The ‘yellow’ of Maasilinn – is it the ‘curse’ of Wasa or a redox reaction?

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The Maasi ship or the wreck of Maasilinn has got its name from the ruins of the Soneburg or Maasilinn order castle on the coast of the Väike Väin (Small Strait) in Saaremaa. The wreck was found in a small cove close to the ruins. The mud-covered wreck was discovered about three metres deep by divers from the Estonian Maritime Museum underwater club Viikar, exploring the strait in 1985. Further investigation proved that the 16th-century ship had been anchored at the medieval port (about 370 m away from the present coastline) and had sunk obviously during a fire on board. About a fifth below the draught line of the ship that was originally 15 to 16 m long and 6 m wide had survived. The above-water constructions and parts of the rig had perished.

The conservation of the wreck was launched in August 1987 when the underwater investigation had been completed and the wreck brought to the shore. The method that was chosen for conservation – sublimation at normal pressure – had been used before only in laboratory conditions. In the process of conservation frozen water is removed from timber saturated with surface active filling substance, a stabilising component added. It means that the drying up process goes on when ice is evaporating. In the evaporation or sublimation the material shrinks considerably less compared to the process of drying up soaking wet timber. The work was carried out in a specially erected building, where the wreck was watered with PEG-1200 20-% solution in a hand-squirt several times a day for almost a year. This was followed over-a-year-long freeze-drying process. The process was finished in January 1990 when most of the water had been removed from the timber. Unfortunately, after that the wreck had to ‘survive’ for 25 years in the conservation building that had become a temporary storage room, although the microclimate was not stabile there. The Maritime Museum got the completed exhibition hall in the Seaplane Hangars in the spring of 2012. The general condition of the wreck seemed to be good – there was neither mould nor had the timber details shrunk, but about ten years after the conservation some lighter patches were noticed close to the iron details of the wreck. These had appeared at the spots of earlier rust damages or around them. It was the time when news about troubles in connection of the wrecks of the famous Wasa and Mary Rose were much discussed and so the Maasi ship was paid more attention, too. In March 2005 the commission of specialists of the National Heritage Board checked the wreck and discovered that pure sulphur (flowers of sulphur) had crystallised in different parts of timber. Although sulphur in ordinary conditions is a rather stabile substance, the sulphur spots showed that some chemical processes had occurred or were still taking place. It was clear that they might damage the wreck seriously in a longer run. As big maritime
history centres (the Wasa Museum, Roskilde Viking Museum, Oslo Viking Museum and Mary Rose Museum) possess highly-qualified teams dealing with preservation and conservation of wrecks, continuously consulting best research centres all over the world and publishing their achievements in expert papers, reports and media, the database about wreck conservation is awe-inspiring. Owing to this we have been able to notice and explain the changes in the condition of the Maasi wreck and detect the possible results.

The aim of the present article was to explain the visually detected observations and to extrapolate the results of similar investigations with the help of describing the processes that have or might have taken place in the materials of the Maasi wreck. Mostly changes in wooden and iron details in various environments (seawater, air, preservatives, micro-flora and fauna) have been observed and the presence is stated together with the prognosis for the future. Among the factors influencing the wreck the most essential ones have been observed. These are sulphur and iron compounds and the changes happening in them, electrochemical processes in iron details and the influences of electrolytes, above all chloride and possibilities of eliminating it. A survey of the same processes and their results concerning the Vasa ship, the so-called Bremen cog, the Mary Rose and remains of the Pärnu cog has been presented for the sake of comparison. Problems that might arise at the conservation of the so-called Tivoli cog found in Tallinn in 2015 have also been touched upon briefly.

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