

The Re-Assessment and Reconstruction of Excavated Boats

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In response to papers by John Coates and by Owain Roberts, the author re-evaluates mid- to late-20th-century reconstruction drawings and models of prehistoric sewn-plank boats Ferriby 1 and Brigg 2. He concludes that an impartial and informed group should re-examine all surviving evidence for these boats and then build a small-scale ‘as-found’ model of each one. After being subjected to criticism, these models could become the basis for generally-agreed reconstruction models of the original form and structure of these two boats. A similar process would be the best way ahead for the Dover sewn-plank boat.

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During the past 15 years new reconstructions of two prehistoric sewn-plank boats have been proposed as preferred alternatives to those already published. These vessels are Ferriby 1 of *c.*1800 BC (Fig. 1), and Brigg 2 of *c.*800 BC. Reconstruction drawings of Ferriby 1 have recently been published by John Coates (2004; 2005a; 2005b), and accounts of the building and use of a derived half-scale model have been published by Gifford *et al.* (2006). An earlier reconstruction of this boat is encapsulated in a National Maritime Museum model (Fig. 2) (McGrail, 2004a: fig. 5.17), one of four 1:10-scale Ferriby reconstruction models built by Kim Allen in 1978, based on drawings compiled by Ted Wright, the excavator of the Ferriby boats.

An alternative reconstruction of the second vessel, Brigg 2, was published by Owain Roberts (1992); criticism of this by McGrail (1994) was followed by a response from Roberts (1995). Brigg 2 is the so-called Brigg ‘raft’ which is, in fact, a sewn-plank boat; Brigg 1 was a prehistoric logboat excavated in 1886 and lost during World War 2 (McGrail, 1978: 166–72). Brigg 2’s first reconstruction is also a National Maritime Museum model (McGrail, 1985: fig. 11.16); it had earlier been published as a series of structural drawings (McGrail, 1981: figs 4.1.13, 4.1.14, 4.1.19, 4.1.21, and 4.1.23).

In a response to these new reconstructions of Ferriby 1 and Brigg 2, Ole Crumlin-Pedersen (2003: 214, 217) has published his assessment of

the earlier and later reconstructions for each of these boats. In both cases he prefers the alternative (later) versions, and quotes data for them, in his table 6.3. More recently, Robert Van der Noort (2006: 275), having uncritically accepted Gifford’s half-scale model of Ferriby 1 as valid, and in the light of that model’s performance afloat, has urged me to revise my suggestion (2004a: 193–4) that the known Bronze-Age plank boats were ‘lake, river and estuary boats and would not have been seagoing except on rare occasions of settled weather’—since ‘their shape, their lack of sheer, and their structure were such that they would have had insufficient stability, freeboard and sea-kindliness qualities’.

Ted Wright’s ‘final thoughts’ on the Ferriby boats (1990; 1994), in particular his incorporation in his final reconstruction of a rockered bottom (that is to say, one with a longitudinal curvature from bow to stern), began this re-assessment process. The recent re-dating of the Ferriby boats (Wright *et al.*, 2001), and the 1992 excavation of the Dover boat with its resulting publications (Clark, 2004a; Clark, 2004b) have undoubtedly been further stimuli.

The Dover boat reconstruction

Owain Roberts’ theoretical reconstruction of the prehistoric Dover boat (Clark, 2004b: 189–210) has recently been criticised in some detail (Crumlin-Pedersen, 2006), as has the Dover boat



Figure 1. Ferriby 1 exposed on the foreshore of the Humber Estuary in 1946. The ruler is 2 feet (60 cm) long. (E. V. Wright)

research group's presumption that this boat must necessarily have been seagoing (McGrail, 2006b). Alternatives to the latter possibility need to be considered: for example, one explanation of her loss could be that severe weather drove her from her usual operational area in the Wantsum Channel (formerly a tidal channel between the Isle of Thanet and Kent) until she was deposited in the River Dour at Dover.

To respond to this criticism and to seek to establish this boat's original form, structure, propulsion and steering and, hence, her most likely operational role, it appears to be generally agreed that further research is needed on the Dover boat, including model building. After the evidence has been re-appraised, small-scale models of every excavated plank and timber should be made and fitted together until a model is formed of the boat as found, but with distortions and compressions removed, displaced elements replaced, fragmented timbers made whole, and the hull rotated to its deduced attitude when afloat. This 'as-found' or 'torso' model, or a measured drawing developed from it, then becomes the basis for an attempt to 'fill in' the missing pieces, a process which may lead, if the surviving evidence allows, to a rigorously-argued reconstruction of the original boat (Crumlin-Pedersen and McGrail, 2006). Evaluation and criticism of the 'as found' and reconstruction models should then be undertaken by an 'impartial and informed' group (to quote Coates, 2005a: 42) with access to the boat remains and to the boat's site and research archives. An agreed reconstruction may subsequently be used to deduce the original boat's performance, including her seagoing potential or, if justified, a full-scale model may be built and tested at sea (Coates *et al.*, 1995; McGrail, 2004b: 52–6; McGrail, 2006a: 10–13).

Ferriby boat 1

In 1977–8 the National Maritime Museum at Greenwich re-appraised the eight or so reconstructions of Ferriby 1 which, over the years, Ted Wright had devised (Roberts, 2006a: 72–3), and built small-scale reconstruction models of four of them. Three of these were variants of a two-strake boat with a plank-keel protruding below flat, outer bottom planks (Fig. 2); the fourth model, which was built some time after the first three, was of a *three*-strake boat with a

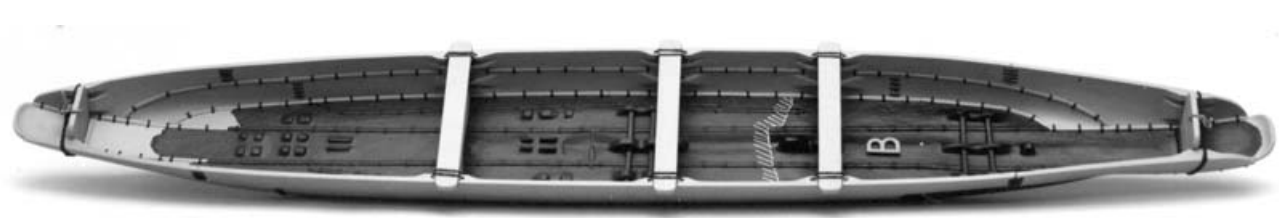


Figure 2. A 1:10-scale reconstruction model of Ferriby 1. The dark-coloured wood represents parts that were excavated; the remainder is conjectural. (© National Maritime Museum, London)

rockered plank-keel. These models were destined to be displayed in the first-ever Greenwich archaeological gallery, and John Coates (2005a: 39) has drawn attention to the ‘vehement argument’ with National Maritime Museum curatorial staff that Wright encountered during preparations for this display (Wright, 1990: 90). To understand why this happened, it is necessary to appreciate two points. Firstly, Ted Wright was a Government-appointed trustee of the museum, and in this role he was an ‘overseer’ of the Archaeological Research Centre (ARC), of which the present author was Keeper and Chief Archaeologist; and secondly the Ferriby display being prepared by the ARC, in collaboration with designer Kim Allen, was planned to include a full-scale diorama of the western end of Ferriby 1 as it had appeared to Wright on the Humber foreshore in 1946 (Wright, 1990: figs 2.3 and 3.10), as well as small-scale interpretive models.

Although of prime importance, this display was just one of four in the new gallery (the others being Graveney, Sutton Hoo and Archaeological Techniques). Furthermore, at a late stage in the preparations, Wright strongly urged that an additional model with a rockered bottom (an idea that had emerged during his discussions with John Coates—see Wright, 1990: 90) should be built and incorporated in the display.

In *Boats of the World* (McGrail, 2004a: 184–7), two different Ferriby reconstructions were mentioned and a photograph published of one of them, the Greenwich, two-strake, 1:10-scale model without embellishments (Fig. 2) (McGrail, 2004a: fig. 5.17). Coates (2005a: 39) has claimed that this reconstruction was ‘preferred by McGrail and much publicised by him’; while Crumlin-Pedersen (2003: 214, note 6) states that no alternatives were discussed. After leaving Greenwich, I held no photographs of the other reconstruction—the Greenwich three-strake, rockered model specified by Wright (1990: 90, figs. 5.17–5.21) and subsequently refined by Coates—and the process of obtaining Greenwich prints was, and may still be, both tortuous and expensive. Nevertheless, references to publications of this three-strake, rockered reconstruction were given and it was briefly discussed (McGrail, 2004a: 186–7).

In three recent publications, Coates (2004: 25; 2005a: 39, 41–2; 2005b: 526) has criticised me for publishing the remark: ‘and it [a rockered keel] may be an unnecessary embellishment’ (McGrail, 2004a: 186). As Coates himself taught me, 30 years ago, a rockered keel improves stability,

manoeuvrability (both afloat and ashore) and behaviour in waves. Thus, from the 20th-century naval architect’s viewpoint, rocker (as on the fourth of the Greenwich reconstruction models) is essential, rather than unnecessary. If, however, the whole sentence in which the quoted words lie is read, it will become clear that my phrase ‘unnecessary embellishment’ was applied to the ‘remains as excavated’. This relationship could probably be made even clearer, by re-phrasing the sentence to read: ‘It is not absolutely clear that a rockered keel is compatible with the remains as excavated, and it may be an unjustified embellishment of those remains’.

Coates (2005a: 41–2) has also asked that I should publish the ‘basis of my doubts’ about the Wright-Coates rockered reconstruction of Ferriby 1. As Coates (2005a: 40) and Roberts (2006a: 72–3) have both recently testified, Wright was not ‘particularly familiar with boats’. Furthermore, with hindsight, it now seems possible that the unseemly haste in which the fourth (rockered) Ferriby 1 reconstruction model was forced on the museum in 1978 coloured my initial reactions to that particular hypothesis; nevertheless, all four models were made to Ted Wright’s specification and they remained on display at the National Maritime Museum until the Archaeological Gallery was dismantled in the late 1980s.

Excavated wooden objects seldom retain their original shape; between deposition and excavation significant changes are to be expected. A flat bottom recorded on a boat during excavation does not mean that such was necessarily her shape when in use; conversely, a longitudinally-curved bottom on excavation does not necessarily imply that the boat was built with rocker. In both cases, the original, pre-depositional shape has to be logically deduced and presented for criticism. The shape of the Ferriby 1 remains when excavated—flat or curved—has yet to be determined by an impartial and informed examination of all the evidence. Whatever that shape proves to have been, will then become the basis for a taphonomic study to establish the form that the surviving parts of the boat had on deposition.

Misgivings about the validity of the Wright-Coates three-strake, rockered model began to crystallise during the early 1980s when Ted Wright deposited his archive at Greenwich. A preliminary, non-systematic reading of some of these records suggested that further detailed study would throw new light on the post-excavation recording of the three Ferriby boats, as well as on the

several periods of excavation on Ferriby strand. Before I could begin this study, however, Wright—for whom some days were good and some days were not—withdrew his archive without any explanation for this precipitate action: the acquisition card was destroyed and I never again saw those papers, newspaper cuttings and photographs. My unease was not dispelled by the lecture on ‘A revised basis for reconstruction’ that Wright (1985) gave at the Sewn Plank Boat conference at Greenwich in 1984. His subsequent incorporation of features found on the wooden fragment known as Ferriby 4, ‘into the hypothetical design for a complete Ferriby boat [that he had] recently developed in collaboration with J. F. Coates’ (Wright *et al.*, 1989: 44), gave me further cause for concern, since this fragment was of alder (*Alnus* sp.), a genus which had not been noted in any early planked boat of NW Europe. Moreover, the fragment had been dated to c.530–375 BC, and had no features suggesting it might be from a sewn-plank boat. Wright’s subsequent account (1990) of how the three Ferriby boats were excavated, recorded and interpreted did not dispel my misgivings. It is relevant to note here that Roberts (2006a: 72) has also found that this book did not clarify details and recording methods.

By 1990, when I had been at Oxford for four years, most of Wright’s archive (including the original field-records and drawings, and duplicates of all photographic negative material) had been re-deposited at Greenwich (Wright, 1990: xvi–xvii). Coates (2005a: 40) notes, however, that before his death in 2001, ‘Wright deposited all his records about his finds at North Ferriby in the Hull and East Riding Museum’. An impartial and informed specialist team should now be given access to those records.

Coates (2004: 21) appears to believe that the conserved remains of the three Ferriby boats are now so badly deteriorated that there is no point in examining them. I understand that there has been no serious study of these important remains since that undertaken by the National Maritime Museum’s Archaeological Research Centre during the 1970s and early-’80s. During that period, conservators, archaeologists and dendrochronologists examined the remains of Ferriby 1, 2 and 3 in the National Maritime Museum’s laboratory at Kidbrooke where they had recently been re-housed on specially constructed shelving. Planking had been lost from Ferriby 1 onwards from 1937 when the Wright brothers first encountered this boat. The remains stored at Kidbrooke did not,

therefore, include all the elements that Wright shows in his published drawings. Nevertheless, much did survive until the early 1980s and ARC found that features such as cleats, lashing-holes, scarfs, and rabbets could be identified. Furthermore, cross-sections cut through cleats on the oak planking revealed ring-and-ray patterns that were sufficiently clear for details of Bronze-Age selection and conversion of timber to be noted, and for Dr Jennifer Hillam of Sheffield University to produce ring-width data for all three boats (1985). These remains may now be a shadow of their former self, but elements of them probably still exist in Kingston-upon-Hull Museum where Ferriby boats 1, 2 and 3 and their archives have been since 1995. As with Ted Wright’s archive, the remains of the three Ferriby boats should be examined in great detail by an impartial and informed team.

Brigg 2

The conserved remains of Brigg 2 and the associated models and site and research archives are still at Greenwich. Possibly without examining the remains, or consulting the archives, Owain Roberts (2006a: 72–3) has recently re-emphasised his belief in his reconstruction of Brigg 2. He states that the revisionist reconstruction he published in 1992 was based on his ‘realisation that her strakes were tapered towards each end’; this led him to reconstruct a ‘round bilged boat with significant seagoing potential’. In his original paper (1992) he mentions that his reconstruction was also influenced by the distinctive shape of the plank edges ‘that were not needed on a flat-bottomed boat’, and by the characteristics of the transverse timbers.

The supposed plank taper

Roberts’s supposed identification of tapering is due to his reliance on one particular drawing of the excavated remains, one out of the four sets of plans published in McGrail (1981): the three other plans being fig 1.2.1—site plan with profiles, dated 21.5.74; and figs 1.3.2 and 1.3.3—photogrammetric detail and contour plots, dated 20.5.74. The plan used by Roberts (1992: fig.2) (Fig. 3) had a caption in the original publication (McGrail, 1981: fig. 2.1.19) which read ‘Composite plot of the “raft” prepared after post-excavation recording by joining together individual plans of individual cleat-units’. To facilitate extraction, transport to Greenwich and

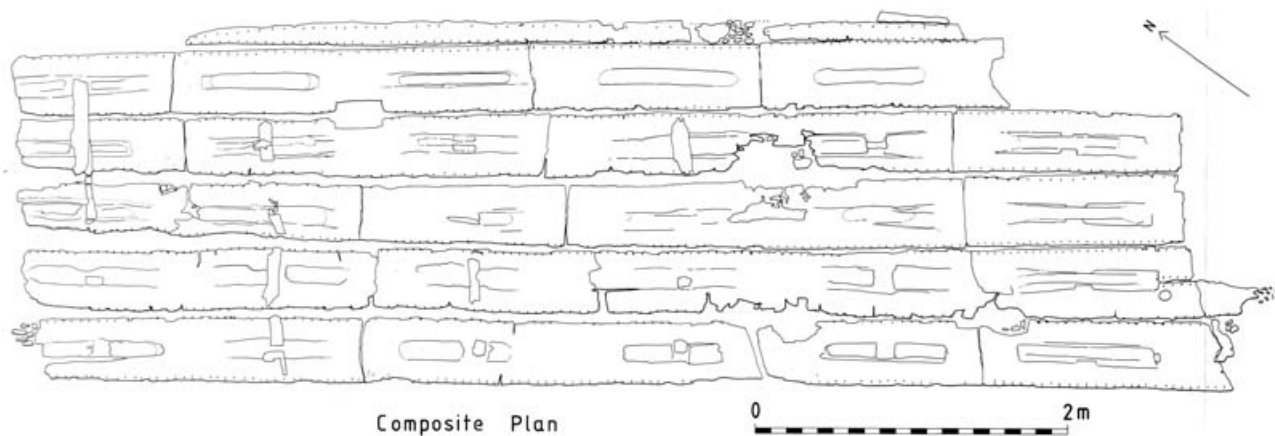


Figure 3. The Composite Plan of Brigg 2, prepared after post-excavation recording by joining together plans of individual cleat-units. (McGrail, 1981: fig.2.1.19)

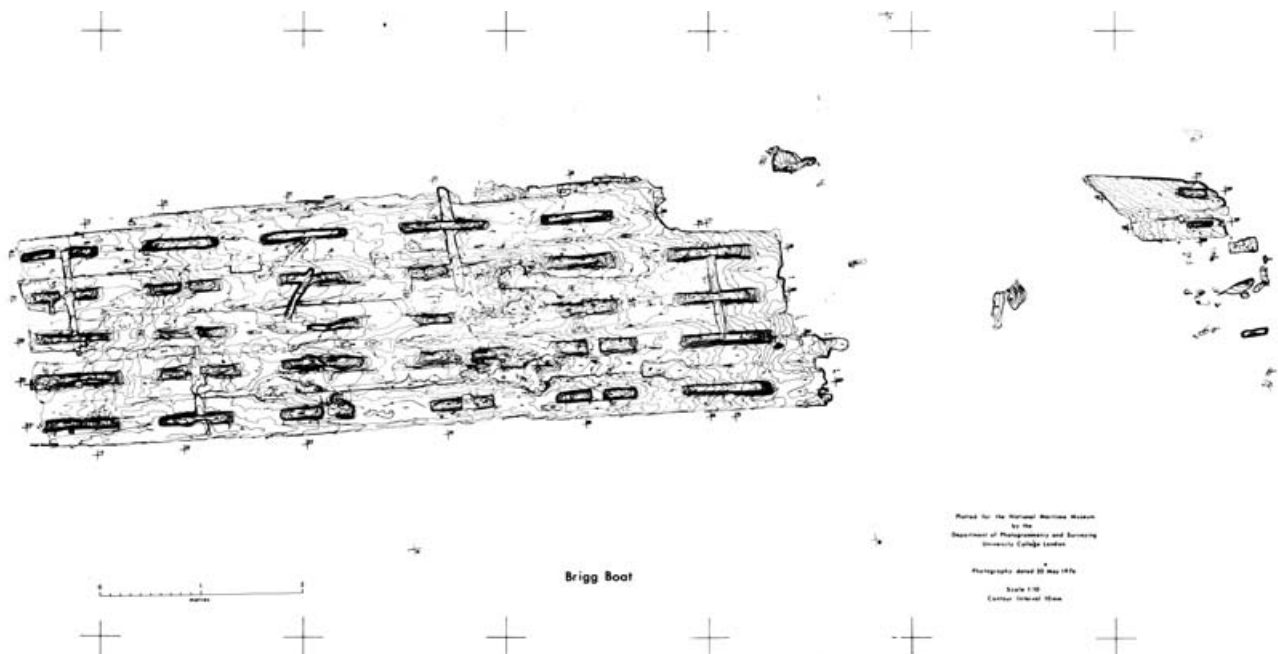


Figure 4. Photogrammetric contour plot of Brigg 2 compiled during the 1974 re-excavation. (McGrail, 1981: fig. 1.3.3)

tanking, each strake of the 'raft' was sawn on site into several 1.5- to 2-m lengths (known as 'cleat-units'). In the post-excavation phase of research at Greenwich, each of these cleat-units was recorded by orthogonal photography of upper, lower and end faces, leading to conventional 1:10 scale plans with transverse and longitudinal sections (McGrail, 1981: 57–82, figs 2.1.4 to 2.1.14). These 30 drawings were then combined by Chris Gregson, ARC conservator, to form the Composite Plot.

Having been left exposed for almost five months when first excavated during the summer of 1888, the remains, when re-exposed in 1974,

proved to be degraded, especially the north-west end of the vessel which is to the left on all published plans (McGrail, 1975: 7). During recovery, transporting, off-loading, and lifting into, and out of, the Greenwich tanks, some plank edges were lost, especially from the most degraded sections (McGrail, 1981: 60). The composite plan (Fig. 3), which was compiled some 4 to 5 years after the 1974 excavation, is therefore incomplete, as can be seen by comparison with the archaeological site-plan (McGrail, 1994: fig.3) the on-site photogrammetric plan (Fig. 4), on-site photographs (McGrail, 1994: fig.5), and a photograph taken during the 1888 excavation (Fig. 5).

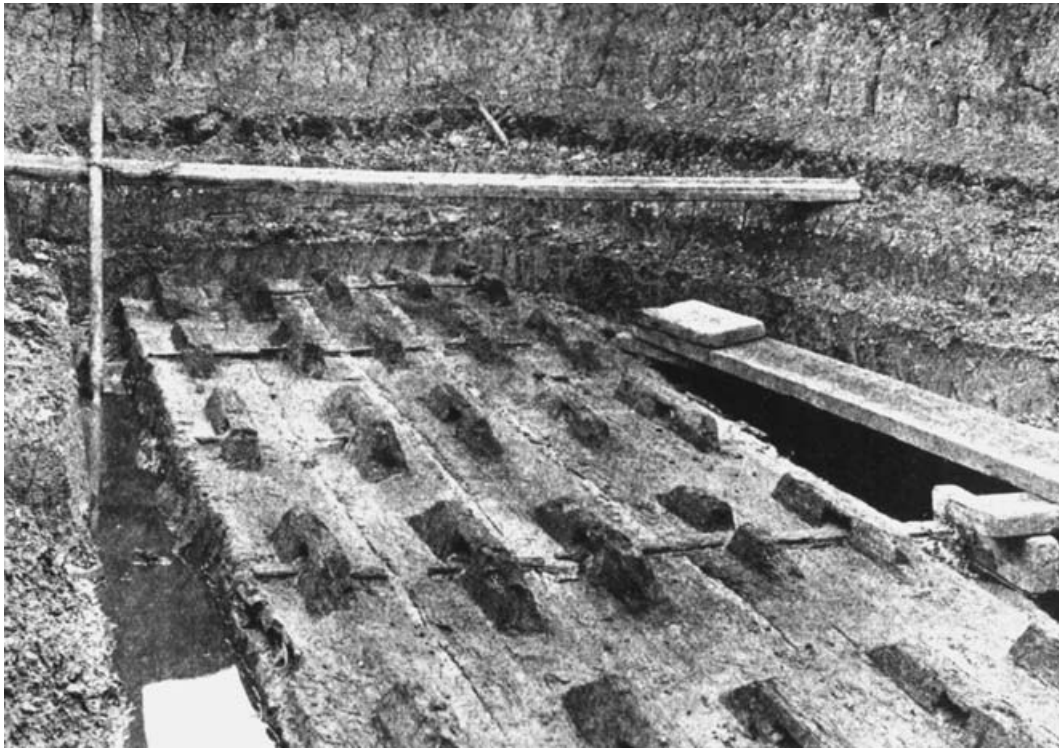


Figure 5. Brigg 2 photographed from the south-east by the Rev. A. N. Claye in 1888. (Hunt, 1907–08)

Although much was missing from both edges of the north-west end of the central bottom plank (plank 3) when re-excavated in 1974, the seams between the first and second bottom planks (on the left of Fig. 5 and towards the bottom of Figs 3 and 4) and between the fourth and fifth bottom planks (right on Fig. 5, near the top of Figs 3 and 4) were almost complete: they showed no splaying but had a relatively-constant gap along their length. South-east of cleat row 3, the seams on either side of the central bottom plank were similarly parallel. We were able to show, from elliptical hole measurements, that, between deposition and re-excavation, the planking had shrunk across its breadth by 11 or 12%. If an allowance is made for this, opposing plank edges, where they survive, butt together along their edges (McGrail, 1981: 228; McGrail, 1985: 178).

As to the supposed taper at the south-eastern end of the boat: most of this end had been lifted during the 1888 excavation and subsequently lost. Two elements of planking (cleat units G5, the larger; and G4) remained isolated *in situ* and were excavated in 1974 at what was probably the south-eastern corner at that end of the boat's bottom. Dendrological examination showed that G4 was part of the same log as strake 4 (and 3),

and G5 of strake 5 (and 1). The latter cleat-unit was found to have been slewed out of line with strake 5, probably during the 1888 excavation, and overlapped G4; its alignment recorded in 1974 cannot therefore be used as evidence for taper at that end of the boat.

These two isolated cleat-units were from the butt-ends of trees 1/5 and 3/4 and post-excavation examination showed that they had originally been fashioned to be some 150 to 200 mm narrower than they need have been if the tree's broadening (recorded along the main surviving runs of planking) had continued into the south-eastern part of the bottom planking lifted in 1888. The parsimonious deduction from this observation is that, during felling and/or conversion, all three Brigg logs had been damaged near their butt ends, with the damage extending furthest up the bole of the parent tree 3/4, in the half that became plank 4 (McGrail, 1981: 94–8).

When Brigg 2 was first assembled, the five bottom planks were probably positioned close alongside one another with their narrower ends (north-west as excavated; upper ends in the parent logs) adjacent, thus giving that end of the boat an elongated trapezium shape in plan. Because of the damage that had occurred to the

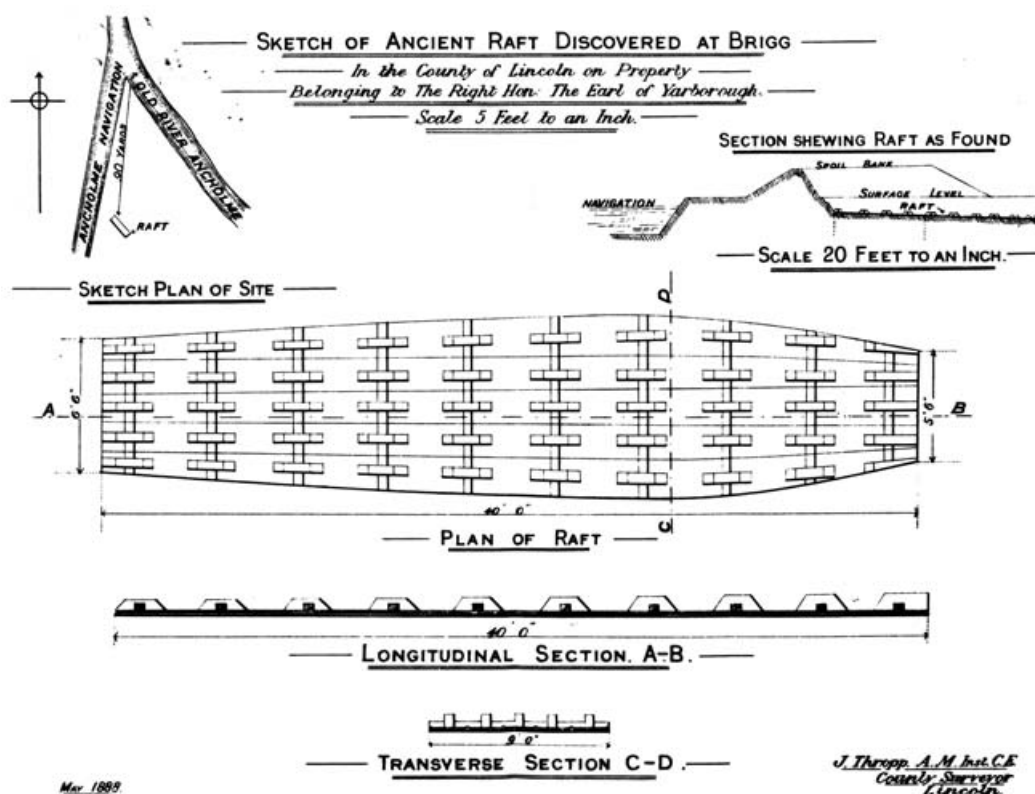


Figure 6. Plan and sections of Brigg 2 *in situ*, compiled in May 1888 by J. Thorpe, County Surveyor, Lincoln. (McGrail, 1981: fig. 1.1.4)

lower ends of the three trees, the trapezium shape achieved at the north-western end could not be maintained to the other end (McGrail, 1981: 224–5). The resultant modified-trapezium shape may be seen on Thropp's 1888 drawing of the 'raft' (Fig. 6), on the larger of the two 1:12 scale models made of the 'raft' during the 1888 excavation and now in Lincoln Museum (McGrail, 1981: fig. 1.1.5), on the published outline reconstruction drawing (McGrail, 1981: figs. 1.1.4, and 4.1.23), and on the National Maritime Museum's 1:10-scale reconstruction model (Fig. 7).

Plank edges

These bottom planks (originally at least 12.2 m long) had been split from half-logs: planks 1 and 5 (outer bottom planks) from one log; planks 3 and 4 from another, and plank 2 from a third. The builder's aim had evidently been to obtain the greatest possible breadth of log: the natural taper of the parent logs was retained and some sapwood was left on the edges of every plank. Moreover, although planks generally had straight edges, occasionally there was a gentle waviness. Where there was natural damage or when a

minor woodworking mistake led to a slight reduction in plank breadth, the builder had fashioned the adjacent strake to match the contiguous defect. These planks did not have curved edges: there were occasional minor 'waves' in otherwise straight edges. Such wavy edges may be seen in some of today's stitched boats (McGrail, 1981: 224–5, fig. 4.1.10)—the Ferriby and Dover boats may have had similar 'waves'.

Contrary to Roberts' statement (1992: 247), the thinning of the inner edges of the Brigg bottom planking was an essential feature of this flat-bottomed boat: by this means, the sewn fastenings were raised 15 to 30 mm above the bottom of the planking (McGrail, 1981: 234, fig. 4.1.19) so that they would not be abraded when the vessel took the ground, as she must have done on almost every passage. The builders of Ferriby 1 had a different solution (Wright, 1990: fig. 4.8c) to this worldwide problem for boats with sewn fastenings.

Transverse timbers

The transverse timbers are squared-off, radial splits of oak (*Quercus* sp.) that had formerly been



Figure 7. A 1:10-scale reconstruction model of Brig 2. (© National Maritime Museum, London)

wedged in position where they passed through holes in the cleats. On re-excavation in 1974 they were found to be thin and fragile. As Roberts (1992: 247–8) has pointed out, even when allowance is made for shrinkage, they do not fill the vertical dimension of the cleat holes; in fact they just about half-fill them. Milne has noted (1982: 10) that with waterlogged wood, ‘the thinner the wood, the greater the shrinkage’—however, this statement has never been quantified and cannot therefore be applied to Brig 2. Had these transverse timbers been fashioned to fill the cleat holes vertically, it could well have led to the bursting of the upper arm of cleats when under way. It may be then that they originally did fill only half the vertical space in the cleat holes, and that a dunnage of light timbers or brushwood was packed below them (Fig. 7) (McGrail, 1981: 236–7). This arrangement would have reduced the adverse effects of the movement of free water in this flat-bottomed boat, thereby improving stability (Coates, 1981: 266). The transverse timbers did, on the other hand, fill the cleat holes horizontally, and in this way kept the five planks in a fixed spatial relationship, thereby reducing the stress on the stitching as one or other of the planks decelerated before the others when the boat was beached. Furthermore, these timbers could have been used to realign the planking, after a refit and before re-sewing.

Discussion

The Dover boat

It is understood that the Dover Boat Trust and Peter Clarke, the editor of the two Dover publications,

are considering the way ahead in the light of the recent criticism by Crumlin-Pedersen (2006), by Von der Porten (2006), and by Roberts (2006a; 2006b). They would be well-advised to follow the procedure suggested earlier in this paper, beginning with building an ‘as-found’ scale model.

Brigg 2

When investigating whether the original form and structure of Brig 2 could be reconstructed, all available evidence was used, including that from the 1888 excavation (Thropp, 1887; Hunt, 1908; McGrail, 1981: figs 1.1.4 and 1.1.6), as well as from the 1974 re-excavation and the subsequent post-excavation research. The conclusion drawn was that this vessel had formerly been a flat-bottomed, sewn-plank boat, as shown in the 1:10-scale reconstruction model (Fig. 7). Roberts’s recent reconstruction (Fig. 8) as a ‘lean, round-bilged, stable, buoyant craft having a versatile operational capacity which would include coastal passage-making and short sea crossings’ (Roberts, 1992: 245, fig 19), is based on a misunderstanding of the excavated evidence and cannot be considered valid.

Even though arguments have been advanced to support the validity of the original reconstruction (Fig. 7), it is considered that an impartial and informed team of specialists should re-assess the evidence from the 1888 and the 1974 excavations, determine what was found, and then investigate the boat’s original shape and structure.

Ferriby 1

John Coates (2004: 22; 2005a: 41–2) maintains that the evidence presented by Ted Wright in his

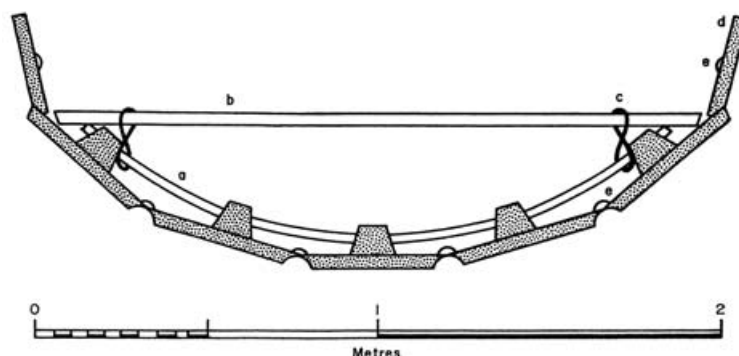


Figure 8. Roberts' reconstructed midships section of Brigg 2, with bent frames through cleats. (Roberts, 1992: fig 4)

1990 publication is 'clear and unambiguous', that 'no further examination of his research is necessary', and that it is, 'beyond reasonable doubt that the bottoms of these vessels [Ferriby 1 and 2] were originally rockered'. On the other hand, Roberts (2006a: 72) found that Wright's 'final comprehensive book (1990)' left him 'slightly confused by some of the details, and even the recording methods. Occasionally conclusions or the reasoning behind the shape or purpose of parts of the structure hint at an uncertain knowledge of boat structures and dynamics'. Roberts (2006a: 72) also noted that the building and testing of a half-scale interpretative model (Gifford, 2004a; Gifford, 2004b; Gifford and Coates, 2006) was undertaken 'despite the incompleteness of the recorded archaeology'. Furthermore, he states that:

there is insufficient information in either the published archaeological record or the subsequent assembly drawings to explore this [the possible post-depositional deformation of Ferriby 1's bottom] further. The description and illustrations of those same two areas [the ends of the boat] make it difficult to judge or accept the archaeological worth of the additions included in the reconstruction of Ferriby 1 and especially in the half-scale interpretative model (Roberts, 2006a: 73).

Despite some difficulty in understanding certain aspects of Roberts' paper, the present author generally agrees with Roberts' criticisms of publications by Wright (1990), Coates (2005a; 2005b), and Gifford and Coates (2006). Confidence cannot be placed in any reconstruction of Ferriby 1 until it has been established exactly what was found on North Ferriby foreshore in the pre-war years, and what was excavated there in 1947 and 1963. To do this, it would be best for an impartial and informed group to examine the boat remains and work through, and report on, all information that can now be assembled about the Ferriby boats:

in essence these are the archives, photographs, slides, models, newspaper reports, and all Ferriby-related publications.

After an 'as-found' model of Ferriby 1, based on the group's conclusions, has been built, it should be subjected to wide appraisal and criticism. Using an agreed 'as-found' model, attempts may then be made to produce a reconstruction of the original boat. During this stage of research earlier proposals, such as those by Owain Roberts for 'A frame-free Ferriby' and 'A different Ferriby framing' (2006a: 74, 75–6), could be evaluated. Gifford's half-scale model should, on the other hand, only be considered further if it turns out to be compatible with the agreed 'as-found' model, although the experience Gifford gained during boatbuilding may be drawn upon.

Coates (2004: 25, 27; 2005b: 521) has suggested that, 1500 years before there is any evidence for sailing in north-west Europe, Ferriby 1 would have been sailed. He justifies this assertion by stating that it 'must be virtually certain on grounds of the overwhelming advantages of sail over oar and paddle on sea passages of any reasonable length that boats would have been sailed from their inception'. Furthermore, he suggests that 'it is hard to accept either that their advantages [of oars and sail over paddles] took two millennia to spread to north-west Europe [from 3rd millennium BC Egypt] or, more likely, that they were not adopted there independently during that period'. Such matters are considered in more detail in McGrail (forthcoming). Suffice to say here that, although conjecture is an understandable, probably desirable, reaction to the absence of evidence, it is hardly a conclusive argument.

A full-scale reconstruction of Ferriby 1—as suggested by Coates (2005b: 529) and by Roberts (2006b)—should not be considered until all these

problems have been tackled and agreement reached: *first*, on exactly what was excavated on the Humber foreshore at North Ferriby in the mid-20th century AD; and *second*, what was the form structure, propulsion and steering of the original 20th-century-BC boat that these remains represented.

Ferriby 1 and Brigg 2

Coates (2005a: 41) considers that the original boats represented by the earlier reconstructions of Brigg 2 and Ferriby 1 would have had similar roles. This is true in that both would have been built for use as ferries. Nevertheless Brigg 2's hull shape, her stability and her available freeboard suggest that she would not have been used within the main Humber estuary—as was Ferriby 1—but was more suited to the relatively quiet, upper reaches of the River Ancholme, then a Humber tidal creek. She would most likely have been used as an east-west ferry near where she was excavated, in a relatively low-energy region of the estuary near the head of tide. This site was also a nodal point in the north-south orientated valley where the two upland regions, the limestone Lincoln Edge to the west and the chalk Lincolnshire Wolds to the east, were closest together, thus constraining the tidal creek to a single channel and minimising the extent of marshy ground that had to be crossed to gain access to a boat. Her tray-like shape would have given her maximum capacity for this role (McGrail, 2004a: 190; McGrail, 2004b: 59).

Ted Wright and the Ferriby boats

The large sewn-plank boat fragment excavated in 1990 from a site within the grounds of Caldicot Castle, Gwent, on the northern shores of the Severn estuary (Nayling and Caseldine, 1997: 210–17), was the first British sewn-plank boat to be discovered outside the Humber region. Ted Wright was, very properly, one of the first persons to be told that important news, and he was the first non-excavation person to be invited to see the timber while it was still in the ground (Fig. 9). This is some measure of how I valued his work. None of the criticism voiced in this paper reduces my admiration for Ted Wright's remarkable achievements in his 50 years of intermittent, but purposeful, research on the Ferriby boats. As I wrote in the Introduction to his *magnum opus* of 1990, these boats 'are of worldwide importance', and 'their excavation was a significant milestone in the progress of archaeological research'. That



Figure 9. E. V. Wright at the excavation of the Caldicot boat fragment in 1990, with Stephen Parry (Site Director) and the author. (S. McGrail)

Ted Wright invited me to write that Introduction is possibly some measure of his regard for me.

Coates (2005a: 42) has stressed that, 'the seaworthiness or otherwise of the Ferriby vessels affects our understanding of an important maritime aspect of the Bronze Age and quite possibly of the Neolithic too'. It should also be emphasised that any future identification of Ferriby 1 as an estuary, rather than a seagoing, boat would not, in any way, devalue the lasting importance of Ted Wright's work or reduce that boat's importance. The primary role of an estuary Ferriby boat 1 would have been as a cross-estuary ferry on a stretch of the Humber where there have been north-south ferries since at least Roman times, the last being three British Rail coal-fired, steam-driven vessels which survived until the Humber bridge was built in the 1980s.

In medieval and earlier times these cross-Humber passages connected north-south routes along the Yorkshire Wolds to corresponding routes along the Lincolnshire Wolds and the Lincoln Edge. Before large-scale drainage of the Humber's lower catchment area was undertaken in the 18th century AD, these passages were even more important than in recent times since the nearest alternative north-south route then lay at

least 40 miles to the west. Ferriby I's underwater shape and her high L/B ratio (as suggested in her two-strake reconstruction) would have given her the potentially high speed needed when

crossing the fast-flowing Humber. In addition, this versatile boat could have undertaken passages along the estuary and into the several rivers that feed it.

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