Traditions in Transition

A Comparative Study of the Patterns of Ertebølle Lithic and Pottery Changes in the Late Mesolithic Ceramic Phase at Skateholm I, III and Soldattorpet in Scania, Sweden

BY OLE STILBORG AND INGRID BERGENSTRÅHLE

Abstract

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A comparative study of lithic material and pottery from two sites in south-eastern Scania during the latest phases of the Late Mesolithic/beginning of the Early Neolithic forms the basis of a discussion of different spheres of interaction in the eastern part of southern Scandinavia.

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Introduction

Traditions in transition, changes in material culture through time and differences across space are visible during the Late Mesolithic period in southern Scandinavia. Differences in the material culture have been interpreted in many ways, often as a functional/practical difference or as a cultural trait/symbolic difference (Vandkilde 2000, pp. 4 ff.). We would like to point out some similarities and differences within the lithic artefact material and the Ertebølle pottery from Skateholm (the sites Skateholm I and III) and the Limhamn area (the Soldattorpet site). Both regional and local variation within the find material in southern Scandinavia during the Late Mesolithic has been pointed out earlier (Vang Petersen 1984, pp. 5 ff.). Vang Petersen's study was based on Danish find material and in order to find out whether similar patterns were discernible in Scania as well, a case study of two settlement areas has been undertaken. Several aspects such as the settlement location with similar economic conditions and plausible contact network areas are supposed to be relevant to a comparison. The discussion will touch upon the ideas of isochrestic style of Sackett (1982), emblemic style of Wiessner (1983) and micro styles of Dietler and Herbich (1994).

Theoretical background

A long-standing discussion on the relation between material culture and human social structures, to a large extent based on ethnoarchaeological studies, has most recently been summarized and extended in a collection of papers edited by M. T. Stark under the title: *The Archaeology of Social Boundaries* (Stark 1998). In particular, the approach to the problem proposed by Dietler & Herbich (1998) involving the principle of *chaîne opératoire*[1] and the concepts of *habitus* and *practice* coined by Bourdieu (Dietler & Herbich 1998, p. 245, with ref. to Bourdieu 1977) is akin to our basic view of the problem (Stilborg 1997). The

concept of *tradition* used here is closely comparable to the ideas of *habitus* and *chaîne opératoire* as used by Dietler & Herbich. Both entail a coherent set of choices made from a range of available, equally functional alternatives (Gosselain 1998, p. 86) as the established way of making an object. The actual making is adapted to the prevailing conditions through *practice* (Dietler & Herbich 1998, p. 253). We also find the ideas about the social embedding of *habitus* and *practice* drawn from their study of the Luo people intriguing (ibid, pp. 250 f.). Such a model can only be tested in other studies of living societies (ibid, pp. 245) while its explanatory value for prehistoric situations may be evaluated. However, as it deals with the established way of doing things, it applies only to the discussion of the flint craft in the present article. The discussion of the pottery craft, in contrast to the flint craft, deals with the establishment of the *tradition/habitus* and thus presumably entails social conditions and relations hardly studied by ethnoarchaeology.

The location of Late Mesolithic coastal settlement areas

The distance between Skateholm and Soldattorpet, along the southern seashore, is about 75 kilometres (Fig. 1). The Limhamn area is situated on the southern outskirts of the city of Malmö in south-western Scania, quite close to Zealand. The Skateholm area is situated on the southern Scanian coastline between Trelleborg and Ystad, closer to Bornholm. In the Danish area the Late Mesolithic sites tend to be concentrated in favourable topographic areas within the coastal area (Andersen 1995, pp. 41 ff.; Fischer 1995, pp. 371 ff.). In Scania, Late Mesolithic settlements tend to be found on similar small elevations within the landscape, close to river outlets as with the Tågerup site in south-western Scania; in former lagoon areas such as Skateholm and the Ystad Sandskog area or on ridges, as with Soldattorpet, close to the sea. Inland sites, such as Bökeberg, are most often situated near lakes (Althin 1954). The topographic location of the Scanian sites resembles the Danish

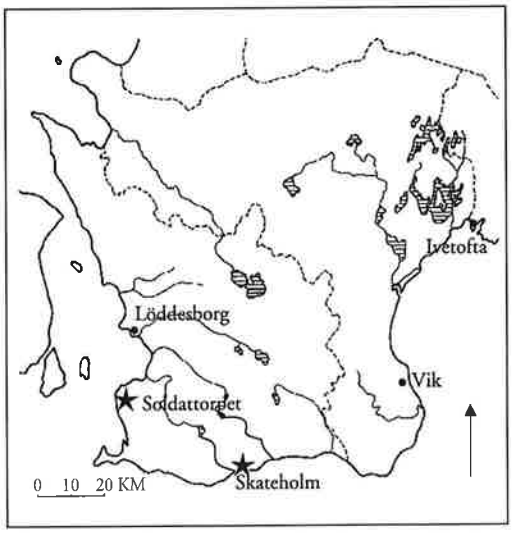

Fig. 1. Map of Scania showing Skateholm and Soldattorpet.

settlement pattern. The present status of research seems to indicate that the settlement pattern and the economy during the Late Mesolithic period is rather similar over the whole southern Scandinavian area. It has been suggested that the coastal environments with a high potential for fishing with stationary constructions have had the greatest concentrations of population and the highest degree of social complexity (Fischer 1995, pp. 380 ff.). This might be the case, but the present study does not aim to discuss social complexity. Instead, we try to discern the presence of local and/or regional variation in Scania.

All of the site areas – Skateholm I, III and Soldattorpet – are situated adjacent to the Järavallen ridge along the southern seashore in Scania. The Järavallen ridge was built up (Lemdahl & Göransson 1988, pp. 20 ff.) during the successive Littorina transgressions in the Baltic Sea area which occurred during the Late Mesolithic and the Early Neolithic (Christensen 1995, pp. 15 ff.). Because of the similar setting in the landscape the environmental aspects, such as the access to terrestrial and marine resources, access to raw materials and the effect on the landscape caused by the changes of the Littorina Sea, are considered to be equivalent for the Skateholm and the Soldattorpet settlement areas.

The Late Mesolithic sites in the Skateholm lagoon area

Eight Late Mesolithic sites have been excavated or field-surveyed to varying degrees within the former lagoon area (Fig. 2). Comparisons of artefacts, the radiocarbon results and the position of the sites in relation to the sea level provide a *terminus post quem* dating suggesting that these sites can be divided into two phases (Bergenstråhle 1995, pp. 335 ff.). These equal one aceramic and one ceramic Late Mesolithic phase. It must be stressed that there is no evidence of a hiatus or sudden change between these phases. Skateholm II predates Skateholm I, but the earliest habitation at Skateholm I might have occurred while Skateholm II was still inhabited. The grave-fields at Skateholm I and II as well as the single grave found at Skateholm III (Larsson 1984, p. 5 ff.) have all been dated to the earlier aceramic phase. Skateholm II, IV and VI have been suggested to belong mainly to the first phase. However, it is probable that Skateholm IV and VI were also occupied during the early stages of Skateholm I. The sites Skateholm I, III, V, VII and IX have been suggested to belong to the second phase. It is plausible that the occupational layers at Skateholm III and IX are contemporary with the later part of the habitation at Skateholm I or postdate it. At Skateholm I and Skateholm III, several sherds of Ertebølle pottery were encountered in occupation layers and in features. A few sherds of Ertebølle pottery were also found at Skateholm VI and IX.

The Late Mesolithic settlement at Skateholm was situated in a former lagoon area behind the Baltic shore, in southern Scania. Within this area the land surface slowly rises from the sea level up to the 5 m a.s.l. isarithm curve. Today two waterways conjoin in the central part of the area, the Tullstorpsån in the west and the Vemmenhögsån in the east. The lagoon evolved as the ingression of the sea took place during the Late Atlantic and Subboreal due to the changes of the Littorina Sea. It has been suggested that some form of natural barrier existed which hindered the direct inflow of water from the sea (Larsson 1988, pp. 9 ff.; Lemdahl and Göransson 1988, pp. 20 ff.).

Due to the favourable preservation conditions in the area, faunal remains were preserved at Skateholm. The faunal remains contain a wide range of species (Jonsson 1988, pp. 56 ff.). Wild pig, red deer and roe deer were the most frequent among the large mammals. Utilization of aquatic resources included fishing, the most common fish caught being pike and perch, but grey seal was also hunted. The pollen diagram (Gaillard *et al.* 1988, pp. 52 ff.; Göransson 1988, pp. 27 ff.) from Ska-

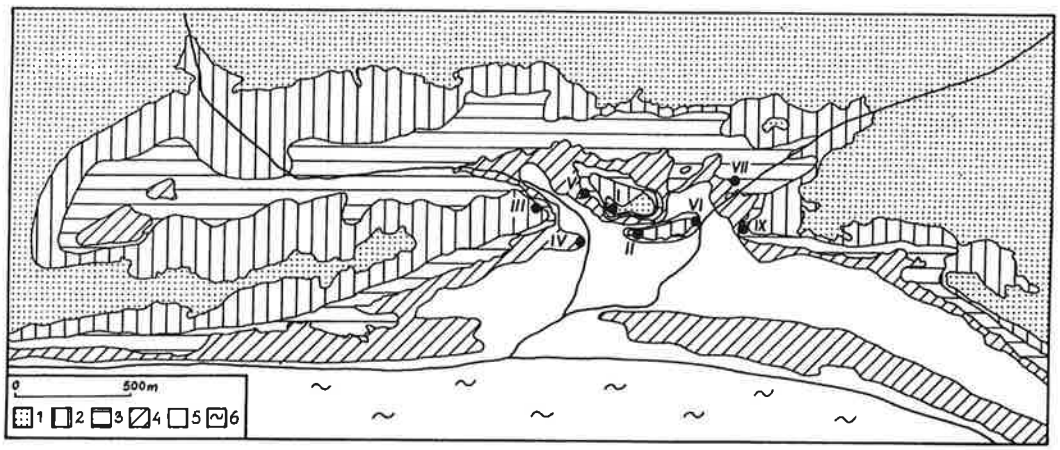

Fig. 2. The research area of Skateholm with the Late Mesolithic sites within the central lagoon area. 1. Area higher than 5 m a.s.l. 2. Area between 4 and 5 m a.s.l. 3. Area between 3 and 4 m a.s.l. 4. Area between 2 and 3 m a.s.l. 5. Area lower than 2 m a.s.l. 6. Present sea level.

teholm shows that grasses and extensive reed belts grew within the lagoon. The hinterland consisted of different types of forests during the Late Mesolithic. The pollen samples suggest that an open forest with hazel and pine was present near the lagoon, while further inland the forest was denser, consisting of elm, lime, oak and ash.

The Late Mesolithic site of Soldattorpet

More than a hundred years ago, in 1891 and 1892, Stone Age artefacts were collected in the Soldattorpet area and the finds were reported to the authorities. A minor investigation was initiated in the 1890s by Söderberg, Lund. Investigation of the actual occupation layer was undertaken in 1901 and 1902 by Kjellmark, Uppsala, and subsequently in 1903 by Rydbeck, Lund (Kjellmark 1903, pp. 1 ff.; Rydbeck 1920, pp. 138 ff.). The exact extent of the site is unknown due to gravel extraction within the area during the late 19th century. Later investigations, at Gränsstigen and Kvarteret Nore north of the 1901–03 excavation area conducted by Malmö Museum indicate that the Late Mesolithic settlement area could have extended in that direction (Salomonsson 1971, pp. 43 ff.; Jonsson pers. com.). The excavation leader at Kvarteret Nore (Jonsson at Malmö Museum) kindly made the artefact material available for this study. Both at the Gränsstigen and the Kvarteret Nore sites artefact material datable to the Early Neolithic have been identified (ibid., pp. 48 ff.).

The stratigraphy at Soldattorpet (Kjellmark 1903, pp. 25 ff.) consisted of several distinct layers. Kjellmark stated that the geological features indicated that Soldattorpet had repeatedly been affected by transgressions of the sea, initially causing temporary abandonment of the site but, in the long run, a final abandonment (ibid, pp. 30 ff.). It seems as if the Littorina transgression did affect the possibility of habitation at the 5 m a.s.l. isarithm curve during the latest part of the Late Mesolithic and the earliest part of the Neolithic period in the Soldattorpet area.

Since distinct, clearly distinguishable, layers were found and documented thoroughly, it is possible to compare the material found in these layers. The lithic material as well as pottery in the upper layer have been dated to the latest part of the Late Mesolithic period and the Early Neolithic period. The lithic artefacts and the pottery within the lower layers have been dated to the later part of the Late Mesolithic period. The faunal material from Soldattorpet is limited but nevertheless comparable to that at Skateholm. Kjellmark mentions that faunal remains from red deer, roe deer, dog and grey seal had been found in the lower layers at Soldattorpet and that bones from domesticated species, cow and sheep/goat, were encountered in the upper layer (ibid., pp. 103 ff.). Bones from wild boar and fish had been found in layers during gravel extraction close to the excavation area at Soldattorpet (ibid., pp. 14 ff.).

The selected artefact material

Danish regional studies suggest that Jutland and Zealand constituted two separate regions, and that there was a close resemblance between Zealand, Bornholm and the east of Scania. This means that southern Scandinavia might be discussed in terms of two large regions divided by the Great Belt, Jutland versus Zealand and Scania. However, it is equally possible that Scania might have constituted a third region (Bergenstråhle 1995, pp. 335 ff.). The shape of the transverse arrowheads has been used as a chronological marker, while the different striking techniques used to manufacture flake axes have been used to distinguish local tradition (Vang Petersen 1984, pp. 7 ff.). Although the dating system has been questioned (Larsson 1986, pp. 25 ff.), no later study has yet been able to disprove the typological and morphological seriation used to distinguish different types. Therefore, the present analysis of the lithic assemblages at Skateholm and Soldattorpet has been based on the criteria described by Vang Petersen in 1979 and 1984 (Vang Petersen 1979, pp. 1 ff.; 1984, pp. 9 ff.). For this selective case study the pottery and a minor part of the lithic material, i.e. the

transverse arrowheads and the flake axes, have been selected for comparison, in order to discuss regional traits and local variability as well as possible interpretations of such traits.

The lithic material

The flake axes found at Skateholm and Soldattorpet display both similar and dissimilar patterns. Judging from the edge angles and the results of the use-wear analysis, several different tasks were performed, such as reed cutting, meat and wood cutting or bone and hide working (Juel-Jensen 1988, p. 175; Knutsson 1976, p. 88, Melin 1998, p. 22). The flake axes thus fulfilled similar functional purposes at the two sites. In spite of this, the shapes of the flake axes differ. The flake axes were classified according to the striking technique used to shape them (Fig. 3), and the two assemblages from Skateholm and Soldattorpet displayed different traits in this respect. At Skateholm I, the symmetrical trimmed flake axes constitute 51% of the material, the asymmetrical trimmed ones amount to 25% and the symmetrical flat-trimmed examples amount to 9% of all the flake axes. A total of 15% of the flake axes is atypical and could not be classified according to the criteria used. This is in sharp contrast to the pattern displayed by the find material from Soldattorpet. Here, a total of 22% of the flake axes are symmetrical trimmed, 44% are asymmetrical trimmed and the symmetrical flat-trimmed flake axes constitute 28% of the find material. Only 6% are atypical. These differences within the find material display a pattern similar to that previously observed in north-eastern Zealand (Vang Petersen 1984, pp. 16 ff.). At Skateholm, the symmetrical trimmed axes dominate but at Soldattorpet the asymmetrical trimmed flake axes constitute the major part of the material. Within the flake axes local traits in the striking technique are thus observable.

Adding to this, the flake axes with a broad edge, the Møn type, are more frequent in the Soldattorpet area while the small flake axes, the miniature flake axes, are more frequent in the Skateholm area.

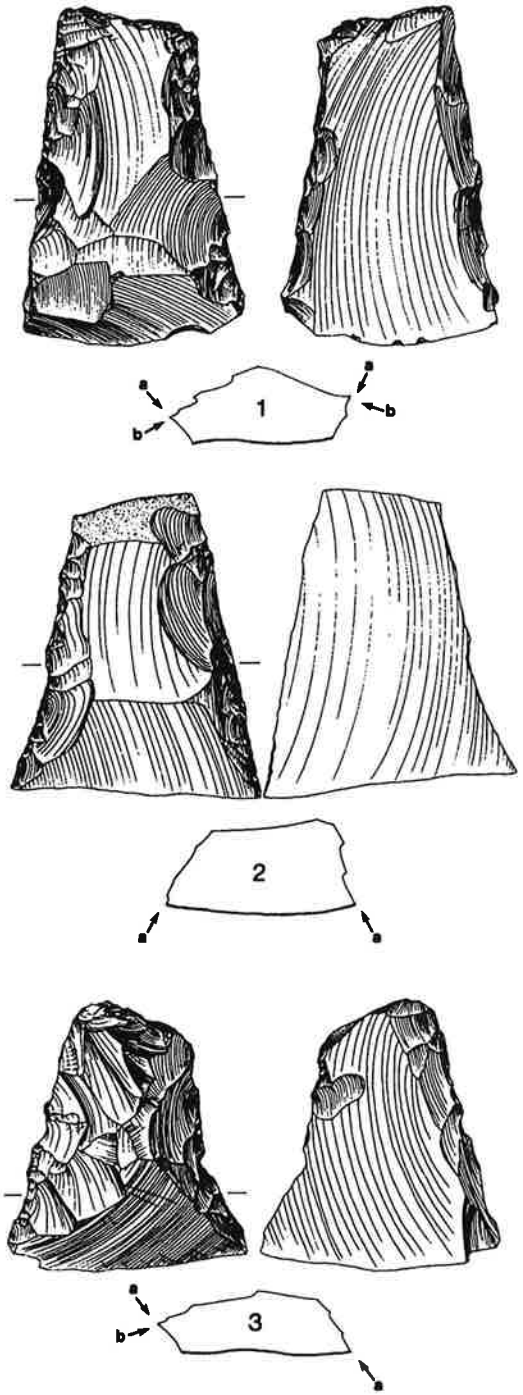

Fig. 3. The Late Mesolithic flake axes can be separated into 3 main types according to the shaping technique: 1. Symmetrical, flat-trimmed axes. 2. Symmetrical, side-trimmed axes. 3. Asymmetrical, trimmed axes (reprinted with permission after Vang Petersen 1984; Koch Nielsen 1987, part 2:3.

Miniature flake axes have since long been noticed within the Late Mesolithic artefact material in southern Scandinavia (Lidén 1938, pp. 77 ff.; Mathiassen 1948, p. 57). Lidén pointed out that few had been found in Scanian material assemblages but that they had been frequent at one site in Blekinge. Mathiassen also stated that they were rare, and because of their size he characterized them as toys. This artefact category is rather frequent in both numbers and percentage at Skateholm, and a limited number have also been identified in the Soldattorpet material.

An interesting problem concerning the classification of transverse arrowheads and flake axes is how to draw the line between small flake axes and large arrowheads. The length between the cutting edge and the neck of the flake axe has often been used to separate transverse arrowheads from flake axes (Andersen *et al.* 1978, p. 230; Vang Petersen 1993, pp. 88 ff.). A functional aspect of those which have been classified as large arrowheads is that specimens which are 7 mm or thicker do not seem to be suitable for insertion as arrowheads in the type of wooden shafts (Andersen 1981, pp. 129 ff.; 1999, pp. 24 ff.) known from the Mesolithic. Thus the thickness has been tested as a criterion to distinguish between arrowheads and miniature flake axes. In order to determine whether such miniature flake axes had been used as axes or arrowheads, a use-wear study (using HPA, Jensen 1994, pp. 12 ff.) on original miniature flake axes was undertaken. The analysis of six miniature flake axes from Skateholm showed that three had been used for reed cutting or wood/skin working while the other three probably had been used as flake axes but on undetermined material (Melin 1998, pp. 22 ff.). This result was in accordance with earlier investigations concerning the use-wear pattern of flake axes, including a miniature flake axe, from Skateholm (Juel-Jensen 1988, p. 175).

The use-wear investigation carried out on the Skateholm material indicates that miniature flake axes were used as proper tools instead of toys. The relatively large amount of them at Skateholm could be a local trait, but a source-critical aspect is that miniature flake axes might have been classified as large transverse arrowheads in other artefact assemblages. Therefore, it is difficult to draw any far-reaching conclusions from this preliminary study.

Using the transverse arrowheads as a dating method it is indicated that the Skateholm II site is older than the other sites. It is also indicated that the Skateholm I site was inhabited for a longer period than both Skateholm III and Soldattorpet (including Kvarteret Nore). The results from Skateholm are in accordance with both the radiocarbon results from that area and the possibility of inhabiting the different sites judging from their respective height above sea level (Bergenstråhle 1995, pp. 335 ff.). It is also in accordance with the presence/absence of pottery at the different sites at Skateholm and at Soldattorpet. The analysis of the relative proportion of transverse arrowheads suggests that all four phases were represented at Skateholm I and that the Stationsvej and Aalkistebro phases were represented in the material at Skateholm III. The transverse arrowheads from Soldattorpet belong to the Trylleskov, the Stationsvej and the Aalkistebro phases, although with a marked emphasis on the latter two. The limited number of arrowheads from Kvarteret Nore is actually too small to draw any conclusions from, but the transverse arrowheads belonging to the Trylleskov and the Aalkistebro phases seem to dominate in that material.

The lithic material from Skateholm and Soldattorpet indicates that previously suggested differences and similarities concerning regional and local variation (Vang Petersen 1984, pp. 10 ff.) are also visible in Scania. The function of the flake axes, the faunal assemblages, and the location of the settlements at Skateholm and Soldattorpet are similar. In spite of this, the striking technique and the form of the flake axes differ between the two areas. It is possible that this artefact category was both produced and used locally and therefore differs. It has been suggested that the pattern displays a social and territorial division. The question is whether the majority of the flake axes were deliberately produced to function as such a symbol

(emblemic style). The flake axes seem to have functioned as ordinary everyday tools used to carry out several daily tasks and probably most often locally. Thus, they might have had less conscious symbolic value than items brought by humans over larger distances. A relatively close examination of the flake axes is needed in order to detect differences in the striking techniques used. Therefore, it is possible that the flake axes may be best explained by different isochrestic options, determined by local traditions at the two sites (Sackett 1982). An exception to that pattern might be constituted by the flake axes which are easily distinguished due to distinct size or shape, i.e. the miniature flake axes and the Møn type.

It is possible that the items that held a conscious symbolic value, displaying group membership, are those that had a distinct and easily recognizable form. It might have been equally important to underline a common tradition over large areas to facilitate contact between local groups when humans were involved in distant activities outside the local settlement area as it was to display a local heritage (Raemaekers forthcoming).

The highly elaborated, strong tradition within the stylistic change of the arrowheads, occurring over large areas seemingly instantly, might display such a conscious common symbolic language. Although hunting probably at no time during the Late Mesolithic period plays an economically important role as a source of food, it provided necessary raw materials. The large mammals provided bone, antler and hides, which supposedly had a high economic and social value in contrast to the less important meat. Although meat most probably was not a crucial food resource, the procurement of meat as well as the redistribution might have fulfilled an important social role within the society. The danger involved in hunting and travelling over large areas might have led to a social manipulation. Thus, the humans themselves might consciously have chosen to encode a mutual social language in tools used during such activities in order to display that they were part of a larger interrelated social community. The stylistic manipulation of arrowheads took place during the whole Mesolithic period and as such might display a common concept of a symbolic tradition dating back to the Late Palaeolithic, when hunting probably also played an important economic role for providing the stable food resources. Man the hunter may have been a common idealized symbolic perception which provided an identity and social common network all over southern Scandinavia (Bergenstråhle forthcoming).

The decline in the elaboration of the styles of arrowheads in the latest phase could be explained as a diminishing emphasis on the social and mythical role played by the act of hunting within society. As new ideas were brought into the society it is plausible that the social role of the hunt became less important and therefore the arrowheads became less elaborated after the end of the Late Mesolithic period.

The pottery

The history of the pottery craft seems to consist of long periods of routine production governed by traditions interspersed with short periods of intense experimenting and change in order to satisfy new needs for pottery objects or to solve problems arising from the change of raw materials (Rice 1984; Stilborg 1995). To put it another way, instances of rearrangement of the *chaîne opératoire* conserve as much as possible of the *habitus*. Too much change too fast may cause severe problems (Stilborg 1997, pp. 20 f.). In consequence, the opportunities to observe such changes in the fragments of the past material culture preserved are very limited. In the emergent or changing craft the different elements making up the pottery craft tradition are not fully integrated. By comparison with the established pottery craft tradition of the ensuing period, this gives us an opportunity to study the process itself of integrating the different elements of the craft. Was the choice of raw materials adapted to the shape of the vessel? To what degree were details of shaping and ornamentation integrated with vessel types, forming techniques and raw materials?

The Ertebølle pottery during the Late Mesolithic period

In the Late Mesolithic of southern Scandinavia (*c.* 5000–4500 BC) pottery was first introduced into the Ertebølle-culture. The idea of making pottery and the knowledge of the basic raw materials reached southern Scandinavia from the south (Hulthén 1977, pp. 49 f.), but the technology of building the pots, and indeed the skills to do it, had to be developed by the Ertebølle people themselves. The study of the pottery from this period therefore gives a unique opportunity to follow the stages in the process leading up to the craft with clear traditions of the ensuing period.

Of the two vessel types predominant in the ERT – the S-shaped beaker and the lamp (Fig. 4, Hulthén 1977, pp. 23 f.) – the former was most often build of coils in the H technique, pressing a new coil vertically down on to the preceding one with the fingertips (Fig. 5; Kjellmark 1903, p. 83; Andersen 1975, pp. 56 f.; Hulthén 1977, pp. 26 ff.). Some pots were coil build using the U technique, smoothing down the sides of the coil on to the preceding one. Both methods and especially the H technique tend to produce very thick vessel walls. The lamp was modelled from a lump.

The wares of the vessels analysed from southern Sweden were made from a variety of fine to very coarse clays tempered with crushed rock or sand in greatly varying qualities. The lamps were often made from fine calciferous clays tempered with organic material in addition to either crushed stone or grog. The relation between this ware and the function as lard lamps as well as the evi-

Fig. 4. Pointed-based vessel and lamp (photo reproduced with kind permision of Nationalmuseet, København).

dence it provides of contact with the Linear Band Ceramic Cultures to the south was thoroughly discussed by Birgitta Hulthén (ibid, pp. 48 f.; 1980). Regional variations are evident in the shape of the beakers and the building technique. H technique and extremely pointed bases are dominant in the eastern parts while U technique and more elegantly shaped bases are the most usual in the western parts of southern Scandinavia (ibid., p. 39).

In the Early Neolithic,[2] the H technique was no longer used and the U technique only sporadically so, while by far the majority of the ceramic vessels of this period were coil-built in the N technique. Using this technique, one side of the coil is smoothed downwards on the preceding coil while material from the latter is drawn up on the other side of the new coil. This technique probably also incorporated a final shaping and strengthening of the bonding between the coils in the vessel wall, using paddle and anvil or pressing and scraping (A. Lindahl pers. com). The N technique made it possible to make thinner vessel walls and probably also increased the shaping possibilities.

The post-doctoral research[3] on which the present discussion of the pottery is based aims to increase our knowledge of development in the emergent pottery craft at a few specific Scanian sites with good relative chronology.

Material

In 1901–2, Kjellmark investigated two main occupation layers at Soldattorpet, both containing a fair amount of pottery. His thorough analysis of the finds, which resulted in a thesis in 1903 (Bergenstråhle & Stilborg 2000), encompassed both a geological/ceramological investigation of the pottery wares and an analysis of plant imprints in the pottery.

Excavations at the Skateholm Late Mesolithic sites took place in the period 1980 to 1985 (Larsson 1988). Pottery has been found in preserved occupation layers of varying thickness at four of the sites: Skateholm I, III, VI and IX. At Skateholm I the pottery was also found in pits and in a hut structure. No pottery was found in the graves. Material from Skateholm I and III was included in the present research.

The Ertebølle pottery material is both small and very fragmented. At both Skateholm I and III around 1 kg of pottery was found. The lower level (e) and the upper level (c) in the 1901 trench at Soldattorpet contain slightly more – 1.6 and 1.8 kg respectively. The total material from the 1902 trench was 1.2 kg.

Different levels of variation

In order to analyse the development of a tradition,

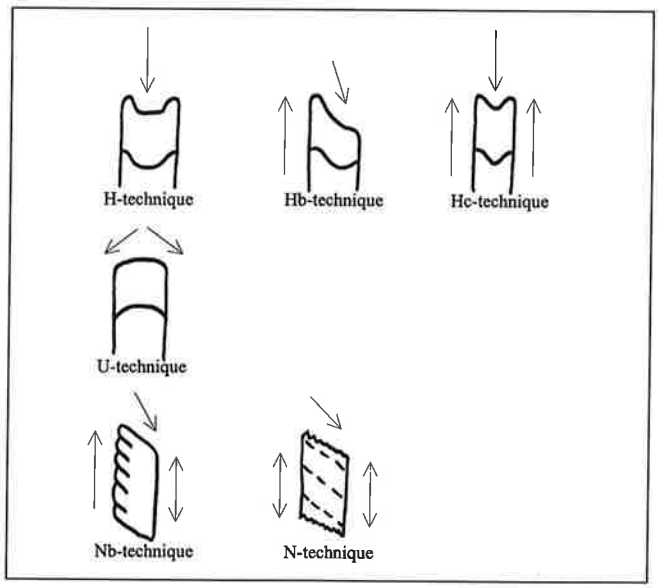

Fig. 5. Illustration of the different vessel building techniques represented in the Late Mesolithic ceramic material.

the different elements of the *chaîne opératoire* and their variation must first be viewed separately, facilitating an appreciation of the degree of integration between them.

The wares

The recording of the ERT pottery from the Skateholm sites and the Soldattorpet site to a large extent confirmed the results of earlier research. The quality of clay chosen as well as the grain size and amount of temper added showed wide variation from very coarse to very fine. Furthermore, contrary to what became usual later on in prehistory (Hulthén 1977, p. 82; Stilborg 1997, pp. 148 f.), there was no apparent connection between vessel-wall thickness and temper quality. At Soldattorpet even the choice of temper type varied, ranging from different types of crushed granite and quartzite to sandstone.

In contrast, Eva Koch Nielsen sees a more limited variation in temper densities for the Zealand ERT pots compared to the Early Neolithic TRB pots (Koch Nielsen 1986, p. 109). In the pottery from south-west Scania there is rather more than less variation in the temper density of the ERT pots compared to the EN pottery. A tendency towards generally smaller stone tempering grains in the EN compared to the ERT pottery is found both in Scania and on Zealand.

The building techniques

Generally speaking, H-building techniques were used for ERT materials at both Soldattorpet and Skateholm (except for the modelled lamps), while the later pottery from the upper stratum at Soldattorpet and from Skateholm III was almost exclusively made using the N-coil building method. H technique was used for 43% of the pottery at Skateholm I and for 52% of the pottery in the lowest level (Layer e) at Soldattorpet. Individual idiosyncrasies of the different potters are revealed in the choice between working from the outside or the inside of the pot, in the angle of the hand in relation to the circumference of the pot and in single or repeated vertical pressures on the coil.

Furthermore, detailed recording of the ERT pottery revealed at least two variations on the rather primitive H-technology, which reduced the thickness of the vessel walls (Fig. 6). The first – Hb – could be described as a slanting H technique. The pressure of the fingers was angled out-

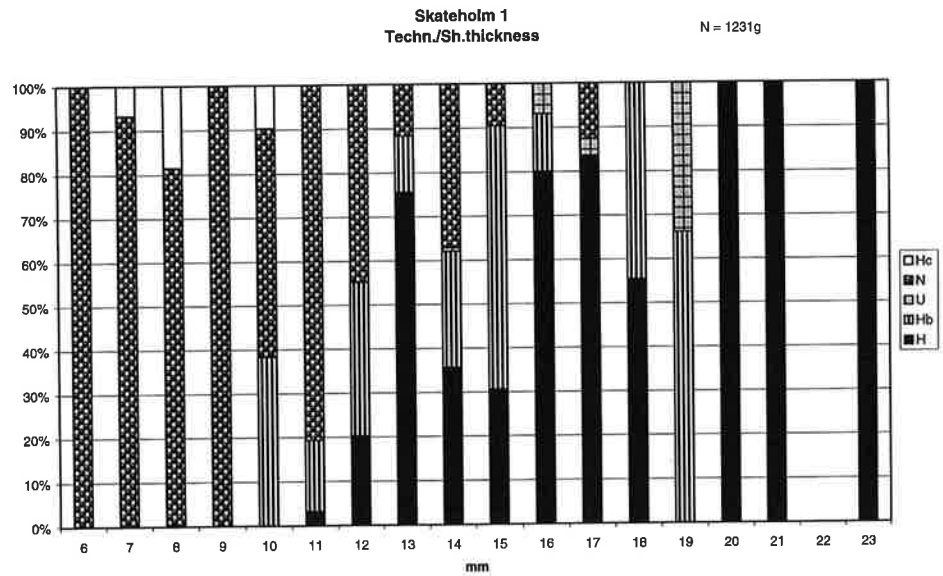

Fig. 6. The frequency of different building techniques within sherd thickness classes.

wards, while material from the preceding coil was drawn up on to the inside of the new coil. This reduced the thickness of the vessel wall somewhat and also provided a broader contact area between the coils. It is related to the N technique, but differs through the visible marks of fingertips on the upper edge and the undulating profile of the lower edge of each coil. In some cases, the Hb technique is combined with ordinary H technique making a smooth transition. The Hb technique was used for about 25% of the ERT pottery excavated at Skateholm I and is also fairly well represented in the lowest level (Layer e) at Soldattorpet (approx. 11%). The slanting H technique has also been observed by Eva Koch Nielsen (1986, p. 110) on a number of whole/large fragments of ERT vessels from Zealand. She, however, identifies the technique as a variant occurring exclusively in concave neck sherds and conditioned by the curvature. A test of this supposition on the Scanian material revealed that while neck sherds are represented among the Hb technique sherds, the frequency in relation to body sherds is not larger than in other materials made in other techniques. The Hb technique does not seem to be used primarily for necks on the Scanian ERT pots.

The other H technique variant – Hc – succeeded in producing thinner vessel walls by applying a vertical pressure on the coil but only using the very tips of one or two fingers while at the same time drawing up material on both sides with the other fingers. This technique, however, is only found in about 4% of the sherds at Skateholm and is even rarer in the material from Soldattorpet – about 1% in layer e.

More than a quarter of the sherds at Skateholm I were made using the N technique. However, since the Mesolithic layer was not sealed off, these sherds might very well be later in date. Indeed, one small body sherd is ornamented with vertical grooves in a way normally dated to the last phase of the Early Neolithic. At Soldattorpet only 9% N technique sherds were found in layer e. On the other hand, a small group of sherds at Skateholm I and more than 16% of the sherds in layer e at Soldattorpet were made using a very crude form of N technique. The technique is characterized by a homogenized outer part and cracks between the coils in the inner half of the vessel wall. One sherd at Skateholm I and several at Soldattorpet, furthermore, bore a typical ERT ornament. This indicates that the transition to the N technique began before the start of the Early Neolithic. Kristina Jennbert, in her analysis (1984, pp. 49 f.) of material from the large site at Löddesborg, Scania, observed a very long period of coexistence between the different ERT techniques and the N technique. A least some of the sherds identified as N technique at Löddesborg are presumably made in what is here termed slanting H technique and crude N technique.

A few of the sherds in crude N technique from Soldattorpet bear traces which might give a clue to the transition from this stage to the pure N technique. In addition to the shallow impressions of the traditional ornamentation, they also carry some even more ephemeral oval impressions oriented diagonally over most of the outer surface. They may be the traces of secondary beating of the outside of the vessel. Since marks of this kind are not seen on the later pottery, another method – presumably scraping and pressing – for strengthening the coil bonding must have been preferred.

The shapes

There seems to be only little variation in the shape of the pots. The material from both sites is highly fragmented, but the few larger pieces preserved and the few rim sherds are all from S-shaped, pointed-based beakers. A couple of sherds with vertical and inverted rims at Skateholm I are made in N technique and may be later in date. However, in the ERT material from Jutland (Andersen 1975, pp. 58 f.) vessels with inverted rims appear as well. From Ivetofta (Hulthén 1977, p. 38) a necked globular vessel is known. One sherd from Soldattorpet (layer e) and one sherd from Mölleholmen in central southern Scania (Kelm 1994, p. 24) may be other examples of globular vessels. The better-preserved material from Jutland indicates three size groups for the beakers – small

(height 8–10, rim diam. 5–6 cm.), medium (height 20–30 cm, rim diam. 10–15 cm) and large (height 40–50 cm. rim diam. 15–20 cm) (Andersen 1975, p. 59; 1998, p. 39) – of which at least the latter is represented at Skateholm. The medium and the large group are represented at Soldattorpet.

Macrofossil and chemical analyses (Arrhenius 1984; Arrhenius *et al.* 1989) have been performed on charred remains from the inside of one of the larger beakers from Denmark. The results indicate fermenting as the most probable use for this vessel. The analyses of protein, amino acids and trace elements suggested that blood and nuts had been essential components in this particular dish. One important product which comes to mind when talking about fermentation is of course beer. Several scientists (e.g. Jennbert 1984, p. 147; Katz & Maytag 1991) have pointed to the fact that the most logical use of the small amounts of seed acquired from farming communities would have been for making beer. In fact, this introduction of a fermented drink as a high-status phenomenon at important social gatherings might even be the very reason behind the introduction of farming to Northern Europe.

The ornamentation

Traditionally, ornamentation has been described as sparse. Only a few vessels per site bore either a single row of nail or finger imprints, Ringkloster in Jutland being a marked exception with more complex ornamentation on 2% of the sherds (Hulthén 1977, p. 36; Andersen 1998, p. 42; Raemaekers 1997; Stilborg 1999). However, at Löddesborg around 15% of the pottery is ornamented (Jennbert 1984, pp. 54 ff.) and at the two sites discussed here the frequency of ornamented sherds is as high as 30–40%.

With the exception of the occasional nail and/or finger imprints on the rim, the beakers at Skateholm and Soldattorpet are ornamented with rows of shallow, elliptical to more rounded oval impressions. According to Kjellmark's meticulous study of the ornaments at Soldattorpet, the impressions vary in size from 3 x 2 mm to 7.5 x 4.5 mm. They are aligned in rows – often vertical – with the narrow ends towards each other and an average distance of 4–6 mm. In some cases, however, the impressions overlap (Kjellmark 1903, p. 85 and unpubl. notes). Judging from larger ornamented fragments, the rows of impressions cover the whole body of the beaker. At Sol-

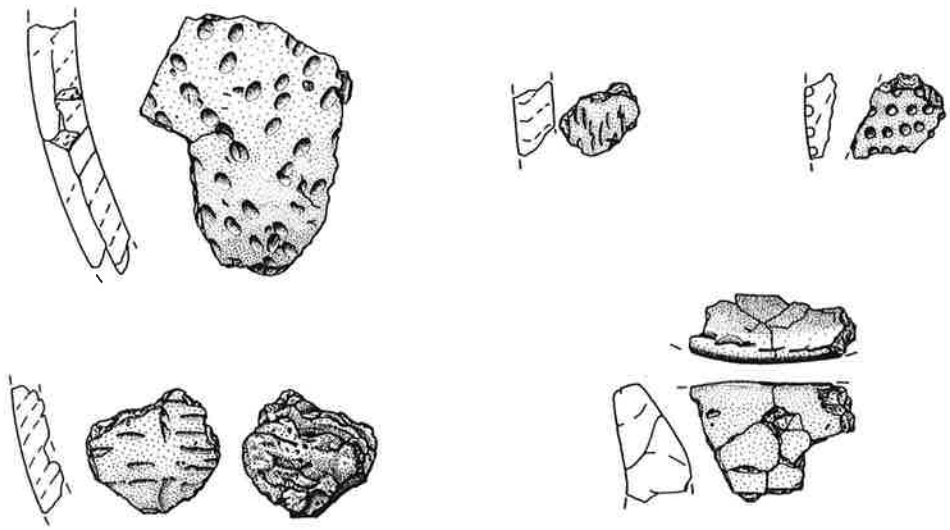

Fig. 7. Ornamented sherds representative of the range of body and rim ornaments at Skateholm and Soldattorpet (Koch Nielsen 1987, part 1:2).

dattorpet some sherds have small, almost rectangular impressions. This is most likely due to distortion of originally elliptical impressions by an ensuing smoothing of the outer surface. At Skateholm exactly the same type – from elliptical to oval – and the same sizes of impressions appear. As in the Soldattorpet material, they are often arranged in rows over the whole body of the vessel, but the rows may be slanting and even chevron-like as well as vertical (Fig. 7). Unlike Soldattorpet, the impressions may also be placed with the broad sides to each other.

At both Skateholm and Soldattorpet this type of ornamentation is found exclusively on pottery made in the H and U techniques, with the exception of one sherd at Skateholm I made in the crude N technique. This means that there is a definite coherence between building technique and ornamentation – in terms of both elements and composition.

At Löddesborg (Jennbert 1984, p. 58), the same types of ornaments dominate, but several other sherds are instead ornamented with lines of deep round impressions made with a thin stick (diam. 1.5–3 mm). There are even examples of sherds where the shallow oval/elliptical impressions are overlain by lines of these impressions. Thus, the same group of people most likely made both types of pottery. One sherd ornamented with deep round impressions was found at Skateholm I. This type of ornamentation otherwise has its closest parallels on Jutland (ibid.).

While it is never possible to reach any definite answers as to the origin of and reasons behind prehistoric ornaments, it is interesting to speculate. Kjellmark in 1903 thought the rows of shallow oval impressions might symbolize or be inspired by footprints in the sand of the raised beach. An equally possible explanation could be that they relate to the shape of the wheat and barley grains being introduced to southern Scandinavia from the LBK cultures at the same time. No imprints of grains were found on ERT pottery either at Soldattorpet (Kjellmark 1903, pp. 100 ff.) or at Skateholm I, but a few imprints of barley and wheat were identified on ERT sherds from Löddesborg (Jennbert 1984, p. 93). Ethnographic records tell us that ornaments are often seen as protection against impurity (e.g. in the Swahili culture, Donley-Reid 1990, p. 56) and what would be more important than to protect the brew made from the precious, imported grains?

Comparable ornamentation consisting of lines of impressions, but made with the fingertips and nails or spatula are common at ERT sites in northern Germany (Rosenhof, see Schwabedissen 1972, p. 6) and in the Swifterband culture in Holland (de Roever 1979, pp. 16 f.; Raemaekers 1999, p. 53). It is quite possible that the ornaments of the Scanian ERT were just an emulation of this ornamentation, for which the original inspiration may have come from the LBK pottery, as did the very idea of making pottery. There are examples of dot-line ornaments on LBK pots, for example, from eastern Germany (Behrens 1973, pp, 28, 245). An argument against a direct influence on Scanian ERT is that with the exception of the necked globular vessel from Ivetofta (Hulthén 1977, pp. 38 f.) and possibly one other similar vessel from Soldattorpet, no attempts seem to have been made by ERT people to copy the shapes of the LBK pottery.

The firing

From the thermal analyses performed by Hulthén (1977, p. 37), and judging from the variation in firing colour on the surface and core of the sherds from Soldattorpet, the ERT pots seem to have been fired in an open bonfire to a temperature of max 500–600 °C some for not more than half an hour, others longer. At Skateholm, however, some sherds may, pending analyses, have been fired to higher temperatures and for a somewhat longer period of time.

The ERT pottery craft

The ERT pottery craft in the eastern part of southern Scandinavia was characterized both locally and regionally by large variation in the choice of clay and temper. Together with large variation in the choice of temper quality and in the techniques used for building the pots, this was set against

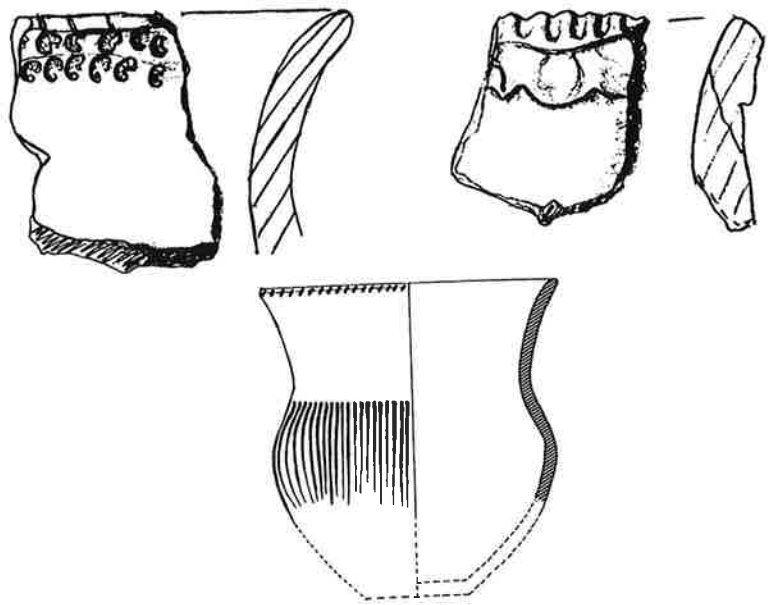

Fig. 8. Ornamentation on pottery from the upper strata at Soldattorpet and from Skateholm III and an illustration of the typical location of the ornaments (funnel beaker reproduced after Hulthén 1977).

a very limited variation with respect to vessel shape and ornamentation.

The establishment of a craft tradition

At both sites, the later pottery – the upper layers at Soldattorpet and Skateholm III – clearly deviates from the ERT pottery. The immediate impression is one of standardization and homogenization – an impression that is confirmed by the recording of the material.

The wares

Even if there is still variation in the coarseness of the clay chosen for pottery production, the very coarse clays are now avoided. For tempering, quartzite is used almost exclusively at Skateholm III, while granite is the usual choice at Soldattorpet. With respect to the quality of the temper, the whole range from natural coarse clays without any added temper to coarse stone tempering with maximum grain size 7 mm is still used. However, the frequency of the extremes of this range has decreased – from 18 and 21% respectively in the ERT pottery to 1 and 2% in the Early Neolithic material at Skateholm III. Furthermore, there is now a clear association between the temper quality and the vessel wall thickness/size of the vessel. The thicker the walls or the larger the vessel, the coarser the temper added.

The building technique

With the exception of some sherds made in H technique and its variations, all of the pottery at Skateholm III and half the pottery in the upper stratum at Soldattorpet is coil-built using the N technique. The technique includes a thorough scraping and pressing to increase the bonding of the coils. In relation to the earlier pottery, this technique resulted in a decrease in the average wall thickness from 14.7 mm at Skateholm I to 9.1 mm at Skateholm III. At Soldattorpet the change was from 14.6 mm in layer e to 9.1 mm for the N technique sherds in layer c. Even if this change is also dependent on the appearance of new types of small vessels, one may readily imagine how much easier it must have been to handle vessels that were almost 33% lighter.

The shapes

Besides the usual funnel beakers, sherds of vessels

with inverted rims have been found at Skateholm III. Both fairly large vessels with rim diameters around 26–28 cm and very small vessels with rim diameters around 5–6 cm are represented. Only flat bases have been observed. Several handles appear. Certainly, the crockery must have continued to serve storage, cooking and/or fermenting functions, but more knowledge is needed about the actual use of the pottery.

The ornamentation

While excluding the oval impressions of the earlier ERT pottery on the N technique sherds, the number of elements used in the ornamentation has increased considerably both at Skateholm III and in the upper stratum of Soldattorpet (Fig. 8). It includes impressions with a round stick, fingernails and with the ends of different animal bones, as well as vertical incised lines, cord stamps, vertical cordons, and "Furchenstich". The sherds are very small and the designs difficult to make out, but they do not seem to be different from what is known from the earliest EN pottery. The "classic" design of the funnel beakers incorporates one or two horizontal lines of decoration on or just below the rim and vertical incised lines or cord stamps on the body (Hulthén 1977, pp. 70 f.). However, the context represented by the other finds at Skateholm III is Late Mesolithic (see the section on the flint material).

The firing

Neither the firing technology and the temperatures reached nor the length of the firing seems to have undergone any changes between the two phases of pottery making.

The establishment of traditions and the socialization of objects

What characterizes the emergent *tradition(s)*/the establishment of *habitus* is a narrower choice of raw materials, a more conscious use of different temper qualities for different sizes of vessels, one superior building technique, more vessel types and more variation in the decoration of the vessels (Fig. 9). Most of theses changes are perfectly understandable in terms of better control of the craft and its products, reduced consumption of raw materials, a larger repertoire of shapes and per-

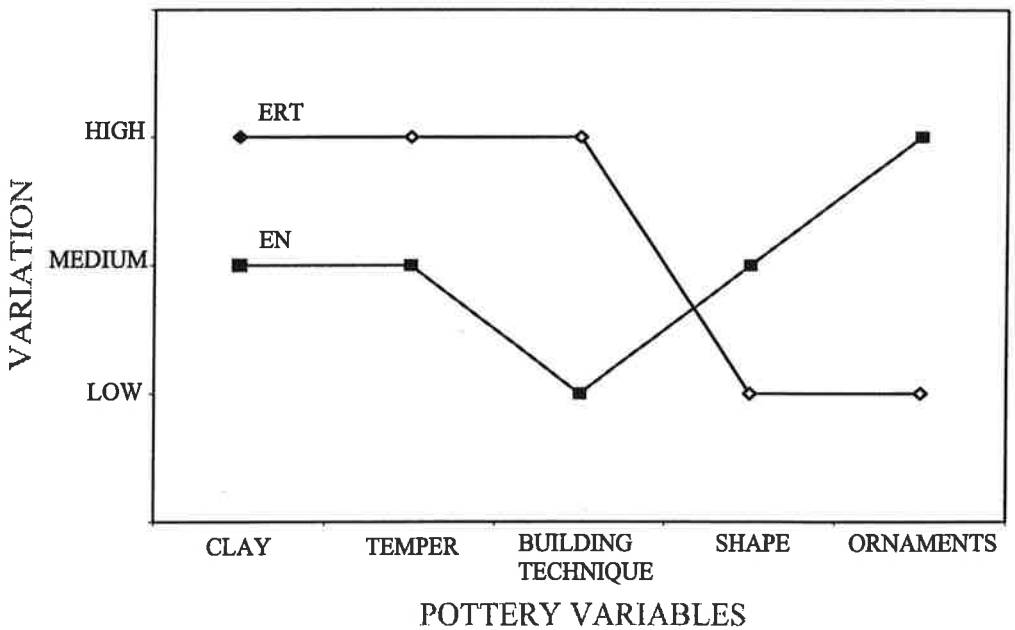

Fig. 9. The relative changes in variability in a series of pottery variables between the Ertebølle culture and the Early Neolithic culture(s).

haps first and foremost – lighter vessels.

There is no comparable practical explanation for the change in ornamentation. One can only assume that the oval/elliptical impressions were inextricably associated with the thick walled ERT beakers and perhaps their function and disappeared with them. One possible association might be that these beakers were made and used for making beer of barley imported from the south and that the impressions on the surface emulated the shape of the grains. If this function lost its importance or was transferred to another type of container, the ornamentation might very well have disappeared with the old container.

Another explanation for this change, admittedly more speculative, could be that it marks the acceptance of the pottery into the social realm. The general impression presented by the products of the early ERT pottery craft is one of a clearly defined and delineated entity. As a novelty the pot as a concept was inextricably linked to its shape and ornamentation. It was accepted and used within society, but was not yet a social object, which could be manipulated and given local or individual shapes and ornaments (Magnusson Staaf 2000). The change in the later phase meant that the craft became more standardized while shape and ornaments became more variable and thereby open to social manipulations. It was now embedded through *habitus* and *practice.*

Changing social landscapes

The choice of who we regard as proper people, with whom we want to interact, and who we don't and therefore avoid, is an important factor in our decisions as to what we like and how we do things. Using the things we choose to surround us with and the way we have chosen to make them, we can situate ourselves in the different spheres of the human social environment. Furthermore, we can do it discreetly (and perhaps unknowingly) within the realm of the hidden technology behind the objects (the isochrestic style or micro styles in the *chaîne opératoire*) as well as ostentatiously in the shape, ornaments and colours for all to see (the emblemic style). A prerequisite, however, is that the objects and their production are first incorporated into the society.

Accepting this general idea, it is possible to interpret distributions of different craft techniques or different shapes and/or ornaments as different spheres of interaction between people (Livingstone-Smith 2000). Social landscapes are forever changing with the vagrancy of human social strategies (Maceachern 1998; Dietler & Herbich 1998). In the studies presented above, varying distributions of technologies and objects of pottery and flint at Skateholm and Soldattorpet indicate the existence of different and changing social networks in the eastern parts of southern Scandinavia.

In an older part of the period covered by the habitation at Soldattorpet and Skateholm I, the synchronous development in the transverse arrowheads in Scania and the eastern part of Zealand speaks for close contact between hunters – very likely connected to the mythical, social role of the hunt. In contrast to the paraphernalia of this extrovert activity, the variation in the shaping technology of the flake axes used in daily profane activities reveals the strictly local spheres of interaction. Even if the range of optional technological solutions is universal, the isochrestic options are determined by local traditions. As with the Lou example, congruence within these traditions is first and foremost the result of basic spheres of contact between people (Dietler & Herbich 1998, p. 253).

The emergence of pottery craft at Skateholm and Soldattorpet actually tells the same story. The sizes and shapes of the pots may be found in the whole of south-eastern Scandinavia, while the surface-covering ornamentation of oval impressions delineates a regional group in south-western Scania – separate from eastern Zealand as well as eastern Scania. Rather, contacts to the south across the Baltic Sea may have been active. Again, the technological choices – in this case the different preferences of coil-building techniques – reveal the local spheres.

Through time these landscapes change. Less

emphasis on the precise designs of the transverse arrowheads by the end of the Late Mesolithic may mean that the mythical role of the hunt was declining and with it the interaction spheres it created. With the establishment of the N technique in the pottery craft, the local technological differences were diminished, while at the same time the increased range of vessel types and especially the much greater complexity of the ornamental design facilitated new expressions of local identity and social strategies. The contact between the people of the Skateholm area and the people of the Soldattorpet area was no longer visible in the similarities of the pottery, nor did differences in the flint craft separate them.

Notes

1. An approach similar to the concept of *chaîne opératoire* has been a key element of the analytical work at the Laboratory for Ceramic Research, Lund University, for 25 years, based primarily on experiences of the craft itself.
2. The pottery of the ensuing Early Neolithic period forms a logical comparison for the ERT pottery. Pottery with some of the characteristics normally assigned to EN was found at Skateholm III together with ERT-type flint tools. Whether this pottery should in fact be taken as very early EN pottery or as technologically advanced ERT pottery is not yet clear.
3. The study was financed by the Birgitta and Gad Rausing Foundation.

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