Social Behaviour and Settlement Structure

Preliminary Results of a Distribution Analysis on Sites of the Maglemose Culture

by OLE GRØN

INTRODUCTION

A problem in recent mesolithic research is the striking discrepancy between the information we want to extract from the archaeological material, and the information the material actually reveals by conventionel archaeological methods. It is thus obvious that to achieve specific results of any significance an analysis of the social structure, the group structure etc. of prehistoric hunter-gatherer communities, must be based on novel theories and methods.

In the current discussion this has readily been realized. Binford a.o. has critizised the archaeological »mining« of »cultural items« that to a large extent have been regarded as equivalent with the cultures they represent. In opposition to this he regards archaeological sites as »the result of cultural activity performed by social units within restricted spatial bounds« (Binford, 1964: 431 ff.). In 1973 Newell, in accordance with this conception, proposed that the mesolithic sites he was working on be defined as: »settlement units having finite borders within which a finite number of people, organized into a social structure, performed a specific and finite range of activities by means of an equally specific and finite range of tools (tool-kit)« (Newell, 1973: 400.). The problem so far has been to develop methods that might translate such abstract ideas into concrete results.

This preliminary analysis is the result of an attempt to achieve concrete knowledge about the social structure of the Maglemose Culture. The basic thesis is that the individuals have been placed in the dwellings according to a specific pattern reflecting their age, sex, and social status.

From an anthropological point of view it is highly probable that this may actually have been the case. According to Jørgen Meldgaard it is customary for Eskimos and Canadian Indians to observe such fixed patterns - and to observe them with a pronounced degree of conservatism (Meldgaard, pers. information). Thus Rogers writes about the Mistassini Indians: »Inside a lodge, for purpose of sitting, sleeping, and eating, individuals were placed according to age and sex. In single family dwellings at feasts and when visiting, the men were at the rear and the women and children were along the sides. The place of honour, occupied by the eldest male member, generally the leader of the hunting group, was in the right rear if the stove was to the left. His wife occupied the right or left side depending on the position of the stove. In general, the family members slept at the rear with a separation of siblings of opposite sex who had reached puberty. In two-family communal lodges, the leader and his family were on one side and the second family was on the other. The women and children were located nearest the door and the men towards the rear.« (Rogers, 1967: 21). A thorough study of Mistassini placing patterns is published by Tanner (Tanner, 1979: 73 ff.). It must be underlined that the patterns can vary from culture to culture; Eskimos for instance are normally sleeping at the back of the dwellings, whereas the Canadian Indians usually have their sleeping-places along the sides (Meldgaard, pers. information).

If such fixed patterns of position can be deduced from the traces of activities found on Maglemose sites, it should be possible to obtain an insight into the group structure.

The investigation is based on a comparison between the horizontal distributions of various tool types on a series of sites. The actual comparison has been made in the following way: the distribution of any one type inside an excavation area is graphically expressed by equidistant »contour lines« drawn by interpolation based on the frequency with which the type appears in each square metre. The distance between the lines is chosen small enough for the distribution pattern to appear in detail, and yet so great that the lines do not blur.

It has been necessary to use a square metre unit, as part of the flint material from the sites in question has only been measured to the square metre. In the material from Duvensee *Wohnplatz* 6, where all flint has been measured in great detail, only the specific number pr. square metre has been taken into consideration to avoid a distortion of the lines due to a difference of methods.

THE SITES

The analysis is based on the following Maglemose sites: Ulkestrup I, Duvensee *Wohnplatz 6*, and Svanemosen 28 (1). Furthermore, Sværdborg II has also been taken into consideration.

Ulkestrup I: The site is located in the Amose bog, West Zealand. It was excavated in 1947 by Knud Andersen for the National Museum. A rectangular bark floor measuring approx. $6 \times 4\frac{1}{2}$ m was observed. Apart from a refuse layer in the south-eastern part of the excavation the flint was found inside the rectangular floor. Above the floor was a 5 cm thick culture layer containing charcoal, and hazel-nut shells besides flint. The hearth, centrally placed in the south end of the hut, was circular, and had a diameter of approx. 11/2 m, and consisted of sand, a little clay, ashes, and charcoal. Its outline was blurred, the sand spreading over the floor layer (Andersen, 1982: 10 ff.). The material seems typologically clean and most probably indicates that these are the remains of one single stay (Andersen, 1951: 73; 1982: 79). The hut has been C 14-dated to 6190 ± 100 B.C. in conventional C 14-years (Andersen, 1982: 77).

Duvensee Wohnplatz 6: The site is located in the Duvensee bog east of Lübeck. It was excavated during 1975–78 by Dr. Klaus Bokelmann for the Landesamt für Vor- und Frühgeschichte von Schleswig-Holstein. There was no regular hut floor. Only pieces of split logs and strips og birch bark were preserved (Bokelmann, 1981: 181). Re-

markable are two rather large concentrations of sand, charcoal, and charred hazel-nut shells inside the central area of the settlement. These are probably »roasting-places« where hazel-nuts were roasted. In connection with the largest concentration the following was observed: in a small depression in the peat was a layer of dark, brown sand. On top of this were alternating layers of charcoal and sand bleached by heat (Bokelmann, 1981: 183). The material seems typologically clean (Bokelmann, 1981: 183 f.). The roots of a number of fir trees were also found. These may be contemporaneous with the settlement and may have been part of the hut structure. However, the latest results indicate that they were stumps already at the time of the settlement (Bokelmann, pers. information). The site has been C 14-dated to 7105 \pm 130 B.C., 6860 \pm 110 B.C., and 7110 ± 130 B.C. in conventional C 14-years (Bokelmann, 1981: 181).

Svanemosen 28: The site is located a few kilometres south of Kolding. It was partly excavated by Erik Jørgensen and Flemming Rieck in collaboration with The Amateur Archaeologists of South Jutland for the National Museum. The site has a 10 cm thick culture layer and is located on the bank of the former lake in the Svanemose basin. Inside the central area of the settlement the subsoil revealed some rather large, 5-10 cm deep »bloches« of dark, brown sand. They may be remains of »roasting places« like those known from Duvensee W.6. The material appears to be typologically clean, and everything seems to indicate only one rather small concentration (Rieck and Jørgensen, pers. information). Typologically the microlithic material from Svanemosen 28 must be placed between Ulkestrup I and Vinde Helsinge (Grøn, in prep.).

Sværdborg II: The site is located between Vordingborg and Næstved in the Sværdborg bog. It was excavated by Mogens Ørsnes for the National Museum. Neither fireplaces nor remains of a hut were observed during the excavation (Brinch Petersen, 1972: 45). The investigation yielded some 750 pieces of unworked bone and a good many tools (Brinch Petersen, 1972: 44). The material seems to be typologically clean, and according to Brinch Petersen it must be contemporaneous with Ulkestrup II, which has been C 14-dated to 6230 ± 100 B.C. in conventional C 14-years (Andersen, *et al.* 1982: 77; Brinch Petersen, 1972: 72).

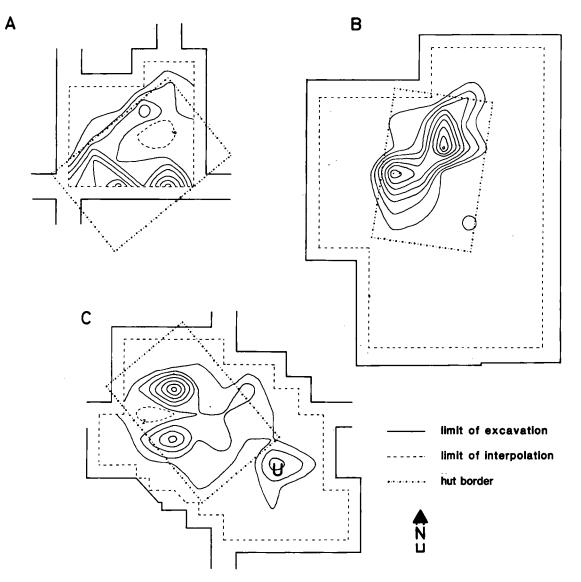


Fig. 1. Microlith distribution maps of Svanemosen 28 (A), Duvensee *Wohnplatz 6* (B), and Ulkestrup I (C). The distance between the lines on maps A, B, and C is respectively 3, 2, and 2. The U on the map of Ulkestrup I indicates the refuse layer the most western part of which was covered by the floating island on which the hut was located (Andersen, 1982: 14).

FLINT DISTRIBUTION

The lines for the distribution of microliths are shown in fig. 3. The drainage ditch that originally led to discovery of Ulkestrup I, and which has removed between 2/5 and 3/5 of each square metre between 9 and 10 south (fig. 1), has been taken into consideration. In each case the number of microliths has been multiplied by the reciprocal of the remaining fraction of the square metre. The result has been rounded off to the nearest integer. The fact that the two microlith concentrations are separated does not reflect that material in between has been removed by digging of the ditch. The northern concentration contains 15 microliths in one square metre, and the southern one 11; the square metre between them, exactly half of which had been removed, yielded only one.

As it is impossible to interpolate lines for the outermost half metre of an excavation, fig. 3 does not show whether the concentrations at Svanemosen 28 continue

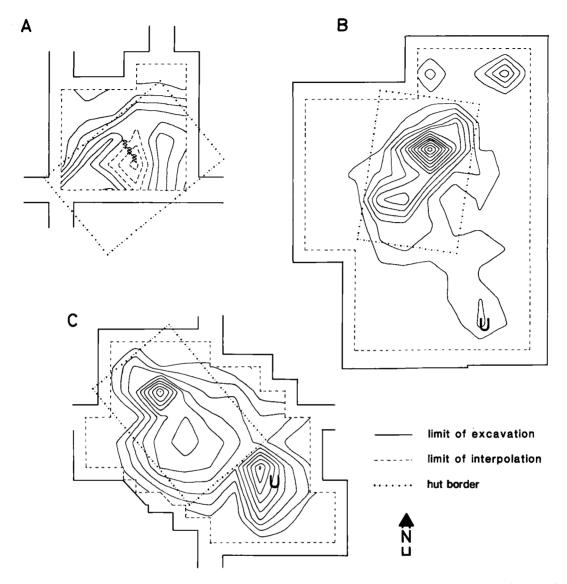


Fig. 2. Flint waste distribution maps of Svanemosen 28 (A), Duvensee Wohnplatz 6 (B), and Ulkestrup I (C). The distance between the lines of maps A, B, and C is respectively 100, 50, and 77. The U on the map of Ulkestrup I indicates the refuse layer the most western part of which was covered by the floating island on which the hut was located. The U on the map of Duvensee W.6 indicates the supposed refuselayer.

outside the limits of the excavation. However, the position of the measured microliths indicates that this is not the case.

The three sites seem to show uniform patterns of distribution: two heavy concentrations with a distance of approximately 2 metres between their centres. Based on the supposition that the two concentrations may be the remains of activities that have had their finite position inside the huts, the rest of the material from the three sites has been regarded as »oriented« alike in relation to 1) the distribution pattern of the microliths and to 2) the bank of the nearby lake.

During the excavation of Duvensee W.6 no lake bank contemporaneous with the site was observed. The small concentration of a.o. flint waste marked U in fig. 2B should probably be regarded as a refuse layer. According to the excavator, Dr. Klaus Bokelmann, wood and shavings were considerably better preserved here than on the rest of the site (Bokelmann, pers. information).

In fig. 2 the outline of the hut found at Ulkestrup I has

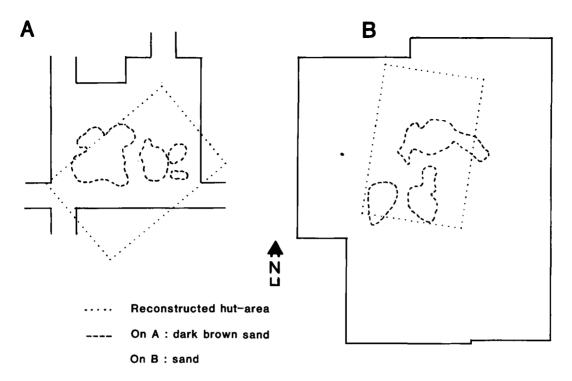


Fig. 3. Map of »blotches« of dark, brown sand on Svanemosen 28 (A) and sand concentrations on Duvensee W.6 (reproduction of Bokelmann, 1981, fig. 1.) (B).

thus been transferred to Duvensee W.6 and to Svanemosen 28. In the following lines this transfer will be evaluated on the basis of the entire material from the three sites. It should be underlined that the rectangles are only models indicating the approximate expected position of the hut walls. The important thing in this connection is the supposition that the huts at Duvensee W.6 and at Svanemosen 28 were approximately rectangular (about 6×4 m) and located roughly like the Ulkestrup hut in relation to the microlith concentrations and the lake bank.

The first part of the evaluation rests on the supposition that a hut wall prevents the spreading of objects beyond it. This seems to have been the case at Ulkestrup I. Knud Andersen writes: »The distribution of flint was very characteristic. Flint abounded on the floor but stopped abruptly on a line that could be drawn just inside the post-holes. This probably indicates that the walls were so tight that they blocked the flint spreading« (Andersen, 1982: 12).

As regards the distribution of flint waste Duvensee W.6 is almost a copy of Ulkestrup I (fig. 2B and 2C). It should be noted that the approximately 500 blades have not been included among the waste at Duvensee W.6 as a distribution map for them has not yet been drawn. The inclusion of the blades will not change the distribution pattern significantly, as they are generally following the distribution of the rest of the waste flint (Bokelmann, pers. information). As appears the lines follow the hypothetical hut wall rather nicely. At the southern corner however, a »tongue« penetrates the rectangular outline. As already mentioned it is tempting to believe that this is a counterpart to the small refuse layer at Ulkestrup I. It should be noted that the waste at Duvensee W.6 need not have been deposited in open water but may very well have been trodden into the humid bank area. The western part of the Sværdborg II excavation may contain such an area (Brinch Petersen, 1972: 52).

From fig. 2A it appears that the flint waste at Svanemosen 28 also agrees pretty well with the hypothetical outline of a hut. Fig. 1A actually shows that the spreading of the microliths may have been prevented by a wall closely following the hypothetical rectangular outline.

When the lines indicating the flint distribution sometimes go beyond the hypothetical rectangular outline, it probably only reflects the fact that the flint density is

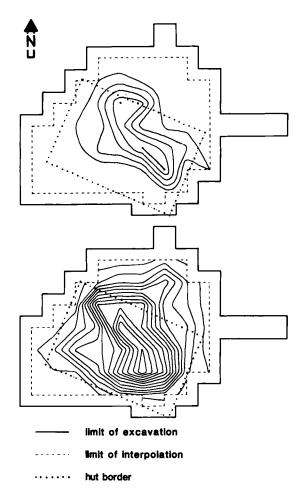


Fig. 4. Distribution maps of microliths (top) and flint waste (bottom) at Sværdborg II. The distance between the lines is respectively 2 and 100. Drawn on the basis of Brinch Petersen, 1972: 46 and 50.

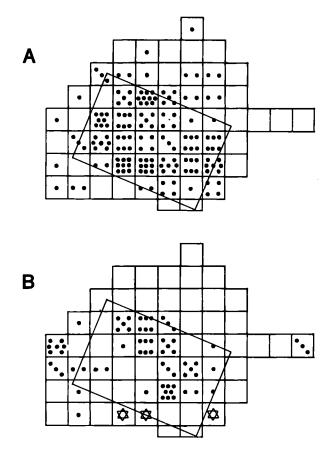


Fig. 5. Distribution maps of cores (A) and bone tools (B) at Svaerdborg II. Drawn on the basis of Brinch Petersen, 1972: figs. 4:2, and 8:1. The asterisks indicate the squares where the culture layer displayed clear lines of demarcation (Brinch Petersen, 1972: 48).

indicated pr. square metre. A square metre with a hundred pieces of flint concentrated in one corner inside the hut wall, and otherwise devoid of finds outside the wall, will appear on the map with a hundred pieces evenly distributed. On Duvensee W.6, where the position of all flint is exactly measured, the accordance between waste flint and the hypothetical hut area is better than indicated by the distribution-plans published here (Bokelmann, 1981: 182).

As regards the distribution of other types of objects besides microliths and flint waste can be said that they agree reasonably well with the reconstructed huts. Apart from micro-burins distributed roughly like the microliths, they appear in so small numbers pr. square metre that it would be unwise to employ their distribution as an argument in the discussion of the position of the huts.

It should be mentioned that the »blotches« at Svanemosen 28 and the sand concentrations at Duvensee W.6 seem to be located more or less alike in relation to the two reconstructed huts (fig. 3). This similarity is probably greater than appears from the illustrations. According to the excavators the dark, brown blotches at Svanemosen 28 were not recognized until the excavation of the main area. It is likely that they have been overlooked in the east-west oriented trial ditch (Rieck and Jørgensen, pers. information).

The refuse layers at Ulkestrup I and Duvensee W.6, emerging like tongues from the main concentrations, indicate that the entrances to the two huts were placed

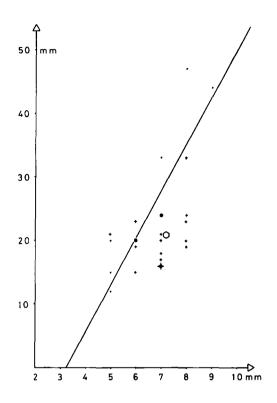


Fig. 6. Corresponding length-width ratios of microliths from Ulkestrup I. Dots indicate measurements from the southern concentration. A small dot indicates an individual set of measurements. A large dot indicates two congruent sets of measurements from the northern concentration. The straight line is the result of linear regression of the measurements from the northern concentration. The illustration is based on measurements made by Knud Andersen.

in the same corner in relation to the interior lay-out of the huts and in relation to the lake bank. The small part of the refuse layer covered by the excavation of Svanemosen 28 apparently reveals the same basic pattern. Observations made during extensive investigations in the Åmose bog during 1939–45 indicate that the Maglemose huts generally had an entrance facing the lake (Andersen, 1978: 106).

In view of the anthropological knowledge about hunters and gatherers it seems likely that the hut-entrances should have a specific orientation with regard to the water or the four points of the compass. Rogers e.g. writes about the Mistassini Indians: »Lodges at base camps and the summer encampments were generally oriented with the entrance facing approximately southeast. This was true even though the camp-site was situated on the south-east shore of a river or lake. Shelters erected when the group was travelling did not adhere to this

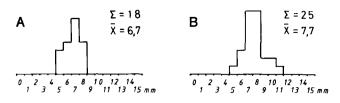


Fig. 7. Widths of micro-blades from the southern (A) and the northern (B) microlith concentrations at Ulkestrup I. The measurements were made by Knud Andersen.

orientation. Instead, the entrance generally faced the shore of a river or lake, although it was considered »bad« if at any time the entrance faced west. Nevertheless a few lodges are today erected with this orientation«. (Rogers, 1967: 11).

The material from Sværdborg II differs from those already treated in that the distribution of the microliths into two concentrations is barely traceable. At the ends of the long concentration the density is 10 pr. square metre, and in the middle it is 9 pr. square metre (fig. 4, the top).

In this case the tools have only been assigned to the respective square metres in which they were found (Brinch Petersen, 1972: 44). An unfortunate position of the square metre grid may make two separate close-lying concentrations merge. This explanation seems likely as the distribution of the Sværdborg triangles, the prevalent type of microlith on the site (Brinch Petersen, 1972: 50, 70) shows the well-known pattern of two concentrations. Though they figure only in small numbers, the retouched pieces show the same tendency (Brinch Petersen, 1972: 49). Fig. 4 shows a tentative reconstruction of the outline of the hut based on the distribution of the microliths. As appears from fig. 4B the distribution of flint inside the hut area resembles the distributions at Ulkestrup I and Duvensee W.6 (fig. 2B and 2C). Furthermore, fig. 5A shows that the distribution of the cores is limited to the reconstructed hut. The position of the hut wall is also in accordance with observations made during the excavation. It was noted that in squares 6C, 6D, and 6G (marked with an asterisk in fig. 5B) the culture layer displayed a clear line of demarcation south of which practically no tools were found (Brinch Petersen 1972: 48).

The fact that the refuse layer at Sværdborg II lies in the western part of the main excavation (Brinch Petersen, 1972: 53) supports the suposition that this site displays a state of affairs similar to that found on the three sites previously dealt with. The distribution of the bone tools (fig. 5B) indicates that the entrance was placed exactly as it is supposed to have been at Ulkestrup I and Duvensee W.6.

In the cases of Duvensee W.6 and Sværdborg II it should be noted that nothing in particular seems to indicate that the huts were rectangular. They might for instance have been oblong, with more or less rounded ends of generally the same size. However, the best preserved bark floors from the Maglemose culture being rectangular (Schwantes, 1939: 90; Becker, 1945: 63; and Andersen, 1982: 11), all the huts seem likely to have had a rectangular form.

INDIVIDUAL DIFFERENCES OF THE FLINT TECHNIQUE

It would be natural to regard the two microlith concentrations on each of the sites as the result of the activities of two individuals. On Duvensee W.6, Ulkestrup I, and Svanemosen 28 technical differences actually exists between the microliths from the two concentrations.

The technical differences between the two concentrations at Duvensee W.6 appear from Dr. Bokelmann's measurements. He is of the opinion that it is rather a question of individual differences than »changes due to structural modifications of the hunting weapons« (Bokelmann, 1981: 185). It seems unlikely that the obvious differences in the indexes and widths of the triangles (Bokelmann, 1981: 185) should be due to a difference in the raw material employed. Especially the differences in index must reflect different working methods.

At Ulkestrup I corresponding length-width ratios of intact microliths indicate that also technical differences come into play (fig. 6). The measurements from the southern concentration can be approached to a straight line with the slope of 7.2 (the correlation coefficient is 0.8). The optimal approximation to the measurements from the northern concentration at a similar linear regression is a straight line with a slope of 1.6. The tendencies in the two sets of measurements are clearly different. However, as the latter has a correlation coefficient of only 0.4, it should be stressed that the »pivot« of the latter set of measurements is at a considerable distance from the line of approximation arising from linear regression to the first set. The widths of the microblades from the two areas also show different tenden-

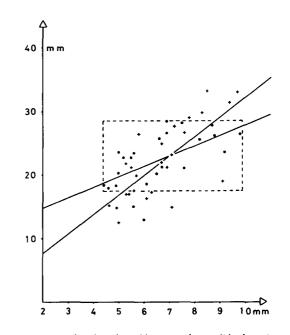


Fig. 8. Corresponding length-width ratios of microliths from Svanemosen 28. Circles indicate sets of measurements from the northern concentration. By linear regression the measurements from the northern concentration have been approximated to the straight line that forms the narrowest angle to the x-axis. Crosses indicate measurements from the southern concentration. By linear regression the measurements from this concentration have been approximated to the straight line that forms the widest angle to the x-axis. The measurements have been made by the author.

cies (fig. 7). The average value of the northern concentration is 7.7 mm; in the southern concentration the corresponding value is 6.7 mm.

The length-width ratios of the microliths from the two concentrations at Svanemosen 28 are shown in fig. 8. The approximation by linear regression of the western ratio is a straight line with a slope of 1.6 and a correlation coefficient of 0.6. The corresponding values for the measurements from the eastern concentration are 3.1 and 0.8 respectively. The different tendencies of the two concentrations are also reflected by the fact that 91% of the measurements from the western concentration are inside or touch the sides of the chosen rectangle. This is true of only 48% of the measurements from the eastern concentration. Furthermore, the measurements of the maximum thickness of the lanceolate microliths in the eastern concentration give an average of 2.57 mm (fig. 9A), whereas the corresponding measurements of the triangles give an average of 1.76 mm (fig. 9B). For the western concentration the corresponding values are 2.15 and 2.00 mm (fig. 9C and 9D). Con-

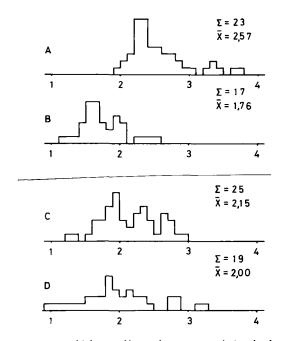


Fig. 9. Maximum thickness of lanceolate points and triangles from Svanemosen 28. A: max. thickness of lanceolate points from the southern concentration. B: max. thickness of triangles from the southern concentration. C. max. thickness of lanceolate points from the northern concentration. D: max: thickness of triangles from the northern concentration. The measurements have been made by the author.

sequently in the last instance there is clearly less variation of the maximum thickness of the microliths in general. The lengths of the lanceolate points in the western concentration concentrate in two peaks (fig. 10), whereas the lengths from the southern one are more evenly distributed. I have noticed that the lengths of the individual types of microliths in typologically clean Maglemose materials often concentrate around two or three values that may vary from site to site and from type to type. Knud Andersen has noticed the same tendency in material from Zealand (Andersen, pers. information). We both think that this reflects the production of arrow-heads according to a fixed pattern with microliths of the same type but varying in size. Lars Larsson's assumption in connection with Ageröd I:B (Larsson, 1978: 66 f., 140) that the lengths and the widths of the microliths concentrating around certain values, indicates that the site is mixed, must be regarded as untenable. On the basis of the above observations I do not think that the tendency in fig. 10 is arbitrary, though it is based on only 14 length measurements from the western concentration. Fig. 12 shows the difference between the

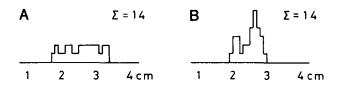


Fig. 10. Lengths of lanceolate points from the southern (A) and the northern (B) concentrations at Svanemosen 28. The measurements have been made by the author.

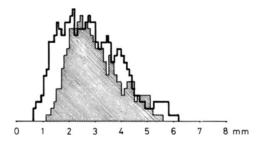


Fig. 11. Thickness of micro-blades from Svanemosen 28. The line showing the measurements from the southern concentration is in heavy print, and the line showing the measurements from the northern concentration is hatched. The measurements have been made by the author.

corresponding length-width ratios of blades from the two areas. In the western concentration 75% of the micro-blades measured are inside the chosen rectangle or are touching its sides. This goes for only 40% of the micro-blades in the eastern concentration. Furthermore, in the first instance the blades and micro-blades are far more easily distinguishable than in the latter. In the southern concentration the thickness of the microblades is also more evenly distributed than in the northern one (fig. 11). In conclusion it must be said that the measurements of the Svanemose 28 material clearly support the subjective impression that the two concentrations are due to two flintknappers of differing ability, the eastern one being actually not very good.

FURTHER CONSIDERATIONS

The four sites analysed cover a period of roughly a thousand years. The results seem to indicate that during this period of the Danish and North German Maglemose

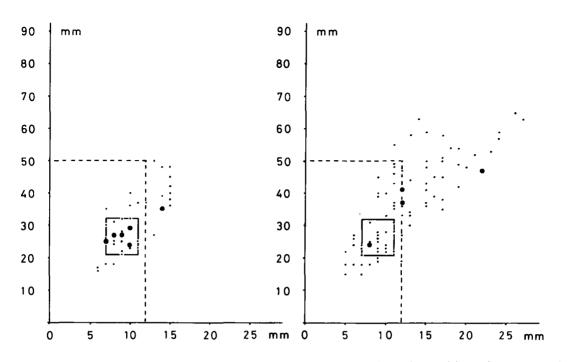


Fig. 12. Corresponding length-width ratios of blades from Svanemosen 28. Measurements from the northern and the southern concentrations to the left and right, respectively. A large dot indicates two congruent sets of measurements. A small dot indicates an individual set of measurements. The measurements have been made by the author.

Culture certain activities have been allocated to certain areas of the dwelling according to fixed rules.

The pattern with two microlith-concentrations was probably present on the hut floor at Duvensee W.1. According to the excavator, Gustav Schwante's notes the flint was divided into two »nests«. However, it is not possible to reconstruct the distribution pattern (Bokelmann, pers. information).

At Lundby II we probably find the same pattern in connection with the two close-lying fireplaces that are very much like the »roasting places« from the Duvensee sites (Bille Henriksen, 1980: 57). The microlith distribution map from Lundby II shows a concentration at each of the two fireplaces. As there are two layers on this site, the concentrations might belong to layer 2, unlike the fireplaces. However the flint mainly belongs to layer 1 (Bille Henriksen, 1980: 56 ff.).

It should be noted that other hut types than the one known from Ulkestrup I, may also have been used. In the Duvensee basin a hut site (W.8) has recently been investigated. Judging by the size of the preserved hut floor, the hut was only about half the size of the Ulkestrup hut. It is interesting that in connection with the floor of W.8 only one microlith concentration and a »roasting place« have been found (Bokelmann, 1982: 23). This hut may have housed the smallest unit of the »Maglemose Society«, whereas the Ulkestrup huts may have housed two. In support of this theory it should be stressed that two fire- or roasting-places were observed at Duvensee W.6. According to Jørgen Meldgaard it is customary among recent and prehistoric Eskimos and Canadian Indians for each household to have one cooking place when two or more households are sharing a dwelling (Meldgaard, pers. information).

At the moment a survey of a series of early Maglemose excavations is in preparation. It is hoped that this survey, combined with new excavations, will make it possible to render a reasonably concise description of the groups that inhabited the Maglemose huts. If successful, this information will serve as a key to the understanding of the cultural conditions proper of the Maglemose period.

Translated by Ul S. Jørgensen

Ole Grøn, Haderslev Museum, Dalgade 7, DK-6100 Haderslev Addendum: During 1983 further excavation at Svanemosen 28 gave support to the above reconstruction of the hut area, the distribution of flint tools and waste being as expected. Furthermore, the sections allowed the hut area to be seen as a 30 cm. thick, grey layer.

NOTE

I wish to express my gratitude to Knud Andersen, Klaus Bokelmann, Flemming Rieck, and Erik Jørgensen for the extraordinary kindness with which they have made unpublished material available to me during my initial work with this analysis of Maglemosian sites.

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