# Five 19th-century Thames lighters from Erith

Giles Dawkes

Erith, located on the south bank of the Thames, owes its existence to the river. In the 18th century, Erith was important as a cargo-lightening port, as it was the furthest point up-stream deep enough for fully laden ocean-going merchant ships. The shipping of local timber, Indiaman cargos and the more mundane London commodities of bricks, gravel and rubbish would have required a vast fleet of sailing barges and their mast-less sisters, the lighters. A description from 1758 sheds light on the activities and character of the town: "The town of Erith consists of one small street of houses, which leads to the waterside, where it lies open to the haven which the Thames forms here. On the Thames… the Indiamen, in their passage up the river, frequently come to an anchor, and lay some time to be lightened of part of their burthen that they may proceed with greater safety higher up the river. This, together with the shipping of goods to and from London, the sending thither and hence the produce of the extensive woods in these parts (great part of which is first laid upon wharfs built here for that purpose) and some few fishing vessels, employ the generality of the inhabitants of this place".[1]

In 2000, in advance of a new residential development, AOC Archaeology undertook work on an irregularly-shaped plot of land situated to the north of West Street, on the south bank of the River Thames.[2] Five wooden lighters, up to 18 m in length and in an excellent state of preservation, were recorded. The vessels had been used as the main structural elements in a river wall (Fig. 1). Aligned end-to-end, various structures were used to infill the gaps between the lighters: flint and chalk cobbles rammed behind the horizontal timber shuttering; a rough wattle-work structure; and a linear wooden revetment. Two oak mooring posts were located between the boat ends, one still attached with a mooring rope. On the landward side two ground anchors or 'dead men' were recovered. These were buried mooring attachments: large pieces of off-cut elm timbers inserted with bolts and chains accessible for mooring river craft. These shipyard off-cuts had numerous sawn faces and were a resource often utilised near Thames shipbuilding or repair yards. Cartographic evidence dates the construction of the wall to between 1843 and 1860, suggesting that the lighters could have been built as early as 1820.

**The lighters**

The vessels were a type of mast-less river barge called lighters. All five lighters were relatively similar: a flat-bottomed 'box' of a boat with stem-headed (rounded) or swim-headed (chisel-shaped) ends. Barges were built from the bottom up, a method distinct from the carvel and clinker boat-building traditions. The salient details of each vessel are discussed below.

*Boat 1*

The bow and cargo hold of the boat were exposed. The boat was more than 10.6 m long, 5.54 m wide and the hold was 2.33 m deep. The stem-headed bow was laid with a pine timbered deck encrusted with tar and coal dust, laid fore and aft with a camber to facilitate water runoff. On the deck, were the remains of a heavily corroded belaying point for attaching ropes and a circular hole, 0.2 m wide, to accommodate a pump fixture. Flat-bottomed vessels, such as lighters, commonly had hand pumps located at the 'corners' as there was no central well for the accumulation of bilge water. The bow

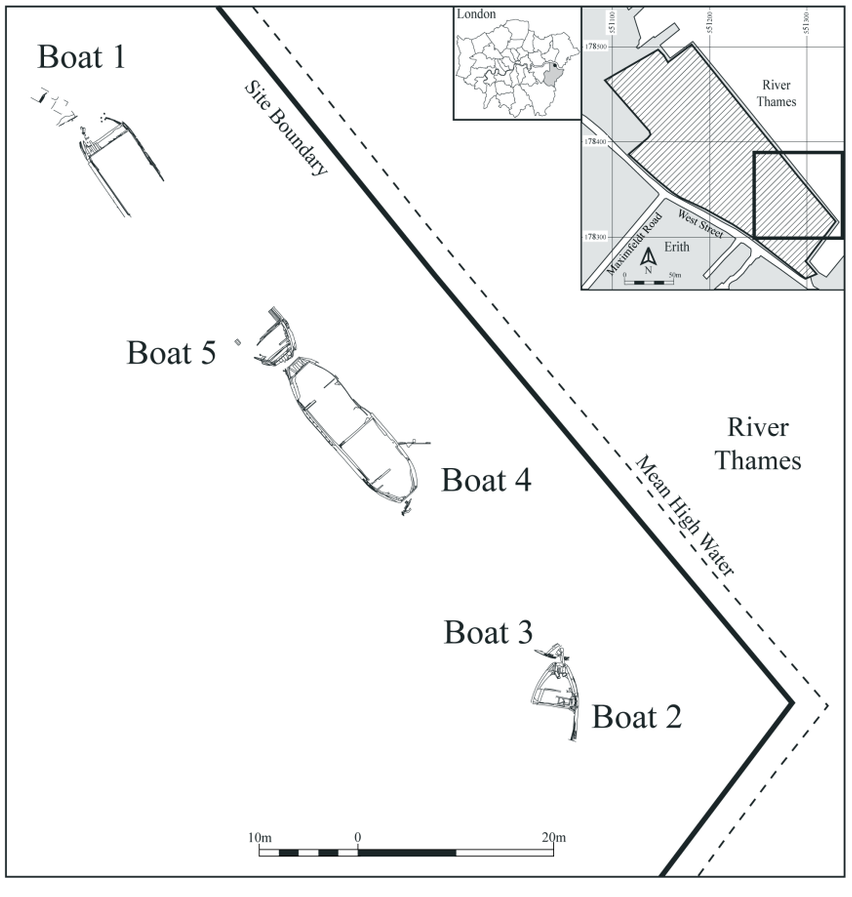


**Fig. 1: location of boats forming 19th-century river wall**

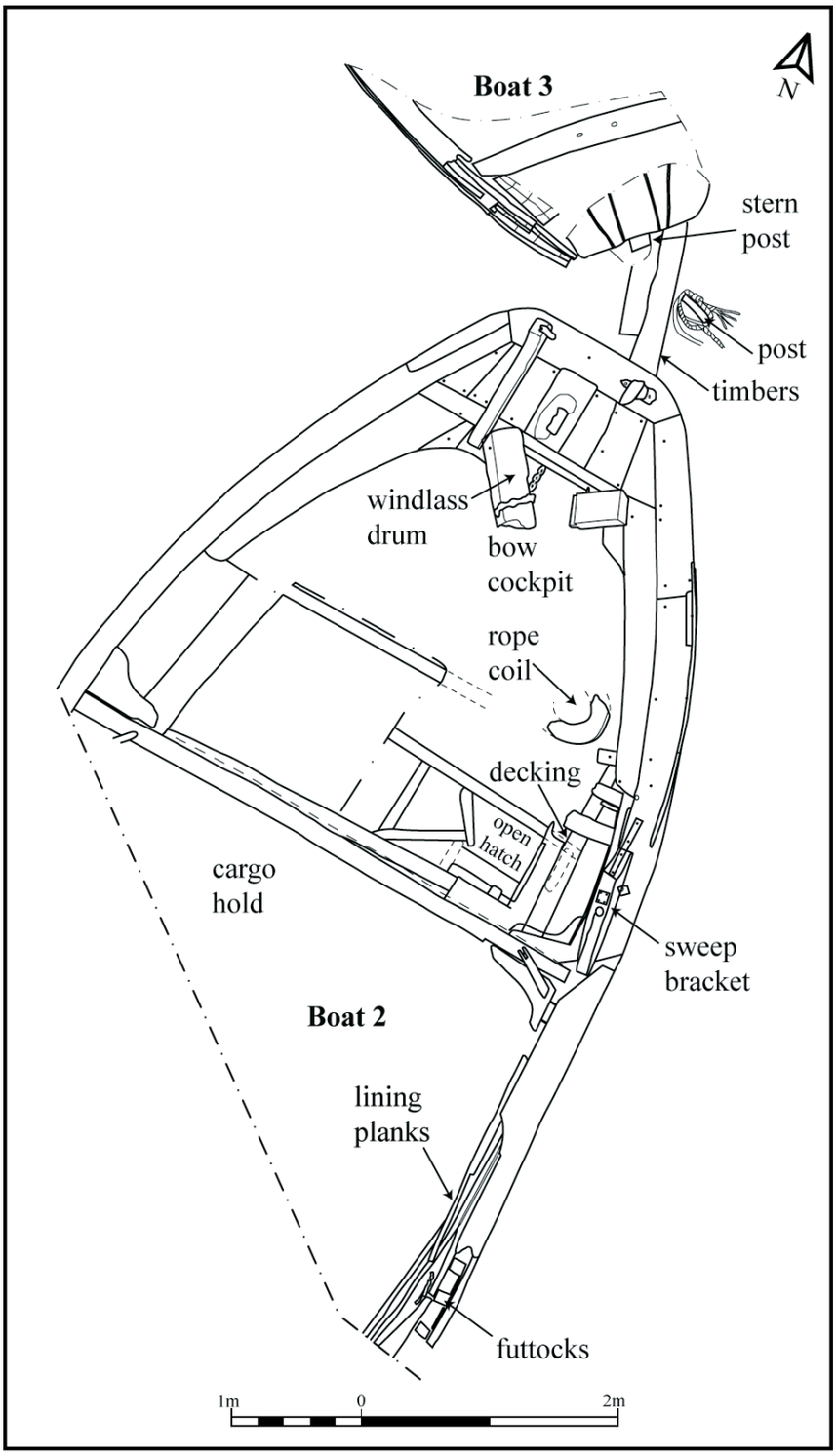


**Fig. 2: plan of boats 2 and 3**

was separated from the hold by a curving oak cross beam timber, bolted to the hull with a simple overlapping joint. Below the beam, vertical planks partially enclosed the bulkhead, allowing access from the bow cockpit into the hold. This presumably could be blocked when carrying a loose load. Attached to the cross beam was a nameplate timber with *MINNIE* carved on the port side. The lettering was 0.13 m high in Roman capitals and with gold paint inside the incised letters. In the hold, running across the width of the boat, was a taut iron chain anchored to iron bolts attached to the hull. The chain strengthened the hull when the lighter was fully loaded.

*Boat 2*

Only the bow of the boat was excavated (Figs 2 and 3). The boat was at least 7.7 m long, 4.88 m wide and the bow cockpit was at least 1.71 m deep. The swim-headed bow was strongly braced by a pair of 2.2 m long lodging knees, set inside the top of the hull. Both sides of the upper hull had indications of repair along the outer edge, suggesting an active work life. The bow cockpit was at least partially decked with pine timbers, running fore and aft, with a hatch or entrance to below deck was located on the port side. Near the hatch was a decayed coil of rope, 0.2 m high and 0.18 m wide. Less than half of the coil survived but individual lengths were still visible. On the very end of the bow was an area of decking flush with the top of the hull with the remains of a windlass. The oak drum of the windlass was recovered nearby, still with one coil of the anchor chain wrapped around it (Fig. 4). A small section of rope was also embedded into a worn groove on the drum, suggesting that the chain linked to the rope, which would have been easier to wind on. The outer hull pine planks or strakes were a somewhat irregular mixture of horizontal and vertical sheathing planks, the result of a multitude of repairs. To deal with timber shrinkage when out of water, strips of oak were nailed vertically to the inner face of the outer hull in between the side hull support timbers or futtocks. The different grain directions of the strips and hull timbers restricted the joints from opening. The bulkhead partitioning the cargo hold from the bow cockpit comprised an upper oak cross beam with vertical planks set edge to edge. Pairs of horizontal knees reinforced the bulkhead on both sides. A wooden plank attached to the stern side of the beam was carved with the figures *2044* on the port side and *33* on the starboard. The former is a registration or identification number and the latter may refer to the tonnage of the vessel. An oak bracket or fixture for the large oars or 'sweeps' was found on each side of the hull. These were the sole means of propulsion for the lighters.

*Boat 3*

Only a small area of the stern was exposed, but this did appear to be a different type of vessel to the others. The stern was a budget stern:

**Fig. 3: boats 2 and 3 from the north** (Photo: Giles Dawkes)

swim-headed with a central fin of planking. The hull appeared to have been much narrower and this may have been a different type of vessel to the lighters. The very end of the bow was recorded approximately 18 m to the northwest.

*Boat 4*

This was the only vessel to be exposed entirely (Figs 5 and 6). The vessel was 18 m long, 5.2 m wide and appeared to have been painted red throughout. The bow was swim-headed with the remains of possible fixtures for a windlass at the very end. The bow cockpit was 2.9 m long, 4.25 m wide and there was no evidence of an internal deck. The budget stern cockpit was 2.9 m long and 4.05 m wide with no evidence of an internal deck. The cargo hold was 10 m long, 4.1 m wide and 1.38 m deep, with a capacity to carry approximately 56 $m^3$ as a level load. The bottom pine hull planks or strakes ran fore to aft and were waterproofed with a mixture of hair and tar, also called blare, applied to the edges before construction. The internal hull support timbers, such as futtocks and knees, were attached to the hull by wooden pegs called treenails, around 0.2 m long and 25 mm in diameter, hammered into bored holes. The side hull strakes were nailed to the futtocks. The bottom oak hull supports or floor timbers ran across the vessel width. Unlike the side strakes, the bottom strakes were not nailed but attached by treenails. Inside of the floor timbers and futtocks were planks lining the hold laid fore and aft. When unloaded, the sides cargo hold could be stiffened by a removable timber cross beam and two taut iron chains running across the vessel width. The futtocks were vertical in the cargo hold and raked towards either end.

*Boat 5*

Only the swim-headed bow and part of the hold of this vessel was excavated. The bow cockpit was 3.24 m long, 1.65 m deep and 4.8 m wide as found. This cockpit was slightly larger than Boat 2 and there was no evidence for any deck or windlass.

**Fig. 4: windlass drum and chain of boat 2** (Photo: Giles Dawkes)

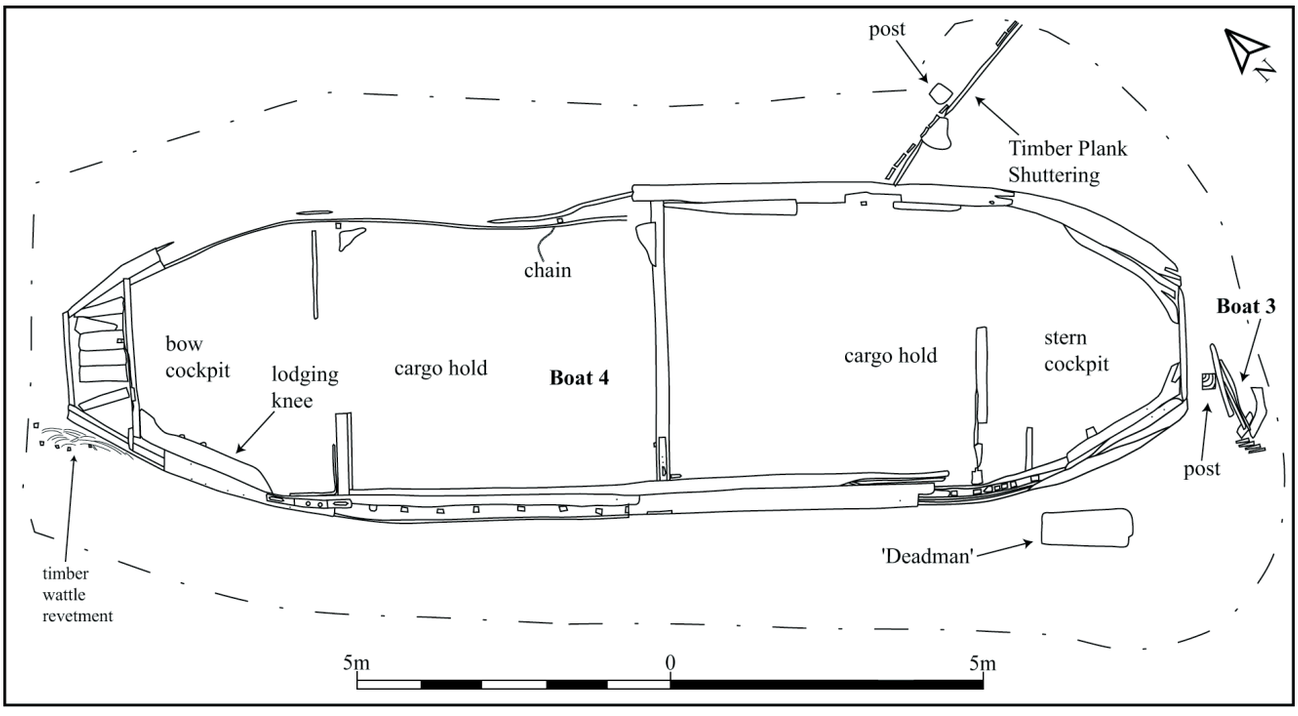


**Fig. 5: plan of boats 3 and 4**

## The construction of the vessels

*Laying the Bottoms*

The central bottom strake or hull plank was laid first, in the same way as a keel, although this timber was the same size as the other bottom planks. The planks each side of the central planks were fitted after the waterproofing sealant of a layer of blare and tar had been applied to the edges and upper surface. The blare used was goat or cattle hair and, in Boat 6, shredded jute plant fibre. The tar was coal or wood tar although Boat 4 had both, possibly indicating a refit. The edges of the strakes were fitted with small dowel-holes and wooden or metal dowels, to reduce the distortion of the hull and thus leakage. The strakes were then cramped together. The strakes would have had to have been steamed and bent into shape with a press or cramp, making a stronger construction than a joint at the turn.[4] The position of the oak floor timbers were then marked out and the holes for the treenails bored through both timbers.

*The Frame and Side Strakes*

The shape of the sides could be then marked out using upright and horizontal lengths of timber. The oak

**Fig. 6: boat 4 from the south** (Photo: Giles Dawkes)

futtocks were then fitted and cut so they would fit evenly with the run of the side strakes. The uppermost strake, the outwhale, would have been fitted first, cut and steamed to shape, followed by the lower strakes. The strake edges were often rebated and fastenings were attached to the frames by both treenails and nails. The waterproofing was blare, and like the bottom strakes, it was set into the joints before fastening rather than added later.

*Ceiling and Lining Planks*

The ceiling planks were the timbers on the hold bottom and on the sides were the lining planks. Generally the ceiling planks ran fore and aft, although in Boat 5 they ran across the beam, almost certainly indicating a repair. The lining planks were all of oak and the ceiling planks a species of pine. Boat 1 had no ceiling planks; they may have been removed before its reuse in the river wall. The lining planks were nailed to the frame. The final elements to be attached to the vessel were the bulkheads, decking, cross beams and the horizontal and vertical knees.

*Repairs*

There was extensive evidence for repairs to the lighters. The areas that had received the most attention were the external side strakes and the internal ceiling and lining planks. There were at least three incidents of repair of the lining planks. Boat 1 and 2 had additional planks nailed over the top, while a metal patch was nailed to the inside of Boat 4.

The repairs of the external side strakes consisted of timber plank patching. Boat 2 in particular was heavily patched with vertical planks, and repairs were also evident on Boat 3. The blare from Boat 4 was of both wood and coal tar, suggesting a caulking repair.

*Materials and Workmanship*

Thames lighters were the poor relations of the queens of river cargo transport, the Thames sailing barges. They were common workhorses, and throughout the 19th and early 20th centuries there would have been thousands working on the Thames and its tributaries. It is therefore surprising that the quality of the timber and workmanship was so high. Perhaps the value and fragility of some of the lighter cargoes, which would have been spoiled by leakage, necessitated the investment in good quality vessels. The knees were all of good quality hedgerow oak as was used on sailing barges.[5] However, larch or spruce was used as strakes and side ceiling planks on Boat 3 and as an internal support in Boat 1, which was a timber generally not used on sailing barges. Furthermore, the name *MINNIE* had been highlighted with gold paint, somewhat lavish decoration for a menial craft.

**The use of the river lighter**

The vessels were built in a broadly similar manner to Thames Estuary sailing barges, a relatively well researched and documented craft built until the 1920s. In contrast, the lighter is a class of boat generally neglected, and the recorded remains of mid-19th-century river craft are rare.[6] The swim-headed craft was distinctive to the post-medieval River Thames, its estuary and tributary systems. Other river and estuary systems had their own distinctive lighters, such as the keel barges of the Humber. The targeted recording of safely accessible sections of hull has also shown that there was some variation in construction that probably represents the work of different builders. Now we can only glimpse the remains of this once common local tradition of barge building in the remains of a few later examples of poorly preserved salt marsh hulks, and in the more developed form of the modern steel Thames lighters. Smaller canal lighters have been recorded at the Waltham Abbey Gunpowder Factory. Some of these were swim-headed and of a late 19th-century date, but were poorly preserved. Large river lighters were recorded in the Whitehall Creek survey dating from the late 19th and 20th centuries.[7] Some of the lighters demonstrated a significant level of repairs, Boat 2 for instance, indicating a long and hard working life, possibly as much as forty years. If the lighters were deposited in the river wall between 1843 and 1860 then they could have been built as early as 1820.

**The river wall**

The river wall was constructed between 1843 and 1860. It was a basic form of land winning and this type of structure was more common in the United States of America, where redundant vessels were often reused to make 'bulwalks', for example in San Francisco and Manhattan.[8] The wall was an *ad hoc* affair reusing materials readily available. Old lighters would have been common, resting on the muddy Erith foreshore, and the timbers for infilling would have been available from the ship-building activity in apparent close proximity. The ground was probably prepared for the lighters by laying crushed chalk as a stable foundation. The lighters were all in good condition and almost certainly still sea-worthy, suggesting that they were manoeuvred into position on a high tide before being backfilled on the low. The coil of rope left in the bow cockpit of Boat 2 also suggests rapid backfilling. After all the lighters were in place the gaps could be filled.

**Acknowledgements**

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5. *Pers. comm*. Damian Goodburn.

6. *Pers. comm*. Damian Goodburn.

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