



ARCHAEOLOGICAL INVESTIGATIONS OF THE 18TH CENTURY GLASSWORKS AT UTSALI

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INTRODUCTION

The first glass-manufacture in the territory of Estonia – Hüti glass-house on the island of Hiiumaa – operated from 1628 to 1664. Almost a century went by until next glass-making enterprises were founded. After recovering the wounds of the Great Northern War (1700–1721) by the mid-18th century, local landlords started to establish numerous industrial enterprises in rural areas. There are 21 glass-houses known in Estonia from the 18th century (Roosma 1969, fig. 1). The earliest of those is Piirsalu glass-house in Läänemaa County (West-Estonia) established in the 1740s (Roosma 1969, 70).

In central Estonia, in the northern part of the lowland of Lake Võrtsjärv there were good premises for glassmaking. There was enough wood for heating the glass furnaces and producing potash from wood-ash. Sand and lime, too were available at site. 11 glass-houses operated here in the estates of four neighbouring manors: Vana-Põltsamaa (Ger. *Schloss Oberpahlen*), Puurmani (Ger. *Schloss Talkhoff*), Kärevere (Ger. *Kerrafer*) and Laeva (Ger. *Laiwa*). This constituted the highest concentration of glass-manufacturing sites throughout the whole area of Russian Baltic provinces of the time.

The first data about Utsali glass-house in written records is from the year 1761 (Varep 1962, 199). Utsali glass-house was founded by the owner of Vana-Põltsamaa manor, Johann Woldemar von Lauw. He also established the glass-house of Laashoone in 1764 in his own estate and rented glass-houses of Laasme and Altnurga situated in the lands of Puurmanni manor. Utsali glass-house was closed down in 1771 (Varep 1962, 199). No written sources regarding the production and the glassmakers at Utsali are known.

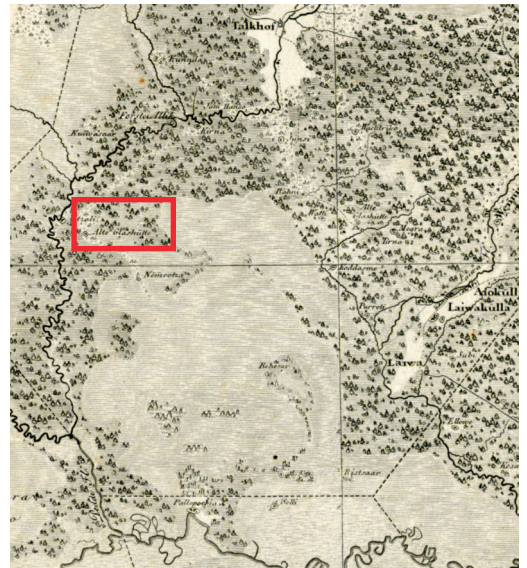


Fig. 1. Location of the glass-house at Utsali on the map of Livland from the year 1839 composed by C. G. Rücker.

Jn 1. Utsali klaasikoja ase C. G. Rückeri Liivimaa kaardil aastast 1839.

My investigations regarding the Utsali glass-house are related to my wider research interests concerning the archaeological remains of the 18th century industrial boom in central Estonia. In previous years I have researched and documented archaeological remains of lime production in the territory of Kursi parish (Saimre 2009; Tvauri & Saimre 2007; 2009; 2010).

Until now, Estonian glass-houses have been researched only by Maks Roosma (1909–1971), a glass artist and professor of glass art. Hüti glass-house was studied most extensively and the results are published in a monograph (Roosma 1966). Roosma also excavated Piirsalu glass-house in Läänemaa, Rekka glass-house in Järvamaa, Gorodjonka glass-house in Virumaa, and Laashoone glass-house in Viljandimaa. Roosma published the results of his research on 18th century glass-houses in an article (1969). Additional information about his excavations can be obtained from manuscripts held in the Estonian History Museum (AM D 296). Finds gathered during the excavations are also kept in the same museum.

THE LOCATION OF THE GLASS-HOUSE

Utsali glass-house is located in the southern part of the historical Kursi parish, 10 km south-west from Puurmanni, on the strip of mineral land in the middle of swamps and bogs (Fig. 1). Utsali village was located in that strip of land until the year 1953 after

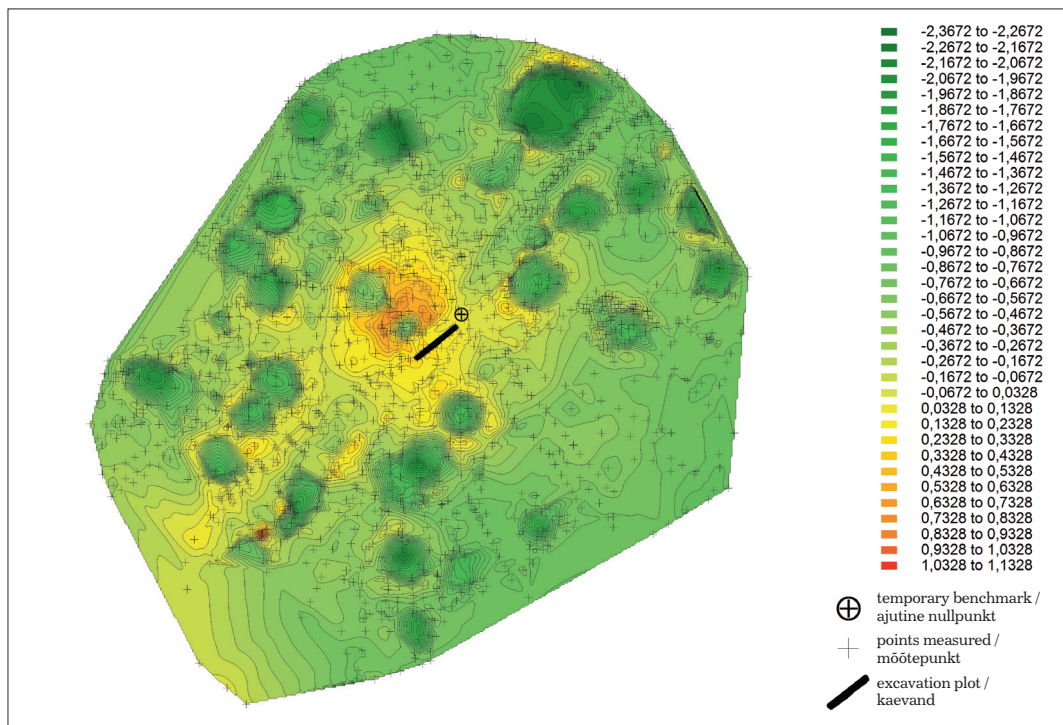


Fig. 2. The elevation map of the glass-house site at Utsali. The depth between two consecutive contour lines is 10 cm.
Jn 2. Utsali klaasikoja aseme kõrgusplaan. Samakõrgusjoonte kõrgusvahe on 10 cm.

Drawing / Joonis: Helena Kaldre

which the inhabitants were deported and a training range was built here for the Soviet Air Force. The training range was used until 1992. The houses of Nõmme farmstead were situated west from the site of Utsali glass-house. All the farm buildings were destroyed during test bombing. The site of the glass-house is also covered with craters (Fig. 2) and there are numerous fragments of aerial bombs on the ground and upper levels of soil.

The site of Utsali glass-house is at present covered with natural forest of dense underbrush. Glass-working waste found on the area of approximately 1500 m² on the ground of a hillock ascertains the site of a glass-house. No remains of glass furnaces or other structures are visible on the ground.

THE CULTURAL LAYER AND THE REMAINS OF GLASS FURNACE

To investigate the spread and composition of the cultural layer 31 test pits were dug in the site of the glass-house. Two of them measured 1 × 1 m, others had the diameter of 30–40 cm. Considering the results of test-pitting a place was picked for an excavation plot. A 10 m long and 0.5 m wide trench was dug into the middle part of the mound (Fig. 3) to establish possible the existence of a glass-furnace.

Two bottom layers – natural yellow sand and a 10–25 cm thick layer of dark brown soil atop of it bore no signs of human activity. A 75–80 cm thick cultural layer had deposited to the virgin soil. At first, a 50 cm thick layer of sand with stripes of dark brown organic soil, sporadic pieces of bricks and charcoal appeared to be piled up. There was no glass-producing waste in this layer. Apparently the ground had been lifted in the course of building the glass-house. Sand was trampled stiff at the top and a layer of soil, 5–10 cm thick with abundant glass-waste was covering it. The uppermost, 20–30 cm thick layer of shattered soil consisted of the soil burst out of bomb craters as indicated by numerous fragments of aerial bombs in it.

In the western part of the excavation trench on top of piled up sand, at the depth of 30 cm from the ground, remains of a glass-furnace were unearthed (Fig. 4). It was a 90 cm wide channel feathered with unburnt bricks measuring 27.5 × 14.5 × 6 cm. 20 cm of the channel wall constituting of two rows of bricks was preserved.



Fig. 3. Excavation plot. View from the east.

Jn 3. Kaevand. Vaade idast.

Photo / Foto: Andres Tvauri



Fig. 4. Bottom of the firing chamber or flue of the glass-melting furnace. View from the north.

Jn 4. Klaasihju kolde või leegikanali põhi. Vaade põhjast.

Photo / Foto: Andres Tvauri

The bottom of the channel consisted of large cobblestones. The melted and broken surface of the stones gives evidence of extreme heat inside the furnace. Sand had also turned red in the vicinity of the furnace. In the bottom of the channel there was a 10 cm thick layer of charcoal and ash with glass-making waste in it. The upper part of the channel was filled with fragmented bricks.

As the narrow trench revealed only a small part of the furnace it is impossible to claim with certainty which part of the furnace was found. Following Maks Roosma's research it seems that either the bottom of the firing chamber or the flue directing the exhaust gases to the chimney might have been unearthed. The channel found in Utsali resembles the flues of the 18th century 7–8 furnaces found in the site of Rekka glass-house. Their width was also 50–90 cm, the bottoms were made of cobblestones and the walls of bricks (AM D 296-1-68; 296-1-71).

Test pitting confirmed that the sand has been piled up to form a base for the glass-house in an area 100 m long in the north–south direction and 60 m wide in the east–west direction. Outside this area virgin sand revealed in the depth of 30–40 cm from the ground. The nearer to the site of the glass house the more glass-making waste the dark organic soil atop the sand contained.

FINDS FROM THE SITE OF THE GLASS-HOUSE

During the excavations all material linked to glass manufacturing excluding brick-pieces was gathered. From the trench and test pits 1 and 2 (altogether 7 m²), 49.7 kg of glass waste and finds were gathered. Fragments of glass artefacts were chosen to be preserved.¹ Samples are preserved of waste deriving from various stages of glassmaking, of which five main types were found: 1) fragments of products which had broken during annealing or later, 2) glass dripped during blowing or the moils from blowpipe or pontil rod, 3) fragments of melting pots made of fire clay, 4) fragments of sandstone parts of furnaces, 5) impurities that have clustered in the bottom of melting pot or gathered floating on top of the melted glass or other dross-like waste.

Fragments of products

According to written sources the main production of 18th century Estonian glass-houses was simple flat glass which was used for house and coach windows and laterns (AM D 296-1-68; Roosma 1969, 79). The majority of the waste found from Utsali glass-house site derives from the process of blowing, annealing and cutting of flat glass. The fragments of flat glass were 2 mm thin in average. They were mostly greenish or slightly blue, made of so-called forest glass containing little bubbles.

Fragments of recognisably hollow glass artefacts were rare among the finds – only 325 g of the total of 49.7 kg. Considering the number of finds, globular utility glass bottles were the main article of vessels produced. Alcohol was stored in such bottles in the 18th century. Characteristic to the 18th century is that bottle mouths were reinforced with a simple glass band applied to the body part (Fig. 5: 1) and bottoms were pushed up (Fig. 5: 2). According to the fragments small rectangular and octagonal bottles (Fig. 5: 3) were also made in Utsali. A handle of bluish green glass (Fig. 5: 4) shows that distinctively 18th century decanter bottles were also

¹ TÜ 1932.



Fig. 5. Fragments of glass products. 1 – mouth of a bottle, 2 – bottom of a bottle, 3 – fragment of a little octagonal bottle, 4 – handle of a decanter bottle, 5 – fragment of the mouth of a medicine bottle, 6 – fragment of a probable rim of a drinking glass, 7 – fragment of the mouth of a soured milk bowl, 8 – rim of a jar.

Jn 5. Klaastoodete killud. 1 – pudeli suuosa, 2 – pudeli põhja katke, 3 – väikese kaheksatahulise pudeli põhja katke, 4 – karahvini käepide, 5 – apteegipudeli suuosa katke, 6 – oletatav joogiklaasi serva katke, 7 – piimakausi serva katke, 8 – purgi serva katke.

(TÜ 1932: 105, 66, 104, 19, 60, 9, 62, 18.)

Photo / Foto: Kristel Külljastinen

made here (see Van der Bossche 2001, pl. 12, 38: 3, 193, 194). Fragments of flattened uneven rims (Fig. 5: 5) and bottoms give evidence of making small cylindrical medicine bottles. Numerous fragments may belong to drinking glasses (Fig. 5: 6). Unfortunately, none of the fragments allows eliminating the possibility of being just a curved edge of a flat glass. Drinking glasses were standard products of preterit glass manufactures.

Fragments of the mouth of a soured-milk bowl were also found (Fig. 5: 7). It was a glass bowl with an upper edge of the rim turned down against the outer surface. Such vessels were also made in Laashoone glass-house (AM 18398: LH V 8–17, 25, 34–38).

In 18th century Finnish glass houses such bowls are also known to be produced (Matiskainen *et al.* 1991, fig. 34). Fragments of soured-milk bowls have been found in the 18th century cultural layer for example in the Roosikrantsi 9/11 estate in Tallinn.²

At least one fragment originates from the rim of a jar (Fig. 5: 8). According to the fragment one can deduce that the diameter of the jar has been 14 cm. Jars were made already in Estonian oldest, Hüti glass-house (Roosma 1966, fig. 145). Jars like this were produced in various Estonian glass-houses even in the 19th century (Ruussaar 2006, 8).

Four glass pipes with the diameter of 0.7–1.5 cm (Fig. 6: 1, 2) were found. Most likely they derive from an alembic cap (see Roosma 1966, fig. 139, 141) or alembic, both used for distillation. An exceptional pipe of 5 mm in diameter and less than 1 mm thick wall was discovered (Fig. 6: 3), the purpose of which is unknown.

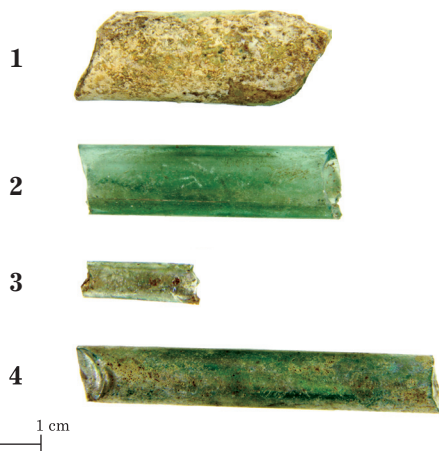


Fig. 6. Glass pipes.

Jn 6. Klaastorukesed.

(TÜ 1932: 63, 24, 36, 55.)

Photo / Foto: Kristel Külljastinen

Glass-blowing and melting waste

Drops of melted glass, chunks of unworked glass, fragments of flat glass, glass threads and strands were the forms that production waste mostly took. During current excavations we mainly found waste of this type – 30.5 kg out of 49.7 kg.

A frequent type of waste was moils – glass stained on top of a blowpipe or a pontil rod after the vessel has been broken off. It usually carries the mark of an iron pipe or rod (Fig. 7: 1). 3.9 kg of such fragments were gathered from the two larger test pits and excavation trench, but presumably a large number of other pieces of melted glass with no visible trace of any instrument have the same origin. Among other waste there were strips cut off from the edge of a product during the producing process (Fig. 7: 2).

Another frequently found waste type were drops dipped during blowing (Fig. 8) or fragments of thin, craunched glass. It is nearly impossible to know whether those derive from blowing vessels or flat glass – as flat glass was also blown. Fragments with sharply cut and annealed edges undoubtedly belong to flat glass.

Glass threads and small balls were abundant (Fig. 8). A large number of balls with the diameter of 5–10 mm were found inside the ash on the bottom of the flue. At the excavations of Hüti glass-house such balls were also found mainly on the ground around the furnaces and inside the ash on the floors of fireplaces (Roosma 1966, 18, fig. 23). The thickness of glass threads differed greatly, the thinnest being less than 1 mm in diameter. In most cases they were straight, but there were also some craunched threads. This kind of waste is found from all 17th–18th century glass houses investigated in Estonia.

² AI 6109: I 150.

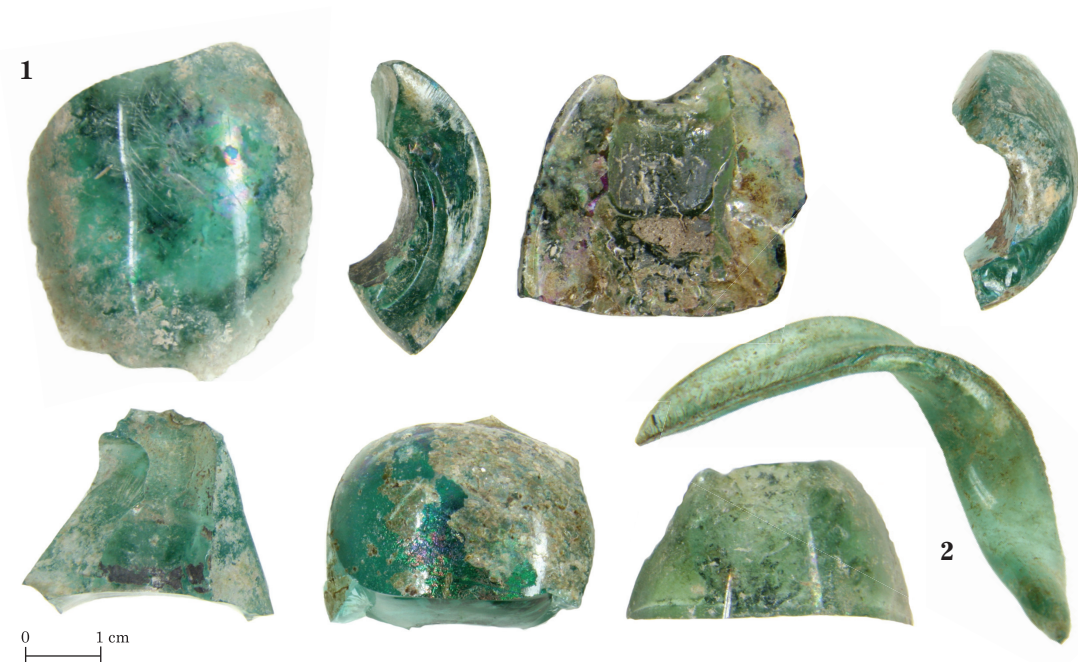


Fig. 7. Glass-blowing waste. 1 – moils, 2 – strip cut off from the edge of a product during producing.

Jn 7. Klaasitöötlemisjäägid. 1 – klaasipiibu või naabli otsast eemaldatud klaasijäägid, 2 – töödeldava klaaseseme servast äralõigatud jääk.

(TÜ 1932.)

Photo / Foto: Kristel Külljastinen



Fig. 8. Glass balls, drops and threads.

Jn 8. Klaasist kuulikesed, tilgad ja niidid.

(TÜ 1932.)

Photo / Foto: Kristel Külljastinen



Fig. 9. Fragments of work equipment. 1 – fragment of the body of a melting pot, 2 – fragment of the rim of a melting pot, 3 – fragment of a ring made of fire clay.

Jn 9. Töövahendite katked. 1 – sulatuspoti külje katke, 2 – sulatuspoti serva katke, 3 – šamottsavist rõnga katke. (TÜ 1932: 117, 116, 103.)

Photo / Foto: Kristel Külljastinen

Fragments of melting pots and glass furnaces

Glass melting pots were made of white or yellow fired clay. 6.1 kg of fragments of fired clay, mostly covered with a glass layer from one side (Fig. 9: 1, 2) were gathered from the test pits and the excavation plot. The collected fragments did not enable to determine the measurements of any melting pot. The thickness of the bodies of melting pots used in Utsali had been 3.7–4.5 cm as decided by the fragments with both the inner and outer surface preserved. It is similar to the melting pots of other 18th century glass houses researched in Estonia. For example, during the excavations at Piirsalu glass-house data was gained about melting pots, which had the inner diameters of 35–53 cm and 1.8–5 cm thick bodies (AM D 296-1-70). Variation in the thickness of bodies of broken melting pots is caused by the fact that they burnt thinner throughout their use.

Also rings that were placed on the surface of the molten glass to avoid the unwanted additives to drop into the molten glass were made from the same material as melting pots. At least two fragments of fired clay rings (Fig. 9: 3) were found from the site of Utsali glass house. For instance, two fragments found from the site of Piirsalu glass-house enabled M. Roosma to calculate their inner diameters, which were 18 and 21 cm (AM D 296-1-70). Fragments of fired clay rings have also been found from the sites of glass houses of 18th century Finland (Matiskainen *et al.* 1991, 69).

Relatively lot (5.6 kg) of white sandstone fragments were gathered. Many of them had glazed surfaces. According to finds, Utsali glass furnace or furnaces were made mainly using cobblestones and unburnt bricks. Sandstone fragments with surface melted into glass indicate that sandstone must also have been used in the construction of the furnaces. The sandstone is possibly of foreign origin.

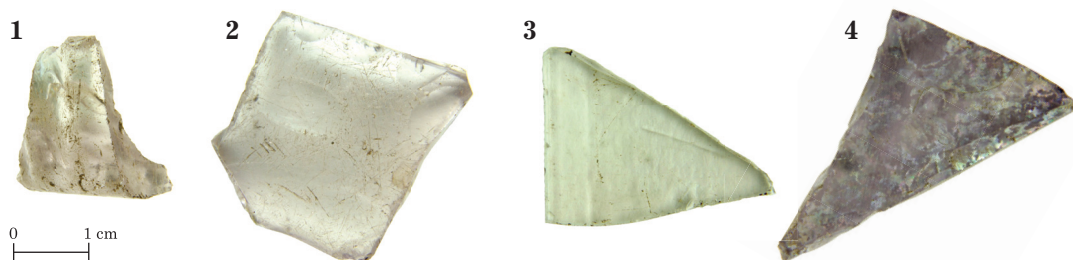


Fig. 10. Finds from glass-house site at Utsali. 1 – fragment of a drinking glass, 2 – fragment of a polished vessel, 3 – fragment of a probable mirror, 4 – fragment of polished flat glass.

Jn 10. Leide Utsali klaasikoja asemelt. 1 – joogiklaasi kild, 2 – lihvitud dekooriga nõu kild, 3 – oletatav peegli kild, 4 – lihvitud tahvelklaasi kild.

(TÜ 1932: 11, 88, 12, 113.)

Photo / Foto: Kristel Külljastinen

Other finds

Although abundant glass-waste was found from the site of Utsali glass-house, other finds dating from the same time were very rare. Some fragments of transparent soda glass are noticeable. As their composition differs from locally produced glass and fragments seem a bit worn out, those can belong to vessels used by glassmakers themselves. Fragments of drinking glass with ribs represent finds of this type (Fig. 10: 1). Similar fragments of drinking glasses were also found from the site of Rekka glass house (AM 17968: LIV 64–68). A piece of a polished vessel with adornment (Fig. 10: 2) and a piece of 2 mm thick glass with a faceted edge (Fig. 10: 3) were also found. The latter is probably a fragment of a mirror. In addition, a piece of transparent pinkish flat glass (Fig. 10: 4), probably a polished one, came to light.

Only one fragment of ceramics was found, belonging to a typically 18th century faience plate with blue decoration.³

It is remarkable that no fragments of clay tobacco pipes were found from Utsali. They are also very rare on other 17th–18th century glass-houses studied in Estonia whereas in all other sites clay pipes are frequently found. Could it be that the glassmakers did not smoke? An answer to the question can be given by a small glass pipe with the outer diameter of 7 mm and inner diameter of 1 mm (Fig. 6: 4). Apart from the different material it matches exactly the measurements of 18th century Dutch pipe stems. Two such pipes have also been found from the site of Rekka glass house (AM 17968: LIV 32, 33). In Finland, from Mariendal glass house a fragment believed to be of a glass pipe bowl has been found (Matiskainen *et al.* 1991, 97, fig. 62). As there is no data about producing glass tobacco pipes for commercial purposes it can be assumed that glassmakers made pipes for their own use.

CONCLUSION

In spite of the fact that the site of Utsali glass-house has been severely damaged by the explosions of the Soviet aerial bombs, the 18th century cultural layer is preserved relatively well. Small-scale excavations carried out in 2011 enable us to say that the furnace (or furnaces) of Utsali glass-house have been erected onto a pile of sand 0.5 m thick. A bottom of one glass furnace was partially revealed in the excavation plot.

³ TÜ 1932: 90.

Finds gathered in the course of the research include fragments of furnaces, melting pots, and production waste (fragments, chunks of unworked glass, moils etc.). Concluding from the waste, mainly flat glass, various utility bottles, medicine bottles, decanter bottles, drinking glasses, jars, soured-milk bowls and presumably lab equipment were made in Utsali glass-house.

To further research the buildings of Utsali glass-house, production, and technologies of glass making, excavations are continued in 2012. The place where glass workers and their families lived is yet to be found.

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ARHEOLOOGILISED UURINGUD UTSALI 18. SAJANDI KLAASIKOJA ASEMELE*Andres Tvauri*

Esimene klaasimanufaktuur Eestis – Hüti klaasikoda Hiiu maal – tegutses aastatel 1628–1664. Pärast seda kulus peaaegu sajand, kuni asutati järgmised klaasitootmise ettevõtted. 18. saj tegutsenud klaasikodasid on Eestis teada 21, neist suur osa paiknes Kesk-Eestis. Siin, Võrtsjärve madaliku põhjaosas olid head eeldused klaasitootmiseks, sest leidis piisavalt metsa klaasiahjude kütmiseks ja potase tootmiseks puutuhast. Ühtlasi olid kättesaadavad ka klaasi tootmiseks vajalik liiv ja lubi. Naabermõisade Vana-Põltsamaa, Puurmani, Kärevere ja Laeva maadel tegutses 18. sajandil 11 klaasikoda.

Utsali klaasikoja kohta on kirjalikest allikatest teada esimesed andmed 1761. aastast. Klaasikoja rajas Vana-Põltsamaa mõisa omanik Johann Woldemar von Lauw, kes asutas 1764. a oma mõisa maal ka Laashoone klaasikoja ning rentis Puurmani mõisa aladel olevaid Laasme ja Altnurga klaasikodasid. Utsali klaasikoda lõpetas tegevuse 1771. a.

Utsali klaasikoda paikneb Kursi kihelkonna lõunaosas, Puurmanist linnulennul 10 km edela pool, keset soid ja rabasid asetseval mineraalmaaribal (jn 1). Sel alal paiknes Utsali küla 1953. aastani, mil elanikud koliti mujale ja siia rajati nõukogude lennuväe õppepolügon, mis eksisteeris aastani 1992. Enne 1953. a paiknesid klaasikoja asemest vahetult läänes Utsali küla Nõmme talu tänaseks hävinenud hooned. Utsali klaasikoja aset katab praeguseks tiheda alustaimestikuga looduslik mets. Klaasikoja ase on kergesti tuvastatav madalal künkjal, umbes 1500 m² suurusel alal (jn 2) maapinnal leiduvate klaasitootmisjääkide põhjal.

Kultuurikihi leviku ja koostise uurimiseks tehti klaasikoja alale 31 šurfi. Neist kaks olid suurusega umbes 1 × 1 m, ülejäänud aga läbimõõduga 30–40 cm. Et teha kindlaks klaasiahju jäänuste olemasolu, rajati künka keskosas 10 m pikkune ja 0,5 m laiune proovikaevand (jn 3).

Loodusliku pinnaseks kaevandi alal oli kollane liiv ja sellel lasuv 10–25 cm paksune tumepruun looduslik muld, milles inimtegevuse märke ei leidunud. Looduslikule mullale oli ladestunud 75–80 cm paksune kultuurikiht. Esmalt oli kuhjatud 50 cm paksune liivakiht, milles sisaldus mulla viirge, üksikuid tellise- ja söetükikesi. Klaasitootmisjääke selles kihis ei leidunud. Ilmselt on see liiv klaasikoja rajamise käigus kokku kuhjatud. Täiteliiva pealmine pind oli kõvaks tallatud ja selle peal lasus 5–10 cm paksune mullakiht, milles leidis rohkesti klaasijäätmekülvide. Kõige pealmine 20–30 cm paksune kobe mullakiht moodustus peamiselt pommplahvatuskraatritest välja paisatud pinnasest, mida näitasid selles leidunud arvukad pommikillud.

Kaevandi lääneosas paljastus liivast kuhjatud täitekihi, 30 cm sügavusel maapinnast, klaasiahju jäänus (jn 4). Tegemist on 90 cm laiuse, 27,5 × 14,5 × 6 cm suurustest toortellistest ääristatud kanaliga. Kanal oli säilinud kahe tellisekihi kõrgusena. Kuna alumise kihi tellised olid asetatud külili ja teise kihi tellised lapikult, oli kanal säilinud umbes 20 cm kõrgusena. Kanali põhi koosnes suurtest maakividest. Ahjus valituses suurest kuumusest andis tunnistust ahjukivide sulanud või murenenud pind, ka liiv ahju ümbruses oli värvunud kuumuse mõjul punaseks. Kanali põhjal oli kuni 10 cm paksune söe- ja tuhakiht, milles oli klaasivalmistusjääke. Kanalijäänuse ülemist osa täitsid purunenud tellised.

Kuna kitsas kaevandis paljastus vaid väike osa klaasiahjust, pole võimalik kindlalt öelda, millise ahjuosaga on tegemist. M. Roosma uurimistöödele tuginedes näib, et avatud osa ahjust on kas kolde põhi või lõõr. Utsali klaasikojalt leitud kanal sarnaneb 18. saj tegutsenud Rekka klaasikoja asemelt leitud 7–8 ahju lõõridega.

Kaevamiste käigus korjati kokku kõik klaasitootmisega seotud leiumaterjal, v.a telliste tükid. Kaevandist ning šurfidest 1 ja 2 (kokku 7 m² alalt) koguti 49,7 kg töötlusjäätmekülvide ja leide, millest säilitatakse kõik klaasesemete katked. Muudest klaasitootmisjääkidest säilitatakse näidised.

Leiti viite peamist liiki klaasitootmisjääke: 1) toodete katked (tahvelklaas, pudelid, karahvinid, jookiklaasid, piimakausid, purgid, laborinõud jms vt jn 5–6), mis on purunenud jahutamise käigus või hiljem; 2) klaasi puhumise käigus maha tilkunud, kokku vajunud klaas ning piibu või naabli otsast eemaldatud jäägid (nt hangunud sulaklaasi tilgad, klaasikamakate ning lehtklaasi killud ja klaasiniidikesed, vt jn 7 ja 8); 3) šamottsavist sulatuspottide tükid ja rõngad (jn 9); 4) ahjude liivakivist osade katked; 5) sulatuspottide põhja jäänud või sula klaasimassi pinnalt kogutud ebapuhtused ning muud šlakisarnased jäätmekülvide.

Kirjalike allikate andmetel oli Eesti 18. saj klaasikodade peamiseks toodanguks lihtne lehtklaas, mida kasutati maja- ja töölaakende ning laternate klaasimiseks. Suurem osa Utsali klaasikoja asemelt leitud klaasijäätmekülvist ongi tekkinud tahvelklaasi puhumise, lahtilõikamise ja jahutamise käigus. Leitud tahvelklaasi kildude paksus on keskmiselt 2 mm. Enamasti on tegemist roheka või kergelt sinaka nn võsaklaasiga, mis sisaldab väikseid mullikesi.

Kuigi klaasitootmise käigus tekkinud jäätmeid leiti rikkalikult, saadi väga vähe muud klaasikoja aegset leiuvainest (jn 10). Huvitava asjaoluna tuleb märkida, et Utsali klaasikojast ei leitud ühtegi savipiibu katket, mida Eesti 18. saj muististel leidub reeglina arvukalt. Ka muudelt Eestis uuritud 17.–18. saj klaasikodade asemelt on savipiipude tükke leitud vaid üksikuid. Kas klaasimeistrid ei suitsetanudki? Sellele küsimuse vastamiseks võib anda vihje klaasikoja-aegselt maapinnalt leitud klaastoruke välisläbimõõduga 7 mm ja siseläbimõõduga 1 mm (jn 6: 4). Kui erinev materjal välja arvata, vastab see täpselt 18. saj Hollandi savipiibu varre mõõtmetele. Kuna klaasist piipude müügiks tootmisest andmeid pole, võib oletada, et klaasimeistrid valmistasid klaaspiipe enda tarbeks.

Kokkuvõtteks võib öelda, et hoolimata sellest, et Utsali klaasikoja ase on tublisti kahjustatud, on 18. saj kultuurikiht seal siiski ulatuslikult säilinud. 2011. a tehtud väikesemahuliste kaevamiste põhjal võib järeldada, et Utsali klaasikoja klaasiahi või ahjud olid püstitatud 0,5 m kõrgusele liivast kokku kuhjatud künkale. Kaevandis paljandus osaliselt ühe klaasiahju põhi. Uuringute käigus kogutud leiuvaines koosneb peamiselt klaasiahjude ja klaasisulatuspottide katketest ning klaasitootmise käigus tekkinud sulanditest ja klaasikildudest.