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THE RUPUNKANGAS 1A SITE IN THE ARCHIPELAGO OF ANCIENT LAKE LADOGA: A HOUSEPIT WITH SEVERAL REBUILDING PHASES

Abstract

A small-scale excavation at the Rupunkangas 1A site in 2005 yielded artefacts dating from the Mesolithic Stone Age to the Early Metal Period. In this article, all sites in the Rupunkangas area are discussed briefly. However, the main focus is on the interpretation of the Rupunkangas 1A site – a housepit with thick blackish cultural layers. Even though the stratigraphy did not yield any clear surfaces that could be interpreted as separate floor layers, demolition layers, or layers with collapsed earth walls or roof, the stratigraphy and finds together with the radiocarbon dates indicate several rebuilding phases of pithouses in the excavated housepit. The maximum thickness of the cultural layers within the partly excavated housepit was ca. 1.5 meters. The oldest radiocarbon date obtained from the site was 8770 ± 85 BP, rendering the oldest occupation at the site approximately synchronous with the isolation of Lake Ladoga from the Baltic Sea Basin. This is also the oldest radiocarbon date obtained from any housepit in the region. The youngest finds date most probably to the early Early Metal Period, prior to the formation of the River Neva ca. 1300 cal. BC. In this article, it is argued that the Rupunkangas 1A site should be interpreted as a seasonally occupied hunting camp as opposed to the typical interpretation of sites with housepits as permanent residential camps in a (semi-)sedentary settlement system.

Keywords: Housepit, Stone Age, Mesolithic, Neolithic, Early Metal Period, Karelian Isthmus, Lake Ladoga, sedentariness

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INTRODUCTION

The former Finnish parish of Kaukola (now Russian *Sevast'janovo*) is located in the valley of the Vuoksi River on the north-western shore of Lake Ladoga, on the Karelian Isthmus, Russia (Fig. 1). About 5 km north-east of the municipal centre of Kaukola and ca. 12 km north-west of the city of Käkisalmi (Ru. *Priozersk*) lies a pine barren area called Rupunkangas, which used to be a large island in the archipelago of Ancient Lake Ladoga. The large dwelling site areas around Piiskunsalmi and Riukjärvi, most of which were excavated in the beginning of the 20th century (see Ailio 1909; Pälsi 1915; Uino 1997: 32–33; 2003; Huurre 2003: 202–203), are located some ten kilometres north-west of the Rupunkangas area.

The nature of the sites on the former island of Rupunkangas is diverse. There are pit structures of various shapes and sizes. Many sites consist of several find areas, some of which are located at different elevations and on separate shore terraces. However, the most interesting results derived from the Rupunkangas 1A site (known in Russian as *Protochnoe IV*), where a housepit[1] that was only

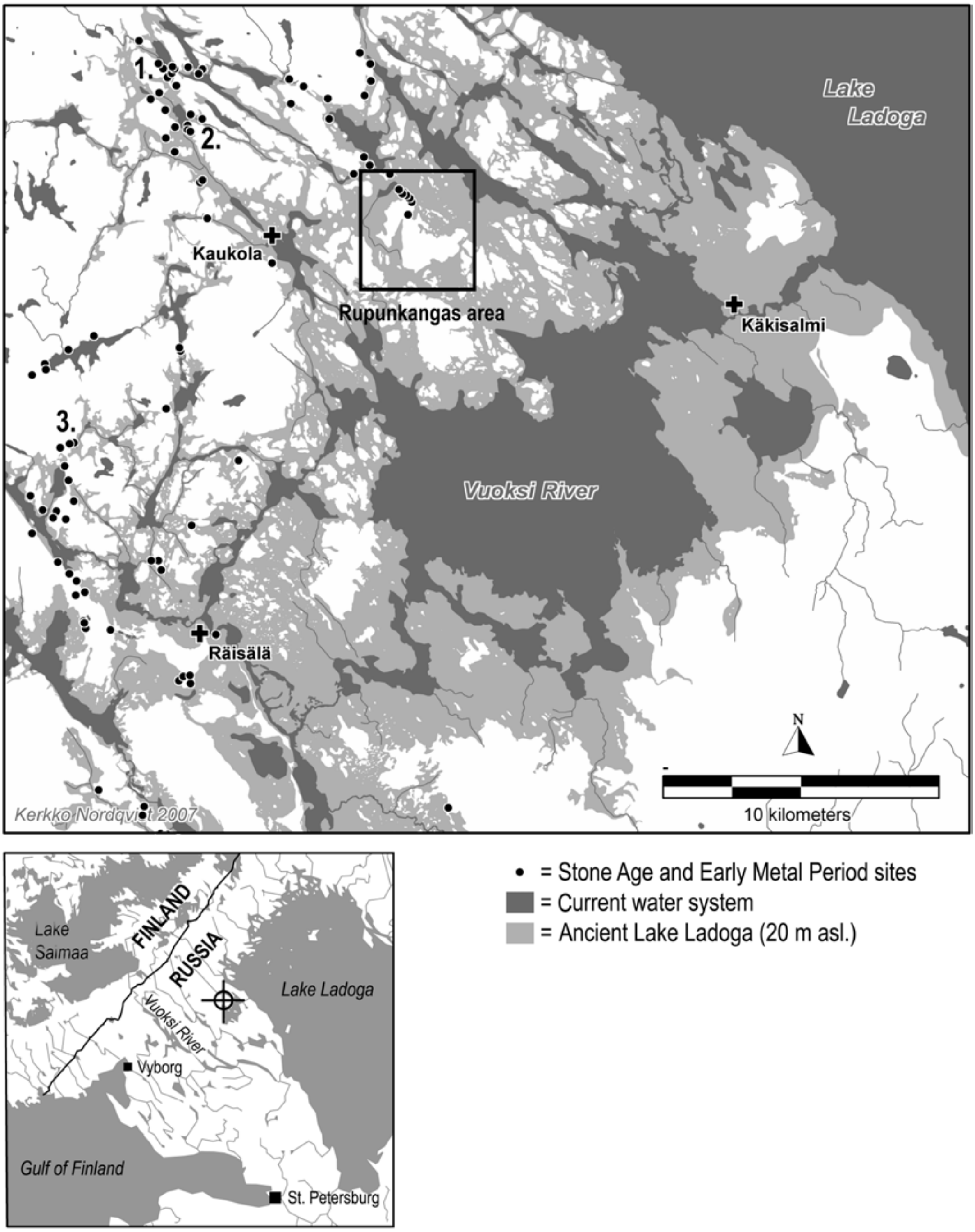

Fig. 1. The hunter-gatherer sites in the Vuoksi River Valley and the location of the Rupunkangas area. In the larger map the former Rupunkangas island is marked with a square. The extent of Ancient Lake Ladoga in the Vuoksi River Valley is illustrated in the larger map with the help of the 20 m a.s.l. contour line. The sites and areas mentioned in the text: 1) sites around the Piiskunsalmi area (Kaukola), 2) sites around the Riukjärvi area (Kaukola), and 3) the Pitkäjärvi site (Räisälä). Maps: T. Mökkönen & K. Nordqvist.

partly excavated proved to have been reoccupied several times during the Early Mesolithic to the Early Metal Period.

A housepit with several rebuilding phases is a rarity in this region. However, the most remarkable characteristic of the housepit at the Rupunkangas 1A site is the total duration of the utilization period. The rebuilding phases of individual housepits usually fall within a few hundred years (e.g., Renouf & Murray 1999). In North America there are records of housepits with several occupation phases, each lasting some hundreds of years. In these cases, the intervening unoccupied periods separating the building phases have lasted longer than the occupation phases, and the total utilization period of the housepit may have lasted up to some 3000 years (see Hayden 2000b; Johnson & Wilmerding 2001: 141; Prentiss et al. 2003). At Rupunkangas 1A the span between the oldest and the youngest rebuilding phases, as indicated by radiocarbon dates and ceramics found at the site, is strikingly long, ca. 6500 calendar years.

A short article dealing with this site will be published in Russian (Mökkönen et al., in press). The interpretation of the site presented here is not fully congruent with the previously written article. The sites in the Rupunkangas area are also briefly discussed in another article presenting the results of the 2004 survey (Mökkönen et al. 2007).

THE RUPUNKANGAS AREA – AN ISLAND IN ANCIENT LAKE LADOGA

Rupunkangas is a moraine esker that formed a large island before the rapid regression of the water level after the formation of the River Neva ca. 1300 cal. BC[2] (Saarnisto & Grönlund 1996). Prior to the formation of the Neva, the water level of Ancient Lake Ladoga was at a higher elevation than today. During the Ancient Lake Ladoga Phase covering the period from the isolation of Lake Ladoga from the Baltic Sea Basin some 9800–9700 years ago (ca. 7800–7700 cal. BC) (Saarnisto 2003: 64) to the formation of the Neva (ca. 1300 cal. BC), the water level in the Rupunkangas area varied between ca. 20.5 and 21.7 m a.s.l. (Saarnisto & Siiriäinen 1970). The present water level of the lakes near the Rupunkangas area varies between ca. 7.5 and 8 meters above sea level.

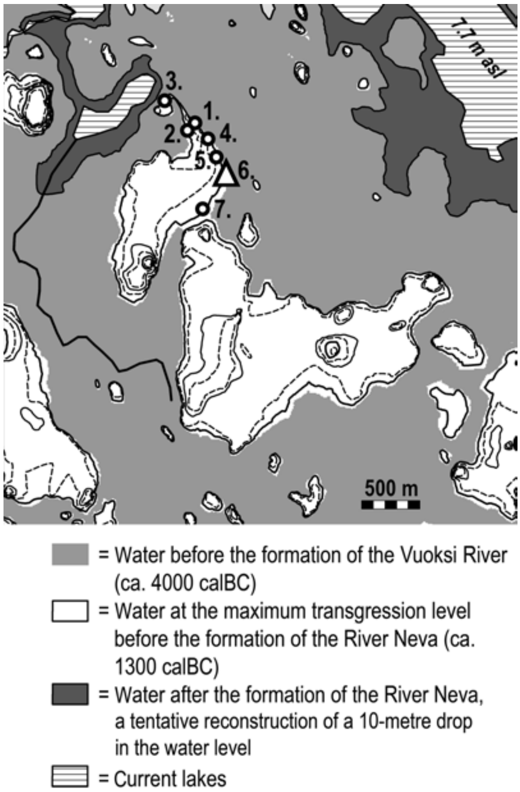

Fig. 2. Dwelling sites and changes in the water level in the Rupunkangas area. The shore levels are based on Saarnisto and Siiriäinen (1970). Contours on the ancient Rupunkangas island are at 2.5 meter intervals. The numbered sites on the map: 1) Pontuksenhauta 1, 2) Pontuksenhauta 2, 3) Pontuksenhauta 3, 4) Rupunkangas 4, 5) Rupunkangas 2, 6) Rupunkangas 1, and 7) Rupunkangas 3. Map: T. Mökkönen.

Since the Rupunkangas area is located approximately on the same land uplift isobase as the outlet of Lake Ladoga before the birth of the River Neva, it is presumed that the water level in the area remained roughly constant during the whole period from the isolation to the formation of the Neva outlet (Fig. 2). Some changes in the water level have undoubtedly occurred, but these changes have been minor, only slightly more than 1 meter at the maximum.

Following the isolation of Lake Ladoga, the water level can be tracked through archaeological sites. In the Rupunkangas area the Rupunkangas 3 site is very suitable for this purpose. It

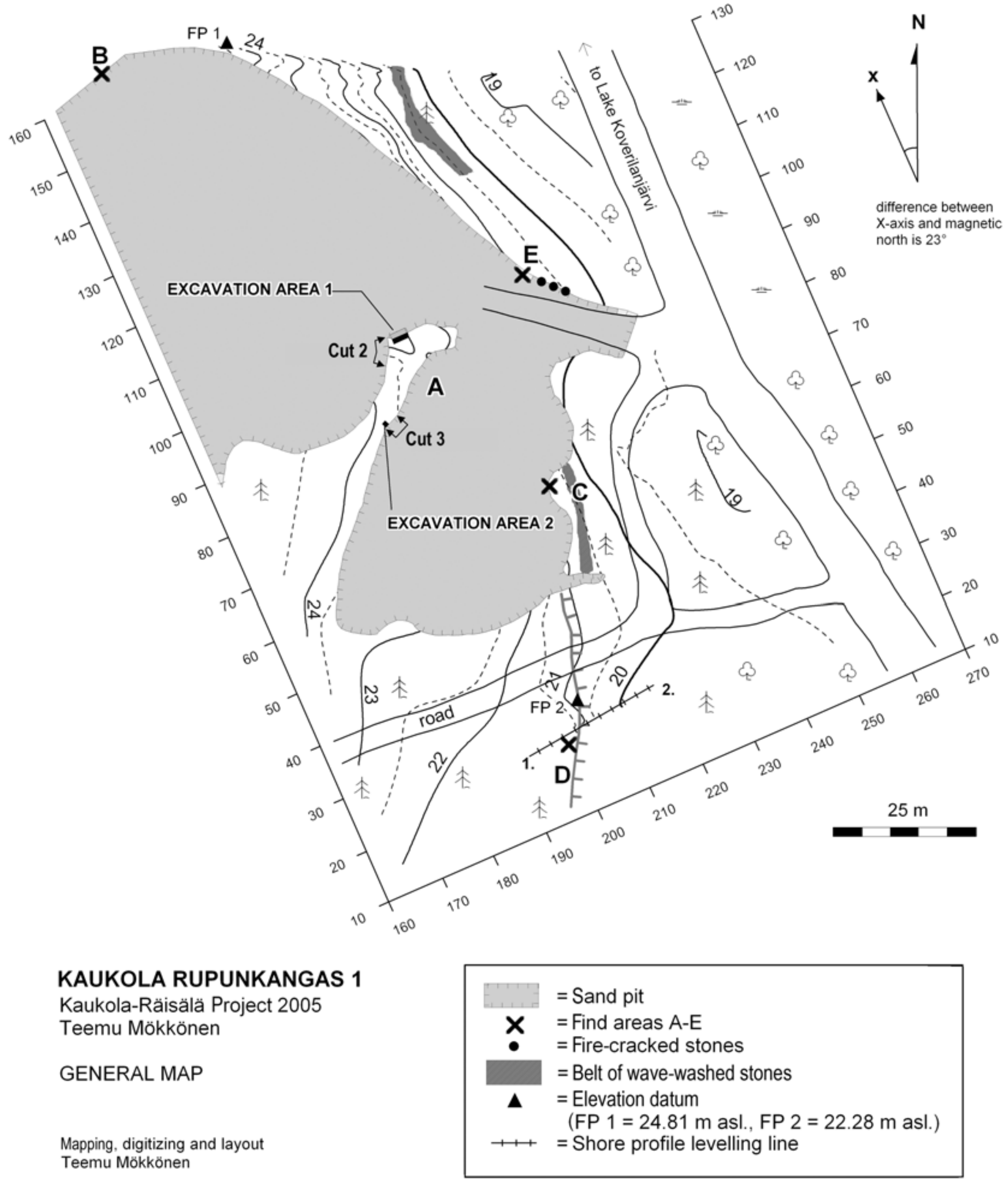

Fig. 3. General map of the Rupunkangas 1 site. The excavated part of the find area Rupunkangas 1A is located on a strip of land between two sand pits. Map: T. Mökkönen.

is located on sandy soil on top of a roughly 50 cm high shore terrace. The terrain at the site and behind it is totally flat. A radiocarbon date on burnt bone dates the site to 7880–7610 cal. BC (59.7% probability, Hela-1165, 8740 ± 80 BP) which is approximately synchronous with the isolation of Lake Ladoga. The Rupunkangas 3 site lies at an elevation of 22.0 to 23.0 m a.s.l. The base of the terrace at the site lies approximately at an elevation of 21.5 m a.s.l., which corresponds to the water level at the time the site was settled or to the later modification of the terrace during the maximum transgression. According to observations on the soil profile of a small sand pit located on top of the terrace, no traces of transgression layers covering the cultural layer are present.

Later, after the formation of the River Vuoksi (ca. 4000 cal. BC), which runs from Lake Saimaa in Finland to Lake Ladoga in Russia, the transgression accelerated also in the Rupunkangas area. As reconstructed, the water level preceding the formation of the River Vuoksi and the accelerated transgression lay at an elevation of 20.8 to 20.4 m a.s.l. in the Rupunkangas area[3] (according to Saarnisto & Siiriäinen 1970). Following the transgression, the maximum water level, that is, ca. 21.7 m a.s.l. in the Rupunkangas area, was reached just before the formation of the River Neva (Saarnisto & Siiriäinen 1970). After the formation of the Neva outlet the water level of Lake Ladoga dropped rapidly by some ten meters (Saarnisto & Grönlund 1996: 207), and the Rupunkangas area ceased to be an island (see Fig. 2).

ARCHAEOLOGICAL SITES IN THE RUPUNKANGAS AREA

All the sites in the Rupunkangas area have been discovered in surveys carried out by the University of Helsinki Department of Archaeology in co-operation with Russian archaeologists from the Institute for the History of Material Culture, Russian Academy of Sciences (St. Petersburg) and the Museum of Anthropology and Ethnography named after Peter the Great, Kunstkamera (St. Petersburg). The first sites in the Rupunkangas area were discovered in 1999 (Halinen et al. 1999; Lavento et al. 2001). The latest surveys and excavations have been carried out during the Kaukola-Räisälä Project (see Lavento et al. 2006; Mökkönen et al. 2007) organized and largely financed by the University of Helsinki in 2004 (Halinen & Mökkönen 2004) and 2005 (Mökkönen 2005a; 2005b; Mökkönen & Nordqvist 2005; Mökkönen et al. 2005). The University of Tartu in Estonia has also taken part in the project's fieldwork.

In all, seven dwelling sites were found in the surveys in an area of some 400 x 800 meters (Fig. 2). The sites are concentrated in the northern part of the former island, where the soil is sandy till. All of the sites have been located right next to the water – on the top of terraces or slightly further back. Some of the sites consist of several find areas. At two of the sites archaeological material is found on successive terraces at different elevations. However, the narrow terraces are located on a sheer slope, and therefore the difference in the elevation does not automatically mean that the materials on the separate terraces are of different ages. During 2005, small-scale excavations were carried out at two of the sites, namely Rupunkangas 1A and 4.

The dating of the sites is based on radiocarbon and pottery typology. Actually, only two of the sites have been dated by radiocarbon. In addition to the Rupunkangas 1A site, the main subject of this article, there is also another Early Mesolithic radiocarbon date from the Rupunkangas 3 site. The dating of the other sites rests on the dating of the ceramics found at the sites in the surveys (Table 3 at the end of the paper). The dating of the sites as a whole covers approximately the span from ca. 8000 cal. BC to ca. 1300 cal. BC. According to the present archaeological data gathered from the Rupunkangas area, the only temporal gap in the material is in the Early Neolithic Stone Age, which is not represented in the radiocarbon dates or in the pottery.

The excavated site Rupunkangas 1A will now be discussed in detail. The other sites with housepits in the Rupunkangas area are discussed at the end of this article.

RUPUNKANGAS 1A – A HOUSEPIT WITH SEVERAL REBUILDING PHASES

Before the formation of the River Neva, the large island formed by the Rupunkangas area was located in the outer zone of the inner archipelago of Ancient Lake Ladoga. The Rupunkangas 1A site, located at the eastern extremity of the ancient island, lay on an exposed shore (see Figs. 1–2). The 2.5 to 4 kilometre-wide stretch of open water opposite the site was separated from the larger open water areas of Ancient Lake Ladoga by a group of rocky islands. The site was located on top of a sheer shore terrace facing the open water and devoid of a sheltered background. The excavated find area Rupunkangas 1A is situated on top of a high bank at an elevation of ca. 22.0 to 23.5 m a.s.l. The base of the bank lies at ca. 20 m a.s.l.

Fig. 4. Kerkko Nordqvist standing in the housepit at the Rupunkangas 1A site in May 2005. The overgrown early 20th century sand pit is on the left. The excavation area was located next to the sand pit to the right of Mr. Nordqvist. Photo: T. Mökkönen.

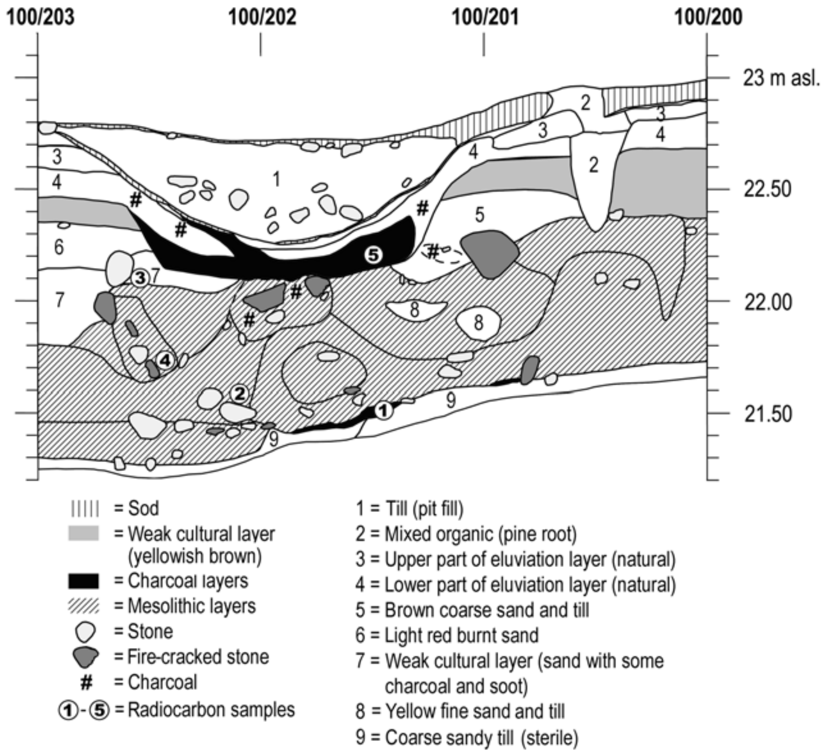

Fig. 5. Southern profile section of the excavation area at the Rupunkangas 1A site. The radiocarbon dates obtained from samples 1 to 4 are shown in the Fig. 7. Radiocarbon sample 5 (Hela-1183, 205 ± 40 BP) dates the traditional tar-burning pit. The Late Comb Ware sherds were found in layer No. 7. Map: T. Mökkönen & K. Nordqvist.

During the surveys (2004–2005) finds pointing to both the Mesolithic Stone Age and the Early Metal Period were found in the find area referred to as Rupunkangas 1A (Halinen & Mökkönen 2004; Mökkönen et al. 2005; see also Mökkönen et al. 2007). There are altogether five find areas around the sand pits, and most of the site was presumably destroyed by sand extraction. The excavation area in find area 1A was situated on a narrow strip of land between the two sand pits (Figs. 3–4). The overgrown sand pit on the southeastern side of the excavation area is of Finnish origin and is marked on a Finnish topographic map from 1939. The other sand pit on the north–north-western side, opened up by the Russians, is still in more or less active use. The excavation area was modest. It originally measured 1 x 3 meters, but during the excavation the area was expanded on the lower elevations towards the sand pit and finally covered 2 x 3 meters.

During the surveys, a depression located on the narrow spit between the sand pits was perceived to resemble a housepit. Due to its location between two sand pits and the coarse till exposed on the surface in some areas inside the pit, however, it was not originally interpreted as a housepit but as a by-product of sand extraction activities. Hence, the true nature of the depression as a housepit became evident only in the course of the excavation.

Stratigraphy and finds

A two-week long small-scale excavation revealed multiple cultural layers with a total depth of 1.5 meters (Fig. 5). The dating of the layers, as presented here, is based on stratigraphic observations, ceramic typology, and radiocarbon dates.

In the beginning of the excavation, the till area exposed on the surface at the bottom of the larger pit indeed turned out to be a by-product of the sand extraction activities. However, it was not formed – as was first thought – during sand quarrying activities carried out on the brink of the sand pits. On the contrary, the till proved to be fill in an older pit and was most probably deposited in connection with sand extraction. This till-filled pit structure was a simple tar-burning pit, dated by radiocarbon most probably to the late 17th or 18th century cal. AD (Hela-1183, 205 ± 40 BP).

The tar-burning pit had gouged out parts of the older cultural layers. The finds from the stratigraphically uppermost yellowish brown sandy cultural layer (ca. 22.4–22.7 m a.s.l.) included some quartz artefacts (flakes and flake fragments), a large number of small, burnt fish bone fragments, and a small amount of pottery dating most probably to the early part of the Early Metal Period. Some of the pottery sherds were decorated with two parallel rows of small roundish pits (Fig. 6). One sherd shows that the vessel has been profiled and the rows of pits were placed approximately at a 45 degree angle in relation to the turn in the vessel's neck. In the 2005 survey one body sherd of pottery with very coarse net or textile impression was found (Fig. 6, artefact 3). This is the only textile impressed piece from the site. A number of other sherds have a striated surface. All of the pieces contain sand and organic temper. In the striated pieces the amount of hair temper is notable. The thickness of the sherds varies between 9.5 and 13 mm.

All of the pottery sherds from the uppermost layers probably derive from a single vessel. The pottery could best be classified as Textile Ceramics. There are also some porous hair-tempered undecorated pieces that could be categorized on the basis of the fabric as Late Neolithic or Early Metal Period ceramics. Considering the environment of the site, this occupation phase dates most likely to the period preceding the formation of the River Neva (ca. 1300 cal. BC). The appearance of Textile Ceramics in archaeological material in Karelia around 1900/1800 cal. BC (Carpelan 1999: 268; Carpelan & Parpola 2001: 87; Lavento 2001: 106; Zhul'nikov 2005: 114) sets the oldest time limit for the Early Metal Period settlement phase.

Under the uppermost layers containing Textile Ceramics there was a weakly coloured cultural layer with only a few finds, namely quartz flakes, flake fragments, and a few large sherds of a single Late Comb Ware vessel (ca. 22.15–22.50 m a.s.l.). Below this, the soil changed into coarser sandy till that contained more charcoal than the upper layers. The lowest layers from ca. 21.3 to 22.9 m a.s.l. were Mesolithic. The upper parts of these layers were partly mixed with younger Neolithic layers, but most of the lowest layers (thickness ca. 50–70 cm) were purely Mesolithic.

The Mesolithic layers were very coarse sandy till heavily mixed with ash and charcoal and containing lots of small stones. Due to the large amount of charcoal, the colour of these cultural

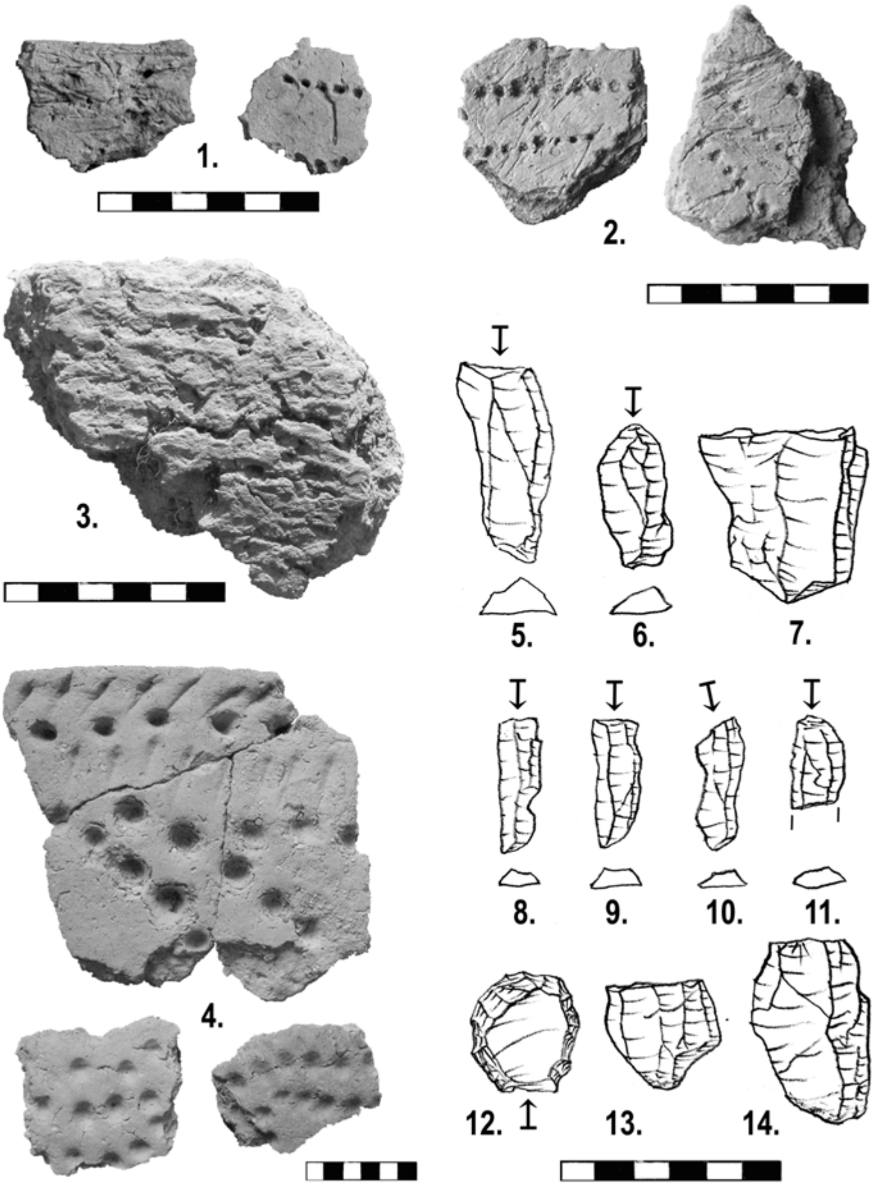

Fig. 6. Finds from the Rupunkangas 1A site. Ceramics 1-4*: 1-2) Hair tempered Early Metal Period ceramics, 3) Textile Ceramics, and 4) Late Comb Ware.* Lithic artefacts made of quartz from Mesolithic layers: *5-6) and 8-11) blades and blade fragments, 7) multi-platform core, 12) scraper, 13-14) platform-on-anvil cores. All lithics were found during the 2005 excavation. The length of the scale bars is 3 cm. Photos: T. Mökkönen, Drawings: O. Seitsonen, Layout: T. Mökkönen & K. Nordqvist.*

layers varied from dark brown to black. These layers did not contain any precisely datable artefacts – the Mesolithic date is based on radiocarbon dates. The lithic material analysed by Oula Seitsonen is mainly composed of quartz, but some lithic artefacts made of quartzite and rock crystal are also included (see Mökkönen 2005a). The largest fraction of the material consists of flakes and flake fragments (Table 1). The material included some blades (according to form and dimensions), cores (bipolar, hammer-on-anvil, and platform cores) and one scraper. Clearly identifiable changes in the find profile within the Mesolithic layers could not be discerned. In total, the number of finds is low.

Table 1. Lithic artefacts found during the excavation of the Rupunkangas 1A site.

Type	N
Flakes	85
Flake fragments	106
Blades	11
Blade fragments	7
Bipolar core	3
Irregular core	1
Hammer-on-anvil core	4
Platform core	1
Scraper	1
Netsinker (?)	1
Other	3
Total	223

Osteological Material

All identified bones in the osteological material recovered in the excavation were fish (Mökkönen 2005a). The excavation yielded only 380 bone fragments of which 115 were identifiable (Table 2). The osteological analysis was carried out by Sanna Seitsonen. Most of the bones identified as to species, genus or family were found in the uppermost layers together with the Textile Ceramics and Late Comb Ware. The poor preservation of burnt bone in coarse sandy till is demonstrated by the fact that only nine bone fragments were found in the Mesolithic layers. In addition to bone fragments found in the excavation, a fragment of elk/reindeer bone and some fish bones were found in the surveys (Puttonen 2004; 2005).

The excavated osteological material from the site consists exclusively of fish. Most of the fish species in the assemblage, such as perch, are relatively easy to catch year round, even though their spawning season is in the spring and summer. However, salmonid fishes, represented in the assemblage by whitefish, are easiest to catch during their spawning season in the autumn and early winter.

The osteological material gathered from the nearby Mesolithic site Rupunkangas 3 includes, in addition to salmonid fishes, also three seal bone fragments (see the analysis by Sanna Seitsonen in Mökkönen & Nordqvist 2005), which suggests that the site was inhabited during the cold season. The best seal hunting season on Lake Ladoga is in the late winter when the seal pups are easiest to catch on the ice at the margin of the open water. However, seal hunting during the open water season is also known from ethnological sources (Lehtonen 1974; see also Ylimaunu 2000: 169–83). The osteological materials from the sites Rupunkangas 1A and Rupunkangas 3 are in harmony with the environmental location of the sites in the archipelago. The only non-aquatic species in the material from these sites are dog and elk/reindeer, both represented in the material by one bone fragment.

In the osteological material there are implications pointing to both cold and warmer seasons. However, this material is too small to be used as

Species	N	MNI	%
*Alces alces/Rangifer tarandus** (elk/reindeer)	1	1	1
Esox lucius (pike)	4	1	3
Coregonus sp. (whitefish)	6	1	5
Salmonidae (salmonid fish)	1	--	1
Perca fluviatilis (perch)	29	5	25
Percidae (perch/pikeperch)	1	--	1
Cyprinidae cf. *Rutilus rutilus* (roach)	1	1	1
Cyprinidae (cyprinid fish)	22	2	19
Teleostei cf. *Esox lucius*	2	--	2
Teleostei cf. *Perca fluviatilis*	1	--	1
Teleostei (fish)	48	--	41
Total	116	11	100

MNI = minimum number of individuals.
* Survey find.

Table 2. Bone fragments identified as to species, genus, or family from the Rupunkangas 1A site.

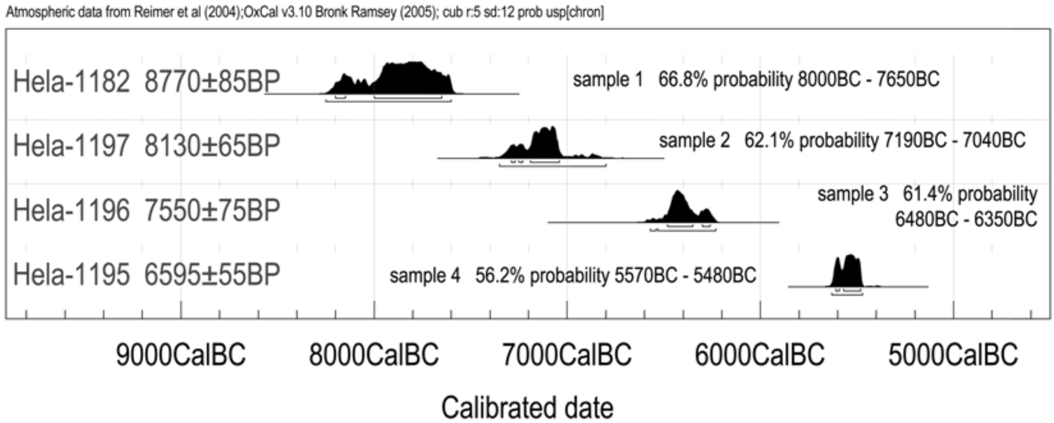

Fig. 7. Radiocarbon dates from the Mesolithic layers. The stratigraphic location of the samples is shown in Fig. 5.

a basis for defining the period of occupation of the site. In addition, the occupation period could have varied at different times.

Mesolithic dates

In all, dates were obtained from five radiocarbon samples from different stratigraphic units at Rupunkangas 1A (Figs. 5 & 7). There was not enough datable material in the uppermost layers, the tar-burning pit being an exception. All dated samples were charcoal. Four of the samples were dated to the Mesolithic Stone Age. The partly mixed nature of the cultural layers is evident in the case of sample 3 (Hela-1196, 7550 ± 75 BP) taken from the bottom of a layer in which the Late Comb Ware sherds were found. The youngest Mesolithic date was produced by sample 4, taken from a stone-lined pit structure that was dug into older layers.

The most surprising feature of the dating results is the temporal distribution of the radiocarbon dates. These cover nearly the whole Mesolithic period. On the basis of the radiocarbon dates, the relative dating of the ceramics, and the dating of the formation of the River Neva, the dwelling site has been in episodic use during a time span extending from ca. 8000 to ca. 1300 cal. BC and covering the whole period of the Ancient Lake Ladoga Phase.

For a long time, the record for the oldest radiocarbon dates from the Karelian Isthmus was held by a fishing net found at the Korpilahti site in the former parish of Antrea (Vuoksenranta) (Pälsi 1920). Two floats made of pine bark have been dated to the late Pre-Boreal period (Hel-269, 9230 ± 210 BP and Hel-1303, 9310 ± 140 BP, e.g., Siiriäinen 1974: 11; Matiskainen 1989: 71) and an AMS analysis of the net cord has yielded an only slightly younger date (Hela-404, 9140 ± 135 BP, Carpelan, in press; Miettinen et al., in press; Takala 2004a: 151 with references). Lately, the possibility of dating burnt bone material has increased the number of old sites dated by the radiocarbon method. At the moment, the oldest radiocarbon-dated dwelling site on the Karelian Isthmus is the Suuri Kelpojärvi site in the former parish of Antrea (Hela-931, 9275 ± 120 BP, Takala 2004a: 152), which is approximately synchronous with the ‘Antrea net’.

The oldest date from Rupunkangas 1 falls in the same period as the next-oldest sites from the Karelian Isthmus. Two sites in the former parish of Heinijoki near the Vetokallio outlet of Ancient Lake Ladoga, namely Valkialampi 1 (Hela-743, 8765 ± 65 BP, burnt bone) and Valkialampi 2 (Hela-744, 8720 ± 70 BP, burnt bone) are also dated to the very beginning of the Boreal period (Takala 2004a: 154, 161, Fig. 159). The oldest date from the Rupunkangas 1 site (Hela-1182, 8770 ± 85, charcoal) and the date from Rupunkangas 3 (Hela-1165, 8740 ± 75 BP, burnt bone) are approximately synchronous with the Valkialampi sites. In addition, there is one unpublished new dating from the Juhola 2 site in the former parish of Kirvu, which is about 200 radio-

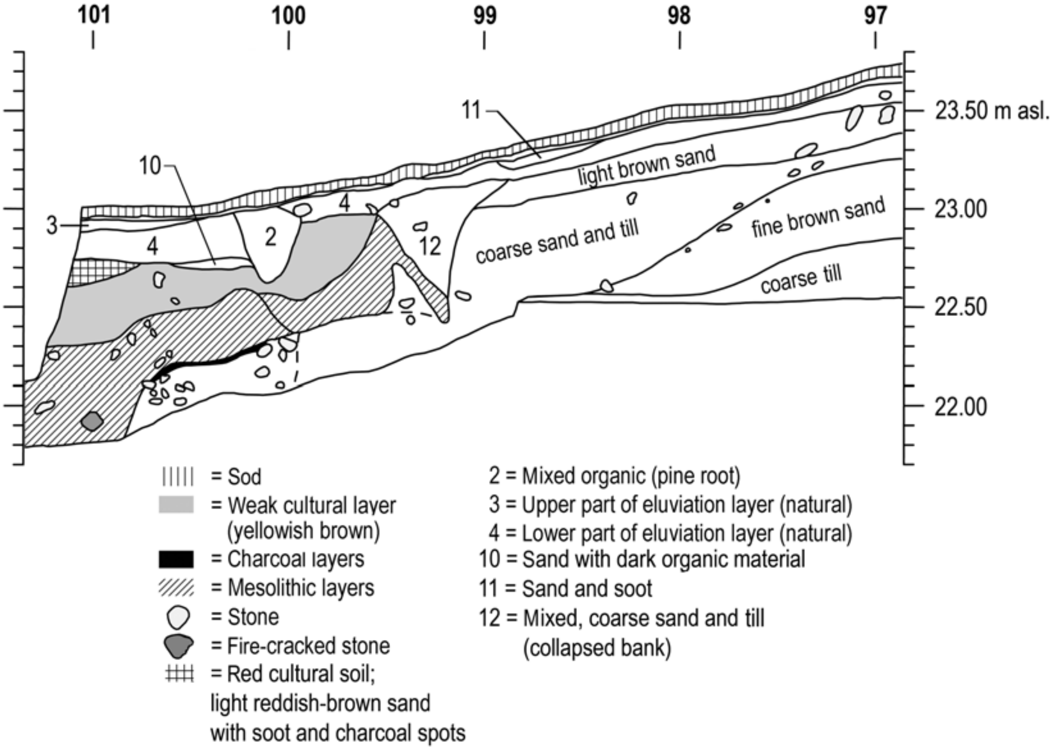

Fig. 8. Cut 2, made in the profile of the sandpit next to the excavation area. The cultural layers have clearly formed in a man-made depression that cuts into the natural layers. The location of Cut 2 is illustrated in Figs. 3 and 9. Map: T. Mökkönen & K. Nordqvist.

carbon years older than the oldest sites in Rupunkangas and Valkilampi areas (Petri Halinen, pers. comm.).

Even though the oldest dates from the Rupunkangas area are among the six oldest radiocarbon dates obtained from dwelling sites on the Karelian Isthmus, these dates are still young when comparing to the oldest dates from north Karelia, south-eastern Finland, and southern Finland. There, the oldest known dwelling sites are dated older than 9000 BP, that is ca. 8250 cal. BC. Compilations of the oldest dates from Finland and the Karelian Isthmus can be found in Takala (2004a: 161, Fig. 159) and Pesonen (2005; see also Matiskainen 1996; Schulz 1996; Forsberg 2006: 13).

PREHISTORIC STRUCTURES AT THE RUPUNKANGAS 1A SITE

Due to the small size of the excavation area, only a few structures were discovered. As mentioned above, the uppermost feature of the excavation area was a simple tar-burning pit filled with till, dating to the late 17th or 18th century AD. The following discussion will concentrate on the rebuilding phases of the housepit and the structures inside the pit.

The housepit

An interesting structure and a key for understanding the stratigraphy of the site was revealed when the edge of the sand pit next to the excavation area was sectioned for the purpose of recording the layers (hence referred to as Cut 2; see Figs. 3, 8 & 9). Due to the very real threat of a landslide, the section was not cut until the recording of the sections in the excavation area was finished. Cut 2 shows that the Mesolithic layers clearly intrude into the natural layers (Fig. 8). This means that the Mesolithic cultural layers were formed in a man-made depression. The depression, visible on the

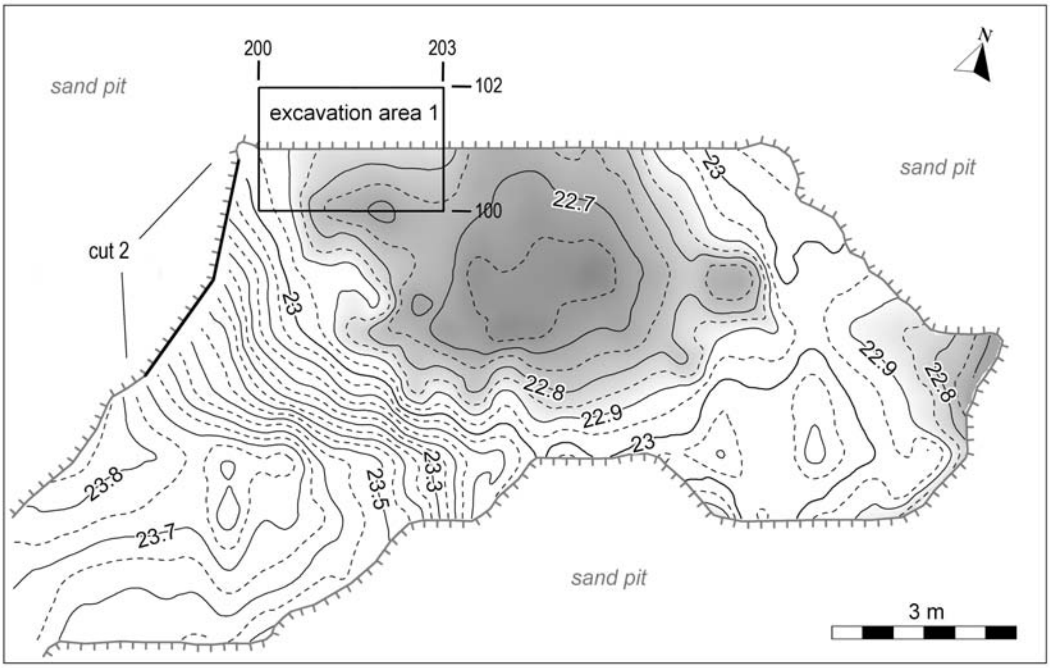

Fig. 9. Surface elevation model of the Rupunkangas 1A site. Contours are given at 10 cm intervals (m a.s.l.). The shaded area shows the shape of the last housepit on the site. Map: T. Mökkönen & K. Nordqvist.

surface of a narrow strip of land between the sand pits, was recognized already in the surveys, but at that time it was not considered to be a housepit for several reasons (see above). After the excavation and exposing of Cut 2, it was obvious that the excavated layers had actually formed inside a man-made depression interpreted as a housepit. Without Cut 2, this interpretation could have been possible, but it would have been much more poorly arguable than now.

The information gained from Cut 2 gave a context for the layers found in the excavation area. At the bottom, the Mesolithic layers were clearly cutting into the natural layers, the Neolithic layers above were partly cutting into the Mesolithic layers below, and the top layers containing Textile Ceramics were partly cutting into both the Mesolithic and the Neolithic layers. Therefore, the dwelling depression was first dug during the early Mesolithic Stone Age and later reused several times in the course of the Mesolithic. The interpretation of the weak cultural layers associated with Late Comb Ware is problematic. The data gathered during the excavation do not allow us to determine whether these layers bear evidence of a Late Neolithic rebuilding phase or of some other Late Neolithic activity, such as trash dumping.

Judging by the stratigraphy of the site, the latest rebuilding phase took place during the Early Metal Period. The layer containing Textile Ceramics in the excavation area continued into Cut 2, where it intersects the dark and coarse Mesolithic layers (Fig. 8). It is clear that the layer with Textile Ceramics was formed in a pit dug into the Mesolithic and Neolithic layers – a pit that can be interpreted as a housepit.

The shape and size of the final rebuilding phase of the pithouse at the site are definable. Based on the surface elevation model, there are two entrances or antechambers, one at each end of the depression (Fig. 9). The entrances are visible as smaller depressions (ca. 2 x 2 meters in size) connected to the larger depression in the middle (ca. 5 x 6 meters in size). The depth of the depression as measured from the surrounding terrain is ca. 35 cm. The surface elevation model illustrates the last building of a pithouse in the housepit, which probably took place during the Early Metal Period. According to the elevation model, the excavation area was located by the entrance and near the corner between the entrance and the main room. The relationship between the excavation area and the older building phases of the pithouses is not known, but the Mesolithic structure may have been larger than the one visible in the surface elevation model (concerning Mesolithic housepits in the Karelian Republic, see Zhul'nikov 2003).

In North America, housepits with several rebuilding phases have been studied in several locations where organic materials have been preserved so well that it has been possible to distinguish separate floor levels and layers with collapsed roofing material (e.g., Hayden 1997: 36–43; Hayden 2000a; Johnson & Wilmerding 2001; Prentiss et al. 2003). This was not the case at Rupunkangas. The deepest thin and totally black charcoal layer was the only clearly definable interface, although it did not form a completely continuous layer covering the whole excavation area. The concentrations of fire-cracked and unburnt stones did not form any identifiable surfaces to be interpreted as separate floor layers, demolition layers, or layers with collapsed earth wall or roof material formed after the abandonment of the structure (see below).

Stone structures inside the housepit

Five identified stone structures could be discerned in the prehistoric layers. In the lowest part of the Neolithic layers a concentration of fire-cracked stones was interpreted at first as a fireplace (see Mökkönen et al., in press). On top of the Mesolithic layers there were two other obscure pile-like concentrations of fire-cracked rocks that could not reasonably be interpreted as fireplaces because no burnt sand was associated with the piles. The Mesolithic layers actually contained a large number of stones, both fire-cracked and unburnt, in more or less blurry concentrations. Nevertheless, it was not possible to distinguish any clear interfaces within the Mesolithic layers even with the help of the stones. Most probably these stone concentrations have not originally lain on the floor of the pithouse but have presumably collapsed into the pit from the bank or from the lowest part of the roof when the structures have deteriorated or caved in (see e.g., Hayden 1997: 37–8, 40–2, 63–4; Kankaanpää 2002: 71; Ojanlatva & Alakärppä 2002: 117–18).

In addition to these more or less obscure stone structures there were two small pit features. One of these was a pit ca. 20 cm in diameter surrounded by small stones and filled with bright red burnt sand. This stone-lined feature was dug at an angle into the older Mesolithic layers. It can be interpreted as a post hole or as a pit used for keeping a fire. This feature is dated to the Late Mesolithic (see Figs. 5 & 7, the radiocarbon sample 4). Another pit feature was found in the lowest Mesolithic layer, where a pit dug ca. 20 cm deeper than the other Mesolithic layers did not contain any finds.

DISCUSSION ON THE RUPUNKANGAS 1A SITE

The former Rupunkangas island is located in an aquatic milieu. Looking at the overall distribution of Stone Age and the Early Metal Period dwelling sites in the valley of the Vuoksi River (Fig. 1; see also Lavento et al. 2001: Appendix 1; Lavento et al. 2006: Fig. 1; Mökkönen et al. 2007), it is clear that the Rupunkangas area, located in the archipelago of the Ancient Lake Ladoga, is not in the heartland of the hunter-gatherer settlement of the area. In the following, issues such as site function and the formation process of thick multi-period cultural layers will be discussed in the light of the Rupunkangas 1A site.

Thick and heavily coloured cultural layers

Thick cultural layers such as those of the Rupunkangas 1A site are not regularly found in the area. However, there are also a few other sites with abnormally thick cultural layers on the Karelian Isthmus. At the Telkkälä site in former Muolaa Parish, the overall thickness of the superimposed layers as measured from the top to the bottom of the lowest cultural layer was 2.5 meters (Takala & Sirviö 2003; Takala 2004b). In Telkkälä, the upper and the lower cultural layers were separated by 20–90 cm thick layers deposited by the transgression of Ancient Lake Ladoga. Another location where the layers reached a combined thickness of ca. 2.5 to nearly 3 meters was at the

Stone Age dwelling site Kunnianniemi, on the shore of Lake Kiimajärvi in the former parish of Pyhäjärvi (Seitsonen & Nordqvist 2006; Gerasimov et al. 2007). There, four cultural layers were separated by transgression layers. At both sites the thick cultural layers were observed in small-scale excavations, and therefore it has not been possible to connect the layers to any definable structures.

The lowest, Mesolithic layers at the Rupunkangas 1A site were heavily coloured by charcoal and ash. A similar phenomenon has also been observed at the Telkkälä site, where the lowest layers of black-coloured sand dating to the Early Neolithic and the Late Mesolithic Stone Age contained an abundant amount of charcoal as compared to the stratigraphically superior, lightly coloured Neolithic layers (Takala & Sirviö 2003: 62, 68, Fig. 8). Similar observations have also been made at the Kunnianniemi site and at the Juoksemajärvi site in Räisälä Parish (Halinen et al., in press). In this light, there may be a tendency of the Mesolithic layers to be coloured blackish by charcoal and soot to a greater degree than the Neolithic layers, which indicates – if some underlying geological process is not responsible – changes in the activities carried out at the dwelling sites.

The layers that have built up inside the housepit discovered at the Rupunkangas 1A site are unusual as regards the thickness of the layers and the amount of charcoal they contain. The radiocarbon dates indicate several occupation or rebuilding phases at the site, which naturally partly explains the thickness of the layers. A housepit with several rebuilding phases is a rarity in the general vicinity – on the Karelian Isthmus, in Russian Karelia, and in Finland. On a global scale, there are a considerable number of known examples of housepits with several rebuilding phases (e.g., Schlanger 1988; Hayden 1997: 247; 2000a: 313; Renouf & Murray 1999; Johnson & Wilmerding 2001; Prentiss et. al. 2003; for ethnological references see LaMotta & Schiffer 1999: 23).

The black charcoal layers in the housepits excavated at the Keatley Creek site on the Canadian Northwest Plateau have been thought to result either from the mixing of charcoal ground underfoot with decomposed organic waste in the floor sediments, or from the collapse of burnt roof structures into the housepit (Hayden 1997: 37–8, 40–2). Some of the material on the wall embankments or on the roof, for example, fire- cracked stones, may also have fallen into the housepit following the collapse of the wooden supporting structures (Hayden 1997: 63–4; Johnson & Wilmerding 2001; Kankaanpää 2002; Ojanlatva & Alakärppä 2002). In the areas with better preservation of organic material, distinct layers containing floor assemblages and remains of collapsed roofs can be identified (e.g., Schlanger & Wilshusen 1993; Hayden 1997; 2000a). In some cases charred wooden structures have preserved also in Finland (Karjalainen 1996; Katiskoski 2002; Leskinen 2002) and in Russian Karelia (Zhul'nikov 2003: 180–3), but multiple building phases have not been observed at these sites.

Since separate floor layers or layers formed by collapsed structures were not identified at the Rupunkangas 1A site, partly because of the poor preservation of organic material and partly because of the somewhat mixed nature of the layers, it is not possible to determine the formation process of the blackish layers with certainty. Nonetheless, it is clear that the use of fire is somehow involved. Experimental burnings of pithouse replicas, based on the Anasazi pithouses found in south-western Colorado, have shown that the accidental burning of such a pithouse is very unlikely (Wilshusen 1986: 247; Schiffer 1987: 92 with references). It should be remembered that in Anasazi pithouses the roof, based on vertical posts, was covered with earth in contrast to Neolithic pithouses found in Fennoscandia, where birch bark covered with sod has been considered the most typical roofing material (Sirelius 1921: 198–9; Kotivuori 1993: 143–4; 2002: 83; Vaara 2000: 6–7; Muurimäki 2007: 102–103). In such a pithouse only the lowest part of the roof might have been covered with actual soil.

Still, since it is not known how easily sod-covered pithouses catch fire, it cannot be said how likely it is for a pithouse like this to burn down accidentally. Moreover, our understanding of Mesolithic housepits and their constructions is still in its infancy – the Mesolithic housepit at the Rupunkangas 1A site may not necessarily have been constructed like the Neolithic examples. The Mesolithic housepits at the Rupunkangas 1A site have been dug so deep that the pithouse could easily have been completely under ground, like a dugout. Even though there is not much that we can say for sure about Mesolithic pithouses, it is possible that the Mesolithic occupation phases of the pithouses at Rupunkangas 1A ended with the burning of the old structures.

The function of the site

The presence of housepits is usually connected to a fairly sedentary way of life. According to ethnographic sources, pithouses are used in non-tropical climates and inhabited during the wintertime by populations with at least a bi-seasonal settlement system (Gilman 1987, see also Binford 1990). However, in areas with a relatively cool climate year-round, such as coastal Siberia and Newfoundland, pithouses could be used also as summer houses (Gilman 1987: 542–3; Renouf & Murray 1999: 121). In the archaeological literature dealing with the northernmost areas of Europe, housepits are generally connected to (semi-sedentary) winter habitation (e.g., Kotivuori 1993: 142, 145–9; Lundberg 1997: 125–6, 136; Katiskoski 2002; Ojanlatva & Alakärppä 2002: 121; Pesonen 2006) or year-round permanent settlement (e.g., Engelstad 1984: 19–20; Helskog 1984: 65; Schanche 1993; Halen 1994: 177; Karjalainen 1999; Leskinen 2002: 168; Núñez & Okkonen 1999).

Despite the general tendency to see a relatively strong connection between pithouses and at least a semi-sedentary settlement pattern, pithouses located in environmentally and ecologically marginal[4] areas are not necessarily occupied for long periods. In areas where predictable resources are available during some time of the year, pithouses could be repeatedly used for short-term occupation (Renouf & Murray 1999; Smith 2003: 163, 165, 180–2; see also Fletcher 1995: 168). In the case of Rupunkangas 1A, the low density of finds (as compared to find material found in the core area of the Stone Age settlement) with respect to the thickness of the layers can be seen to indicate short-term occupation of the site (see Kent 1992: 641–3; Smith 2003: 173–4). In the case of Rupunkangas 1A, it is assumed that the actual duration of the occupation of the site is reflected more reliably by the number of finds than by the thick cultural layers, the formation of which is presumably connected more closely with abandonment and post-abandonment processes than with the actual occupation phase of the site.

The building of facilities such as pithouses – more costly than ephemeral structures such as simple huts or wind shelters – at a site located in a marginal area indicates a multi-year planning range in the exploitation of predictable resources (Smith & McNees 1999: 118; Smith 2003: 182–3). The existence of permanent hunting or fishing camps with pithouses is not strictly connected to any particular type of residential mobility. Permanently used sites with periodical seasonal occupation indicate the existence of a logistically organized system that can occur alongside different types of residential mobility from largely sedentary to wholly mobile (Diehl 1997: 181–2, see also Binford 1980: 12–13, 19; Kent 1992: 637; Hood 1995: 99).

Following the arguments of Wandsnider (1992) it can be supposed that permanently attractive locations with facilities such as pithouses would be reused for long periods. Once the pithouse or houses were no longer inhabitable but the location was still attractive, a new pithouse would be built at a new site within the same location. In the Rupunkangas area the seasonal settlement could have persisted on the same ancient island from year to year with a slight shift in location every now and then (see also Kotivuori 1993: 143–5; Kankaanpää 2002: 73–4).

The location of the Rupunkangas 1A site, as well as of the other sites in Rupunkangas area, provides some hints as to the function of the site. Other sites in the Vuoksi River Valley with long periods of occupation are located on the shores of narrow fjord-like bays near the mainland, where the heartland of the hunter-gatherer settlement in the area has clearly been. The location of the ancient Rupunkangas island is very similar to the locations of ethnologically known seasonal camps used for fishing in the autumn and for sealing during late winter.

During the late 19th and early 20th century sealing in Lake Ladoga was concentrated in the northernmost areas of the lake, that is, in the area of the former parishes of Jaakkima and Sortavala (Lehtonen 1974: 136). There, a chain of islands created a zone perfectly suited for sealing. The islands both created conditions where the ice cover lasted longest, providing good conditions for seal hunting, and offered good campsites for

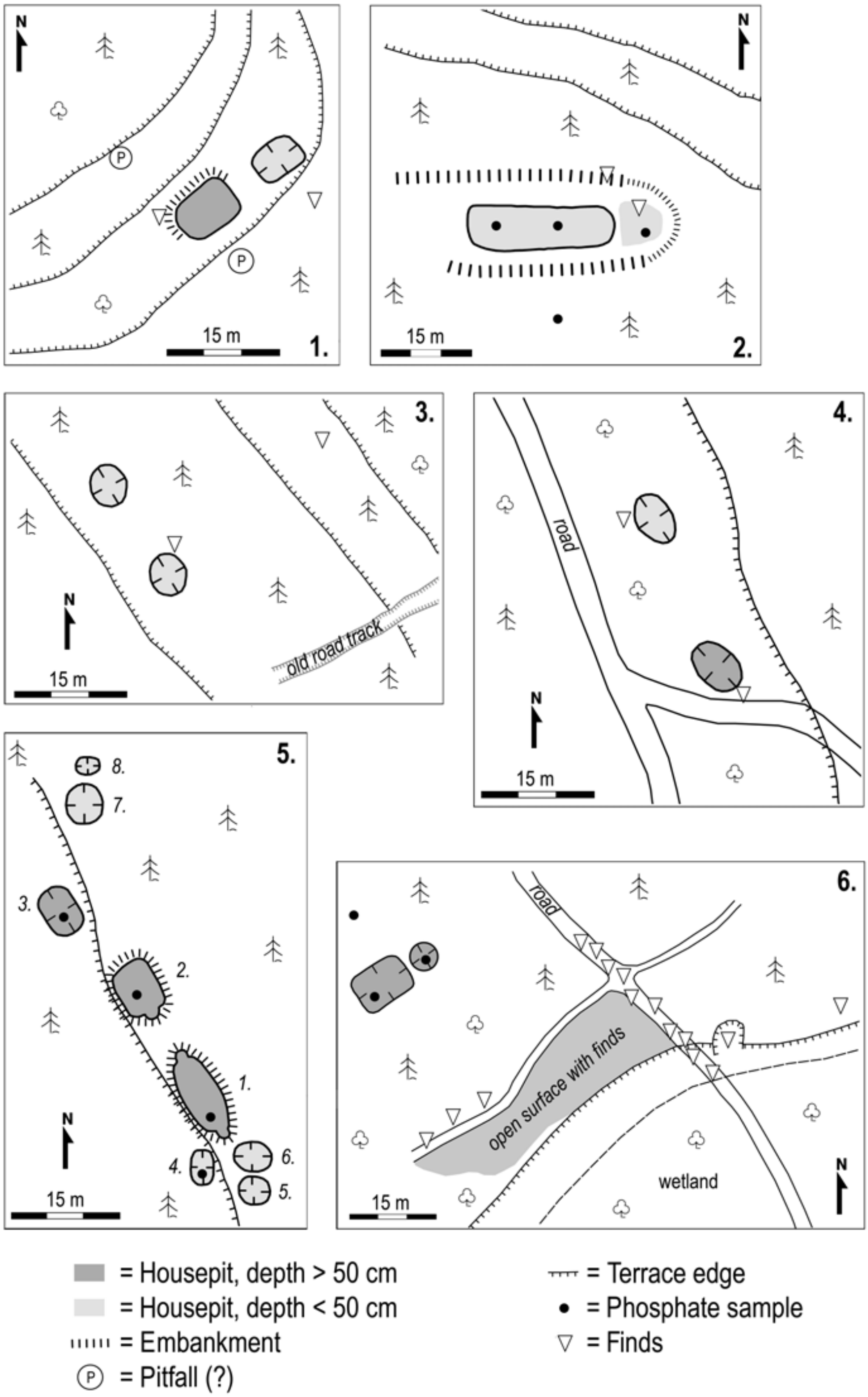

Fig. 10. Sites with housepits in the Rupunkangas area. 1) Pontuksenhauta 3, 2) Rupunkangas 4 (an oblong depression modified by man), 3) Rupunkangas 2, 4) Pontuksenhauta 2, 5) Pontuksenhauta 1, and 6) Rupunkangas 3.
Redrawn by T. Mökkönen after Halinen & Mökkönen 2005; Mökkönen & Nordqvist 2005; Mökkönen et al. 2005.

use during hunting trips. In the northernmost part of Lake Ladoga one of the most popular campsites was Vossina Island, where the fishing cabins were used both during the salmon fishing season in the autumn and the sealing season during the winter (Lehtonen 1974: 136–7).

Despite the environmental similarities between the regions around the Rupunkangas area during the Ancient Lake Ladoga Phase and the best sealing areas in the Lake Ladoga region some hundred years ago, the modest size of the osteological material – only few bones of salmonid fishes and seals – does not allow us to draw any definite conclusions about the function of the sites in the Rupunkangas area. However, at least the Rupunkangas 1A site may be tentatively interpreted as a seasonally occupied hunting and fishing camp with permanent structures that were utilized for a long time. However, this interpretation is not directly valid for all sites in the Rupunkangas area.

THE OLDEST HOUSEPITS IN THE VICINITY OF THE FINNISH-RUSSIAN BORDER

Housepits dating to the Stone Age are a recently discovered phenomenon on the Karelian Isthmus. The first housepits were found as late as 1999[5] (Lavento et al. 2001; see also Mökkönen et al. 2007: 117). On the Finnish side of the Finnish-Russian border a number of housepits were found in the area of Ancient Lake Saimaa in the surveys carried out in connection with a research project during 1990s (see Pesonen 2002 with references). However, due to the transgression of Ancient Lake Saimaa prior to the formation of the Vuoksi River ca. 4000 cal. BC, most of the Mesolithic sites in this region have been destroyed or covered by transgression layers. In other words, Mesolithic sites are rare in the Lake Saimaa area (see Koivikko 2000). This is not the case in the northern parts of the Lake Saimaa catchment, where a number of Mesolithic sites are located. Nonetheless, the known housepits – with only one exception – date to the Neolithic Stone Age and a few examples to the Early Metal Period.

The only known site with a Mesolithic housepit near the Finnish-Russian boarder was discovered in 2004 at Rahakangas in Eno Parish, Finnish North Karelia. According to a radiocarbon date on burnt bone found in a round housepit 5 to 6 meters in diameter, this housepit dates to a period between 8800–8550 cal. BC (1 sigma) (Pesonen 2005: 4–5). This date is the second oldest radiocarbon date obtained from a dwelling site in Finland. Another site with Mesolithic housepits is located on the southern coast of Finland. More than ten housepits have been recorded at the Susikopinharju 1 site in Pyhtää Parish, and some of these have also been excavated. Based on the finds and shore displacement chronology, these round and roundish housepits date to the Late Mesolithic, most probably to the 7th millennium cal. BC, although the elevation of the highest areas of the site would allow an even earlier date (Miettinen 1998: 19–22; Miettinen 1999).

In the area of the Karelian Republic on the north–north-eastern side of Lake Ladoga and around Lake Onega, the oldest known housepits appear during the 7th millennium cal. BC (Filatova 1996; Zhul'nikov 2003: 44). These oldest housepits are rectangular in shape and the frame construction is based on supporting posts. The round-shaped pithouses are a slightly younger phenomenon in the area, appearing from ca. 6000 cal. BC (Zhul'nikov 2003: 43–4, 101–102, 115–20, Table 2). In the sphere of the Veretye culture to the east of Lake Onega, the dwelling site Veretye 1 contains several housepits (Oshibkina 2006: 8–10). The oldest date from the site is 9600 ± 80 BP (Le-1469, ca. 9200–8800 cal. BC), the youngest one being 7700 ± 80 BP (Le-1473, ca. 6600–6460 cal. BC). The oldest radiocarbon date dates to the end of Preboreal period, but the Veretye culture dates for the most part to the Boreal period (Oshibkina 2006: 27). Unfortunately, there are no radiocarbon dates connected to the housepits.

The Russian chronology of the area of the Karelian Republic is based on radiocarbon dates on charcoal, as are also the dates obtained from the Rupunkangas 1A site. At Rupunkangas 1A the two oldest dates are older than the oldest radiocarbon dated housepits in the Karelian Republic. Thus, the initial building phase of the pithouses at Rupunkangas 1A is older than the oldest previously known housepits on the Karelian Isthmus and in the Karelian Republic.

OTHER HOUSEPITS IN THE RUPUNKANGAS AREA

Altogether, there are 17 housepits on the ancient

Table 3. The archaeological sites in the Rupunkangas area.

Site	Dating	Structures	Finds
Pontuksenhauta 1	Mesolithic (?)	- rectangular housepit x 2 - oval/round housepit x 6	- no finds
Pontuksenhauta 2	Neolithic – Early Metal Period	- oval housepit x 2	- Late Neolithic or Early Metal Period Asbestos Ware - quartz scrapers and flakes - burnt bones
Pontuksenhauta 3	Stone Age	- rectangular housepit x 2	- quartz scrapers and flakes - burnt bones
Rupunkangas 1	Mesolithic – Neolithic – Early Metal Period	- rounded square (1 housepit)	- Late Comb Ware, Textile Pottery (Early Metal Period) - quartz, quartzite, and rock crystal artefacts including blades, cores, scrapers and flakes - burnt bones
Rupunkangas 2	Neolithic	- round housepits x 2	- Typical Comb Ware, Kierikki Ware, Kierikki/Pöljä Wäre - quartz artefacts and flakes - slate flakes - burnt bones
Rupunkangas 3	Early Mesolithic	- round housepit - rectangular housepit	- quartz, quartzite, and rock crystal artefacts including blades, cores, scrapers and flakes - flint burin and flakes - burnt bones
Rupunkangas 4	Mesolithic – Neolithic	- large oblong depression	- quartz, quartzite and rock crystal artefacts including scarapers, cores and flakes - badly preserved bones

Rupunkangas island (Table 3, Fig. 10). The largest concentration of housepits is at the Pontuksenhauta 1 site, where eight housepits are located on the top of a narrow esker formation. The largest housepit at Pontuksenhauta 1 is 10 x 7 m in size and 0.8–1 m in depth (see Lavento et al. 2001). Its shape is rectangular with entrances at both short ends, and there is a clear embankment around it. The other housepits at the Pontuksehauta 1 site are round, oval or rectangular and a bit smaller, the smallest round dwelling being only 2.5 m in diameter.[6] At the nearby site Pontuksenhauta 3, there are two rectangular housepits 8 x 6 m and 6 x 5 m in size. These roughly 50 cm deep housepits have been dug into a narrow terrace between two shore formations. Both dwellings were dug partly into the edge of the upper terrace.

In the most southern part of the Rupunkangas area there are two housepits side by side at the Rupunkangas 3 site, which is radiocarbon dated to the beginning of the Boreal period (Hela 1165, 8740 ± 40 BP). One of the pits at the site is rectangular (10 x 6.5 m in size and 0.6 m in depth) and the other is round (4.5 m in diameter and 0.6 m in depth). These housepits are not located on the top of the terrace but in the background of the dwelling site, approximately 40–50 meters away from the shore terrace. The richest find area, observed on the mineral soil surface uncovered by a logging tractor, is located between the housepits and the terrace edge.

In addition to housepits, the structures also include a large oblong depression 20 x 5 meters in size located at the Rupunkangas 4 site (see also Mökkönen et al. 2007: 119).[7] This depression is of natural origin but has been modified by man. Fire-cracked stones and quartzes line the embankments and at the bottom there is a lightly coloured cultural layer in which two quartz flakes were found while test pitting during the survey. However, most of the bottom area in this depression did not yield any signs of a cultural layer or any finds.

Even though there is extensive variation as regards the shape, size and topographic location

Table 4. Phosphate values from the sites in the Rupunkangas area.

Site	Sample	P mg/kg	Cultural layer
Pontuksenhauta 1	Housepit no. 2	839	dark brown cultural layer with lot of soot
	Housepit no. 3	292	--
	Housepit no. 4	823	dark brown cultural layer with lot of soot
Rupunkangas 3	Rectangular housepit	853	dark brown charcoal mixed cultural layer
	Round housepit	422	--
	Background of the site	375	--
Rupunkangas 4	Oblong depression	560	--
		848	--
		808	--
	Background of the depression	848	cultural layer mixed with a lot of soot and charcoal

of the housepits, there is also one common feature. A trait shared by all the housepits is the low number of finds, even though test pits were dug during surveys. None of the housepits yielded any datable finds during test pitting. In all, the number of finds directly connected with the housepits is insignificant, consisting of only a few quartz flakes and pieces of burnt bone.

In addition to the low number of finds, the cultural layers are lacking in some of the housepits. In order to explore the cultural impact on the soil inside the housepits, sporadic phosphate analyses were carried out (Table 4) (Mökkönen et al. 2005; Mökkönen & Nordqvist 2005). According to the analysed samples from the Rupunkangas area and the nearby Autio 1 site, the natural background values in the area are quite high, from about 300 mg/kg to values as high as nearly 400 mg/kg. In all of the phosphate analyses carried out during the Kaukola-Räisälä Project, only three samples actually had a phosphate content lower than 300 mg/kg. In the phosphate analyses carried out in Finland in the Lake Saimaa area, the natural phosphate values have been somewhat lower, about 200–250 mg/kg (Matiskainen & Jussila 1984: 35; Lahelma 2006: 9; 2007: 54). In northern Finland the natural values are even lower, lying clearly below 200 mg/kg (Carpelan & Lavento 1996: 99–102).

At the Pontuksenhauta 1 site the largest and one of the small housepits with intensely coloured cultural layers produced phosphate values as high as over 800 mg/kg.[8] At the same site another small housepit without any signs of cultural layers or finds contained a natural phosphate concentration of 292 mg/kg.[9] These results are reasonable, but at the same time contrary results were obtained. At the other analysed sites high phosphate values were also obtained from samples taken from inside the structures, but in some cases there were no traces of cultural layers. At the Rupunkangas 3 site the rectangular housepit with a cultural layer contained clearly elevated phosphate values (853 mg/kg). In the adjacent round housepit at the same site the phosphate values were slightly elevated (422 mg/kg) regardless of the absence of cultural layers. At the Rupunkangas 4 site the samples taken from the bottom of the natural oblong depression partly modified by man contained high phosphate values (560–848 mg/kg) even though the cultural layer was missing.

On the basis of phosphate analyses carried out in connection with the surveys, the presence of high phosphate values in the housepits and other depressions utilized by man is not directly dependent on the existence of a visible cultural layer. High phosphate values were observed connected both to heavily coloured cultural layers and to samples without any visible cultural content. A housepit without any cultural layer or finds or raised phosphate values – as in the case of the housepit at Pontuksenhauta 1 – is an interesting phenomenon, especially when such a feature is found in the same cluster as other housepits with clear cultural layers. The raised phosphate values, in some of the samples even higher than 800 mg/kg, clearly indicate quite a wide range of human activity, which is not limited only to the areas with artefacts and visible cultural layers. The differences between housepits at the same site as regards phosphate values and the presence of a cultural layer and finds might indicate differentiation in the activities performed in different pithouses. However, this suggestion is purely hypothetical, since it is not known whether the pithouses were contemporaneous or not.

The reason for the great variation in the outward appearance of the housepits in the Rupunkangas area and in the characteristics of the layers inside them cannot be resolved here. The main question in this issue is the temporal relationship between the houses – are they synchronous or not? Whatever the answer may be, at the moment it seems that the variation is more closely related to time than to variation between synchronous housepits. This is, however, only an assumption based on a notion of certain time-related changes in the shape and dimensions of housepits (see Mökkönen 2002; Okkonen 2003: 226–8; Núñez & Okkonen 2005: 29; cf. Pesonen 2002).[10]

CONCLUSIONS

At the Rupunkangas 1A site the location of the small-scale excavation area in the narrow strip of land between two sand pits made it possible to gain additional information about the stratigraphy of the site. It would not be possible to understand the context of the excavated cultural layers solely on the basis of the data obtained from the excavation area. The sectioning of the sand pit next to the excavation area clearly showed that the cultural layers at the site had formed in a man-made depression that cut into the natural layers of sandy till. The stratigraphical observations together with the observations made on the surface made it possible to interpret the depression as a housepit.

The stratigraphy, finds, and radiocarbon dates together provided insights as concerns the chronological depth of the site. The four radiocarbon dates from the lowest blackish layers covered nearly the whole Mesolithic Stone Age. In the upper layers the ceramics dating to the Late Neolithic and the Early Metal Period provided evidence as to the youngest occupation phases at the site. On the basis of the oldest radiocarbon date (ca. 8000–7650 cal. BC) the initial occupation phase of the site is practically synchronous with the isolation of the Lake Ladoga Basin from the Baltic Sea Basin. This date also represents the first building phase of a pithouse at the site. The last occupation phase at the site is connected to Textile Ceramics and dates most probably to the period preceding the formation of the River Neva ca. 1300 cal. BC.

Due to the poor preservation of the organic material and the partly mixed nature of the layers, no unambiguous strata that could be interpreted as floor layers or layers originating from the collapse of the structures were found. The interpretation that the remains represent several Mesolithic rebuilding phases is based on the radiocarbon dates and partly on stratigraphical observations. The gathered data do not allow conclusions to be drawn as concerns the origin of the Neolithic layers with Late Comb Ware, that is, are we looking at a rebuilding phase or a dump? On the basis of the stratigraphy the youngest rebuilding phase of the pithouses at the site is connected to the layers with Textile Pottery. The housepit visible in the surface elevation model is also connected to the last rebuilding phase.

The oldest radiocarbon date (ca. 8000–7650 cal. BC) connected to the housepit at the Rupunkangas 1A site is considerably older than the oldest dates from housepits on the Karelian Isthmus or in the Karelian Republic. On the Karelian Isthmus there are no other sites with Mesolithic housepits, and in the Karelian Republic the oldest housepits date to 7th millennium cal. BC. The oldest date from Rupunkangas 1A is, however, nearly a thousand years younger than the date obtained from the housepit at the Rahakangas site in Finnish North Karelia.

Finds from all the sites indicate that the Rupunkangas area was used throughout its existence as an island, that is, ca. 8000–1300 cal. BC. The only temporal gap in the archaeological material is in the Early Neolithic period – no finds can be connected to the period synchronous with Early Comb Ware. Nonetheless, the archaeological data from the Rupunkangas area and the absence of an alternative site of similar nature in the nearby archipelago points to a fairly continuous seasonal or permanent settlement in the Rupunkangas area. The continuation of the occupation through the millennia shows that the exploitation of resources in the archipelago of Ancient Lake Ladoga has remained, at least on the face of it, unchanged all through the Stone Age.

Despite the strong connection between pithouses and an at least semi-sedentary settlement pattern, pithouses located in a marginal area do not necessarily represent permanent residental sites. This notion, together with the environmentally marginal location of the Rupunkangas area in the archipelago far from the heartland of the hunter-gatherer settlement of the area and with a low number of finds in relation to the thickness of the cultural layers, lead to the interpretation of the excavated Rupunkangas 1A site as a regularly used seasonal camp for sealing and fishing. The occupation period has most likely been in the autumn and winter. This conforms well with the osteological material gathered from the sites in the Rupunkangas area, although it must be remembered that the number of identified bone fragments is low.

The interpretation of the Rupunkangas 1A site as a seasonally occupied camp used regularly for the exploitation of aquatic resources is largely based on the low number and monotonous character of the finds and the environmental location of the site, which could be categorized as a marginal area. Especially the location of the site is seen to indicate why this particular site was occupied. The formation of the black thick cultural layers in the housepit is assumed to be connected to the abandonment processes rather than to the actual occupation phases of the site. The seasonal camp interpretation presented here is launched as a contradictory view with respect to the typical, overly direct and simplified argumentation where the occurrence of housepits is equated with more permanent, sedentary or semi-sedentary settlement at the site.

Another, more traditional interpretation of the Rupunkangas 1A site might also be possible, but it appears that the available archaeological material *alone* would not support that interpretation, either. The conclusions drawn on the basis of archaeological data, which does not speak for itself, usually requires reasoning and the making of assumptions before the final statements. In the case of the Rupunkangas 1A site the interpretation either as a seasonally used camp or permanent dwelling site could not be read directly from the archaeological data – the method of reasoning on the basis of the data points to certain conclusions.

It is not possible to extend the interpretation of the Rupunkangas 1A site to the other sites in the Rupunkangas area. The low number of finds connected directly with the housepits is evident on every site, but at some of the sites, namely Rupunkangas 2 and Rupunkangas 3, the existence of well-developed cultural layers with a notable number of finds points to a fairly intensive occupation of the sites. Current archaeological data do not allow a comprehensive interpretation of the sites in Rupunkangas area. In order to gain a comprehensive understanding of the diverse sites in the Rupunkangas area, more detailed archaeological data, obtained through excavations and new radiocarbon dates, is needed.

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The calibration of radiocarbon dates in the article has been carried out using the OxCal Version 3.10 calibration program (© C. Bronk Ramsey 2005).

NOTES

[1] The pit structures, which are the remains of semi-subterranean structures used as dwellings, have many names. In Finnish archaeological literature published in English, terms like 'dwelling depression', 'pithouse' and 'semi-subterranean house remain' have been most popular. In this article the term 'housepit', adapted from North American archaeological literature, is used (in Finnish archaeology this term is also used in Kankaanpää 2002 and Hertell & Manninen 2006; see also Karjalainen 1996). The term 'pithouse' refers to a whole pithouse and its standing wooden structures. When the structures have collapsed and only a pit remains, the preferred term is 'housepit' (Hayden 1997). A housepit is an archaeological remain of a pithouse.

[2] The dating of the formation of the Neva outlet is based on radiocarbon dates published by Saarnisto and Grönlund (1996). In this article, they give two reliable dates, namely 3020 ± 55 BP (Su-2271) and 3200 ± 80 BP (Su-2275), the former of these being more suitable for dating the River Neva (Saarnisto & Grönlund 1996: 210). The calibration of the dates gives 1390–1200 cal. BC (67.5 % probability) for the former date and 1540–1390 cal. BC (60.1 % probability) for the latter date (OxCal Version 3.10 © C. Bronk Ramsey 2005). Even though the approximate date of 1300 cal. BC for the formation of the River Neva is used here, it must be borne in mind that the frame of the exact date is much wider.

[3] The shifting water level is due to the uneven speed of land uplift within the area. This means that the older the shore level, the more tilted it is at present.

[4] Here, marginal areas are defined as areas located far from the heartland of the settlement, where only a few, often seasonally exploitable, resources are available. The study area, being located in the archipelago, was also environmentally harsh as compared to the mainland.

[5] Possibly at least one housepit has been excavated during the active research period in the area in the early 20th century. The first Stone Age dwelling structure, the 'Räisälä hut', excavated and reconstructed by Pälsi (1918) at the Pitkäjärvi site in former Räisälä Parish, has upon re-examination proven to be a possible half of a housepit (Seitsonen 2006).

[6] Finnish archaeological literature lacks an adequate definition of a housepit (or dwelling depression or semi-subterranean house remain). As concerns the sizes of the pithouses, in a review article on housepits in Finland the smallest pits regarded as housepits and taken into consideration are ca. 4 meters in diameter (Pesonen 2002: 13). However, this is not a rule – the limitation is made merely for practical purposes. In other areas the existence of housepits smaller than 4 meters in diameter is recognized. For example, the average diameter of the 41 excavated housepits in Wyoming (USA) was only 3.15 meters, the smallest diameter of a housepit being 1.7 meters (Smith 2003). In Sweden, the definition of the Neolithic housepits presented by Lundberg (1997: 13) argues for 2–3 meters in diameter as the minimum size of a housepit.

[7] In the 2004 survey several round, 2.5 meter-wide pits were found at the site near the oblong depression. These were preliminary interpreted as cooking pits (see Mökkönen et al. 2007: 119). One of the pits excavated in 2005 turned out to be a traditional tar-burning pit (Mökkönen 2005b). The charred wood at the bottom of the pit was dated to 370 ± 40 BP (Hela-1181). A similar structure was also excavated at the Rupunkangas 1A site (see Fig. 5).

[8] The phosphate samples were analysed at the laboratory of the University of Helsinki Department of Archaeology by Paula Kouki. Due to the limited resolution of the equipment used, the calibration of values higher than 800 mg/kg is only suggestive. In practice, this means that samples with a phosphate content of some 800–1000 mg/kg may give fairly similar values in the analyses (Paula Kouki, pers. comm.).

[9] The absence of cultural layers and finds was easy to ascertain since a rectangular pit some 150 x 50 x 50 cm in size had been dug into the middle of the housepit for an unknown reason.

[10] This, again, raises the question, how should a housepit be defined? Is the type of soil at the site where the house is erected a reasonable basis for classifying different types of semi-subterranean structures used as dwellings? According to present convention semi-subterranean structures erected on sand or gravel are called housepits while similar structures erected on rocky moraines are called settlement embankments (see Pesonen 2002: 13–14; Okkonen 2003: 28–30).

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