

Chapter Title: Evidence of a marine environment associated with the Dover boat

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Book Title: The Dover Bronze Age Boat in Context

Book Subtitle: Society and Water Transport in Prehistoric Europe

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Book Editor(s): Peter Clark

Published by: Oxbow Books. (2004)

Stable URL: <https://www.jstor.org/stable/j.ctt1cfr9j9.5>

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2. Evidence of a marine environment associated with the Dover boat

Christopher Green

Previous research

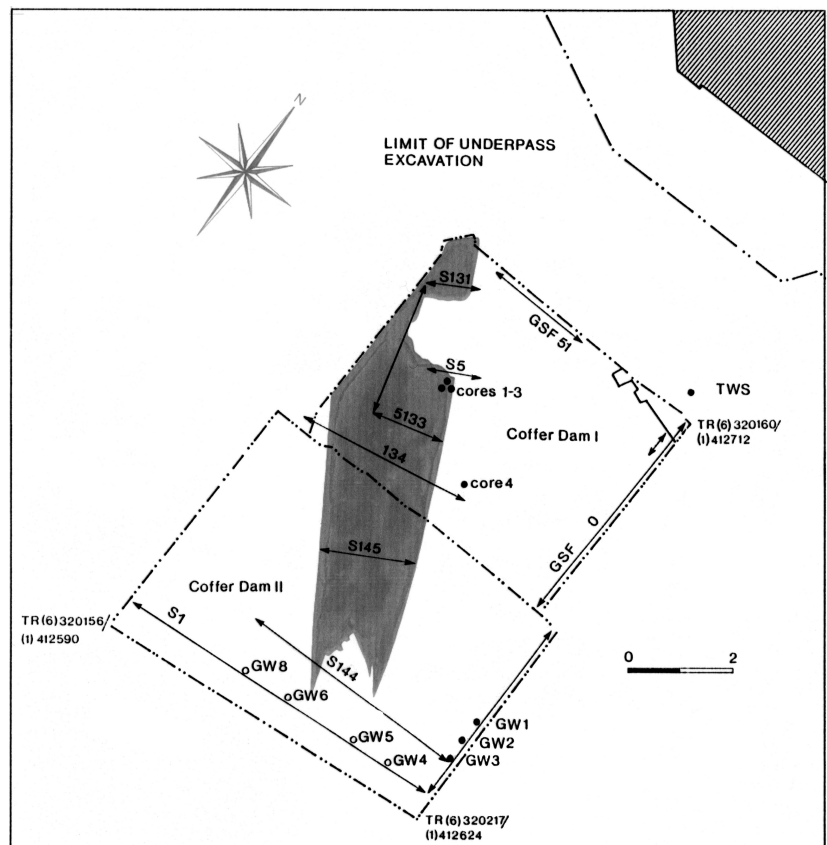
Whether the Dover boat was a sea-going vessel or not remains a matter of debate. The argument that it was intended solely as a river craft seems to have gained significant support from the palaeo-environmental evidence in the sediments on which the boat lay and by which it was enclosed. Marine indicators are almost entirely absent from this setting, and the final resting place of the boat was undoubtedly the floodplain or channel of a river, upstream of any tidal influence. However, in assessing the significance of this evidence, it is necessary to recognise the challenging circumstances in which the boat was discovered, the sediment sampling procedures that were possible in those circumstances and the aims of the subsequent palaeoenvironmental investigations.

Palaeoenvironmental studies concentrated on the depositional environment in which the boat was found. These studies, both of the sediments themselves and of their contained flora and fauna show that the setting is the product of river activity, and that the boat came to rest, or was emplaced, near the edge of a channel of the Bronze Age River Dour. Although the sea was at most a few kilometres away, there is almost no evidence of its proximity. A few plants that normally occupy coastal habitats are sparsely represented in the pollen flora, and the shells of marine molluscs, or their broken remains, occur in the sediment, but only rarely and not in typical faunal assemblages.

The possibility that physical traces of a sea-going past might still be associated with the boat does not seem to have been systematically explored. Such traces might be materials or organisms adhering to the timbers of the boat, or preserved in joints in its structure or cracks or other openings in its timbers. Bearing in mind the unknown lapse of time between any hypothetical sea-going use of the boat and its arrival at its final resting place, and bearing in mind also that it was affected by fluvial processes and processes of decay once it had been abandoned, traces of a marine context are likely to be small and patchily preserved.

When ArchaeoScape, based in the Geography Department at Royal Holloway, University of London, assumed responsibility, in 1997, for detailed sedimentological and stratigraphical investigations, the sample material still available that could be assigned to a context in contact with the boat's timbers was limited to one 0.5m column sample and one bulk sample. Both these samples came from sections in the northern coffer dam (Coffer Dam 1; Fig 2.1). The column sample (Monolith 10) was taken from Section 6 (S136) which formed the southern face of the excavation and exposed a

Fig. 2.1 The boat excavation; position of sections and sample positions.



complete cross-section of the boat's remains. The column reached down to the inboard surface of the timbers forming the bottom of the boat. The bulk sample came from Context 4933 recorded in Section 4 (S134), which also exposed a cross section of the boat's remains (Fig 2.2), at a distance of $\approx$ 0.5m to the north of Section S136.

Context 4933

Context 4933 (Section S134) is the sediment resting directly on the inboard surface of the timbers forming the bottom of the boat. It extended across the boat as a layer nowhere exceeding 64.5mm in thickness. A similar (but un-numbered) context was present in Section 6 (S136).

A 0.5m column sample (M05) from Section 4 (S134) was examined by Bates and Williamson (1997) and the lowermost 65mm, equivalent to context 4933, was described by them as a sandy coarse silt. A sharp contact separated this unit from a darker overlying layer of coarse silt. This column sample was no longer available for inspection in 1997 but the basal lithostratigraphic unit in column sample M10 (S136) is closely similar and it seems reasonable to regard it as equivalent to archaeological context 4933. This unit, examined at Royal Holloway, consisted of a thickness of 68 mm of silty clay.

A sub-sample of sediment from context 4933 was also examined by Dr Enid Allison as part of her investigation (1998) of the insect faunas preserved in the sediments enclosing the boat. She described the sediment as clay silt.

In the present account the particular significance of the fine-grained character of the sediment forming context 4933 is the evidence it provides for quiet water deposition within the boat during the initial stages of burial. This contrasts with the evidence of sedimentation outside and adjacent to the boat where scouring appears to have taken place, undercutting the boat on its riverward side, and where much of the sediment around the boat is in the form of tufa gravels, indicating flow velocities greater than those affecting the inside of the boat.

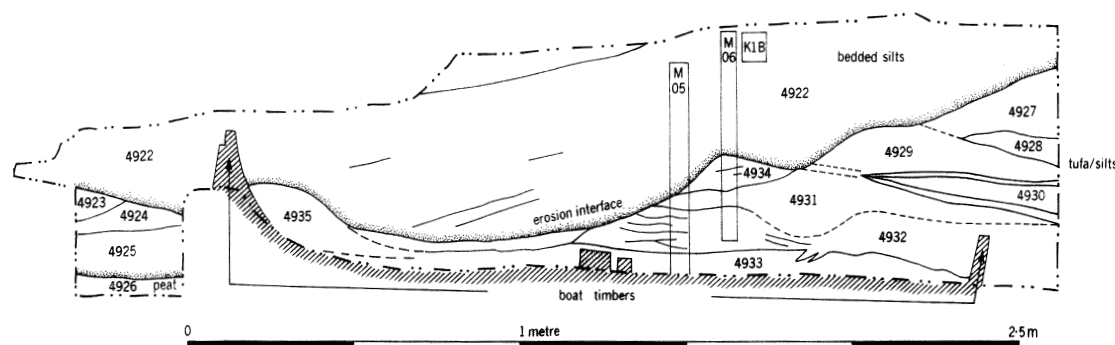
Thus in terms of the burial history of the boat, the inside is the more likely place for materials to be preserved that relate to its pre-burial history.

Sedimentology

No sedimentological investigations were undertaken that set out specifically to identify materials relating to the use of the boat prior to its arrival in the Dour valley, and adhering to or trapped among its timbers. More than 30 core and column samples were described, either by Bates and Williamson (1997) or in the ArchaeoScape studies, but the original sampling strategy provided few opportunities to examine material in immediate contact with the boat's timbers, and detailed attention was not particularly directed to these opportunities. The principal sedimentological evidence, outlined in this paper, that the boat had a sea-going history, comes from a more general study of the composition of sediments within and outside the boat. Over 2 tonnes of sediment were sieved by Dr Enid Allison and yielded just over 100kg of residue, mainly retained on a 5mm mesh. However, although this work contributed significantly to an understanding of the environment in which the boat was found, apart from the sub-sample from context 4933 (mentioned above), none of this material came from contexts adjoining the inboard surface of the boat's timbers.

In the less extensive investigation described in this paper, 8 samples from contexts both inside and outside the boat were wet sieved to 1mm, and the 1–2mm fraction was examined under a low power binocular microscope. This was not a quantitative study and the results were recorded in terms of presence or absence. In all samples the main components were tufa and flint together with particles of wood and pieces of terrestrial or freshwater mollusca. Other components present in some but not all samples included quartz, chalk, moss remains, seeds, charcoal and bone. While all the samples are broadly similar in character and can be explained almost entirely in terms of derivation within the catchment of the River Dour, the sample

Fig. 2.2 The boat excavation; Section 134.



from context 4933 contained a distinctive and conspicuous assemblage of components that was not present in any of the other samples. This consisted of well rounded grains of glauconite, well-rounded and polished grains of quartz and well-rounded and polished particles of mollusc shell. These components are interpreted here as having been derived from marine beach sand that had been preserved on the inboard surface of the boat's timbers. This interpretation is based on the following evaluation of the nature and possible source of the distinctive components involved.

Marine shell

Particles of well-rounded and polished mollusc shell were present only in the sample taken from context 4933. They are unlike the shell remains of terrestrial or freshwater species and comprise pieces of thick-walled shell in which growth layers are recognisable. They have a slight iridescent sheen, typical of the shell of many marine species. They are unlikely to be the remains of large freshwater species as none is present in the mollusc fauna recovered from the sediments enclosing the boat, and none would normally be expected in a river as small as the Dour. The rounded and polished condition of the shell particles is also unlike that of the freshwater and terrestrial shell material in the samples, which is only lightly abraded and has a matt surface texture. Thus these distinctive particles appear to be the shell remains of marine species. Such material is often present in marine beach sand.

The shells of marine molluscs, or their broken remains, are present elsewhere in the sediments that enclose the boat. They are recorded from several of the bulk samples examined by Dr Allison, and marine shell was noted by the author in a column sample (M11) taken from the east side of Coffey Dam 2 (Section S143) at a distance of *c.* 2m from the boat. However, in no case is there any indication of a marine faunal assemblage, and where the probable species of the marine molluscs was recorded, they are edible species. It seems likely that this shell material is domestic waste, and this possibility is supported in the residues examined by Dr Allison, where marine shell is almost always associated with burnt flint, charcoal and probable flint debitage.

Glauconite

In the study described here, glauconite was recorded only in the sample from context 4933. There are no obvious sources of abundant glauconite in the basin of the River Dour. The bedrock underlying the entire catchment is the Chalk. Hancock (1975) notes that glauconite is present in the Chalk only in 'minute quantities' and he quotes figures from Weir and Catt (1965) recording 0.077 per cent as an exceptionally

high content. Hancock (1975) states that 'greater quantities of glauconite occur very locally in hard-ground-chalks', but he does not say where or provide any quantitative data.

Despite this background, Bates and Williamson (1997) found glauconite in the sediments enclosing the boat. Altogether they recognised 183 lithostratigraphic units but they recorded glauconite in only 17. In 16 cases the glauconite was described as 'rare' or 'very rare', but exceptionally in one unit it was estimated to form 5–10% of the sediment. Glauconite was not recorded by Bates and Williamson (1997) in the sands and gravels by which the boat was initially buried. All but two of the glauconite-bearing lithostratigraphic units were in the body of mainly silty sediment that overlay the sand and gravel that initially buried the boat. This silty sediment was deposited after erosion had partly removed the sand and gravel around the boat and had probably partly re-exposed the boat. The remaining glauconite-bearing units were in sediment beneath the boat.

Thus, although a source of glauconite is apparently present in the basin of the River Dour, glauconite was not found in the sediments that enveloped the boat, except in context 4933, immediately overlying the inboard surface of the boat's timbers. If, as is argued here, the glauconite in context 4933 originated not in the basin of the Dour but elsewhere in marine beach sand, a potential source is present only a few kilometres away near Fokestone where glauconite-bearing geological formations in the Lower Chalk and the Lower Cretaceous Greensands reach the coast.

Quartz

There are no obvious sources of abundant quartz in the basin of the Dour, but like glauconite it was recorded by Bates and Williamson (1997) as occasionally present in the sediment associated with the boat and it was present as a minor component in some samples examined in the present study. However, the quartz content of the sediment forming context 4933 is remarkable for the size, shape and surface texture of the grains, which, as noted above, are large, well-rounded and well-polished. Quartz having these characteristics was not noted in any of the samples examined in this study except the sample from context 4933. The shape and surface texture of the grains is typical of quartz that has been a component of marine beach sand.

Conclusion

Thus, in the sediment forming context 4933 there are three components that might be expected to occur in nearby marine beach sand. In this respect,

context 4933 is unique among the sediments recorded around the Dover boat. The setting of this material, resting directly on the inboard surface of the timbers forming the bottom of the boat, suggests that it might represent traces of sediment adhering to the boat at the time that it came to rest in the valley of the Dour. It is not difficult to visualise that such components could have entered the boat while it lay on a sandy beach – possibly on the feet of people using the boat, possibly on cargo or equipment that had rested temporarily on the beach, perhaps only a few kilometres away near Folkestone. The quiet-water conditions that prevailed during the initial stages of sedimentation within the boat as it lay in the valley of the Dour would have particularly favoured the survival of such traces of a previous sea-going history.

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