Ringsjöholm

A Boreal–Early Atlantic Settlement in Central Scania, Sweden

BY ARNE SJÖSTRÖM

Abstract

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This article is a preliminary presentation of the excavation at the Ringsjöholm site, central Scania. The site has been dated to the Maglemose–Kongemose transition. Several hundred early trapezes have been found and the dating of different types is discussed. A metrical analysis of trapeziform microliths is presented and microliths from Ringsjöholm are compared with trapezes from some Middle and Late Mesolithic sites in Scania.

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Introduction

The excavation at the Ringsjöholm site is a part of my work for a doctoral thesis about the Kongemose Culture and its origin. The main focus in this preliminary presentation of the site is on the description of the broad trapeziform microliths, the stratigraphy and a comparison with similar find materials from other sites in southern Scandinavia.

The Mesolithic sites in Scania and Denmark are both numerous and rich. The chronology in the area has been studied and discussed for nearly a hundred years, but there still remains some uncertainty as regards the dating of the transition and the cultural relations between the Maglemose and the Kongemose Culture. Early in archaeological research the word "culture" became synonymous with a certain body of artefact material and a geographic distribution. When a new site was excavated and the find material was not directly comparable with any previously known pattern, a new culture was created. Scientists of our days more often use the less controversial words "phase" and "period". This is probably not only due to a desire to avoid the discussion about the culture concept but also that the chronology has been more subdivided. In Scandinavian Mesolithic research "culture" is synonymous with material culture (Brinch Petersen 1973, pp. 91 f.; Larsson 1990, p. 266). Even though the use of the word "culture" and the division of the Mesolithic cultures can be criticized, they still serve their purpose in the terminology.

In 1900 the Mullerup site on Zealand was excavated (Sarauw 1903). At the beginning of the century this site and several other Danish sites, such as Sværdborg and Holmgård, were considered to be older then the kitchen middens. They were grouped in a period of their own, called the Maglemose Culture (Broholm 1924).

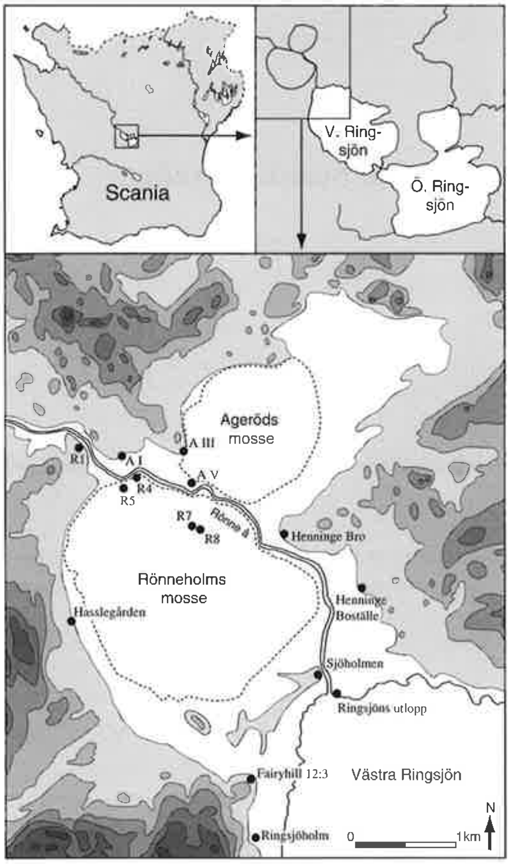


Fig. 1. Relief map showing the location of the Ringsjöholm site and the area to the north. Dotted lines shows the extension of the raised bogs. The white area northwest of Västra Ringsjön shows the extent of the filled-in lake in early postglacial time. Dots mark sites excavated by the Institute of Archaeology/the Historical Museum. A=Ageröd, R=Rönneholm. Elevation: 5 m.

Today the period is divided into six different phases, depending on the shape of the microliths (Brinch Petersen 1973, p. 123).

The name "Kongemose Culture" was used for the first time by Brøndsted (1957) in his book *Danmarks Oldtid*. The Kongemose site was excavated in 1955–1956 and the industry was characterized by a macrolithic blade technology and large rhomboid arrowheads (Jørgensen 1956). Until some years ago the Kongemose Culture was divided into two phases: the Villingebæk phase (early Kongemose, ca. 7500–7000 BP) and the Vedbæk phase (late Kongemose, ca. 7000–6500 BP) (Vang Petersen 1984, p. 10). Another phase, the Blak phase, has recently been placed at the beginning of Kongemose Culture, before Vang Petersen's Villingebæk phase. The radiocarbon dates from Blak II indicate that the Villingebæk phase actually is somewhat younger than earlier indicated (Sørensen 1996, pp. 92 f.). This classification into three phases is mainly based on the shape of broad trapeziform microliths: "traditional" trapezes, rhomboid arrowheads and oblique transverse arrowheads.

Even though a few more Danish sites have recently been dated to the Maglemose–Kongemose transition, the period still remains relatively unknown (Fischer 1994; Grøn & Sørensen 1995). Except for the site complex at Ageröd I (Larsson 1978), Ringsjöholm is the only site in Scania that has been dated to the transition period.

The Ringsjöholm site

Ringsjöholm is located in central Scania on Lake Ringsjön's ancient western shore. Today the shoreline is about 300 m to the east (Fig. 1). The settlement is situated on a roughly 250 m long and 10–20 m broad sandy spit, oriented in a north-south direction, parallel to the old shoreline (Fig. 2). During prehistoric times it had contact with firm land only in the south. Before the 75 m broad area west of the spit was transformed into a fen, there was open water on both sides. The spit ascends at the most 0.8 m from the surrounding terrain, which consists of marshland. During periods of rain and melting snow it is partly surrounded by water. The wet meadow became cultivable after the lowering of Lake Ringsjön by 1.5 m in the years 1882–83. The spit was used for growing potatoes around forty years ago and has been used since then as pasture for cattle.

The western ancient shoreline is clearly marked by a steep slope and behind it rise hills of clayey till. The surrounding area is rich in both

Mesolithic and Neolithic remains. About 250 m east of the spit, 10 m out in the lake, at dept of approximately 0.5 m is a site dated by stray finds to the Ertebølle Culture. The location of that site indicates a major water-lowering during the Early Atlantic chronozone. Two kilometres to the North the Rönneholm and Ageröd raised bogs are located. During early postglacial time the bog area consisted of a 12 square kilometre large lake that was partly connected to Lake Ringsjön. The ancient lake was completely filled up with vegetation at the end of the Early Atlantic chronozone (Nilsson 1935). The area around Lake Ringsjön and the ancient lake is one of the most investigated in Sweden when it comes to Mesolithic sites (e.g. Kurck 1872; Reventlow 1905; Forssander 1930; Althin 1954; Larsson 1978, 1983) (Fig. 1).

The Ringsjöholm site was found by the author in connection with an inventory of the sites around Lake Ringsjön in 1989. In numerous molehills worked flint and bone were found. Of special interest were the finds of trapeziform broad microliths and the somewhat unusual location of the site (in the following text the word trapeze will be used when referring to trapeziform broad microliths). Before the excavation started in 1994, an introductory geophysical investigation was carried out. A resistivity survey showed the relative thickness of the occupation layer and that the spit had been damaged every 15 metres in east-west direction by pipe draining. A magnetic survey revealed several anomalies, and the subsequent excavation showed, among other things, that the two largest were caused by hearths with burned stones (Sträng 1995).

During three seasons 1994–1996, 230 square metres were excavated, under the direction of the author. At the beginning it was expected that it would be possible to study how the limited ha-

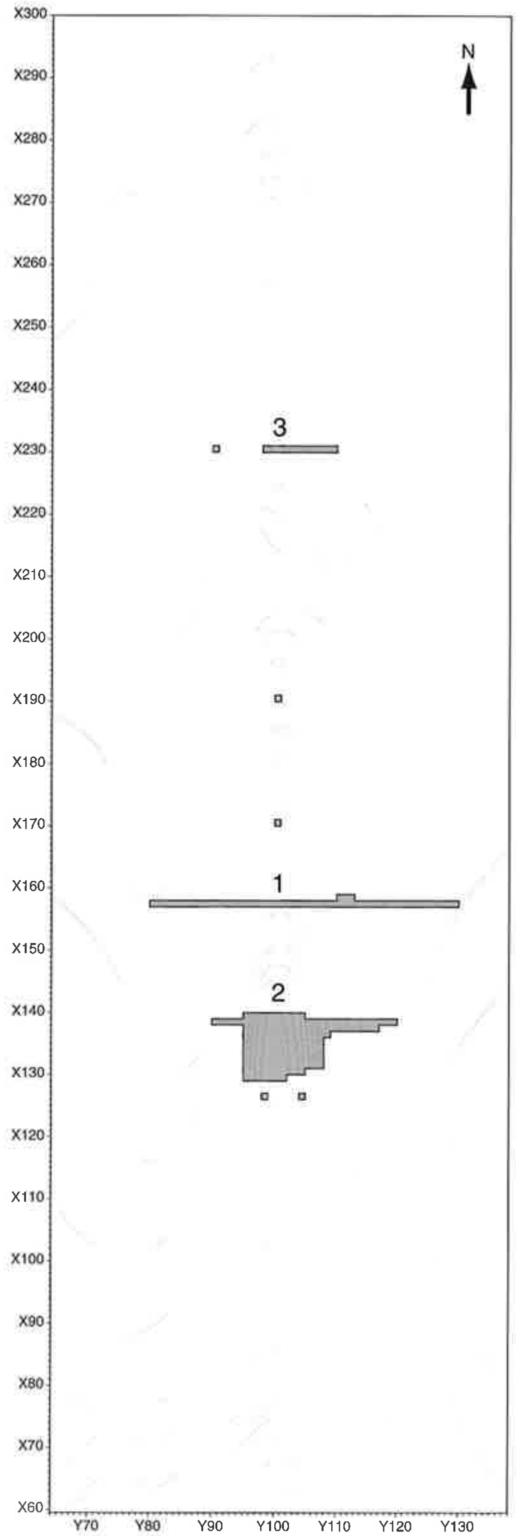


Fig. 2. Relief map and plan of excavated areas at the Ringsjöholm site. The gap in the spit at X210 is caused by levelling-out soil at the boundary between two estates. The disturbance in the southernmost part is an old sand-pit. Gradation in metres. Elevation: 0.05 m.

bitation area on the spit and the two refuse areas at the sides had been used. It soon turned out, however, that the habitation had lasted a relatively long time and that the uppermost layer with the most finds was chronologically mixed. One of the major goals was to find contexts which would give information about the typological-chronological development of trapezes and shed light upon the Maglemose–Kongemose transition.

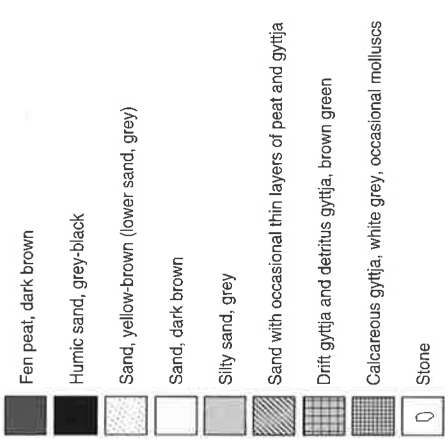
Finds and stratigraphy

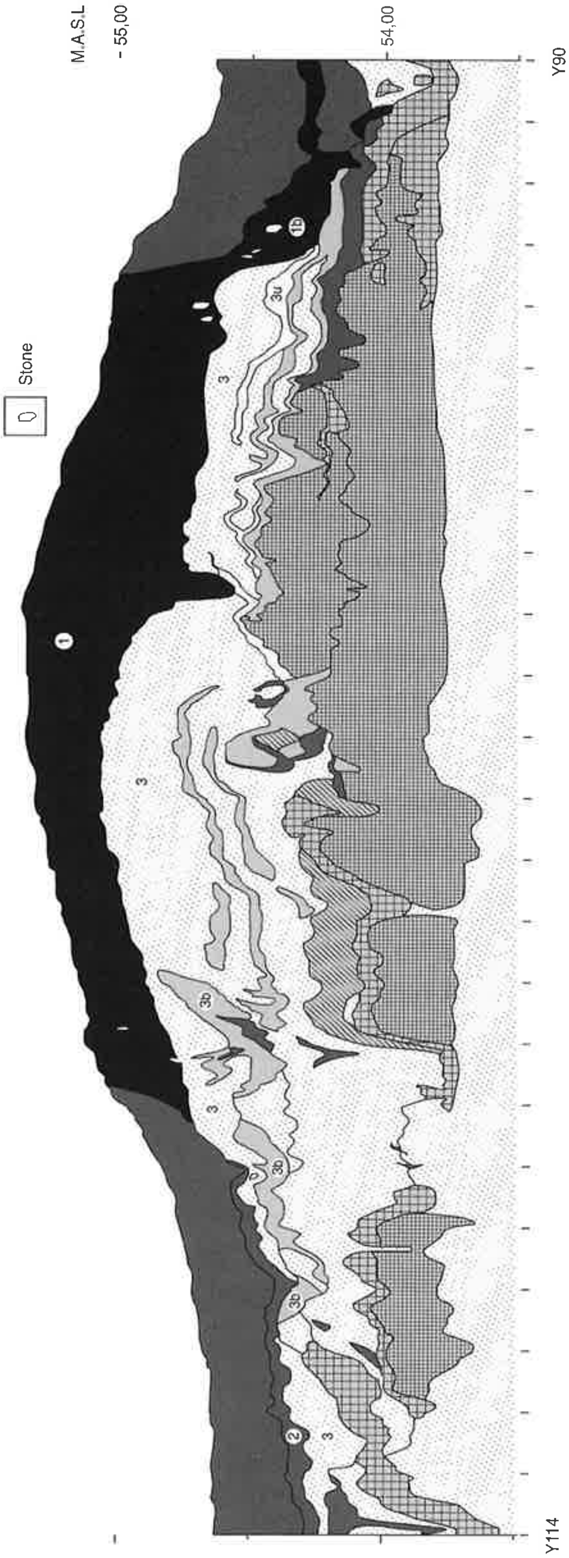
Worked flint and bones can be seen in molehills along the whole spit. To get a good view of the stratigraphy, three trenches were dug in east–west direction across the spit (Fig. 2). Around the two hearths, which were found during the magnetic survey, a larger area was excavated because it was assumed that they could be located in or close to possible hut floors. The total weight of the excavated flint material is about 250 kg, almost exclusively of good quality senon type. Along the western side the weight of the flint can be up to 3–4 kg per square metre.

The uppermost layer (L1) on the top of the spit consists of a roughly 0.2–0.3 m thick layer of sandy topsoil which has been exposed to bioturbation and agriculture activity (Fig. 3). The majority of the flint is located in this layer, and some bones can also be found there. The eastern part of L1 is not as rich in finds but on the other hand the flint pieces are larger. This difference is probably due to the way the habitation area on the spit was utilized for different activities. Differences between the two refuse areas on the western and eastern sides can also be noticed. Both the amount of bones and their size are much larger in the eastern refuse layer. People obviously preferred to throw the waste towards the lakeside rather than into the fen. No close study of the spatial distribution of tools on the spit has yet been carried out. Apart from narrow and broad microliths, blade burins and retouched blades, there are very few stone tools in the find material. The microliths can mainly be dated to the Middle Mesolithic. Apart from one small fragment of a polished Neolithic flint axe, no younger artefacts have been found in L1. There are also some transverse arrowheads which are difficult to date. The broad microliths are dominated by early trapeze forms (Fig. 4) but there are also some trapezes that can be dated to the Middle and Late Kongemose. The different types of trapezes will be dealt with more thoroughly below. Except for microburins for the production of narrow microliths, only a few examples of large microburins have been found. This indicates that the microburin technique was not used for the production of early trapezes at the site. Apart from a small number of lanceolates, the narrow microliths are dominated by narrow scalene triangles and narrow trapezes of Sværdborg type (over 1200, including fragments). In L1 there are also some older microliths which can be dated to the early or the middle part of Maglemose Culture. These consist of two isosceles triangles, of which one is of Prejlerup type and five shouldered points (Fig. 5:1–5). Only four flint axes have been found: three oval symmetrical core axes and one flake axe. Among the datable tools, one almost complete pointed weapon made of danien flint was found in L1. The blade cores are dominated by handle cores but there are also some conical cores. Both blades and micro-blades are of good technical quality.

To the west of the mid-axis of the spit, L1 is very much thicker than on the eastern half. In trench 2 this layer was divided into four layers (L1:1–1:4) of which layer 1:2–1:4 includes the undisturbed part of the occupation layer. In the northern part of trench 2 there was a depression about 5 m broad and 0.2 m deep interpreted as a hut floor which was excavated according to the same layer classification: L1:2–1:4. It measured at least 5 m from south to north and continued into the northern trench wall. The sand in the depression was black and sooty, rich in flints and fragmented bones. Four pits were found in the underlying sterile sand (L3). They were situated

Fig. 3. The western part of section X138, through the sand spit.





along the edge of and inside the depression and were 0.3–0.5 m in diameter and 0.1–0.3 m deep. The filling in the pits was of the same material as the black occupation layer above. A collected sample of small charcoal pieces from one of the pits (feature 8) was radiocarbon-dated to 7750 ± 120 BP (all radiocarbon dates are uncalibrated ^{14}C years before present, Table I). One of the two hearths was situated on the eastern border of the hut floor. Charcoal from the hearth has been dated to 7450 ± 130 BP. The datable flint artefacts in the hut floor consist mainly of narrow scalene triangles of Sværdborg type and handle cores. These and the radiocarbon date in feature 8 indicate that the hut can be dated to the Late Maglemose Culture. A few trapezes of different forms were found in L1:2, in the upper part of the hut floor. In L1:3 in the lower part of the hut floor only three trapezes were found (Fig. 5:7–9), of which one is very similar to a transverse arrowhead. There is of course a probability that the upper part of the filling in the hut floor has been mixed with younger material, but the trapezes can have some stratigraphic significance if this happened in an early stage. Outside the hut floor in L1:3, only one trapeze was found which also is very similar to a transverse arrowhead (Fig. 5:6).

On both sides of the spit there is a roughly 0.4 m thick layer of fen peat with no finds. The find horizon (L1) continues under the fen peat where

Table I. Radiocarbon dates from Ringsjöholm.

Lab. no.	*Material*	*Context*	*^{14}C-Age BP*	*^{14}C-Age bc*
Lu-4023	Bone, elk	Layer 3	7150 ± 90	5200
Lu-4291	Bone, urus	Layer 2	7170 ± 90	5220
Lu-3828	Bone, elk	Layer 2n	7240 ± 90	5290
Lu-4024	Bone, red deer	Layer 2	7280 ± 80	5330
Lu-3829	Bone, red deer	Layer 2b	7310 ± 90	5360
Lu-4022	Bone, large cervid or bovid	Layer 3	7410 ± 90	5460
Lu-3827	Bone, elk	Layer 2	7440 ± 90	5490
LuA-4261	Charcoal	Hearth 2	7450 ± 130	5500
Lu-4290	Bone, urus	Layer 4	7450 ± 90	5500
Lu-3830	Hazelnuts	Layer 2n	7460 ± 90	5510
LuA-4258	Charcoal	Layer 3b	7670 ± 100	5720
LuA-4259	Charcoal	Feature 8	7750 ± 120	5800
LuA-4260	Charcoal	Layer 3b	7910 ± 110	5960

it consists of an undisturbed black peaty sand layer (L1b), rich in flints, fragmented bones, hazelnut shells and charcoal. A few metres from the edge of the spit the sandy find horizon is transformed into a 0.05 m thick refuse layer consisting of black, highly humified fen peat (L2). Under L2, on the west side, there is a layer of brown fen peat that is gradually transformed into drift gyttja situated on a layer of grey sand. There are no artefacts under L2 on this side except at the edge of the spit where they occur down to the grey bottom sand. On the east side the find horizon almost immediately transforms into the black fen peat (L2). Artefacts are also found under L2 in a brown fen peat (L2b). These two layers are rich in large bones, flints, hazelnut shells, pieces of charcoal and burnt sticks. Except for differences in humification and colour it is stratigraphically difficult to differentiate the two layers. Large bones can be situated in both layers, which indicates that these layers really consist of one thick peat layer that was deposited under a relatively short time. Three radiocarbon dates of bones from L2 have given the result: 7170 ± 90, 7280 ± 80 and 7440 ± 90 BP. A dating of a bone from L2b has also given a value within this period, 7310 ± 90 BP. Two small fragments of polished Neolithic flint axes have been found in the upper part of L2. This shows that the peat layer probably has been exposed to weathering for thousands of years. In parts of trench 1, under L2 and L2b, there is a 0.4 m thick drift gyttja (L2n) mainly consisting of hazelnut shells mixed with pieces of bark, sticks and large pieces of charcoal. One radiocarbon date of hazel-nut shells has given the result 7460 ± 90 BP. One bone in the same layer has been dated to 7240 ± 90 BP.

Under the previous organogenic layers there is a sterile layer of sand (L3). Occasional flints and bones have been washed into the upper part of the sand. Two datings of bones from L3 indicate almost the same time interval as the layers above, 7150 ± 90 and 7410 ± 90 BP. In L3 (trench 2) trapezes have been found on the eastern slope and out in the refuse area to the east. Most of the 23 trapezes found in the slope can be characterized as transverse arrowheads and symmetrical trapezes. Some are very similar to the transverse types in L1:3. Two of them have a very distinct form (Fig. 5:10 and 12). They are extremely thin in relation to width and have a concave edges. A further example of this type was found in L3, far out in the refuse area under L2, L2b and L2n (Fig. 5:11). In trench 2, where L1 is situated directly on top of L3 (see profile, Fig. 3), the risk is high that the find material in L3 could be mixed with younger material, even if observable disturbances were excavated separately. The risk

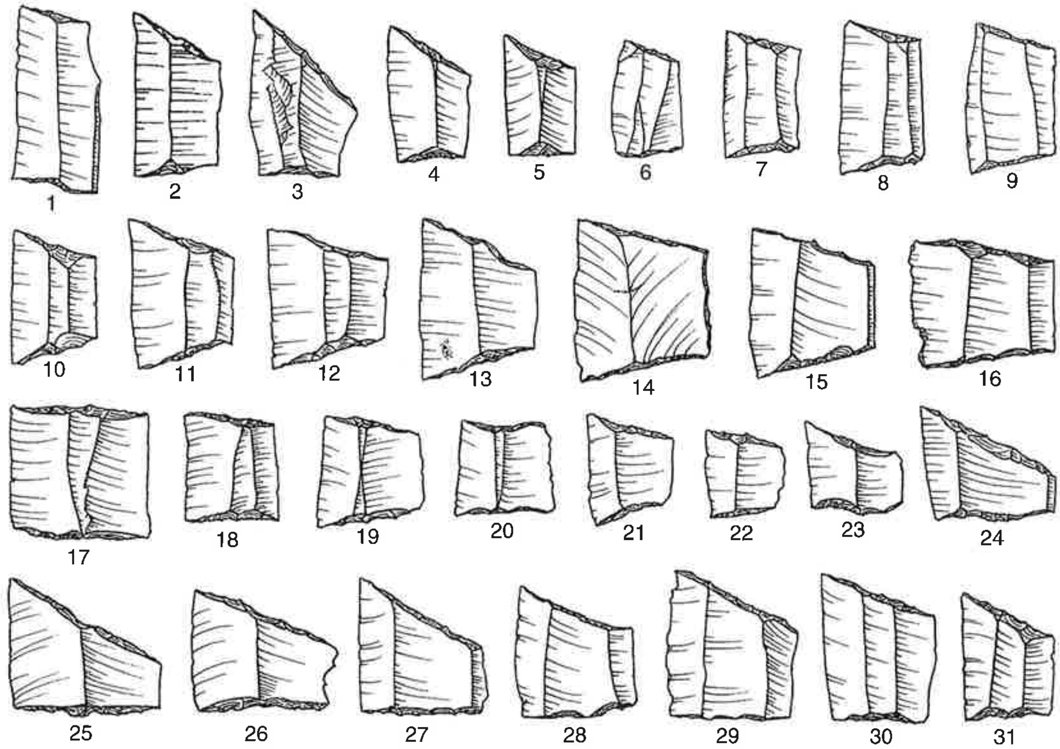


Fig. 4. Selection of trapeziform broad microliths from layer 1. Scale 1:1. Drawn by Christina Truedsson Sjöström.

can be considered minor in the eastern part where L3 is situated under L2. In this part only two trapezes were found in L3 (Fig. 5:13–14). One more trapeze, of the transverse type, was found under the same conditions in trench 3 (Fig. 5:15). Other artefacts found in L3 are narrow microliths in the form of 32 narrow scalene triangles of Sværdborg type (Fig. 5:16), 3 narrow trapezes (Fig. 5:17) and 4 microliths with parallel sides and retouch only on the shortest side (Fig. 5:18–19). The blade cores consists of a few handle cores and long conical cores.

In the eastern part of trench 2, there is also a 0.02–0.2 m thick occupation layer consisting of grey silty sand, rich in charcoal (L3b). Two radiocarbon dates of charcoal from the layer have given the result 7670 ± 100 and 7910 ± 110 BP. In L3b and in the border between L3 and L3b only three complete trapezes were found (Fig. 5:20–22). These are of the long type and the stratigraphically oldest at Ringsjöholm. One fragment and one partly broken trapeze in L3b can possibly have been of the transverse type. The other datable artefacts in the layer consist of 17 narrow scalene triangles of Sværdborg type (Fig. 5:23), a few handle cores and long conical blade cores. The artefacts in L3 and L3b can be dated to the Late Maglemose Culture and the earliest part of the Kongemose Culture.

In the western part of the spit, about 0.2 m down in L3, there are also remains of a 0.05–0.1 m thick occupation layer, mostly destroyed by wave action (L3u). It consists of greyish-brown sooty sand with a few flints and fragmented bones. One radiocarbon date of a piece of charcoal from this layer has given the oldest date at Ringsjöholm, 9020 ± 140 BP. Apart from one core axe in L3u (Fig. 5:24), no datable artefacts have been found in the oldest layers. According to its shape and the radiocarbon dating of the layer, the axe can be dated to the Early Maglemose Culture. It is symmetrical and can be compared to axes from the Flaadet site on Langeland, dated to the same age (Skaarup 1979, p. 104). Under the thick sand (L3) there is a layer of whitish-grey calcareous gyttja under the greater part of the spit. It has a maximum thickness of about 0,7 m and is partly rich in molluscs and reed-roots. In the calcareous gyttja, burnt sticks, charcoal and burnt tar torches were found abundantly in some places. The layer has not yet been dated but ought to be of the same age as the calcareous gyttja in the Rönneholm bog, which was deposited during the Preboreal-Early Boreal chronozone (Nilsson 1935, p. 416)

Other worked lithic material than flint is scarce on the site. Only a minor number of waste and flakes made of diabase and quartz, two oval pecked stone axes and a prefabricate have been found. There also occur some flakes of sandstone remaining from the work with grindstones. A total of 49 complete and fragmentary grindstones of sandstone and slate have been found. Several dispersed fragments in the refuse area can be refitted. Some grindstones are so heavily worked on both sides that the opposite sides have met in the middle. The bones have not yet been systematically examined by osteologists. The total weight, including tools, amounts to approximately 80 kg. The game seems to be almost the same as at other inland sites in Scania and Denmark dated to the middle Mesolithic. In the sandy layer on the west side (L1b) and in the hut floor there are plenty of fragmented and small bones, for example, fish bones. Bone tools and worked bones/teeth (216 examples) have mainly been found in the refuse layers and in the hut floor. Half of these are small burin-worked and polished fragments. Some of the tools have simple ornaments in the form of parallel lines.

Trapeze typology

A trapeze is a geometrical form with four corners and two parallel sides. In the Middle and Late Mesolithic in South Scandinavia the majority of broad microliths are of trapeze form. Some transverse arrowheads have convex and concave sides and retouches. They can be very irregular in shape, especially if they are produced from flakes. It can be difficult to classify them as trapeze forms, but most transverse arrowheads can technically be classified under this definition (Clark 1958, p. 41). It has not yet been clarified how early trapezes were used; the most common interpretation is that they were arrowheads. Because of this interpretation some archaeologists think that certain trapeziform microliths cannot be real trapezes, because they only include arrowheads under this term. According to one definition, a broad trapeziform microlith which has a distance between the two retouched sides exceeding more than twice the width cannot be an arrowhead but a double edged microlith with another function (GEEM 1969, p. 360). Only trapezes of the transverse type have been found mounted, which verifies the use as arrowheads for the late trapeze types. Trapezes were manufactured mainly of blades, by the use of microburin technique or by breaking and retouching afterwards. If one of the corners was retouched more sharply than the other, the trapeze became more or less asymmetrical. No metrical classification system has yet been presented where all types of trapeziform microliths can be classified. This makes the distinction between short trapezes and transverse arrowheads difficult and the classification very subjective. In South Scandinavian microlith typology, transverse arrowheads are intimately linked with the Late Mesolithic and the Neolithic.

The first serious attempt to make a metrical classification of broad trapezes of South Scandinavian material was made by Larsson (1978, pp. 73 ff.) on the findings from Ageröd I:B and Ageröd I:D in central Scania. Several different morphological elements were measured and presented in a triangle diagram (Larsson 1978, p. 74). Larsson was able to distinguish five different types among the 90 trapezes. His typology was based on a modification of trapeze definitions

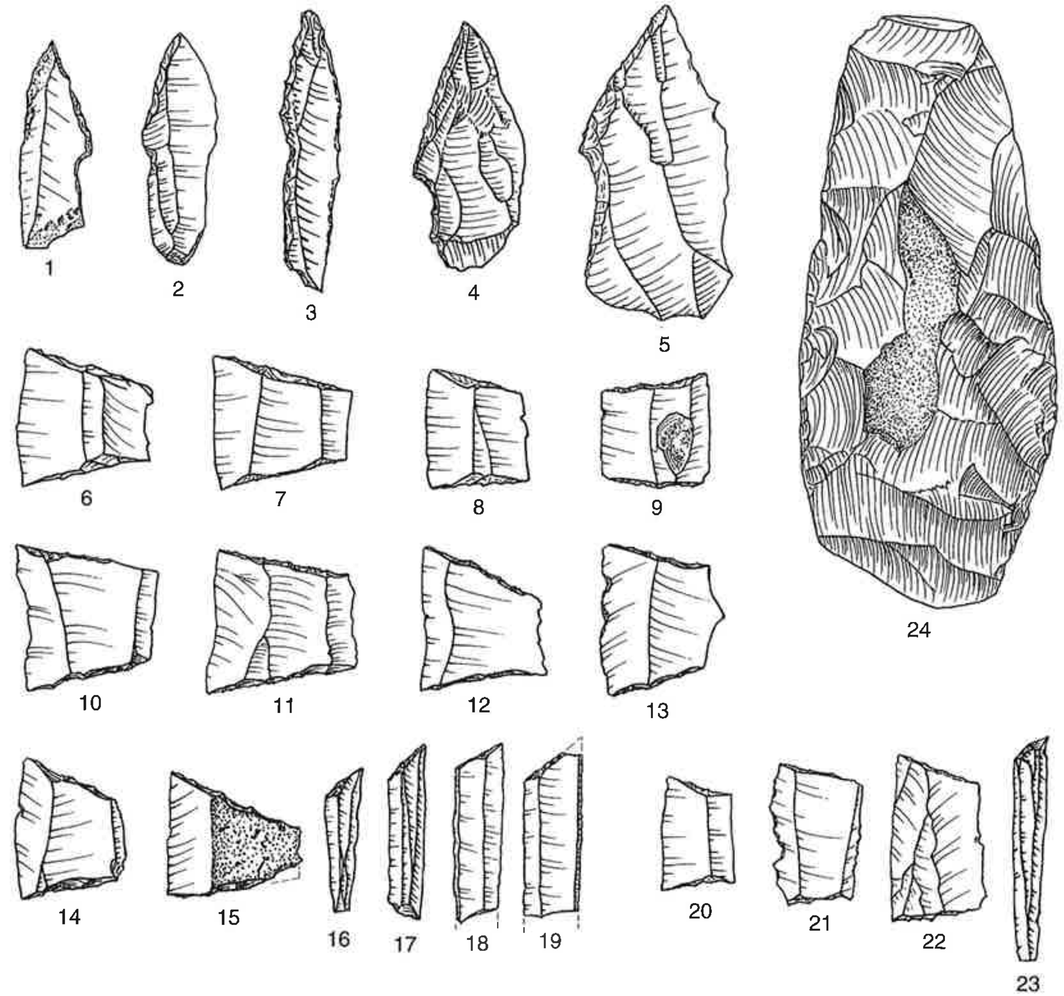


Fig. 5. Selection of flint tools from different layers at Ringsjöholm: 1–5 (L1), 6–9 (L1:3) 10–19 (L3), 20–23 (L3b) and 24 (L3u). Scale 1:1. Drawn by Christina Truedsson Sjöström.

worked out by "Le Groupe d'Etude de l'Epipaléolithique-Mésolithique" (GEEM 1969, pp. 360 ff.). Larsson's trapeze type 1–3 has a base angle of less than 90 degrees (for definitions of morphological elements, see the illustration in Fig. 6). Type 4 has a base angle of about 90 degrees and type 4 more than 90 degrees. It was not possible, however, to make any typological-chronological division of the trapezes. Vang Petersen (1979, pp. 8 ff.) has metrically defined different trapeze forms, dated to the Kongemose and Ertebølle Culture. His investigation included 21 sites in north-east Zealand and Scania. He distinguished 31 different types consisting of rhomboid arrowheads, oblique transverse arrowheads and straight transverse arrowheads. From the find material at ten of the sites he was able to distinguish five different phases: Villingebæk, Vedbæk, Trylleskov, Stationsvej and Ålekistebro (Vang Petersen 1984, p. 11). Sørensen recognizes three different types among his 34 trapezes from Blak II. His definition of type 1 resembles Larsson's type 1–3, his type 2 resembles Larsson's type 4, and his type 3 Larsson's type 5. The three

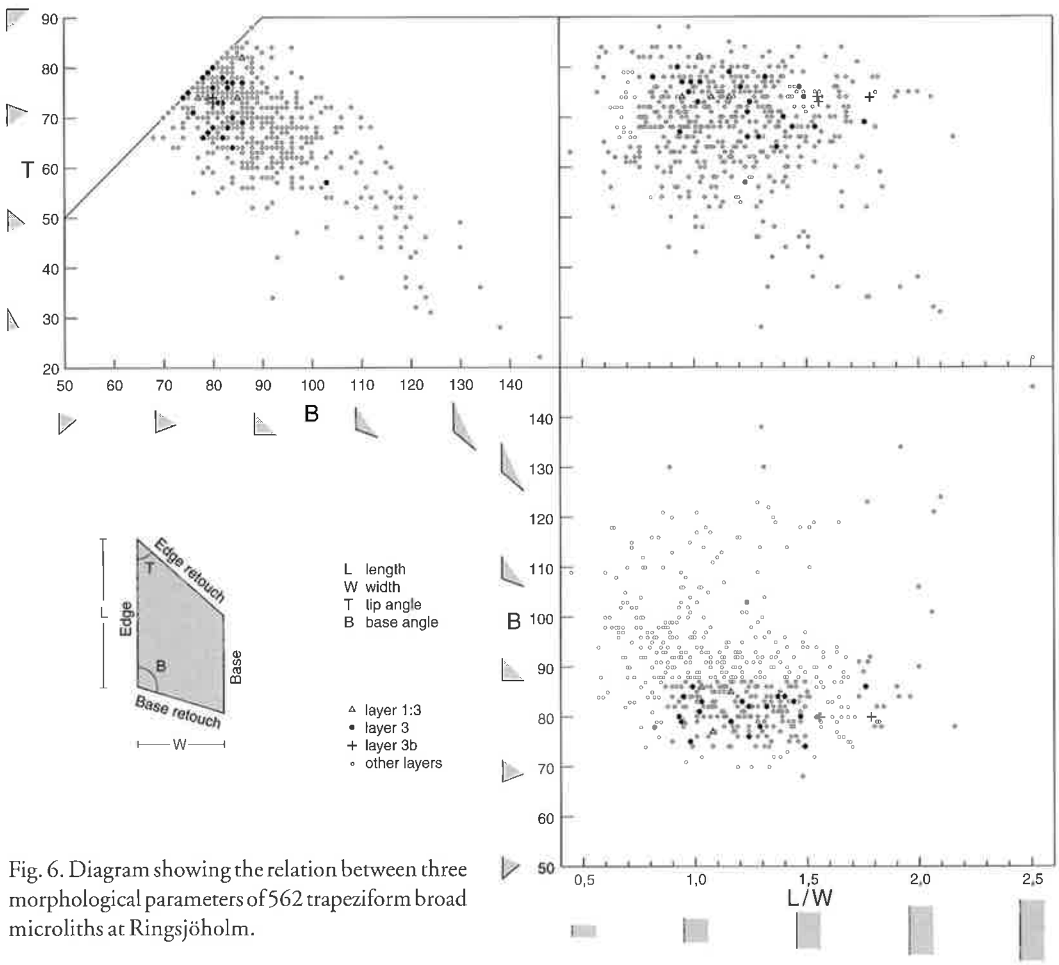


Fig. 6. Diagram showing the relation between three morphological parameters of 562 trapeziform broad microliths at Ringsjöholm.

trapeze types were considered to be of the same age and used simultaneously, perhaps as a composite arrow (Sørensen 1996, pp. 56 f.).

At Ringsjöholm more than 800 fragmentary and whole trapeziform microliths have been found, including the prefabricates. The whole ones and those with only minor damage have been analysed in a morphological study. The choice of measurable morphological elements and the presentation differs somewhat from Larsson's and Vang Petersen's methods. Four different morphological elements have been measured: length (the longest unretouched edge, L), width (the mean distance between the unretouched edges = blade width, W), tip angle (the angle between the longest edge and the edge retouch, T) and base angle (the angle between the longest edge and the base retouch, B) (Fig. 6). The value of the edge length (L) is then divided by the value of the width (W). The sum forms a length/width index (L/W). The sharpest edge angle has been determined as the tip angle regardless of whether the microlith is right- or left-angled or whether it was used as an arrowhead. If the two edges are not quite parallel and the sides not straight the form has been simplified to a trapeze shape based on the corners.

The values T, B and L/W have then been put in relation to each other in three diagrams, which can be seen as an unfolded three-dimensional

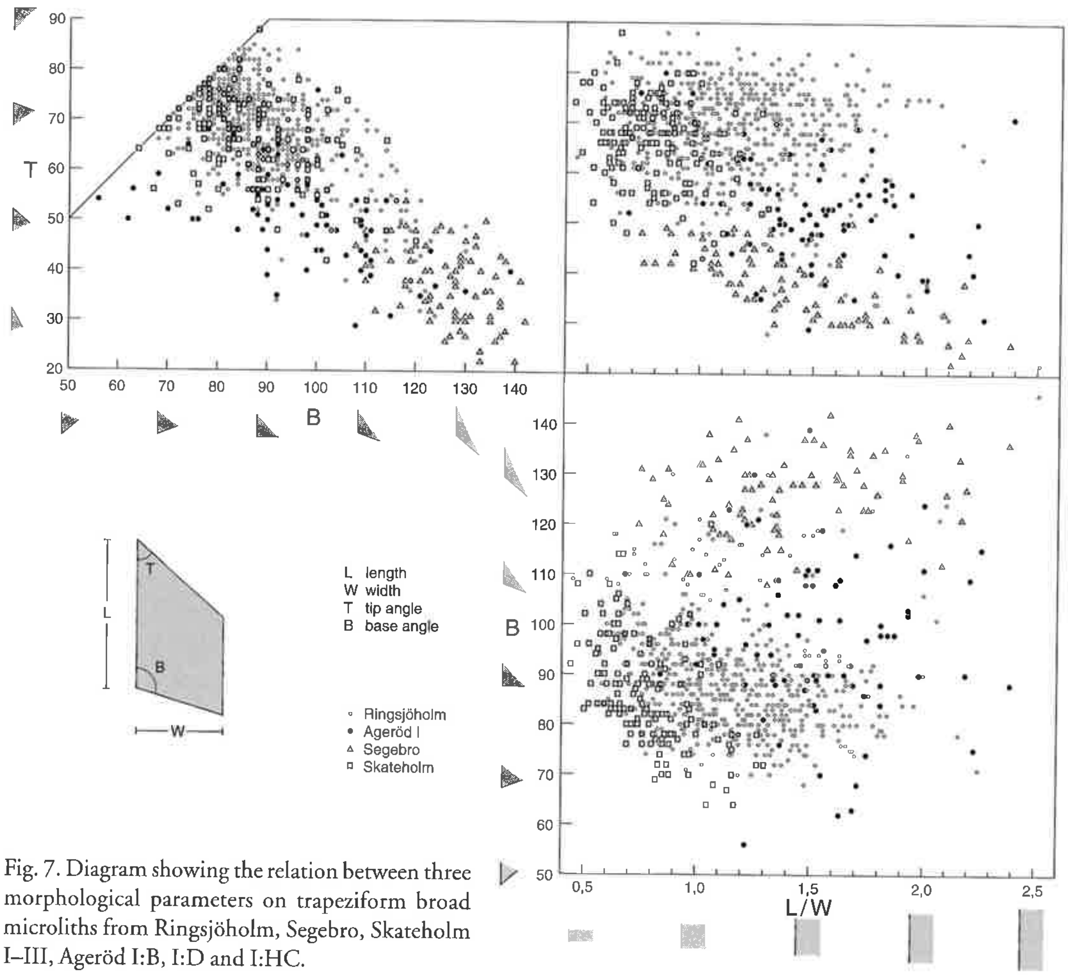


Fig. 7. Diagram showing the relation between three morphological parameters on trapeziform broad microliths from Ringsjöholm, Segebro, Skateholm I–III, Ageröd I:B, I:D and I:HC.

diagram (Fig. 6). The optimal way to look at these data is in a three-dimensional computer program where the diagram can be rotated. In the diagrams it is not possible to see differences in size. Only the morphology can be studied. The choice of measured and presented parameters makes it easy to read and interpret the diagrams since the values show the actual form.

The majority of the 562 measured trapezes in the diagram are left-angled (94%), and the right-angled ones, with few exceptions, have a base angle less than 90 degrees. The difference between the tip angle and the base angle for these is in most cases so small that they probably were not deliberately made right-angled. Only one rhombic arrowhead of Villingebæk type is right-angled. Concave base retouch is found on ten trapezes of which five also have concave edge retouch. Nine trapezes also have retouch completely or partially along the base (Fig. 4:14). Within the main cluster in the diagram no distinct groupings can be discerned. Both visually and with the help of a three-dimensional "nearest neighbour analysis", two groups outside the main cluster can be observed. These are 21 rhombic arrowheads of Villingebæk type, 34 narrow rhombic and oblique transverse arrowheads of Vedbæk type. Besides these two groups (defined by Vang Petersen 1979) there are several different trapezoid forms within the main cluster. Even if there are some more or less divergent forms on the periphery, these are so few that they cannot be considered to form clear type groupings. In spite of the large number of trapezes found at Ringsjöholm it is difficult to divide them into natural distinct typological groups. The Villingebæk and Vedbæk types are easy to distinguish in the material but the rest have so far only been divided into three tentative groups of short, broad and long trapezes. Each of these groups can also be divided into Sørensen's types 1–3. Type 1 can also be divided into symmetrical and asymmetrical forms.

To obtain a general view of the different forms in the main cluster one can make a subjective division based on the L/W index. The short trapezes, similar to transverse arrowheads (L/W=< 1) (e.g. Fig. 4:16 and 4:23–26) number 160 pieces. Most of these are difficult to date but some can of course be of younger age. The largest group (L/W=1–< 1.5) consists of 283 broad trapezes with a base angle around 90 degrees (e.g. Fig. 4:27–31) and less. Some of them could be classified as transverse symmetrical types (e.g. Fig. 4:12–15). In the third group (L/W=≥1.5) there are 64 symmetrical and asymmetrical long trapezes with a base angle around 90 degrees and less (e.g. Fig. 4:1–11). In the three groups the asymmetrical form predominate.

As mentioned earlier, no typological-chronological division of early trapezes has yet been made at any site in Scandinavia. At Ringsjöholm there are indications that the long trapezes of type 1 found in L3b are the earliest type. This type is then followed by broad trapezes of type 1, which are more or less symmetrical, some of them similar to transverse arrowheads. In L1:3 and L3 all the 31 trapezes, except one, have a base angle of 87 degrees or less (Fig. 6).

The presented method of measuring and presenting trapezes should only be seen as a technique to distinguish the coarse morphology. Other morphological aspects such as size, thickness, retouches and so on must also be considered when making a more exact typology.

Comparison with other sites

Until recently early trapezes were almost only found on mixed sites in Jutland (Mathiassen 1937). The first time a context with early trapezes were radiocarbon-dated in Scandinavia, was at Ageröd I:B and Ageröd I:D. Larsson (1978) referred the trapezes from the two sites to the Late Maglemose Culture. Even though most sites with early trapezes in Jutland are mixed, there were indications that the trapezes first appeared in the Late Maglemose in South Scandinavia (Andersen 1983, p. 261).

The radiocarbon dates from Blak II and Musholm Bay in Denmark and Ringsjöholm challenge the validity of the radiocarbon dates from the Ageröd I sites as regards dating the early trapezes (Fig. 8). The submarine settlement of Musholm Bay, dated to ca. 7490 ± 115 – 7320 ± 70 BP, is situated in the Great Belt at a depth of 8–9 m. Only 3 trapezes, of type 1 and 2, have been found at the site and according to Fisher (1989; 1994) the find material must be referred to the Kongemose Culture. At the settlement Blak II, situated at a depth of 4 m in the Roskilde Fjord, 34 complete trapezes of types 1–3 were found. Five radiocarbon dates, 7460 ± 115 – 7160 ± 120 BP, verify the dating of the trapezes to the Early Kongemose (Sørensen 1996). All the trapeze forms found at Musholm Bay and Blak II are present at Ringsjöholm.

There are also two Danish sites which can possibly be considered to be of Early Kongemose age according to the shape of the trapeze finds. At the Aggemose site on Langeland the 10 trapezes are all of types 2 and 3 (Grøn & Sørensen 1995, p. 8). Some of them are very similar to oblique transverse arrowheads. The location of the site on a 50 m long and 10–15 m broad sandy spit in a former lake is an interesting parallel to Ringsjöholm. At Orelund IX on Zealand 5 trapezes of type 1–3 were found together with triangle microliths, lanceolates and a narrow trapeze. Two of them can be classified as oblique transverse arrowheads (Andersen 1985, p. 37).

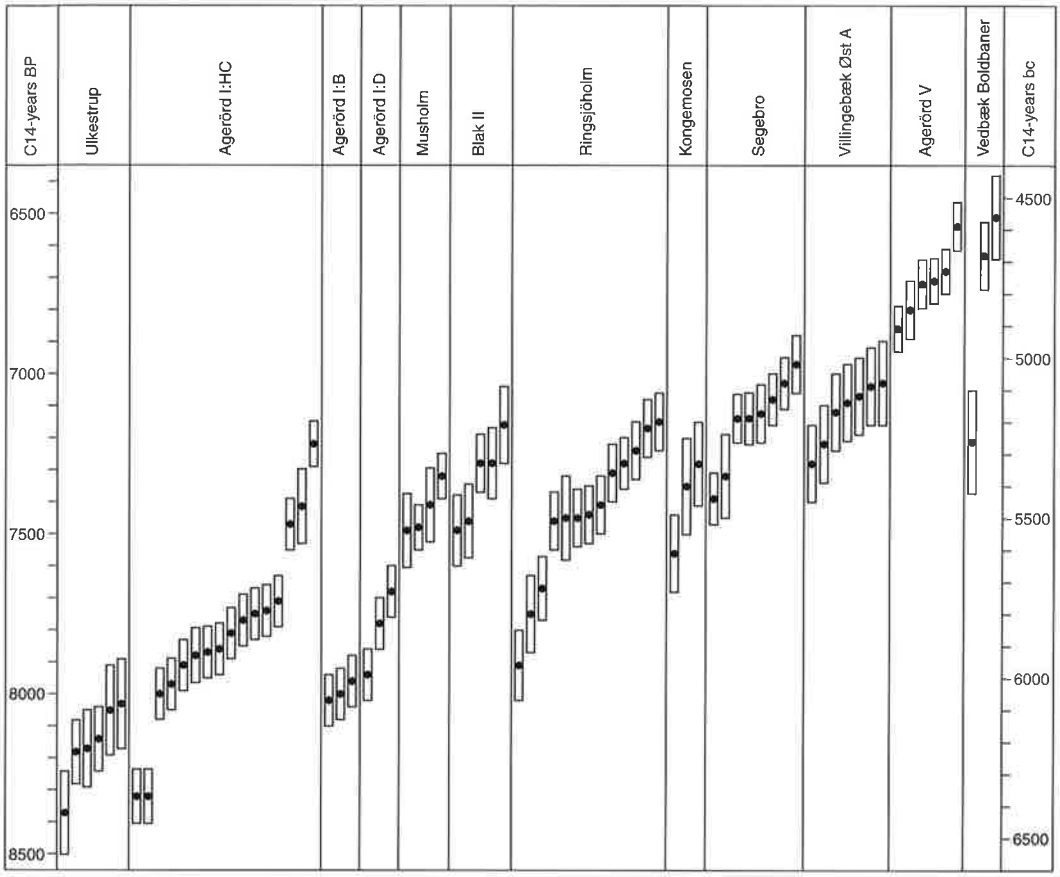


Fig. 8. Uncalibrated radiocarbon dates from Middle Mesolithic sites in Scania and Denmark (from Andersen *et al.* 1982; Fischer 1994; Larsson 1978; 1982; 1983; Sørensen 1996; Tauber 1971).

The radiocarbon datings of the layers containing trapezes at Ageröd I:B and Ageröd I:D are within the interval 8020 ± 80 – 7680 ± 80 BP. The dominating types of trapezes (totally 81) at Ageröd I:B are type 2 (59) and type 3 (15). At Ageröd I:D 9 trapezes of type 2 have been found. Only 8 trapezes have been found at Ageröd I:HC, 3 of type 2 and 4 of type 3. The upper layer (UP) which contains trapezes at this site, has been dated to 7810 ± 80 – 7470 ± 80 BP (Larsson 1978). A comparison of these datings and types of trapezes with the results from Ringsjöholm shows that the ones from Ageröd I mainly consist of broad and long trapezes of type 2–3 and that they are much older than the oldest types at Ringsjöholm. For a more thorough comparison between the two locations 86 measurable trapezes from Ageröd I:B, I:D and I:HC have been examined and measured according to the method described above. According to the diagram (Fig. 7), they differ morphologically from each other at the two locations. Many trapezes at Ageröd I are larger and have much sharper tip angles and more blunt base angles. Yet some forms are alike at both sites. For comparison with younger trapeze material, dated to Villingebæk phase, 81 rhombic and oblique transverse arrowheads from Segebro (Larsson 1982) have also been included in the diagram. Morphologically several of the trapezes from Ageröd I are similar to the ones from Segebro. Some of the type 3 trapezes at Ageröd I:B could in my opinion be classified as rhombic arrowheads of Villingebæk type (e.g. Larsson 1978, p. 76, Fig. 41:10–13). Some of the type 3 trapezes from Ageröd I:HC can also be classified as rhombic trapezes of Villingebæk type (e.g. Althin 1954, p. 239, plate 17:18–19). Even if some of the trapeze types at Ageröd I are early, the question remains if they are of the same age as the ^{14}C datings from the same layers. According to the morphological comparison (Fig. 6 and 7) the trapezes at Ageröd I and the earliest ones from L1:3, L3 and L3b at Ringsjöholm form two different morphological groups. Except for one, no broad or long trapeze of type 2 and 3 has been found in the stratigraphically oldest layers at Ringsjöholm. On the other hand, this type is found in L1 at Ringsjöholm. It is not impossible that the layers with trapezes at Ageröd I contain some Kongemose artefacts, when one considers that they also contain some transverse arrowheads and Neolithic material.

One of the problems with the trapeze material from Ringsjöholm and other Early Kongemose sites, especially on mixed sites, is the element of transverse arrowheads. Until broad symmetrical trapezes have been found hafted it is impossible to draw a line between these and transverse arrowheads from a functional point of view. The use of the word "transverse" must refer to the position of the edge in relation to the arrow, rather than the age, since early short trapezes also could have been used as transverse arrowheads. For a comparison with trapezes of transverse type, dated to the Ertebølle, 146 arrowheads from Skateholm I, II and III have been examined and measured (Larsson 1988). The types can be found, according to the Vang Petersen (1979) system, in the stages Trylleskov, Stationsvej and Ålekistebro. Most of them have very similar tip and base angles to the trapezes at Ringsjöholm. Differences can be noticed in the L/W index (Fig. 7) and in other morphological characteristics. The majority of the arrowheads from Skateholm are made of flakes and have one or two concave retouched sides. I find it most probable that some of the short and broad symmetrical trapezes of the transverse type at Ringsjöholm (e.g. Fig. 5:6–7 and 5:10–15) can be dated to the Early Kongemose and were used as transverse arrowheads.

The function and hafting of some of the various forms of broad and long trapezes are more difficult to understand. Unfortunately, no resin has been found on the material from Ringsjöholm, but the numerous broken trapezes, damage and microwear are going to be important factors when interpreting the function. In all layers at Ringsjöholm where trapezes are found there are also narrow microliths of triangular and/or trapezoid form. In the mixed layers they could of course be older than the trapezes but they also appear on other sites with early trapezes. This fact implies that both narrow and broad microliths were in use simultaneously, perhaps as a composite arrow. Since we do not know how the narrow microliths were used, it is hard to speculate on the matter.

Whether the broad trapeziform microliths first appear in the Late Maglemose or the Early Kongemose is a question of terminology. The division of the two cultures is today mainly based on the occurrence of trapezes. The latest definitions of the technological characteristics of the Kongemose Culture are made by Fisher (1994, p. 5): "a blade industry dominated by large elegant blades produced by soft hammer technique, large core axes of rhomboidal cross section, and broad arrow-points of trapeze shape" and by Sørensen (1996, p. 51): "core axes, broad trapeze shaped arrowheads ... blades with straight or convex end retouch and angle burins of blades". No other changes than the introduction of broad trapezes can so far be recorded with certainty in technology during the transition period, since the known sites are so few. There are of course great differences if one compares extremes, hundreds of years apart, such as the Late Maglemose with the developed Kongemose during the Villingebæk phase. The main question is whether the cultural development was gradual or if other changes took place in technology and non-material culture when the idea of broad trapezes spread to South Scandinavia. Even if a few sites dated to the Early Kongemose Culture have been found recently, there still remains a rather long period between the latest dated Maglemose site and the earliest Kongemose site. So far very few sites from the latest periods of the Maglemose Culture have been radiocarbon-dated. We still do not know when the introduction of broad trapeziform microliths took place in South Scandinavia and what was the shape of the earliest types.

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References

Althin, C.-A. 1954. *The Chronology of the Stone Age Settlement of Scania, Sweden.* Acta Archaeologica Lundensia Series in 4° 1.

Andersen, K. *et al.* 1982. Maglemose hytterne ved Ulkestrup Lyng. *Nordiske Fortidsminder* 7. København.

Andersen, K. 1985. To Åmosepladser med håndtags-blokke. *Aarbøger for Nordisk Oldkyndighed og Historie* 1984.

Andersen, S. H. 1983. The Introduction of Trapezes in the South Scandinavian Mesolithic: A Brief Survey. In Kozlowski, J. K. & Kozlowski, S. K. (eds.), *Les changements, leurs mécanismes, leurs causes dans la culture du 7e au 6e millénaire av. J-C. en Europe.* Archaeologia Interregionalis.

Brinch Petersen, E. 1973. A Survey of the Late Palaeolithic and the Mesolithic of Denmark. In Kozlowski, S. K. (ed.), *The Mesolithic in Europe*, Warsaw.

Broholm, H. C. 1924. Nye Fund fra den Ældste Stenalder. Holmgaard- og Sværdborgfundene. *Aarbøger for Nordisk Oldkyndighed og Historie* 1924.

Brøndsted, J. 1957. *Danmarks Oldtid* 1: *Stenalderen.* København.

Clark, J. G. D. 1958. Blade and Trapeze Industries of the European Stone Age. *Proceedings of the Prehistoric Society* XXIV.

Fischer, A. 1989. Musholm Bay: Excavation of a Sub-marine Settlement in a Drowned Forest 9 Meters below Present Sea Level. *Mesolithic Miscellany* 1:2.

Fischer, A. 1994. Dating the Early Trapeze Horizon: Radiocarbon Dates from Submerged Settlements in Musholm Bay and Kalø Vig, Denmark. *Mesolithic Miscellany* 15:1.

Forssander. J. E. 1930. En märklig stenåldersboplats vid Sjöholmen. *Meddelanden från Lunds universitets historiska museum* 1938.

GEEM, 1969. Epipaléolithique-Mésolithique: Les microlithes géomÈtriques. *Bulletin de la Société Préhistorique Française* 66.

Grøn, O. & Sørensen, A. 1995. Aggemose. An Inland Site from the Early Kongemose Culture on Lange-land. *Journal of Danish Archaeology* 11.

Jørgensen, S. 1956. Kongemosen: Endnu en Aamose-Boplads fra Ældre Stenalder. *Kuml* 1956.

Kurck, A. 1872. Om stenålderns delning och kustfynd i Skåne. *Samlingar till Skånes historia, fornkunskap och beskrifning* 1872.

Larsson, L. 1978. *Ageröd I:B – Ageröd I:D: A Study of Early Atlantic Settlement in Scania.* Acta Archaeologica Lundensia. Series in 4° 12.

Larsson, L. 1982. Segebro: En tidigatlantisk boplats vid Sege ås mynning. *Malmöfynd* 4.

Larsson, L. 1983. *Ageröd V: An Atlantic Bog Site in Central Scania.* Acta Archaeologica Lundensia Serie in 8° 12.

Larsson, L. 1988. The Skateholm project I. *Man and Environment.* Lund.

Larsson, L. 1990. The Mesolithic of Southern Scandinavia. *Journal of World Prehistory* 4:3.

Mathiassen, T. 1937. Gudenaa-kulturen: En mesolitisk indlandsbebyggelse i Jylland. *Aarbøger for Nordisk Oldkyndighed og Historie* 1937.

Nilsson, T. 1935. Die pollenanalytische Zonengliederung der spät- und postglazialen Bildungen Schonens. *Geologiska Föreningens i Stockholm Förhandlingar* 57:3.

Reventlow, C. D. 1905. Ringsjöfynden. *Ymer* 1905.

Sarauw, G. F. L. 1903. En Stenalders Boplads i Maglemose ved Mullerup, sammanholdt med beslægtede Fund. *Aarbøger for Nordisk Oldkyndighed og Historie* 1903.

Skaarup, J. 1979. Flaadet. *Meddelelser fra Langelands Museum.* Rudkøbing.

Sørensen, S. A. 1996. *Kongemosekulturen i Sydskandinavien.* Copenhagen.

Sträng, T. 1995. *Geophysical Methods Applied to Two Archaeological Sites, Skåne, Sweden.* Master's Thesis. 1995:061 E. University of Luleå.

Tauber, H. 1971. Danske Kulstof-14 dateringer af arkæologiske prøver III. *Aarbøger for Nordisk*

Oldkyndighed og Historie 1970.
Vang Petersen, P. 1979. *Atlantiske bopladsfund fra Nordøstsjælland og Skåne – Dateringsproblemer.* Unpublished Master's Thesis, University of Copenhagen.
Vang Petersen, P. 1984. Chronological and Regional Variation in the Late Mesolithic of Eastern Denmark. *Journal of Danish Archaeology* 3.

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