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A PRELIMINARY ANALYSIS OF THE CERAMICS OF THE RUHTINANSALMI DWELLING-SITE COMPLEX IN KAINUU, NORTHERN FINLAND

Abstract

The principal aim of this article is to present the ceramic material found at the Ruhtinansalmi dwelling-site complex in Suomussalmi parish including material from Northern Finland in general. Six dwelling-sites in Ruhtinansalmi are rich in ceramics – maybe because of their advantageous geographical position. The chronological range of the ceramics covers a period from c. 4100 BC to the Iron Age c. 300 AD. The availability and use of raw and temper materials are central considerations. Classification and the use of numerical methods are discussed at the end of this article.

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1. INTRODUCTION

The Ruhtinansalmi dwelling-site complex in Suomussalmi is situated in the north-eastern part of the Kainuu region on the upper reaches of the Lake Oulujärvi water system. This complex consists of six sites: Kellolaisten tuli, Kalmosärkkä N, Kalmosärkkä S, Mikonsärkkä, Nuolisärkkä, and Maikonsärkkä of Lake Kylmäjärvi. The present water-level (Fig. 1) at Ruhtinansalmi has been raised, following the regulation of Lake Kiantajärvi in the late 1950s, and is now at the same level as in Lake Kiantajärvi. Because of this, the Kellolaisten tuli and Maikonsärkkä sites have almost completely been washed away, and Mikonsärkkä and Nuolisärkkä are also threatened. Kalmosärkkä is in better condition, as both ends of the site are shielded from the waves of Lake Kylmäjärvi by a stone wall.

The sand formations at Ruhtinansalmi can be morphologically classified as curving sandy ridges, with the concave sides opening to the north-west. The origin of these formations is linked with ice flow and its main directions in this region (Saarnisto & Peltoniemi 1984). Following deglaciation they have changed into eolic sand hills, which have stagnated into fossil dunes because of vegetation. Kalmosärkkä, Mikonsärkkä and Nuolisärkkä are formations of this kind, in which the curved form is clearly visible.

The easternmost part of the Kainuu region is situated in the so-called supra-aquatic area, above the former elevations of the Baltic. Because of the small size of Lake Kylmäjärvi shore displacement has had no practical effect on shorelines, and therefore offers no help in dating dwelling sites.

Ruhtinansalmi first became known to archaeologists in the mid-1950s, when Martti Manner, a local school teacher, and his pupils found a number of stone artefacts which were forwarded to the Archaeological Commission, the predecessor of the present National Board of Antiquities. Because of planned hydroelectric projects in the vicinity of Lakes Kiantajärvi and Vuokkijärvi, an archaeological survey was carried out along the shores of these lakes by Matti Huurre in the summers of 1957 and 1958. In 1958, Huurre organized the first excavations at Kalmosärkkä S and Kellolaisten tuli. Field work was continued in 1959 at Kellolaisten tuli and Kalmosärkkä N and S. When water levels were low in the early summer months, artefacts and pot sherds could be collected at Mikonsärkkä, Nuolisärkkä, and Maikonsärkkä. The water

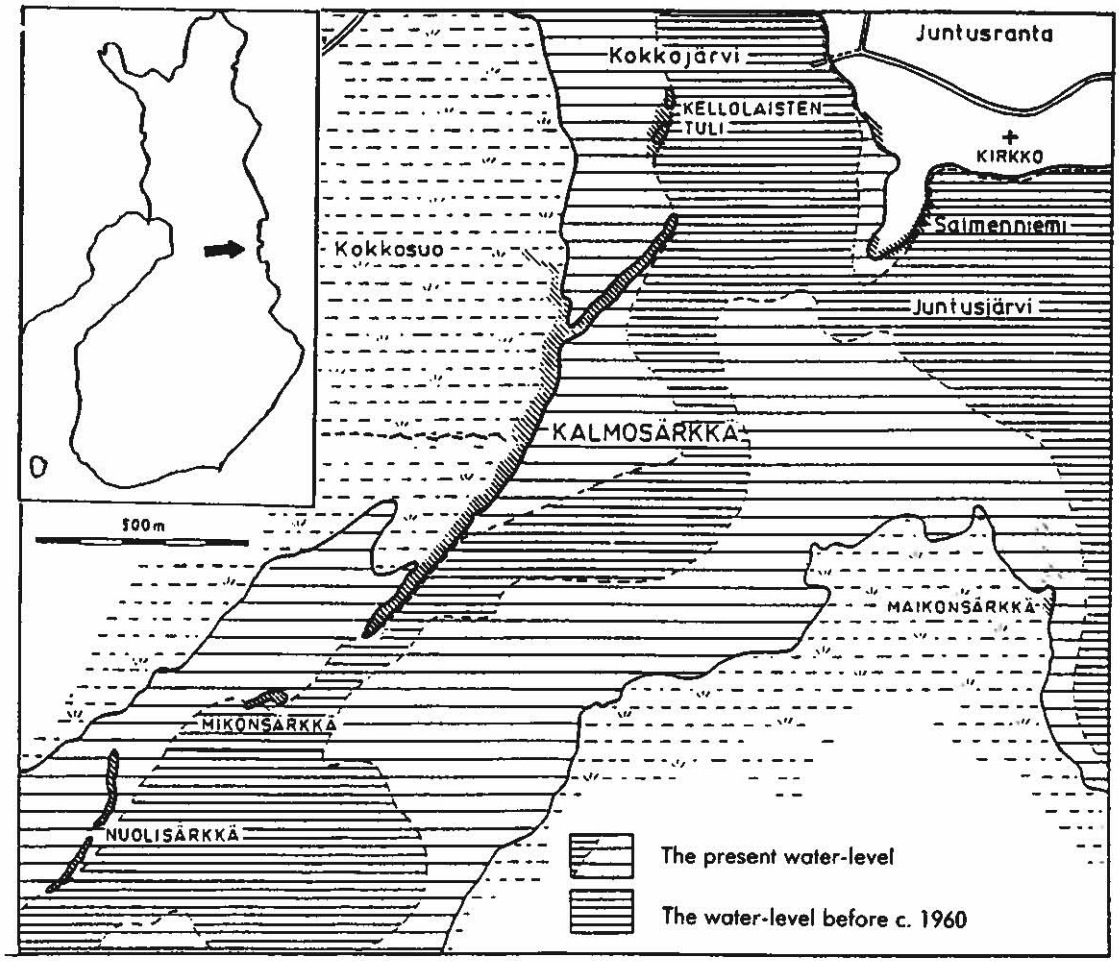

Fig. 1. The Ruhtinansalmi dwelling-site complex.

level has been raised after these excavations, but field work was still carried out at Nuolisärkkä by Huurre in 1975 and at Mikonsärkkä by Päivi Kontio in 1991.

However, the main intensity of prehistoric settlement in the Ruhtinansalmi complex appears to have been in the Neolithic and the Early Metal Period. From a quantitative point of view, pot sherds form the largest group of finds. There are also stone artefacts: adzes, axes, whetstones etc. Casting moulds are an important group in view of Early Metal Period cultural contacts (Huurre 1982:23–25; 1984:48–49). This article, which is based on my graduate thesis in archaeology (Lavento 1989) mainly discusses the ceramics, and further information on problems discussed here can be found in this study. The finds cover the whole prehistoric period from the Mesolithic to the Iron Age (Huurre 1973). The youngest formations at Kalmosärkkä date from the Winter War of 1939–40.

2. RESEARCH PROBLEM

The ceramic material from the Ruhtinansalmi complex represents a many-sided and prominent selection of North-Finnish Neolithic and Early Metal Period pottery. Chronologically, this material covers a period from Säräisniemi 1 Ware, dating from 4100 B.C. (Siiriäinen 1974; 1978), to the Kjelmøy and Luukonsaari pottery groups from c. 300 A.D. after which pottery traditions appear to have died out in Northern Finland (Carpelan 1979).

Because of the stability of the shoreline in the Lake Kiantajärvi basin, the dwelling sites re-

mained on the same shores throughout the prehistoric period. This is normal at Lake Kiantajärvi and in the supra-aquatic area on the whole. The same sites contain several phases of occupation, from the Mesolithic to historically documented times. These phases are intermixed, and it is very difficult to establish any chronological order in the material. Accordingly, vertical stratigraphy cannot be used (Lavento 1989: 132–138). There are no radiocarbon dates from the Ruhtinansalmi sites, which means that a comparison of finds is the only way of ascertaining a dating scale for the complex. This can be done by using the ceramics and other artefact groups for constructing a chronological order. This is, in principle, a potentially dangerous practice. Where pottery is dated by itself, there is a clear danger of circular reasoning. However, the main emphasis of this study is not on the problems of chronology, but on introducing the Ruhtinansalmi material and supplying information on its general characteristics.

The first problem addressed in this paper is the range of ceramic groups in the material, defined according to the more or less conventional systematization of Finnish prehistoric pottery.

Secondly, we must seek reasons for the quantitative and qualitative variation of ceramic types or groups in different periods. This leads to the question of technological development. The selection of suitable nonplastics or temper, added to the ceramic paste, changed considerably over the 4,000-year period considered. It is possible to clarify to some extent the use of different tempers in various ceramic groups, and to discuss possible reasons for the choice of tempering materials.

Although ready-made pots can be transported to some degree (at least in theory), the availability of basic raw materials is essential for potters. Suitable clays are needed, but there are often other requirements as well. The raw materials for pottery that are available at Ruhtinansalmi and in the Suomussalmi area are discussed at the end of this article.

The fourth task has been to numerically sort and classify the pottery on the basis of technological features, vessel form, and surface decoration. After a preliminary sorting, the vessels were then used as units for grouping the material. Ten variables or attributes were chosen for numerical classification. This was done according to numerical methods, already applied in Finnish studies (see Kokkonen 1978; Ruonavaara 1988; Vikkula 1987). This article presents the results of an experiment in ceramic classification, which are compared with groups already established in many Finnish archaeological studies.

3. CERAMIC GROUPS AT RUHTINANSALMI

1. The Early Neolithic

Although the earliest pottery styles in Finland (Ka I 1 and I 2) are not present in the Ruhtinansalmi material, Säräisniemi 1 Ware (hence Sär 1) is included. Sär 1 has been appended to Aarne Äyräpää's typological-chronological sequence of Finnish Stone Age pottery. It was first discovered at the Nimisjärvi site in Säräisniemi (Ailio 1909), which Ailio classed as two distinct groups, respectively named Säräisniemi 1 and 2. Both terms are still used, although their original meaning and content have significantly changed. Ailio originally included among Sär 1 Ware sherds which today have been reclassified as Ka I and Ka II. The basic material of the Sär 1 group consisted of what could not be included into these groups. This may be a reason why Sär 1 Ware has never been properly defined by Finnish archaeologists. In 1948 V. Luho presented a brief defination of Sär 1, basing his viewpoint possibly on Äyräpää's personal comments (Luho 1948:74). According to Ari Siiriäinen, '...the "pure" Sär 1 sites contain far too few sherds to allow any useful definition' (Siiriäinen 1971:9).

The problem of the definition and chronological position of Sär 1 has been discussed not only in Finland. On the ancient shores of the Arctic Ocean, Sär 1 Ware has been found at the Varanger Fiord and on the Paatsjoki River. Povl Simonsen (1957) has discussed the definition of Sär 1, proposing a number of essential and characteristic features. According to him, Sär 1 vessels are round-based, with even or sometimes rounded rims. Crushed rock fragments were used as temper, and the decoration, covering the whole surface, is rich and varied. Elements of decoration consists of straight and curved imitated cord impression, denticulated or toothed stamps, straight or oblique checks, bone stamps, Cardium stamps, z-shaped stamps, comb-shaped, oval and zig-zag stamps, and pits. In all cases, the ornamental motifs consist of zones of pits and different kinds of stamps (Simonsen 1957:239–242).

Simonsen's description of the material contains an important point: 'In many cases the pits

are placed individually, but stamp impressions are often applied into them, mainly evenly, but there are 5 vessels with zones where the stamp was applied obliquely so that one end of the impression is almost as deep as the pit, while the opposite end, i.e. away from the pit is only slightly impressed' (Simonsen 1957:242). The distinctive feature of Finnish Sär 1 is precisely a comb stamp extending from one pit to another, or a stamp ending in a pit (Luho 1948:74; Huurre 1983:140). Furthermore, in the Finnish material the range of decorative elements is somewhat smaller, and Cardium, z-shaped and toothed stamps are lacking (Siiriäinen 1971:11).

Although Simonsen's detailed description appears to be exhaustive, a more thorough examination reveals a number of problems. This description of ceramics from the Paatsjoki River cannot be applied as such to the Finnish material. There is also the problem of clearly distinguishing Sär 1 from Early Comb Ware (Ka I 1).

At Ruhtinansalmi, Sär 1 is represented by two vessels (Fig. 2). The horizontal decoration of wound-cord stamps and comb stamps ending in pits is clearly observable. In many cases, Sär 1 is not difficult to identify. The pronounced horizontality of decoration, the densely applied motifs, comb stamps ending in pits, and a kind of 'simplicity' of ornament and vessel form are usually easy to recognize. However, a thorough review of Sär 1 is still lacking.

As there is no clear operational or practical definition of the Sär 1 group, archaeologists in former Soviet Karelia and in Petrozavodsk have not distinguished this material from the so-called Sperrings ceramic complex (Gurina 1961; Pankrushev 1978). Sperrings Ware was named after an Early Neolithic site in Espoo, Southern Finland (Europaeus 1922: 141–149; Pankrushev 1978:26). This term, representing Finnish Early Comb Ware, has remained in use in Eastern Karelia, although it has been replaced in Finland by the terms Early Comb Ware, Ka I 1 and Ka I 2, and Sär 1. Sär 1 is mentioned only sporadically in Karelian studies (Gurina & Kocečkin 1978:83).

If we regard Sär 1 as an independent group, and not as part of Finnish Early Comb Ware, then the Ruhtinansalmi material does not contain Ka I 1 material.

In most cases, typical Comb Ware (Ka II) is not as clearly present at sites in Kainuu as Sär 1 (Huurre 1986), which was also the case at Ruhtinansalmi. However, sherds belonging to the Ka II 1 and II 2 phases have been found at the Kellolaisten tuli and Kalmosärkkä sites (Fig. 2). In Kainuu, most finds of Typical Comb Ware are of phase II 1 (Huurre 1983); Ka II 2 is represented by only a few sherds.

One of the reasons for the small amount of Typical Comb Ware at Kalmosärkkä, and in Kainuu as a whole, may be the presence of so-called Early Subneolithic Asbestos-Tempered Ware (Carpelan 1979). According to C. Carpelan, this group of ceramics was used already during phase Ka I 2, and remained in use throughout the Ka II phase. This phase also includes so-called Kaunissaari pottery (Tallgren 1914; Äyräpää 1935), which can be interpreted as younger component of early Subneolithic Asbesto-Tempered Ware.

South of Kainuu the amount of Typical Comb Ware increases considerably, with large numbers of finds from sites originally on the shores of Ancient Lake Saimaa. However, there are only a few sites where the ceramics are exclusively Ka II Comb Ware. In most cases Comb Ware is found together with Asbestos-Tempered Ware.

At Nuolisärkkä in the south-west section of the settlement complex, two vessels were found with decoration resembling the ornament of the above-mentioned Subneolithic Asbestos-Tempered Ware (NM 14504:146, Fig. 3). The most typical motifs are short but deeply impressed ovat stamps, grouped in zones (cf. Edgren 1966, Fig. 69). The paste is tempered with thin fibres of asbestos.

A slightly different pattern of decoration – resembling the above-mentioned Kaunissaari pottery – can be seen in sherds from Kalmosärkkä S (Fig. 3) with walls clearly thinner than in Typical Comb Ware. The oval comb stamps were lightly impressed on the vessel surface.

The distribution and even the definition of early Subneolithic Asbestos-Tempered Ware have not been studied thoroughly. However, their main areas of distribution are in Savo and South-East Finland, where asbestos was more readily available than in Kainuu.

3.2. The Middle and Late Neolithic

Late Neolithic Comb Ware does not occur widely in Kainuu, and there are only a few finds of ceramics resembling the Ka III style. Finds from the southern end of Kalmosärkkä and from Kellolaisten tuli include a few sherds decorated with only small round pits. The pits were densely impressed on the surface, forming a horizontal zone (Fig. 3). Matti Huurre (1983; 1984) compa-

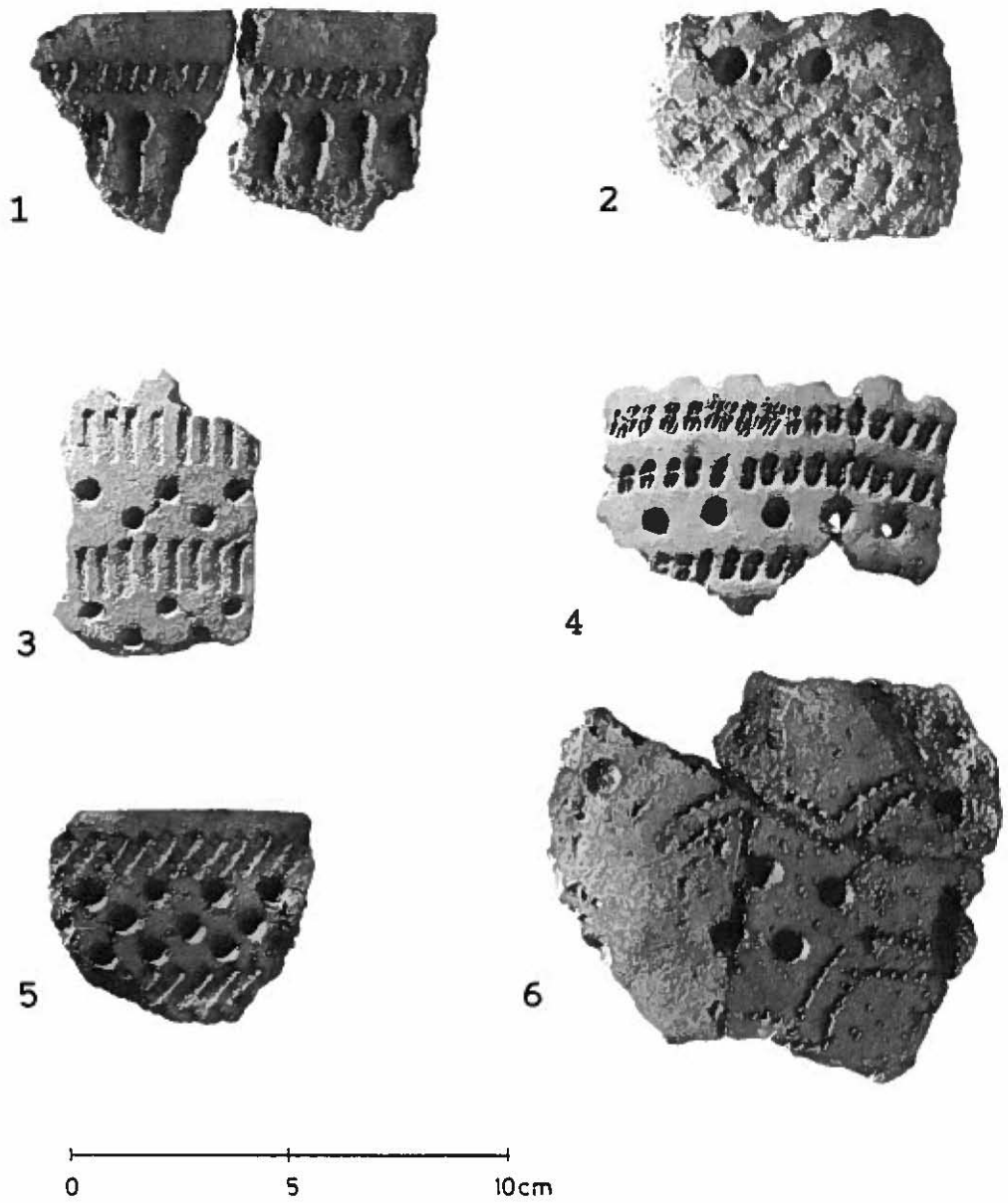

Fig. 2. Säräisniemi 1 Ware: 1–2 (NM 14830:842, 14831:1707); Typical Comb Ware II: 3–6 (NM 14830:740, 14830:1364, 14831:675, 14829:89)

res these sherds to Eastern Pitted Ware, but he considers them an abnormal or atypical phenomenon in Kainuu. However, they cannot be included in Eastern Pitted Ware, as the material is too fragmentary.

Late Neolithic Pyheensilta Ware is mainly found in South-West Finland. In his article on the salvage excavations at Kalmosärkkä in 1958–59, Huurre (1959) states that the finds include decorated sherds greatly resembling Pyheensilta ware. In her study on Pyheensilta Ware, Anne Vikkula (1984) classes the Kalmosärkkä sherds as Pyheensilta Ware. Their decoration consists of impressed comb stamps in zonal arrangements of alternating orientation. Other elements include short oval impressions, round shallow pits, and ring-shaped stamps (Fig. 4).

All the sherds of the above group were tempered with various organic materials, which dis-

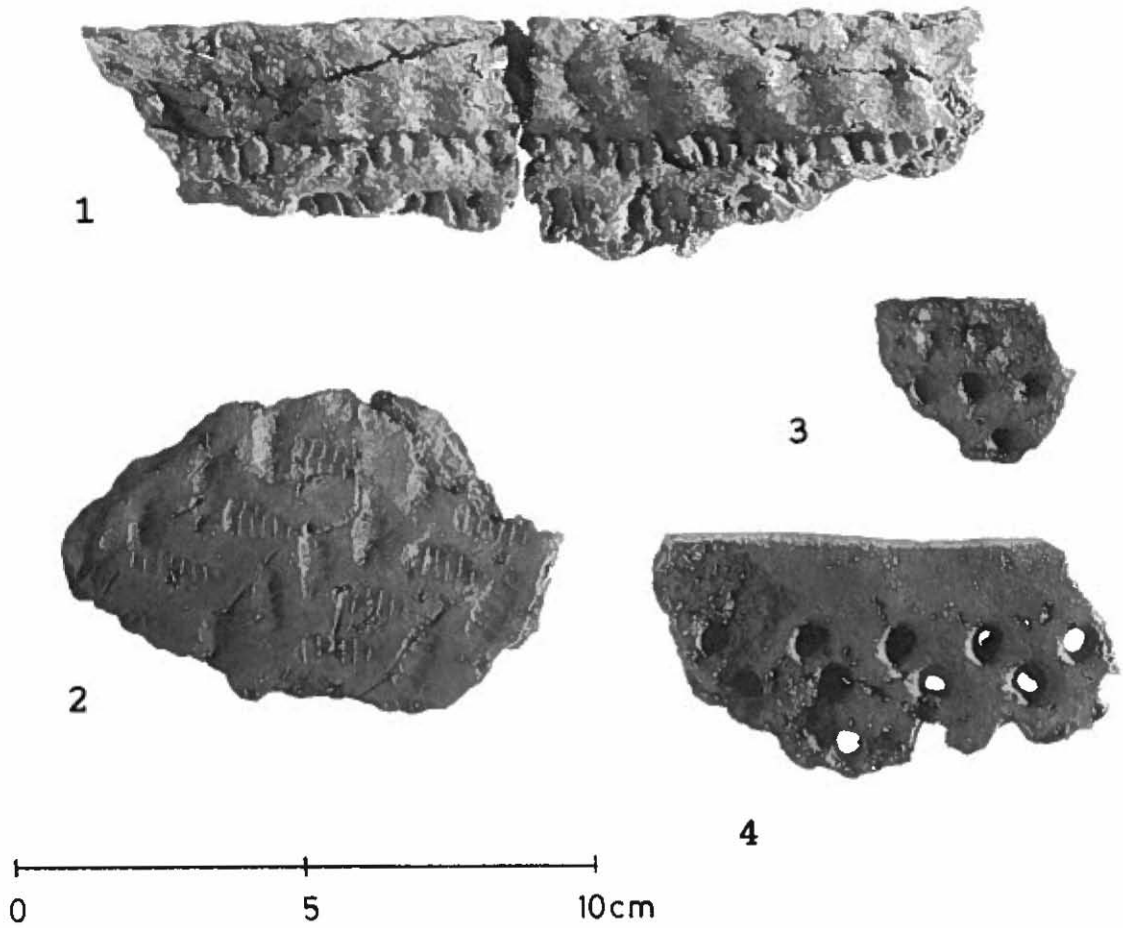

Fig. 3. Subneolithic Asbestos-Tempered Ware: 1–2 (NM 19843:13, 14504:146); Pottery resembling Eastern Pitted Ware: 3–4 (NM 14829:157, 14831:959)

appeared in the firing. Therefore, the sherds contain only impressions of plants, molluscs, egg shells, and feathers (Huurre 1984). Because of this, the clay paste is mostly porous and quite fragile.

The classification of this material remains problematic. In Huurre's opinion, these sherds could be classified as Pyheensilta Ware or to the Pöljä or Kierikki groups. In his most recent article on this problem, Huurre mentions a new term, and a new group, 'organic-tempered ware' (Huurre 1986). It may be premature to use this term to describe a separate ceramic group, but in principle it refers to what is still a vague entity definitely existing in the material (see 4.2 Temper materials).

Alfred Chalikov (1986:40,49) finds many points of contact between the ceramics from Kalmosärkkä and the Garino-Bor ceramics of the Volga-Kama region. Common features are porous, organic-tempered paste, and decoration dominated by short comb stamps (Chalikov 1986:40).

Writing in 1954, C.F. Meinander suggested a common course of development for Volosovo Ware, Pyheensilta Ware and the Pöljä group (Meinander 1954a:167). After Meinander's study, a new group, Kierikki Ware, was defined (Siiriäinen 1967), belonging to the same chronological horizon as the above, and differing from them only through the lack of an inward-turned rim protrusion or lip and in certain details of decoration. Both the Pöljä and Kierikki groups have many features in common with Typical Comb Ware, and they obviously derive from it. Vessel size varies within the same limits, and the pots always have round bases. The horizontal decoration consists of comb stamps and small round pits.

The technique of tempering with asbestos fib-

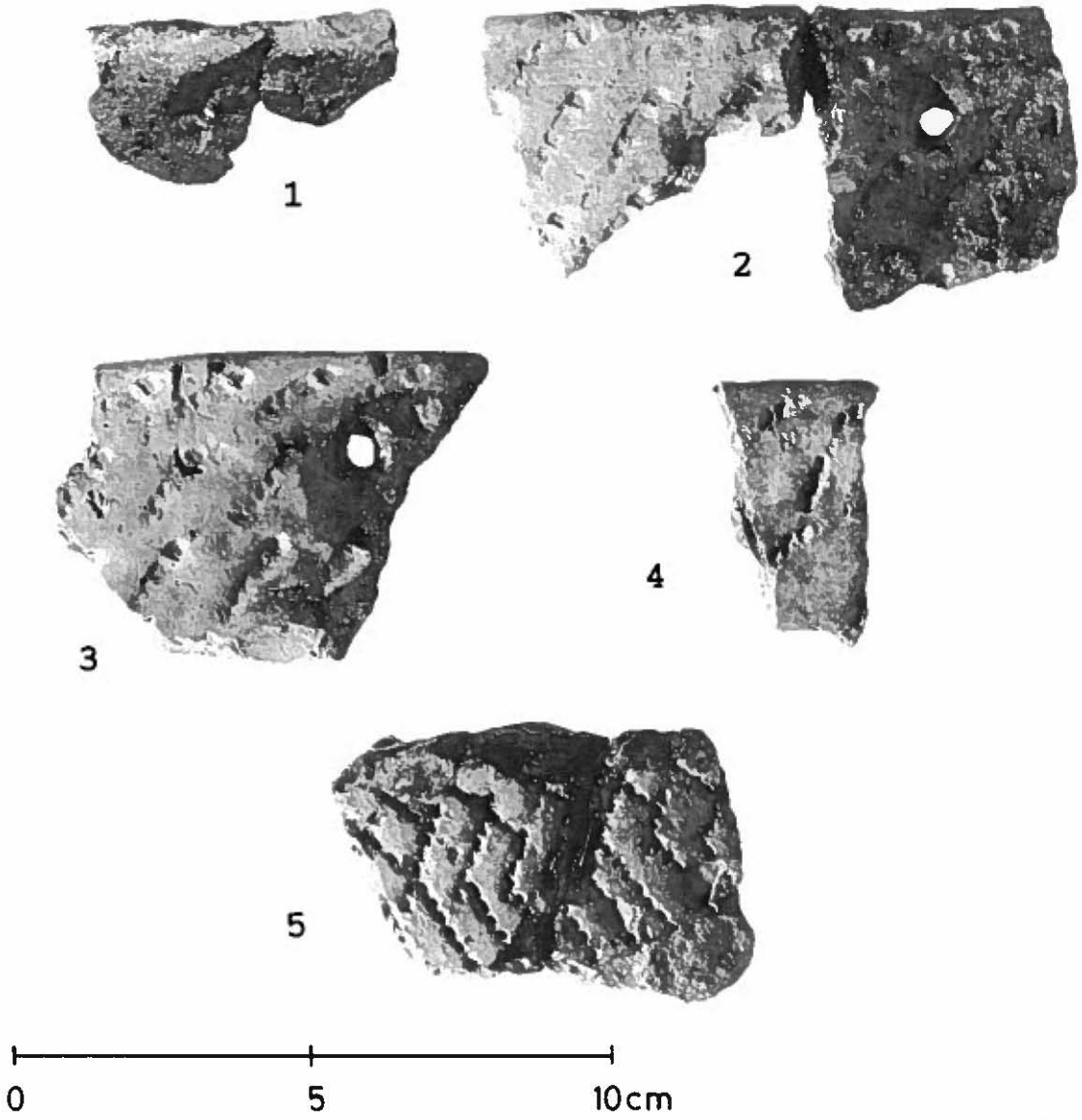

Fig. 4. Ceramics of Pöljä type: 1 (NM 14504:429); Organic-Tempered Ware 2–5 (NM 14504:99, 14829:103, 14829:115, 14831:1794)

res (Carpelan 1979) is the most important feature linking the Pöljä and Kierikki groups. It became a leading 'fashion' in Eastern Finland during the Middle Neolithic.

If the inward-turned lip is taken as a criterion of classing asbestos-tempered ceramics, the Ruhtinansalmi material contains pots of the Pöljä type. The vessel surface is either undecorated (Fig. 4) or decorated with long and narrow or oval stamps (cf. Huurre 1959:58, NM 14504: 341).

Some specimen (NM 14831:1794, Fig.4) with zones of comb stamps of varying orientation include features also found on the surface of Kierikki Ware (cf. Siiriäinen 1967:11). However, this vessel is tempered with organic material instead of asbestos.

A clear division between the Pöljä and Kierikki groups is difficult to define. Originally, Pöljä Ware was defined strictly on the basis of its characteristic lip protrusion (Meinander 1954a: 162–166; Edgren 1964). According to this criterion, only some of the material from the eponymic site in Siilinjärvi belong to this group.

As the Kierikki group is defined in broader terms by including all the ceramics from the site (Siiriäinen 1984:32), comparisons between these groups remain problematic. Carpelan (1979) assumes that the Pöljä group was the successor of the early Subneolithic Asbestos-Tempered Ware, whereas the Kierikki group was more closely linked with the Typical Comb Ware tradition. The chronology of these types or groups depends on the scholar's point of view: Siiriäinen (1984) emphasizes an affinity between Ka II and the Kierikki group, and maintains that the Pöljä type developed from Kierikki (Siiriäinen 1984). On the other hand, Carpelan (1979) claims that both groups are chronologically simultaneous.

The Ruhtinansalmi material does not shed much light on the above groups and their affinities, but the various stages of development from early Subneolithic Asbestos-Tempered Ware to the Pöljä type can be observed. Edgren (1964:25) links the sherds from Kalmosärkkä with the Pöljä group, which also displays features in common with Kaunissaari group.

There is in fact another member to be added to the Pöljä-Kierikki complex. Carpelan (1979) uses the term Jysmä Ware for sherds with a T-shaped thickening at the lip. These vessels are flat-based, and bear signs of textile impressions on the surface. The division between the Pöljä and Jysmä groups is primarily based on the latter's lower elevation above water level of Ancient Lake Saimaa at the Jysmä site (Edgren 1964). Thus far, Jysmä Ware has not been found at Ruhtinansalmi.

3.3. The Early Metal Period

The Metal Period began around 2000 BC in the Suomussalmi region. A gouged adze of copper from the small Kukkosaari Island in Suomussalmi is to date the oldest metal tool found in Finland (Huurre 1982). The number of finds relating to bronze casting gradually increased, the most typical artefacts being casting moulds and their fragments. These were all made of steatite, an abundant raw material along the shores of Lake Kiantajärvi (Lavento 1989).

Along with casting artefacts, new types of pottery begin to appear in the dwelling-site material. Textile or textile-impressed ceramics, Sarsa-Tomitsa Ware (ST), (Äyräpää 1951; Meinander 1954b) and various groups belonging to the Säräisniemi 2 (Sär 2) (Carpelan 1965) complex are included in the new phase. ST and Sär 2 pottery form an essential part of survey finds collected from the shores and beaches of Lake Kiantajärvi, and from Lakes Vuokkijärvi, Lentua and Ontojärvi in nearby Kuhmo.

Textile-impressed pottery spread to Kainuu along with ST. The present material leaves the proportions and relations of these groups unclear. It is reasonable to treat them either as one group, under the heading 'textile-impressed ceramics', or to distinguish ST as a separate group. In many cases the surfaces of ST vessels contain light textile impressions, but there are also sherds in which these marks were very clearly impressed into the soft and wet surface. However, the ST group also includes vessels without any textile impressions.

Many features of ST Ware make it easy to distinguish from the above-mentioned groups. The temper, which appears to include many different minerals, is often exceptionally coarse-grained. ST vessels have flat bases, and the rim is often markedly profiled. A new technique of finish now appearing in these vessels, is scratching, leaving the surface striated with lines and grooves. In all specimens the decoration is limited to the upper part of the vessel. In the sherds collected from Ruhtinansalmi the most typical elements of decoration are lines of small 'spots' forming horizontal zones, or groups of lines leaning to the right or to the left (Fig. 5). They are sometimes arranged in net patterns (NM 14831:921; NM 20413:3). Decoration also includes small pits and short stamps possibly of nail impressions (Fig. 5).[1] A well-known example of textile-impressed pottery is a markedly profiled vessel from Kalmosärkkä (Fig. 6) (Huurre 1959:61).

Shown in Fig. 5 is a vessel which cannot be classified in the ST group. A characteristic feature of decoration is a horizontal zone with two rows of small 'spots' running between large pits. The paste is tempered with mica flakes. The walls are thin and smooth. This atypical vessel has many features common with Sär 2 ceramics.

The number of sherds that can be classed as textile-impressed pottery in general is considerably large in comparison with other types of ceramics from Ruhtinansalmi. In addition to ST Ware, there are undecorated sherds in which the surface is covered with the impression of a coarse fabric, possibly covering the whole vessel surface. These sherds cannot be linked with ST Ware, but mainly with textile-impressed ceramics, if the decoration is considered as a criterion.

Lovozero Ware is named after a site in the

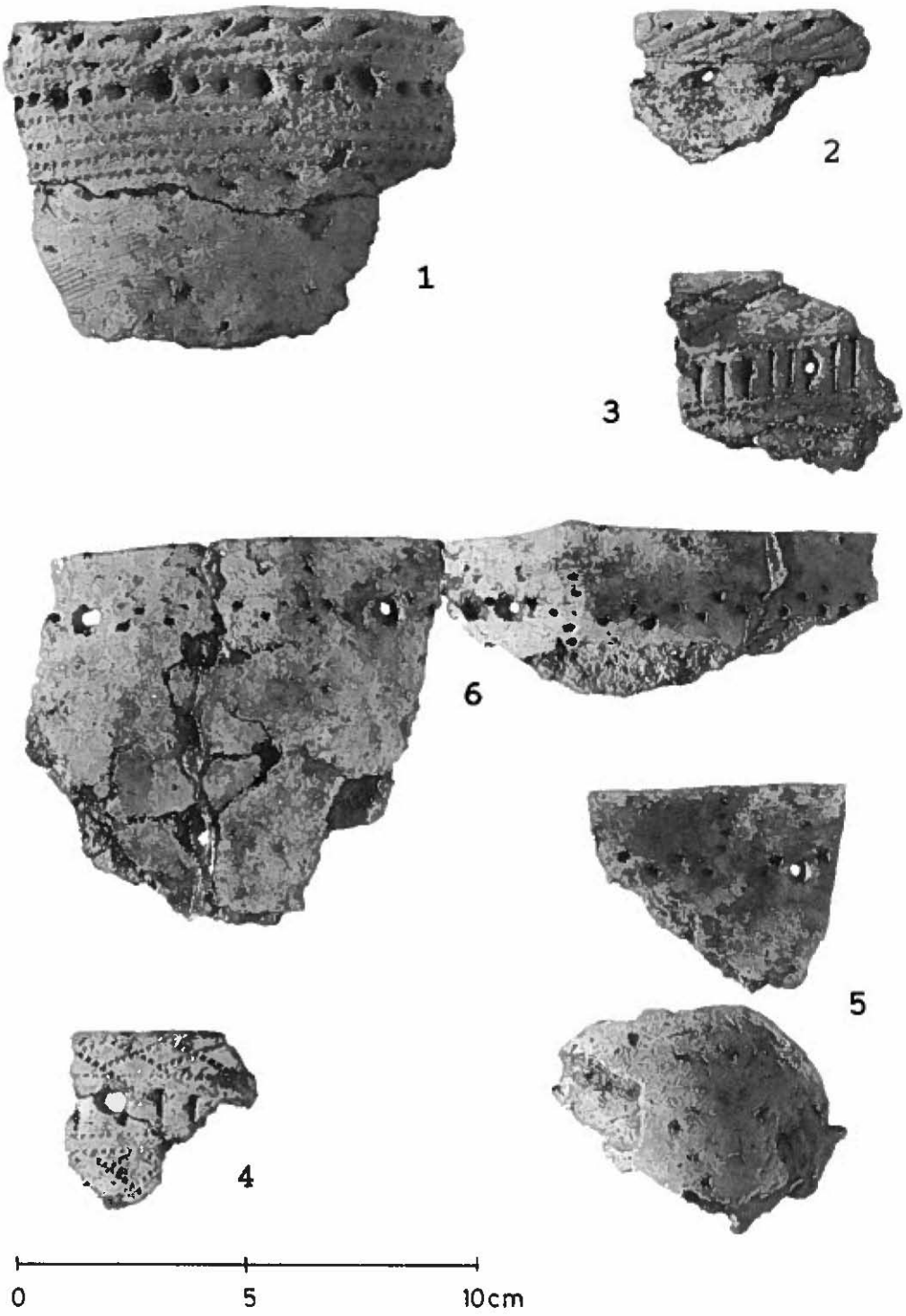

Fig. 5. Sarsa-Tomitsa Ware: 1–4 (NM 14830:1115, 14830:1274, 14831:921, 20413:3); Undefined pottery of Early Metal Period: 5–6 (NM 14831:1579, 14831:1555)

Fig. 6. Reconstructed vessel of ST-ceramics (NM 14504:282)

Kola Peninsula. A characteristic feature of its decoration is a net pattern drawn on the surface with a thin stick. Two vessels with this design have been found at Kalmosärkkä and Kellolaisten tuli (Fig. 7). In these vessels the rim is straight, but slightly thickened. Temper includes fragments of steatite, but there are also signs of burnt organic material, possibly hairs. This group is defined according to studies by Christian Carpelan. So far, Lovozero Ware has been mentioned in only a couple of articles (Rankama 1986; Jørgensen & Olsen 1987).

The Sär 2 pottery complex contains several groups which are also typical of the Ruhtinansalmi material. In his unpublished licentiate thesis from 1965, Christian Carpelan originally divided Sär 2 into South-Finnish, North-Finnish, and North-Scandinavian groups.

All three groups have many features in common: flat-based form, mainly thin walls, and profiled rims. The paste is tempered with asbestos, talc, or mica. Ornamentation is restricted to the upper part of the vessel.

C.F. Meinander (1969) introduced the term Luukonsaari Ware for a ceramic assemblage found at Luukonsaari, near Kuopio in Savo. Although this group naturally belongs to the Sär 2 complex, it represents only a part of its South-Finnish group (Carpelan 1965; Kehusmaa 1985). Some of the vessels from Ruhtinansalmi correspond in decoration to this group (Fig. 7).

In the Ruhtinansalmi material, the most numerous variant of Sär 2 is its North-Finnish group, also known as the Anttila group after a site on the Kemijoki River in Kemijärvi. In this group, decoration is based on broad or narrow lines around the upper part of the vessel. Highly typical examples of this type are shown in Fig. 8. Motifs resembling parallelograms are also typical. These were made with a comb stamp or a sharp pointed tool.

Compared with the Anttila group, the North-Scandinavian, or Kjelmøy group is rare in the Ruhtinansalmi material. The finds include only two fragments of this type, in which the decoration is in some way visible (Fig. 9). The walls of these sherds are very thin, and their surfaces are smooth. The decoration of parallel horizontal lines incised with a sharp instrument is sparse.

A sherd with a raised 'cleat' with fish-bone ornament (NM 14830:311, Fig. 9) may be linked with the Sär 2 group, as representing the so-called

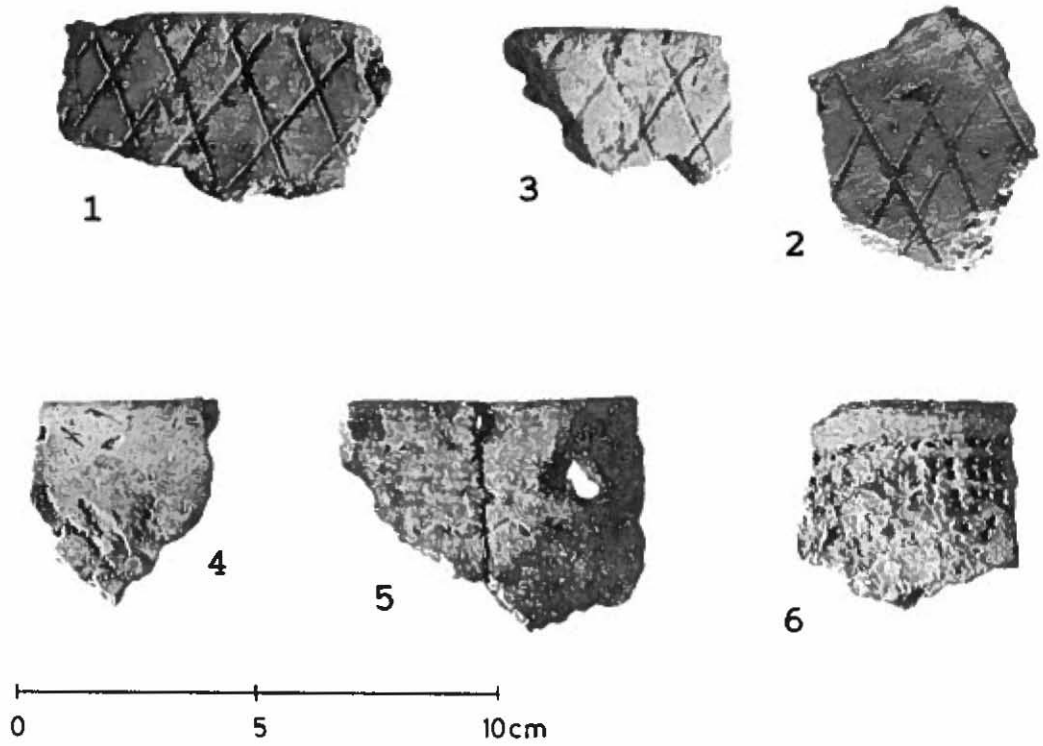

Fig. 7. Lovozero Ware: 1–3 (NM 14831:1452); Sär 2 pottery, Luukonsaari Ware: 4 (NM 14829:269), Anttila group: 5 (NM 19879:13), Undefined Sär 2 pottery: 6 (NM 21755:1)

Sirnihta group (C. Carpelan pers. comm.). This type is named after finds from a site at Kesälahti on an island in Lake Saimaa, Eastern Finland.

All Sär 2 vessels have flat bases, often decorated. Base sherds from the Ruhtinansalmi complex are decorated with bands of designs. Because of the small percentage of sherds classifiable as individual vessels, connecting rim parts with base sherds has remained uncertain. Shown in Fig. 10 are examples of vessel-base decoration some of which can possibly be connected with Sär 2 pottery.

It is important to note the role of the Kainuu region as a locus of the various groups of Sär 2. All groups are present in the Ruhtinansalmi material, which suggests a number of interpretations. The first question concerns the existence of a possibly separate population linked with these groups. C.F. Meinander (1969) has divided the pre-Roman Iron Age inhabitants of Finland into four distinct populations, two of which – the Luukonsaari and so-called Arctic populations – belong to the Sär 2 complex. The second question focuses on contacts between Kainuu and Eastern Karelia and regions further to the east (see Huurre 1984), and how such contacts were manifested in the ceramics of the Bronze Age or Early Metal Period.

4. Making Pottery

Because of its large degree of variation and long temporal range, the Ruhtinansalmi material is highly suitable for observing traits of development and opportunities in manufacturing techniques. Observations can be made concerning: choice and use of clay, choice and use of temper, manufacturing technique, surface treatment, and firing. In recent years ceramic technology has become an important topic of archaeological studies in Scandinavia (see e.g. Hulthén 1977; Jaanusson 1981; Lindahl 1986). As the investigated technological traits have a certain role in classifying and understanding the development of ceramic types, they will be discussed in further detail in the following sections.

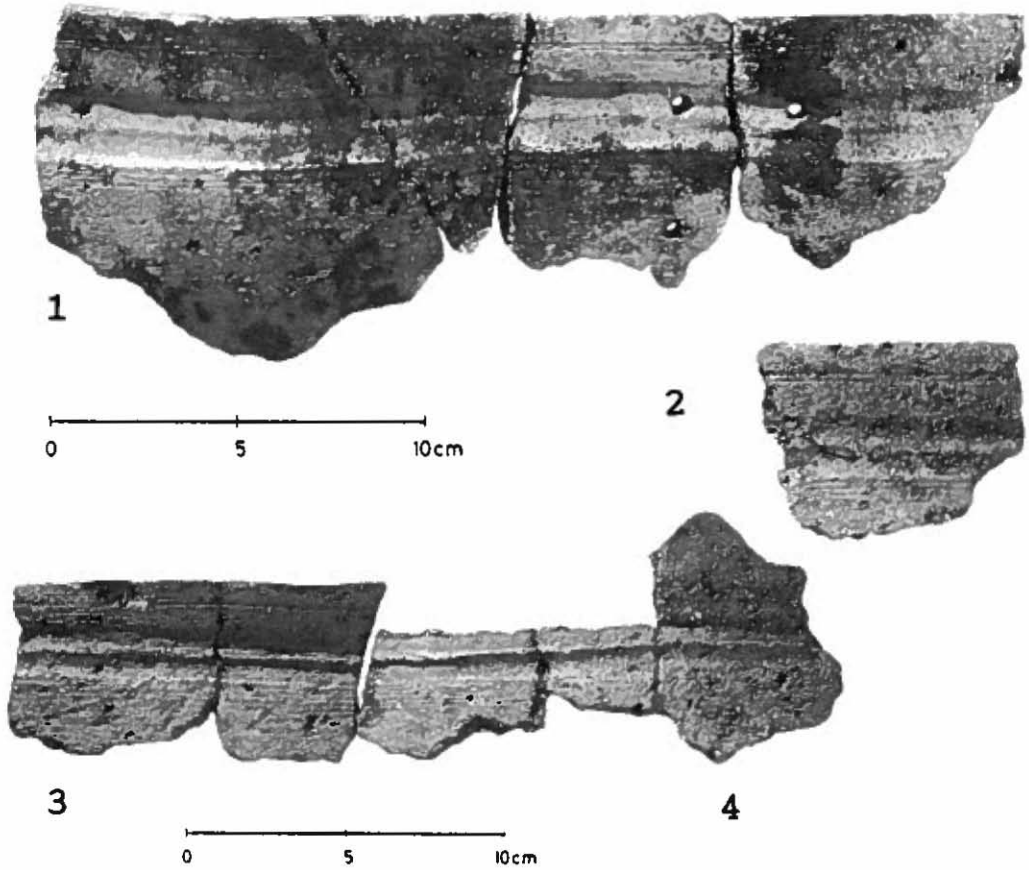

Fig. 8. Sär 2 pottery, Anttila group: 1–4 (NM 20414:25, 19879:9, 14831:1308, 14830:672)

4.1. Clays

The origin of most clays in Finland and Fennoscandia is related to the different geological stages of the Baltic. As Suomussalmi is almost completely within the supra-aquatic region, clays formed in the above manner are lacking. However, post-glacial clay deposits have formed at the mouths of streams. An analysis of post-glacial clay samples from these formations shows that these 'clays' contain less than 13% of proper clay minerals (Lavento 1989). This causes a number of problems for potters, as the vessels will become very fragile. One solution to this is to obtain the clay from elsewhere. However, the nearest glacial clays are over 50 km south-west of Kalmosärkkä, which does not eradicate the problem. Another solution is to use suitable tempering materials for improving the paste based on poor-quality clay. It is therefore reasonable to assume that asbestos were used for this essential function already in the Early Neolithic. According to Hulthén (1991:12), the proportion of asbestos fibres in paste can be 50–60% or even more. Asbestos-tempered ceramics from Ruhtinansalmi does not usually have this proportion of fibres, but the quantity of these minerals varies to a great degree.

4.2. Temper materials

In addition to strengthening paste, asbestos minerals are highly resistant to fire. For this reason they have been extensively used as insulating materials. It appears that, in Finland, asbestos minerals began to be mixed with paste not because of their fibrous characteristics but perhaps as a result of their fire-resistant properties. Carpelan (1979) distinguishes two different traditions in the use of asbestos minerals as temper. In the

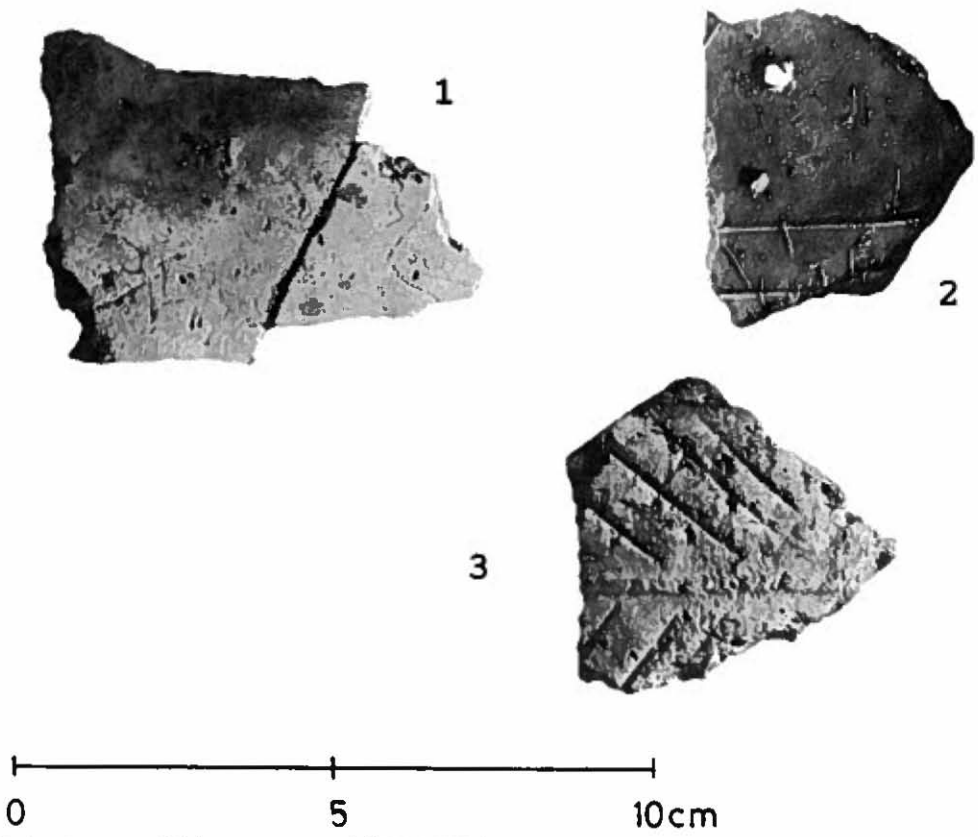

Fig. 9. Sär 2 pottery, Kjelmøy group: 1–2 (NM 14830:312, 14830:992), Sirnihta group: 3 (NM 14830:311)

Typical Comb Ware of Eastern Finland, asbestos was cut into pieces like ordinary grains of sand and crushed stone. The 'correct' method of using asbestos began in Eastern Finland already during the early Subneolithic Asbestos Ware ceramic phase and continued through the Kierikki, Pöljä and Jysmä ceramic phases.

Asbestos minerals are found in mafic or ultramafic mineral contexts, and they can be regarded as the final product of advanced metasomatic processes. The principal division between various asbestos minerals is among serpentine and antophyllite asbestos, which can be further divided into a number of separate minerals (Deer, Howie & Zussmann 1963). Typical trait of antophyllite minerals is their association with the occurrence of talc and steatite (Aurola & Vesasalo 1954), which have also been widely used as temper.

At the northern end of Lake Kiantajärvi, there is an archaean greenstone belt surrounded by granitoids. The greenstone material consists of mafic and ultramafic volcanites and serpentinites. Steatite is a common rock in the till (Saarnisto & Peltoniemi 1984; Saarnisto et al. 1980), and there are two deposits of asbestos in the immediate surroundings, only a few kilometres from Ruhtinansalmi. Analysed with a simple immersion method under a petrographic microscope, the samples from both deposits proved to be of the serpentine asbestos group (Lavento 1989). However, in the ceramic samples antophyllite asbestos was found in all cases.[2] Assuming these observations are correct, the potters did not use the raw materials of their vicinity. Antophyllite asbestos usually occurs in the asbestos region of Savo, where deposits are principally antophyllite minerals alone. As an accessory mineral antophyllite asbestos may contain fibres of serpentine. However, the asbestos from Paakkila in Tuusniemi is antophyllite.

The Ruhtinansalmi material contains various organic materials as temper. These have all disappeared in the firing process or during the long period of deposition in acidic mineral soil. However, the impressions of hairs, feathers, and

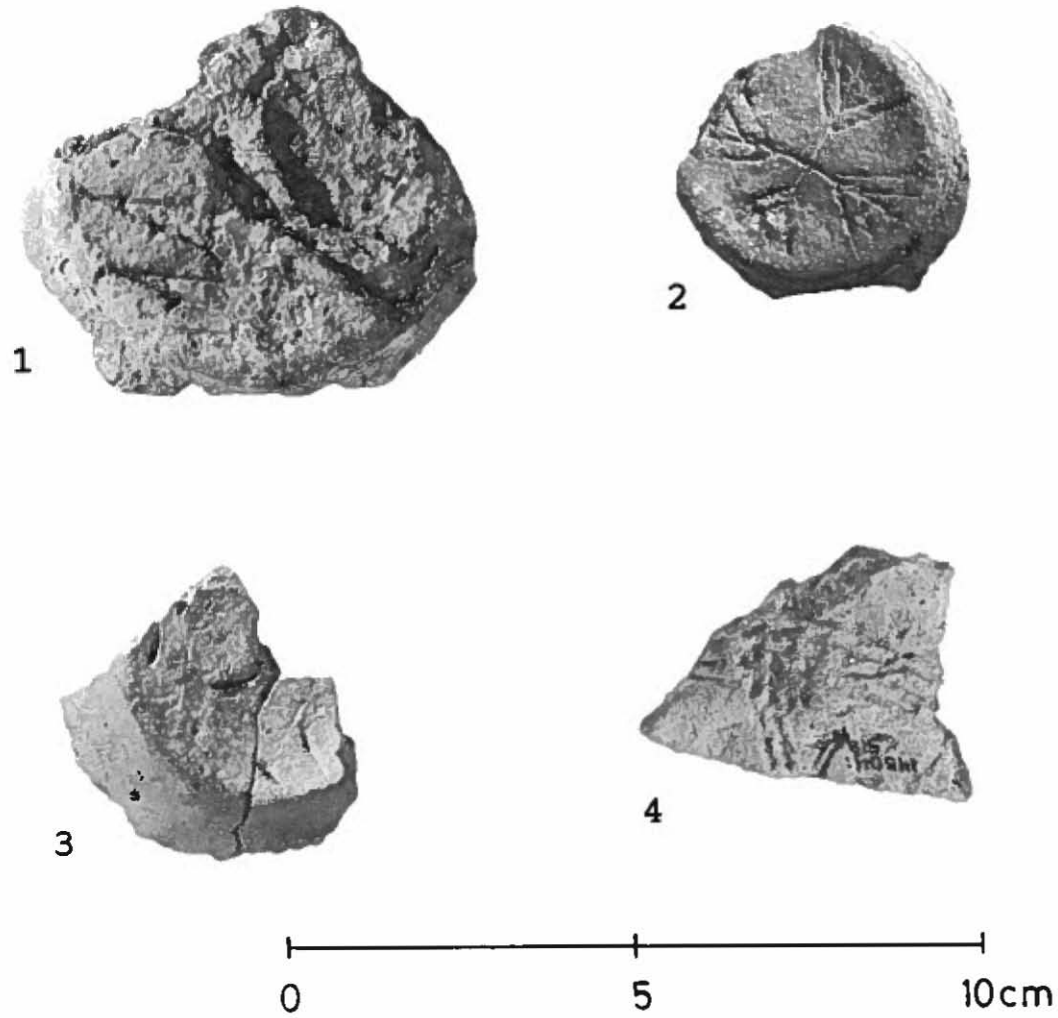

Fig. 10. Base sherds, flat bases: 1–4 (NM 14829:291, 19541:1, 20414:14, 14504:518)

plant fragments have often remained in the paste (see Huurre 1986:59). The practice of mixing organic material into the clay paste can be possibly considered as a late Neolithic trait in general (Carpelan 1979:15). Organic temper came into use already during the Ka II phase at Ruhtinansalmi. Its proportion in the paste increased in the Pyheensilta or Volosovo group, or in the so-called 'organic-tempered' ceramics, the definition of which is based on only this particular technological trait. As already mentioned, at least fragments of Pyheensilta, Pöljä and Ka II ceramics, can be included in this group. Huurre (1986) assumed that organic temper began to be used as a means of strengthening the paste during the coiling of the vessel.

Mica minerals are common tempering materials in the ST and Sär 2 ceramics from Ruhtinansalmi. The most typical micas are flogopite and muscovite. Used as temper, mica caused the problem of parts of the wall cleaving as sheets from the surface. On the other hand, micas have the advantage of being as resistant to firing as asbestos minerals.

The most common tempering material is ordinary crushed stone or sand. The main minerals in this group are ordinary quartz and various feldspars. Hornblende and other dark minerals were used only in a few cases (Lavento 1989).

The following table (Table 1) summarizes observations of various tempers in the ceramic groups:

Group/ Mineral	Sär 1	Ka II	P/K	Py	ST	Sär 2
Quartz/ Feldspar	x	x			x	
Organic		x	x	x	x	x
Asbestos		x	x		x	x
Talc/ Soapstone				x	x	x
Mica group					x	x

Table 1. Temper materials in different groups.
Sär 1 = Säräisniemi 1
Ka II = Typical Comb Ware II
P = Pöljä Ware
Py = Pyheensilta Ware
ST = Sarsa-Tomitsa Ware
Sär 2 = Säräisniemi 2

4.3. Manufacturing Techniques

It is obvious that manufacturing techniques changed in many ways during the 4000-year period considered. In most cases, the coiling technique was used, but in the Early Metal Period other methods came into use.

In most cases, the shape of the vessel cannot be determined. The forms of only 20 vessels are known in the whole material, and this data can permit only rough conclusions. Early and Middle Neolithic vessels have round or tapering bases. In the Late Neolithic this detail changed, and flat-based vessels were introduced (Carpelan 1979). However, this phenomenon cannot be verified on the basis of the Ruhtinansalmi material. The flat-bottomed form did not become the rule until the Early Metal Period (NM 20414:14). In the various Sär 2 groups the base is usually decorated with incised scores, forming different designs (NM 14829:291; NM 19541:1).

We must note the close links between vessel-building technique and the shapes of vessels. It seems evident that flat-based pots were mostly made with moulds. In principle, moulds can be used in two ways. On the basis of practical experiments, Sakari Pälsi (1916) observed that vessels can be made *in a mould* with the help of a piece of fabric. In fact, Pälsi attributed textile impressions to this technique where the paste is pressed against to fabric spread inside the mould. This is a possible explanation, but not the only possibility. Textile impressions on vessel surfaces can be obtained in other procedures following the actual shaping of the pot. This is indicated by various types of impressions, e.g. on the inside surface.

Another way of shaping a vessel is to make it *on a mould*, which will leave impressions on the inside. In this case, the inside surface will usually be very even and smooth; the technique will only leave narrow ribs formed by paste pressed out of cracks or clefts in the mould (Carpelan 1965). Some of the pottery from Ruhtinansalmi was made in this way, as shown by these details on the walls of the vessels.

Small vessels or cups were made by hand. These may have been used as crucibles for melting metal. The ceramics from Ruhtinansalmi include only a few fragments of this kind. One of these has a foot – perhaps for tongs (cf. Huurre 1986: 102). The Kalmosärkkä finds include iron slag, for which Huurre (1986) suggests an Early Metal Period date.

4.4. Surface and Finish

In addition to textile impressions, a number of sherds from Ruhtinansalmi have striated, smooth, rough, and painted surfaces. Smooth surfaces are the most common feature, and were probably not treated with engobe or slip. This practice is suggested by vessels with small holes on their smoothed surfaces. It is possible that smoothing was carried out e.g. with a smooth stone (Bøe 1931). The amount and quality of temper have a great effect on surface texture. A great deal of coarse or rough temper in the paste will duly affect the surface, and much work and slip is needed to obtain a smooth surface.

Striated or grooved interior or exterior surfaces are a common feature of Metal Period pottery in North-Western Europe (e.g. Jaanusson

1981). It is hard to imagine any decorative purpose for this kind of striation. On the basis of experiments, Hille Jaanusson (1981) suggests that, at least in some cases, striations on pottery are the impressions of coarse blades of grass (see also Gurina 1961). The Finnish material contains sharp and light striations. The former are assumed to have been made with a comb-like tool, and the latter with some kind of spatula (Carpelan 1965:125). However, it may not be possible to explain striation in general terms or on the basis of only a few examples. The sherds from Ruhtinansalmi do not reveal any particular technique. There are a few examples where striation may have been caused by a rigid comb-like tool, but there are also sherds where striation is irregular and uneven, as if resulting from a bunch of grass.

4.5. Firing

Not much can be said about firing conditions or temperatures without scientific measurements and observations. A visual inspection of samples under a binocular microscope shows that all temper minerals remained unchanged in firing, suggesting temperatures well below 900°C. According to Hulthén (1991) asbestos ceramics were fired at temperatures between 600 and 900°C. More information is clearly needed concerning the firing conditions and temperatures of prehistoric pottery in Finland.

5. Classification

The classification of pottery is an essential part of investigation, aiming at understanding and periodizing prehistory. In archaeology, ceramic classification is of special importance, going beyond the concrete accommodation of pieces into typological series. Ceramic groups have been interpreted as more or less analogous with groups of peoples. Accordingly, classification acquires further scope, as a reflection of the culture and cultural development of groups of peoples.

The first problem for the archaeologist is to choose essential traits or features for the classification procedure. The second problem follows from this and concerns the weight given to respective features in relation to each other – in other words, the means by which decisions are taken concerning the importance of each feature. Ceramic groups have often been defined on the basis of only one or few features. Because of different starting points, comparisons of groups are problematic (cf. above); one group can include several features of polythetical classification, while another is defined only monothetically.

The methods of numerical taxonomy provide a means of clarifying and standardizing classification procedures. Numerical taxonomy is of great importance in biology (Sokal & Sneath 1963), and experiments, or successful taxonomical classifications, have also been carried out in archaeology (Doran & Hodson 1975; Shennan 1988). These methods have also been popular among Finnish archaeologists (Kokkonen 1978; Vikkula 1987; Ruonavaara 1988; Lavento 1989).

The procedures of numerical taxonomy can be divided into three main groups: methods of hierarchical fusion, monothetic division, and iterative methods (Doran & Hodson 1975; Wishart 1987). In the study at hand, the method has been used only as a preliminary, heuristic experiment. The question here was to see which of the groups arrived at in the above classification would come up in a rigorous numeric classification. In other words, which groups are defined by features made explicit by the numerical taxonomic approach. If numerical classification produces results different from existing typological schemes, these results will then be heuristically significant. Furthermore, where the numerical approach can be broken down or resolved into individual parts, it will be possible to detect reasons for, or common features of, possible new groupings.[3]

Ten variables were chosen for the numerical classification. These were divided into three groups: technological variables (3), variables of form (3), and variables of decoration (4). Technological variables are temper, surface treatment, and manufacturing technology. The variables of shape are rim form, wall form, and diameter at the mouth. The variables of decoration are the elements of the rim and wall, and the motifs of decoration of these parts. (A detailed description of these variables is given in Lavento 1989.)

The interpretation of three-figure dendrograms is not a routine task, and the results of classification greatly depend on pre-understanding, and an interpreter able to consider the specific details. There is no rule according to which separate entities should be classed together as a group.

The results of the numerical classification of the Ruhtinansalmi material are in principle par-

allel to those of ordinary archaeological classification. It can be noted that the group of organic temper, containing several standard ceramic groups (Pöljä, Pyheensilta, Ka II, and 'organic-tempered ceramics') is distinct. Typical Comb Ware and Sär 1 are close to each other, and the ST Ware group appears to be divided into several clusters along with Sär 2. This may be due to the large number of ST vessels included in the analysis. ST Ware contains a number of traits (e.g. coarse crushed stone temper and comb stamps) linking it with Typical Comb Ware. In many cases the rim is profiled, and vessels are, without exception, flat-based-decoration is restricted to the upper part. Striated surfaces are common in both groups, but textile impressions are not typical of the Sär 2 groups. Other ceramic groups are represented only sporadically in numerical analysis, and their clustering cannot be investigated under normal conditions.

6. Chronology

The chronological framework for the ceramic sequence at Ruhtinansalmi is based on previously published studies (Siiriäinen 1974; Siiriäinen 1978; Carpelan 1979). Along with the supra-aquatic location of Ruhtinansalmi there are a number of other reasons for a lack of inroads into chronology. It is not possible to find reliable connections with other dateable find groups, and the lack of stratigraphy imposes a number of restrictions (Lavento 1989).

Until recently, the ceramic chronology for Eastern Karelia has been 'shorter' than in Finland. For example, Sperrings Ware has systematically been given younger dates than in Finland (Pankrushev 1978; Savvateev 1977; Gurina & Kocečkin 1977). New radiocarbon dates for Neolithic ceramics have, however, changed the picture (Pesonen 1988; Lobanova 1988; Vitenkova 1988; Pankrushev 1988). The ages given for Sperrings Ware and also Sär 1, which is not regarded as a distinct group in Eastern Karelia, are now closer to the Finnish chronology, and in some cases even older (Pesonen 1988). The chronological position of asbestos ceramics in Eastern Karelia is also an interesting problem. According to Pankrushev (1988), the earliest radiocarbon ages for asbestos-tempered ceramics are almost 1500 years younger than in Finland. Pankrushev, however, rejects a number of clearly older datings as unsuitable: If these are taken into a consideration, the gap between Finnish and Karelian datings will be much narrower. There are further problems in the comparison of Finnish asbestos ceramics with the Karelian material, and at present the Finnish classification is considerably more detailed.

New Norwegian dates for asbestos-tempered ceramics have recently been published (Jørgensen & Olsen 1987). These Masca-calibrated ages are mainly related to Early Metal Period Sär 2 Ware. It is interesting to note the chronological distribution of radiocarbon dates for Kjelmøy Ware. These results are in agreement with Carpelan's (1979) chronology. With reference to E. Helskog (1983), K. Helskog (1980) and Rankama (1986), Jørgensen and Olsen (1983) 'maximdate' the Lovozero ceramics to a period from 2100 to 1000 BC. A more detailed survey of dates from various parts of Fennoscandia and a compilation of results are necessary for a better understanding of the ceramic sequence in Kainuu.

7. Concluding Remarks

I have briefly touched upon the value of ceramic studies for understanding and periodizing the Finnish Stone Age. With reference to Ailio's and Äyräpää's studies concerning the Stone Age of Eastern Finland, we can observe progress as a result of Christian Carpelan's contributions. At any rate, our picture of the prehistory of this region has acquired more detail. Classification is not an end unto itself, but only a means for achieving more important aims in archaeology. But before we are able to construct sophisticated and far-reaching models concerning prehistoric life and societies, a great deal of solid ground work for exemple with ceramics, is needed.

Acknowledgements

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NOTES

[1] A detailed description of the elements and their combinations is given in my unpublished graduate study in archaeology (Lavento 1989) presented at the University of Helsinki.

[2] These results must be considered preliminary, as the firing of ceramics may affect the optical properties of minerals.

[3] Dendrograms were formed with the Clustan program package. Multi-state variables (features mentioned in text) were converted into binary form, and association was based on calculating a simple Jaccard coefficient. Comparison is based on taxonomic distance as Euclidic distance, and the dendrogram itself was constructed with Ward's method (Wishart 1988).

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ABBREVIATIONS

FM = Finskt Museum
КСИА = Краткие сообщения Института археологии АН СССР
МИА = Материалы и исследования по археологии СССР
SM = Suomen Museo
SMYA = Suomen Muinaismuistoyhdistyksen Aikakauskirja