



# The 1710 plague burial ground on the outskirts of Tallinn

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## INTRODUCTION

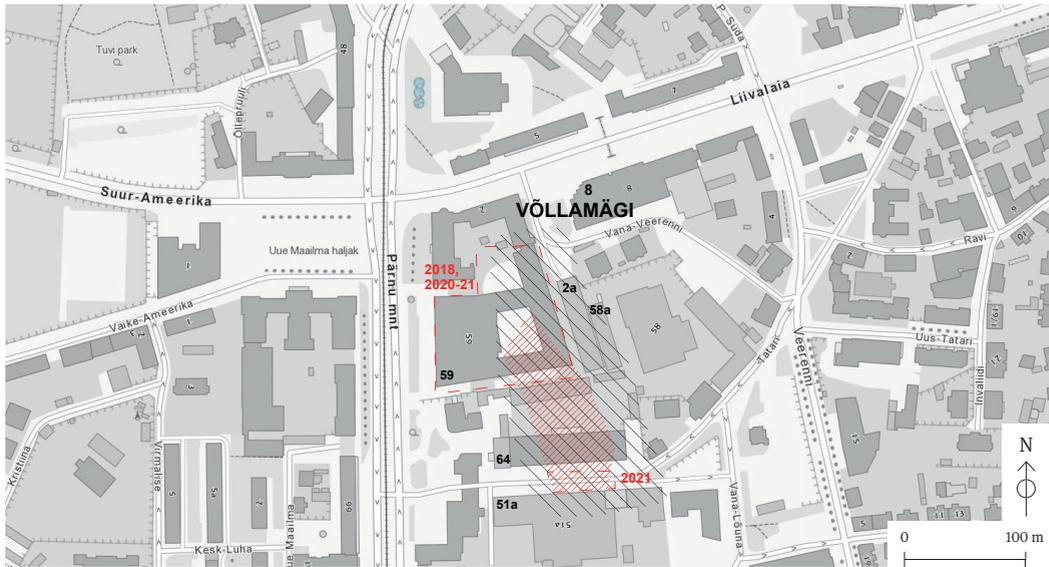
In 2017, preliminary excavations took place in Tallinn on the plot of Pärnu Rd 59 as part of the preparatory works for the construction of Tallinn School of Music and Ballet (MUBA) during which *in situ* burials and commingled human skeletal remains were discovered (Reppo & Toos 2018; Fig. 1). During the rescue excavations carried out in 2018 (Malve & Juus 2019) and in 2020 (Malve 2022) 98 skeletons were unearthed from the southern and eastern part of the plot. In 2021 it was discovered that the burial site extends further south to Tatari street, where 11 partially preserved inhumation burials were found during the reconstruction of the heating supply network (Malve & Reppo in prep.; Fig. 1). The burial site also extends even to the northern edge of the former Luther Quarter (Tatari St. 51a) where commingled human remains were found from test pits (Vedru 2022) and nine *in situ* burials were unearthed.<sup>1</sup> The graves were situated irregularly over a large area and most of the deceased had been interred in multiple burials in a very short time period. Numerous artefacts dating from the second half of the 17th and early 18th century were found by the burials. The skeletons also had no signs of battle-related nor execution traumas and had likely passed away due to famine or an epidemic, e.g. plague. The latter seems the most probable explanation, as in the early modern period, Tallinn suffered multiple devastating plague outbreaks.

## BURIAL GROUND

The burial site was located outside the city walls, on the edge of Tõnismäe suburb and on the sand dunes situated east of the Pärnu road (Fig. 1). A natural north-south ridge was used as a cemetery ground. So far human remains and graves have been discovered from an area of approximately 15.000 m<sup>2</sup>. There are only a few earlier notes about the studied burial site: the mass graves of the 1710 plague victims are known to have been located in Liivamäed (Eng. *Sand hills*; Laane 2002, 34<sup>2</sup>), which is likely a larger area with sand dunes extending from the corner of Liivalaia street and Pärnu road to Lake Ülemiste. Locals know of human bones being discovered already in the mid-1950s when utility trenches were dug on Tatari street and human remains were found during the construction works at Tatari St. 64 in the early 1970s (Malve & Juus 2019, 3). It is hard to establish the exact size of the burial ground, as the area is densely covered with buildings. There are certainly undisturbed graves in the eastern part of the street in front of Tatari St. 64, as well as underneath the yard and the warehouses situated

<sup>1</sup> The fieldwork was still in progress during writing the paper. Archaeologist Gurlu Vedru, pers. comm., October 2022.

<sup>2</sup> The location has erroneously been marked as Kadrioru German Gymnasium where an Orthodox cemetery was located instead.



**Fig. 1.** Map of the plague cemetery: the central area of the graveyard (hatched in red), probable burial area (hatched in black), and areas investigated.

**Jn 1.** Katkukalmistu plaan: kalmistu tuumikala (punane viirutus) ja võimalik matmisala (must viirutus) ja uuritud alad. Drawing / Joonis: Monika Reppo

there. Beyond the currently studied area, some *in situ* burials and commingled skeletal remains may lie under the parking house at Liivalaia St. 2a and the adjacent plot, Tatari St. 58. Based on current research results, the central area of the graveyard is situated between the northern part of Pärnu Rd 59 and Tatari street.

The original ground level of the burial site was not preserved. To a large extent, the burial area has been dug up repeatedly during later construction work on the site and disturbed by garbage pits and other earthworks (Reppo *et al.* 2021). Less than half of the burials were fully or nearly fully preserved. The shallowest graves lay around 1.1 m below modern-day ground level. The deceased had been interred in a single layer and the graves were situated irregularly on a larger area. The graveyard was not organised, the graves were located individually or as smaller clusters. This layout is due to the constant and continuous burying of plague victims on-site. The individuals brought to the burial site together or at the same time probably ended up being buried side-by-side and/or in the same grave. Most of the deceased were buried with care, but there were also some cases when individuals had been thrown in the graves haphazardly and in a rush.

Generally, a typical grave contained the remains of two or up to seven individuals, so the number of double and mass burials was exceptionally high. There were 31 individual burials<sup>3</sup>, a remarkable amount of 16 double burials, 8 triple burials and 6 mass graves.<sup>4</sup> The deceased were both male and female, of varying ages, including non-adults. The mass graves contained the remains of 29 individuals. There was no regularity with the mass graves – from four up to seven individuals had been interred together (Fig. 2). A few of the deceased had been buried in a prone position, it is possible that the body had been placed in the grave in a

<sup>3</sup> The location of one of the graves discovered in 2018 is unknown (burial no. 24) as the bones were collected from the cut and fill of a later garbage pit.

<sup>4</sup> All the burials with four or more deceased are regarded as mass burials in this article.

hurry and haphazardly or aiming to fit more bodies in one grave. Some of the burials in the mass graves had been interred in coffins. In several of the mass graves, the first, lower layer of individuals were interred in coffins whereas the individuals in the subsequent layer had been thrown on top of the lower layer of coffin burials without coffins (Fig. 3).

Almost all the deceased had been buried in an extended supine position. Three individuals were laid to rest flexed and three individuals were in a prone position. Overall, a large part of the burials (92) were more or less northeast-southwest-oriented, a smaller number (10) were southeast-northwest-oriented. Eight burials (12 individuals) were unusual as although they were east-west-oriented, the heads were placed towards the east and the feet towards the west. In one of the mass graves, all the deceased were buried in opposite directions. In total, 65 burials were interred in coffins, possibly all in plank coffins. Coffin burials are indicated by the presence of coffin wood remains from 51 burials and iron coffin nails from 52 burials. Most of the individual burials (23) were laid to rest in coffins. In two cases, a non-adult had been placed in the same coffin on the legs of an adult. In four of the double burials, only one of the deceased was interred in a coffin. There were also six double burials where both the deceased had been buried in coffins and four where neither of the burials had a coffin. The position of the hands was possible to determine in 48 skeletons – the hands had mostly been placed on the body. In multiple cases, the arms were in an abnormal position, e.g. with one arm by the head. Such position of the arms may be the result of a hurried burial (e.g. throwing the deceased in the grave).

## HUMAN REMAINS

The Tallinn plague cemetery was only used for a very limited period of time, which makes it an exceptional source of information in the study of individuals who were probably the strongest part of the population, but were still killed rapidly by the plague. The skeletons belonged to people who lived in the end of 17th century and early 18th century, representing both the citizens of Tallinn and its suburban population, peasant migrants from the hinterlands, as well as Russian and Swedish garrison soldiers. Moreover, the remains provide further details about the lifestyles and habits of the individuals.



**Fig. 2.** The largest mass grave containing seven adult individuals from Pärnu Rd 59.

**Jn 2.** Suurim, seitsme täiskasvanuga ühishaud Pärnu mnt 59 krundil.

Photo / Foto: Martin Malve



**Fig. 3.** The body of a deceased young adult female (without a coffin) had been thrown on top of a mass grave with four adults who were interred in coffins.

**Jn 3.** Noore täiskasvanud naise surnukeha (kirstuta) oli visatud nelja (kirstudes) ülejäänud täiskasvanu peale, kes olid samasse ühishauda maetud.

Photo / Foto: Martin Malve

The rescue excavations on the plague cemetery lasted for three seasons during which 118 inhumation burials were unearthed – 89 in 2018 (Malve *et al.* 2019a), 9<sup>5</sup> in 2020 (Malve 2022), 11 in 2021 (Malve & Reppo in prep.) and 9 in 2022.<sup>6</sup> In addition, large amounts of commingled remains were found. Out of 117 individuals 38 were adult males (32.5%), 49 were adult females (41.9%), six were probable females (5.1%) and 20 (17.1%) were non-adults. In four cases it was impossible to determine the sex of an adult skeleton. Adult remains made up the majority of the material, which is uncommon for a regular medieval and early modern period cemetery, where the proportion of non-adult burials is usually remarkable. It reached 45% in Kose churchyard in north Estonia (Malve 2018, 4) and 46.3% in Siksälä rural cemetery in south Estonia (Malve 2014, 309), while in the case of the 14th-century Black Death cemetery in Otepää<sup>7</sup> in south Estonia, the number of adult and non-adult burials was quite equal, 48.9% and 51.1% respectively. Similar to the latter site, the osteological material of the plague cemetery discovered in Tallinn was almost completely devoid of infant burials (age 0–1 year). Among the remains from 117 individuals, only one very poorly preserved skeleton of a fetus or neonate was discovered. This was unexpected, as the largest number of deaths normally occurs at or below the age of one year (Waldron 2007, 36). The reason may be poor preservation conditions (sandy soil does not favour the preservation of bones) or the absence of infant burials in this part of the site.

The age group of 1–5-year-old children was underrepresented in the burial site as well. Again, this differs greatly from other churchyards and cemeteries from the same period. A similar age distribution could be seen with a plague and famine burial site from 1601 to 1603 found in Ravi St. 6 in Tallinn. There, children under one year of age were absent in common burials, and the number of children between 1–5 years of age was exceptionally small (1.7%; Heapost 2009). Compared to other medieval and early modern burial sites, for example Kose and Tartu St Jacob's cemeteries, the majority of the deceased children were between the ages 1 and 7. At the Tallinn plague cemetery, most of the non-adults died during adolescence. The same tendency is also observable in Ravi St. 6, where 17.2% of the burials belonged to adolescents (Heapost 2009).<sup>8</sup> For comparison, only 0.8% of Kose cemetery's and 2.3% of St Jacob's cemetery's (Liblik 2017, 20) osteological material were adolescents. The higher number of burials in this age category is possibly due to an epidemic (the plague), as these individuals had previously successfully survived the high infant mortality rate. The age and sex distribution of burials found from Tallinn serves as a prime example that nobody was safe from the plague, even if the distribution differs from one cemetery to another.

The high prevalence of female burials (47%<sup>9</sup> out of all burials and 56.7% of adult burials) was surprising as such a large percentage of female skeletons has not been observed in any other Estonian cemetery material that has been osteologically analysed. It is possible that women were more prone to the disease outbreak than men, or that there were simply more of them in the studied area than in the rest of the unexcavated burial site. In Otepää medieval cemetery, the female-to-male ratio was almost equal, with 23 females (25%) and 20 males (21.7%), in the Ravi St. 6 famine and plague burial ground the percentages were 26.5% and

<sup>5</sup> Although nine skeletons were found in 2020, eight have been analysed here. The World War II burial has been omitted from the article, because it is not contemporaneous with the other burials.

<sup>6</sup> Preliminary osteological analysis of the skeletons was carried out for the present paper.

<sup>7</sup> Unpublished osteological analysis by Martin Malve.

<sup>8</sup> Adolescent groups from different research used in the comparison: 15–19 years (Ravi St. 6 burial ground), 15–18 years (Kose churchyard) and 12–17 years (Otepää borough cemetery) at death. Adolescent groups vary, but in the present article they are viewed as a group despite their differences.

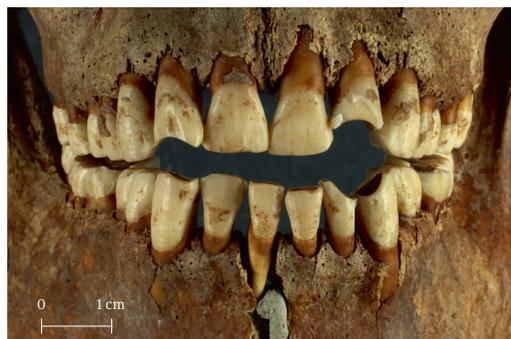
<sup>9</sup> Combining probable and definite sex determination.

25.6% respectively. Similar male-to-female ratios have also been observed in other medieval and early modern regular cemeteries, but also in burial sites related to epidemics or famine. The corresponding numbers in Kose cemetery were 25.8% and 22.5% respectively, and in Tartu St Jacob's cemetery 22.5% and 23.4%, whereas in the possible mass graves of soldiers found under the Triumph bastion in Narva, who also probably succumbed to an epidemic outbreak, male burials were dominant (60.6%) with considerably fewer females – 11.5% of the adults and 22.1% of the non-adults (Ööbik *et al.* 2015).

Pooled data for all adults indicated that the deceased were mainly young adults with the greatest percentage of individuals dying at the age between 17 and 25 years, followed by the 26 to 35 years age group. The lowest death rates were between the ages 36 and 45 years and over 46 years at death. On the contrary, the Otepää plague cemetery had the highest mortality among individuals over 46 years, followed by those who died between 26 and 35 years of age. This could be due to a high number of older individuals in the population in general, but it cannot be ruled out that the excavations at the Tallinn plague burial ground simply did not include the section where older people were buried in greater numbers. Similarly to the plague cemetery of 1710, young adults also dominated the mass grave of those who died at the beginning of the 17th century discovered at Ravi St. 6. Such a high mortality rate among young adults is characteristic of plague cemeteries, as the infection did not only affect the frail and children, but also people in full vigour. The high prevalence of deaths among adolescents and young adults is characteristic to a catastrophic mortality profile in which case more young people died (Gowland & Chamberlain 2005).

Analysis of the skeletal remains of the individuals buried at the plague cemetery of 1710 also provided some interesting insights into the habits and lifestyles of the garrison and town population. Irregular wear of the front teeth due to long-term pipe smoking was observed on 27 skeletons (Fig. 4). Teeth had been preserved on 74 adults in total and less than half (36.5%) of them had been smokers during their lifetime. There were 17 males and 10 females among the pipe smokers and all of them were adults aged between 17 and 50 years. Ten individuals had worn teeth only on the left side of the jaw and for six individuals wear was visible only on the right teeth. Thirteen individuals had more than one pit from pipe smoking, in 10 cases it was visible on both sides of the mouth, and in two instances two pits were visible only on the left side of the mouth. The custom of pipe smoking came to Estonia with Swedish soldiers at the beginning of the 17th century and became widespread in the second half of the century (Pallo & Russow 2008, 9).

One of the skeletons of an adult man found in the largest mass grave probably belonged to a soldier, as was indicated by five healed injuries found on his skull (Fig. 5). Four of the injuries were sharp force traumas and one a blunt force trauma. The individual had two wounds on the lateral part of the left parietal bone (62.48 mm; 33.83 mm) and one in the vault of the skull, near the junction of the coronal and sagittal sutures (15.43 mm). A wound (34.11 mm) was also



**Fig. 4.** Teeth with wear characteristic of habitual pipe smoking.

**Jn 4.** Pikaajalisele piibusuitsetamisele omase kulumusega hambad.

Photo / Foto: Janika Viljat



**Fig. 5.** An adult male had two healed sharp force traumas on the left parietal bone of the cranium.

**Jn 5.** Täiskasvanud mehel oli kaks paranenud terariista vigastust kolju vasakul kiiruluul.

Photo / Foto: Janika Viljat

Numerous dental pathologies (e.g. dental calculus and caries), degenerative diseases (e.g. osteoarthritis of the limb joints and spondylosis of the spine) and few cases of healed traumas (e.g. healed fractures of the long bones and ribs) were detected on the skeletons as well. Overall, the pathologies found are characteristic of the osteological material of early modern burial sites.



**Fig. 6.** Finds from the Russian soldier: 1 – Eastern Orthodox cross pendant, 2 – band ring, 3 – thimble.

**Jn 6.** Vene sõduri juurest leitud esemed: 1 – õigeusu kaelarist, 2 – lahtiste otstega vitssõrmus, 3 – sõrmkübar.

(AI 8336: 1767, 1768, 1769.)

Photo / Foto: Triinu Borga

found on the cranial roof of the right parietal bone. In addition to these listed sharp force traumas, there was one blunt force injury on the left parietal bone (28.66 × 24.94 mm). All the cuts were superficial, the blade had not penetrated the inferior part of the skull. The wounds were straight, suggesting they were inflicted with a fine blade (e.g. sword). All injuries were well-healed as the edges of the wounds were rounded. Additionally, another possible injury was found from the mastoid process of the right temporal bone. All the traumas found most likely reflect that the man was a soldier. Therefore, the injuries mentioned were probably received during a fight, but the individual had survived them all, as indicated by their state of healing.

## THE FINDS

In terms of Estonian early post-medieval cemeteries, a rather numerous and varied array of finds was collected – approximately 500 objects.<sup>10</sup> The Estonian contexts in which early post-medieval weapons, ammunition and other military equipment are found generally do not allow accurate dating or positive identification of which military the items belonged to. This makes the plague burial ground graves of the Swedish and Russian soldiers who died of the plague in 1710 vital sources of information.<sup>11</sup> Likewise, the finds from the other graves are noteworthy because of the precise dating.

The richest individual early post-medieval military burial in Estonia was discovered here; it belonged to an 18–22-year-old male. The copper alloy Eastern Orthodox cross pendant (Fig. 6: 1) on the right side

<sup>10</sup> Pärnu Rd 59 finds of 2018 (AI 8011), finds of 2020 (AI 8336) and Tatari St. 64 finds (AI 8539).

<sup>11</sup> The article focuses only on the finds of the warrior's grave found in 2020 (burial no. 9) and the objects recovered from the burials unearthed in 2018.

of the neck shows that he was probably a Russian soldier. The man wore a band ring on his right ring finger (Fig. 6: 2), thimble (Fig. 6: 3) near the right hip and a sword had been placed on his legs. The sword (Fig. 7), a rapier by type, was so poorly preserved it was impossible to determine the place of origin. A textile pouch with a small iron buckle was placed by and under the head of the deceased. The same pouch contained two rows of 20 cast lead musket balls (Fig. 8: 3), five musket flints (Fig. 8: 2), a thimble and fragments of a gunpowder horn with an iron dispenser (Fig. 8: 1). The musket balls from the pouch were ca. 15 mm in diameter and had uncut casting sprues.



**Fig. 7.** Partly excavated grave of the Russian garrison soldier, diagonally on the legs a rapier is visible.

**Jn 7.** Vene sõduri haud osaliselt lahti puhastatuna, jalgade peal on näha diagonaalis surnu peale asetatud rapiir.

(AI 8336: 1820.)

Photo / Foto: Martin Malve

21 copper alloy buttons with remnants of tanned leather and woolen fabric were discovered on and by the sides of the skeleton. The buttons from the burial are domed coat buttons with loops.

In addition to the graves of the Russian soldiers, the grave goods from the other burials at Pärnu Rd 59b are of interest. In total, 34 Swedish coins were found from the graves, mostly 1/6 öre copper coins from the reigns of Charles XI and XII. The newest, a 5-öre silver coin from



**Fig. 8.** Finds from the pouch from the Russian soldier grave: 1 – fragments of a gunpowder horn with an iron dispenser, 2 – five musket flints, 3 – 20 cast lead musket balls with casting sprues.

**Jn 8.** Vene sõduri hauast avastatud koti sisu: 1 – rauast dosaatoriga püssirohusarv, 2 – viis püssiluku tulekivi, 3 – 20 pliiist valujäägiga püssikuuli.

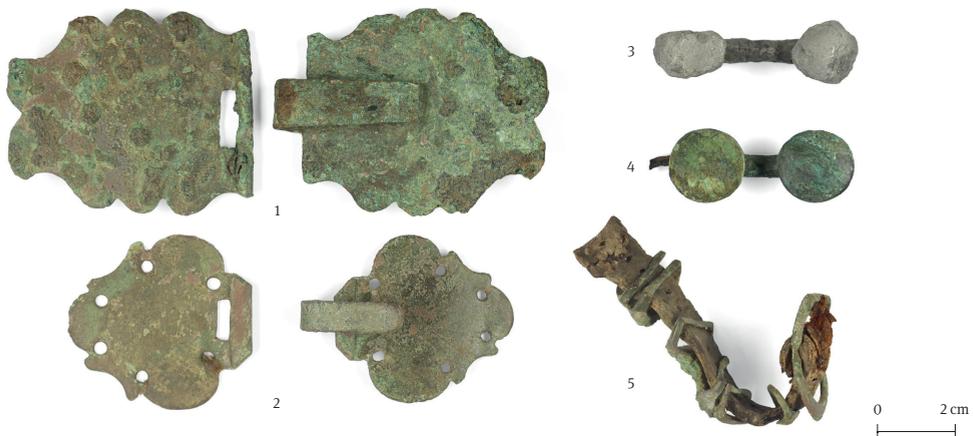
(AI 8336: 1776, 1770–1774, 1777–1796.)

Photo / Foto: Triinu Borga

1710 was found by burial no. 73. Ten Swedish silver coins were recovered from that burial in total – six 5-öre coins from 1693–1710 and two 1-mark coins from 1686 and 1701. The coins buried with the individuals indicate that these were the graves of the victims of the plague of 1710.

Copper alloy hook and eye fastenings were found by male burial no. 71 alongside a simple annular brooch and six copper alloy coat buttons with loops (Fig. 9: 1). Similar hooks were also discovered by burial no. 69 (Fig. 9: 2). In Estonia, such clothing fasteners have not been found in burials before. These hook and eye fasteners were in widespread use in the 17th and 18th centuries to fasten cloaks. A copper alloy clothing hook (Fig. 9: 3) with adhering textile and leather strip fragments was found by burial no. 19. Although not a unique find in Estonian graveyards and as chance finds, only at the graveyard under study their location in the grave has been ascertained. As these were placed at the anterior side of the sacrum, we can identify these items as trouser fastenings. A similar object but with a tin or lead alloy hook was found by burial no. 11 (Fig. 9: 4). Around the proximal part of the tibiae of burial no. 57, the fragments of two leather straps with a copper alloy buckle and 35 belt loops (Fig. 9: 5) were found. This find indicates that at the beginning of the 18th century they were used on footwear.

A glass pendant earring was found by the skull of burial no. 73 (Fig. 10: 1). The discovery of bead necklaces in multiple graves and a decorated pendant (Fig. 10: 2) by the right side of the neck in burial no. 16 are important additions in the study of early 18th century beads (Fig. 10). The ornament has no known analogues in Estonian archaeology. Decagonal yellow glass beads were found by burials nos 33 and 53 (Fig. 10: 3, 10). 29 spherical transparent colourless glass beads (Fig. 10: 4, 5) were found around the neck in burials nos 12 and 53. White, blue or black opaque and colourless, light blue or yellow transparent spherical glass beads are the most common types of glass beads of the Estonian early post-medieval period. By burial no. 53, a spherical glass bead with wavy lattimo trails was discovered (Fig. 10: 7). Only a few are



**Fig. 9.** Dress accessories: 1–2 – copper alloy hook and eye fastenings for a cloak, 3–4 – trouser fastenings, 5 – leather straps with a copper alloy buckle and belt loops.

**Jn 9.** Riide kinnitused: 1–2 – vasesulamist keebi rõivahaagid, 3–4 – püksihaagid, 5 – nahkrihma katke vasesulamist pandla ja vöösirkadega.

(AI 8011: 152, 154a, 131–132, 41, 23, 111a–b.)

Photo / Foto: Triinu Borga



**Fig. 10.** Selection of ornaments. 1 – a copper alloy ring and a glass pendant earring, 2 – a pendant decorated with glass pieces, 3–10 – beads found from the graves. 3 – burial no. 33, 4 – burial no. 12, 5–10 – burial no. 53, 11 – burial no. 14, 12–15 – burial no. 23, 16 – burial no. 4.

**Jn 10.** Valik ehteid. 1 – vasesulamist rõngast ja klaasist ripatsist koosnev kõrvarõngas, 2 – klaasitükkidega kaunistatud ripats, 3–10 – matustest saadud helmed. 3 – matus 33, 4 – matus 12, 5–10 – matus 53, 11 – matus 14, 12–15 – matus 23, 16 – matus 4.

(AI 8011: 165a, 39, 58, 28, 91, 92, 93, 94a, 94b, 94c, 33a, 46a, 46b, 46c, 45, 6.)

Photo / Foto: Triinu Borga, Martin Malve

known from Estonia. 11 olive-shaped glass beads (Fig. 10: 11) were found around the neck of burial no. 14; a single olive-shaped bead (Fig. 10: 9) was found by burial no. 53. Olive-shaped glass beads have been recovered from a quarter of a hundred sites from all over Estonia. The 16 spiky opaque white (Fig. 10: 12) and four blue faceted Biser-type beads (Fig. 10: 13) from burial no. 23 are unique in Estonian archaeology. Opaque yellow and transparent green Biser-type beads are mostly known from the early post-medieval period. Two spherical faceted jet beads (Fig. 10: 16) were found by the neck area of burial no. 4. Jet beads have been recovered from slightly over a quarter of a hundred sites in Estonia. Twelve small spherical amber beads (Fig. 10: 15) were found by burial no. 23 with the Biser-type beads mentioned above. Only a few amber beads have been found in the 17th and 18th century contexts from Estonia.

An object of note is also a Dutch clay pipe from burial no. 40, which had tooth marks at the end of the stem. A Dutch clay pipe was also found with burials no. 2 and 28.

## DISCUSSION

The plague cemetery described here is one of the biggest burial sites of the 1710 plague epidemic discovered and studied both archaeologically and osteologically in Estonia to date. There are some other burials that can be associated with the same period such as those found at Lehmja-Pildiküla (Kriiska 1991). Additionally, the artefacts found in two mass graves at Tallinn St Barbara cemetery (around 70 individuals in total; Sokolovski *et al.* 1996, 60) and in three mass burials at Tallinn St John's cemetery (around 124 individuals in total; Sokolovski 2001; 2002) point to the same epidemiological event. The identification of victims of the 1710–1712 plague epidemic has been possible only in one case: the burials of a family of four found in Peanse village, Lääne County (Mandel *et al.* 2016, 128–130). In recent years, multiple mass graves have been discovered from town and rural churchyards (Malve *et al.* 2018), but due to indefinite dating they are hard to connect with particular demographic events. In regards to earlier plague outbreaks, the 14th century Black Death cemetery at Otepää has been archaeologically thoroughly studied (Malve & Valk 2021). Rescue excavations have also revealed the mass graves of the victims of the early 17th century plague epidemic and famine at Ravi street (Sokolovski 2009) and St Barbara cemetery in Tallinn (Sokolovski *et al.* 1996, 60).

The territory of Estonia was ravaged for nearly a decade by the Great Northern War (1700–1710) and the deadly plague of 1710–1711. The plague reached Tallinn in August 1710 and the outbreak lasted until December. In seven weeks, the town population dropped to 2,000 (Kröönström & Pölsam-Jürjo 2019, 272), whereas before the plague outbreak the population of Tallinn is estimated to have been between 10,000 and 11,000 people (Palli 1996, 75). Around 3,500 of the 4,000 Swedish garrison soldiers and roughly 8,000–10,000 people in the town and suburbs (Pullat 1990, 18; Palli 1996, 74), or even 15,000–20,000 people when including people who moved from the countryside to the town during the outbreak died in the epidemic. People who lived in close quarters – the war refugees from the hinterlands, the homeless and the garrison soldiers – were most likely to fall victim to the plague (Loit 2010, 23). Initially, the plague victims were buried in churchyards, but as the outbreak progressed it became impossible due to the sheer number of the deceased, so the burials were moved out of towns.

It is probable that the people who did not belong to any of the town congregations were buried outside the town boundaries – mostly soldiers and their families and refugees from the countryside. By September 1710, there were no coffins nor undertakers available in town. At first the deceased were buried at Kalamaja, St Barbara and St John's suburban cemeteries,

after which several garden plots were repurposed in the Tõnismäe area. Later, the lay people did not receive any burials whatsoever and their bodies were left to rot in front of the town bastions (Gustavson 1969, 32). After the town surrendered to the Russian forces, it was cleaned from the corpses and bodies were exhumed from multiple churches and churchyards within the town to be reburied outside of town limits with mass graves dug for example in the sand dunes by Lake Ülemiste (*ibid.*, 33). There were likely several plague cemeteries around the town, besides Pärnu Rd 59 and Tatari St. 64, one of which was perhaps the graveyard at C. R. Jakobsoni St. 13 (Malve *et al.* 2019b). As this Tallinn plague cemetery is spread over a very large territory and several of the deceased were buried together or in mass graves, there may still be dozens if not hundreds of undiscovered burials in the area.

The plague cemetery in question is certainly one of the most exceptional burial sites ever excavated in Estonia. Its uniqueness lies in its very short period of use, the abundance of artefacts in the graves, the types of burials, and for archaeology, in the unusually precise dating – the deceased were interred at the plague burial ground probably only from August until December 1710. Based on artefacts collected from the burials, both urban and suburban commoners, peasants, also Swedish and Russian soldiers and potentially their family members, were interred at this plague cemetery.

The 1710 plague was the most prominent outbreak in Tallinn, causing probably more deaths than any previous epidemic. It was also the last widespread epidemic in Europe. Dozens of plague cemeteries across Europe have been studied from an osteo-archaeological point of view, but few have focused on those dating from the early 18th century. So far the closest studied plague cemetery of this period to Estonia has been found in Mikołajki, north Poland (Davis-Marks 2021).

## CONCLUSION

Multiple seasons of excavations revealed the total of 118 burials from the plague cemetery of 1710. The graves were situated irregularly over a large area. The burial ground was used for a very limited period of time as is concluded from the graves being in only one layer. Although individual burials were present, in most cases a single grave contained the remains of two to seven individuals so the number of double and mass burials was outstanding. Most of the deceased were young adults and the number of non-adults and older individuals was remarkably low. Surprisingly the majority of skeletons were female, which is unusual in comparison to any other osteologically analysed cemetery in Estonia. Young individuals being dominant among the buried is however characteristic to a plague cemetery, as the infection did not only catch the frail and children, but also people in full vitality.

Osteological analysis showed that 27 adults had been regular smokers during their lives, which was indicated by the wear on their teeth. Judging by the artefacts and clothing remains found from the graves, a great number of the burials may belong to Swedish soldiers and their next of kin who died as a result of the 1710 plague epidemic in Tallinn. At least one Russian soldier was also buried in the plague cemetery. Among the deceased were definitely also suburban residents and peasant migrants. The Greater Northern War plague cemetery represents a burial place with the most abundant archaeological findings from this period so far. As the cemetery spans a very narrow time period, it has provided an exceptional way to study the health, lifestyle and material culture of the plague victims.

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## 1710. AASTA KATKUKALMISTU TALLINNA SERVAL

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Tallinnas Pärnu mnt 59 toimusid 2017. aastal seoses Tallinna Muusika- ja Balletikooli (MUBA) ehitamisega arheoloogilised eeluuringud, mille käigus avastati krundi lõunaosas *in situ* matuseid ning lõhutud inimluid. 2018. ja 2020. aasta päästekaevamistel leiti 98 luustikku krundi lõuna- ja idaosast. 2021. aastal selgus, et matmisala ulatub ka Tatari tänavale, kust soojatrassi vahetusega saadi 11 osaliselt säilinud laibamatust. Samuti ulatus kalmistu kunagise Lutheri kvartali põhjaosa servaalele Tatari tn 51a, kust tuli välja lõhutud inimluid ja veel üheksa luustikku (jn 1). Maetute juurest avastati rohkelt 17. sajandi II poole – 18. sajandi alguse esemeid. Maetutel puudusid paranemata traumad, tõenäoliselt olid nad hukkunud mõne näljahäda või haiguspuhangu, nt katku tagajärjel. Kogutud mündid viitavad 1710. aasta katkuohvrile kalmistule.

Matmispaik asub Tõnismäe eeslinna servaalal, Pärnu mnt idaküljel asuvaltel liivaluidetel. Kalmistuna kasutati looduslikku põhja-lõuna suunalist seljandikku, inimluid ja haudu on seni avastatud ligi 15 000 m<sup>2</sup> alalt. Matmispaika mainitakse allikates kui 1710. aasta katkusurnute ühishaudu Liivamägedel, mis tõenäoliselt ulatub Liivalaia tn ja Pärnu mnt nurgast kuni Ülemiste järveni. Tihehoonestuse tõttu on matmisala suurus raske hinnata. Kindlasti on puutumata haudu veel Tatari tn 64 hoone ette jääval alal, hoovis ja seal asuvate ladude all, samuti võib *in situ* matuseid ja lõhutud haudadest pärinevad inimluid olla Liivalaia tn 2a parkimismaja all ning selle kõrval olevad Tatari tn 58 krundil (jn 1). Kalmistu tuumikala jääb hetke uurimisseisuga Pärnu mnt 59 krundi põhjaserva ja Tatari tn vahelisele alale.

Katkukalmistu päästekaevamistel puhastati välja 118 laibamatust. Neist alla poole olid säilinud terviklikult või peaaegu terviklikult, enamik oli hilisemate mullatöödega lõhutud. Surnud olid sängitatud ühes kihis, matused paiknesid juhuslikult suurel alal. Hauad paiknesid eraldi või väiksemate kogumitena, mis on tingitud sellest, et hukkunuid maeti pidevalt ja järjest juurde.

Valdavalt oli ühes hauas kaks kuni seitse inimest ehk nii kaksikmatuste kui ka ühishaudade arv oli erakordselt suur (jn 2). Üksikhaudu oli 31, kaksikmatuseid 16, kolmikmatuseid kaheksa ning ühishaudu

kuus (29 indiviidi). Haudadesse oli maetud koos nii täiskasvanud mehi kui ka naisi ning alaealisi. Mitme ühishaua puhul olid alumises reas asunud indiviidid sängitatud kirstudes ning pealmises kihis olnud surnud olid ilma kirstuta teiste peale visatud (jn 3). Üldiselt võib täheldada, et suur osa matustest (92) olid pigem kirde-edelasuunalised, 12 olid ida-läänesuunalised ja väike osa (10) kagu-loodesuunalised. Kokku oli 65 matust sängitatud kirstus. Käte asendit sai määrata 48 luustikul – enamasti olid käed kehale asetatud. Mitmel indiviidil olid käed ebaloomulikult, nt üks käsi kolju kõrval. See võis tuleneda kiiruga matmisest (nt hauda viskamine).

Luuainese teeb erakordseks kalmistu lühiajalisus, mis võimaldab uurida inimeste skelette, kes olid enne epideemia puhkemist täiselujõus ning hukkusid kiiresti katku läbi. Katkuohvrile luustikud annavad hea võimaluse saamaks teavet 17. sajandi lõpu ja 18. sajandi alguse Tallinna eeslinna, kodanike, maalt linna põgenenud talupoegade, Rootsi ning Vene garnisoni sõdurite tervise, elustiili ning harjumuste kohta.

Maetutest 38 olid täiskasvanud mehed (32,5%), 49 täiskasvanud naised (41,9%), 6 võimalikud naised (5,1%) ja 20 alaealsed (17,1%); nelja täiskasvanu sugu polnud võimalik määrata. Luuaineses domineerisid täiskasvanute luustikud, mis ei ole tolle perioodi tavakalmistule omane, imikute matused (vanus alla 1 aasta) puudusid peaaegu täiesti. Samuti oli matmispaigal alaesindatud 1–5-aastaste laste vanusegrupp. Üllatav oli suur naiste matuste osakaal (47%), millelaadset pole varem ühegi Eestis osteoloogiliselt analüüsitud kalmistu puhul täheldatud. Suurim suremus oli 17–25-aastaste seas, millele järgnes 26–35-aastaste vanuserühm.

27 luustikul täheldati eesmistest hammaste eba-reeglipärasest kulumist, mis on tingitud pikaajalisest piibusuitsetamisest (jn 4). Suitsetajate seas oli mehi 17 ja naisi 10, kõik need olid täiskasvanud vanuses 17–50 aastat. Võimalikule sõdurimatusele osundab üks suurimast ühishauast leitud täiskasvanud mehe skelett, kelle koljul oli viis paranenud vigastust (jn 5), neist neli olid terariista löikehaavad ja üks tõmbi eseme trauma. Leitud traumad võivad viidata, et vigastatu oli võitluses saanud haavadest paranenud sõdur.

Ühishauas oli ka teine mees, kelle koljul otsmikuloo paremal poolel oli lohukujuline trauma. Lisaks tuvastati lohukujuline fraktuur täiskasvanud naise parema kiiruloo selgmises osas ja mehe otsmikuloo vasakul poolel; veel ühel täiskasvanud mehel oli paranenud lohukujuline trauma vasaku kiiruloo koljuvõlvi osas noolõmbluse kõrval. Kõik sellised vigastused olid mõõtmelteil väikesed ja hästi paranenud.

Luustikel tuvastati arvukalt hambapatoloogiaid (nt hambakivi ja kaaries), luustiku vananemisega kaasnevaid haigusi (nt jäsemeliigeste osteoartroos ja lülisamba spondüloos) ja üksikuid paranenud traumasid (nt jäsemeluude ja roiete paranenud luumurde). Leitud patoloogiad on omased varauusaegsete matmispaikade osteoloogilisele ainesele.

Matuste juurest koguti Eesti varauusaja kalmistute kontekstis suhteliselt arvukas ja mitmekesine leiuaaines – ligi 500 alanumbrit leide. Kalmistult saadi Eesti kõige rikkalikuma sõjavarustusega varauusaegne üksikmatus (nr 9). 18–22 aastase mehe pea all ja kõrval oli kukkur, milles oli 20 pliiist püssikuuli (jn 8: 3), viis püssiluku tulekivi (jn 8: 2) ja rauast dosaatoriga püssirohusarv (jn 8: 1). Kaelapiirkonnast avastatud vasesulamist õigeusu ristripatsi (jn 6: 1) põhjal oli maetu vene sõdur. Luustiku pealt ja külgedelt leiti 21 vasesulamist nõopi, mille küljes oli pargitud loomanahka ja villase kanga jäänuseid. Mehe parema käe neljandas sõrmes oli vasesulamist vits-sõrmus (jn 6: 2) ja parema niudeluu juures sõrmkübar (jn 6: 3) ja jalgade peale oli asetatud rapiir (jn 7).

Mehematuse nr 71 juurest saadi lisaks lihtsale vitssõlele ja kuuele vasesulamist aasaga kuuenõobile ka vasesulamist rõivahaagid (jn 9: 1). Samalaadsed haagid olid ka matuse 69 juures (jn 9: 2). Eestis selliseid keebi kinnitamiseks mõeldud rõivakinnitusva-

hendeid varem haudadest leitud ei ole. Vasesulamist rõivahaak koos selle külge jäänud tekstiili ja nahkpaela katkega (jn 9: 3) saadi matuse nr 19 juurest. Ehkki selliseid on Eestis kalmistutest ja juhuleiuuna saadud ka varem, kuid siinse haagi asukoht ristlöö eesmisel küljel näitab, et selliseid esemeid kasutati püksihaagina. Teine samalaadne, kuid tinast või pliiist haak oli matuse nr 11 juures (jn 9: 4). Matuse nr 57 säärite ülemise osa ümbert saadi kahe nahkrihma katked vasesulamist pandla ja 35 võõsürgaga (jn 9: 5). Mitmete luustike juurest leiti arvukalt helmeid (jn 10).

Tallinnas avastatud katkukalmistu on seni üks suurimaid matmispaiku, mis 1710. aasta katkupuhan-gust Eestis arheoloogiliselt ja osteoloogiliselt uuritud. Katk jõudis Tallinna 1710. aasta augustis ning kestis detsembrikuuni. Linnaelanike arv kahanes seitsme nädalaga u 10 000–11 000 elanikult 2000-ni. Epideemia tagajärjel suri Tallinna 4000 Rootsi garnisoni sõdurist u 3500, linna- ja eeslinna elanikke võis hinnanguliselt hukkuda u 8000–10 000, koos maalt linna põgenenutega lausa 15–20 000. Katkuohvreid maeti esialgu kirikaedadesse, kui hukkunute arvukuse tõttu see polnud enam võimalik, hakati surnuid matma linnast välja.

Väljaspool linnamüüri maeti 1710. aasta katkupuhan-gu ohvreid mitmetele kalmistutele (nt ühishauad Püha Barbara kalmistul, Jaani seegi kalmistul). Võttes arvesse, et hukkunuid oli tuhandeid, siis on lõviosa matmispaikadest ja haudadest seni leidmata. Siin käsitletud matmispaik on kindlasti üks erakordsemaid, mida Eestis on kaevatud, selle teeb ainulaadseks lühike kasutusperiood, esemete rohkus haudades, matmisviisid ja arheoloogia kontekstis kindel dateering, surnud on sängitatud sinna tõenäoliselt augustist kuni detsembrini 1710.