REUSING A LOG-BARRIER EMBANKMENT AT THE SUOMENLINNA SEA FORTRESS ISLANDS

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Abstract

It has always been technically and economically challenging to build constructions on a shoreline. For that reason, those constructions can be used and maintained for a long time, and today contain interesting archaeological information. Despite this, at the time of carrying out repairs, archaeologists are not usually consulted, and the history of a construction is seen as unimportant. However, with this case study of a log-barrier embankment from the early 20th-century Suomenlinna fortress, a new approach is available, challenging the way archaeologists collect data. The data collected from the site can be used together with the archaeological interpretation to aid in the plan for the reuse of the site.

Key words: maritime archaeology, underwater archaeology, Baltic Sea, Suomenlinna, Sveaborg, reuse, embankment.

Introduction

Sveaborg, the Sea Fortress in front of Helsinki, was founded in 1747. Today it is called Suomenlinna, and it is a Unesco World Heritage Site and receives 700,000 visitors every year, making it one of the most important cultural heritage sites in Finland. Suomenlinna is a state-owned area, managed by the Ministry of Education and Culture. The Governing Body of Suomenlinna is the agency that manages, restores and maintains the fortress. Maintaining a fortress on a group of islands is not an easy task. For this reason, the Governing Body has started to take into consideration the potential of underwater archaeology to provide new insights into maintaining and reusing the constructions which are still in use.

The increasing interest in marine archaeology has heightened the need to evaluate the process of archaeological documentation, and to choose what can be understood as an important site.

This article presents the first project in Finland on a shoreline where archaeological documentation was carried out on a construction which was still partly in use. This construction is a log-barrier embankment, and its context presents certain challenges to the collection of archaeological evidence. Together with archaeological interpretations, the documentation material can be used as a practical tool for architects making a plan for the reuse of physical remains. Usually archaeological excavations destroy the physical remains; but this article shows how archaeological methods and interpretations can be used in the *systemic context*, where the site remains in use as a reused construction.

The historical background of the dockyard

Suomenlinna has had several functions, but its main focus has been to serve as a naval base and a dockyard. The main dockyard is the dry dock, located on the island of Susisaari, one of the main islands. This dry dock is still a home port for historically important vessels (Matikka 2008, p.23). The dockyard area has gone through several phases of rebuilding since it was established in 1750. The dry dock used to form the central area of the fortification, and it has a rich history connected to the strategic situation of the Baltic Sea area. The focus of this article is, however, the end of the Russian period in the 1910s, when the islands had a large population of over 6,000 men (Gardberg, Palsila 1998, p.136). Suomenlinna was serving the Russian Baltic Fleet, and the dockyard was called 'the Admiral Essen dockyard', after a former commander of the Baltic Fleet in the Russian army (Rosén 2008, p.19; 2007, pp.8-15). More precisely, this article deals with the very last year of the Russian era, 1917 to 1918. This period includes the February Revolution, the October Revolution and the Finnish Declaration of Independence on 6 December 1917. All this political activity influenced the decision-making and the formation of archives at the time, creating a shortage of sources for historical study.

The history of the construction of the dry dock was published in the 1950s by Lars Petterson (1953) in his series of general articles on the Suomenlinna dockyard. The plan for building a completely new basin was only referred to by Petterson as an unfinished plan (Petterson 1953, p.3). What we have left from the process of building a new dockyard basin today are the physical remains, two log-barrier embankments. They are

Fig. 1. The larger log-barrier embankment under construction, 17 February 1917, at the mouth of Tykistölahti Bay (Helsinki City Museum).

located on opposite sides of the planned basin, which was a bay called Tykistölahti between two islands. It is unclear when exactly these two remains were discovered. The smaller embankment was later left under a landfill, and is more or less visible in the water; but the origin of the construction was almost forgotten until this case study.

The larger embankment is submerged and invisible from the surface. It was identified by the marine archaeologist Harry Alopaeus in an article in 1984. He had found the only 'eyewitness' to the construction work, which had so far been referred to as only an unfinished plan without any kind of building activity. This eyewitness is an old photograph from the archives of the Helsinki City Museum, dating from 17 February 1917 (Fig. 1). In this picture, the larger log-barrier embankment is partly floating on top of the current location, giving us an excellent dating for the construction work (Alopaeus 1984, p.34).

It is not clear if these two embankments were built simultaneously, or one after the other. Nevertheless, the construction work of the new basin was unfinished by the time the Russians handed over the fortification to Finland on 14 April 1918 (Enqvist, Härö 1998, p.17). Suomenlinna technical administration's engineering workshop took over the site, and relatively quickly presented a plan for enlarging the dockyard with a new basin (Sipilä 2007, p.39). From this plan, there is at least one copy of a map (Fig. 2), partly preserved, together with public records and minutes revealing the lively discussions involved. The plan for building a new dockyard basin on Suomenlinna stayed in active political discussion until the 1940s (Sipilä 2007, p.42; Petterson 1953, p.5). It was finally rejected as old fashioned, but it can be referred to as evidence of the importance of shipbuilding at the time. These two underwater remains of log-barrier embankments show the amount of hard work related to this process.

Source material from two different log-barrier embankments

The smaller embankment construction is the site of archaeological documentation in this case study. There is also one surviving old photograph of this smaller embankment (Fig. 3). This photograph is from the year 1918, before the landfill, which later on covered up the construction. (Rosén 1994, p.49). This smaller log-

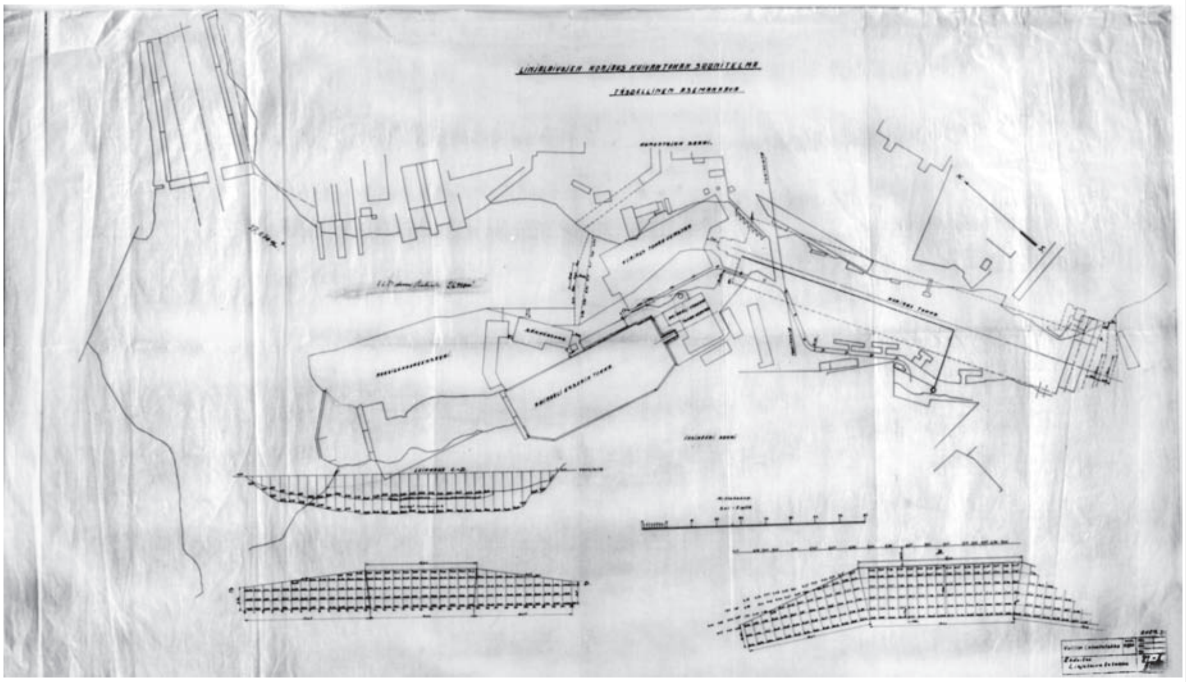

Fig. 2. The plan of 30 July 1918 for building a new basin. Both embankments are presented in the drawing (Archives of the National Board of Antiquities).

Fig. 3. The smaller log-barrier embankment is visible before the landfill. This picture was taken in 1918 (Helsinki City Museum).

Fig. 5. Archaeological documentation on the smaller log-barrier embankment was carried out with the help of Total Station (photograph by M. Leino).

barrier embankment was partly reused as a jetty in the 1980s. It was used as a temporary bridge before the construction of the jetty. About a third of the structure has been dredged away, and the last third of the structure is now visible in the water.

The larger embankment at the mouth of the bay was never finished, and it was left at the bottom where we can find it today. It is probably the biggest underwater wooden barrier construction in the world, covering the whole width of the mouth of the bay. It is made up of three different parts in a V-shape, and altogether it forms an almost 100-metre-long and 12-metre-high wall of logs. The available documentation of this construction was made by voluntary divers in the 1980s, after more than 100 diving hours. At the time, its origin was interpreted to be a sailing obstacle. These original sketches and measurements were found in the Marine Archaeological Archives of the National Board of Antiquities in Finland. In addition, multibeam sonar documentation was carried out in June 2010, in connection with the archaeological survey of the area conducted by the author between the years 2007 and 2010 (Fig. 4, see Plate VI).

The documentation of the smaller embankment

Archaeological documentation was carried out on this structure from 8 to 12 June 2009, covering altogether 160 square metres. The construction of the log-barrier embankment was first excavated with shovels. The underwater part of the construction, mainly the end and the side profiles, was brushed and cleaned of vegetation and sediment. The whole construction was documented by photographing it with digital cameras. The construction was documented in detail with Total Station (Fig. 5). The side profiles were only visible in the underwater parts, and were thus in addition measured and drawn by hand. These two sets of information were combined afterwards. In the documentation, the focus was on different kinds of joints and the condition of the wooden material (Fig. 6).

The dendrochronological sampling of the smaller embankment

The aim was to see if dendrochronological analyses can give us new information on the time of construction. Besides the confirmation of dating, there was a possibility for gaining new information on the logistics of the time. Where did the wood come from, and what

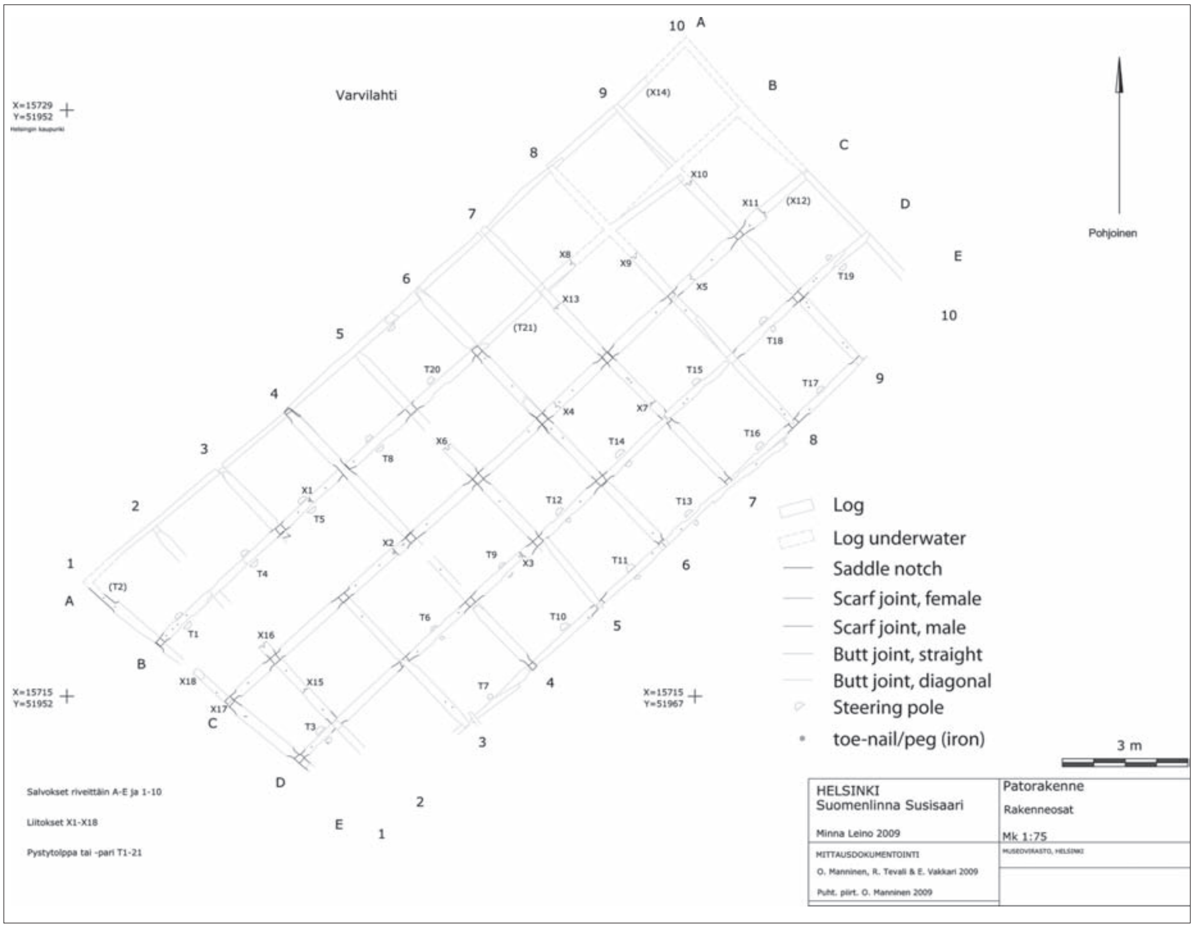

Fig. 6. A map of the smaller log-barrier embankment (drawn by Otso Manninen).

type of wood was used? The sampling was organised on 3 September 2009 with the use of a chainsaw. Altogether, four different samples from different trunks were taken. These samples were analysed by the Dendrochronological Laboratory of the University of Joensuu (Zetterberg 2010).

No of sample	Years of growth	Estimation of the year of felling
FIU6101	1826-1911	0-10 years after 1911
FIU6102	1859-1916	0-3 years after 1916
FIU6103	1736-1915	0-3 years after 1915
FIU6104	1831-1915	0-3 years after 1915

All four samples were pine (*Pinus sylvestris*), which gives us reason to believe that the whole construction was made of pine wood. Four samples were not enough to determine the exact location of the growth of the wood, but curves from southern Finland were used as reference material. Every trunk used in the construction was peeled, leading to some inaccuracy in the dendrochronological results. After the last identified ring, the soft surface could still have contained more annual rings. The number could only be estimated from the depth where the heartwood changes into sapwood (Zetterberg 2010).

Theoretical background of reuse in an archaeological context

At the time the archaeological documentation was carried out, it was obvious that the construction maintained its use. This is not a typical solution, and therefore it is necessary to look into the theoretical background of reuse in an archaeological context. Reuse and recycling have been discussed in archaeology in several contexts. In a marine archaeological context, recent views are expressed by Nathan Richards in his book *Ship Graveyards*. On the questions of reuse and recycling, Richards refers to the principles laid down previously by Schiffer, Downing and McCarthy in their article 'Waste Not, Want Not: An Ethnoarchaeological Study of Reuse in Tucson, Arizona'. They expressed, at the beginning of the 1980s, how little is known about what happens to artefacts after their original owners no longer find them useful. Do they end up as waste, or something else? We can agree that waste is a human concept. In nature, nothing is wasted: everything

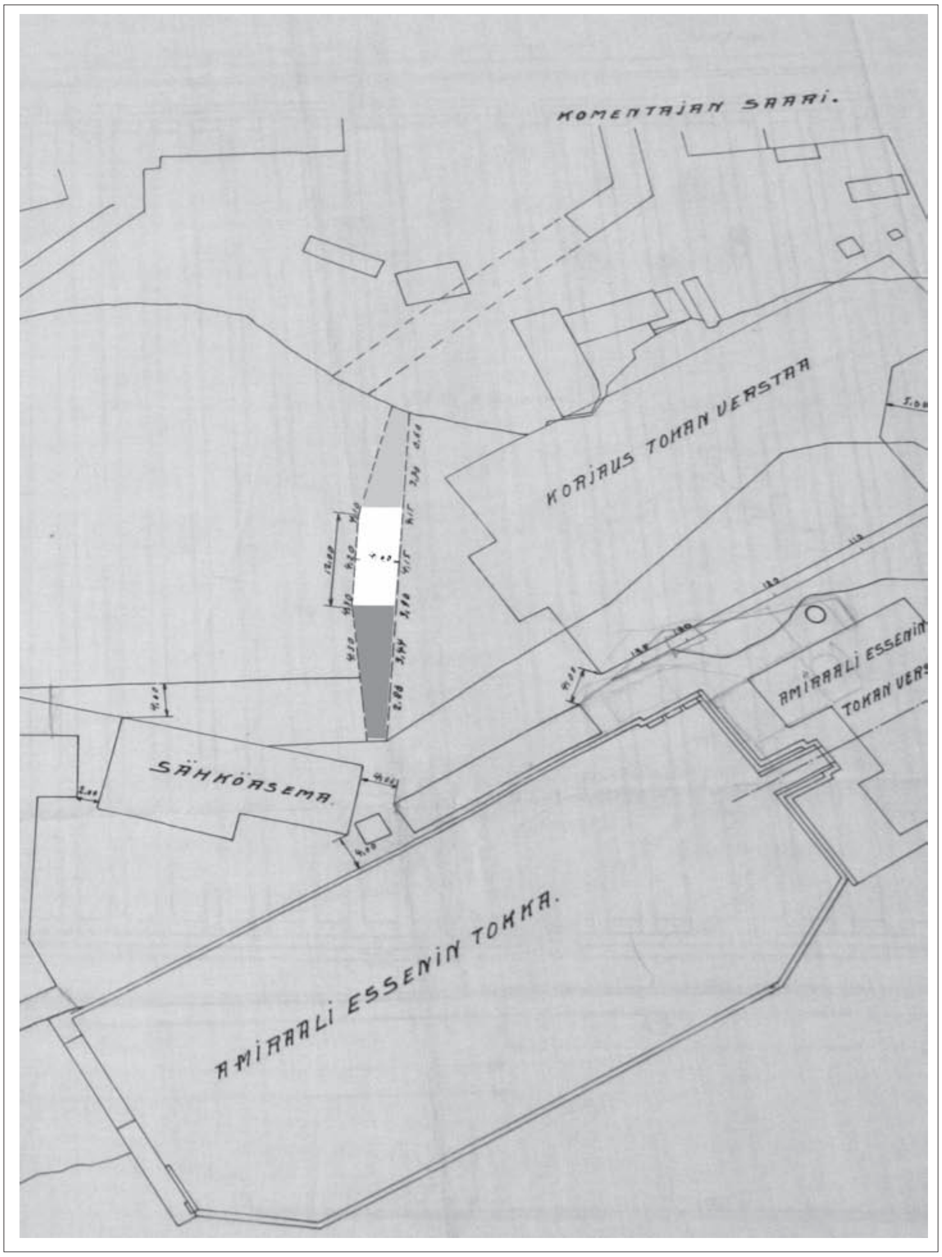

Fig. 7. A detail of the map: red presents the archaeological documentation of 2009; green the dredging in the 1980s; the blue area of the construction is under a jetty (by M. Leino).

is part of a continuous cycle (Hayes 1978, p.6). Does waste equal an archaeological context, where remains from a systemic context end up as protected ancient sites; and does the continuous cycle of use end there?

Schiffer *et al.* explain the elementary nature of reuse behaviour: it is a process where a change occurs either to the user, the use or the form of a particular artefact. Distinct behaviours are connected to different reuse mechanisms. According to Schiffer, recycling requires the reintroduction of material into an industrial process, where the material is transferred to some other form or function. A typical process of recycling is the salvaging of objects and the dismantling of watercraft. Secondary use, meaning reuse, refers to a situation where the form of an object is not changed, but its function is altered to something different to the original. It is typical that this occurs in objects which are worn out (Richards 2008, p.55; Schiffer *et al.* 1981, pp.67-86). From this perspective, we could argue that turning a log-barrier embankment into a jetty construction could be called reuse.

Conservation processes are related to the process where the techno-function of an object changes from techno-function to socio- or ideo-function. A good example is the number of historic ships used as museums, where they are not technically speaking serving as ships, but as historical objects (Richards 2008, p.55; Schiffer *et al.* 1981, pp.67-86). In the case of log-barrier embankments, there could also be some aspects of a conservation process, if the historical background of the construction could be made visible in the landscape. This could be achieved by establishing information signs explaining the history of the log-barrier embankments, and also presenting pictures visualising the construction.

Results

After documentation and dendrochronological sampling, we were able to transfer the structure from an archaeological context to a systemic context. The site can again be in active use, but in a different way to what it was originally built for. The site can be reused as a base for a new jetty. In order to be reused, a different kind of information was collected from the structure compared to normal archaeological documentation. Attention was paid to the condition of the wood as a building material, and to the strength of the structure. It was a surprise how big a difference there could be in the preservation of the wood in different parts of the structure. On the side towards dry land, the wood was badly destroyed by erosion and bacterial activity. In the water, it was waterlogged, and, kept as such, it will stay in good condition. If the wood is taken on to dry land, it will not last for long. The best preserving conditions were, however, inside wet sand: even tool marks were still visible.

Only visual estimations of the preservation of the wood could be carried out, no ultrasound measurements were made. The same estimation happened with the conditions of different joints. The whole structure had been influenced by the dredging of a third of the structure, and in particular joints close to the dredged end of the construction had opened up, decreasing the structural strength of the whole construction. This does not necessarily mean that the ability to preserve the land on the shoreline from erosion is weakened. Steering poles on both sides of the wall anchor the construction into the ground, making it a stable construction.

We could not reach a more precise dating for the structure. We have a dating for the construction already from a previously mentioned old photograph, where the construction is visible in the year 1917. It was taken in the spring of 1917. In this sense, the dendrochronological samples do not give us new information for dating the construction.

In our case study, we were able to compare two similar constructions, two embankments on opposite sides of a planned dockyard. Both structures were made with roundwood, using saddle notches, box-like structures which are better known from traditional log cabins. The bay called Tykistölahti offered a natural basin between two islands, making it geographically suitable for enlarging the old dry dock with a new dockyard basin. Still, it was technically and logistically very challenging to build a wooden construction in these kinds of geographical conditions. Even the underwater topography of the water area varies a great deal, and is 21 metres at the deepest point by the larger embankment, while the depth around the smaller embankment is less than two metres. This might be the reason why the smaller log-barrier embankment has no tabled splice joints, that is, a type of joint which is more durable but more difficult and time-consuming to make than a simple scarf- or butt joint, which were both used. Instead of these, tabled splice joints, or 'lock-joints', were used in the larger embankment.

Traditionally, wooden pegs are used in these kinds of constructions as nails attaching logs on top of each other in order to prevent them from moving sideways. Using iron nails instead of wooden pegs in an embankment made for underwater conditions is an exceptional and unusual choice. The embankments were probably made very quickly, and were intended to be short-term embankments that were supposed to prevent the sea water from entering the basin while permanent constructions were being made. In other words, it should have been possible to build permanent embankments within the shelter given by these embankments. It is clear that neither work hours nor costs were saved by making both of these constructions with axes and knives. The exact techniques of the building operations are worth closer study. Were they built on the site on top of ice, as we would expect from the eyewitness photograph?

Discussion

This presentation was given as part of the international conference called 'Underwater Archaeology in the Baltic Region: Challenges and Perspectives'. Challenges are present in research in general, but they are particularly prominent in different kinds of fieldwork. This log-barrier embankment case study was challenging because it was a combination of land-based archaeological documentation and underwater archaeological methods. Even more challenging was the need to collect information on the condition of the construction and the material to plan the future of the structure. The combination of all of these can be very successful.

In dealing with very recent history, as in our case the year 1917, we always have to find a way to use different kinds of sources. Archaeological records are the main source of information describing the manner of interpretation when an archaeologist is doing research. This kind of construction can easily be studied by other disciplines, concentrating more on historical data. It is a question of a different kind of approach, and all are equally important in forming a reconstruction of the past. Archaeology should not be used merely to verify the historical record, nor is the historical record enough if there is a possibility for collecting archaeological data. We marine archaeologists should be able to convince not only our colleagues but other scholars and a wider audience as well that an archaeological perspective is necessary in a situation where there is already a wealth of information from other sources. Widening the scope of the documentation, as in this case study, could be one way of making people understand the possibilities that archaeological research can offer contemporary society.

One problem with marine archaeology is that sites are not visible: they are not *real*! New techniques, like multibeam sonar, help in visualising the underwater cultural landscape and archaeological remains such as the larger log-barrier embankment. The smaller log-barrier embankment was in a location where people could partly see the construction. A lot of effort during the fieldwork went into disseminating information: it was happening in a Unesco World Heritage Site. We accept that people are fascinated by archaeological excavations in general, and, instead of being unreceptive towards curious visitors, we should take the time to explain what we are doing. This is a way of making people respect their environment and appreciate the historical layers in the landscape. Archaeologists should, in this respect, realise the educational side of archaeological research. This research also honours the work of past generations. We should not remove all these signs of work from the landscape; rather, we should aim to make them more visible and accessible, by working together with other professions.

All this does not exclude the fact that, being a research discipline, we should also be able to come up with new information. There is a trend in marine archaeological research to refer to constructions as artefacts. This creates the possibility to concentrate on a study of the lifespan of an object or a construction, offering the possibility for a new kind of approach. It can also mean that we can study sites which are not ancient, but which have been abandoned rather recently or are still in use.

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PAKARTOTINAI PANAUDOTA RĄSTŲ UŽTVARA SUOMENLINNA SALOS TVIRTOVĖJE

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Santrauka

Suomenlinna salos jūros tvirtovė, įkurta 1747 m., yra šalia Helsinkio miesto. Ši tvirtovė pastatyta siekiant apsaugoti jūros bazę ir laivų statyklą.

Dvi medinių rąstų užtvaros buvo pastatytos tuo pačiu metu – 1918 m. Didžioji rąstų užtvara yra 10 m aukščio ir 70 m ilgio. Antra rąstų užtvara trumpesnė ir yra kitame įlankos gale. Archeologiniai užtvarų žvalgymai vykdyti 2009 m 160 m^2 plote. Dendrochronologinių tyrimų metu nustatyta, kad rąstai buvo paruošti 1911–1916 metais. Tarpusavyje rąstai sujungti kabliais ir geležinėmis vinimis. Šių rąstų sujungimo darbai buvo atliekami po vandeniu. Povandeninių archeologinių tyrimų metu konstatuota, kad rąstų užtvara yra geros kokybės ir būtų kliūtis net dabartiniams laivams. Tyrimų metu sukauptos medžiagos analizė rodo, kad jūros vanduo mediniams rąstams irimo atžvilgiu didelės įtakos neturėjo. Šios užtvaros taps jūros muziejaus ekspozicijos dalimi.

Vertė Algirdas Girininkas