Ship mills in historical Hungary

Schiffmühlen in Ungarn

Moulins flottant en Hongrie

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History of ship mills in Hungary

The first available written documentation regarding ship mills in Hungary is from the 13th century. This allows us to establish clearly that the mention is made of mills working on the Danube near Pozsony and Buda (*Smoling Somorjay 1934*, 23–24; *Pongrácz 1967*, 106). The earliest archaeological relic, found in the river at Tiszabecs (Upper-Tisza region) dates from the 14th century (*Páll 1993*, 79–81). Hollowed-out tree trunks longer than 12–13 m have been found not only in the Tisza but also in the river Szamos. These are, in my opinion, no remains of boats carrying salt, but carriers of ship mills (*Iuraşciuc 1967*). More information is available about ship mills in Hungary at the beginning of the 1600s. Faustus Verancsics mentions in his work entitled Machinae novae that the smaller ship of ship mills carries only the shaft of the water wheel. He relates that the ship mills on the Danube used to be tied to mill stakes driven into the river bed by using a rope twisted from willow twigs (*Verantii 1616*, XVIII). An early depiction, which is considered to be an authentic representation, dates from 1588: the view of Pozsony shows a ship mill on the Danube (*Soltész 1993*, 12). The view of Győr made in 1597 by Nicolaus Aginelli and Georg Houfnagel shows the town in 1566. One or two ship mills float here on the Danube (*Soltész 1993*, 16). After this time, plenty of data are available. In the 17th century ship mills work on all big rivers, moreover, we know well their construction and ways of mooring. As the population increased in the course of the 18th century, the number of mills multiplied too. In 1750–51 altogether 22 ship mills worked near Szeged, which number increased in 1763–68 to 36, and in 1777–78 to 47 (*Juhász 1960*, 128). This multitude of mills became a hazard to shipping and several regulations tried to control their mooring and locations. Industrial development in the 19th century didn't pass by the mill industry, the more so since the boom in the grain market was one of the driving forces of the development. In a second wave of reconstruction of modern mills in Hungary, being already world-leaders, ship mills were equipped too with new machinery according to the latest technology. The middle of the 20th century was the period of decline of the ship mills. The few mills, which survived the Second World War, were closed down by the communist dictatorial regime.

The structure of the ship mills

Based on historic data and archaeological finds, we establish two methods for building the hull. The carcass of the ship was made of U shaped ribs hewn from timbers. This frame was covered with broad oak planks. The planks were fixed to the ribs with wrought-iron nails, in earlier times with huge wooden nails. The gaps between the planks were filled with moss. The moss was pressed down and held in place by laths. U shaped wrought-iron nails fixed the laths. We recognise this type of ship-building on pictures from the 16th century and the mentioned U shaped nails are well known from archaeological finds of the late Middle Ages. Faustus Verancsics shows such hulls in his book presenting new machines (*Verantii 1616*, XVIII–XIX). Following the older method, huge hollowed-out oak trunks carried the floating mills. 2–3 such trunks supported the bigger ship, and one or two trunks were under the shaft of the water wheel. The length of the trunk was often 13 m, and its diameter might have exceeded 1 meter. (For those interested in linguistics: these trunks had a special name in Hungarian: *tombác or dudu.*) Mills supported by tree trunks were still in use in the 19th century on small rivers, but they completely disappeared by the 20th century (*Kovács 1989*).

Ship mills in Hungary consisted of two ships and had an asymmetric construction (of the katamaran type). The bigger ship (the 'house-ship') was moored near to the banks. The mill together with the machinery was set up on this ship. The smaller one, an open boat ('valley ship' or *tombác*) supporting the end of the shaft of the water wheel, faced midstream. Long timbers connected the two ships. Planks, nailed on the first two timbers, served as a walkway between the ships. The diameter of the water wheel of smaller ships was about 4–5 m, its length was 7–8 m. The diameter of the wheel of a bigger ship could reach 6 m. The water wheel could be stabilized by a wooden lock lowered into water. The thicker end of the shaft of the water wheel entered the mill house. A big cog-wheel was attached to it, which fitted together with the bits of a smaller cog-wheel. The short shaft of the smaller cog-wheel formed a right angle to the shaft of the water wheel. A bigger cog-wheel joint the other end of the short shaft, which turned the spindle. This way, the rotation of the water wheel was sped up by double transmission before reaching the mill-stones. In modern mills, an elevator moved the grain and cylinders ground it. The flour was