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TELKKÄLÄ, MUOLAA – A MULTI-PERIOD DWELLING SITE ON THE KARELIAN ISTHMUS

Abstract

The Telkkälä site in the former municipality of Muolaa on the Karelian Isthmus was discovered in 1999 in connection with an inspection of formerly known find locations and sites. Joint Finnish-Russian archaeological excavations were carried out in two field seasons at the site, in which connection local shore displacement was also investigated. The site revealed three Stone Age cultural layers of different date. Together with natural strata and deposits, the layers were almost 250 cm thick. It was possible to establish known events in the history of the Baltic and shoreline elevations in the excavated sections.

Keywords: lithostratigraphy, artefacts, Mesolithic, Neolithic, Iron Age, Karelian Isthmus.

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INTRODUCTION

History of archaeological research on the Karelian Isthmus

Archaeological research concerning the Karelian Isthmus began in the mid-19th century. The first excavations were carried out in 1849 in the Iron Age cemetery of Tontinmäki, Hovinsaari in Räisälä. In the 1870s, students of the Viipuri Student Corporation of the University of Helsinki organized expeditions to the Karelian Isthmus and the Lake Ladoga regions of Karelia, in which connection stray finds were collected and information was gathered on the locations and circumstances of the finds. Around this time archaeological expeditions to the area were initiated, mainly involving small-scale trial excavations and general collection of information (MV AOA; Härö 1984:47, 52-54; Nordman 1924; Schvindt 1892; Uino 1997:23, 42).

The hitherto most significant Stone Age research in all ceded Karelia took place in the early stage. The excavations by Sakari Pälsi at Korpilahti in

Antrea, by Pälsi and Julius Ailio at Riukjärvi and Piiskunsalmi in Kaukola and by Ailio and Kaarle Soikkeli at the Häyrynmäki site in Viipuri laid the basis for later studies (MV AOA; Pälsi 1920a; 1920b).

During the Soviet era almost all the areas of Karelia that had been ceded by Finland in the Second World War were a border zone for a long time, with limited access even for Soviet researchers. It was not until the 1970s that Russian research intensity began to increase as scholarly interest in Karelia grew. Research mainly concerned Iron Age hillforts and sites from historically documented times (Lapshin 1995; Uino 1997:38-40; cf. Saksä 1998).

Finnish archaeologists did not actively return to the Karelian Isthmus until the 1980s, at first to participate in various joint projects. Research involving archive sources had already been conducted previously (e.g. Huurre 1979; Taavitsainen 1990).

The results of earlier archaeological research can be summarized as follows. Stone Age

settlement began on the Karelian Isthmus immediately upon the outset of the Postglacial period, as early as ca. 9200-9300 BP (ca. 8400-8500 cal BC) as indicated by the Antrea net find (Pälsi 1920b; Maticskainen 1989b:71; 1996:255-259). During the Neolithic settlement spread over a large area of the Isthmus, but stray finds indicate particularly concentrations to the south of the River Vuoksi in the former parishes of Heinjoki, Uusikirkko and Kuolemajärvi. There are few Bronze Age finds and the focus of Iron Age settlement was in the Lake Ladoga region of Karelia, although finds from the period are also known from areas south of the River Vuoksi (MV AOA; Uino 1999).

The main lines of shore displacement on the Karelian Isthmus

Shore displacement on the Karelian Isthmus has been dealt with by several authors. Among the first to describe transgressive phases of the Ancylus Lake and Lake Ladoga were Ailio (1915) and Hyypä (1937; 1943). According to the current knowledge of shore displacement on the Karelian Isthmus Lake Kirkkojärvi became isolated from the Yoldia Sea around 9700 BP (ca. 9200 cal BC) (Davydova *et al.* 1996). After few hundred years of isolation shore level of the Baltic Sea started to rise rapidly and Lake Kirkkojärvi became a part of the Ancylus Lake around 9500 BP (ca. 8800 cal BC). Transgressive phase of the Ancylus Lake reached its maximum level around 9000 BP (ca. 8200 cal BC) (e.g. Björck 1995), after which regression took place and Lake Kirkkojärvi became again isolated from the Baltic Sea. The maximum altitude of the Ancylus transgression has been estimated as being around 27 m a.s.l. at the Heinjoki threshold (Hyypä 1943; Saarnisto & Grönlund 1996) and at the altitude of 22 m a.s.l. at the isobases of Lake Kirkkojärvi and at the current sea level at the isobases of St. Petersburg (Hyypä 1943).

The second transgressive period, Ladoga transgression started around 5200 BP (ca. 4000 cal BC) (Saarnisto 1970) during the period of Typical Comb Ware ceramics (Phase II) (Saarnisto & Siiriäinen 1970). Saarnisto (1970), Kvasov (1979), Malachovskij *et al.* (1996) and Saarnisto & Grönlund (1996) have concluded that Ladoga transgression took place in a single stage. The reason for the transgression has been commonly

explained as having been caused by glacio-isostatic uplift of the northern part of Lake Ladoga (e.g. Ailio 1915). The formation of the present outlet (River Vuoksi) of the Saimaa lake complex and the drainage of Lake Saimaa into the Lake Ladoga had a comprehensive influence on the accelerating transgression (Saarnisto 1970). During the transgression and before it, Lake Ladoga drained into the Gulf of Finland through the Vetokallio outlet in Heinjoki.

The maximum limit of the Ladoga transgression has been defined on the basis of altitude measurements of shore bars and cliffs (e.g. Ailio 1915; Hyypä 1937; 1943). The upper limit of the Ladoga transgression is located at 20-21 m a.s.l. at Heinjoki threshold and at 15-18 m a.s.l. at the current outlet (River Neva) of Lake Ladoga (Hyypä 1943; Saarnisto & Siiriäinen 1970). After the transgression reached its maximum level, the waters of Lake Ladoga broke through the Porogi threshold east of St. Petersburg. The most recent datings of the origin of the River Neva suggest that the maximum level of the Lake Ladoga was reached around 3100-2800 BP (ca. 1300-1000 cal BC) (the former data from the Kilpolansaari Island in the northwestern part of Lake Ladoga (Saarnisto & Grönlund 1996); the latter from River Neva valley (Malachovskij *et al.* 1996)). This led to the final isolation of Lake Kirkkojärvi from the ancient Lake Ladoga and the Lake Ladoga reached its present level (app. 5 m a.s.l.) around 2400 BP (ca. 400 cal BC) (Malachovskij *et al.* 1996). According to the Stone Age chronology the regression of Lake Ladoga occurred during the period of Late Comb Ware (Phase III) (Saarnisto & Siiriäinen 1970).

Major changes after the formation of the River Neva in the Lake Kirkkojärvi area were connected to human activities and changes in the level of the River Vuoksi. In 1857 the Vuoksi was diverted into Lake Suvanto (oz. Sukhodolskoe) by cutting the Kiviniemi (Losevo) isthmus. In 1818 Lake Suvanto had already been connected with Lake Ladoga by the new Taipale River (r. Burnaya). These actions together led 6 meter lowering of the water level of the central part of the River Vuoksi. This resulted isolation of several lakes from River Vuoksi in the middle parts of the Karelian isthmus including almost the totally dried-up Lake Äyräpää (oz. Rakovoe) (Davydova *et al.* 1996) and Lake Kirkkojärvi.

Fieldwork conducted by the Lahti City Museum

The Lahti City Museum launched its own research project on the Karelian Isthmus in the former administrative county of Äyräpää in 1998 (Takala 1999). The purpose of this project was to locate and map known prehistoric sites and find locations on the basis of archive data. From the beginning of the project, attention was also focused on establishing the local history of the Baltic and other bodies of water.

When the Lahti City Museum's project came under way, over twenty antiquities and some 200 stray finds were known from the area of the former county (MV AOA). There were two stray finds from the village of Telkkälä in Muolaa: a spearhead and a pin with ring attached to one end. These finds are from the latter half of the Iron Age, and possibly from as late as the transition to historically documented times (Luoto 1991:85; Uino 1997:277, 279).

In an inspection of the find locations in Telkkälä in May 1999 large numbers of quartz and flint flakes were found at the waterline on the shore of Lake Kirkkojärvi and from a partly collapsed terrace by the shore (Takala 1999:86-87).

Collaboration with the Institute for the History of Material Culture in St. Petersburg made it possible for a research team from the Lahti City Museum directed by Hannu Takala to investigate the site under the supervision of Russian archaeologists in 2000 and 2001. In connection with the excavation, the history of local bodies of water was also investigated. In 2000 the fieldwork was supervised by Dr. Vladimir I. Timofeev and in 2001 by MA Dmitri Gerasimov. The overall coordination of the supervision was carried out by Dr. Aleksandr Saksa in both years.

THE FIELDWORK

The excavation site

The excavation site of Telkkälä in Muolaa is on the Central Karelian Isthmus on the east bank of Lake Kirkkojärvi, two kilometres ESE of ruins of the former Finnish Lutheran church of Muolaa. The location in Finnish basic survey map (4024 04 MUOLAA) coordinates is X = 6715 28 and

Y = 4478 40 (Fig. 1). Lake Kirkkojärvi (oz. Pravdinskoe) (14 m a.s.l.) discharges to the northwest along the River Kannilanjoki (r. Pcelinka) in to Lake Äyräpäänjärvi, which in turn flows through the River Salmenkaitajoki (r. Bulatnaja) into the River Vuoksi (9 m a.s.l.).

The Telkkälä (Silino) excavation site is located in the middle of a gently southwest-sloping terrace on the eastern shore of Lake Kirkkojärvi. Nearly symmetrical geomorphology of the terrace follows closely to the present-day pattern of shore terrace formed under the mean water level of Lake Kirkkojärvi. Gently convex shoreline of the excavation site forms small cape on mostly concave eastern shoreline (Fig. 2).

Fieldwork methods

The excavations of 2000 and 2001 respectively had different objectives, which were reflected in the research and documentation methods applied. The fieldwork in 2000 involved a trial excavation to establish the extent and age of the dwelling site. A trench measuring 1 x 8 metres was dug across the lower shore terrace at the site, in addition to which three test pits were dug and corer samples were taken from several locations on the shore (Fig. 2). The test trench was dug by arbitrary spits of five centimetres, and the finds were recovered according to each spit and the relevant coordinates were measured. The excavated soil was sieved when dry with five-millimetre mesh hand sieves.

At the end of the excavation in 2000 the undisturbed sand layer at the site revealed another cultural layer, of which only one square metre could be excavated within the allotted time. This excavation grid section was 248 cm beneath the surface of the ground.

The purpose of the excavation in 2001 was to obtain more detailed documentation of both cultural layers and material for investigating the processes of change that applied to the layers. There was also the aim of obtaining datable material from the layer beneath the undisturbed sand. Owing to these objectives, it was decided to extend the test trench in addition to excavating it down to the bottom along its whole length. The excavation methods followed those applied in 2000, but now the finds were documented with greater precision. The data for each find also

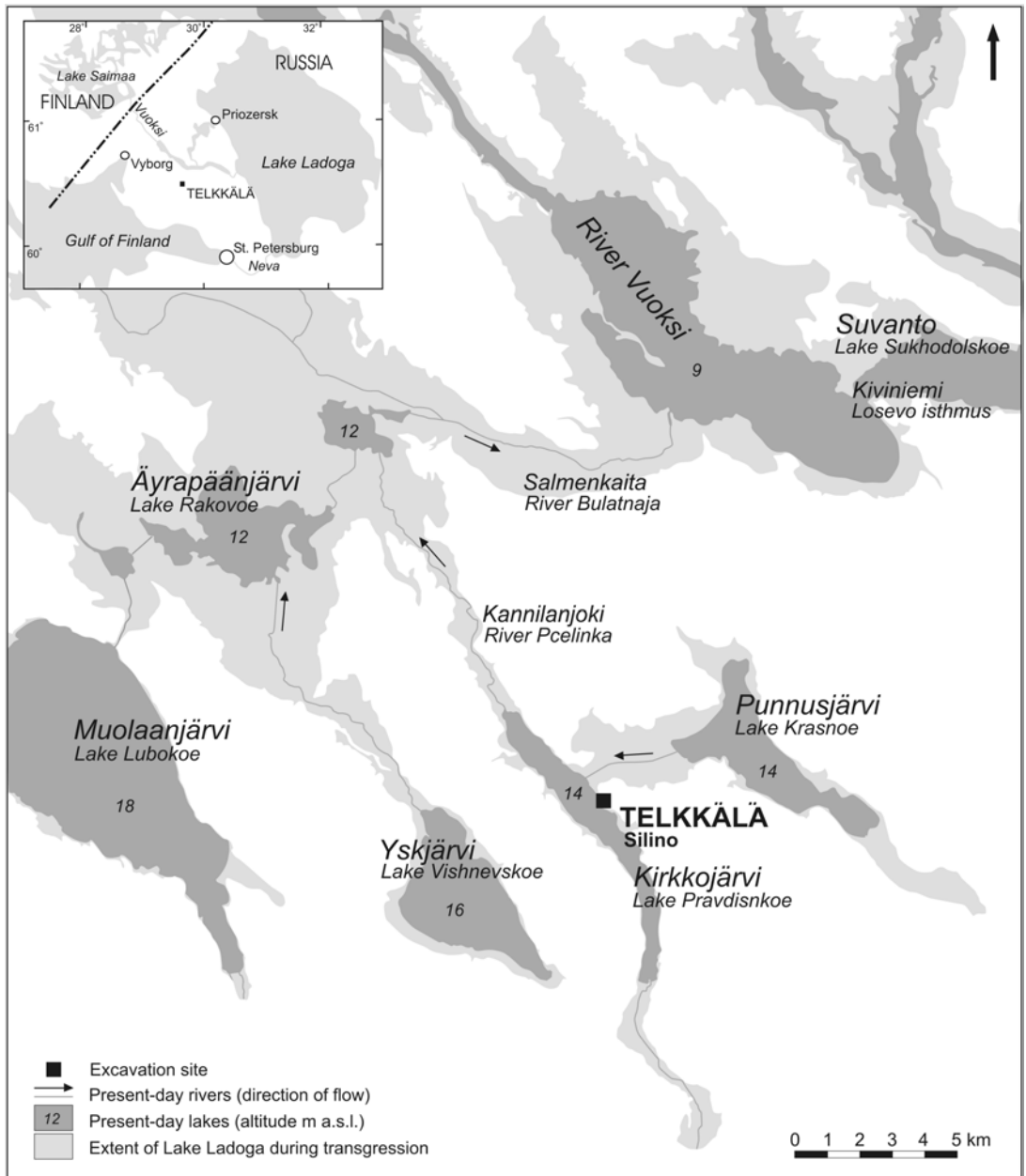


Fig. 1. Location of the excavation site. Present-day lakes and rivers with reference to the maximum extent of Lake Ladoga during the transgression maximum are also presented.

included information on the geological or cultural layer to which it belonged. The excavation spits were 5-10 cm thick.

In both seasons the test pits were one square metre in size. As it would have been slow and partly impossible to excavate test pits to the depth of 2.5 metres, a geological sampling borer was

used in 2001. This made it possible to reach depths of up to 4 metres.

A preliminary description of the lithostratigraphy of the excavation site (e.g. drawings, photography and levelling) was carried out on the field. The final classification of the sedimentary facies of the excavation site is based

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General plan



Drawing by Tommi Sirviö & Anssi Malinen

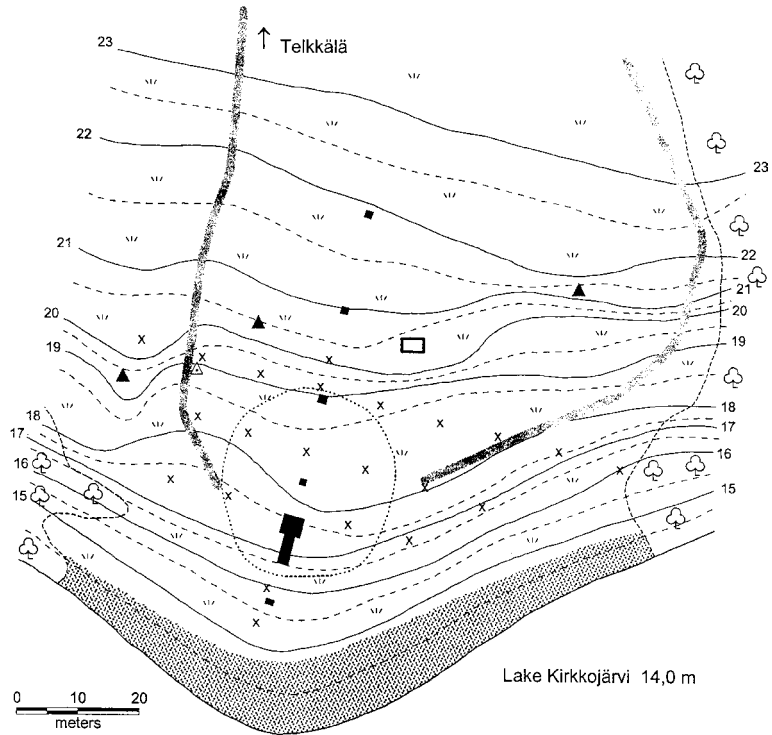


Fig. 2. Excavation site plan.

on analysis of grain size distribution of selected soil samples, possible sedimentary structures and colour of the soil. Selected soil samples were sieved through a series of sieves (\varnothing 4.0, \varnothing 2.0, \varnothing 1.0, \varnothing 0.5, \varnothing 0.250, \varnothing 0.125, \varnothing 0.0625 mm) and classified according to the Udden-Wentworth scale (Wentworth 1922) for the histograms and parameter calculations presented. The graphic measures were calculated according to the formulae and descriptive scales presented by Folk & Ward (1957). All the altitude measurements were made with a tachymeter. Given absolute altitudes (app. ± 0.5 m) are based on the level of Lake Kirkkojärvi (14.0 m a.s.l.) from the first year (2000) of excavations.

Radiocarbon dating was done on seven samples from archaeological remains including both sherds of ceramics and charcoal on selected sedimentary facies. Radiocarbon datings were carried out at the Dating Laboratory of the University of Helsinki and the radiocarbon dates (14C BP) were calibrated (cal BC) with the CALIB rev 4.3. Programme (Stuiver *et al.* 1998).

Description of lithostratigraphy, cultural layers and features of the excavation site

A description of the lithostratigraphy was made on two vertical profiles (east and north sections) of the excavation site. The total depth of the described profiles varies between 2.0-2.3 m and their length between 2.7-3.4 m. Both profiles are divided into 6 facies including three distinctive cultural layers (CL I, CL II & CL III). The description of the profiles and characteristics of the grain size distribution of the facies are presented in Figures 3 and 4. Interpretation and schematic presentation of the facies are presented under the following part of Discussion in Figure 9.

The surface of the excavation site is consisted of thin (5-10 cm) and continuous layer of surface peat (1). The underlying surface layers (11, 10/11) are disturbed by anthropogenic action and they are 10-25 cm thick. The surface layers form mostly continuous gradual contact (based on colour of the facies) with underlying Sm facies of massive sand. Horizontally continuous lower

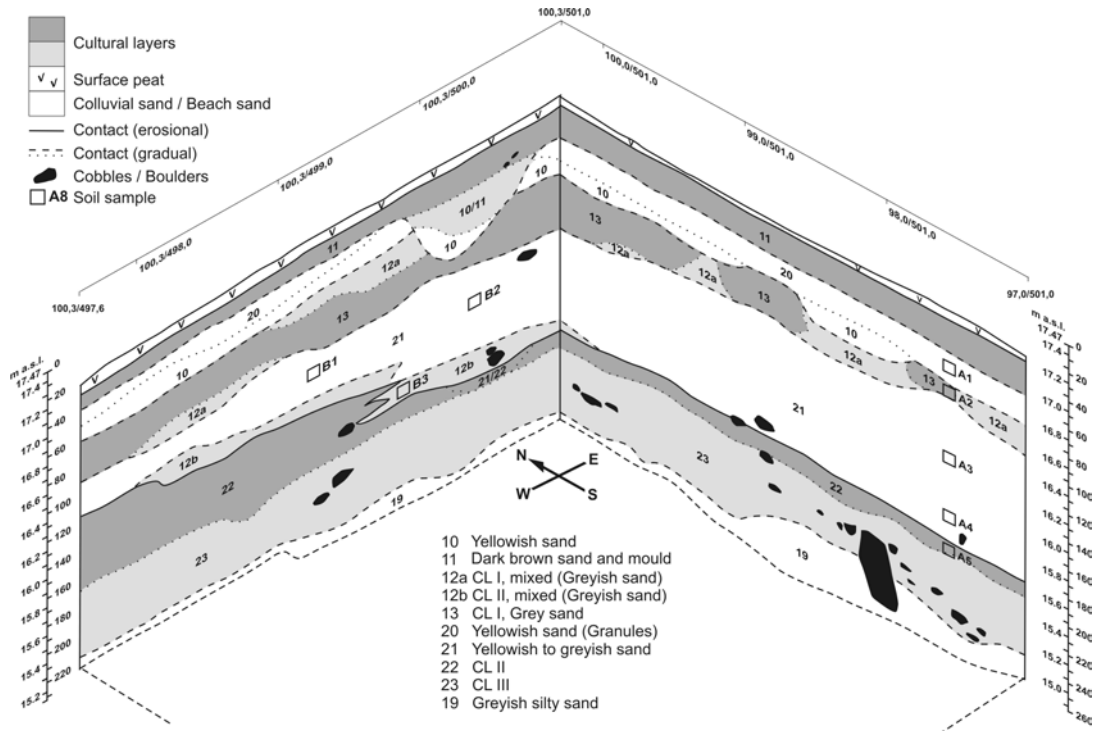


Fig. 3. North and east profiles of the excavation site.

contact surface is partly disturbed by a 40 cm deep and 100 cm wide dug hole in the north section. Surface layers (not analysed) consisted of dark brown sand and mould coloured by charcoal with some granule-sized clasts (> 2 mm).

The Sm facies (20, 10) under the surface layers is 0-30 cm thick and the absolute altitude of facies varies between 16.75-17.25 m a.s.l. The Sm facies forms gradual contacts with both upper surface layers and the lower cultural layer CL I. Partly poorly defined (especially in north section) lower contact surface with CL I is distinguished by both the colour and material of the soil. Two samples analysed from the Sm facies consisted of yellowish medium sand, which was poorly sorted with clearly identified and unevenly distributed granules in the sand matrix. Granules were more abundant in the upper part (20) of the facies and they form a clearly identified tail in cumulative grain size distribution curves. The difference from underlying layer of St/p facies can also be observed from the graphic measures of Kurtosis and skewness (Fig. 4). The Sm facies does not consist of any visible sedimentary structures.

The first cultural layer CL I (12a, 13) is 10-45 cm thick and the altitude of the facies varies between 16.50-17.10 m a.s.l. CL I is consisted of two distinguished parts, which differ in colour from lightly coloured greyish sand (12a) to dark coloured sand with charcoal particles (13). One sample taken from the facies consisted of moderately sorted coarse sand, the graphic measures of which are very similar to the upper parts of the underlying St/p facies. In the northern section marks of a recent cut were clearly visible up to the first cultural layer. The contact with underlying sand (St/p facies) is gradual and based on clear difference in colour of the facies.

On the interface between CL I (13) and underlying St/p facies (21) a small hearth was found (16.41-16.48 m a.s.l.). It consisted of small burnt pebbles and charcoal. Between the pebbles a large amount of fragments of burnt bone were found. The depth of the hearth was 7 cm and its diameter was 45 cm. The hearth was located in the western section - and thus it was possible to excavate only half of it.

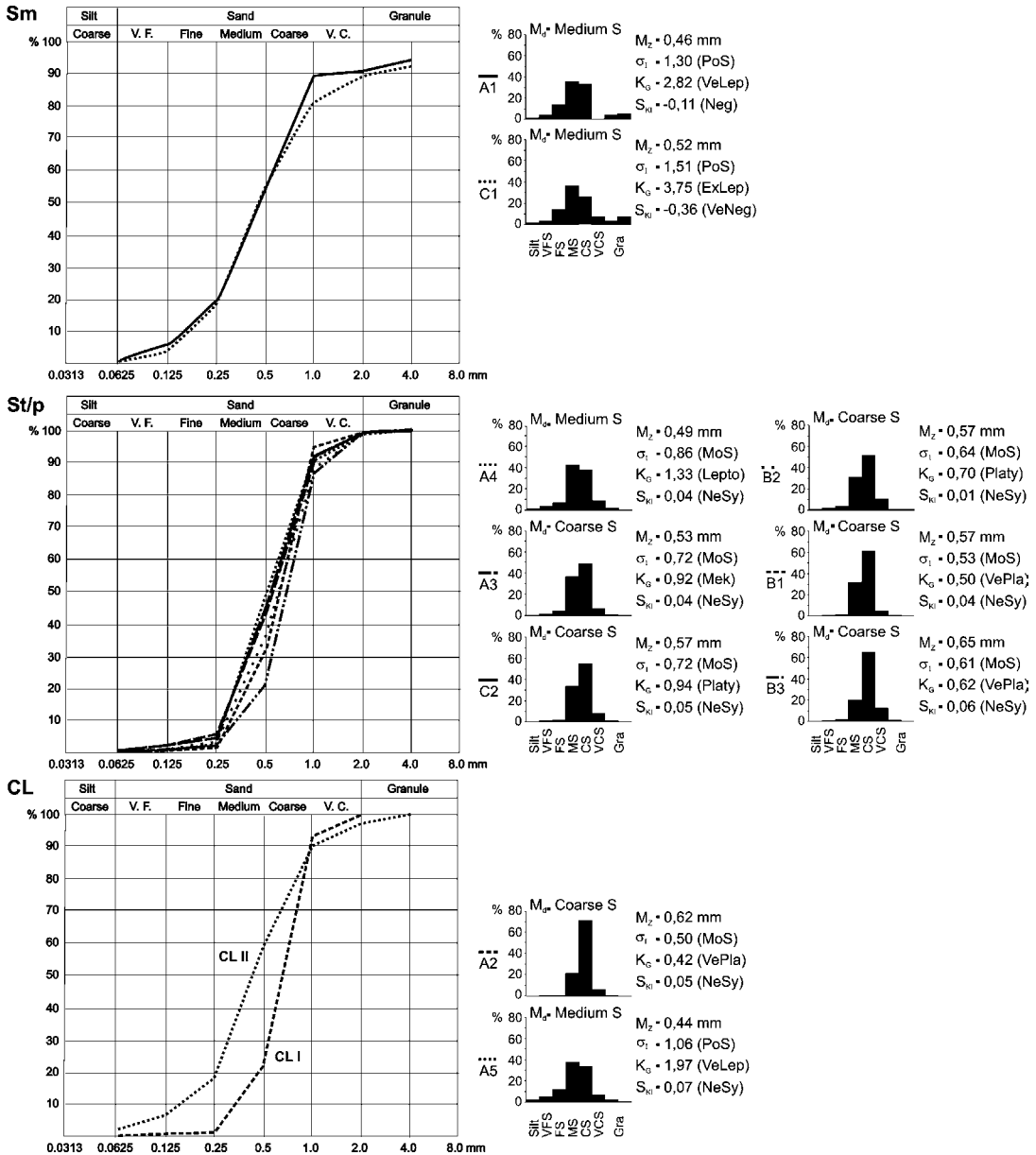


Fig. 4. Cumulative frequency distribution curves, histograms and grain size distribution parameters of selected soil samples (Folk & Ward 1957). M_d = Median, M_Z = Mean (in mm), s_l = Sorting (MoS = Moderately sorted, PoS = Poorly sorted), K_G = Kurtosis (ExLep = Extremely leptokurtic, VeLep = Very leptokurtic, Lepto = Leptokurtic, Meso = Mesokurtic, Platy = Platykurtic, VePla = Very platykurtic) and S_{KI} = Skewness (VeNeg = Very Negatively skewed, Neg = Negatively skewed, NeSy = Nearly symmetrical). A series is taken from the east section, B series from the north section and C series from the west section of the excavation site. Sm = colluvium facies, St/p = beach sand facies and CL I & II = upper and lower cultural layers.

Find	Amount
Quartz	1365
Flint	56
Other lithics	67
Burnt bone	741
Amber	5
Ceramics	2728
Others	74
TOTAL	5036

Fig. 5. Finds from areas excavated in 2000 and 2001, test pits and surface collection.

The St/p facies (21) is 20-100 cm thick and the altitude of the facies varies between 15.70-16.70 m a.s.l. Contact with the lower cultural layer CL II (22) is sharp and erosional with some indication of scouring. The contact is further sharpened by a clear change in colour from greyish and yellowish sand to almost black or dark grey sand coloured by abundant charcoal. The bottom of the St/p facies is marked by several sedimentary structures. These consist of trough crossbeds (lenses of coarse sand a few centimetres thick), which are superimposed by planar laminated crossbeds dipping gently to moderately (10-24°) towards the southeast (114-140°). Some parts of the bottom layers (12b) consist of interbedded sand with charcoal. These laminated charcoal stripes are organized in a pattern similar to the planar and trough crossbeds formerly described. At the bottom of the facies in the north section two lenses of coarse sand partly mixed with charcoal are crudely interbedded with the CL II (in situ) facies. Several cobbles are located near to the surface of the CL II facies. The upper part of the facies lacks any significant structures as being massive in character. The geometry of the whole St/p facies is asymmetrical, noticeably thickening to the southeast and being only 20 cm in the northwestern corner and 100 cm in the southeastern corner of the excavation site.

The total thickness of the second and third cultural layers CL II / CL III (22, 23) is 45-100 cm and the altitude of the facies varies between 15.10-16.30 m a.s.l. CL II / CL III consists of two sections, which differ in colour from charcoal coloured blackish sand (22) to underlying greyish sand (23). Contact with underlying light grey sand

is gradual. One sample taken from the top of the CL II facies consisted of medium sand, which was poorly sorted, differing from the St/p facies above. Both sections of the facies consisted of several cobble and boulder-sized particles. The geometry of the facies is asymmetrical and the surface of the facies slopes gently to the southeast. The thickest part (up to 100 cm) of the facies is located in the northwest corner of the excavation site.

The sand of the second cultural layer (CL II, 22) was coloured black throughout as the result of marked use of fire. Although the third cultural layer had almost the same composition as the second, the finds differed in relation to the latter. The third cultural layer also contained a stone setting for a hearth. The stones had been placed in two layers in a circle. The diameter of the setting was 100 cm at the top and 25 cm at the bottom. The stones were worn and sooty. Two samples for radiocarbon dating were taken from the hearth.

The third cultural layer also contained a cluster of charcoal without stones which also provided samples for dating. There was also a concentration of unburnt stones that could not be associated with any kind of human activity. To the north of the stones was a semi-circular mark 40 cm wide that proved to be pit originally dug down to the bottom soil. The pit was distinguished from the surrounding soil by its lighter colour and the composition of the sand in it.

Basing on the information obtained from the test pits, there were still marks of the cultural layer above the undisturbed sand at a distance of 19 metres from the test trench on its north side, but not in the test pits to the south of the trench. All other test pits that were excavated further away were completely without finds. No signs of the cultural layer beneath the undisturbed sand were found in any of the test pits or bored samples.

In addition to the trial pits, soil samples were taken with a field corer from 22 locations to a depth of 50 cm. All cored locations revealed a mixed layer beneath the surface turf, and five locations closest to the test trench also revealed weak indications of cultural layer (see Fig. 2). The field corer samples did not extend to below the undisturbed sand layer.

The finds

The combined number of finds from both excavations totals 5020 items, of which 4325

Finds/layer	Topsoil	11 and 10/20	12 and 13	21	22	23 and 19	Sections	Sum
Ceramics	1	758	272	578	158	0	534	2301
Quartzflake	2	100	52	165	274	473	80	1146
Quartzcore	1	3	3	0	2	22	4	35
Quartzartefact	0	17	1	4	7	9	3	41
Flintflake	0	11	5	7	3	13	5	44
Flintblade	0	0	1	0	1	0	0	2
Flintartefact	0	1	1	1	0	0	0	3
Quartziteflake	0	3	7	1	3	1	0	15
Quartzitecore	0	0	0	1	0	0	0	1
Quartziteartefact	0	0	1	0	0	0	0	1
Lithic flake	0	7	0	3	7	15	2	34
Lithic artefact	0	1	0	4	3	0	0	8
Burnt bone	0	49	48	67	43	385	51	643
Amber	0	0	1	0	0	0	2	3
Others	0	51	4	5	0	0	1	61
Sum	4	1001	396	836	501	918	682	4338

Fig. 6. The finds of the 2001 excavation by layer and in numbers of items.

were recovered in 2001. In addition to the excavated area, finds were also recovered from test pits and collected from the surface by the lake shore. Surface collection revealed finds of quartz, flint and ceramics, and an intact so-called primitive stone axe. The finds from the 2000 and 2001 seasons are itemized in Fig. 5.

The finds from the 2001 season were also documented with regard to soil and cultural layer. The distribution of the finds is given in Fig. 6.

According to Fig. 6, over 40 % of quartz finds came from the third cultural layer which consisted no ceramics at all. Also 60 % of all the burnt bone came from that layer. When the total number of finds per layer is compared we see that the richest layers were those that were situated on top of all the cultural layers (11 and 10/20) and the third cultural layer.

1) Quartz

The total number of quartzes from both seasons consisted of 1265 flakes, 45 cores, 14 scrapers, 20 points and 21 other artefacts or unfinished pieces. The cores included both bipolar and platform cores. The flakes revealed marks of both techniques.

A significant feature of the stratigraphic

distribution of the quartzes is that up to 41% were found in the third cultural layer, which was completely devoid of ceramics. Of the whole excavated material 41 % of the quartz flakes and 60 % of the quartz cores were from this layer.

2) Flint

The flint material from the site itself consisted of 46 flakes, 3 scrapers and 6 retouched blades. The flint material was dark red or reddish brown carboniferous flint of good quality. The flakes were either roundish pieces made by platform striking or blades made by pressure or by soft hammer technique. The scrapers were round- and end scrapers.

There were no datable types among the flints, but there were differences in technology between the cultural layers. In 2001 the fragment of a flint point with flat surface retouch was found in layer 12, and the flint collection from layer 23 included fragments of pressed-off blades.

3) Other lithic finds

The finds included 55 flakes and 12 artefacts or artefact fragments of quartzite and other types of stones. A piece of quartzite raw material was also found. Polished artefacts and their fragments were discovered in the excavations of 2001. The

finds came from the undisturbed sand layer (21), and the second cultural layer beneath it (22). One object was also found in the undisturbed sand under the surface turf layer (10).

The axes or adzes were four-sided, parallel-bladed artefacts polished throughout. One small adze can be classed as a South-Karelian even-bladed adze. The artefacts were made of quartz-porphry or other porphyric and schistose types of rock. The material included a struck parallel-bladed adze made of quartzite and a rectangular grinding stone of sandstone. The stone flakes were of the same types of rock as the artefacts: quartz-porphry, porphyry and quartzite.

A so-called primitive axe collected as a stray find from the shore was polished only at the blade; the rest of the piece was made by hammering and striking techniques. The axe had a wide blade, with a similar angle on both faces. It was made of dark brown porphyric rock.

4) Bone

Burnt bone was found in all the excavated layers and the cultural layers. The largest amount was recovered from the third cultural layer. In the 2001 excavation 60% of the burnt bone was recovered from the third cultural layer. The pieces of burnt bone include a fragment of an artefact. It was found in the first cultural layer, at the boundary of layers 12 and 13. The item is a fragment of a small carved personal ornament consisting of two matching pieces with a small groove. The groove was apparently for attaching the ornament.

5) Amber

The finds from the 2001 season included an amber button, a fragment of a teardrop-shaped amber pendant and a piece of amber. The button, which had split in the middle was discovered in the north profile section, as also the amorphous piece of amber. The teardrop-shaped amber pendant, which had split at the hole was found in soil layer 13. Two pieces of amber were already found in 2000. One was a partly fractured piece, while the other was a fragment of a triangular pendant which had broken at the hole.

The amber button had two holes, of which the larger one passed through the whole piece, being joined by the smaller hole. This is a so-called v-bored button of the twin-concave type. The pendant fragment was part of a plate thinning towards the edges. The Telkkälä button was found

in a collapsed excavated section, and accordingly the only data on its stratigraphy is that it was either in the first cultural layer or the undisturbed sand layer of the collapsed section.

6) Ceramics

Potsherds were the largest category of finds from the excavation. Samples for radiocarbon dating were taken from carbon deposits on three sherds. Nine different types of decoration can be distinguished in the ceramics from the site. Crushed quartz, sand, organic materials, chamotte and asbestos were used as temper.

Distinguishable in the ceramic material are Early Comb Ware, Typical Comb Ware, Late Comb Ware, Pitted Ware, Asbestos-tempered ceramics, Karelian ware, and red-clay ware. In addition, there is a large number of sherds decorated with various comb stamps and pits whose type cannot be precisely defined because of their small size and limited amount of decoration.

With one exception, all the sherds of Karelian and Iron Age type ceramics found in 2001 were found in layer 11. The Karelian ware, totalling 10 sherds, was turned with a spun wheel or a hand wheel, with crushed stone used as temper. The outer surface of the sherds is dark or reddish brown, and the inner surface is dark grey. The rim sherds are markedly profiled - some of them are decorated with gently slanting grooves.

Three potsherds classed as being of Iron Age date were found, two in layer 11 and one in layer 10. The sherds are brownish, fired at low temperature and they have weak marks of smoothing on the outside. The temper is coarse crushed stone. Layer 11 also revealed a few pieces of wheel-turned, thin walled red clay ware, of which one sherd was glazed.

In 2001 sherds of asbestos-tempered ceramics were found in layers 10 (3 sherds), 12 and 13 (16 sherds), and 21 (1 sherd). The sherds have limited decoration consisting of oval pits and shallow stamps or impressions. There is a distinct row of pits and a row of oval impressions on the outer surface of one sherd. There is a large undecorated area between the rows. The pits form negative impressions on the interior surface. The intact pieces are 8-10 mm thick. All the asbestos-tempered sherds are wall sherds from which the shape of the rim or base could not be discerned. The excavation in 2000 revealed a total of 11

sherds of asbestos-tempered ceramics. They concentrated in the uppermost layers of the excavation and close to the north profile. The sherds contain asbestos fibres and the thickness of the wall sherds varies from 4 to 8 mm. There is little or weakly distinguishable decoration consisting of comb stamps and impressions on the surface.

Contemporaneous with the asbestos-tempered ware is so-called Late Comb Ware, sherds of which were found in layers 10/20, 12 and 21. The sherds are decorated with large pits and small, shallow pits forming zig-zag motifs. Ring-shaped stamps are the most common ornamental element. The ring impressions for uniform adjacent rows, sometimes with overlap. On some of the sherds there is a deep horizontal groove with ring stamps above and beneath it. The temper appears to have been some kind of organic material, which left pores in the clay body, and crushed stone - one sherd had chamotte temper.

The main body of ceramic material from Telkkälä consisted of Typical Comb Ware, among which sherds of the early and late phases can be distinguished. There were also sherds from a vessel of the so-called Hochstil of Typical Comb Ware. In the 2001 excavation, Typical Comb Ware concentrated in layers 10/20, 12, 13 and 21. The main ornamental elements are comb stamps and pits, forming alternating horizontal rows. The ornamental motifs made with comb stamps also include triangles, lozenges, zig-zag lines, web designs and a water-fowl design. The decoration covers the walls of the vessels, and in many rim sherds there are short comb stamps on the top surface. One sherd was decorated on both the inside and outside surface, with comb stamps on the outside and three rows of oval pits on the inside. In between the rows of pits are slanting comb stamps with even bases. The pits impressed on the inside form bulges on the outside surface.

One definite sherd of the late phase was found in excavation layer 10 at Telkkälä, while the sherds of the early stage concentrated in layers 10, 13 and 21. Also the second cultural layer (22) contained a number of sherds of the early stage of Typical Comb Ware with comb-stamp decoration.

Pit-decorated pottery from Telkkälä can be divided into two groups. The first group consists of sherds in which the vessel is decorated solely with zones of numerous pit impressions. The pits

are without exception oval. The vessels are well fired and their surface is light brown. The temper consists of crushed stones and sand. The second group consists of vessels which are decorated with rows of comb stamps in addition to pits. The upper section of the vessel and sometimes the top surface of the rim are decorated with comb stamps, with a large zone of pit ornament beneath it. The pits are round.

The oldest pottery in the Telkkälä finds is represented by 7 sherds of Early Comb Ware from layer 22. This layer contained a total of 157 potsherds, of which 16 were undecorated, 1 marked with a lattice design, 11 with comb stamps and one with finger-nail impressions. The remainder lacked an outer surface or were otherwise unidentifiable.

The Early Comb Ware sherds were tempered with coarse crushed stone. In addition the pieces are porous. The rim is of simple form, having a straight-topped rim with no decoration. The ornamental elements were sparsely denticulated or very small comb stamps, so-called finger-nail impressions, drawn lines or grooves and lines with pits. The pit ornaments were applied sparsely on top of the other decoration. Also short, parallel grooves sometimes form horizontal zones. Grooves of various orientation form herringbone, net and basket-weave patterns.

7) Other finds

The other find categories of the excavations consist of recent metal objects, iron slag and fragments of clay pipes found under the surface turf layer and in the mixed layer. Asbestos fibres were collected from the first and second cultural layers in both years.

Radiocarbon dates

Seven radiocarbon dates were taken from the excavation: three from the stone-settings of hearths, one from a concentration of charcoal without stones and three from potsherds. The dating of the sherds was from the carbonized encrustation on the inner surface. The results of dating are given in Fig. 7.

Carbon samples 1 and 2 were taken beneath the stones in the middle of a hearth setting in the third cultural layer (23). The absolute elevation of both samples was 15.37 metres a.s.l. The dates

No.	Sample	Year BP	s 13 C	Cal BC/AD	Lab. no.
1	Hearth, layer 23	6975±80	-27.2	5820 (5840-5813) CalBC	Hela-524
2	Charcoal conc., layer 23/19	6860±75	-25.4	5730 CalBC	Hela-526
3	Hearth, layer 23	6815±80	-26.0	5720 CalBC	Hela-525
4	Ceramics, layer 22/23	5830±80	-27.5	4700 (4710-4694) CalBC	Hela-554
5	Ceramics, layer 10	4965±80	-27.0	3710 CalBC	Hela-553
6	Hearth, layer 13/21	4965±60	-26.0	3710 CalBC	Hela-591
7	Ceramics, layer 11	1275±65	-28.8	720 (694-766) CalAD	Hela-555

Fig. 7. Radiocarbon datings from the Telkkälä site.

obtained were 6975±80 BP (5820 cal BC) and 6815±80 BP (5720 cal BC).

Layer 23 (CL III) contained several small concentrations of charcoal, of which the lowest ones bordered on natural soil layer 19. Sample 2 was taken from boundary of these two layers in the northeast corner of the test trench at an elevation of 15.34 m a.s.l. The date of the charcoal concentration, 6860±75 BP (5730 cal BC), falls in between the dates for the hearth. The hearth and other fires kept in this layer are dated to the end of Mesolithic times.

The date for a sherd of Early Comb Ware found at the boundary of the second and third cultural layers was 5830±80 BP (4700 cal BC). Although outer surface of sherd was weathered, it still revealed a row of slanting comb stamps and a line formed by a double zig-zag design. The clay was tempered with very coarse crushed stone. The absolute elevation of the dated sherd was 15.89 m a.s.l.

The first sandy layer (10/20) underneath the top soil revealed plenty of sherds of which a rim sherd of Early Typical Comb Ware was dated. There were distinct comb stamps on the outer surface below which were several rows of round pits. The uppermost row of pits was impressed on top of the comb stamps. The upper part of the rim was decorated with short comb stamps. Fine crushed stone was used as temper. The sherd was discovered at an elevation of 16.59 metres and is dated to 4965±80 BP (3710 cal BC).

One fireplace was discovered at the boundary between the first cultural layer and the St/p facies. The fireplace was partly covered with the first cultural layer and the bottom of it was dug in to the St/p facies. The dating of the charcoal from the fireplace is 4965±60 BP (3710 cal BC). The fireplace was situated at 16.41-16.48 m a.s.l.

Sherds of Iron Age ceramics were found in the layer beneath the top soil. Some of them were slightly profiled rim sherds. A dating of a carbonized encrustation on the inner surface of a rim sherd gave the result 1275±65 BP (720 cal AD). The dated rim sherd was found when preparing the west profile section of the excavation, in layer 11 without any detailed information on the location.

DISCUSSION

Archaeology

The quartzes from Telkkälä are common artefact types that were in use throughout the Stone Age. Quartz technology alone cannot be used for dating purposes, even though bipolar striking, which was also in use at Telkkälä, was more common during the Mesolithic than platform striking according to Swedish research (Knutsson & Lindgren SA; Lindgren 1996).

The oldest lithic artefact is a so-called primitive axe collected as a stray find from the lakeshore. Although the axe was not found in a cultural layer it belongs to the context of the site. Primitive axes are dated to the Mesolithic, ca. 9300-6000 BP (ca. 8500-4900 cal BC) (Matiskainen 1989a:389). Although the distribution of the axes is concentrated in Southern Finland and Karelia, there are also finds from Northern Finland (Huurte 1983:81-82; Luho 1967).

The nearest significant Mesolithic site to Telkkälä is the location of the Antrea net, dated to 9310±140 BP (ca. 8540 cal BC) and 9230±210 BP (ca. 8370 cal BC) (Siiriäinen 1974:11; Matiskainen 1989b:71), situated 39 kilometres

NNW from Telkkälä. The Antrea find also included quartz artefacts, a primitive axe, possible quartz inserts, lithic artefacts and various artefacts of bone and antler (Luhó 1967:25-33; MatisKainen 1996:258; PälSi 1920b; Taavitsainen 1995). The lowermost cultural layer at Telkkälä is dated ca. 2900 younger than the Antrea find.

The intact and fragmentary polished stone artefacts from Telkkälä are from the Neolithic. The adzes or axes are four-sided objects polished throughout, that can be technologically attributed to the Comb Ware period. Except for a South-Karelian even-bladed adze, there were not datable artefact types. This adze type was in use from the Mesolithic to the Comb Ware period. Its distribution is concentrated in Southern Finland, the Karelian Isthmus and the Lake Ladoga regions of Karelia (Luhó 1948).

There are chronological differences in the techniques of the flints found at Telkkälä. Flat surface retouch, which was applied in the flints of the upper cultural layer, is a typically Neolithic feature (Edgren 1987:68). Thin blades of the kind found in the lowermost cultural layer at Telkkälä are typical Mesolithic forms (Ostrauskas 2000:172; Sulgostowska 1999:87 table 1, 89).

During the Mesolithic there were several flint-using cultures in North-West Europe and West-Russia, of which the Kunda and Butovo cultures are the best known. The Kunda culture occupied areas of present day Baltic states and northern Poland and southern Finland around ca. 9000-4900 cal BC (Lang & Kriiska 2001:88, fig.1; Ostrauskas 2000:171, fig.1). The Butovo culture appeared in the Upper Volga¹ region about 10 000-6900 BP (ca. 9500-5700 cal BC) (Zhilin 2001:269-272; 2003). Apart from that, single sites like Pulli (9740-9165 BP, ca. 9200-8400 cal BC), Lahti Ristola (ca. 9250 BP, 8500 cal BC) and Butovo (9310 BP, ca. 8440-8140 cal BC) have clear analogies in their flint collections especially with the so-called Pulli-type arrowheads (Koltsov & Zhilin 1999:346-347; MatisKainen 1996:257; Ostrauskas 2000:171; Zaitseva *et al.* 2000:39; Zhilin 2003).

The Telkkälä site thus falls into the zone of the Kunda culture. The date obtained for the lower cultural layer at Telkkälä 6975-6815 BP (ca. 5820-5720 cal BC) is contemporaneous with the final stage of the Kunda culture.

The bone ornament from Telkkälä is an exceptional artefact among Stone Age bone

ornaments. The most common decorative motifs were various engravings, dots and drillings (Edgren 1969:15, 17; Gurina 1958:16-17). There is no information on bone ornaments shaped by carving, which was usually used for making the grooves for attaching the piece. Bone ornaments are distributed throughout Finland, and are known from various stages of the Stone Age, although during the Mesolithic they were undecorated (Edgren 1969:19-20).

According to Pesonen (1997:12-14) circa 30 v-bored amber buttons have been found in Finland and most of these date to the Kierikki/Pöljä asbestos ware. Siiriäinen (1967:21-24) gives dating to the type from the Typical Comb Ware to the turn of the Pyheensilta and Kiukainen time. But it is also possible that the type will continue later in the so called Haffküsten-culture in the continental Europe, and then the type may also emerge during the time of the Kiukainen culture in Finland (see Siiriäinen 1967:24).

The coast of Latvia is the closest source of amber for Karelian Isthmus - it is regarded as having provided the raw material for the amber ornaments that spread to East Karelia and the Karelian Isthmus, and having partly been a place of manufacture for them (Siiriäinen 1967:21).

With regard to Telkkälä, the nearest finds of amber ornaments are stray finds from Lehtokylä in Muolaa, Koukunniemi in Metsäpirtti, Sakkola and the Stone Age sites of Pitkäjärvi in Räisälä, Häyrynmäki in Viipuri and Riukjärvi and Piiskunsalmi in Kaukola (MV AOA). No v-bored buttons have been found at any of these sites as the finds consist of rhomboid or lamellar pendants and their fragments in addition to a pendant with a human face from Metsäpirtti (MV AOA; PälSi 1920a:143-145; Äyräpää 1945:10-15). The round ring-like pendants from Kaukola are presumably of the same type as the fragments discovered at Telkkälä. During the autumn of 2002 one v-bored amber button was excavated from a Neolithic site at Heinjoki Vetokallio (V. Timofeev, personal comm.), which is so far the nearest such find to Telkkälä site.

The latest stage of the ceramic finds from Telkkälä is represented by sherds of red clay ware and so-called Karelian ware. Karelian ware is a type that was in use from the Iron Age to the Early Middle Ages; the largest numbers of finds are from sites in Savo and Karelia (HY Arla).

FACIES	DESCRIPTION	ENVIRONMENT	ARCHAEOLOGY	¹⁴ C yr BP
Surface (1, 1f) (10-25 cm)	Surface peat, dark brown sand and mould, granules Contact gradual	Disturbed surface	Iron Age ceramics, recent finds	1275-65 BP (Hela-555)
Sm (10, 20) (0-30 cm)	Yellowish, matrix supported and massive medium sand, poorly sorted, granules abundant (app. 10%) Contact gradual	Colluvial sand	Typical combware, Late combware, quartz	
CLI (12a, 13) (10-40 cm)	Lightly coloured greyish to grey coarse sand (charcoal), moderately sorted, partly discontinuous horizontal sections Contact gradual	Cultural layer I	Typical combware, Asbestosware, quartz, flint	4965-60 BP (Hela-591)
St/p (21, 12b) (25-90 cm)	Yellowish to greyish coarse sand, moderately sorted, upper part: gently to SE dipping planar crossbeds to massive sand, lower part: trough crossbeds, partly mixed with charcoal organized in crossbeds, cobbles (possible lag) Contact erosional	Transgressive sequence of beach sand (Ladoga transgression)	Typical combware, Pit and combware, Early combware, quartz	4965-80 BP (Hela-553)
CLII (22) (10-60 cm)	Dark grey to greyish medium sand, poorly sorted, tight packing, several cobbles and boulders, charcoal abundant	Cultural layer II	Early combware, quartz	5830-80 BP (Hela-554)
CLIII (23) (45-100 cm)	Dark grey to greyish medium sand, poorly sorted, tight packing, several cobbles and boulders, charcoal abundant	Cultural layer III	Quartz, burnt bone, flint	6860-75 BP (Hela-526) 6815-80 BP (Hela-525) 6975-80 BP (Hela-524)
Bottom (19)	Greyish sand, silty Contact gradual	Post-glacial	—	

Fig. 8. Schematic presentation of the lithostratigraphy of the excavation site.

The decoration of sherds of asbestos-tempered ceramics from Telkkälä resembles both the Kierikki and Pöljä types of asbestos-tempered ware, but the limited material makes it difficult to present any precise definitions (see Meinander 1954:165; Siiriäinen 1967:9-10, 31-33). Accordingly, the asbestos ceramics from Telkkälä should be given the term Kierikki/Pöljä type (cf. Pesonen 1995:143-144).

Asbestos-tempered ceramics of the Pöljä type are dated to ca. 4400-3900 BP (ca. 3000-2400 cal BC) and the Kierikki type to approximately 5000-4400 BP (ca. 3800-3000 cal BC) (HY Arla; Carpelan 1979:10-11). The Kierikki and Pöljä types were previously regarded as being contemporaneous, but the age and relationship of these groups are still being debated (Carpelan 1979:14; Lavento & Hornytzkyj 1996:42-44; Siiriäinen 1967:34-35; 1984:32).

The respective distributions of the Kierikki and Pöljä types resemble one another, but for the time being only Pöljä type ceramics have been found on the Karelian Isthmus (HY Arla; Siiriäinen 1984:32). The distribution of the Kierikki type has a slightly more northern focus, but this ceramic group also has connections with the East Karelian ceramic tradition (Siiriäinen 1967:34-35; 1984:32; HY Arla).

Late Comb Ware is contemporaneous with asbestos-tempered ceramics, being dated to ca. 5000-3900 BP (ca. 3800-2400 cal BC) (HY Arla). The distribution of the older phase of Early Comb Ware is concentrated in the South Finnish coastal region, while the later phase is known from only a few sites in Western Finland (HY Arla; Äyräpää

1930:183-187). With regard to Telkkälä the nearest finds of Late Comb Ware vessels are from the Häyrynmäki site in Viipuri and from Säkkijärvi and Räisälä (HY Arla; Äyräpää 1930:188 abb. 78-81).

The distribution of Typical Comb Ware (5200-4800 BP, ca. 4000-3600 cal BC) is concentrated in Savo-Karelia, the Southeast Finnish coastal region and the Karelian Isthmus (HY Arla; Äyräpää 1930:179-183). The nearest finds to Telkkälä are from Kannilanjoki, Kuusaa in Muolaa and the Häyrynmäki site in Viipuri (MV AOA).

The sherds of Pitted Ware from Telkkälä belong to so-called Eastern Pitted Ware (also known as Pit and Comb Ware). Eastern Pitted Ware is dated to the same period as Typical Comb Ware, ca. 5200-4800 BP (ca. 4000-3600 cal BC) (HY Arla). Eastern Pitted Ware is known from only a few sites in the Kymenlaakso region, Southern Savo and Northern Karelia. The distribution of this type is concentrated in the presently Russian areas of Karelia (Kokkonen 1978:93-95). With regard to Telkkälä, the nearest finds of Pitted Ware are from the Häyrynmäki site in Viipuri and Kaukjärvi in Uusikirkko (MV AOA; HY Arla; Äyräpää 1930:188-189).

The nearest sites to Telkkälä that have revealed older Early Comb Ware are Häyrynmäki in Viipuri and Riukjärvi in Kaukola (MV AOA; Äyräpää 1930:171-177). The late phase of Early Comb Ware has been found at the Kaukjärvi site in Uusikirkko, among other locations (MV AOA). The older phase of Early Comb Ware is dated to approximately 6200-5500 BP (ca. 5100-4300 cal BC) (HY Arla).

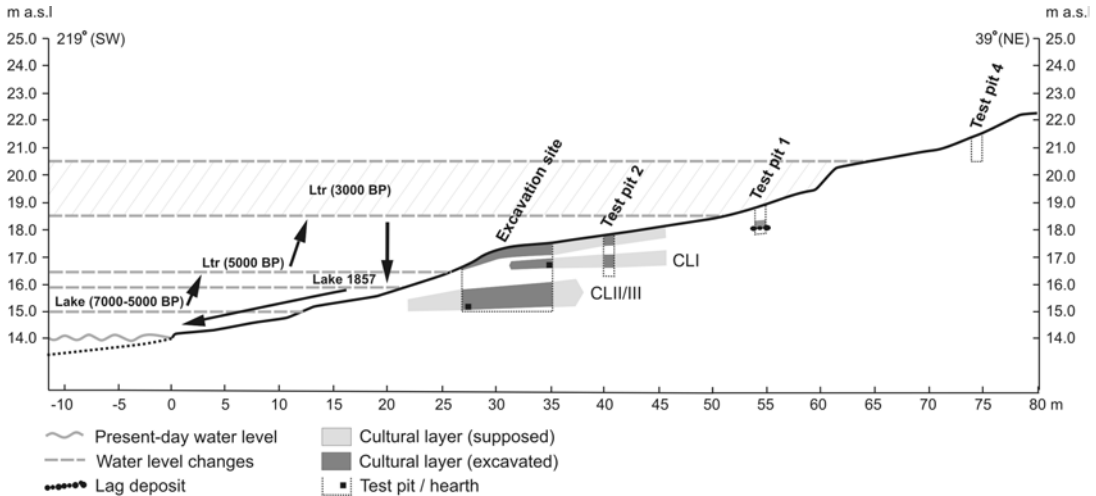


Fig. 9. Cross-sectional profile of the excavation site with reference to the changes in shore level during the Ladoga transgression (Hyypä 1943; Saarnisto & Siiriäinen 1970). Ltr.= Ladoga transgression.

This type of ceramics is found mostly along the South Finnish coast, but in practice it is distributed throughout Finland: in the east the area of distribution extends as far as the Karelian Isthmus, the Lake Ladoga regions of Karelia and as far as the areas to the east of Lake Onega (MV AOA; HY Arla; Edgren 1987:29, 32).

Lithostratigraphy in connection to the Ladoga transgression

A schematic presentation of the lithostratigraphy of the excavation site is given in Figure 8. The most significant features in the lithostratigraphy of the excavation site are a thick layer of moderately sorted sand in the St/p facies underlain by the cultural layers CL II and CL III.

Recent finds together with radiocarbon dates 6975-5830 BP (ca. 5820-4700 cal BP) obtained from the hearth at the lowermost cultural layer (CL III) suggest quite a low shore level at Telkkälä site (below 15.4 m a.s.l.) before the onset of the discharge of the Lake Saimaa through Vuoksi channel to Lake Ladoga (Fig. 9).

The contact surface between the lowermost cultural layers (CL II / CL III) and transgressive layer of beach sand (St/p facies) is erosional. Redeposited charcoal from CL II as being thickest in western and northern sections of the excavation site is organized in a similar pattern with lower

primary structures of St/p facies. The evidence of erosional contact is further supported by some structures of scouring observed in the north section of the excavation site and possible lag deposit on the surface of the second cultural layer (CLII). This indicates that the uppermost part of CL II facies has been partly destroyed by wave action in the early phases of the Ladoga transgression.

Sedimentary structures of planar laminated crossbeds above CL II in the lowermost part of St/p facies have been formed during the early phases of Ladoga transgression. Wedge-shaped planar crossbeds gently dipping seaward on clean sands are typical in beach deposits. The direction and dip of the planar crossbeds would suggest a southeastward sloping shoreface at the time of deposition.

In the case studied partial preservation of transgressive facies (both CL II / CL III and St/p) would support a rapid rise in water level. Abundant supply of sand of fluvio-glacial origin in the area has made the construction of a shore terrace possible under low water level on the lowermost cultural layers (CL II / CL III). During the first phases of transgression rising water level slightly eroded the surface of the second cultural layer (CL II). As transgression has proceeded, the landward migrating beachface has reached upper areas with abundant supply of sand and

construction of shore terrace has begun and the shoreline in the area might have been remarkably deformed during the early phases of transgression. As the two identical radiocarbon dates 4965 BP (ca. 3710 cal BC) obtained from the ceramics from the upper part of the St/p facies and from the hearth at the upper cultural layer (CL I) suggest, the deposition of the St/p facies upon the lowermost cultural layers can be interpreted as related to the discharge of Lake Saimaa into Lake Lagoda through Vuoksi channel ca. 5000 BP (ca. 3800 cal BC) as already suggested by Saarnisto (1970) and Saarnisto & Siiriäinen (1970) and it caused rapid rise of 1-2 meters (Saarnisto 1970) in the level of the Lake Ladoga.

The upper cultural layer (CL I) is located mostly at the top of the transgressive layer of beach sand (St/p). Because of the asymmetric geometry of the St/p facies, the distinction between the CL I and St/p facies is not very clear at the northwestern section of the excavation site. The material of CL I is very similar to the material of the St/p facies and the cultural layer consisted of loose and very lightly coloured sand with some discontinuous vertical sections. Radiocarbon date 4965 BP (3710 cal BC) obtained from the hearth in situ belonging to the bottom of the first cultural layer CL I clearly indicate that the Telkkälä site has still been inhabited during the early phases of the transgression. This is further supported by the abundant finds of Pit and Comb Ware and Late Comb Ware from St/p facies and the layers above. As transgression has proceeded transgression has eventually deformed and destroyed the new site as the shoreface has migrated landwards. The maximum altitude of the continued Ladoga transgression at the isobases of Lake Kirkkojärvi has been defined at ca. 18.5-20.5 m a.s.l. (Hyypä 1943; Saarnisto & Siiriäinen 1970), which was reached at the time of the origin of River Neva around 3100 BP (ca. 1300 cal BC) (Saarnisto & Grönlund 1996).

The upper cultural layer (CL I) is superimposed by poorly sorted yellowish massive sand (Sm). Poorly sorted sand with a significant amount (c. 10 %) of granules indicates clear difference from underlying cultural layer (CL I) and transgressive facies (St/p). The Sm facies is interpreted as colluvial deposits of sheetwash formed after the origin of the Neva and a rapid drop of shore level in the area. The age of the deposition is further

supported by the radiocarbon date 1280 BP (ca. 700 cal AD) obtained from a sherd of Karelian ceramics above from the upper surface layers. The end of the Ladoga transgression led to the final isolation of Lake Kirkkojärvi from Lake Ladoga.

CONCLUSIONS

The dating results from the hearth and concentrations of charcoal in the lowermost cultural layer indicate occupation of the Telkkälä site as early as 6975-6815 BP (5820-5720 cal BC). At this stage the elevation water level in Lake Kirkkojärvi was under 15.4 metres a.s.l. as indicated by the hearth found in the lower part of the cultural layer.

The second stage of habitation is a continuum from the Mesolithic to the Neolithic. The cultural layer of the Neolithic phase is well preserved and markedly black. A sherd of Early Comb Ware from this layer dated to 5830 BP (4700 cal BC) is 1000 years younger than a Mesolithic hearth in the lower cultural layer.

Pot sherds decorated with pits and long regular comb stamps in zones are from the Typical Comb Ware period, its early phase. The beginning of the Typical Comb Ware style is dated to ca. 5200 BP (4000 cal BC). The radiocarbon dates obtained and the typology of the artefacts suggest that the occupation at the site continued until it was inundated by the transgression of Lake Ladoga around 5000 BP (ca. 3800 cal BC). Similar sites of Typical Comb Ware, which were inundated by the Ladoga transgression have already been described by Saarnisto & Siiriäinen (1970). So far this is the first time when such lithostratigraphy together with several radiocarbon datings has been described from the Karelian isthmus. At Telkkälä site the water level rose to ca. 16 metres a.s.l. leaving the lower cultural layers under the water and the shore deposits. Since the lower cultural layers had eroded to only a small degree in the early stages of the transgression, the rise of water level and the formation shore deposits were presumably fast and connected to the formation of River Vuoksi and discharge of the waters of Saimaa Lake complex to the Lake Ladoga as suggested by Saarnisto (1970).

The final transgressive stage of the Lake Ladoga before the origin of the River Neva lasted approximately 2500 years - 5000-3000 BP (3800-1300 cal BC). Pot sherds that can be dated to this

period (Typical Comb Ware, Eastern Pitted Ware / Pit and Comb Ware, Kierikki/Pöljä asbestos-tempered ceramics and contemporaneous Late Comb Ware), the amber ornaments and the bone ornament together with the fireplace dated slightly under 5000 BP found on top of the transgressive beach deposits show that Telkkälä was inhabited also during the later phases of the transgression. The uneven nature of the first cultural layer and distribution of artefacts contemporaneous with the transgression indicate that the dwelling site was probably destroyed either in part or completely in connection with the proceeding transgression.

The ceramic material indicates that the site was abandoned in 3900 BP (ca. 2400 cal BC) at the latest. Abandonment of the settlement was most presumably connected to the continuing flooding of the site because of the rise of water level due to the Ladoga transgression. The maximum limit of Lake Ladoga transgression at the site (19-20 m a.s.l.) was reached around 3100 BP (1300 cal BC) (Saarnisto & Grönlund 1996). It was not until the Iron Age that new human activity took place at the Telkkälä site. Two stray finds from the village of Telkkälä also indicate Iron Age settlement.

In summary it can be said that human occupation at Telkkälä began at the end of Mesolithic around 7000 BP (ca. 5900 cal BC) and continued, possibly directly, into the Comb Ware period. Typical Comb Ware spread into the area before the flooding of Lake Ladoga inundated the original site around 5000 BP (ca. 3800 cal BC). At this time the settlement moved to a higher level and continuous settlement at the site came to an end in 3900 BP (ca. 2400 cal BC). The next signs of human activity are from the Iron Age, after an interval of some 3000 years.

The Telkkälä site has had contacts to several cultures. At the end of the Mesolithic, Telkkälä was within the sphere of influence of the Kunda culture. The Late Mesolithic flints from the site are a possible indication of contacts to this culture. During the Comb Ware period Telkkälä was at the intersection of cultures spreading from both east and west and under their influence.

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NOTES

1 Other flint using cultures during the Mesolithic in the Upper Volga region were the so called Ressetta and Yenevo cultures and east of Lake Onega the Veretye culture (Koltsov & Zhilin 1999:353-358; Kravtsov 1999:278-279; Oshibkina 1989:404, 412; 1999:325-328; Sorokin 1999:313-315), but the Butovo culture is the best researched (Sorokin 1999:311).

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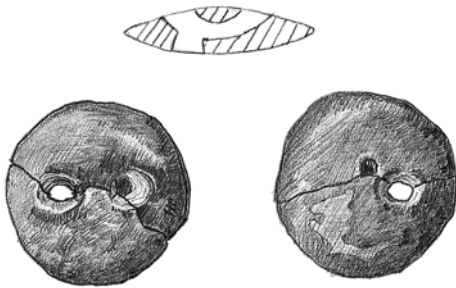
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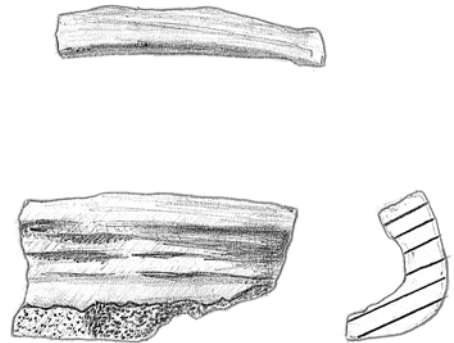
Appendix 1.

Finds from the excavation. Scale 1:1. Drawings by Museum of Lahti / Antti Lahelma.

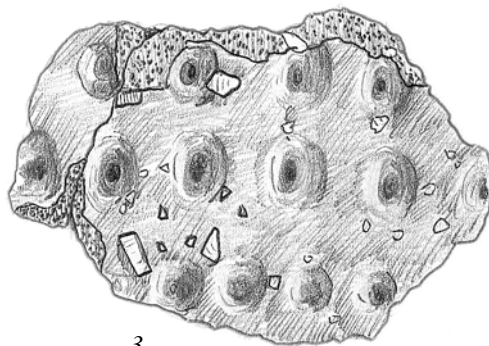
1. Amber button

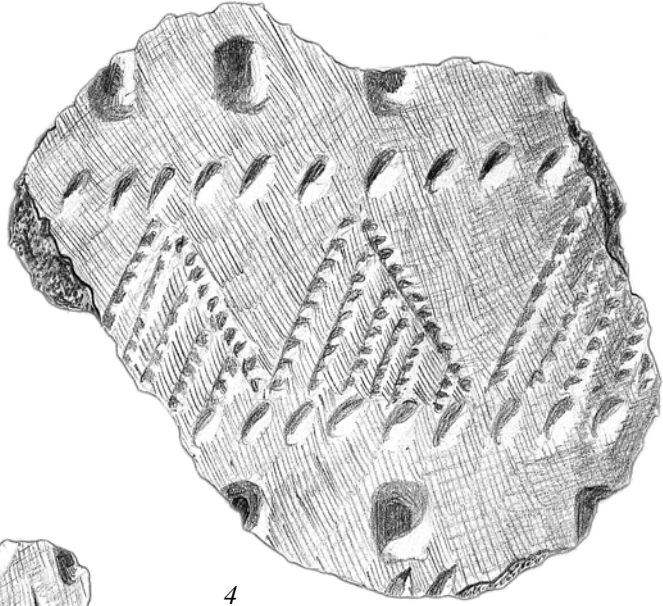


2. Piece of Karelian ware

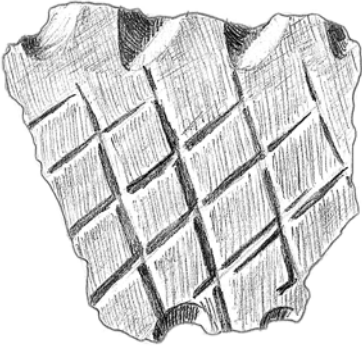


3.-9. Pieces of Neolithic ware

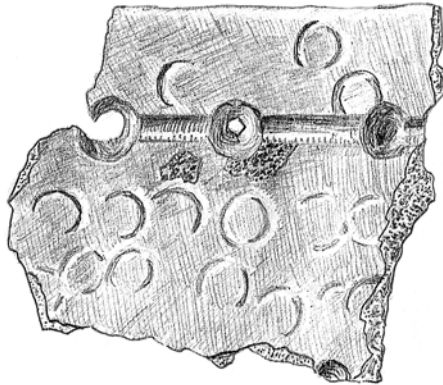




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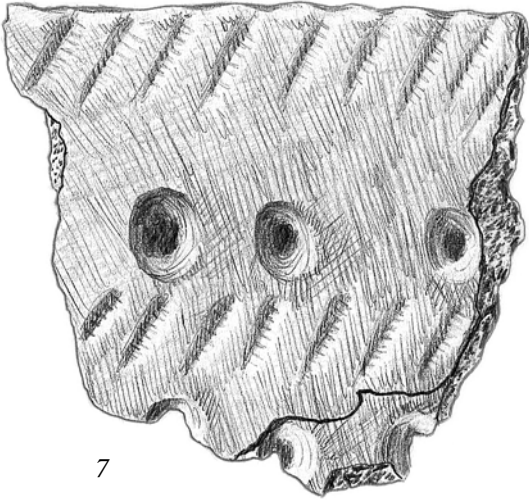
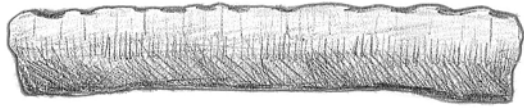


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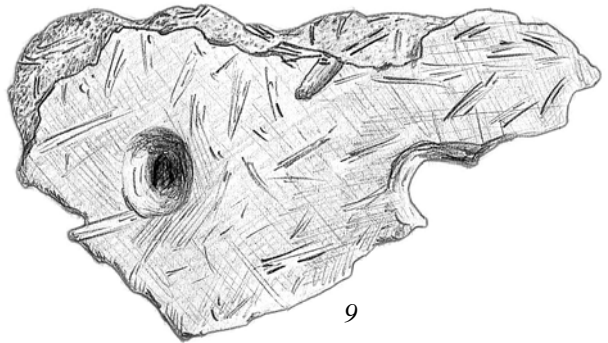




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8



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10. Slate axe

