



Tidal power in medieval Greenwich

Excavations at Greenwich Wharf have uncovered the foundations of the earliest medieval tide-powered mill yet found in London. The huge structure, measuring 10 by 12 m at its base, would have had a wheel diameter of over 5 m, and has been dated to the 12th century. The mill structure represents an extraordinary example of medieval engineering ingenuity. The tidal mill was discovered during investigations by Museum of London Archaeology (MOLA), working closely with Erith Contractors Ltd to prepare for the construction of a new residential development by London and Regional Properties at Greenwich Wharf in Greenwich.

Tidal mills worked by drawing water from the river into an artificial pond as the tide rose and releasing it as it fell, powering the mill. The mill at Greenwich features a substantial fragment of intact waterwheel and an enormous trough to channel the water, which was shaped out of a single oak beam. Remarkably well preserved in riverside peat deposits, the mill is an unprecedented and rare find. It appears to have been pre-fabricated, and constructed in two phases from prepared oak beams, on which carpenters' construction marks are still clearly visible.

Damian Goodburn, Museum of London's ancient timber specialist, identified the beams as being cut with an axe rather than a saw, initially suggesting an early medieval date. Dendrochronological analysis has supported this observation, dating the trees' felling to 1194. A large curved section of the waterwheel

itself was found preserved within the water trough enabling archaeologists to estimate the diameter of the wheel at around 5.2 m – a vast size for a structure of this type and testament to the craftsmanship and engineering skills of its makers. It would have required exceptional stability to prevent millstones from shifting. No evidence for the gearwheels or the mill pond were found. Numerous fragments of broken millstone were however discarded within the structure and were possibly reused, once worn-out, as packing material beneath the mill foundation.

Four mills in Greenwich are mentioned in the Domesday Book of 1086, and over 6000 mills were recorded across the country at this time. However, little evidence of mills in use in the early medieval period has been found on archaeological sites, so the discovery of a 12th-century tide mill at Greenwich is very significant.

Following its excavation and dismantling by the MOLA field team, and in consultation with English Heritage, each timber has been carefully recorded so the mill can be properly researched. The post-excavation study will enhance understanding of milling technologies, early medieval economies and tidal ranges. Key sections of the find, including the trough and the waterwheel, have been removed and are undergoing conservation by the Conservation Department at York Archaeological Trust.

~ Clive Orton

ABOVE: MOLA field team recording the mill, with the River Thames in the background. The dark peat deposits surrounding the structure preserved the timbers.

INSET: Archaeologist Sarah Leveille cleaning the northeast corner of the mill. The millwright's assembly mark is visible below the mortice joint.

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