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Results of archaeological fieldwork of 2002

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ARHEOLOOGILISED  
VÄLITÖÖD  
EESTIS

ARCHAEOLOGICAL  
FIELDWORK  
IN ESTONIA

2002

Koostanud ja toimetanud  
Ülle Tamla

Muinsuskaitseamet  
Tallinn 2003

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Uus 18, Tallinn 10111, Eesti  
National Heritage Board  
Uus 18, Tallinn 10111, Estonia

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ISSN 1406-3972

Trükitud AS Pakett trükikojas  
Laki 17, Tallinn

# THE RESULTS OF RESEARCH OF ESTONIAN STONE AGE IN 2002

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## INTRODUCTION

Fieldwork connected with the research of the Stone Age took place in several parts of Estonia during the year 2002. The results of the survey led to the finding of about twenty Stone Age settlement sites, most of which come from Central Estonia. Besides the already well-known settlement areas of the lower reaches of the Pärnu River and the Võrtsjärv depression, the sites from this era were also for the first time discovered on the territory of the former Karula parish in Southern Estonia. More intensive excavations were carried out in three places: the settlement site of Võhma I (see the article by Mirja Ots in the current volume), the settlement site of Sindi-Lodja I and the settlement and burial site of Kivisaare. The current article provides an overview of the research financed by the Estonian Science Foundation (grant no 4558, 5328, 5098), concentrating primarily on the excavations at the latter two sites and the exploitation of fauna at these sites. The fieldwork as well as the analysis of the material has been conducted in close cooperation with the researchers of the University of Tartu, the Institute of History and the Museum of Pärnu.

## THE RESEARCH IN SOUTHWESTERN ESTONIA

In May and June of 2002, the fieldwork that had started in the autumn of 2000 continued in the lower reaches of the Pärnu River in Southwest Estonia (Kriiska 2001a; Kriiska et al. 2002; Fig. 1). The main object was the settlement site of Sindi-Lodja I – an investigation of the test excavation, unfinished from the previous season, was carried out (the total area 31 m<sup>2</sup>, the area of the opened Mesolithic cultural layer 9.3 m<sup>2</sup>) and another smaller test excavation was made (D, area 6 m<sup>2</sup>; Fig. 2).

At the test excavation C, it was possible to observe various soil layers (Fig. 3), many of which contained archaeological finds. 10–20 cm thick humus was located at the ground surface and under it an 80 cm thick dark grey sand layer. From

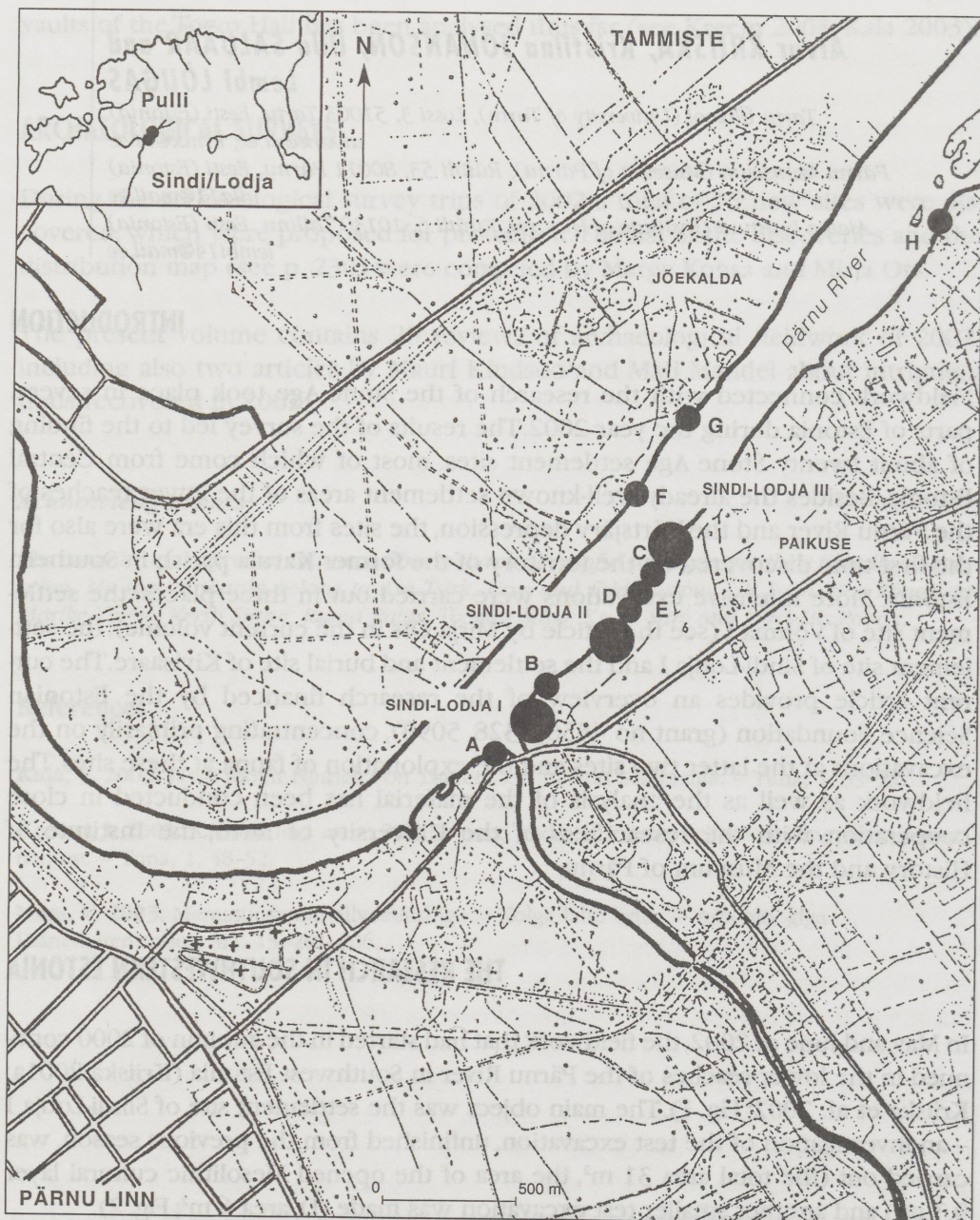


Fig. 1. Stone Age Sites and locations of finds of lower reaches of Pärnu River.  
 Joon. 1. Kiviaja asula- ja leiukohad Pärnu jõe alamjooksul.

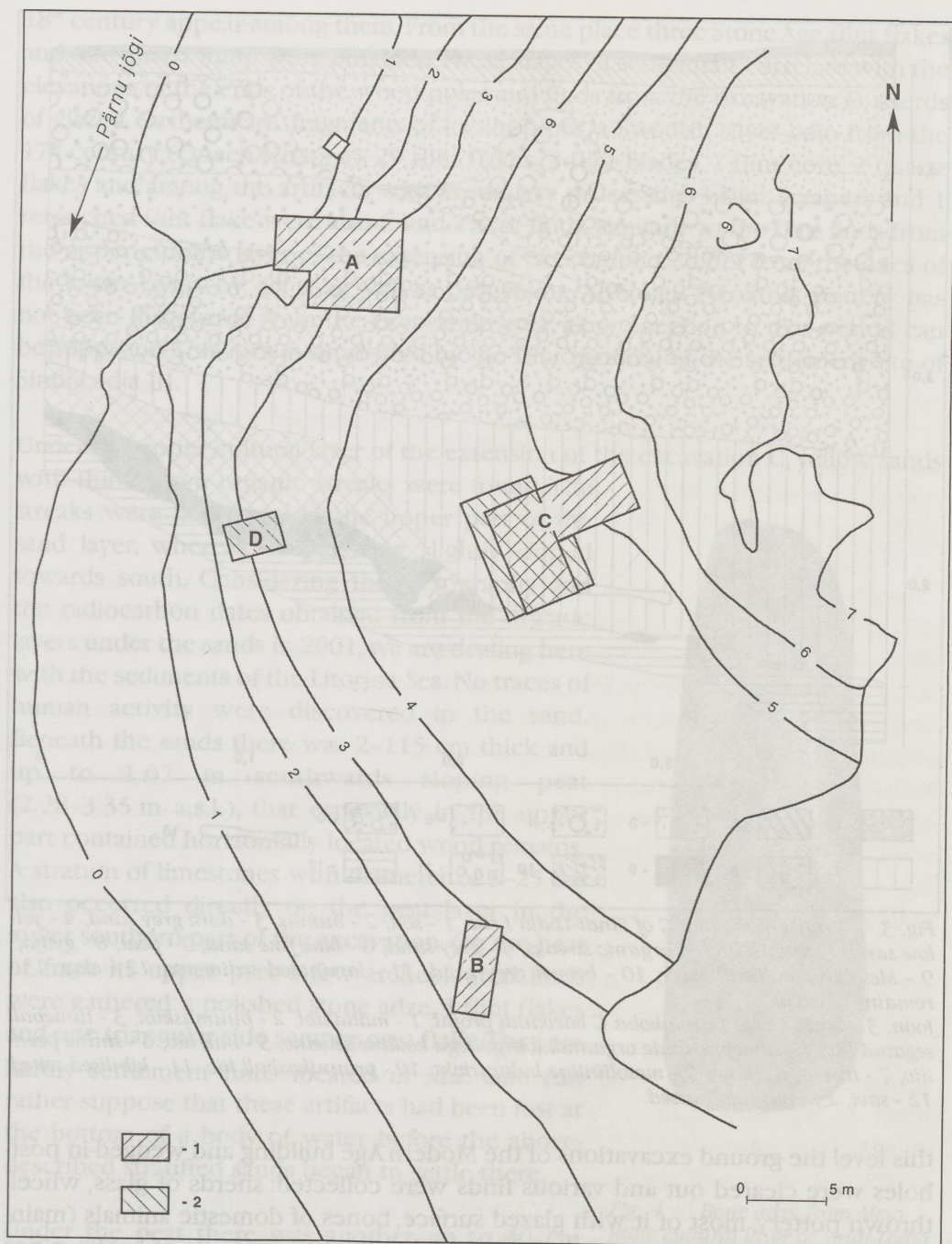


Fig. 2. The plan of Sindi-Lodja I site. 1 - Excavation plots of 2000-2001, 2 - Excavation plots of 2002.

Joon. 2. Sindi-Lodja I asulakoha plaan. 1 - 2000.-2001. aasta kaevandid, 2 - 2002. aasta kaevandid.

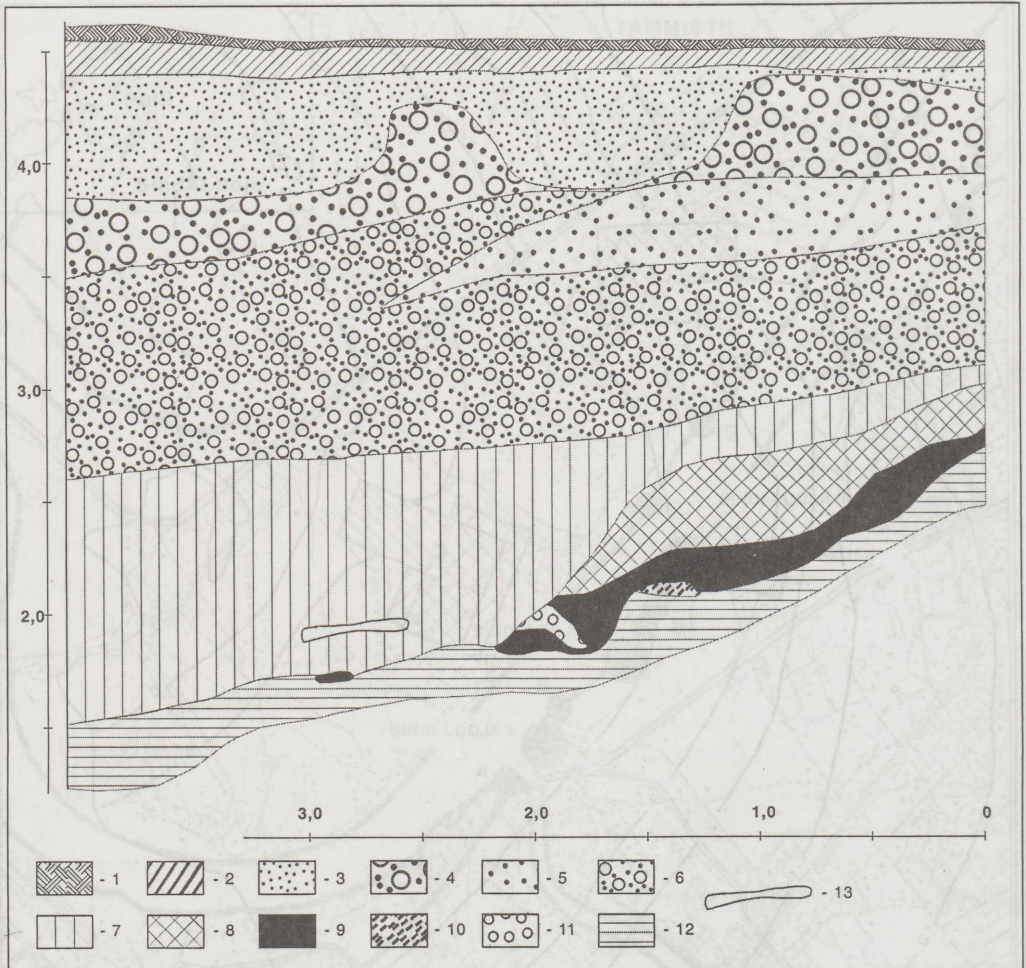


Fig. 3. Profile of the plot C of Sindi-Lodja I site. 1 - sod, 2 - humus, 3 - dark grey sand, 4 - yellow sands with thin brown organic streaks, 5 - grey sand, 6 - blue fine sand, 7 - peat, 8 - gyttja, 9 - Mesolithic cultural layer, 10 - brown grey sand, 11 - laminated sediments, 12 - clay, 13 - remains of wood.

Joon. 3. Sindi-Lodja I asulakoha C kaevandi profiil. 1 - mättakiht, 2 - huumuskiht, 3 - tumehall segatud liiv, 4 - tumepruunide orgaanikaviirgudega kollane setteliiv, 5 - hall liiv, 6 - sinine peenliiv, 7 - turvas, 8 - jütja, 9 - mesoliitiline kultuurkiht, 10 - pruunikashall liiv, 11 - kibilised settel, 12 - savi, 13 - puidujäänused.

this level the ground excavations of the Modern Age building and wedged-in post-holes were cleared out and various finds were collected: sherds of glass, wheel-thrown pottery, most of it with glazed surface, bones of domestic animals (mainly cattle) etc. According to Erki Russow, potsherds and fragments of kaolin pipes dating to the 2<sup>nd</sup> half of the 16<sup>th</sup> century, to the 17<sup>th</sup> century and the 1<sup>st</sup> half of the

18<sup>th</sup> century appear among them. From the same place three Stone Age flint flakes and one quartz lump were obtained. These stages of settlement correlate with the elevations of the ends of the wood poles and finds from the excavation D: sherds of glazed earthenware, fragments of kaolin pipes, a Swedish silver coin from the 17<sup>th</sup> century (Queen Kristina). 29 flint flakes, 2 flint blades, 1 flint core, 2 quartz flakes and among the artifacts with secondary processing 3 flint scrapers and 1 retouched flint flake were also found. These finds, similarly to the flint finds from the upper cultural layer of the extension of excavation C, differ from the ones of the lower layers by color as well as processing. Although Neolithic pottery has not been discovered from the excavation area, its connection to that period can be supposed. This idea is supported by the flint material of the settlement site of Sindi-Lodja III.

Under the upper cultural layer of the extension of the excavation C, yellow sands with thin brown organic streaks were found. The streaks were horizontal in the upper part of the sand layer, whereas deeper they slightly sloped towards south. Considering the stratigraphy and the radiocarbon dates obtained from the organic layers under the sands in 2001, we are dealing here with the sediments of the Litorina Sea. No traces of human activity were discovered in the sand. Beneath the sands there was 2–115 cm thick and up to 1.07 m southwards sloping peat (2.28–3.35 m a.s.l.), that especially in the upper part contained horizontally located wood remains. A stratum of limestones with diameter of 5–25 cm also occurred directly on the peat layer in the lower southern part of the excavation. On the peat or from its upper part a few archeological finds were gathered: a polished stone adze, 3 flint flakes and one triangular side scraper on a flake. They are hardly settlement finds located *in situ*. One can rather suppose that these artifacts had been lost at the bottom of a body of water before the above-described stratified sands began to settle there.

Under the peat there was another up to 40 cm thick organic layer – probably gyttja. In the northern part of the excavation it was deposited pri-



Fig. 4. Bone adze from Mesolithic cultural layer of Sindi-Lodja I site (PäMu 15260/A2553:107).  
Joon. 4. Luust talb Sindi-Lodja I asula mesoliitilisest kultuurikibist.



Fig. 5. Bone fish hooks from the Pärnu River above the settlement site of Sindi-Lodja I (PäMu 15260/A2553:108).

Joon. 5. Luust õngekonksud Pärnu jõest Sindi-Lodja I asulakoha lähedalt.

ly 2.15–3.37 m a.s.l.). The layer was strongly sloping towards south, with elevation differences predominantly ca 1 m. Individual patches of humified organics occurred even deeper (up to 1.5 m a.s.l.); there, however, they were situated under the peat layer and the gyttja was entirely absent. The cultural layer was predominantly deposited on clay but in places clay and sand occurred also upon it. This kind of positioning of layers is indicative of the bank slide and probably also water activity that sometimes changed the succession of the layers under the peat and shaped the edge of the ancient terrace.

Thus only a part of the Mesolithic cultural layer has remained in its initial position; it is possible that it is a periphery of a settlement site. The latter is also apparently reflected in the considerable scarcity of the materials found; only 2 flint flakes, 1 flint blade, 1 flint core, 3 flint lumps and a bone adze (Fig. 4) were found. A trapezoidal adze with narrowing butt has an entirely polished surface and possesses analogs among the adzes collected from the lower reaches of the Pärnu River during the 1<sup>st</sup> half of the 20<sup>th</sup> century. The animal remains found from the cultural layer confirmed the characteristics of the material found last year (Kriiska *et al.* 2002): bones of ringed seal predominate, while pikeperch and perch were more or less equally represented. There were bone fragments of larger mammal in the material as well. Probably from elk, but as they were just pieces, the exact identification is not possible. The rest of the bones came from dog, water vole, pike and birds.

marily at the absolute altitude of 2.7–3.37 m, while in the south-western part it descended to 2.11 m a.s.l. Strongly deformed wood remains as well as archaeological finds and animal bones occurred in the upper part of the layer. There were 7 flint flakes, 2 flint blades, 1 flint core, 1 quartz flake, 1 flint burin, 1 flint burin-knife, a big grinding stone and a blade of an elk antler with traces of processing.

Under the gyttja there were 5–30 cm thick humified organics – the cultural layer of a Mesolithic settlement site (mainly

During the survey of the shores of the Pärnu River, which took place within the framework of the archaeological expedition in Sindi-Lodja, two new Stone Age settlement sites were found. The settlement site of **Sindi-Lodja III** is situated on the border of Paikuse village and the state forest on the bank of the Pärnu River 300 m north-east from the settlement of Sindi-Lodja II (Fig. 1). Similarly to the other Sindi-Lodja settlement sites, this site had also an area of concentrated finds on the river bank, from where a fragment of an artifact made of black high-quality flint, apparently a part of a dagger blade, was found among other things. The cultural layer with finds is rather well-preserved and is located on a wide area (at least a couple hundred meters in length and in north-eastern part almost 100 m in width). By now, the limits of the site have been determined only in the north-eastern part of the settlement site where construction work was started last summer. In order to determine the extent and character of the settlement, surface finds (also partially mapped) were collected and more than twenty test-pits and a 3/4 m size test excavation were made. The location of two fireplaces could also be determined.

The finds: potsherds, debris, flint scrapers and knives *etc.* can primarily be associated with the Typical Combed Ware Culture and dated to about 4000–3700/3500 cal. BC. Among other finds numerous sherds were gathered from a 22 cm high vessel with an orifice diameter of 40 cm. One sherd of Corded Ware was also obtained from the same place. A living area from the Combed Ware Culture period was probably situated close to the mouth of the Pärnu River. Even if the living area was not located directly at the mouth of the river, then judging from the valley of the river, one can suggest that similarly to the present situation the water level back then in that area was practically at the same elevation as the sea level. Therefore, the shore displacement chronology elaborated by Timo Jussila and Aivar Kriiska (in print) can be applied. According to this chronology the most probable date of the settlement is 3600 cal. BC (maximum age 4000 cal. BC, minimum age 3200 cal. BC). The typology of the pottery would allow to date the site to about 4000–3700/3500 cal. BC. The settlement period of the Corded Ware Culture can not be dated more exactly than to the Late Neolithic (3000–1800 cal. BC).

A Neolithic settlement site was discovered also on the right bank of the Pärnu River near Tammiste (the settlement site of **Jõekalda**; Fig. 1). From the edge of the bank slide that had taken place in the spring of 2002, a fragment of a flint arrowhead, flint flakes and potsherds were collected from the sand close to the surface. According to the shore displacement chronology, it has the same age as the settlement site of Sindi-Lodja III, but the pottery sherds could be classified as the

Late Combed Ware, the beginning of which, considering the dates of Estonia and the neighboring countries (Kriiska 2001b), is between 3700 and 3500 cal. BC.

Additional numerous finds were obtained also from the previously locations of the finds on the bank of the Pärnu River, many new find-concentration areas were discovered in the sediments of the river. In addition to stone finds, mostly flint flakes and small flaked tools, three fragments of bone fish hooks (Fig. 5) from the Pärnu River above the settlement site of Sindi-Lodja I are also noteworthy.

## **ARCHAEOLOGICAL EXCAVATIONS AT KIVISAARE STONE AGE SETTLEMENT AND BURIAL SITE**

Archaeological excavations at Kivisaare Stone Age settlement and burial site took place in July and August of 2002. The site is located in Viljandi county, Meleski village, on the Kivisaare drumlin about 6 km from Võrtsjärv. The earliest finds from there were gathered already at the end of the 19<sup>th</sup> century and in the 20<sup>th</sup> century several archaeological excavations have been carried out at Kivisaare: by Martin Bolz and Richard Hausmann in the 1<sup>st</sup> quarter of the 20<sup>th</sup> century, by Max Ebert in 1913, by Aarne Mikael Tallgren in 1921, by Richard Indreko in 1931 and by Lembit Jaanits in 1962, 1964 and 1965 (Bolz 1914; Ottow 1911; Tallgren 1922; Indreko 1931; Jaanits 1965). Altogether more than twenty skeletons were excavated that different researchers have dated to the Mesolithic, Neolithic, Bronze Age or generally to the Stone Age. In addition to the material from the cemetery, finds indicating a settlement site (flint flakes and a few artifacts with secondary processing, Corded Ware sherds *etc.*) were also obtained from there. On the basis of these a rather cautious statement was made that "people have lived on the Kivisaare drumlin already since the Mesolithic but finds from later periods up to the Bronze Age are also present." (Jaanits *et al.* 1982, 100).

It was decided to conduct additional research on the site in order to find out about the possible existence of the Mesolithic settlement, determine the age of the cemetery and obtain more information on the settlement of the Corded Ware Culture. As the bronze sickle from the Early Bronze Age found from Kivisaare has been one of the main arguments in assuming that the Corded Ware Culture in Estonia continued during the mentioned period (Jaanits *et al.* 1982, 117; Lang & Kriiska 2001, 94), the researchers hoped to shed light on this matter as well.

During the fieldwork which was attended by the students of the universities of Tartu and Helsinki as well as amateur archeologists, an area of 61 m<sup>2</sup> was opened

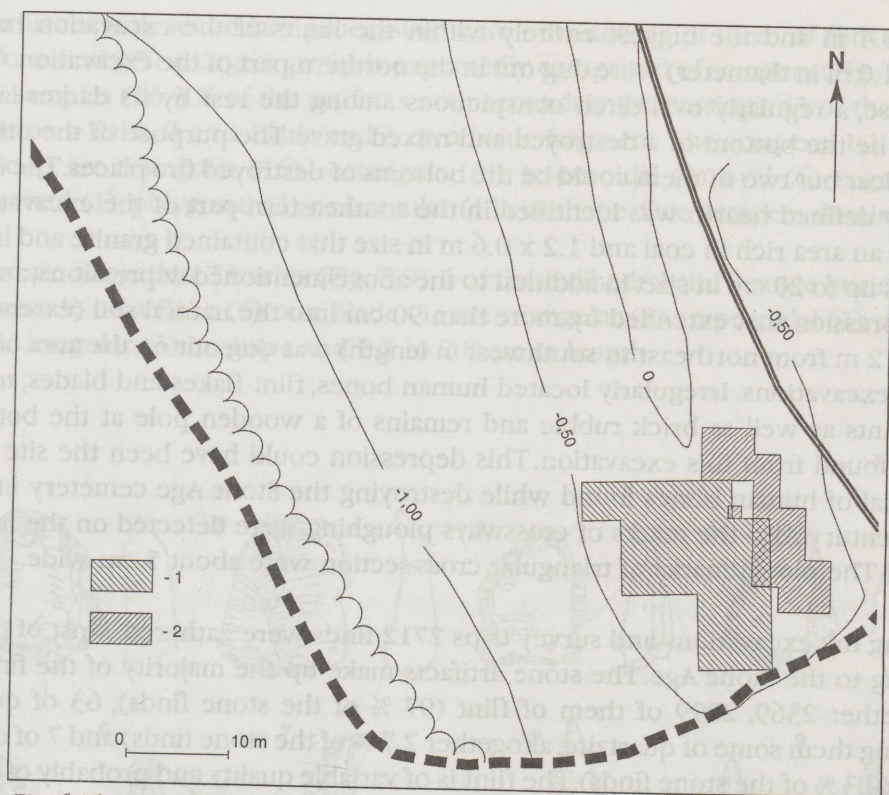


Fig. 6. The plan of Kivisaare Stone Age settlement and burial site. 1 - Excavation plot of 1965, 2 - Excavation plots of 2002.

Joon. 6. Kivisaare kiviaja asula- ja matmispaiga üldplaan. 1 - 1965. aasta kaevand, 2 - 2002. aasta kaevand.

in the southern part of the Kivisaare drumlin and the extent of the settlement layers was studied with test-pits and phosphate mapping. The excavation was carried out in the vicinity of the area investigated in 1965. Unfortunately the exact location of the latter could not be determined on the landscape, as a result of which the excavation of 2002 overlapped it by 9 m<sup>2</sup> (Fig. 6).

An intensive and multicultural settlement layer as well as traces (human bones and tooth pendants) of the destroyed cemetery were found. Unfortunately the cultural layer was almost entirely mixed with the later agricultural activity, the undisturbed soil occurred only in the depressions extending into the bottom moraine. The thickness of the layer with finds was 10–50 cm, in one of recent pits even up to 1 m.

Six depressions extending into the natural soil by 5 to 20 cm (the smallest being

0.5 x 0.4 m and the biggest entirely within the limits of the excavation being 2.0 x 1.0 m in diameter) were dug out in the northern part of the excavation. One of these, a regularly oval ditch conspicuous among the rest by its darker layer, could be the bottom of a destroyed and mixed grave. The purpose of the others is unclear but two of them could be the bottoms of destroyed fire-places. The only clearly defined hearth was identified in the southeastern part of the excavation. It was an area rich in coal and 1.2 x 0.6 m in size that contained granite and limestones up to 20 cm in size. In addition to the above-mentioned depressions, another depression that extended by more than 90 cm into the natural soil (extending about 2 m from northeast to southwest in length) was dug out on the area of the 1965 excavations. Irregularly located human bones, flint flakes and blades, tooth pendants as well as brick rubble and remains of a wooden pole at the bottom were found from this excavation. This depression could have been the site of a reburial of human bones found while destroying the Stone Age cemetery in the 20<sup>th</sup> century. Also the marks of crossways ploughing were detected on the natural soil. The ploughmarks of triangular cross-section were about 5 cm wide.

During the excavations and survey trips 2712 finds were gathered. Most of these belong to the Stone Age. The stone artifacts make up the majority of the finds – altogether 2369, 2299 of them of flint (97 % of the stone finds), 63 of quartz (among them some of quartzite, altogether 2.7 % of the stone finds) and 7 of other rock (0.3 % of the stone finds). The flint is of variable quality and probably of local origin, only in the case of one flake the raw material is presumed to be from Central Russia. The Võrtsjärv depression is one of the areas richest in flint in Estonia; this is also evidenced by natural flint in the form of gravel and pebbles in the excavated soil of Kivisaare.

Prevalent part of the finds are flakes: 1960 flint flakes (85.3 % of flint finds), 59 quartz flakes (93.7 % of quartz finds) and 2 flakes of other stone. There are also numerous blades and fragments of blades, half of which were obtained from the southern part of the excavation. While the quartz and quartzite blades are represented only by a single specimen, there were altogether 230 flint blades (Fig. 7: 10–13) and their fragments (respectively 171 and 59, a total of 10 % of flint finds). 140 of them are single-ridged, 45 double-ridged, 40 without a ridge, 4 with three ridges and 1 with four ridges.

27 cores and one preform of a core were collected, 27 of them are of flint and one of quartz. More than half (15) of the 1.5 to 4.4 cm high flint cores are bipolar<sup>1</sup> (thinning towards both sides and with structural damage on both ends), but cores with one or several striking platforms were also found. The latter are often of irregular shape.

83 artifacts with secondary processing were obtained, all of them of flint (3.5 % of stone finds). The largest group is expectedly comprised of scrapers (Fig. 7: 1-4) - 55 samples (66.3 % of the artifacts with secondary processing). 43 of them are made on a flake, 9 on a blade and 3 on a blade fragment. The scrapers, 1.1 to 3.6 cm long, are triangular (16), rectangular (8), trapezoidal (8), oval (6), segmental (1), round (1), polygonal (2) or irregular (13) in shape. Side scrapers dominate.

There are altogether 7 burins (Fig. 7: 9), 4 of them dihedral and 3 angle burins. The tools made on a flake (6) or a blade (1) are triangular (2), trapezoidal (1), square (1) or irregular (3) in shape and 1.1 to 2.8 cm in length.

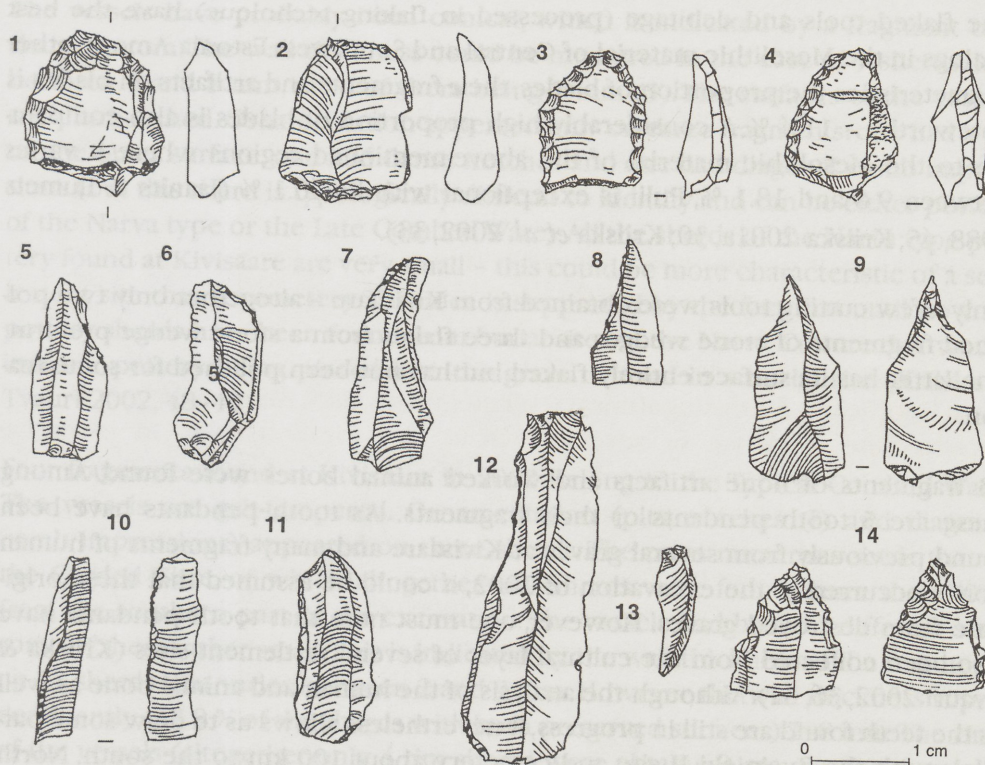


Fig. 7. Flint scrapers (1-4), microliths with slanting retouched end (5-7), triangle (8), burin (9), blades (10-13) and fragment of arrowhead (14) from Kivisaare (TÜ 1113:105, 230, 188, 581, 1503, 671, 280, 414, 741, 1337, 626, 892, 740, 319).

Joon. 7. Tulekivist kõõvitsad (1-4), viltuse retušitud otsaga mikroliidid (5-7), kolmnurk (8), uurits (9), laastud (10-13) ja nooleotsa katke (14) Kivisaarest.

The rest of the lithic artifacts include 12 retouched blades (probably flint inserts; Fig. 7: 10), 1 scraper-burin, 1 knife, 1 bore, 1 retouched flake, 1 triangle (Fig. 7: 8) and 3 microliths with a slanting retouched end (Fig. 7: 5-7) and a fragment of an arrowhead (Fig. 7: 14). The most remarkable of them are the triangles and the fragment of the arrowhead. The latter, made on a blade retouched on both surfaces, has an edge that resembles the arrowheads of the Early Mesolithic Pulli type and could thus be one of the few typologically dated finds. These points are predominantly dated to the 1<sup>st</sup> half of the Mesolithic (Ostrauskas 2000, 171-172). Since the find from Kivisaare is just a fragment, it cannot be unfortunately connected to the Pulli type and it could be younger, as arrowheads on a blade with retouch on its end and/or tang were used in Estonia still in the Early Neolithic (Jaanits *et al.* 1982, 63).

The flaked tools and debitage (processed in flaking technique) have the best analogs in the Mesolithic material of Central and Southwest Estonia. Among other characteristics the proportion of blades, their fragments and artifacts on blades is noteworthy - 11.4 %. A considerably high proportion of blades is also comparable to the Mesolithic material of the above-mentioned regions where it varies between 9.6 and 18.1 %, Pulli is exceptional with its 40.1 % (Jaanits & Ilumets 1988, 45; Kriiska 2001a, 30; Kriiska *et al.* 2002, 33).

Only a few cutting tools were obtained from Kivisaare - altogether only two polished fragments of stone wedges and three flakes from a stone wedge preform. The latter has its surface entirely flaked but has not been polished for some reason.

13 fragments of bone artifacts and worked animal bones were found. Among these are 5 tooth pendants or their fragments. As tooth pendants have been found previously from several graves at Kivisaare and many fragments of human bones occurred in the excavation of 2002, it could be assumed that these originate from destroyed graves. However, one must note that tooth pendants have also been collected from the cultural layer of several settlement sites (Kriiska & Tvaauri 2002, 36, 61). Although the analysis of the human and animal bone as well as the teeth found are still in progress, it nevertheless allows us to draw some parallels with the Zvejnieki II site and cemetery about 100 km to the south, North Latvia, and Tamula I site, Southeastern Estonia. There are similarities with the tooth pendants from the Neolithic period: they come from dog, wild carnivores and some from seals (Zagorskis 1987; Eriksson *et al.* 2003). It is different from the Mesolithic, when herbivores predominate, and the Bronze Age, when tooth pendants almost disappear from the graves.

Out of the potsherds gathered, 193 definitely belong to the Stone Age, as do probably also some of the 24 fragments the type of which could not be determined more exactly. Unfortunately these do not correlate with the stone and bone finds because indicator artifacts characteristic of different stages of the Neolithic are not present among the latter. 20 fragments of Narva type pottery are the oldest. Most of them were gathered from the southern part of the excavation. The pottery is mostly shell-tempered (15), more seldom with organic temper (4) or with both crushed shells and organic temper (1). The vessels have been made by the coiling technique, which is typical of the Narva type pottery. The coils are narrow (both contact surfaces were visible on 6 sherds and these were only 5–13 mm wide), and predominantly of U-type (6), a single case of NU and N-type coils occur.

The vessels have probably been conical, which is indicated by a fragment of a sharp bottom. The wall thickness could be measured in the case of 9 sherds. It is between 4 and 8 mm, most of them being 7 mm (5). The surfaces of the vessels are all smoothed. Ornamentation appeared only on three fragments: one had a pit on the outer surface, one had dense notches and one had diagonal comb impressions (but this sherd is typologically difficult to identify and can be either pottery of the Narva type or the Late Combed Ware). All the sherds of the Narva type pottery found at Kivisaare are very small – this could be more characteristic of a settlement site than a cemetery. This idea is supported by the fact that until now no pottery sherds have been found from burial sites of the Narva Culture that would indicate pottery being placed into the grave or used in a burial rite (Kriiska & Tvauri 2002, 48–49).

Four fragments found at Kivisaare in 2002 belong to the Typical Combed Ware. The vessels are grit-tempered. Ornamentation (pits, notches (?) and diagonal comb impressions) appeared on three sherds. The most numerous set is that of the Corded Ware, of which altogether 169 sherds were found, more than 70 % from the southern part of the excavation. The vessels had been of different size, some of them rather small. This is indicated by the wall thickness of the fragments on 73 sherds that varies between 2 and 9 mm. However, the wall thickness is predominantly (47.9 % of the sherds with both preserved surfaces) 7–8 mm. The rims of the vessels (altogether only 4 rim sherds were obtained) are curving outward, thinning in one case and forming a thickening protrusion of 9–10 mm in case of the rest. A thinning and curving rim profile is characteristic of the beakers of the Corded Ware Culture, while the sherds with a protruding rim originate from simpler pots (Kriiska 2000, 69). Only a small part of the sherds has been ornamented (6.3 % of the sherds): grooves (3), notches (2), shallow pits (1), cord impres-

sions (1) occur and one sherd has an imprint resembling textile impression.

The Corded Ware has been made of clay mixed mostly with organic (probably plant) temper (85). Sometimes sand (40), chamotte (19), stone debris (9), sand and chamotte (9), sand and stone debris (2), stone debris and chamotte (1) have been added to the plant temper. A few sherds have only sand mixed in the clay body (3). Although only one fragment of a bottom was found, one can suggest that the vessels had flat bottoms. The vessels have been formed by the coiling technique, 6 fragments of N-type coil were identified.

In the surface finish smoothing prevailed, only in a few cases were one or both surfaces striated. On the surfaces of 17 sherds fine fibrous impressions (of hair or plant fiber) could be observed.

To some extent (109) the artifacts from the Historic Period were also collected: wheel-thrown pottery, glazed earthenware and sherds of faience, sherds of glass, metal artifacts and their fragments (predominantly horseshoe nails), pieces of brick and burnt clay, pieces of slag, a glass bead and a fragment of a bone handle of a knife.

In conclusion, it can be stated that while during the earlier relatively large-scale excavations (because of the inaccuracy of the excavations, revealed by the restudied part of the 1965 excavation containing bones and other finds as densely as the unstudied area) only the few flint finds and Corded Ware sherds collected were insufficient for distinguishing settlement sites, then the excavations of 2002 revealed the existence of several sites at that location. First an extensive Mesolithic settlement site was situated at Kivisaare that, according to the fragment of the arrowhead on blade, could have originated already in the Early Mesolithic. The few sherds of Narva type pottery (the first in Central Estonia!) indicate a habitation of the Early Neolithic (5000–4000 cal. BC), and fragments of Combed Ware indicate Middle Neolithic (4000–3000 cal. BC) habitation. A new and more intensive settlement stage can be dated to the end of the Neolithic (3000–1800 cal. BC) when a settlement site of the Corded Ware Culture was situated at this location.

## Notes

- <sup>1</sup> This to a certain degree is inconsistent with the debitage among which only 4 blades and 6 flakes can be considered definitely bipolar.

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## EESTI KIVIAJA UURIMISE TULEMUSI 2002. AASTAL

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2002. aastal toimusid kiviaja uurimisega seotud välitööd mitmel pool üle Eesti. Suuremad arheoloogilised kaevamised ja inspeksioonid koondusid Kesk- ja Edela-Eestisse (joon. 1).

Pärnu jõe alamjooksul jätkusid kaevamised **Sindi-Lodja I** asulakohal, kus lõpetati C proovikaevandi uurimine ning rajati D proovikaevand (joon. 2). C kaevandi alal oli võimalik jälgida mitmeid arheoloogilisi leide sisaldavaid pinnasekihte (joon. 3). Otse pinnal asetses 10–20 cm paksune huumus ja selle all kuni 80 cm paksune tumehall liivakiht, millest leiti uusaegse ehitise sissekaeveid ja postikiilustikke. Selle kihiga seostus D proovikaevandi pindmine liivakiht: mõlemad sisaldasid enamasti uusaegseid (savinõukillud, mündid, piibufragmendid, koduloomade luud) ja mõnevõrra ka kiviaegseid (tulekivist ja kvartsist tootmisjäägid, tulekivist kõõvitsad), oletamisi neoliitilisi leide. Ülemise kultuurkihi all lasusid C kaevandis kollast värvi õhukeste pruunide orgaanikaviirudega Litorinamere setteliivad. Neile järgnes 2–115 cm paksune ja lõuna suunas kaldus turbakiht, mis eriti ülemises osas sisaldas puidujäänuseid. Turba pealt saadi üksikuid arheoloogilisi leide: lihvitud kivitalb, tulekivikilde ja tulekivist kõõvits. Tõenäoliselt on need esemed kaotatud veekogu põhja enne kui sinna hakkasid settima kihilised liivad. Turba all oli veel kuni 40 cm paksune orgaanikakiht – oletatavasti jütja – mille ülas osas esines puidujäänuseid ning arheoloogilisi leide. Leiuvaines oli tulekivikilde ja -laaste, tulekivinukleus, kvartsikild, tulekivist uurits, uurits-nuga, suur lihvimiskivi ning töötlemisjälgedega põdrasrve laba. Oletatavasti on need esemed sattunud elupaiga lähedal asetseva veekogu põhja. Jütja all oli 5–30 cm paksune, vaid osaliselt algses asendis mesoliitilise asula kultuurikiht. 9,3 m<sup>2</sup> suuruselt alalt koguti tulekivikilde ja -kamakaid, tulekivist laast ning nukleus ja luust talb (joon. 4). Loomaluudest domineerisid, nii nagu ka eelneva aasta kaevandis, hülgeluud (viiger), sekka mõni suurema imetaja luukild. Kaladest olid arvukamad koha ja ahven, kuid esines ka haug. Linnuluid liigini määrata polnud võimalik.

Samaaegselt Sindi-Lodja arheoloogilise ekspeditsiooni töödega inspekteeriti Pärnu jõe kallaste maastikku ja leiti kaks uut kiviaja asulakohta (joon. 1). **Sindi-Lodja III** asulakoht paikneb Pärnu jõe kaldal, 300 m Sindi-Lodja II asulast kirdes. Leide sisaldav kultuurikiht oli säilinud vähemalt paarisaja meetri pikkusel ja ligi 100 m laiusel alal. Pinnalt, prooviaukudest ja proovikaevandist koguti rohkesti leide: savinõukilde, kivitöötlemisjääke, tulekivist kõõvitsaid, nuge jms., mis seonduvad peamiselt tüüpilise kammkeraamika kultuuriga. Samast saadi ka üks nõorkeraamika kild. Neoliitiline asulakoht avastati Pärnu jõe paremkaldalt Tammiste lähedalt ja see nimetati **Jõekalda** asulakohaks. 2002. aasta kevadel toimunud kaldalihke servast, pinnalähedasest määratud liivast koguti tulekivist nooleotsa katke, tulekivikilde ja savinõukilde, mille võib tüpoloogiliselt liigitada hiliseks kammkeraamikaks.

Leide saadi rohkesti ka juba varem tuntud leiukohtadest Pärnu jõe kaldalt ning avastati mitmeid uusi leiukontsentratsioonialasid jõesetetes. Kivileidude (peamiselt tulekivikillud ja väikesed lõhestustehnikas valmistatud tööriistad) kõrval on tähelepanuväärsed kolm luust õngekonksu katket (joon. 5) Pärnu jõest Sindi-Lodja I asulakohalt.

Kivisaare kiviaja asula- ja matmispaiga kaevamistel avati 61 m<sup>2</sup> suurune ala (joon. 6) Kivisaare voore lõunaosas ning lisaks sellele uuriti asulakihtide ulatust prooviaukude ja fosfaatkaardistusega. Leiti intensiivne ja leiutihe multikultuurne asulakiht ning jälgi lõhutud kalmistust. Kultuurikiht oli hilisema maaharimisega segatud, puutumatut pinnast esines vaid põhjamooreni ulatuvates süvendites. Kaevati välja seitse looduslikku pinnasesse ulatunud lohku. Neist üks võis olla segatud hauapõhi,

teised lõhutud tuleasemete põhjad ning üks 20. sajandil toimunud kiviaja inimluude ümbermatmise paik. Avastati üks selgema ilmega maapinda süvendatud kividega koldekoht. Looduslikul pinnal fikseeriti ka ristkünni jälgi.

Väljakaevamiste ja inspeksioonidega koguti Kivisaarest 2712 leidu. Leiuainese enamuse moodustavad kivileiud – kokku 2369, neist 2299 tulekivist, 63 kvartsist ja kvartsiidist ja 7 muudest kivimitest. Tulekivi on erineva kvaliteediga ja tõenäoliselt kohalikku päritolu. Suurem osa leidudest on killud: 1960 tulekivi-, 59 kvartsi- ja 2 kivikildu. Suhteliselt rohkesti on ka laaste ja laastukatkeid (joon. 7: 10–13). Kui kvartsist ja kvartsiidist on kummaski vaid üks laast, siis tulekivist on kokku 230 laastu ja laastukatket. Koguti 27 nukleust ja üks pronukleus, neist 27 tulekivist ja üks kvartsist. Rohkem kui pooled neist olid bipolaarsed, kuid esines ka ühe või mitme löögiplatvormiga eksemplare. Teisese töötusega esemeid leiti 83, kõik tulekivist (3,5 % kivileidudest). Suurima rühma moodustasid kõõvitsad (joon. 7: 1–4) – 55 eksemplari. Domineerivad külteraga eksemplarid. Muudest esemetest leiti 12 retušitud laastu (tõenäoliselt pistikterad, vt. joon. 7: 10), 7 uuritsat (joon. 7: 9), 1 kõõvitsuurits, 1 nuga, 1 puur, 1 retušitud kild, 4 selgemat mikroliti (kolmnurk ja 3 viltuse retušitud otsaga mikroliti, vt. joon. 7: 5–8), ja nooleotsa katke (joon. 7: 14). Neist tähelepanuväärsemad on mikroliidid ja nooleotsa fragment. Võrdlemisi vähe saadi raieriistu – kokku vaid kaks lihvitud kivitalva katket ja kolm kildu ühest kivitalva toorikust. Luuesemete katkeid ja töödeldud loomaluud leiti 13, sealhulgas 5 hammasriipsit.

Savinõukildudest kuuluvad kiviaega kindlalt 193 ja ilmselt osa ka neist, mille tüüpi ei osatud täpselt määrata. Kahjuks ei ole need seostatavad kivi- ja luuleidudega, sest puuduvad neoliitikumi eri järkudele omased nn. indikaatorsemad. Vanimaks on 20 Narva tüüpi nõukatket. Keraamika on valmistatud peamiselt teokarbi purruga, harvem taimse massiga või nii teokarbi purru kui ka taimse massiga segatud savist. Nõud on vormitud linttehnikas; linnid on kitsad ja valdavalt U-tüüpi. Nõude pinnad on silutud; ornamendi (lohk, täkked ja diagonaalsed kammivajutused) esines vaid kolmel killul. Neli kildu pärineb tüüpilisest kammkeraamikast. Nõud on valmistatud kivipurru segatud savist. Ornamenti (lohud, täkked ja diagonaalsed kammivajutused) esines neljast killust kolmel.

Kõige rikkalikuma kogumi moodustab nõorkeraamika – kokku 169 kildu. Anumad on olnud erineva suurusega, osa neist võrdlemisi väikesed. Servad on väljapoole kaarduvad, ühel juhul õhenedes ja ülejäänutel moodustub paksenev eend. Õhenev kaarjas servaprofiil on iseloomulik nõorkeraamika teekritele; eendärelised killud pärinevad põhiliselt lihtsamatest pottidest. Ornamenteeritud on 3,6 % kildudest; kaunistusena esineb sooni, täkkeid, lohke, nõorivajutist ning ühel killul on tekstiilivajutist meenutav jäljend. Nõorkeraamika on valmistatud põhiliselt orgaanilise (arvatavasti taimse) massiga segatud savist, mõnikord esineb koos taimse massiga liiva, šamotti ja kivipurdu. Nõud on vormitud linttehnikas; fikseeriti N-tüüpi linte.

Kui varasematel Kivisaare kaevamistel oli kogutud vaid väheseid tulekivileide ja nõorkeraamika kilde, mis ei olnud piisavad asulate eristamiseks, siis 2002. aasta kaevamised osutasid mitme kinnismuistise olemasolule. Esmalt on Kivisaares paiknenud laiaulatuslik mesoliitiline asulakoht. Vähesed Narva tüüpi keraamikakillud (esimesed kogu Kesk-Eesti alal!) osutavad sealsele varaneoliitilisele ja kammkeraamika killud keskneoliitilisele elutegevusele. Uue ja intensiivsema asustuse järgu saab dateerida neoliitikumi lõppu, kui seal on paiknenud nõorkeraamika kultuuri asulakoht.