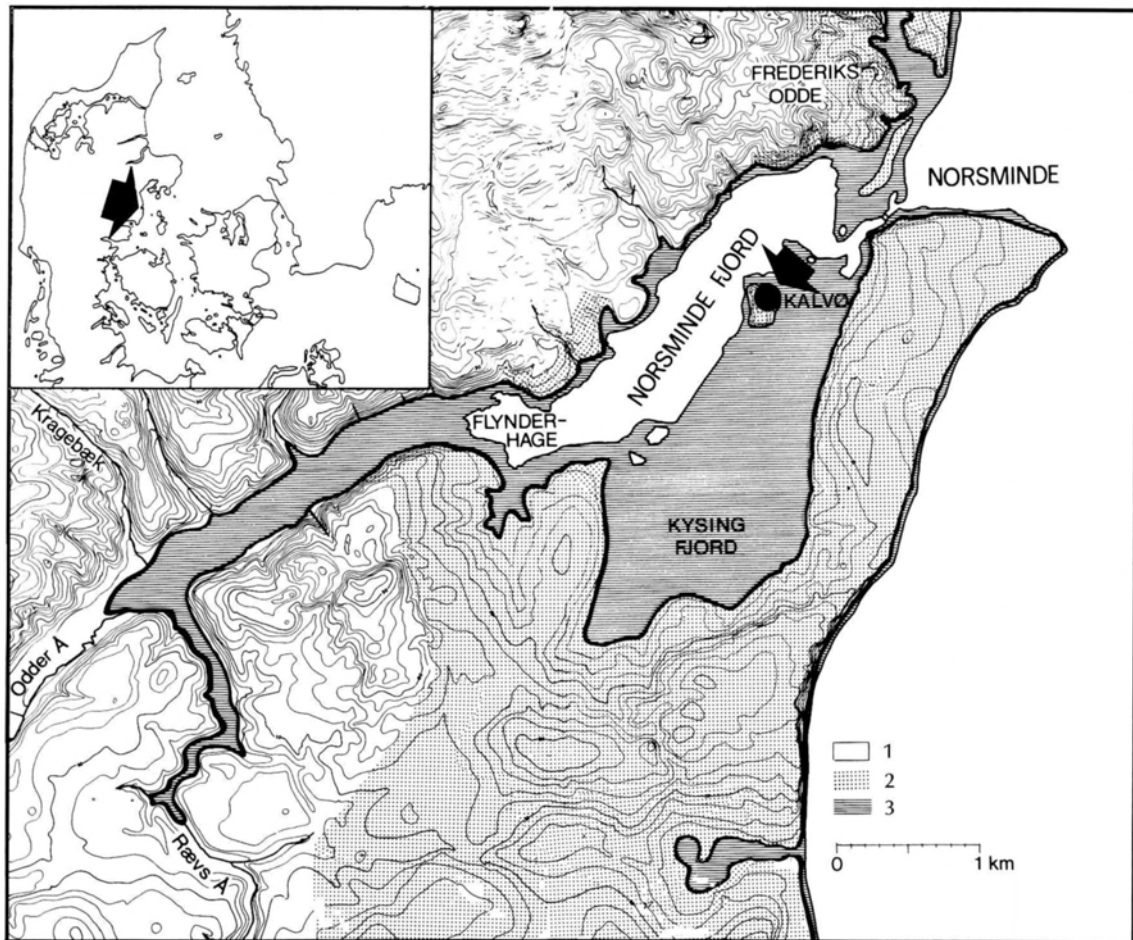


Fig. 1. Orohydrographic map of the Norsminde Fjord area showing site and coastline of ca. 3,000–2,000 bc (in conventional  $^{14}\text{C}$  years). 1, clay; 2, sand; 3, raised sea-bottom.

fully studied, but it appears that flake technique dominates. Regular blades occur, but are few in number.

Flake scrapers are the commonest tool type (15 specimens). They are regular round/oval scrapers, half with corticate dorsal surface. Seven are »thick«, i.e. more than 2 cm, while eight are on thin flakes (under 2 cm).

Borers are fairly common (7 examples). Four are small and short, with retouch right down the sides (drills); one is a regular flake borer; and two are irregular borers on longer flakes.

There is one median burin, made on a short thick flake with lateral retouch. The burin edge, formed by two blows, is at the proximal end.

Knives, or pieces with retouched back and oblique or curved distal end, are present with five examples. Four are on regular blades and two on more irregular flakes.

In addition to a number of spalls and flakes from polished axes the material includes two incomplete thick-butted axes (fig. 3). One has partial grinding of the two faces of the butt, deep grinding near the working edge, and rectangular butt section (fig. 3, bottom). The other is a thick-butted gouge with deep grinding of all four sides as well as on the slightly rounded butt (fig. 3, top).

The axe, fig. 4, is also from the Single Grave occupation. It was found in the actual settlement area on the top part of the holm and can therefore be assigned to the culture only from its shape and workmanship, which is somewhat related to that of the axe, fig. 3, bottom, and clearly different from that of the axes known from the other Neolithic periods represented on the island. It seems to be complete except for a missing corner, and must have been a little irregularly flaked out,

which gave it a slightly crooked outline. In a few places the sides have been prepared by a technique usually described as »crushing«. The section is rectangular, and the butt has a narrow rectangular section. The only deep grinding is on the upper and lower faces near the working edge, but the sides and butt show more scattered traces of grinding. The butt measurements and proportions of this axe agree with those of fig. 3, bottom.

There are two axe roughouts, both roughly hewn on four sides out of nodules without fresh cortex. In one case only the outer surface of the nodule has been removed, but the other had come a stage further in preparation. These finds show that the production of axes took place on Kalvø.

Another common flint artifact is the trihedral arrowhead with equilateral triangular section of Becker's type D, fig. 5 (Becker 1951). There are six of them, and a further seven uncompleted specimens show that they must have played an important part in the inhabitants' activities, as indicated as well by the number abandoned during stages of preparation.

Examination of the waste flakes and cores shows that the blanks for the arrowheads were struck from special short cylindrical cores, which could give short powerful blades with a keeled dorsal surface and an equilateral triangular section.

Among the more diagnostic finds are three fragments of stone battleaxes (fig. 6). Two are from the settled area on the slope (fig. 6, above), while one is from the midden (fig. 6, bottom, left). The raw material is a fine-grained blackish-green rock. All three are broken through the shaft hole and are worn and strongly re-sharpened, so that their original type characteristics are hard to recognize. One also bears traces of re-shaping by flaking, perhaps an attempt to rejuvenate the edge before the axe broke. The axes can be determined as of Glob's types G and H (Glob 1944). Both the fact that they were found in settlement debris and their worn condition shows that they must have been used as ordinary tools.

#### *Tools of bone and antler*

Thanks to the favourable conditions for preservation a number of these were found (fig. 7).

There are three bone artifacts, two of them broken ends of bone points, while the third, with a broad tongue-shaped end, is probably a chisel. The chisel and one of the points were made on parts of long bones, while the second point is on a smaller fragment.

There is a well preserved fabricator of deer antler, (fig. 7, left), with a longitudinal burin groove on its outer side, no doubt intended to split the tine.

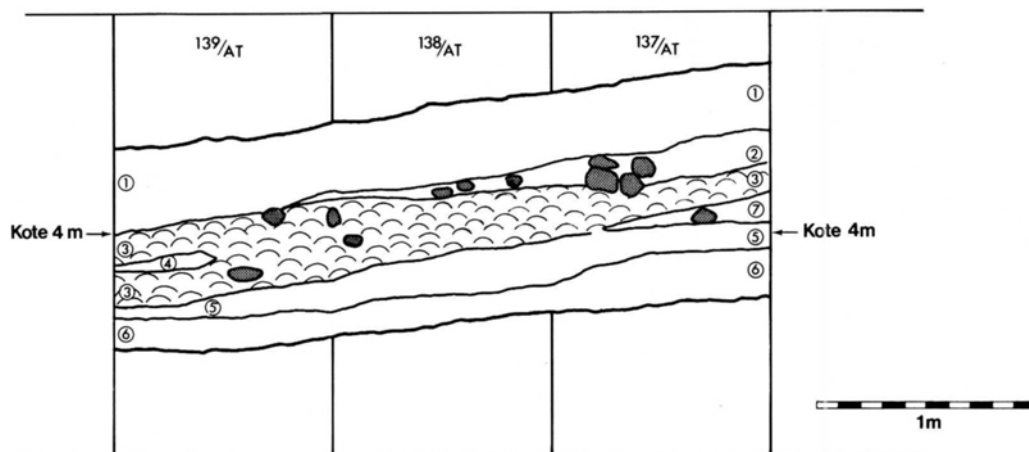


Fig. 2. Section through midden (at right angles to shoreline).

1. Plough layer.
2. Black sand, rich in charcoal and with some communitated shells and gravel. Contains many burned stones (cooking stones).
3. Shell midden. Shells and shell debris mixed with charcoal, burned stones, flint waste, animal bones, and pottery. Shells lie flat, flints belong to the East Danish Single Grave Culture.
4. Homogeneous black-grey sand with charcoal.
5. Homogeneous grey-black sand with a little shell debris at top. Contains flint, bones, and charcoal. Finds of late Middle Neolithic Funnel Beaker type (MN V).
6. Homogeneous yellow-grey sand (outwash sand) with a few flint objects of Ertebølle type.
7. Black-grey sand with charcoal and a little shell debris.

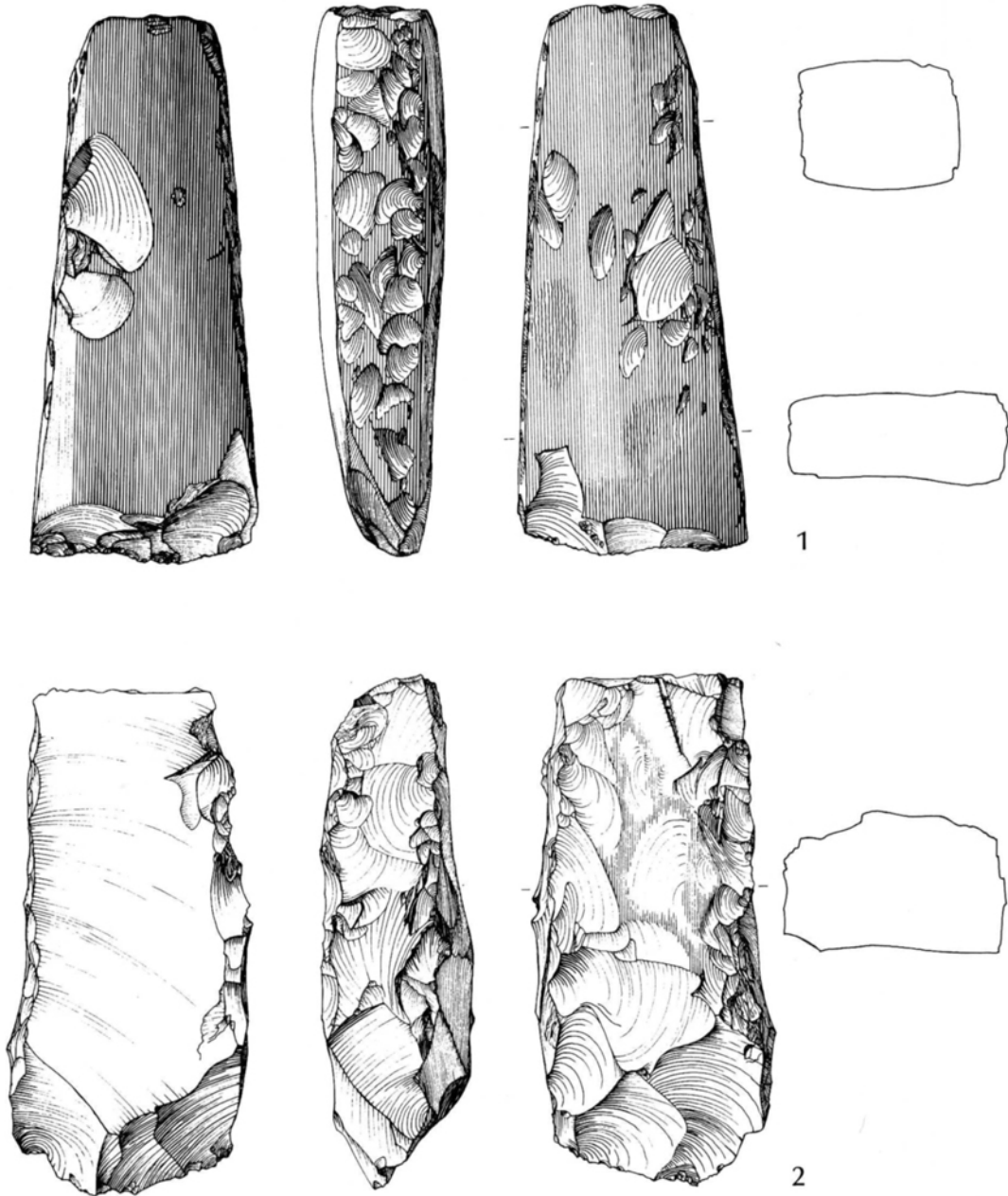


Fig. 3. Above, thick-butted gouge from the midden. Below thick-butted axe (?) found immediately below the midden in a layer with Single Grave pottery. Drawn by Elsebeth Morville.

As with similar finds from the Ertebølle Culture this is probably an example of intended re-use of a fabricator to make a harpoon, whose place in the site's inventory is thereby indirectly indicated. This interpretation is supported further by the presence of a piece of split and partly smoothed antler, which is either a stage in the production of a harpoon or else is waste from har-

poon making. Thus the production of harpoons is included among the activities carried out.

#### *Pottery*

Sherds were scattered evenly in the midden and the settlement area above it. The material is small, con-

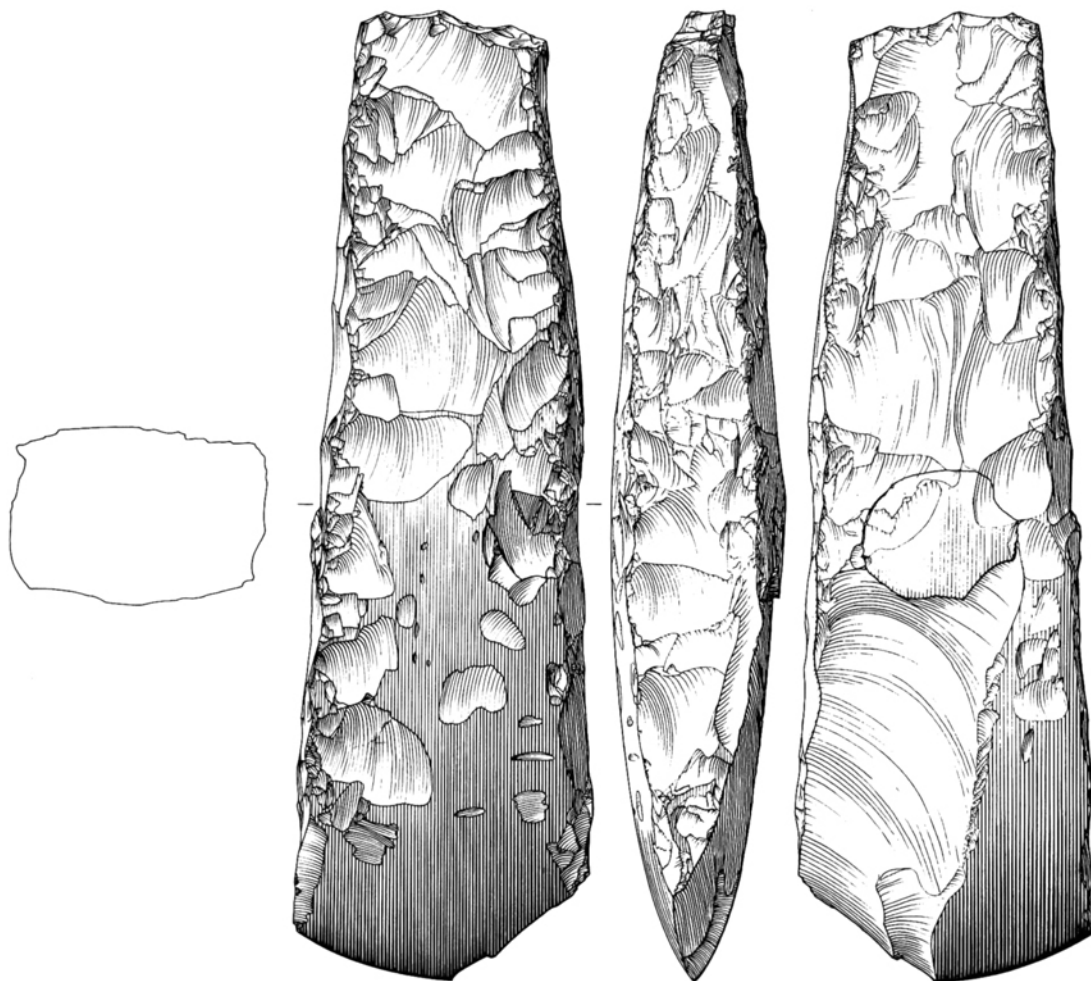


Fig. 4. Polishd flint axe with narrow rectangular butt section. Drawn by Orla Svendsen.

sisting of sherds of only 8–12 vessels, among which are decorated thin-walled beakers and other small vessels, and also storage jars (fig. 8). The finer wares include rim sherds of at least three pots of Glob's groups C and E/H, and there are sherds of about five larger »dwelling-place« vessels (Glob 1944; Becker 1956 and 1957).

A sherd found up the slope is ornamented on the neck with three horizontal rows of curved impressions (fig. 8d). It is probably a beaker of Glob's group C. A large number of sherds of a beaker with hollow collar and gently curved profile were found scattered in the midden (Glob's type E or H) (fig. 8:2–3). It is ornamented on the collar with a carelessly drawn chevron band, while lower down are two separate cross-hatched zones.

A good deal of a beaker of Glob's group C was found in the midden and elsewhere. It bears a carelessly

drawn continuous herringbone pattern covering the whole neck. Near the rim are two holes from an attempt to repair a crack (fig. 8, top).

There are in addition sherds of at least five larger »dwelling-place« vessels. Fig. 8:6 shows a rim sherd of a globular pot with short, sharply upturned rim (Glob's group I). It was ornamented with a multiple chevron pattern close to the rim.

There is furthermore a rim-sherd of a large vessel with finger impressions on the outside of the rim and a finger-impressed cordon 4 cm lower down (fig. 8:5). The ornament recalls the so-called »short-wave« ornament characteristic of several of the Single Grave Culture's larger vessels from settlements (Becker 1956).

Yet another slightly splaying rim-sherd bears finger impressions on the lip, and ca. 4 cm below the rim is

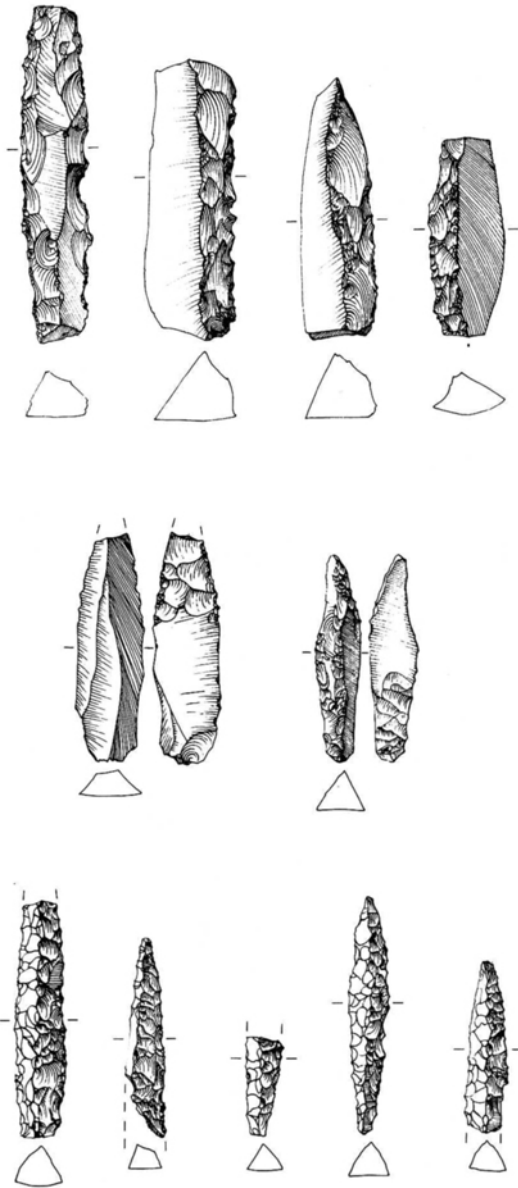


Fig. 5. Trihedral arrowheads. Bottom row type D, top and middle rows various stages of manufacture. Drawn by Elsebeth Morville. 2:3.

seen a single horizontal row of finger impressions. Despite the simplicity of the decoration also this rim is related to those with short-wave ornament.

Also from storage jars are 30 body sherds with a characteristic scored or »swept« exterior – a feature that has been singled out as especially typical of a series of larger vessels from the Single Grave Culture (Becker 1956 and 1957). These sherds, most of which could be

fitted together, were found in the midden and apparently come from a single storage jar.

The limited nature of the ceramic material emphasises the short duration of the settlement. All the finds are fully typical of the Single Grave Culture, and some, including the thick-butted gouge and the battle-axes of type G/H, are characteristic of the so-called »East Danish« group, to which the Kalvø site may be assigned (Glob 1944). As already said several times, the conditions show that the discovery represents a small occupation, but it is not possible to say whether the occupation layer is the result of a single or of several short stays on the island.

#### DATING

The whole find is datable, but the battle axes and pottery give the closest date. The battle axes clearly indicate the Ground-Grave Period. The ornamented rim sherds, fig. 8:1 and 8:4, point to the same period, but fig. 8:2–3, on the other hand are from the late Upper-Grave Period (Mogens Hansen 1977). The pottery appears thus to suggest two separate settlement phases, but we should bear in mind the possibility of regional divergences and remember that our reference material is mainly from graves.

Oyster shells taken from the base of the midden beside the battle axe fig. 6, bottom right, gave a dating of 1900 bc ( $^{14}\text{C}$  years) (K-2508) (C. Malmros and H. Tauber 1977, 80 and 89). This is the first Single Grave settlement site to be radiocarbon dated, which adds to its interest. In comparison with other dates from the Ground and Upper Grave Periods the result seems very late. The  $^{14}\text{C}$  result seems to relate best to the hypothetical late phase based on the pottery.

All in all the results seem to indicate that the settlement on Kalvø represents one – or perhaps two – short settlements in the Ground Grave (battle axes and pottery like fig. 8:1 and 8:4 and in the late Upper Grave periods (pottery like fig. 8:2–3 and 5, and perhaps the  $^{14}\text{C}$  date as well).

#### ECONOMY

The animal bones have been identified by U. Møhl, University Zoological Museum, Copenhagen, and P.

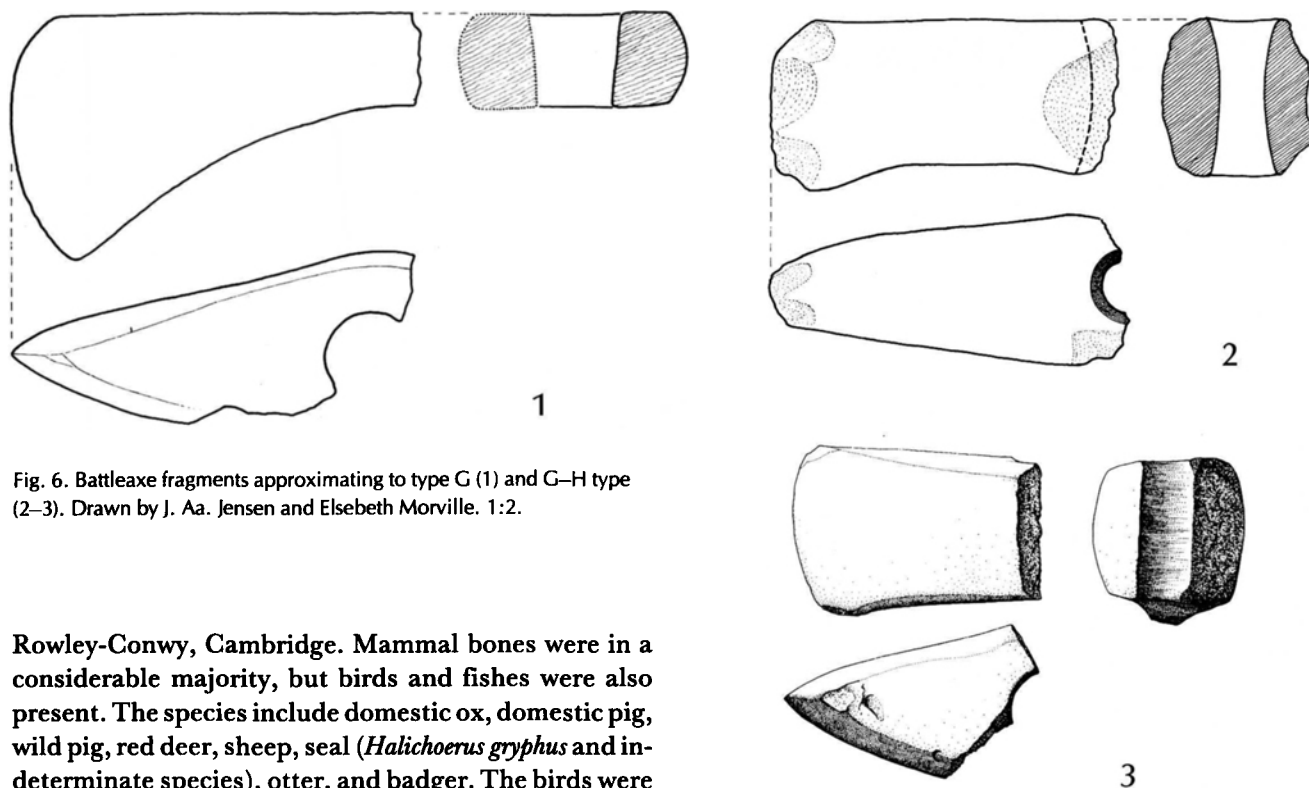


Fig. 6. Battleaxe fragments approximating to type G (1) and G–H type (2–3). Drawn by J. Aa. Jensen and Elsebeth Morville. 1:2.

Rowley-Conwy, Cambridge. Mammal bones were in a considerable majority, but birds and fishes were also present. The species include domestic ox, domestic pig, wild pig, red deer, sheep, seal (*Halichoerus gryphus* and indeterminate species), otter, and badger. The birds were swan (*Cygnus sp.*), common gull (*Larus canus*), red-throated diver (*Gavia stellata*), mallard (*Anas platyrhynchos*), velvet scoter (*Melanitta fusca*), scaup (*Aythya marilla*), great crest grebe (*Podiceps cristatus*), and great black-bucket gull (*Larus marinus*). Fish were represented by the cod family.

Cattle provided about half the mammal bones. As these have a higher meat ratio than the other species domestic cattle must have provided the major part of the meat consumed. In addition there were many bones of pig, but fewer of sheep.

It can be seen also that hunting played an important role in the economy. Bones of red deer were the next most common after those of cattle. Also wild pigs were hunted in the neighbouring forests, where otter and badger were caught, too, presumably for the sake of their fur.

The importance of marine hunting is indicated by the many seal bones, and also by the remains of harpoons, which we have seen were made at the site. Fowling and fishing also played a part in the economy and must have taken place on the fjord or in the adjacent Kattegat (fig. 1). The shells indicate the collecting of molluscs, chiefly oysters and mussels, but on a smaller scale also clams and periwinkles.

A sample consisting of ca. 260 liters of earth from the midden was washed for seeds and fruits. Surprisingly enough no corn was found, but there were many seeds of *Chenopodium album*, *Stellaria media*, and *Polygonum aviculare*. Also elder (*Sambucus nigra*) was present. Not too much stress should be laid on the absence of corn. Many causes can have contributed, but its absence could be genuine and indicate that the economy of this particular coastal site was based exclusively on a combination of herding, hunting, and collecting. It should be added that no grain impressions were found on the pottery and that neither sure sickle blades nor querns were found. In this last respect Kalvø differs from a number of other sites of the same culture, e.g. Vorbasse (S. Hvass 1978), Blegind, and Myrhøj (J. Aa. Jensen 1973), where querns were a characteristic element of the assemblage.

Kalvø is thus one of the few sites in Denmark with indications of the economy of the Single Grave Culture. The other sites however are even smaller or are »mixed« settlements, and we lack, to the best of my knowledge, adequate comparative material. It is therefore still unsure how far Kalvø is typical. It may be noted that cattle

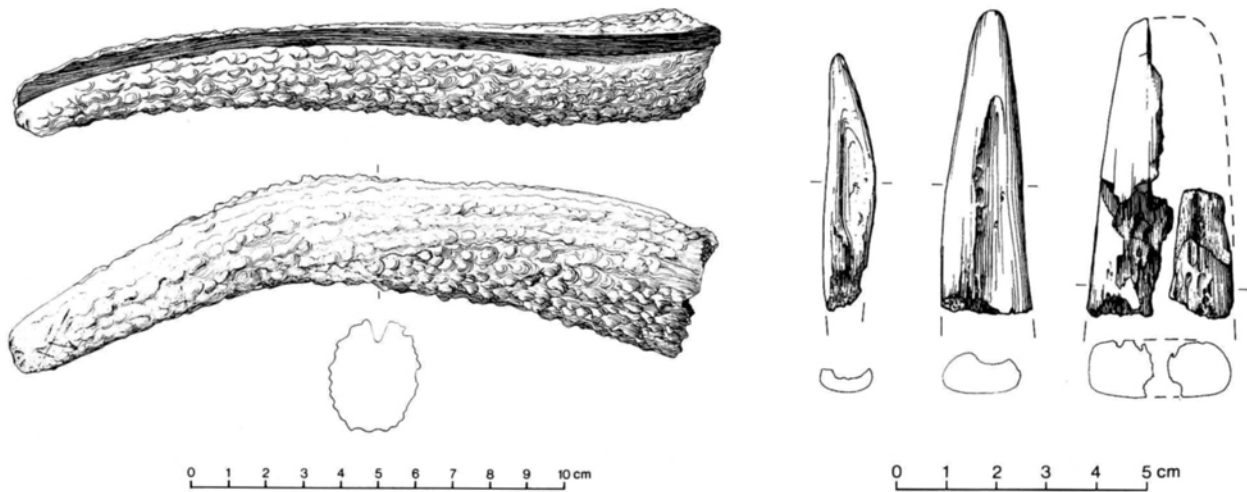


Fig. 7. Objects of antler and bone. Left: a fabricator (scale 1:2). Right: two bone points and fragments of a chisel (scale 2:3). Drawn by Elsebeth Morville.

dominated at the few Single Grave sites in Europe with a statistically reliable faunal material (K. Davidsen 1977, p. 68 and note 125).

Another problem in the evaluation of the Kalvø site is that we cannot judge of its place in the total pattern of Single Grave settlement. At first glance there seem to be two possibilities:

1. Kalvø may have been what is termed a base site, as the island's size (2 hectares) and soil quality do not exclude year-round occupation by a small unit with economy based on livestock, possibly corn growing, and hunting.

2. It may have been a specialised seasonal site (herding combined with hunting, fishing, and collecting) and been part of a wider settlement system in eastern Jutland having other specialised and permanent sites.

It seems the most natural to see the settlement as a small combined herding and hunting site, probably seasonal, where possibilities for grazing stock were combined with exploitation of the surrounding biotopes.

#### OTHER SINGLE GRAVE SETTLEMENT SITES

There is very little other Single Grave material around Norsminde Fjord. North of it was found part of a thick-butted gouge, and a type D arrowhead comes from the floor of the earlier fjord close NE of the island – perhaps

a strayed shot. There are no other finds within 1–2 km of the fjord.

The same story is told by a new regional survey of Stone Age settlement in Hads Herred (S and SW of Norsminde Fjord), which shows that there was a much thinner occupation in this than in early periods, i.e. in the Early and Middle Neolithic Funnel Beaker Culture. Six Single Grave settlement sites were recorded, of which three were situated in the hilly moraine country west of the long NE–SW valley that divides the area into two quite different pedological and topographical zones. Two settlements have been found in the flat country east of the valley and one site on the island of Alrø (J. Skamby 1978).

A parallel to Kalvø is a Single Grave Culture coastal site near Holme Skanse in south Mols, on the other side of Århus bay. This was also from the Ground Grave period and yielded a thick-butted flint axe of Single Grave type and an arrowhead of type D. The economy was indicated by bones of cattle, ovicaprids, red deer, wild pig, bear, and seal. Comminuted shells in the occupation layer showed the collecting of oysters, clams and periwinkles. A single grain of six-row barley was found by washing (unpublished, FHM j. no. 1852).

Parts of two late Single Grave beakers were found during an old excavation of a coastal site at Voldbæk in what was formerly Brabrand Fjord (Davidsen 1978, p. 41 and Pl. 67, d, and i).

Many type D arrowheads have been collected from a



small area ca. 2 km further west along the old fjord (at Årslev Enge). They probably also indicate a coastal site.

Also several type D arrowheads have been collected from a small area near Brigsted on the north side of Horsens Fjord (private collection).

Coastal sites with finds from the Single Grave Culture have been found at a number of further places in Jutland also. The best known is Selbjerg on the Limfjord (Marseen 1953, Becker 1954), with remains of at least 8 Single Grave pots. The Single Grave finds, which can be assigned to the Upper Grave period, appear mostly to have lain in the upper part of the layer and been associated with a »pavement«, giving a stratification of Single Grave Culture over Pitted Ware Culture with types A3 and B arrowheads. Unfortunately the many interesting animal bones cannot be assigned to the separate occupations, but the whole geographical situation emphasises the importance of hunting/gathering.

These examples show that sites from the Ground and Upper Grave Periods can be found scattered along the northern and eastern coasts of Jutland. To the sites already mentioned may be added finds of type D arrowheads (see Becker 1951).

All these sites appear to belong to the Ground Grave and Upper Grave Periods, while so far there are no sites from the Undergrave or early Ground grave periods as defined for the graves (Glob 1944).

Though only of a preliminary character, these observations show that coastal hunting sites of the middle and late Single Grave Culture are not uncommon. Unfortunately there have been few systematic excavations of settlement sites. To acquire a better understanding of the various forms of settlement and economy it will be necessary to carry out new excavations, which must be either of known sites or of new ones on the coast and along the lakes and watercourses.

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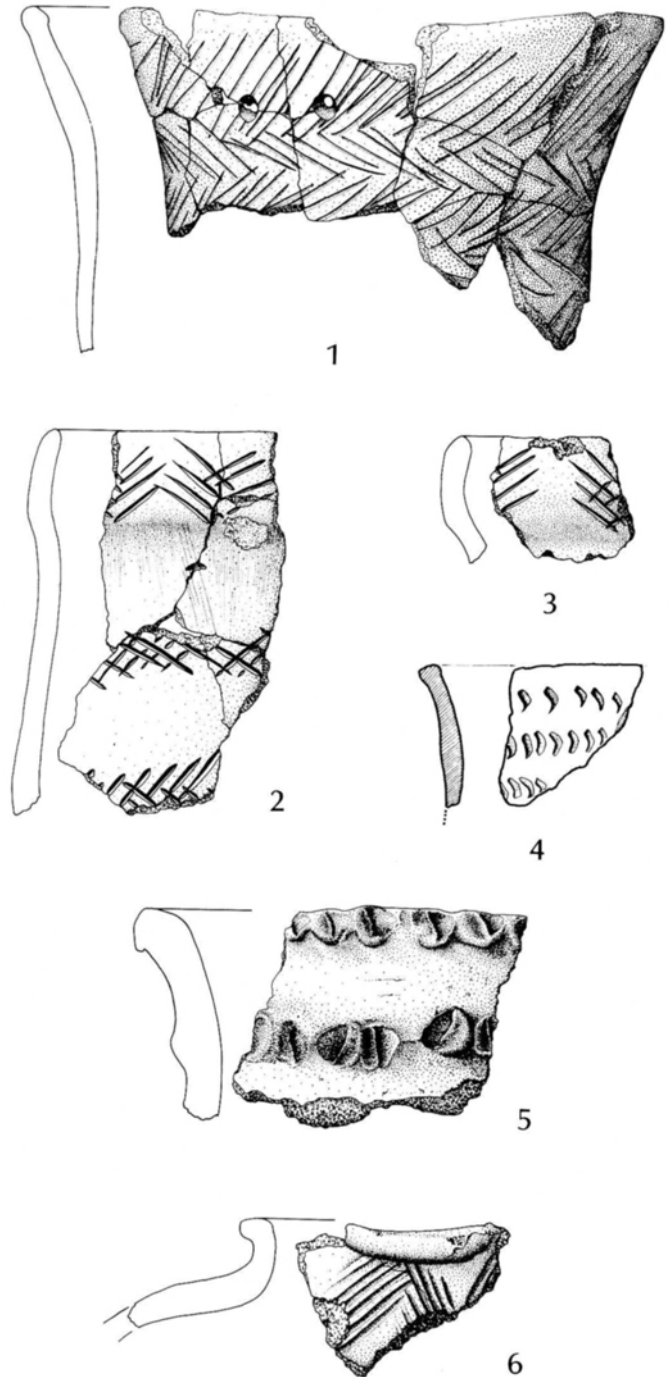


Fig. 8. Decorated rim-sherds. 1–4, thin-walled pottery; 5, a large »dwelling-place« vessel; 6, a vessel with globular body. Drawn by Elsebeth Morville and J. Aa. Jensen. 1:2.

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