

ARCHAEOLOGICAL INVESTIGATIONS IN SAAREMAA: LIHULINN HILLFORT OF KÄRLA AND IRON SMELTING SITES IN THE TUIU AREA

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1. LIHULINN HILLFORT OF KÄRLA

Kärla Lihulinn is situated in Mustjala parish, Saaremaa Island, on the estate of the former Vesiku farm. The hillfort lies about 6 km to the south of Mustjala, the closest inhabited place. The Mustjala–Kuressaare highway runs about 2 km north-east from Lihulinn.

The hillfort was first mentioned as Leolinn (Lerchen-Stadt) in a parish register from the 2nd half of the 18th century. As Lihulinn it occurs on the map by Mellin (Vaas, 1924, p. 86).

Kärla Lihulinn (Fig. 1) is one of the largest ancient hillforts not only on Saaremaa but in the whole Estonia. The hillfort is an oval fortification stretching from north-west to south-east (about 270 m long and 170 m wide), surrounded by an almost ten-metre high wall of sand and granites. The western and eastern side walls are piled on natural sand dunes, whereas the base of the end walls consists of moraine. The total length of the walls is almost 500 m, and the area of the yard is nearly 2000 m². The surrounding wetlands and the Kalja stream, which evidently was much more abounding in water in the past, provided natural protection.

The archaeological excavations followed the geoarchaeological research, in the course of which samples had been taken to determine the phosphate content of the slightly sloping smooth ground in front of the northern end wall and of the plateau by the east side wall of the hillfort, where the natural layer was of various thickness.

With the aim of ascertaining the nature of the cultural layer and of getting a geological cross section, five boring cores were taken with a geological spiral drill from the above-mentioned parts of the fort and from the crest of the eastern wall. The wall was piled up of sand and stones on top of a natural sand dune. A compact layer of charcoal, 5 to 8 cm thick, occurs 160 cm down from the crest. The sand under the charcoal has acquired a red hue because of burning. Under the sand there is a layer resembling a cultural one as it contains charcoal particles. One more burnt layer is at a depth of 330 cm. It consists of burnt sand and charcoal only. The sand under this layer has burnt red to a depth of 2 to 5 cm. The mixed layer containing pieces of charcoal ends at a depth of 525 to 530 cm. Still deeper, within 10 to 15 cm, there are two thin layers of sandy soil. Next comes bright yellow sand of dunes.

The excavation site (12 × 4 m) is located on an oval plateau of 35 × 25 m, in front of the eastern wall of the hillfort, in the direction of north-east to south-west, perpendicular to the eastern wall. Numerous pits of different size cover the plateau. According to Vaas (1924), local people believed there were ancient cellars with gold statues of idols. Thus, the pits can be traces left by gold diggers. Everywhere on the plateau, there are plenty of granites of various size, mostly 20

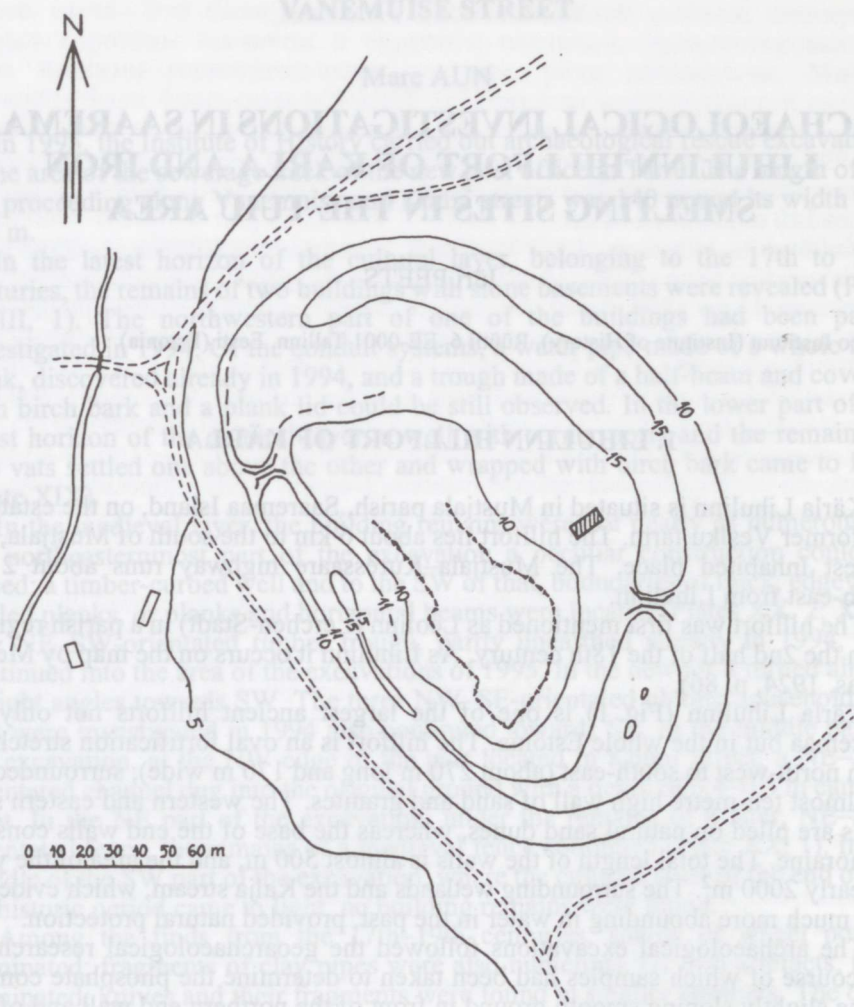


Fig. 1. Plan of the Lihulinn hillfort of Kärla.

to 30 cm in diameter. The geoarchaeological research revealed a cultural layer of an average thickness of 20 to 30 cm. In places, it is more than 1 m thick. The excavation layers were 10 cm each.

The first finds – fragments of clay vessels, a bronze plaque, a piece of flint, and fragments of knives – appeared immediately under the surface. After the removal of the sod, a pile of mostly burnt or sharp-edged granites was exposed in the northeastern part of the excavation. Between the stones, there was charred soil, but its amount was not big enough to suppose the stone debris could have been the remains of a stove. Stones could be found everywhere in the excavation. The majority of them were small, the larger ones had a diameter of 10 to 20 cm. In the second layer, another stone pile appeared in the southwestern end. The greater part of the excavation was covered by a 15–25 cm thick cultural layer, but there were also some 60–70 cm deep pits, containing gray coal and sand.

A sample for ^{14}C analysis was collected from the bottom of a pit in the centre of the excavation. In the southwestern end of the excavation, situated near the slope by the yard, the abundantly mixed layer with granite stones was over 150 cm thick. It gave the impression as if the slope had been made steeper. The excavated plateau could probably be an earlier phase of the hillfort. The view is supported by the fact that the whole plateau is elevated for a couple of metres in comparison to the surrounding ground.

In an attempt to date the crest of the wall, an embrasure ravaged by war games of young pioneers and members of the Young Communist League in the 1970s was cleaned up and a sample of charred softwood was taken for radiocarbon dating at a depth of 55 cm.

Despite the smallness of the excavation site, the finds were numerous (40 pieces) and varied (Plate XXIV, 1–5). The majority of them were hand-made pottery. Unfortunately, there were very few brim fragments to enable a more exact dating. There were no pieces of pottery with trellised ornament characteristic of the Late Viking Age and the earlier period of the Late Iron Age. A low bowl-like thin-walled vessel with a vertical neck and a fold (Plate XXIV, 4) can be dated to the 9th century. There are a couple of brim fragments of probably analogical vessels, but of these only the top brim has survived.

Among the most impressive metal objects are two very well preserved bronze penannular brooches (Plate XXIV, 1, 2) and an intact iron spur (Fig. 2). The brooches have faceted knobs. The knobs of one brooch are decorated with a circle and a dot in the centre (Plate XXIV, 2), the other has a square with dots inside its corners (Plate XXIV, 1). The diameter of the plano-convex hoop that imitates a wire coil is 44 mm in both cases. The fastening pins, the so-called shield-like pins (Carlsson, 1988, p. 42), are decorated with lines. According to the Gotland typology, the pins belong to the Fac:S/R*rak:c type and date from 1000 to 1150 AD. J. Selirand and A. Kustin date such pins to the 12th–13th centuries (Selirand, 1974, p. 159).

The iron spur (Fig. 2) has plano-convex branches with two-hole buckles for fastening the strap. The branches are on the same level. The 42 mm cone-shaped point of the spur has a circular profile with a 13 mm diameter at its widest, and its diameter at the fastening is 10 mm. In its centre there is a 1 mm deep and 1.5 mm wide groove. A spur of similar shape has been found in Sigstuna (St. 1386:e) and most likely dates from the 10th–12th centuries. In Russia, spurs of this type have been dated to the 11th and 12th centuries, in Central and Western Europe to 1050–1150 AD (Кирпичников, 1973, pp. 64–65).

Three knives (one intact, two fragments) represent the types that were in use during the period from the Viking Age to the end of the Late Iron Age.

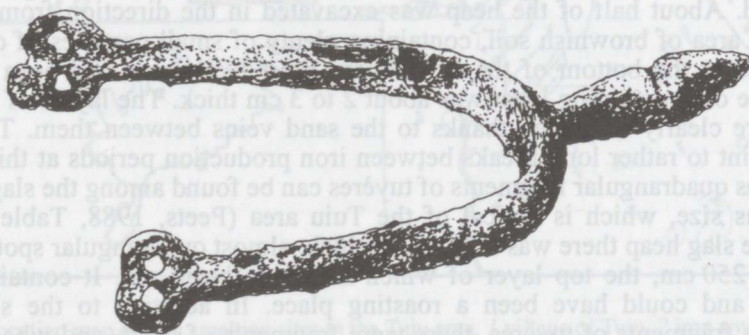


Fig. 2. Spur from the Lihulinn hillfort of Kärle.

Among the other finds one should mention a 34 mm long bronze wire spiral 3.5 mm in diameter (in Estonia, it occurs in the 11th century burials at the latest), a fragment of a bronze plaque, a blue bead, an iron rivet, and a 4 × 4 cm piece of sheet iron (Plate XXIV, 3) (a fragment of a plate armour (?)).

The charcoal samples collected from the excavation and the crest of the eastern wall of the hillfort were dated respectively to 1054 ± 43 and 1132 ± 32 BP (Table 1) by the Isotope Laboratory of the Institute of Geology.

Radiocarbon dates from Lihulinn

Lab. No.	Site	¹⁴ C years BP	Calibrated in calendar years	Calibr. ± stand. dev.
Tln-2025	Lihulinn, excavation site	1054 ± 43	988	905–1018
Tln-2035	Lihulinn, east wall	1132 ± 32	894–938	783–979

Radiometric research and the archaeological finds suggest that the hillfort was used from the 9th century until the 12th century. The limited dimensions of the excavation site and the scarcity of finds make it impossible to more precisely date or determine the probable stages of construction.

2. IRON SMELTING SITES IN THE TUIU AREA

The aim of the archaeological excavations was to specify the details of the ancient iron smelting process and to more precisely date the different parts of a large iron smelting area which was studied from 1993 till 1995 in the region of "Iron Slag Hills of Tuiu" and the Pelisoo mire (Peets, 1995a, b). In 1995 we examined four iron smelting sites (Fig. 3) situated on sand dunes marking the presumable coast line of the Ancylus Lake (Aaloe & Kustin, 1966, p. 162) west of Lake Järise and the Pelisoo mire.

The iron smelting site b₃ lies 400 m to the south of the culvert that covers the Paka Brook on a forest road from Võhma to Pelisoo. There are two smithing slag heaps in this area (Fig. 3, 2). One of them was already examined in 1994 (Peets, 1995b, p. 470). In 1995 a partially explored slag heap 5 m in diameter was examined. About half of the heap was excavated in the direction from east to west. An area of brownish soil, containing plenty of small particles of ore, was uncovered at the bottom of the excavation; most likely, ore had been roasted there. The ore-containing layer was about 2 to 3 cm thick. The layers of the slag heap were clearly displayed thanks to the sand veins between them. This fact might point to rather long breaks between iron production periods at this place. Numerous quadrangular fragments of tuyères can be found among the slag pieces of various size, which is typical of the Tuiu area (Peets, 1988, Table XXX). Under the slag heap there was a 2 to 4 cm thick, almost quadrangular spot of clay of 230 × 250 cm, the top layer of which had been burnt red. It contained ore particles and could have been a roasting place. In addition to the slag and numerous fragments of tuyères, there were fragments of hand- and wheel-made clay vessels (Plate XXIV, 6), a broken fire iron, a nail, and some iron blooms. Earlier, we had found a leg of a three-legged cooking utensil in the same slag heap (Plate XXIV, 7).

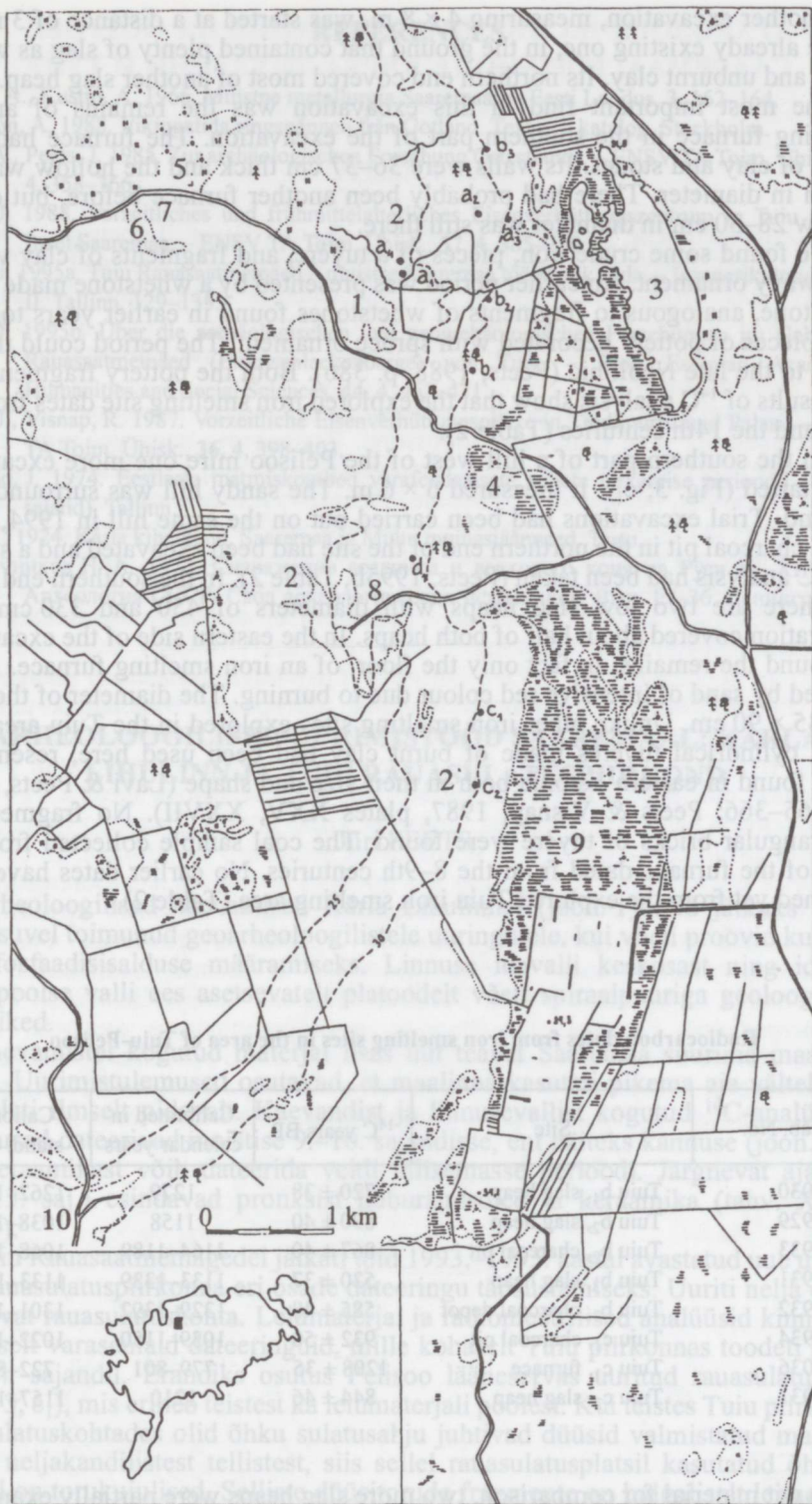


Fig. 3. Location map of iron smelting sites in the Tuui area. 1 village of Tuui, 2 iron smelting sites, 3 Lake Järise, 4 Jõhvikasoo mire, 5 village of Paatsa, 6 stronghold of Paatsa, 7 smithy from the 11th-14th centuries at Paatsa, 8 village of Kirumaa, 9 Pelisoo mire, 10 village of Ohtja; a₁-a₄, b₁-b₃ iron smelting sites investigated in 1986-94; c₁, c₂, d₁ iron smelting sites investigated in 1995.

Another excavation, measuring 4×8 m, was started at a distance of 3 m east of the already existing one, in the ground that contained plenty of slag as well as burnt and unburnt clay. Its northern end covered most of another slag heap.

The most important find in this excavation was the remains of an iron smelting furnace in the southern part of the excavation. The furnace had been made of clay and stones. Its walls were 36–37 cm thick and the hollow was 30–35 cm in diameter. There had probably been another furnace before, but only a hollow 28–30 cm in diameter was still there.

We found some crude iron, pieces of a tuyère, and fragments of clay vessels with wavy ornament. An earlier period was presented by a whetstone made of red sandstone, analogous to fragments of whetstones found in earlier years together with pieces of pottery decorated with spruce ornament. The period could thus be dated to the late Neolithic (Peets, 1988, p. 386). Both the pottery fragments and the results of ^{14}C analysis show that the explored iron smelting site dates from the 13th and the 14th centuries (Table 2).

On the southern part of a hill west of the Pelisoo mire one more excavation was started (Fig. 3, c_1). It measured 6×6 m. The sandy hill was surrounded by wetland. Trial excavations had been carried out on the same hill in 1994, when half a charcoal pit in the northern end of the site had been excavated and a sample for ^{14}C analysis had been taken (Peets, 1995b, Table 2). In the southern end of the hill there are two low slag heaps with diameters of 450 and 330 cm. The excavation covered about half of both heaps. In the eastern side of the excavation we found the remains, in fact only the floor, of an iron smelting furnace. It was marked by sand of intensive red colour due to burning. The diameter of the floor was 85×90 cm. Unlike other iron smelting sites explored in the Tuiu area until 1995, cylindrical tuyères made of burnt clay had been used here, resembling those found in eastern Estonia both in their size and shape (Lavi & Peets, 1985, pp. 365–366; Peets & Visnap, 1987, plates XXV, XXVII). No fragments of quadrangular bricks of tuyère were found. The coal sample collected from the floor of the furnace dated from the 8–9th centuries. No earlier dates have been obtained yet from the explored Tuiu iron smelting area (Table 2).

Table 2

Radiocarbon dates from iron smelting sites in the area of Tuiu-Pelisoo

Lab. No.	Site	^{14}C years BP	Calibrated in calendar years	Calibr. \pm stand. dev.
Tln-1930	Tuiu b_1 , slag heap	720 ± 38	1279	1262–1283
Tln-1929	Tuiu b_2 , slag heap	890 ± 40	1158	1038–1210
Tln-1933	Tuiu b_2 , charcoal pit	867 ± 40	1164–1189	1068–1219
Tln-1931	Tuiu b_3 , slag heap	520 ± 37	1133–1339	1133–1429
Tln-1932	Tuiu b_3 , charcoal depot	585 ± 48	1329–1392	1301–1411
Tln-1934	Tuiu c_1 , charcoal pit	932 ± 50	1039–1150	1022–1161
Tln-2036	Tuiu c_1 , furnace	1208 ± 35	779–801	722–875
Tln-2031	Tuiu c_2 , slag heap	844 ± 46	1210	1157–1257

To get material for comparison, two more slag heaps were partially examined. One of them (Fig. 3, c_2) lay 350 m south of the hill (c_1) and the other (Fig. 3, d_1) 1780 m north of the hill. The finds (slag and quadrangular fragments of tuyère) were analogous to others of the kind found in the Tuiu iron smelting area. The charcoal sample from the iron smelting site c_2 dated from the 11th to 12th centuries (Table 2).

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ARHEOLOOGILISED UURIMISTÖÖD SAAREMAAL: KÄRLA LIHULINN JA TUIU RAUASULATUSPIIRKOND

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Arheoloogilised kaevamised Kärla Lihulinnal (joon. 1) olid jätkuks 1992. aasta suvel toimunud geoarheoloogilistele uuringutele, kui võeti proovid kultuurikihi fosfaadisisalduse määramiseks. Linnuse idavalli keskosast ning ida- ja põhjapoolse valli ees asetsevatelt platoodelt võeti spiraalpuuriga geoloogilised läbilõiked.

Kaevamistel kogutud materjal lisas uut teavet Saaremaa suurima maalinna kohta. Uurimistulemused osutavad, et maalinna kasutati pikema aja vältel ning seal elati ilmselt pidevalt. Kaevandist ja linnusevallist kogutud ¹⁴C-analüüside tulemused dateerivad muistise 9.–10. sajandisse, ent näiteks kannuse (joon. 2) ja osa keraamikast võib dateerida veidi hilisemasse perioodi. Järgnevat ajajärku (11.–13. saj.) esindavad pronksist hoburaudsõled ja keraamika (tahv. XXIV, 1, 2, 4).

Tuuu Rauasaatmemägedel jätkati töid 1993.–1995. aastal avastatud uue ulatusliku rauasulatuspiirkonna eri osade dateeringu täpsustamiseks. Uuriti nelja eraldi asetsevat rauasulatuskohta. Leiumaterjal ja radiomeetriselised analüüsid kinnitasid põhiliselt varasemaid dateeringuid, mille kohaselt Tuuu piirkonnas toodeti rauda 11.–14. sajandil. Erandiks osutus Pelisoo lääneservas uuritud rauasulatuskoht (joon. 3, c₁), mis erineb teistest ka leiumaterjali poolest. Kui teistes Tuuu piirkonna rauasulatuskohtades olid õhku sulatusahju juhtivad düüsid valmistatud massiivsetest neljakandilistest tellistest, siis sellel rauasulatusplatsil kasutatud õhutusdüüsid on torukujulised. Selliste düüsitõrude fragmente on hulgaliselt leitud Ida- ja Kirde-Eestis uuritud rauasulatuskohtadelt. Radiomeetriselise analüüsi põhjal kuulub rauasulatuskoht 8.–9. sajandisse. See aeg langeb kokku Jõhvikasoost võetud suiraproovides ilmneva järsu söeosakeste kasvu algusega. Kõigist kaevanditest koguti sütt ka dendroloogiliseks analüüsiks.

АРХЕОЛОГИЧЕСКИЕ ИССЛЕДОВАНИЯ НА ОСТРОВЕ СААРЕМАА: ГОРОДИЩЕ КЯРЛА ЛИХУЛИНН И ТУЙУ РАУАСААТМЕМЯЕД

Юри ПЕЭТС

Археологические раскопки в 1995 г. на городище Лихулинн в Кярла (рис. 1) были продолжением геоархеологических исследований 1992 г., в ходе которых были взяты пробы для определения содержания фосфатов в культурном слое. В центральной части восточного вала, а также на площадке перед северным валом получены с помощью спирального бура геологические разрезы.

Собранный в ходе раскопок материал существенно дополняет данные о крупнейшем на о-ве Сааремаа городище. Результаты исследований свидетельствуют, что городище функционировало в течение длительного времени и было заселено, вероятно, постоянно. Радиоуглеродный анализ образцов из раскопа и вала городища датирует его 9–10 вв. Часть находок датируется несколько более поздним временем (11–13 вв.), например, шпора (рис. 2), бронзовые подковообразные фибулы и керамика (табл. XXIV, 1, 2, 4). Ранее раскопки на городище не проводились, поэтому археологически датированный материал получен только теперь.

В ходе исследований 1993–1995 гг. в Туйу Рауасаатмемяед (Шлаковые горы) продолжены работы по уточнению датировок отдельных районов древней плавки железа. Обследовано четыре отдельно расположенных пункта. Вещевой материал и радиоуглеродные анализы подтвердили ранние датировки, согласно которым производство железа велось здесь в 11–14 вв. Исключением является пункт на западном краю болота Пелисоо (рис. 3, с₁), который отличается от других и составом вещевого материала. В отличие от других мест плавки железа, где для доступа воздуха в железоплавильную печь использовались массивные четырехугольные дюзовые трубки, там применялись цилиндрические дюзовые трубки с тонкими стенками. Фрагменты аналогичных трубок известны с железоплавильных мест Восточной и Северо-Восточной Эстонии, а также Северо-Западной России и Центральной Европы. По данным радиоуглеродного анализа, место плавки железа в Пелисоо датируется 8–9 вв., т.е. по времени соответствует повышенному содержанию угольной пыли в отложениях болота Йыхвика-соо. В раскопах отобраны также образцы для дендрологического анализа.