



## Archaeological studies in Paide, Posti Street 12

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### INTRODUCTION

Paide (Germ. *Weissenstein*) is the only town with medieval origin in central Estonia, capital of the historical province Järva (Germ. *Jerwen*), situated at the juncture of a network of roads between historical centres Tallinn, Tartu, Pärnu and Rakvere. In spite of solid written sources – town privileges from 1291 – the medieval town Paide has evaded the attempts of archaeologists to discover almost anything from the Middle Ages (see Tvauri 2016, 176–177). The archaeological studies in Posti St. 12 in 2017, 2018 and 2020 have provided some information, which can, although with caution, be interpreted as remains of a medieval household among Early Modern structures.

During the preliminary studies in 2014 fragments of stone walls and a few Early Modern artefacts were discovered (Piiirits 2014). In 2017–2018 full-scale archaeological research was undertaken on the plot, necessitated by the reconstruction and enlargement of the historical schoolhouse from 1910. Most of the plot between the schoolhouse and the castle moat had to be excavated, ca. 1630 m<sup>2</sup> in total. In 2017 a huge lime kiln and foundation fragments of a dwelling house (Fig. 1) came to light and were studied in the eastern part of the plot (Piiirits 2017, 7–9; discovery of the lime kiln briefly noted in Russow *et al.* 2018, 19). In 2018 the western part of the plot was excavated with scarce results (Piiirits 2018). In 2020 field research was undertaken during the demolition of the previously discovered building remains (Piiirits *et al.* 2020), because no solution could be found to fit these with the new buildings. All the fieldwork episodes were led by archaeologist Peeter Piiirits (MTÜ Arheoloogia ja ehitusajaloo grupp AEG). The author of the present article acted as consultant of buildings archaeology during the excavation and demolition of the building remains and took part in the assembly of the final fieldwork report (Piiirits *et al.* 2020).



**Fig. 1.** Lime kiln (left) and remains of a medieval dwelling (right) in July 2020.

**Jn 1.** Lubjaahi (vasakul) ja keskaegse elumaja jäänus (paremal) 2020. a juulis.

Photo / Foto: Maili Roio

## HISTORICAL BACKGROUND OF PAIDE TOWN

The town Paide emerged near Paide castle which was established by the master of the Teutonic Knights in Livonia Konrad von Mandern in 1265 according to the chronicle of Hermann von Wartberge (Wartberge 1863, 36). The town got its privileges in 1291 from one of the next masters (Johansen 2005, 65–66, 68–69), but little else is known about the history of the town during the Middle Ages (Ungern-Sternberg 1910, 10–13; recent overview of written sources in Tvauri 2016, 174–175). The castle together with the town was repeatedly conquered during the Livonian Wars: in 1573 by the Russian, in 1581 by the Swedish, in 1602 by the Polish and finally in 1608 by the Swedish troops again (Gernet 1893, 14–17; Ungern-Sternberg 1910, 3). In addition, only the town was probably plundered in 1558 and 1560 by the Russian troops (Ungern-Sternberg 1910, 3).

In 1636 the castle was abandoned as a fortress and the site was given together with a nearby private manor of Mäo to count Lennart Torstesson, a Swedish army general. Based on an ambiguous text of the respective document, the next manor owners interpreted it to their own interests and considered the land of the town as also belonging to the manor. Although the town's privileges were formally never cancelled, it had to fight in court for the privileges throughout the 17th century. Getting a new status as a capital of the province in 1783 finally ended the dispute (Gernet 1885; Kroon 2017, 89–119) and facilitated its growth to a proper town again. A small urban settlement existed throughout the 17th century, but in the beginning of the 1770s it was still rather small,

with only about 40 timber houses and 50 citizens (Hupel 1774, 370).

As a result of the Livonian wars most of the town had probably been razed to the ground. The earliest list of plots and plot owners survives from 1591, although partly referring to information from 1573. In 1591 there were 54 plots, 48 of these were private; only six of the former plot owners were alive, of these only four had managed to rebuild the house and resided in Paide. According to the list there had been a town hall, a guildhall, a clergy house, two schoolhouses, two almshouses among the private households (Hupel 1789, 631–632; Ungern-Sternberg 1910, 3–9; Kroon 2017, 84–85, 128–130; recent overview in Tvauri 2016, 175). It is not possible to bring the list into connection with plots known from the later sources.

The earliest town plan survives from 1683 with the network of streets depicted (SE. KrA.0406.28.055.002; Kroon 2017, 20–21). The next plan from 1692 (RA, EAA.1.2.C.IV.173, p. 1; Veispak 1991; Kroon 2017, 22–23) also depicts ca. 65 plots (Fig. 2). In the 17th century the urban area consisted of two districts: *Teutsche*



**Fig. 2.** Map of Paide from 1692.  
**Jn 2.** Paide plaan 1692. aastast.  
 (RA, EAA.1.2.C.IV.173, p. 1).



historical town only the remains of the medieval church have been discovered and studied (Kadakas 2014). Several field studies have taken place in the castle area, mostly in the 1980s (Alttoa *et al.* 1987).<sup>1</sup>

## HISTORICAL BACKGROUND OF POSTI STREET 12

The plot at Posti St. 12 is situated at the northern edge of the historical town, between Posti and Valli streets. While Posti street was depicted already on the earliest town maps (SE.KrA.0406.28.055.002; Kroon 2017, 20–21), Valli street was built only in the 19th century into the southern moat of the castle. According to the town plan of 1692 about 2/3 of the present plot belonged to plot no 37, but about 1/3 on the western side to plot no 25 (RA, EAA.1.2.C.IV.173, p. 1; Figs 2–3). In the plot owners list from 1698 probably the one listed as no 4, belonging to the widow of the late Christian Raspius can be brought into connection with plot no 37 from 1692. In 1698 there was a ‘threshing barn’ (*Riege*) situated at the plot (RA, EAA.3.1.455d, p. 46–57; Veispak 1991; Kroon 2017, 162–167). Probably, in this context such word was not used in the meaning of a dwelling house type of Estonian peasants (Est. *rehielamu*), but rather for an uninhabited building where grain was dried and threshed (Veispak 1991, 37). The 18th and 19th-century town maps have also depicted small buildings, but none in the excavated area of Posti St. 12. Apparently, the schoolhouse built in 1910 (Viires 1997) was the first known large building on the plot.

The medieval castle was reconstructed in the 1580s into a fortress of bastions and curtain ramparts (Hansar & Nurk 2019, 267). During this, the southern curtain rampart and two bastions were built in front of the southern curtain wall of the castle. Probably the moat was made much wider towards the south in this period. Therefore, during the Middle Ages the urban block and the plot under study probably extended much further northwards. It is obvious that in the period of rampart fortifications until 1636, no urban buildings or households could exist so close to the fortifications – it must have functioned as an esplanade.

Kalle Kroon has recently drawn attention to the gap in the southern curtain wall of the castle, depicted on the plan of 1692 (RA, EAA.1.2.C.IV.173, p. 1) and has supposed that during the Middle Ages the castle had a gate in this spot and it was connected with the town with a bridge across the southern moat, following the line of Rüütli street (Kroon 2017, 22–23, 60–61). Such an extension of Rüütli street towards the north, the supposed castle gate, theoretically must have been located in the western part of Posti St. 12, in the excavation area of 2018.

In 2015 digging of a communication trench was monitored on the streetline of the plot and a 1 m thick wall of limestone with lime mortar was discovered under the pavement, aligned with the western wall of the schoolhouse (Tvauri 2015, 7). It is difficult to interpret this wall in connection with the results of the excavations from 2017 to 2020, as these took place on the other part of the plot.

## CULTURAL LAYER AND ARTEFACTS

Excavation of topsoil and the cultural layer both right behind the schoolhouse, on top of the horizontal plateau and on the slope of the moat provided only rather recent artefacts from the 18th–20th centuries, with a few exceptions. A fragment of a crosshead decorative pin from the 10th–11th centuries<sup>2</sup> (JM A-98: 17) was the earliest and the single find from the period. The

<sup>1</sup> In 2020 medieval artefacts, mostly fragments of pottery were discovered by archaeologist Kalle Lange (OÜ Muinasprojekt) in a pipe trench under Suur-Aia st., from an area which was situated within private plots in the Middle and the Early Modern Ages, but it was too late to include these results into this article.

<sup>2</sup> The author is grateful to Mauri Kiudsoo (TLÜ AT) for the identification.

Middle Ages are represented only by a single fragment of a stoneware vessel, probably from the 14th century (JM A-99: 14). Some fragments of glazed redware tripods may theoretically come from the 17th century, although the context of these finds rather suggest later dates. Some foundation fragments were unearthed within the cultural layer, but after closer study all these appeared to belong to some light structures (sheds, small storage cellars built into the slope, etc.) from the 19th and 20th centuries.

It also appeared that on the whole excavated area, original topsoil and probably also the cultural layer of earlier periods had been deliberately removed. This was especially obvious in the western part of the excavated area, where the ground has been and still is slightly higher because of the natural inclination towards the east. It is likely that when the rampart fortifications with the wide moat were built in the 1580s, and the esplanade was created in front of it, also the upper part of soil was removed from the whole studied area.

## REMAINS OF A DWELLING HOUSE

### Description of the remains of the dwelling house

However, the depth of the soil removal of the 1580s could not have been very extensive, because remains of a building – foundations of a cellar and a heating furnace – could be recorded within the natural soil, in the middle of the plot, on the edge of the slope of the moat (Figs 4: 1; 5 & 6). As the remains were scarce for solid conclusions, and Paide lacks any comparable finds, a rather detailed description is necessary.

The main part of the preserved structure was a furnace, made of limestone and boulders with lime mortar, built at least 1.2 m deep into the natural ground (Figs 5: 1; 6). Only two side walls of it, ca. 1.1 and 1.5 m thick, had preserved. There were no traces of brick lining or bottom inside the furnace – the heat had directly affected the side walls built of erratic boulders still covered with soot. The furnace could be accessed from a small antechamber (Figs 5: 2; 6) on its southern side, built of limestone and boulders with clay. The floor of the antechamber was designed as a slope, because the floor of the cellar room was ca. 90 cm higher than the bottom of the furnace.

A very thin (35–70 cm) foundation, consisting of one row of boulders without mortar, was attached to the south-western corner of the antechamber (Figs 5: 2; 6), positioned in north-south direction. Whereas other foundations were thick enough to carry a stone wall, this one could obviously carry only a timber or framework structure. Only its eastern side had been built straight, as the inner wall surface of a cellar, stones laid along a construction string, but the other was uneven, built against natural soil. The floor level of the room was once positioned at least 0.3 m deeper than the natural ground level. Taking into consideration that the cultural layer had been removed in the Early Modern period, the floor of the cellar must have initially been even deeper in the natural ground.

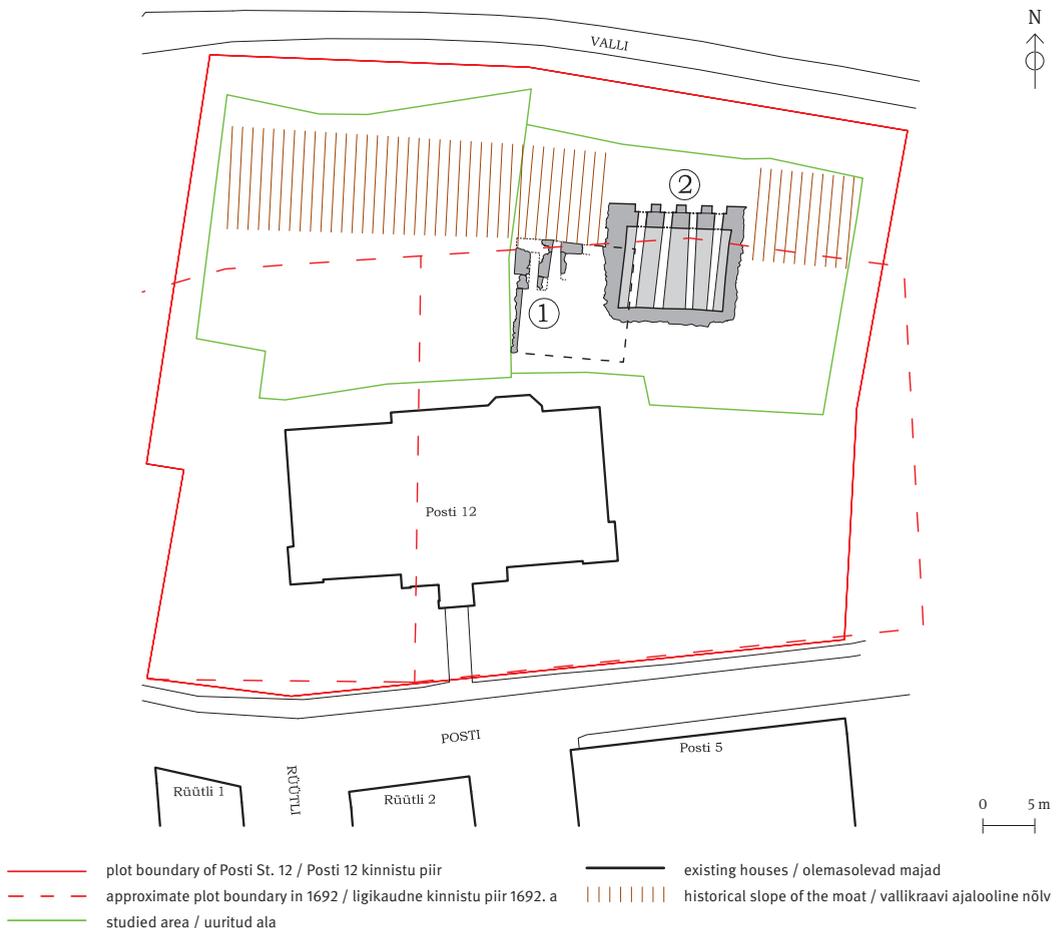
The best-preserved foundation was attached to the north-eastern corner of the furnace, built of large limestone slabs and boulders, ca. 1 m thick and positioned in the east-west direction. Its northern edge was built in a straight line along a construction string and preserved up to 0.5 m high, with a few remains of lime plaster. Within this wall, to the east of the furnace an area covered with worn limestone slabs was interpreted as a floor and threshold of a ca. 80 cm wide doorway (Figs 5: 3; 6). The threshold was positioned ca. 30 cm deeper than the floor level of the room to the south of it. Therefore, there were once probably two steps within the doorway. Right east of the threshold, on the corner of the wall there was a large limestone block with a roughly worked chamfered corner and a cavity for an iron hinge of a

door (Fig. 5: 4). The eastern wall of the doorway towards the south was built with lime mortar, like the walls of the furnace.

### Interpretation of remains of the dwelling house

Although information about the house was limited, some conclusions can be made. Such an underground heating furnace is in principle comparable to the medieval hypocaust furnaces with heat storage rather than to heating systems of the Early Modern period. As the furnace floor was positioned deeper than the room floor, access into it was designed as a slope. Two comparable underground furnaces with a sloped access have been found e.g. in Rakvere and dated hazily to the Middle Ages, but in these cases the remains of the houses had not been preserved (Kadakas 2007, 199–201; Lissitsina *et al.* 2016, 117–118).

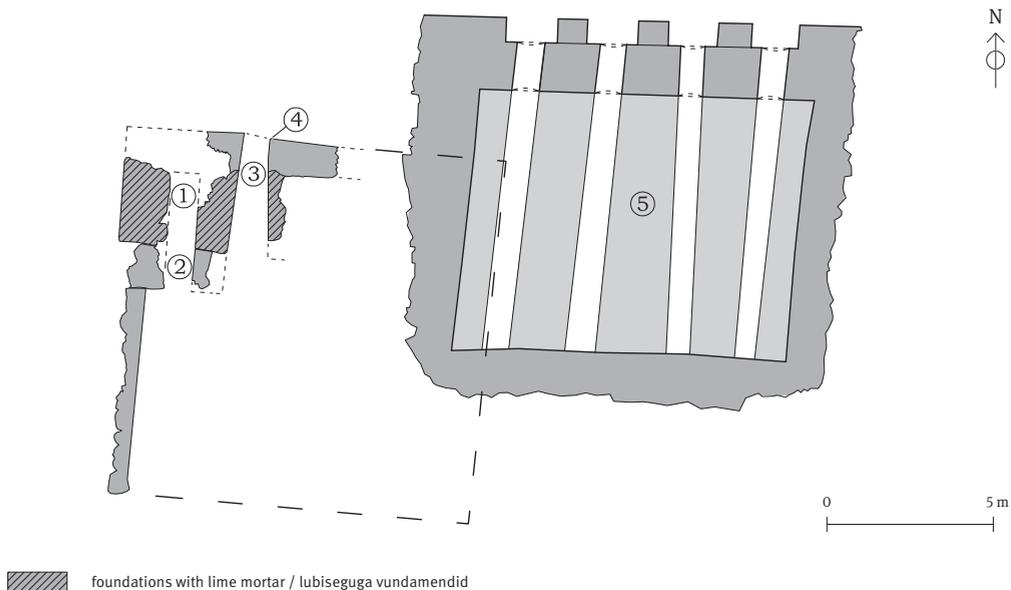
It is difficult to determine the extent of the cellar, furthermore of the whole house. The narrow foundation indicates that the cellar reached at least 6 m south from the antechamber, 11 m from the door in the northern wall. A possible extent of the room to the east had



**Fig. 4.** Plan of Post St. 12. 1 – house remains, 2 – lime kiln.

**Jn 4.** Posti tn 12 plaan. 1 – elamu jäänus, 2 – lubjaahi.

Drawing / Joonis: Villu Kadakas



**Fig. 5.** Plan of house remains and lime kiln. 1 – heating furnace, 2 – furnace’s antechamber with a sloping floor, 3 – doorway, 4 – recess of an iron hinge, 5 – lime kiln.

**Jn 5.** Elamu jäänuse ja lubjaahju plaan: 1 – kütteahi, 2 – ahju kaldpõrandaga eesruum, 3 – uksekäik, 4 – uksehinge süvend, 5 – lubjaahi.

*Drawing / Joonis: Villu Kadakas*



**Fig. 6.** Remains of the medieval dwelling.

**Jn 6.** Keskaegse maja jäänused.

*Photo / Foto: Maili Roio*

been removed when building the lime kiln and a further extent to the south when building the schoolhouse. The position of the threshold of the northern doorway at least half a metre lower than the natural ground, also the location of the door on the northern side indicate that another cellar room probably existed to the north. In medieval stone buildings doors usually open to the interior, not outwards. Continuation of the house towards the north is also supported by traditions of planning medieval houses with a two room plan in the region. Usually the furnace and the chimney with a fireplace (kitchen) were both located next to the partition wall, in order to sparingly enable heating and piping the smoke away for both rooms.

There were no signs of a doorway to the west. Although there was probably a timber wall on top of this thin foundation, a threshold of a doorway should have been preserved if there was one. Even if there was a room to the west, its floor must have been positioned much higher, above the natural ground.

It is difficult to estimate how much of the house was built as a stone structure. Only the northern wall, partly preserved above the threshold level, was a ca. 1 m thick stone wall, but built using clay. The antechamber of the furnace was also a stone structure, but the wall on top of the thin wall extending far south was obviously not. It is possible that only one or two walls in direct contact with the furnace and chimney were built of stone.

### Dating of the dwelling house

The question about the building sequence of the house is complicated. It is not clear, if the foundations of lime mortar and clay have been built at the same time. It is obvious that clay and mortar elements have not been built during the same construction event, but these may have all been parts of the same plan, fulfilled during the same season. However, it is also possible that a new furnace was built for an existing house or, e.g. after fire a new house was built around the old furnace. The study of the interfaces between the different foundations gave equivocal results in this aspect. From within the furnace's walls, also from under the thin western foundation several fragments of monk and nun type roof tiles were found. The tiles from these two contexts have slight differences, indicating different production episodes. It may show that the furnace and the foundation were not built at the same time.

No datable artefacts were obtained from the soil within the dwelling remains, which made also the absolute dating complicated. Since the early phase of the excavation one thing was clear: the dwelling could have not coexisted with the lime kiln. As the foundations were well aligned with the moat, as if built on its edge, an Early Modern date was also considered, but then it became clear that the eastern part of the dwelling has been destroyed while building the kiln, and it seemed unlikely that the dwelling had a doorway opening right on the steep slope of the moat.

During demolition two samples of small pieces of charcoal were obtained from the soil under the thin foundation, running southwards from the south-western corner of the furnace. According to the analysis in the 14CHORNO Centre at Queen's University Belfast their radiocarbon ages are  $763 \pm 22$  BP<sup>3</sup> and  $799 \pm 17$  BP<sup>4</sup>, which, with a 95.4% probability, correspond to 1226–1280 cal AD and 1222–1269 cal AD, respectively. These results are surprisingly early, but not in contradiction with the written sources, the general context of Paide and the particular site. So close to the castle, only ca. 60 m away, it is not clear if the results refer to the early activities of the urban settlement or the castle. However, it would be risky to connect the

<sup>3</sup> UBA-44392. All samples were calibrated using CALIB REV8.2 programme (Stuiver & Reimer 1993) with IntCal 20 atmospheric curve (Reimer *et al.* 2020).

<sup>4</sup> UBA-44395.

dwelling automatically to these early dates – the charcoal from an earlier age may have got under the foundation during its construction. But such early dates cannot be excluded – it is likely that the urban settlement started to emerge right close to the castle, even so next to the hypothetical castle gate.

All the foundations and walls of the house have been built of unworked erratic boulders and limestone rubble, but two large masonry blocks of limestone, with one roughly worked side, were discovered within the foundation of the furnace. These were not used for wall surfaces but were found among the inner rubble. It is not likely that such demolished and discarded building material, including fragments of roof tiles was available already in the 13th century.

Based on the sequence with the kiln, the type of the furnace, the lack of buildings on Early Modern maps, and the radiocarbon dates, it can be concluded, that the house was probably built in the Middle Ages as an urban dwelling house, but its precise date remains unclear. However, the radiocarbon dating indicates some human activity on the plot in the second or third quarter of the 13th century already.

### THE PLOT AND THE DWELLING HOUSE IN THE MEDIEVAL TOWNSCAPE

One could expect a medieval urban house to be built next to or at least close to the streetline, but the remains in Posti St. 12 are located ca. 30 m away. Reconstructing one or two missing rooms to the remains would not bring it to the existing streetline, unless the house was enormous or the street was closer than depicted on the 1683 map. It is difficult to explain the location of the dwelling in townscape, because it is neither aligned to Posti street, the castle nor the moat. It appears to be aligned to some distant town structures – Vee street to the south and the medieval town church to the southwest (Fig. 3).

It is possible that Posti street has been established on its present course only after the building of the bastions and widening the moat in the 1580s. The hypothesis that Rüütli street continued north to the hypothetical castle gate in the Middle Ages (Kroon 2017, 60–61), has to be considered. There is no evidence about such a street, but the logic is apparent and has several parallels among the medieval towns in Estonia. In these three towns the street which started from the castle's gate led directly to the market square: Pikk street in Uus-Pärnu, Suur street in Narva and Lossi street in Viljandi (Altoa 2019a, 88–90; 2019b, 100; 2019c, 109–110). However, in none of these cases bastions were built between the castle and the town. There was no reason to sever the connection with the town and it could survive unlike in Paide.

In case Rüütli street started at the castle gate in the Middle Ages, it is possible that there was no Posti street or its medieval predecessor at all and the blocks on both sides of Rüütli street extended from Vee street from the south to the castle moat. This distance is about 170 m which matches the length of the block between e.g. Vee and Vainu streets further to the south. Posti street would be necessary only on condition that Rüütli street did not continue in the northern direction until the castle's gate.

As mentioned, the main street of Uus-Pärnu, Narva and Viljandi ran from the castle's gate to the market square. In Paide, the oldest map from 1683 shows the market square not next to Rüütli street but next to its western parallel – Pikk street, right on the southern side of the church, where it remained until the 20th century. However, on the map of 1692 (Fig. 2) a small square (ca. 35 × 60 m) is depicted on the western side of Rüütli street, right south of the crossing with Posti street (Fig. 3). It has been marked in Swedish *gaml. drillplatz*, 'old drilling square' and has been interpreted by Kalle Kroon as a square for military rehearsal of

the town's citizens already during the Middle Ages (2017, 60–61). Recently this interpretation has been criticized with an argument that such military drilling squares were characteristic to towns with a military garrison only in the Early Modern period (Altkoa 2019d, 118).

In case this square goes back to the Middle Ages, it is more likely to interpret it as remains of a former market square. Such a location was typical, compared to Uus-Pärnu, Narva and Viljandi – next to the main street, one or two blocks away from the castle's gate. By the end of the Middle Ages the market was probably situated south of the church, but the square next to Rüütli street may have been established as a market site in an earlier phase of the town, when urban settlement may have been concentrated only along Rüütli street, in front of the castle's hypothetical gate. The hypothesis that this square was a former market is supported by the opinion of A. W. Hupel while interpreting the list of plot owners from 1591, that the medieval city hall was situated between the church and Rüütli street (Hupel 1789, 631–632). So, the city hall would have been on the western side of this square – a typical combination of a city hall and a market square. Although the list of 1591 does not give solid basis to claim it, Hupel may have had additional information, including oral tradition still available in the 1780s.

In conclusion, if Rüütli street started from the castle's gate in the Middle Ages, the house discovered at Posti St. 12 probably stood next to or very close to it. The plots in the area were probably arranged as narrow strips of land, stretching out in the east-west direction, as the historical plots elsewhere along Rüütli street have been arranged. While during the recent centuries the plot at Posti St. 12 has been situated in the periphery of the historical town, in the Middle Ages it may have been situated in a rather prominent spot of townscape: next to the hypothetical extension of the main street, and very close to the hypothetical castle gate and the hypothetical market square.

#### **WHERE IS ARCHAEOLOGICAL EVIDENCE OF THE MEDIEVAL TOWN OF PAIDE?**

Recently Andres Tvauri has analysed the apparent lack of medieval, also Early Modern archaeological artefacts and occupation layer in the town of Paide (Tvauri 2016, 175–176). He concluded that the occupation layer of Paide has been far less dense than that of other small towns of Estonia, like Haapsalu or Viljandi. He explained the lack with the fact that almost all the archaeological studies have taken place along the streets, but if the street network has remained the same since the Middle Ages, the finds should be rather expected from the plots.

Based on the field study and townscape analysis regarding the results from Posti St. 12 this conclusion can be elaborated. Recently architect Raul Vaiksoo drew attention to the fact that the town area of Paide as depicted on the earliest surviving maps and considered to reflect the situation at the end of the Middle Ages, is enormously large, comparable only to the largest towns of medieval Livonia, Tallinn and Riga (Altkoa 2019d, 119). Whereas in medieval Tallinn there have been hundreds of plots, there are only 65 on the map of Paide from 1692, and only 54 in the list of 1591. Although it is considered possible that the number was bigger in the Middle Ages, it is likely there were never more than 100 (Altkoa 2019d, 119).

Taking into consideration the large urban area and the small number of plots, also the plots of Paide were very large. Whereas the streetline of one medieval plot in Tallinn is often only 10 m wide, more in the case of larger merchant houses, but rarely over 20 m (Kadakas 2019, 62), the narrowest plots on the 1692 map of Paide have a 20 m wide streetline, but most vary between 30 and 40 m. In Tallinn the longest plots which extend from one street to another, were rarely over 50 m long, but the ones on the map of Paide are typically ca. 100 m long, in some blocks up to 180 m.

In the case of such enormous plots, it is obvious that not only the streets lack artefacts and an occupation layer, but probably also much of the plot areas. Whereas e.g. in medieval Tallinn the plot owners could additionally have a large garden plot in the suburb, outside the town wall, the plot owners of Paide probably had two in one – a large plot within the urban centre. Agriculture was a crucially important side income especially for people of small towns like Paide, where trade possibilities were limited. Therefore, it is likely that most of the area of a typical plot in Paide was used for gardening, cattle breeding or even as a small field, and the household covered only a small part of it near the street. As the streetline of plots was long, hardly a continuous occupation layer could be even expected along the streets. In conclusion, probably only 10–20 m wide patches of occupation layer, which mark the medieval households, can be expected to exist as the medieval occupation layer of Paide. It is likely that often the existing timber houses from the 18th and 19th century cover the same spots than their medieval predecessors. As many existing historical houses of Paide have cellars, much of the medieval dwelling remains and patches of occupation layers have probably been disturbed. Among these, some medieval cellars may survive, but none have been identified so far.

### LIME KILN

In the north-eastern part of the excavation area, from the slope of the moat, remains of a large rectangular building of limestone came to light in 2017 (79 × 10.0 m inside, 11.3 × 13.0 m outside), with 1.2–1.8 m thick walls (Figs 1; 4: 2; 7–9). Eventually it was interpreted as remains of a huge lime kiln, built into a pit which had been excavated into the slope of the moat. The four walls of the kiln were preserved 2.5–3.5 m high (Figs 7–9). These were built without lime mortar, with clay. The surfaces of the walls were made of limestone of various size,<sup>5</sup> without a single erratic boulder. Only the northern wall, the façade, was built as a free-standing wall, but the three others stood against the edge of the pit, against natural soil. However, during demolition it appeared that only the surfaces of these three walls were built as masonry: behind a thick stone crust there was a mixture of various rubble, clay and soil. The two side walls had given in to the pressure of surrounding natural soil and deformed, the middle part of the southern wall had collapsed (Figs 7; 8). Intensive fire had damaged most of the inner wall surfaces, which facilitated deformation and collapse and had given an orange-brown hue to the whole structure, characteristic to burnt limestone.

Four ca. 80 cm wide doorways with low segment arches were positioned in the northern façade wall (Figs 4; 7–9), built probably on the level of the bottom of the moat. The façade wall was especially thick (ca. 2.2 m) near the corners and designed as three buttresses between the four entrances. From every doorway a passage extended to the southern wall. The width of



Fig. 7. Lime kiln, view from the north-east.

Jn 7. Lubjaahi, vaade kirdest.

Photo / Foto: Villu Kadakas

<sup>5</sup> The limestone is of invariable geological characteristics, identified by geologist Helle Perens as originating from the quarry of Mündi, situated ca. 2 km southeast of the castle.



**Fig. 8.** *Façade of the lime kiln with arched entrances and buttresses.*

**Jn 8.** *Lubjaahju fassaad kaaravade ja tugipiilaritega.*

*Photo / Foto: Villu Kadakas*



**Fig. 9.** *Inner view of the façade of the lime kiln with arched entrances.*

**Jn 9.** *Lubjaahju fassaadi sisekülg kaaravadega.*

*Photo / Foto: Villu Kadakas*

The rest of the kiln was filled with its own collapse and/or demolition debris, which was thicker near the walls. In the middle the upper layers consisted of mixed soil, which was probably used to fill the pit and level the ground long after the collapse of the kiln.

### Dating of the lime kiln

No datable artefacts could be gathered within the kiln. Its context – built into the slope of the Early Modern moat – suggests that it was built only after the moat had obtained its final width, which probably took place when the bastions and curtain ramparts were built in the 1580s (see above). Taking into consideration the pollution such a huge kiln produced, it is obvious that at the same period no urban households could exist in the vicinity. These aspects leave open two possible dates: either it was built during the final decades of the castle (1583–1636), in order to provide lime for the various new stone walls necessary in the rampart fortifications, or after the fortress was abandoned in 1636, in order to make use of the ruin of the castle as raw material. In any case, in the kiln at Posti St. 12 probably stones of the medieval castle walls were used as raw material, because even in the 1580s, many old walls became redundant within the modernized fortress.

the passages varied between 0.5–0.8 m. The walls between the passages were preserved 0.2–0.4 m high, but fragments of the two outermost ones were preserved much higher near the southern corners of the kiln. In the southwestern corner it could be recorded that the wall between two passages was built of loose limestone blocks as a corbel vault, so that the passage gradually narrowed upwards until it was covered with a flat slab on the top, ca. 1.9 m from the bottom. Evidently, the last burn was not a 100% success, as the limestone walls in the southern corners had not turned into lime.

However, most of the lime probably had been removed after the last burn. Inside the passages, also on top of the fragments of the partition walls a thick layer of lime had still preserved. It was up to 70 cm in the middle, more on the edges, especially near the eastern wall and the corners – up to 2.2 m in the north-east and 2.6 m in the south-east. The lime layer also contained chunks of poorly burnt limestone. Although often lime and bricks were produced inside the same kiln during the same burn (Ansorge 2005, 307), no evidence of burning bricks could be found. There was an up to 20 cm thick layer of charcoal preserved on the bottom of the central and northern parts of the passages.

One sample from the charcoal layer in the bottom of the easternmost passage of the kiln could be successfully analysed. According to the 14CHORNO Centre at Queen's University Belfast its radiocarbon age is  $308 \pm 17$  BP<sup>6</sup>, which, with a 95.4% probability, corresponds to 1510–1592 or 1619–1644 cal AD, and with 68.3% probability, to 1524–1561, 1563–1572 or 1630–1639. This result leaves both supposed periods open for discussion, but also seems to suggest an even earlier period (1524–1561). However, this early period of the sample may rather refer to the use of old timber from the castle's buildings for burning in the kiln, than to the age of the kiln.

### Interpretation of the lime kiln

In Estonia, the study of medieval and Early Modern lime production, especially field studies, have been limited. A lot of documents about lime production in Tallinn have been preserved and analysed (Alamaa & Kivi 1966; Kotter 1999, 45–53; Kangrool & Lumiste 1977), but not supported by fieldwork evidence. Early Modern lime production in the rural area of Kursi parish has been studied (Kruus 1933) and preliminary excavations have taken place to study some lime kilns of this area (Tvauri & Saimre 2007). Evidence of lime burning and wall fragments supposedly belonging to an Early Modern lime kiln were discovered in 2013 in the song festival grounds of Viljandi, right outside of the medieval town centre (Lissitsina *et al.* 2014).

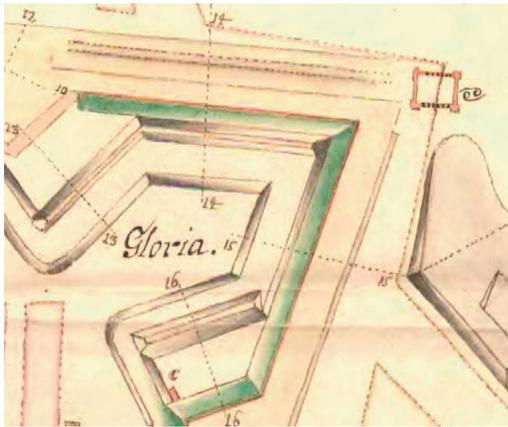
Using stones demolished from medieval castles for burning lime was a well-studied common practice in Late Medieval and Early Modern Latvia, where lime kilns were built into several castle ruins on the banks of the River Daugava e.g. Vecdole, Salaspils and Ikšķile; several have even been excavated (Ose 2015, 157–159). In several countries many medieval and Early Modern lime kilns have been discovered and excavated (Ansorge 2000; 2005; Zeiler 2015; Müller 1976), but these have apparently been much smaller than the one found at Posti St. 12. Therefore, it is difficult to find relevant cases for comparison. In many countries a lot of large lime kilns of the industrial era have been studied as preserved vernacular buildings. Brief scanning through literature about archaeology of lime kilns left an impression that such large pre-industrial lime kilns as the one at Posti St. 12 have not been preserved or attracted the attention of archaeologists.

All the studied medieval or Early Modern kilns mentioned in literature were small structures compared to the one at Posti St. 12, with dimensions which did not exceed 6 m, often much less. The enormous size and regular architecture of the kiln at Posti St. 12 suggests that a big amount of lime was needed quickly and substantial resources and know-how were available for investment into production. It would be characteristic rather to a military organization of the state, trying to quickly reconstruct a fortress, than to a peacetime landlord, who gradually turns an old ruin into profit, but is rather interested in investing as little as possible and getting more revenue in the long run.

A comparable lime kiln in regard to size, design and context is depicted on some plans of the fortifications of Narva from 1680 and 1697–1699 near the tip of bastion Gloria, and marked in the explication as *den stora Kalckugnen* ('big lime kiln' in Swedish) (Fig. 10; SE.KrA.0406.28.031.065; SE.KrA.0406.28.031.036; SE.KrA.0406.28.031.039; SE.KrA.0406.28.031.040).<sup>7</sup> It was situated not in the slope, but on flat land, so that all four corners were supported with large rectangular buttresses. Its name reflected the size, it was even bigger than the kiln in Paide, with inner dimensions ca. 12 × 17 m, and had six entrances side by side. As it was situated on flat land, also the opposite wall was provided with entrances as a

<sup>6</sup> UBA-44393.

<sup>7</sup> The author is grateful to Ragnar Nurk (TLPA), who drew attention to this kiln.



**Fig. 10.** Lime kiln depicted on a plan of Narva fortifications from 1698 near bastion Gloria. Detail with the vicinity of bastion Gloria. S – marked in the explication as den stora Kalckugnen ('big lime kiln' in Swedish).

**Jn 10.** Narva kindlustuste 1698. a plaanil kujutatud lubjaahi Gloria bastioni juures. Detail Gloria bastioni ümbrusega. S – eksplikatsiooni märgitud kui den stora Kalckugnen („suur lubjaahi“ rootsi keeles).

Drawing / Joonis: SE.KrA.0406.28.031.036

mirror image. These maps have been created with an aim to record the progress of the construction work of the bastions, hence there should be no doubt that the kiln was used to produce lime for the construction of various walls within the rampart fortifications. It is difficult to estimate, if the 'big lime kiln' was able to provide all the necessary lime for the military enterprise in Narva, but no other lime kilns have been marked on the surviving maps of the period.

The remarkable size, regular architecture and context of the kiln near bastion Gloria in Narva support the opinion that the kiln at Posti St. 12 was also built by the military engineers during a large-scale reconstruction campaign of the fortress. The kiln in Narva was remarkably bigger, but so was the fortress complex of Narva, and a century had passed since the construction work on the bastion system of Paide.

## CONCLUSION

During the excavations in Posti St. 12 in Paide, in connection with reconstructing the historical schoolhouse from the early 20th century, it appeared that all the medieval and Early Modern occupation layers had been removed previously, probably when the curtain rampart and bastions were built around the medieval castle and the moat of the castle widened in the 1580s. Despite the lack of medieval and Early Modern occupation layers two significant building remains, which had been built into the natural ground, were preserved. In the middle of the plot scarce building remains consisting of a heating furnace and foundations for both stone and timber walls of a cellar, were interpreted as a probable medieval dwelling house. It is the first such find from the whole medieval urban area of Paide. The attempt to reconstruct the medieval townscape around the plot at Posti St. 12 countered lack of facts. It was concluded that the street network of the northern part of the historical centre of Paide may have changed considerably since the Livonian Wars. The dwelling house supposedly once stood next to the initial main street of the town – Rüütli street – which during the Middle Ages may have started from the castle's gate. The other significant structure was a huge lime kiln, built into the slope of the castle moat, most probably by Swedish military engineers during the reconstruction campaign of the medieval castle into a fortress of bastions in the 1580s.

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## ARHEOOLIGILISED UURINGUD PAIDES, POSTI TN 12

Villu Kadakas

Posti tn 12, Paide ajaloolise koolimaja riigigümnaasiumiks rekonstrueerimise käigus leiti 2017., 2018. ja 2020. a väljakaevamistel kaks tähelepanuväärset ehitusjäänust: oletatava keskaegse elamu ning hiiglasliku varauusaegse lubjaahju jäänused (jn 1; 4–9). Kaevamisi juhatas Peeter Piirits (MTÜ Arheoloogia ja ehitusajaloo grupp AEG), artikli autor osales ehitusjäänuste uurimisel.

Kuigi Paide sai linnaõiguse juba 1291, on selle ajaloo kohta teada väga vähe. Linn hävis Liivimaa

sõdade ajal toimunud rüüstamiste ning linnuse vallutamiste käigus (1558, 1560, 1573, 1581, 1602, 1608). Pärast linnuse kustutamist Rootsi kindluste nimekirjast (1636) läks piirkond Mäo mõisale ning linnakodanikud pidasid ligi sajandi poliitilist võitlust linna privileegide tunnustamise nimel. Veel 1770. aastatel oli A. W. Hupeli teatel tegemist väikese asulaga, kus oli umbes 40 puumaja ja u 50 elanikku. 1980. aastatel uuriti linnuse eri piirkondi, 2007 ja 2013 linna keskaegse kirikuhoone jäänuseid, kuid linna alal

on arheoloogiline uuring suuresti piirduvad vaid kommunikatsioonikraavide kaevetööde jälgimisega. Katsed kesk- või varauusaegseid esemeleide või kultuurkihti ja ehitusjäänuseid avastada on seni peaaegu täielikult ebaõnnestunud.

Posti tn 12 asub 17.–18. saj nn Saksa alevina tuntud linnaosa põhjaservas ajaloolise Posti tn ja vallikraavi kohale rajatud Valli tn vahel (jn 3). Arvatavasti sai kinnistu põhjaosa hõlmav vallikraav oma praeguse laiuse 1580. aastatel, kui linnus rekonstrueeriti bastionite ja kurtiinvallidega kindluseks. Keskaegne vallikraav oli arvatavasti palju kitsam, nii et keskaegne elukvartal ulatus põhja suunas ka praeguse vallikraavi alale. Hiljuti on Kalle Kroon oletanud, et keskajal võis Rüütli tn alata mitte Posti tn ristmikult vaid linnuse lõunaküljel oletatavasti asunud väravast. Selline tänavalõik pidi kulgema otse läbi Posti tn 12 kinnistu.

Selgus, et bastionite ehitamisel esplanaadi rajamise eemaldati varasem kultuurkiht. Hiljem alale ladestunud pinnasest saadi vaid kaks vanemat juhu-leidu: 10.–11. saj ehtenõela ja 14. saj keraamikakatke. Kultuurkihi eemaldamine ei olnud väga sügav, sest kinnistu keskosast leiti maasse süvendatud küttehju ja sellega liitunud keldri jäänused (jn 1; 4–6). Peamiselt maakividest lubiseguga laotud u 85 cm laiuse koldega ning paksude külgliseintega (1,1 ja 1,5 m) ahi (jn 1; 4; 5: 1) oli süvendatud vähemalt 1,2 m võrra maa sisse. Ahju ukse ees oli kahest saviga laotud müüritisest koosnev eesruum (jn 1; 4; 5: 2). Ahju edelanurgaga liitus õhuke (35–70 cm), põhja-lõuna suunaline sideaineta vundament, mis ilmselt kandis keldri lääneseina. Vundamendile sai maapinnast kõrgemal tõenäoliselt toetuda vaid puit- või vahvärksein. Ahju kirdenurgaga liitus paks (u 1 m), pae- ja maakividest saviga seotud ida-lääne suunaline vundament, mis moodustas keldri põhjaseina. Selle põhjaküljel oli laotud sirgena hoone välis- või siseseina pinnana ning sellel oli lubikrohvi jäänuseid. Müüris paiknes u 80 cm laiune ukseava (jn 1; 4; 5: 3). Keldriruumi põrand asus keskajal vähemalt 30 cm võrra ümbritsevast maapinnast sügavamal, kuid esplanaadi rajamisel toimunud koorimise tõttu ei ole selle algne sügavus teada.

Hoone ahi on võrreldav keskaegsete kerishüpo-kaustahjude, mitte uusaegsete küttesüsteemidega. Kaks sarnast keskaegset ahju on leitud Rakvere Teatrimäelt, kuid seal polnud elamute vundamendid säilinud. Posti tn 12 elamu kunagist ulatust on raske hinnata. Keldriruum oli suur, ulatudes vähemalt 6 m ahju eesruumist lõuna poole. Lubjaahju ja koolimaja ehitamisel on ära kaevatud elamu võimalik ulatus ida- ja lõuna suunas. Tõenäoliselt liitus vähemalt üks keldriruum põhjaküljel, kuhu viis leitud ukseava. Usutavasti oli elamu vaid osaliselt kivist, võib olla vaid ahju ja korstnaga vahetult külgnevad seinad.

Elamu vanuse hindamine on keeruline. Elamu on hävinud hiljemalt lubjaahju ehitamisega sellest ida poole. Läänepoolse vundamendi alt saadud söeproovide analüüs osutab 95,4% tõenäosusega ajavahemikele 1226–1280 ja 1222–1269. Nii varane dateering on üllatav, kuid mitte vastuolus kirjalike allikate, Paide ajaloolise linna üldise ja konkreetse koha kontekstiga. Vaid 60 m kaugusel linnusest ei ole selge, kas söeproov seostub linnuse või selle juurde tekkinud linna varase asustusega. Dateeringu seostamisel elamu jäänusega tasub olla ettevaatlik, sest vundamendi alla võis sattuda märksa varem tekkinud sütt. 13. sajandist hilisemale ehitusajale osutab vundamentidest leitud sekundaarses kasutuses ehitusmaterjal: kaks paest töödeldud müürikivi ja munk-nunn tüüpi katusekivide tükid. Varane linnaline asustus Posti tn 12 krundil, linnuse läheduses on siiski ootuspärane, eriti oletatava linnusevärava ees. Kokkuvõttes võib järeldada, et tõenäoliselt ehitati elamu keskajal, kuid selle täpne vanus jääb selgusetuks.

Keskajal ehitati linnaelamud enamasti tänavajoonele, kuid leitud elamujäänus asub tänavast u 30 m kaugusel (jn 4). Samuti pole see orienteeritud ei Posti tänavale, linnuse ega vallikraavi järgi. Samas sihis on vaid paar kaugemat linnastruktuuri elementi: Vee tn lõuna ja keskaegne kirik edela pool (jn 2–3). Võimalik, et Posti tn moodustati praegusele, juba 1683. ja 1692. a linnaplaanidel märgitud kohale pärast bastionite ehitamist ja vallikraavi laiendamist 1580. aastatel ning varem oli tänavavõrk teistsugune. Rüütli tänav puhul on oletatud, et see sai keskajal alguse linnuse väravast. Selline linna peatänavalahtumine linnuse väravast on Eesti keskaegsete linnade puhul tüüpiline (nt Pikk tn Uus-Pärnus, Suur tn Narvas ja Lossi tn Viljandis). Paides likvideeriti ühendus linnuse ja linna vahel tõenäoliselt seoses muldkindlustuste rajamisega. Posti tn olemasolu on hädavajalik vaid praeguses olukorras, kus Rüütli tn ei ulatu sellest kaugemale põhja suunas. Keskajal ei pruukinud Posti tänavat olla. Juhul kui Rüütli tn sai alguse linnuse väravast, siis arvatavasti olid ka uuritud piirkonnas keskaegsed kinnistud kitsad ja ida-lääne suunas välja venitatud nagu praegugi lõuna pool Rüütli tn ääres.

1683. a plaanil on Rüütli tn lääneküljel, põhjaotsa juures kujutatud väike väljak, mida on eksplikatsiooninimetatud rootsi keeles *gaml. Drillplatz*, „vana drillimisväljak“ (jn 2–3). Kalle Kroon seostab väljakut oletamisi Paide kodanike keskaegsete sõjaväeharjutustega, kuid seisukohta kritiseerib Kaur Altoa, kelle hinnangul olid sellised linnaväljakud tüüpilised pigem uusaegsetele garnisonilinnadele. Juhul, kui väljak ulatub keskaega, siis on loogilisem oletada, et tegemist oli hoopis vana turuväljakuga. Kuigi vanimatel kaartidel on Paide turukoht hoopis kiriku lõuna-

küljel Pika tn ääres, on põhimõtteliselt võimalik, et algselt asus see hiljem drillimisväljakuna tuntud alal. Selline asukoht oleks tüüpiline: nii Uus-Pärnus, Narvas kui ka Viljandis asus turuväljak linnuse värvast lähtuva peatänava ääres, ühe või kahe kvartali kaugusel linnusest. Kokkuvõttes võib Posti tn 12 leitud elamu keskaegses linnaruumis paiknemise kohta järeldada, et see võis asuda linnuse värvast lähtunud Rüütli tn ääres ning väga lähedal algele turuväljakule või isegi selle ääres. Kuna fakte keskaegse Paide kohta peaaegu ei ole, siis on tegemist hüpoteetilise rekonstruktsiooniga, mida tulevased väljakaevamised saavad kinnitada või ümber lükata.

Hiljuti võttis Andres Tvauri kokku Paide ajaloolist linnasüdat puudutanud arheoloogiliste kaevamiste väga vähesed tulemused. Leidude puudumist selatas ta muu hulgas sellega, et senised kaevamised on toimunud peaaegu eranditult vaid tänavatsoonis, aga kui tänavavõrk on keskajast püsitud muutumatu, siis esemeleide ja kultuurikihti on põhjust loota pigem kinnistutel. Posti tn 12 uuringute ja ümbritseva linnaruumi analüüsi alusel on võimalik neid järeldusi täpsustada. Paide ajaloolised kinnistud olid võrreldes suurlinnadega väga suured: 1692. a plaanil on väiksemate kinnistute tänavafraat 20 m laiune, kuid enamikul 30 ja 40 m vahel (jn 2); enamik ühelt tänavalt teiseni ulatuvaid kinnistuid olid u 100 m, mõnes kvartalis kuni 180 m pikkused. Niivõrd suurte kinnistute puhul hõlmas keskaegne majapidamine tõenäoliselt vaid väikese osa tänaväärsest maast ning suur osa kinnistut oli kasutusel aia- või põllumaana. Vastavalt ei kata kesk- ja varauusaegne kultuurikiht koos esemeleidudega katkematult kogu linna ala, nagu tiheasustusega linnades, vaid eksisteerib arvatavasti 10–20 m läbimõõduga laikudena kunagiste majapidamiste lähiümbruses. Arvatavasti paiknes enamik majapidamisi tänava ääres, tihti ilmselt samas kohas, kus praegused, kivikeldritega 18.–19. saj puust elamud, mille ehitamisega on osa varasemat kultuurikihti ja ehitusjäänuseid lõhutatud.

Kaevatud ala kirdeosast, vallikraavi nõlva seest leiti suure neljakandilise ehitise jäänused (sisemõõdud 7,9 × 10,0 m; müüri paksus 1,2–1,8 m; jn 1; 4–5; 7–9). Ehitist tõlgendati hiiglasliku lubjaahjana, mis on ehitatud vallikraavi nõlva sisse. Neli saviga, pae-kividest laotud välismüüri olid säilinud 2,5–3,5 m kõrgusena. Vaid põhjapoolne, vallikraavi põhja ehitatud fassaadsein oli ehitatud korralliku paksu seinana, kolmel vastu pinnast laotud seinal oli vaid sise-pind

laotud ühe kivi paksuse koorikuna, kuid augu serva vahe oli täidetud kivide, savi ja mullaga. Fassaadsein oli eriti paks nurkades (u 2,2 m), selles paiknes neli u 80 cm laiust segmentkaarset sissepääsuava ning avade vahel neli tugipiilarit. Sissepääsuavadest lähtusid umbes sama laiad käigud läbi kogu ahju lõunamüüri. Käikude vaheseinad olid enamasti säilinud vaid 20–40 cm kõrgusena, kuid kahe äärmise käigu seinad lõunapoolsetes nurkades kohati algses kõrguses: läänepoolse käigu lõunaotsas selgus, et paeivid olid laotud riitadesse astmikvõlvi põhimõttel, nii et kõik kitsenes ülespoole ning oli pealt kaetud paeplaadiga u 1,9 m kõrgusel põhjast.

Käikude põhjas, kohati ka vaheseinte (kiviriitade) jäänuste peal lasus kohati halvasti põlenud paekamakaid sisaldav lubjakihit 0,7–2,6 m paksusena, servades paksemana. Käikude põhjapoolsetes lõikudes oli lubja all säilinud mõnekümne cm paksune söekiht, kust võetud süsinikuproov andis 95,4% tõenäosusega tulemuseks kalendriaastad 1510–1592 ja 1619–1644. Võttes arvesse, et ahi oli ehitatud alles bastionite rajamisel oma lõpliku laiuse saanud vallikraavi nõlva sisse, ei saanud see tõenäoliselt toimuda enne 1580. aastaid. Ei saa välistada, et ahi rajati alles pärast Paide linnuse kustutamist Rootsi kindluste nimekirjast 1636, kuid tõenäoliselt ehitati see pigem bastionite ehitamise käigus mitmesuguste vajalike kivimüüride jaoks lubja tootmiseks Rootsi sõjaväeinseneride poolt. Arvatavasti põletati ahjus toorainena kive, mis saadi linnuse keskaegsetest müüridest, mis osutusid moderniseerimisel üleliigseteks.

Eestis on lubjatootmist kesk- ja varauasaial uuritud suhteliselt vähe. Põhjapoolse Euroopa arheoloogia kirjanduse põhjal jääb mulje, et nii suuri tööstusliku ajastu eelseid lubjaahje nagu Posti tn 12 leitu, ei ole arheoloogide uurimisfookusesse jäänud; samas on kõigis maades säilinud palju suuri 19.–20. saj tööstuslikke ahje. Posti tn ahjule sarnaseim analoog leiti Narva kindlustuste 1680.–1699. aastatel valminud plaanidelt (jn 10): Gloria bastioni tipu lähedal on kujutatud hiiglaslikku (sisemõõdud u 12 × 17 m), tasasele maale ehitatud, kahes vastasseinas paikneva kuue sissepääsuavaga, nurkadel massiivsete neljakandiliste tugipiilaritega varustatud ahju. Selle ahju suurus, korrapärane arhitektuur ja üldine kontekst toetavad oletust, et ka Posti tn 12 leitud ahju puhul on tegemist Rootsi sõjaväeinseneride poolt kindlusemüüride tarvis ehitatud lubjaahjuga. Narva ahi oli suurem, aga seda oli ka ehitatav kindluskompleks.