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The medieval and modern era building complex at 2 Lutsu Street in Tartu

Results of the archaeological, architectural historical, dendrochronological and osteoarchaeological research

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In December 2008, archaeological investigations started in Tartu at 2 Lutsu Street (Fig 1), in connection with the renovation of the house in use by the Tartu Toy Museum and the establishing of the cellar rooms. The investigations that were planned as short-term monitoring works turned out to be almost year-long fieldwork. Archaeological research implied that in the course of the construction of one of Tartu's oldest preserved wooden houses, established in the middle of the eighteenth century, the earliest structures had not been destroyed completely but some of these had remained underneath the building. At least two medieval buildings can be discerned that have been preserved to a considerable extent. Moreover, in addition to walls, a complete stove-hypocaust was unearthed. The disposed medieval constructions were preserved almost completely, and a part of these can be observed in the museum.

The completed investigations provide much information about the medieval houses of Tartu and specify the street network of the period. The material of the filling layers amassed in the course of rebuilding and dismantling the houses, including one of the biggest tile and everyday pottery collections of Estonia, offers data abut the modern era processes in Tartu, for example the changes in heating systems, the extent of war damages, etc.

The excavations took place in several stages and proceeded primarily from the needs of the renovation works and the foundation depths of new rooms. Therefore, only one of the medieval rooms was entirely opened and excavated to the natural soil, and the majority of rooms were only partly

Fig 1. The situation plan of 2 Lutsu Street. Kristel Külljastinen.

unearthed and merely until the planned floor levels. In these cases, test pits were dug in order to gain data about the strata beneath. The gathered find material and the documentation of the building remains is huge, as a result of which the analysis is still being completed by different specialists and will be continued for years. In spite of this, the main part of the information has been organized, the first radiocarbon analysis has been made, and the initial standpoints have been formed which could quickly reach the academic circles. In the current article we concentrate descriptively on the medieval construction remains, presenting the bulk of the material and tentative conclusions. In the main part, however, we will discuss the find material, especially glazed tiles and human bones, from modern era layers, and we will also present the results of dendrochronological analyses.

Medieval constructions[1]

Building I

In the first medieval dwelling house, three rooms were opened almost entirely and one partly. The total number of rooms is unclear. Building I had been established on a previously used territory. Several planning

[1] About medieval period building remains, see also Aivar Kriiska, Raido Roog, Kaur Alttoa, "Mittelalterliche Überreste der Lutsu-Strasse 2, Tartu: Verläufige Forschungsergebnisse", *Baltic Journal of Art History* (Spring, 2010), 171–200.

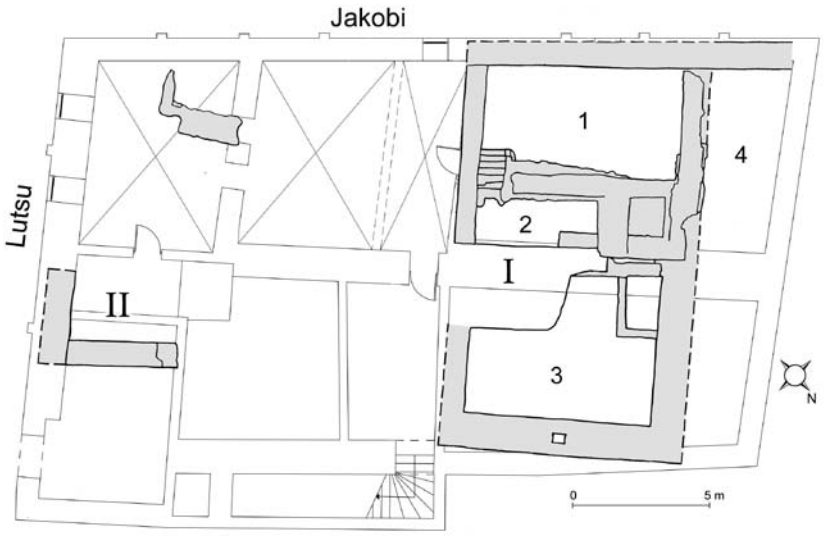

Fig 2. Medieval wall remains on the contour of the present building. Kristel Külljastinen.

layers lay under the walls, and two wooden constructions are older than the building. One of these was situated in the southern corner of room no 1 (Fig 2). The remains of logs were found from the depression dug into the natural soil at a depth of approximately 110–120 cm. Longer logs (approximately 1 m long in their visible section, 8–16 cm thick) lay in the northeast-southwest direction. The exact construction of the formation remains unclear, but we were apparently dealing with a sort of system for irrigation or water ducting.[2] The other part of the wooden construction – the stratum of 24–26 cm wide northeast-southwest directed logs – was unearthed in test pits dug into different parts of room no 3. The radiocarbon analysis gave the result of 1330±80 AD for the date of one of the burnt logs and 1470±170 AD for the other (Tab 1). The latter is apparently incompatible and can be explained by the contamination of the sample with later carbon, since the charcoal from the cultural layer covering the wooden construction was also dated to the fourteenth century.

Room no 1 is approximately 7×3–4 m (Fig 2). The preserved parts include the walls of the ground floor laid of boulders and bricks[3] up to a height

[2] Through the area of Lutsu Street, an underground water flume ran from Toome Hill to Emajõgi River. See August Mieler, "Tartu aseme geomorfoloogia ja hüdroloogia", *Tartu* (Tartu, 1927), 185.

[3] The proportions of bricks are ordinarily 30–31×14–14.5×9–9.5 cm. Those kinds of bricks were used in Tartu through the medieval period.

Fig 3. View of room 1 of medieval building I form the northwest. Kristel Külljastinen.

of more than two meters until the supporting structures of the partition joists of the main floor (Fig 3).

The southwestern outer wall, which also reaches room no 4, was established of bricks and boulders without a discernable foundation on top of the mortar layer. In places, plaster has been preserved on the walls approximately 75 cm from the foundation depth. In the southeastern part, a relieving arch of bricks has been discerned above the earlier wooden construction (Fig 4). Four holes for the ceiling joists were found in the top part of the southwestern wall.

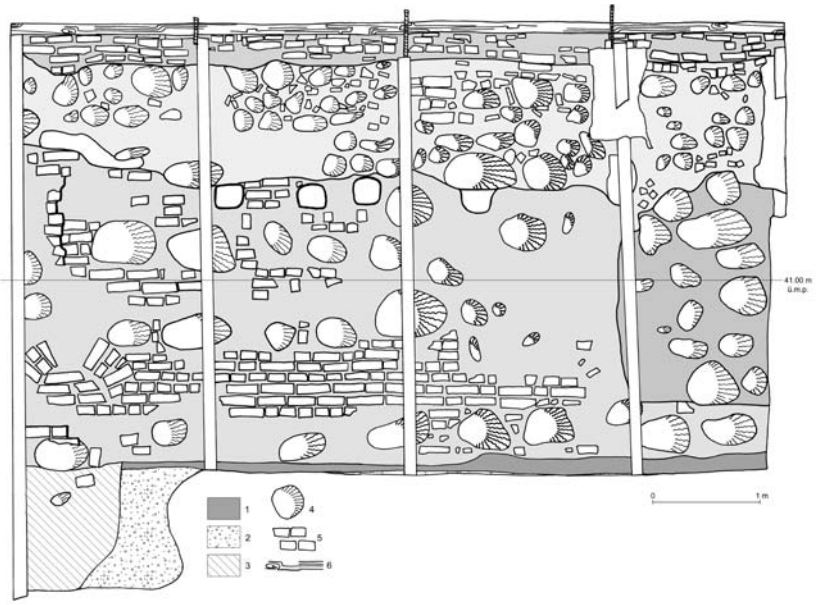

Fig 4. The southeastern wall of room 1 of medieval building I. Symbols: 1–black soil layer, 2–grey natural gravel, 3 – a pit , 4 – granite, 5 – brick, 6 – wood. Kristel Külljastinen.

Fig 5. View of the northwestern wall of room 1 of medieval building II from the southeast. Kristel Külljastinen.

Fig 6. Part of the northeastern wall of room 1 of medieval building I, and a staircase. Kristel Külljastinen.

The exact founding depth of the southeastern wall, which also reaches room no 2, could not be determined. The wall was established of bricks and boulders and was plastered, perhaps also repaired with bricks. We are supposedly dealing with the outer wall.

The 90–110 cm thick northwestern wall was built on the filling layer, consisting of pieces of bricks against the southwestern wall of room no 1 and continuing towards the northeast into room no 3. The foundation was laid of boulders and the wall of bricks. In the northeastern part of the northwestern wall the section protrudes from the rest of the wall by one vertical brick layer, a probable later inset. A vaulted door (gate?) opening, with a height of 190 cm and a width of 230 cm that was bricked in with boulders with a diameter of up to 60 cm, is located in the southwestern part (Fig 5). The filling was covered with plaster.

The northeastern wall was built in several stages. This part of the wall was laid on a foundation of bricks and boulders on top of the cultural layer rich in brick debris. The earliest stage consists of bricks. A wall of boulders and bricks was established on top of and next to the brick wall of the first construction stage. The wall of boulders and bricks was covered with plaster. In the upper part of the described wall there are six holes for ceiling joists. The inner surfaces of these holes consisted of mortar and pieces of bricks and roof tiles.

A 95 cm wide staircase (Fig 6) of bricks is situated in the northeastern wall of room no 1. The staircase has seven preserved steps with a height of 18–24 cm and a depth of 25 cm. The staircase was established against the southeastern wall of room no 1. The northwestern inner side of the stairway, made of bricks, was laid against the second construction stage of the northeastern wall. As indicated by the 7–15 cm deep and 2 cm high gaps in the partition wall and the back wall of the highest step, the staircase was covered by boards. In parts, timber was preserved which gave 1330±70 AD (Tab 1) as the result of the radiocarbon analysis.

Tab 1. Radiocarbon dates from the excavation plots of 2 Lutsu Str.

Sample	Lab. no.	Radiocarbon age (BP)	Measuring age (1s) (AD)*	Measuring age (2s) (AD)*
Building I, room no 1, wood from the burnt layer 39.4 m asl	SPb-79	680±100	1250–1400	1150–1450
Building I, room no 1, wood from the boarding of the staircase in the northeastern wall	SPb-80	670±50	1270–1390	1260–1400
Building I, room no 3, charcoal from the cultural layer on the natural soil ca 38.55 m asl	SPb-156	665±60	1270–1400	1250–1420
Building I, room no 3, brand from the wooden construction 38.85 m asl	SPb-157	470±80	1320–1620	1300–1640
Building I, room no 3, brand from the wooden construction	SPb-180	680±50	1270–1390	1250–1410
Building I, room no 3, charcoal from the layer on the wooden construction	SPb-179	700±60	1250–1390	1210–1400
Building I, room no 3, wood in front of the southeastern door	SPb-182	90±30	1690–1920	1680–1930
Building II, coal from the burnt layer ca 39.4 m	SPb-81	570±50	1310–1420	1290–1490

* All the calibrations by: Atmospheric data from Paula J. Reimer and others, "IntCal04 terrestrial radiocarbon age calibration, 0-26 cal kyr BP", *Radiocarbon,* 46:3 (2004), 1029–1058; Christopher Bronk Ramsey, OxCal (computer programme). Version 3.10. The Manual, 2005 (available at <http: //www.rlaha.ox.ac.uk/oxcal/oxcal.htm>); cub r: 5 sd: 12 prob usp[chron].

Fig 7. The southeastern wall of room 2 of medieval building I. Kristel Külljastinen.

There were several floor layers in room no 1, but only one of these can be clearly distinguished. At a depth of 3.4 m from floor level prior to the reconstruction works, a floor pavement of bricks was laid on the sand cushion. Some finds from the burnt layer underneath the bricks and the sand cushion helped determine the age of the floor: a piece of wheel-thrown pottery (TM[4] A 178: 4795) originates from the late sixteenth century, a fraction of a tripod (Fig 18: 4) from the second half of the sixteenth century, and a piece from the narrow edge of a corner tile (TM A 178: 4887) from the third quarter of the sixteenth century. The brick floor probably was laid after the destructions of the Livonian War (1558–83).

The status of room no 2 is not entirely clear. The modern rebuilding conceals whether it was detached from room no 3 entirely or only partly

[4] TM = Tartu City Museum.

Fig 8. View of the orifice of the stove-hypocaust from the northeast. Kristel Külljastinen.

with a partition wall. If the part of wall opened in room no 3 is a fragment from a former partition wall, then room no 2 was approximately 7×2 m large and a stove-hypocaust encompassed 5.5 sq m of this (Fig 2).

The uneven southwestern wall of room no 2 was built of boulders joined with mortar and wedged with roof tiles and pieces of bricks. The southwestern wall is secondary in relation to the southeastern wall (Fig 7). In the upper part of the wall, a 20 cm deep step laid of bricks was discerned that supported the former ceiling construction. The part of the wall above the step had been preserved at a height of 30–40 cm. Differently from the wall below, it had been laid very carefully, using bricks and carefully chosen boulders that had a flat side or were hewed into shape.

The southeastern wall of room no 2, only part of which was opened, was established on a dark soil layer deposited on natural travertine. The lower part of the wall consisted of bricks that supported a row of boulders, and the upper part was made of both bricks as well as boulders. Differently from room no 1, this wall in room no 2 has not been daubed, although we are dealing with the continuation of the same wall. An approximately 145 cm high and 65 cm wide vaulted door opening (Fig 7) is situated in the central part of the unearthed wall. The door had been bricked in with boulders and densely covered with plaster.

Fig 9. View of the inner vaults of the stove-hypocaust from the south. Kristel Külljastinen.

From the northwestern side, room no 2 was encircled by a stove-hypocaust (Fig 2). The inner dimensions of the hypocaust from the top were 130 cm from northwest to southeast, in the northwestern wall 145 cm, and in the southeastern wall 135 cm from northeast to southwest. The heater cobbles with the diameter of 10–40 cm had been swollen and brittle from the strong heat. The cobbles had been laid on the arches and against the inner walls of the stove so that smaller ones could be situated above with bigger ones below. The inner walls of the stove, laid of bricks and some boulders, were built against the detaching wall of rooms 1 and 2 in a way that indicates that the northeast-southwest directed walls of the stove were established first and the northwest-southeast directed wall with the stove orifice later. Red clay was used as the binder. The up to 52 cm high and 68 cm wide vaulted orifice of the burner of the hypocaust is located in the northeastern wall (Fig 8). A step of bricks and boulders was established by the southeastern, southwestern, and northwestern walls of the stove. The step supported both the two arches that carried the heater cobbles (Fig 9) as well as the heater cobbles themselves (Fig 10). Both the width as well as depth of the heating chamber under the arches is 100 cm, and the height measured from the bottom of the stove up to the center of the arches is 60 cm. The bottom of the chamber was laid of bricks.

Fig 10. View of the heater rocks of the stove-hypocaust from the northeast. Kristel Külljastinen.

On the main floor above the stove-hypocaust there were floor panels made of baked clay and with a hole located in the centre. Two of these panels were found in the first filling layer, the first one from the filling layer of room 4 (TM A 178: 10893) and the second one from the filling layer of room 2 (TM A 178: 4391). Pieces of caps meant for closing the above mentioned holes were found in filling layers of the houses (e.g. TM A 178: 5677).

In the case of room no 2, it is possible that it was filled up already during the use of the building in the Middle Ages. This is indicated by both the unevenness of the southwestern boulder wall (it seems that the stones were laid directly on the soil) and the filling material that provided neither the fragments of tiles nor pot-like tiles. Certain findings from the filling, such as the fragments of fourteenth- and fifteenth-century wheel-thrown pottery (TM A 178: 5240, 5244, 5242), stoneware from Siegburg with annealed surface dated to the last quarter of the fourteenth century and the last quarter of the sixteenth century[5], glazed North-West Russian pottery dated to the third quarter of the fourteenth century and the first quarter of the fifteenth century[6], or the fragment of a glass goblet (TM A 178: 5227), biconical

[5] Erki Russow, *Importkeraamika Lääne-Eesti linnades 13.–17. sajandil* (Tallinn: Tallinna Ülikooli Ajaloo Instituut, 2006), table in the end of the book.
[6] *Ibid*.

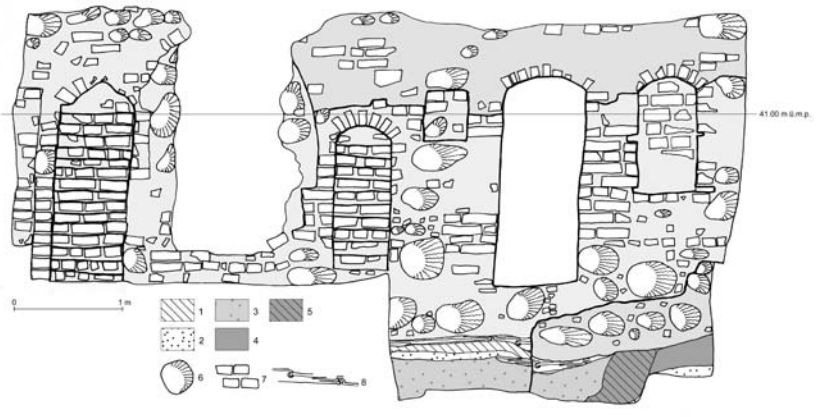

Fig 11. The northeastern wall of room 3 of medieval building I. Symbols: 1 – dark-grey rubble layer, 2 – natural river lime, 3 – brown layer with brands, 4 – black soil layer, 5 – mixed black soil layer, 6 – granite, 7 – brick, 8 – wood. Kristel Külljastinen.

ceramic spinning wheel (TM A 178: 5237), and the needle made of bone (TM A 178: 5263) dating back to the Middle Ages. The filling layer also contains a lot of animal bones. This room probably formed in the course of building the stove-hypocaust. The stove does not originate from the first construction stage. This is indicated by the fact that there is a bricked in door opening just above the stove in the wall between the rooms 1 and 4. If the stove and the wall between the rooms 1 and 2 as well as the staircase had been established simultaneously, and there is hardly any reason to doubt that, then the radiocarbon date of the boarding of the staircase also dates the building of the stove. In the case of the hypocaust, we are dealing with a heating system widely used in Old Livonia, more than 90 of which have been documented in the area of Estonia,[7] though this is only the sixth oven of this type extant in Tartu.[8] On the basis of the oldest finds of stove tiles gathered from the filling layer (if these originate from the same building), it can be suggested that this hypocaust was still used during the sixteenth century.

Room no 3 is situated at the side of the yard of the building under discussion and is 5/5.5×7 m large (Fig 2). The preserved parts include the walls

[7] Andres Tvauri, "Late medieval hypocausts with heat storage in Estonia", *Baltic Journal of Art History* (Autumn 2009), 76.

[8] Andres Tvauri, "Õhkküte keskaegses Viljandis ja mujal Eestis", *Viljandi Muuseumi aastaraamat 2007* (Viljandi: Viljandi Muuseum, 2008), 82.

of the ground floor built of boulders and bricks up to more than two meters until the supporting constructions of the partition beams of the main floor.

Several construction stages can be discerned in the northeastern wall of room no 3. The older part is 90–120 cm thick and built on a foundation of boulders, pieces of bricks, and mortar. The foundation could be followed by 1.7 m length in the southeastern part of the northeastern wall and it protrudes from the northeastern wall maximally by 60 cm. The northeastern wall northwest of it had been established on the debris layer with pieces of bricks. The bricks and boulders wall under discussion is primary in relation to both the southeastern as well as northwestern walls. Two door openings, two shafts, and one niche can be discerned in the wall (Fig 11). The northwestern door opening was almost entirely dismantled. The opening is, however, indicated by the threshold carefully laid of bricks and a few preserved bricks of the vault. The width of the door opening at the narrowest spot is approximately 90 cm and the height by the vault approximately 190 cm. The height of the southeastern door opening is 190 cm by the vault and 200 cm in the center and its width is 82 cm. The northwestern shaft was laid of bricks as a diagonal plane rising towards northeast, so that every upper brick is 3–4 cm behind the lower. The height of the shaft opening in the wall by the vault is approximately 165 cm and in the center approximately 180 cm, the width being approximately 65 cm. The southeastern shaft is analogous to the previously described one, its height being approximately 120 cm by the vault and approximately 115 cm in the center, the width being approximately 65 cm. The function of the shafts is not entirely clear. Most probably these were airing shafts,[9] which were supposed to relieve the cellar of moisture penetrating the floor underneath.[10] There are grooves in the side walls of the niche that used to hold the timber shelf planks. The first groove was situated in the bottom of the niche and the other one 45 cm from the bottom of the niche.

The southeastern wall of room no 3 has been preserved only partially. The wall of boulders and bricks was created on reddish debris layer and is secondary in relation to the earlier construction stage of the northeastern wall.

The northwestern wall of bricks and boulders was probably built in different stages. Its earliest part was located on a protruded foundation. The foundation was constructed partly on sand and partly on dirt of boulders and pieces of bricks. There is a 14–16 cm deep step in the upper part of the preserved wall. The step supported a former ceiling construction.

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[9] It has been suggested that these were fireplaces. But this cannot be true, as the foot of the shaft does not have a vertical wall, which is always the case with fireplaces.

[10] See footnote 2.

The nature of the southwestern wall of the room is more difficult to assess. The location of the wall has gradually changed with time. The wall with the door opening laid of bricks or the part of it that hides the stove-hypocaust (Fig 8) were preserved better. The width of the door opening is 110 cm, its height in the middle of the vault is 190 cm and by the vault 178 cm. Part of the wall is 220 cm long, and it is not clear whether or not they are the remains of the full partition wall between the rooms 2 and 3. The thickness of the walls on the internal side is 50 cm and only 31–32 cm under the vault of bricks, in other words, the length of one brick. Another part of the wall of bricks was situated northeast of it. This 48 cm thick wall, which has been documented by the length of 250 cm, was preserved up to 80 cm in height.

A part of a brick construction (Fig 2) was excavated in front of the orifice of the stove-hypocaust in the western corner of the room. Its northeast-southwest directed side was approximately 180 cm and northwestern-southeastern side approximately 120 cm long. Its purpose or the time of construction could not be determined, but it could have been simply the platform in front of the hypocaust or the foundation of the heating chamber.

The dimensions of room no 4 are not clear, but its existence is indicated by the continuation of the southwestern wall of the building towards the northwest of room no 1, as well as the step of the ceiling construction on the northwestern side of the northwestern wall of room no 1. In the course of excavations, a part of the southeastern and southwestern wall of room no 4 were unearthed.

The southeastern wall was rebuilt several times (Fig 12). The wall of bricks is located on a foundation of boulders laid in a single row, whereas the latter was erected directly on a natural gravel layer. The southwestern part of the wall is thinner than the northwestern part by one brick, whereas the wall was established simultaneously. A door opening filled with bricks was located in the northeastern part of the wall. The biggest height of the door opening was 183 cm in the middle of the vault and 153 cm by the vault, the width being 238 cm.

The southwestern wall of room no 4 could only be studied in a 2.5 m long section. The brick wall was established on a foundation of boulders laid in a single row. A 102 cm wide door opening was situated in the southeastern part and a 106 cm high and 60 cm deep niche of bricks in the northwestern part of the wall.

The time of the establishment of the first dwelling house is unclear but the burnt layer under the sand cushion, in case of which the fire inside the stone building cannot be excluded, gave 1300±150 AD (Tab 1) for the date.

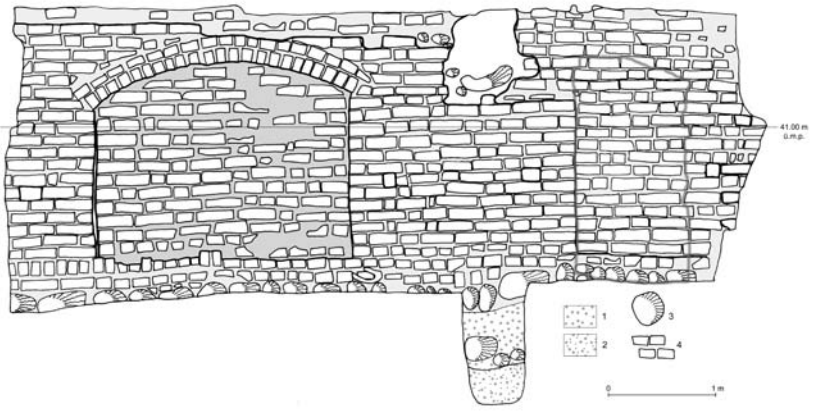

Fig 12. The southeastern wall of room 4 of medieval building I. Symbols: 1 – yellowish gravel, 2 – grey natural gravel, 3 – granite, 4 – brick. Kristel Külljastinen.

The charred pieces of wood found in the cultural layer deposited directly on the natural soil layer in room no 3 were also dated to the first half of the fourteenth century (1335±85 AD, Tab 1), but even here the connection to the building is not entirely certain. Findings from the described layer do not help determine the age more accurately, but they certainly do not contradict the above dating. The time of usage of Langerwehre (*Southern Lower Saxony)* stoneware [11] with engobe (TM A 178: 5059, 5060) in West-Estonian towns has been placed into the period between the last quarter of the thirteenth century and the second quarter of the fourteenth century.[12] Proceeding from these dates, the first quarters of the fourteenth century could be suggested for the construction time.

The ground floor of the building was rebuilt on several occasions. According to the radiocarbon date from the sample from the covering boards of the steps of the staircase, it could be proposed that the partition wall of room no 1 and the staircase leading to the main floor were rebuilt in the second half of the fourteenth century. The shape of the building, its size, and the planning of rooms is not entirely certain since only two sure outer walls (southwestern and northeastern) and one supposed outer wall (southeastern) were excavated, and at the same time the boundaries of the house towards the northwest are not sure. In any case, at least one room was in the part of the building next to Jakobi Street, but it cannot be excluded that there was another

[11] Determined by Arvi Haak, March 2011.
[12] Russow, *Importkeraamika Lääne-Eesti linnades*, table at the end of the book.

Fig 13. View of the lower paving above room 4 of medieval building I from the south-east. Kristel Külljastinen.

room behind it by the yard. The latter statement is supported by room no 4 and the collection of finds among the filling material on top of the upper cobble stone pavement northeast of the room, as well as its chronological similarities. These include numerous fragments of stove tiles from the end of the seventeenth century and the beginning of the eighteenth century, in case of which we might be dealing with the dismantling rubbish of not only the excavated house but several buildings in the neighborhood.

The northwestern part of building I was dismantled by the end of the Middle Ages or in the early modern period. It is tempting to associate this with the damages of the Livonian War in the second half of the sixteenth century, but archaeological proof for this is absent. After the dismantling a cross-road was established there, the surface of which was paved with boulders. The pavement laid on the sand cushion was at least 2 m wide, and bigger boulders (with a diameter of 30–50 cm) encircled the deposit of smaller stones (with a diameter of 5–20 cm). The area was filled between 1500–1700, and another at least 2 m wide pavement of boulders (with a diameter of 5–30 cm) was built (Fig 13). On the basis of the finds gathered from the sand cushion under the stones, the upper pavement can be dated to the seventeenth century.

Fig 14. View of the remains of the walls of medieval building II from the northwest. Kristel Külljastinen.

The southeastern side of building I was continuously used and was damaged during the Great Northern War. It cannot be excluded that the house was used after the war as well, but in any case it could not be restored or adapted to the needs and possibilities of the time. The buildings were dismantled and the rubbish (which dated to the beginning of the eighteenth century) was used to partly fill the rooms of the ground floor of the medieval dwelling house. Apparently the dismantling was simultaneously taking place in several buildings, so the fragments of the same stove tiles have been found from rooms no 1 and 4 of building I and from building II.

Building II

The building was situated on the corner of Lutsu Street and Jakobi Street, southeast of building I (Fig 2). The limited volume of archaeological research did not determine whether the two buildings were located next to each other during the Middle Ages or with space between them. One cannot even rule out the possibility that all the rooms were part of the same building or that at a certain point the two houses were reconstructed from a single building. The initial size of the building and its spatial division is unclear, since a single room was only partly opened during the excavations. Some kind

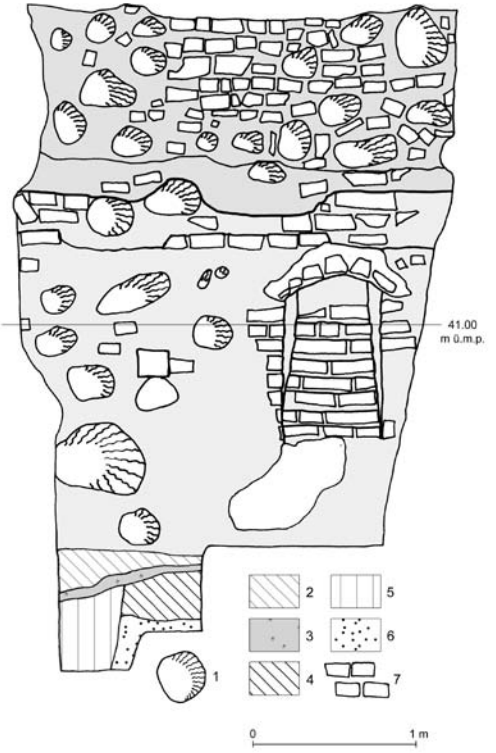

Fig 15. The southeastern wall of medieval building II. Symbols: 1 – granite, 2 – reddish rubble layer, 3 – burnt layer, 4 – dark soil layer, 5 – a post hole, 6 – natural river lime, 7 – brick. Kristel Külljastinen.

of structure had stood on the spot already before the construction of the stone building. Black burnt layer consisting of charcoal and pieces of burnt wood was located under the stone walls and the planning layer probably preceded the walls that included the debris of bricks and roof tiles. The charred piece of log taken from the burnt layer was radiocarbon dated to 1360±70 AD (Tab 1). The dating was fully consistent with the fragments of wheel-thrown pottery unearthed (e.g. TM A 178: 6214, 6219, etc).

The northeastern and southeastern walls of the ground floor (Fig 14) of the unearthed stone building have been preserved up to a height of 2 m and were simultaneously established on the above-described reddish planning layer. The walls of bricks and boulders were erected on the foundation consisting of boulders. In the upper part of the preserved sections of both walls, there is a 14–18 cm deep step that supported the former ceiling

construction. The thickness of the northeastern wall below the step is approximately 105 cm and above the step approximately 90 cm. A 100 cm high and 55 cm wide shaft (Fig 14 and 15) is situated in the southwestern part of the southeastern wall. Both the edges of the shaft as well as the diagonally risen plane have been laid of bricks. A 15×18 cm big and approximately as deep hole, probably established for the scaffolding, is situated in the northeastern part of the same wall. Both walls were plastered. The initial floor was a 5–10 cm thick layer of light lime mortar of even composition.

The house was seriously damaged in the Great Northern War and was dismantled probably in the middle of the eighteenth century in the course of the construction of a new building. Among other things, this is reflected in the filling material, the main part of which includes shattered (with few exceptions of intact) everyday vessels, including pottery, which were probably used until the first half of the eighteenth century.

A latrine bin

Outside the building, primarily modern era layers have been investigated in connection to the securing of the foundation, the laying of pipes, and the works in the courtyard. As an exception, a medieval latrine bin was opened up (Fig 16). It was located 1.4 m to the northeast from the center of the northeastern side of the modern building at 2 Lutsu Street. It was possible to investigate the latrine only to the extent needed for construction works. The southwestern side of the bin, 2.4 m long, and partly on the southwestern side (1.15 m) were excavated and cleaned to the depth of seven logs. The bin had been built from unpeeled logs of an average diameter of 10–15 cm, and connected by saddle-notch corners. In the bin there was a dark brown organic-rich layer of soil, from which some leather objects and leftovers from leather crafting (TM A 178: 10882, etc.) as well two pieces of a birch bark vessel (TMA A 178: 10 880, 10 881) were found. Since other latrine bins found and examined in Tartu have been as a rule situated in central parts of the lots in central areas of house quarters,[13] it is reasonable to assume that the bin at 2 Lutsu Street was also placed in what was previously a courtyard and that similar latrine bins could be found in the proximity.

The beams of the latrine bin were dated dendrochronologically. The common dendrochronological practice in Europe requires multiple wood

[13] Rivo Bernotas, "14. sajandi teise poole jäätmekast Tartus Ülikooli 15 õuel", *Tartu Linnamuuseumi aastaraamat* XIII (2007), 54, 61.

Fig 16. View of the partly excavated latrine bin from the southeast. Kristel Külljastinen.

samples from different beams.[14] The tree-ring series of the samples should contain at least 70 tree rings, to ensure the reliability of their similarity. From the tree-ring series, the most similar series are selected and averaged. For measuring and statistical treatment of the ring-width series, computer

[14] Dieter Eckstein, *Dendrochronological dating*, Handbooks for Archaeologists 2 (Strasbourg: European Science Foundation, 1984), 55.

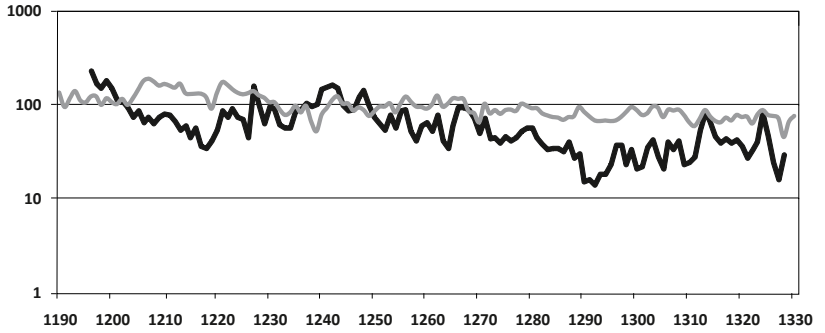

Fig 17. The average of samples of latrine from 2 Lutsu Street (black line) in Estonian pine chronology (grey line). Y-axis marks the width of annual ring and x-axis marks the years. Rivo Bernotas.

programs Catras (Aniol) and TSAP-Win (Rinntech) were used. Similarity of the series is assessed by Student's t-criterion and by the percentage of agreement (*Gleichläufigkeit*) W. In the case of 100-year coverage of the pair of series, the Student's t≥4 is considered to be significant. Higher t shows higher similarity of the two series. The agreement is the percentage of common year-to-year variations (either decreasing or increasing) in the two ring-width series.[15] The program Catras shows if the percentage of common variations is significant at 95.0, 99.0, or 99.9 significance level. Besides these two statistical similarity indices, all similarities of series were checked visually on graphs. The same statistics and visual checking were used in dating the sample series with the dated reference series.[16]

From the beams of the southwestern wall of the latrine bin, six cross-sections were removed and the width of their tree-rings measured. Two series of them appeared similar with each other and they were averaged into a mean series 1eplu2a1, with length 133 ring-widths. Matching of this mean series with dated reference chronologies produced dendrochronological dating of the mean series of 2 Lutsu Street: AD 1328. The reference chronologies included Estonian pine chronology 3epalaja (t = 5,30, W = 68,2), a latrine bin of 14 Ülikooli Street in Tartu 3epy1401 (t = 4,40; W = 67,0),

[15] *Multilingual glossary of dendrochronology: terms and definitions in English, German, French, Spanish, Italian, Portuguese and Russian*, ed. by Michèle Kaennel and Fritz Hans Schweingruber, Swiss Federal Institute for Forest, Snow and Landscape Research (Bern: Paul Haupt Publishers, 1995).

[16] Alar Läänelaid, "Puude aastarõngalaiuste võrgustik Eestis", *Publicationes Instituti Geographici Universitatis Tartuensis*, 89 (2004), 298–312.

and Novgorod pine chronology 3rpnovo5 (t = 4,76; W = 64,0) (Fig 17). As the waney edge was not preserved in both averaged samples of 2 Lutsu Street, we assumed from the extremely fine outer rings that no more than ten rings had disappeared from the trunk surface. So the probable felling date of the trees for construction beams of the latrine bin would be in the limits of 1328 to 1338. As a simple construction like a latrine bin was probably built from raw timber (i.e. during next year after dendro-dating), the likely building year falls into period AD 1329–39.

The finding material from modern era layers

The ruins of medieval buildings were filled with soil containing all kinds of findings. The layers were in most cases actually constituted from rubble heaped during demolishing works after the Great Northern War. The filling was done gradually over many years and, in addition to the two houses described above, rubble from other houses was probably used in the filling. Apart from room 2 of medieval building I, most of the filling layers of the other rooms were more or less of the same age and of the same thickness, more than 3 m. Only in room 4 of medieval building I was the layer thinner than elsewhere, reaching the modern street pavement described above.

The finding material from the filling layers is rich and diverse, including pieces of buildings (bricks, roof blocks) and everyday pottery (Fig 18, 19), metal tools, coins from Poland-Lithuania, Sweden, and Riga (Fig 20: 1–9, 12), jewellery (Fig 20: 11, 13, 14), seventeenth-eighteenth-century cups and shanks fragment of pipes made from kaolin clay (TM A 178: 164, 5337, 5406, 5431), and animal and even human bones.

The volume of everyday pottery found in the filling layers is different in each room. From the filling of the ground floor of medieval building II many tripods with glaze, probably made in Tartu (Fig 18: 1, 2, 3, 5), as well as fragments of bowls and plates (e.g. TM A 178, etc.) and a complete clay mug were found. There are somewhat fewer examples of imported pottery in the findings; among the material there are fragments of a Frechen stone-ceramic bottle dated to the seventeenth century (TM A 178: 3928) and of a Westerwald jug with blue décor (TM A 178: 172, 3535).[17] There are also pieces of unglazed wheel-thrown pottery, some of which are from the medieval and early modern periods. Some tools – for example knives, scissors, axes – were also found in the filling layer (TM A 178: 6056, 8619). Some findings relate to the practice of war, such as a cross-bow bolt from

[17] Russow, *Importkeraamika Lääne-Eesti linnades.*

Fig 18. Fragments of tripods from the filling layer of medieval building II (1,2,3,5) and from room 1 of medieval building I (4) (TM A 178: 5694, 5708, 5712, 4829, 6050). Kristel Külljastinen.

the fourteenth century found in room 3 of medieval building I (TM A 178: 8628, 8629) (dating Ain Mäesalu 12.05. 2010), a stone cannonball (TM A 178: 5857) from medieval building II, and a bomb completely preserved in a cast-iron shell (with gunpowder intact) (TM A 178: 10 890) from room 1 of building I, and a decorative bone-plate of a stock of the crossbow or the gun (TM A 178: 10891). The latter depicts a man, naked, wearing a lion skin on his back, with a moustache and a beard – possibly Hercules (Fig 21). Among the rest of the finding material was a large bronze Orthodox cross (Fig 20: 10), a bronze penannular brooch from the thirteenth century and another one from the thirteenth–fourteenth centuries (dating by Heiki Valk, 21.05.2010, Fig 20: 13–14), a playing piece made of horn (TM A 178: 3536), and bone combs. One of the combs is a double composite (TM A 178: 4630) and three are double simple combs (TM A 178: 8889, 10445, 10583).

Fig 19. A ceramic cup and fragments of clay pots from the filling layer of medieval building II (TM A 178: 6054, 5710, 5683, 569). Kristel Külljastinen.

Analogues of combs decorated with circles and with flat connecting plates dated to the thirteenth-fourteenth century[18] and trapezoid simple combs to the twelfth-fourteenth century. Combs and few other findings, for example the fragments of wheel-thrown pottery mentioned above, indicate that the filling layer heaped up in the eighteenth century contains material not only from the modern but also from the medieval era.

A more thorough analysis has been done only in the case of stove tiles and glazed tiles. Among the glazed-tile findings there were, of course, many fragments of flanges, but some tiles were complete and still others could be restored by plastering. The result of this work is one of the largest and most complete collections of modern glazed tiles, which is well researched and therefore compares easily with earlier collections gathered from excavations in Pärnu[19] and 22–26 Suur Street in Narva.[20] In this article only some more general results will be presented.

[18] Heidi Luik, "Muinas- ja keskaegsed luukammid Eestis", *Muinasaja teadus*, 6 (Tallinn: Ajaloo Instituut 1998), 97.
[19] Aldur Vunk, "Pärnu 16. sajandi ahjukahlite tüpoloogiast ja valmistamise tehnoloogiast", *Stilus*, 6 (1996), 37–42.
[20] Aldur Vunk, "Narvast, Suur tänav 22–26, Leitud 16.–18. sajandi ahjupotid", *Linnas ja linnuses. Uurimusi Narva ajaloost*, Narva Muuseumi toimetised, 6 (2006), 74–89.

Fig 20. Coins (1–9, 12), an orthodox cross (10), string of beads (11) and penannular brooch (13–14) (TM A 178: 10761, 10770, 10763, 10764, 10767, 10772, 10762, 10766, 10765, 10892, 10773, 10771, 10774, 10769) found at excavations at 2 Lutsu Street. Kristel Külljastinen.

Fig 21. Decorative plate of bone (TM A 178: 10891). Kristel Külljastinen.

The finding material from room 1 in building I contains rubble from the demolition of stoves of different periods. Many burnt fragments of low relief tiles, which probably belonged to a baroque-style green tower oven with plant ornament (Fig 22: 8, 23: 3) from the second half of the seventeenth century, were found from the top layer (about a meter thick) of the filling, but also from the lower layers, and even from rooms 3 and 4 of building I, and from the northeastern corner of room 4, from which the filling was removed only a few dozen centimeters deep. This was probably an oven produced in Tartu in the Swedish period, because the context of findings allows one to connect the oven to the representative low relief massive crest tiles (TM A 178: 1821, 2729, 9221) with a stylized image of the crest of Tartu. From the same place large volumes of demolition rubble were found, which all originate from a green box A-oven depicting the rulers of Sweden, Gustav II Adolf (ruled 1611–32) and Christina (ruled 1632–54), dated to the second half of seventeenth century. From the second meter of the filling layer, well-preserved pieces of edge tile of a green B-II- and C-oven with geometrical ornament (e.g. TM A 178: 1998) from the second half of the seventeenth century were found. From the third meter of the lower layer of the filling in the described room, tiles of at least 15 different tiled stoves were found (this is in addition to the pieces of tiles of ovens described above). Most of these ovens were in use in the second half of the seventeenth century or in the beginning of the eighteenth century, but some findings also belong to earlier periods starting from the second quarter of the sixteenth century.

Fig 22. Glazed tiles found at excavations at 2 Lutsu Street (TM A 178: 67, 790/ 816, 3533/3534, 3502/ 3516, 9302, 2018 (1), 783, 768/3392 (1)/4239, 36/9291/9801/9825). Kristel Külljastinen.

From the filling layers of room no 3 of building I, mostly fragments of medallion tiles from the second quarter of the sixteenth century and the second quarter of the seventeenth century, as well as demolition rubble from a green tiled stove (e.g. TM A 178: 7742–7755) from the beginning of the eighteenth century, were found. A burnt fragment of a baroque-style edge tile, probably waste from the production of tiles (TM A 178: 7699) was also uncovered. It is possible to connect this finding to the pottery workshop run in Tartu from 1684–1708 by Johann Rehn. This theory is substantiated by the fact that the dates of the construction of the wooden house at 2 Lutsu Street and of the *Church of the Assumption of the Virgin Mary* (built in 1752/1753 and destroyed by fire in 1775), which was built on the place of the former workshop of Rehn, coincide to a large extent,[21] and it is known that rubble from the location of the church was brought as filling

[21] Niina Raid, *Tartu vanemaid ehitisi* (Tallinn: Eesti Raamat, 1981), 52.

material to other construction grounds in the town.[22] One of the oldest tiles originate from the filling of room 3 (TM A 178: 7987), which can be dated probably even to the second half of the fifteenth century up to the first quarter of the sixteenth century.

The filling layer from room no 4 of building I, the depth of which was only 2 m, contained more findings in the higher stratum. Tiles originate from about seven ovens. The dark green rosette oven can be dated to the second half of the sixteenth century, the green oven with Moresque ornament (Fig 22: 1) to the second half of the sixteenth century or the first quarter of the seventeenth century,[23] the light green box oven with saints to the first half of the seventeenth century, and the light green A-oven with geometrical ornament (Fig 22: 9), the green B-oven with geometrical ornament (Fig 22: 5), and the light green-greenly brown-light brown E-oven with geometrical ornament to the second half of the seventeenth century. The use of another tile oven can be dated more loosely to the seventeenth century or the beginning of the eighteenth century. Many fragments of the ovens from room 4 have also been found in the filling layer in room 1 (TM A 178: 1995, 1999, 2001, 2002, etc).

Tile findings have been collected also from the northeastern corner of room 4, where another medieval room may have been situated (as discussed above). The filling layer in that corner was removed only in the depth of 1 meter, yet quite rich finding material was collected. Most of the tile findings can be dated to the second half of the seventeenth century or to the beginning of the eighteenth century. One can identify the remains of at least three different tile ovens – of a baroque-style black tower oven, of a baroque-style black tower oven with wallpaper pattern, and of a green box B-oven with the rulers of Sweden. By the rock debris in the mixture of clay, we can suppose that tiles from the black tower oven were made in Johann Rehn's workshop,[24] while the tiles of other ovens were probably produced elsewhere.

The filling layer of building II was rich. The relatively large volume of everyday pottery, which came in large pieces (a few even complete) (Fig 18: 1–3, 5; 19: 1), suggests that the ruins of the building were used for some time as a place for the disposal of waste. Among other things, pieces of tiles dated to the second half of the seventeenth century were found; some of them are the same as those which were found in room 2 of building I.

[22] Andres Tvauri, Romeo Metsallik, "The production of the workshop of potter Johann Rehn of Tartu (ca 1684–1708)", *Estonian Journal of Archaeology,* 10 (1) (2006), 29, 54.
[23] Ieva Ose, "Ähnliche Verzierungsmotive der Ofenkeramik in Lettland und Litauen im 17. Jahrhundert", *Archaeologia Lituana*, 9 (Vilnius, 2008), 142.
[24] Tvauri, Metsallik, "The production of the workshop of potter Johann Rehn of Tartu", 37.

Fig 23. Glazed tiles found at excavations at 2 Lutsu Street (TM A 178: 439/2007, 35, 113/1064/2143, 51/9198 (1)/9198 (2)/10046, 61 (1)/61 (2)/83/360/373, 1994/3677, 9298, 9200/9962/9974). Kristel Külljastinen.

A fragment of a blue faience corner tile (TM A 178: 5553), dated from the first half of the eighteenth century, and a fragment of a baroque-style cone-shaped crest corner tile, which can be dated to the second half of the seventeenth century or the beginning of the eighteenth century, are included in the finding context researched here. The latter dating also applies to a fragment of a frieze tile (TM A 178: 5681). From the deeper parts of the filling layer, a faience cornice tile (TM A 178: 5872) dated to the beginning of the eighteenth century was found.

During the excavations, several human bones – one hip bone from the attic and the rest from the filling layer – and a relatively compact and disturbed skeleton were found. Among the stray bones at least nine individuals could be distinguished (five adults and four subadults). The adults were all male; the sex of the subadults was impossible to determinate due to undeveloped sex indicators on their bones. Among the mixed material no bone pathologies were discovered, but several tooth pathologies were

found (caries, hypoplasia, tooth stone). The only fully preserved skeleton, which was found behind the burner of the stove-hypocaust, belonged to a male aged 35–45 years (according to the skull structure). Excavation works were complicated by concrete that had gotten into the soil when construction poles were installed, and this had the result that the position of the skeleton could not be precisely determined. In any case this is not a full skeleton: it included a skull, ribs, shoulder blade, spine, but hand and foot bones as well as a hip bone were missing. The bones were situated in a north-south direction with the skull in the north. The head was lying lower than the rest of the skeleton. A bit higher up in the same filling layer there was a bronze penannular brooch (Fig 20: 13); the connection to the skeleton is, however, doubtful. How and why the skeleton got there is not clear. It is probable that part of the body or part of the half-decomposed body was placed purposefully in front of the mouth of the hypocaust. The person had pathological signs on the *thoracic vertebrae* (Th 2–7). It is an intervertebral discs disease of backbone called Schmorl's nodes. The origin of the disease could be congenital or caused by hard work or trauma.

Dendrochronological dating of the present wooden house

In March 2009, 21 borer samples were taken from the wall beams of the house at 2 Lutsu Street for dendrochronological dating. Another objective of the dendrochronological investigation was to establish if the horizontal and vertical wall beams were contemporary or not. For the selection of suitable beams for boring, the main criterion was the intact waney edge (the preserved outermost tree ring). Nevertheless, five cores appeared to be without waney edge. The sample cores were numbered and the location of each sample in the construction was recorded (core no 21 was taken from a removed post). Tree species was determined either visually or in some cases by microscope. Seventeen sampled beams appeared to be made of Norway spruce (*Picea abies* Karst.) and 4 beams of Scots pine (*Pinus sylvestris* L.). The width of the tree rings of the cores was measured to the nearest 0.01 mm in program TSAP-Win by using the measuring device Lintab (both Rinntech) and microscope Leica S4E. Four samples were left out for their small number (fewer than 40) of tree-rings. The ring-width series of the wood samples were synchronized with each other in pairs using program Catras (Aniol). The similarity of the ring-width series at a certain position was assessed by two statistics – the Student's t-criterion and the percentage of agreement. All similarity positions of the series were checked

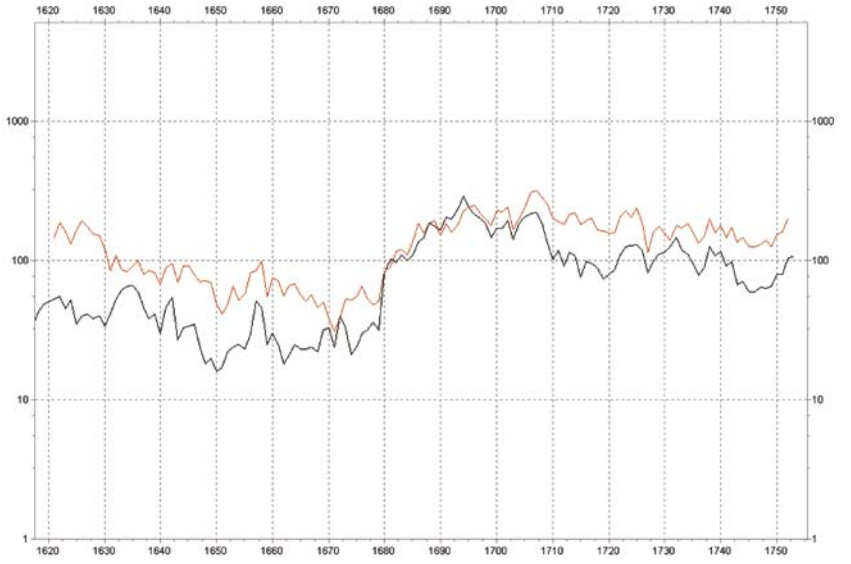

Fig 24. The mean ring-width series of 10 spruce samples of 2 Lutsu Street 1eslu204 (the red graph line) in synchronous position with mean spruce series of the Tampere House in Tartu (Student's t = 9.21, per cent of agreement W = 69.1 at 99.9 significancy level). Abscissa – calendar years, ordinate – ring width in 0.01 mm. Alar Läänelaid.

also on graphs. The reliable similarity of tree-ring series enabled step-by-step averaging of the ring series of ten beams into a mean series 1eslu204 with a length of 132 years.

For dendrochronological dating, this mean series 1eslu204 was synchronized with averaged spruce tree-ring series of Estonian buildings (altogether 56 series) as dated references.[25] The result was that the mean series of 2 Lutsu Street was significantly similar to a number of references (the Tampere House, 5 Lutsu Street, 30 Lutsu Street, Karlova Manor, 2 Struve Street, the Uppsala House, and 8 Jaani Street in Tartu, Järva-Madise Church, Palamuse Church, Catherine's Quay in Pärnu, Saadjärve Manor, and others) at the position where the last year of the 2 Lutsu Street series was AD 1752 (Fig 24). After this dendrochronological dating, it was possible to date also the single samples. As the mean series 1eslu204 contains tree-ring series from both horizontal and vertical beams, these single series were averaged into separate means. Figure 25 shows that the similarity of the mean series of horizontal beams and the mean series of the vertical

[25] Alar Läänelaid, "Puude aastarõngalaiuste võrgustik Eestis".

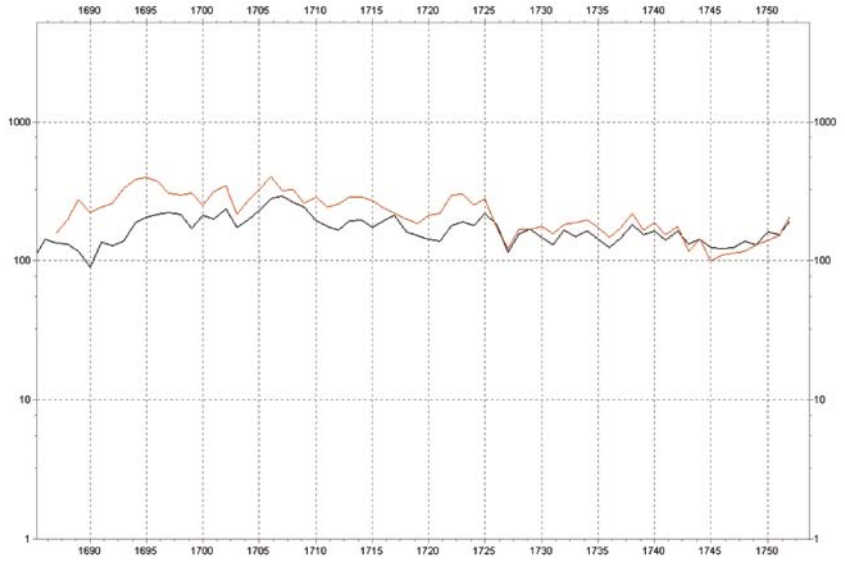

Fig 25. The mean ring-width series of 3 vertical beams 1eslu205 (the red graph line) and the mean ring-width series of 10 horizontal beams 1eslu206 in synchronous position. Note that both graphs end with the same year, AD 1752. Abscissa – calendar years, ordinate – ring width in 0.01 mm. Alar Läänelaid.

beams is evident, while both series end with the same date AD 1752. The dendrochronological dating AD 1752 refers to the last growth year before felling the trees. The spruces for building the house were felled after the summer of 1752 and before the next vegetation period of 1753, i.e. in the winter period of 1752/53. Assuming the use of raw timber, as was common in constructions in earlier centuries, the present house of 2 Lutsu Street was probably erected in AD 1753. The tree-ring analysis proved that the inner covering of the walls made of vertical beams was contemporary with the walls of horizontal beams, both dated to AD 1752.

Conclusions

As pointed out above, the research of the material from 2 Lutsu Street has only started and will probably continue for years. Therefore, we have not yet distinguished all medieval and modern era construction stages, which in some way or another can be followed in the excavated construction remains. As is often the case, there are hardly enough clues for dating the stone formations. For the time being, we will predominantly lean on the relative chronology

of the construction stages, radiocarbon dates, and the initial analysis of find material. The dating results of many wood and charcoal samples are not known yet, and the analysis of the find material is in a way superficial. Dendrochronology has added important details about the time of the construction of the preserved building and the age of the latrine bin. The latter is the fourth latrine bin dated with the methods of dendrochronology in Tartu.[26]

The medieval secular buildings in Tartu have not been much researched. On a number of occasions during excavations the remains of medieval buildings have been found,[27] but often these have been very fragmentary and have not resulted in substantial conclusions about the buildings themselves, let alone the wider picture. One should also note that in many cases there has been no attempt to analyze the unearthed ruins from the perspective of construction techniques. In this context of neglect, the analysis of the ruins at 2 Lutsu Street mark the beginning of research on medieval secular architecture in Tartu. One could expect that the results of this investigation will support future research on similar buildings and that information collected from analogous buildings in the future will present new possibilities to interpret more accurately the problems arising in connection with the structure at 2 Lutsu Street.

First results are intriguing. Archaeological investigations at 2 Lutsu Street indicate that the area was developed already by the beginning of the fourteenth century. However, the wooden buildings located there soon burnt down, but already in the first half of the fourteenth century stone building I and in the mid-fourteenth century stone building II were erected. It is open to debate whether this was the fire that according to the chronicles took place either in 1328 or 1329 and destroyed the whole town.[28] After the catastrophe, several important shifts in construction techniques in downtown Tartu can be detected: for instance, in several locations there was an attempt to plan and prepare the ground in grand scale. In any case, the datings of timber confirm rather than refute the hypothesis that the cause for the construction of the buildings in question was the conflagration of 1328/29. After the large fire, in the period between 1229–39, a latrine box was built of logs.

The ground plan and the scope of both buildings are unclear, since only part of the rooms on the lower ground were opened up by archaeological

[26] Rivo Bernotas, "Dendrodates of three medieval latrines of Tartu", *Estonian Journal of Archaeology*, 12 (2008), 16–29.

[27] Romeo Metsallik, "Tartu arheoloogilisest uurimisest", *Tartu arheoloogiast ja varasemast ehitusloost*, Tartu Ülikooli Arheoloogia Kabineti Toimetised, 8 (1995), 32.

[28] Konstantin Höhlbaum, "Beiträge zur Quellenkunde Alt-Livlands", *Verhandlungen der Gelehrten Estnischen Gesellschaft*, Bd. VII, H. ¾ (Dorpat, 1873), 66.

methods. It is not even known whether in the Middle Ages the houses were situated side by side or had space between them. What is clear is that building I faced Jakobi Street with its facade, which means that the line of the modern street developed already in the Middle Ages.

The buildings were reconstructed many times over. Building I went through several changes in the second half of the fourteenth century, when the stove-hypocaust, a screen in front of it, and a staircase leading up to the main floor were apparently built. This created a small room, which was filled with soil. The findings suggest that the northeastern side of building I was demolished already by the end of the Middle Ages or in the early modern period. It is quite possible that the building was severely damaged during the Livonian War in the second half of the sixteenth century, when at least a third of the buildings in Tartu were destroyed.[29] After this, a street with granite paving crossing to Jakobi Street was laid. From the sixteenth–seventeenth centuries, the area was filled and another granite paving was established. The upper paving can be dated through the findings collected from the sand cushion underneath to the seventeenth century. Reconstruction works have also been carried out in the northeastern part of building 1, where among other improvements a brick floor paving was laid in room no 1.

Both houses were severely damaged in the Great Northern War. During the attack on Tartu in June–July 1704, around 100 houses were hit or destroyed entirely in massive bombings,[30] and some of the ruins were torn down by the defenders in order to restore parts of the town wall that had been damaged,[31] and the remaining houses or the ones that had been hastily restored were again destroyed in July 1708, when the Russian army blew up the stone defence structures of the city and then set the houses on fire.[32] The bombing during the Northern War is reflected well in the archaeological material collected elsewhere in the town, and in many places cannon balls fragments have been found.[33] In some written sources, it has been recorded that bombs hit graveyards and even blew bodies out of graves.[34] One cannot be certain, however, if this could explain the presence in the filling layer at 2 Lutsu Street of scattered bones belonging to eight different individuals. They were probably scattered beforehand, covered by rubble, and left in the

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29 Margus Laidre, *Dorpat 1558–1708: Linn väe ja vaenu vahel* (Tallinn: Argo, 2008), 185.
30 *Ibidem*, 582.
31 *Ibidem*, 597.
32 *Ibidem*, 662.
33 Romeo Metsallik, "Toomemäe põhjanõlva kujunemisest", *Tartu ja kultuur* (Tallinn: Eesti Teaduste Akadeemia kodu-uurimise komisjon, 1990), 71.
34 Laidre, *Dorpat 1558–1708*, 597.

soil. It is impossible to date them through the finding context. One of the partly preserved skeletons in front of the mouth of the hypocaust, however, was placed there before the flesh had fully decomposed and was probably laid or buried there purposefully. The preserved bomb with a cast-iron shell is also linked to the Northern War, as thousands of such bombs were fired and some of them did not explode.[35]

The Northern War and the destruction of the town left a mark on the city for many years. The sorry state of the town center and existing ruins were mentioned even in the mid-eighteenth century.[36] The houses at 2 Lutsu Street were in ruins at least by 1734.[37] Both ruins were probably demolished up to the inserted ceiling of the lower floor in the mid-eighteenth century during the construction of a new wooden house. This is clearly reflected among others in the filling layer, which in the main part consists of broken (sometimes even preserved) everyday cutlery, including pottery that could have been used as late as the first half of the eighteenth century. Demolition rubble was planned in a way that it filled part of the rooms of the lower floor of the medieval building. Demolition works apparently ran simultaneously in many buildings, which explains the fact that the pieces of the same tiles were located in rooms 1 and 4 of building I and also in building II.

The construction of the wooden building, which has been preserved until today, was probably commissioned by T. Plaschning, the pastor of St. John's congregation. Houses planned by the Russian architect Domenico Trezzini served as a model.[38] Dendrochronological methods indicate that the logs used in the building were cut in the winter of 1752/53, but according to written records the house was completed in 1775.[39] According to the stones and mortar, three construction stages can be discerned in its ground walls, so it cannot be excluded that the building in its present dimensions was built in several phases.

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35 Laidre, *Dorpat 1558–1708*, 577, 580, 582.
36 Mati Laur, "Vene võimu all 18. sajandil", *Tartu. Ajalugu ja kultuurilugu* (Tartu, 2005), 59.
37 Raid, *Tartu vanemaid ehitisi,* 31.
38 *Ibidem*.
39 *Ibidem*.

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KOKKUVÕTE: *Tartu Lutsu tn 2 kesk- ja uusaegne ehitistekompleks. Arheoloogiliste, arhitektuuriajalooliste, dendrokronoloogiliste ja osteoarheoloogiliste uuringute tulemusi*

Kirjalike allikate kohaselt 1755. aastal valminud Jaani kiriku pastor T. Plaschningi elamu Lutsu tn 2 (joonis 1) on üks väheseid puithooneid Tartus, mis jäi puutumata peaaegu kogu linna hävitanud 1775. aasta tulekahjust. Hoone renoveerimisel Tartu mänguasjamuuseumi tarbeks toimusid seal 2008. ja 2009. aastal arheoloogilised välitööd, mis osutasid, et maja rajamisel 18. sajandi keskel ei ole lõhutud varasemaid ehitisi terves ulatuses, vaid osa neist on jäänud praeguse hoone alla. Selgus, et kohati on keskaegsete hoonete müürid säilinud enam kui kahe meetri kõrguselt kuni põhikorruse vahetalade kandekonstruktsioonideni. Välja kaevati ka terve kerishüpokaustahi. Toimunud uuringud andsid rohket teavet Tartu keskaegsete kodanikemajade kohta ja täpsustasid teadmisi toonasest tänavatevõrgust. Hoonete ümberehitamiste

ja lammutamise käigus kuhjatud täitekihtidest koguti rikkalik leiumaterjal, sh esinduslik ehitus- ja tarbekeraamika kollektsioon, ning leiti ka inimluid. Käesolevas artiklis keskendume keskaegsetele ehitusjäänustele, peamiselt uusaegse täitekihi leiuainesele, ennekõike kahlitele ja inimluudele ning esitame dendrokronoloogiliste uuringute tulemused.

Arheoloogilised uurimistööd Lutsu tn 2 osutasid, et piirkond oli hoonestatud juba 14. sajandi alguseks. Sealsed puitehitised põlesid aga peagi maha ja asemele rajati tõenäoliselt kaks kivihoonet (joonis 2). Neist üks (keskaegne elamu I) rajati arvatavasti 14. sajandi esimesel poolel ja teine (keskaegne elamu II) 14. sajandi keskel. Mõlema kivihoone puhul selgus, et need on ehitatud pärast mingit põlengut. Võimalik, et tegemist on 1328. või 1329. aasta tulekahjuga, mil kroonikate teatel põles maha kogu Tartu linn. Senised radiosüsinuku dateeringud (tabel 1) pigem toetavad kui välistavad sellist tõlgendust. Linnapõlengu järel, dendrokronoloogilise dateeringu järgi vahemikus 1229–39, on rajatud hoovialale ka palkidest jäätmekast (joonis 16, 17).

Kummagi elamu planeeringud ja suurused ei ole selged, sest arheoloogiliselt avati vaid osa alakorruse ruumidest, selge ei ole ka see, kas need paiknesid keskajal kõrvuti või vahega. Vähemalt elamu I on tõenäoliselt olnud fassaadiga Jakobi tänava poole, osutades muuhulgas, et praegune tänavajoon järgib keskaegset. I keskaegsest elamust avati kolm ruumi peaaegu tervikuna ja üks osaliselt (joonised 2–3), sellest kagu pool paiknenud II keskaegsest elamust aga vaid üks ruum ja sedagi osaliselt (joonised 2, 14). Tellistest ning maakividest seintes on säilinud mitmeid ukseavasid, šahte, nišše, laetalade auke ja mademeid ning elamus I ka alakorruselt põhikorrusele viinud trepp (joonised 4–7, 11–12, 15). Kahtlemata atraktiivseim leid on I hoonest väljakaevatud tellistest kerishüpokaustahi, millest on säilinud nii seinad, küttekolle kui ka kerisekivid ja nende alused telliskaared (joonis 8–10).

Hooneid on korduvalt ümber ehitatud. Elamus I on üks selline ajajärk olnud 14. sajandi teisel poole, mil alakorrusele on rajatud kerishüpokaustahi, vahesein selle ette ja eelmainitud trepp. Leidude järgi osutades on hoone I loodeosa lammutatud juba keskaja lõpus või varauusajal. Võimalik, et ehitis sai raskelt kahjustada Liivi sõja ajal 16. sajandi teisel poolel. Seejärel tehti sinna Jakobi tänavaga risti paiknenud tänav või hoovitee, mille pind sillutati maakividega. 16.–17. sajandil ala täideti ja rajati veel üks maakividest sillutis (joonis 13). Ülemise sillutise võib kivide alusest liivapadjast saadud leidude järgi dateerida 17. sajandisse. Ümberehitustöid tehti ka hoone I säilinud kagupoolses osas, muuhulgas rajati ruumi nr. 1 telliskividest põrandasillutis.

Mõlemad majad said tugevaid kahjustusi Põhjasõjas ning kirjalike allikate järgi olid ehitised varemeis veel 1734. aastal. Varemed lammutati kuni

aluskorruse vahelaeni arvatavasti 18. sajandi keskel uue puitmaja ehitamise eel. See kajastub muuhulgas täitematerjalis, millest põhiosa moodustavad purunenud (erandina isegi terved) tarbenõud, sealhulgas keraamika, mille kasutuse aeg võib ulatuda 18. sajandi esimesse poolde. Lammutuspraht planeeriti nii, et sellega täideti osa keskaegse elamu aluskorruse ruume. Täitmine on toimunud järk-järgult ja tõenäoliselt on lisaks eelkirjaldatud kahe elamu lammutusprahile toodud sinna materjali veel mujaltki lähikonnast. Täitekihtidest saadud leiuaines on rikkalik ja mitmekesine, sisaldades ehitus- ja tarbekeraamika katkeid (joonised 18, 19), metallist tööriistu, 16.–17. sajandi Riia, Poola-Leedu ja Rootsi münte (joonis 20:1–9, 12), ehteid (joonis 20: 11, 13, 14), ammu või püssi kaba luust kaunistusplaati (joonis 22), 17.–18. sajandi kaoliinsavist piipude katkeid ja rohkesti ahjukahleid (joonised 22–23). Vanimad kahlileiud pärinevad 15. sajandi lõpust ja 16. sajandi esimesest veerandist. Enamus kahleid on aga erinevatest peamiselt 17. sajandil kasutatud ahjudest nagu barokkstiilis taimornamendiga roheliseks või mustaks glasuuritud kahlitest tornahjud (joonised 22:8, 23:3), geomeetrilise- (joonis 22:9) ja moreskornamendiga (joonis 22:1), pühakute (joonis 22:4) või Rootsi valitsejate (joonis 22: 2, 7) kujutistega roheliseks glasuuritud kahlitega ahjud jne Noorimad kahlileiud, nagu sinise maalinguga fajansist kahli katked, pärinevad aga juba 18. sajandist.

Lutsu tn 2 täitekihtidest leiti ka seitsmele eri inimesele kuulunud üksikluid. Ilmselt on need olnud juba pinnaseteisaldustöödele eelnevalt laiali paisatud. Erinev on aga kaheksanda indiviidi, 35–45 aastase mehe osaline luustik hüpokaustahju suu ees, mis peab olema toodud paigale enne liha luude küljest lahti kõdunemist ja on nii sinna pandud või sängitatud ilmselt tahtlikult.

Tänini säilinud puitelamu rajamisaega tõid selgust dendrokronoloogilised uuringud, mille kohaselt on ehitamiseks kasutatud puud langetatud 1752/53. aasta talvel (joonised 24–25).