

Notes

The Dover Boat: the Reality of Deep-Mud Rescue

This article is based on a lecture given in early 1994 to the Society of Antiquaries by the author, then editor of *IJNA*. With over 30 years' experience of work on ancient buried boats she was among the first 'outside' experts alerted and on the site of the Middle-Bronze-Age Dover Boat, subsequently dated to c.1550 BC. She was at work there by the morning after the find and throughout the recovery operation, following which, as an English Heritage consultant, she headed the post-excavation team in premises kindly loaned by Dover Harbour Board.

Reconstructing archaeological finds from fragmentary original material typically relies on iconography, documentary evidence and, above all, comparison with other similar objects. In the case of boat-finds, a three-dimensional model may be built from tracings of planks which reveal the subtle curves into which a boatbuilder must cut his wood in order to create fair shapes distinctive of a particular hull-form. Using just three planks, a Viking boatbuilder achieved each side of the elegant, high-performance 6.5-m *faering* from Gokstad in Norway (Nicolaysen, 1882). 'Strake diagrams', as these patterns are called, are of value in the study of not only conventional planked, but also sewn boats, such as the largest one known, the Egyptian Cheops ship, which is 4700 years old (Ward, 2000). For ancient ship specialists difficulties arise with any discovery exhibiting features unparalleled elsewhere, and hinting at traditions for which existing information is either non-existent, or at best scrappy.

Blackened, waterlogged wood appears daunting to even the most dedicated experts. The mud, the tide, the weather, the lack, or excess, of water make drawing, cleaning and photography a nightmare. Time is at a premium: from the moment they are exposed the remains start to deteriorate. Water, which has for centuries supported robust-looking timber, starts to leak from it. Slowly in air the degraded cellulose ceases to support its own weight and begins to shrink and collapse. The surfaces crack and the original tool-marks disappear.

Recording on site is essential. Whether or not remains are to be permanently retained, rapid recovery and careful washing is necessary in order to record the detail obscured by adhesive mud and poor light. Full immersion in cold water is imperative to halt the degradation. In Britain response to emergencies has depended on the enthusiasm of individuals both within and outside institutions. In 1955, for instance, staff from two national museums came to the aid of an extended dugout found in a Cumbrian lake-bed, the Kentmere boat (Wilson, 1966). In 1937 and 1946 it was the same story after the initial discovery by local enthusiasts of a prehistoric sewn-plank boat on the eroding Humber foreshore at North Ferriby (Wright, 1990). Both finds were unparalleled and thus of major significance. The crude little Kentmere dugout, given deeper draught by the addition of planked sides, proved to be medieval. In contrast, the large, superbly-crafted vessel from Ferriby was 2700 years older. Its main features were: in place of a keel, a central plank made of two unconnected parts; the rocker or curvature fixed by the shaped bottom planks; side planking with a gentle transition and not a hard angle; seams packed with moss and covered with laths held in place by small yew branches twisted into individual stitches; and groups of cleats upstanding on the bottom planking through which transverse timbers passed to confer some stiffness.

Humber estuary finds

Since the first boat was found, further plank fragments and a cleat have been recovered from the Ferriby site on the north bank of the Humber. Radiocarbon dates for them start about 1800 BC and span more than 1000 years. To add to this evidence for a long-established sewn-boat tradition in the area, there were two earlier discoveries in a tributary river on the south bank: a sewn boat 12 m long (the so-called 'Brigg raft') and a huge dugout 14.8 m long with a sewn and cleated repair (Roberts, 1992). A more recent find

was a 12-m-long dugout from Hasholme with a terminal element fitted by means of cleats, and dated to c.300 BC (Millet and McGrail, 1987). This concentration of prehistoric sewn craft is unparalleled in Britain or the rest of Europe. While any of these boats might have had a sea-going capability, their location and limited distribution suggested an estuarine use.

Severn estuary finds

In 1990 a sewn plank found at Caldicot and further fragments from Goldcliffe, of slightly earlier date than the North Ferriby finds, extended the distribution of prehistoric sewn-planked boats to the Severn (Bell, 1993; McGrail, 1997). Rather disappointingly, they were fragmentary.

The Dover find

The breakthrough, when it came in September 1992, was from an unexpected corner of the country and from the heart of a town. A pedestrian underpass was needed to connect the centre of Dover to the seafront beneath the trunk road being upgraded to take traffic for the Eastern Docks. For this purpose contractors were putting in a cofferdam. In this very archaeologically-sensitive spot it was known that a section of the medieval town wall would be exposed and, at a lower level, possibly remains of the Roman harbour-works linked with the *Classis Britannica*. The operation, therefore, was closely monitored by staff from the Canterbury Archaeological Trust. Sheet-piling had been driven down and water pumped out in order for the Roman sediments to be sampled, when Dr Martin Bates noticed that the pump had smashed through a timber structure at an even deeper level. The significance of the revealed cleat and stitched planking was immediately recognised by Keith Parfitt. Stratigraphy pointed to a boat of prehistoric date. The site foreman agreed to delay work in the cofferdam for the rest of the day and all available Trust staff congregated to clear the overlying mud until late evening. By the next morning it was possible to see how much of the boat lay within the cofferdam which had sliced through it twice (Parfitt and Fenwick, 1993) (Figs 1 and 2).

Construction

The boat consisted of a coherent structure of oak planks with twisted-withy stitches. The surfaces



Figure 1. October 1992: deep excavation by floodlight in the midst of Dover's major road-works. (V. Fenwick)



Figure 2. Time was short: surveying, photography and sampling had to take place simultaneously. (V. Fenwick)

were beautifully preserved, representing the mid-portion of a vessel with a beam of c.2.3 m. The daunting task was to recover the remains in the time available—now extended to three days. After much publicity and numerous consultations the authorities were persuaded that the find was of outstanding international importance. Therefore it was paramount that at least one end of the boat should be exposed. With the co-operation of the Department of Transport and its contractors, English Heritage agreed to fund a further extension so that the southern end of the site could be cofferdammed and excavated. A major worry had been that the boat might extend beyond the piling and under the arterial road. By good fortune its southern extremity (unofficially



Figure 3. In the race against time features had to be progressively planned as they emerged. (V. Fenwick)



Figure 4. Archaeologists are trained to impose order on muddy chaos. The soft sediments were carefully sprayed in order to uncover the softened timber which was then protected with foam. (V. Fenwick)

designated the 'bow' thereafter) did survive and moreover exactly fitted within the second cofferdam. However, the northern continuation of the boat was lost indefinitely to archaeology as it lay beneath buildings. It was disappointing that the closing component of the southern end had been deliberately removed in antiquity. For these reasons the original overall length of the vessel remains a matter of debate.

Recording and recovery

Planning the boat *in situ* was facilitated by its coherence and well-defined construction. Nevertheless the site-plan made by Keith Parfitt and Barry Cork was undertaken in a very short time and under difficulties (Figs 3–8). Together with



Figure 5. Part of a boat was revealed in the first cofferdam. The hole made by the pump which led to its discovery can be seen in the upper centre. (V. Fenwick)

cross and longitudinal sections and 179 levels it remains the key documentary record.

Next came the matter of how to recover the now cleaned and vulnerable timbers in the most efficient and speedy fashion. There could be no question of lifting the boat in one piece. Past experience with the recovery of *Ferriby 1* and the *Brigg* craft led to the same conclusion, namely, to cut it up into predetermined manageable pieces. Under my supervision it was cut up using a diamond-tipped circular saw. The cuts were planned to avoid stitches and fastenings. In the event they provided sections smooth enough for the tree-rings and degree of compression and distortion of the timber to be subsequently recorded (Figs 9 and 10). The value of sectioning ancient ship-structure in this way cannot be over-emphasized.

Post-excavation study and recording

Every surface of each boat-piece was traced and photographed. Wood-grain and the minutiae of all the structural elements were recorded. All signs of wear and every tool-mark was mapped. Numerous technical and handling problems were ingeniously solved. After six months, the recording team had produced no fewer than 75 plans, 1000 overlays, 126 sections and some 1500 black-and-white photographs (Figs 11–18).

Interpretation

By the beginning of 1994 a mass of data had been acquired, and yet it had to be admitted that



Figure 6. The second cofferdam contained the intact ends of the bottom planks and curved side planks of a unique type of watercraft. (V. Fenwick)



Figure 7. Using sponges and water, rather than trowels which might create misleading tool-marks, archaeologists painstakingly cleaned the timber so that it could be recorded *in situ*. (V. Fenwick)

we still had everything to learn about the boatbuilding technology of this Middle-Bronze-Age boat. For instance, it might have been supposed that the yew stitches were the weakest

and most-frequently-replaced feature of the construction. On the contrary, tests showed that they were extremely strong and rigid and so were likely to have been an integral structural



Figure 8. A full-size cross-section of the strange construction was replicated from green oak using copies of Middle-Bronze-Age-tools. The *ile*, or curving plank between the bottom and (missing) side, can be seen together with two chunky cleats carved out of the solid. (V. Fenwick)



Figure 9. A diamond-tipped circular saw was skilfully controlled to cut the boat into pieces for lifting. (V Fenwick)

mechanism. We did not at all understand how single wedges were used to hold the two halves of the hull together. My suggestion that they were deliberately dried before insertion and, upon swelling, combined to produce an 'interference fit' to lock each mortise in position predicated a very precise understanding and control of materials by the builders. However, as the wood



Figure 10. The resulting smooth cross-sections showed compression of the wood-grain. This later proved crucial for determining the original shape of the hull. (V. Fenwick)



Figure 11. Contractors watched anxiously as carefully-supported boat-pieces were craned out. (V. Fenwick)



Figure 12. Expert conservators helped with the nerve-racking task of detaching the weighty end portion of the boat. (V. Fenwick)



Figure 13. Post-excavation controlled conditions: the end portion in Fig. 12 undergoing detailed recording by Caroline Caldwell. Strips of moist paper towel marked the positions of the cross-sections. (V. Fenwick)



Figure 14. The author devised a method for inverting each boat-piece, so that its underside could be recorded and a supporting cradle moulded to its contours. Mike Halliwell successfully inverted the prototype and (inset) holds the fragment supported by its fibreglass cradle. (V. Fenwick)



Figure 15. Constructing cradles for all the fragile boat-pieces was a labour-intensive task and the work soon required a production-line. (V. Fenwick)



Figure 16. Ancient woodworking and boat experts, Damian Goodburn and Owain Roberts, are here seen examining boat-pieces and annotating drawings prepared for this purpose. (V. Fenwick)



Figure 17. The quantity of drawn records of boat-pieces steadily increased. (V. Fenwick)

expert, Richard Darrah, observed, to compare the Dover Boat's workmanship to any other contemporary artefact is like comparing a Chippendale chair to a post-and-rail fence.

Although the northern end of the vessel had not been recovered, we assumed as a working hypothesis that it was equal-ended. On the other hand some early comparative evidence supported



Figure 18. Only when the tracings of the inside of the boat were completed was it possible for the author to study as an entity the remains recovered from the two cofferdams. (V. Fenwick)

a differentiated bow and stern; for instance, the Thera frescoes from the Mediterranean and the Kalnes rock-carvings from northern waters (Casson, 1975; Malmer, 1981). Paddles, it was agreed, were the most likely means of propulsion, but the evidence is ambivalent. The oar was in use in Egypt by the 3rd millennium BC as was the sail (Ward, 2000). For northern Europe the iconographic evidence is open to a number of interpretations.

Enigma of the 'iles'

There is no English word for a plank shaped to form the transition from the bottom to the side of the hull, so the French term '*ile*' was adopted. Although the Dover Boat is the only prehistoric vessel with this feature, there are in northern Europe a number of much later boat-finds in which *iles* are employed. They enjoyed a long vogue, being taken by settlers to Carolina, while in France the barge-builders of the River Adour continued to employ them into the 20th century (Beaudouin, 1970).

The Gallo-Roman barque from Yverdon, Switzerland, is a missing technological link, being constructed from two oak trunks hollowed out and fastened to create a beamier vessel. Other Roman-period finds from Yverdon and Bevaix, and from Druten and Zwammerdam in the Netherlands were constructed of *iles* with planks laid between them (De Weerd, 1978; Lehmann, 1978; Arnold, 1992). Present indications are that *ile* construction either did not exist in Britain, or may have died out a very long time ago. Perhaps the fact that there is no English word for the construction is significant, and it is possible that the boat was built on the French side of the Dover Straits, to engage in cross-Channel trade. The carving of upstanding cleats for fastening transverse elements was widespread and is found in the earliest lap-strake craft, such as the 4th-century-BC Hjørtspring boat from Denmark (Crumlin-Pedersen and Trakadas, 2003), and the latest, such as the 10th-century Gokstad ship—again on the Continent and not in Britain.

Conclusion

The technique of sewn planking is widespread in time and place. It is perhaps only an accident of the archaeological record that Britain is so rich in early examples. The exceptional level of skill, the available materials and the large workforce implicit in the construction of the Dover Boat suggest a high-status role or a carrier of valuable cargo. Since there exists no river system close to its find-spot, it appears that the boat engaged in coastal or cross-Channel voyages. The large group of Continental bronze weapons and tools recovered from the sea below Dover's cliffs—whence France is visible on a fine day—provides a ready suggestion as to the kind of cargo the boat may have carried (Needham and Dean, 1987). On this topic Stuart Needham remarked that, 'the nature of Bronze-Age trade is imperfectly understood ... the boat will bring a new focus to this period'—a prescient remark as witness the theme of the October 2006 Dover Boat Conference. Following the excellent, and by archaeological standards speedy, full publication of *The Dover Bronze Age Boat* by English Heritage in 2004, informed debate on the implications of the discovery has begun in the pages of *IJNA*.

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The Dover Boat; Some Responses to Ole Crumlin-Pedersen and Seán McGrail Concerning its Propulsion, Hull-Form, and Assembly, and Some Observations on the Reappraisal Process

The recent flurry of articles in *IJNA* concerning the Dover Boat have been interesting and made a useful contribution to discussion about the vessel, and of methods of assessing the excavated evidence. Crumlin-Pedersen and McGrail (2006: 53) wrote:

It has recently been suggested that a number of excavated boats and ships should be reappraised by a multiple-phase process (McGrail, 2001: 433; McGrail, 2004: 52–6). This task should preferably be undertaken by an independent, inter-disciplinary group of experienced maritime archaeologists, naval architects, craftsmen and sailors. Such a group, working as a team, can offer a combination of practical know-how of building and sailing full-scale reconstructions of ancient vessels with the naval architect's

ability to present and assess hypothetical reconstructions on paper, and this will serve as a crucial supplement to the archaeologist's first-hand knowledge of the excavated evidence, the ancient technological environment, and the environmental factors which characterise the site where the vessel ended its active life.

I could not agree more, except that I take issue with the suggestion that the naval architects, craftsmen and sailors are a *supplement* to the archaeologists and the archaeological evidence. I would argue that to ensure that key questions are asked and clues not missed they need to be fully integral to the process of understanding the evidence, and that much of the reappraisal needs to have a practical basis. Ironically, some of the content of recent papers is proof of this need.