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Preface to the First Volume

Journal of Danish Archaeology, whose first volume is presented here, will have the aim of orientating Scandinavian and European scholars, students, and museum workers on the most important results achieved by archaeological investigation in Denmark or by Danish archaeologists working abroad. Behind its publication stands a broadly-composed editorial committe with representatives from the central and the regional museums, the universities, and from the National Agency for the Protection of Nature, Monuments, and Sites.

The background for launching JDA is the increasing pile-up of unpublished excavations that has accompanied the expansion of Archaeology in Denmark in the 1960's and even more in the 1970's. Only a small selection of these many investigations have found their way into the established periodicals. In this way there has been an increasing disagreement between the existing publication structure and expanding needs. Moreover the established periodicals have been at the disposal mainly of archaeologists at the universities and central museums while today the majority of Danish archaeologists work at regional museums.

It is the editorial committee's hope that the appearance of JDA will help to remove these discrepancies and bring published knowledge more in line with the existing. This will be done by presenting new contributions and adapting publications that have already appeared in smaller local periodicals. JDA will also aim to stimulate archaeological discussion through short comments and reviews.

Kristian Kristiansen Poul Otto Nielsen Hans Rostholm

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Trade in Danubian Shaft-Hole Axes and the Introduction of Neolithic Economy in Denmark

by ANDERS FISCHER

INTRODUCTION

There is general agreement among Danish archaeologists that the introduction of animal husbandry and grain cultivation were one of the most decisive events in the country's prehistory. On the other hand there is no agreed opinion as to how the new production forms came to the country in the first place (see e.g. Becker 1947 and 1955, Troels-Smith 1953 and 1967, Andersen 1973, Skaarup 1973 and 1975, Fischer 1974). Were they brought here by land-hungry and adventurous immigrants from the agricultural cultures further south, or did increasing population pressure and the development of a more complex social organization among the local hunting population make the change of economy attractive and possible? In this debate the recent find of a central European shaft-hole axe on a Late Mesolithic habitation site in Denmark opens new perspectives.

THE CULTURAL AND CHRONOLOGICAL POSITION OF THE DANUBIAN SHAFT-HOLE AXES

The new find (fig. 1) is made of a layered rock. Its present colour is grey-green with stripes of green-black. The dark parts – which unlike the rest of the surface are unweathered – show that the axe was originally very smoothly polished.

The form is that of the common Central European »Danubian shaft-hole axe«. With its unequally curved narrow sides it fits most closely to the variant »hohe durchlochte Schuhleistenkeil« though the flatness of the broad sides show some correspondence to the variant »Breitkeil« or »Axt« (c.f. Brandt 1967:9–12, Schwabedissen 1967:411). On the basis of some thin-section analysies it has been postulated that some Danubian axes from the Rhineland and Schleswig-Holstein were made of amphibolite from Zobten (Sobotka) in SW Poland (Schietzel 1965:39, Meier-Arendt 1966:70–71, Schwabedissen 1967:411). No equivalent examination has yet been made of the new axe, but it has been shown by X-ray and refraction examination done by Niels Hald at the Geological Museum in Copenhagen to be made of amphibol-rich crystalline rock. A number of shaft-hole axes of the same shape and material are already known from various parts of Denmark (fig. 3). These axes are generally considered as imports from until now undetermined parts of Central Europe (see Glob 1939 and 1951, Lomborg 1963) – an assumption which is affirmed by the fact that the kind of rock used is not commonly seen as glacial erratic in Denmark.

The new find is a surface discovery from a recently ploughed-up settlement measuring about 20×20 m situated on the edge of a very low sand ridge in about the middle of the bog, Store Åmose, in western Zealand. The rest of the material from this clearly defined find concentration consisted – apart from simple flint flakes and cores – of 1 elongated flake scraper, 3 blade awls, 3 transversely retouched blades, 1 transverse arrowhead, 4 core axes (2 of which seem to have a »specialized« edge), 4 symmetrically flat-flaked axes, 1 amber pendant, and a sherd from a so-called blubber lamp (fig. 2). In addition there were a fragment of a smoothed shaft made of Red Deer antler, a spike of mammal bone, and a number of fragments of unworked bone, identified by Morten Meldgaard, Zoological Museum in Copenhagen, as of Red Deer, Roe Deer, Wild Pig, Otter, and Pike.

Apart from the shaft-hole axe the finds are exclusively of types which are common on sites from the later part of the Ertebølle Culture (EBK). Despite the small number of artifacts the industry can readily be

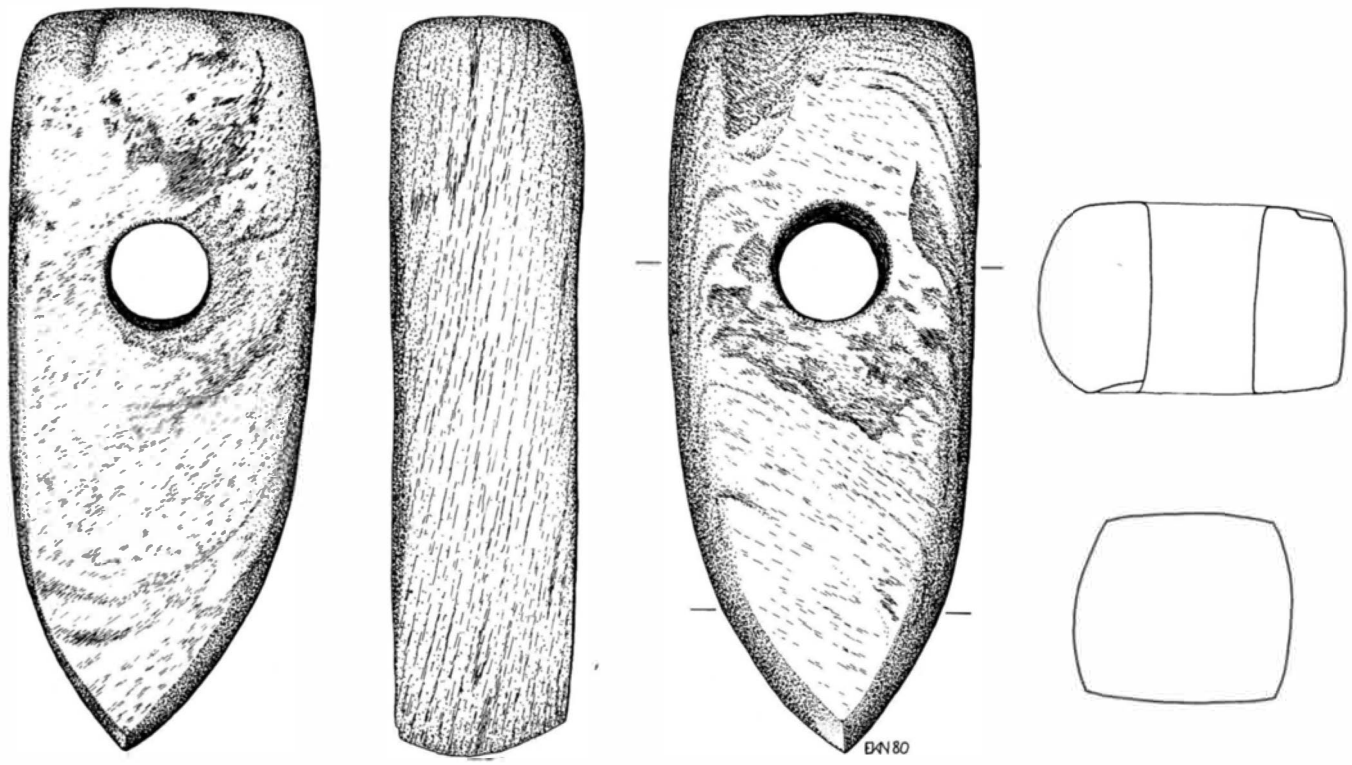

Fig. 1. Danubian shaft-hole axe from a recently found Ertebølle Culture settlement in Store Åmose, W-Zealand. 2:3. (Eva K. Nielsen, del).

parallelled with layers 8 and 9 at Vejlebro, ca. 3500 b.c. (Malmros 1975), Ølby Lyng, ca. 3300 b.c. (Petersen 1971), and Ringkloster's middle and upper layers, ca. 3300 b.c. (Andersen 1975) (1).

As all the finds were from the surface it cannot be proved that they were of the same age, but the limited extent of the find-bearing area and the apparent cultural homogeneity of the objects of flint and bone/antler argues that the site was only in use once, and it is therefore probable that the shaft-hole axe was deposited at the same time.

If we take into consideration the other finds of Danubian shaft-hole axes in Denmark we find support for this chronological and cultural placing. The existing literature already contains various indications that the axes belonged to the EBK. To begin with there is an old discovery from Vester Ulslev on Lolland (Glob 1939:132). According to the quite clear account of the finder this was found in an occupation layer that was sealed by peat. In the National Museum's subsequent excavation the layer was found to contain a rich material from the late EBK (Skaarup 1973, note 279). There is also a newer find from Brændegård on SW Funen. Here a Danubian shaft-hole axe was found on a ploughed up late EBK settlement (Thorlacius-Ussing 1977). Furthermore a number of unpublished surface finds of Danubian shaft-hole axes derive from more extensive find concentrations, largely or exclusively of late EBK types (2).

Thus there are several indications in the present material that the Danubian shaft-hole axes from Denmark probably belonged to the EBK. This cultural attribution however conflicts with earlier opinions according to which the type was a plough-share and/or was attributed to the time of the Funnel Beaker Culture (TRB) (Glob 1951:82, Brøndsted 1957:174, Berg 1973:73).

If the attribution to the EBK is correct the interpretation as ploughshares must be abandoned. In the first place the extensive material from the Danish EBK gives nowhere any sure indication that agriculture was practised. Secondly – and no less important – the first agricultural indicators in the pollen diagrams (cereals, plantago lanceolata, etc.) first appear at about the time

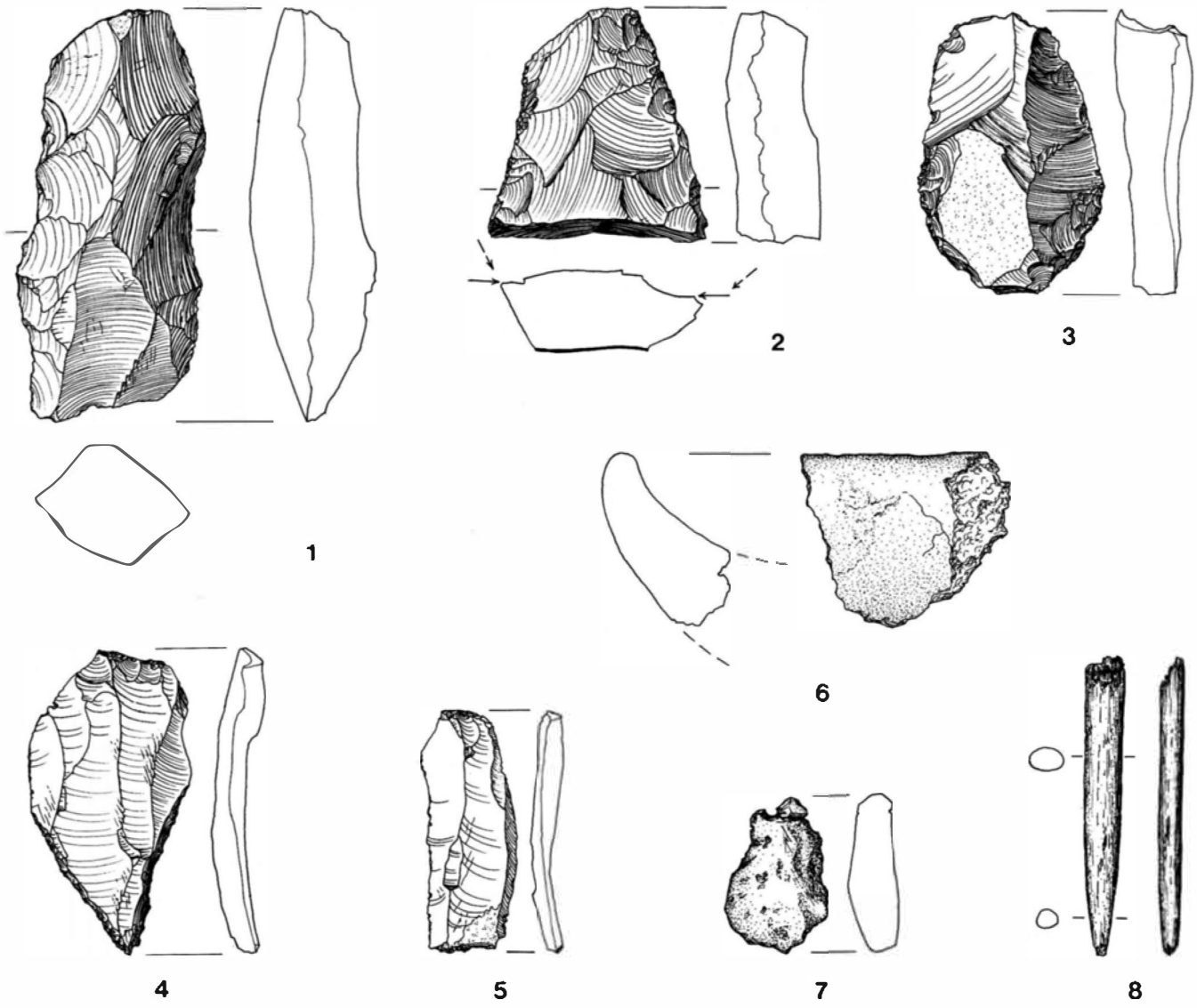

Fig. 2. Flint tools, bone point, potsherd, and amber pendant from the recently found Ertebølle Culture settlement in Store Åmose. 2:3 (Eva K. Nielsen, del.).

of the elm decline (Troels-Smith 1953:13, Iversen 1967:44). This took place at about 3100 b.c. (Nilsson 1964). As the EBK ended about 32–3100 b.c. (Andersen 1975:83) this culture cannot be responsible to the vegetational innovations. It is most reasonable to connect these agricultural indicators with the TRB, whose earliest C-14 dates in Denmark are from about 3100 b.c. (Skaarup 1975:205). It need give no great surprise if the earlier attribution of the Danubian shaft-hole axes from Denmark to the time of the TRB is mistaken. It was not based on find combinations containing TRB objects, but on the interpretation as ploughshares, and as well perhaps on an unstated supposition that a primitive hunting society could not have had trade connections with a distant farming society. As the present attribution to the EBK is not based on closed finds it would be reasonable to re-examine the cultural placing suggested here in the light of the far larger Central European material.

Danubian shaft-hole axes are known there from

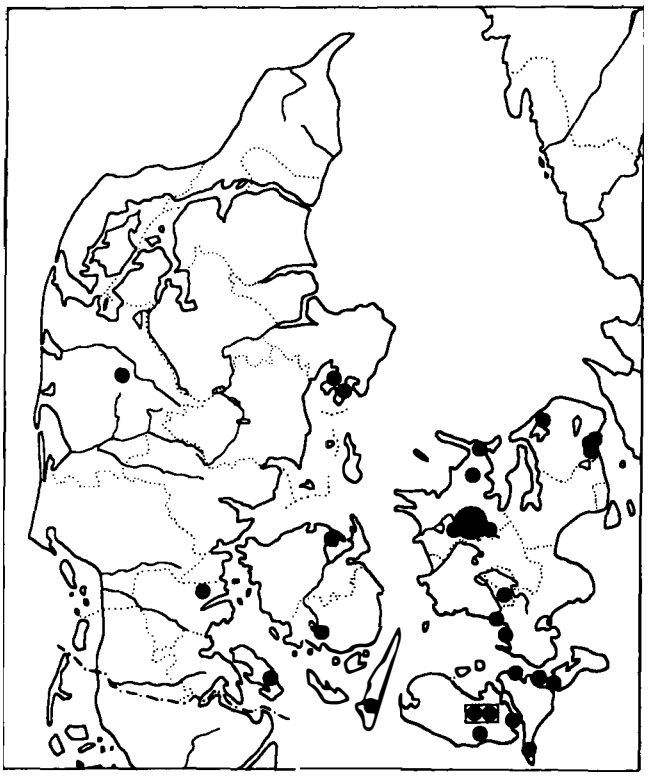

Fig. 3. The distribution of Danubian shaft-hole axes found in Denmark (unprecisely located finds excluded). The big dot indicate the axe recently found at a small Ertebølle culture site in Store Åmose. The dots surrounded by a rectangle indicate a possible grave from Udstolpe containing two Danubian shaft-hole axes.

many well-documented graves and settlements dated to the later part of the Danubian culture cycle – i.e. from the Stichband, Rössen, and Gatersleben cultures (see e.g. Brandt 1967, Schwabedissen 1967, Behrens 1973, and Lichardus 1976). Two C-14 dates of about 3400 b.c. (Behrens 1973) suggest that these cultures were contemporary with the Late EBK in Denmark. Typological considerations place these cultures earlier than the various local variants of the TRB, which have yielded no certain finds of Danubian shaft-hole axes. It is now established by a considerable number of C-14 dates that the Danish EBK preceded the appearance of the TRB groups of this region (see above). To judge from the available C-14 dates the TRB certainly cannot have made a later appearance in Central Europe than in Denmark (see e.g. Skaarup 1975:205). So from comparison with the situation in Central Europe it may be concluded that the axes came to Denmark before the time of the local TRB culture, and that the import probably occurred during the later part of the EBK-epoch.

THE FUNCTION OF THE SHAFT-HOLE AXES

The Danubian axes have been interpreted earlier, both in Central Europe and in Denmark, as ploughshares. By now, however, the idea seems to have been abandoned by Central European archaeologists, and the objects are thought of rather as axe blades or related tools (Henning 1961, Schietzel 1965:35 ff., Modderman 1970:189), and it has been added that the way the Danubian shaft-hole axes were used as grave gifts implies a function corresponding to that of the later so-called battle axes (Zápotocký 1966:178 ff., Brandt 1967:8).

From the point of view of the Danish finds it is hard to see that the objects had any exclusively practical function. As axes they are unlikely to have been more durable than those of local rock (round butted axes and Limhamn axes), and they cannot have been as sharp as the native flint axes. Perhaps therefore their function in the EBK was partly symbolic – indicating social status. Analogies can be drawn with the New Guinea highlands, where certain kinds of stone axes were not merely of practical use, but served as status symbols and for payment of bride prices, compensations for slaying, etc. (Højlund 1979). Such a comparison is all the more attractive because the axes in the New Guinea highlands, like the Danubian axes, are distributed widely from a few centres of production. In view of the conspicuous material from which they were made and their shiny polished surface these shaft-hole axes of amphibolite must have been obvious status indicators and exchange objects for the Central European agricultural communities and the EBK's hunting tribes.

TRADE AND THE INTRODUCTION OF NEOLITHIC ECONOMY IN DENMARK

The trade system that has been shown to have existed between the Danubian cultures and the EBK is of interest not only as an example of trading contacts between different cultures, but more especially be-

cause the cultures had very different economic bases. The producers practised a broad spectrum agriculture, while the recipents lived exclusively from hunting, fishing and gathering.

Awarenes of this trade reinforces the interpretation of certain EBK types as imitations of objects belonging to more southerly agricultural cultures of the same period (Andersen 1973:33 ff.). This concerns on the one hand a number of artifacts made of bone and antler (bone combs, bone rings, T-shaped antler axes) on the other hand it concerns the late EBK's pottery, on which there at certain sites in eastern Jutland can occur ornaments (Andersen 1975:62–64, see also Jennbert-Spång 1979:18) reminiscent of the Rössen culture's characteristic rows of double impressions.

It has long been clear (see e.g. Troels-Smith 1953:29, c.f. Becker 1955:154) that a number of flint tool types belonging to the early part of the Danish TRB culture continue a tradition from the preceding period's EBK. This has led to the hypothesis that the Danish TRB was borne by the same population as had earlier borne the EBK. However adherents of this theory have always found it difficult both to explain why the local EBK population introduced Neolithic economy and how it acquired knowledge of stock keeping and grain cultivation. Therefore many archaeologists havde prefered to ascribe the introduction of domestic animals and plants to the immigration of agricultural societies from the south (thus leaving the problem of explanation to their colleagues further to the south). In this way it was considered easier to understand the existence of those early TRB artifact types and grave forms in Denmark that lacked clear antecedents in the EBK: the new cultural traits were thought to build on traditions from the south, while the obvious EBK traditions could be the result of assimilation by the agricultural communities of traditions and persons from the EBK.

The new knowledge of the EBK's trading connections with agricultural cultures supports the view that it did not necessarily have to be immigrant farming populations that brought the new agricultural technologies to Denmark. Through trade contacts it would have been possible for the EBK communities to acquire livestock and grain, and the knowledge necessary to start an independent agricultural production. Whether the possibility was in fact made use of is quite another question. If so it would have presupposed:

1) that the new forms of production were economically advantageous (at least to some individuals), and
2) that the local societies were at a stage of development (big-man society) that made it possible to organize the work and distribute the products in such a way that breeding-stock and seed-corn for future production were assured.

It is a task for future research to establish whether these preconditions were present. For the moment we must be content with a degree of reassurance that the second precondition was met. This reassurance comes from the Danubian shaft-hole axes (2) witnessing the existence of long-distance trade in objects of special status value.

Translated by D. Liversage

NOTES

1. All C-14 dates in this paper are given in conventional C-14 years, i.e. are based on a half-life of 5570 years and are uncalibrated.
2. A systematic enquiry after and registration of examples of the type in and near Denmark is being prepared. Information about such finds would be received with gratitude. Please apply to L. Pedersen and A. Fischer, First Department, National Museum, Frederiksholms Kanal 12, DK-1220 Copenhagen K.

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An Early Neolithic Ritual Structure on Sejerø

by DAVID LIVERSAGE

Sejerø is an island 11 km long and 1½ km wide situated about 11 km off the NW coast of Zealand in Sejerø Bay. Despite its relatively isolated position it was inhabited at many different periods and has produced many archaeological remains (Liversage 1974). A new discovery was made in 1977. The site was situated on the southern slope of a prominence called Lundehøj on the Geodætisk Institut maps, more precisely at the place where a shoulder of Lundehøj begins to fall steeply towards the area of raised beach below. Part of it (Feature A) was discovered during agricultural operations in November 1977. First some stones were taken away and then the remainder were exposed in place by some of the islanders, who called in the National Museum as soon as there was reason to suppose it was an archaeological feature. The rest of the feature was cleared under my supervision.

The excavation was basically very simple and consisted of uncovering the stones of the entire feature, planning and photographing them, removing them carefully while looking for possible slots or alignments, and finally searching the natural subsoil for features dug into it. The upper plan, fig. 1, shows all the stones visible when the overburden was removed, while the lower plan, fig. 2, shows the stones and other features in the end thought best to reveal the original plan of the structure after fallen and displaced stones had been taken away.

There were two separate features, called A and B. After the islanders' clearance Feature A showed as an irregular heap of stones about 2,6 m long and 0,5 m wide, running in an E-W direction and already somewhat disturbed by cultivation (fig. 1). In it were field stones, broken stone fragments the size of a fist, and scattered pieces of shattered flint. Removal of these showed that the basal layer was a rough paving of stones laid with a flat face upwards. Some were cloven and others were not. The paving is seen in fig. 2. It rested on a thin humic layer immediately above the till, and must have sunk to this level through the effect of earthworm action after being built on the surface. Under the western part of the paving was found a pit about 10 cm deep, whose edges are shown freely reconstructed with a stippled line in the places where they had been destroyed during the initial clearance. The fill of the pit consisted of the same humified clay as found elsewhere under the paving. Two querns were included among the stones of Feature A, but there were no other finds.

Feature B was much larger and more complicated. It was a complex heap of stones with a length of 8–9 m and a width, disregarding outlying stones, of nearly 4 m. The stones had obviously been piled on the original ground surface or had fallen on to it, and in the course of time the sod had grown up between them. In the end the whole heap had been buried by soil creep resulting from the cultivation of the slope above. There was no trace of any transported earthen fill.

As fig. 1 shows, Feature B was roughly symmetrical about a long axis. The northern side consisted in its western 6 m of a continuous arc of stones two to three stones wide (more outlying stones are presumably displaced). They were arranged rather curiously, in that most of them had their long axis at right angle to the direction of the arc and they were pitched with their northern ends low and their southern ends higher. The farther south a stone lay in the belt, the higher it lay, so that the whole arc rested on a bank of soft earth that sloped up from north to south under it. An impression of the lie of the stones is given by fig. 3. The matching southern arc was laid differently. The long axes of the stones were mainly vertical and the stones were packed very closely. We will return later to a possible reason why the stones were laid differently on the two sides of the feature. It is not clear what

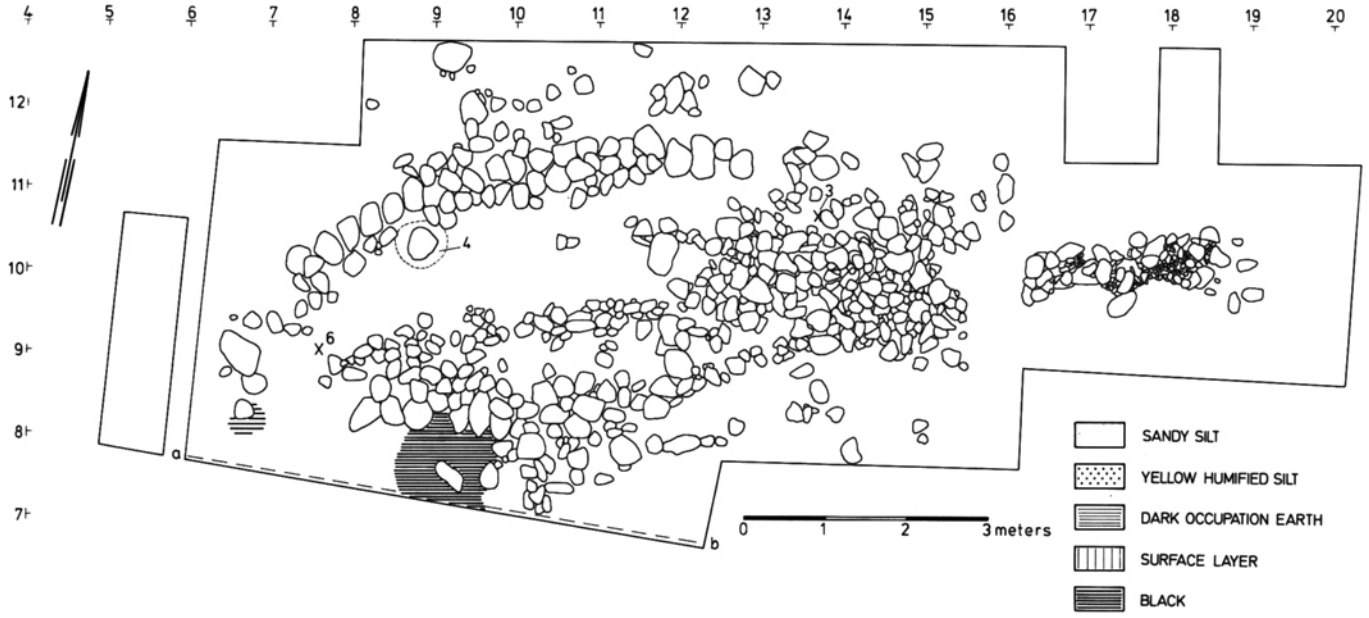

Fig. 1. Lundehøj, upper plan showing all stones in place.

happened at the western end of Feature B, as the stones here had been disturbed.

Where the continuous arcs of larger stones ended at the east there lay a flat heap of somewhat smaller field stones two or three deep. This part of the feature is seen before removal of any stones in fig. 1. The heap was well demarcated to the south and reasonably well demarcated to the east and north, but less so to the west, where it ran out as an irregular wedge between the northern and southern arcs. The northern and southern edges ran into the stone arcs but had a slightly different direction from them. Because of the planigraphic continuity between all parts of what is called Feature B, and because of the way all the stones interlocked, the whole thing must be regarded as a single complex structure.

Further west there was a good deal of empty space between the two arcs, but a belt of stone from about 8/9 to 12/10 on the excavation's co-ordinates lay parallel with and slightly south of the long axis of the feature. These stones were somewhat smaller than those of the northern and southern arcs, and, surprisingly, lay slightly lower, definitely sunk into the humified material immediately above the natural; this had not, however, been dug into. The stones could have been inserted at this depth by digging a shallow trench in the then existing soil, or by removing the soil from the whole interior of the structure to give a clean floor. Fig. 2 shows this belt between the two arcs after loose and presumably displaced stones had been removed. There was nothing about the placing of the stones in the belt that suggested the earlier presence of either horizontal or vertical wood, so the feature remains something of a mystery.

South of the southern arc, from approximately 11/8 to 13/8, ran an extra row of stones. They appeared to have been carefully set, and it is suggested that they supported reinforcing timbers on the downhill side of the structure.

Fig. 2 also shows the positions of the five postholes found. Three lay close together between the eastern end of the two arcs. Their diameters were all about 30 cm, and when sectioned they were found to extend only 10–15 cm into the sandy silt of which the bedrock in this area consisted (sections e-f, g-h, and j-k in fig. 1). A further posthole of similar dimensions had been dug at about 15,5/11, where the bedrock was hard till. This one was filled with humified grey clay. A little over a meter south of it was a slightly larger hole, into which stones from above had sunk. There is a clear planigraphical connection between these holes and the stones of Feature B as a whole. In particular the two

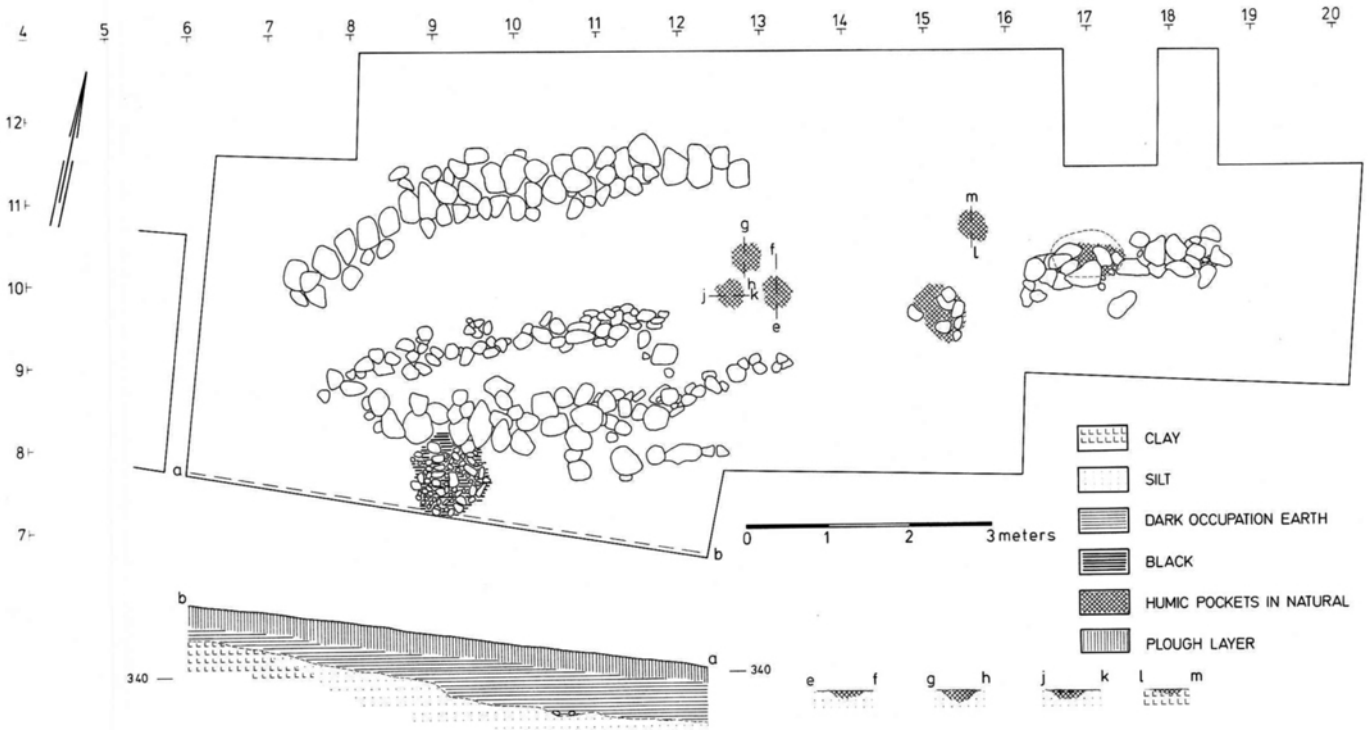

Fig. 2. Lundehøj, lower plan showing only structurally significant stones.

last mentioned holes lay near its NE and SE corners. Among the stones of Feature B were found 2 querns and 3 fragments of querns.

FINDS

The date of these structures was implied at an early stage by the presence of shattered flint and of the relatively many quernstones (which in the author's experience at Lindebjerg on the mainland of Zealand close by are both early Neolithic traits (Liversage 1981)). Confirmation came with the discovery of the two pots illustrated in fig. 6. They were found when the stones were taken up, both in sherds and incomplete, but no doubt originally deposited intact. The smaller beaker was found at the point marked "3" in fig. 1 and the larger one at the point marked "4", where a stone from the northern arc had evidently fallen on it in prehistoric times and crushed it. The smaller beaker was 10 cm high and the large one's estimated height was 15 cm. Both were of dark grey-brown ware rather sparingly gritted with angular pieces of crushed stone. They originally had a smooth, slightly burnished surface, but this had deteriorated in most places. Each was decorated close to the rim with two rows of horizontal cord impressions. The cord had two strands and appears to have been wound of fibres. Except for the quernstones mentioned earlier, there were no other finds that could be connected directly with Features A and B. The two pots date from an early stage of the Funnel Beaker culture.

A LATER SETTLEMENT

There were also signs of later settlement on the spot. With centre at 9,5/8 was found a round hearth about 90 cm in diameter (Feature C). It was floored with small shattered pieces of stone resting on the natural surface. It is seen on the right in fig. 4. There was no recoverable charcoal in it but over and around it the soil was considerably darkened. It lay at so deep a level because the surface soil was removed from a small area

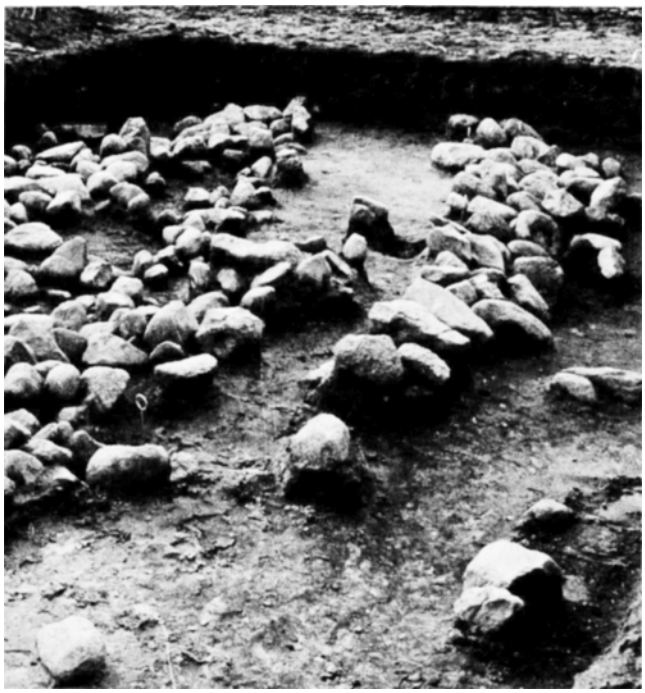

Fig. 5. Feature B partly uncovered from NE before removal of any stones. Note the arc of sloping stones on the north side of the structure (above).

Fig. 3. Feature B from the W before removal of any stones (above, left).

Fig. 4. The western end of Feature B after removal of loose stones. Note secondary hearth on right (below, left).

when it was built. The scarped edge of this intrusion is seen in section a-b about a meter uphill from the hearth, whose position in the section is revealed by two small stones. Furthermore the northern edge of the hearth had been dug in among the bases of the stones of the southern side of Feature B. This was not a purely temporary hearth, but one which had been prepared with some care, and it may very well have belonged to some sort of hut or shelter, which however had not left much trace except the hearth and the scarp. At some date a group of people had laid their dwelling beside the grown-over heap of stones on a hillside that Feature B by that time had become, and the stones at the western end of B were presumably disturbed at this time. The date of the settlement must be indicated by the only find of any significance from the dark layer. This is the thick-butted axe of Late Neolithic type shown as fig. 7, which was found at the point marked "6" in figure 1. A little burned bone found during the excavation of Feature B and later identified by J. Balslev Jørgensen as probably human, is likely also to be from this period of settlement.

INTERPRETATION

It is natural to ask what Features A and B were originally. As there was no fill, there cannot have been a barrow on the site, and as there was no occupation layer from the primary period there cannot have been a normal settlement either. It seems natural to look for the answer in a ritual feature. Feature B must have been a building, but its curved plan suggests that it was built of flexible materials. The author suggests that

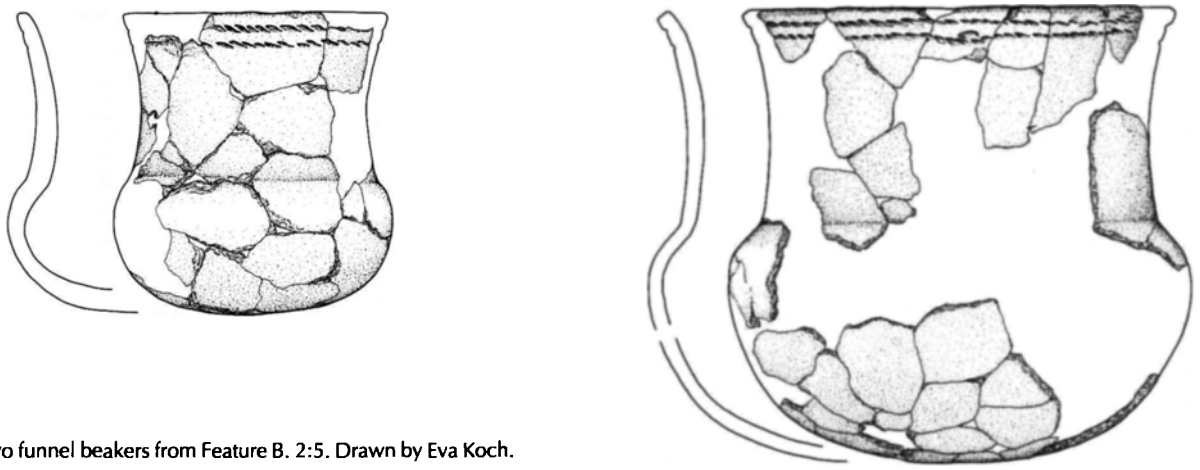

Fig. 6. The two funnel beakers from Feature B. 2:5. Drawn by Eva Koch.

this may have been closely set wooden rods stuck into the topsoil along its northern and southern sides in a curve, bent inwards to meet in the middle, and stabilised at the foot by stones. Such a framework would presumably have been crudely thatched. On the uphill side the stones had been set on end in two to three courses leaning against the wooden rods and possibly filled out with sods. When the wooden framework decayed the stones pressed the wall over, but in the meantime so much earth had accumulated below them that they never came to lie completely flat, but assumed the position seen in fig. 5. On the downhill side an inward-leaning revetment of this kind would have been in danger of slipping, and therefore the second course of stones was placed outside instead of on top of the first to steady it. The eastern part of the structure must have been otherwise constructed. The two posts at the corners suggest the jambs of an entrance. Access may therefore have been through a sort of porch, whose floor was covered with 2–3 layers of stones when the building was abandoned. They were perhaps a sort of symbolic blocking, or perhaps they had rested on the roof of the supposed porch and collapsed when the wood rotted. The three postholes close together between the eastern end of the stone arcs presumably held supports for the roof either of the porch or of the main part of the building. The size of the structure and its content of originally complete pots suggest an obvious analogy with the so-called cult houses, of which published examples are known from Tustrup (Kjærum 1955), Ferslev (Marseen 1960), Herrup (Becker 1969), and Engedal (Faber 1977). The Sejerø structure differs in its flimsier character and fewer pots, which might be attributed either to its earlier date or to its isolated geographical position.

Features A and B were obviously closely connected. This emerged not only from their planigraphy, but also from the shattered flint and quernstones in both. It is suggested that Feature A was the floor paving of a wooden cist which originally stood free on the surface. The author has proposed elsewhere that the prototype of the *Urdolmen* was a wooden cist (Nice proceeding forthcoming). Like many urdolmens it was found empty.

Fig. 7. Secondary flint axe found at west end of Feature B. 2:3. Drawn by Eva Koch.

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The Excavation of a Passage Grave Site at Himmelev, Central Zealand

by JØRGEN SKAARUP

In the autumn of 1968 the author excavated, for the National Museum of Copenhagen, a passage grave site near the village of Himmelev, a few kilometres north-east of Roskilde. Before excavation the site was noticeable merely as a low mound in a cultivated field consisting of a heavy clay top-soil resting on moraine clay. For excavation the mound was divided into four quadrants separated by baulks 0.5 m wide which together formed a slightly oblique cross. A cross section extending NE-SW through the mound (section A) was recorded, but first a number of c. one-metre-wide test pits were dug along the mound section (fig. 1) in order to clarify the original extent and structure of the mound. The larger excavation trenches were dug as an extension of these test pits. They had to be confined to the area in and around the chamber, passage, and passage opening since this was a rescue excavation with limited resources. In 16 days a total of 128 m² was uncovered.

THE MOUND

By means of the test pits we succeeded in finding a sufficient quantity of *in situ* stone packing for the approximate diameter of the mound to be determined. From north to south it measured c. 19 m, from east to west c. 18 m (fig. 1). The test pits clarified another matter: the layer of moraine clay turned out to rise slightly from the outer edges to the middle of the mound. Thus the mound was built on top of a small natural elevation in the terrain.

The excavated portions of the mound together with the recording of section A soon made it possible to reconstruct the structure of the lower parts of the mound – in spite of a sizable, recent disturbance penetrating from north to south right through the eastern half of the mound, which had completely eliminated any traces of the passage way (fig. 1). The following seems certain: on a small elevation was placed an almost circular packing of boulders 0.1–0.5 m large, measuring c. 19 m from north to south and 18 m from east to west. Towards its perimeter the packing consisted of simple paving of, apparently, fairly scattered stones. Towards the chamber, which was situated away from the centre in the northerly quadrant of the mound, the thickness increased considerably, the stones here being preserved in up to four layers in very dense and – especially at the back, the western side of the mound – very wide stretches of packing. In several places in the south and northerly ends of the mound there was a fill between the stones, consisting of very firm sand – with a slight admixture of clay – of a yellowish grey or yellowish brown colour. This fill must have come from elsewhere as the subsoil around the mound consists of moraine clay (cf. Strömberg 1971:67). A few undecorated potsherds, some flint waste and bone fragments mixed with the grave fill may stem from a culture layer (discussed below) that was identified underneath the floor of the chamber. The purpose of the massive stone packing, which was supplemented nearest the chamber by a packing of crushed flint, must undoubtedly have been to provide a solid and rigid backing for the megalithic uprights of the chamber and thereby prevent these from being displaced by the earth of the mound (cf. Strömberg 1971: 233 f.).

It was impossible to determine whether the mound had been surrounded by kerb stones, but as none of the trenches at the base of the mound revealed definite traces of their sockets, they are unlikely to have existed.

None of the many stones in the packing gave any indication that they had been used as hammer stones, grind-stones or whetstones.

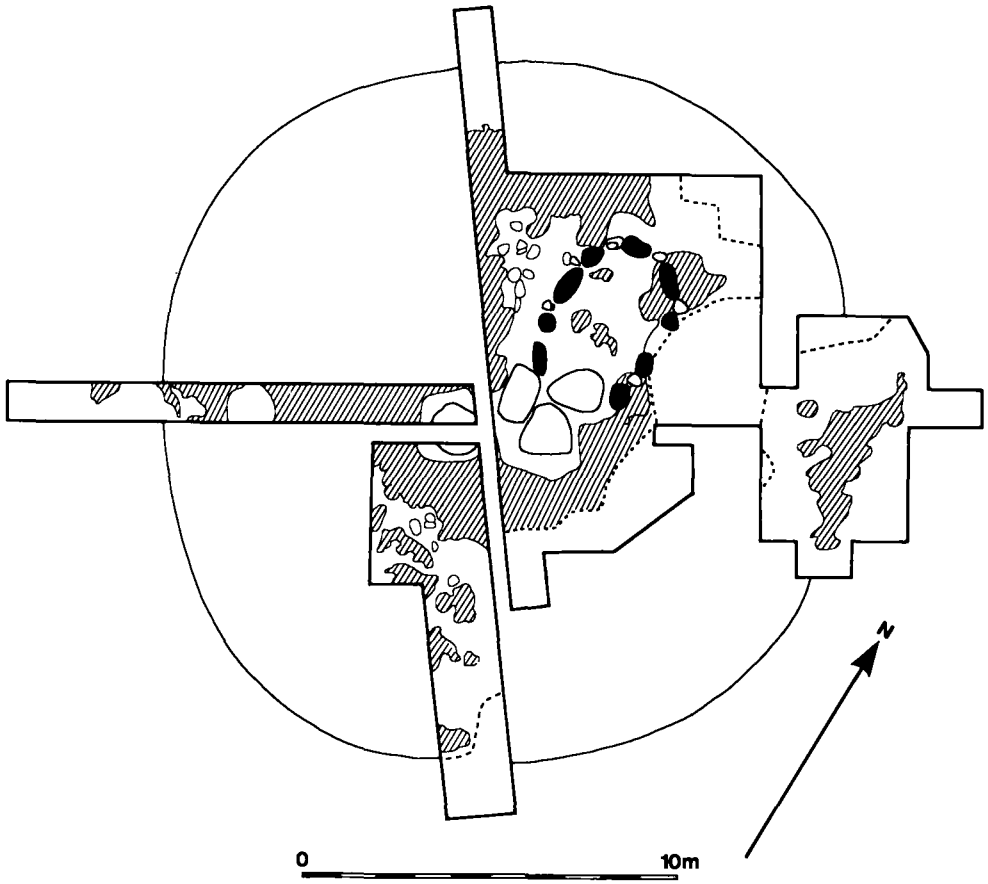

Fig. 1. Plan of the passage grave site at Himmelev (National Museum parish register No. 53). The full line indicates the probable periphery of the mound. 1:200.

THE CHAMBER AND THE PASSAGE

The chamber of the passage grave was located fairly quickly in the northern excavation quadrant, trench I. This was gradually extended to cover c. 50 m², i.e. the whole chamber as well as the adjacent northern and north-eastern parts of the mound and almost the whole area through which the passage must have run. The disturbance, mentioned above, in the east side of the mound turned out to include the whole area up to the outside face of the chamber and the north corner of the trench. Between these two areas there was a course, c. 1.3 by 1.5 m, of the external support packing of the chamber, consisting of boulders between 0.1 and 0.25 m placed in layers of one to three deep with an admixture of crushed flint. Both boulders and flint were laid in yellowish grey sand lightly mixed with clay. The flint level continued in a packing 5–10 cm thick northwards past the chamber.

Nearly all the megaliths from the chamber and passage had been removed when the grave was demolished. However, four heavy stones – three of granite and one of gneiss – remained, presumably because it proved impossible to remove them. Instead the stones, which were up to 1.5 m tall, had been rolled down into two pits – one large pit that disturbed the south end of the chamber, and a smaller one close to the middle of the mound, where it was necessary to take up the heavy stone packing before the unmanageable megalith could be removed (figs. 1 and 2). Apart from the disturbance in the south end the floor of the chamber was hardly affected by the destruction of the chamber. The floor was covered by a layer of top soil 15–20 cm thick and (below it) a layer of clay 5 cm thick, which

had probably come from the pits for the megaliths. The clay level was situated immediately above the packing of crushed flint, which in the middle of the chamber was 15–20 cm thick. In the northern part of the chamber the thickness of the flint layer diminished to only 5 cm.

On top of the flint packing two small areas of paving appeared in the middle of the chamber and across its longitudinal axis. Another small area of paving was discovered near the north-west corner of the chamber. The entire north-east corner was paved with stone. It was impossible to decide whether the scattered paving stones originally formed a continuous pavement over the flint packing. Underneath the paving and on and within the flint packing were the grave goods, comprising a large quantity of broken pottery and several artefacts of flint, stone and amber. Only a few, very fragmented bones remained of the people buried.

One find deserves special mention as it appears to date the flint packing in the chamber. It is a fairly large potsherd, which consists of the rim and shoulder of a shouldered pot with two lugs on opposite sides (fig. 4.8). This sherd was found immediately beneath the flint packing. Its shape and decoration make it the oldest potsherd in the chamber. If its location beneath the flint packing indicates the original position of the – later broken – pot (and in the north-west end of the chamber the packing was compact and firm), the flint packing must be later than the building and first use of the chamber (cf. Strömberg 1971:210).

After the removal of the upper paving and the flint packing in the chamber, its ground plan became apparent (fig. 2a). Traces of no less than six sections of dry wall with up to four courses of cloven or naturally split flagstones of granite and sandstone remained in the northern half of the chamber, and along the edge of the floor there were traces of nine sockets for the side stones of the chamber. Several of the sockets were edged with stones or had a mixture of flint and gravel at the bottom. The south end of the chamber was fairly damaged by the embedded megaliths, but the presence of a small preserved sections of the stone packing behind the south wall nevertheless made it possible to determine fairly accurately the southward extension of the chamber. It was orientated north-south and had an oval ground plan. The interior length north-south was c. 4.5 m. East-west the width in the middle was 2.55 m. The north end was 2.3 m wide, the south end 2.05 m wide. The entrance to the chamber was situated in the middle of the long side facing east. The distance between the two entrance sockets was 80 cm.

As already mentioned the traces of side stones in the passage had been eliminated by recent digging activities, but the length of the passage can be estimated at c. 4.2 m on the basis of the distance between the passage opening and a preserved paving area with broken votive pottery in trench V east of the entrance. The interior width of the passage opening was 80 cm, as mentioned above.

HABITATION LEVEL

In connection with the uncovering of the sockets a black layer of top soil mixed with clay was excavated between the underside of the flint packing and the moraine clay. This layer contained a number of charcoal particles, a little flint waste and a few potsherds. Sherd No. 9 (fig. 4.8), mentioned above, was found on the very top of the layer. The thickness of the layer was 3–10 cm. In the western and north-western parts of the chamber it continued down into three small, flat-bottomed pits, which contained a fill of top soil mixed with charcoal and one flake waste. Because of its composition the layer was interpreted as a habitation level, which – judging by a few simply decorated rim sherds from funnel beakers – must predate the erection of the passage grave.

ARD MARKS

Below the assumed habitation level the moraine clay of the subsoil appeared. As mentioned in the introduction, it rose to form a small natural elevation under the mound. This elevation revealed furrows looking like ard scratches, which must precede the building of the mound. In the moraine clay below the chamber floor there were ard scratches in the direction east-west and NNW-SSE. The greater part of the scratches, and the most visible ones, extended from east to west (fig. 2b). To the west, where the situation was clearest, these scratches were broken by side stone holes, which must consequently have been dug later. The distance between the U-shaped ard scratches extending east-west,

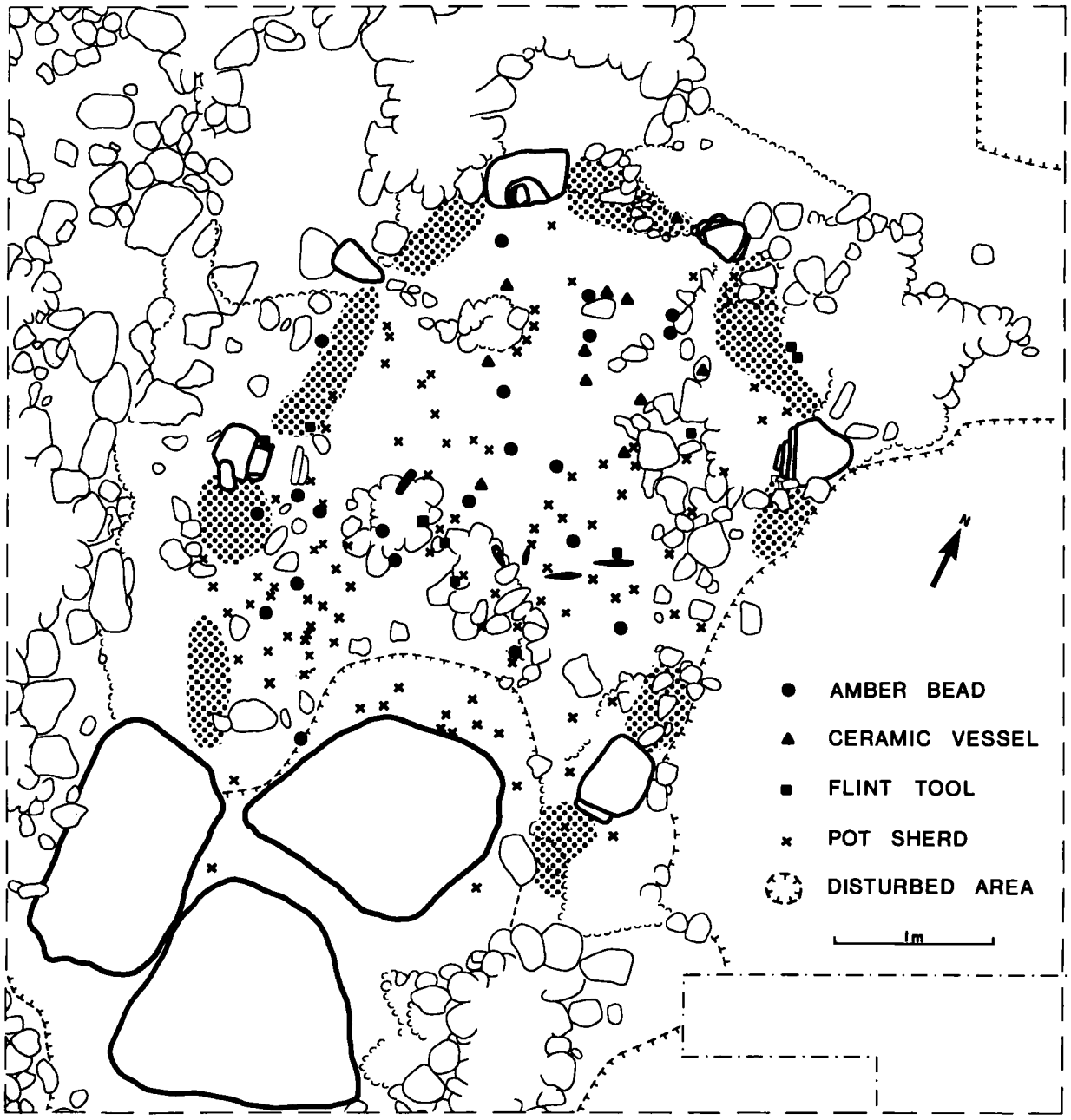

Fig. 2a. Detailed plan showing the distribution of finds in the grave chamber and parts of the votive deposit. 1:40.

which measured 3–6 cm in width and c. 1.5–2 cm in depth, was 15–20 cm.

The intersecting scratches extending NNW-SSE were fewer in number and less conspicuous in the clay. The distance between these scratches, which were 2–3 cm wide, fluctuated between 10 and 30 cm.

As it was not economically feasible to remove the solid stone packing west of the chamber to follow the ard scratches there, we attempted instead to scrape the surface of the 1.5-metre-wide area with undisturbed subsoil located in the east side of trench I in order to demonstrate possible ard marks east of the chamber.

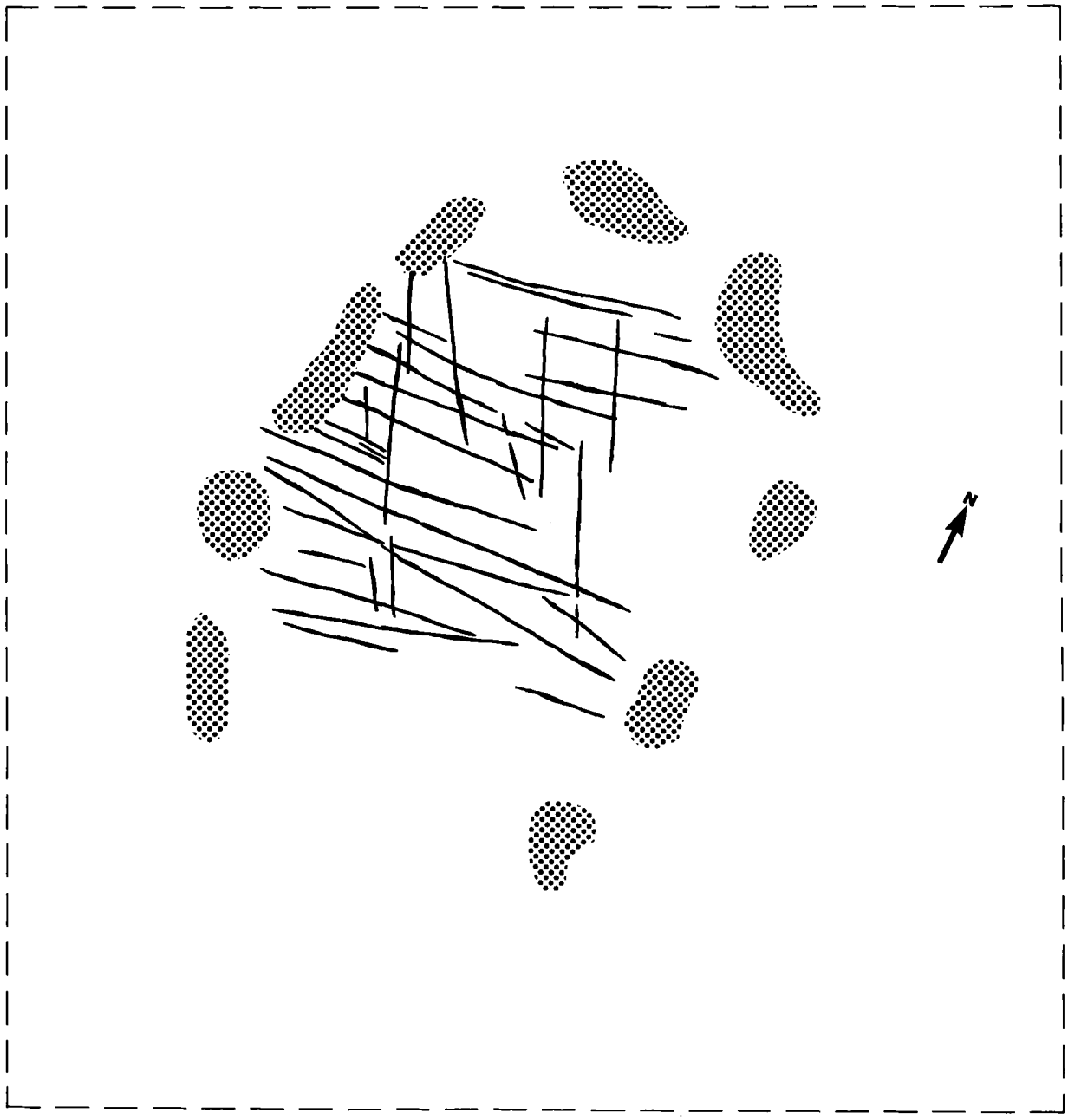

Fig. 2b. Ard scratches under the chamber floor. 1:40.

This attempt was unsuccessful, however, because in this particular place the subsoil was penetrated by a gravel bar that prevented closer observations. It was impossible to decide whether the ard marks stemmed from ploughing during an earlier occupation or whether they were connected with rituals when the mound was built (Ørsnes 1956:231).

THE STONE PACKING AT THE PASSAGE OPENING

In front of and around the place where the passage is assumed to have opened into the east side of the mound, an area of c. 26 m² was uncovered, which was designated trench V (fig. 1). This contained an irregular, oblong piece of paving 5.3 m long from north to

south and up to 1.4 m wide from east to west. The paving consisted of one or two layers of stones measuring 15–30 cm, which rested on a layer of whole and broken stones measuring 10–50 cm. The extension of the paving was established everywhere except to the north, where a single row of stones continued underneath the edge of the trench. The paving appears to have been placed just outside the opening of the passage as the mound fill with clay admixture was not found further to the east than the western limit of the paving. Just east of the paving the clay subsoil sloped down, and the top soil was heavy with ploughed-in mound fill.

A number of potsherds from e.g. pedestal bowls and funnel beakers as well as a single flint tool, a flake knife, were recovered from between the two upper layers of the paving and its close vicinity. The paving with its potsherds must be regarded as a votive offering at the passage opening, as we know from a number of excavated passage graves (cf. Strömberg 1968: 173 f.).

FIND MATERIAL

Pottery

The excavation of the passage grave site yielded a considerable quantity of pottery, namely 2.067 sherds. (To which may be added nearly a score of mainly glazed potsherds from the 17th or 18th century. These sherds, found with fragments of clay pipes in the heavily disturbed southernmost part of the chamber, probably indicate the time when the grave was destroyed). Of the 2.067 potsherds, 427 were very small and predominantly undecorated. In all 718 sherds or 34.7% of the total material were decorated.

The majority, i.e. 1.453 of the potsherds, were found in or on the flint packing of the chamber floor. One sherd was found immediately below the packing. Fourteen sherds come from the thin habitation level under the chamber floor. Twenty sherds from the mound fill probably also originate mainly from this level. Finally, 579 potsherds were recovered from the irregular paving in trench V, which was interpreted as a votive offering in front of the passage opening. All the prehistoric pottery is TRB. In fig. 2a, x indicates the location of small collections of potsherds, while greater concentrations are marked with a triangle.

The number of vessels from the burial layers in the chamber amounts to at least 28, the majority of which are greatly fragmented, probably because of repeated interments. The predominant pottery shape is shouldered pots with a single lug, which measure 9–17 cm in height and 13–18 cm in diameter at the mouth. Ornamentation usually consists of a combination of horizontal lines of chevron and groups of vertical strokes executed as stab-and-drag or incised decoration. Characteristic examples can be seen in figs. 3.2-7 and 4.1.

One very large shouldered vessel, to which the above-mentioned potsherd No. 9 (fig. 4.8) belongs, had two opposing lugs and a decorative pattern that differs markedly from that of the other shouldered vessels. Below the rim there is a wide cross-hatched band, while the broad sharp-angled shoulder has large deeply excised triangles, which – like the lugs – are decorated with dentate spatula impressions. The body is undecorated. Inside the vessel, just below the rim, there is a horizontal row of chevrons (fig. 4.8).

Biconical and shouldered vessels are represented by two pots, one of which is undecorated while the neck and body of the other, which was originally about 15 cm high, are decorated with a metope pattern consisting of horizontal bands of grooved and imitation cord impressions, alternating with undecorated zones (figs. 4.13 and 10). Finally, we have a potsherd, which seems to come from the bottom of a pedestal bowl, decorated with horizontal rows of curved stabs (fig. 4.5).

The few potsherds from the habitation level below the chamber represent at least two funnel beakers with one and three rows of incised decoration, respectively, below the rim. A flat base may have belonged to one of them (fig. 4.11-12).

Most of the potsherds from the mound fill are undecorated and small. Two side sherds with vertical grooved and vertical impressed decoration, respectively, from the paving just west of the chamber may have been removed from it by ploughing.

The considerable quantity of potsherds from the deposit in front of the passage represents at least 12 clay vessels. Two or three of these are pedestal bowls of which only a few sherds (fig. 4.9) and a couple of pottery chips have survived. The pedestal bowls are decorated with large rhomboid figures (fig. 5.14) and vertical herring-bone decoration bordered with double bean-shaped indentations.

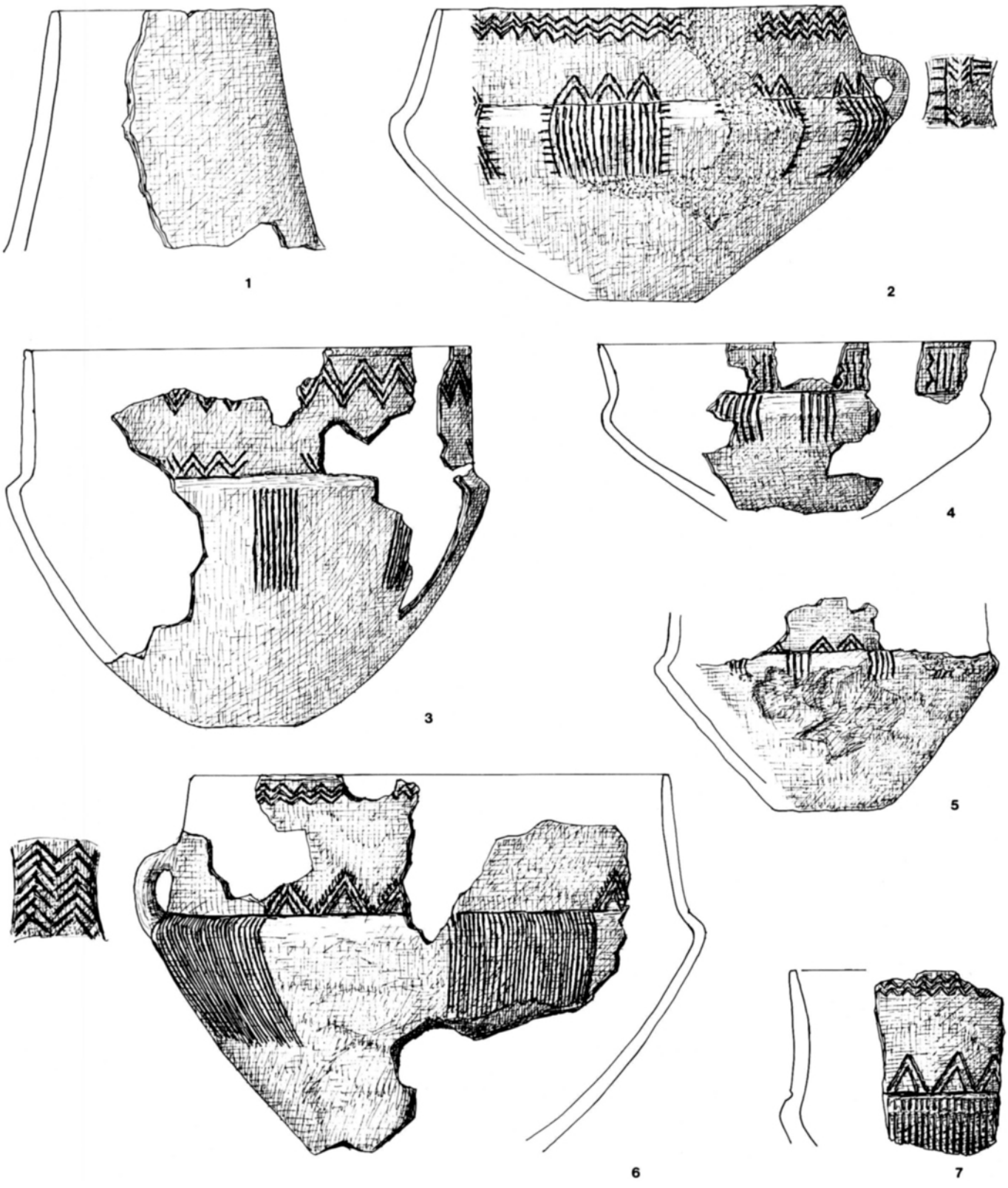

Fig. 3. Clay vessels from the votive deposit (1) and chamber (H. Ørsnes *del.*). 2:5.

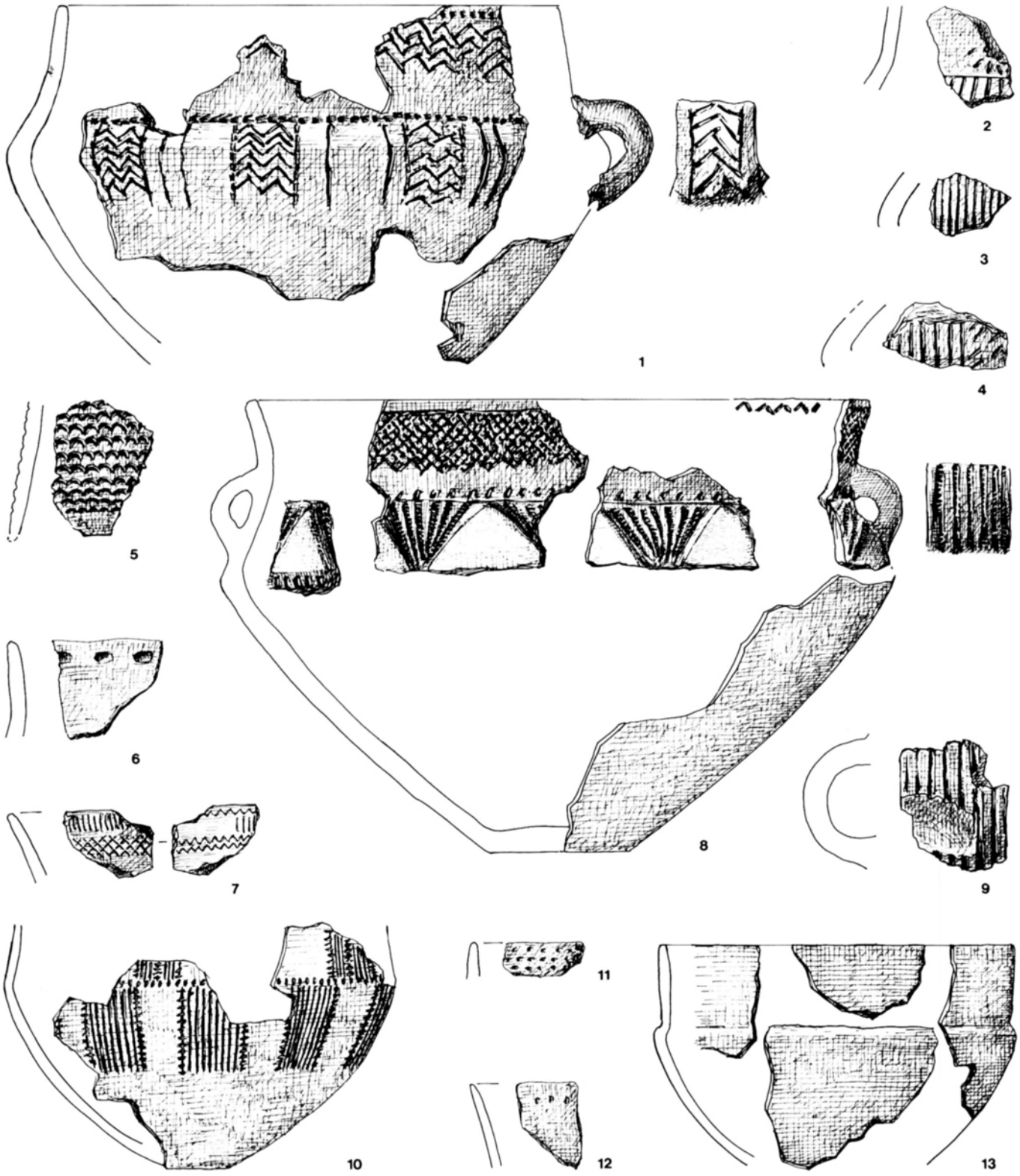

Fig. 4. Potsherds from the chamber (1,5,8,10 and 13) and votive deposit (2-4,6,7 and 9) and from the habitation level underneath the passage grave (11-12) (H. Ørsnes *del.*). 2:5.

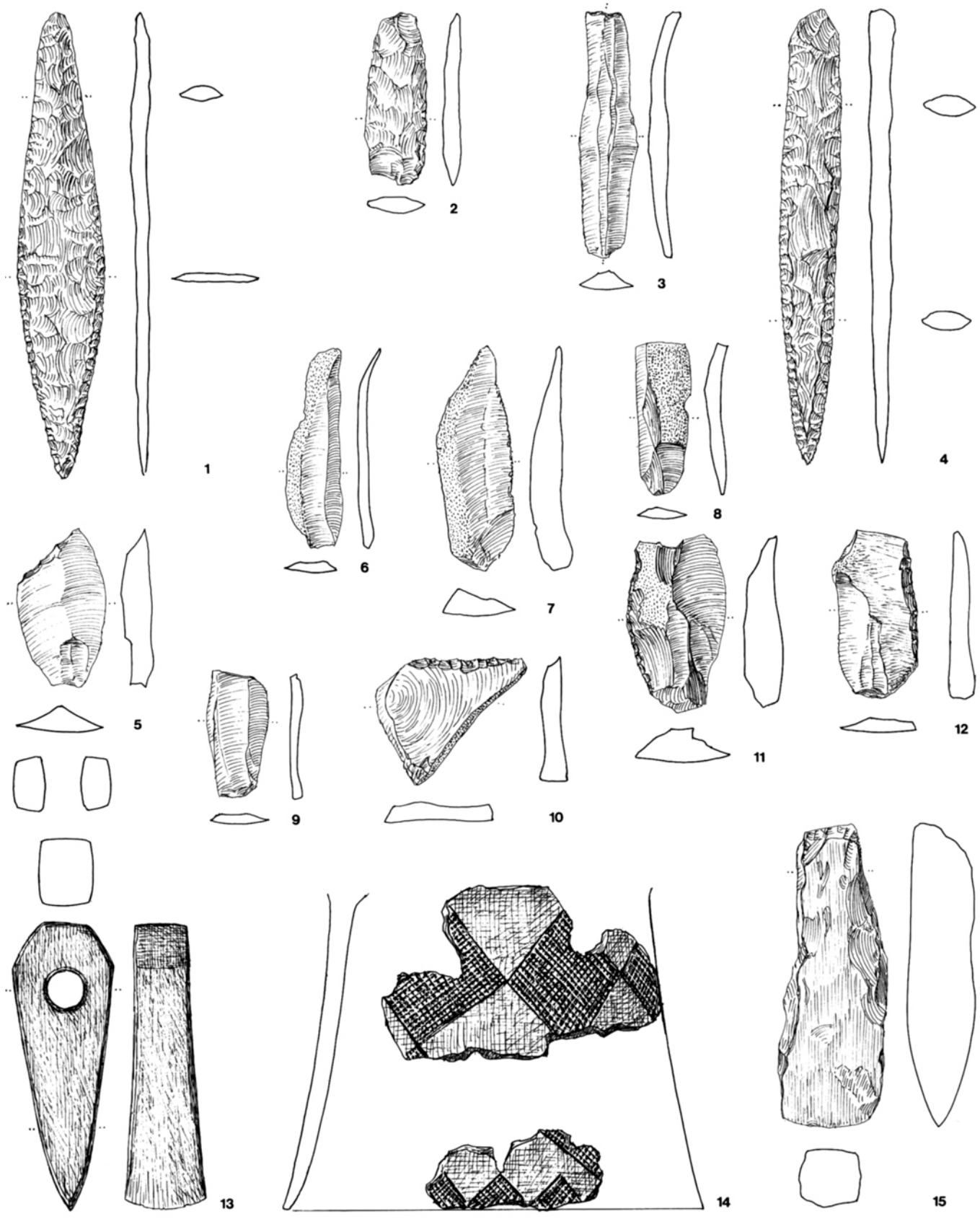

Fig. 5. Flint and stone tools from the chamber and a flake knife (12) and a pedestal bowl (14) from the votive deposit in front of the passage opening (H. Ørsnes *del.*). 2:5.

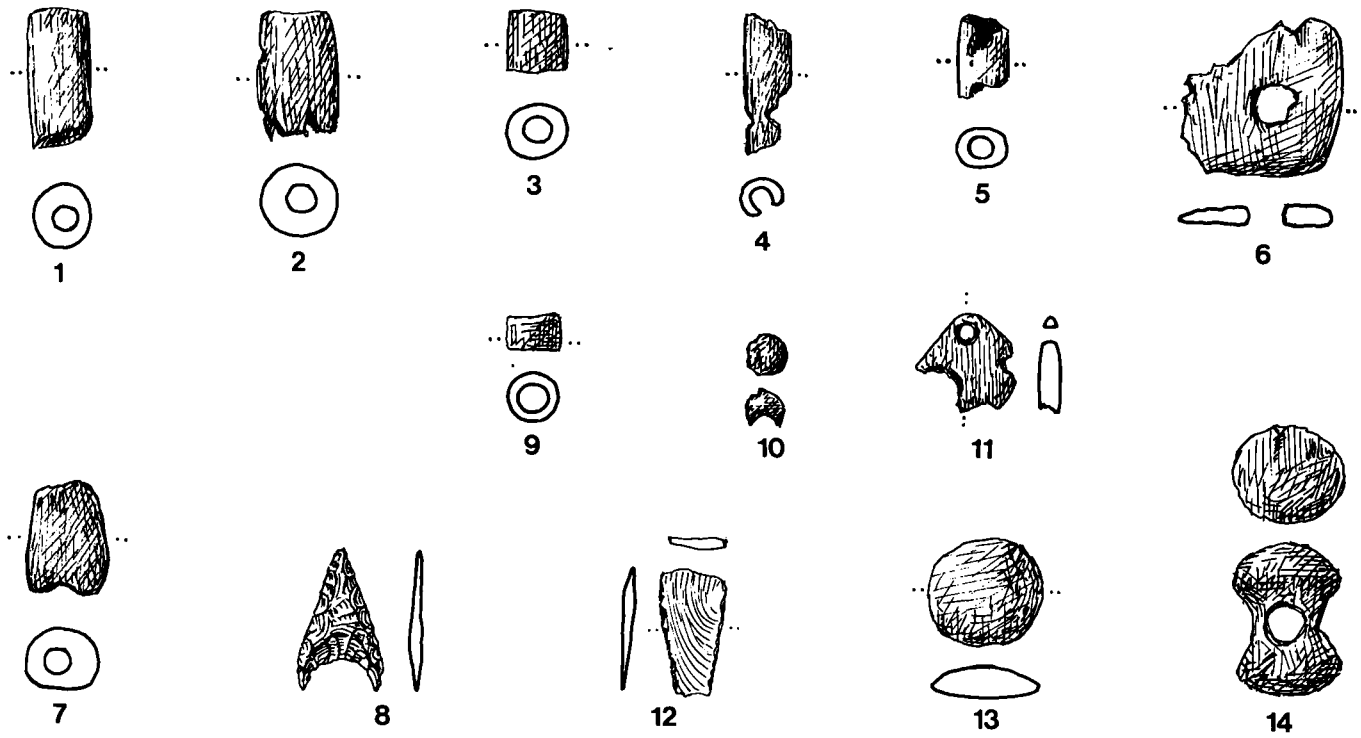

Fig. 6. Amber beads and flint arrow-heads from the chamber (H. Ørsnes *del.*). 2:3.

The rest of the pottery from the votive deposit consists of the remains of two badly preserved, undecorated biconical pots (fig. 3.1); three or four shouldered vessels with chevron and linear ornamentation, impressed, incised or in stab- and -drag (fig. 4.2-4); and as many funnel beakers with pits below the rim (fig. 4.6) or more complex rim patterns (fig. 4.7) and vertically striped body.

Flint and stone

In comparison with the rich material of potsherds the finds of flint and stone were few. A total of 16 finished and unfinished tools were retrieved, 15 of flint and one of greenstone. The tools were found in or on top of the flint packing in the chamber, with one exception: a knife 7.6 cm long, produced from a sturdy flake, was discovered in the eastern end of the votive deposit (fig. 5.12). Their location is indicated in fig. 2a. Two flint daggers, one lanceolate 20.7 cm long and one very pointed type VI dagger (cf. Forssander 1936:121 f.), 21.2 cm long, were placed with facing points in front of the passage opening (figs. 5.1 and 4). A little further west and fairly deep down in the flint packing was found a flat-trimmed unidentifiable flint tool 7.8 cm long (fig. 5.2). Below the oblong paving in the middle of the chamber there were uncovered a 13.0 cm long axe of greenstone with a tubular shaft-hole measuring 2.0 cm in diameter (fig. 5.13), and a 13.6 cm long thick-butted flint axe with a crudely flaked rectangular butt and polished cutting edges (fig. 5.15). A heart-shaped, flat-trimmed arrow-head 2.8 cm long (fig. 6.8) was found in what appeared to be a secondary deposit above the remains of a socket in the west side of the chamber. Finally, six blade and flake tools were found scattered in the chamber: scrapers and knives as well as two unshaped blades and a 2.6 cm long transverse arrow-head made from a tiny flake (fig. 5.3 and 5.11, fig. 6.12). In the chamber the packing of broken flint contained 128 homogeneous waste flakes, a core and a hammer stone. The habitation level contained only six small flakes. Scattered among the mound fill there were a total of 84 flakes, 2 blades – one with a retouched edge – and two

cores. Seventeen flakes, apart from the knife mentioned above, were found in trench V. Some of the flint from the mound fill and trench V may come from the habitation level. No concentrations of worked flint were observed (Strömberg 1968:197 f. and 1971: 310 f.).

Amber

No less than 21 amber beads, many of which were in a poor state of preservation and could be removed only as fragments, were found scattered over the whole chamber floor and in a few instances in secondary deposits above traces of sockets. The location of the amber beads appears from fig. 2a. Tubular amber beads with a length varying between 0.8 and 2.6 cm and a diameter of approx. 1 cm are the most common type among the identifiable beads. Other preserved pieces include a single club-shaped bead, a discus-shaped bead without perforation, a flat rectangular bead with a central hole, and a rounded disc with a hole near the edge (fig. 6.1-7, 9-11 and 13-14).

Bone

The excavation recovered no artefacts of bone. Four hundred and thirty-two bone fragments together with a poorly preserved lower jaw and two molars – jaw and molars both definitely human – were found in the chamber. This material presumably represents the sparse remains of those interred. No physical anthropological study, however, has been carried out. Of the bone fragments 226 showed traces of fire, though none had become brittle as a result of it. The interpretation of this fairly common phenomenon in passage graves is uncertain (Strömberg 1971:241).

DATING

The relatively numerous artefacts from the passage grave provide an excellent basis for dating its construction and period(s) of use; they are also important in dating the habitation level and ard marks under the grave. The oldest pottery in the chamber was the big double-lugged shouldered vessel and the pedestal bowl with curved incisions. These pots can be dated to MN I b. The rhombus-decorated pedestal bowls and possibly also the funnel beakers from the votive deposit in front of the entrance are of the same date (Berg 1951: 16 f.). This pottery must belong to the first period of use just after the passage grave was built. However, the majority of the potsherd material derives from MN II, when the grave chamber must have been rather intensively used. Virtually all shouldered vessels from the chamber and the sacrificial layer are decorated and shaped in the East Danish style of MN II (Winther 1943: 16 f.). In the same category belongs a greatly fragmented (probable) pedestal bowl with crude vertical herring-bone decoration from the votive deposit (Winther 1943: fig. 38). The undecorated biconical pottery from the votive deposit and the chamber first appears in MN II, but may be later.

The TRB people's use of the passage grave appears to have ceased during MN III. Continued burial in the chamber during this period is attested only by a biconical vessel with metope-decoration (fig. 4.10) and possibly also the undecorated biconical pottery mentioned above, and a shouldered vessel, all found in the chamber. The thick-butted axe with rectangular cross section could perhaps be taken as evidence of a continued TRB-use of the grave chamber into MN IV (Becker 1957:29), but the axe is too crudely chipped for it to be confidently dated and culturally classified. The amber beads all represent shapes that are common in the Middle Neolithic TRB culture. They cannot be accurately dated. The same is true of the core and flake tools. By contrast, the four flat-trimmed implements and the axe with a shaft-hole from the chamber indicate that the passage grave was used as a burial place on at least two later occasions; the first time during an early phase of the Late Neolithic when the lanceolate dagger was deposited together with a dead body that has now disappeared; the second and presumably last time during the Early Bronze Age when the sharpened dagger with a fully shaped hilt and the shaft-hole axe constituted the grave goods in connection with one or more burials. The flat-trimmed tool and the heart-shaped arrow-head can be dated only to the Late Neolithic or the Bronze Age and may either be associated with the other artefacts from this period or they may represent independent burials. The last phase in the history of the passage grave is its destruction, which seems to have occurred

during the 17th or 18th century, as already mentioned.

The supposed traces of ard-ploughing below the passage grave must, as appears from the above, be earlier than or contemporary with MN I b. Their presence below the thin culture layer, which – owing to the funnel beakers – must be assigned to the Early Neolithic or the beginning of the Middle Neolithic, does not necessarily imply that they precede the culture layer. An ard or a similar ploughing implement may be assumed to be able to cut through the culture layer. Consequently it is impossible to determine whether the occupation or the ploughing is the earlier, but in any case the furrows under the Himmelev passage grave are one of the earliest examples of ploughing in Denmark.

Translated by Ole Bay-Petersen

NOTE

[1] The site is located in the south-eastern corner of Title No. 6a in the Land Register, Himmelev town and parish, Sømme district. Prior to excavation it had not been recorded in the parish register of the National Museum, Dept. I (NMI). Report and maps are filed in the archives of NMI (File No. A 50383).

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Journal of Danish Archaeology vol. 1, 1982, pp. 31–33

A Neolithic Causewayed Camp at Trelleborg near Slagelse, West Zealand

by NIELS H. ANDERSEN

In the 1970's a new type of monument was identified, belonging to the Middle Neolithic TRB-culture in Scandinavia, viz. the causewayed camp. These constructions are characterized by a system of ditches separated by numerous earth bridges. At the present time we know of five such fortifications within the borders of Denmark (1). To these may be added the one at Büdelsdorf near Rendsburg (Schleswig), belonging to the same culture (Hingst 1971).

The causewayed camps of Scandinavia correspond in type and date to those in Central and Western Europe (Boelicke 1976/77: 106–112). So far there is no unanimity of opinion about them, but the excavations of e.g. the Sarup and Toftum camps seem to indicate that these were places of local ceremonial significance where people carried out a single or a few ceremonial activities, after which the monuments gradually disintegrated and were covered up.

Once a structure of this type has become identified as belonging to a culture group, attempts are made to locate more of a similar kind so as to broaden our knowledge of them.

One of the familiar settlements from the Middle Neolithic TRB-culture is Trelleborg. Excavations of the Viking Age ring-fort revealed 125 pits belonging to different phases of the Middle Neolithic TRB-culture (Mathiassen 1944:77–98, Becker 1956:91–108). If we study the published plans from Trelleborg (Nørlund 1948:Table V a), we notice that the south-east square courtyard within the ring-fort contains a row of large pits in a system extending from the south-west towards the north-east. The size and shape of the pits seem to correspond to the ditches of the causewayed camps. The location across a headland agrees with observations at e.g. the Sarup and Lønt constructions (1).

Trelleborg was excavated in such a way that we cannot feel entirely confident that the published excavation plan is correct in details. The absence of excavation boundaries, for instance, makes it impossible to ascertain whether the above row of pits ceases or whether it continues towards the north-east. In August 1979 a small-scale re-excavation was carried out of the site (2) to establish:

a) whether the system of pits extended across the headland
b) the cross section of the pits, since the ditches of fortified constructions are always regularly dug, and
c) whether, in connection with this construction, there might have existed a palisade which had been overlooked during the previous excavation.

At the re-excavation a test-pit was dug in the area of the north-east square near the east gate where it was obvious that no previous excavation had taken place (fig. 1,A). This test-pit contained two Stone Age pits, one of which (fig. 1,B) was regular in shape and formed an extension of the row of pits mentioned above. Thus it would seem that the pits in question actually form a continuous system across the headland – a system of pits that corresponds to the ditch systems round the fortified sites.

In the newly discovered pit/ditch and in two of those found previously transverse trenches were dug to examine their profile. The trenches show that they were dug to a regular shape in the subsoil, which here consists of a hard, sticky clay (fig. 2). The ditches of other fortified constructions are generally several metres deep (Andersen 1974: figs. 3 and 8, Madsen 1977: figs. 2 and 4), but those examined at Trelleborg showed a depth of only 50–60 cm. The reason for their slight depth may be that when the Viking fort was built the headland was levelled (3), which would have removed a considerable amount of earth from the area investigated. Another reason may be that there was no intention of making them deeper. Obser-

Fig. 1. Plan of the Viking fort of Trelleborg at Slagelse (after Nørlund 1948, Table LVII). Neolithic pits are shaded black. Leters refer to the excavation trenches and pits mentioned in the text.

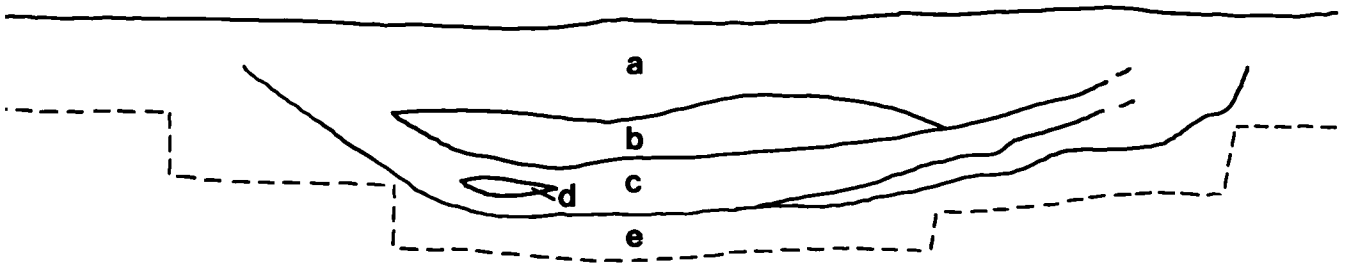

Fig. 2. Cross section of ditch B in test-pit A viewed from the north, scale 1:20.

Description of strata:
a) light grey, dessicated clay with a few stones.
b) yellowish grey, heterogeneous, dry clay.
c) brown, heterogeneous clay with charcoal particles, stone, flint and pottery.
d) as c), but with a dense concentration of pottery and flint.
e) yellow, heterogeneous subsoil clay.

vations at Sarup as well as Toftum show that individual ditches may vary considerably in depth (4). The recently discovered pit/ditch contained a culture layer with artefacts from the transition from MN I b to MN II.

Attempts were made to locate a possible palisade by a broad trench across the courtyard in the south-east quadrant (fig. 1,C), but none was found. This may be because no palisade was built, or because the levelling of the headland during the Viking period removed so much earth that the traces of a palisade disappeared as well.

The re-examination at Trelleborg has demonstrated that there is every reason to suppose that there was a causewayed camp on this site during the Middle Neolithic TRB-culture. It must have been in use around the transitional period MN I b/ II, which is roughly contemporaneous with the period when the passage graves were constructed.

Translated by Ole Bay-Petersen

NOTES

[1] *Sarup* on South-West Funen with two causewayed camps, one from the Fuchsberg phase and one from the Klintebakke phase (Andersen 1974 a and b and 1975).
Toftum near Horsens (Jutland) from the Fuchsberg phase (Madsen 1977), *Lønt* near Haderslev (Jutland) from the Fuchsberg phase. Personal communication from Erik Jørgensen, Haderslev Museum.
Bundsø on Als. Personal communication from Poul Otto Nielsen, Dept. I of the National Museum, Copenhagen.

[2] The excavation was conducted by the Forhistorisk Museum, Moesgård (Journal No. 2155). The excavation team comprised Jens Jeppesen, Århus and the present author, together with a team of young unemployed sponsored by Slagelse town council.

[3] A study of the contour map in the original publication suggests this (Nørlund 1948: fig. 10).

[4] At Sarup the depth varies between 30 cm and 180 cm, at Toftum between 30 cm and 230 cm.

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A Grave Complex of the Early Single Grave Culture at Skarrild Overby, Central Jutland

by HANS ROSTHOLM

Herning Museum has for some years been carrying out the excavation of settlements of the Funnel Beaker Culture and settlements and graves of the Single Grave Culture in Skarrild parish. Skarrild lies about 20 km south of Herning at about the centre of the area that has yielded most of the finds from the early Single Grave Culture (Glob 1944: 243; Becker 1954: 72). It has been found that both these cultures are well represented at two places – one on the eastern side of Skarrild bog, the other 1½ – 2 km to the NE at Pilgård and Lustrup (1).

East of Skarrild bog (in Skarrild Overby) surface reconnaissance and excavation have been carried out over an area covering at least 200 × 300 m. The finds are mostly from the Funnel Beaker Culture, but a small settlement material from the Single Grave Culture has also been found. In 1973 a ploughed-over barrow was excavated containing a grave that was datable to the early Single Grave period (battle-axe of type B, etc.) and there were stratigraphically earlier traces of settlement from different periods, including period V of the Middle Neolithic Funnel Beaker Culture (Rostholm 1977: 103–06; Davidsen 1978: 89–90). In the eastern part of the same area were excavated two ploughed-over barrows in 1975 and 1977. They had graves from the Ground Grave and younger Bottom Grave periods and settlement finds from the Single Grave Culture and from the end of the Funnel Beaker Culture (2). Thus both cultures have lived within the same small area east of Skarrild Bog. The Funnel Beaker Culture is represented by lots of settlement finds from periods I and V and sporadic finds from periods III and IV; not of least importance is a considerable material from the latest period of the culture (3). On the settlement area or within a few hundred meters there are graves from all five periods of the Single Grave Culture and a small quantity of settlement pottery, mostly from the earlier part of the culture.

In 1979 excavation was continued in the southern part of the area east of Skarrild bog with support from the Danish Research Council for the Humanities. An occupation layer, post-holes, and various pits, mainly from the final period of the Funnel Beaker Culture, were found over a considerable area.

A grave structure with three graves from the early Single Grave Culture was also found (4). Grave 1301, which was the earliest, was surrounded by ring-ditch 1302. Superimposed over the east end of this grave and also inside the ring-ditch was grave 1388, while grave 1251 was placed close outside the ring-ditch to the SW (fig. 1).

Nothing could be seen on the surface before excavation, no barrow has ever been recorded here, and no trace of one was observed during excavation, so these may very well have been flat graves, though perhaps the possibility of a completely levelled barrow cannot be entirely excluded (5). The graves had been dug through an occupation layer, whose upper surface was ploughed up in recent times. Depths are measured from the bottom of the present plough soil – the original depths must have been somewhat greater.

Grave 1301 measured 195 × 140 cm, was orientated W-E, and had a depth of up to 30 cm. There appeared to be faint traces of a wooden coffin and patches of darker fill that could have been remains of the corpse. The coffin had been supported in the outer parts of the grave by stones of size 20–40 cm – 2 along the south side, 1 at the eastern end and 4 along the northern side. The latter included quernstone 1386. In the central part of the grave were found a battle-axe 1358, two amber discs 1359–60, an amber ring 1361, and a flint blade 1362 (fig. 2). At the eastern end of the grave a little over the bottom lay amber bead

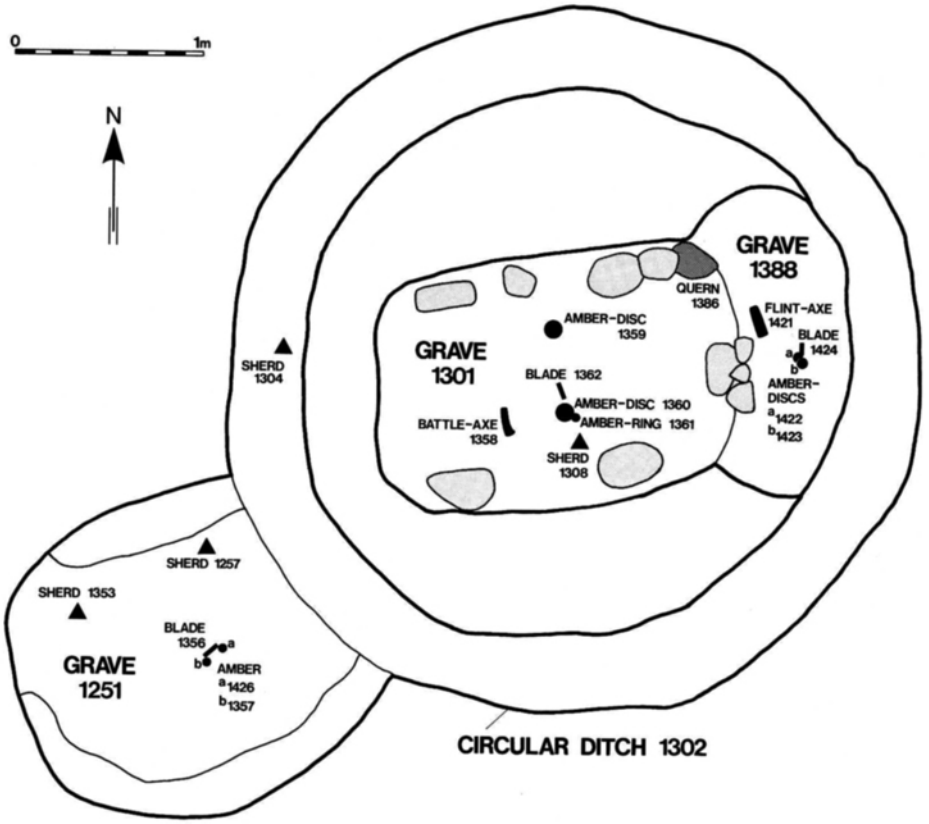

Fig. 1. Plan of grave complex from the early Single Grave Culture composed of 3 graves and a ring-ditch. Skarrild Overby, Skarrild parish, central Jutland. 1:40.

1385. It can have come by chance into the fill or could come from grave 1301 or 1388.

Battle-axe 1358 is of fine-grained rock and has slightly concave underside and splayed cutting edge. Its length is 12.4 cm and the shaft-hole is close to the butt, which is somewhat decomposed without a smooth surface as on the rest of the object. The shaft-hole is cylindrical and 1.8 cm in diameter. The axe is clearly of Glob's type B.

Amber disc 1359 has maximum and minimum diameters of 5.9 and 5.1 cm, and disc 1360 diameters of 5.7 and 5.5 cm. Both are 1.6 cm thick in the middle with flat under-side, convex upper-side, and in places a flat margin 5–6 mm thick. The central borings are conical with a diameter of 3 mm on the upper-side and respectively 8 and 6 mm on the under-side.

Amber ring 1361 has an external diameter of 2.5 cm and an internal diameter of 1.5 cm. Its thickness is 4½ – 5½ and its breadth 7–8 mm.

Blade 1362 measures 6.4 × 1.9 × 0.4 cm with a 3 mm high scraperlike edge at one end.

Ring-ditch 1302, which surrounded grave 1301, had an external diameter of 3.70 m and a width of 35–40 cm. Its depth was mostly 45–50 cm, but differences in level of up to 15 cm occurred. At the bottom of the eastern side of the ditch was found charcoal 1438, a couple of up to 17 cm long vertical pieces, presumably the remains of a post or something of the kind. There were no other certain traces of posts in the ditch.

Grave 1388 measured 160 × 85 cm and was orientated N-S. It occupied the space between grave 1301 and the ring-ditch, touching the inner edge of the latter and for ca. 25 cm overlapping the eastern end of the former. Its base lay 5–8 cm over the bottom of grave 1301 and 10–20 over the bottom of the adjacent part of the ring-ditch. There was no trace of coffin or skeleton. The grave was distinguishable only by its darker fill and grave goods. The latter were flint axe 1421, amber discs 1422 and 1423, and flint blade 1424 (fig. 2).

Flint axe 1421 is 15.7 cm long and of light grey/greyish flint. Its maximum thickness (about in the middle) is 3.3 cm. Breadth and thickness 2 cm from the butt are respectively 2.6 and 2.7 cm. The cutting edge is sharp, protruding, and 4.6 cm wide. The broad sides are polished on the lower half, but the rest is unpolished, including the very irregular butt half.

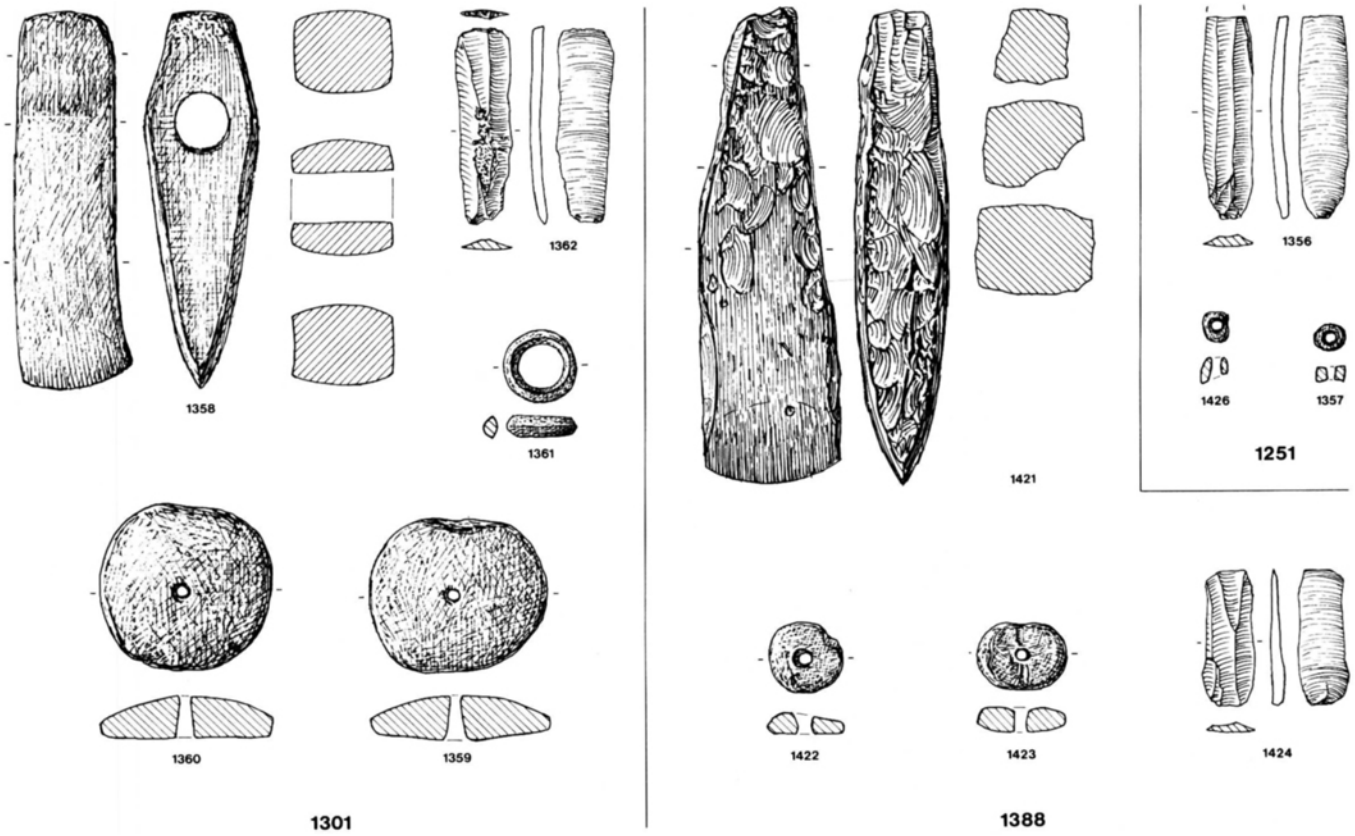

Fig. 2. Finds from graves 1301, 1388, and 1251. Ca 2:5 (Henning Ørsnes del.).

Amber disc 1422 is 2.2 – 2.5 cm in diameter and 4–8 mm thick, irregular, and has a slightly biconical hole 3½ to 6 mm in diameter.

Amber disc 1423 is 3.0 × 2.3 cm in diameter and 9 mm thick with a hole 3½ – 5 mm in diameter. There is a slight furrow on one side that may have been worn by a cord or something similar.

Blade 1424 measures 4.4 × 1.6 × 0.2–0.4 cm, thickest near the bulb.

Amber bead 1357 is disc-shaped, 9–11 mm in diameter and 5–6 mm thick with a hole 3½ mm across.

Amber bead 1426 is irregular, 9–11 mm in diameter and 5–9 mm thick, and has a slightly biconical hole 3½–5½ mm in diameter.

Blade 1256 measures 6.7 × 1.7 × 0.4 cm. The end opposite the bulb is broken.

Grave 1251 lay to the SW outside the ring-ditch (fig. 1) and measured ca. 175 cm in diameter and 30 cm in depth. The base lay 10–15 cm higher than that of the adjacent part of ring-ditch 1302. Around the edge of the grave floor (except on the W) ran a ca. 25 cm wide miniature ditch, which joined the bigger ring-ditch and in places reached the same depth as it. On the floor of the grave were found scattered pieces of charcoal, which appeared to derive from the coffin, and also amber beads 1357 and 1426 and flint blade 1356 (fig. 2.)

The central grave 1301, surrounded by the ring-ditch, is certainly the oldest and is dated to the early Bottom Grave period by its battle-axe. The two other graves did not contain closely datable finds, but their placing is clearly dependent on the ring-ditch.

The three graves seem to be so intimately connected that it is unlikely that much time elapsed between the successive burials. The two graves within the ring-ditch held male gear, but the third grave with flint blade and the two amber beads is more probably a female grave.

This complex, which consisted of a primary grave

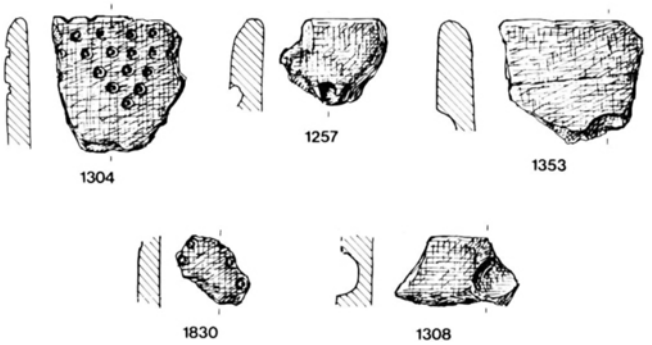

Fig. 3. Settlements sherds from the late Funnel Beaker Culture, found in the fill of grave 1251 (sherds 1257 and 1353), grave 1301 (sherd 1308), and of ring-ditch 1302 (sherds 1304 and 1830). Ca. 2:5 (Henning Ørsnes del.).

with encircling ditch, a secondary grave inside the ring-ditch, and a third grave placed almost as an addition to the ring-ditch, seems to be a new variant among the grave forms of the Single Grave Culture.

It is hard to find parallels in the Danish material (6). From the Single Grave Culture in NW Germany are known ring-ditches with marginal graves, but these features differ clearly from our own in that there are no burials in the middle (Asmus 1954: 135 ff.).

The fill of the graves and ring-ditch consisted of grey-brown mould with settlement finds. Apart from a single undecorated body sherd, to judge from its ware from the Single Grave Culture, the sherds are all almost certainly from the close of the Funnel Beaker Culture. Five sherds bear ornament (fig. 3).

Sherds 1257 and 1353 were found in grave 1251, respectively high and low in the fill. The former is a thick rim sherd with impressions ca. 2 cm below the top which are jabbed obliquely from below. Sherd 1353 is a thick rim sherd from a large vessel and shows the edge of a finger-impressed pit with marks of the nail ca. 3 cm below the rim. High in the fill of grave 1301 was found sherd 1308, a thick body sherd with a finger-impressed pit with nail. High in the NW part of the ring-ditch was found sherd 1304, a thin rim sherd with faint notches on the rim and 15 round impressions, made apparently with a tubular bone, arranged in a hanging triangle below the rim. Among the sherds from the NW part of the ring-ditch is sherd 1830, a body sherd from the same vessel with four impressions that make up the edge of two hanging triangels.

Oblique jabs, hanging triangles made of small impressions, and not least, fingertip impressions are dated to period MN V (Davidsen 1978: 100–102). Among places where sherds with these three kinds of decoration were found is an occupation layer from MN V found under a Single Grave barrow at Lille Hamborg, about 15 km further north (Rostholm 1977: 106–08 and 1982: 35–36 and 44–45).

The discovery described here of a burial complex from the early Single Grave Culture with an admixture of earlier finds from the late Funnel Beaker Culture reinforces other discoveries showing that the Single Grave Culture could at earliest have begun in the final phase of the Funnel Beaker Culture (Davidsen 1977; Rostholm 1977 and 1982: 35–37).

Translated by David Liversage

NOTES

[1] Resumé of investigations 1972–78 in Rostholm (n.d.). The work at Skarrild bog 1972–76 is briefly published in Rostholm 1977 and the Skarrild-investigations 1972–1980 in Rostholm 1982: 29-34, 45-57 and 62-66.

[2] Herning Museum's no. 1964 (Rostholm 1977: 97–98) and no. 1524 (Rostholm 1982: 80).

[3] Herning Museum's no. 1521 and 1519 (northern and southern parts of settlement area). Rostholm 1977: 93 ff.; Davidsen 1978: 78 and Pl. 99, k-l; Rostholm 1982: 30–34 and (n.d.): fig. 1.

[4] Herning Museum's no. 1519.

[5] A grave with ring-ditch but no trace of barrow was excavated ca. ¾ km to the NE in 1974, also in Skarrild Overby. Herning Museum's no. 1629. Rostholm 1977: 102–03.

[6] A possibly related feature was excavated in 1901 at Koldkur in Resen parish (between Holstebro and Viborg), where skeletal remains and amber beads were found high in a very wide (up to 110 cm) ring-ditch (Glob 1944: 170).

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A Late Neolithic House Site with Bell Beaker Pottery at Stendis, Northwestern Jutland

by TORBEN SKOV

The discovery was made in connection with Holstebro Museum's excavation of a megalithic site at Stendis in 1973 (Skov 1973). The new discovery lay NW of the megalith in a flat landscape deposited as glacial outwash sand. Trial excavations brought to light sherds giving the profile of a beaker with recurved rim and toothed stamp ornament (fig. 1), after which a systematic excavation was undertaken.

The topsoil was cleared by machine from a ca. 1500 m² area (fig. 2). This revealed a large dark discoloration 15 m long from W to E and 4 m wide at the west and 5 m wide at the east end (fig. 3). In and around it were found post-holes, so it must have been the remains of a house.

The next stage of the excavation was to lay a number of 60 cm wide cuts transversely across the feature (fig. 4). All finds were kept apart by cuts, and in addition rim, base, and ornamented sherds, and also secondarily worked flint were plotted in individually (fig. 3). The feature was deepest in the middle, ca. 25 cm, becoming shallower towards the edges. The fill was humified sand with finds and charcoal. Within the feature were found four stone hearths.

There were post-holes going down into the pale sand over the whole area. Some of these belonged demonstrably to the house, without however allowing us to say much about its construction. It seems that there were several rather small posts near the edge of the dark area, but there was no trace of proper roof-bearing posts along the central axis.

The closest parallels to this discovery, the three Bell Beaker houses found at Myrhøj in Himmerland (Jensen 1973), are characterised by having a sunken floor area at the eastern end, whose shape in plan is that of an irregular rectangle with a diffuse border to the west. That the original buildings were larger than the dark discoloured areas is indicated by the way the post-holes continue further west, but the western termination of the Myrhøj houses is not clearly defined, so that the total length of the buildings remains uncertain. At Myrhøj the houses had a central row of posts that must have borne the roof. The house remains at Stendis are similar in character to those at Myrhøj, but owing to the many post-holes and the irregular shape of the dark area it is even harder to say anything definite about its shape and dimensions. It

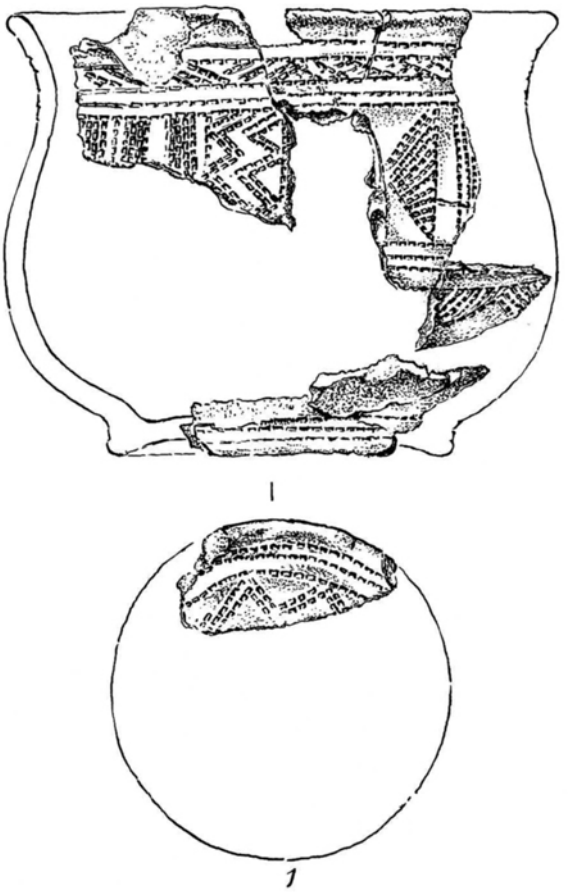

Fig. 1. Sherds of beaker from trial excavation. 3:5.

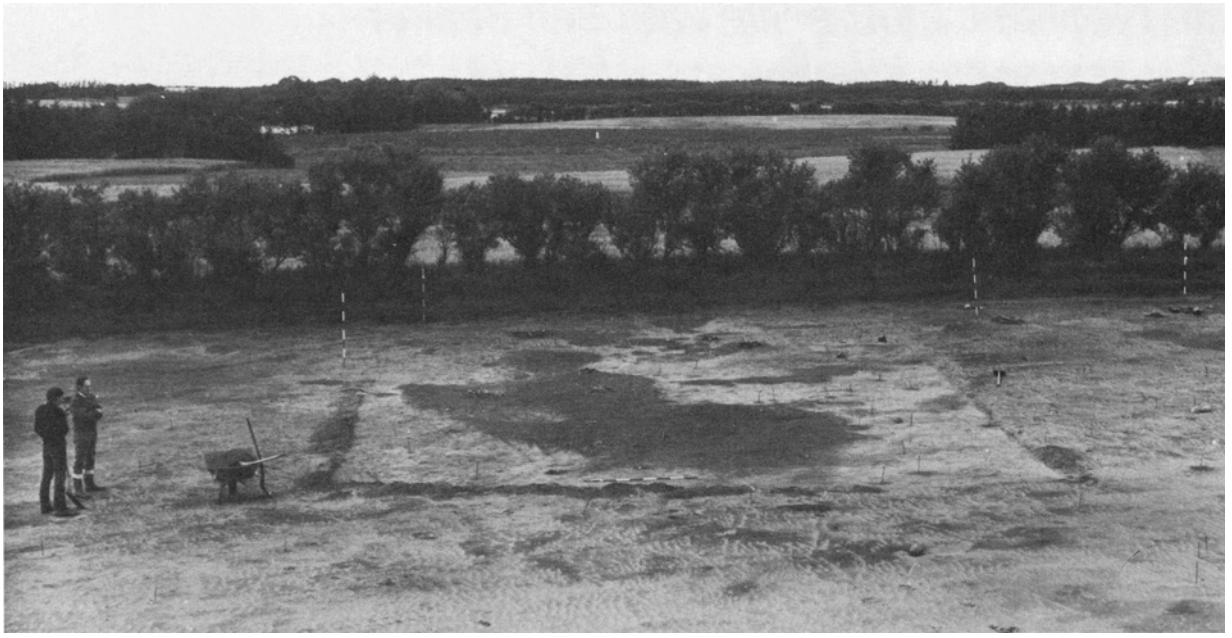

Fig. 2. View of the house-site during excavation, seen from the east.

cannot be excluded that there may have been more than one phase of the same building.

Continued exploratory digging south of the excavated area revealed a number of large, dark features, that may be further houses. Owing to the continued excavation of the Viking settlement at Trabjerg the excavation at Stendis had to be postponed, but it has not been forgotten and will in due course be resumed.

FINDS

There were found altogether 1,445 pieces of flint, of which 24 were secondarily worked, three hammerstones of quartzite, and 308 sherds of pottery, 27 of which were ornamented. The finds were reasonably evenly distributed throughout the fill of the house, but there was a slightly increased density of sherds at the eastern end. The flint implements were more evenly spread over the whole area, but there was a tendency for the southern edge of the feature to produce little flint and pottery.

Flint

In the house there were found 1,421 pieces of unretouched flint. It was characteristic for a proportion of the flakes that their breadth exceeded their length, as also observed at Myrhøj (Jensen 1973). The following finished implements may be mentioned.

Four transverse arrowheads made from flakes – a common Neolithic form (fig. 5: 178, 243, 244, 253). Two flat-flaked arrowheads of late Neolithic type with characteristic triangular or barbed form – unfortunately both have lost a barb (fig. 5: 157, 182). There is also a piece showing an earlier stage in the making of a flat-flaked arrowhead (fig. 5: 269).

Of larger implements there is the cutting edge of a thickbutted flint axe, ground on the broad faces, and a piece from one of the side angles of a flint chisel with grinding on both the surfaces present (fig. 5: 246, 231). While describing the flint we may mention three hammer stones of quartzite with battered ends (fig. 5: 289), which were probably used to make the finer flint implements like arrowheads and daggers. No fragments of lanceolate daggers occurred, though their presence could be expected in such an assemblage.

Pottery

The sherds of the beaker, fig. 1, the discovery which inspired the excavation, did not derive from the house itself, but were found north of it.

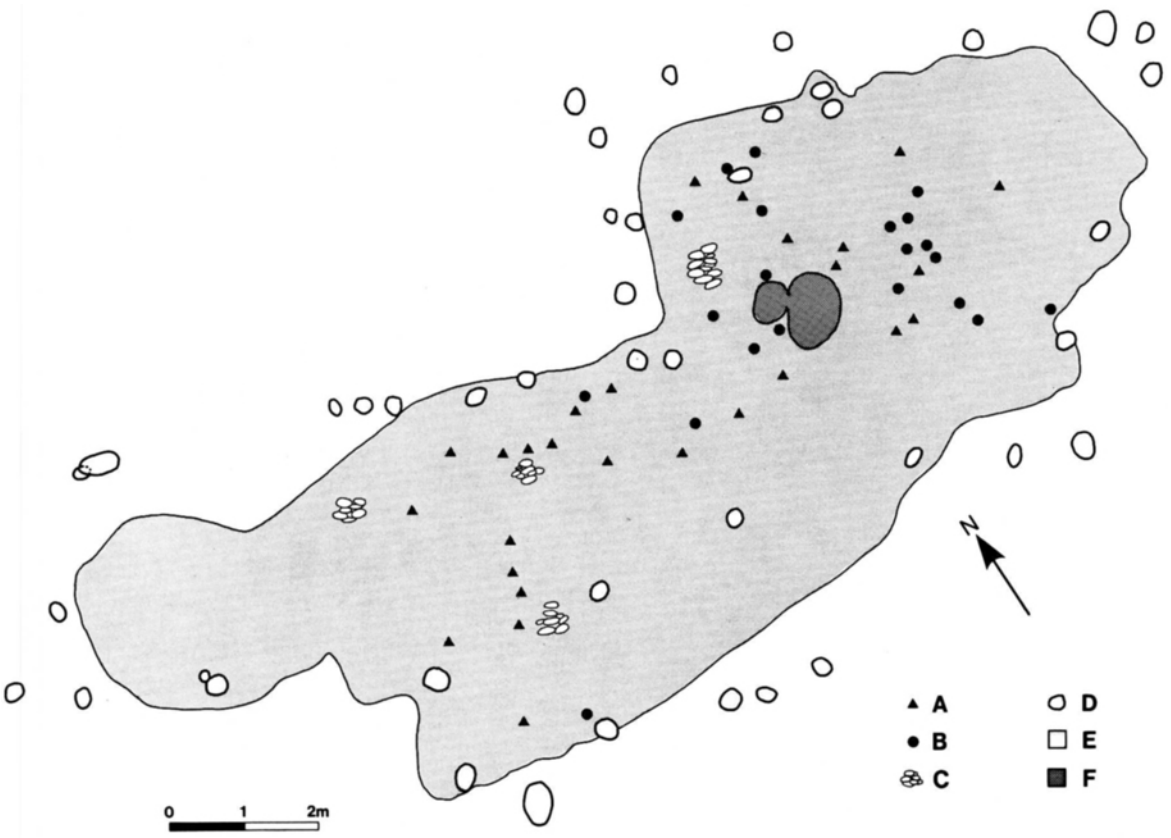

Fig. 3. Plan of the house-site. A, worked flint. B, rim, base, or ornamented sherds. C, hearths. D, post holes. E, dark sand. F, concentrations of sherds. 1:100.

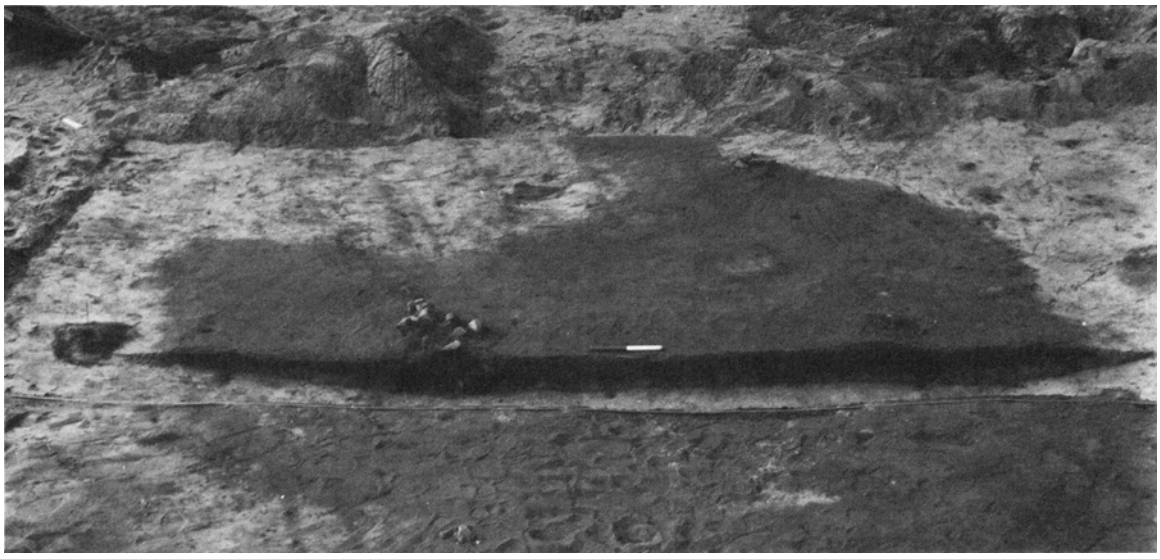

Fig. 4. Section north-south through the eastern end of the feature. Seen from the east.

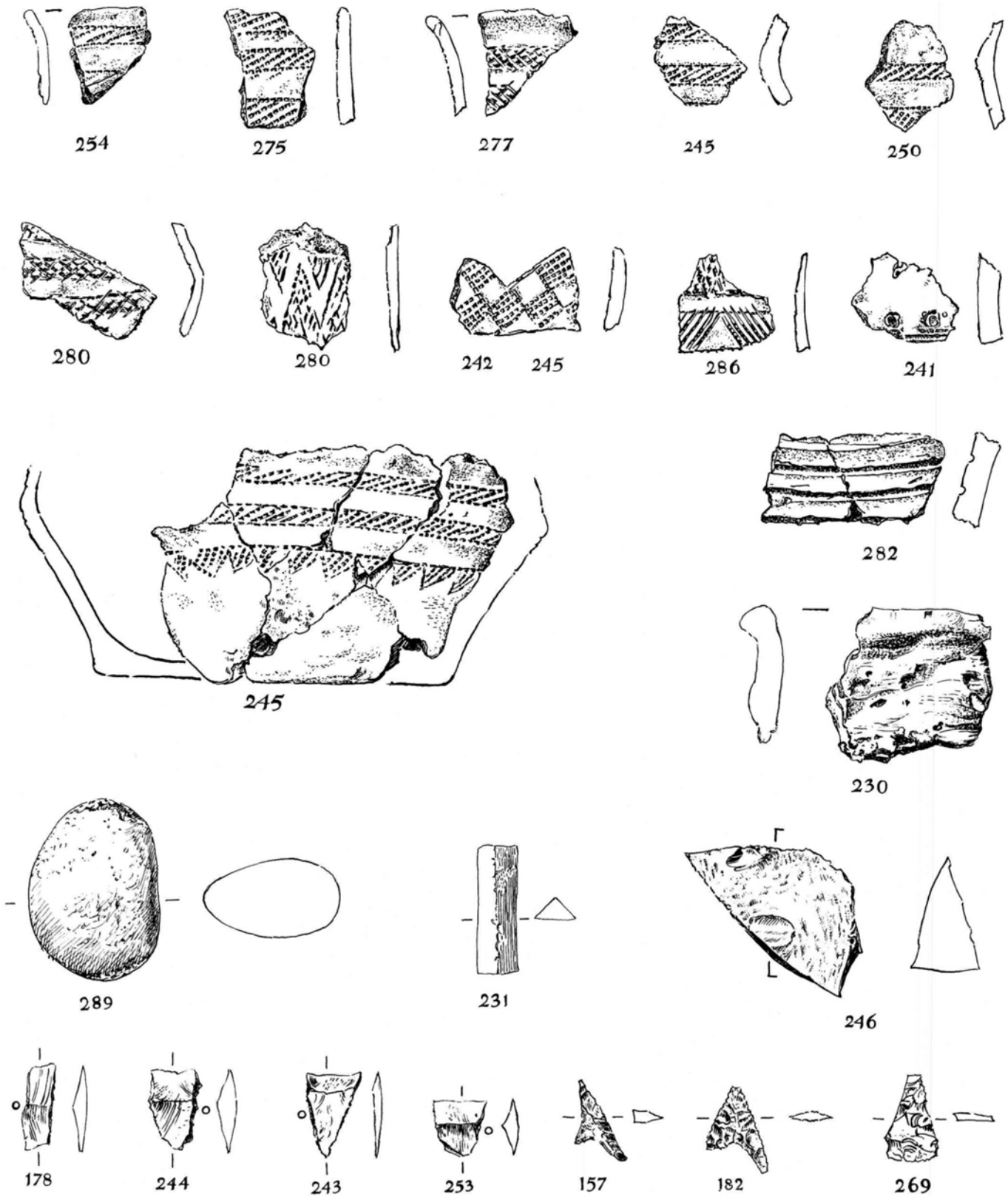

Fig. 5. Finds from the culture layer. 2:3.

An examination of the 308 sherds from the house, 27 of which were ornamented, gave some indication of the pottery forms present, but it must be admitted that the material is very small and fragmentary. The following forms and other details could be noted: –

Beakers with S-shaped profile, ornamented with horizontal bands filled with oblique or cross-hatching – either incised or made by impressing a toothed stamp (fig. 5: 254, 275, 277).

Wider and lower beakers with rounded body separated from the neck by a more or less sharp angle and with distinct foot. Also these are ornamented with horizontal bands of toothed stamp or plain line ornament (fig. 5: 245, 250, 280).

There are a few occurrences of a more lively decoration in the form of vertical bands of toothed stamp rhombs and other geometric figures (fig. 5: 242/245, 280, 286). On this type of vessel the broad horizontal zones are found also low on the body, and not infrequently end with a row of hanging triangles, all in toothed stamp impressions (fig. 5: 245). To somewhat coarser pots belonged three sherds with deep incised grooves, applied cordons, and circular impressions (fig. 5: 230, 241, 282).

By and large the pottery is hard-fired, thin – almost reminding one of eggshell – and it rings when a sherd is laid on the table.

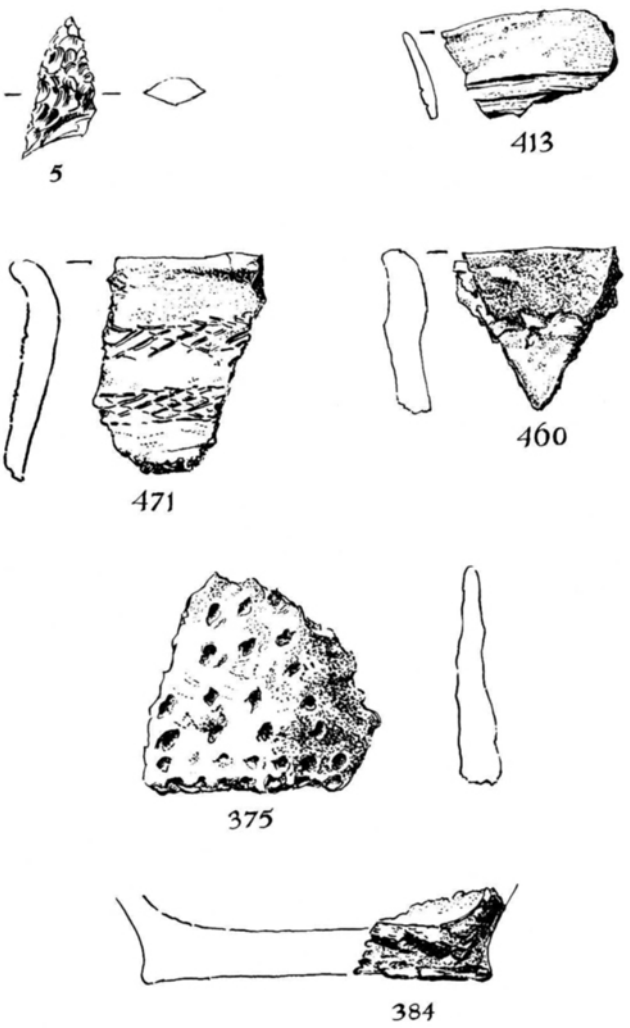

Fig. 6. Stray finds from the house-site. 2:3.

STRAY FINDS

In the topsoil near the house were found flint and pottery presumably from the same settlement (fig. 6). North of the house was found a fairly large material from the final phase of the Funnel Beaker Culture, MN V. This has been published elsewhere (Davidsen 1978: 75 and Pl. 99,a-i).

DATE

The flat-flaked arrowheads and ornamented pottery make a dating to the beginning of the Late Neolithic "Dagger" period seem the most natural. The placing of Bell Beaker stylistic influences in the chronology of the Danish Neolithic has recently been taken up for renewed consideration (see for example Lomborg 1977). It has been attempted to distinguish between separate appearances of Bell Beaker elements in late Single Graves pottery and in the early Late Neolithic. There are both "pure" Bell Beaker impulses and influences from the pottery styles that developed from Bell Beaker in Holland, NW Germany, and the British Isles. The pottery from Stendis can, like the pottery from Myrhøj, be compared with the late Beaker influences that fall into the first period of the Danish Late Neolithic (SN A of Lomborg, cf. Lomborg 1973).

During the excavation enough charcoal was collected from the lowermost layers of the house to make possible two C-14 datings. These were in conventional C-14 years 1780 and 1510 b.c. (K-2296-97). The dates are younger than expected, as the transition from the

Single Grave to the Dagger period occurred at about 2000 b.c. in conventional carbon fourteen years. Also the large difference between the two dates suggests that the samples may have been contaminated. There is always an element of uncertainty about samples of scattered charcoal from settlement sites, and the remains of a house like this one could have lain uncovered for centuries after being inhabited. It must be admitted, however, that during excavation the sections through the house did give the impression that the house had been quickly covered by blown sand after being abandoned.

Translated by D. Liversage

NOTES

[1] Stendis, Ryde s., Ginding h., Ringkøbing a. – Holstebro Mus. no. 15.117. – Publication in Danish, see Skov 1974. – The excavation was supported by grants from The Research Council for the Humanities.

[2] K-2296: 3700 ± 100 before 1950
3750 ± 100 before 1950
average: 3730 ± 100 before 1950, i.e. 1780 bc.
K-2297: 3400 ± 100 before 1950
3480 ± 100 before 1950
3500 ± 100 before 1950
average: 3460 ± 100 before 1950, i.e. 1510 bc.

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Towards a research policy for Bronze Age Settlements

by HENRIK THRANE

In times of shortage the need for a basal research policy to ensure the optimal use of the available sources becomes more imperative than ever.

This has for too long been neglected in Denmark, the times when a firm policy was enforced by Sophus Müller as omnipotent ruler of Danish archaeology being looked upon with horror by lesser spirits of the day and by the following generations (cf. the discussion Kristiansen 1978–Becker 1979, Thorsen 1979).

The results were spectacular, the Single Grave Culture being born after 10 years of concentrated research digging and Iron and Bronze Age settlements at last being located and dug.

The National Museum during Therkel Mathiassen's rule still managed to conduct major projects aimed at solving specific problems like the Gudenå- and Åmose-projects for the Mesolithic and Neolithic, West Jutland and Northwest Zealand for the history of settlement (Mathiassen 1948 and 1959).

The last major effort from this venerable museum was the attempt in the 1950/60'es to excavate Bronze and Iron Age settlements as a logical continuation of Gudmund Hatt's impressive work in Jutland, but even now, 20 years later, no final publications have appeared and only the best sites have been presented in preliminary reports (Becker 1971, Kann Rasmussen 1968, Thorvildsen 1972, Thrane 1971, Vebæk 1971).

Now, due to the decline of the National Museum, the initiative has been with a number of other institutions for so long that no policy exists. A collective attempt 1971 to bring up the problem may have had effects on the individual level, but has otherwise been abortive.

The last major attempt was initiated by C. J. Becker and 1971 – 1977 the "Settlement Council" set up by the National Research Council conducted excavations above all of Iron Age Settlements and cemeteries with great success (Becker 1972, 1969, Becker *et al.* 1979, Hvass 1976, 1979, and others) even if the final publications have been slow to appear. This project was so costly that an immediate repetition or continuation is unlikely and it suffered from having a too narrow basis for selection. Far too few sites were available to choose from, due to a nearly total lack of up-to-date survey data – on the ground, under water or from the air.

The result was that nearly all activity was concentrated in West and Central Jutland, without a preceding discussion of the desirability of this.

This sort of geographical or other bias is typical of short term projects which have to be carried through during a short period because of personal constellations in the deciding bodies. This situation should be contrasted with the optimal situation where the money is only applied for when the starting platform has been thoroughly prepared, i.e. when an evaluation of the current state of knowledge has been made and a sufficient sample is available to choose from. Only then can a geographical, chronological and typological representativity be obtained – or a bias if that is thought to be the right thing.

The immediate background for the "Settlement Council" initiative was the threat to the archaeological sources from the mechanization of Danish agriculture compared to the near non-existence of totally excavated settlements and cemeteries.

Apart from the spectacular results from Jutland the situation is now the same as in 1971; deep ploughing has continued to churn up our Pre- and Protohistoric settlements countered by individual attempts to rescue something from the most eyecatching sites.

Elsewhere I have tried to sketch the background for the present paper, the situation created by 100 years of research, how and why Bronze Age settlements were found and how archaeological techniques as well as non-archaeological trends, such as the mechaniza-

tion of modern society have led to the present state of knowledge (Thrane n.d.). In giving an outline of some recent results I hope to raise some issues vital to a better understanding of Bronze Age society through future work on the basic social units – the settlements.

This view is entirely personal but may perhaps lead to a discussion of basic principles as well as specific issues, a discussion which is long overdue. For the task of giving priorities which the newly created "Council of Ancient Monuments" (Fortidsminderådet) views as an urgent one, a general discussion would be extremely valuable.

Bronze Age settlements are now known in such numbers that it is evident that their discovery is no more difficult than that of Early Iron Age Settlements. The absence of BA Settlements from Mathiassens surveys was because the effects of deep ploughing were still minimal in 1953. (Thrane n.d.) Recent survey in Southwest Funen has given a minimum of 26 settlement sites on 36 km² all pottery dated to Late Bronze Age.

There is a great contrast between the earlier material exclusively represented by pits and refuse layers and the new, largely house-dominated, settlement excavations. An incredible increase in the number of house plans excavated has been seen since 1955 when the first houses were dug at Fragtrup. Large scale excavations in the West Jutland area have revealed more than 100 houses (Becker 1976) with Vadgård as the second largest group (Lomborg 1973, 1976).

This abrupt change over only few years has led to a nearly exclusive interest in houses, which is understandable enough considering the amount of information about technology, sociology and architecture latent in this fundamental source group. Attempts have been made to apply this new material to the questions of the linkage between BA and Pre-Roman Iron Age (Becker 1980) and of the structure of BA settlements (Becker 1976, Lomborg 1973).

In spite of the obvious importance of the new material pitifully few house plans – not to mention supporting data, such as publication of the pottery providing the dates – are available. At a rough estimate less than 10 % have been preliminarily published. This lack of information is most unfortunate as it gives rise to too many poorly founded speculations. A comprehensive study of Bronze Age ceramics is long overdue and is really a precondition for any settlement chronology.

Even if there are difficulties in dating individual houses, there are now so many house plans available, that regional types may be recognized at least for some areas. The one most fully illustrated is the west Jutish LBA type with rounded ends and set back door posts in the middle of both long walls (Becker 1968, 1972, 1976). This type with its three aisled post construction fits well into a wider North European context (Müller-Wille 1977) and also into an historical evolution leading on into the IA. The latest reconstruction is Lomborg's (1979).

At least three groups may be established in the west Jutish finds: 1. the great long house or hall without stable, reaching lengths up to 25–33 m., widths up to 8 m (Becker 1972, Fig. 7–10); 2. the average dwelling house with lengths of 10–20 m. and widths of 6–7 m., some with stable ends (Jensen 1970); and 3. the small rectangular four-post constructions, 6–9 × 3–4 m., which are seen as storage houses and which also accompagny the dwelling houses at a ratio of 1:1 as in the PRIA (Becker 1976, and Müller-Wille 1977, Abb 12–18, 21 and 23).

Other house types include the smaller, nearly oval post houses of the Limfjord area (Lomborg 1974, Fig. 4, 1976, Abb 3), datable to the EBA with lengths of 12 m. and the smaller houses with similar size and ground plan but with turf walls or foundations (Lomborg 1974, Fig 2–4 & 7, 1976, Abb 2). Houses with partly sunken floors (working areas or cooking areas?) are known from Egehøj (Boas 1980) and are also represented at Vadgård (Lomborg 1976, Abb. 4). They reflect traditions from the Neolithic (Aarup Jensen 1973, Fig. 1, Callmer 1973). This multitude of EBA house types is supplemented by regular long houses like the west Jutish (Neumann 1975 and Bokelmann 1977). Obviously a variety of traditions and innovations were sorted out during the EBA to merge or to be purged into the more stereotype LBA long houses.

Next to nothing is known of the construction of floors, roof or interior plans since the floor levels are mostly ploughed away. What little we know indicates that the floors were probably just earthen, leaving no clear traces in the archeological record, that pithoi containing grain (Müller 1919, 37 f., Thrane 1971, Fig. 3), were placed in the houses and that special activities took place in the houses (Boas 1980).

Bits of walls made of wattle and daub are known from many sites. In rare cases lime plaster or painted whitewash may be expected as at Kirkebjerg (Thrane 1979, Lomborg 1979. Cf. also the contribution by J. Berglund in this volume).

The first step towards a better understanding of the evolution and function of the Bronze Age houses will be to have all excavated house plans published with their dating evidence. Till then a broader geographical basis must be obtained, excavations like Skamlebæk being steps on the right path. The absence of data on the use and planning of the inside of the houses is a grave omission and complete excavation of houses with preserved floors from different regions should receive high priority.

The character of the complete settlements with houses and other buildings etc., i.e. whether they were single farmsteads or villages, remains controversial. The absence of stratigraphical evidence or of enclosures like Grøntoft (Becker 1969) prohibits unequivocal statements on this problem. Although the argument that Vadgård I (Lomborg 1974) was a settlement of some 8 individual houses finds support in the fact that Vadgård II (unpublished) consists of the same number of similar houses, it cannot be proved that the houses were all contemporary. Some may have been added and others given up during the lifetime of the individual settlement. If a village is to be understood as a society of at least three contemporary households with farming as their primary way of living, further problems arise. They become even more acute in the west Jutish settlements like Ristoft and its neighbours (Becker 1977) where the limits of the settlements seem rather fluid. I do not see any way of determining the size of the average BA settlement here and even less elsewhere. There are too few large scale excavations and too few of them have been published. To establish regional differences is out of the question at the moment. This problem can only be solved through a programme of trial excavations on suitable sites to establish the conditions of preservation and the practical feasibility of excavating a solution with limited means – certainly a long term project.

Another vital issue – the duration of the individual settlements – is still open to discussion. The absence of culture layer need not indicate a short period settlement, later activities may have destroyed it. The presence of layers more than 1 m. thick on some BA settlements clearly shows prolonged or repeated settlement. The idea of prolonged, if not permanent, settlement in some areas may find support in the mounds made of cooking stones so well known from Sweden (Hyenstrand 1979) and now also from Zealand (Gregersen 1969, Thrane 1975) and Kirkebjerg (Berglund, this volume).

They are obviously by-products of a long settlement period – or of a very intensive and extensive shorter one – and accompany some of the east Danish sites with substantial deposits of rubbish: Jyderup, Skamlebæk, Kirkebjerg.

There is no evidence enabling us to decide which alternative to prefer; periodic movements of the whole settlement or movements of individual houses or activity centres within the confines of the settlement may result in the same archaeological traces. At Jyderup and Kirkebjerg pits were dug into older pits (Thrane 1971, Fig. 5) and at Kirkebjerg wind blown sand separates three stratified levels. Several of Becker's sites have at least 2 phases of houses on top of each other. The concept of the wandering or fluctuating settlement moving at intervals within rather narrow limits has pervaded the interpretation of IA settlement at least in W. Jutland since Becker's impressive series of excavations (Becker 1971, 108). Much points towards a more general use of this kind of settlement pattern even during most of the BA (Thrane 1980).

At Vadgård we find that the settlement seems to have moved after an unknown period of time, perhaps 100 years. It did not move very far – 160 m. – if it really was the same settlement. Becker's series of BA settlements would be plausibly explained by this pattern. The evidence elsewhere is not sufficient to ascertain whether the same situation ruled in other parts of Jutland and on the islands. It could be argued that the east Danish settlement with their thick deposits represented another settlement pattern i.e. exploitation system. Further information is needed before this problem can be solved.

The reason for the existence of the moving village pattern is still obscure, i.a. because so little is known of the economy of the west Jutland settlements – due to the absence of rubbish.

Pollen diagrams could come in very useful here – but how do we get them done in DK? They would be extremely valuable not only in relation to the question of area continuity – wandering village or permanent

village, but perhaps even more so in providing us with the environmental background for different types of settlement and their subsistence economy. The situation is really drastic for a country known as pioneering in the field of palynology. No single up-to-date pollen-diagram is available for a BA settlement and whole areas such as Funen are devoid of even a single general diagram illustrating the evolution of the flora.

Actually our knowledge of food production during the Bronze Age has not improved much since 1919 (Winge and Jessen), and the application of new retrieval techniques for botanical information has been neglected – largely because of the absence of research potential. The lack of scientists able (or willing) to do the sort of work that archaeologists want has been serious for so many years that the situation tends to be accepted as just inescapable. The lack of younger scientists to succeed the present staff will be disastrous in the future. The research councils are probably the only ones who could alter this situation.

To my mind the best framework for future work is a regional one. Only through concentrated effort in limited areas can sufficiently coherent data be obtained at reasonable expense on the individual houses or settlements or settlement pattern of a chosen period – and also on the preceeding and succeeding periods. If archaeology has anything to do with history, diachronic knowledge must be rated high.

One such region could be Odsherred in Northwest Zealand. It is a natural entity, probably an island in Prehistoric times, with the advantage of being little urbanized, with a number of small woods providing shelter for otherwise doomed types of monuments (Thrane 1975) and a reasonable size. It was surveyed as part of Therkel Mathiassen's large scale project (1959) and his work has been followed up by more recent excavations combining excavations of settlements with grave excavations to present a fuller picture (Thrane 1971 & 1975, Lomborg 1977, Gregersen 1969). Large scale excavations at Skamlebæk in preparation for construction work have given a wealth of material. It must be hoped that there will be opportunity to study this soon and that the full extent and time range of the settlement will have been established before excavations are stopped. This is obviously another long term project, but one for which the National Museum is well suited because of its long standing interest in the area.

Another project is planned for the Norsminde fjord on the East coast of Jutland in continuation of the Stone Age settlement study being undertaken by Søren H. Andersen (1976).

A third project has been running since 1973 on South West Funen as a joint venture by Odense University and Fyns Stiftsmuseum (Thrane 1978). Here a survey of an intensity like the Hagestad project (Strömberg 1978) is supplemented by a concentration of rescue excavations. Although the project covers the entire Prehistoric period continuing into the Middle Ages, Late Bronze Age is being focussed heavily upon.

Barrows of different types, ranging from mini- to super-size and quality (Lusehøj, Thrane 1977) have been excavated as well as contemporary settlements. The most important of these is undoubtedly Kirkebjerg in Voldtofte (Berglund 1982), where the National Museum more than 60 years ago made the first spectacular excavations (Müller 1919).

This project has shown the presence of a large potential of settlement sites which will provide us with a solid basis for the selection of sites for rescue excavation over the years to come.

Observations in many ways similar to those made at Skamlebæk have been made and possibilities for relevant scientific work are eminently present. To find ways and means of exploiting them will be important.

While Southwest Funen had a special importance during the middle of the late Bronze Age – ca 850 BC – it should be possible to examine the background and the cause of the eclipse which this area suffered during the final BA.

While projects are under way which will elucidate the Bronze Age settlement of the major islands and East Jutland it seems strange that the work on West Jutland so brilliantly inaugurated with the many house excavations should not be continued. It will thus remain one of the much too common isolated pillars of knowledge in a sea of ignorance – a situation far too common yesterday to be accepted for tomorrow.

A study of a settlement is not complete until a knowledge of its physical and cultural environment has been obtained. If an excavation is important enough to spend 100,000 kroner some effort should be made to round off the work harmoniously. There are cheaper ways of obtaining the relevant knowledge than stripping the topsoil away and professional

archaeologists are not the only workers in the garden of archaeology.

Last but not least top priority should be given to the preservation of a reservoir of settlement sites, which should be typical as well as exceptional and geographically and chronologically representative.

It is legitimate and even desirable to rescue sites from the silent death at the hand of contractors etc. but it is even more important to ensure that future generations with better facilities are ensured a sufficient potential of sites to choose from. New ideas and techniques and perhaps a more leisurely rythm will surely enable them to correct many of our mistakes and gain new levels of knowledge. This action is by no means easy; such a demand contrasts with the "rabies archaeologorum" (Olsen 1979), which favours the easiest and quickest way of immediate excavation, as well as with the unwillingness of farmers to let their land be controlled or "preserved" and with the unwanted pressure by farmers on the political sphere.

Every opportunity must be seized to achieve this protection against the slow destruction by farming as complementary to the immediate threat of construction and extraction.

PS. For the islands the situation is not much different for Iron Age sites, so that a very similar strategy seems desirable for this period too.

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Kirkebjerget - A Late Bronze Age Settlement at Voldtofte, South-West Funen

An Interim Report on the Excavations of 1976 and 1977

by JOEL BERGLUND

One of the most renowned of sites in settlement studies relating to the Late Bronze Age is the classic settlement adjoining the present day village of Voldtofte lying approximately halfway between Assens and Hårby on West Funen. The site initially came to light in 1908 as a result of public works. It was subsequently excavated in the years 1909 to 1911 and once more in 1915 and 1916. The finds were many, drawing much attention because here, for the first time, was a large quantity of pottery attesting to the versatility of the potter of the Late Bronze Age. Further finds afforded clues to subsistence, to the economy and social fabric, while a single discovery of grain remained for many years the largest of its kind from the Late Bronze Age (Thrane 1980).

In 1909 Carl Neergaard of the National Museum investigated a culture layer on the southern slope of the hill, which had been dug into during road construction (fig. 1.). The culture layer which contained a rich material from the Late Bronze Age measured 48 m. N-S and 18–20 m. E-W. During the years 1909–11 altogether 110 m² were excavated. Four small test pits were furthermore dug on the northern slope of Kirkebjerget where a similar culture layer had come to light, likewise being partly removed by road digging.

In 1915 excavation continued on the northern slope. The extent of the culture layer was determined by means of a series of test pits, giving the outline shown in fig. 1. Approximately 250 m² were excavated on the northern slope during the campaigns of 1915 and -16.

The finds were first published in 1919 by Sophus Müller when, in somewhat summary fashion, he announced the findings from Bronze Age settlement sites in Denmark. Attention to the site was refocused in 1967, this time with a view to testing Müller's ceramic dating while also incorporating the settlement within a wider field of enquiry (Jensen 1967). In assessing the former researcher's work one should bear in mind those methodological short-comings which make it difficult to use the material to illuminate settlement in the Late Bronze Age. A comprehensive re-examination of this particular site was required before the finds could be used to this end.

Such an opportunity came a good ten years later when the council of Glamsbjerg (who administered the area) embarked upon a building programme. Before this could commence, however, the area had to undergo an archaeological survey in compliance with paragraph 49 of the Conservation Act. This happy opportunity brought about an almost total examination of the area in 1976 and 1977.

The new excavations took place on the eastern and southeastern part of the elevated area known as "Kirkebjerget" which formerly separated the now amalgated villages of Voldtofte and Flemløse. The northern slope of the ridge has been totally urbanised since the early excavations, being terraced in several steps so that where the culture-layer survives it is inaccessible. The south side of Kirkebjerget, however, had remained agricultural until 1976, when it yielded its last harvest.

The highest point of the field lies to the northwest where it rises to approx. 69.3 m. above Danish mean sea level. From here it slopes evenly down to the middle of the field where, at 64.2 m. it levels out into a small plateau. From here the descent continues down

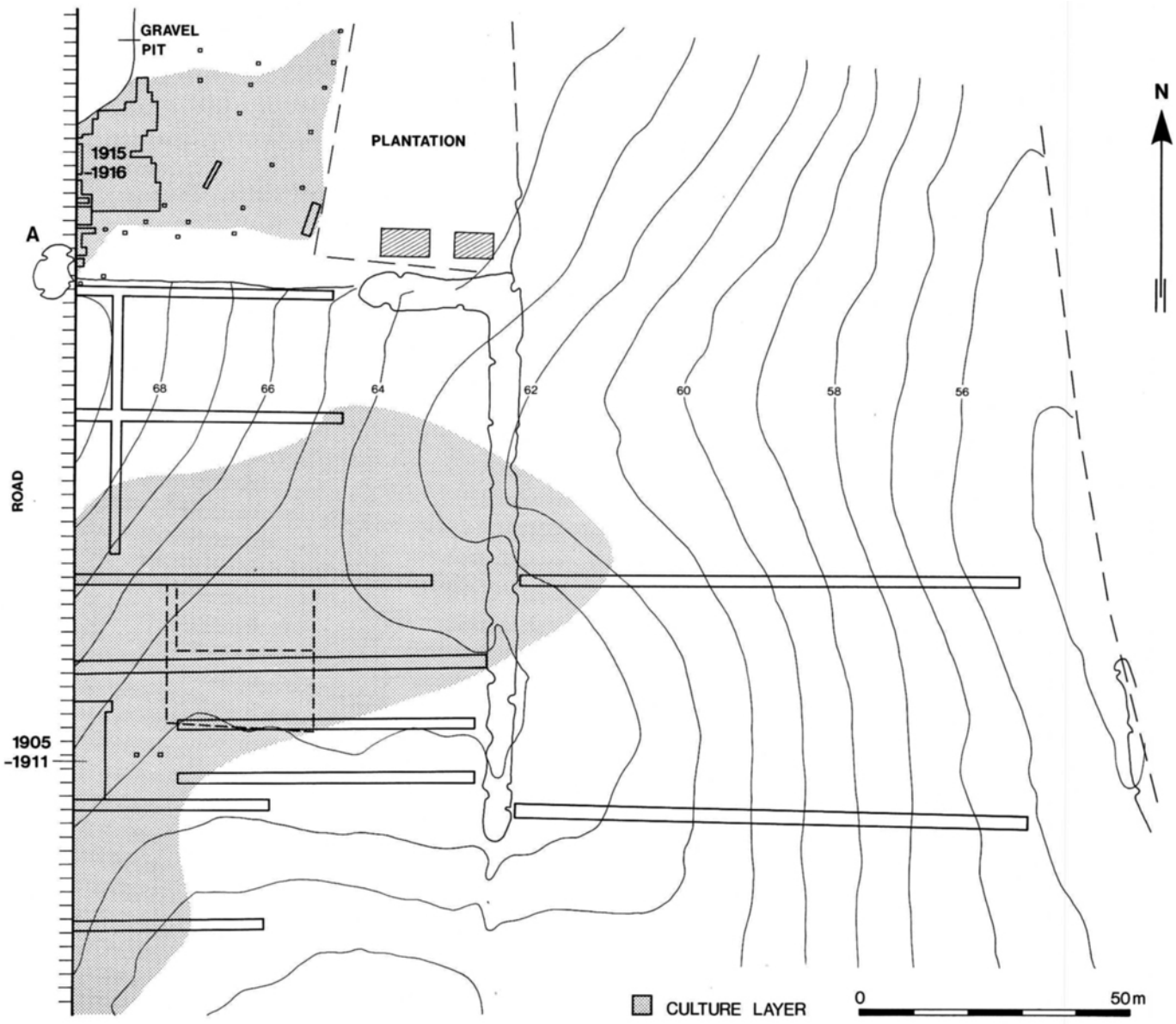

Fig. 1. Plan of the excavations at Kirkebjerget. The trial trenches of the 1976–77 excavation are shown together with their extensions during the 1978 supplementary investigation. "A" indicates the position of the five grain vessels found 1908.

to the southern edge of the field at 60 m., spreading for 9.3 m. The northern slope seems to have compared with such a topography.

In order to locate and plot the full extent of the culture-layer a grid of trial trenches was drawn across the whole field. It extended furthest in an east-west direction, the field being barren of finds above the altitude of 67 metres. The maximum width stretched north-south and was interrupted by the road from Voldtofte to Flemløse, lying to the west. The culture-layer tapered to a point in the east. This implies that the layer derived from the west and not from the top of ridge. The total field area was 11.300 m², an estimated half of this being covered by the culture-

layer (fig. 1). The layer apparently continued to the west of the road, though at the time this was not open to confirmation.

The thickness of the culture-layer varied from 15 cm. to more than 150 cm. (fig. 2), the thinner parts lying along the layer's northern and eastern peripheries.

Equally variable was the depth of the soil between the present-day field surface and the culture-layer which, in some places surfaced into the ploughsoil earth, especially towards the southernmost end of the field, while to the north it lay as deep as 150 cm. The Bronze Age field-surface profile differed somewhat from that of the present day. Apart from lying deeper the slope descended less regularly, in that a little more than halfway north the slope was intersected by a trough or ditch, its bottom running 3 m. below the present-day surface. South of this the terrain became more even, descending uniformly to the foot of the slope.

The culture-layer contained the following elements (listed in order of quantity): carbonized grain, fire-shattered stones, pottery, flint, burnt clay-daub, charcoal and bronze. The vertical distribution of these revealed the greatest abundance of flint and pottery (the two most important elements) in the upper 40 cm. of the culture-layer.

Below this dispersion density declined rapidly to zero at the bottom of the layer, lying on average 70 cm. beneath the culture-layer surface. The burnt clay-daub occurred throughout the entire depth of the layer, concentrating at 10 – 20 cm. beneath the layer-surface. This clay-daub converged on the aforementioned trough where it formed a close, continuous layer in which the other elements were sparsely represented. There was no evidence for any sort of structure: it was throughout an accumulation of fragments from one or several burnt-out houses brought to this place as débris. All of the examined culture-layer should be interpreted as a gradual piling up of rubbish, deposited over several years and accelerating towards the close of the settlement period. In no place was there a clear chronological sequence with regard to artefacts: chronologically diagnostic pottery occurred in upper and lower layers, regardless of period.

The features outlined above are in close accord with Sophus Müller's own observations and with his interpretation of Kirkebjerget's southern slope (Müller 1919, 43). There can be no doubt that in both cases these culture-layers are accumulations of rubbish from a settlement area most probably lying to the west of the road connecting Voldtofte and Flemløse. This interpretation is strengthened by the outline of the culture-layer's perimeter, its maximum width lying north-south. It seems logical that the distribution would be widest at the source, shrinking thereafter in proportion to its distance from the source. Furthermore, the dip in the field to the south and east also suggests deposition from the west.

Fig. 2. The culture layer at its deepest point.

After preliminary investigations in 1976 it was decided to lay bare the surface in that part where the layer was thickest as well as the plateau immediately south of the trough or ditch. The intention of the excavation was to test whether this idea of a settlement area and separate culture-layer held good, or whether house-structures could indeed be traced within or beneath the layer. Altogether, an area of 729 m² was exposed, 228 m² being manually excavated in meter squares. In all 800 tons of earth were removed. Some of this went towards re-heightening the nearby burial-mound of Lusehøj (likewise dating to the Late Bronze Age) (Thrane 1973:5).

Fig. 3. Pits below the culture layer.

Fig. 4. Pit with boulders during excavation.

THE PITS

Once stripped there appeared a sandy surface punctuated by 93 black patches, these marking large or small diggings (fig. 3). From the distribution and nature of these holes it soon became clear that they were unassociated with house structures and that they must have had some other function. All the holes seemed to have been made prior to the formation of the culture-layer, as none could be traced through it. Indeed, the culture-layer rested snugly upon the top of each hole. A further peculiarity was that no hole intersected any other – in other words, all holes must have featured contemporaneously. In plan the holes were generally oval to circular (fig. 5). In section they varied from sack-like to conical in shape (fig. 6). At first all the holes were most probably sack-shaped, becoming more conical as their sides gradually eroded.

Those of the latter shape, therefore, testify to greater age, their sides having been exposed for a longer time than the bag-shaped holes. This erosional migration could be seen clearly in section as a U-shaped sandy layer of the same consistency as the pit sides. Over this lay the culture-layer whose contents had subsided in a sloping manner, indicating a gradual in-filling (cf. Limbrey 1975, 291). The holes varied somewhat in size, depths ranging between 10 and 100 cm., diameters from 30 towards 200 cm. Most of the pits contained fire-shattered natural boulders varying from fist- to football-sized. These were found either scattered throughout the pit in-fill or, in frequent cases, half covering the pit in a densely packed layer (fig. 4). The fill between the stones contained flecks of charcoal while the bottom of each pit was often covered by a greasy black layer of dissolved charcoal, deposited by percolating water. The sides in many instances bore traces of intense heat, often appearing crusty or granulated.

Finds of flint, pottery or bone always occurred in the upper half of the pit, never at the bottom. Such finds were always associated with the later jettisoning of rubbish.

Everything points to these pits having been used for heating, indeed that they were oven-pits (Thrane 1974; 96). Since it was equally possible that the pits might have played some part in the drying of grain, samples were taken from the bottom layer for sieving. However, all results unfortunately proved negative,

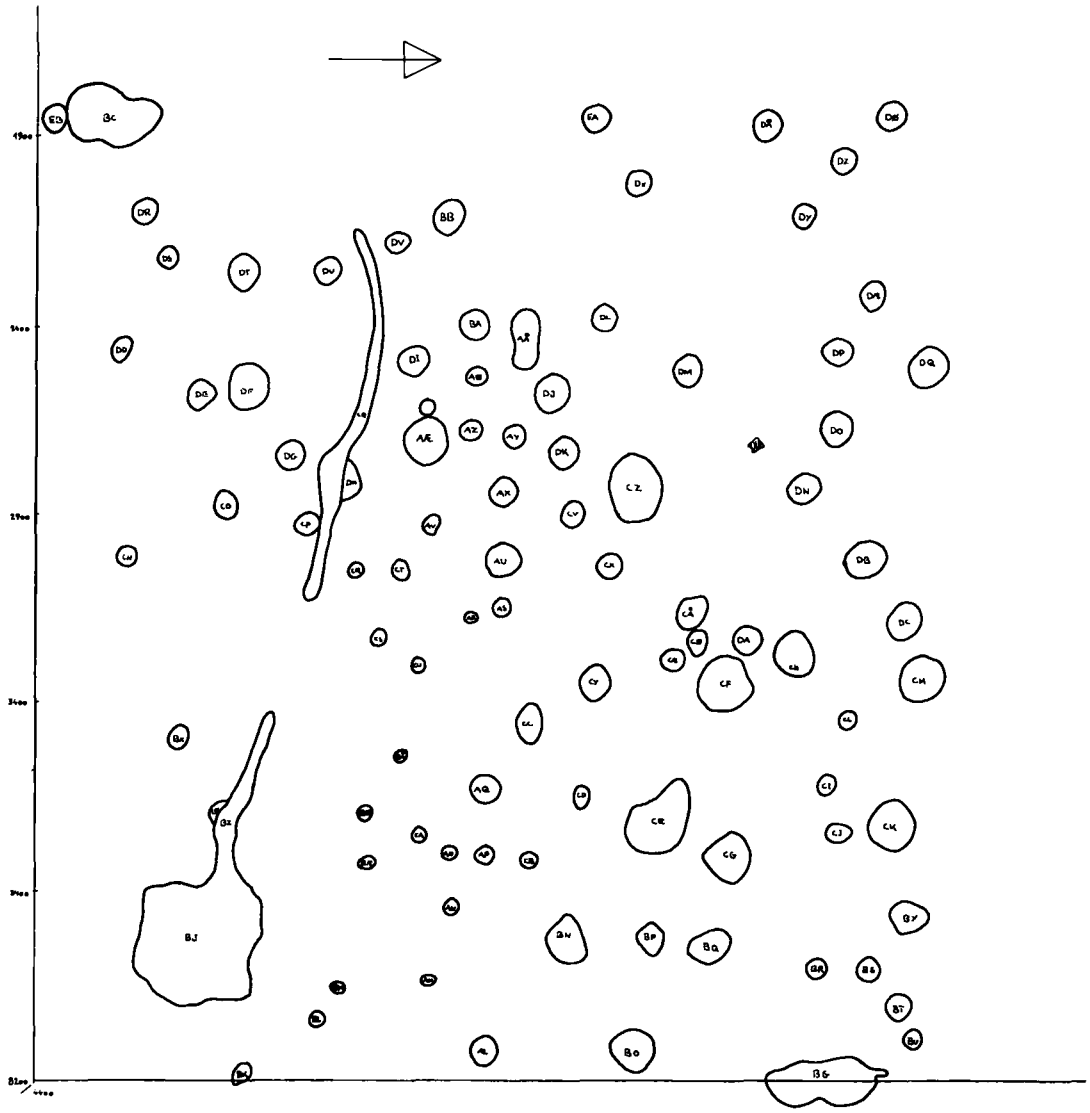

Fig. 5. Plan of pits below the culture layer. 1:200.

the sole botanical remains discovered being a few hazelnut shells and three hawthorn-berry pips.

It is difficult to arrive at any explanation for the remaining pits. These could not have been for refuse since, as the foregoing pits, they were entirely devoid of finds, excepting the uppermost layer which had been invaded by the all-covering culture-layer.

THE COOKING-STONE CAIRN

A trial trench immediately to the east of the exposed area had unearthed a pile of fire-shattered stones. The pile of stones comprized boulders of varying size, none so big that they couldn't be lifted. Each stone's common feature was the fact it had been affected by fire. Furthermore, the pile was not simply a random heap but had been meticulously constructed by the insertion at various angles of firmly interlocking stones. The in-fill took up approximately 50% of the total mass, and varied in colour from black in the middle to brown at the surface where it also included scattered sherds. The bottom layer was in places covered by a thin, yellowy grey layer of sand. The whole sequence has been interpreted by the excavator as a thin cul-

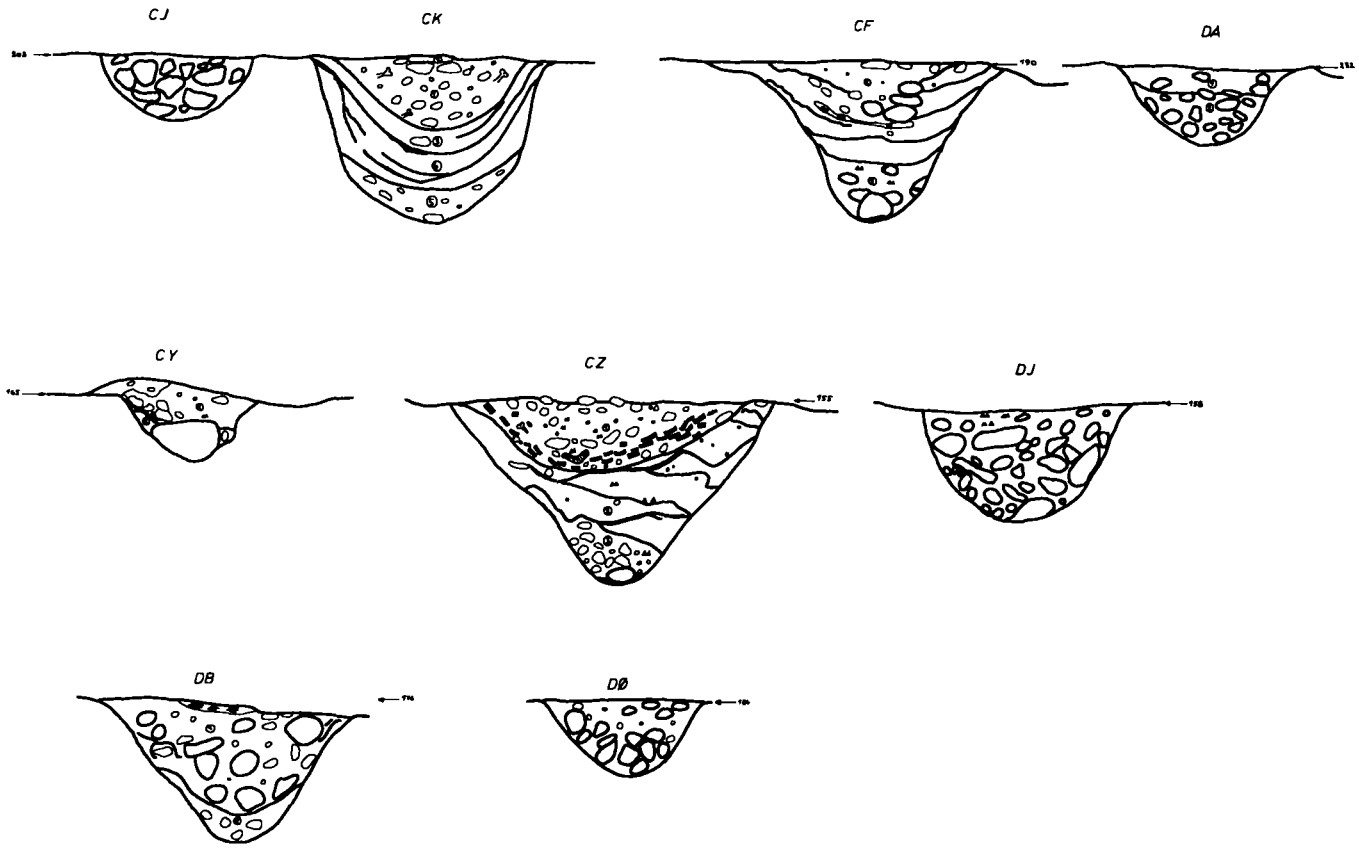

Fig. 6. Sections of pits. 1:40.

ture-layer covered by aeolian sand prior to the heaping of the stones. On removing all stones less than hand-sized and those not lying directly upon the ancient surface in the eastern quadrant, three apparently concentric stone circle arrangements were disclosed (fig. 7). The outermost comprised sixteen stones measuring 20 to 38 cm. Sixty centimetres within this lay a double circle of seventeen stones measuring up to 37 cm., two of these being fragments of quernstones ruptured by fire. Finally, 140 cm. within the outermost circle lay an inner double-rowed stone circle of stones measuring up to 44 cm. The outher diameter of the stone pile was estimated between 15 and 17 m., though since its northern segment was not investigated it might be somewhat greater.

There can hardly be any doubt that this is a cairn, a so-called cooking-stone cairn. Bornholm excepted, these are only found in any numbers in Odsherred, NW Zealand, connected precisely with settlements of the Late Bronze Age (Thrane 1975: 173). The full height of the cairn could not be gauged on account of the levelling effect of years of cultivation. However, to compare with the cairns of Odsherred it would probably not have exceeded 2 m. in height.

After the excavated segment of the cairn had been removed there appeared a culture-layer in composition largely identical to the layer encountered in the surface exposure. Here too the surface was punctuated by numerous pits, several of these, however, turning out to be post-holes.

Altogether 23 pits and 24 definite post-holes were identified. The culture-layer under and near to the cairn was characterized by small concentrations of mud-daub which in places covered areas of mottled, unburnt clay. These layers seem to have been formed prior to the introduction of the pits, which, when it could be determined, penetrated the layers. Both in morphology and sediment these pits do not seem to diverge substantially from those described above. The majority, therefore, can be grouped within the same

class, that is, as oven-pits. Since a number of pits from both areas were either bereft or devoid of burnt stones it would follow that their contents had been reutilized in the building of cairns along the settlement perimeter. It is not impossible that the unexamined neighbouring fields may yet reveal the ploughed out remains of further cairns (Thrane 1975, 174).

TRACES OF HABITATION

In addition to the burnt clay-daub, several other features in this area might point to the former presence of a building. Let us, for the time being, suppose the areas of black and yellow speckled unburnt clay to be the remnants of a house-floor and the heavy concentration of overlying mud-daub, a collapsed wall. Such an interpretation is strengthened by the discovery between daub and supposed floor of a smashed pottery vessel. One may suggest that the vessel was standing upright when crushed by some form of subsidence, perhaps that of a collapsing mud-wall. This picture, however, is not substantiated by the evidence of the post-holes, eighteen of which can be deemed to be later features as they penetrate the very layer containing the mud-daub. Nor are we helped in this interpretation by the remaining six post-holes which, however we look at them, lie too un-regularly and far-spaced to infer a house structure. The remarkably substantial fragments of mud-daub suggest somewhat massive walls requiring a weight-bearing frame which, in turn, would have entailed easily recognizable post-holes within the soil. We can only conclude, therefore, that this was not the house supporting area, that the scattered yellow patches of clay are not floor layers, and that the culture-layer should be seen as a layer of rubbish similar to its larger western neighbour of which it is an eastern extension. For the present we must postpone any explanation for the crushed pottery vessel.

THE ARTEFACTS

Pottery, the most predominant artefact, was present throughout almost the entire area under investigation. In all, 12,934 sherds were collected. Disappointingly few of these, however, were capable of reconstruction into larger surfaces. Nevertheless, sufficient of this material is characteristic enough to allow broad identification. In order to gain some overall impression of the total sherd assemblage a detailed examination of 1,084 sherds was undertaken so as to incorporate the full depth and extent of the entire culture-layer. By the attribute of surface texture the whole ceramic material can be divided into three categories: 1) smooth; 2) sandy/rough; and 3) coarse/gritty, almost granular. The first column of the following table shows the relative frequency of the 1,084 sherds between each category. The second column shows the average ware-thickness per category:

Fig. 7. Segment of the cooking-stone cairn during excavation.

surface texture	frequency	average ware thickness
smooth	25%	66% between 6 and 8 mm
sandy	35%	74% between 8 and 10 mm
coarse	40%	70% between 10 and 12 mm

This random sample, incorporating 8 % of the total number of pieces, is a statistically meaningful one and may be considered representative of the whole assemblage. We see, therefore, that most of the settlement's pottery detritus comprises rough and coarse

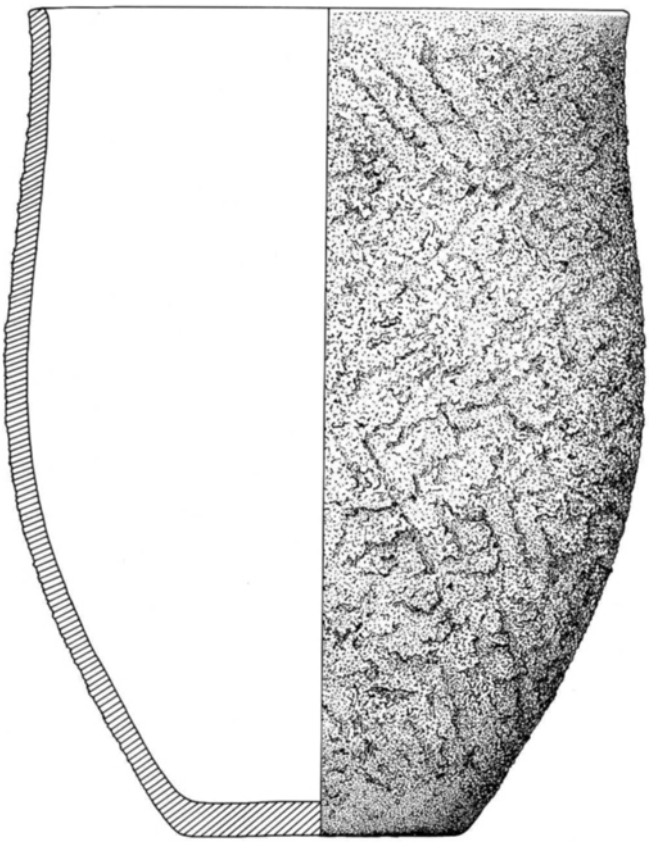

Fig. 8. Coarse storage vessel (Claus Madsen del.). 1:4.

wares. However, we should not take these percentages as the actual frequencies of production since coarser vessels are generally larger and will have left more sherds than the finer ones. Even ignoring the percentages, however, it is still clear that the coarser wares were produced on a larger scale than the finer ones. It has hitherto not been possible to conduct a minute analysis of the very large total assemblage using a meaningful typology, nor with regard to individual variations.

Even so, the major features all point in the same direction as the 1967 investigation (Jensen 1967). The reader is as far as possible referred to that study, as most of the types of pot analysed there are found also in the present material. Most sherds were of large, coarse food-storage vessels with a slurried, gritty, or rough surface (fig. 8). A small number of these are decorated with ribs or studs applied under the often finger-wide smoothed rim (Jensen 1967, figs. 12–14). Also to be seen are rims with finger indentations all the way around (idem., fig. 15, 2). These vessels date with high probability to period V.

Within the group of storage jars can be discerned a small number of vessels certainly dating to period VI. These are characterized by their evenly rounded form, a smoothed band under the rim below which are applied horizontal ribs, interrupted or continous. In this assemblage these pieces are represented by types such as those illustrated by Jensen (1967: 124, figs. 1, 4, 5 and 11). As in the previous investigation sherds of this type are very rare. Surfaces of food-storage vessels vary from a rough sandy texture to a very coarse, granular one, ware thickness sometimes reaching 20 mm.

One-third of the material from the previous investigations comprised fine or smooth-surfaced vessels (i.e. approximatelty 13,000 sherds). In the present investigation the proportion is considerably smaller: if the random sample holds good only one-quarter. We have succeeded in finding only a very few vessel-profiles within this group. While even small rim-sherds may give clues we are otherwise in the dark.

Bowls were represented by six rim-sherds, one of which (a slightly coarser specimen than the others) relates to a vessel from the original find with a vertically grooved handle (Müller 1919: 45 and fig. 5). The remaining five rim-sherds all fall within the type with an inward recurved neck and a sharp ridge at the meeting of neck and belly (Jensen 1967: 114, fig. 9). Bowls of this type cannot be dated more precisely than "Later Bronze Age". Covers constitute a small separate group, and of these one complete example has been found plus six fragments. Six were of domed form answering to the scheme of *Aarbøger*, 1967: 113, fig. 8.

The last cover was of the flat-topped sort with an under-hanging lip for enclosing the vessel-rim (Broholm 1949, pl. 41: 4). The covers can only be dated to the span of periods IV and V, a time when they had achieved widespread distribution throughout Denmark.

Peculiar to a great deal of finer pottery from the original find was the common occurrence of grooved decoration. Horizontal grooving is an especially important stylistic attribute of period V. It is rarely seen in the new material where decorated sherds of any sort are altogether scarce: only 0.5% (69 pieces in all) of the total assemblage exhibit ornamentation. Of these, three (all from the same vessel) are horizontally

grooved (as in *Aarbøger* 1967: 111, fig. 7:11), nine have thin grooves widely spaced and alternating with vertical chevron clusters (almost as in Broholm, vol IV, pl. 48:5). Instances of vertical grooving also occur as well as horizontal grooving over a basket-weave band (that is, a single thin groove incised under the rim and over a band incised with alternately criss-crossing lines in imitation of basket-weaving). Other forms of decoration are: combed ornament (Jensen 1967: 111, fig. 7; 23) and impressed lines alternating with oblique bands. Decorative motifs are completed by simple incised V-bands, vertical fluting and impressed fingermarks (Thrane 1971, 156). As far as the 1967 investigation goes, most of the decorated sherds could be assigned to period V, although occasional variants might span a longer time-period.

Under the heading of ceramics we may also include a circular loom-weight of fired clay which, in conjunction with sheep-bones, points to the local manufacture of textiles.

While all these features largely reiterate the previous excavations our attention now turns to the many *chunks of burnt clay-daub* which were unearthed. During the find registration in the museum in Odense (Fyns Stiftmuseum) faint traces of colour were observed. On closer examination this was confirmed by the discovery of flat surfaces upon the actual daub bearing white or brown-coloured plaster. This surface had a striated appearence, as if smoothed out by brush. The plaster layer varied between 1 and 3.5 cm. Several overlying layers of plaster testify to regular maintenance. It follows, therefore, that houses must have stood for some years. In several cases on the plastered surfaces traces of decorative paint-work in red-brown or black were seen (fig. 9). Unfortunately, however, all pieces were too small for any actual pattern to be reconstructed. Irregular line groupings were often seen as well as a single occurrence of the S-motif, an ornament peculiar to period V (fig. 10). Also found among the chunks were parts of decorative moulding in the form of applied clay bands of variegated profile. It transpires that the Bronze Age house was not so plain after all. It will no doubt become clear that the Voldtofte settlement was by no means unique in this respect (Thrane 1979: 10). In point of fact we already possess a parallel in that similar paint-work has been recorded among the house-remains from the settlement of Skamlebæk in North-West Zealand, likewise dating to the Later Bronze Age (Lomborg 1979: 4). The attention must also be drawn to the occurrence of painted plaster in the celebrated royal tomb of Seddin in Brandenburg (Kiekebusch 1928), dated to period V. Such fine decoration and meticulous maintenance was perhaps not the norm within the settlement at Kirkebjerget. Indeed it suggests a division into a

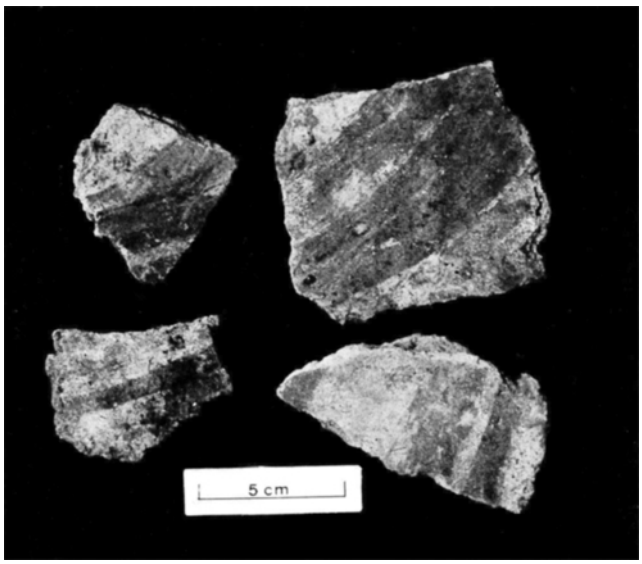

Fig. 9. Fragments of painted plaster.

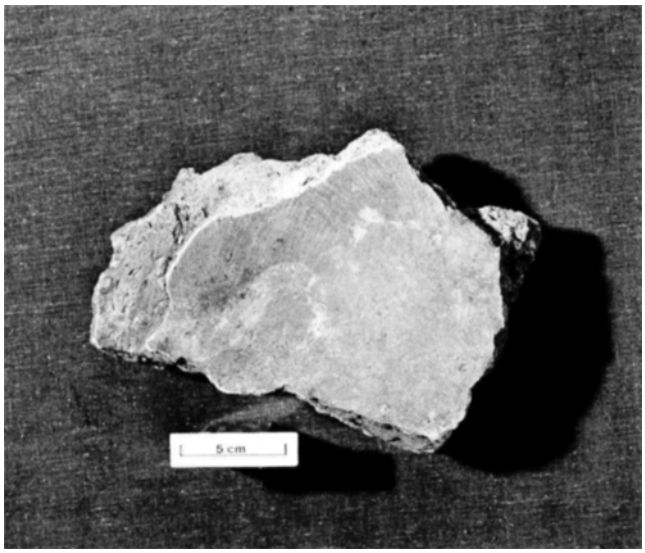

Fig. 10. Fragment of painted plaster with S-motif.

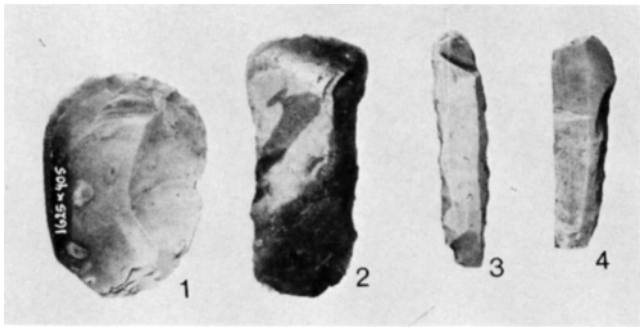

Fig. 11. Flint artefacts from the culture layer. 1–2, scrapers. 3, firestriker. 4, blade knife.

higher and a lower class, such as in a lordship or chieftainship. Similar conclusions have previously been suggested by the rich gravefinds from the top of Kirkebjerget as well as from the immediate vicinity. Perhaps it would be appropriate to abandon the term "settlement" (with its implied lack of permanence), substituting "village" – a seemingly more apt designation for the community on Kirkebjerget.

Even though more than 2,000 pieces of *flint* were discovered few of these were recognizable artefacts. By far the majority were irregular flakes or core-waste from their manufacture. The vertical distribution of flint within the culture-layer mirrors the pottery, the largest quantities accruing towards the end of the layer's formation period. Horizontally it permeated the culture-layer's full extent.

The actual flint workmanship was of an altogether crude nature, characterized for the greater part by violent blows, knocks and crushing. In order to produce such shatter-scars the raw flint must frequently have been hurled against some other stone, so that blanks often lack any formal bulb of percussion. Of the 2,309 collected pieces of detritus 262 exhibited a bulb of percussion. Altogether 18 pieces could be designated "blades" in the formal sense. No regular cores were found but 29 nodules of the sort described by Sophus Müller (1919: 49) were unearthed.

The most common artefact was the scraper, of which 34 examples were found (fig. 11: 1–2). Thirty-two of these were scrapers on flakes (14 long and 18 rounded), while only two were blade-scrapers. In thirty-three instances the scraping edge was diametrically opposite the bulb of percussion. In only one case was the bulb itself trimmed for scraping. Edges were produced by flaking from the bulbar surface although reverse flaking was also seen. Furthermore, edges formed by crushing were not unusual, especially on the larger artefacts.

Borers, of which there were four, had all been manufactured upon flakes of the most elementary preparation. The working point had been fashioned by unilateral or bilateral retouch, and in two cases the gripping end had been extensively retouched so as to illiminate troublesome irregularities.

There were altogether six fire-strikes and, lastly, three wellmade flint knives, all executed on blades retouched with hand and fingergrips. The only harvesting implement discovered was a crude blade-knife, one side worked for mounting in a wooden haft as a sickle (Broholm 1953, type 457). Also among the flint was a quantity of indeterminable retouched pieces as well as occasional fragments of Neolithic polished axes, one of which had probably been employed as a hammer-stone. Odd fragments of detritus with part polished surfaces show that polished axes were also used as cores or for raw material.

Grain milling was attested by several discoveries of fragmentary quern-stones. The best worked piece was an unfinished mace-head made of polished stone. Lastly we must mention 14 crushing stones, mostly of quartzite and crushed over their entire surfaces. All were more-or-less spherical in form and of near-equal size.

There is nothing out of the ordinary within the flint and stone assemblage. It can be characterized only by its paucity and preparatory nature, mirroring other assemblages from contemporary sites within Denmark (Thrane 1975, 153).

As might be expected of a midden, *finds of bronze* were few (fig. 12). The extensive surface stripping produced only three pieces: a knife, the edge of a celt axe, and a wholly intact knife with a ring-shaped shaft. The cairn excavation also yielded three pieces: a knife, a complete torque, and part of another. Adding these unimpressive pieces to the bronzes from the previous excavations we arrive at a total of 26 pieces. Their very nature and paucity emphasise the high prestige-value of bronze, even on a settlement so apparently well-appointed as Voldtofte.

The many incomplete grave-finds recovered over

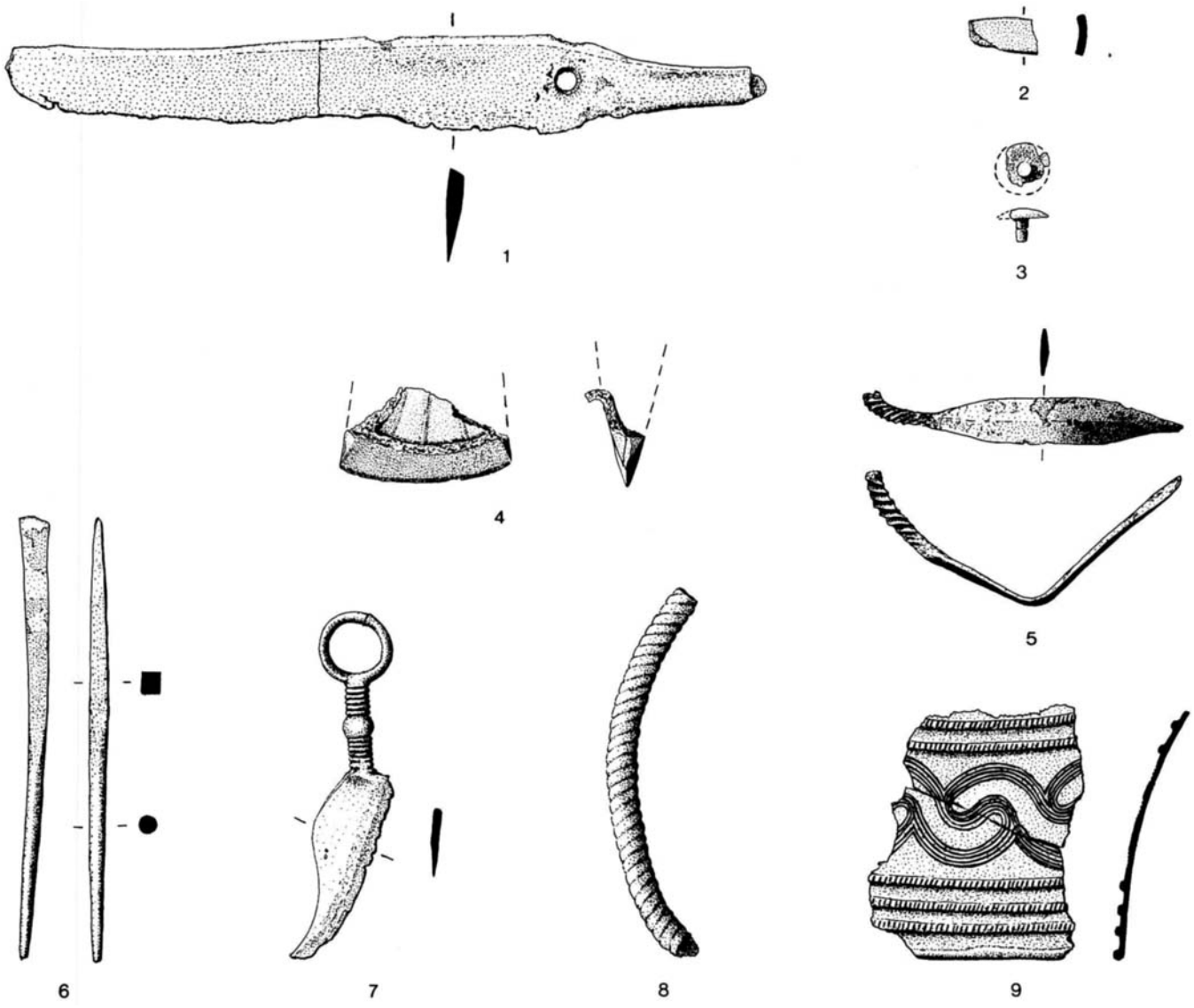

Fig. 12. Objects of bronze found within the settlement area. (Claus Madsen del.). 2:3.

the years from the immediate vicinity of Kirkebjerget (presumably related to the Bronze Age village) by no means suggest a scarcity of bronze in the area (Jensen 1967, 182). Discoveries of crucibles and of sword-casting moulds from the previous excavations show, firstly, that there was an abundance of raw material and, secondly, that there existed an advanced metallurgical expertise. On uniting these two complementary features it becomes clear that bronze played a dual role: on one hand as a raw material for superior artefacts, ornaments and weapons, and on the other as an acceptable currency for transactions large or small.

ZOOLOGICAL AND BOTANICAL MATERIAL

In addition to artefacts, materials of a zoological and botanical nature were also collected, completing the comparison with the former excavations. This material has been identified by Tove Hatting of the Zoolo-

gical Museum, Copenhagen. We here present the summarized results.

Altogether 3,397 bone fragments were collected. Of these 1,359 could be identified to the species. The majority, approx. 82 %, were of cattle (*Bos taurus domesticus*), 11 % pig (*Sus scrofa*), 5 % sheep (*Ovis aries*), 2 % horse (*Equus caballus*), 0.2 % dog (*Canis familiaris*), and finally 0.1 % red deer (*Cervus elaphus*).

Immediately striking is the almost total lack of wild game as well as the two predominant groups of cattle and pig. These were exactly the features noted in the previous investigations, where, excepting two fragments of goat and roe deer, the groups were identical. Even the relative frequencies can be seen to concur (Winge 1919: 33).

Quantity comparisons between the charcoal collected from both excavations are not directly feasible, in that K. Jessen's table records only the number of squares yielding charcoal rather than (as in the latest investigation) the actual number of charcoal fragments. Charcoal samples were analyzed by Peter Wagner of the Central Botanical Libray, Copenhagen.

tree	1919 no. of squares	1976–77 no. of fragments
Fraxinus sp. (ash)	53	134
Corylus sp. (hazel)	32	89
Quercus sp. (oak)	23	30
Betula sp. (birch)	31	0
Fagus syl. L. (beech)	5	1
Ulmus sp. (elm)	1	0
Other deciduous	12	
Alnus sp. (alder)		5
Tilia sp. (lime)		53
Acer sp. (maple)		6
Pomoideae (apple, pear, hawthorn etc.)		3

Probably most noteworthy of the original find were the five large pottery vessels discovered in 1908 inserted in a hole in the sand and standing close together in a row, approximate position of the find indicated on fig. 1 (A). From these were retrieved the first quantities of prehistoric bread-corn of any size. Three of the pots were sent to the National Museum (Thrane 1980, fig. 2. – Two of the vessels are illustrated in Jensen 1967, fig. 3). The vessels were interpreted as corn-storage vessels, in keeping with what was known from classical antiquity. Nor was there any lack of grain from the last excavation, where it occurred throughout the culture-layer. A large number of grains were washed out by hand or mechanically during the excavation:

	1919	1977
Hordeum (barley)	approx. 190 grams	412 grains
Triticum (wheat)	approx. 20 grams	120 grains
Avena (oats)	0	2 grains
Panicum (millet)	69 grams	23 grains

The original grain-find was analyzed by the botanist Ove Rostrup, the latest find by Peter Rowley-Conwy, Cambridge.

In both cases barley can be seen to predominate, being represented largely by the six-row husked variety – *Hordeum vulgare* var. *nudum*. The wheat varieties were nearly all spelt and emmer – *Triticum spelta* and *Triticum dicoccum* – common wheat being represented by only seven grains (*Trit. aestivum / aestivum grex.*). Oats (*Avena*), in contrast to barley and wheat, is a secondary cereal, originally occurring in the field as a weed. With the passing of time oats evolved certain crop-like features, and from the Later Bronze Age onwards they appear as common oats. The few instances recorded from this period may indicate that the cereal had not yet become an independent cultigen and that it occurred as a mix within wheat and barley crops.

CONCLUSION

In this discussion of the latest in a series of excavations the many questions posed by the ancient village on Kirkebjerget have received far from exhaustive answers. One issue, however, does seem settled, namely, that all previous excavations have undoubtedly been of a rubbish heap adjoining a settlement area. The latter, in the author's opinion, should be sought to the west of this midden. And as this area is still under cultivation it should be possible to test this theory before the lapse of yet another 58 years.

Translated by Lars Broholm Tharp

NOTE

The excavations at Kirkebjerget were directed by the author on behalf of *Fyns Stiftsmuseum*, Odense, where the finds are kept under file no. 1625. The excavation of the cooking-stone cairn was undertaken by the University of Odense and *Fyns Stiftsmuseum* in 1977–78.

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Bronze Age Houses at Jegstrup, near Skive, Central Jutland

by KARSTEN DAVIDSEN

Our knowledge of Bronze Age houses in Denmark is of recent date. The first finds came to light in the mid-1950's and since the late '60's we have had regular opportunity to excavate house-floors dating to this period. A series of excavations in the area between Ringkøbing and Holstebro were particularly productive, though equally significant finds from other parts of the country have since emerged. Over 120 house floors from 30 separate localities have hitherto been recorded (1), but not one of these has been conclusively published. There are, however, a few intermediate notes on the most important of these sites, in which occassional house-floors – but almost none of the artefacts – are illustrated (c.f. the bibliography).

The Jegstrup locality was discovered in 1968 when sherds and dark patches appeared after deep ploughing (2). An exploratory excavation was then carried out by Skive Museum in 1978 (3). At this time the whole area lay under grass and encroached upon military training ground attached to the barracks at Skive.

The place itself is a sandy promontory which juts out into the now drained Lake Tastum (Tastum sø). C 14 determinations on marine shells from test borings into the former lake have shown that as recently as the Late Stone Age this area was still a marine inlet. The transition to stagnant water has been dated at 1470 ±80 b. c. (K-3156) (4).

The examined area is situated upon the summit of the promontory, where it commands a wide vista across the lake and surrounding slopes. Such an elevated site location is typical of Bronze Age house finds.

In the trial excavations of 1978 three 1.75 m wide trenches were dug by machine, their combined lengths totalling 190 metres. Here and there the trenches were expanded. Altogether 568 features were excavated, including: two complete Bronze Age houses, parts of another three, plus a number of pits from the Late Stone Age and Late Bronze Age. The uncovered area did not contain any culture-layer.

THE STONE AGE FINDS

The Neolithic pits were small and somewhat lacking in finds. Only six pits contained identifiable pottery (5). These sherds all belonged to the beginning of the Middle Neolithic (period I). The same date applies to all loose finds with the exception of a single rim-sherd, comb decorated with a fish-bone motif and bearing witness to the presence of the Single Grave Culture at the settlement (6). The modest size of the stone age pits can no doubt be attributed to the sandiness of the subsoil, as the great majority of large and rich Neolithic pits are refilled clay pits.

The siting of the Neolithic settlement is identical to other sites where ditch systems have been discovered (as at Sarup on Funen), demarcating the headland settlement. Although no such ditches were seen at Jegstrup, none of the trial trenches were long enough to rule out altogether their existence.

The Neolithic finds comprised sherds of funnel-necked beakers, bowls, shouldered vessels and a single clay ladle (a drilled fragment of the tubular handle). Flint artefacts were few and polished axes were entirely absent. Occasional Neolithic sherds had found their way into Bronze Age pits (7) and the same probably applies to the few flints also within these pits. The stone age pits contained a quantity of fire-charred clay daub while none of the Bronze Age pits yielded unequivocal house daub.

One of the Neolithic pits contained hazelnut shells as well as small fragments of burnt animal bones. This was the only pit on the whole site to yield food remains.

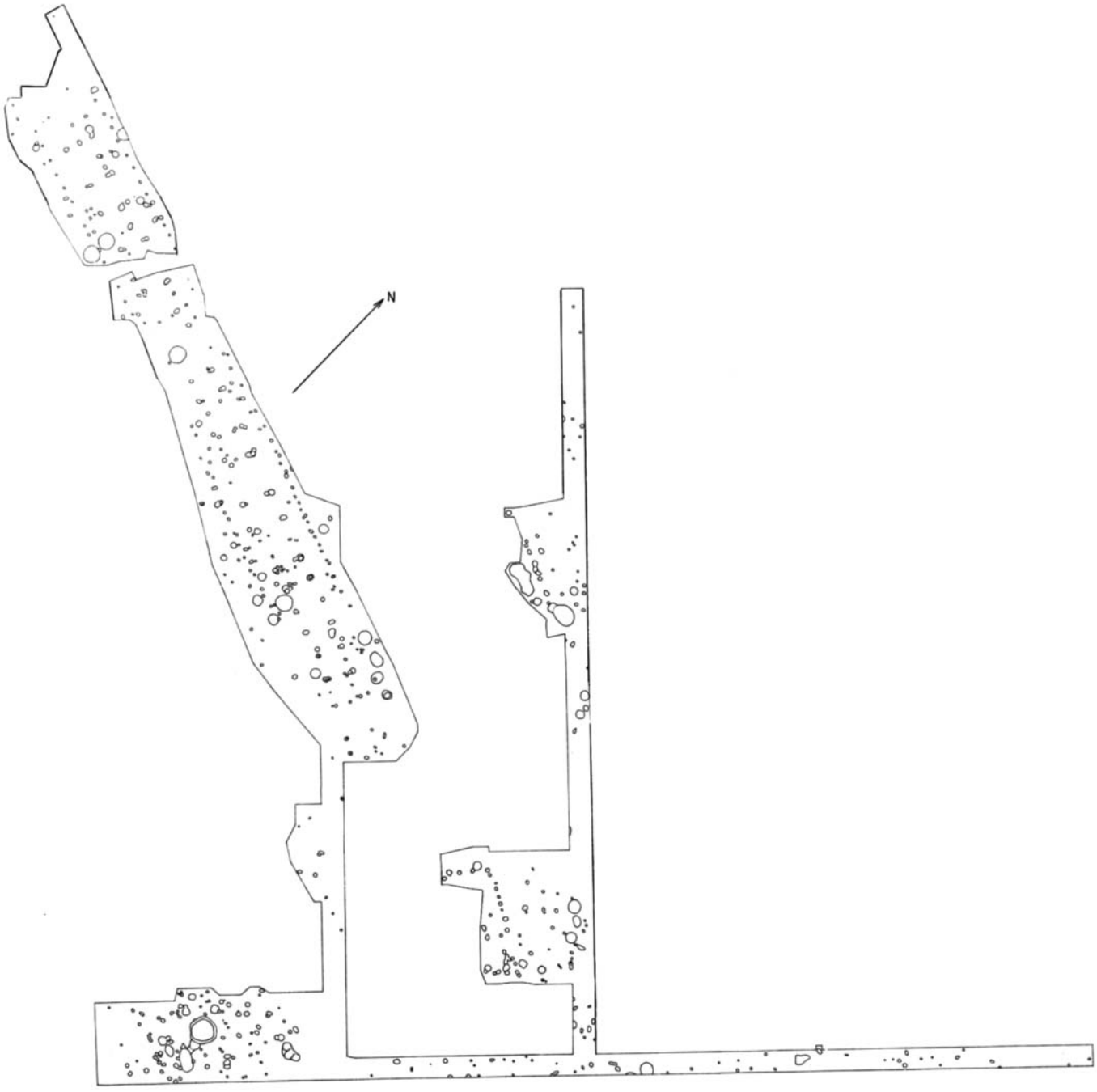

Fig. 1. Plan of the 1978 trial excavation. 1:500.

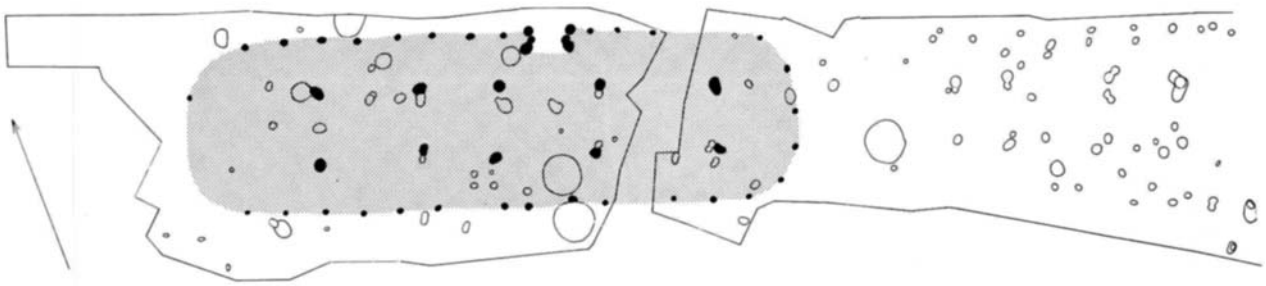

Fig. 2. Plan of house II. 1:250.

THE BRONZE AGE HOUSES

A plan of the excavation may be found in fig. 1. On it can be seen two complete houses plus conjectured and certain vestiges of three other houses. The two complete dwellings continue along one common line, while a third house may also have stood along this axis.

House II lies westernmost along this line (fig. 2). It is a clear and well-preserved example of the Late Bronze Age house. Such houses feature a double row of roof-supporting posts (in this case, five pairs) and round-cornered walls consisting of a single line of posts. A clear vestibule of three post-hole pairs could be seen along the north wall of house II. One of these pairs was incorporated within the wall-line proper, the remaining two pairs standing inside the house. Such inverted porticoes have proved typical of bronze age dwellings, though usually there are only two internal post-holes. House II was approximately 20.5 m long and 6.0 m wide. The wall posts were 15–20 cm in diameter while the roof-supporting posts measured 30–40 cm in diameter.

In rare instances partition stalls have been located in the eastern end of Bronze Age houses, and the buildings doubtless had separate stable and dwelling quarters, such as also seen in Iron Age houses. Orientation also follows Iron Age houses, i. e. more-or-less east-west. The Jegstrup houses' long-axes follow the contours of the promontory.

House I, lying to the East of house II, seems at first a very large construction, apparently 31 m in length and with 12 pairs of roof-supporting post-holes. It becomes clear, however, that the wall is in fact double, and that at least two phases are represented. In one place it was possible to discern the chronological succession between the posts of the two walls. Only after a closer scrutiny of the excavation plan could the two phases be distinguished.

Several of the holes are stone age pits, while some are cooking pits of the Late Bronze Age (fig. 3A). In its original form (phase Ia) the total house length was 24.0 m (fig. 3B). There are two clear entrances situated approximately in the middle of the longside walls where, to the north, the post holes are doubled and to the south they are trebled. The distance between adjacent pairs of roof-bearing post-holes is greater between the entrances and at the western end of the house than it is elsewhere. At the eastern end there is a slight narrowing of the span between the post-holes in each pair. Most of the holes for the wall posts are preserved except at the east end, which lay lowest with a thick humus layer, through which some of the posts perhaps did not penetrate.

All post-holes in house I were excavated in section, allowing the detection of original posts and their replacements. Such replacements were indeed noted especially at the eastern end of house Ia, while the east gable wall had been set with two roof-supporting posts in addition to the usual wall posts. These features all suggest that the east end of house Ia was susceptible to collapse (perhaps on account of damp), which in turn might explain why the house was shifted to the west in its ensuing phase.

On building house Ib the four easternmost roof-supporting posts were abandoned while the west end was lengthened by the addition of three further pairs of roof-supports (fig. 3C). House Ib had altogether eight pairs of roof-supporting posts, five of these pairs being reutilized from house Ia. There seem to have been entrances between the two innermost pairs in the western extension. At this point one sees a lengthwise widening between the roof-supports, as could also be

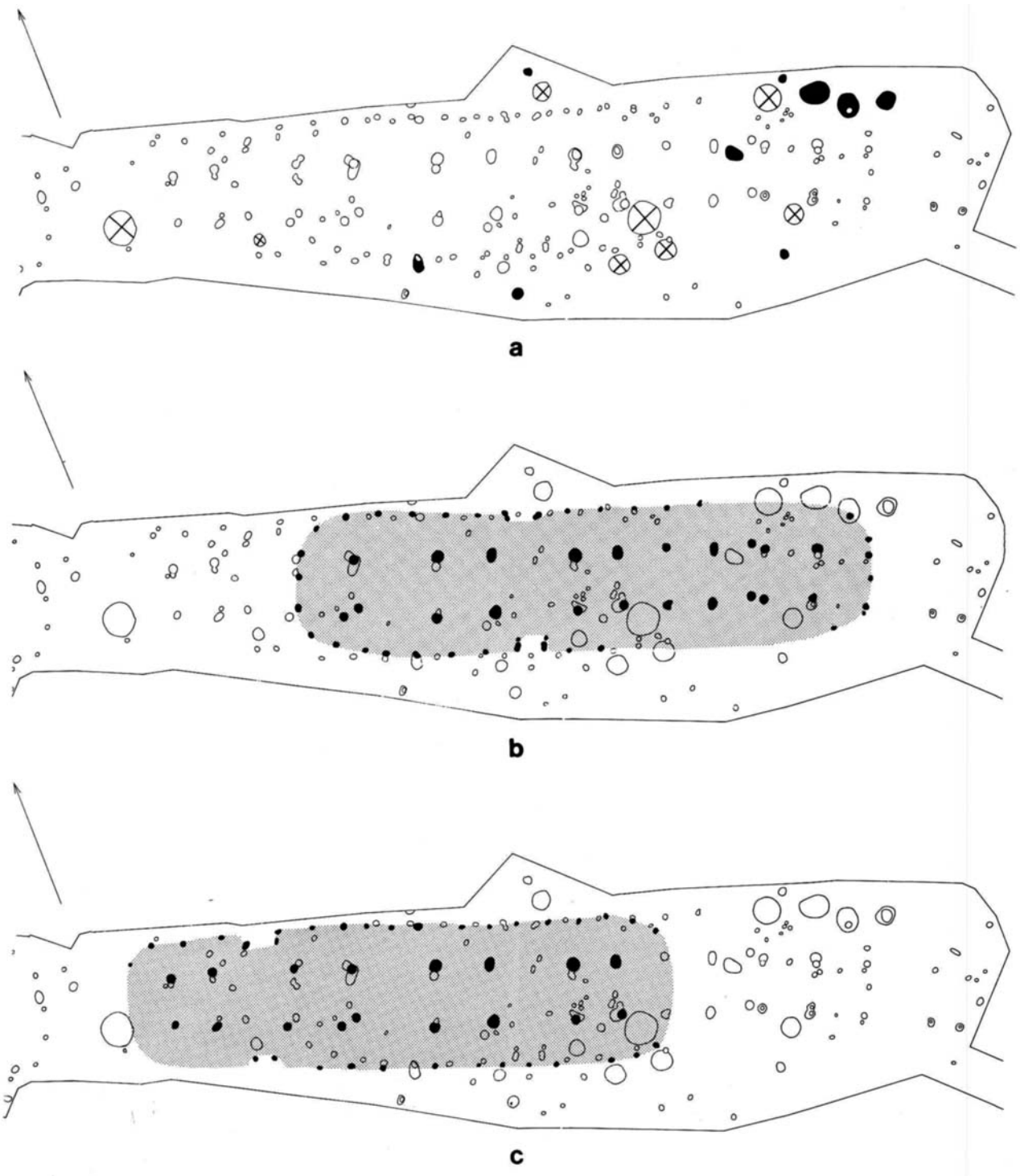

Fig. 3. A: Pits around house I. Stone Age pits in black, Bronze Age 'cooking pits' marked with a cross. – B: house Ia. – C: house Ib. 1:250.

seen by the door to house Ia. The total length of house Ib was 22.5 m, i. e. approximately 2.0 m shorter than house Ia. If we assume that the entrances mark the approximate divide between stable and domestic quarters it follows that the stable end had become approximately 2 m longer in phase Ib, taking up some 16 m of the total house length.

The roof-supporting post holes in house I measured approximately 30–50 cm in diameter and between 24 and 70 cm deep. The largest and deepest of these converged on the entrance to house Ia. Depths decreased towards the gable ends.

The wall posts were relatively slight and were so shallow that they could only be detected through the exercise of great caution when stripping the surface. Occasional wall posts, however, went 20 cm into the ground and the deepest of them were to be seen about the northern door of house Ia. The wall posts were round-bottomed with an average diameter of 20 cm. Both house Ia and Ib were 6 m in width. The respective walls of the two houses could be distinguished with relative certainty since the wall-posts of house Ia were situated a little to the North of their counterparts in house Ib.

Their construction places these houses firmly in the Late Bronze Age. The few finds from the post holes in no way contradict this. Two of the post holes at the western end of house Ia yielded a loom-weight (fig. 5:11) (8) and a body-sherd with vertical grooving (9). A bottom-sherd of a straining vessel (fig. 4:2) was found in one of those roof-supporting post-holes common to both houses Ia and b (10), while a body-sherd with a vertical knob (fig. 5:9) was discovered in a post hole probably relating to house Ia (11).

Publications of Bronze Age houses to date nearly all illustrate uninvolved and easily interpreted constructions such as House II, but the accompanying texts intimate that, more often than not, the true state of affairs is more complex. For this reason we are unable to form an impression of typical house-finds from the existing literature, nor can we find material for comparison with more complex structures such as house I.

Previous writings on Bronze Age houses do, however, allow us to assume that houses were commonly erected over the remains of a previous dwelling. Jørgen Jensen has produced a good example of this at Hover in West Jutland (Jensen 1971: 10). Until now, however, no Bronze Age houses have been published exhibiting such structural alterations as seen in house I at Jegstrup.

Becker has divided dwellings of the Late Bronze Age into two main groups (Becker 1976: 74f.). The first, considered the older, has widely spaced massive wall posts while those of the second group were slighter and closer together. The Jegstrup houses adhere to the latter type, recalling houses at Ristoft (Becker 1968: 85), dated with certainty to the end of the Bronze Age (period VI).

Thrane has postulated a typological division based on house dimensions, distinguishing between ordinary dwellings (10–20 m long and 6–7 m wide) and "halls" measuring between 25 and 33 m in length and up to 8 m wide (Thrane 1978: 523). Such a division is not upheld by the Jegstrup houses whose lengths range from 20.5 to 22.5 and 24.0 m.

THE BRONZE AGE PITS

So-called "cooking pits" – a typical feature of Late Bronze Age settlements – were found in great numbers on the Jegstrup settlement. Approximately 15 such features were excavated, all much alike. Cooking pits were always circular, the majority having rounded bottoms. Diameters varied between 0.5 and 2.0 m, depths between 0.5 and 1.0 m. The largest of these pits exhibited a ledge approximately 0.4 m below the subsoil surface. All other pits, however, were of regular cross-section. In the bottom of each pit was a layer of fire-shattered stones usually covered by a layer of clean subsoil sand totally bereft of extraneous stones or charcoal. This in-fill was so homogenous that one can only conclude that the pits had been rapidly filled. There was generally very little charcoal among the fire-shattered stones, and in only a few cases could a reddening of the pit sides (due to heat) be detected. These features presumably signify that there was never open fire in any of the pits, and that the stones were all pre-heated in some nearby fire. Uppermost in each pit there usually rested a slumped culture-layer in which by far the majority of prehistoric antiquities were discovered.

Cooking pits are common features nevertheless, little is known about them. The term itself reflects their usual interpretation, i. e. that they were used in the preparation of food (12). This view seems justified

for the majority of cooking pits found upon settlement sites. Even so, there also seems evidence for other functions (13).

Only two of the Bronze Age pits at Jegstrup were of a different sort. One of these was 2 m wide and 1 m deep. It contained only a few stones and had filled up slowly, in that 10 consecutive layers could be distinguished. Unfortunately, artefacts from this pit were particularly scarce.

The second pit was circular in plan, with a diameter of 1.3 m and a depth of 0.7 m. It contained three layers, the middle one being yellow clay incorporating many red-fired fragments of burnt clay, most of these lying towards the bottom of the clay layer. These fragments measured 2–3 cm in thickness and up to 12 cm in size. They exhibited two flat surfaces, one smooth and the other somewhat rougher. These rather resembled ordinary clay daub, though lacking the impressions of branches or planks. It seems reasonable to interpret these as fragments of an oven casing. The clay layer thinned out towards the west where the oven mouth was doubtless situated. Beneath the clay lay 30 cm of black mould with scattered fire-shattered stones. Unlike the usual cooking pits, however, this had not been a stone packing, and only two of the stones exceeding 7 cm in size. The subsoil about the pit sides had been burnt to a strong red colour.

THE POTTERY

The artefactual assemblage pertaining to the Bronze Age settlement is somewhat sparse, comprising almost solely pottery. However, querns, polishing stones and crushing stones were also found. The Bronze Age pits contained neither clay daub nor any evidence for bronze casting. No flint artefacts of a diagnostically bronze-age type were found anywhere on the site.

The dearth of published pottery from Bronze Age settlements makes it difficult to treat this material exhaustively. We can say, however, that there occurs no single example of typical period VI ware (14), for which reason we may place the find within period IV–V. Most features suggest period V, that is, the middle of the Late Bronze Age.

Coarse, slurried sherds are often predominant in settlement finds of the Late Bronze Age (Cf.e.g. Jensen 1967: 116). In the case of the Jegstrup find, however, slurried sherds are strikingly rare. This may be due to the storage vessel component being relatively small. Figure 4:1 illustrates the only reconstructible storage jar. It lacks slurry and is supplied with vertical knops. These are especially familiar in period V (Jensen 1967: 122, 125), though they are exclusive to no particular period (Jensen 1970: 85). Three such vessels with knops were seen at Jegstrup (figs. 4:1 and 5:9).

Figure 4:3 illustrates a slender bi-conical vessel with a rounded body-angle. Such vessels are well-known in graves, particularly from period V (possibly also period IV) (Bandou 1960: 99, type B 2). A wider, more compressed vessel of this type is illustrated in figure 4:4. This vessel had a maximum diameter of approximately 54 cm while nonetheless belonging to a finer ware with its thin sides and burnished surface. The rounded shoulder suggests a post-period IV date (Jensen 1966: 201). Bi-conical vessels seem quite frequent (c.f. also figs. 5:1 and 5:2) although a closely related shouldered type was absent. However a shoulder zone was often seen. Such decoration indicated purely by the ornament here consists of horizontally incised lines or, more rarely, of hatched bands as in figures 5:1 and 5:2.

Internal facets near the rim are a characteristic feature of bi-conical vessels, though they also occur on other types.

Bowls with funnel-shaped neck form a second major group. There occurred a single piece with a preserved handle looping from the carination up to just over the rim (fig. 5:5). One particular bowl exhibited a peculiar lip (fig. 5:3). Bowls from Bronze Age settlements are difficult to date, but the weak profiles do not suggest that period IV is represented anywhere within the present assemblage (Jensen 1967: 115). The pottery from Jegstrup can be characterised by its altogether gentle lines. Figure 5:8 illustrates the sole example of an angular profile. At its carination this vessel must have exceeded 0.50 m in diameter.

Decoration consists exclusively of the already mentioned 'simulated' shoulder, of horizontal rows of finger identations, fig. 5:10, and of lines horizontally incised below the rim (as seen on a single rim-sherd, find 61 from pit 189). Horizontal lines at the base of the neck are the commonest form of ornament. This pattern was most widely used in period V, occurring

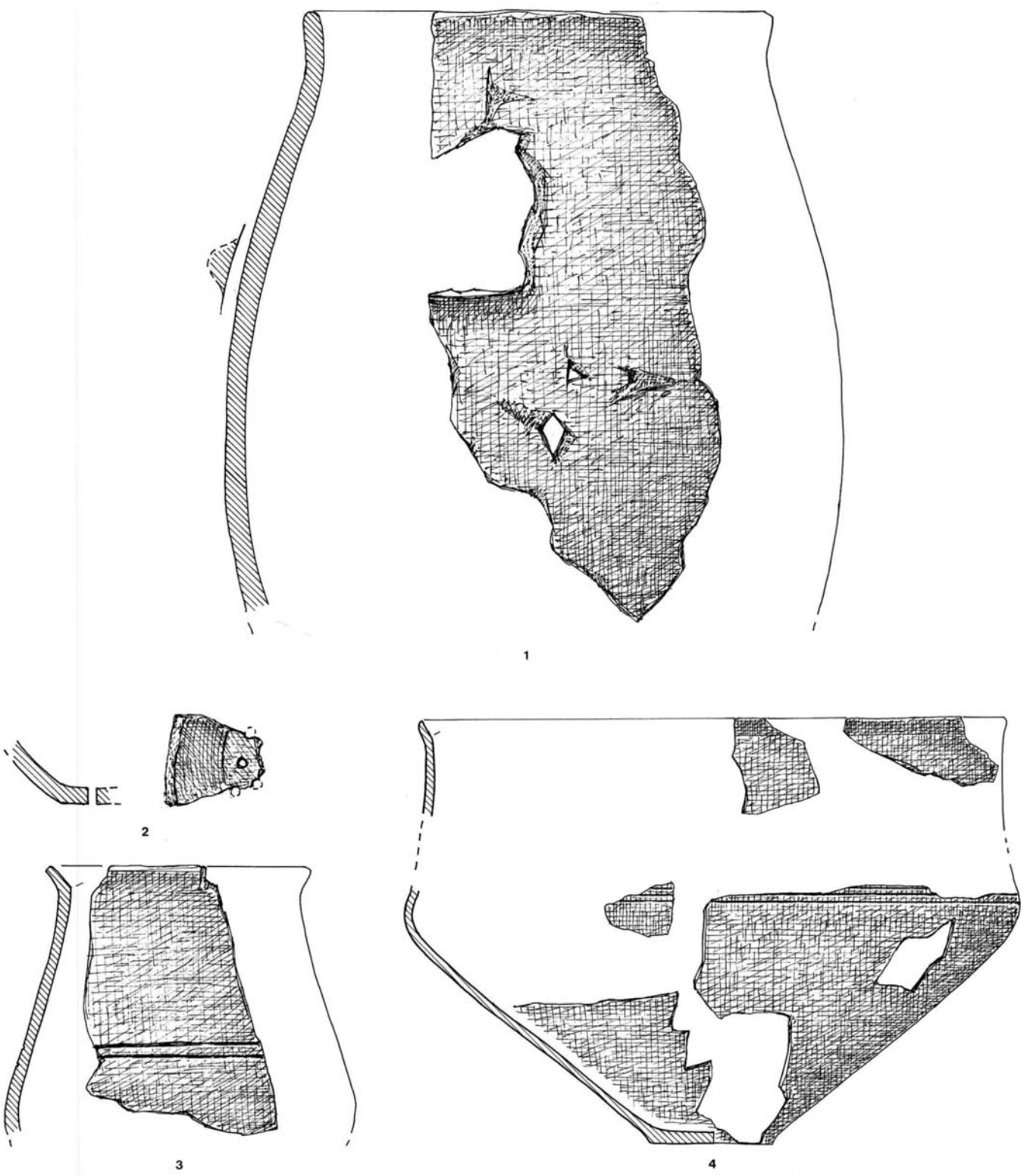

Fig. 4. Pottery. 1,4: sherds from pits. 2: sherds from post hole. 3: stray find. 2:5.

sporadically in both the neighbouring periods (Jensen 1967: 109). Finger-indentations are recorded in both periods IV and V (Ørsnes 1958: 19ff).

One pit yielded three body-sherds with rounded edges, one of these bearing in its centre the impression of incomplete drilling (15).

THE LOOM WEIGHT

Most noteworthy of all the artefacts from entire find is the loom-weight, discovered at the western gable end of house Ia (fig. 5:11) (8). This piece was originally circular in form, with a diameter of 10 cm. Its centre (where it was 3.5 cm thick) had been drilled with a hole 2.8 cm in diameter. There are no visible wear-marks around the sides of this hole. The weight was very fragile upon excavation, having almost the consistency of clay daub. It was presumably unfired in its original state, having been preserved by a subsequent fire. It is the first loom weight datable to the Late Bronze Age and one of the very few loom weights to come from a pre-Iron Age site.

No examples of loom weights are known from the Early or Middle Neolithic periods, although mention should be made of one illustrated by P. V. Glob, in connection with his publication of the Single Grave settlement material, from Bjerregård in Skanderborg Amt (16). This specimen was discovered in a fox-hole within a ploughed over tumulus containing a Single Grave. As the tumulus had been ploughed it is possible that the loom weight may have derived from a later phase in the life of the tumulus (Late Neolithic or Bronze Age).

The oldest well-dated finds of loom weights are from the Late Neolithic. In 1976 Silkeborg Museum excavated a tumulus near Tvilumgård in Skanderborg Amt. It contained, among other things, a grave with a type I flint dagger, the in-fill yielding a loom weight fragment (17). Additionally, there are the finds from the settlement at Myrhøj where the majority of one and fragments of six other loom weights were discovered in two of the sunken house-floors (18). This find has been firmly dated to the commencement of the Late Neolithic. "Myrhøj-type" pottery was also found on a settlement at Solbjerg in Ålborg Amt, excavated in 1963–64 by O. Marseen (19). Here they discovered a round loom weight among some fire-shattered stones of fist size lying in a sunken hearth. Another welldated Late Neolithic find comes from Birknæs in Skanderborg Amt, where in 1910 T. Thomsen excavated a settlement (20). Pit 5 on this site measured 1.35 by 1.10 m and approximately 1 m in depth. It contained a loom weight, 15 undecorated body-sherds and scattered grain (2.6 litres in all) now carbon dated at 1640 ± 85 (K2926), 1620 ± 85 (K2924) and 1580 ± 85 b.c. (K2925).

Further loom weights have come from the settlement near Egehøj on Djursland (Late Neolithic/Early Bronze Age), excavated in 1971–72 by N. A. Boas (21); and also from derived material within a cremation grave at Lilholt in Haderslev Amt, excavated by C. M. Lund (22). The Lilholt grave contained a period II bronze dagger, fragments of three loom weights lying between the stones of the grave lining.

In 1937 C. J. Becker excavated a Bronze Age tumulus at Særslev in Holbæk Amt. In it were four inhumation graves (one of which dating to period II) as well as settlement material from the Late Stone Age / Early Bronze Age period (23). Beneath the tumulus lay a small pit, 30 cm deep and containg traces of charcoal and a loom weight fragment. Its diameter would have been 7 cm, assuming the hole to have been central.

All of these Late Neolithic and Bronze Age loom weights are of the same type: circular with a diameter of 5 to 10 cm and a thickness of 3 to 4 cm. Most examples have rounded edges such as the weight from Jegstrup.

Translated by Lars Broholm Tharp

NOTES

(The present article was originally published in Danish in MiV vol. 10, 1980. Emendations to this text are few.

Abbreviations:

ÅHM – Aalborg historiske Museum
SIM – Silkeborg Museum
FHM – Forhistorisk Museum, Moesgård (Aarhus)
HAM – Haderslev Museum
KHM – Kulturhistorisk Museum, Randers
NM I – The National Museum 1st Dept., Copenhagen

[1] For a distribution map see Thrane 1978: 594, fig. 156; see also Thrane's contribution to the present volume.

[2] Skive Museum j. 270/69 and inv. no. 6063–70. The finds were collected by J. Vester Christensen (who again pointed out the findspot in 1978) and P. O. Gredal.

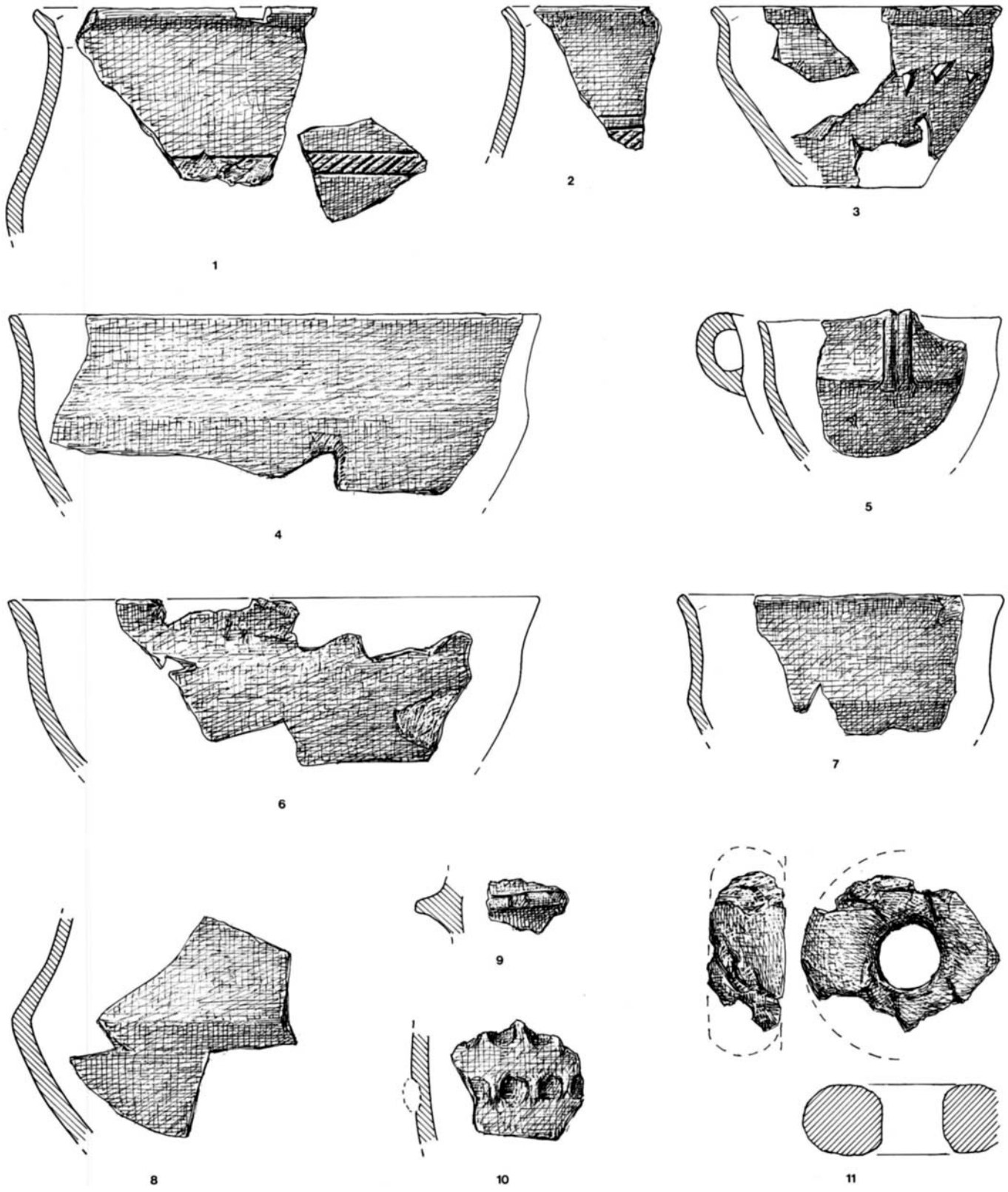

Fig. 5. Pottery and burnt clay. 1: stray find. 2–8,10: sherds from pits. 9: sherd from post hole. 11: loom weight from post hole. 2:5.

[3] Skive Museum j. 149A, Jegstrup, Dommerby sogn (NM I sb 59), Fjends herred, Viborg amt. A copy of the report may be seen in the National Museum, 1st Department (j. 2836/79). The excavation took place between 16/5 and 10/6, 1978. Only two persons participated, the author and John Simonsen, Skive Museum.

[4] L. Aabo Rasmussen et al. 1978: 115; L. Aabo Rasmussen and Kaj Petersen 1979: 51 ff.

[5] Confirmed stone age pits: 179, 214, 275, 430, 509 and 512; probably stone age: 134, 192, 205, 215, 226, 247, 296, 403, 469 and 486.

[6] Find 23.

[7] Finds 7, 12 and 80 from pits 1 and 431.

[8] Find 46 from post hole 332.

[9] Find 90 from post hole 315.

[10] Find 49 from post hole 263.

[11] Find 37 from post hole 219.

[12] Lerche 1969: 195 ff; Eskildsen 1979: 16.

[13] Levin 1971: 5 ff; Olesen and Seeberg 1971: 48 ff; Thrane 1974: 96 ff.

[14] For example, Kristiansen 1972: 62 ff; and Iversen and Näsman 1978: 46 ff; storage jars of the sort illustrated in figs. 14–15 in the latter article are common in period VI but completely absent in the Jegstrup find.

[15] Finds 34 and 50 from pit 189; cf. Kristiansen 1972: 65, fig. 5.

[16] NM I A 30052, Bjerregård, Ale sogn, Vrads herred, Skanderborg amt; Glob 1944: 247, fig. 114.

[17] SIM 459/75 BX, cf. NM I 1440/75, Tvilumgård, Tvilum sogn, Gjern herred, Skanderborg amt.

[18] FHM j. 1576, Myrhøj, Strandby sogn, Gislum herred, Ålborg amt (Jensen 1972: 90, fig. 24).

[19] ÅHM A 918, Solbjerg, Solbjerg sogn, Hellum herred, Ålborg amt; copy of report in NM I (j. 328/63).

[20] NM I A 26850–51, Birknæs, Østbirk sogn, Voer herred, Skanderborg amt; la Cour 1927: 302, fig. 3; Helbæk 1952: 97 ff; Jørgensen 1979: 140.

[21] KHM j. 160/69, Egehøj, Hemmed sogn, Djurs Nørre herred, Randers amt; Boas 1980, p. 112, fig. 10.

[22] HAM 4607–4608, Lilholt, Skrydstrup sogn, Gram herred, Haderslev amt; Broholm 1943: grave 1109; Broholm and Hald 1935: 300.

[23] NM I B 13037, Særslev, Særslev sogn, Skippinge herred, Holbæk amt; Aner and Kersten 1976: 102 f (and references), Taf. 61.

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The Use of Air Photographs in Celtic Field Studies

by P. HARDER SØRENSEN

INTRODUCTION

In his work on aerial photography in archaeology (Ancient Landscapes, 1957) John Bradford points out that even if air photographs are taken for other purposes they can often serve archaeology as a valuable source of 'intelligence'. In this country aerial photographs are now in common use for planning and development purposes, both in public and in private enterprise. This steadily increasing quantity of photographic coverage provides an abundant source of information and invites archaeological analysis.

The aim of this paper is to demonstrate how the study of Celtic fields may benefit from such data. The paper will discuss some important points emerging from the identification of a large number of Celtic field remains discovered by examining semi-official series of black-and-white vertical air photographs.

In the present context the aerial photographs are regarded as 'documents' that may be analysed independently of time factors and access to the site or area in question, and also in most cases regardless of field reconnaisance and excavation. For the sake of convenience such an application of air photographs may be named an *Airphoto approach*, and it may be regarded either as a method of investigation in its own right or as a method to support results obtained from other, more orthodox methods.

REMAINS OF CELTIC FIELD BOUNDARIES

From Gudmund Hatt's *Oldtidsagre* (Hatt 1949) we know that most Celtic field sites found during his comprehensive surveys and excavations were identified on the basis of boundary banks and lynchets that were intact or only partly destroyed. These remains have survived up to – and in some areas even beyond – the time of investigation because the fields they enclose were laid out in the least fertile areas; and when these fields were subsequently abandoned, little or no tillage took place until they were reclaimed for agricultural purposes. Even in cases where part of the field system was completely levelled, Hatt sometimes succeeded in tracing the outline of the boundaries because the demolished bank or lynchet contrasted in soil-colour with the field they enclosed.

These traces in the top-soil – in the terminology of airphoto interpretation called *Soil Marks* – belong to the kind of archaeological features which are very difficult to detect from ground level, whereas they might be clearly and comprehensively revealed in aerial photographs. This fact is illustrated in figs. 2–4 where the ploughed-over boundary banks and lynchets are clearly visible as a pattern of light-grey bands. The great majority of soil marks in Celtic fields appear as such light traces on a more deeply toned background; in some subsoils, however, this pattern of tone contrast may be reversed.

Acting on the assumption that soil marks need not be restricted to boundaries levelled in recent times but might also occur where banks and lynchets were levelled centuries ago, a preliminary airphoto study was carried out for the area of Vendsyssel. This was done partly to verify the results from Hatt's investigations of nine Celtic field systems recorded in this area, partly to see whether a study of the relevant aerial photographs would reveal additional, unknown Celtic field remains.

Three different airphoto coverages were examined: Basic Cover 1954, 1968 and 1972. The results were highly satisfactory in that it was possible to record more than 300 previously unknown Celtic field systems on the basis of soil marks (fig. 1). The number and distribution of soil marks in fig. 1, together with the whole concept of soil marks, open up fresh pro-

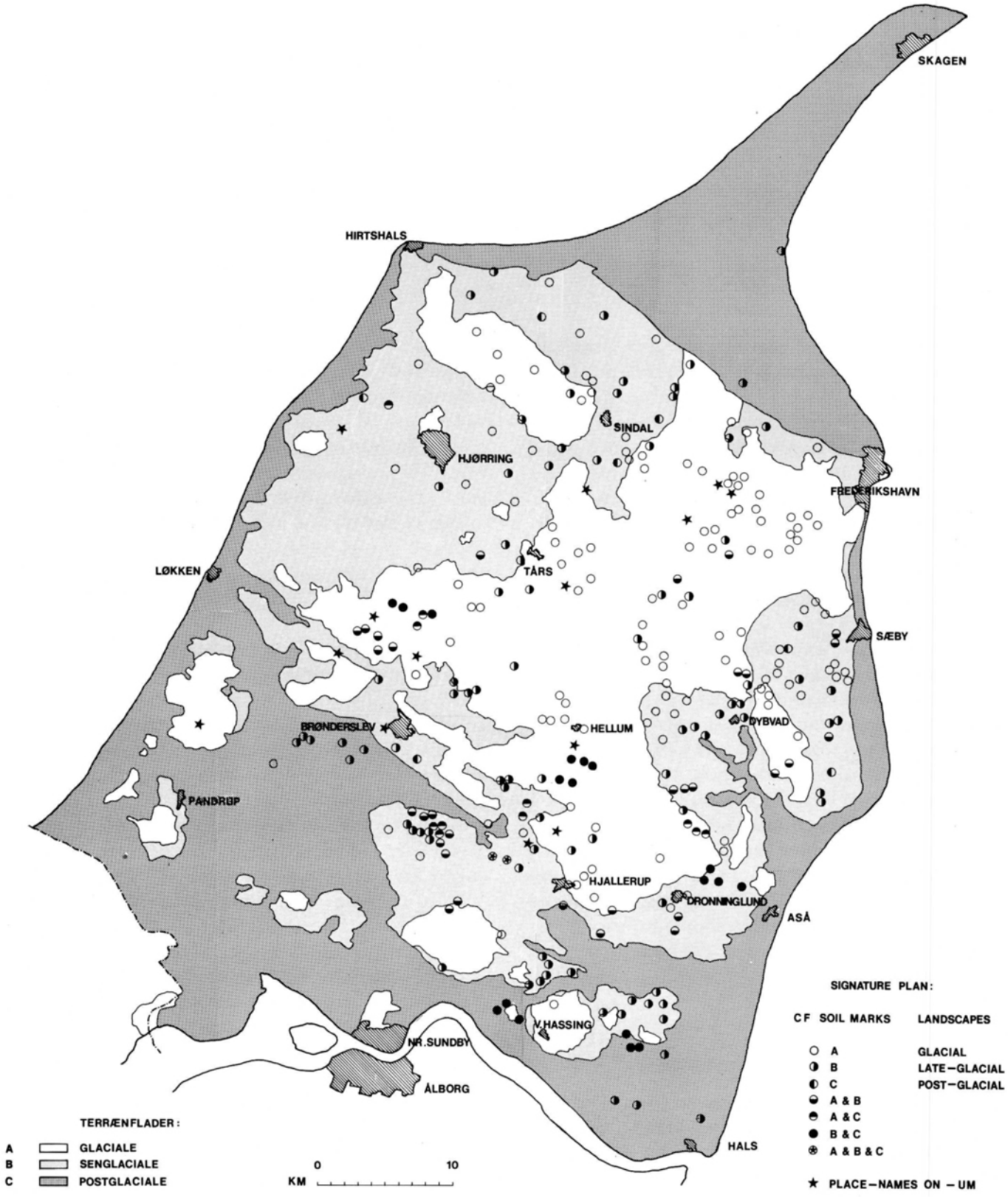

Fig. 1. Map showing the location of Celtic Field soil-marks in Vendsyssel. From an airphoto coverage BC 1954 with a supplement from BC 1968 and 1972.

spects in the study of Celtic fields. Some problems and observations concerning these marks will consequently be discussed in further detail below.

THE CELTIC FIELD SOIL MARK

Two general points may be stressed: 1) all soil marks in Vendsyssel identified from the three sets of air photographs are light-grey (cf. figs. 2–4). 2) There is no discernible difference between soil marks from levelled boundary banks and those from boundary lynchets. In the following we shall make no distinction between these constructions, and Celtic fields will be regarded as enclosed simply by a boundary.

As mentioned above (and apparent in the figures), soil marks are visible only if a distinct contrast in tone is shown in the photograph. Tone contrast depends on the difference in brightness between an image and its background. Brightness is a result of the amount of light reflected, and this reflection in its turn depends on the condition of the soil surface, either bare ground (ploughed and harrowed, for instance) or with only a thin cover of vegetation so that variations in soil colour may still be visible. Accordingly, the photographic image of soil marks cannot appear lighter than that of the enclosed field unless the soil material in the levelled boundary has a sufficient value of light reflection, i.e. brightness.

A discussion of the complicated origin and building of Celtic field boundaries is not intended in this paper. However, from the photographs of the levelled banks and lynchets, it would appear that both constructions consist mainly of a mixture of soil particles which emit a high degree of brightness. It is generally held – if we leave out the more intricate details and parameters of aerial photography – that if the soil consists of fine particles of a light intrinsic colour and has access to perfect drainage, much light will be reflected and a high degree of brightness will result. Most cross sections excavated by Gudmund Hatt (Hatt 1949) exhibited exactly these soil properties and conditions.

To conclude this point: depending on its origin and construction a levelled boundary (ploughed and harrowed) will spread its material over a certain area and leave a light trace on the soil surface. Under certain conditions the trace will be visible from ground level for some time after the levelling, but the great majority will be visible only in aerial photographs.

The individual field systems in fig. 1 cover areas between 2 and approx. 200 hectares. If, as a working hypothesis, we assume that each farm unit (people as well as animals) requires 15 hectares for one year's subsistence and that the crop rotation is 5 years, then the cultivated area works out at 75 ha, as indicated by a circle in fig. 1. The 300 field systems comprise a total of 22,500 ha of arable land exploited for a certain number of years within the period under discussion (roughly delimited, for the sake of convenience, from 400 B.C. till 400 A.D.).

Considering the size as well as the location of the area it is unlikely that it would have remained uncultivated for centuries during the time preceding the large-scale reclamation of moorland. A sizeable part of the most fertile and best located arable land must have been recultivated over at least one period of some duration, which would have initiated the obliteration of the covered boundary traces. In areas where this recultivation was especially intensive and where there may even have been little difference between the soil material of the boundaries and that of the fields, the obliteration may, in time, have become complete, or at any rate so extensive that only a few hectares of remains have survived, as appears from present-day records.

In this connection soil conditions and the duration of recultivation differ in their impact. In the following we shall illustrate the latter factor with a few examples.

The first example comes from the parish of *Albæk* (for a map showing the distribution of moorland in Albæk parish, see *Danmarks Natur*, vol. 7, p. 24). When the 1:100,000 overlay map of recorded fields prepared by the author was superimposed on the parish map, it appeared that 8 out of 10 field systems within the parish were located on light soils on moorland reclaimed in 1830. In other words, the still visible boundary traces have survived the more or less intensive soil working carried out since then.

Another example, the perspectives of which go somewhat further back in time, resulted from a close study of the aerial photograph in fig. 5, supported by information from the Land Register of 1688 and from TRAP's DANMARK.

The air photograph was taken in May 1954 over the manor house of *Langholt* between Ålborg and Dronninglund. There are clear boundary traces (marked with white arrows) in the field. According to the Land

Fig. 2.a. Vertical airphoto of Celtic Field soil-mark type A, scale 1:10,000.

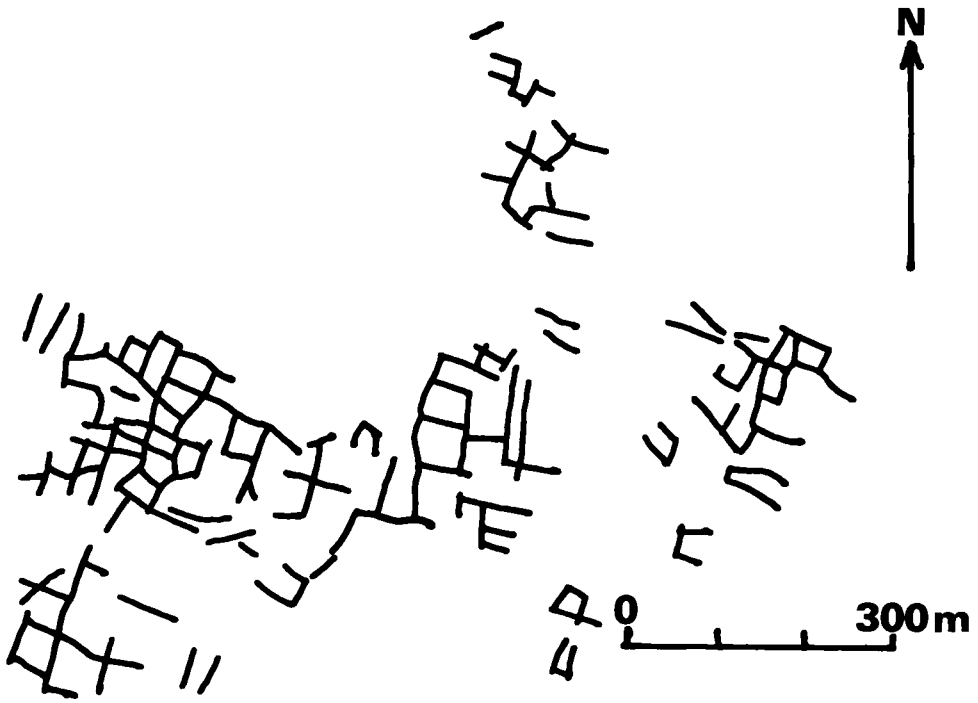

Fig. 2.b. Trace of the soil-marks from a.

Fig. 3.a. Vertical airphoto of Celtic Field soil-mark type B, scale 1:10,000.

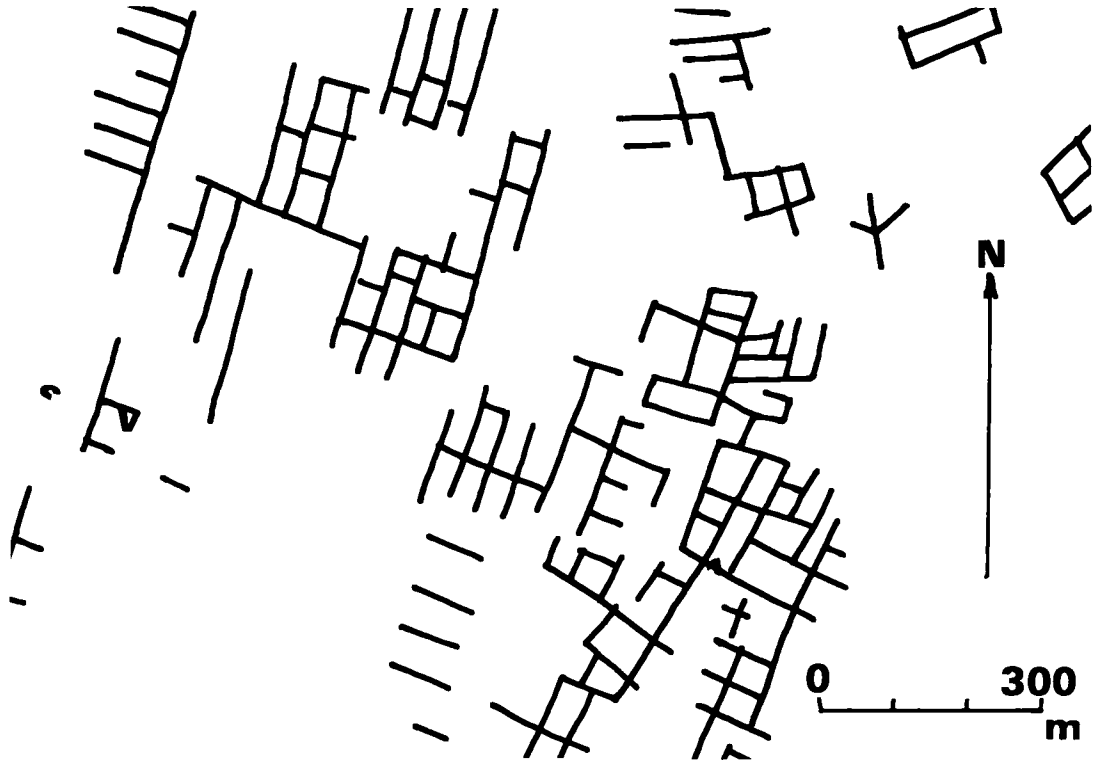

Fig. 3.b. Trace of the soil-marks from a.

Fig. 4.a. Vertical airphoto of Celtic Field soil-mark type C, scale 1:10,000.

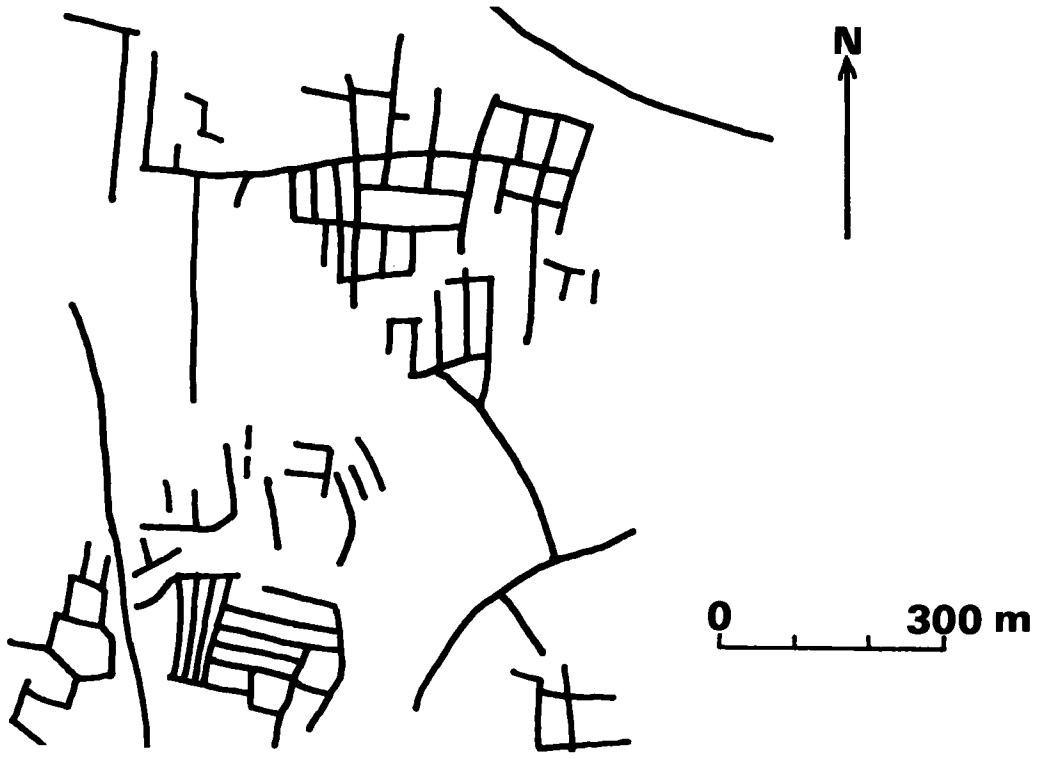

Fig. 4.b. Trace of the soil-marks from a.

Register of 1688 this land included furlongs with high-backed fields (name, number of fields and direction of ploughing are all given in the Land Register). According to TRAP's DANMARK, Langholt Manor has been known from the middle of the 14th century, and we can probably assume that most of the surrounding land has been more or less permanently cultivated ever since. This means that boundary traces from the ancient fields have proved impervious to sustained agriculture of a kind unknown to us, and to a couple of centuries involving the ploughing down of high-backed fields. Furthermore, an air photograph from March 1974 reveals that the traces are as marked as they were in the photograph of 1954, i.e. following twenty years of modern agriculture.

In the same way clearly perceptible boundary traces adjacent to the home farm can also be observed at a number of manors and large farms in Vendsyssel. However, except, in the case of Langholt, there have been no attempts to relate this observation to historical data, for which reason it is mentioned here only by way of information, not evidence.

Until a team of archaeologists, pedologists, geologists and historians carry out a scientific study of the subject, like that of the fields discovered at *Rone* on *Gotland*, we shall probably have to make do with rough and ready working hypotheses like that given above.

Finally, it should be pointed out that fig. 1 does not represent a final recording of the visible traces of fields remaining today. An analysis of other sets of aerial photographs than the three used in this investigation is bound to reveal additional traces. The 1968 photographs, taken during the summer, resulted in 15 additional discoveries and confirmation of several field systems previously recognised. The 1972 photographs, taken in April, May and September, resulted in 45 new discoveries and also revealed that several previously recognised field systems were considerably more extensive than was first realised. Both the season and the crops impose certain limitations on the possibility of recording field systems, though the margin of error is reduced by comparing several sets of air photographs. Thus the 300 field systems must be considered a significant and representative proportion of the systems recognisable from aerial photographs.

CLASSIFICATION OF FIELD SYSTEMS

Having discovered the many field systems and established their exact location in relation to the 1:100,000 soil maps, it may be useful to attempt a systematization, especially as far as various types of agriculture are concerned.

A detailed examination of the boundary traces reveals that a classification of the fields should include not only the shapes of the fields but also other factors, such as the appearance of the boundary remains (width, evenness, visibility) and their layout in the terrain, sub-divisions, and some consideration of circumstances governing their location on the three main morphological types: the moraine, the Yoldia and the Littorina plain.

The preliminary result of the investigation is a division into three main types which may be susceptible of further sub-division after analysis of material of a more comprehensive kind.

To illustrate the three types we have chosen air photographs showing the most characteristic features of each type, regardless of whether the picture is from Vendsyssel or the rest of Jutland.

TYPE A: (see figs. 2a and b)

The fields are very irregular in shape, though there is a visible attempt to achieve a quadrangular form. The course of the boundary marks is irregular, and the variation in width must be due to the fact that the bank originally varied in height and width. The fields are between 0.04 and 0.3 ha in size.

The layout of the field systems appears to reflect the needs of the moment and the conditions of the terrain, rather than any preconceived plan. The irregular course of the boundaries suggests that the builders had to bypass obstacles which could not be removed. Compare in this connection the course of boundary marks of type B and C below.

Type A is represented in all three types of terrain, but there is a distinct concentration on the moraine, where it constitutes approx. 56% of the boundary marks identified here. Furthermore, type A shows a clear preponderance in undulating areas. In comparison with types B and C it tends to be further removed from valleys and swampy areas.

TYPE B: (see figs. 3a and b)

This type is characterised by long and narrow, parallel strips divided into rectangular fields of varying size by transverse banks. Within the same field system the strips vary in width, though 25–35 m seems to be the most common width.

The layout of the field system appears to be based on a carefully conceived plan, and the relatively uniform width of the traces that mark the course of the levelled banks probably indicates good maintenance of the fields during the entire period of cultivation. The air photograph also shows, however, the ability of sand drift to cover and conceal large parts of the system, whether this happened during the period of cultivation and forced the people to abandon their fields or whether it occurred only after the fields had been given up for other reasons. The size of the fields varies between 0.06 and 0.45 hectares.

Apparently the ground-plan of this type of field lends itself best to the fairly level Yoldia and Littorina plains, where most of the identified B-types were indeed discovered. However, some are located on the moraine and some even in slightly undulating terrain. In such types of terrain it is generally not feasible to lay out long parallel strips as shown in fig. 3. However, the strictly rectangular shape of each field has been clearly realised and such systems can therefore undoubtedly be assigned to type B.

Another characteristic of this type is the complete absence of a lengthways division of the individual fields, unlike type C where fields are often sub-divided in a manner that brings the high-backed fields to mind.

Some of the recorded type B remains seem to suggest that this type developed over an extended period of time so that it reached its final shape (as shown in fig. 3) only when the Littorina plains came under development.

An example of a rudimentary layout is the field system belonging to the interesting site at *Kraghede* south of *Øster Brønderslev*. The system is recorded in two sets of air photographs and comprises an area of c. 150 ha of visible remains. The ground-plan shows the same characteristics as that in fig. 3, but both the orientation of the field strips and the varying width of the boundary marks demonstrate its rudimentary form.

TYPE C: (see figs. 4 a and b)

Fields of type C show more clearly than those of type B that they are the result of thorough planning, able workmanship, and firm supervision of labour. An extensive area has been divided into large fields, which are accurately laid out and separated at precise right angles by transverse banks. As the soil marks from this type of land division seem to indicate wider boundary banks, the division into large fields must have existed for some time before the subsequent sub-division took place; cf. Hatt's suggestion that the earlier banks are the highest and widest.

The fields are sub-divided with great accuracy into a number of large sections of equal size. In many cases we have a tripartition, which may reflect the number of households in the settlement (Hatt 1949, *Skørbaekkomplekset*) or may be a division resulting from inheritance. Individual fields may vary in size between 0.04 and 0.7 hectares.

As mentioned above with reference to type B, a different sub-division is characteristic of type C, namely a division of a rectangular field into a number of long and narrow strips which suggest the high-backed fields. An example of this can be seen in fig. 4, bottom left-hand corner.

In the original air photographs the boundary marks are sharply delineated on the ground surface, which would suggest meticulous maintenance of the fields until they were abandoned.

Type C comprises only c. 13% of the field systems recorded, which fact – combined with the thorough planning – may date the type as the most recent. The Yoldia plains are the preferred soil, but several fields are also found in the slightly more undulating terrain of the moraine.

AGE AND TYPE DISTRIBUTION OF FIELD SYSTEMS

The order in which the various types have been discussed and the letters assigned to them suggest their probable order of age. This is, however, a subjective assessment based entirely on the writer's interpretation of photographic data. A more objective assessment of age can probably be had only by comparing the data presented here with e.g. the various find maps and records available on graves, grave

Fig. 5. Airphoto of Langholt Manor, scale 1:10,000, May 1954. White arrows indicate Celtic Field soil-marks. Until 1642 the manor buildings were situated ca. 600 m to the south near the two ponds.

mounds, settlements and artefacts. Compare in this connection the site at Kraghede mentioned above.

Attempts to classify the recorded field remains can only yield reasonable results if a certain degree of generalisation is accepted. Nevertheless, it is surprising that so many field systems lend themselves to definite classification. Only approx. 20 cases were impossible to classify. In some cases two or all three types are found together within the same complex. In such cases they have all been included, i.e. one of each type of system.

Figure 1 shows the distribution of types according to terrain, each type being marked with its particular sign together with the area indication of 75 ha. Since the whole investigation is based on an interpretation of aerial photographs, it would not be valid to attempt a full assessment of the data resulting from the type distribution. Suffice it to call attention to the concentration of B and C types between the *Limfjord* and *Gerå* and the density of type A on the undulating part of the moraine due west of *Frederikshavn*.

Perhaps this density of field remains of type A

suggests that in the area around *Skaerum*, *Lendum* and *Gerum* there may have existed the kind of local interdependence the absence of which Viggo Hansen remarks on in the following passage: "... perhaps it may even be their contemporaries who in Jutland created the familiar ancient fields, the distribution of which is fairly similar to the distribution of settlements with an -um suffix. Though there is no discernible local interdependence, which was not to be expected, yet the geographical context must have been almost the same." (*Geografisk Tidsskrift* 1948–49).

CONCLUSION

Finally a few brief remarks concerning the pattern shown by the general distribution of boundary marks (*not* the types), as illustrated in fig. 1. Although future studies of air photographs will reveal even more boundary marks, the present investigation has made it likely that the pattern of distribution in fig. 1 will not be significantly altered. This is partly because the distribution of new field systems discovered in the photographs of 1968 and 1972 followed this pattern, and partly because there seems to be an acceptable explanation why some parts of the area contain no or remarkably few boundary marks.

For obvious reasons areas with swampy soil, dunes and shifting sand did not come under cultivation. Probably the coastal Littorina plains and the areas along the lower reaches of rivers only became sufficiently well-drained for extensive cultivation at a time when fields were no longer divided by boundary banks. The absence of finds in the moraine region extending from *Dronninglund Storskov* over *Allerup Bakker* and towards the north-east over *Tolne* is probably due to dense, mature forest, cf. the distribution of place-names ending in -holt (Viggo Hansen 1964).

Harder to explain is the near or complete absence of field remains on the glacial islands of the west coast of Jutland and on those at *Hjørring*, *Albaek*, *Hammer* and *Vester Hassing*. According to other find maps covering e.g. graves and grave mounds (Brøndsted III, 1957) the areas were fairly densely populated, but any traces of agriculture are missing. It is possible that the density of settlement entailed more intensive cultivation and thus caused a complete elimination of such traces. This process may have been accellerated by the fact that the soil of the boundary banks did not differ sufficiently from the soil of adjoining fields for durable soil marks to be formed.

There are undoubtedly many problems yet to be solved in the study of ancient fields, but it seems likely that a meticulous study of aerial photographs will help to solve some of them.

Translated by Ole Bay-Petersen

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An Uncompleted Fortification on Sejerø

by DAVID LIVERSAGE

In 1978 the National Museum carried out a small exploratory excavation at Borrebjerg on Sejerø. Borrebjerg is a steep natural knoll rising to 20 m above sea level from surrounding fields at 5–10 m. It has a flat top and a curious shelf on its western side, both of which give a deceptive appearance of being artifical. At various places around the northern and eastern foot of Borrebjerg there is (or was earlier) a substantial occupation layer with finds from fairly late in the pre-Roman Iron Age. Excavations were carried out by Carl Neergaard and Hans Kjær just before the turn of the century, and the locality is mentioned in a number of publications. It is necessary to give a brief account of the background in order to explain the aims of the 1978 excavation.

1. In 1897–98 extensive excavations were carried out by the National Museum under Carl Neergaard and Hans Kjær. Their excavation plan, redrawn with additions, is shown in fig. 2. They found a very substantial occupation layer at the foot of the hill in cuttings L – P, and also to some extent in cutting B at the top of the hill as well as fainter traces in other cuttings. Their work is described in four handwritten reports at the National Museum. These include many photographs, detailed if rather schematic plans and sections, lists of finds with their number and provenance, etc. The excavation was very well conducted according to the standards of the time, but failed in fact to elucidate the structural features of the site. Much space is devoted to various accumulations of stones, which appear to have been accidental, and to the places of the objects found. The finds consisted of a considerable quantity of pottery and animal bone, and also a number of bone artifacts, which are not common at Iron Age Settlement sites because of soil acidity, and, as is rather strange, a number of iron spearheads. Some of the objects are illustrated by Liversage (1975, figs. 13–14), and the pottery is referred in Liversage (1980) to the Rørby phase of the pre-Roman Iron Age of Zealand, which can be related to C.J. Beckers pre-Roman Iron Age IIIa in south and central Jutland.

2. The site was described by Sophus Müller in an article on Roman Iron Age settlement sites (Müller 1906), where it was grouped together with the shell midden at Eltang Vig as being an abnormal site. With present knowledge of pottery development Müller's dating can be corrected, but this is not so important. He regarded the terrace as artificial and of Iron Age date as there were thin traces of occupation earth on it in some of cuttings F-J. He suggested that the terrace might have been for an audience to stand on and watch ceremonies taking place on the flat top of Borrebjerg. The finds of weapons were interpreted as indicating that a battle had taken place at the site, of which the name Borrebjerg or Borgbjerg might be a reminiscence. He also thought there were traces of terraces on the opposite side of the hill and on the neighbouring hill of Bybjerg, but his imagination was already beginning to play up as photographs show that these were doubtful even at that time (ploughing notches).

3. In 1928 Hans Kjær published an article suggesting that a quite different hill, "Borgbjerg" at Boeslunde on Zealand, where much Bronze Age gold had been found, had been a cult site with terraces (Kjær 1928). Admittedly the supposed terraces were only known from a landscape painting and had been destroyed decades earlier. In this article he also mentions the terraces at Borrebjerg on Sejerø, which he wrote were "strange and so far not explainable". His memory must have been playing him tricks, for he described the "terraces" (in my opinion there was never more than one) as leading obliquely up to the top. In reality the highest point of the terrace is four meters below the top in vertical distance and falls from there in both directions to peter out in the lower slopes. The hunt was now out for terraced ritual sites. In 1938

J. Winther described a terraced hill, Solbjærget, near Illebølle on Langeland, and mentioned a further one at Nymark Skov on the Egeskov estate on Funen. He regarded the terrace on Solbjærget apparently as artificial, prehistoric, and of cultic significance, but there was really no evidence. Nymark Skov he passed more quickly over. The idea that there had existed a class of ritual site characterised by terraced hills was given verisimilitude by its treatment in the second edition of Brøndsted's *Danmarks Oldtid* (1957–60, ii, 278 and iii, 178–79). However nothing can conceal the fact that none of the sites have been properly investigated and described. Seemingly Borrebjerg on Sejerø is the only one whose terrace is at all striking. It may be hoped that the investigations described below and those carried out recently at Boeslunde by Henning Nielsen will de-mystify one of the wilder footnotes in Danish archaeology.

4. A few years ago while studying Hans Kjær's reports the author was struck by various indications that there had been a ditch in the excavation north of the hill, though it had not actually been mentioned by the excavator. The evidence was presented in an article on the finds and monuments of Sejerø (Liversage 1974), where some of the relevant drawings and photographs were reproduced, and this was followed up in 1978 by the trial excavation which it is intended to describe here.

THE 1978 EXCAVATION

This was carried out with the strictly limited aims of: –

a) ascertaining whether the terrace was natural or artificial, and

b) checking whether there had been a ditch in Kjær's or Neergaard's cuttings on the lower slope.

Five radial trenches were cut by machine on the lower slopes of the hill on the north and east, and three more were dug by hand across the terrace, where the machine could not dig in a radial direction because of the slope. In fig. 2 the new cuttings are shown added to Neergaard and Kjær's plan from 1897–98, and at this point something must be said of the problem of planning the site.

There are two difficulties. In the first place the old plan is not very precise, and in the second there are no fixed points whereby the new cuttings can be keyed into it. If the terrace had proved artificial there would certainly have been made a complete new survey, but it would still have been impossible to fit the old cuttings in correctly, so in the event it was decided to try to place the new cuttings on the old plan. This was done by choosing an arbitrary base point at the centre of the flat top of the hill, from which compass bearings were taken to the new cuttings and the distance was measured by tape in horizontal segments. A check of the distance between trenches showed that sufficient accuracy had been achieved. The new plan was then correlated with the old by drawing it on transparent film at the original scale, centering the new base point at the middle of the top of the hill on the old plan, and aligning the orientation so as to allow for the slight clockwise shift of the magnetic deviation since the turn of the century. The result reveals some errors in the old plan, particularly in the placing of the hachuring that is supposed to indicate the slope. This is worst on the western side. Cuttings VII and VIII and the wider part of cutting VI were in fact dug across the terrace, while the separate western outlier of cutting VI is 5½ m lower at the bottom of the very steep slope below the terrace. The gap is there because the 45° slope was too steep to dig on. Cuttings I to IV come right in to the steep upper slope of Borrebjerg instead of beginning a few meters out in the field as the old plan suggests. On the other hand the relation between cuttings IX and B and between I and II and P agrees fairly well with what was observed during excavation, when traces of Kjær's digging were found. Cutting III falls nicely between Kjær's cuttings O and P, where a gap in the black earth is shown in the original reports (Liversage 1974, fig. 11). Thus the composite plan, though not cartographically correct, is still serviceable for relating the two excavations.

We may first consider the new trenches I – III. They were dug from the steep grass-clad slope of Borrebjerg out into the sloping ploughed field, and must have passed through Kjær's cuttings. An old ditch cut into the boulder clay showed quite clearly in the sections of cuttings I and II (fig. 3). It was about 2 m wide and 1 m deep, steeper on its inner than its outer edge, and had an irregularly rounded bottom. The material filling it was quite clearly the backfill of Kjær's excavation. The idea that Kjær had encountered an old ditch at this place was thus confirmed.

In cutting III there was no ditch, which coincides

Fig. 1. Borrebjerg seen from the SSW (photo 1897).

with information indicating there was a gap in the occupation layer between Kjær's cuttings O and P.

Cutting IV, which despite the different impression given by Neergaard and Kjær's slope hachuring also lay right up to the steep slope of Borrebjerg, was quite remarkable. The mechanical excavator cut across a filled-up ditch that had been 3.75 m wide and 2.50 m deep with V-shaped section and undisturbed fill (fig. 4). At the bottom there was a deposit of primary silt consisting of sand and gravel and capped by a streak of brown mould. It had been deposited mostly from the uphill side of the ditch, where the slope above became steep. Over this lay a thick mixed layer which was obviously a deliberate backfill. It consisted of dense clay, which was the same as the bedrock surrounding the lowest part of the ditch, and sand, which was the bedrock higher up, and contained also streaks of surface loam and a gritty mixed layer as explained in the figure text. The ditch had been refilled with this material, so that it survived afterwards only as a gentle depression in which a brown-coloured soil or turf layer formed, presumably indicating some interval between the refilling of the ditch and the formation of the overlying dark layer. This latter was blackest below and browner higher up, and contained sherds of the same kind as found by Neergaard and Kjær as well as also happening to produce a human occipital bone, determined by Berit Sellevold as belonging to a young adult, probably male, and C-14 dated to 2300 ± 80 B.P, or 425 B.C. calibrated (K-3582). This seems rather earlier than is likely in view of the pottery from the same layer.

Cutting V was placed where it would intercept Neergaard's cutting M out in the more gently sloping ploughed lower part of Borrebjerg on the east (the outer belt of hachuring in fig. 2 here represents the gentle lower slopes, which are not hachured at all on the north). At its western end were encountered two undisturbed parallel ditches, which crossed the trench at approximately right angles. They were both flat-bottomed, about 2 m wide and 1 m deep, and they were separated from one another by a one meter wide baulk of undug till (fig. 5). Each had at its bottom a deposit of primary silt that had accumulated from the

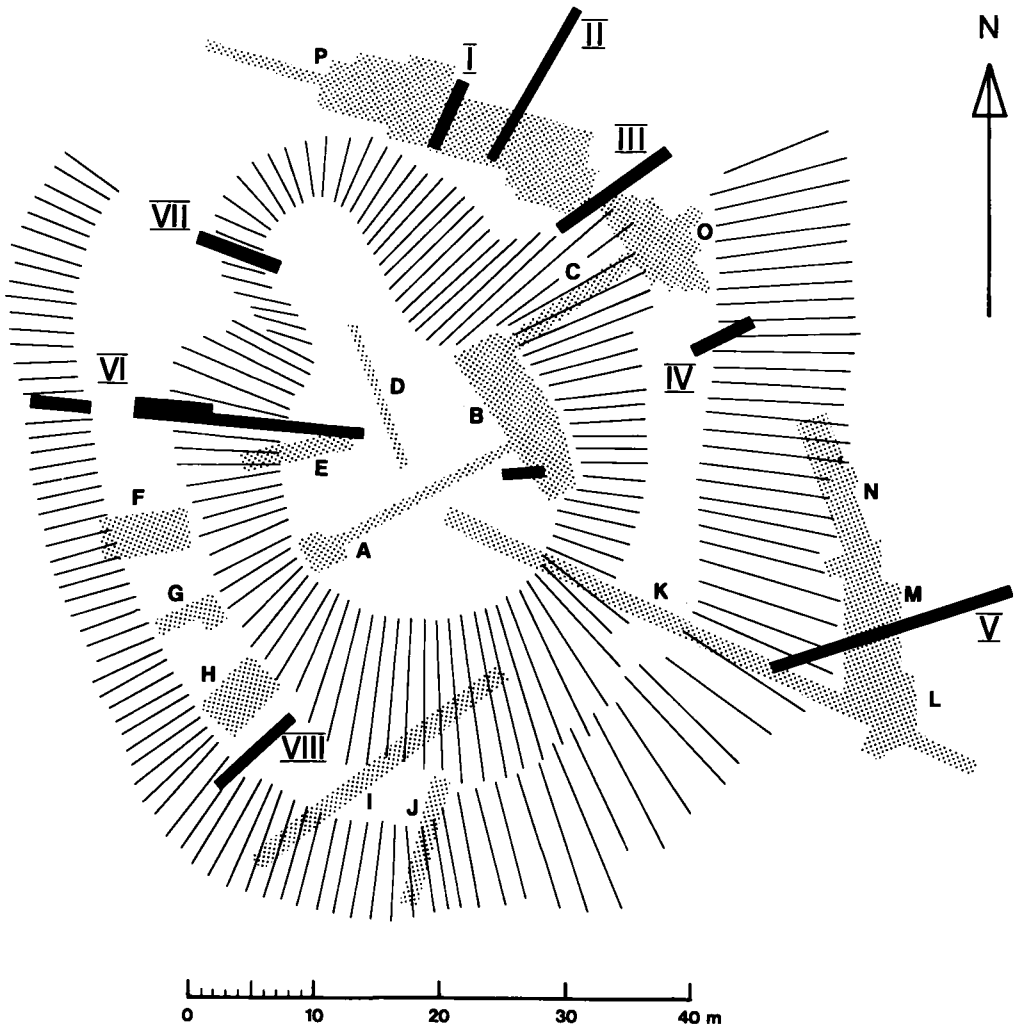

Fig. 2. Borrebjerg, Sejerø. Cuttings I – IX according to 1978 survey, areas A–P and relief hachuring after Neergaard and Kjær's plan, 1897–98.

uphill side and was overlain by a mixed backfill over which again there were traces of a dark occupation layer. The stratigraphy was thus the same as in cutting IV, but the backfill was more homogeneous, probably because the bedrock at this place also was more homogeneous, and the occupation material was less pronounced.

Let us now turn to the three cuttings made across the terrace on the other side of the hill. In cuttings VII and VIII nothing whatever was found. Under the sod came the undisturbed till with no intervening occupation layer or any sign of human interference. Cutting VI was more interesting (fig. 6). It was placed on the highest part of the terrace and the part of it dug across the terrace itself was supplemented by a narrow strip taken up to the top of Borrebjerg and by a separate little area dug at the bottom of the slope down to the surrounding field. There did not appear to have been any human interference with the natural deposits. Material dug out to make the terrace had neither been piled up to build out the flat top of Borrebjerg nor thrown out over the slope, where it would certainly have revealed itself at the bottom. However the section across the terrace was not without features. It could be seen that there originally at this spot had been no real terrace but merely a local reduction in the steepness of the slope. Onto this had been thrown a deposit of stones of various sizes mixed with dark earth, animal

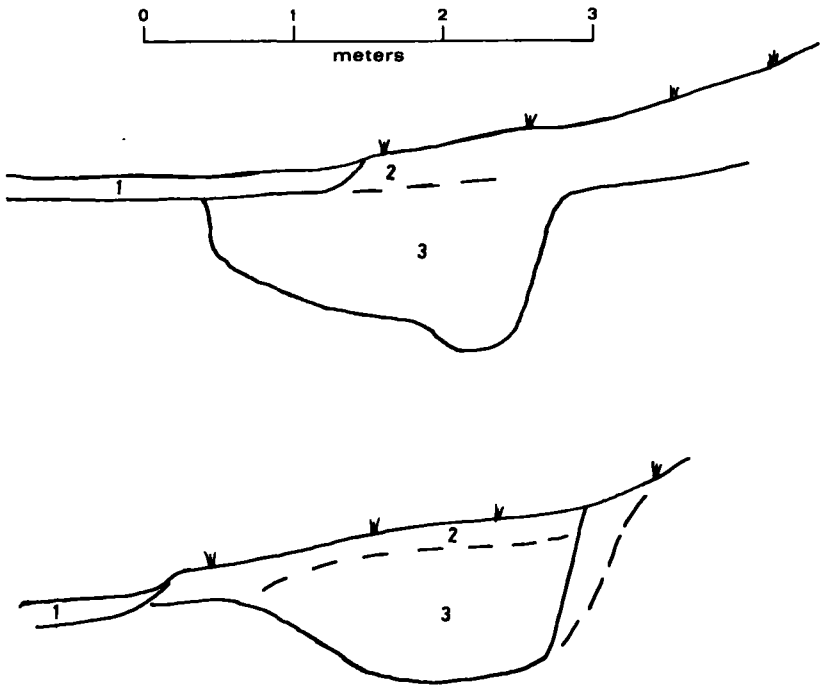

Fig. 3. Borrebjerg. Cutting I above and II below, E sides' section. 1: plough soil. 2: older plough soil. 3: Kjær's fill.

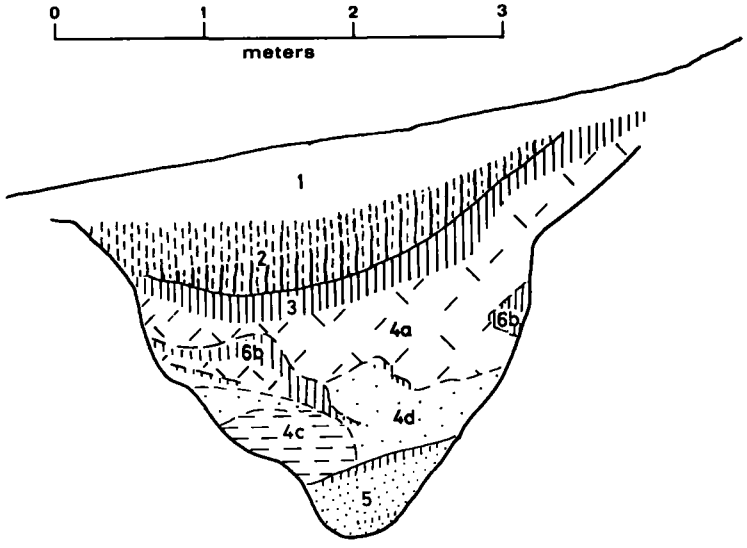

Fig. 4. Cutting IV, SE side, section. 1: blackish plough-soil. 2: brown to black clayey loam, darkest below. 3: brown loam. 4a: rust-coloured gritty fill. 4b: brown to dark brown loam. 4c: tough yellow clay. 4d: calcareous sand. 5: coffee-coloured sand and gravel with lenses of brown loam.

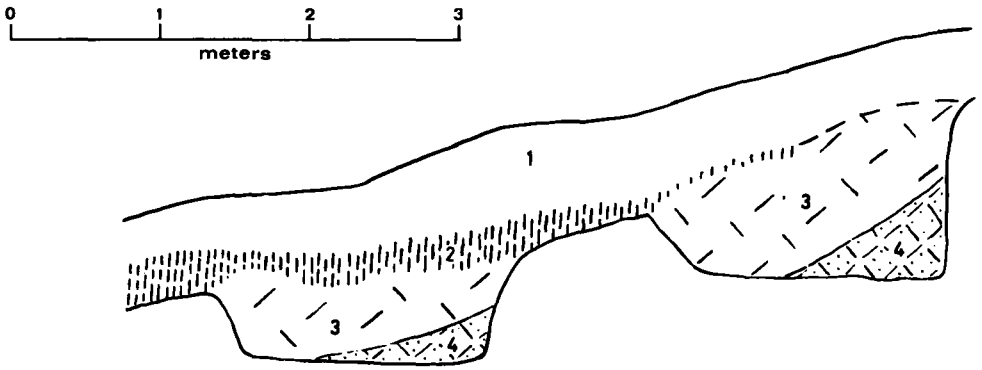

Fig. 5. Cutting V, S side, section. 1: ploughsoil. 2: dark brown loam. 3: redeposited natural clay with humic pockets. 4: dark grey sandy loam.

bones, and pottery of the same kind as found in the old excavation. This was not a makeup layer intended to level out the terrace, but a perfectly ordinary rubbish deposit such as is frequently found in pits or natural hollows (see Liversage, 1980, 41). Not only did the stones slightly level the slope, but it seems that the nutrients from the rubbish stimulated biological activity in the soil resulting in an especially thick surface layer at these places. Because of the limited extent of the excavation is not possible to say how extensively the rest of terrace was altered by rubbish dumping, but it is clear that it was not formed by the hand of nature in quite the shape it has had since the Iron Age occupation. The changes, however, were not a deliberate building-out, but only a fortuitous consequence of the casting of rubbish into hollows in the slope. A possible post-hole was intersected by the cutting, but it is not possible to say anything about it because the excavation was so small.

THE INTERPRETATION OF THE RESULTS

The hypothesis that there were prehistoric ditches at the foot of Borrebjerg has now been amply confirmed. Combined with the unusually many finds of weapons this really suggests that the name may be a reminiscense of events that took place more than two thousand years ago – as indeed was suggested by Sophus Müller.

However the fortification – and it is hard to see that the ditches can have had any other purpose than to fortify the site – was never finished. We found a finished ditch only in cutting IV, where it was deep and pointed with a definitely military character. It can be suggested that the double ditches in cutting V only indicated a preliminary stage, the intention being later to join them up as a single large V-shaped moat. Nor does it seem likely that the ditch in cuttings I and II was finished, because as found it was not big enough to have great defensive value. The absence of any trace of a ditch in cutting III may also reflect the incompleteness of the work, but of course it is always concievable that there was intended to be an entry at this place.

The curious thing is that after the accumulation of a small quantity of primary silting at the bottom of the ditches, probably indicating a period of days or weeks rather than years, they were refilled, presumably with the earth taken out of them. It looks as though there was a change of plan. Perhaps the project was found to exceed the labour resources of the island, or the military threat seemed to have passed over, or the site had to be levelled as part of a peace agreement. Nobody knows. Afterwards the place was settled, and rubbish from the occupation is preserved in the upper parts of the ditches that had not been filled quite to the top. It is likely that the settlement followed not long after the filling-up, for in his cuttings Hans Kjær reported that there was an upper, black, and a lower, grey layer, which seem likely to be respectively the occupation layer and the backfill; the pottery was of the same kind in both layers.

A fortified site of the Early Iron Age is something of a rarity anywhere in northern Europe except on certain Baltic islands. There is a parallel on an islet in

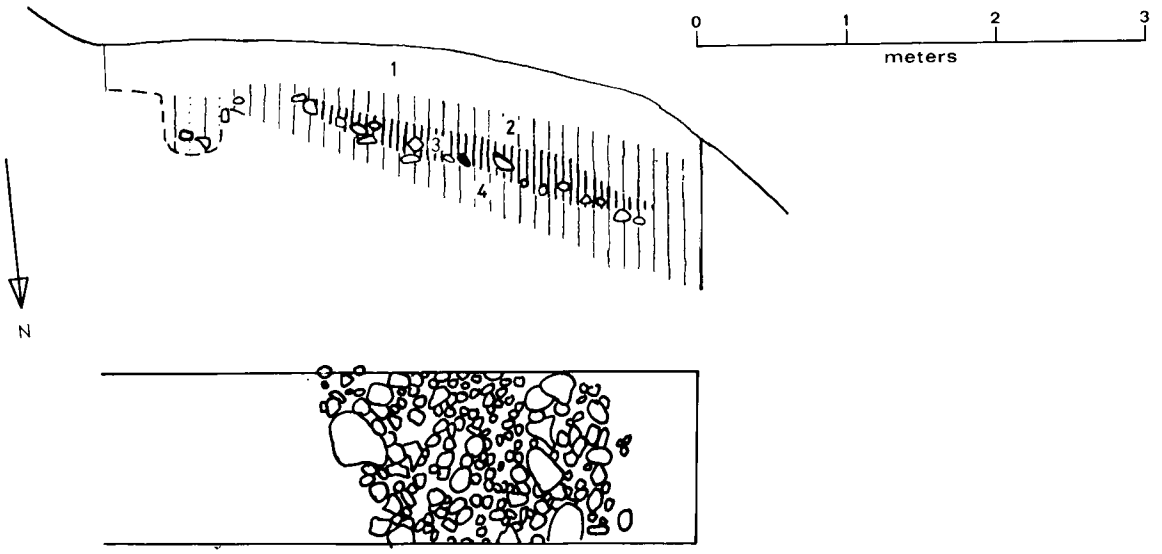

Fig. 6. Cutting VI, plan and section of S side. 1: surface soil. 2: grey sandy loam. 3: black sandy loam with occupation material. 4: grey sandy loam.

the bog, Borremose, in north-central Jutland, which was girded with a ditch early in pre-Roman times and later used as a settlement (Brøndsted 1957–60, iii, 47–54), and recently what appears to be a fortified Roman Iron Age site has been found at Priorsløkke (Skalk 1981: 5 – is it possible that the ditch here was V-shaped but only its upper more humic silting was recognized and excavated?). The linear earthwork of Olmer's Dyke in southern Jutland is also dated to the Early Iron Age. Borrebjerg is thus not completely unparallelled.

The other result of the excavation was to show that the terrace can be discounted as a deliberate man-made feature, even if its present form is somewhat the result of rubbish tipping from the settlement. This is really evident on the surface, for however artificial the shelf may look in the middle, it has no clear beginning or end. To the south it inclines increasingly outwards, narrows, and merges into the hillside. To the north its outer edge diverges from Borrebjerg and gradually assumes the appearance of a natural bank in the field. The shelf must be the result of an early landslip, when the ice was melting. Its regularity has been increased by early rubbish tipping and newer cultivation. There is no reason to hear more about terraced cult sites.

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Interpretation of the Great Votive Deposits og Iron Age Veapons

by JØRGEN ILKJÆR and JØRN LØNSTRUP

Ever since Engelhardt's excavations in the 19th century of the finds from Thorsbjerg, Nydam, Vimose and Kragehul many imaginative suggestions have been made to interpret this category of finds. Some of these are summarized in Ørsnes 1969: XXI ff.

The two main interpretations were advanced by Worsaae/Brøndsted and Jankuhn, respectively. The former argued that the finds represent sacrifices of war booty, i.e. they consist of objects belonging to a defeated enemy and collected from the battle-field after combat. It was further assumed that in some cases people returned to the same locality to make additional votive deposits of booty (Brøndsted 1960: 228 ff.). This explanation has the advantage of defining the find category and is moreover documented in classical sources (Hagberg 1967: 65 ff.). *A consequence of the war booty theory is that the objects sacrificed did not belong to the local population* unless it was a civil war.

The other interpretation, made by Jankuhn, was based on a study of the Thorsbjerg find. Jankuhn stated that Thorsbjerg had been the scene of sacrifices at different times and that the deposits gradually changed in type (Jankuhn 1936: 202, Ørsnes 1964: 206). The great votive deposits of army equipment in Schleswig were said to have been possibly "a war sacrifice" (Jankuhn 1966: 388 ff.). The concept of "war sacrifice" is not defined, but either Jankuhn accepts the war booty theory or he postulates that it is *the equipment belonging to the local (Anglian) population that is sacrificed.*

In Jankuhn's opinion Thorsbjerg was a central sanctuary for the whole of Angeln (Jankuhn 1977: 231). We agree that from the time during B 2 when the first sacrifice was made of army equipment, Thorsbjerg became a central sanctuary for sacrifices of such equipment. The many clay vessels, the majority of which are of pre-Roman date (Raddatz 1970: 189 ff.), belongs to an entirely different and very common type of sacrificial find, which has nothing in common with the deposits of army equipment (Becker 1970: 30 ff.).

Any large-scale peat excavation in Jutland and Schleswig invariably yields pottery, and the "bog pottery" from Thorsbjerg may at best constitute a "central sanctuary" for an area the size of a parish. There is nothing to suggest an innate connection between votive deposits of pottery and those of army equipment.

It appears from Raddatz's study of the Thorsbjerg military equipment that it was not deposited continuously over an extended period (Raddatz 1957: 143, Raddatz 1970: 191, fig. 1). Raddatz dates only two objects to B 1, namely the fibula illustrated in Engelhardt 1863: T. 4: 1 and the belt buckle illustrated in Engelhardt 1863: T. 11: 63. The fibula, which shows several repairs, was old when deposited and may well have been sacrificed only during B 2. The buckle, shaped like a figure of eight, belongs to a common B 1 group but is also known from definite B 2 contexts (Albrechtsen 1956: 171 and T. 17 f and g). Both objects may have been sacrificed in B 2, and in our opinion the whole army equipment from the Early Roman period may have been deposited on a single occasion during B 2. The limited distribution within the sacrificial pool of Early Roman army equipment (cf. fig. 1 and note 1) would also seem to support this assumption.

The artefacts assigned by Raddatz to the Early Germanic period (Raddatz 1970: 191 ff.) do not occur during this period. On the other hand, identical objects are known from Ejsbøl-Nord (Ørsnes 1963: 232 ff.), and they must consequently be assigned to the end of C 2. These objects too have a limited distribution within the sacrificial pool, cf. fig. 1. This would suggest that they were deposited on a single occasion.

The great votive deposit at Thorsbjerg containing more than 95% of the military equipment was made during C 1b. Fig. 2 shows the distribution of finds

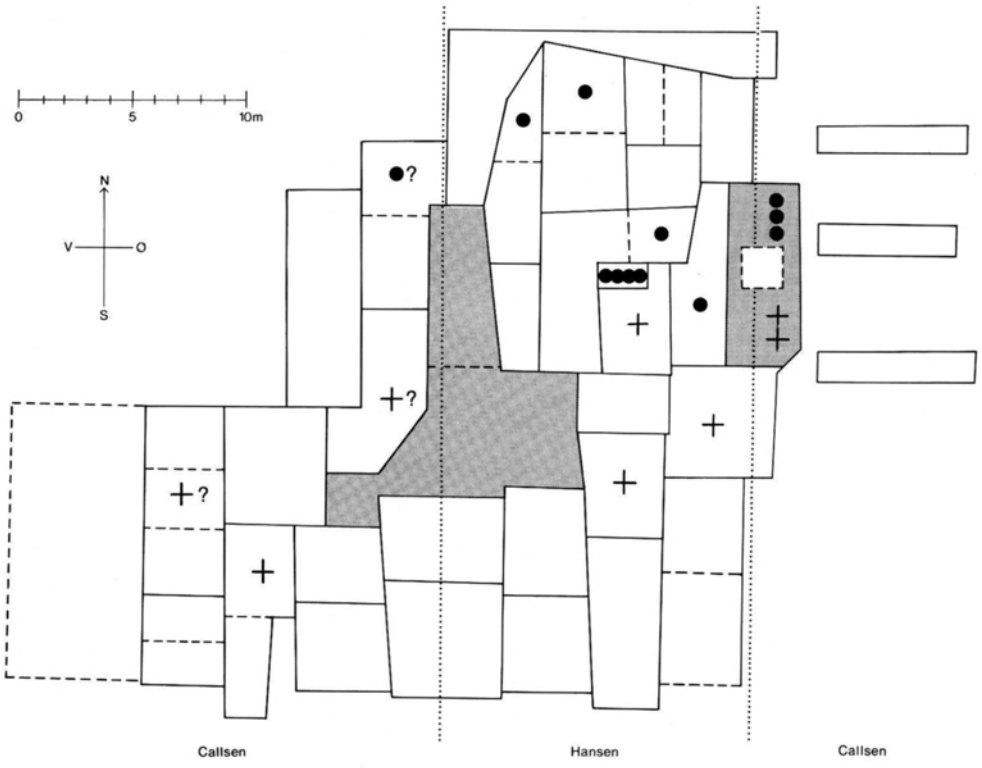

Fig. 1. Thorsbjerg. Artefacts from period B 2 (+) and period C 2 (•). The following symbols have been used: 1) _____ Definite limits of excavation trenches. 2) - - - - Indefinite limits of excavation trenches. 3) . . . . . Boundaries between plots within the excavation area (names of plot owners are added below) 4) Excavation trenches reproduced by screen process were investigated in 1856 and 1858, and few or no find data are available. 5) ? indicates that an artefact cannot be confidently assigned to the trench given.

within the excavation area. It can be seen that objects were uncovered in practically the whole excavated area, and that the density of finds declines towards the edges of the excavation.

That votive offerings have been made throughout the excavation area on a single occasion during C 1b is apparent from the shield-bosses and shield-handle mountings. The shield-bosses have been subjected to uniform ritual destruction; they show several cuts, and all were removed from the wooden shields prior to the offering. As appears from fig. 3, most of them were deposited within a very small area. This is in accordance with Engelhardt 1863: 15, who states that "there was thus one area where nearly all the shield-bosses were discovered close to each other". The uniform destruction and the heap of shield-bosses indicate the simultaneous offering of all bosses. This supposition is strengthened by a typological analysis which shows that all the scattered shield-bosses are of types also found in the heap of bosses.

In contrast to the shield-bosses, the shield-handle mountings were dispersed fairly evenly throughout the excavation, cf. fig. 4. The shield-bosses and handle mountings must have belonged together before the ritual destruction of the shields (we know from grave finds that shield-bosses of iron, bronze or silver are associated with handle mountings of the same material). Since all bronze and silver bosses are assumed to have been deposited simultaneously, together with the associated mountings, we have evidence of a very considerable votive deposit from C1b (cf. Godłowski 1970: 13 and 95). This deposit can be traced throughout the excavation area.

At Thorsbjerg there were found a total of 42 fibulae datable to C 1b. Thirty-eight of these (i.e. 90%) belong to Almgren's group VII. Fig. 5 shows the distribution

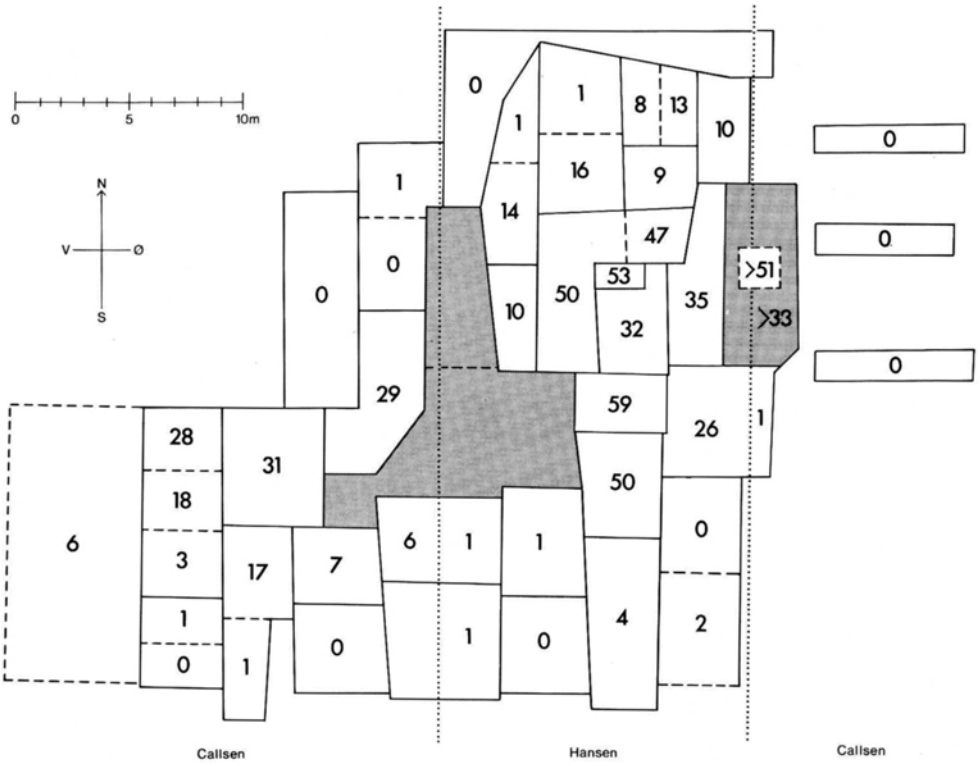

Fig. 2. Thorsbjerg. The number of artefacts from period C 1 in each excavation trench. The map includes only artefacts of metal (but not objects of iron and buttons of bronze and silver) as well as artefacts of glass and stone. Cf. the map in fig. 1.

of the fibulae within the votive area. It can be seen that their pattern of distribution is almost the same as that of the shield-handle mountings, and that both series 2 and 3 are evenly distributed. Because of this uniform distribution over a large area the fibulae from Thorsbjerg cannot be interpreted as a votive find á la Pyrmont (Frischbier 1922: 1 ff.), where the fibulae were concentrated within a very small area. Consequently, for reasons of distribution and chronology these fibulae must be interpreted as an integral part of the army equipment from C 1b. We know from the finds at Ejsbøl-Nord (Ørsnes 1963: 241) and Illerup site 1 and 2 that this category of votive finds includes fibulae.

In 1957 Raddatz classified the Thorsbjerg fibulae according to Kuchenbuch's typology. He established that the fibulae belonging to Almgren's group VII were of Elbe-Germanic shape and explained this by assuming that Angeln was a transition zone between the Scandinavian and Elbe-Germanic culture areas (Raddatz 1957: 109 ff.). As early as 1930 la Cour had pointed out that some of the fibulae from Thorsbjerg were "Saxon" in shape, and he concluded that the find testified to an unsuccessful Saxon invasion (la Cour 1930: 186 ff.).

In the following we shall employ Kuchenbuch's typology with a few modifications (2). Fig. 6 maps grave finds of fibulae belonging to Kuchenbuch's series 1 and 2. It will be seen that fibulae of these series are found within the whole area mapped – their presence in Angeln being particularly noteworthy. Outside the area studied these types are common in Scandinavia (especially the western part) and in the Elbe region (especially the northern part). At Thorsbjerg there were found only 7 specimens of series 1 and 2, as opposed to 19 of series 3. Fig. 7 maps grave finds of fibulae belonging to series 3. As will be seen this series is not met with north of the Eider. In Holstein the series is very common, and outside the mapped area it is commonly found in the northern

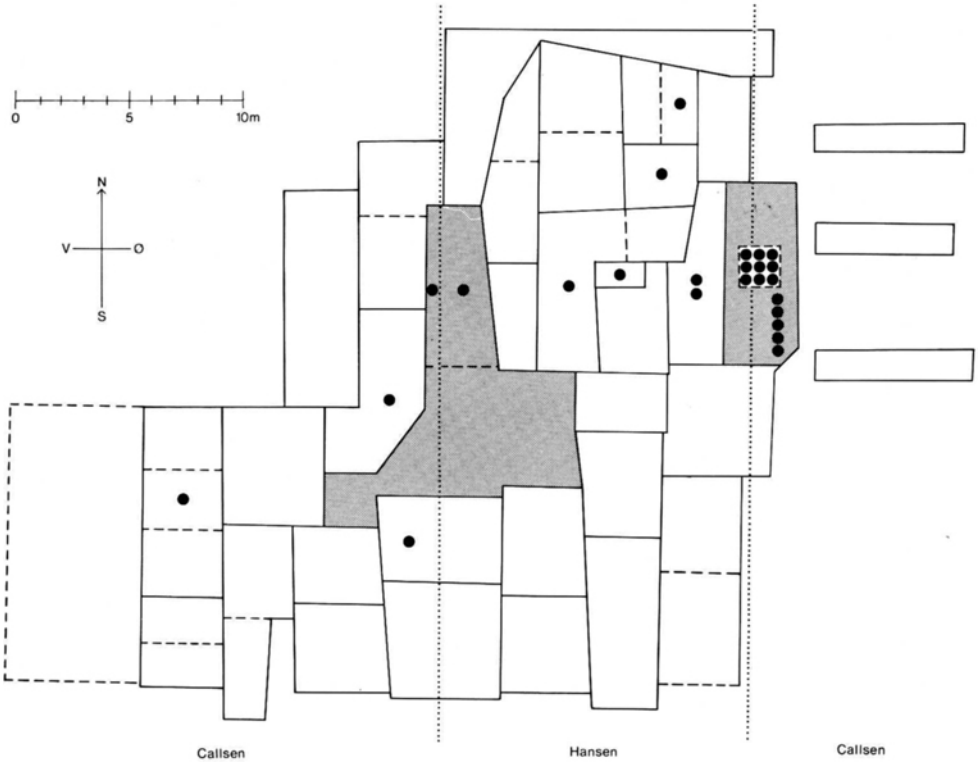

Fig. 3. Thorsbjerg. Shield-bosses of bronze or silver (small fragments not included). Cf. the map in fig. 1.

part of the Elbe region and in the Rhein-Weser area (Kuchenbuch 1938: 76 ff Liste 5 and Böhme 1972: Table 22, figs. 893–99). Kuchenbuch's series 4 has not been mapped. Series 4a is very common in grave finds from Scandinavia as well as West and East Germany. By contrast, series 4b, three specimens of which are known from Thorsbjerg, has a significantly more restricted distribution. In graves and settlements it is restricted almost exclusively to the area between the Elbe and the Rhine (Kuchenbuch 1938: 79 ff Liste 6 and Böhme 1972: Table 22, figs. 900, 901, 904 and Table 23, fig. 907). We may therefore conclude that *during C 1b, in terms of fibulae, Angeln is not a transition zone between the Scandinavian and the Elbe regions. Angeln definitely belongs to the Scandinavian culture area, the south boundary of which is the Eider.*

Since more than half (22 out of 42) of the Thorsbjerg fibulae from C lb are not of Anglian provenance, but must have been manufactured at least south of the Eider, the find may be interpreted in one of the following ways:

1) The C lb deposit is a votive offering of war booty.
2) The fibulae were imported to be used solely in votive offerings. This does not agree with their horizontal distribution at Thorsbjerg which strongly indicates that they are an integral part of the C lb offering.
3) Series-3 fibulae are not contemporaneous with those of series 1 and 2, which is the reason for the absence of series 3 in grave finds from Angeln. Against this it may be argued that there is no indication that the series are not contemporaneous.
4) The number of fibulae found in graves from Angeln is not particularly large, and it may be accidental that series 3 is not represented in the graves. This is at variance with the frequent presence of series 3 in Holstein and its complete absence on Funen, which is culturally very close to Angeln.

We may thus conclude that the fibulae form part of a votive offering of war booty from C1b, and that the army whose equipment was deposited at Thorsbjerg must have originated

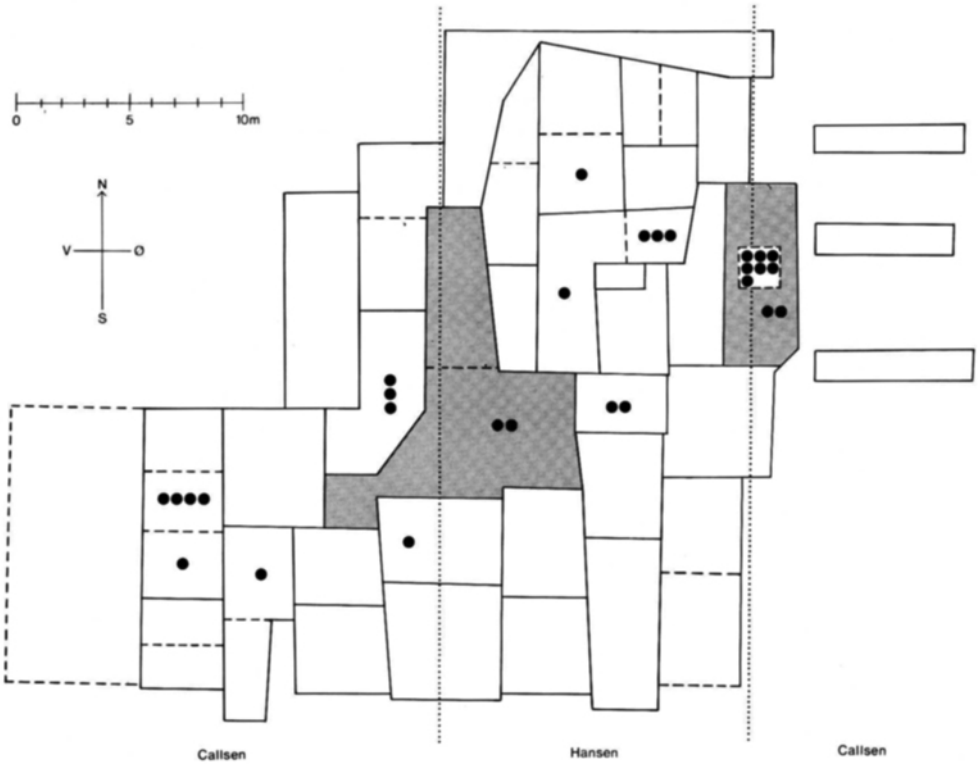

Fig. 4. Thorsbjerg. Shield-handle mounting of Jahn's type 9. Cf. the map in fig. 1.

in the area between the Elbe and the Rhine. Only this assumption provides a reasonable explanation of the types of fibulae and shield-bosses discovered. Nine of the shield-bosses found at Thorsbjerg (i.e. 32%) (Engelhardt 1863: 33 ff.) are of Roman provenance (or come from an area under heavy Roman influence). These shield-bosses, which are decorated with incisions of concentric circles having a common centre with the boss, are unknown among the rich grave goods found in Scandinavia and Poland. On the other hand, the type has been found twice in the Elbe culture area (3), where graves with weapons are very rare.

One of the Thorsbjerg fibulae was definitely manufactured on Funen or in Schleswig-Holstein (Raddatz 1957: 109 and map 12). It must have belonged to a local assistant (forced or voluntary?), or it may have been looted by the invaders before they were finally defeated in or around Angeln.

The two small deposits of army equipment from B 2 and C 2 cannot in the same way be demonstrated to represent war booty offerings. Their limited distribution within the votive pool probably indicates that only two deposits are involved. Since votive offerings of war booty have been demonstrated at Thorsbjerg, and the two lesser deposits can be interpreted as such without difficulty, we must interpret these deposits too as votive offerings of war booty, until an acceptable alternative explanation is put forward.

There is also no evidence of continuous votive deposits of army equipment in the Skedemosse find on Öland (Sweden). Unfortunately, the find is difficult to evaluate as almost 90% of the material had been destroyed before systematic excavations began (4). From an initial study of the material in Statens Historiska Museum, Stockholm, we were satisfied that from a chronological point of view the find can be regarded as consisting of two deposits from the Late Roman period and at least one from the Early Germanic Iron Age. A distinct sorting of the Skedemosse material had clearly taken place before the votive offering was made. The actual deposition normally happened from a boat, i.e. in exactly the same way as the earliest sacrifice at Illerup (Ilkjær and Lønstrup 1977: 156 ff.).

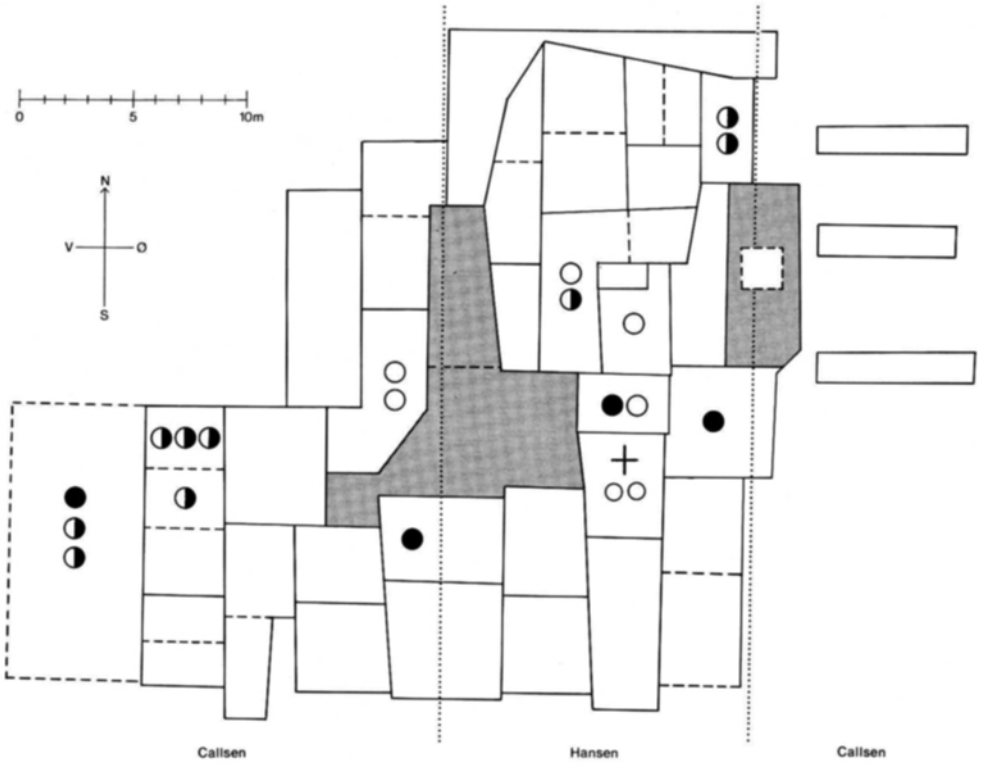

Fig. 5. Thorsbjerg. Fibulae of Almgren's group VII. Series 1 (+), series 2 (o), series 3 (•), series 2 or 3 (o). (N.B. Of the latter, two at most belong to series 3, the others to series 2). Cf. the map in fig. 1.

In all probability the Illerup deposit represents a single major offering made partly by throwing from the edge of the lake and partly by boat. *In our view the army equipment from Skedemosse should be interpreted as three or more war booty deposits*, since there is nothing in the find to contradict such an interpretation. The meat offerings on the same site during the pre-Roman and Early Roman Iron Age (Hagberg 1967: 61 ff.) should in our opinion be compared with the contemporaneous votive deposits of pottery at Thorsbjerg. Consequently, they have no other link with the votive offerings of army equipment/war booty than a shared place of deposition. There are no indications that a local tradition of pottery or meat offerings is automatically succeeded by offerings of army equipment.

On the basis of the ship finds from Nydam and Hjortspring Jankuhn has proposed a theory about a regional find group of ships sacrificed in special "ship sanctuaries" (Jankuhn 1966: 394). The two intact ships from Nydam were discovered filled with army equipment, and from the records of the Flensburg Collection, Engelhardt's publication and the find report by the royal gamekeeper Jørgensen it seems likely that the two ships were sacrificed at the same time. We may assume that both ships were part of a war booty offering since their contents of weaponry classify them as part of a votive deposit of military equipment, and since one of them was built of pinewood, a tree not growing in Denmark at the time (personal communication from P. Wagner, Botanisk Centralbibliotek, Copenhagen). Boat sacrifices are also known from Vimose (Engelhardt 1869: 26) and Ejsbøl (Ørsnes 1963: 247), but there the boats themselves had been burnt and only rivets were deposited. As we have seen, some votive offerings of war booty include ships, and there is no reason to assume that they were not sacrificed to the same deity as the remaining booty.

Engelhardt rejected the "battle-field theory" already after the first excavation at Thorsbjerg (5). It was later adopted by H. Kjær and C. J. Becker as a result of the finds from Illemose and Krogsbølle (Kjær 1901: 26 ff. and Becker 1948: 170). In both finds the swords in

particular had been subjected to a secondary, ritual destruction, which makes the "battle-field theory" very unlikely. Nothing in these two finds argues against an interpretation of them as classic votive offerings of war booty.

CONCLUSION

The great C Ib votive deposit from Thorsbjerg can only be interpreted as a war booty offering. The fibulae show that the invaders whose weaponry was deposited in the then existing lake originated from the region between the Elbe and the Rhine. In this particular region graves with weapons are virtually unknown, and we have no previous knowledge of weaponry at the beginning of the Late Roman Iron Age. The Thorsbjerg find fills this gap and provides a very detailed insight into the military equipment.

The two small deposits of army equipment from Thorsbjerg as well as all the other Iron Age deposits of this type can be readily interpreted as votive offerings of war booty. No other theories are supported by the archaeological evidence, and there is no reason to accept other interpretations.

From the Early Germanic Iron Age a group of votive offerings is known containing sword and belt mountings. Whether these finds – Nydam II (Kjær 1902: 23 ff.), Porskær (Engelhardt 1881: 128 ff.) and Ejsbøl Syd (Ørsnes 1963: 243 ff.) also represent deposits of war booty is uncertain. It is significant, however, that these *pars pro toto* offerings are found only in places with previous deposits of war booty.

Translated by Ole Bay-Petersen

Fig. 6. Grave finds of fibulae belonging to Kuchenbuch's group VII, series 1 and 2, from South-West Denmark and North Germany. (N.B. Only fibulae with flat-ended feet are included). Series 1 or 2 (•), series 1 b (+), series 2 (o), Thorsbjerg (□). For a list of finds see note 2 and Appendix.

Fig. 7. Grave finds of fibulae belonging to Kuchenbuch's group VII, series 3, from South-West Denmark and North Germany. Series 3 a (+), series 3 b (•), Thorsbjerg (□). For a list of finds see note 2 and Appendix.

NOTES

[1] The distribution maps of artefacts from Thorsbjerg are based on Engelhardt's excavation plan and excavation diary. Unfortunately, we possess detailed information only about the excavation project in 1860, though it has been possible to locate a few finds from 1856 and 1858. A new assessment of Thorsbjerg as illustrated by archival findings has been completed and will be published in the Jutland Archaeological Society Publications.

[2] The typology used is that advocated by Kuchenbuch 1938: 26 ff., but with the following changes:

1) In his series 1, Kuchenbuch includes fibulae the bow of which terminates in a knobbed catch-plate, i.e. the whole of Almgren's

group VII, series 1. As these fibulae are of no interest in this context, we have not included them in the Appendix.

2) Kuchenbuch distributes the fibulae belonging to Almgren's group VII, series 4 (the "monstrous" fibulae) between the other groups. We have accepted this except for fibulae decorated with embossed tinplate rosettes. In this case series 4 should be kept as an independent type.

3) To be able to use Kuchenbuch's typology it is necessary to define the concept "foot-plate" (*fodskive*). We have used the following definition: a fibula is said to have a foot-plate if the foot is thickened and lies below the line in the fibula's symmetry plane that is tangent to the top side of the end of the foot and the spring catch.

N.B. In the Appendix we have included only fibulae that can be definitely classified according to type, i.e. fibulae that are illustrated or so accurately described that their type can be identified without doubt.

[3] Bischleben, Kr. & Bez. Erfurt (e.g. Godłowski 1970: Plate XVII, fig. 5) and Schafstedt, Kr. Merseburg, Bez. Halle (Mildenberger 1970: 147).

[4] Personal communication from the excavator, U.E. Hagberg.

[5] Cf. letter from Engelhardt to Thomsen dated September 5, 1858 (the National Museum, Dept. I, Topographical Archives).

APPENDIX

Abbreviations: s. = sogn (parish), h. = herred (districht)
a. = amt (county).

Kuchenbuch, Group VII, Series 1 a 2:

Fravde, Fravde s., Åsum h., Odense a.: grave 15 (Albrectsen 1968: 57 & T. 77:e) – grave 27 (Albrectsen 1968: 58 & 59, fig. 20) – grave 44 (Albrectsen 1968: 63 & T. 12:g).

Ferreslev, Rolfsted s., Åsum h., Odense a.: single find (Albrectsen 1968: 71 & T. 83:g).

Ørbæk, Ørbæk s., Vindinge h., Svendborg a.: grave 3 (Albrectsen 1968: 77 & 306, fig. 62 e).

Rejstrup, Avnslev s., Vindinge h., Svendborg a.: single find (Albrectsen 1968: 144 & T. 15:a, b) 2 brooches.

Ringe II, Ringe s., Gudme s., Svendborg a.: grave 27 (Albrectsen 1968: 85 & T. 85:c 5) – grave 28 (Albrectsen 1968: 85 & T. 5:h).

Møllegårdsmarken, Gudme s.&h., Svendborg a.: grave 60 (Albrectsen 1968: 99 & T. 13:e) – grave 417 (Albrectsen 1971: 63 & T. 238:a 2) – grave 978 (Albrectsen 1971: 73 & T. 74:g & T. 244:a 3) – grave 979 (Albrectsen 1971: 73 & 75:b) – grave 1358 (Albrectsen 1971: 84 & T. 91:g) – grave 1587 (Albrectsen 1971: 92 & T. 103:b).

Espe mark, Hillerslev s., Sallinge h., Svendborg a.: grave 2 (Albrectsen 1968: 124 & T. 14:f, g) 2 brooches.

Lundehøj, Hillerslev s., Sallinge h., Svendborg a.: grave 35 (Albrectsen 1968: 127 & T. 12:j) – grave 40 a (Albrectsen 1968: 128 & T. 8:i).

Husby, Kr. Flensburg, Schleswig: grave 537 (Raddatz 1974: 46 & T. 107:537 b) – grave 780 (Raddatz 1974: 60 & T. 149:780b) – grave 791 (Raddatz 1974: 60 & T. 150:791 b).

Nottfeld, Kr. Schleswig, Schleswig: grave (Mestorf 1894: 14, fig. 18).

Thorsbjerg: 2 brooches (Raddatz 1957: T. 16:19 & T. 17:2).

Kuchenbuch, Group VII, Series 1 b:

Ringe II, Ringe s., Gudme s., Svendborg a.: grave 7 (Albrectsen 1968: 82 & T. 3:f) series 1 b 2.

Nybølle, Hillerslev s., Sallinge h., Svendborg a.: single find (Albrectsen 1968: 138 & T. 138:c 4) series 1 b 1.

Møllegårdsmarken, Gudme s. & h., Svendborg a.: grave 1017 (Albrectsen 1971: 75 & T. 76:h + T. 244:c 2) series 1 b 3 – grave 1431 (Albrectsen 1971: 87 & T. 99:b) series 1 b 2.

Husby, Kr. Schleswig, Schleswig: grave 1955/42 (Raddatz 1974: 9 & T. 6:42/1955 b) series 1 b 3 – grave 494 (Raddatz 1974: 43 & T. 96:494 b) series 1 b 3 – grave 757 (Raddatz 1974: 58 & T. 145:757 c) series 1 b 3.

Goting, Föhr, Kr. Südtondern, Schleswig: grave (Genrich 1954: 56 & T. 12:B 3) series 1 b 1.

Preetz, Kr. Plön, Holstein: grave 110 (Brandt 1960: 84 & T. 16:110 b, c) 2 brooches series 1 b 3 – grave 116 (Brandt 1960: 84 & T. 24:116 b) 2 brooches series 1 b 3.

Reinfeld, Kr. Stormarn, Holstein: grave 36 (Hingst 1959: 386 & T. 121:36) series 1 b 2.

Thorsbjerg: 4 brooches (Raddatz 1957: T: 16:15, 18, 20 & T. 17:1).

Kuchenbuch, Group VII, Series 2:

Ringe II, Ringe s., Gudme h., Svendborg a.: single find (Albrectsen 1968: 88 & T. 88:a).

Husby, Kr. Flensburg, Schleswig: grave 176 (Raddatz 1974: 21 & T. 42:176 b).

Nottfeld, Kr. Schleswig, Schleswig: grave (Mestorf 1894: 14, fig. 20).

Preetz, Kr. Plön, Holstein: grave 9 (Brandt 1960: 77 & T. 5:9 c).

Krummensee/Pötterberg, Kr. Eutin, Holstein: grave 2 (Genrich 1954: 62 & T. 16:E 3) 2 brooches of series 2 – grave 8 (Genrich 1954: 62 & T. 16:D 3).

Thorsbjerg: one brooch (Raddatz 1957: T. 15:11).

Kuchenbuch, Group VII, Series 3 a:

Preetz, Kr. Plön, Holstein: grave 41 (Brandt 1960: 80 & T. 20:41 c) – grave 119 (Brandt 1960: 85 & T. 8:119 b).

Krummensee/Pötterberg, Kr. Eutin, Holstein: grave 10 (Genrich 1954: 65 & T. 17: K 5).

Thorsbjerg: 6 brooches (Raddatz 1957: T. 16:5, 12, 13, 14, 16, 17).

Kuchenbuch, Group VII, Series 3 b:

Schellhorn, Kr. Plön, Holstein: single find (Genrich 1954: 70, find 3).

Preetz, Kr. Plön, Holstein: grave 24 (Brandt 1960: 78 & T. 2: 24 d, e) 2 brooches of series 3 b – grave 26 (Brandt 1960: 78 & T. 6:26 c).

Krummensee/Pötterberg, Kr. Eutin, Holstein: single find (Genrich 1954: 65 & T. 27:1).

Gleschendorf, Kr. Eutin, Holstein: grave 1 (Genrich 1954: 55 & T. 10:A 2).

Thorsbjerg: 8 brooches (Raddatz 1957: T. 15:12, 13 & T. 16:1, 2, 6, 7, 8, 21).

Kuchenbuch, Group VII, Series 3 c:

Preetz, Kr. Plön, Holstein: grave 135 (Brandt 1960: 86 & T. 13:135 d).

Thorsbjerg: 5 brooches (Raddatz 1957: T. 16:3, 4, 9, 10, 11).

Kuchenbuch, Group VII, Series 4 a:
The grave-finds are not mapped, but the type is extremely common within the whole area.
Thorsbjerg: 8 brooches (Raddatz 1957: T. 17:3, 4, 5, 7, 8, 11, 12, 15).

Kuchenbuch, Group VII, Series 4 b:
No brooches from graves are known from the mapped area.
Thorsbjerg: 3 brooches (Raddatz 1957: T. 17:6, 9, 10).

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Iron Age Settlement and Cemetery at Sejlflod in Himmerland, North Jutland

Excavations 1973-1980

by JENS N. NIELSEN

Among the many sites photographed from the air by J.K. St Joseph, Cambridge, in the late 1960's was an area at Sejlflod, south-east of Aalborg (1).

Near the burial mound of Tofthøj there were detected c. 25 rectangular and a large number of circular outlines; the latter included large scattered outlines and two groups of small ones (fig. 2).

No immediate positive identification was possible; the rectangles were supposed to be houses, which was confirmed during a small test excavation in 1973 (2) (fig. 3).

The area is the scene of very intensive gravel digging, and in 1976 a concerned inhabitant of Sejlflod approached the Historical Museum in Aalborg. A subsequent inspection revealed that a ploughed mound and a few houses etc. north of it had been removed. Furthermore, two houses, EA and EB, were so close to the edge of the gravel pit that an investigation was necessary.

In the spring of 1979 the museum learnt that an adjacent area was set aside for gravel digging. The aerial photographs indicated that two houses and a number of circular features were endangered, for which reason an excavation had to be carried out.

Very surprisingly, the small circular outlines turned out to be inhumation graves. Judging by the air photographs there is a total of c. 350, and 300 of these are to be investigated.

In 1979 two houses (CL and CR) were investigated, together with 2 wells, post-holes and 82 graves.

At the present time only a small part of the area has been excavated, and the material is not fully analysed. The following is therefore a very tentative account.

THE SETTLEMENT

The houses at Sejlflod are long houses with the whole floor sunken in relation to the top of the subsoil or any other layer, e.g. shifting sand, beneath the top soil. In other words it is not a question of parts of the floor having been excavated to adapt to a sloping terrain.

This is a fairly new type of Iron Age house construction. So far similar houses have been excavated only at Overbygård near Stae. From aerial photographs they are also known at Uglegård and Tiendegård just south of Sejlflod (fig. 1) (3). In both places pottery from the Early Iron Age has been collected from the surface (4).

At Sejlflod the excavation of EA and CR is complete, while a little of CL still remains and only half of EB was excavated.

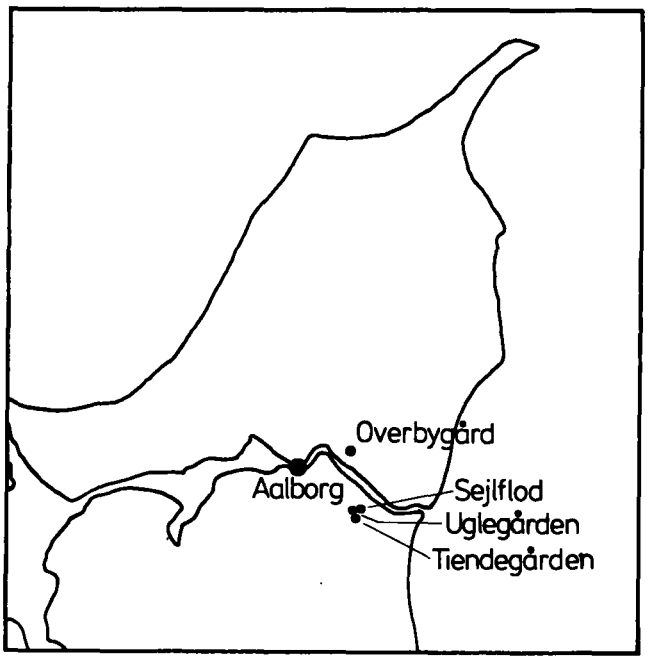

Fig. 1. Map of Early Iron Age settlements in Northern Jutland with houses with sunken floors.

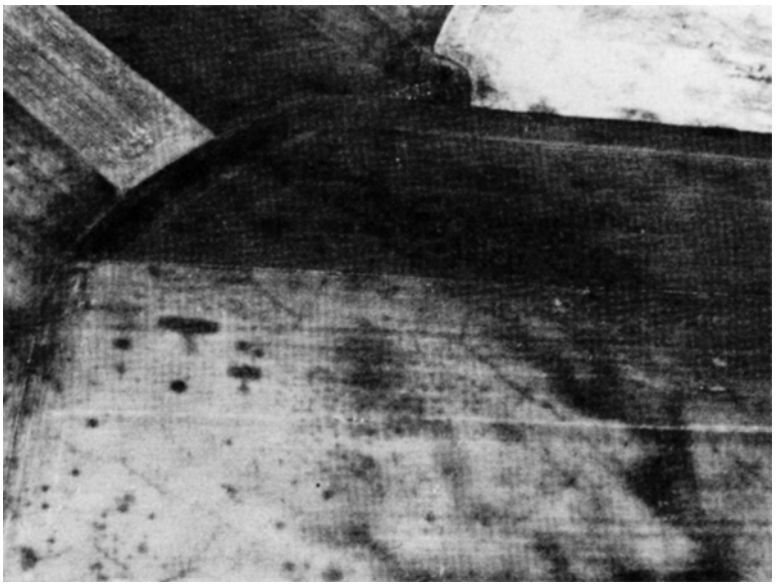

Fig. 2. Aerial photograph of the fields South of Tofthøj at Sejlflod (photo by J.K. St.Joseph, Cambridge).

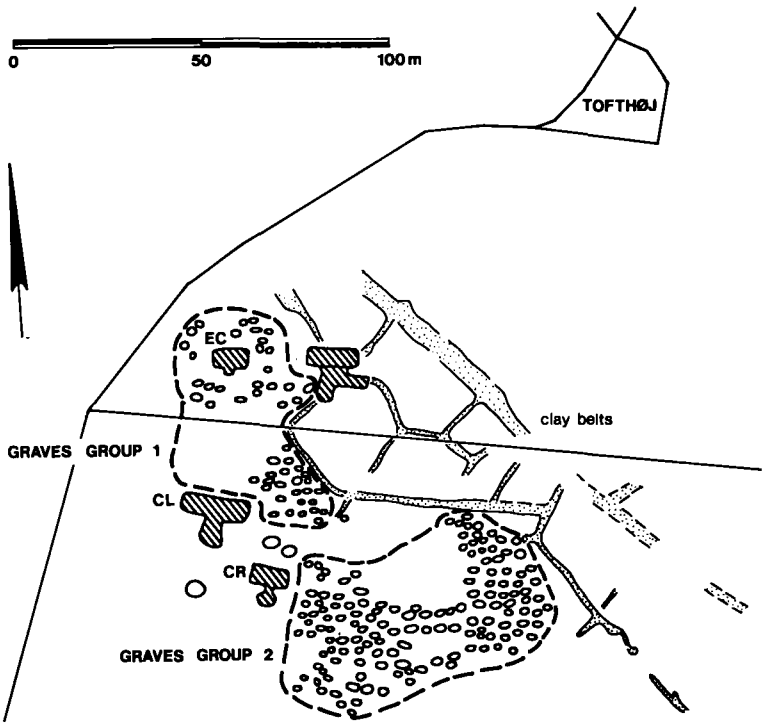

Fig. 3. Archaeological and geological features as detected from the air. CL, CR, and EC are house sites. 1:2000.

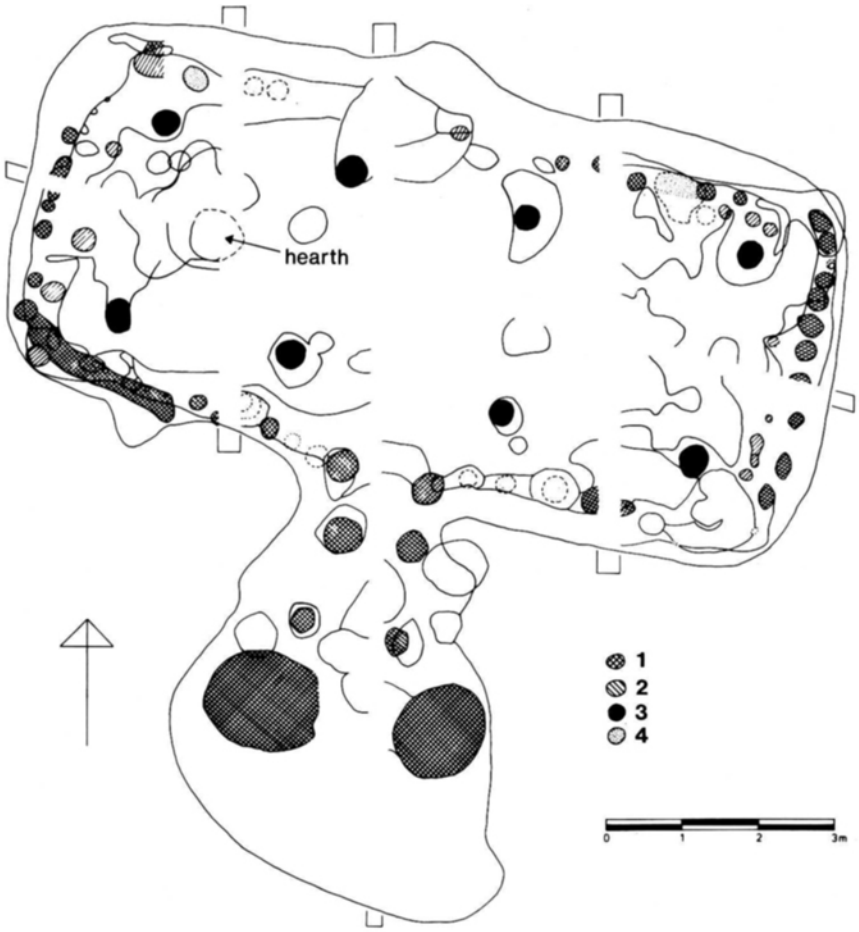

Fig. 4. Plan of house CR. (1) phase 1, wall posts and wall ditch. (2) phase 2, wall posts. (3) phase 1 + 2, roof-supporting posts. (4) wall posts (Jan Slot-Carlsen *del.*).

Excavations up till now have shown that the houses are dug roughly 50 cm into the subsoil. The first house (phase 1) was built at the bottom of this pit. Later this house was abandoned and replaced by a new one (phase 2), which again may have been replaced by a phase 3. The individual phases are generally separated by a 20–30 cm thick layer of cultivated soil or shifting sand. House CR, however, appears to show virtually no difference in level as between phase 1 and phase 2. When a house was abandoned, both roof-supporting posts and wall posts were pulled down.

The building design of the sunken houses is fairly similar to the well-known three-aisled Iron Age long house (fig. 4); there are two rows of solid roof-supporting posts. In many cases close-set posts can be observed in the wall trench. So far no traces have been discovered of filler between the posts.

No definite stall partitions have been found in the houses CR and EA.

The entrance is located in the middle of the south wall. In phase 1 it is on the slightly inclined plane leading from the ground surface down to the floor. There are post-holes west and east of this chute, the posts of the south long wall curving outwards by the entrance. Consequently there must have been a kind of porch at the entrance.

In phase 2 the entrance changes its character, in the houses CL and CR as well as EA, in that it now consists of a fairly large area of paving. At EA there is a single step down facing the south long wall of the house.

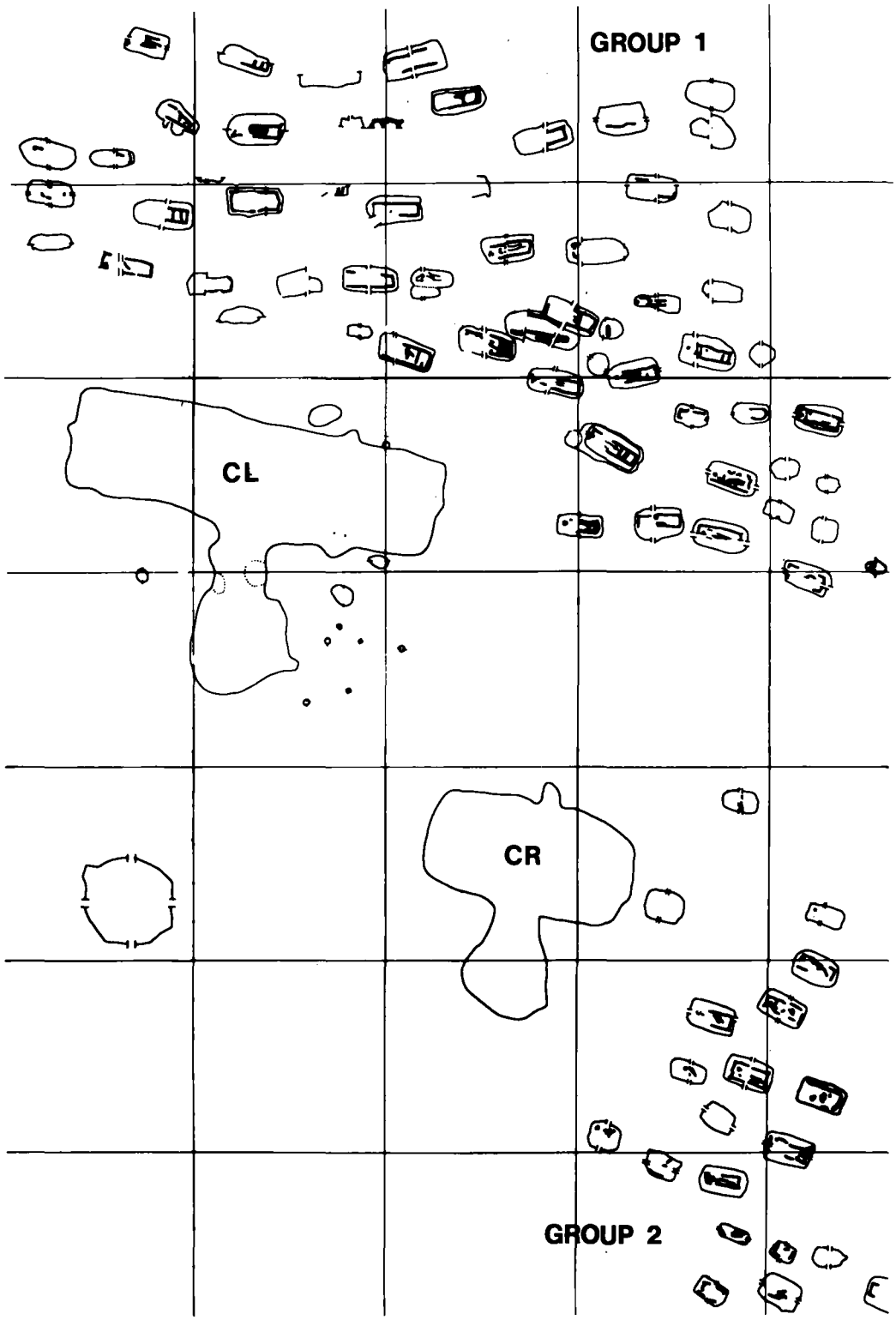

Fig. 5. Part of the excavated area with houses and graves. 1:300.

In the houses CL and CR the hearth is found in the west end. In a slight depression there is a layer of stone, which in CR is covered by a clay mantle. In EA the hearth is placed in the east end. The mantle is of chalk.

The floors in house EA, phases 1 and 2, consist of a layer of fairly compact chalk. CL and CR have simple earthen floors.

To the east of the entrance in house EA there is a small construction which can best be characterized as a kind of cellar. It probably belongs to phase 1 or 2, but neither stratigraphy nor other factors provided definite proof.

In construction the houses CL and CR differ from EA in several respects. The dates of the houses also differ. The first two phases of house CR, and in all probability CL as well, have been dated to the early part of the Pre-Roman Iron Age, period I – II. The first phase of house EA is somewhat later. The pottery dates the house to the Early Roman Iron Age, though a few pieces may be from the Pre-Roman Iron Age, period III B.

In the house CR, nearly 20 cm above phases 1 and 2, there is a layer containing small stones and a good deal of pottery. This layer must be regarded as an ordinary refuse layer, consisting as it does of flawed clay vessels, discarded hammer stones and other refuse. The pottery is from the Late Pre-Roman Iron Age (period III B) or, more likely, the beginning of the Early Roman period. There is nothing to indicate that there was a building phase in this level. The potsherds may well have been used as filler in connection with the building of a phase-3 house at the top of the house pit; the latter contains a layer which may represent the remains of a floor.

Thus at the time of writing it is possible to distinguish at least two settlements on the site. The first, with the houses CL and CR – phases 1 and 2 –, is from the Pre-Roman Iron Age, period I – II. The next settlement, with house EA, is from the Early Roman period, possibly starting during the Pre-Roman Iron Age, period III B.

Until more houses have been examined it is impossible to comment on the exact delimitation of the two settlements, or on the possible presence of a settlement covering the late phase of the Pre-Roman Iron Age (periods III A and III B (?)); in other words whether settlement was continuous.

Fig. 6. Grave AG during excavation. Two boulders were found on top of the grave.

As previously mentioned, Overbygård is the only other place where sunken houses have been excavated. The village was built towards the end of the Pre-Roman Iron Age (period III) and continued to exist during the Early Roman period. The sunken long houses are all from the Early Roman period. The buildings largely display a plan similar to that at Sejlflod, with the possible exception of the deep holes in front of the door and the annexes found at Overbygård.

Thus it appears that both at Sejlflod and Overbygård there were villages with sunken houses during the Early Roman period. Both sites also contain traces of settlement from the Pre-Roman Iron Age; at Sejlflod the houses are from the beginning, at Overbygård from the end of that period. But only Sejlflod has sunken long houses from the Pre-Roman period.

THE GRAVES

As mentioned above, the graves are placed in two groups. In 1979 a total of 82 were excavated. Of these, 59 belonged to group 1 – the endangered group – and 23 to group 2 (fig. 5).

The dates of the excavated graves are as follows. Group 1: one Early Neolithic and the rest Late Roman

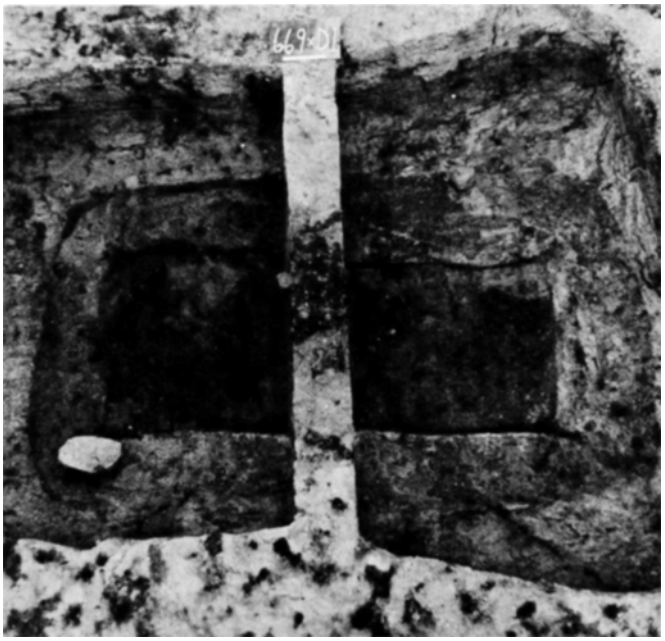

Fig. 7a-b. Grave DI showing traces of wooden coffin.

(4th century). Group 2: two Early Roman and 23 Early Germanic. Judging from the graves excavated so far the two groups cover the Late Roman period and the Early Germanic period. The remaining graves must be characterized as accidental intrusion.

Only in one case do two graves overlap. This happens in group 1, where a Late Roman grave (AT) partly covers an Early Neolithic grave (AS). Considering the great time gap between the two graves one may assume that the traces of the Early Neolithic grave were gone by the Iron Age.

In all other cases early graves were evidently visible and were respected. The question is how were they visible?

Some of the graves excavated in 1979 had marking stones placed slightly west of the middle of the grave. Usually there was only one stone, but the grave AG, for instance, contained two stones, one of which had clearly been placed on top of the other (fig. 6). It is impossible to ascertain how many marking stones the graves originally contained, or whether all graves had them. Many of the stones must have been removed when the area came under cultivation, if not before. None of the graves contained traces of other forms of marking, e.g. wooden posts as found in the burial place at Slusegård (Klindt-Jensen 1978 I: 11f).

The graves must also have been visible as low mounds. Though there is no direct proof of this it may be assumed that the excavated earth was thrown back over the coffin. Only when the coffin collapsed would the mound have more or less disappeared. And by then the next grave had probably been dug already.

The situation of the graves was influenced not only by the presence of earlier graves. None of the graves belonging to the two main groups were placed on top of the house sites. The southern boundary of group 1 is clearly determined by the house CL, and an area around the house EC is completely devoid of graves.

The subsoil consists mostly of fine sand. Furthermore there is an extensive system of clay bands, c. 50 cm wide. These are so-called fossil ice-wedge polygons formed during the last (Weichsel) glaciation (see figs. 1–2). They too have influenced the placing of the graves. Air photographs show clearly that the graves to the east stop precisely at the clay bands. The probable explanation is that the bands were too difficult to dig using the tools of the time.

Three factors therefore affected the location of the graves: the presence of earlier graves, the presence of house sites, and the nature of the subsoil.

The Early Neolithic grave obviously differs from the Iron Age graves: at the bottom, parallel to both the

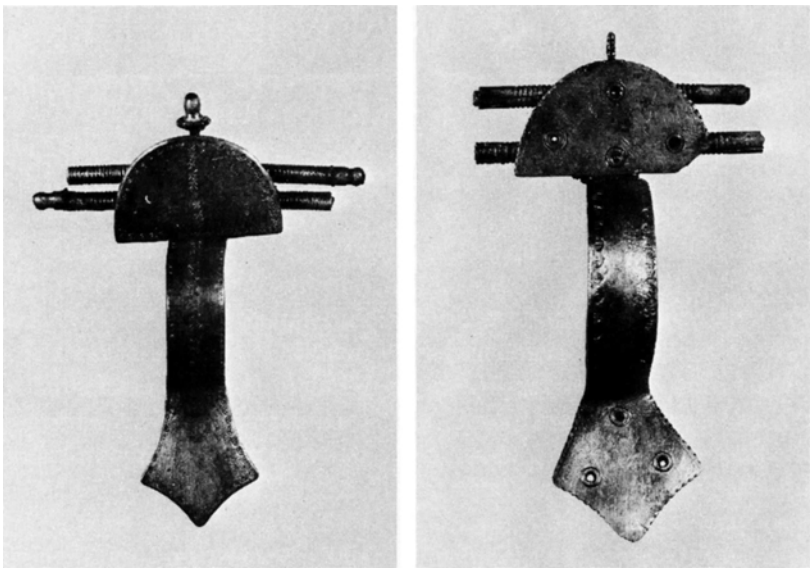

Fig. 8a-b. Two small sheet silver fibulae from grave AE. 1:1.

long sides, there was a c. 10–25 cm wide band containing carbonized organic material – apparently plant matter – well mixed with grave fill. The grave goods uncovered in the western end consisted of a thin-butted flint axe, a collared urn, almost 200 amber beads – including 3 lanceolate ones – and 2 copper pieces.

The Iron Age graves are orientated in an east-west direction, with minor deviations. They are dug 30–120 cm into the subsoil. The coffins are plank-built except for a few of the child burials where another type of coffin, probably made from a hollowed tree-trunk, was used. The lid and bottom consist of transverse boards which, judging by the few reasonably preserved specimens, were over 10 cm wide and c. 1.5 cm thick.

All the planks show traces of singeing, which does not appear to have happened in the grave itself (fig. 7 A-B). It is natural to interpret it as a ritual purification of the coffin before the dead body was deposited in it; or could it be a more practical consideration, namely an attempt to increase the durability of the planks?

The bones are almost invariably completely destroyed, but traces of the dead person often remain in the form of a brownish, fatty deposit. In a few cases dental enamel has been preserved.

The head of the dead body always faces west. Sometimes the body is laid out on its back, sometimes on its side, in which case it generally faces south.

The absence of bones makes it difficult to identify the sex of the burials. On the basis of grave goods such as ornaments and spindle whorls it is sometimes possible to distinguish female graves. Likewise one may reasonably assume that the presence of axes and arrow-heads signify male graves.

It is also difficult to determine the number of child burials because of the small quantity of teeth. Occasionally the graves are so small as to leave no doubt. The coffin in grave BC, for instance, measured only c. 85 × 35 cm. Obviously, only a minimal number can be identified by size alone; in most cases additional information is required to distinguish between graves of adults and children.

Nearly all the Iron Age graves show disturbance at the west end. The worst disturbances comprise up to half the grave at subsoil level, but are less marked towards the bottom of the grave. The fill in the disturbed area is richer in humus than the remaining grave fill. In several cases the disturbance affects the remains of the coffin, though there are instances where it extends only a short way down into the grave without reaching the coffin itself.

The disturbance is unlikely to have been caused by grave robbers. In several graves with proven distur-

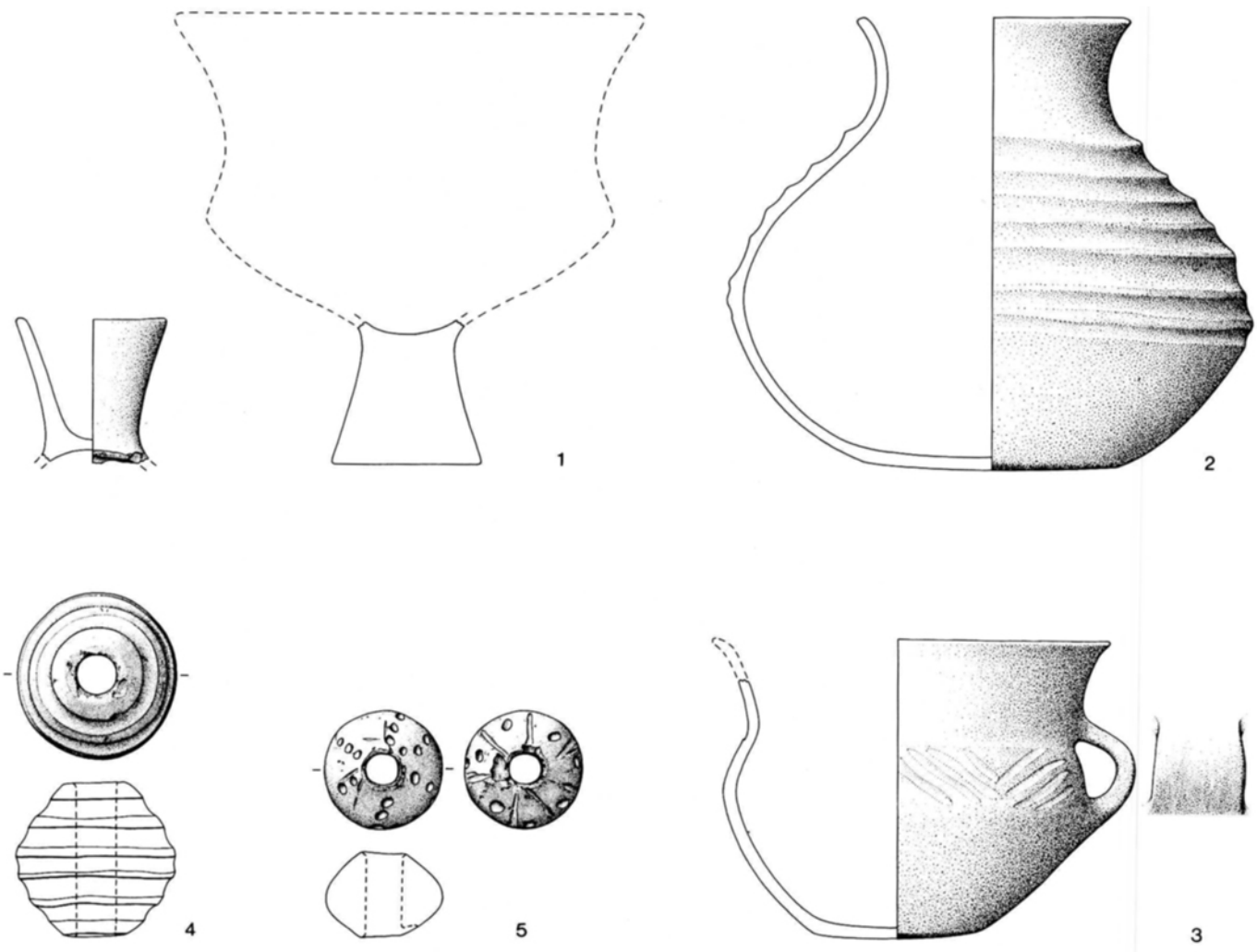

Fig. 9a. Finds from grave U. Pottery 2:5, loom weights 2:3 (Orla Svendsen *del.*).

bance there were artefacts *in situ*, e.g. strings of several hundred beads, as in the graves U and AE. In grave U the disturbance could be traced beyond the coffin lid.

Other theories that have been discussed refer to traces of the removal of marking stones, different times of covering the east and west ends of the graves, symbolic destruction of earlier graves etc. However, none of the explanations are adequate.

GRAVE GOODS

The various aspects of the graves discussed so far have revealed no differences between the Late Roman and Early Germanic periods, i.e. between group 1 and group 2. Such differences become noticeable only when we look at the grave goods.

Practically all burials contain two or three clay vessels at the foot of the grave. In group 2 one of the pots may be placed in the west end. Close to the pots there nearly always lies an iron knife, often with a preserved wooden handle,and bronzes. Sometimes the sheaths are also present. Finally, the east end contains iron rivets from a comb.

At the top end of the grave there are often beads, generally 10–30 pieces, but the graves U and AE contained c. 400 and 377, respectively. The western end of the graves also contain bronze pins and fibulae.

In the middle of the graves two groups of artefacts predominate: hooks and eyes as well as buckles. The

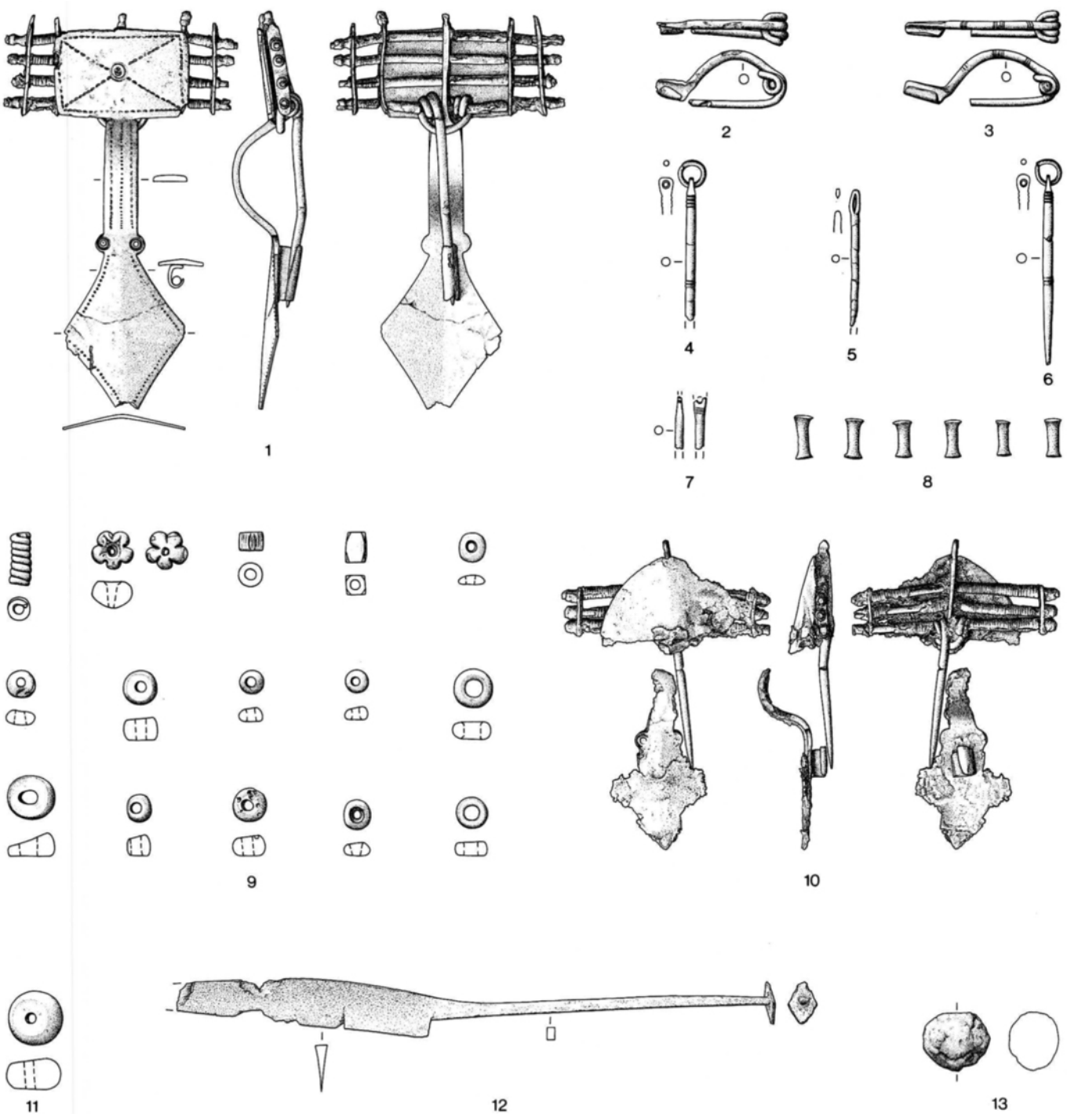

Fig. 9b. Finds from grave U. 2:3 (Orla Svendsen *del.*).

hooks and eyes are arranged in sets near the chest. The most common type is shaped like a figure of eight and is approx. 6 mm long. Some are of bronze, others of silver, occasionally gilded. The buckles come in many different shapes: D-shaped, O-shaped, rectangular etc.

Other grave goods include one glass beaker, gold finger rings, two iron axes, both with a preserved wooden handle c. 10 cm long, three iron arrow-heads, spindle whorls, clay beakers, two stave-built wooden buckets with bronze hoops and handle etc. Finally there is an exceptionally large quantity of organic material, e.g. fabric remains.

Among the quaint and rare objects there are two clay beakers which are evidently imitation glass beakers.

On average each grave contains 2 clay pots, 4 metal objects, a number of beads etc. A closer look at individual graves reveals differences in the quantity and composition of grave goods.

Child graves are always sparsely furnished: one or two pots, usually atypical, and possibly a very few beads.

Adult graves also differ. The most poorly furnished have only one or two clay vessels. But the majority, as previously mentioned, also contain a knife and rivets. The most marked difference in grave goods appears in the western end of the graves.

The graves AE and U were among the most richly furnished in group 1. Thus *grave AE* contained 2 sheet silver fibulae (fig. 8 A-B), 1 Haraldsted fibula, 1 bronze fibula, three bronze pins, 1 bronze ring, 1 gold finger ring, 377 beads of amber, glass and bronze, 3 spindle whorls, 1 spindle hook (?), iron rivets, 1 iron comb, 3 clay vessels, 1 clay beaker, 1 iron knife etc. The beads show great variation in material and form. It is the only grave where berloque-shaped amber beads have been discovered.

The contents of *grave U* deserve a full description (see figs. 9a – 9b).

x 441. Base of footed beaker used secondarily as a beaker (fig. 9a, 1).

x 439. Pot with circumferential furrowing on upper part of body. Black burnished surface. Height 17.2 cm, rim diameter 9.7 cm, and maximum diameter 19.8 cm. (fig. 9a, 2).

x 438. Handle cup with slight ledge at base of neck with below it grooves arranged in a triple to quadruple chevron pattern.. Strap-shaped handle. Burnished brown-black surface. Height 10.7 cm and rim diameter 14.1 cm. (fig. 9a, 3).

x 437. Clay spindle whorl ornamented with broad encircling grooves. Diameter 3.6 cm. (fig. 9a, 4).

x 1119. Clay spindle whorl, one face ornamented with roughly radial rows of pits and a couple of thin lines, the other with radial lines with pits between them. Diameter 2.5 cm. (fig. 9a, 5).

x 1099. Sheet-metal fibula of bronze with band-shaped bow ornamented axially with small struck pits and laterally with aligned arcs. Rectangular head-plate with under it four mock spring-axles of iron held in bronze tubes. They are held in place by four bronze strips, all of which, together with the iron axles and the front extension of the bow, originally ended in moulded bronze knobs. The head-plate only covers parts of the mock spring construction and bore stamped ornament consisting of concentric arcs along the edges and diagonals and of concentric circles in the middle.

The true spring is of bronze with cross-bow construction and four turns.

The foot is rhombic with ridged section. Along the edges it is ornamented with pits. At the transition to the bow there are two small lobes ornamented with concentric circles. The corners of the foot are missing.

The catch-plate is a short vertical plate close to the bow. (fig. 9b, 1).

x 2001. Sheet-metal fibula of bronze, fragmentary and badly corroded. The bow was band-shaped and the head-plate was semi-circular with three mock spring axles of iron in transversely ribbed bronze tubes. They are held at the ends by bronze strips. There were originally moulded bronze knobs at the ends of the mock axles and front extension of the bow. The true spring is of bronze with cross-bow construction and four turns.

The head-plate is semi-circular with a tendency to the triangular and it only partly covers the three mock axles. The foot is badly corroded but appears to have been rhombic. At the transition to the bow there were two semi-circular lobes on each side, one with stamped ornament preserved in the form of concentric circles. The catch-plate is a short bronze plate close to the bow. (fig. 9b, 10).

x 2003 and x 2006. Two Haraldsted fibulae, one of them with three groups of encircling lines on the bow. Lengths respectively 3.4 and 4.0 cm. (fig. 9b, 2 and 3).

x 2005. Bronze pin like x 2004 but less well preserved. (fig. 9b, 4).

x 2008. Bronze needle. Point missing. Length preserved 3.5 cm. (fig. 9b, 5).

x 2004. Bronze pin, ornamented with encircling lines at head and middle. Flat perforated head through which passes a bronze ring. Surviving length 4.8 cm. (fig. 9b, 6).

x 390. Bronze pin, fragment. Head flat with perforation for ring. Ornamented with four encircling lines. (fig. 9b, 7).

x 451. 6 iron rivets from a comb. Drawn from radiograph. (fig. 9b, 8).

x 440. Iron knife (point missing). Single-edged with slightly curved back. The rectangular-sectioned tang is in line with the back and ends with a rhombic bronze plate. Surviving length 15.3 cm. Drawn from radiograph. (fig. 9b, 12).

x 1089. Selected beads of glass and amber from a chain with altogether 387 beads. (fig. 9b, 9 and 11).

x 443. Globular clay lump, diameter ca. 1.5 cm. (fig. 9b, 13).

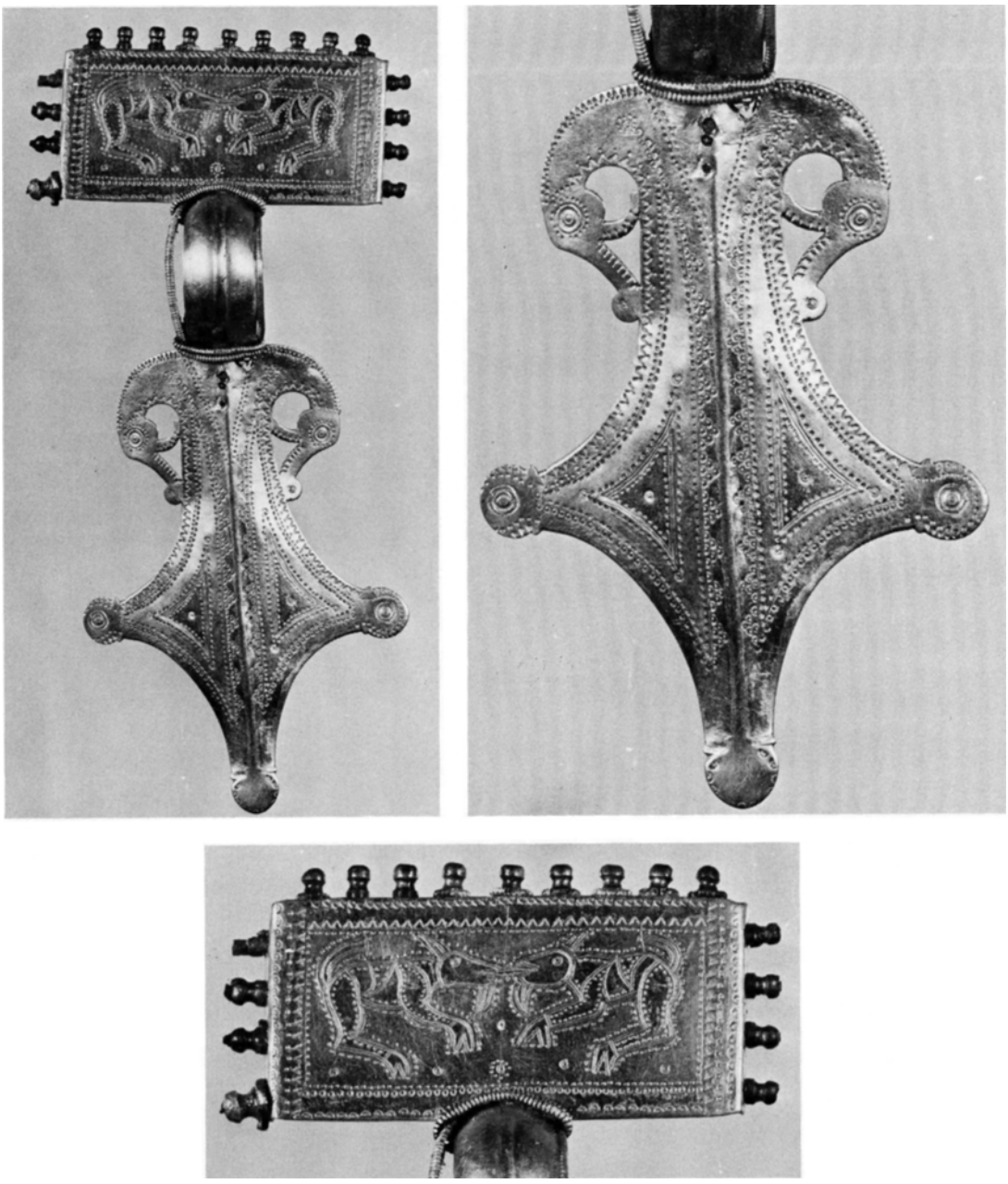

Fig. 10. Sheet silver fibula from grave DI. Length: 16.9 cm.

In group 2 *grave DI* was the most richly furnished. Apart from 3 clay pots (fig. 11) it contained more than 20 different metal objects including 4 fibulae, namely one sheet silver fibula with an animal head in profile (fig. 10) and three cruciform fibulae (fig. 12).

The silver sheet fibula has small silver knobs on three sides of the head-plate, their bases wound with fluted silver thread. On the two short sides the knobs are fixed on 4 spiral axes on the underside of the plate, whereas on the long sides they are placed on a bronze plate. On the head-plate punched ornamentation has produced two animal figures facing each other (fig. 10). The bow has an elongated groove in the middle and is surrounded with fluted silver

Fig. 11. Pottery from grave DI.

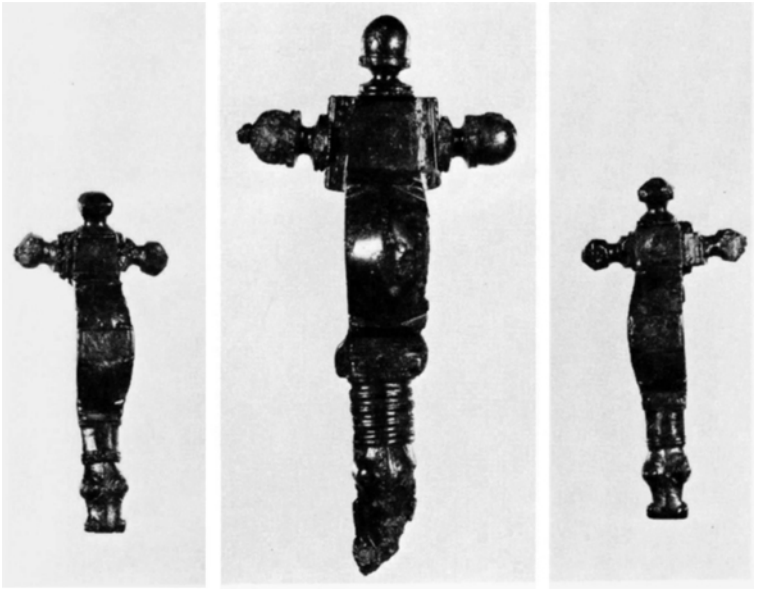

Fig. 12. Three cruciform fibulae from grave DI. 2:3.

threads, one on each long side and two at the ends. Both the bow and the head-plate are richly decorated with punched ornamentation, and they are both partially gilded. The three main parts of the fibula are joined together by means of a bronze band placed at the bottom of the bow and extending somewhat into the head-plate as well as the foot-plate. When the fibula was deposited in the grave it was fairly old, as appears from the wear, repairs etc.

Only three specimens of this type of fibula are known from Denmark: two from Kvarmløse and one from Mejlby. From Sweden and Norway we know, respectively, one and three silver sheet fibulae with animal heads in profile (Lund Hansen 1969: 84).

The cruciform fibulae include two small almost identical ones, and one largish fibula. The two small ones were silver-plated. The foot of all three fibulae terminates in an animal head (fig. 12).

This summary account of the grave goods from graves AE, U and DI gives an indication of the great prospects inherent in the material as regards e.g. typology and chronology.

The difference in grave goods between individual graves must be regarded as a reflection of social and economic stratification in the society of that time. This is also true of the clay beakers mentioned above (p. 114). For the time being we can only state that there are sparsely as well as richly furnished graves. It is quite conceivable that further excavation and a closer study of the material will enable us to classify them further.

The excavation at Sejlflod is planned to last up to and including 1982.

Translated by Ole Bay-Petersen

NOTES

[1] J.K. St Joseph's air photographs are kept at Forhistorisk Museum, Moesgård.

[2] By J. Lund, Aarhus University, Moesgård.

[3] Sejlflod: Sejlflod parish, Fleskum district, county of North Jutland. ÅHM journal No. 669. FHM journal No. 1791. Overbygård: V. Hassing parish, Kær district, county of North Jutland. FHM journal No. 1790. Uglegård: Lillevorde parish, Fleskum district, county of North Jutland. ÅHM journal No. 1012. FHM 1807. Tiendegård: Lillevorde/Gudum parish, Fleskum district, county of North Jutland. ÅHM journal No. 97. FHM journal No. 1806.

[4] J. Lund 1976: 129–50. This is also based on personal observation during the excavation, as well as conversations with J. Lund.

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Stengården, an East Jutland Occupation Site from the Early Germanic Iron Age

The Problem of Settlement Continuity in Later Iron Age Denmark

by STIG JENSEN

In spring 1979 a settlement pit from the Early Germanic Iron Age was excavated at Tåstrup, 15 km west of Århus, after being discovered during spring ploughing in a field belonging to the farm Stengården (1). It showed first as a 4,5 × 6 m dark area, sharply delimited to the north and east, more diffuse to the south and west, which was found to be a flat-bottomed pit about 0,5 m deep filled with black-brown clayey sand with charcoal, pottery, burned daub, iron slag, and stones up to a size of ca. 25 cm. Most of the finds came from the upper layers. No actual structures were observed connected with the feature, which was situated on a relatively steep south-western slope.

The largest find-category was the pottery. Altogether 282 sherds and parts of pots were found, including 37 rim sherds, 6 base sherds, 3 handles, and 236 body sherds. Only 12 of the sherds were ornamented (4,2%).

Some of the sherds show characteristic features. There had been large jars with slightly curved profile in three sections (fig. 1: 1–3). These were usually unornamented, but a body sherd (fig. 1: 4) with grooved ornament is probably from one of these vessels. There were also unnecked, unornamented pots with nearly vertical sides. (fig. 1: 5).

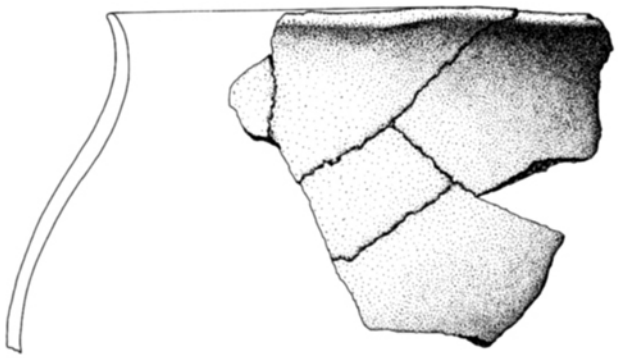
Four bowls can be distinguished among the sherds (fig. 1: 6–7, 10–11), three of them ornamented. It is characteristic that the ornament extends down over the widest diameter of two of them. There are two strap lugs (fig. 1: 9) and one pinched vertical lug with horizontal perforation (fig. 1: 8). This lug and the bowl with high carination date the material to the Early Germanic Iron Age (S. Jensen 1978, 109ff).

The sherds appear to be fired harder than Early Iron Age pottery, but whether or not this is a general rule for Early Germanic period pottery must be decided by more objective means. It is worth mentioning that none of the sherds had split apart. The pottery from Stengården was made of clay gritted with sand, and colours range through brown, grey, and dark-grey shades. A few sherds are red, probably as a result of secondary burning.

The pit also held 72 fragments of clay daub. On some of them can be seen impressions of posts and branches. The daub must come from a nearby house, which presumably stood to the east of the pit. The immediate vicinity of the pit slopes so steeply that it is difficult to imagine that the acual settlement was here.

In addition there were found three loom weights, of which two are so well preserved that the wear of the suspension cord can be seen (fig. 2). All the other finds were scattered throughout the pit, but chiefly in the upper levels, while the three loom weights lay together (fig. 2), presumably as a single deposit. There is nothing to suggest that a loom ever stood at this place.

The finds are just what one would except to discover in an Iron Age rubbish pit – pottery, daub, charcoal, and loom weights. Also the blacksmith had left traces of his work, as is quite usual at the settlements of the period. There were 12 pieces of slag or cintered clay. Six of them were hard-fired, porous, grey fragments with greenish vitrifaction on one side. Similar finds come from an Early Germanic Iron Age settlement at Enderup in SW Jutland (S. Jensen 1980) and from the Viking Age layers at Ribe. Their purpose was made clear by finds from Lindholm Høje (M. Bencard 1979, 121 f). They appear to be from *tuyères* protecting the bellows. The *tuyère* must have been made as a protec-



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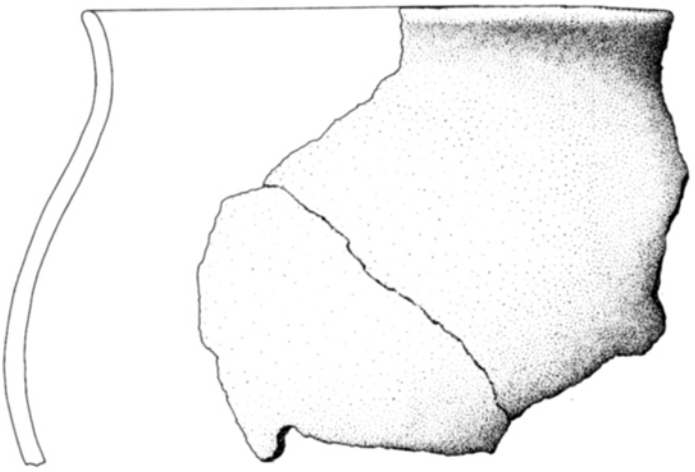

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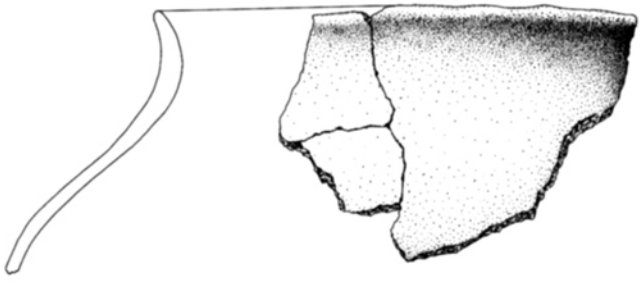

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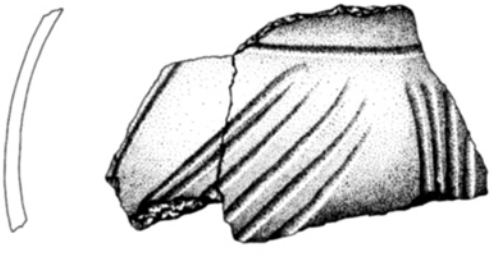

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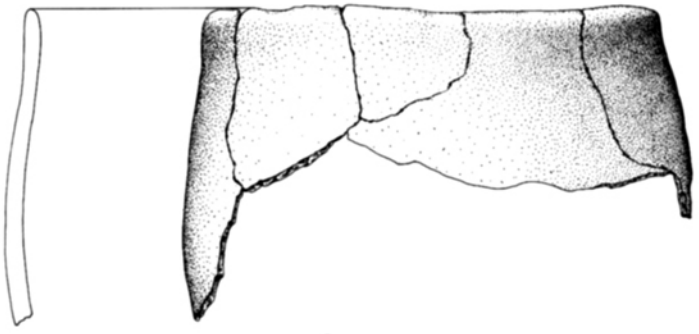

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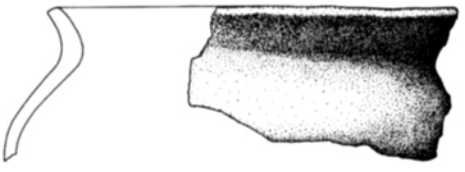

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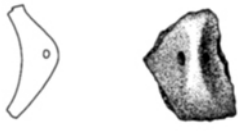

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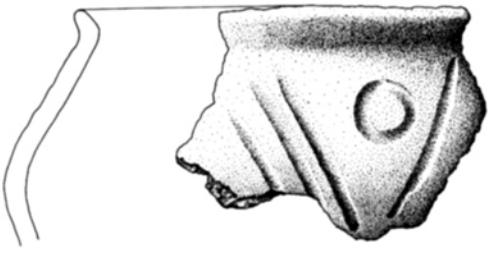

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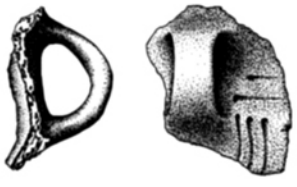

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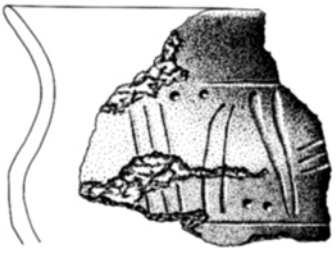

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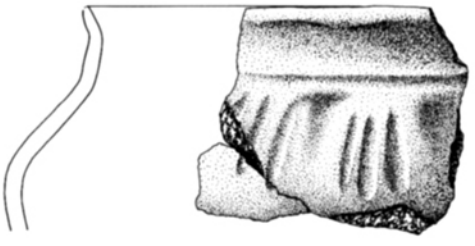

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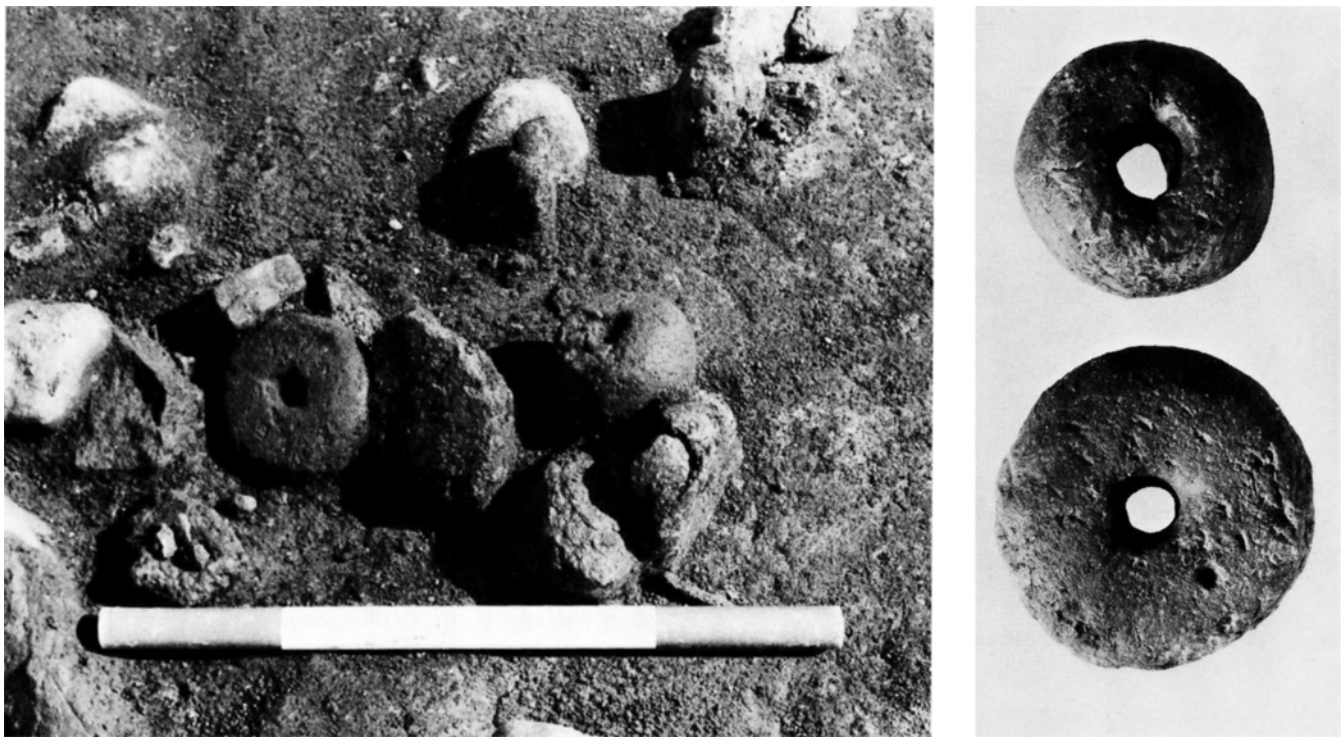

Fig. 2. Left: loom weights and clay daub in situ. Right: Two loom weights of burnt clay showing wear from suspension (Photo Preben Delholm) 2:5.

tive clay coating separating the hearth from the bellows. The Stengården finds also include a plano-convex or calotte-shaped slag.

Further evidence of smithing activity was provided by a sample of earth brought home from the pit. The presence of hammer scale was demonstrated with the help of a magnet. Hammer-scale is the oxidation layer that forms on the surface of iron when it is annealed. The layer is magnetic and when hammered breaks off as black scales.

The rubbish pit reflects, as has been said, traces of the activities that would normally be expected at a settlement of the Iron Age. Whether iron smelting actually took place at the site is not shown by the slags, but it is worth mentioning that bog iron ore was found only 25 m west of the pit on a later visit to the site in March 1980 (2).

Fig. 1. Selected pottery from Stengården (Drawings by Lars Hammer) 2:5.

THE PROBLEM OF SETTLEMENT CONTINUITY IN LATER IRON AGE DENMARK

Settlements of the Germanic Iron Age have for many years been one of the gaps in our knowledge. However the large settlement excavations of more recent years have done much to change matters (3), and a certain amount of information about Early Germanic period settlement is now available, though the number of known sites is still very small compared with the Early Iron Age. For the latter Germanic period information is still very poor indeed as hardly any settlement sites are known. To consider the causes of this lack of sites we must first ask how settlement from these periods is established at all, and then by what means it is dated and thereby separated from that of other periods.

The decline in the number of known settlement sites goes back to the beginning of the later Roman Iron Age, and is a continuing problem throughout the later Roman and Germanic periods. An examination of the data shows that a considerable majority of the settlement sites of the early Roman period were found

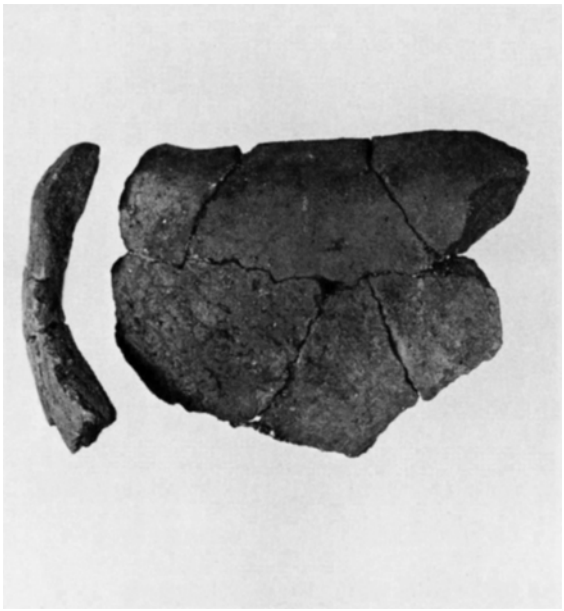

Fig. 3. Sherds from grave 1202 at Lindholm Høje. 1:2.

when a clay floor, a hearth, or a stone pavement were encountered in the course of agricultural work. This does not apply for the known later Roman and Germanic settlements, as important survey criteria such as clay floors and stone pavements disappear. Moreover the occupation layers of these periods are often thin and easily removed by cultivation. There are therefore grounds for reservations about the said reduction in the number of sites.

The problem in locating late Iron Age sites at all is undoubtedly one of the explanations for the annoying lack of knowledge of settlement. But it should also be emphasised that Iron Age settlements are dated almost exclusively from the pottery found. It is therefore important to remember that the pottery of the Germanic period – and especially its later part – has not so far been very thoroughly studied, and is therefore difficult to identify. It is particularly necessary to bear this in mind in connection with field surveys, for example in advance of major building projects, where one can only expect to find a few sherds revealing a settlement.

The question therefore arises whether one would not – in a routine exercise – have assigned most of the sherds from Stengården in the pre-Roman Iron Age (fig. 1: 1–3, 5, 6). Only 13% of the sherds are rim sherds, and 89% of these were of forms habitually assignable to that period. Furthermore only 4,2% of the pottery from Stengården was ornamented – so small a proportion that one would not expect to find it in a sample collected on the surface. When the culture-layers of later Iron Age occupation sites are also normally thinner and have fewer finds than equivalent layers from the Early Iron Age, it will be understood why our knowledge of settlement in the Germanic period is so limited. For example the Stengården pit is the first settlement find of the period recorded in the Århus area, where several hundred Early Iron Age sites are already known.

Helped by a number of SW Jutland settlement finds we now have a fair knowledge of the early Germanic period's pottery (S. Jensen 1978 and 1980), but what was the pottery like in the later Germanic period? Here the large cemetery at Lindholm Høje in northern Jutland is important, as the pottery development can be followed there through the Germanic and Viking periods (T. Ramskou 1976). In the present paper only certain aspects of this development will be touched upon (4).

The find combinations at Lindholm Høje show that the hemispherical vessel, which is normally dated to the Viking period, in several cases occurs in graves of the later Germanic Iron Age. Those in question are four pots (figs. 3–6) found with datable objects – all of them plate fibulae. The vessels in graves 1202 and 1502 (fig. 3–4) were both found together with plate fibulae ornamented in Style C, and must therefore date to phase 2, which is customarily placed between 650 and 725 A.D. (M. Ørsnes 1966: 60, 224, 256). The interlace ornament on the fibulae from graves 1714 and 1721 must date the other two hemispherical bowls (figs. 5 and 6) to phase 2 or 3. It may be added that sherds of a hemispherical bowl were found in a pit-house at Karby on the island of Mors together with a rectangular plate fibula from phase 3 (S. Nielsen and P. Noe 1977: 8).

The above find combinations show clearly that the hemispherical bowl made its appearance in western Denmark at latest in the middle of the Later Germanic Iron Age. The question of absolute dating has been further elucidated by the recent excavations of the Viking Age layers at Ribe. It has been found that objects which in relative-chronological terms belong to the Viking period – for instance tortoise brooches of

Fig. 4. Vessel from grave 1502 at Lindholm Høje, height 12 cm.

Fig. 5. Vessel from grave 1714 at Lindholm Høje, height 17,5 cm.

Fig. 6. Vessel from grave 1721 at Lindholm Høje, height 22,5 cm.

Fig. 7. Vessel from grave 1505 at Lindholm Høje, height 11 cm.

Berdal type – should be dated to somewhere in the 8th century (M. Bencard 1979, 120). This change must require a corresponding re-dating of the late part of the Germanic Iron Age. It is outside the scope of the present article to consider this complicated set of problems further, but it is clear that the "gap" between the Early Germanic Iron Age and the Viking period is less than supposed.

Fig. 8. Vessel from grave 1697 at Lindholm Høje, height 11 cm.

Fig. 9. Vessel from grave 1697 at Lindholm Høje, height 18,5 cm.

The fact that the hemispherical bowl occurs as early as the Later Germanic Iron Age probably means that a part of the settlement activity that hitherto has been dated to the Viking period ought instead to be placed in the Later Germanic Iron Age. In this way the boundary between the Germanic and Viking periods does not emerge very clearly from the pottery. There is the same difficulty with the boundary between the Early and the Later Germanic Iron Age. Two hemispherical bowls from Lindholm Høje with nearly vertical sides (figs. 5 and 6) considerably resemble the unnecked Early Germanic pots from Stengården (fig. 1: 5).

The pottery from Lindholm Høje shows how hard it in general is to separate some elements of the pottery of the Early and Later Germanic periods from one another. However differences do exist. Neither pots with inbent rim nor with round base appear in closed finds from the Early Germanic period at Lindholm Høje, but both are present already in phases 1 and 2 of the Later Germanic period (graves 1421, 1505 and 1535). To take an example, a round-based pot with outbent rim (fig. 7) appears in grave 1505 together with a beaked fibula.

Another point is that handled bowls do not occur later than the Early Germanic period. The bowl from grave 1697 (fig. 8) was found together with a pot with markedly concave neck, likewise a trait that seems to end with the Early Germanic period.

The material shows that the development of the pottery in Jutland was continuous and steady throughout the whole Later Iron Age. With the transition to the Later Germanic period the handled bowls disappear and two new traits make their appearance – the inbent rim and the round base. These are combined in the hemispherical bowl, which first occurs at latest in the middle of the Later Germanic period and continues in use in the Viking period. One may therefore ask whether there was not a much greater degree of continuity in settlement in Jutland in the Later Iron Age than hitherto supposed. A re-assessment of the dating evidence for a number of the occupation sites that have been dated to the Viking period would presumably show that some of them could equally well be from the Later Germanic period.

It ought not, however, be thought that these new datings mean that out knowledge of Later Iron Age settlement can be greatly extended. They cannot alter

the fact that few settlement sites of the period are known. However it is important for our culture-historical interpretations for us to know whether there was a continuous development in the already known habitation finds, or whether there is a break in settlement to be explained.

Would it be contentious to close by suggesting that the 300-year long gap in settlement (from 500 to 800 A.D.), which is supposed to have taken place at Vorbasse (S. Hvass 1979: 27), has not been sufficiently established by the current pottery chronology?

Translated by Toni Liversage

NOTES

[1] Sb. 45, Harlev parish, Framlev herred, Århus amt. Excavated by the author for Forhistorisk Museum Moesgård (FHM 2121).

[2] FHM 2236 Stengården II.

[3] See for example E. Thorvildsen 1972, O. Voss 1976, and S. Hvass 1979. Compare also the contribution by S. Hvass in this volume.

[4] The study of the original material from Lindholm Høje would have lain outside the limits of this article. I would like to thank Hans Jørgen Madsen for calling my attention to some of the find combinations quoted, and Erik Johansen and Jan Slot Carlsen for their kindness in securing illustrations.

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Settlement Continuity in the Villages of Stevns, South-Eastern Zealand - an Archaeological Investigation

by LOTTE HEDEAGER

INTRODUCTION

In recent years the extensive excavations of Iron Age settlements and the investigations in Danish villages and towns have brought into focus the question of settlement continuity and its preconditions. Of central importance in this debate are the villages on Funen, where a number of excavations have demonstrated continuity of settlement as far as villages in North-West Funen from the Late Viking Age / Early Middle Ages are concerned (Grøngaard Jeppesen 1979).

Nowhere, neither on Funen nor in Jutland, does Iron Age settlement show an unbroken sequence into historic times. Matters are different on Zealand, where Iron Age settlement has not been demonstrated so far. There may be several reasons for this: traces of settlement sites may be too inconspicuous to be recognized in surface collections, or habitation layers may be "sealed" beneath collapsed mud walls and are now protected from the plough by the thickness of the top-soil. Finally, Iron Age settlements may lie immediately below present-day villages. A convincing statistical analysis of the comprehensive find material from graves belonging to the Roman Iron Age suggests a significant concentration of finds, as regards graves from the Late Roman Period, in the vicinity of villages with the following place-name suffixes: -inge, -lev, -løse and -sted (Nielsen 1978). This makes it likely that Iron Age settlements should be looked for within the present-day village boundaries or in their immediate vicinity (Nielsen 1978: 87).

In view of these considerations it was decided in the spring of 1979 to apply for a grant from the local councils of Stevns Municipality and Storstrøms County to finance a three-month investigation of the villages of Stevns as a joint project between Køge Museum and Stevns Museum (1). Stevns was selected as the area of excavation on account of its heavy concentration of grave finds from the Late Roman Age, on which the place-name studies (Nielsen 1978) are chiefly founded. The same material is also the basis of the interpretation of Stevns as the focal point of an important political centralization (Hedeager 1980), an interpretation that is significant for an assessment of the results of the research.

The excavation was carried out according to the same methodological principles as were employed on Funen, i.e. by means of sampling (Grøngaard Jeppesen 1979 I). The randomly selected squares were laid out within the village boundaries as we know them from Denmark's earliest village maps (the "enclosure" maps from the late 18th century); the number varied between five and twelve for each site and the average size was 3 m × 1.25 m. A total of 80 squares were dug in the 9 villages (2). (figs. 1 – 2).

The selected sites fall into the following place-name groups: one with the suffix -inge (Lille Heddinge); three with -lev (Sigerslev, Varpelev and Gjorslev); one with -sted (Hellested); two with -by (Raaby and Magleby); one with -øje (Arnøje) and one with -høj (Holtug – the name being derived from Holt*høj*). Of these Lille Heddinge, Varpelev, Hellested, Magleby and Holtug are all church villages.

FIND MATERIAL

a) Pottery

This has been classified in accordance with the main categories of the material from Funen (Grøngaard Jeppesen 1979 II: 6–7), with some minor changes:

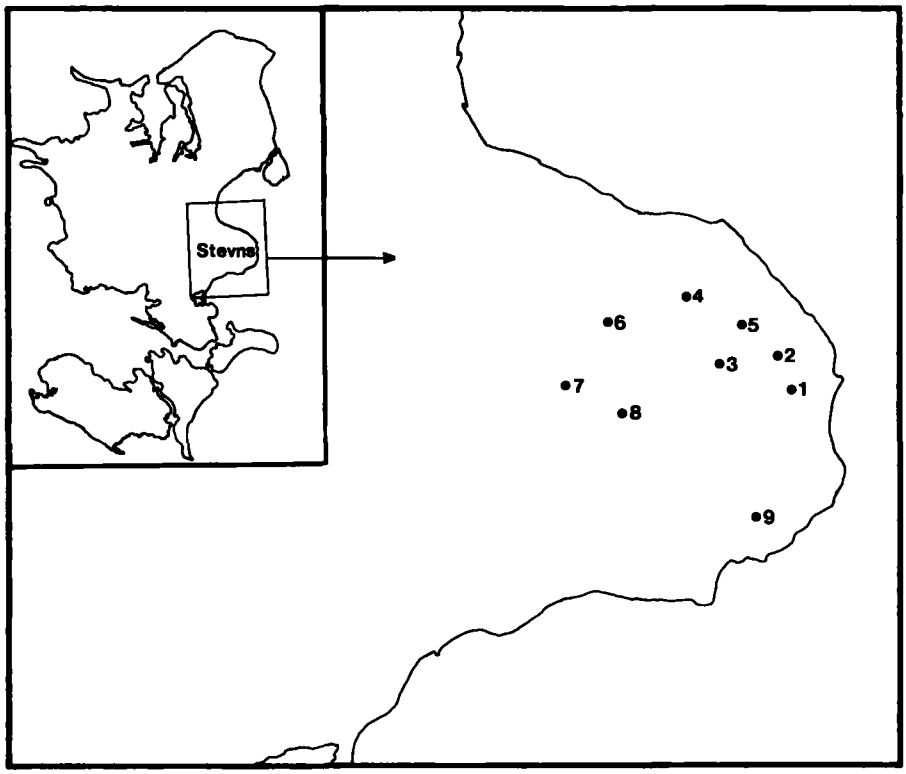

Fig. 1. Map of Stevns showing the location of the villages under investigation.
1. Sigerslev
2. Holtug
3. Råby
4. Magleby
5. Gjorslev
6. Varpelev
7. Hellested
8. Arnøje
9. Lille Heddinge

A: pottery with "prehistoric characteristics"
B: Viking Age pottery and Baltic pottery
C: globular pots, baked at a high temperature (mediaeval ware)
D: mediaeval jugs and other glazed pottery
E: Glazed Renaissance pottery
F: black ware
G1: mediaeval stoneware
G2: more recent stoneware
H: modern pottery
J: porcelain and faience

Table I shows the distribution according to locality of pottery classified as above.

To give an idea of the amount of sherd material we list below the number of squares for each locality:

Sigerslev	: 8
Holtug	: 8
Raaby	: 5
Magleby	: 9
Gjorslev	: 5
Varpelev	: 12
Hellested	: 13
Arnøje	: 9
Ll. Heddinge	: 12

The great majority of the find material is pottery (cf. the specimens of Baltic ware, fig. 3).

Table I

	A	B	C	D	E	F	G1	G2	H	J	Total
Sigerslev	0	20	0	11	54	5	2	1	157	31	281
Holtug	0	92	26	24	55	1	2	5	207	85	497
Raaby	0	28	1	1	14	0	1	2	89	72	208
Magleby	0	18	0	16	45	27	0	3	146	113	368
Gjorslev	13	2	0	1	13	3	2	11	305	129	479
Varpelev	0	39	1	13	49	9	0	3	76	40	230
Hellested	0	23	0	11	37	2	1	2	177	132	385
Arnøje	0	98	5	9	67	2	2	1	168	92	444
Ll. Heddinge	0	11	12	4	64	2	1	2	169	158	423
Total:	13	331	45	90	398	51	11	30	1494	852	3315

b) Other artefacts

Objects from the middle Ages included:
- 2 spindle whorls of sandstone
- 2 bone combs (for weaving)
- 1 small faceted gambling counter of bone
- 1 iron spur
- 1 amber bead

c) Constructions

1. In several cases the trench encountered extensive soil disturbance from the digging of wells or pits. Among ancient constructions we may mention a well – or possibly a pit – at Arnøje containing c. 100 pieces of Baltic pottery (fig. 3), and a cone-shaped Iron Age well at Gjorslev, in the top layer of which lay the cranium and other bones of a small horse (trench 664 × 1, C^{14} date: 720 ± 70 A.D. [cal. 735 ± 70 A.D.]. K-3377). Refuse pits from the Late Middle Ages and subsequent periods were not uncommon.
2. House remains in the form of post holes, occasionally stone-lined and sometimes containing datable pottery, were very common in the small excavation trenches. Of special interest was a 14th century limestone building, sealed by a Renaissance layer, at Holtug.
3. Among the other constructions we may finally mention a furnace, collapsed as a result of heat, with iron slag from the 14th century, and a couple of drying kilns with visible firing layers, in one case with a thick layer of burnt linseed and fragments of a pair of iron scissors. The collapsed furnace was excavated at Varpelev on the spot where in 1929 the National Museum uncovered a basement foundation which is supposed to belong to one of the aristocratic residences of the Rane family (Stiesdal 1979: 154).

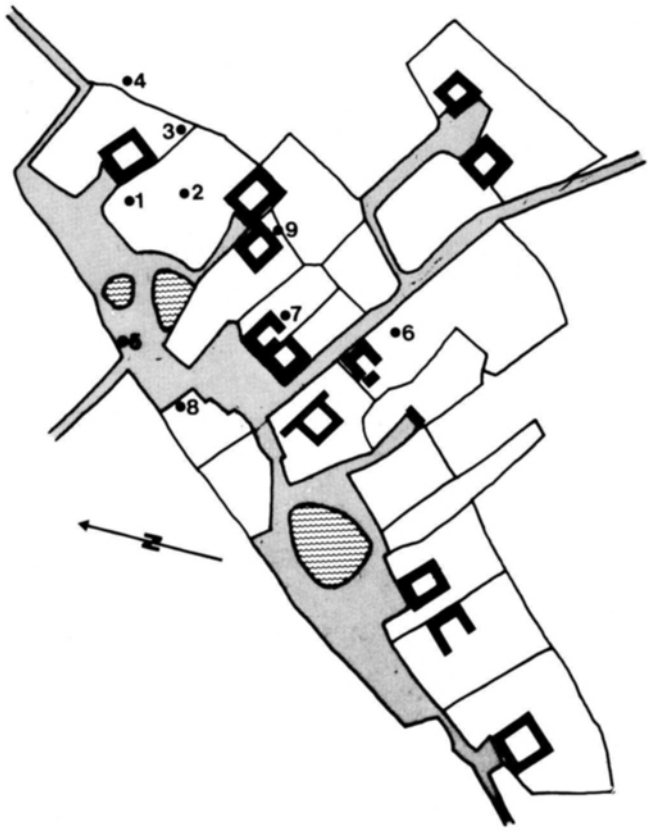

Fig. 2. The village of Arnøje (no. 8 on the map fig. 1). The excavated squares are numbered 1 to 9.

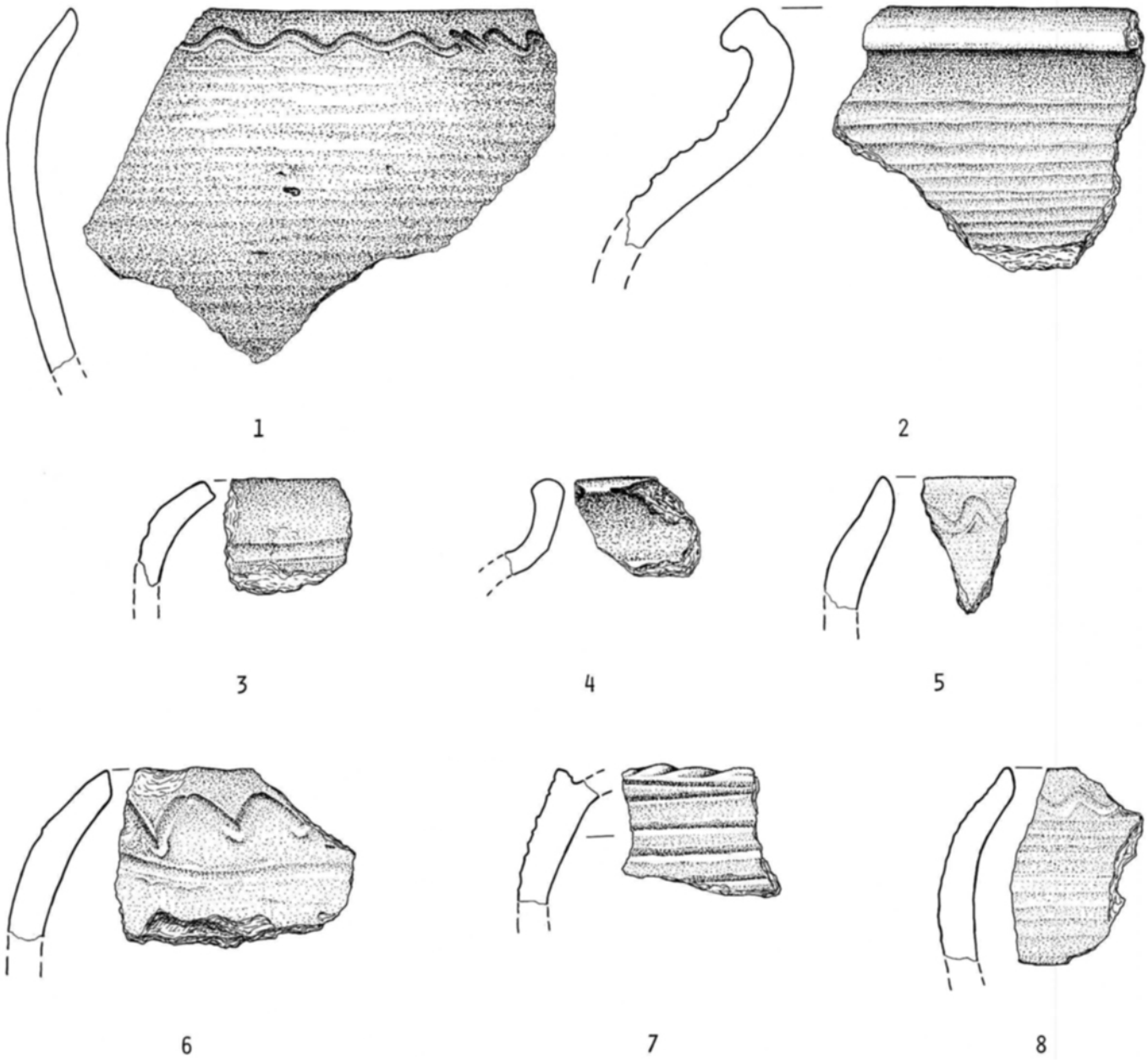

Fig. 3. Radiocarbon dated Baltic pottery from Arnøjegård (no. 3 on the map fig. 2). 2:5.

d) Zoological material

The bone material was very comprehensive, but only in few cases did the find context merit a zoological analysis. Bones for C-14 determination were identified as follows by Tove Hatting of Copenhagen University Zoological Museum. Gjørslev, square 664 × 1: part of horse scapula and bones of horse and domestic ox. Magleby, square 663 × 8: bones of horse, sheep and domestic ox. Arnøje, square 667 × 3: bones of horse and domestic ox.

DATING

The archaeological dates depend entirely on the pottery chronology. The Baltic pottery is assigned to the period 1000–1200 A.D.

Bones from a positively identified Baltic layer containing pottery (fig. 3) have been radiocarbon dated as follows: Arnøjegård, trench 667 × 3: 950 ± 70 A.D. [cal. 990 ± 70 A.D.], K-3383, and 970 ± 70 A.D. [cal. 1005 ± 70 A.D.], K-3385.

CONCLUSION

A total of 3.315 pieces of pottery were retrieved from the 80 squares. Approx. 300 of these are from the Viking Age / Early Middle Ages.

All the nine sites investigated yielded Baltic pottery, though in different proportion. In one case it was discovered in all squares (Holtug); in general most squares on each site contained Baltic pottery. At Gjorslev and Arnøje it was found only in a single square.

Five of the sites are villages with a church, but they do not differ from the other sites as far as the sequence and distribution of early pottery is concerned. It also appears to be immaterial whether the church is situated at the center or on the outskirts of the village.

Finally, let us briefly compare the results from Stevns with those obtained from Funen (Grøngaard Jeppesen 1979 II): 1) In Stevns, Baltic pottery was found in 35 of the total of 80 squares, i.e. in approx. 45% of the squares; on Funen in 27 of the 89 squares, i.e. 30%. 2) The total quantity of Baltic pottery from Stevns is 310 sherds (3); from Funen only 100 sherds despite the fact that on average the squares on Funen are three times larger than those in Stevns. Thus the presence of Baltic pottery is much more marked in the area closest to the Baltic Sea.

On the basis of 80 excavated squares distributed at random over 9 villages we may conclude provisionally that the villages of Stevns have retained their location since the 10th / 11th century. This result, which is identical with that from Funen, suggests a regularity that may have a wider national application.

The excavations have not answered the question of the location of Iron Age settlements. It may be assumed, however, that they are not to be found underneath present-day villages: their almost simultaneous foundation during the Middle Ages (as evidenced by the pottery) and continuity of location until the present time represents a regular feature in the history of settlement which is in marked contrast to prehistoric settlements.

Translated by Ole Bay-Petersen

NOTES

[1] The research was carried out with Bjørn Poulsen from the Institute of History, Copenhagen University, as an assistant. Bjørn Poulsen also helped to analyse the material. The artefacts were drawn by Eva Koch, the maps by Bjarne Nielsen. The Danish Research Council for the Humanities assisted financially with the postexcavation analysis.

[2] Documentation of the work is as follows: all squares were photographed in black and white and colour, and were recorded on the "enclosure" maps. The section and/or surface of individual trenches were drawn whenever stratigraphic conditions affected the find material. The trenches were excavated in horizontal layers.

[3] Of the 331 pieces of pottery from the Viking Age / Early Middle Ages, 310 have been identified as Baltic.

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Medieval Roskilde - an Urban-Archaeological Survey

by INGRID NIELSEN and OLE SCHIØRRING

For many towns evidence of their origins and early development can be gained from the archaeological finds and observations which non-archaeologists through ages have delivered to museums or noted down. This material may, however, be large and difficult to use directly; but it is possible to get some ideas of trends of town development by plotting such finds and observations on to a map. The procedure of mapping all old finds has been tried before in countries where medieval town archaeology is well established, as in England (Can 1934; Jope 1952, 1956; Waterman 1959; Addyman and Biddle 1965; Biddle, Hudson and Heighway 1973), Germany (Lung 1956) or Norway (Fisher 1920; Lunde 1977). In Denmark H.U. Ramsing in 1940 published a survey of the medieval topography of Copenhagen based on a combination of information gained from diggings and written evidence.

In 1977 the Danish Research Council for the Humanities embarked on a programme of research on medieval towns, which was to run for a period of four years. The aim was to investigate the origin and topographical development of towns through all available sources – archaeological, scientific, written, and cartographic, and then follow these studies up by archaeological excavations. As it would have exceeded the available means to study all of the more than fifty medieval Danish boroughs, ten towns were selected: Ribe, Horsens, Århus, Viborg, and Aalborg in Jutland; Odense and Svendborg on Funen; and Næstved, Roskilde, and Køge on Zealand. In addition Søborg on Zealand, demoted from the status of borough in postmedieval times was included. New archaeological investigations in these towns were to be concentrated on sites where the preliminary survey of the sources suggested that particular topographical questions could be answered.

It must be noted that this paper was first written in 1979 when the work had only been in progress for two years and before the phase of archaeological excavations. Hence we have concentrated on the problems and results of the preliminary data collection rather than on the results from the excavations.

For the ten towns old as well as new archaeological data is collected for the purpose of plotting them on maps of the towns. This is not without problems, and the results gathered will be presented here, illuminated by examples from Roskilde.

THE ARCHAEOLOGICAL SOURCES FROM ROSKILDE

Roskilde is notable for having a large number of archaeological finds as well as a rich amount of (medieval) written sources. Thus different types of information can be compared and used as supplement to each other. All finds from medieval Roskilde have been registered, whether in Roskilde Museum or in the National Museum. The latter contains medieval objects from Roskilde delivered as far back as 1802. The number of recorded finds, observations, and excavations reaches 541. Archaeological excavations are by far the smallest group. Additional data can be gleaned from the local historical literature and from newspapers. The latter have not been examined systematically in the course of the project, but the local literature has provided some useful information, as, for example, the reference in Pontoppidan's work from 1774 to medieval burials, observed during the building of a house in 1765.

The registration was done by Michael Andersen at Roskilde Museum, and by Gert Posselt under the supervision of Jørgen Steen Jensen at the Royal Coin Cabinet. The museum collections were registered from the accessions ledgers, as an examination of

every single object was judged to be too time-consuming in view of the purpose of the registration. Special problems may later require that specific finds are examined, but for the preliminary survey we have found the method sufficient.

The material falls into three main categories:

1. Stray finds.
2. Reports of observations of buried archaeological monuments.
3. Proper archaeological excavations.

The groups differ in character as well as in the value of information obtainable.

1. *Stray finds* make up the largest category. They were often collected and presented to the museums by interested members of the public who had gathered them from gardens, building sites, sewer trenches, etc. Especially at building sites many objects might be found at the same time. In such cases the finder may have selected for the museum those which seemed most appealing, thereby choosing mainly "nice" things for the collection. When pottery is selected this way there will, mostly likely, be a greather representation of glazed pottery and stoneware from the later Middle Ages than of the grey-black sherds which provide evidence of the early period of the history of the town. This "method" of collecting finds limits, of course, the representativity of the pottery. The same, no doubt, applies to other kinds of objects. Coins are an exception. They are Treasure Trove and must be surrendered to the National Museum. Although many no doubt have remained in private hands, the map, fig. 3, shows that a very large number has been retrieved from the soil of Roskilde and registered.

2. *Reports of observations of buried archaeological monuments* have in the older times not always been checked by experts. The recorded information can be rather scanty, such as "discovery of a wooden pavement in the Town Hall Square" or "discovery of wall, probably from a monastery, running north-south". At best the depth is recorded, but seldom other details which might have helped to establish date and function. The various information about wells, pavements, or building remains does, however, give indications where fruitful excavations may be carried out. Interpretation of this kind of data must, however, be made with great caution in contrast to another set of data, namely information concerning burials or skeletons. These can always be presumed to indicate cemeteries attached to ecclesiastical institutions, important to the understanding of the early topography of the town. Moreover, skeletons are nearly always noticed and probably just as frequently reported.

3. *Proper archaeological excavations* had not been carried out in many Danish towns before the recent decades. In the 50's and 60's few took place in Roskilde, but Roskilde Museum has since 1978 conducted investigations aimed at solving problems of the topography of the medieval town. However, churches and other major stone-built monuments have always attracted attention, and a number of church sites were examined earlier. Excavations around the cathedral, and the churches of St. Laurentii, St. Olai, and All Saints are presented in *Danmarks Kirker, Københavns Amt (1944–51)*. In the 50's and early 60's St. Clemens' Church on Sankt Jørgensbjerg and St. Ib's Church were excavated by Olaf Olsen (Olsen 1960, 1963).

The source material is thus large and varied. Before proceeding further a number of problems have to be considered, especially concerning the location and dating of stray finds and observations.

THE PROBLEMS OF LOCATION

Many of the objects and observations were presented to the museums with vaguely recorded provenance only, often just the name of a street, in a few more fortunate cases with the house or land registry number. When the provenance is the like of "found in gardener Thomsen's garden on Frederiksborg Road" one has to search through old directories. This means that many finds must be plottet with only a general reference to a street or a property without precise location on the property.

Furthermore, information of stratification or of the relative depths in which the objects were found is missing. When objects are presented as a single lot like this they can be distinguished chronologically but not stratigraphically and there is no way of knowing whether the mixture occurred before or after the things were found. When mapping we have marked all the periods represented, but it is important to bear in mind that isolated finds cannot be used as an indication of settlement nor of its date, as they can be in secondary position. Still, it is possible to use the distribution map in its totality to draw broader con-

clusions about the growth of the town in different periods. The map, then, partly demonstrates what has been given to the museums as objects or observations, and we have only few possibilities of ascertaining how the things got there in the first place. Anyway, similar finds from neighbouring plots must bear evidence of the former use of the area. Two groups of finds must be excluded from this uncertainty. Skeletons and coin hoards can safely be assumed to indicate original deposit sites. If they were moved at all they would inevitably be scattered and thus become bones and coins.

HOW REPRESENTATIVE IS THE DISTRIBUTION?

Blank areas on the map may only show the absence of more recent gardening, building work or interested people, so negative evidence is of use only when confirmed by excavations or observations by archaeologists, as done south of the street, Bondetinget. Occupation material missing at this site was probably due to Sømme Herreds Ting; "ting" being the moot of the ancient military and judicial area, "herred", equivalent to the English hundred (fig. 1,1). It is, however, remarkable that no finds have been collected from the area north of the Bondeting, site of the ancient royal manor (fig. 1,2). The land was sold in the 1450's to various ecclesiastical persons. The plot where the royal manor had stood, just north of the Bondeting, became the property of Bo Madsen, a priest. The royal grant described the site as "filled with refuse and rubbish". Bo Madsen himself accounts in great detail the clearing of the site, which was more or less a garbage dump, when he received it:

"... The site was in those days bare and unsuitable for buildings, as it was completely filled by a great mountain of garbage and refuse, gathered from streets and lanes and from the houses of clerks and citizens ... I did not let myself be stopped by such matters but made a concerted effort to clear the land. One day during the first three months I hired more than 40 workmen and used only carts for two horses. Clerks, priests and monks gathered in order to watch the proceedings and each one of them threw off his cloak and joined in the work as long as he was able to. That day three barrels of ale were barely sufficient; they were emptied down to the last drop. On other days during the early summer, I would hire two workmen one day, three another day. I am not able to say exactly how much work has been done, nor how great my costs were in clearing the area. For a period of five years I have often used spare hours for working, along with the young people in my charge, with wheelbarrows so the sweat ran.". (Translated from Petersen 1889–90, p. 356 & p. 339).

One might expect that a clearance of this nature had removed all traces of the royal manor. In 1980 a trial excavation was carried out, and the signs of Bo Madsen's work were recognized. However, the deepest layers remained untouched and could be dated to the first half of the thirteenth century, when workers dug clay at the site. This activity was probably carried out in connection with the construction work on the cathedral, then being rebuilt in brick. The digging could have destroyed still earlier archaeological evidence.

We know that soil from the old town was used as fill at another place in recent times, resulting in the discovery of several coins. An enthusiastic coin collector has left an account with the National Museum's Coin Cabinet. The place was a market garden within the north-west part of the fortifications (fig. 3,1). It had previously been a swamp, but fill had been brought from the town. The collector was allowed to spend a couple of hours every morning, and thus he had the opportunity to observe that one of the workmen kept finding coins in the fill, especially in newly raked beds after heavy rains during the spring. The same gardener found coins in many other gardens in the town. From the registrations of the research project it is apparent that gardeners in particular have turned in coins to the National Museum. The story is a reminder of how careful one must be in considering whether finds derive from secondary or from primary deposits. Despite these examples of deceptions caused by the moving of soil in the past and present, we may assume, however, that finds by and large belong to the place where they were found, especially if they come from deep modern building excavations in the town centre.

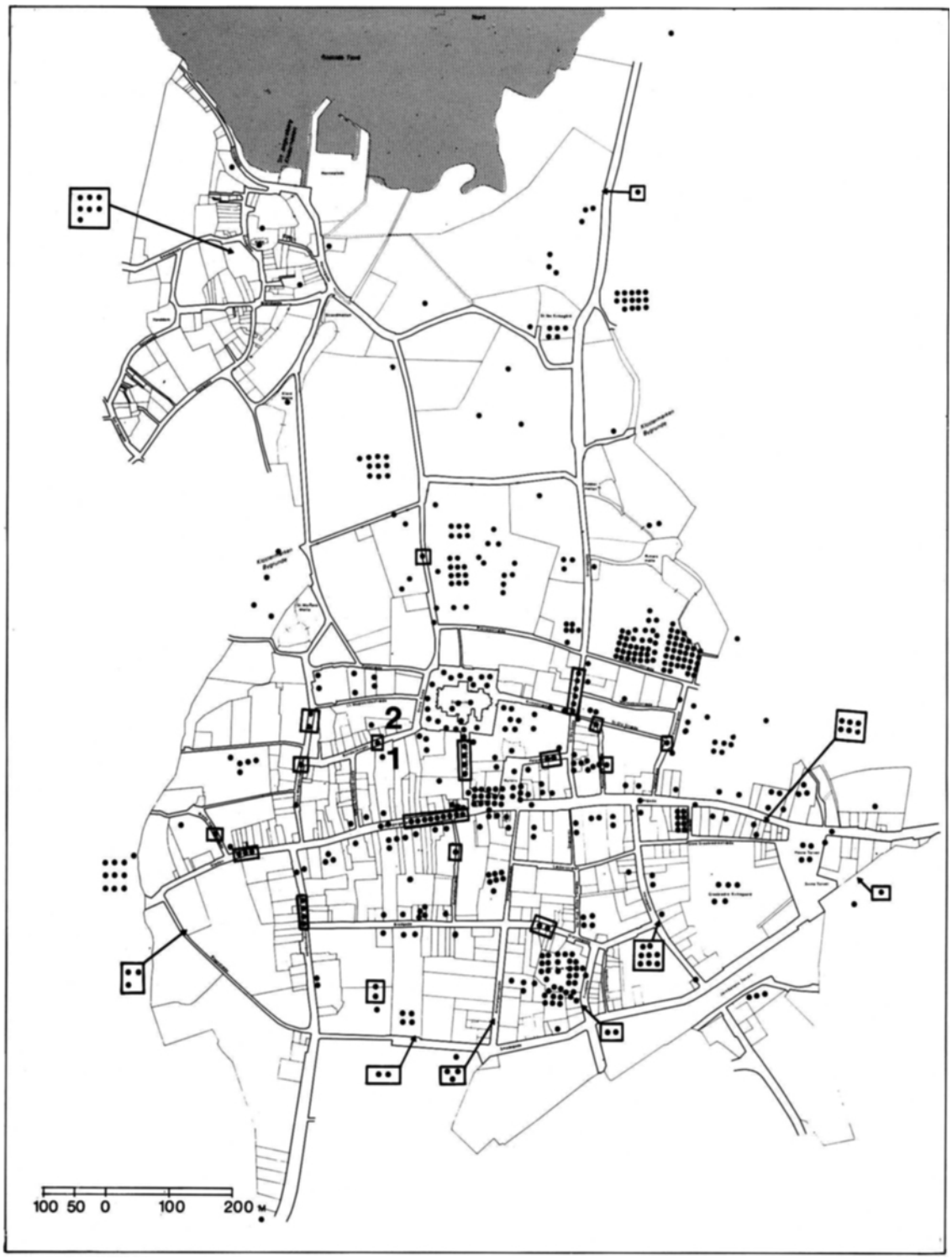


Fig. 1. Distribution of all known sites of finds and observations. Each dot indicates one find complex ranging from a single object picked up and given to a museum to proper archaeological excavations. Frames are used if only a street has been referred to.
The map has been drawn by Matrikeldirektoratet, Copenhagen, especially for the purpose of the project. It is based on the original drawings from measurings in 1887, scale 1:800, in Matrikelarkivet.

PROBLEMS OF DATING

The dating of archaeological finds will always depend on the state of research. Medieval archaeology has earlier concentrated on monuments and structural remains mainly. In Denmark the planned study of small finds has begun only in recent years. This means that a solid typo-chronological foundation is lacking, so one has to begin with the types of object, most studied, and supplement the acquired information with European "standard-datings". Owing to the absence of a fine typo-chronological grid we have divided the finds into three broad groups – viking, early medieval, and late medieval. Dates are determined by the coins characteristic of each period. This use of coins means, however, that the time frames tend to be artificial and excessively rigid when applied to other finds, as in reality a continuous development took place during each period and from one period to the next. An example is the dating of the glazed pottery, based upon the European standard dating of 1250–1350, despite the fact that in some towns in Denmark glazed pottery is found in layers obviously older than 1250. The same applies to "near-stoneware", which appears before as well as after 1241. Despite these uncertainties it is chiefly pottery that provides the measures of dating based upon a number of recent studies of Danish Medieval earthenware (Andersen, Crabb and Madsen 1971; Bencard 1972; Bencard and Roesdahl 1972; Liebgott 1975, 1979; P.K. Madsen 1980). Similarly, we seem to be approaching greater clarity concerning the transition from the viking to the early medieval period.

The viking period is defined by soapstone, conical spindle whorls, ornaments with viking style decoration (except that the Urnes style is sometimes found also in the 1100's), and by all coins struck before 1074, i.e. up to and including those of Svend Estridsen.

The early medieval period is characterised by Baltic pottery, weaving combs, unilateral combs, ornaments in "Romanesque" style, and all coins struck between 1074 and 1241 (from Harald Hen to Valdemar 2.). Baltic pottery and unilateral combs are placed within this period although they also occur during the viking period, but precise dating is difficult without a detailed study. Baltic pottery, which is so important for the earlier periods on Zealand is being studied intensively at present.

The later medieval period is characterised by glazed pottery, stoneware (which is always imported), bilateral combs, and a number of other objects whose style and form show that they belong to the later part of the Middle Ages. To this period belong all coins struck between 1241 and 1559 (from Erik Plovpenning to Kristian 3.).

When in doubt we have placed an object in the more recent rather than the older period. In the following will be given a few concrete examples of how the material can be interpreted.

CONCENTRATIONS OF COINS

Despite the above reservations about the value of scattered finds, noticeable concentrations always call for attention. In St. Maria's Hospital garden exceptionally many coins have been found (fig. 3,2). No less than 71 coins ranging from Harald Hen to Kristian 3. (1074–1559) have been recorded. (The project has not made a count of younger coins that have been found at the site). It was observed that some of the coins were found near the "Apoteker-kilden" (Apothecaries' Well). The chronological range is too great for the coins to belong to a dispersed hoard. The many post-medieval coins show furthermore that they cannot be "church-floor coins" from one of the parish churches demolished shortly after the Reformation in 1536. It is tempting to see the coin deposit as being connected with a cult of a sacred well, despite the scarcity of contemporary accounts of medieval well cults and the absence of accounts from Roskilde (A.F. Schmidt 1926; N.-K. Liebgott 1975). Yet, coin offerings near a well seem to be a distinct possibility. The absence of more definitive documentary evidence makes it difficult to find another plausible explanation. Archaeological research will probably be the only way to solving the mystery.

THE ORIGIN OF ROSKILDE

Some main topographical features may be used as point of departure for the consideration of other problems concerning the town, for example the extension of the built-up area, the boundaries of the borough, the street plan, and the sites of ecclesiastical

institutions and other major buildings like water mills. Here we shall pay attention to two of these issues – the boundaries, and the placement of parish churches both seen in relation to the built-up area. First, a few words about one of the major issues in the history of the town – where was the earliest Roskilde situated?

The first historical sources to mention Roskilde are from the late 10th century, when Harald Bluetooth built the church of the Holy Trinity. Finds from the first two centuries of the town's history have been considered uncommon. It came as a surprise, therefore, when registration of the museum collections revealed 28 finds earlier than 1074 – this despite the fact that Baltic pottery is counted as early medieval and not included. Excavations at the churches of St. Jørgensbjerg and St. Ib have showed that the buildings date to the 11th century. Among the remaining 26 collections were a number of coins.

In a summary of the problems concerning the earliest Roskilde Frank Birkebæk has argued that the first settlement was near the fjord (Birkebæk 1979). The settlement then moved to the area around the cathedral. In 1979–80 excavations were carried out near the old shore-line, revealing scattered settlement from the 11th–12th centuries, contemporary with a settlement near the cathedral, testified by the parish churches of the period. At present we shall merely point to viking and early medieval finds from north-western outskirts of the medieval town, which may show an old area of activity (fig. 2,1). The most remarkable thing is, however, that the finds are distributed all over the area from the fjord in the north to Our Lady's cemetery in the south. At the latter site, a coin hoard from about 1050 has been found (fig. 3,3). The distribution of viking finds demonstrate that there was no restricted town nucleus, rather, that as early as the 11th century activities took place within the entire area occupied by the medieval town.

THE TOWN DEFENCES

Roskilde's defensive works have to be seen in relation to the natural topography. The distance from the present fjord in the north to the southern boundary of medieval Roskilde is about 1500 m, with the land rising to a height of 45 m. The cathedral stands at 38 m more or less at the edge of a plateau. To the East and West the town is bounded by wet areas caused by the many springs that rise out of the edge of the plateau.

Saxo writes that Roskilde was fortified by the mid-twelfth century king, Sven Grathe. In 1978 this dating was supported by archaeological investigations of the northern and north-eastern parts of the fortifications (fig. 6). A bank and ditch were revealed and tie in with the course of the fortifications recorded on the south and west (Birkebæk & Vorting 1979). Further, the written sources – describing the course of "Borgerdiget" ("Burgher Dike") – confirm the result. The fortifications are not likely to have been altered during the later Middle Ages. The sources mention two gates only, one at each end of the major east-west road, now called Algade, Skomagergade, and Støden. Part of this road was the medieval market place. Sources from the High Middle Ages mention settlement outside both gates (Nielsen 1979). Thus the town defences established in the middle of the twelfth century did not make up the limits of fifteenth century Roskilde.

THE MEDIEVAL PARISH CHURCHES

Medieval Roskilde had 14 parish churches shown on the map, fig. 6. The cathedral had no parochial functions. Here we will consider only their dating. The sites of some of the parish churches were previously unknown. Two of these have now been located in the course of the present project. They will be discussed in detail below.

The cathedral is mentioned in written sources from the late 10th century. Traces of one (possibly two) 11th century churches of calcareous tufa have been found below the present building. Three parish churches, namely the two nearest the fjord (fig. 6, 1 and 2) and Our Lady's Church (fig. 6,17), can safely be dated to the same century. At the other eleven churches walls or graves of calcareous tufa have been found. This building material was available at a number of the town's springs. Even if the stone may have been re-used, it must at any rate have been easily accessible. Probably by at latest the middle of the 12th century the majority of the parish churches had been built in this stone. After this date brick succeeded all other building materials.

The two problematic churches are St. Peter's and St.

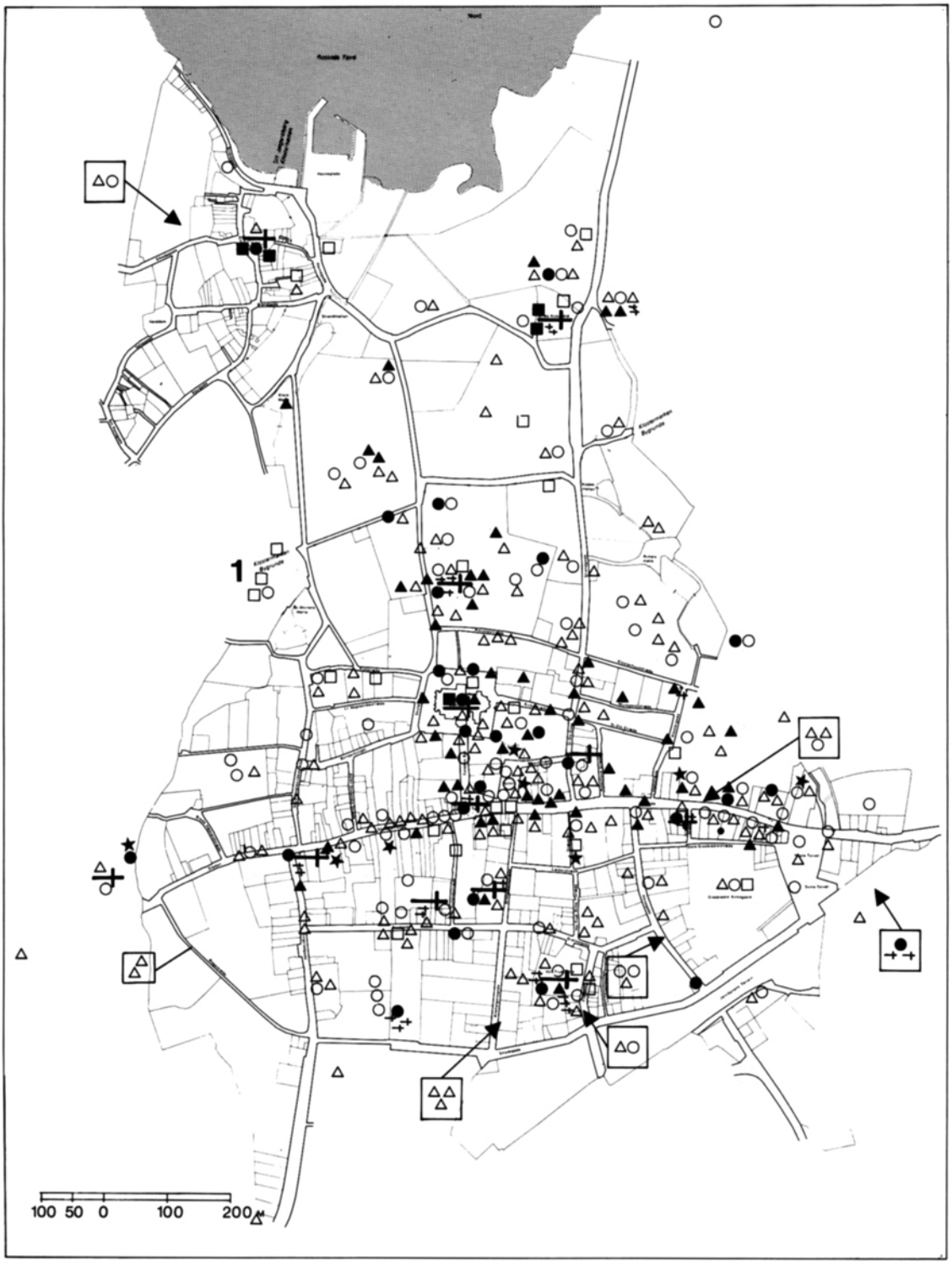


Fig. 2. Distribution of stray finds, observations, and archaeological excavations, dated as far as possible corresponding to the three periods given from the coins, see fig. 3. On each ground plot all period represented are indicated. The solid symbols indicate buried archaeological monuments, ranging from churches and graves (especially marked) to pit houses. Square = Viking Age. Circle = Early Middle Ages. Triangle = Later Middle Ages. Star = medieval well.

Fig. 3. Distribution of finds of coins and their number. The smaller symbols indicate the find of 1 to 5 coins belonging to a certain period at the site, while the often numerous finds from church sites or church floors are shown with larger symbols. Square = Viking Age, i.e. including the reign of Sven Estridsen († 1074). Circle = Early Middle Ages, i.e. from Harald Hen to Valdemar 2. Sejr (1074–1241). Triangle = Later Middle Ages, i.e. from Erik 4. Plovpenning to Christian 3. (1241–1559).

Fig. 4. Foundations of the parish church of St Michael excavated by Roskilde Museum 1980 (photo: Roskilde Museum).

Paul's. Dedications to these saints are mentioned for the first time in a papal letter of 1257, in which they are clearly connected to one church only. As a consequence, this church has been thought to be situated in the area where skeletons have been found (fig. 6,8), but this area must have been part of the cemetery of the Dominican monastery. That there never was any "Church of St. Peter and St. Paul" is confirmed by the fact that all documents of local origin refer to the two saints separately with each his church and parish.

The analysis of the written information concerning some property in St. Paul's parish shows that the parish church was situated south of the eastern part of Algade. Since the beginning of this century a graveyard was known there, but the graves were always supposed to belong to St. Mikkel's cemetery (fig. 6,10). However, when the archaeological evidence is examined, we find two lots of graves with an empty area in between. The existence of a grave-free zone was confirmed by an archaeological investigation in 1978 (Engberg 1979). We have, therefore, two separate cemeteries, of which the more easterly can be identified as St. Paul's with the help of the written sources (fig. 6,9).

The church of St. Peter remains a problem. For this we try to take note of a discovery albeit with scanty information. When the railway between Roskilde and Copenhagen was built in 1846, a "round" foundation of calcareous tufa surrounded by many walled graves was noticed. According to the information available the discovery was made south or east of the square, Hestetorvet. It has earlier been interpreted as the remains of a "round chapel" (*Danmarks Kirker*, p. 141) because the internal diameter of 5–6 m given seemed too large for the apse of a church and too small for a round church like All Saints' (fig. 6,15). With four meters of railway embankment covering it, the site is not likely to be re-excavated. Indeed, it is not certain that an excavation would solve the question of whether the structure belonged to a church or a chapel. However, Roskilde's ecclesiastical institutions are so well documented that it seems unlikely that so old a chapel, furthermore one with a cemetery, could have escaped mention. We should, therefore, like to suggest that the foundations below the railway are those of church of St. Peter (fig. 6,20).

There are several reasons why so much attention has been given to locating the old parish churches. The discoveries of skeletons together with written sources make it possible to establish with considerable certainty the sites of the churches. This information is very useful for the study of the written sources. In deeds houses and plots are often described by the relation to a parish. Furthermore the churches are especially important as centres of settlement areas in early medieval period. But none of the 14 parishes seem to have been totally depopulated during the later Middle Ages. Hence the relation of the churches to the town walls has interesting chronological perspectives.

Fig. 6. The Medieval defenceworks, ecclesiastical institutions, and water mills of Roskilde. – 1. The parish church of St Clemens (now St Jørgensbjerg) with the hospital for lepers. – 2. The parish church of St James (St Ib). – 3. The Dominican nunnery of St Agnes. – 4. The Franciscan nunnery of St Clara. – 5. The parish church of St Martin (St Morten). 6. The parish church of St John (ST Hans). – 7. The Cathedral, originally decicated to the Holy Trinity, later also to St Lucius (a 3rd Century Pope). – 8. The Dominican Friary. – 9. The parish church of St Paul. – 10. The parish church of St Michael (St Mikkel). – 11. The parish church of St Olaf. – 12. The parish church of St Laurentius, and north-west of this the Hospital of the Holy Ghost (Helligåndshospitalet). – 13. The parish church of St Botulf. – 14. The parish church of St Dionysius. – 15. The parish church of All Saints (Alle Helgen). – 16. The Franciscan Friary. – 18. The parish church of St Nicolaus. – 19. The hospital of the friars of the Holy Dove (Duebrødre Hospital), the only institution of this dedication in Denmark. – 20. "A round chapel", or possibly the parish church of St Peter. – a. The Red Gate (Røde Port). – b. St Botulf's Gate. – Observed or excavated parts of the defence works are shown with a broarder line than the reconstructed parts.

CONCLUSION AND SUMMARY

The main question asked in this paper has been whether use can be made of stray finds in determining the topographical development of the medieval Danish borough, in this case Roskilde. The answer has been affirmative, as the evidence concerning Roskilde shows. In spite of problems in using objects and archaeological observations, the material from Roskilde is so extensive and widely distributed, that it must be considered fairly representative and undistorted by accidental factors. Hence, the plotting of finds and observations on maps of the town will greatly aid in illuminating the development of the town of Roskilde from the viking period through the Middle Ages. The fullest use of the information gathered is not achieved, however, until we include written information, gleaned from contemporary documents. The two different categories of sources reveal different sides of medieval life; they complement each other and both must be utilized in order to gain an understanding of the society, we wish to examine.

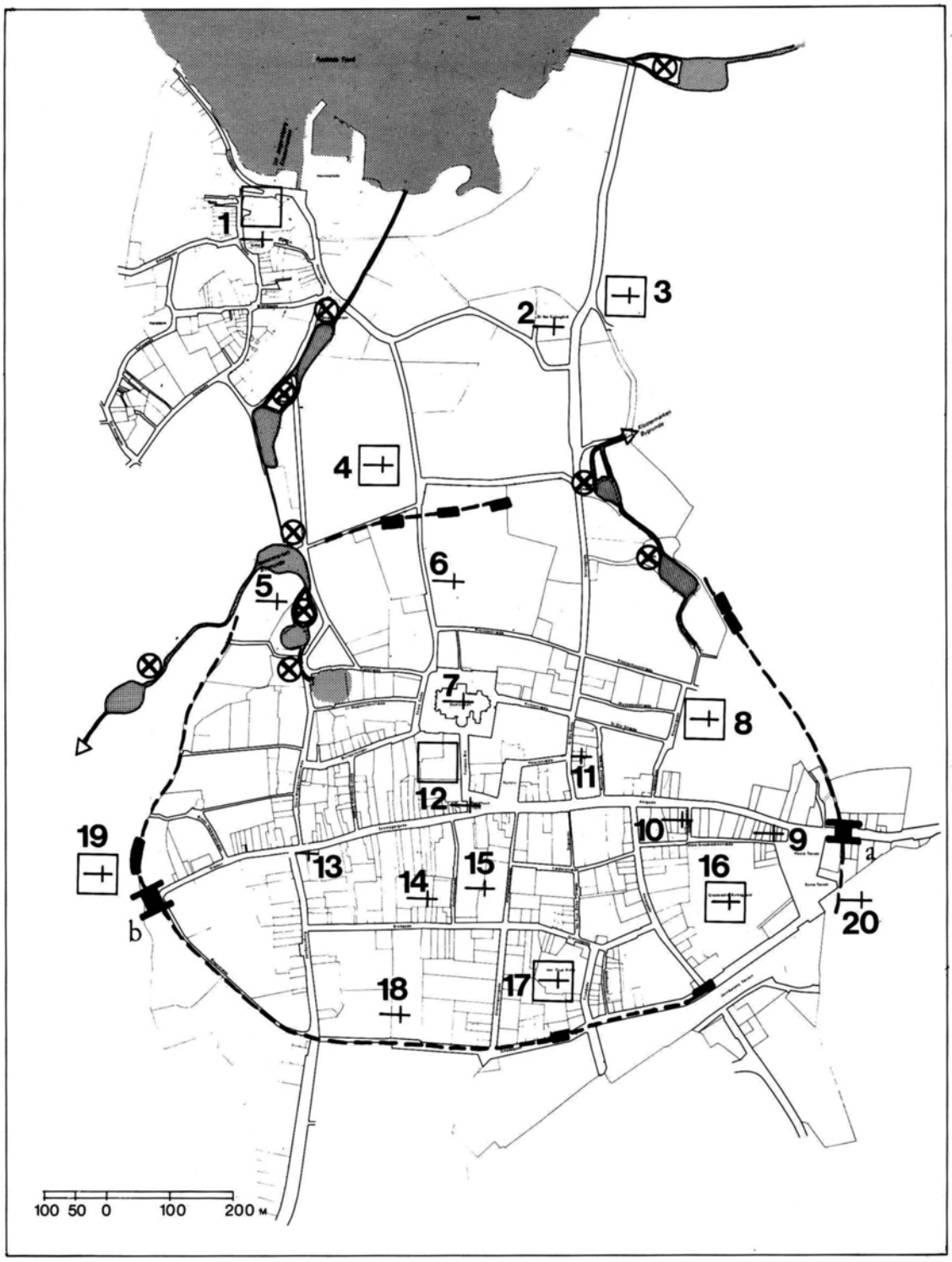
The research project "The Medieval Town" of which the analysis of Roskilde's past is a part, is not yet completed. In this paper, we have discussed the methods of presenting finds and observations cartographically in order to discern the main trends of the topographical development of Roskilde.

The distribution of finds from the viking period suggests that the earliest settlement covered an area as large as that of the medieval town. Although the finds do not indicate a dense population in general, they are scattered over an area of impressive size. The parish churches show that during the Early Middle Ages the town occupied an area, larger than the one enclosed by the bank and ditch in the middle of the twelfth century. Topographical features explain why the two churches situated near the fjord were considered to be outside the physical limits of the town. The reason why the church of St. Peter was not enclosed within the bank and the ditch must be that the latter were fortifications of truly defensive measure, not merely markers of borough boundaries.

In the later Middle Ages the sources still indicate settlement outside the gates. The distribution of the finds demonstrates activity in and around the town during the entire medieval period. It is of particular interest in this case, as it shows that Roskilde was still an important town even after the royal residence was removed to Copenhagen and the economic role of Roskilde was assumed by the new commercial centres along the Sound, noticeably Copenhagen and Køge. This discovery leads to further questions that must be raised, concerning the economic foundation of the late medieval borough. Finally, it underlines the importance of examining the finds of the later Middle Ages and their distribution, not just concentrating, as has generally been the case, on the viking and early medieval periods.

The work of the research project "The Medieval Town" continues, answering old as well as raising new questions. As we have concentrated on major developments in this paper, we should like to point out in closing, that specialized studies have been published,

Fig. 5. A Viking Age brooch found at the church yard of the Medieval Franciscan Friary (photo: The National Museum).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including a survey of the medieval mills and hospitals (Nielsen 1978) and an examination of the settlement along the main street, Algade and Skomagergade, running east-west (Nielsen 1979). An even more important result has been achieved by the mapping: archaeological excavations are being carried out at many of the sites where the plotting has taken shape of a question mark – excavations that already look promising.

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Chemical Analyses of Archaeological Bone-Samples: Evidence for High Lead Exposure on the Faroe Islands

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The Faroes, a group of rocky islands in the Atlantic Ocean located between Iceland, Scotland and Norway, were colonized by the Vikings about 800 A.D. The origin of the population is primarily Danish and Norwegian. Farming was limited by geographical and climatic conditions but sheep raising contributed significantly to the Faroese economy. Fishing and hunting for pilot whales were also important activities. Lacking metals, timber and grain, the Faroe Islands had important commercial relations to Denmark and Norway.

On these remote islands, exposure to environmental chemicals must have been low. Recent measurements of air pollution with lead have shown very low results (OECD, 1977). Lead was never mined on the Faroe Islands, and the importance of lead during the period of monopolized commerce was minimal. Thus, human exposure to lead must be expected to be of a very low order of magnitude.

Lead is a heavy metal with a low melting point and useful physical and chemical characteristics. Lead is probably the nonferrous metal which has the widest spectrum of applications, and it has been in use for several thousand years. Currently, lead pollution from automobile exhausts, lead compounds in old paint and ceramic glazes, and occupational exposures cause much concern (WHO, 1977). Subtle forms of chronic lead poisoning may cause interference with blood formation and nervous system functions.

Due to the low solubility of lead phosphate, lead accumulates in the skeleton. Thus, bones and teeth contain about 95 percent of the total body burden (WHO, 1977). Lead is probably incorporated in the hydroxyapatite crystals in the bone matrix, from where any leaching must be a very slow process. Archaeological samples of skeletons may, therefore, be used for analyses of body burdens of lead in the past. This approach has been used previously in several countries, i.e., Poland and Denmark (Jaworowski, 1968; Grandjean, 1973). These studies have indicated that lead exposures were very high during past time periods, particularly during the 18th and 19th centuries. These high lead levels have been traced to several lead sources: water pipes of lead, lead additives in wine and beer, lead compounds in cosmetics, paint, and drugs, pewter containing lead, and ceramic glazes. Similar lead sources may have occurred on the Faroe Islands, though definite evidence is lacking.

MATERIAL AND METHODS

We have examined an extensive skeletal material (N = 27) from two locations, Kirkjubø and Sand churches, cf. Table 1.

The Mediaeval graves at Kirkjubø were originally situated outside the church, but the area was later incorporated into the church. The three individuals examined may have had an important social position since they were buried close to the walls of the church. The 18th century graves under the church floor belonged to wealthy farmers. No information, however, is available about any distinction between graves in the different parts of the church (Dahl, 1977).

Kirkjubø was the center of cultural and religious life during several centuries. Sand church, however, was a small village church. Mediaeval skeletons were found under the floor of the second of the total of six churches which were built on top of each other in Sand. Archaeological and anthropological evidence

Table 1. Skeletal material which has been examined for lead.

Time period	Grave No.	Age	Sex	Lead (ug/g)
		Kirkjubø		
Early Mediaeval Ages	11	Mat.	M	42
	15	Sen.	M	240
	19	Mat.	F	33
18th century (nave)	1 a	Sen.	M	10
	3	Mat.	M	120
	4	Mat.	M	4
	16	Mat.	F	34
	6 b	Sen.	M	21
18th century (choir)	II	Mat.	M	85
	III	> 20 yrs.	F	109
	IV A	Mat.	M	156
	V A/B	> 20 yrs.	?	108
	V A/B	> 20 yrs.	?	99
	VI A	Ad.	M	53
	VI B	Mat.	M	15
	VI C	> 20 yrs.	?	11
	XII	Sen.	M	67
	XI A1	Mat.	M	140
		Sand		
Early Mediaeval Ages	7	Mat.	F	36
	8	Newb.	?	1.4
	9	3 mths.	?	0.5
	14	Ad.	M	45
	16	Mat.	M	17
	19	Mat.	F	14
	20	Mat.	M	11
	21	Newb.	?	2.7
	25	Mat.	M	54
18th century	I – II	> 20 yrs.	?	39
	II A/B	Mat.	?	29
	V	Mat./Sen.	M	38

Ad. = 20–35 years. Mat. = 35–55 years. Sen. = > 55 years.

suggests that the church may have belonged to a nearby manor and that the individuals buried in the church were all related (Krogh, 1975; Andersen, 1978). The 18th century graves under the eastern part of the fifth church may have belonged to ministers and their relatives.

Most skeletons were quite well preserved under the floors of the two churches. The early graves from Kirkjubø were, however, originally outside the church, but were later covered by the extended church construction. During the excavations, a few objects made of lead were found, i.e., weights, seals, etc. None of these objects were found in the graves, however. Due to the fairly good condition of the bone material and the negligible risk of post mortem contamination, these samples were suitable for lead analysis.

The lead determination of bone was carried out as described by Grandjean et al. (1979). This method has an average correlation of variation of 10% and an almost complete recovery of lead. Thus, the results obtained with this method are more accurate than the previously published results (Grandjean, 1973). A vertebral body was analysed from all skeletons, and the dissection of the bone sample was carried out as described by Grandjean (1973). A reference material from present-day Denmark was obtained at autopsy at the Institute of Forensic Medicine in Copenhagen. The present-day samples were taken from the temporal bone (Grandjean et al., 1979), which may contain about 50% more lead than the vertebral body.

RESULTS

The result for each skeleton is given in Table 1. All lead levels are given in μg/g (parts per million) dry weight. Lead is usually accumulated with age, and males often have higher lead levels than females. In this study, however, no such sex or age relationship could be found, except for very low levels in the three child skeletons. The average lead levels of the adult skeletons are given in Table 2. The high average level in the earliest Kirkjubø skeletons is due to one single sample with a lead level of 240 μg/g. Otherwise, the lead levels in Sand and kirkjubø seem to be similar. A striking difference was found in the average lead levels of the 18th century skeletons from the two Kirkjubø groups.

The most important finding was the difference between the lead levels of the archaeological samples compared to 22 present-day samples from Copenhagen. The latter samples had been obtained from males and females of comparable age groups. The lead level in the vertebral body was not measured in the fresh samples, but would be expected to be somewhat lower than the lead level in the temporal bone. Thus, the lead concentration in the archaeological samples average about 10-fold above the present-day level in Denmark.

Table 2. Summary of lead levels in bones from adults.

Time period	Location	Average lead (ug/g)	
Early Mediaeval Ages	Kirkjubø	105	(N = 3)
Early Mediaeval Ages	Sand	30	(N = 6)
18th century	Sand	35	(N = 3)
18th century	Kirkjubø (nave)	38	(N = 5)
18th century	Kirkbujø (choir)	84	(N = 10)
Present	Copenhagen	6.5*	(N = 22)

* From Grandjean et al. (1979).

DISCUSSION

Current environmental pollution by lead adds to the human burden of this metal. The natural lead levels, to which *Homo sapiens* originally adapted, were much lower. On the basis of geological and ecological measurements, Patterson (1965) suggested that the natural lead exposure of humans would be about 1% of present day level. Since then, archaeological bone samples from pre-metallurgical time periods have been analysed (Grandjean et al., 1979; Ericson et al., 1979). On the basis of these measurements, a natural lead concentration in the vertebral body can be calculated at about 0,1–0,2 μg/g. Compared to this level, several archaeological samples from the Faroe Islands contain more than 100-fold excess of lead.

The sources of such high lead exposures are not known in detail. Water pipes of lead were not used, but wealthy people could afford pewterware and ceramics. No information is available on the extent of the use of lead compounds in paints, cosmetics, drugs, wine additives, etc.

A previous study of bone samples from 1711 showed an average lead level of 5-fold above the present day average (Grandjean, 1973). High lead levels in medieavel samples were also found in this study and in one by Jaworowsky (1968). Despite the remoteness of the Faroe Islands and the lack of natural sources of high lead exposure, imported goods resulted in extremely high lead exposures during the past centuries.

A toxicological evaluation of these findings is very difficult because the lead content of the skeleton is supposed to be almost inert. Toxic effects are due to lead in brain, bone marrow and blood (WHO, 1977), and these levels are difficult to estimate from the present findings. Lead levels in target organs must, however, have been elevated, perhaps as much as in the skeleton. Thus, it may be speculated that chronic lead poisoning, and perhaps acute cases, were rather prevalent on the Faroe Islands in the past. Lead toxicity may, therefore, have contributed to the morbidity, mortality, and perhaps fertility patterns on the islands. Similarly high levels may have been prevalent in the Roman Empire, and Gilfillian (1965) has suggested that lead poisoning contributed to the fall of the Roman Empire. Though this hypothesis has not been proved, it indicates the possible significance of wide-spread lead poisoning.

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Reviews

ARNE SKJØLSVOLD: *Slettabøboplassen. Et bidrag til diskusjonen om forholdet mellem fangst- og bondesamfunnet i yngre steinalder og bronsealder. Arkeologisk museum i Stavanger – skrifter* 2. Stavanger 1977. 380 pp., including 67 plates. With an English summary and a report on preliminary mineralogical analysis of the pottery carried out by A.M. & I. Th. Rosenqvist.

The Stone Age settlement of Slettabø is situated in Rogaland, South-Western Norway, and was excavated by Arne Skjølsvold in four summer field-work programmes in 1963–68, after which a preliminary but fairly extensive account of the excavations was published in *Viking 1972*. The present monograph is the final publication, and is to be welcomed. It is not only a comprehensive presentation of important material but also discusses a number of problems of fundamental significance for the Norwegian, or for that matter the Scandinavian Stone Age. Consequently there is every reason to take a closer look at the book, the significance of which extends beyond the promise of the title.

The Slettabø settlement is now situated on the mainland, between seven and nine metres above sea level; but with a five to six metres higher water level in the Stone Age Tapes Sea the settlement would have been situated on a small island, probably next to the shore. The area is now, as it was during the Stone Age, afflicted by shifting sands, which at the beginning of the excavation completely covered the culture layers; in fact, these were sandwiched between sterile layers of shifting sand. Broadly speaking the stratification on the site was as follows:

turf
light grey sand
greyish brown sand
culture layer I
yellowish grey/brown sand
culture layer II
yellowish brown sand
culture layer III
yellowish grey/brown sand.

The extent and thickness of the culture layers varied a good deal, but in some areas the above mentioned stratification reached a thickness of over a metre.

The site was excavated in metre squares and in layers with a thickness of 10 cm, finds from each of these units being kept separate. The excavation was not total and 164 m² were examined while the whole site is supposed to cover c. 200 – 220 m². During the investigation sieving was only carried out on a small scale, whereas several sections were made to facilitate an understanding of the very complex stratification. One gets the impression that it was a very carefully conducted excavation, which is indeed crucial when assessing find frequency etc. of individual types of artefacts. On the other hand, the adoption of a system of co-ordinates with small and capital letters as well as positive and negative numerical values does not appear very useful. It is difficult to work with and it will often involve errors during the registration. – Why not employ a system of compass-orientated Cartesian co-ordinates with the use of positive values alone?

Judging by a number of C^{14} dates, layer I belongs to the middle of the Bronze Age; one date stands out from the rest and may suggest occupation at the end of the Bronze Age. Some fireplaces and remains of pavements and stone packing were noticed but neither in layer I nor in the other habitation layers were distinctive traces of huts or houses, for exampel postholes, seen. The artefact material from layer I is limited: a few flat-trimmed tools, various tools of flint and rock, as well as pottery. There was only one bronze object: a fragmented pin that defies further identification. Several of the ca. 4.500 potsherds have been shown to belong to almost bucketshaped vessels. The pottery, a minute proportion of which is decorated, does not invite to further discussion. The osteological material is considerable but – as in the other layers – so badly preserved that it is difficult to identify. It has, however, been possible to recognize bone remains of cow, deer, whale, a couple of bird species, and cod. These finds, when related to the location of the settlement, support Skjølvold's assumption that Slettabø was a hunting and fishing settlement.

The subjacent layer II represents the main habitation on the site and has an average thickness of 35–40 cm. Here, too, the bone material suggests that we are dealing with a hunting and fishing settlement since bones from cow, deer, seal, porpoise and a few species of bird and fish have been recognized. The identification of cow/deer on the basis of tooth fragments is, however, said to be subject to some uncertainty. One would expect there to be high phosphate values in such layers, but this is not borne out by the analyses, and the low values (in comparison with, for instance, Swedish hunting sites) are regarded as a result of leaching of the sandy strata.

The flint material is considerable: c. 700 g per square metre, but this is said to be a normal quantity in Stone Age settlements in Rogaland. Both Senon and Danian Flint was

used, probably collected locally on the beach. Apart from the more commonplace flint objects and approx. 110.000 pieces of waste one notes the presence of over 200 tanged arrow-heads of the types A1–A3, including also some AO. Other types of arrow-head are single-edged, flat-chipped, and a few tanged arrow-heads of the types B and D, whereas no transverse arrow-heads have been found. Furthermore there are some slate arrow-heads, fragments from polished flint axes, many flint cores, including cylindrical ones, some axes of rock, pumice (with traces of wear) etc. Altogether, the material appears to be rich and varied. There are not many bone tools: some fragments of fish-hooks, a couple of bone points (from harpoons?) and a few small pieces of decorated bone.

The pottery from layer II is of particular interest, partly because of its abundance – almost 10.000 potsherds, i.e. approx. 250 g per sq. metre – and partly because it is a fairly varied collection, 11% of which is decorated. This contrasts with other South Norwegian coastal settlements where there are fewer finds of pottery and the range of types is small. Skjølsvold estimates that the sherds represent the remains of at least 185 pots of fairly varied shapes: almost hemispherical, conical-bottomed, flat-bottomed and with S-shaped profile. A mineralogical examination has shown considerable variation in clay and temper and also demonstrated the use of grog.

The discussion of the pottery, and especially the ornamentation, is very detailed, and there are many instructive drawings by T. Strenger. Comparative material is introduced from far and near and experiments are carried out with stamps to illustrate how ornamentation was produced. This comprehensive discussion of the pottery is amply justified since it is the first publication of a major pottery find from this region.

One exotic discovery is that of a sizable part of a bell-beaker – the first find of bell-beaker pottery in Norway. Analysis of the ware suggests a foreign, probably North German, origin. Some flat-trimmed, barbed arrow-heads with a short tang may also belong to the Bell-Beaker Culture. Corded-Ware pottery predominates in the rest of the pottery, as is generally the case on coastal sites in Southern Norway. The pottery is associated mainly with late types of pottery from the Battle Axe culture (Malmer's groups C, K, J and O) and in a few instances with Single-Grave pottery from Jutland. Potsherds decorated with grooves, horizontal zigzags and cross hatching are rare and regarded as Pitted Ware, although the possibility that they may represent pottery belonging to the Funnel Beaker Culture is not completely excluded. The Late Neolithic pottery includes sherds with the barbed wire motive and beading.

The bottom layer of the settlement (layer III) contained few finds and presented partly the same types as layer II. There were bone remains from deer, cod and haddock. The layer, incidentally, appeared merely as a thin discontinuous band.

The presentation of the material is followed by a wide-ranging discussion concerning definition and classification of the material. This is especially true of the tanged arrow-heads, where the results of K. Odner, A.B. Johansen and S. Indrelid are discussed. Skjølsvold reaches the conclusion that the division of the tanged arrow-heads into an early and a late group (A1/A2–3) does not apply to the Norwegian material since there is a clear predominance of A1 arrow-heads in a number of Norwegian sites from the Late Stone Age. The presence of pottery belonging to the Battle Axe Culture together with the tanged arrow-heads of type A, also indicates a different course of development from that in Southern Scandinavia.

On the basis of find contexts and the published tables it appears difficult to get a really clear picture with regard to the stratification and the chronology. This is especially true when one is looking at layers II and III. Types that, for all we know from elsewhere, are not of the same age here lie side by side. The layers so nicely sandwiched between sterile layers of shifting sand, as it can be seen on the photographs, must have been disturbed to a certain degree. This may be due to local activity during the Stone Age, or the artefacts may have "sunk" in connection with sand drift. In this connection it should be mentioned that, according to information from Arne Skjølsvold, the flint is not sand-worn and therefore is unlikely to have lain exposed for a long time.

A concluding chronological section provides the results from a number of C^{14} datings, which add greatly to the understanding of the settlement. There are four dates from layer II: 2020, 1910, 1840 and 2700 B.C. with an uncertainty margin of ± 70–100 years. As Skjølsvold points out, Battle Axe pottery and its derivatives, B and D tanged arrow-heads, the Bell-Beaker element, Late Neolithic pottery and flat-trimmed arrow-heads can easily be placed within the period covered by the first three dates, and the same must apply to tanged arrow-heads of type A, which in Norway in all probability occur from the Mesolithic through the Neolithic. It is difficult, however, to concur with Skjølsvold in also placing pitted ware and a few other types of pottery as late as the first three dates indicate. On the other hand, as Skjølsvold emphasizes, there is pottery with cord and pit ornamentation on the same vessel. Here, as with certain other finds, we still know too little about the occurrence of the types in time and space. This is true, for instance, of slate arrow-heads and single-edged arrow-heads. The dating of 2700 B.C. presumably refers to layer III, which has yielded the following C^{14} dates: 2780, 2520, 2690, 2870 and 2830 B.C. ± 100–180 years (the date of 2830, however, is from a charcoal layer below layer III). In the preliminary publication Skjølsvold thought that layer III did not form an independant settlement. Now, with a whole series of "early dates", he concludes that it does represent an independant settlement phase. For, according to Skjølsvold, some pottery from layer III, e.g. cord ornamented ware, is to be regarded as an intrusion from layer II. The remaining material form layer III is fairly sparse, as already mentioned, and there is a lack of distinctive types for closer dating. It can be assumed that six tanged arrow-heads of type A in layer III may in fact belong to it.

The section on chronology based on C^{14} is less succesfull. Skjølsvold employs both the official half-life of 5570 and the "new" one of 5730. Since there is no agreement to abandon the official half-life and adopt the new one, it is quite superfluous to provide dates based on a half-life of 5730. It only helps to create confusion and, anyhow, does not produce "real" absolute dates, which in connection with the material in question is of minor importance but which could be provided by means of tree-ring calibration.

Moreover, the use of Welinder's chronological table for Scandinavia is an unfortunate choice in view of its problematic division of the Neolithic based on the long half-life as well as samples collected from an excessively large geographical area. It may be appropriate to point out that the period designations MN I – V should be used only within Danish territory since they were introduced largely on the basis of pottery found only in this country. To apply these terms to other Scandinavian regions where this material is absent will cause many problems. Furthermore the chronology of the Middle Neolithic in Denmark is certainly not so reliable as was once thought. Consequently it is necessary to establish a separate chronology for each individual area in Scandinavia. For the sake of good order it should be mentioned that Skjølsvold does not use the terms just mentioned to a larger extent, but merely points out that layer III belongs to the transition EN C/MN I, while layer II is said to fall within MN IV–V. Skjølsvold has not been able to take litterature published after 1975 into consideration, and there is obviously a good deal of recent litterature which is relevant to an assessment of the chapter on chronology.

A section on economy and settlement reports on recent studies into the penetration of agriculture into Southern Norway. As far as the Slettabø settlement is concerned it has so far not been possible, on the basis of pollen analysis in the immediate vicinity of the site, to demonstrate the presence of agriculture coeval with the settlement. The section on economy also deals with hunting, fishing, gathering etc. and includes a large collection of mainly etnographic material in the discussion. Another question considered is whether habitation was seasonal or permanent. Here, as elsewhere, the book explores the problems whether the inhabitants were farmers or not, thus following up the theme debated at the Nordic Archaeological conference in Tromsø in 1970.

There is also a useful survey of mountain investigations and the fairly intensive research that is being done on the Fosna and Nøstvet sites. In this connection it is natural to associate the C^{14} dates from layer III with a local Mesolithic. There are still, however, difficulties in dividing the South Norwegian Mesolithic into reliable regional and chronological groups. It looks distinctly odd, for instance, that it is still possible to discuss whether there were microliths during the transition to the Late Neolithic period.

Skjølsvold refers to layer III as "Fosna-like", whereas no elements point toward Nøstvet. In view of the above comments on the division of the South Norwegian Mesolithic, and considering the paucity of types found in layer III, it would probably have been better to say nothing.

The discussion of the cultural affiliation of layer II inevitably touches upon the origin and nature of the Pitted Ware Culture, and a useful account is given of a number of Norwegian settlements. Material from the other Scandinavian countries is also considered. Skjølsvold does not find the term "Pitted Ware Culture" satisfactory, but sees no suitable replacement term for this, as he calls it, "Sub-Neolithic mixed culture". To the present writer the term "Sub Neolithic" to cover such diverse assemblages is also inadequate, apart from the fact that the term is occassionally used in a completely different context, i.e. the period immediately preceding the Greek Bronze Age.

The account of the non-Norwegian material leaves out some publications that might have contributed to the discussion, e.g. Edgren's excellent book on the Corded Ware Culture in Finland, some papers from Meinander and Tauber's survey of Danish C^{14} readings. Nor has Janzon's book on Middle Neolithic graves on Gotland been included. Admittedly, publications now appear in such quantity that it is hard to keep up with them.

When analysing layer I from the Bronze Age Skjølsvold is disinclined to believe that the finds represent traces of the relatively rich Bronze Age society, the presence of which is otherwise manifested in the erection of large grave mounds and stone circles, as well as in the surplus invested heavily in metal objects. Instead he suggests that we may here be faced with traces of the old hunting and fishing culture, which persisted into the Bronze Age and co-existed with the carriers of the metal culture, and that such a dualism may indeed have been present also later in prehistoric times. In Skjølsvold's opinion it is easier to understand certain aspects of the prehistoric settlement pattern if we accept the presence of such a hunting population. The present writer, being convinced of the correctness of the theory of unilinear development, does certainly not agree!

As a publication of material Skjølsvold's book is of lasting value. Its survey of several Neolithic settlements and dwelling places in South Norway is also useful, as are the considerations of economy and settlement pattern. The picture is rounded off with a topical survey of research into the division of the Mesolithic, the beginning of the Neolithic, and finally the transition to the Bronze Age. Because of its wide range the book is a must for everyone who is concerned with these problems in Scandinavian archaeology.

This assessment is not altered by the objections raised against certain views in the book. After all, no two archaeologists will agree about chronology and cultural development in the late Scandinavian Stone Age. Here, if anywhere, a remark by Anatole France is appropriate: "Un archéologue, c'est un monsieur qui est d'un autre avis".

Svend Nielsen

KLAUS EBBESEN: *Tragtbægerkultur i Nordjylland. Nordiske Fortidsminder*, Serie B – in quarto, Vol. 5. Det kgl. nordiske Oldskriftselskab, Copenhagen 1978. 186 pp., 137 illustrations. Summary in German.

In 1975 K. Ebbesen published a comprehensive study of the material from the Middle Neolithic Funnel Beaker Culture (TRB) found on the Danish islands (K. Ebbesen, Die jüngere Trichterbecherkultur auf den dänischen Inseln. Arkæologiske Studier, Vol. II, Copenhagen 1975). The central part of this study is an analysis of style and form of the TRB pottery from megalithic graves on the Danish islands. It is the first survey of a very comprehensive collection of material. The subject-matter is difficult because of the lack of recent excavations of passage graves in Eastern Denmark. The whole mass of material has been collected over the last centuries and much of it stems from early excavations or unauthorized digging in metalithic graves. Consequently, there is a complete absence of chronological indicators such as, for example, stratigraphic data. Ebbesen employs a purely stylistic analysis. By means of an analysis of the combinations of stylistic elements he proposes a total of seven hypothetical stylistic groups. These are associated with the chronological divisions of the Middle Neolithic TRB in Denmark based on the pottery found in settlement sites (cf. C.J. Becker, Die mittel-neolitischen Kulturen in Südskandinavien. Acta Archaeologica Vol. XXV, 1954). The seven stylistic groups are termed MN I-style, MN II-style, Ferslev-style, MN III-style, MN IVA-style, MN IVB-style and MN V-style. The fact that the designations of style include the period designations should not, however, be regarded as definitive dating of the stylistic groups to the respective periods.

In "Tragtbægerkultur i Nordjylland" the Middle Neolithic TRB pottery from Jutland is analysed on the same lines. The book centres on the material from five megalithic graves in North Jutland and from this basis proceeds to an examination of the entire pottery material from the megalithic graves of Jutland. As in the book on the Danish islands the material from the settlements is not given primary attention, nor is the material from Jutland's stone packing graves, a considerable amount of which was published independently a few years ago (E. Jørgensen, Hagebrogård-Vroue-Koldkur. Neolitische Gräberfelder aus Nordwest-Jütland. Arkaeologiske Studier, Vol. IV, Copenhagen 1977. This publication also presents important new excavations of passage graves). Apart from the stylistic classification of pottery Ebbesen's book contains discussions of general problems concerning passage graves, and a brief survey of the rest of the material in megalithic graves from both the Middle Neolithic TRB, the Single-grave Culture, the Pitted-ware Culture and the Late Neolithic. In between one notices a short well-written passage on discoid mace heads. There is also an interesting passage on the development of burial customs in North Jutland.

These passages contain several new contributions, both in relation to the book of 1975 on the Danish islands and in relation to previous research. It is particularly important that the relative chronology of the Middle Neolithic has been revised and brought up to date so that it is now in agreement with the C^{14} chronology. The book on the Danish islands argues strongly in favour of the traditional notion that the Middle Neolithic TRB continued to exist until the beginning of the Late Neolithic, so that the Single-grave Culture was contemporaneous with the late phase of the Middle Neolithic TRB (part of MN III as well as MN IV and V). Ebbesen was then of the opinion that he could demonstrate continuity from the TRB to the Late Neolithic, both as regards pottery forms and flint tool techniques. Also the Globular Amphorae Culture was used as a chronological horizon in an attempt to date the TRB and the Single-grave culture in relation to each other. In the study of the TRB in North Jutland this line of reasoning has been completely abandoned in favour of the picture that emerges from the C^{14} dates. According to these the Single-grave Culture succeeds the TRB. Consequently, in the chronology diagram, fig. 108, a new terminology is proposed for the division of the Danish Neolithic, in which the terms *jættestuetid* (Passage Grave Period) and *enkeltgravstid* (Single-grave Period) are introduced. According to Ebbesen's terminology the *Mittle Neolithic* (MN) would signify the Middle Neolithic TRB and the *Later Neolithic* the subsequent phase, during which the Single-grave Culture is dominant, until the beginning of the Late Neolithic. Ebbesen thus sides with other researchers who in recent years have been studying the relationship between the TRB and the Single-grave Culture. In addition to the indications given by C^{14} readings, excavations during the 1970's of single-grave barrows in Jutland have resulted in stratigraphic data indicating that the earliest phase of the Single-grave Culture is later than period V of the TRB, or briefly contemporaneous with it (K. Davidsen, Relativ kronologi i mellemneolitisk tid. Aarbøger for nord. Oldk. og Hist. 1975. – K. Davidsen, The Final TRB Culture in Denmark. A Settlement Study. Arkæologiske Studier, Vol. V. Copenhagen 1978, pp 86–92, 167–175). A relative chronology that accords with the C^{14} dates has also been worked out on the basis of the thick-butted flint axes, in terms of typology and context (P.O. Nielsen, De tyknakkede flintøksers kronologi. Aarbøger f. nord. Oldk. og Hist. 1977).

Another important problem touched on in Ebbesen's book is the dating of Danish passage graves. Previously (including Ebbesen's book of 1975) the earliest building of passage graves has been dated to MN Ib (the Klintebakke phase; cf. H. Berg, Meddelelser fra Langelands Museum, 1951). Recently, however, Erik Jørgensen published a collection of pottery from passage graves in West Jutland (E. Jørgensen, op. cit.), which he assigns to MN Ia. Accordingly, Ebbesen suggests that the first passage graves in Denmark (Jutland) may have been erected during the earliest phase of the Middle Neolithic. In this connection Ebbesen dissociates himself from the wide-spread notion that the inspiration for Danish passage graves came from Western Europe: they were the result of an independent development within the Scandinavian megalithic area from polygonal dolmens via the large dolmens (*Grossdolmen*) to passage graves.

Let us now return to the studies of pottery, with which the book is mainly concerned. Viewed against the background of developments in pottery within the entire North European TRB area, North Jutland forms a regional sub-group with a partially independent stylistic development. The MN I-style corresponds to the East Danish MN I-style, but contains several local features. The MN II-style is sparsely represented. The Ferslev-style is in part contemporaneous with MN II in East Denmark. In North Jutland it acquires a distinctive form and it probably represents the most original pottery produced in North Jutland during the Middle Neolithic. The Ferslev-style is dated to the late MN II and MN III. The MN III and MN IV-styles that characterize a major part of the pottery from East Denmark's megalithic graves are of hardly any significance in North Jutland (and in Jutland generally). The sequence ends with a small number of MN IVB-style sherds and a slightly larger quantity representing MN V. A few minor objections may be raised to Ebbesen's developmental outline. In order to comprehend the development of the Ferslev-style, especially in North and Central Jutland, it is neccessary to draw a straight line from certain elements of the MN I-style (e.g. on the Troldebjerg bowls) to the Ferslev-style. One may therefore question the sequence MN I-style – MN II-style – Ferslev-style and rather assume a development from MN I-style to Ferslev-style, with MN II forming a largely East Danish stylistic element, which in Jutland is partly contemporaneous with the Ferslev-style (during MN II). Another objection concerns the MN IVB-style. In 1973 Karsten Davidsen dated the Jutland pottery decorated with the leitmotif of this style – suspended and standing triangles formed by means of short incisions – to MN V (K. Davidsen, Neolitiske lerskiver belyst af danske fund. Aarbøger f. nord. Oldk. og Hist. 1973, p. 30 note 88. Cf. Ebbesen's note 88 p. 163). In Davidsen's latest publication (op. cit. 1978, pp. 102 and 109) this dating is further supported by the presentation of a number of settlement finds from MN V the pottery of which exhibits this motif. This leaves very little evidence of Ebbesen's MN IV among the pottery from Jutland's megalithic graves. The difficulty of demonstrating definite MN IV pottery in Jutland – in graves as well as settlement sites – has also been pointed out by others (Davidsen, op. cit. 1978, pp. 113–117). The MN IV-style is beginning to look more and more like a local stylistic phase on the Danish islands, its main distribution being in the south-east.

There is an interesting demonstration of the local features characteristic of the Middle Neolithic TRB in North Jutland. For instance, the custom in votive offerings of placing pottery in front of the entrances to passage graves continued longer in North Jutland than on the islands, i.e. these deposits extended into MN III in North Jutland whereas they ceased during MN II on the islands. In contrast to the traditional belief that there was a break in continuity in the use of megalithic graves in Jutland (one of the arguments in favour of the early dating of the Single-grave Culture) Ebbesen's investigation demonstrates continuity right up to the close of MN. However, there was a development in burial custom, e.g. the votive offerings at the entrances and kerb stones changed from pottery to burnt and unburnt flint tools. As was the case on the Danish islands there was a reduction in the quantity of pottery placed in grave chambers from MN I to MN V. On the other hand, during the late TRB relatively many flint tools, axes and chisels were deposited in the chambers.

The book reflects the writer's interest in broad outlines. As in the study from 1975 the depicted pottery material is culled from a number of find contexts in order to provide examples of shapes and decorative styles. It would certainly have assisted the reader's comprehension greatly if Ebbesen had made use of typological tables to illustrate the individual styles. A subject of this kind almost demands it. Another difficulty about reading the book is the fact that the styles are not dated in the figure captions. For part, though not all, of the depicted pottery the date of styles must be deduced from the description of pottery *forms*.

Poul Otto Nielsen

BIRGITTA HULTHÉN: *On Ceramic Technology during the Scanian Neolithic and Bronze Age.* Akademilitteratur, Stockholm, Sweden, 1977, 226 pp.

This thesis is a pioneer work within Nordic prehistoric research. It was preceded by: "On Documentation of Pottery" (Hulthén 1974 a.), "On choice of Element for Determination of Quantity of Pottery" (Hulthén 1974 b.) and "On Thermal Colour Test" (Hulthén 1976).

Hulthén has put a lot of work into registering and data coding of her material, and developed methods of her own, both practical and technical.

The basic material is 250 kg of pottery, 17000 sherds, emanating from systematic excavations in Hagestad, S-E Scania. As a complement, material from adjacent regions have been brought into the investigation. For comparative analysis, sherds from Danish and other N.European localities have been examined by the same methods as the Hagestad material. The time stretches from the Ertebølle period to the end of the Bronze Age, a span of 3000 years. Middle Neolithic TRB culture is represented by 10200 sherds (59%) the others are, in order of quantity, Pitted Ware, Early Neolithic TRB, Late Neolithic, Bronze Age, Battleaxe and Ertebølle, the last represented by 160 sherds (1%).

The intention of the work is to contribute to the understanding of how ceramic manufacturing techniques developed and changed during the Stone and Bronze Age in Scania. The complex of problems is channelled into five principal questions: (p.13)

1. "Have potters with different cultural origins practiced particular manufacturing methods, which were specific to the individual cultures?"

2. "Is it possible to make observations concerning continuity and discontinuity respectively on the basis of technical studies of archaeological ceramics?"
3. "How have raw material resources been exploited by prehistoric potters?"
4. "Do manufacturing techniques and the selection of raw materials vary with distinct vessel functions? If so, can qualitative differences be observed in pottery material of a culture group within the same interval of time?"
5. "Is it feasible to study vessel distribution within an area by means of results from technological investigations?"

To what extent these problems could be solved or elucidated is discussed in the concluding chapter. (p.205 ff.)

Methods are described in short in the introducing chapter (p. 16–23). If nothing else is stated, the following quotations are from these pages.

17000 sherds have been recorded. This must have involved a tremendous amount of work; not only had matters like finding place, culture, shape and decoration to be noted, but also sherd thickness, weight, colour, temper, vessel-forming technique etc. (The bulk of the material, MN TRB, appears to be registered in less detail.) The methods are more fully presented in Hulthén 1974 a and b.

The data have been coded on data forms. "All measured values have been statistically treated and evaluated by means of a computer. Also by means of computer, a random sample has been obtained *within each group* of material taking *culture, finding place, layers etc.* into consideration" (my underlinings). The *etc.* is unfortunate in connection with "a random sample". The representativity depends on the number of "groups" and the sample size within each of them. There is no information on the number of "groups" or the number of test sherds within each "group", nor even, so far as I have been able to ascertain, on the number of selected test sherds within each culture. "The number of selected test sherds is 350."

The samples have been further analysed concerning clay, temper, vessel-forming techniques, surface finish and firing conditions. A number of methods have been used: petrological microscopy, chemical analyses, X-ray diffraction analyses and thermal analyses.

An important part of the work is the investigation of raw clays in the area. Samples of 80 clays, from "various depths", have been analysed. "They have all been sieved in order to determine the grain size." According to table 5, the modules are: "coarse sand", "fine sand", "silt" and "clay". An additional method of separation must have been used, since "silt", the fraction below ca. 0,07 mm, is the finest fraction obtained by sieving. "The amounts of 23 elements have been determined by chemical spectrographical (emission) analysis."

Differential Thermal Analysis (DTA) has been used to assess original firing temperature on sherds, and for clay mineral identification. Clay minerals have also been identified by means of X-ray diffraction analysis.

Thermal Colour Test (TCT) has been performed on all 80 clays and on 200 of the test sherds. As this is a new and simple method for investigations of clay composition in pottery as well as raw clays, introduced by Hulthén, it is more fully presented and discussed in the thesis than the other methods.

"TCT is based on temperature-dependent colour changes of clays. These changes are due to the mineral contents and to the impurities of the individual clays." (Hulthén 1976, p. 2). The test sherds or clays are heated to 1000°C, and the colour changes are recorded for every 100°C. For colour recording the Munsell Color Chart system is used. The test results in three curves, hue, value and chroma respectively, for each test piece. "Clays of the same type – with *approximately* the same mineral contents and the same impurities – have *similar or identical curves.*" (my underlinings). The curves obtained from clays can be compared with each other and with those of sherds. "There is a significant difference between the two kinds of curves. The reason for this is that the clay in the sherds already has passed through the first 4–5 or even 6 stages during the original firing. The colour does not start changing until the original firing temperature has been exceeded." Thus, "conclusions about the approximate original firing temperature" can be drawn. (Hulthén 1976, p. 5) "Identity between the TCT curves of clays and sherds is not to be interpreted as the final answer to the question of raw material sources. Further tests, such as DTA and X-ray diffraction analyses are needed to confirm the results of TCT before a final decision can be made." (Hulthén 1976, p. 5).

Another important part of the work is the examination by petrological microscopy of tempering materials in the test sherds; amount, grain size distribution, orientation, type and original raw material were investigated.

When possible, shape and decoration have been recorded and analysed.

The results have been treated statistically. "Mean values, standard deviations and correlation coefficients have been calculated. When necessary, the X^2-test has been used to prove probability."

In the following, I would like to discuss the methods used, especially the TCT. The reason for this is, that TCT plays an important role as a link in the chain of evidence, that is used to elucidate or solve the archaeological problems formulated as five questions in the introducing chapter.

TCT is based on the observation that clays change colour when heated. Colour tests are not normally used by clay mineralogists, because the colours, according to Grim, depend "much more on the nonclay minerals that are present and the conditions of firing than on the clay mineral composition. Thus, the presence of iron oxide, particularly in the free state, and the oxidizing-reducing conditions in the kiln are likely to be the determinative factors." All clays, except kaolinite and halloysite, "are likely to contain some iron, and there is no characteristic color that any of them develops." (Grim 1962, p. 122).

X-ray diffraction analyses and DTA offer more reliable information. Hulthén is aware of this and states very clearly

in her first paper on TCT, cited above (Hulthén 1976), that such tests are needed to confirm TCT results. TCT is a tentative method.

The problem is, however, that neither DTA nor X-ray diffraction analyses are designed to, or capable of giving the final answer to identity between clays of composite character and ceramics – fired clay of mixed composition. Both give diagrams as result, and these have to be interpreted.

There are at least two more problems in this archaeological-technological research situation:

1) the proportion of colouring components in the raw clays *in situ* might have changed during the past 3000 – 6000 years;
2) the sherds might be contaminated by e.g. soluble salts.

To make an attempt to localize raw material resources is, even under the most favourable geological circumstances, difficult, time consuming and beset with uncertainties. As Hulthén remarks: "The clay situation of great parts of Scania is very complex and clay types vary considerably within limited areas." (p. 209) The situation in Denmark is the same.

My criticism of the methods, presented here, was prompted by some confusing results. I will take an example:

Hulthén in question 3: "How have raw material resources been exploited by prehistoric potters?" Her answer to this question starts: "Information extracted from studies of raw materials, clays and temper, indicates that the prehistoric potters in the area investigated were highly aware of the available materials. They paid particular attention to the types of clay to use for ceramics. From craft traditions, by trial and error and most probably via information from outside their own group, they learnt to utilize certain clays and to avoid others. In most cases the composition of the rejected clays was such that pottery made from them would have undesired qualities." (p. 205 f)

This seems very reasonable, but the presented results confuse the picture:

The investigated clays contain between 40% and 90% nonclay components. Few, if any, of these clays would have been improved by temper of any kind. The nonclay components provide a "natural temper" and all of them are likely to contain organic material.

According to Hulthén, the whole range of clays were used for pottery manufacturing. This is not stated explicitly, but can be deduced from table 5 (Properties of some raw clays) with e.g. table 8 (Early Neolithic TRB pottery). The finest clay, number 35, a Hagestad sample, contains 40% nonclay minerals and the coarsest, number 14a, a Hörup sample, 86%. The estimated amounts of added temper do not seem to be negatively correlated to the coarseness of the suggested clays. If one, like Hulthén, wants to show that the prehistoric potters knew their job, and one has a fair sample and a computer, a negative correlation between coarseness of clay and amount of temper would be one of the first things to look for.

The above-mentioned clays, 14a and 35, and five of intermediate coarseness, are identified by Hulthén as raw clays used by Early Neolithic TRB potters. The estimated amount of added temper to the coarse clay 14a is 20–22%; in clay 35, the finer one, it is 15% (table 8). Thus, in this case the coarser clay was more tempered than the finer. This is strange: a fat clay is improved by temper, a lean one becomes less workable and more brittle in dry as well as fired state.

Clay 14a, with 86% of nonclay components, is suggested as a raw clay resource exploited not only by the Early Neolithic potters, but also by the succeeding Middle Neolithic ones and by Pitted Ware producers and Battleaxe people. They would have had to walk 5 km to get it. (figs. 32, 33, 58, 79 and 98).

As this clay plays a central role in Hulthéns hypotheses regarding the connections between raw clay resources, settlements and graves, (figs. 58, 78a and 98; compare Hulthén 1976, fig. 4) results from X-ray diffraction analyses and DTA on clay 14a would have been of crucial interest. They are not presented.

Clay 35, with 40% of nonclay components, is also suggested as a raw clay resource exploited by Early Neolithic TRBs. This clay could be dug 1 km away from the main settlement area. It seems to have been rejected by all succeeding potters. A possible reason for this could be that it is too fine in structure and / or that its content of smectite is high. Smectite is a 'swelling clay' with several undesired ceramic properties. No information on clay minerals in clay 35 is given.

This kind of problems have not been discussed or penetrated by Hulthén, to the extent that one would have wished.

Concerning estimated firing temperatures: TCT curves, as published (figs. 5 and 42), start changing at about 300°C. This is far too low a temperature to produce a ceramic ware. Hulthén has not commented on this, as far as I have observed. Her estimated firing temperatures range from 400°C to 900°C, the most common being 500–600°C. The reason for the colour change, starting at 300°C is obvious: the reactions causing colour changes are not completed in the original firing. The dark core frequently encountered in prehistoric pottery, is, in most cases, due to a short period of heating and thus incompletely oxidized organic impurities. The problems concerning firing conditions, oxidizing – reducing firing, are too complicated to be discussed here.

Another way of approaching Hulthéns work could have been to discuss the value and results of the extensive data recording. It seems that time and / or space has not permitted Hulthén to present the results of the analyses program, which was outlined in her methods section.

Hulthén has made the final conclusion herself: The work should be looked upon "as an attempt to systematize, priorate and test various methods and routines for investigation of ceramic artefacts. Much work remains within this field and future efforts will especially be devoted to development and improvement of investigation techniques." (p. 209).

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RENATE ROLLE, *Totenkult der Skythen I. Das Steppengebiet, Vorgeschichtliche Forschungen* 18, I, 1 and I, 2, Walter de Gruyter, Berlin–New York 1979, DM 260 (I, 1: 188 pp., 45 tables, 2 maps; I, 2: 155 pp., 15 fold-out plans).

In the first volume on Scythian burial customs and social conditions Renate Rolle discusses the finds from the South Russian steppe, i.e. the black earth areas just north of the Black Sea between the mouth of the Danube and the lower reaches of the Don. To the north lies the taiga, the finds from which will be presented in the next volume. Cultural conditions on the steppe among a nomadic people subsisting on their domestic animals is characterized in part by contacts with the Greek towns by the sea and the mouths of rivers. The fertile land was already under cultivation by farmers when the Scythians, an Iranian nomadic tribe, penetrated and obtained control. It is primarily by means of the graves, including impressive mounds with deep graves, that Scythian society can be identified. The writer has spent two years in the Soviet Union and participated in e.g. the very productive excavation at Ordžonikidze in 1971. The material comprises more than 700 graves, several of which are the result of the successful large-scale excavations in recent years.

Renate Rolle states a number of criteria for social ranking, which are of interest also in a North European context. She operates with three categories to establish princely rank: the dimensions of the grave, people and means of transport buried with the deceased, and personal wealth. As we know, some of the grave goods are among the richest of the time owing to the presence of gold ornaments and gold foil for the clothes, richly decorated weapons, and status symbols. It is a curious fact that weapons may occur in female graves and beads in male graves; but otherwise the majority of goods are distributed according to sexual criteria corresponding to those of the West.

A characteristic of princely graves is that the mounds measure at least 5 metres across and contain extended burials at least four or five metres deep, with niches and hiding-places for treasures. The so-called catacombs are deep, large extensions, occasionally over 120 sq. metres in size. The mounds are built with turves of black earth, which may have been collected some distance away and possibly represents a whole field of pasture.

Princely status is further denoted by the accompanying burials of many people, horses, vehicles, worked gold and jewels of excellent quality and objects shaped like a sceptre. Goods imported from Greece, including collections of amphorae and metal vessels, might suggest funeral feasts. A curious feature of the Ordžonikidze ornament is the picture of an amphora which was evidently used for the storing of milk. As in Northern Europe we thus see imported wine containers used for local beverages. This obviously does not preclude importation of wine, but is a strightforward utilization of the vessels in their new context.

The high women's headdress with vase-shaped gold ornaments (on which the most recent publication is Sovjetskaja arkheologija 1980) and shoes with star-shaped gold buttons are most impressive. They must have distinguished the wearers as did the numerous pieces of decorated gold foil that covered parts of the dress.

Among the graves that meet the criteria mentioned seven or eight are singled out as being especially outstanding; another 23 have been accorded princely status. The former, at least, reminds one of Herodotus' description of royal burials; they involved, of course, the killing of numerous people and horses. His account of embalming also appears to be based on fact, since it is known from related graves in Altai where the corpses and other organic remains are in an excellent state of preservation.

Renate Rolle's book points out several interesting aspects of Scythian culture; some other points are not discussed and must be found in other publications, such as the classic works by Minn and Rostovtzeff. New finds are still adding to our knowledge of the links with Iranian art. The transition to the Sarmatian style is of considerable interest also for Northern Europe.

Another aspect of cultural life is the relationship between the nomads – the Scythians themselves –, the farmers and Greek cities. A productive agricultural economy with cereal croups was a *sine qua non* for these cities which imported food and functioned as ports of exportation to the western world. During the 4th to 3rd century B.C. the Scythians themselves were developing permanent settlements, both rural and semi-urban, the latter with metallurgy (mentioned on p. 160 ff), as, for instance, in the fortified town of Kamenskoje. The Scythians were being influenced by their environment and were adapting to the changing conditions brought about by cultural development and by a well-defined pastoral zone.

Altogether this first volume presents weighty documentary material which adds to our knowledge of Scythian society and culture. During the last fifteen years our knowledge has expanded considerably and this makes the present material even more welcome.

† Ole Klindt-Jensen

WERNER HAARNAGEL: *Die Grabung Feddersen Wierde. Methode, Hausbau, Siedlungs- u. Wirtschaftsformen sowie Sozialstruktur.* Röm. German. Komm. d. Dt. Archäolog. Inst. zu Frankfurt am Main u. Niedersächs. Landesinst. für Marschen- u. Wurtenforschung in Wilhelmshaven. Wiesbaden: Steiner, 1979. The publication consists of a volume of text with 55 illustrations, a volume of 190 tables, and 31 appendices.

Archaeological investigations of *terpen** settlements in the marshlands in North Holland and North-West Germany have been going on for many years. The first scientific study took place in Holland with van Giffen's excavations starting in 1908 and in particular the systematic excavations from 1931 to 1934 of the large *terp* settlement of Esinge in Groningen, which resulted in the first uncovering of large areas of a *terp* settlement. Since then excavations of several *terpen* have been carried out in North-West Germany and Holland. One of the most recent and most detailed investigations is the nearly complete excavation of the *terp* settlement of Feddersen Wierde near Wilhelmshafen.

The choice of Feddersen Wierde for excavation was not accidental. It was preceded by extensive studies of *terpen* in the marshlands between the Elbe and the Weser. In the years 1954–56 a great many drilling examinations had already shown that a complete excavation of Feddersen Wierde would provide a large quantity of data not previously attainable. The drillings also supplied a rough idea of the stratigraphy and habitation levels of the *terp* to be excavated. The excavations lasted from 1955 till 1963 and covered an area of 26,000 m². The *terp* has a diameter of approx. 200 m and a thickness of 4 m.

The excavations were conducted in exemplary co-operation between biologists and archaeologists under the day-to-day supervision of Professor U. Körber-Grohne, biologist, with Professor P. Schmid as archaeologist.

A preliminary survey was published as early as 1956, following the first excavation project the year before. Since then preliminary reports have been published almost every year, so that it has been possible to follow the work in progress and researchers have been able to study the results from a very early stage.

A major series of publications has been planned to present the results, and in 1967 there appeared two independent volumes by U. Körber-Grohne containing geo-botanical data from Feddersen Wierde. We now (1979) have volume II, dealing with the prehistoric buildings. Additional volumes are planned, including one by Rechstein on bone finds and one by P. Schmid on pottery.

The 325-page publication provides an exemplary account, with many illustrations, of the excavation results.

The main volume consists of 23 sections in which the different topics are analysed and comparable finds are discussed from, especially, North-West Germany and Holland. One of the first sections deals with the excavation method employed, including the recording of finds, and discusses the special approach required when excavating marshland settlements. The next section discusses the settlement at Feddersen Wierde and also refers to the other *terpen* in the North Sea region.

Occupation of the *terp* started during the 1st century B.C. and continued until the 5th century. Then there was a gap followed by fresh, scattered occupation during the Middle Ages (8th–9th century). There was no subsequent habitation.

The next section deals with houses and their structure and draws comparisons with houses of the same type from other areas. As a result of the unique preservation conditions obtaining in marshland, woodwork is often preserved from the lower structure of houses. This is true of the roof-supporting posts and the walls of interlaced branches, but also of the interior parts of the houses with fireplaces, stalls, dung channels etc.

A total of 205 houses have been excavated, but there are drawings only of the 52 long houses, on a 1:150 scale.

In this country, house posts have been preserved only in exceptional cases, so from a Danish perspective the unique marshland conditions of preservation offer an exciting prospect of completing our picture of Iron Age houses, since there is no great difference between houses in the North-West German marshlands and Danish Iron Age houses – only minor structural details dependent on differences between Danish and North-West German settlement patterns.

At a time when Iron Age long houses are being reconstructed and rebuilt in many places the house analysis in the Feddersen Wierde publication is particularly useful. It is noteworthy, however, that despite the excellent preservation conditions for organic material no fragments of the roof have been found among the great quantity of wood. This is interpreted by Dr. Haarnagel as the result of consistent re-use of the wood.

The long houses are of the type with living quarters and a fireplace at one end and stable and stalls at the other. In the middle of the house there is an entrance in each long wall, and this middle section is regarded as a kind of work room. Furthermore, these houses always have a characteristic doorway in the end wall leading to the stable.

The houses generally have transverse walls and in comparison with Danish Iron Age houses it should be noted that, unlike stall partitions and external walls, these walls are not dug into a foundation trench. Consequently, transverse walls have been recognized only where the woodwork remains. Another feature not found in Danish Iron Age houses is the frequent presence of small rooms with partitions, placed between the roof-supporting posts and the external walls.

Houses of a special type are the small houses with normal, spacious living quarters but a tiny stable where the few stalls are often built parallel to the long walls of the house. They are described as artisans' cottages, whose inhabitants worked mainly as artisans but also engaged in small-scale subsistence farming.

There are some long houses that have no transverse walls,

*) *terp* (singular) / *terpen* (plural): the Frisian word for artificial mounds built out of turf sods. The equivalent Dutch term is *wierde* as in Feddersen Wierde.

stall partitions, or dung channel and only a few chambers. These houses are believed to have had a special function, some as simply dwelling houses for a chieftain, others as meeting houses.

To almost every long house belongs a separate building indicated by the presence of 4, 6, 8, 9, 12 or 16 posts placed in a square. They are interpreted as storage outhouses. It is characteristic of the settlement that a long house with living quarters and stable as well as a storage outhouse form a farm unit.

The woodwork of the houses at Feddersen Wierde contains many details that reveal complete mastery of timber construction.

One of the most important sections in this publication is the analysis of individual habitation levels and the actual type of settlement. This places the settlement in a wider context. As far as the social structure at Feddersen Wierde is concerned, the surrounding drainage trenches and, to some extent, the surviving fences indicate the size of each farm unit.

Towards the end of the Pre-Roman Iron Age, 1st century B.C., began the large-scale exploitation of land in the Elbe-Weser triangle, both in the marshland and the geest behind it. This sizeable occupation must have been planned and directed. References are made to Heidenschanze, the nearly contemporary circular-walled settlement close by, in which only minor excavations have taken place. Heidenschanze is viewed as the centre of the new settlement and it probably contained a fortified market or a trading post where people from the geest and the marshlands could exchange goods.

The earliest habitation level, from the second half of the 1st century B.C., consists of five equally large farmsteads, each comprising a long house and a storage outhouse. It is not a raised settlement, but is superimposed on the original surface. It was later enlarged to a total of 11 farmsteads placed in a row close to each other.

The first *terp* habitation proper is found in the next habitation level, 1st-2nd century A.D. Each farm is built on its own *terp*, the core *terp*, which is surrounded by a fence and a drainage ditch. The incipient *terp*-formation was caused by a slight rise in sea level. In this settlement the village plan was radically altered. The settlement was arranged radially around an open square, i.e. a change in village structure. Artisans' cottages can now be identified for the first time. The radial village plan persist in later levels. Subsequently, there was a gradual enlargement of the mound with more farms and more workshops. Settlement level No. 3 contains a dike surrounding parts of the habitation site, where a larger farming unit now begins to emerge. It is the oldest dike of its kind known so far.

The enlarged farming unit consists of several farmsteads surrounded by a fence. It is interpreted as a chieftain's estate. There are two long houses without stables. One of them is regarded as the chieftain's residence, while the other houses within the unit provided stabling for his cattle. The other long house has no kind of interior divisions and contains a hearth in the usual place in the western wall. This house is regarded as a kind of meeting house. Several graves with human skeletons have been discovered near it, so it is possible that it may have been a centre of both secular and religious activities.

As far as I can judge from the published plans there is no difference in the actual construction between long houses with living quarters and stable on the one hand, and meeting houses on the other. It is curious that the meeting house only has a fireplace in the western end as is customary in long houses with a stable. There is an entrance in the middle of each long wall and one at the house end, as is also customary. If it is indeed a meeting house, the location of the doorway at the east end of the house, which in the long houses evidently opens into the stables, may also appear strange. Though there is no storage outhouse belonging to the meeting house, nevertheless the interpretation appears problematic.

The new organization of the village is thought to have emanated from the chieftain's farm. The settlement continues to expand in later levels. In the habitation level from the 3rd century the individual core *terpen* have amalgamated into one large mound. The individual farms on this mound are separated only by narrow drainage ditches or fences, and the settlement now covers an area of c. 210 m in diameter.

In this settlement layer there is a continued expansion of the chieftain's farm, near which the majority of the imported objects have been found. Furthermore, it now becomes possible to distinguish a new, completely independent workshop area north of the settlement. This artisan area is regarded as belonging to the chieftain's farm so that handicrafts as well as trade are concentrated around this farm. The imported goods are mainly from the Roman provinces. Judging by the finds, trade with these areas culminates during the 4th century.

Later in the 4th century (habitation level No. 7) the state of preservation has deteriorated but the settlement has grown to comprise a total of 25 farms. It now extends beyond the area excavated. The separate workshop area no longer exists but has become covered with small farms. Otherwise the settlement is unchanged though all the farms turn out to be small, suggesting that agriculture is on the decline.

The last level from the 4th-5th century is in a worse state of preservation because it is found immediately below the present-day ground surface. The settlement pattern changed in the course of the 4th century. The radial village plan has been abandoned. There are no large farms, only two middle-sized and twenty small farms. An impoverished population in the last century before the settlement is abandoned?

The smaller houses suggest that the settlement now supported itself mainly by handicrafts. After the 5th century the rise in sea level caused the *terp* to be abandoned. It is especially noteworthy that there is very little change in the location of farms from the foundation of the radial village until its end.

Owing to the excellent conditions of preservation a very large quantity of bone has survived. A total of 70,000 have been discovered, of which 60,000 have been identified. This creates fresh opportunities of assessing occupational and economic conditions in the different levels. It is clear from

the great number of bones and the numerous stalls in the long houses that stock breeding dominated the economy. According to the bones, the domestic animals were cow, sheep, goat, pig, horse and dog. The extensive bone material has provided a number of excellent descriptions and dimensions of the various domestic animals that lived in the settlement, and the number of stalls indicates the size of the winter herd in each settlement level.

The number of stock appears to have increased steadily from 100 animals in the earliest level to 450 animals in the 3rd century, after which it decreased during the 4th-5th century to c. 242 animals. Increased workshop activities probably compensated for the decline in stock-raising.

The excellent preservation conditions for bones have also led to the discovery of several human and animal skeletons buried in pits within the settlement area. Most of them probably represent regular sacrifices. Animals are sometimes buried under the hearth, under the door, or near the houses. Several human skeletons are buried in pits underneath the settlement. The usual burical custom is cremation, but here we find burials of whole skeletons – children as well as adults. A few skeletons of children have been found buried under the fireplace. They too are regarded as victims of some kind of sacrifice.

The *terpen* are densely distributed, one or two km apart. This implies that practically all available marsh and grassland must have been used for pasturing the large herds. Because the marshlands have a clear boundary it is possible to quantify the area of pasture available to each *terp*. Bone analyses indicate that about half the animals were cattle, one quarter sheep (goat) and the last quarter divided between horses and pig.

The geography of the area shows that compared to the extensive pastures there was little arable land available in the marshland. At the time of the earliest settlement, around the birth of Christ, there were cultivated fields of nearly the same size as those found on the mainland. The fields are bounded by ditches that served as drainage canals. It should be emphasized that cultivation was identified by the presence of furrows, and cross sections reveal that the soil was turned, i.e. it was ploughed with a plough with mould-board. In this connection one of the finds from Feddersen Wierde is significant, namely a triangular plough-share of iron. It is one of the earliest finds of a plough-share and also among the earliest evidence of ploughing with a mould-board known so far north.

The comprehensive biological investigation has revealed the vegetation around Feddersen Wierde and also which cereals were cultivated. It appears that c. 50% were barley and oats, 25% beans and c. 25% flax. Around the settlement have been discovered remains of a kind of garden in which there are visible traces of digging, probably with a spade.

Hunting and fishing played a fairly minor role at Feddersen Wierde. Bones of wild animals constitute only 0.5% of the total number of bones. All the game are animals not found in the marshland, only in the geest.

Another important section deals with handicraft at Feddersen Wierde. The find maps include iron slag and crucibles, bone tools of various types, grindstones and whetstones, spindle whorls, warp weights as well as grinding slabs, but strangely enough iron slag and crucibles are the only artefacts that indicate special workshop areas.

Among the household articles the querns are important. Some of them are made of local granite procured from the geest, and a great many others are imported querns made of Rhine Mayern basalt. No special workshop areas for querns can be recognized. One special discovery should be mentioned in this context: a wooden handle for the cover stone of a quern, which could hold it and help turn it. The querns of Rhenish basalt are also among the earliest finds of this kind. As early as around the birth of Christ they represent 7%, and they are particularly numerous in the 4th-5th century, representing 62% of the querns.

The textile finds are particularly noteworthy. There is a great number of them and they reveal a very high quality of weaving technique.

Another subject is pottery kilns. The publication contains a discussion of one of the best-preserved pottery kilns found so far. It was discovered in 1967 at Boomberg-Hatzum and dates from the Early Roman Iron Age. It is among the most advanced kilns found until now and differs radically from previous finds.

There is a great number of worked bones. The semi-finished ones suggest the existence of a few manufacturing areas near some small workshops. In general, however, the find maps seem to indicate the absence of specific workshop areas for the working of bones.

An exceptionally large number of wooden objects have survived. The people made furniture: the so-called milking stools, seats of chairs and whole chairs – a group of artefacts not previously present in settlement finds. There is also evidence of cooperage, and several parts of vehicles and spoked wheels have been found.

Other important finds include turned wooden bowls and vats as well as handles. There can be no doubt that wood-turning was carried out on the site itself. To the best of my knowledge this is the first demonstration of turnery in such an early settlement find. It is a discovery of particular significance for the turned wooden artefacts from the Early Iron Age in Denmark. They show no signs why they should not have been made locally, as indeed is suggested by some turned pieces of wood from the recently excavated basement at Overbygård in Vendsyssel (Jutland). The turned wooden dishes are of masterly execution and could hardly be bettered today.

Two types of artisans are recognized: a) artisans who support themselves by small-scale agriculture and b) artisans solely dependent on their trade – the blacksmith and the bronze founder. The blacksmiths worked in the workshop area situated in the chieftain's farm-yard, not in the square by the artisans' cottages inside the village. The whole workshop area is clearly situated on the outskirts of the settlement, and the artisans are consequently thought to have belonged to the chieftain's estate. Judging by the finds I consider this

relationship somewhat dubious. It seems equally plausible that we are dealing with a special workshop area, which to some extent was kept isolated from the ordinary functions of the village, and from the livestock. Many finds of crucibles for bronze casting indicate that workshops too existed in the village. They are mainly concentrated in two areas near two workshops inside the settlement, but not, according to the find maps, in the same areas as the smithies. In this connection it will be interesting to see whether the analysis of pottery finds will lead to identification of special pottery workshops in the area.

There is evidence of active trading at Feddersen Wierde. Because of its location in marshland many of the daily requirements of material – wood and clay – had to be procured in great quantity from the geest. There are also clear signs of long-distance trade with the provinces of the Roman Empire. Trade started already in the first settlement and is associated with the chieftain's farm, which begins to appear simultaneously with the growing trade.

The imported finds are Roman *terra sigillata* sherds, glass beads and, especially, the many basalt querns. There is no evidence of the type of goods exported from Feddersen Wierde, but it can hardly have been anything but animal food, meat and hides. It is believed that there was a great demand for provisions for the Roman legionaries, and perhaps also for cloth: as mentioned above the textile finds were of a high quality.

It is important to note that twice during the existence of the settlement there was a visible change in the social structure. In the earliest habitation level the farmers were, on the whole, equal. The earliest members of the village community were farmers enjoying equal rights, but this state of affairs changed in the late phase of the next level. Habitation level No. 2, and especially level No. 3, reveal the emergence of social stratification, with the rise of a leader who must be characterized as the village chieftain. The size of the farms suggests a gradual transition towards this social stratification.

The excavation of Feddersen Wierde is the result of a deliberate effort to locate the most suitable *terp* that would provide a maximum of excavation data. Both the excavation and the publication of results have taken place in a spirit of exemplary co-operation between archaeology and the natural sciences. It illustrates how such efforts may produce the best possible results from a complete excavation, unlike the date yielded by an incidental investigation conditioned by external factors (as is, unfortunately, often the case, also in Denmark).

Although the publication under review does not present the complete material, the presentation and interpretation are so satisfactory that the reader gets a clear impression of the potential of the material as well as a number of interpretations with which one can disagree only on minor details. The comprehensive find material has widened our understanding of Iron Age villages, and as a *terp*-settlement publication it is a valuable supplement to the Danish village excavations, which have retrieved organic material only in exceptional cases.

In future, the research programme focussing on Iron Age settlements in the marshlands will be significantly amplified by the recently finished complete excavation of the neighbouring geest-settlement at Flögeln, but it is beyond the scope of this review to assess the relations between the *terp*-settlement of Feddersen Wierde and the geest-settlement. The publication of the investigation at Feddersen Wierde is highly important for our knowledge of settlement and, by implication, social structure in the Iron Age.

Steen Hvass

U. NÄSMAN and E. WEGRAEUS (editors): *Eketorp. Fortification and Settlement on Öland / Sweden. The Setting.* Royal Academy of Letters, History and Antiquities. Almqvist & Wiksell International, Stockholm, Sweden, 1979.

The publication of the Eketorp monument, volume 2, deals with a variety of themes: "Introduction" by U. Näsman and E. Wegraeus, "Öland during the Iron Age and early Middle Ages" by U.E. Hagberg, "The Surroundings of Eketorp" also by U.E. Hagberg, "Medieval Eketorp and Contemporary Turn-over Places on Öland" by N. Blomkvist, "The Shaping of the Landscape of Eketorp. Geology and Hydrology" by C.-G. Holdar and finally "Agronomic Practices in Migration Period Eketorp" by H. Helbæk.

The publication is an essential supplement to the first volume, which primarily described and analysed the ringfort itself, its different phases, its development and internal function. In the new publication Eketorp is related to natural as well as man-made factors, to the landscape as well as other surviving sites, to the physical as well as the cultural landscape. In this way we gain an understanding of Eketorp's location and its function, both internally and in relation to other sites.

The introductory section gives a brief outline of Eketorp's location and development, discusses practical matters regarding the form of publication, introduces the authors and describes their involvement with the many-sided work on the Eketorp material.

U.E. Hagberg's survey of the Iron Age and Early Middle Ages on Öland presents a wide range of material without which Eketorp cannot be seen in its proper context. The section summarizes the archaeological history of Öland and the other Baltic islands and also discusses recent archaeological excavations. There is also a comprehensive survey of burial and settlement sites. Recent large-scale excavation projects have disclosed the very depressing fact that until about 1940 only approx. 10% of the island's ancient monuments known today had been recorded.

A special section is devoted to the Roman Iron Age, the late phase of which is contemporaneous with the earliest Eketorp construction (I), the refuge fort. It is important

partly because during this period Öland played a significant role in a highly complex pattern of communications, and partly because of the advent in recent years of much essential material with a bearing also on our understanding of the position of Öland within the Scandinavian region. As in other recent publications the special female grave goods – knives, pins and bodkins for leather working – are associated with extensive stock-breeding and the large-scale working of hides – an article in great demand in the Roman Empire. While animal husbandry was important, cereal-cultivation was also intensified, as indicated by pollen analysis. Contacts with the Roman Empire – perhaps via other regions – resulted in the presence of Roman products such as glass, bronzes, coins, figurines etc. In comparison with Gotland only a few of a great many known farms have been excavated, but a picture has now emerged of settlements similar to e.g. Vallhagar on Gotland. Moreover, recent excavations have disclosed houses without external walls of stone but built according to the long-house pattern as known, for instance, from Denmark. As far as we can tell from the relatively few excavations, Öland too saw a break in settlement pattern towards the end of the Early Germanic Iron Age, often observed in connection with the large hoards of solidi. Today we have far more varied interpretations of these deposits. The finds also include bog sacrifices like Skedemosse.

U.E. Hagberg's account furthermore includes later phases of the Iron Age as well as a very important survey of Viking Age / mediaeval sites, especially those with trading functions. Hagberg's account is a welcome updating of existing surveys, an updating that is difficult for outsiders to accomplish because of shortage of publications.

U.E. Hagberg is also the author of the analysis of Eketorp's surroundings (Gräsgård parish). There is a more detailed analysis of Roman imports, gold finds, iron bars (probably imported from Småland) and of the buildings for whose protection the refuge fort was erected. The same applies to the later material.

To facilitate a proper understanding of Eketorp's functions it is only natural to include an analysis of find material from the surrounding area. It seems inadequate, however, to study the material – such as imported Roman goods – from only one parish. In this context the whole of Öland would appear to be the smallest geographical unit on which conclusions can be based concerning a prehistoric phase with considerable external activity.

N. Blomkvist's section on the early mediaeval phase of Eketorp (Eketorp-III) and the contemporaneous habitation on Öland is a very important contribution to the debate on early urbanization and its characteristics. The characterization of Eketorp-III is affected by the fact that traditional definitions of the town do not include, for instance, densely populated areas without agriculture but with handicrafts.

Öland's important role in the Baltic trade during the Iron Age continued in the mediaeval period. Its political rulers exploited this position throughout the Middle Ages. According to Blomkvist, Swedish mediaeval towns were built on the model of North German sea ports which, in their turn, were inspired by the towns of the Rhineland. In Sweden urbanization seems to have been promoted by the central authorities and to some extent by the Church. In this way an exchange system for goods was introduced that lasted throughout the Middle Ages. Although the foundation of towns was due to influences from the South, the towns did not expand in a commercial vacuum but at the expense of a less sophisticated system often called "*farmanna*", i.e. agriculturalists engaged in occasional long-distance trade. The foundation of towns also led to the creation of artisan and trading centres.

The character of Eketorp-III gives it a central place in the discussion of the minimum requirements for the definition of a town. As a case in point Blomkvist refers to Fritz's narrow definition of a town in contrast to Schück's broader definition. In his further analysis of Eketorp-III, Blomkvist adopts Fritz's definition according to which Eketorp-III does not qualify as an urban settlement. Instead Eketorp-III is described as "an organized concentration of houses where, to judge from the find material, many have lived or regularly stayed, chiefly engaged in other activities than the production of things necessary for their livelihood and for their own use." This description can apply to a town, a trading centre, an estate, a manufacturing industry, a monestary, a fishing place etc. Until an analysis of artefacts from Eketorp-III is available it is impossible to decide whether the settlement was in contact with the rest of South Öland or with other areas.

Blomkvist stresses the importance of the function of a society within its own region, in which a distinction is necessary between natural centres of, for instance, concentrically located surroundings called "central places" and centres that have arisen through special circumstances, e.g. centres that exploit natural resources and have a multi-regional market, called "production places". A third concept is that of "transit places", i.e. settlements that have arisen as a result of special boundary conditions, e.g. a border or a place where great quantities of goods are reloaded because of transport factors. Clearly Eketorp-III must have pursued activities that made it attractive for villagers to leave home and settle elsewhere. What places of this kind have in common is the fact that goods or abstract values are produced there and change owners. They are referred to as "turn-over places". This concept is subdivided into actual "trade places" where goods are purchased and exported, and "administrative places" which provide authority, expertise and cultic values, i.e. suppliers of abstract values. The systematic exchange of goods and/or abstract capital is common to these places, whether professionally or otherwise.

Eketorp-III is interpreted as a densely populated "turn-over place" with a ring-wall and with houses grouped round an agora. The settlement is not an agricultural site though there are indications that it was of a more than temporary nature. Only the artefact analyses pending can determine whether Eketorp-III was an administrative centre, a trading centre or both. In relation to this point the article contains an extremely comprehensive survey of a) other "turn-over places" such as Köping and Sikavarp (both trading centres)

and Borgholm (administrative centre) and b) other ancient monuments that may suggest the presence of such a centre, e.g. a chapel, a well or other buildings.

The historical analysis of Eketorp-III is forced to conclude that by itself the method employed is incapable of discerning the function of Eketorp-III, although it resulted in a theoretical model and a number of hypotheses.

Several of Öland's "turn-over places" seem to be in close association, Eketorp-III, for instance, with the fishing village of Kyrkohamn on the southern tip of Öland.

C.-G. Holdar's section on the shaping of the landscape around Eketorp comprises both a geological and a hydrological review.

The bedrock consists of limestone, underneath which are Cambrian slate and sandstone. To the west, Öland rises sharply to a ridge called "Västra landborgen". From there the terrain declines towards the east. The dominant terrain on South Öland is Stora Alvaret (300 km^2), bounded to the west by "Västra landborgen" and to the east by a Littorina coastal cliff. Stora Alvaret consists of bedrock and in parts a thin remnant layer of wind-eroded earth; clay soil has made settlement and cultivation possible. The Littorina cliff delimits a series of elongated lakes and swamps; Eketorp is situated by one of these basins.

Holdar's paper is crucial to our understanding of Eketorp's location and function. His account also makes the exploitation of the landscape comprehensible and logical.

The last chapter of the book is H. Helbæk's discussion of agriculture in Eketorp during the Migration period (Eketorp-II). The section is based on the identification of charred grains and other seeds recovered during the excavation.

The inhabitants of Eketorp-II (permanent agricultural settlement) cultivated gravel areas north, east and south of the swamp to the east of Eketorp. Judging by the plant remains the areas were exploited intensively, including the swampy banks of the bog and the sandy zone along the foot of the Littorina cliff.

The analyses of the Eketorp material – the most extensive we have from Sweden's Iron Age – are related to our knowledge of plants on Gotland and Bornholm, in particular, and the Baltic countries in general. Similarities and differences between the various areas are accounted for.

Two species of six-rowed barley were cultivated on Öland (Hordeum vulgare L. and H. hexastichum L.). The question is raised whether this combination of two barley species came from climatically severer zones further north in Scandinavia or whether it was a common mixture in the Baltic countries, and was introduced from there. It is noteworthy, however, that certain weeds of Siberian/Middle Eastern origin were present on Öland and Gotland during the Migration period, i.e. several centuries before they are known from other parts of Scandinavia. In Denmark the two barley species have been found together only on one site, namely the settlement of Drengsted in South Jutland.

An important feature of Eketorp's range of weeds etc. is the great proportion of Galium (the madder family). These plants probably reached Öland from the East in the company of flax, with which they are specially associated as weeds. Other weed seeds point in the same direction, including Neslia (ball mustard), which is unmistakably of eastern origin: it comes from Siberia and is a common weed in the Middle East. It was first discovered west of Russia in the barley from Eketorp. Thus it is clear from Helbæk's analysis of Eketorp's barley remains that – as with the grain from Fyrkat in Denmark – with the diffusion of cultivated plants through trade and other contacts many wild plants were moved from one area to another and established themselves where ecological conditions were satisfactory.

The conclusion drawn from these analyses is that in several respects Eketorp's seed material shows close contacts with the Baltic countries to the south and east. This is interpreted as the result of generally peaceful commercial relations between the three large Baltic islands and the areas to the east and south. The grain has so far been traced only towards the east; the place of origin of some weeds has been fully established.

Some of the Eketorp weeds were found in the northern Roman provinces, though considerably earlier. Helbæk concludes therefore that since the Romans never had direct communication with Denmark and the Baltic region we must assume the existence of two independent diffusion routes: the Danube and the Rhine were essential to the introduction of plants in Western Europe, while more easterly rivers like the Oder and the Vistula must have been the main routes south as far as the Baltic region is concerned.

Helbæk's analysis of the seed material from Eketorp makes very exciting reading. Similar analyses ought to be a matter of course these days – if the material survives – in all major investigations of settlement sites where land exploitation is one of the problems being explored. This procedure gives valuable data not only on the cultivation of cereals and other plants but also on associated weeds and growing conditions, which in their turn may illustrate which parts of the surrounding area came under cultivation. An analysis of cereal combinations and weeds may also reveal contacts with distant regions. Even so, Helbæk's unconditional eastern derivation, motivated by the lack of contacts with the Roman Empire, produces some reservations.

Recent research into the Roman Iron Age in Scandinavia indicates, for a variety of reasons, that there was fairly regular contact with the Roman Empire, which may therefore have influenced the special picture shown by the Öland material. On this point Hagberg's paper is therefore not in agreement with Helbæk's interpretation, and a comment on this would have been welcome. For the same reason an analysis of seed material from other parts of Scandinavia where the archaeological source material suggests contacts with the Roman Empire would be very important for testing Helbæk's theory.

Volume II in the series of publications on Eketorp is a very valuable supplement to the first volume and, according to the preface, was originally intended to have been published as an integral part of it. We now await publication of, *inter alia*, the artefact material.

The many analyses that have been carried out in connec-

tion with the excavation of Eketorp are exemplary in their diversity, and it would be desirable if this procedure was adopted far more often. The efforts have indeed been rewarded, for the analyses in volume II are successful in placing Eketorp in a well-documented context with other prehistoric and historic phenomena. At the same time the publication as a whole succeeds in accounting for fascinating phases of the cultural development of Öland, while its individual papers make valuable contributions to research in the whole of Scandinavia.

Ulla Lund Hansen

INGRID ULBRICHT: *Die Geweihverarbeitung in Haithabu. Die Ausgrabungen in Haithabu*, Vol. 7. 151 pp., 77 diagrams, 40 find distribution maps and 54 plates. Summary in German, English and Russian. Neumünster 1978.
HEID GJÖSTEIN RESI: *Die Speicksteinfunde aus Haithabu. Berichte über die Ausgrabungen in Haithabu*, 14. 184 pp., 132 figs. Summary in German and Norwegian. With contributions by Else Augdahl, Bjørn E. Alfsen and Olav H.J. Christie. Neumünster 1979.

In the 1960's the pre-war Hedeby excavations were resumed with extensive investigations both inside and outside the semi-circular earthwork. This has naturally resulted in a high output of publications in recent years based on the Hedeby material. Thus the monograph series "Die Ausgrabungen in Haithabu" has been expanded with several important volumes, and a new series of publications has also appeared, edited by Kurt Schietzel, "Berichte über die Ausgrabungen in Haithabu", which – usually in the form of articles – presents minor or major topics concerning the archaeology of Hedeby.

Ingrid Ulbricht's book on the working of antler belongs to the monograph series and was submitted for a doctorate at Hamburg University in 1975. The work is based on nearly all the antler material discovered inside the semi-circular earthwork in recent excavations and only excludes the combs which have already been analysed by Wolf Dieter Tempel in his doctoral thesis. The material then consists of no less than 288,000 pieces comprising both raw material, semi-finished and finished artefacts as well as waste products. The study seeks to clarify the technical and organizational aspects of antler working – primarily comb making – whereas it does not aim at establishing the actual typology or dates of the finished products.

The material consists almost exclusively of antler from red deer with, strangely enough, reindeer as the next most important source, though the latter accounts for only 0.5% of the material. By a meticulous examination of the marks left by working Ingrid Ulbricht is able to demonstrate which tools and manufacturing techniques were used in connection with the manufacture of finished products such as combs, pins, gaming counters, dice etc., and with her knowledge of the specific semi-finished goods can determine which products were made at Hedeby.

The find distribution is discussed in immense detail in an attempt to grasp the means of production. It is impossible to identify workshops, but refuse heaps containing antler can be found scattered throughout the settlement area, and it can therefore safely be argued that there was no special comb manufacturing quarter.

The find distribution has very properly been examined in great detail both from a horizontal and a stratigraphic point of view, and the large-scale systematic surface collections carried out in recent years at Hedeby have also been studied. Even so the text could have been considerably shortened on this point since the distribution analyses do not yield many results and, furthermore, are well illustrated in 40 excellent maps.

Then, however, the writer embarks upon some exciting subjects which the abundant material makes possible: an appraisal of the scope of production and organization together with an assessment of the trade in raw material and finished products.

Because of the presence of certain waste fragments (sawn-off pieces of the middle sections of the combs) Ingrid Ulbricht is able to establish that a total of approx. 2000 combs were produced within the excavated area. Considering that this represents only 6% of the town area and considering that the manufacture of combs at Hedeby only began in the 10th century and is untraceable in the top aerated culture layers, it can be concluded that there was a maximum annual output of 250 combs at Hedeby. In view of this modest production Ingrid Ulbricht supposes that the comb makers must have had other daily tasks than just manufacturing combs, although they must definitely be regarded as specialists. The methodical exploitation of the raw material and the manufacturing technique itself testify to their expertise. During the 9th century it appears that the inhabitants of Hedeby imported their combs from Friesland and Scandinavia but in the 10th century a production started in Hedeby. The large amount of red deer antler is not accompanied by finds of bones from this animal, so the antlers must have been acquired by trade, in the last resort from farmers and foresters. Ingrid Ulbricht does not consider the possibility that migratory comb-makers came from time to time to Hedeby with their materials and carried on business for a time.

Towards the end of the Hedeby period, i.e. the 11th century, there was a change, in that bones now began to be used for the manufacture of combs, and this trend persisted in Schleswig during the early Middle Ages. The writer interprets this to mean that in this period the forests became hunting grounds for the privileged – royalty and nobility – as a result of which antlers functioned as trophees and therefore became less accessible to the comb makers. However, Ingrid Ulbricht herself is sceptical about this hypothesis, since in a number of other sites antler continued as a raw

material for a very long time. The correctness of this social historical explanation obviously depends on the results of further investigations. It may be added, however, that a similar shift from antler to bone is also revealed in the 13th century deposits at Søndervold in Århus. It is therefore very reasonable to look for a general explanation of this change in the comb-making technique.

Heid Gjöstein Resi's study of soapstone finds takes up an entire volume of "Berichte über die Ausgrabungen in Haithabu". The material comprises all finds of soapstone at Hedeby, a total of 3,428 pieces with a total weight of c. 540 kg, and thus constitutes the biggest collection of soapstone from a single site. It consists almost exclusively of fragments, primarily of vessels, though *tuyères*, spindle whorls, casting moulds etc. also appear. A sensible typological division provides an insight into the diversity of the Hedeby material; furthermore there is a compilation of different find lists covering the appearance of soapstone in Scandinavian and North European finds.

The large amount of material has also prompted special investigations, e.g. into the use of soapstone vessels, which reveal that it was the medium-sized vessels that were primarily used for cooking (external traces of soot), and that the vessels with a crudely worked interior were also used for this purpose.

Yet the soapstone vessels should be viewed only as a precious supplement to locally made cooking vessels. This is clear not just from the numerous finds of sooty pots of local manufacture but also from the relatively modest number of soapstone vessels that we are actually dealing with. For if we assume that the entire Viking Age quantity of soapstone still remains within the semi-circular wall, and if we further regard the quantity found within the excavation area as fairly representative, then Heid Resi can demonstrate two methods of calculating the original number of soapstone vessels. On the basis of the rim-sherds, each of which of course represents a certain percentage of the whole pot rim, we can calculate by a simple process of addition the rim percentage of the whole excavation area as being the equivalent of 65 whole vessels, which corresponds to approx. 1085 soapstone vessels for the whole semi-circular area. However, Resi reduces this figure by 25% on the grounds that the whole town is unlikely to have the same density of finds as the centrally located excavation area, and she thus arrives at a total of 814 vessels at Hedeby. By a more complicated method of calculation based on the weight of the soapstone fragments she arrives at a total number of 853, and she therefore concludes that imports into Hedeby amounted to 700–1000 soapstone vessels altogether. This means that the whole material could well have been transported in a single shipload, as far as both weight and volume are concerned.

Presumably the soapstone objects actually arrived as finished products, since there is only an insignificant quantity of waste products, and both archaeological and scientific investigations point to East Norway / South-West Sweden as the production area for Hedeby's soapstone material.

It is impossible of course to discuss here all the results presented in the two books under review. Both publications give evidence of much thorough work, and because of the large amount of find material from a well-studied site they arrive at results of a kind that can rarely be obtained. Unfortunately, the absence of stratigraphic data for the excavation weakens the statements on chronology, but it may be hoped that dendrochronology will help to remove such difficulties in similar works to come.

H. J. Madsen

The reviews in this volume were translated by Ole Bay-Petersen

Recent Excavations and Discoveries

Please observe the following abbreviations:
s. – *sogn*, Danish parish
h. – *herred*, Danish district
a. – *amt*, Danish county
All places mentionned in this list can be located on the map p. 191 and identified by their no.

PALAEOLITHIC

1. TROLLESGAVE II, Southern Sjælland
Fensmark s., Tybjerg h., Præstø a.

Late-glacial settlement site
In the autumn of 1981, a newly-discovered settlement site of the Brommean Culture was excavated on the edge of Holmegård Mose in southern Sjælland. The find-material consists almost entirely of flint. Three types of retouched tool occur in the flint-inventory: scrapers, burins, and tanged points. The inventory displays great similarity to that of the neighbouring findspot Trollesgave I, which has been dated to the later Allerød Period.

Most of the flint objects were found within an area 6–8 m. across. A number of flint objects occurred in deep marine-deposits outside the settlement site. A series of features were found on the edge of the flint-concentration which must come from a hut.

Nationalmuseet, Prehist. Dept. 1041/75

Anders Fischer

2. LØVENHOLM, East Jutland
Gjesing s., Sønderhald h., Randers a.

Late glacial hunting-stand
Excavations in 1980–81 revealed a concentration of approximately 550 flint artefacts in a rounded area of 5×6 m. Burnt flints and charcoal indicated the position of a central hearth.

The inventory comprises 24 tanged points, 18 endscrapers, 7 burins, 2 borers, etc. Typologically the tool types belong to the Brommean Culture, though the endscrapers exhibit archaic traits like retouch on the lateral sides of the blade. Most of the tanged points show macro damage, a wear-type typical of penetration into flesh and bone. Due to re-use, the tools are rather small in comparison to those from other contemporary sites. Several tanged points have been modified into a new shape for a new function.

Attempted refitting of cores, flakes, and tools, suggests that the larger tools, principally points and knives, were brought to the site from the outside. That activity on the site was episodical is underlined by the scarcity of evidence of flint-knapping that actually did take place there. The local lithic outcrop, mainly morainic deposits, must be considered poor. Only four or five cores, with some conjoined flakes, the total non-tool lithics, are local material.

Kulturhistorisk Museum, Randers, 27/74

Bo Madsen

3. LANGÅ I, East Jutland
Langå s., Middelsom h., Viborg a.

Late glacial habitation site
Excavation in 1982 revealed a dense concentration of more than 3,000 flint artefacts scattered around a central, deeply placed hearth, in an area of 4×7 m. The tool inventory, typical of the Brommean Culture, comprises approximately 40 tools, mainly endscrapers on blades, and burins, together with two tanged points.

The largest group of flint artefacts includes blade-cores, thick blades 'outre passages', blade core trimming flakes, and unmodified blades. A 'soft type' hammerstone was also found.

Due to a superimposed clay layer and permanently wet conditions, some faunal remains have survived for approximately 11,000 years. For the first time in Jutland, small fragments of bone and antler and a few complete teeth have been found in the context of a late glacial habitation site.

The excavated site is situated amongst a group of 5 late glacial sites which cluster on a plateau on the late glacial terrasses of the Gudenaa river. The immediate surroundings are unusually rich in morainic flint of senonian origin. Most of the nodules are still covered with primary cortex.

The archæological evidence is so far interpreted as the remains of a base camp, one of the dominant factors in the placement of which was the access to suitable raw material for blade-production.

Kulturhistorisk Museum, Randers

Bo Madsen

4. JELS I, South Jutland
Oksenvad s., Gram h., Haderslev a.

Late-glacial settlement site
During a trial excavation in the area Jels I in 1981 a late-glacial settlement site with several types of the Hamburg Culture was discovered. These types include double-Zinken, single-Zinken, scrapers with lateral-retouch, Kratzer, flakes with angled end-retouch, centre burins, borers, etc. Fragments of true Kerbspitzen were found during the continued excavation in 1982.

Haderslev Museum j.no. 1356

J. Holm

MESOLITHIC

5. VEDBÆK, VÆNGET NORD, Northern Sjælland
Søllerød s., Sokkelund h., København a.

Settlement site
An undisturbed settlement site of the Kongemose Culture, situated on raised ground, once an islet by the southern side of the prehistoric Vedbæk Fjord. The settlement layer is sealed by peat and surrounded by mud. Total excavation began in 1980 and continues in 1983. Besides rich flint-tool material, fire-cracked stones, pits, and driven-in wooden posts have been found.

Institute of Prehist. Arch., University of Copenhagen. – Nationalmuseet, Prehist. Dept. 1659/76

E. Brinch Petersen

6. VEDBÆK, MARIEVEJ, Northern Sjælland
Søllerød s., Sokkelund h., København a.

Settlement site
A settlement site with two culture-layers of the later Ertebølle Culture situated on a shore-bank. Both layers, separated by a transgression layer, include pottery. The upper layer is distinguished by the occurrence of core-axes with specially-treated edges. Above were found scattered neolithic finds of a secondary character.

Nationalmuseet, Prehist. Dept. 3213/80

Peter Vang Petersen

7. SKJOLDNÆS, ÆRØ
Søby s., Ærø h., Svendborg a.

Submerged settlement site
Beyond Skjoldnæs in north-western Ærø, underwater archaeological investigation of a mud layer containing many branches and tree-trunk pieces has been carried out.

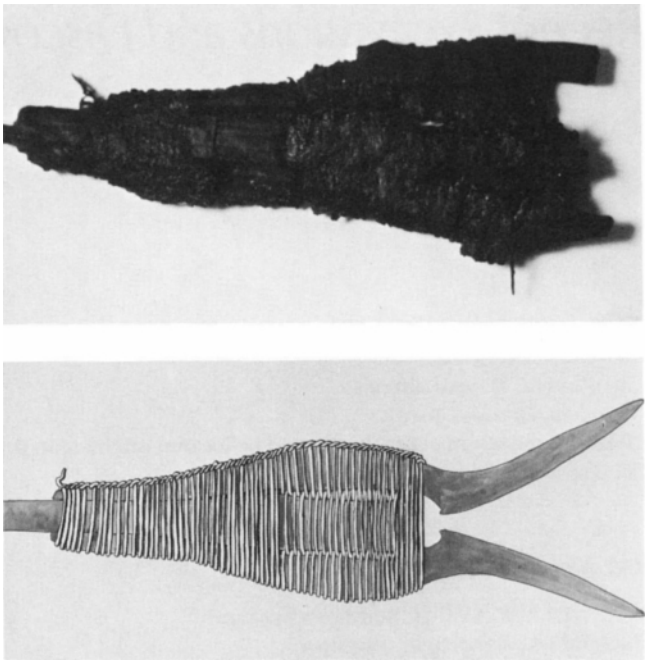

Fig. 1. Leister of hazel and thorn from Skjoldnæs by Ærø (no. 7). Reconstruction by Jens Kortermann Larsen.

Auroch, red deer, elk, seal, cod, and human bones have been found spread in and above the mud. Domesticated animals are represented by ox and pig. Artefacts found include a number of flake- and core-axes, borers, an awl, a large rim-sherd of an Ertebølle vessel, and the lower part of a leister, almost intact (fig. 1).

The hazel shaft is virtually square in cross-section by the break, but flattens out right down to ½ cm. thick between the side-branches, where it ends, again in a break, but not one that has removed significant length. It is a common belief amongst those who have worked on the reconstruction of leisters that a central spike of bone or wood was situated between the branches, possibly produced by the pointing of the shaft, but there is no sign of this here.

The side-branches of thorn must originally have been about 40 cm. long. Inwardly they end fast by the shaft; both the branches and the shaft are planed flat to this end. Soon after however they begin to bend out, and continue thus to the break. Obviously the damage is regrettable, but it is not difficult to reconstruct what is missing thanks to earlier finds.

Substantial pieces of the lashing which held the pieces together are preserved. It takes the form of a tight row of half-hitches, used by seamen and fishermen then as now. The lashing changes form where the side-branches are to diverge, with the string now taken alternately over and under the shaft. The lashing is a lightly twisted plant-fibre, possibly nettle.

Langelands Museum, Rudkøbing, 10138.

Jørgen Skaarup

8. DEJRØ, Ærø
Ærøskøbing s., Ærø h., Svendborg a.

Submerged settlement site
To the east of the islet Dejrø outside Ærøskøbing an extremely rich settlement site of the Ertebølle Culture has been located under barely 2 m. of water. It appears that both remains of a kitchen-refuse deposit and a heavy mud layer with a large amount of wood have been preserved. Investigations so far have produced a great number of flint tools, cores and flakes, some Ertebølle pottery, and a number of faunal remains. A complete human humerus may have come from a washed-out grave.

Amongst the finds from 1982's investigations was a 40 cm long antler axe, with a socket for an inset flint edge.

Langelands Museum, Rudkøbing, 10137

Jørgen Skaarup

9. TINGBJERGGÅRD, Central Sjælland
Undløse s., Merløse h., Holbæk a.

Decorated amber pendant
A trapezoid amber pendant of red-brown amber with prominently rounded front- and back-sides. (Fig. 2:3). A double-conical hole towards the narrow end. A major rupture on the back-side near the hole. The surface is scraped smooth, glossy in some places, matt in others. The front-side is decorated with fine incised strokes. Two lines run from the hole towards one corner. They form an oval figure, open at one end. From here three groups of lines emanate, with 3–4 strokes each, plus one single line. A rather similar motif, with two groups of strokes between single parallel lines, can be seen on the right-hand side/edge of the front. Four to five small ladder motifs appear in various places on the front- and back-sides.

The pendant was found in 1978 during a systematic survey of the Mesolithic settlement site at Tingbjerggård in Åmosen.

Nationalmuseet, Prehist. Dept. A 51041

P.O. Nielsen

10. DOKKEDAL, North Jutland
Mou s., Flesum h., Ålborg a.

Decorated amber pendant
A pendant of yellow-brown amber, 9.6 cm. long, 4.8 cm. wide, 2.1 cm. thick, oval with sharp angled edges (fig. 2:4). Clear wear-marks from the string can be seen on the edge of the suspension-hole. Decorated on both sides with both thin and heavy strokes. Highest up on the most rounded side, towards the suspension-hole, is an H-figure. In the middle is a decoration consisting of two vertical and one heavy horizontal strokes, from which slighter parallel strokes emanate. Below are two fringed motifs in heavy strokes, the upper of these cutting across a similar but more weakly incised motif together with 6–7 long, slight strokes. On the other side, three fringed motifs are placed over one another, with a horizontal stroke only in the uppermost. A number of short, heavy strokes, and several rather weak ones, are spread about the surface. Overall the piece is very worn. Weight: 63 g.

The pendant was found in a newly-ploughed field only one or two hundred metres from the sea.

Nationalmuseet, Prehist. Dept. A 51055

P.O. Nielsen

11. VEDERSØ STRAND, West Jutland
Vedersø s., Hind h., Ringkøbing a.

Decorated amber pendant
Small, irregular pendant of matt yellow amber. (Fig. 2:2). The trace of a suspension-hole can be seen at the narrow end. The upper half is decorated all the way round with densely-packed, heavily-incised strokes, which in some places emanate from a horizontal line above. On the lower part's two downward-facing surfaces a motif consisting of 2–3 parallel lines with adjacent groups of short lines is placed.

The pendant was found on the beach on the west coast of Jutland.

Nationalmuseet, Prehist. Dept. A 50844

P.O. Nielsen

12. FANØ VESTERSTRAND, South West Jutland
Nordby s., Skast h., Ribe a.

Decorated amber pendant
Small, irregular three-sided pendant of clear orange amber, broken off in the suspension-hole. (Fig. 2:1). The object has cutting-marks on its uppermost part, but otherwise there is no apparent attempt to modify its natural form. On all three sides a fringed motif is found, formed of incised lines, one horizontal, with densely-packed, short lines perpendicular to it. Two such motifs are placed slightly overlapping one another on the broader side. Four short lines are incised on the thick bottom-end.

The pendant was found washed up on the flat beach on the west coast of Fanø.

Nationalmuseet, Prehist. Dept. A 50750

P.O. Nielsen

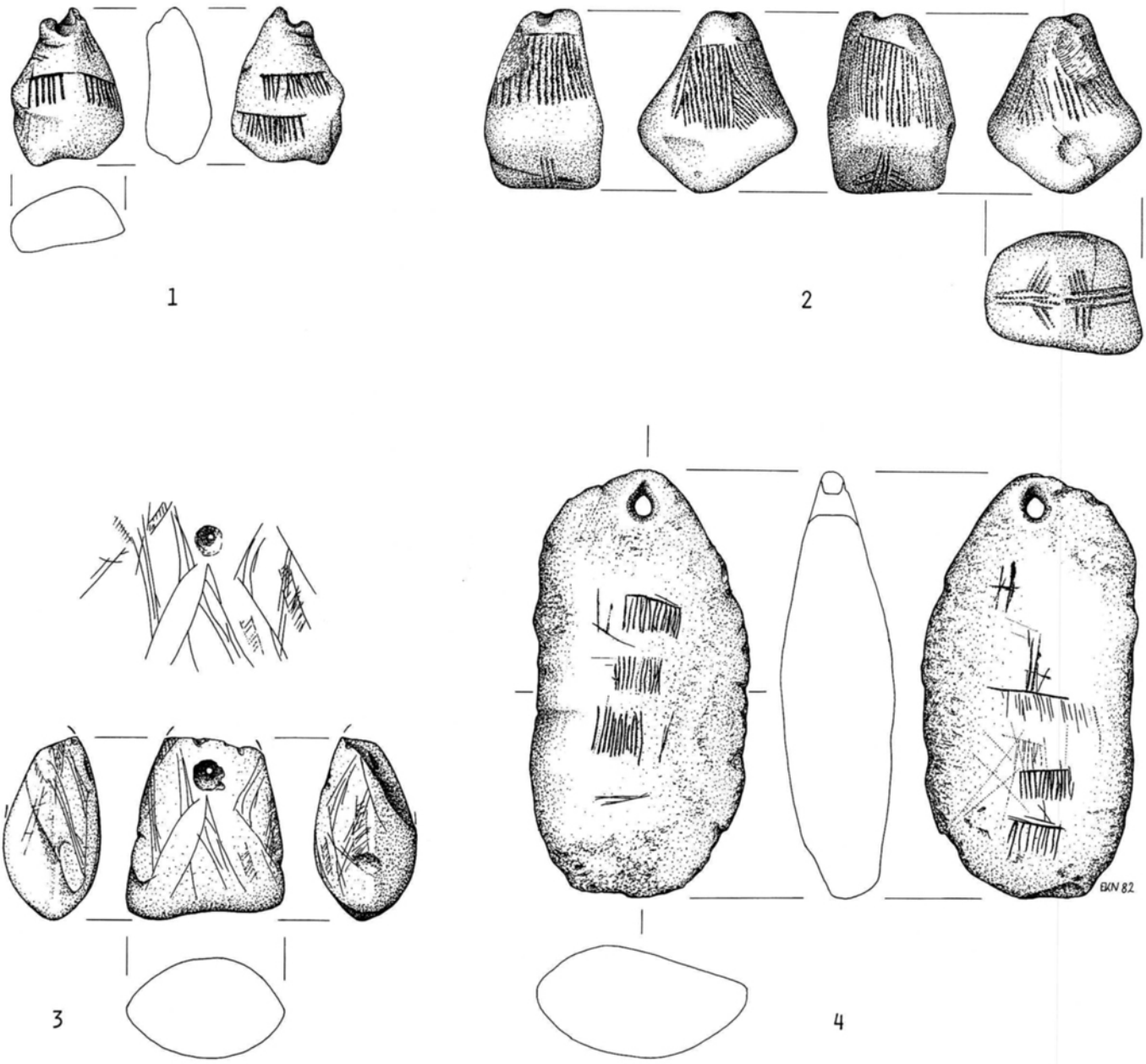

Fig. 2. Decorated amber pendants. (1) Fanø Vesterstrand (no. 12), (2) Vedersø Strand (no. 11), (3) Tingbjerggård (no. 9), (4) Dokkedal (no. 10). 2:3 (drawn by Eva Koch Nielsen).

NEOLITHIC

13. RUNEGÅRD, Bornholm
Åker s., Bornholm Sdr. h.

Middle-neolithic settlement site
Pits and post-holes with finds of the middle-neolithic Funnel Beaker Culture in an area with finds from the Neolithic, Bronze Age, and early Iron Age. The find-material includes sherds of at least 75–100 different ornamented pots, with a significant element of Middle-Neolithic Period III pottery. Investigations continue.

Bornholms Museum, Rønne – Lit.: *Antikvariske Studier* 4, pp. 67–76. – *Fra Bornholms Museum* 1980, pp. 19–23.

Margrethe Watt

14. SPODSBJERG, Langeland
Longelse s., Langelands Nørre h., Svendborg a.

Settlement site and dam
In 1979–82 sections of an extensive and exceptionally rich settlement site of the late Funnel Beaker Culture, more accurately MN V (the Store Valby Phase), were investigated near Spodsbjerg by the east coast of Langeland. The settlement site lies along and around the foot of a promontory, which in the Stone Age was surrounded by salt or brackish water towards the east, south, and south-west, while west of the promontory lay a fresh-water marsh.

Outside the settlement site a rich refuse layer including many bone and antler tools, pottery, and wooden objects, was investigated. The finding of a well-preserved ash paddle, 1.5 m. long with a blade 50 cm. long, deserves particular mention.

South-west of this promontory, a well-preserved dam, associated with the settlement, was investigated. The construction consisted of two 10 m.-long barrages placed parallel across the outlet of the marsh mentioned above, built of an earth fill supported by timber-work, and provided with water-resistant layers of bark-chips. A basin about 10 m. long and 1.5 m. broad lay between the barrages, interpreted as a kind of intermediate cistern in which fresh water could collect. The timber-work of the barrages was fully preserved, and, like the settlement site itself, has provided a great quantity of trimmed and pointed timber piles in the best state of preservation conceiveable. The investigation resulted from road-works begun in 1982. Upto 1982 only those parts of the site which will be destroyed by the road-works have been excavated. The greater part of the settlement site lies outside this area, where covering culture-layers are ploughed up during farming, and which should be the subject of future investigations.

Langelands Museum, Rudkøbing, 9688

Jens Bech

15. SKJOLDBORG, North West Jutland
Skjoldborg s., Hundborg h., Thisted a.

Single-grave mound
In 1979 a barrow with two single-graves was excavated. The primary grave was a ground-grave, surrounded by an irregular stone construction ca. 6×6 m., and covered by a small mound ca. 8 m. in diameter and 1 m. high. A large number of amber beads, at least 160, were found in the grave. The second single-grave was partially cut into the primary mound, and covered by the barrow's second construction phase. The grave contained two amber rings. Additionally, three secondary late Bronze Age cremations were found.

Museet for Thy og Vester Hanherred, Thisted, 1408 x 1–118

Jens Henrik Bech

16. SEJLFLOD, North Jutland
Sejlflod s., Fleskum h., Ålborg a.

Early-Neolithic grave
Two Early-Neolithic graves, both alligned E-W, were found during the excavation of a later Roman- and early Germanic Iron Age cemetery. Immediately east of the two graves two pits were found, one stone-lined. Grave AS contained a collared flask, a thin-butted flint axe, 220 amber beads, and two copper fragments. Grave PY produced two thin-butted flint axes, six transverse arrowheads, a blade-knife, and a piece of amber.

Aalborg historiske Museum, j.no. 669

J.N. Nielsen

17. VESTHIMMERLANDS FLYVEPLADS, North Jutland
Ulstrup s., Års h., Aalborg a.

Single-grave mounds
Three barrows beside Vesthimmerland airfield were investigated in 1980. They lay 75–250 m. distant from one another, and all contained large timber-built North Jutish grave-cists, or large timber-built cists as they shall be called here.

In Barrow 3 (VMÅ j.no. 49) a ditch was found surrounding a pear-shaped burial-chamber alligned E-W with an entrance to the east. The chamber measured 2.8×2.0×0.7 m. Stones were found at the bottom of the ditch, and traces of decayed wood and charcoal along its inner side and partially up over the chamber floor. These timber traces are from the chamber wall, which was roughly vertical. There were also traces of wood on the chamber floor, and at a level about 15–20 cm. above the floor a corresponding layer which must be the remains of the chamber ceiling. A single-grave battle-axe (Glob 1944, Type G) of the earlier ground-grave period was found on the chamber floor, together with a thin-bladed flint axe, and two amber rings, one large, one small. Two C-14 dates were taken: one of oak and lime from the walling (K-3627), 2080 ± 85 B.C.; one of oak, lime, and alder from the floor-layer (K-3628), 2060 ± 85 B.C.

In Barrow 1 (VMÅ j.no. 47) a very similar construction was found. The chamber here was roughly rectangular, 2.9×2.2 m., with a passage to the east. No stone foundations were found in the ditch. An amber bead, which itself cannot be closely dated, was found in the chamber.

In Barrow 2 (VMÅ j.no. 48) another large timber-built cist was found. It was rectangular, 2.4×1.9 m., alligned ENE-WSW, with an entrance to the WSW, but no passage. The grave contained a Late-Neolithic pot.

The danger of grave-clearance and later burials is very small in the case of the large timber-built cists because of the limited time that these graves were accessible before collapsing. One may therefore assume that the objects found in the grave are contemporary with its construction. The situation is quite the opposite with the large stone-built cists, where

clearance and reuse of the grave often occur sooner or later. The large timber-built cists could therefore hold the key to a better understanding of the whole large-cist complex: their dating, development, and origin.

A provisional survey of the large timber-built cists now known, (about 14 from Denmark), and some of the stone-built, shows that it is possible to make a typological-chronological classification which is common for both timber- and stone-built large cists.

The oldest type, from the earlier ground-grave period, is the pear-shaped, as the one described above from Barrow 3. A comparable example from Kjeldgård, Aars parish, is already published (*Fra Himmerland og Kjær Herred* 1980, pp. 91–100). This contained a Swedish boat-axe, and a battle-axe of the Single-Grave Culture, (Glob 1944, Type G or H). Two C-14 datings are available, one of oak from the walling of 2150 ± 85 B.C. (K-3626), and one of hazel from the floor-layer of 2050 ± 85 B.C. (K-3625). The latter must be supposed to be closest to the grave's construction date.

The subsequent types of the ground-grave and upper-grave periods have a rectangular chamber and a fore-room and/or passage, as the one from Barrow 1 at Vesthimmerland Airfield.

The Late-Neolithic types are rectangular with only a very short passage if any at all. The type is known from Vesthimmerland Airfield Barrow 2 and from Kjeldagerhøj, Tånum s. (Glob 1944 p. 195). Glob dated this to the Single-Grave Culture, but a fresh look at the pottery shows it to be Late-Neolithic.

These finds of large timber-built cists have helped to show continuity of construction of both timber- and stone-built large cists from the Single-Grave Culture's ground-grave period into the Late-Neolithic.

Vesthimmerlands Museum, Års, no. 47–49. – Lit.: P.V. Glob: *Studier over den jyske Enkeltgravskultur. Aarbøger for nordisk Oldkyndighed og Historie* 1944 (1945). – *Fra Himmerland og Kjær Herred* 1980.

Mogens Hansen

18. TASTUM SØ, Central Jutland
Kobberup s., Fjends h., Viborg a.

Late-Neolithic settlement site
A house-site with a sunken floor, ca. 11 m. long and 5 m. wide, was discovered as a result of road-works between Skive and Kjeldbjerg. Flint and potsherds were found both in and above the floor-layer. The potsherds include rim-sherds with one or two horizontal mouldings, and sherds with Bell Beaker decoration.

Skive Museum 219A

J. Simonsen

19. TANGE SØ, Central Jutland
Højbjerg s., Lysgård h., Viborg a.

Mortuary house of the TRB Culture
The house was ca. 3 m. across and 2.6 m. deep, with a forecourt of about 1 m. The side-ditches were 50 cm. wide and 50 cm. deep, and contained traces of upright posts. The fore-wall contained well-preserved traces of four vertical posts spaced 50 cm. apart. The only finds were a handful of undecorated sherds and a single sherd with vertical stripes.

Viborg Stiftsmuseum 706D

Mette Iversen

20. KAINSBAKKE and KIRIAL BRO, East Jutland
Ginnerup and Enslev s., Djurs Nørre h., Randers a.

Middle-Neolithic settlement sites
Two settlement sites in the eastern part of Djursland were investigated in 1980–81. Both sites lie on the edge of an earlier fjord complex, Kolindsund. Flint-types and pottery date the sites to the late Funnel Beaker Culture, Middle-Neolithic period V, and the early Pitted-Ware Culture. Pitted-Ware Culture tanged arrowheads of type A1 are here found together with MN V types for the first time. The topography indicates different settlement-site types, and the bone material shows the presence of both domestic and wild animals.

Djurslands Museum, Grenå, no. 1900 & 1930. – Lit.: *Antikvariske Studier 5*, 1982, pp. 104–114

Lisbeth W. Rasmussen

21. FORSØGSGÅRDEN, South West Jutland
Esbjerg s., Skast h., Ribe a.

Single-grave mound
In the summer of 1981 a small group of four barrows lying within the present town of Esbjerg, three of which had not previously been registered, were excavated. One of the barrows contained four graves, one of which lay centrally, and was alligned E-W, furnished with a Single Grave Culture battle-axe, a club-head, and an amber bead. The other three graves lay off-centre in a long row running NE-SW. Two of these were connected by a feature ca. 20 cm. broad and 15 cm. deep.

The excavation of these two graves gave surprizing results. Both had clear coffin-traces, and above one grave, on the traces of the coffin-lid, lay a battle-axe of Glob's Type F/G and four amber beads. At the bottom of the grave lay a dog's skeleton. This was poorly preserved, but the cranium and four teeth survived quite substantially. The bones were analysed by Tove Hatting, Københavns Universitets Zoologiske Museum, who describes the dog as a Neolithic pointer, cf. the dogs from the settlement site at Bundsø (cf. *Aarbøger for*

Fig. 3. Votive axe of bronze from North Sjælland (no. 23). Ca. 1:2 (L. Larsen photo).

nordisk Oldkyndighed og Historie 1939). The second grave produced neither skeleton nor grave-goods. It is suggested that the dog's grave, axe, and amber beads were grave-goods of the deceased in the second grave.

Esbjerg Museum, j.no. 931

Michael Lauenborg

22. BUNDSØ, Als
Havnbjerg s., Als Nørre h., Sønderborg a.

Middle-Neolithic settlement site
In 1978 the National Museum undertook a trial excavation at Bundsø in northern Als, right beside the place where a large Middle-Neolithic settlement site had earlier been excavated (*Aarbøger for nordisk Oldkyndighed og Historie* 1939). A rich culture-layer with mollusc-shells, pottery, flint, and faunal remains from Middle-Neolithic period III was investigated in the subsequent excavations of 1979–81. Many preserved timber stakes were found over the whole area, but their function is indeterminable. A ditch-system belonging to a causewayed camp of the Sarup-type is earlier than the main occupation phase.

Nationalmuseet, Prehist. Dept. 2329/78

P.O. Nielsen

BRONZE AGE

23. NORTH SJÆLLAND

Votive axe
It has long been known that large votive axes were an important part of the cultic equipment in the Bronze Age. Their significance was further emphasized when in 1977 the National Museum acquired, as treasure trove (Danefæ) three large massive bronze axes weighing a total of 20 kilogrammes. At this time a survey of the complete material was published (J. Jensen 1978), in which reference was made to 10 finds of such axes, most of them from the Early Bronze Age. In publishing these finds, it was emphasized that the axes represented a cultic form which, like many other Bronze Age symbolic expressions, ranged, with an astonishing continuity, through both the Early and the Late Bronze Age. This viewpoint has been convincingly confirmed by the find of yet another Bronze Age axe, acquired by the National Museum in 1980. This axe, fig. 3, is 22.5 cm long and 17.2 cm wide. Its weight of 200 grammes indicates that it was cast in the lost-wax technique, as were the well-known axes from Brøndsted Forest in Jutland (H.C. Broholm 1952, 253). The metal varies in tickness from 1 to 2 millimetres, and the axe thus clearly differes from the axe forms of the Early Bronze Age, nearly all of which are massively cast.

The finding place of the new axe is uncertain. For many

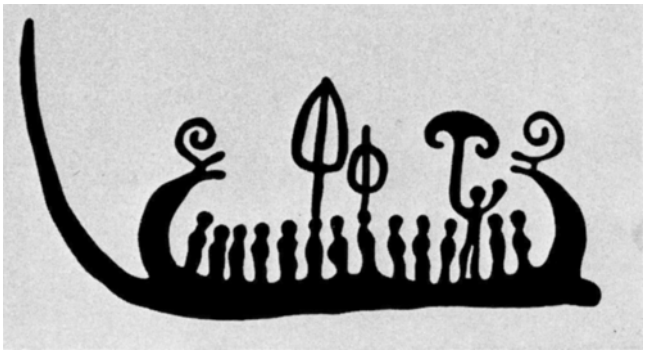

Fig. 4. Rock carving from Åby in Bohuslän, Sweden.

years it was in private possession in Asminderød, near Fredensborg, northern Zealand. Most probably the axe comes from northern Zealand, and to judge by the patina it was a bog find. This surmise as to the original finding place of the axe is supported by a find from the Frederiksborg region, also in northern Zealand, namely a fragment of a similar axe (Aner and Kersten 1973, no. 166), which to date has been dated to the Early Bronze Age, but which, like fig. 3, ought to be ascribed to the Late Bronze Age instead.

A piece which is nearly identical, though somewhat larger, measuring 36 cm in length, is known from Galstad, Tumbergs parish, Västergötland, Sweden (M. Stenberger 1979, 287), where it was found together with 5 thin so-called wendelringe which can be dated to Bronze Age period V–VI (E. Baudou 1960, 56). In type, this axe is very likely to the axe seen on the well-known bronze figurines from Grevensvænge (H.C. Broholm 1953, 105a) and on various rock-carvings such as the one from Åby in Bohuslän, fig. 4 (G. Burenhult 1981, 376). The many Bronze Age cult axes which have gradually come to light bear witness to a religious symbolism which must have prevailed in the southern Scandinavian Bronze Age core region for more than a thousand years.

Nationalmuseet, Prehist. Dept. 3058/80

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Jørgen Jensen

24. ROSKILDE, Sjælland
Roskilde s., Sømme h., Københavns a.

Two hollow-cast ankle rings

In May 1973 two finds were made, two days apart, of a couple of hollow-cast ankle rings (German: Hohlwülste) at the edge of the town of Roskilde. The rings were found in soil which had been dug up from a little damp natural depression in which about a half-metre of peaty soil was still preserved. One of the rings (fig. 5, right) was nearly intact and measured 16.5 cm in diameter. The second ring found (fig. 5, left) had been somewhat damaged by the excavation machine but seems to have been identical to the first ring.

The two newly-found hollow-cast ankle rings belong to a group of rings originating in the Central European Ha C milieu. A North European variant of this type which evolved in period VI is known from about 250 finds. Its distribution extends from East Thuringia over the entire North European lowland region to southern Scandinavia. In Denmark about half a dozen finds of this type are known (J. Jensen 1966, 57), and 5 of these doubtless come from wetlands (J. Jensen 1972, 164). This type seems to have been made in Denmark as well, as indicated by the find of a fragmented mould from a period VI refuse pit at Flædemose on Stevns, eastern Zealand (H. Thrane 1980).

There has been some doubt as to the dating of the hollow-cast ankle rings. Their origin in a Central European Ha C milieu dates them to period VI in North Europe as confirmed, for example, by the appearance of the type in the Holbæk Slots Ladegård hoard (H.C. Broholm 1946, M 213). But the type has also long been known to extend down to the beginning of the pre-Roman Iron Age (J. Jensen 1966, 58), where it appears, for example in period I grave finds (J. Jensen 1971, 10). Thus, like a number of other bronze types, such as the so-called wendelringe, it appears on both sides of the boundary between the Bronze Age and the Iron Age.

With regard to their find circumstances, the two new hollow-cast ankle rings seem to be typical for the large group of single finds of bronzes, particularly occuring in wetlands at the close of the Bronze Age. During the Nordic Bronze Age period VI, votive deposits consisting of many objects decreased in number. Instead, there was a predominance of votive finds consisting of objects deposited singly or in pairs, for example pins and neckrings, a custom which continued late into the pre-Roman Iron Age and which in its way testifies to a cultural continuity from the Bronze Age to the Iron Age (J. Jensen 1972). The changes in religious customs seem instead to indicate that the bronze import from Central Europe began to decline from the beginning of Ha D, corresponding to the close of period VI of the Nordic Bronze Age.

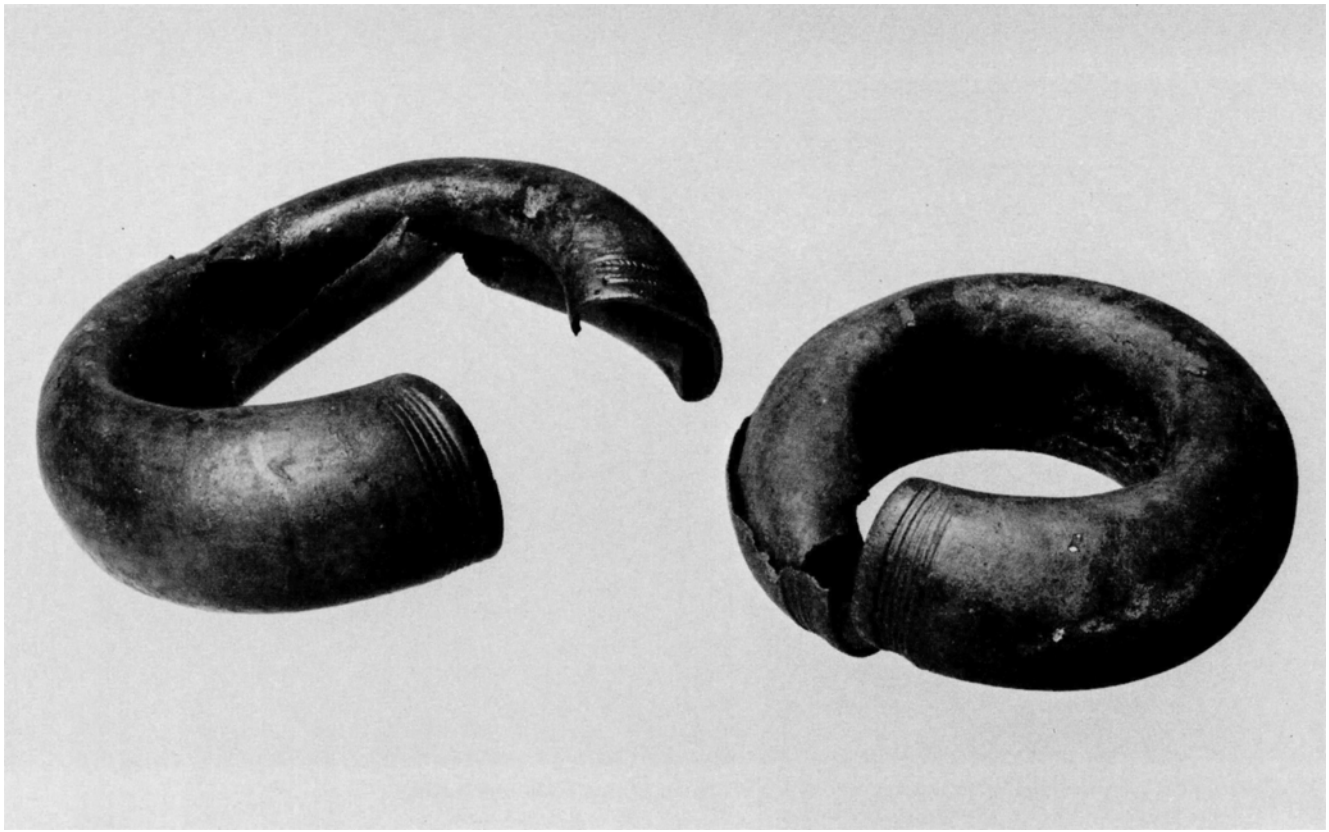

Fig. 5. Two hollow-cast ankle rings from Roskilde (no. 24). Ca. 2:5 (L. Larsen photo).

The cessation in bronze import and the consequent changes in the sacrificial customs may very well be attributed to the peripheral position of North Europe within a larger exchange system, the fluctuations of which were determined by political and economic conditions as far south as the Alpine region and the Mediterranean lands (J. Jensen 1982).

Nationalmuseet, Prehist. Dept. B 16805-06

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Jørgen Jensen

25. JERSIE STRAND, Eastern Sjælland
Jersie s., Tune h., Københavns a.

Late Bronze Age settlement site

As a result of building work, a major settlement site of the Late Bronze Age was discovered in 1981, with many pits, post-holes, one long-house 32×6.2 m., and two minor buildings. One-third of the pits produced pottery, mostly of Late Bronze Age period VI. Substantial fragments of two pots were found in the long-house.

Køge Museum, no. 695. – Lit.: *Antikvariske Studier* 5, 1982, pp. 251–2

Sv. Å. Tornbjerg

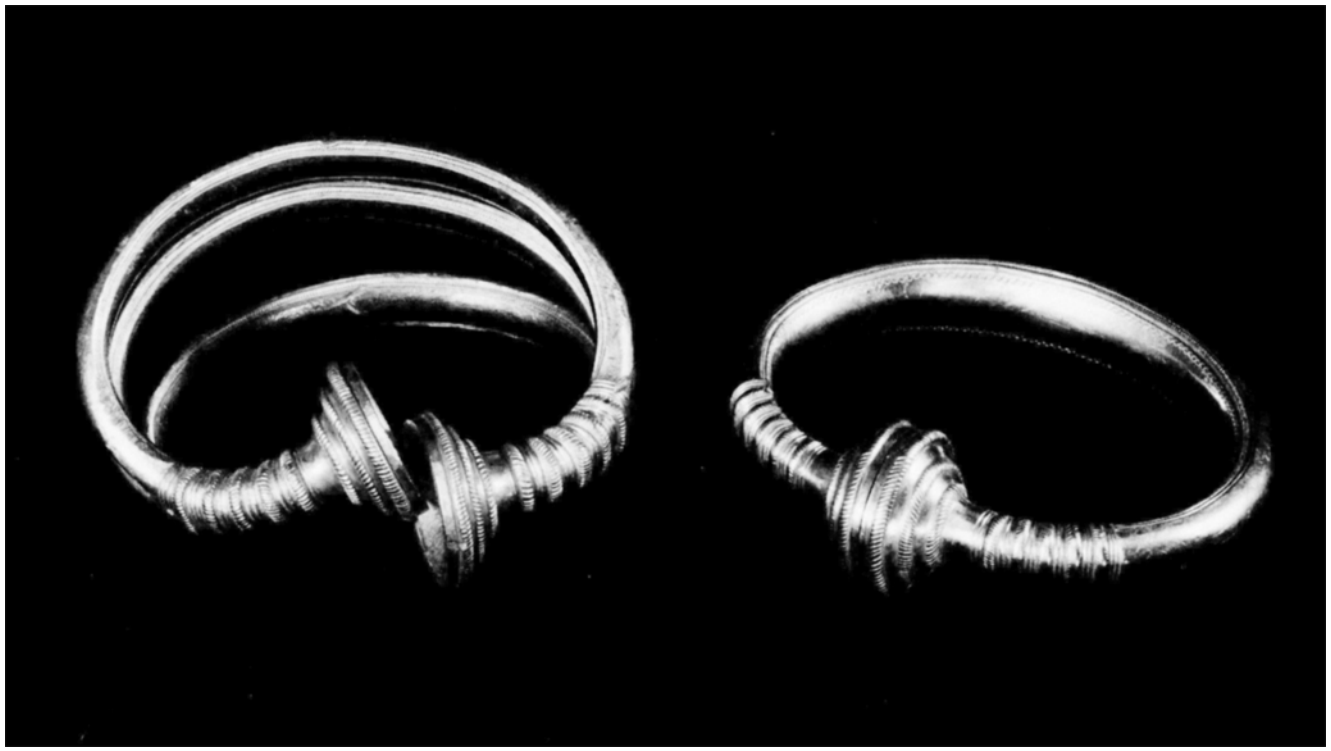

Fig. 6. Two massive gold rings from Neble by Boeslunde, West Sjælland (no. 26). Ca. 4:5 (L. Larsen photo).

26. NEBLE, West Sjælland
Boeslunde s., Slagelse h., Sorø a.

New gold finds

In March 1981 the National Museum acquired two massive gold rings, found at Neble, southwestern Sjælland. The two gold rings (fig. 6) were probably unearthed in November 1980 during digging for a sewer at a little boghole just a few hundred metres from the well-known Borgbjerg Banke (H. Kjær 1928). The rings were found the following spring: the single one on the edge of the little boghole, the triple one about 100 m away, where it had probably been dragged during spring harrowing. No doubt the two gold rings had originally been deposited together. The big ring weighs 770 grammes and has a purity of 819 o/oo. The smaller ring weighs 572.5 grammes and has a purity of 811 o/oo.

Mention of the two rings in the press brought yet another ring to light (fig. 7); unfortunately its exact finding place is unknown. For many years this ring had been in private ownership in the Boeslunde region. However, as it is so closely related to the first two rings in shape and style, there can be little doubt that it also originated in the Boeslunde region. The weight of this third ring is 517.3 grammes, and its purity is 812 o/oo.

The first two gold rings were, as mentioned, found only a few hundred metres from the Borgbjerg hill, where 6 gold cups from the Late Bronze Age had been found in the last century (H.C. Broholm 1946, 271). This total of approximately 4 kilogrammes of gold is the largest quantity of gold from the Bronze Age to be found within a single Danish parish. Such a large concentration of wealth cannot be coincidental. In periods IV and V of the Bronze Age a number of notable concentrations of wealth developed within certain regions of southern Scandinavia and northern Germany. This holds true especially of period V, to which the newly-found rings may be dated (J. Jensen 1982). Of the total of 5.9 kilogrammes of gold known from Denmark east of the Great Belt in period V, more than 3 kilogrammes of gold have been found within an area of just a few hundred square kilometres in southwestern Zealand.

From the same area and the same period there is a corresponding concentration of imported goods from central and northern Europe. Similarly symbolic objects such as miniature swords are also clearly concentrated in southwestern Zealand.

The concentration of wealth, so distinctly indicated by the newly-found gold rings, closely resembles another concentration observed in recent years namely in the southwestern part of the island of Funen, in the Voldtofte area (J. Jensen 1967 and H. Thrane 1978), where a hierarchical settlement pattern also seems to have prevailed. Similar conditions are also encountered in northern Germany, for example in the Seddin region (H. Wüstemann 1974) and elsewhere.

The period in question corresponds to Ha B 3 in central

Europe, which was in fact a period of marked cultural expansion, as indicated by rich warriors' graves, the so-called Adelsgräber (H. Müller-Karpe 1952 and A. Jockenhövel 1974). From Switzerland and the Rhineland there was an extensive distribution of metal wares to a zone south of the Baltic and hence a secondary distribution, mainly to eastern Denmark (H. Thrane 1975, 238 ff). There can be little doubt that the formation of such powerful centres of wealth as those on Funen and Zealand is related to the central and northern European exchange system of raw materials and finished products which culminated at this very time in the 8th century B.C., after which it declined sharply in the course of the following centuries.

Nationalmuseet, Prehist. Dept. 3635/81, 3669/81.

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Jørgen Jensen

27. LÆKJÆR, North West Jutland
Nors s., Hillerslev h., Thisted a.

Early Bronze Age grave

Central grave in a ploughed-over barrow, excavated 1979. The grave was a stone cist, alligned WNW-ESE, built of a single layer of six large, heavy stones, one at either end and two at each side, and covered with three large stones. The cist measured 1.6×0.5 m., and was 40 cm. deep. Burnt bone was found at the bottom, upon which lay a belt-plate, a tutulus, a dagger, and a scabbard chape, all of bronze. Montelius period 2.

Museet for Thy og Vester Hanherred, Thisted, 1492 x 1–7

Jens Henrik Bech

Fig. 7. Gold ring from Boeslunde, West Sjælland (no. 26). Ca. 2:3 (L. Larsen photo).

28. TILSTED, VORUPØRVEJ 14, North West Jutland
Tilsted s., Hundborg h., Thisted a.

Early Bronze Age graves

A ploughed-over burial mound with a child's grave of Early Bronze Age period 3 as central grave was investigated in 1979. There was a secondary grave consisting of a stone cist plus burnt bone. The contents of the grave, which also dates to period 3, include a small ring of gold wire, and two armbands, a dagger, a double-button, and a belt-box with a flat base decorated with a star-motif and resin-inlay, all of bronze. The belt-box contained an armring composed of small bronze spiral-beads and glass beads, a bronze tutulus, and a fragment of a bronze sickle. A stone construction radiating out from the centre was also found in the barrow. Outside the barrow a settlement site layer of period III or the Late Bronze Age.

Museet for Thy og Vester Hanherred, Thisted, 1417 x 1–128. – Lit.: J-H. Bech: En rig kvindegrav fra Thylands ældre bronzealder. *MIV* vol. 10, Viborg 1980, p. 96ff.

Jens Henrik Bech

29. TASTUM SØ, Central Jutland
Kobberup s., Fjends h., Viborg a.

Late Bronze Age settlement sites

As a result of road-works between Skive and Kjeldbjerg two settlement sites have been found close by one another. One of these produced a long-house, cooking-pits, and a large

refuse-pit with sherds from many pots. The other produced post-holes and a single refuse-pit.

Skive Museum 219A

John Simonsen

30. RAVNING MARK, East Jutland
Bredsten s., Tørrild h., Vejle a.

Late Bronze Age settlement site
The trial excavation of a settlement site was undertaken in 1979, and two house-sites of the Late Bronze Age and several refuse-pits were found.

Kulturhistorisk Museum, Vejle, M 193

Steen Hvass

31. OMGÅRD, West Jutland
Nørre Omme s., Hind h., Ringkøbing a.

Late Bronze Age settlement site
Two 'farmsteads' lying ca. 300 m. apart. One major house has been partially excavated on the eastern site. It was surrounded by a ring of pits with fire-shattered stones. Only the eastern part of the other site was investigated, consisting of a half-ring of pits with fire-shattered stones. These two farmsteads are succeeded by a village of the pre-Roman Iron Age period Ia. The excavation took place in 1976 and 1981.

Nationalmuseet, Prehist. Dept., 1140/75 & 2947/80

Leif Chr. Nielsen

PRE-ROMAN AND ROMAN IRON AGE

32. RUNEGÅRD, Bornholm
Åker s., Sønder h., Bornholms a.

Settlement site of the Early Iron Age
A settlement site with finds from the Neolithic, Bronze Age, and Early Iron Age, was investigated near Grødby on southern Bornholm in 1979–80. Several well-preserved house-sites from about the time of Christ were excavated. The investigation continues.

Bornholms Museum, Rønne. – Lit.: *Antikvariske Studier* 4, 1980, pp. 67–76. – *Fra Bornholms Museum* 1980, pp. 19–23

Margrethe Watt

33. VOGN, North Jutland
Mosbjerg s., Horns h., Hjørring a.

Cemetery
A fully excavated cemetery of the Late pre-Roman and Early Roman Iron Age. In all about 100 interments were found, mostly cremations. Several of these were weapon-graves. The investigations of the cemetery were begun by Holger Friis in 1912, continued by Ole Klindt-Jensen in 1953 & 55 and Jens-Henrik Bech in 1974–5 & 78, and completed by Anne-Louise Haack Olsen in 1980.

Vendsyssel historiske Museum, Hjørring no. 1948/101ff., 1951/1ff., 1975/9ff. – *Nationalmuseet*, Prehist. Dept. C 28000ff. – Lit.: *Acta Archaeologica* XX, 1949 (1950), pp. 53ff., 207f. – *Kuml* 1979 (1980) pp. 141ff. – *När järnet kom. Polen-Vendsyssel-Göteborg vid tiden omkring Kr. f.* Göteborg 1976, pp. 197ff. – *Die Vorrömische Eisenzeit im Kattegatt-Gebiet und in Polen.* Göteborg 1980, pp. 68ff

Jens Henrik Bech

34. EGEBJERG, North Jutland
Ugilt s., Vennebjerg h., Hjørring a.

Stone-built cellar
Circular, stone-built cellar, ca. 1.7×2 m. at the bottom, and 90 cm. deep. The entrance to the cellar appears to be connected to an as yet unexcavated house-site. This is the most westerly appearance of this particular construction-form characteristic of northern Vendsyssel.

Vendsyssel historiske Museum, Hjørring 154/1981

Per Lysdahl

35. HAMBORG, North Jutland
Ugilt s., Vennebjerg h., Hjørring a.

Cemetery
19 graves were investigated in 1979–80: 4 cremation graves, 3 collapsed stone-built graves, and 12 inhumations. Five inhumation graves were covered by an offering layer consisting of whole and crushed pots, which are formally similar to the pottery-types found in votive-deposits in bogs.

Vendsyssel historiske Museum, Hjørring 387/1979

Torben Dehn
Per Lysdahl

36. SKÅRUP, North West Jutland
Sjørring s., Hundborg h., Thisted a.

Settlement site
In 1980–81 a settlement site with 17 house-sites was excavated; 6 house-sites were fully investigated and one partially. Several of the houses had burnt down, and several building-phases separated by layers of blown-sand could be seen. Internally the buildings were 10–12 m. long and about 5 m. wide. They had turf walls with clay facing on the inside, and clay floors. In several cases a byre with stone-lined gutters was placed at the east end. Two of the burnt sites produced pottery with charred grain. The settlement site is dated to pre-Roman Iron Age period II on the basis of the pottery. The extent of the site is estimated at 12,000 sq.m.

Museet for Thy og Vester Hanherred, Thisted, no. 1482 x 1–442. – Lit.: *Antikvariske Studier* 5, 1982, pp. 253–4.

Anne-Louise Haack Olsen
Lis Helles Olsen

37. TOLSTRUP, North Jutland
Års s., Års h., Ålborg a.

Settlement site and graves of the pre-Roman and Roman Iron Age
In 1980–81, in connection with building-work, an area of 17,000 sq.m. was investigated at a site in the town of Års where parts of a settlement site had been excavated by the National Museum in the 1920's & 30's (by G. Hatt, Johs. Brøndsted, & G. Rosenberg, cf. *Aarbøger for nordisk Oldkyndighed og Historie* 1928). During the new investigations, 22 buildings, rubbish-pits, 3 inhumations, and 3 cremations, were found. The cremations and refuse-pits are dated to the Early pre-Roman Iron Age, the buildings and inhumations to the Early Roman Iron Age. Very thick culture-layers associated with the house-sites were investigated. Remains of fencing were found around the buildings and the settlement.

Vesthimmerlands Museum, Års. – Lit.: *Antikvariske Studier* 5, 1982, pp. 255–6.

Mogens Hansen

38. ÅLESTRUP, Central Jutland
Østerbølle s., Rinds h., Viborg a.

Settlement site
In 1978 a number of the best-preserved house-sites on a settlement site of the Late pre-Roman/ Early Roman Iron Age were investigated. The site lies 3 km. from the settlement site at Østerbølle, which is dated to the 1st. century A.D. (G. Hatt, *Aarbøger for nordisk Oldkyndighed og Historie* 1938). At Ålestrup most of the settlement site was removed before excavation, so its original extent is not known. It appears to have covered more than 1 ha., and to have included about 20 buildings. One of the excavated sites was a burnt house, with, *inter alia*, a number of pots lying broken on the floor, charred grain, and charred remains of posts and roof. A second house-site was emptied and produced almost no finds. The clay floor was about 15 cm. thick, and raised at the west end as in the houses at Østerbølle. A sea-urchin was found in the wall-line. Underneath this house the site of a burnt building with clay-lined walls was found.

A house with turf walls preserved to a height of 40 cm. was partially investigated. Finds of rubbing- and polishing-stones, lumps of raw clay, and misfired pottery, indicate that the building functioned as the workplace or refuse-place for a potter after occupation in it ceased. Other finds from the same building include hammer-stones, sausage-shaped flint-nodules, and masses of potsherds, including fragments of a number of fire-dogs.

Viborg Stiftsmuseum 664D

Mette Iversen

39. PRIORSLØKKE, East Jutland
Horsens s., Nim h., Skanderborg a.

Settlement site and fortification
A settlement on a low bank situated fast by a low-lying and damp area was investigated in 1980–81. Remains of a fortified site, consisting of a dry moat behind which stood a pallisade of heavy oak stakes, were found. Post-holes from a settlement were uncovered within the fortified site. Pottery from the settlement dates the site to the Early Roman Iron Age.

Nationalmuseet, Prehist. Dept. 1180/75

C.L. Vebæk

40. OMGÅRD, West Jutland
Nørre Omme s., Hind h., Ringkøbing a.

Settlement site
5 buildings belonging to a village, several pits, and fields with ardmarks have been investigated. An early phase can be dated by pottery to pre-Roman Iron Age period Ia, and a later phase to period Ib, and possibly period II.

The single farmstead consists of four buildings, of which Building C I was a house, with a fireplace to the west and probably a byre in the east, C II probably a smithy, and the remaining buildings, C III a & b, probably store-houses. The site was fenced-off with a pallisade in which five gateways were found (Fig. 8). A contemporary hollow-way lay west of the farmstead. This forded the River Tim to the north. Here the road was stone-paved. A number of fire-pits were found parallel to the road on either side of the river. Two C-14

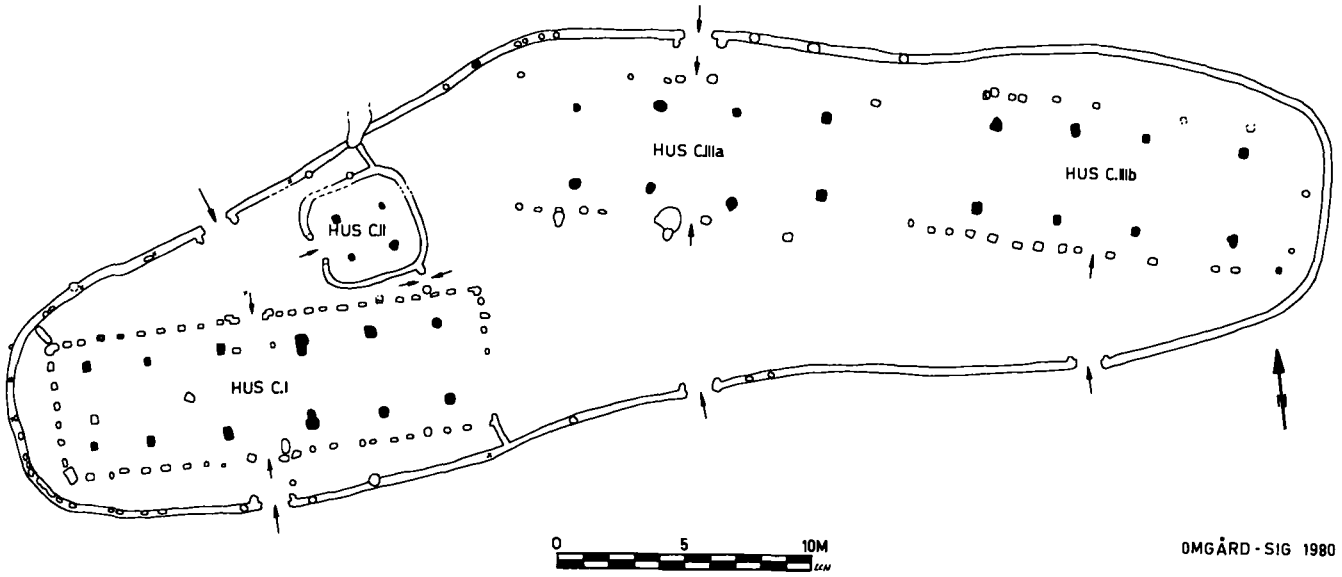


Fig. 8. Plan of the single farmstead of the late pre-Roman Iron Age at Omgård, West Jutland (no. 40).

dates are available for Building C I, 80 ± 70 B.C. (K-3566) and 200 ± 70 B.C. (K-3567). There is one for Building C IIIb, 90 ± 70 B.C. (K-3568). All of these are from oak charcoal. The farmstead had burnt, and much more charcoal was found, all of oak.

The farmstead is dated by pottery to late in the pre-Roman Iron Age period IIIa. A similar farm site was investigated at Omgård in 1972, pottery-dated to late period II and early period IIIa. At both sites a fine-tempered, black shiny ware with broad facetted rims was found. A contemporary village lies about 1,000 m. from the farmsteads.

The investigation took place in 1975–6 and 1979–81.

Nationalmuseet, Prehist. Dept. 1140/75 & 2947/80
Leif Chr. Nielsen

41. ADELVEJ/NUSTRUP, South Jutland
Nustrup s., Gram h., Haderslev a.

Settlement site and cemetery
Settlement site of the Early Roman Iron Age with 6 excavated house-sites plus fencing. 4 inhumations were excavated in the contemporary cemetery.

Haderslev Museum j.no. 1111

42. ANDERSMINDE, South West Jutland
Ribe Domkirke s., Ribe h., Ribe a.

Settlement site
Settlement traces of the early Roman Iron Age were discovered through the excavation of an area of ca. 3,100 sq.m. to the north of the Ribe River, on the edge of the marsh. Traces of roof-bearing posts of two Early Iron Age buildings could be distinguished, but it proved impossible to sort out the remaining muddle of pits and post-holes. Most distinctive amongst the find-material are the substantial pottery remains which date the settlement to the pre-Roman Iron Age period III through to the Early Roman Iron Age, with by far the most material belonging to the latter period. Other finds include a spindle-whorl, and a whetstone. A settlement of the Viking Age/Early Medieval Period has also been found on the site.

Den Antikvariske Samling i Ribe, ASR 19M80C
Steffen Stummann Hansen

43. GALSTED NORD, South Jutland
Agerskov s., Nørre Rangstrup h., Haderslev a.

Settlement site and cemetery
Comprehensive investigation of a settlement site and cemetery of the Early Roman Iron Age. 6 house-sites, refuse-pits, fencing, and two stone-built ovens, were excavated. 6 cremations were found in the cemetery, one containing a gold finger-ring.

Haderslev Museum j.no. 1099

ROMAN IRON AGE

44. RUGTVED, North Jutland
Asdal s., Vennebjerg h., Hjørring a.

Cemetery
A small cemetery with two stone-built graves and one interment. Above one stone-built grave was a compact offering-layer of sherds from about 30 broken pots. These pots are of coarser and larger types than those from the bottom of the grave.

Vendsyssel historiske Museum, Hjørring, 201/1980

Per Lysdahl

45. EGEBJERG, North Jutland
Ugilt s., Vennebjerg h., Hjørring a.

Votive place
The find was made in 1980 on the edge of a meadow. A compact layer of sherds, roughly oval, lay around a large earth-bound stone. The greatest extent of the sherd-layer was 4 m., and its maximum thickness 16 cm. The sherds date the site to the Early Roman Iron Age. Spread amongst them were fist-sized and smaller stones.

Vendsyssel historiske Museum, Hjørring, no. 1980/1–3

Anne-Louise Haack Olsen

46. OMGÅRD, West Jutland
Nørre Omme s., Hind h., Ringkøbing a.

Settlement site of the Late Roman Iron Age
A farm site of the third and fourth centuries A.D., consisting of four buildings surrounded by a fence. Finds of slag indicate the smallest building to have been a smithy.

Nationalmuseet, Prehist. Dept. 1140/75

Leif Chr. Nielsen

47. GALSTED SYD, South Jutland
Agerskov s., Nørre Rangstrup h., Haderslev a.

Settlement site of the Late Roman Iron Age
Large settlement site with house-sites of the Late Roman Iron Age, partially excavated in association with the laying of a gas pipe-line. 5 long-houses, several post-fences, and refuse-pits, have been investigated.

Haderslev Museum, j.no. 1097

ROMAN and EARLY GERMANIC IRON AGE

48. STAVAD, North Jutland
Tise s., Børglum h., Hjørring a.

Settlement site and cemetery
A settlement site of the later Roman Iron Age (ca. 300–400 A.D.), and possibly the beginning of the early Germanic Iron Age, with buildings, drainage-ditches, wells, plough-marks, and much well-preserved faunal material, situated on the edge of a wet area. Ten buildings were excavated in all, some with preserved culture-layers. Two grave-mounds contemporary with the settlement were investigated, one situated above a house-site.

Vendsyssel historiske Museum, Hjørring. – Lit.: *Antikvariske Studier* 5, 1982, pp. 115–137 *Vendsyssel nu og da*, 1980 (Vendsyssel historiske Museum, Hjørring) pp. 34–45

Torben Dehn

49. ØRNEFENNER, North Jutland
Thise s., Børglum h., Hjørring a.

Road and settlement site
In 1981 a section of roadway built of large stones covered with sand, ca. 30 m. long and 2.5 m. broad, was investigated. In prehistoric times the road led over a swampy area with a small stream. Two rows of stepping-stones were found connected to the road. South of here a settlement site of the Late pre-Roman/Early Roman Iron Age was found, with a 50 cm. thick culture-layer. The paved road itself was probably constructed in the Late Roman/Early Germanic Iron Age. At the end of the prehistoric period the area was covered by 3–4 m. of bog peat.

Vendsyssel historiske Museum, Hjørring, no. 1981/51–72. – Lit.: *Vendsyssel nu og da*, 1982 (Vendsyssel historiske Museum, Hjørring) pp. 46–53

Anne-Louise Haack Olsen

50. SEJLFLOD, North Jutland
Sejlflod s., Fleskum h., Ålborg a.

Cemetery and settlement site
The first year's excavations at Sejlflod are described elsewhere in this volume. In 1981 the number of excavated graves reached 225. Some of these are exceptionally richly furnished, e.g. Grave 00 with a Silver-sheet brooch, 2 Haraldsted brooches, an equal-armed brooch (silver-gilt and stamped), a scutiform pendant, a large string of beads, and a wooden vessel. 7 Early Roman Iron Age inhumations have been excavated right beside the Germanic Iron Age graves.

Beside the cemetery, a 14,000 sq.m. area with Early

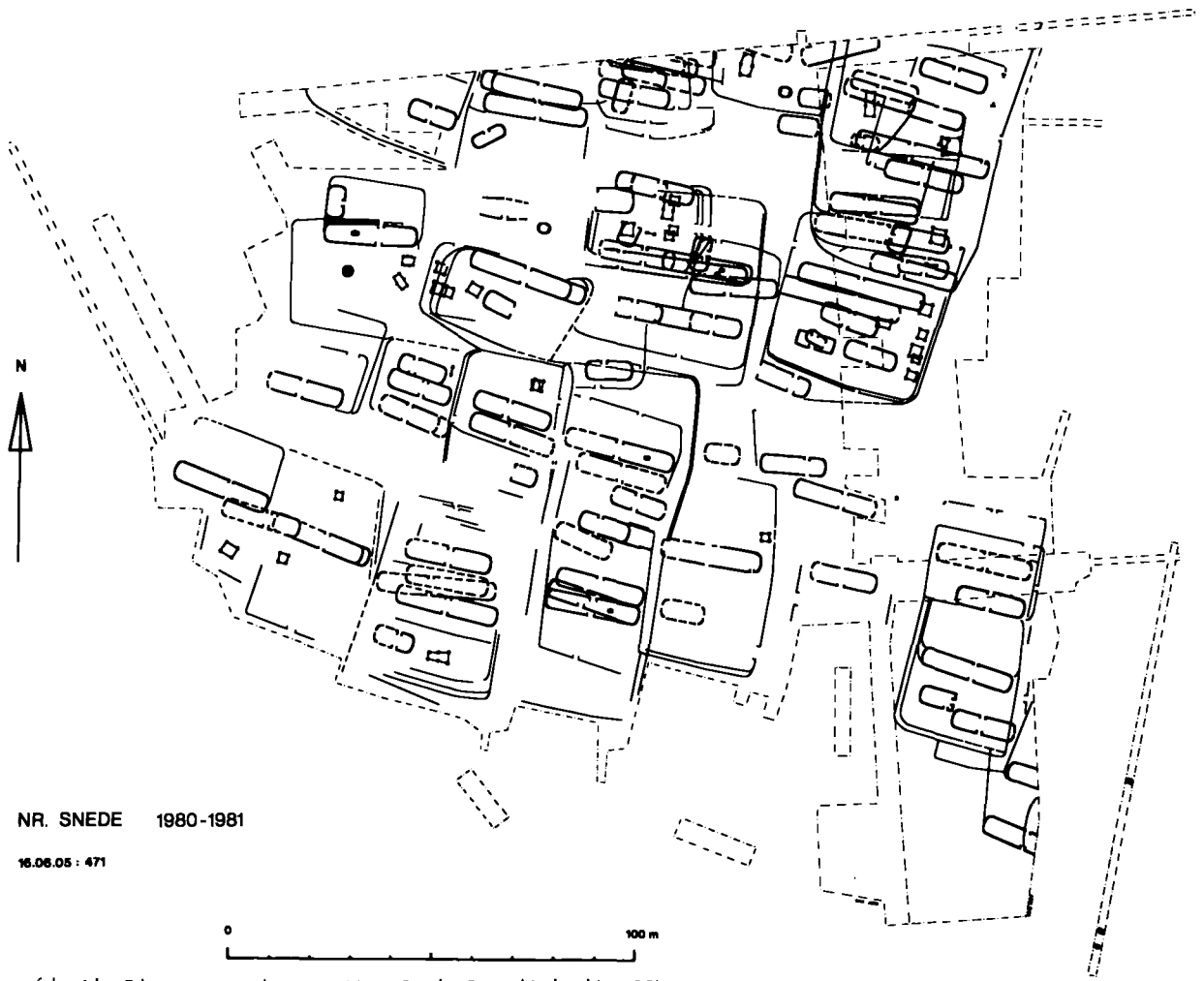


Fig. 9. Plan of the 4th.–5th. century settlement at Nørre Snede, Central Jutland (no. 52).

Germanic Iron Age settlement traces has been investigated. These include 25 long-houses, 2 sunken-dwellings, and rubbish-pits. The buildings are 17–35 m. long, and ca. 5.5 m. broad. Finds from these include potsherds, loom-weights, iron knives, and much faunal material.

Aalborg historiske Museum, j.no. 669 – Lit.: *Antikvariske Studier* 5, 1982, pp. 263–4

Jens N. Nielsen

51. FOULUM, Central Jutland
Tjele s., Sønderlyng h., Viborg a.

Settlement site

In 1980–81 parts of three settlement complexes of the 4th.–5th. centuries A.D. were excavated. One consisted of about 20 buildings, only a few of which cut another. The second complex was only partially investigated, and produced 11 buildings with fences, representing at least 3 building-phases. Only one corner of the third area has been investigated, producing 2 buildings.

Traces of three long fences emanating from the settlement but apparently ending blind have been found. They extended 420, 300, and 200 m. respectively. A cremation cemetery and a few inhumation graves of the Late Roman Iron Age were also investigated.

Viborg Stiftsmuseum 804D

Mette Iversen

52. NØRRE SNEDE, Central Jutland
Nørre Snede s., Vrads h., Skanderborg a.

Settlement site
In 1980–81 an area of 32,000 sq.m. was investigated in association with municipal development in Nørre Snede. Traces of about 120 buildings were found, of various lengths from 2 to 37 m. (fig. 9). There are a number of building phases, and a shift towards the NW with time is inferrable. Remains of about 15 building-groups from the later part of the settlement have so far been uncovered, each consisting of one or more buildings and surrounded by a fence. The northern boundary of this part of the settlement is not yet investigated. As a whole, the Nørre Snede excavations show an agrarian community, similar in many ways to the contemporary settlement at Vorbasse (cf. *Acta Archaeologica* 49, 1978 (1979), pp. 61–111). But the two are not identical: the village structure at Nørre Snede is clearly different and the buildings are generally shorter, especially the byre-sections. Date: ca. 300–500 A.D.

Kulturhistorisk Museum, Vejle. – Lit.: R. Zölitz: Phosphatuntersuchungen zur funktionalen Differenzierung in einem völkerwanderungszeitlichen Langhaus von Nørre Snede, Dänemark. *Archäologisches Korrespondenzblatt* 10, 1980, pp. 273–280

Torben Egeberg Hansen

53. HJEMSTED, South West Jutland
Skærbæk s., Hviding h., Tønder a.

Settlement site and cemetery
A major settlement site of the 4th.–5th. centuries A.D. of which an area of 15–20,000 sq.m. was investigated in 1980. 9 long-houses, 4 pit-dwellings, 5 wells, and fencing have been excavated. At the same site a number of cremations of the Early Roman Iron Age have been found.

Haderslev Museum j.no. 1004

Erik Jørgensen

GERMANIC IRON AGE

54. VIBY, Sjælland
Syv s., Ramsø h., Københavns a.

Gold spiral
Tiny spiral of gold alloyed with silver, with three turns. The diam. is 1.4 cm. and the thread is 0.2 cm. thick. Weight: 7 g. Single find from a field.

Nationalmuseet, Prehist. Dept., no. 3784/81.

E. Munksgaard

Fig. 10. C-bracteate from Tranegilde Strand, East Sjælland (no. 55). 2:1 (L. Larsen photo).

55. TRANEGILDE STRAND, East Sjælland
Ishøj s., Smørum h., København a.

C-bracteate
The bracteate depicts a male head looking left, placed over a four-legged animal (fig. 10). The 'rider' has an elaborate hairstyle which terminates in a plait. In front of the man's face is a bird with a curved beak. The bracteate is of the well-known Zealand type with a sharp bend between the animal's neck and back. Struck with a hitherto unknown die. Found several years ago on a sandy bar near the coast.

Nationalmuseet, Prehist. Dept. no. 1/79. – Lit.: M. Axboe: The Scandinavian Gold Bracteates. *Acta Archaeologica* vol. 52, 1981.

E. Munksgaard

56. SCT. HANS HOSPITAL, Roskilde
Sct. Jørgensbjerg s., Sømme h., Københavns a.

Bronze oval-brooch
The brooch measures 3.7×1.4 cm. (fig. 11). The rounded upper surface is covered with a quadruped animal with round eyes. The back is shown by three lines. On either side of this emanate two almost pear-shaped thighs, both ending in a foot. On the back-side remains of the pin-anchor and catch are visible. Found in a ploughed field.

Nationalmuseet, Prehist. Dept. 4040/81.

T. Ramskou

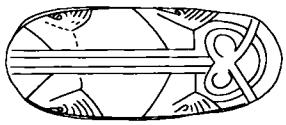


Fig. 11. Bronze oval-brooch from Sct. Hans Hospital, Roskilde (no. 56). 1:1.

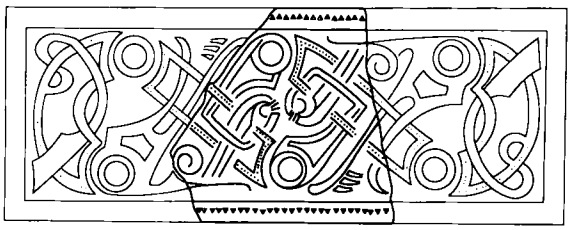


Fig. 12. Fragment of a bronze plate brooch from Kalmergården, West Sjælland, with reconstructed design (no. 57). 1:1.

57. KALMERGÅRDEN, Western Sjælland
St. Fuglede s., Arts h., Holbæk a.

Bronze plate-brooch
Fragment of a rectangular bronze plate-brooch, gilt on the front (fig. 12). Present length ca. 3 cm., breadth 3.1 cm. The ornamented surface is framed by a ridge with punched holes. The ornamentation is a typical style-D animal. The body-lines have punched holes like the framing. The back-side has white-metal plating, in which a pattern of hatched triangles is incised in very fine lines. Possible remains of green and red enamel are visible in the eyes. Date: Late Germanic Iron Age. A single find in a ploughed field.

Nationalmuseet, Prehist. Dept. 1423/75.

T. Ramskou

58. SKÅNINGGÅRDS MARK, Central Sjælland
Haraldsted s., Ringsted s., Sorø a.

Bronze bird-brooch
A rounded brooch measuring 5.8×1.7 cm. Heavily corroded. The lines forming the wings end at the shoulders in a circular bow. The turned-up legs emanate from two dot-in-circles, of which only the right-hand one is fully preserved. Remains of pin-anchor and catch on the back-side. Date: 8th. century A.D. Found in a ploughed field.

Nationalmuseet, Prehist. Dept. 4039/81.

T. Ramskou

59. TAGESGÅRD, Lolland
Stokkemarke s., Lollands Sønder h., Maribo a.

Gold spiral
Spiral of silver-alloyed gold with three turns. The ring is 2.1 cm. in diam., the thread measures 0.2 cm. in diam. Weight 9 g. Found in a field.

Nationalmuseet, Prehist. Dept., no. 3995/81.

E. Munksgaard

60. ALLESE, Fyn
Allese s., Lunde h., Odense a.

Gold spiral
Ring made of a heavily silver-alloyed, facetted gold rod in a little more than two turns. 3.4 cm. in diam., the rod is 0.6 cm. in diam. Weight: 47.5 g. Found about 70 years ago in a field near a peat bog.

Nationalmuseet, Prehist. Dept., no. 4012/81.

E. Munksgaard

61. GUDME, Fyn
Gudme s., Gudme h., Svendborg a.

Bronze bird-brooch
A flat brooch, although the head is lightly rounded. The eyes only lightly marked. The neck is separated from the body by a transverse rib. Two pointed-oval openings mark the wings. Remains of white-metalling are visible on the back, together with several incised lines. Remains of pin-anchor and catch on the back-side. Length: 5.1 cm. Found in a ploughed field. Date: Late Germanic Iron Age.

Nationalmuseet, Prehist. Dept. 2498/78.

T. Ramskou

62. HASSERIS, North Jutland
Hasseris s., Ålborg by

Bronze bird-brooch
The brooch is 5.5 cm. long, cast bronze, and lightly rounded. It has been plated with white-metal. The type corresponds most closely to M. Ørsnes: *Form og Stil*, fig. 56, type D5. The eyes are sharply distinguished, and the edge of the head by the body marked with a large rib. Below this a heavy entrelac pattern framing the upper part of the wings whose upper ends have two circular knobs, a little larger than the eyes. The points of the wings reach some way down into the almost trapezoid 'crow's-tail'. Along this the back-turned legs and outstretched feet are visible. The forming of the wing-section is such that it can certainly be understood as a mask, similar to those known from the Viking Age. Rusty remains of a

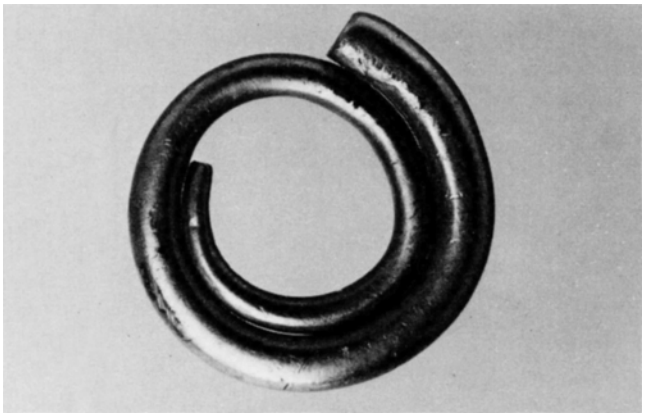


Fig. 13. Gold spiral from Romalt, East Jutland (no. 64). Ca. 1:1 (L. Larsen photo).

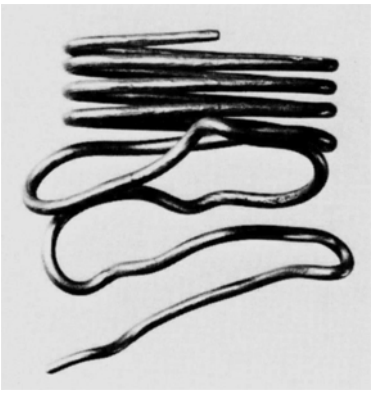


Fig. 14. Gold scabbard mount from Tøjstrup, East Jutland (no. 65). Ca. 2:3 (L. Larsen photo).

pinanchor and catch on the back-side. Date: Late Germanic Iron Age. Found in a ploughed field. Placed in Ålborg historiske Museum.

Nationalmuseet, Prehist. Dept. C 30164.

T. Ramskou

63. SDR. KIRKEGÅRD, North Jutland
Hasseris s., Hornum h., Ålborg a.

Bronze bird-brooch
The fragmentary brooch shows the fore-part of a bird with neck bent forward. The beak is extended. A curving line emanates from this, which continued out over the hind-parts. The breast is marked with inscribed semi-circles. Similar semi-circles mark the front edge of the wing. The hind-parts and tail are broken off, though the end of the foot remains. Size: 3×4.5 cm. Found by a member of the public and sent to Ålborg historiske Museum, where the find is kept.

Nationalmuseet, Prehist. Dept. C 30158.

T. Ramskou

64. ROMALT, East Jutland
Kristrup s., Sønderhald h., Randers a.

Gold spiral
Spiral in about four turns, not as usual shaped like a ring, but as a flat spiral, 5.3 cm in diam. (fig. 13). The outer end of the rod is the thicker of the two. Weight: 138.3 g. Found in a potato-field.

Nationalmuseet, Prehist. Dept., no. 6/79 (deposited at *Kulturhistorisk Museum*, Randers).

E. Munksgaard

65. TØJSTRUP, East Jutland
Vejlby s., Sønderhald h., Randers a.

Gold scabbard mount
Scabbard mount made of a gold rod wound in about seven flat turns. (fig. 14). Four of the seven turns are tight and regular whereas three turns are twisted and the rod is cut over at this end. Weight: 100.7 g.

Six such scabbard mounts are known from Danish finds. Two from the Kaasbygaard hoard (Bornholm) are ornamented with a crescent-shaped stamp which is also seen on contemporary necklets (cf. O. Klindt-Jensen: *Bornholm i Folkevandringstiden*, Copenh. 1957, p. 156ff, fig. 129). The rest are undecorated, the largest, from Højstrup Skov, Stevns (East Sjælland) is built up of no less than ten turns.

The new mount was found in a field after a boundary ditch had been cleared.

Nationalmuseet, Prehist. Dept., no. 9/79. (Deposited at *Kulturhistorisk Museum*, Randers).

E. Munksgaard

66. HØJRIS, West Jutland
Nørre Omme s., Hind h., Ringkøbing a.

Settlement site
A major village of which some parts have been investigated. The building-groups consist of one or more buildings. Each building-group is fenced-off. The fences are built of double posts. On the inner side of each fence is a row of paired, vertical posts. There are gateways in the fences.

The village is dated to the 5th. century from the pottery. It is the last of a long series on this site. Settlement runs back unbroken to the end of the later Bronze Age.

Fig. 15. Plan of the settlement site of the Early Germanic Iron Age at Omgård, West Jutland (no. 67).

The excavation took place in 1981. Earlier investigations took place in the 1960's. The investigations continue.

Nationalmuseet, Prehist. Dept. 3882/81

Leif Chr. Nielsen

67. OMGÅRD, West Jutland
Nørre Omme s., Hind h., Ringkøbing a.

Settlement site

4–5 building-groups have been investigated. The village is larger yet. Two phases are distinguished, one, probably the earlier, with the building-groups fenced-off. The largest building-group of this phase had three buildings. The largest of these had an occupation area in the west, a workshop in the middle, a byre beside this with room for 28 beasts, and finally a room of uncertain function in the east. The other two buildings had no byre. Of two other building-groups of this phase, one has two buildings (Fig. 15), the other, one. Loom-weights were found in the east end of the largest building of the former. Querns, grindstones, iron-slag, loom-weights, and pottery are found in both phases. The loom-weights always occur in the east ends of buildings, and fire-places in the west. The pottery is evenly spread, although only in the west end of buildings with byres.

Two C-14 dates are available from Building C IV of the largest group: one of 210 ± 70 A.D. (K-3569); the other 510 ± 70 A.D. (K-3570). The former is oak charcoal, the latter birch charcoal. The house-site overlay an earlier one of pre-Roman Iron Age period IIIa. This house-site contained much charcoal, entirely oak. K-3569 could therefore be contaminated with the earlier charcoal. This cannot affect K-3570. Building C IV also produced charcoal of hazel, lime, ash, and aspen or willow.

The pottery dates to the middle or later part of the Early Germanic Iron Age. The village is succeeded by one of the 7th. and 8th. centuries which was investigated in 1974–6.

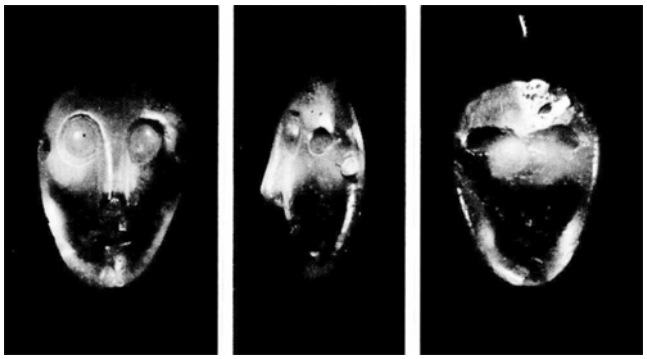


Fig. 16. Amber mask from Eskør Strand, Fyn (no. 68). Height: 1.9 cm (L. Larsen photo).

This village gives way to a single Viking Age farmstead. The investigation took place in 1976, and 1980–81.

Nationalmuseet, Prehist. Dept. 1140/75 & 2947/80

Leif Chr. Nielsen

GERMANIC IRON AGE and VIKING AGE

68. ESKØR STRAND, Fyn
Husby s., Vends h., Odense a.

Small amber mask
A small, delicately carved human head of clear yellow amber, height 1.9 cm. (fig. 16). The eyes are formed by circular cavities so that the points of the eyes lie plane with the face. The nose projects, its point broken off. The mouth is formed by an incised groove in a slightly raised section which forms the lips. The object was handed in by a member of the public to Fyns Stiftsmuseum, Odense, where it is kept. Find-information lacking, the object can only be dated to the Late Iron Age/Viking Age on stylistic grounds.

Nationalmuseet, Prehist. Dept. C 29981.

T. Ramskou

69. HANS BROGESGADE, Århus
Århus, Hasle s., Århus a.

Gold bracelet
Bracelet of gold, about 7 cm. in diam., made of a flat rod which is folded together, so that a rather untidy seam appears on the inner side (fig. 17). The ends are flat and hooked together. Weight: 28.6 g. There are no exact parallels from the Germanic Iron Age, the date may be 10th cent. – Found about 1 m. below the surface in a ditch dug for district heating pipes.

Nationalmuseet, Prehist. Dept., no. 4/80. (Deposited at Forhistorisk Museum, Moesgård).

E. Munksgaard

70. SYSVIG, South Jutland
Nustrup s., Gram h., Haderslev a.

Settlement site
An area of about 8,000 sq.m. was investigated in connection with the laying of a gas pipe-line, and produced traces of 16 long-houses, and 27 pit-dwellings. The settlement continues through the period ca. 400–1000 A.D. The finds include pottery, loom-weights, and querns. An associated find of pottery, a bronze, circular brooch, and an English silver coin of the end of the 9th. century, was discovered in one of the pit-dwellings.

Haderslev Museum, j.no. 1112.

Flemming Rieck
Erik Jørgensen

VIKING AGE

71. GAMMEL LEJRE, Central Sjælland
Allerslev s., Voldborg h., København a.

Settlement site
During excavations below Mysselhøjgård at the south-western edge of Gammel Lejre in 1981, an uninterpretable mass of post-holes together with three pit-dwellings of the second half of the 10th. century were found. The very rich find-material included coarse-tempered pottery of flat-bottomed East Danish vessels, together with Baltic pottery, soap-stone vessels, simple combs, loom-weights, smith's slag, bronze slag, glass beads, and bone-working debris, including red deer antler. An Arab coin was also found.

The pit-dwellings measure between 2×3 m. and 3×4 m., and had roof-bearing posts at the gables.

Roskilde Museum, 175/81.

Frank Birkebæk

72. KALMERGÅRDEN, Western Sjælland
St. Fuglede s., Arts h., Holbæk a.

Bronze plate-brooch
Most of the plate of this brooch is covered by a mask which differs greatly from other Scandinavian Viking Age masks (fig. 18). It has large ears and hair curling up at either side. The eyes are round buttons above rounded cheeks. A double, beaded ribbon winds about the upper part of the face, running behind the crown of the head, round the ears, round the hanging hair, and behind the neck. The drooping moustache is formed of a single, beaded ribbon. Three

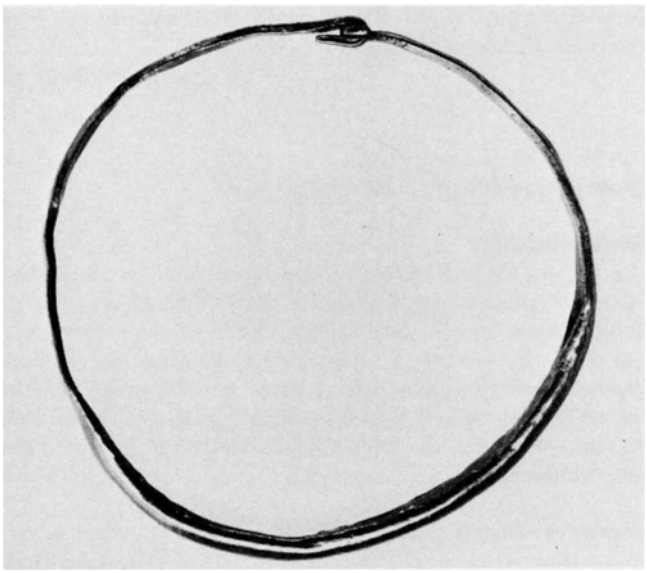


Fig. 17. Gold bracelet from Hans Brogesgade, Århus (no. 69). Diam. 7 cm (L. Larsen photo).

powerful teeth bite on a double, beaded ribbon whose ends are turned up like the hair. The chin is formed of a triangle with convex sides. Five knobs above a roughly anvil-shaped element, both halves of which are decorated with chevrons, are visible above the head. In its centre is a 'kviétra'. Triskeles appear on either ear and on the two areas lying above the upturned ends of the ribbon the mask bites upon. The oblong section below the chin with 5 angled lines may be interpreted as a beard, framed by a plain area. At the bottom a futher convex-sided triangle is visible, below three horizontal lines. A double, beaded ribbon winds over these, and under two angles of the triangle. A pin-anchor on the back-side, with part of the pin, and the catch. In cross-section the brooch is shaped rather like a box with an inturned edge. Length 7 cm., max. width 2.5 cm. Date ca. 900 A.D. Surface-find in a ploughed field.

Nationalmuseet, Prehist. Dept. 2654/79.

T. Ramskou

73. KLINTESKOVEN, West Sjælland
Buerup s., Løve h., Holbæk a.

Small gold ring
The ring (fig. 19) measures 3.4 cm. in diam. It is shaped like the flat, ribbon-like bracelets with stamped ornaments which appear in silver hoards from the 9th cent. AD. The front of the ring is flat, with stamped, T-shaped ornaments. The back is rounded, with a twisted fastening. Two gold bracelets of this type are known, one from Råbylille, Møn (*Aarbøger f. nord. Oldk.* 1942, p. 36, fig. 6), the other from Nabbe, Fyn

Fig. 18. Bronze plate-brooch from Kalmergården, West Sjælland (no. 72). 2:1 (L. Larsen photo).

(*Fynske Minder* 1969, p. 6). The new ring is too small for a bracelet and too large for a finger-ring. It might have served as a hair ornament. – Found in a wood.

Nationalmuseet, Prehist. Dept., no. 8/79.

E. Munksgaard

74. BYBJERG, Orø
Orø s., Tuse h., Holbæk a.

Broad-edged iron axe
The axe has a broad, curved edge with a shoulder about 3 cm. thick. Length 21 cm., the edge 18 cm. from corner to

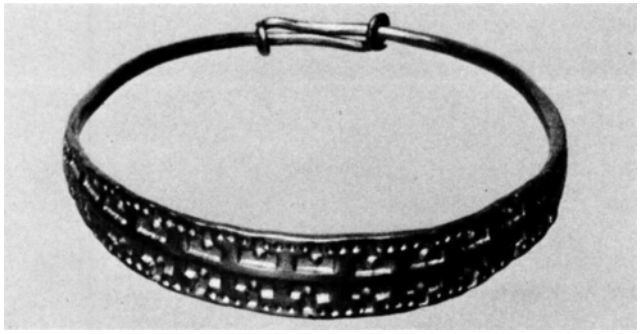


Fig. 19. Gold ring from Klinteskoven, West Sjælland (no. 73). 2:1 (L. Larsen photo).

corner. Date: Late Viking Age (cf. Jan Petersen: *Vikingetidens sværd*, Type M). Found in a ploughed field.

Nationalmuseet, Prehist. Dept. 3698/81.

T. Ramskou

75. BORRE MOSE, Møn
Borre s., Mønbo h., Præstø a.

Openwork bronze brooch
Made in a variant of the Urnes style (fig. 20). "The Great Beast's" head with extended jaws and the characteristic eye are seen uppermost on the left. A pear-shaped thigh section to end the body. Two hind-legs emanate from this, one also with a thigh section and a foot which goes out under the tail (to the right). The other foot goes over the tail and extends into a piece of entrelac. The element that lies over the tail can be interpreted as a tongue emanating from the animal's extended jaws. The snake's weakly distinguished head is visible underneath the pear-shaped thigh, and its twisted body ends by "The Great Beast's" mouth. The body and tail are ridged, with raised cross-bands. The snake and the tongue are beaded. On the back-side are remains of a pin-anchor and catch. Size: 3.8×3.8 cm. Date: 11th. century. Single-find from a ploughed field.

Nationalmuseet, Prehist. Dept. C 30201.

T. Ramskou

76. FREDERIKSDAL, Lolland
Sandby s., Lollands Nørre h., Maribo a.

Silver ring (bracelet?)
Well-preserved ring, the size of a bracelet, upon which hang miniature silver rings (fig. 21). The large ring is made of a rod, the two ends of which are bent together.

The type is well-known from the silver hoards of 10th-century date: Mandemark, Sejrø, Rømersdal, and Gravlev. One stray find, from Kragerupgård, West Zealand, is made

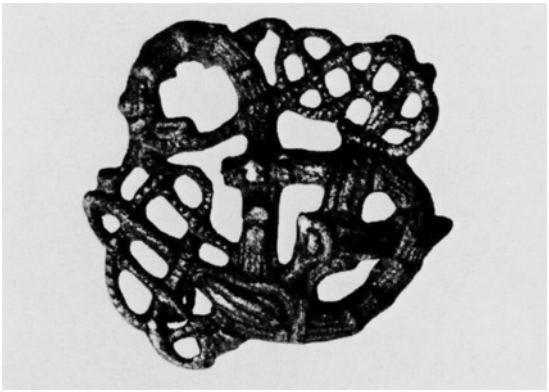


Fig. 20. Bronze brooch from Borre Mose, Møn (no. 75). 3:2 (L. Larsen photo).

of gold. The number of small rings varies from two (Gravlev) to ten (Sejrø). – Found in a ploughed field.

Nationalmuseet, Prehist. Dept., no. 3/80.

E. Munksgaard

77. FRUENS BØGE, Odense
Odense s., h. and a.

Fragment of trefoil fibula
One 'leaf' of a trefoil fibula made of partially gilt silver. The fragment measures 2.9 cm. and is decorated with Carolingian leaf ornament in the form of spirals and tendrils. – Found in a garden.

Nationalmuseet, Prehist. Dept., no. 4124/81.

E. Munksgaard

78. KØSTRUP, Fyn
Brenderup s., Vends h., Odense a.

Inhumation grave with textiles
When a Viking Age inhumation grave was excavated, two gilt-bronze tortoise brooches, style-dated to ca. 950 A.D., containing well-preserved textile fragments, were found. Analysis has shown that the textiles come from a woollen goose-feather eiderdown, and a female costume consisting of two pinafore-dresses – a long, pleated, woollen under-dress, and a short linen over-dress. A fancy-woven, decorative woollen ribbon was sewn to the under-dress.

Fyns Stiftsmuseum, Odense, 3502.

Henriette Wielandt

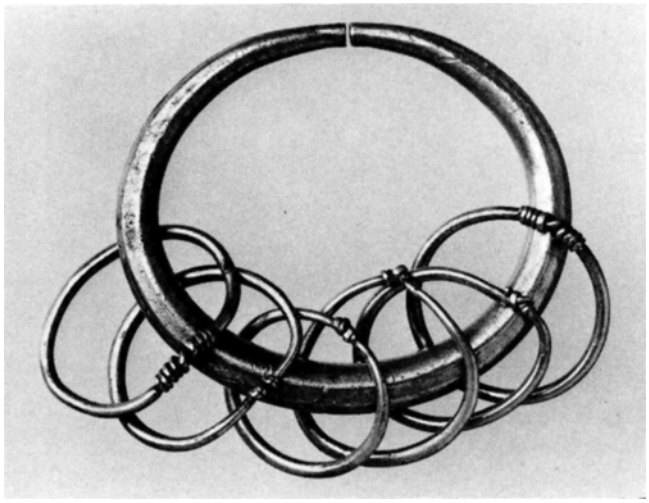


Fig. 21. Silver ring from Frederiksdal, Lolland (no. 76). Ca. 3:4 (L. Larsen photo).

79. FOURFELD BÆK, South West Jutland
Guldager s., Skast h., Ribe a.

Bronze tortoise-brooch
Tortoise-brooch, ca. 8.7 cm. long, and 5 cm. broad, with 6 pear-shaped sections for now lost decorative knobs (fig. 22). Each of these sections is framed by a hachured ridge, and the sections are connected by similar ridges. On the back, two rectangles with concave sides can be seen. On the side-areas, four gripping-beasts with round ears, gripping themselves. A gripping-beast's head is visible over each end-section. On the back-side is the mark of woven material. Date: 9th. century. (Cf. Jan Petersen: *Vikingetidens Smykker*, Berdals Type). Found in sand and peat during the deepening of a water-course in the western part of Esbjerg town.

The brooch may have been made in Ribe, as its form and decoration correspond closely to a number of moulds which were found in the bronze-caster's workshop there. (Personal communication, H. Brinch Madsen.)

Nationalmuseet, Prehist. Dept. C 30154.

Thorkild Ramskou
Ingrid Stoumann

80. ANDERSMINDE, South West Jutland
Ribe Domkirke s., Ribe h., Ribe a.

Settlement site
During the excavation of an area of ca. 3,100 sq.m. on the north side of the Ribe River, on the edge of the marsh, and about 1,000 m. from Ribe town, settlement traces of the Viking/Early Medieval Period have been found. 2 long-houses could be distinguished, one of the type with internal roof-bearing posts, alligned N-S, the other alligned E-W, apparently with roof-bearing posts in the walls. Both houses could only be partially excavated. Besides these, 15 pit-dwellings were found, of which 11 were excavated, 5 wells, and fence-remains. There were no stratigraphic relationships between long-houses, pit-dwellings, and wells.

Fig. 22. Tortoise brooch from Fourfeld Bæk, South West Jutland (no. 79). 1:2 (Esbjerg Museum photo).

The find-material includes pieces of soap-stone vessels, Pingsdorfware, about 100 loom-weights, spindle-whorls, unworked amber, a quern, slag, a fragment of a forge-stone for a bronze-founder, 3 glass beads, a glass rod, pieces of a green, funnel-shaped, glass beaker, whetstones, and a finger-ring of jet (fig. 23). Domestic pottery includes hemispherical and globular vessels, one cup, and one dish.

The settlement is to be dated within the period 800–1200 (a dendrochronological dating of one of the wells indicates the end of the 12th. century.) – A settlement of the early Iron Age was found on the same site.

Den Antikvariske Samling i Ribe, ASR 19M80C.

Steffen Stummann Hansen

81. ULDAL NORD, South Jutland
Skrydstrup s., Gram h., Haderslev a.

Settlement site
8 long-houses and 11 pit-dwellings were excavated on this Viking Age settlement site. In the pit-dwellings, pottery, loom-weights, spindle-whorls, a glass bead, and a well-preserved bronze ornament, were found. In one of the pit-dwellings a number of constructional details could be seen. It transpired that the long walls of the building had been built of horizontal planks, while the gables were stave-built. In one corner of the building was a stone-built oven, and traces of a bench were found by one end. The building is reconstructed to life-size and exhibited in Haderslev Museum's permanent exhibition. It is the excavator's conclusion that the buildings represent a brief phase.

Haderslev Museum, j.no. 1109.

Per Ethelberg

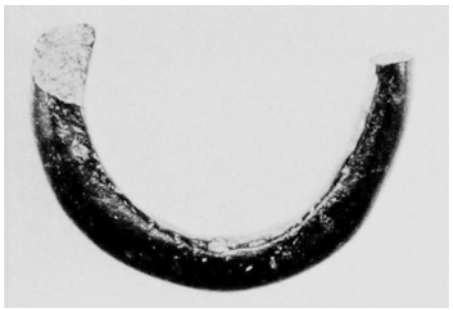


Fig. 23. Fragment of jet ring from Andersminde, South West Jutland (no. 80). External diam. 2.3 cm. Found in a pit-dwelling.

MEDIEVAL

ARCHÆOLOGICAL RESEARCH IN THE HISTORY OF MEDIEVAL TOWNS

In 1977 the Danish Research Council for the Humanities initiated a project called 'The Medieval Town'. The aim was to expand the knowledge of the Danish medieval town through archæological excavations, and as a natural consequence of the means chosen, to improve the understanding of its topography. Of more than 50 Danish medieval boroughs, the following were selected for closer examination: Ribe, Horsens, Århus, Viborg, and Ålborg, in Jutland; Odense and Svendborg on Fyn; Roskilde, Næstved, and Køge on Sjælland. In association with the project the National Museum has also worked on Søborg in northern Sjælland, demoted from the status of borough in post-medieval times.

An axiom of the activities under this project has been to embark only on well-prepared excavations with a specific aim. The first years were therefore spent in collecting all the available information on the medieval topography of the selected towns. The date consists of archæological, geological, cartographical, and written sources. A preliminary examination of this data has been the basis of nearly 50 excavations in the towns in the years 1979–82. The project itself has principally concentrated on small excavations on sites where the preliminary investigations had shown a possibility of solving important problems in the topographical development. Many local initiatives have also been supported in the project's work, and in several cases it has been possible to give a definite goal to suddenly necessary rescue excavations. All the excavations have been carried out in close cooperation with the local museums, who receive all finds and other material from the excavations.

The results gathered will be included in the final reports of the project. These will take the form of monographs on each town, aiming to present a picture of the town from its origin, through the Middle Ages, to the middle of the 16th. century. Some of the excavations are, or shall be, more thoroughly published elsewhere. Only the main results of the work in Ålborg, Viborg, Næstved, and Ribe will be sketched here.

In *Ålborg*, investigations have been made of the northern defences, and of layers from the town's beginning. On the previously known site of the Franciscan Friary the church was localized, under which floor layers from 11th.- and 12th.-century buildings were found. In the same period settlement layers at Strandstien began. Amongst the finds were traces of silver-working, and debris from comb-making.

A long tench from Farvergade to the river that runs through *Næstved* showed culture-layers from the period of ca. 900–1600. The layers from the 10th. and 11th. centuries seem to be those of a settlement based on agrarian production rather than on trade and craft.

An excavation close to the lake that defines the eastern borders of *Viborg* revealed houses from the period of ca. 1000–1350, the oldest being dendrochronologically dated to 1017. The rich culture-layers contained imported objects and traces of craftsmens' work. The desertion of the area must have been caused by a rise of ca. 2 m. in the level of the lake, recognition of which throws new light on the early history of Viborg, both as regards which areas were fit for settlement, and the possibility of dry roads to Asmild on the other side of the lake.

The development of *Ribe* has long been a puzzle. Before the project began, layers of the 8th. century were known north of the river, Ribe Å, in an area that was later a suburb of the medieval town south of the river, archæologically known from the 12th. century. No layers have yet been found from the period of ca. 800–1100, a time at which occupation of the site is documented, but several new excavations now seem to provide an explanation. Investigations north of the Ribe Å seem to indicate that soil has been removed from these parts in the first half of the 13th. century, only leaving the lowest layers of human activity. Perhaps this was done to provide material for the construction of a dam that was to carry a road as well as a mill. To-day this dam is still the main street of the town, offering only limited possibilities for further archæological investigation. The defences have also been investigated, including the royal castle of Riberhus. The results of the new excavations, combined with a re-examination of the old archæological material and written sources, now show us a town that was radically remade south of the river in the first half of the 13th. century, while the areas north of the river, probably where the town began, were first degraded to the status of a suburb, and later totally deserted.

One very important side-product of the work must be mentioned. The initiative of the Research Council for the Humanities has greatly stimulated interest in town archæology. The pattern of this project has been followed as similar work in creating a solid basis for future excavations in several other towns has been taken up.

Ingrid Nielsen

82. GLATTRUP, Central Jutland
Skive s., Hindborg h., Viborg a.

House-site
In association with a local plan for areas in Glattrup, south of Skive, a late medieval house-site, amongst other things, has been investigated. The find was made on slightly raised ground in a meadow area near Glattrup Bæk.

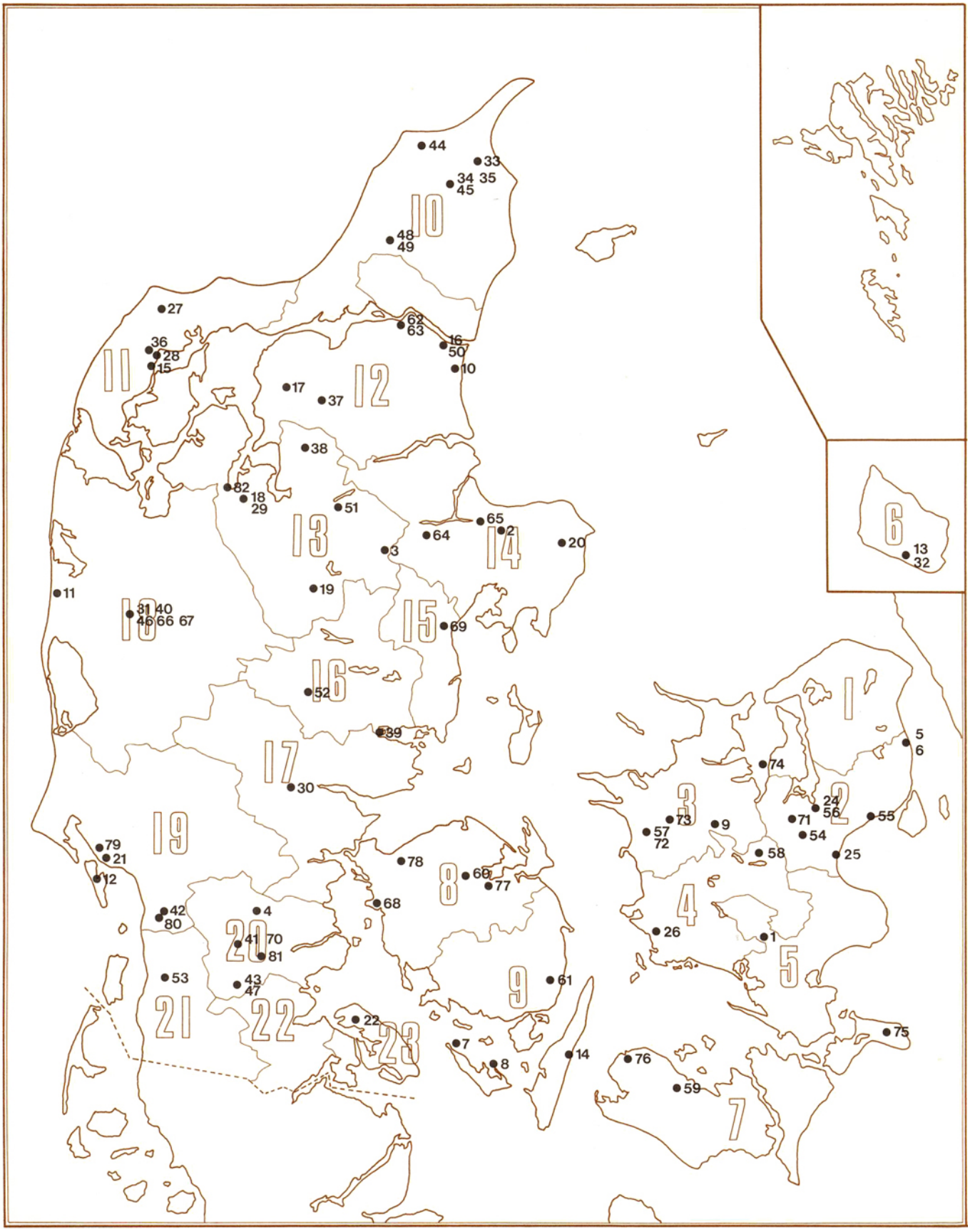
Skive Museum 210A.

John Simonsen
Bi Skaarup

The short reports in this volume were translated or corrected by John Hines.

Map showing the location of sites mentioned in the section 'Recent Excavations and Discoveries'. The counties (Danish *amter*) are numbered in the following way:

1. Frederiksborg
2. København
3. Holbæk
4. Sorø
5. Præstø
6. Bornholm
7. Maribo
8. Odense
9. Svendborg
10. Hjørring
11. Thisted
12. Ålborg
13. Viborg
14. Randers
15. Århus
16. Skanderborg
17. Vejle
18. Ringkøbing
19. Ribe
20. Haderslev
21. Tønder
22. Åbenrå
23. Sønderborg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