Archaeological Fieldwork in Estonia 2022, 115–128

A 14th-century wreck discovered at Lootsi Street 8 in Tallinn

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In spring and early summer of 2022, an exceptional shipwreck was brought to light during the construction of an office building at Lootsi St. 8 in Tallinn: it measures 24.5 metres in length and 9 metres in width. In terms of its dimensions, this discovery ranks among the largest medieval shipwrecks found in Northern Europe. Identified as a cargo ship, it is believed to have been in use around the mid-14th century, and its scientific value was enriched by the numerous arte- and ecofacts recovered from it. Since the beginning of July 2022, the Lootsi Wreck, as archaeologists named it, has been located at the Estonian Maritime Museum's Seaplane Harbour area where the conservation works are taking place and micro-scale excavation work inside the hull continues as well.

DISCOVERY

The archaeological investigations that culminated with the National Heritage Board's 'find of the year 2022' award took place at Lootsi St. 8, where a medieval shipwreck 'pressed' in the courtyard of an industrial quarter was discovered (Fig. 1). From the same area – at the parking lot in front of Lootsi St. 8 – remains of another ship were previously known (Tammet *et al.* 2023, 76). Earlier geological surveys of the site revealed significant variations in the former seabed elevations over the considered excavation area (Harjo 2022). Since it might have been the former river delta area of the Härjapea River (Fig. 2), it was assumed that these differences were caused by the movement of the medieval riverbed and associated sand ridges in the shallow coastal sea.

Modern bathymetric maps show (Tammet *et al.* 2023, 74–76) that the coastal area stretching from the harbour towards Kadriorg was relatively shallow during the medieval and subsequent periods. Therefore, it is not surprising that efforts were made to intentionally reclaim this area from the sea. Sea was transformed into land at the present Lootsi Street only in the first half of the 19th century. The construction of warehouses around the site in proximity to the harbour started towards the end of the century following the establishment of railway

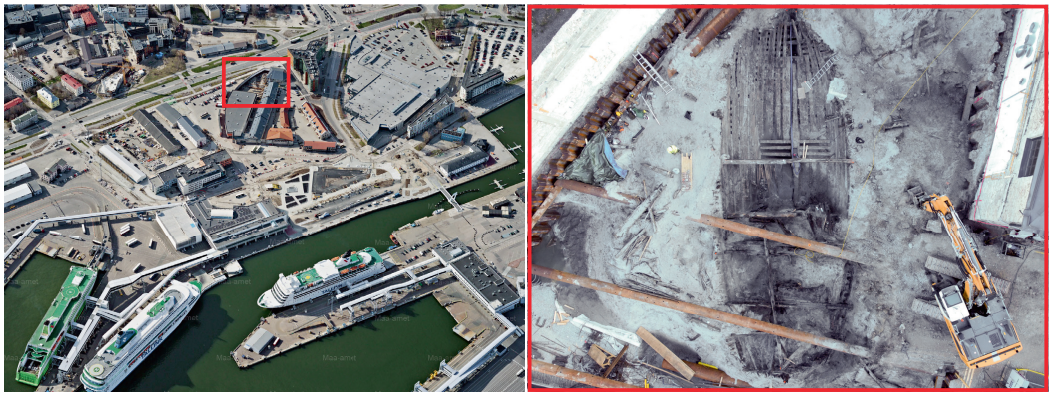

Fig. 1. *The Lootsi Wreck was found in the vicinity of the present-day Tallinn harbour, from an area with 19th-century store houses.*
Jn 1. *Lootsi vrakk leiti Tallinna sadama naabrusest, 19. sajandi laohoonete keskelt.*
Photo / Foto: Estonian Land Board / Maa-amet; Silver Jäger

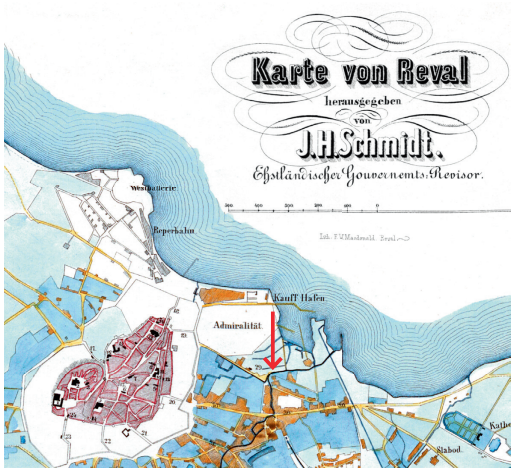

Fig. 2. *The wreck site in the mouth of the Härjapea River on the map from 1850.*
Jn 2. *Vraki asukoht Härjapea jõe suudmes 1850. aasta kaardil.*
Map / Kaart: Schmidt 1850

connections with St Petersburg. The construction area was bordered in the east and south by a limestone wall, preserved until the present day, against which lightweight shelters were built. Prior to the current construction, there was a cellar-less building in the southern part of the area, beneath which a bow section of the wreck was later found. Considering the above, it could be anticipated that there was a risk of encountering historical wrecks during the excavation work, which geologists estimated could occasionally already emerge as shallow as 160 centimetres below the ground (Leinsalu 2015). This estimation is also indirectly substantiated by another 14th-century wreck find – the 'Peeter Wreck' –, found in 2015 about 800 metres to the NE from Lootsi St. 8, at Pikksilma St. 2/1 (Roio *et al.* 2016).

EXCAVATIONS

The medieval shipwreck discussed below was discovered on 31 March during the archaeological monitoring of construction work at the depth of about two metres on the construction site. Following the initial discovery, consultations were immediately held with experts from the National Heritage Board and the Tallinn City Heritage Department, leading to the decision to commence full scale archaeological excavations. The excavation was carried out by the team of OÜ Muinasprojekt led by field archaeologist Mihkel Tammet and included field assistant Silver Jäger, osteologist Raija Katarina Heikkilä, archaeology student Lisette Reinvars, conservator Maria Romet, and team members Mihkel Ivanov, Jan Talts, and Artem

Yakubovych. The aspects of shipbuilding were examined and details were documented by Priit Lätti from the Maritime Museum.

Although the above mentioned ground-penetrating radar geological survey did not identify the contours and constructions of the wreck, subsequent comparisons of the ship remains with the radar image at depth readings up to 6.0 m allowed linking the documented soil elevation fluctuations with the submerged hull. The higher parts of the wreck were situated just about 1.5 metres below the ground surface, beneath the layers of the 19th- and 20th-century fill, while the stern extended to the depth of approximately 5 metres. During the excavation of the ship's bow section, it became evident that the vessel's bow was severely damaged. This was caused by the ship hull position in the ground with its bow-end elevated. It was evident that the bow section had suffered significant damage due to later soil removement during construction works. It was estimated that approximately 2 metres of planking were missing compared to the stern section. In addition, the bow's stem was missing. Based on these observations, the decision was made to start excavation work from the bow leaving the stern area where more intact structures were expected for later on since the likelihood of finding structural elements in this area was low. Following this decision, an excavation plan was made, which served as the basis for describing the findings and artefacts. The wreck was mostly filled with sand (Fig. 3) and it became clear that the best way to uncover artefacts and structures was just by washing sand off with running water. The common tools of archaeologists were supplemented with a water hose.

Fig. 3. *The team of archaeologists working at the stern area of the wreck.*
Jn 3. *Arheoloogide meeskond vraki ahtriosa välja puhastamas.*
Photo / Foto: Mihkel Tammet

Construction

In general, the excavated wreck was extremely well preserved. Most of the keel, keelson, bottom and hull planks, internal planking, crossbeams and the massive sternpost with rudder fastenings were preserved. The keel is flat, measuring 17.94 m in length and 19–20 cm in height. In the stern area, a section of the keel of approximately 3.8 m is missing. The traces on the remaining keel seem to indicate that it was torn or broken off, possibly during sinking. The width of the keel varies somewhat along the length of the vessel, reaching from 23 cm in the bow area to about 56 cm in the middle section of the vessel. The keel consists of two parts, connected with a scarf joint and fastened with trenails. Unfortunately, the connection between the keel and sternpost could not be studied, since the aft part of the keel is missing. Also, the stempost is missing, therefore the details fastening the keel to the stempost could not be studied.

The port side of the ship was generally better preserved than the starboard. On the port side of the bow area, 16 outer and 9 inner planks and on the starboard side, 9 and 6 planks respectively are preserved. The stern is preserved probably to the deck level with 23 outer and 9 inner planks on the port side and 16 outer and 7 inner planks on the starboard side.

Fig. 4. *Caulking between two planks. Animal hair marked with the red arrow.*
Jn 4. *Tihtimismaterjal plankude vahel. Punase noolega on tähistatud loomakarvad.*
Photo / Foto: Lisette Reinvars

The flush-laid bottom planks of the vessel are about 50 cm wide and 8 cm thick, fastened to the frames with wooden trenails. In the bow area, the garboard plank is fastened to the rabbet in the keel using iron nails. The rabbet is about 180 cm long. Otherwise, the garboard plank was laid next to the keel. The seams of the bottom planks are caulked with moss and animal hair and covered with wooden laths. The laths are fastened with sintels. From the inside, the seams are covered with thin, about 10 cm wide wooden planks, which were fastened to the bottom planks with small iron nails. On the outer side of the bottom planks, small holes for temporary fastening clamps or cleats are visible, which indicate the usage of bottom-based building methodology (Belasus 2019, 179; Gould 2011, 188–189): the bottom planks were installed first, held together with temporarily fastenings, the floor timbers were added later, the clamps were removed and the remaining small holes filled with small wooden pegs.

The board planks of the ship were built in clinker-technique, the planks were fastened to the frames with trenails. The planks themselves were fastened with iron double-clenched nails (for a more detailed description, see Rebane 2023). The seams are caulked from the inside with moss and covered with wooden laths, which were fastened to the planks with sintels (Fig. 4). The latter correspond to the Type III (used widely between 1350–1400) in sintel typology by Karel Vlierman (1996, 58).

The internal planks on the bottom of the ship are approximately 45 cm wide and 8 cm thick, the upper planks are somewhat narrower and thinner. The planks were laid with about 15–20 cm gap between them, which was filled with loose smaller trees and branches, probably for creating a floor for the cargo. The internal planks were fastened to the frames with trenails, in some locations, iron nails have been used.

Altogether, 62 frames are preserved. In the bow area, the floor timbers and first futtock are observable, in the stern area, additional futtocks are preserved. The floor timbers have limberholes on each side of the keel, located on the garboard and the second bottom plank. The floor timbers and futtocks were connected with a scarf joint and fitted together with trenails. In the bow and stern, V-shaped floor timbers have been used. The width of the frames is between 20–25 cm and height 15–20 cm, the upper futtocks are generally narrower and thinner. The futtocks feature cut-out joggles for the lapstrake planks.

The keelson is preserved in full length and *in situ*, reaching from frame 7 to 46 and has an overall length of 14.96 m. The width and height of the keelson increases towards the middle of the ship and forms a massive detail (length 274 cm, width 60 cm, height 31.5 cm), which houses the rectangular maststep. On both sides of the maststep, the keelson is supported with four chocks. The keelson is attached to the frames with trenails. The lower edges of

the keelson between the frames are beveled upwards, thus leaving more room between the keelson and the keel. On the bottom of the maststep, a water drainage hole has been drilled (Fig. 5).

From the midships towards the stern, five through-beams have been preserved *in situ*. The ends of the beams protrude through the planking and are equipped with hemi-conical fairings. These features are observable only on the better preserved port side of the vessel. The fairings are attached with iron nails. It is worth mentioning that fairings were attached on both, forward and aft faces of the protruding beam. These details are interpreted as fenders, meant to protect the beams during maneuvering in port (Waldus *et al*. 2019, 477; Vlierman 2021, 578). With the ship fully laden, the protruding beams were probably fully submerged and the fairings may have helped to reduce the drag (Vermeersch & Haneca 2015, 123; Vlierman 2021, 629).

Fig. 5. *Maststep with a drainage hole (marked with the red arrow).*
Jn 5. *Mastisteps vee äravoolu auguga (tähistatud punase noolega).*
Photo / Foto: Lisette Reinvars

The sternpost is preserved almost intact, with some damage to the upper and lower parts. The sternpost consists of two details – the sternpost itself and a false stern, connected to the sternpost with metal nails. On the false stern, metal gudgeons are fitted for rudder.

The ship does not appear to have had a designated area for a hearth. It is possible that a portable hearth or grilling rack was used for cooking. The presence of such a rack is indicated by a charcoal-marked stripe on the left side of the ship. Found pieces of peat, cut into 15–20 centimetre blocks, were certainly used for heating. Burned bones were also more numerous in the stern area.

In conclusion, the ship has a flat keel, a carvel-built bottom and a clinker-built hull with beams protruding the outer planking. The vessel has a straight sternpost with gudgeons for rudder. Moss, animal hair, wooden laths and sintels have been used to caulk the plank seams. These construction features have generally been attributed to cogs or cog-like vessels. The usage of sintels and double-clenched nails can also be considered characteristic (Crumlin-Pedersen 2000; Steffy 2017; Reinders 1985; Reinvars 2023).

3D MODEL AND CAUSES OF THE SHIPWRECK

During the archaeological fieldwork, also a 3D model of the entire ship was made (Fig. 6) to complement and ensure a better description of the wreck. A detailed photogrammetric model was created using the RealityCapture program, capturing the entire ship in detail. A drone weighing less than 250 grams was used for this purpose, permitting capturing images in tight and complex conditions.[1]

[1] Models and point-clouds were created in cooperation with Hades Geodeesia OÜ. Photogrammetry was performed by Silver Jäger.

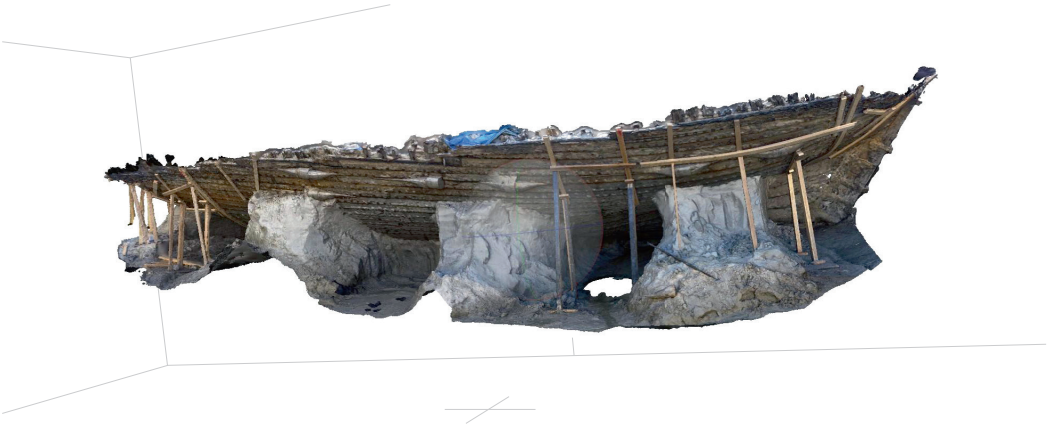

Fig. 6. *3D-model of the left side of the ship.*
Jn 6. *Laeva vasaku parda 3D-mudel.*
Model / Mudel: Hades Geodeesia OÜ

It is too early to determine the causes of the ship's sinking. For instance, a piece of the keel was missing from the stern of the wreck. It is possible that a coastal rock became fatal for the ship. The leaking ship might have sailed onto a sandbank, where it gradually became covered by sand and sediments over time. Perhaps we will be able to simulate different scenarios of the ship's sinking using the virtual 3D model.

FINDS

Artefactual evidence

To improve registration methodology the ship was conditionally divided into sections based on the preserved ship beams. Spaces between the beams formed a separate section. Furthermore, the ship was divided longitudinally into two imaginary halves, based on the starboard and port sides. This approach was also used in describing the locations of finds and larger find complexes with multiple artefacts (Fig. 7). Therefore, each find or collection

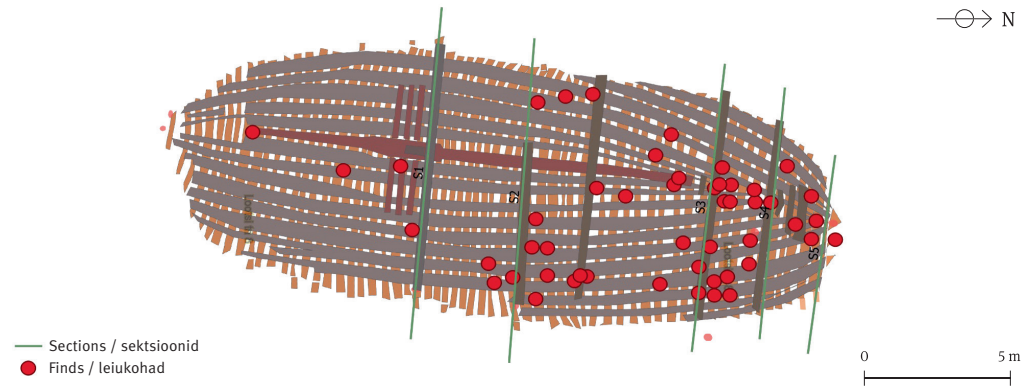

Fig. 7. *Concentration of finds inside the hull.*
Jn 7. *Leidude paiknemine Lootsi vrakis.*
Drawing / Joonis: Mihkel Tammet

of finds was described using the following parameters: section, side (starboard or port), artefact collection (in case there was an observable relation), height, coordinates. The following example describes how finds were registered: 'chest of iron tools, Section 4, Starboard side, Collection 7, -1.6 meters above sea level, X; Y coordinates'.

Initial estimate on the total number of finds on the wreck was approximately 300 archaeological artefacts. This number might change as the process of conserving and cleaning the objects is ongoing.[2] Many items discovered on the wreck were located in small collections, mainly at the rear or stern of the ship. Various craft tools were found. Sometimes the finds were stacked together (Fig. 8). Over 100 arrowheads and a few smaller spearheads (*springald* heads, see Mäesalu 2000, 8) were also discovered (Fig. 9). Numerous cords and ropes made from plant fibers, as well as textile fragments, were relatively well preserved. More than ten intact leather shoes and boots were found, and a leather belt pouch with silver-plated rings and buckles that was discovered from the presumed galley section is also important to note.

Whereas the above mentioned artefacts are perhaps common items of the late medieval material culture, there are some examples that stand out. Something we did not expect to find on this ship is the handle of a carpenter's caliper with rare cutouts (Fig. 10). According to initial assessments, this may depict Sventovit (Zaroff 2019), a four-headed god worshipped by the Slavs, who kept his spiritual status during the Middle Ages in the Baltic Sea cultural sphere, despite the spread of Christianity. Perhaps this find sheds some light on the nationality and home port of the sailors who navigated it.

Another artefact that beyond doubt deserves extra handling in the future is the compass, found in two parts (a compass kettle and a compass rose) in the stern section of the wreck (Fig. 11). To our knowledge

Fig. 8. *A barrel chest for keeping iron tools, fastenings and nails.*
Jn 8. *Raudvarakast rauast tööriistadele ja kinnitusvahenditele.*
Photo / Foto: Silver Jäger

Fig. 9. *A spearhead of the springald.*
Jn 9. *Laskeseadeldise notstali nooleots.*
Photo / Foto: Silver Jäger

[2] The finds are stored at the Maritime Museum, MM 23708Aa.

Fig. 10. *A handle of a carpenter's caliper depicting four-headed Slavic god Sventovit. The handle is made of apple (*Malus *sp.) or pear (*Pyrus communis*).*
Jn 10. *Vararaua käepide neljapealise figuuriga, valmistatud kas pirni- või õunapuust.*
Photo / Foto: Jaana Ratas

Fig. 11. *A 14th-century marine compass found from the Lootsi Wreck.*
Jn 11. *Lootsi vrakist leitud 14. sajandi kompassi katel ja kompassiroos.*
Photo / Foto: Jaana Ratas

this is the oldest compass found in Northern Europe, about 150–175 years older than the archaeological compass find from Mary Rose, sank in 1545 (Stimson 2005, 268). However, this find seems to fit very well into the temporal context, as maritime compasses were not uncommon in ships sailing along Baltic coasts based on written sources from the late 14th century. Thus, for example, in 1394, a compass maker in Kampen received money for outfitting a cog. In 1398, skipper and compass maker Gise Korling was mentioned in Stralsund, which led to a dispute between the city and Kampen (Ellmers 2018, 233). Hence, in both Hanseatic cities, compasses were crafted for local sailors. The discovered object from the Lootsi Wreck offers additional food for thought on late medieval maritime navigation.

Animal remains

In total, 281 bones and bone fragments were collected from inside the ship (Table 1).[3] Since the bones were hand-collected and the sediments partially removed with an excavator, then smaller fish and bird bones are likely underrepresented in the assemblage. However, the light sandy sediment and favorable weather conditions during excavation allowed to distinguish bones relatively easily from the surrounding environment. This is also evidenced by the recovery of several rat bones and an almost complete rat skeleton. The animal remains were found in various areas of the ship and in different depths, but are considered here as a whole because most bones collected presumably date from the same shipwreck event.

Most cranial and postcranial elements (except for ribs and vertebrae) could be identified to species or family. The faunal assemblage is dominated by domestic animals, primarily cattle (*Bos taurus*), sheep (*Ovis aries*), goat (*Capra hircus*), and pig (*Sus domesticus*). The less identifiable rib and vertebrae fragments classed as ungulate or unidentified mammals most likely belong to the same common livestock species. A few horse (*Equus caballus*) and dog

[3] Animal bones were identified using a personal skeletal reference collection and common identification manuals (e.g. Schmid 1972; Bocheński & Tomek 2009).

(*Canis familiaris*) bones were also found, as well as three bird bones identified as chicken (*Gallus gallus*). Wild animals were represented as well, including fish such as pike (*Esox lucius*) and pikeperch (*Sander lucioperca*), black rat (*Rattus rattus*), and fox (*Vulpes* sp.).

The almost complete rat skeleton was found underneath a leather pouch, which might have helped keep the skeleton intact. The faunal material is relatively well-preserved, but it is evident that the bones have been subjected to varying taphonomic conditions. The remains exhibited both natural and anthropogenic taphonomic modifications, such as discoloration (e.g. staining, burning, etc.), carnivore and rodent gnawing, some rounding (from contact with water and sand), and cut and chop marks. Several bones were partially or almost completely stained black. Due to the somewhat waterlogged setting it was sometimes complicated to distinguish between burning and other types of blackening, but in certain cases it was clearly related to the burial conditions or close contact with tar (the latter bones also have a strong distinctive smell).

Except for the rat, dog, and possible fox bones, the assemblage was characteristic of food waste. Cattle bones were the most abundant (n=56) and all anatomical regions except horncore were represented. The bones exhibit a high degree of butchery (chop marks and cut marks) and burning, and some have been gnawed by rodents and carnivores (probably by dogs, although humans can also leave bite marks on bone). Sheep and goat bones are the second most abundant finds (n=23), out of which three specimens could be distinguished as goat (including an almost complete horncore) and two as sheep. The bones show signs of butchery (particularly chop marks) and carnivore gnawing but unlike cattle, there is no evidence of burning. A few of the pig bones have also been butchered and chewed, but not burned. Among the ten specimens collected was also a scapula of a juvenile animal. The two horse bones included a humerus which exhibited black staining, including from contact

Table 1. *Animal remains found on the Lootsi Wreck (NISP – number of identified specimens)*
Tabel 1. *Lootsi laevavrakilt leitud loomaluud (NISP – määratud luufragmentide arv)*
Compiled by / Koostanud: Raija Katarina Heikkilä

Group / Rühm	Taxon / Takson			NISP	%NISP
Mammals (n=269)	horse	*Equus caballus*	hobune	2	0.7
	cattle	*Bos taurus*	veis	56	19.9
	sheep	*Ovis aries*	lammas	2	0.7
	goat	*Capra hircus*	kits	3	1.1
	sheep/goat	*Ovis aries/Capra hircus*	lammas/kits	18	6.4
	pig	*Sus domesticus*	siga	10	3.6
	dog	*Canis familiaris*	koer	2	0.7
	fox	*Vulpes* sp.	rebane	1	0.4
	canid	Canidae	koerlased	2	0.7
	black rat	*Rattus rattus*	kodurott	103	36.7
	ungulates	Ungulata	ungulaadid	35	12.5
	mammals	Mammalia	imetajad	35	12.5
Birds (n=3)	chicken	*Gallus gallus*	kana	3	1.1
Fish (n=9)	pike	*Esox lucius*	haug	3	1.1
	pikeperch	*Sander lucioperca*	koha	1	0.4
	fish	Pisces	kalad	5	1.8
			Total / Kokku	**281**	**100**

with tar, and a vertebra, both of which have some scrape marks. The canid bones include an almost complete pelvis and cervical vertebra of a dog, another fragmentary ilium that could belong to a slightly smaller dog (or perhaps fox), a metatarsal of a possible fox, and a lumbar vertebrae of a small-medium animal. The pelvis and cervical vertebrae were found together on the right side of the ship, further up compared to the other bones and probably belong to the same individual.

Although rats make up the bulk of the NISP (n=103), the remains represent only two or three individual animals. The majority of the bones come from just one individual whose partial skeleton was excavated using water-sieving. Another interesting find was a fragmentary burned rat skull in the stern of the ship. Beside mammals, three galliform bird bones were found in different parts of the ship, all showing evidence of butchery. Additionally, nine fish cranial bones were collected, among which the pike and pikeperch were identified.

On many later 16th–18th-century shipwrecks, the mammal bone assemblage is dominated by cattle and pig, although sheep is also common, yet goats, dogs and horses have rarely been observed (Migaud 2011). However, a horse cranial bone was found on the 'Peeter wreck' excavated in Tallinn (Roio *et al.* 2016) and a complete dog skeleton was retrieved from the Mary Rose which sank in 1545 (Zouganelis *et al.* 2014). Bones with carnivore gnaw marks also hint at the presence of a ship dog (or another animal chewing on bones). Interestingly, the dog pelvis found higher up in the sediment had some rodent gnaw marks.

Fig. 12. *The rats (*Rattus rattus*) that were found under the barrel of tar.*
Jn 12. *Tõrvatünni alt leitud rotid.*
Photo / Foto: Lembi Lõugas

In addition to bones, other faunal remains were also found. Two well-preserved desiccated rat mummies (Fig. 12) were found underneath a barrel filled with tar in the ship's bow. Further studies may reveal the last meal of the rats. Presumably, they ate the same food as the sailors, as is also evident from the rodent gnaw marks on the animal bones.

DATING

As of time of writing (late Summer 2023) we cannot offer exact and final dating of the Lootsi Wreck since the ongoing analyses of the ship details and the artefacts could bring more detailed estimation later. Presently, the dendrochronological samples taken during the fieldwork brought a reliable dating for the last cargo: the samples from oak logs (chopped down after 1374) suggest that the ship could have sunk between 1375 and 1377 (Läänelaid 2022). However, it is much more difficult in the case of the hull as the ship shows several signs of repair. Thus the first result (1363d) coming from the ship should be handled with extreme caution and it is to be expected that the additional dendrochronological samples from the non-repaired parts of the wreck, extracted after the fieldwork might deliver an earlier dating. At the same time, it should not be too much earlier as the use of Vlierman's Type III sintels suggests that the ship was built around 1350 AD.

This assumption can be supported by the preliminary handling of the finds. Whereas a lot of the tools and utilitarian items do not allow exact dating, there are some objects that give an approximate temporal framework. Thus, based on artefactual evidence, the ship's period of

use dates back to the mid-14th century.[4] This assessment relies on a Langerwehe funnel-neck beaker, dated typologically to the third quarter of the 14th century (LANG2, Russow 2006, 52ff.), also partially confirmed with a well preserved Dutch glazed redware tripod (Fig. 13) with a single loop handle (e.g. Gawronski 2012, 123, cat. no. 83). The collection of footwear does not contradict with this dating either, representing the typical leather shoes of ca. mid-14th century (Volken 2014, fig. 201 (type 12.07), fig. 206 (type 17.28), fig. 220 (type 18.12 and 12.17)). But in one way or another, the provided dates correspond to the beginning of a period of significant economic growth in Tallinn, largely reliant on its role as an intermediary in trade between Western Europe and the East. It was also a period of establishing better and secure sea routes in the competitive and sometimes merciless fight for commercial superiority on the Baltic Sea. It seems we are now a step closer to understanding the ships that contributed to bringing prosperity to the Hanseatic city.

Fig. 13. *Dutch redware tripod.*
Jn 13. *Madalmaade kolmjalgnõu.*
Photo / Foto: Jaana Ratas

CONCLUSIONS

The maritime nature of medieval Tallinn has been visible in the local archaeological contexts for many past decades: compared to the inland urban settlements, the variety of arte- and ecofactual evidence is much more diverse, underlining greater openness to foreign influences. This accessibility to overseas material culture was supported by the water-bound means of transport, that is well known from written sources, but had only meagre physical evidence until the early 21st century. This situation has dramatically changed over the last decade or so, as the growing focus on property development at the coastal areas has led to unearthing a large number of historical wreck sites. The most recent discovery of these finds – the 14th-century Lootsi Wreck introduced above – is also by far the most intriguing one. In addition to the exceptional state of preservation of the almost intact hull of a ca. 25 metre long 'Hanseatic workhorse', also the diversity of the technological details and the richness of the loose finds deserve highlighting here. The present paper only scratches the surface of this outstanding object, future in-depth studies of the wreck and the accompanying finds will deliver a series of new exciting data without any doubt. The conditions for that are promising, as after the excavations the wreck was transported to the Estonian Maritime Museum, where it is currently housed in a specially-built conservation hall. Cleaning and pre-conservation activities are in progress, supplementary laser scans and measurements are being made and detailed drawings prepared. Hopefully, the ship, which profoundly enriches our understanding of medieval shipbuilding, navigation and life onboard a merchant vessel, will be exhibited to the public in the near future in a brand new purpose-built exhibition hall.

[4] Probably the oldest find is a small sherd of Siegburg fully developed stoneware (Sieg3a), likely from a Jacoba jug type I (1325–1375, Russow 2006, 48–50) that was found in the bilge.

ACKNOWLEDGEMENTS

We are grateful to conservator Tarvi Toome (TLÜ AT) who is still struggling to make waterlogged wooden and metal finds look like museum showpieces and who outperformed himself making leather shoes look like shoes. We also thank conservators and archaeologists Riina Rammo and Karin Rannaäär (TÜ) who are doing miracles with textile and ropes found on the ship. We thank Jaana Ratas for the great images. Last but not least – Ragnar Nurk (TLPA) shared with us invaluable information on the history of the Tallinn shoreline.

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14. SAJANDI LAEVAVRAKK LOOTSI TÄNAVALT TALLINNAS

Mihkel Tammet, Priit Lätti ja Raija Katariina Heikkilä

2022. aasta pakkus Tallinnas taas arheoloogilisi üllatusi, millest vaieldamatult kõige enam väärib tähelepanu tänase Tallinna sadama D-terminali lähedalt leitud keskaegne laevavrakk (jn 1). See tuli päevavalgele 31. märtsil Lootsi 8 büroohoone ehitamisel ning juba uuringute algusfaasis oli selge, et tegemist on erakordse leiuga: pea tervelt säilinud laevakere pikkuseks mõõdeti 24,5 meetrit ning laiuseks 9 meetrit. Selliste mõõtmetega laev paigutub hetkel suurimate keskaegsete laevavrakkide hulka Põhja-Euroopas. Vrakile annavad teaduslikku lisaväärtust arvukad esemeleiud, nende seas nii mõnigi esmakordne. Esialgsete andmete järgi kasutati laeva 14. sajandi kolmandal veerandil. Alates 2022. aasta juuli algusest paikneb Lootsi vrakk Eesti Meremuuseumi Lennusadama alal ja sealsamas on plaanis seda ka eksponeerida.

Juba enne uusehitise kavandamist oli ette teada, et piirkonnas leidub vanu laevajäänuseid. Näiteks sama kinnistu Lootsi tänava äärsest osast avastati juba 2009. aastal keskaegne laevavrakk, mistõttu ei olnud uus vrakileid selles kohas kuigi suureks üllatuseks.

Lootsi vrakk paikneb Härjapea jõe suudme esisel rannikul (jn 2), kuid keskaegne sadam asus toona ilmselt juba vanalinna külje alla, Mere puiestee ja Sadama tänava piirkonnas. Võib arvata, et laev pääses tormiga sadamast või reidilt lahti ning leidis oma otsa rannikumadalikul. Vrakk oli jooksnud liivasesse merepõhja kinni, nii et maismaa poole vaatav vööriosa oli oluliselt kõrgemal kui ahtriosa. Tõenäoliselt mattus vrakk üsna ruttu liiva sisse. Uusaegsetelt mere sügavustega plaanidelt teame, et sadamast Kadrioru poole kulgevas rannikuosas oli meri madal, mistõttu pole üllatav, et seda sihilikult täitma hakati – Lootsi tn 8 ala sai maismaaks umbes 19. sajandi esimese poole jooksul. Järgnevalt püstitatud kaubalaod olid keldriteta, mistõttu vraki kõrgemad osad, mis olid 19.–20. sajandi täitekihtide all umbes 1,5 m sügavusel, jäid õnneks puutumata (jn 3).

Laeval on lai ja lame kiil, karveeltehnikas ehitatud põhja- ning klinkertehnikas paigaldatud kereplangutus. Laeva asendi tõttu pinnases on paremini säilinud vasak parras, mis ahtriosas on alles kuni tekikonstruktsioonini – suurte puust kniide ehk põlvedeni, millest ahtripoolseimad on säilinud *in situ*. Alles on 62 kaart – vööriosas vaid floortimberid, kuid ahtriosas on jälgitavad ka jätkutimberid ning nende kaldseoses kinnitus floortimberite külge. Kaartele toetub kiilson, mis ligikaudu kesklaevas laieneb ja moodustab massiivse puitdetaili, milles paikneb süvistatud nelinurkne mastisteps. Vöörtääv pole paraku säilinud, kuid ahtritääv koos rooliaasadega on alal hoidunud (ilmselt) pea kogu pikkuses. Laeva ahtripoolses osas on säilinud ka läbi parraste väljaulatuvad põiktalad ehk piimid.

Laeva põhja- ja kereplangud on kaarte külge kinnitatud naaglitega, kereplangud on omavahel seotud raudnaeltega, mille sissepoole ulatuv ots löödi kõveraks ja taoti planku tagasi, moodustades nii omamoodi raudklambri. Plangusaamad on tihitud sambla, kohati ka tõrvatud loomakarvadega ning kaetud pikkade puitliistudega, mis on plankude külge kinnitatud lamedate, sintleiks nimetatavate raudklambritega. Viimaste kuju alusel võib oletada, et nad on valmistatud ajavahemikus 1350–1400.

Vraki dokumenteerimise ja kirjeldamise osana valmis Hades Geodeesia ja Muinasprojekti koostöös tervest laevast 3D-mudel (jn 6).

Vrakilt koguti ka arvukalt leide (u 300) ning muuseumi järeluuringute käigus kasvab see arv laeva konstruktsioonide vahelt leitute näol veelgi. Lõviosa esemeid paiknes kogumitena laeva ahtriosas, kus oli säilinud ka vaheseinte ja tekkide jäänuseid, sh arvatav kambüüs. Esemete hea säilivuse tagas niiske liivapinnas, seetõttu oli säilinud ka palju orgaanilist ainest, tekstiilist nahkesemeteni. Kõige rohkem saadi mitmesuguseid laeval tarvilikke tööriistu, sh väärib eraldi esile tõstmist ideaalses seisukorras puidust käepidemega tahumiskirves. Märkimisväärses koguses – üle saja – saadi ammunooleotsi, millele lisanduvad mõned väiksemad odaotsad või nn notstali nooleotsad (jn 9), võiks viidata kaitsemeeskonna olemasolule laeval.

Kui paljudele leitud asjadele on arvukalt vasteid ka mujalt, siis vähemalt kaks eset paistavad oma erandlikkusega rohkem silma. Neist esimene on ehituspuusepa vararaud (jn 10), mille teeb eriliseks tema käepide. Sinna on sisse lõigatud neli eri suundadesse vaatavat mehenägu, mis võivad kuuluda slaavlaste

jumalusele Sventovitile. Eriti haruldane on vraki ahtriosast leitud kompassi kauss ja -roos (jn 11), millele nii varaseid paralleele pole teada. Küll aga võib kirjalike allikate põhjal oletada, et sarnased kompassid olid 14. sajandi lõpus üsna tavalised.

Olulise osa leiumaterjalist moodustasid loomaluud. Kokku koguti laeva seest 281 luud ja luutükki (tabel 1). Kuna luud koguti käsitsi ja setted eemaldati osaliselt ekskavaatoriga, võivad väiksemad kala- ja linnuluud olla koosluses alaesindatud. Kerge liivane sete ja soodsad ilmastikutingimused kaevamiste ajal võimaldasid aga luid suhteliselt kergesti välja puhastada. Sellest annab tunnistust ka mitmete roti luude ja peaaegu täieliku roti skeleti säilimine. Leiti ka kaks mumifitseerunud roti korjust (jn 12). Loomajäänused leiti laeva erinevatest piirkondadest ja erinevatest sügavustest, kuid siin vaadeldakse neid tervikuna, sest enamik kogutud luid pärineb oletatavasti samast laevahuku sündmusest.

Hetkel on veidi keeruline välja pakkuda laeva täpsemat kasutusaega, sest vraki dendrokronoloogilised uuringud pole veel lõpule viidud. Välitööde ajal võetud proovide järgi saab aga siiski oletada, et laeva lastiks olnud ehituspuit (tammeprussid) langetati 1374. aastal, seega võis laev uppuda vahemikus 1375–1377. Pardalt leitud tarbeesemete (keraamika, jn 13) valmistamis- ja kasutamisaeg jääb aga umbes 14. sajandi keskpaika. Kokkuvõttes võib tõdeda, et lasti dateering ja vraki pardaid iseloomustav klinker- ehk ülekattega laudis lubab oletada, et tegemist on Läänemere ja Põhjamere piirkonnas toona tuntud kaubalaeva kogega.