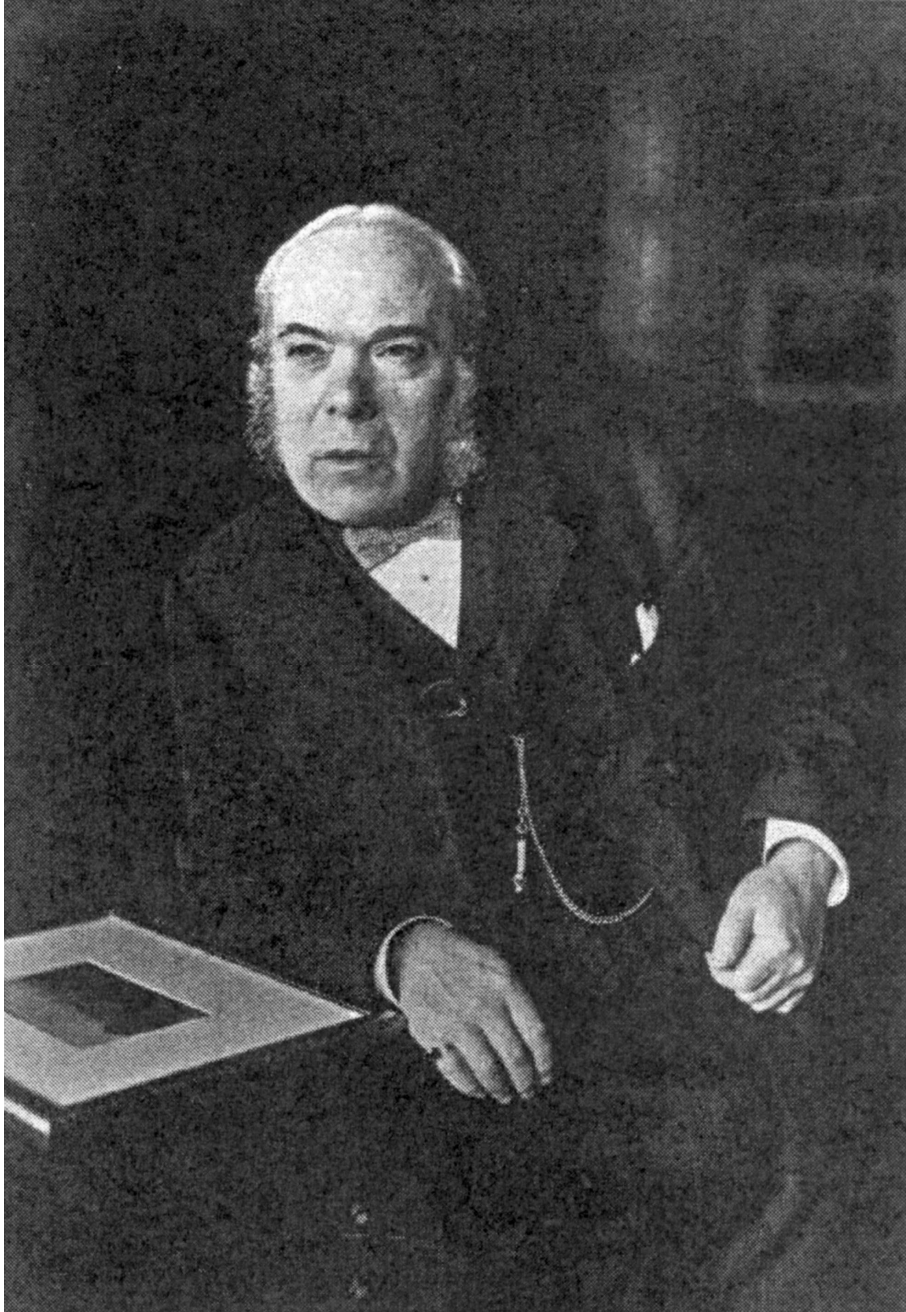


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Some new aspects of Roman Broadland

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Introduction

The ordinary¹ view is that the Broads and Great Yarmouth were not occupied in the Roman period. The area, which is one of deposition in a wetland (Fig. 1), is generally believed to have been a 'Great Estuary' in which, during all that time, no occupation was possible. This seems strange to me. Other major wetlands in eastern and south-eastern England provide clear evidence of Roman occupation of new land formed before, and even during, Roman times.

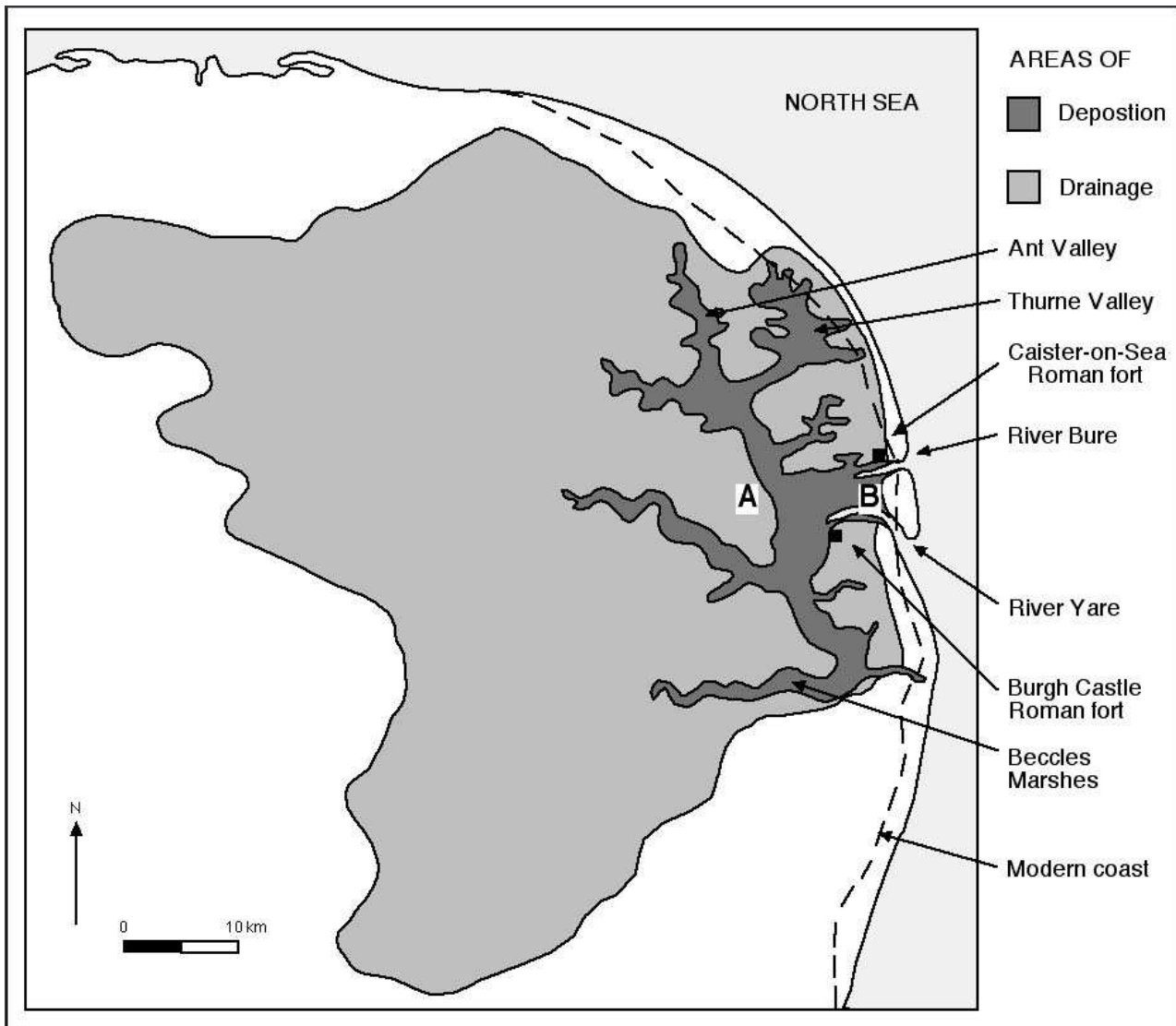


Figure 1. Yare/Bure drainage basin geography at the end of the Roman period, based on Godwin's reconstruction, but showing no opening of the Thurne valley to the sea.

As we shall see, when considering the history of the physical landscape of this area in the Roman period, the views of archaeologists and geologists conflict. I therefore welcomed the opportunity to discuss the matter at a conference on the Geoarchaeology of River Valleys held in the Autumn of 2006 at the University of Ghent (Belgium). My contribution to the proceedings, in course of publication, is abbreviated here, so I hope that the reader can take some of the evidence on trust. Even so, I am aware that arguments could be constructed against what I suggest, and that many unexplained facts remain. These call for further debate and research.

Human occupation of wetlands such as Broadland depends on the prevailing geological conditions. These in turn depend largely on changes in the local sea level. So the first part of this article will present the most

recent and authoritative opinions on changes in sea level in the last 2,000 years. These are at odds with claims made in a local museum. The museum's claims seem to be based solely on the ordinary view of the Great Estuary. In my opinion, they are incorrect.

The archaeological evidence will then be considered. Firstly, we look at the relative number of Roman finds in two built-up areas of similar size: Great Yarmouth and Gorleston. The former (Great Yarmouth proper), which was supposedly inundated and uninhabitable in the Roman period, has the greater number. Secondly, we study the Roman finds from the coast between Eccles and Winterton, where the advancing sea is eroding the wetland. In complete contradiction of the ordinary view, these indicate Roman occupation of sediments deposited before and during the Roman period. Thirdly, there is a brief report of a recent Roman find from the centre of the southernmost arm of the Broads wetland. This also seems to have been deposited on dried-out marshland rather than within a tidal estuary.

The article concludes with a view based on this new evidence. This portrays a Roman Broadland landscape that was similar to that which we now see. At times, when sea level temporarily declined, the marsh was dry enough to permit occupation. Most importantly, the Great Yarmouth bar continued to exist. Its possible role at that time, as a means of communication between the uplands of Flegg and Lothingland, is one of many areas for further research.

Sea level and geological development

According to the fourth assessment report of the Intergovernmental Panel on Climate Change (2007), global sea level rose by 120m from the end of the last ice age (about 21,000 years ago) until some time in the first millennium BC. After that it did not change significantly until the late 19th century, since when human industrial activity has caused it to resume its rise at an ever-increasing rate

Because global sea level has been the same (with variations of the order of a metre) for 2,000 years, local changes in sea level have been due to other factors, such as land movement. For the UK, an accessible source of information on this is Basil Cracknell's *Outrageous Waves*. This shows that the UK land surface is simultaneously sinking (around the Thames estuary) and rising (around the Scottish Highlands). Shennan and Horton have assembled further evidence of land/sea relative movements over the last 4,000 years. Land level, on the coast from the Humber to Southampton Water, has been falling at 0.4 - 0.9mm per year, depending on location. The figure for Lowestoft is 0.6mm per year. This is in excellent agreement with the figure given by the British Geological Survey, in their memoir for Great Yarmouth. They propose a local change of one metre since the end of the Roman period. In other words, the average sea level (relative to the land surface locally) was then one metre lower than it is now.

This account, based on solid research, is not the one presented to the public in the otherwise excellent Time and Tide Museum in Great Yarmouth. One of the museum's display panels entitled "Great Yarmouth in the Roman Period" tells us:

"In 43 AD Great Yarmouth did not exist. The site lay under water. ... When the Romans invaded Britain sea levels were much higher than they are today. The site of Great Yarmouth lay at the mouth of a vast estuary which opened out into the North Sea. The area where the Halvergate marshes now stand was tidal mud-flats. The districts of Flegg and Lothingland² were islands in the great estuary."

This vision seems to depend on a supposed much higher sea level, for which no evidence can be given. In my view, and according to the accounts of several geologists, it is incorrect.

At the Ghent conference a member of the audience, evidently very familiar with the true history of sea levels in the southern North Sea, asked me how such a claim could be made. At the time, I suggested that it could be a symptom of insularity - after all, this part of the museum was entitled *The Town that Grew Out of the Sea*. Since then I have had second thoughts.

It is an almost general belief that, prior to the formation of the vast open estuary, a sand and gravel bar protected the wetland, which was then a peaty swamp, from the sea. A catastrophic event, the destruction of the bar, brought about a radical change. This supposed sudden change required a cause, and the museum display implies that the cause was a much higher sea level. The claim therefore seems to be a product of belief in a theory, and not evidence for it.

Another panel in the museum reinforces current convictions. It shows the *Coastline in the Roman Period*. The panel is in two colours (Figure 2 is a partial reproduction in tones of grey). The land is green. The estuary itself and the open sea are both coloured blue. These colours are iconic. We almost automatically associate blue with water. It is not surprising that the public, and at least one archaeologist, see the boundary between green and blue as a line dividing land from sea. This is a gross over-simplification.

The current theory of the development of the "Great Estuary" makes three basic claims: (i) that there was a bar, (ii) that it was destroyed before Roman times and (iii) that a tidal Great Estuary existed over that period. The icon representing the third stage (Fig. 2) is questionable, and we must also question the theory that gave rise to it. But, before doing so, we should consider what sediments have been deposited in Broadland over the last few thousand years.

The generalised geology of the wetland immediately west of Great Yarmouth is shown below (Fig. 3). This section, between points A and B (in Fig. 1), shows alternating deposits of peat and clay. They correspond to periods of lesser and greater marine influence, due mainly to changes in the rate of rise of sea level. Slow rises allow peat to form. Fast rises lead to deposition of more silt and clay.

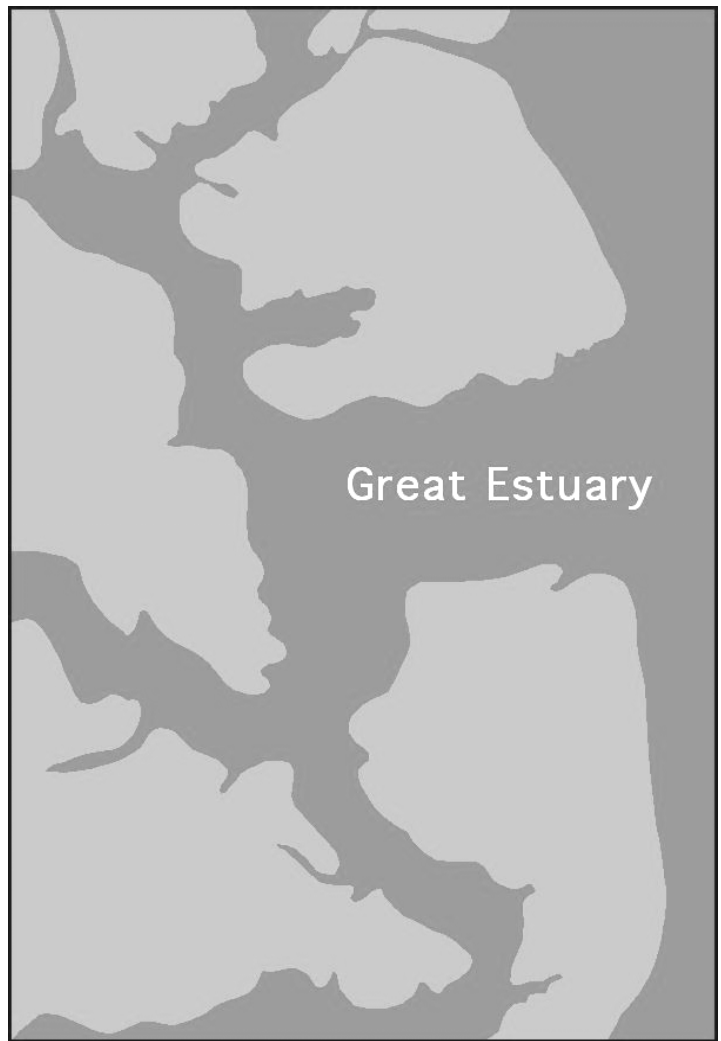


Figure 2. The Great Estuary, according to a display panel in the *Time and Tide: Museum of Great Yarmouth Life* (detail).

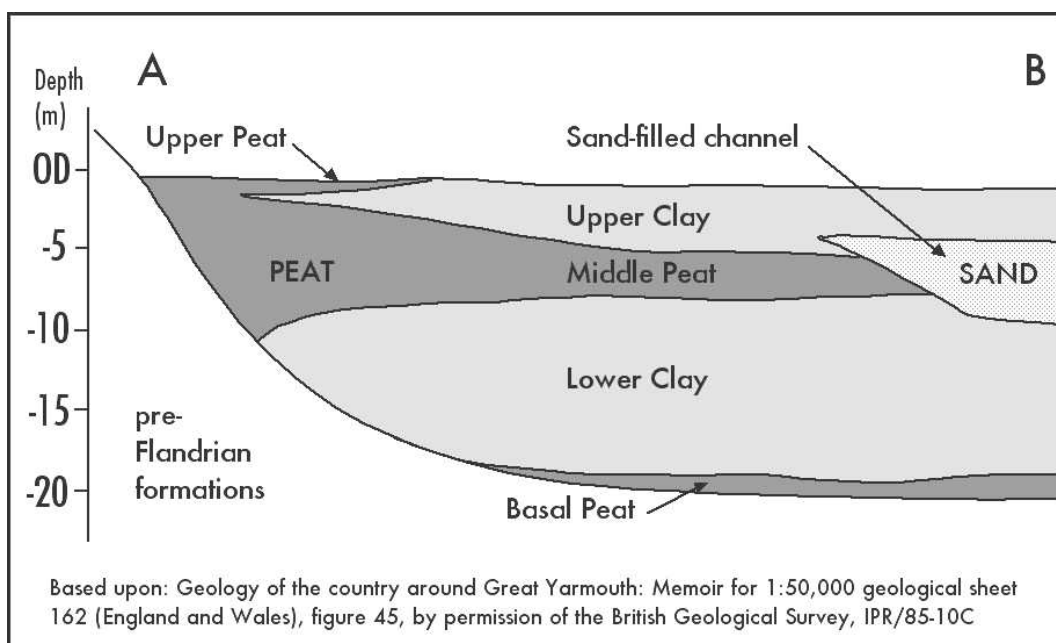


Figure 3. Generalised sequence of deposits in Broadland (the Breydon Formation) on line A-B (Fig. 1).

Further upstream, in each individual valley, the Upper Clay fills a river channel incised in the Middle Peat. Cross sections show that this former channel normally has very little lateral displacement from the existing river course. As shown in cross section (Fig. 4), clay fills the old channel and spreads in a flange on each side. This flange does not always reach the valley side, and it grades into peat, both vertically and horizontally.

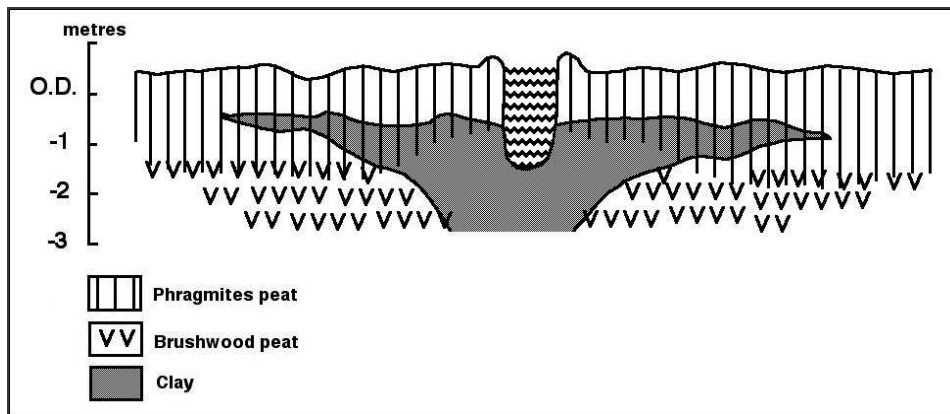


Figure 4. Diagram of Broadland upper alluvial stratigraphy in a river valley.

A more detailed representation of stratigraphy above the Middle Peat in one of these valleys (that of the Ant) was given by Wells and Wheeler in 1999 (Fig. 5). They obtained radiocarbon dates for samples of the sediments. I have calibrated these to calendar years and superimposed the sample positions (grey rectangles) on the appropriate borehole logs within their Sedge Marsh section

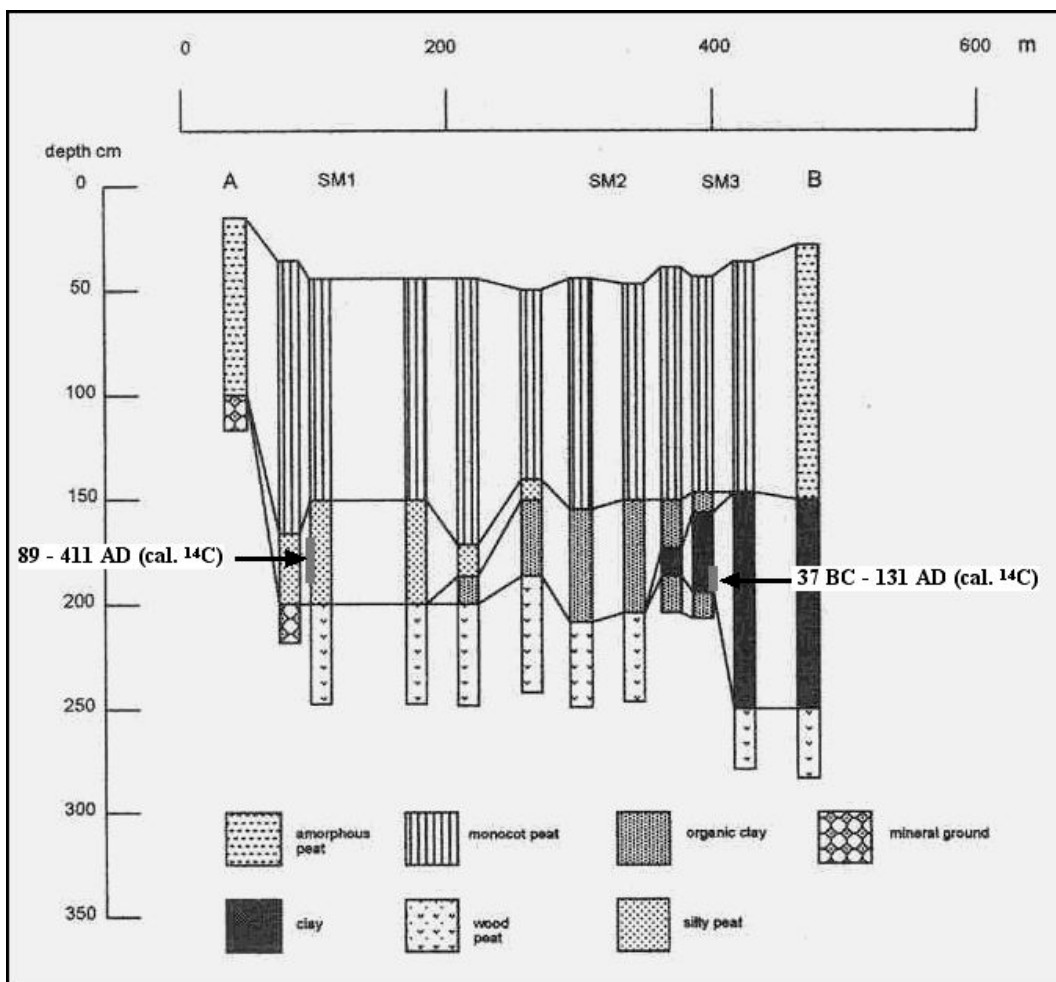


Figure 5. Section from upland boundary (left) to centre of Sedge Marsh, Ant Valley, with calibrated radiocarbon dates for sediments of the Romano-British transgression, after Wells and Wheeler (1999).

The data from these boreholes make it clear that the varied sediments lying between the wood peat and the monocot (i.e. "Phragmites" or "reed") peat were, at any given level, all laid down at the same time. The clay and the organic clay together form the clay flange (shown as clay in Fig. 4). Silty peat formed further from the river. They graded into each other, and existed, side by side, in the Roman wetland. So we must not assume that the type of deposit can be equated with a particular range of dates. Clay, although typical of this period, was not the only sediment then forming. For this reason, I will, from now on, use "Upper Clay", with capital initial letters, as shorthand for (i) a time period, and (ii) a range of sediments deposited in that period.

The shape of the clay flanges indicates a widening of the tidal river channels in which the clay was deposited, followed by contraction. It is also clear that, even at the time of greatest extent of tidal waters, some peat was still being formed at the margins of the wetland. This environment is very different from the open estuary that is supposed to have come into being following the catastrophic destruction of the Great Yarmouth bar (Fig. 2).

What gave rise to these ideas of barrier destruction and the open "Great Estuary"? Brian Coles made the initial suggestion³ in a PhD thesis presented in 1977. Then in 1981 a Special Publication of the International Association of Sedimentologists included an article by him and his supervisor, Brian Funnell. It describes the Middle Peat as the result of sedimentation behind a sand and gravel barrier, and continues as follows:

The second estuarine episode apparently began at the seaward end of the present Halvergate marshes with the establishment of sheltered estuarine conditions in what had previously been a freshwater lagoon. Coarse sandy sediment, containing open estuarine and estuarine channel foraminifers soon succeeded however, indicating both the destruction of a pre-existing sand barrier and the strong incursion of marine water into the lower valley.

In the opinion of Coles and Funnell, the Upper Clay

consisted of medium to very fine sand nearest the coast, ranging through silt further inland to true clay furthest inland. ... Open estuarine intertidal mud flats and salt marsh environments characterised the seaward limits."

This account became widely accepted. Other authors have relied on it, including Martin George, Tom Williamson and, as late as 16 March 2007, Percy Trett in the Eastern Daily Press. However, we should note that Coles and Funnell's paper, appearing in 1981, was based on research done by Coles more than four years before that. Two reports of more recent research do not support their conclusions.

In 1993 Michael Godwin, another UEA postgraduate student, presented his PhD thesis, based on research in Mautby Marsh near Caister-on-Sea. His Upper Clay reconstruction was different from that presented by Coles. It is in essence that shown above (Fig. 1).

In 1994 a Memoir of the British Geological Survey (BGS) was published. This is an authoritative and comprehensive study of the area near Great Yarmouth. In addition to the generalised section (Fig. 3), it includes maps reconstructing the geography of the lower estuary during past periods, including Middle Peat and Upper Clay times. The bar between the floodplain swamp and the sea is shown on the Middle Peat map, but its label, "Presumed sand barrier (Coles and Funnell 1981)", indicates the authors' reservations as to whether or not it really existed at that time. Despite this doubt, the Memoir's reconstruction for the following Upper Clay period, dated to the first millennium AD, shows, as on Godwin's map, a sandbank occupying the mouth of the estuary, with channels draining the estuary to north and south.

What is more, the data itself, even that amassed by Coles, casts doubt on Coles and Funnell's hypothesis. Coles' thesis of 1977 shows that his section nearest to the Great Yarmouth bar was 5km inland. Hence the information it produced was not very informative about the intervening area. Perhaps to rectify this deficiency, he provides (in his thesis) the logs of three commercial boreholes close to the bar. Surprisingly, the logs do not support a crucial conclusion of the 1981 article, for in only one case is the clay overlying the peat described as "sandy". The Norfolk Historic Environment Record (NHER)⁴ portrays a similar environment. The three entries for Roman material in clays immediately behind the bar also make little mention of sand, as part of the context of the finds. Although the clay at Runham, north west of mediaeval Great Yarmouth, is implied to be "brickearth" (a sandy clay), other clays at Caister-on-Sea are described as "marine clay" and "bluish-grey clay with organic inclusions". Most of the evidence is thus against Coles and Funnell's claim that the estuary was open, and hence more sandy towards the sea.

Certainly, some sand was found in the clay, but the authors of the BGS memoir suggest that large bodies of sand could be derived from old water courses (see Fig. 3). Other sand is in "laminae or thin beds", being visible in the lower part of the clay in most parts of the lower marsh. This clay is dark bluish or brownish grey, and silty. Above it is soft grey clay with the remains of *phragmites* reed in growth position. They did not see, in these sediments, any evidence that the bar had been destroyed.

My own opinion is that the sand in the lower part of the clay is more naturally explained as the result of flooding from the rivers, when their sandy levees were occasionally overtopped. Such floods occur now, so there is no good reason why they should not have occurred then. There is therefore no need to postulate such an extraordinary event as the destruction of the bar. For more than 2,000 years the estuary has probably never been open in the way it is ordinarily portrayed.

Roman finds from Great Yarmouth

The parish of Great Yarmouth lies on the sand bar, whereas the town's modern urban extension in Gorleston-on-Sea lies partly on a higher land surface, predating the formation of the wetland. The distribution of Roman finds from the two parishes is shown here (Fig. 6).

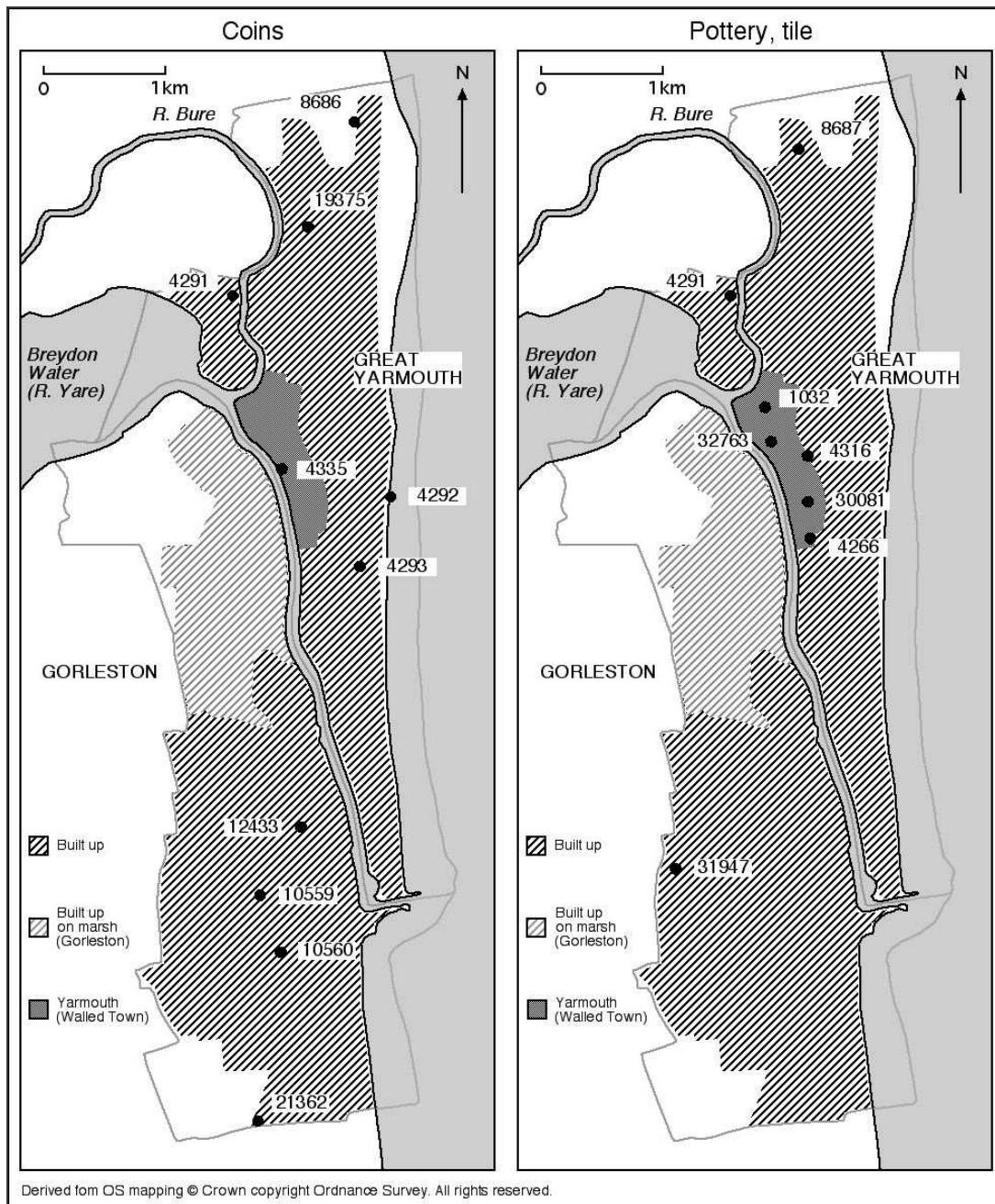


Figure 6. Roman finds from Great Yarmouth and Gorleston-on-Sea.

If in Roman times the bar was submerged, the coins found in Great Yarmouth must be explained as mediaeval and later imports, and you might expect that less would be found there. However, the almost equal number in each area is apparently a random distribution, compatible with the proposition that both areas were dry land in the Roman period, and ever since.

Pottery and tile, on the other hand, does not have a very random distribution. Against all expectation, significantly more has been found in Great Yarmouth than in Gorleston.

In terms of the original distribution this may be of little genuine importance. Ceramics are more often revealed and recorded in planned excavations, and more of these have taken place in Great Yarmouth. However, the details of two sites are particularly interesting.

The first site is at Runham (NHER 4291). It produced ceramics and Roman coins. From the NHER data it seems that the context was brickearth at about current high tide. The following were found: Roman coins including a bronze of Augustus Caesar and fragments of cinerary urn (in May 1879), and cinerary urns with a coin of one of the Constantine family (a few years before 1883). On the face of it, this looks like an early Roman cemetery, but by 1941 Rainbird Clarke was prepared to suggest that it could be as late as pagan Anglian (seventh century AD). In 1960, in *The Making of the Broads*, the site had definitely become an early Anglo-Saxon cemetery. And, in 1976 Andrew Rogerson gave an description of this site (now supposedly Anglo-Saxon) that is even more consistent with the inundation of the area in the Roman period, saying that, according to Barbara Green, the finds could be associated with salt working. The cremation urns and Roman coins have been lost, so, apart from the original reports, there is now no surviving evidence to contradict this interpretation.

Secondly, there are the Roman pottery fragments found in clay under the Midsands Cross (NHER 8687). George Rye described these in *Norfolk Archaeology* in 1965. The mediaeval cross, of which only the base remains, is in the middle of the sandbank (and near the centre line of the Great Estuary). Rye suggested, and I accept, that the clay, and then some loam, had been imported to give the cross a better foundation. He tried to imagine where the clay, and Roman pottery in it, could have come from, saying that "one naturally thinks of the Roman town of Caister-by-Yarmouth [Caister-on-Sea] as the source". This idea makes little sense. Why should the workers take clay from Caister-on-Sea, and be obliged to cross the river Bure, which then flowed north of the cross? Surely they would have taken it, not from 2.5km away, but from a much nearer source of this material in the marsh west of the cross, within 150m. The only obstacle to this more rational explanation is the current view of the area in Roman times. It insists that the pottery could not then have been deposited anywhere near the site of the cross. Therefore, in theory, the mediaeval builders must have gone to quite unnecessary, and inexplicable, effort to obtain the clay. As in the case of Roman sea levels and the Runham cremation urns, the Great Estuary hypothesis has not responded to the evidence, but forced us into a particular interpretation of it.

Roman sites on the upper Thurne coast

On the coast north of the 'island' of Flegg there is another source of information on the relationship between Roman finds and the Upper Clay sediments. The river Thurne currently drains away from the coast to join the Bure, which then loops round before it exits to the sea (Fig. 1). The sea is now separated from the Thurne valley by a line of sand dunes less than 100m wide in places.

This coastline (Fig. 7) is under pressure of erosion by the sea. Maps and written material show that over the last two centuries the sea has been moving inland at Happisburgh at an average rate of about one metre per year. At Eccles, since the end of the 18th century, the dunes and the high tide line have passed right over the ruined parish church. At Winterton Ness the mid-tide line has also moved inland, by approximately 130m in 120 years, as shown by comparison of the modern map and the OS map published in 1889.

Since this coastline has kept its smooth curved outline for at least 200 years, it is highly probable that all of it has been retreating at a rate similar to that at Happisburgh and Winterton Ness. Hence any Roman material now found on the beach was then under the dunes. And, going back further in time, Roman sites are likely to have been in the wetland or on its margins, and not in an area strongly influenced by the sea.

The inland movement of the coast has thus given us a long section through what was, in Roman times, probably an inland part of the wetland. In this long section, several finds of Roman material have been made.

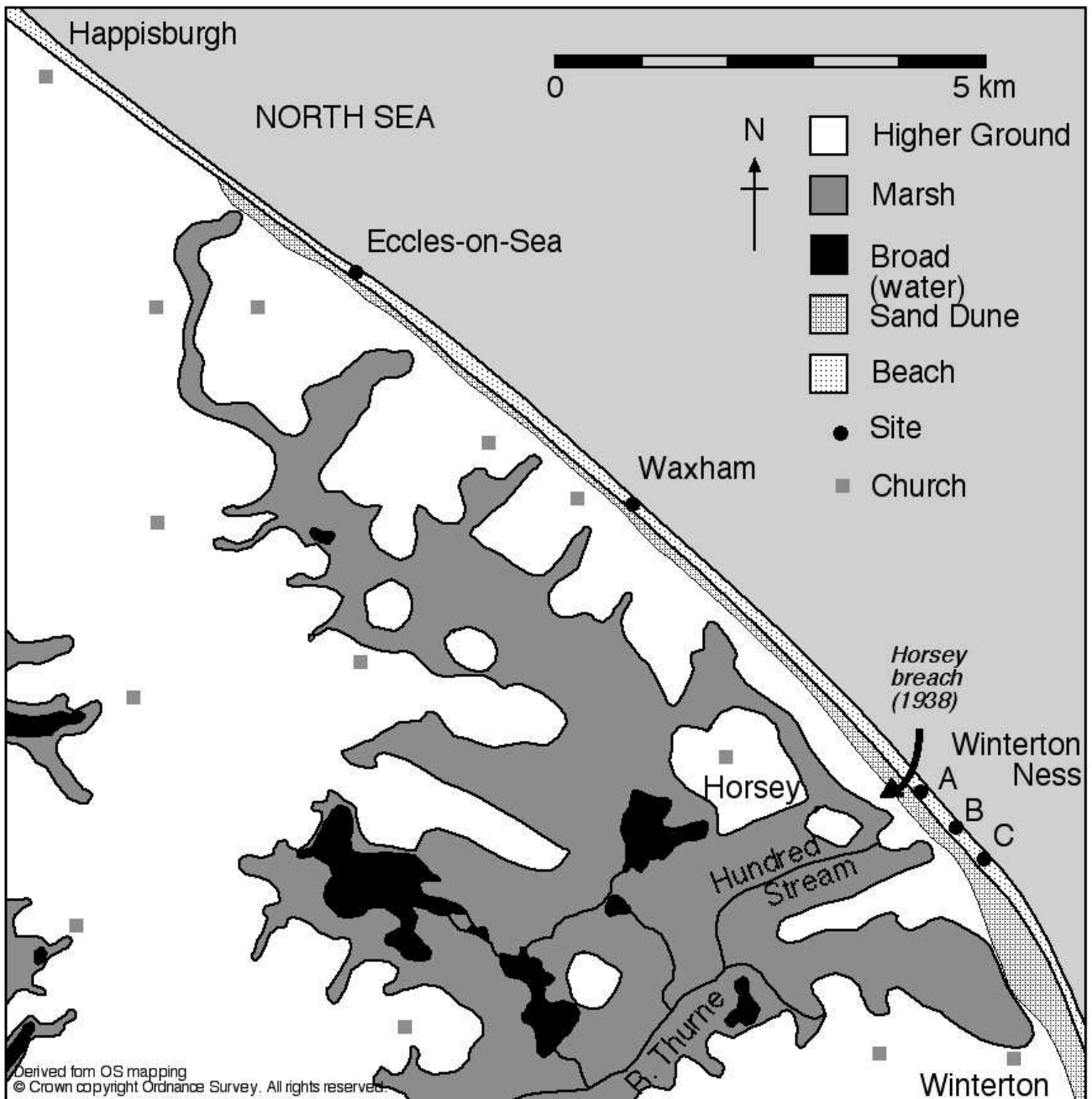


Figure 7. The upper Thurne valley, showing sites with Roman material on the Happisburg-Winterton coast.

The sites at Eccles-on-Sea (NHER 8342) and Waxham (NHER 32093) are both underlain by boulder clay, a deposit predating the wetland sediments. At both places Roman pottery has been found in linear features filled with grey clay. At Eccles only a few sherds of Roman grey ware were found in a short linear feature. Tim Pestell has informed me that, whereas he originally interpreted it as a possible house foundation, he now thinks it is more likely to be an earlier feature surviving in the medieval village.

At Waxham an area of topsoil about 400m long was exposed in September 1996, containing numerous pieces of pottery, mainly medieval. At a lower level on the beach, where erosion had taken place, several features cut into the boulder clay were seen. According to another report from Tim Pestell, one ditch yielded a large quantity of unabraded Roman greyware sherds, partly reconstructable. The size of these, and of a similar sherd from another feature, suggested to him that these are stratified deposits within a system of Roman ditches. The implication is that, as the pottery was discarded, the ditches were being filled with grey clay.

Somewhere near Horsey the boulder clay sinks deeper, beneath the wetland deposits. The authors of *The Making of the Broads* were aware that North of Winterton, between the site of the 1938 Horsey breach and

Winterton Ness, along approximately 500m of beach, a peat outcropped. They equated this with the peat found on the marsh side of the dunes. They also described Roman material seen in 1939 at Winterton Ness (site A), where peaty clay overlies boulder clay. They describe the finds - a sherd of the mid first century AD Roman pottery, pebbles, mammalian bones, brick and wood - as "embedded" in the peaty clay at approximately -0.3 to 0 m OD. However there is some doubt in my mind about the position of this site, and whether or not the finds are in situ⁵.

Site B at Winterton Ness (NHER 40106) is better documented. It was found in December 2003. Notes in the NHER describe "Ditches with Roman pottery lying stratified within them" lying at 45 degrees to the coastline, possibly at a salt making site. Tim Pestell tells me that the features were light grey and that he interpreted them as land boundaries, although he found it problematic that they were so close together. He also expressed doubts that this was definitely a salt making site.

Site C at Winterton Ness (NHER 41181) is the source of the most recent Roman find. On 17 February 2005 Mrs Sarah Guy and her son Richard discovered animal bones and a human skeleton. According to Edwin Rose's report in the Norfolk Historic Environment Record, the skeleton was in a hard mass of blackish peaty clay resting on a bed of clean grey clay. He told Mrs Guy, in a letter of 29 March 2005, that the site contained "a Roman inhumation (and therefore late Roman) with remains of a funerary meal"⁶.



Figure 8. Exposure of clay. Winterton Ness (Close-up). View to south west. 2 January 2006. Overall length of trowel: 240mm.

Following another temporary exposure at the end of 2005 near site C, the grey clay could be studied further. I observed the clay, scoured clean of sand, approximately 150m to the south east of the inhumation, at about mid-tide level, (0.4m OD), over a length of about 50m. In close-up (Fig. 8) it was grey, and darker towards the top, as the vertical section (centre, above the trowel) shows. Thin black strips of organic material, possibly roots, could be seen emerging from the eroding clay. These appeared to be the remains of plants growing in it. Hence, the clay could have been laid down in a reed bed.

At the same level, another 50m to the southeast, was another exposure of clay, again dark grey, containing numerous brick and pottery fragments. Some of these were post-medieval brick. Others are possibly Roman briquetage. None of these finds is necessarily in situ

There is also evidence that peat and organic clay underlies the grey clay. During excavations prior to repair of the groyne 300m southeast of the inhumation, on 1 October 2005, I saw that the excavating machine (near the high tide line) was digging through grey clay. My later inspection of the beach near the lower end of the same groyne, on 10 September 2006, when the tide was exceptionally low, revealed black organic clay and peat with remains of tree stumps, about 300mm in diameter and 500mm high, with their roots embedded in the black clay. This former land surface, apparently a carr woodland, is now at about -1.3m OD. This is about two metres lower than current high tide levels in the marsh (Fig. 9)

There can be little doubt that, at this point, the grey clay and the peaty clay containing the skeleton are an extension of the sediments of the Upper Clay that appear immediately below the land surface in the upper Thurne valley, on the other side of the dunes. Indeed, given the known movement of the coast inland in the last 120 years, the remains were probably within the Thurne marshes as recently as the 18th century.

The elevation of the burial is difficult to estimate precisely. It is described as lying "between normal high water and the dunes, although the tide had been covering it in recent weeks". Together with records of the heights of tides at the time, this indicates that it could have been as high as 1.5m above Ordnance Datum. This is significantly higher than the level of other Roman finds on this coast (Fig. 9).

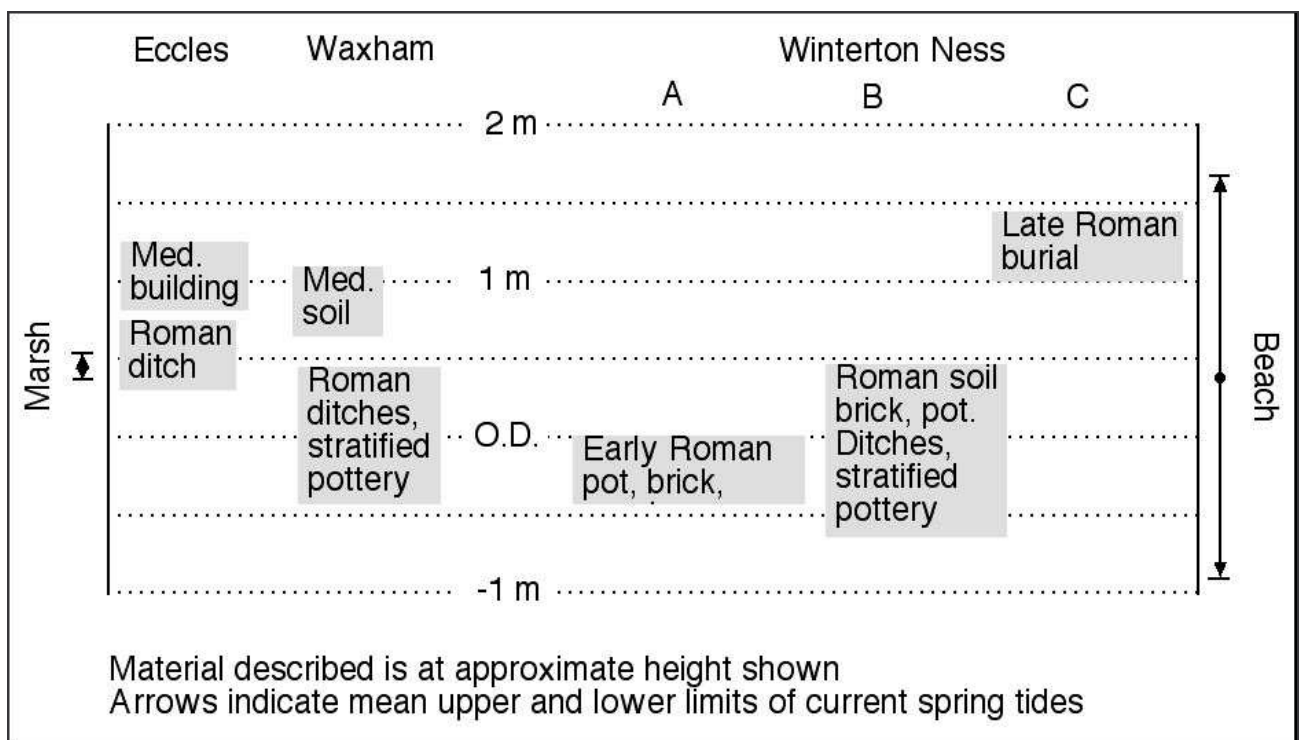


Figure 9. Elevations of sites with Roman material on the Happisburg-Winterton coast (arrows indicate range of current mean spring tides inside and outside the dunes).

The relationship between the Roman sites and the Upper Clay sediments varies. Certainly at Waxham, and probably at Eccles, ditches were dug into boulder clay that formed part of the pre-marsh upland. These ditches were then invaded by water borne grey clay within which, at Waxham, Roman pottery was stratified. This suggests that Upper Clay sediments transgressed a Roman landscape while occupation continued.

At Winterton Ness the evidence at site A is ambiguous, but it is likely that early Roman activity was going on nearby, if not at, the find spot. At site B the evidence of ditches filled with light grey clay containing stratified Roman pottery leads to the suggestion of a transgressed Roman landscape, as at Waxham. Finally at site C, we have the late Roman inhumation, apparently at a higher level than other Roman activity. The description of its position in the sedimentary sequence, in dark clay over light clay, could indicate that it was buried in a dried-out marsh from which marine influence had been receding, and within which, in consequence, the clay was becoming more peaty.

These finds, in their different contexts, do not support the case for a much higher Roman sea level. Most of them suggest occupation below the current water level in the Thurne marshes. This implies that, at that time,

sea level was lower. On the other hand, the elevation of the Winterton Ness burial, if correctly reported, suggests a rise and fall within a range of about 1 - 2 metres during the Roman period. The rise would have caused the incoming grey clay to raise the level of the marsh and fill ditches in an earlier Roman landscape. The subsequent fall would have allowed the new, higher level, mud flats and reed beds to become land on which a late Roman burial could take place.

A new find

The finds from the upper Thurne coast indicate that, contrary to the ordinary expectation, we may find signs of Roman land use in other parts of the Broads wetland.

This idea received more support in August 2006, when an excavation was concluded in Beccles Marshes, at a spot 300m beyond the supposed Roman 'coast' (Fig. 1). The original target of the excavation was a linear wooden structure (a trackway) with a north-west orientation. Members of the Birmingham Archaeology excavation team told me at the time that this probably predated the Roman period and may no longer have been visible at that time. The majority of the archaeology related to this structure was found in woody peat, above which was a silty peat. Late Roman pottery was found towards the base of silty peat, but not directly over the wooden structure.

Further information is now available on the Suffolk County Council website⁷. There were in fact two trackways, whose orientations were different. Both are probably prehistoric. Of concern to us is the following statement:

By the Roman period in situ tree trunks were recorded suggesting that the surface of the peat was dry enough to permit tree growth.

In other words the marsh had dried out and trees were growing there, as they do now.

According to the Great Estuary map (Fig.2), the Roman pottery in Beccles Marshes was deposited in the middle of a blue area (darker grey in the reproduction). The map thus gives a false impression. At some time in the Roman period this location was not under water; nor was it within a tidal estuary. It was land.

Discussion

There is no evidence that sea level at Great Yarmouth was, in the Roman period, much higher than it is now. The level now most widely accepted, as an approximation, is (for 400 AD) one metre lower than the current sea level. However, the archaeological evidence suggests that it was not constant. Different levels of Roman material on the Thurne coast could be the result of at least one oscillation. Such oscillation of sea level is known elsewhere. Basil Cracknell, in *Outrageous Waves*, shows that there was a change, with a range of 1-2 metres, that caused the Romano-British transgression and led to the widespread formation of sediments akin to those of the Upper Clay. Such a rise in sea level could have caused the introduction of the clay itself (with its associated marginal organic clays and silty peats). The subsequent fall would then have made land from the clay of Winterton Ness and the peat of Beccles marshes.

There is at least one objection to this proposal. The postulated general rise and fall of water level within Broadland, possibly more than once, should, in principle, have created extensive new land surfaces. At present, away from the two areas already discussed, there is little evidence of them. Despite examination, such a surface has not been seen in the clay immediately west of Great Yarmouth, in the area studied by the BGS. This lack of evidence does not support the hypothesis, but neither does it disprove it. In the Fens (in the Wisbech bypass sections) such a land surface can certainly be inferred in silts contemporary with the Upper Clay. It is not directly visible as a change in the appearance of the silt from one level to another. Only sealed ditch fills, containing Roman pottery, reveal it.

The iconic picture of the Great Estuary (Fig. 2) stems from a hypothesis that now appears to give rise to extraordinary contradictions. Firstly it is stated, against all informed opinion, that Roman sea level was much higher than it is now. Secondly we are supposed to accept that Roman inhabitants buried one of their number beyond a coast, on a mud flat, north of Winterton. Thirdly we have evidence of trees growing in a supposedly tidal environment, 300m from the coast, near Beccles.

One might think that a hypothesis leading to absurd conclusions should be rejected. However, scientific hypotheses cannot be treated in this way. They can be modified to explain away the aspects of the real world that do not match the expected outcomes. So, the current hypothesis of a watery Great Estuary may perhaps

be rescued. However, it is hard to see how the icon itself (Fig. 2) can remain a trustworthy guide to reality. It was always clear that such a visual metaphor could not be taken literally; but it now seems very misleading, and should be replaced.

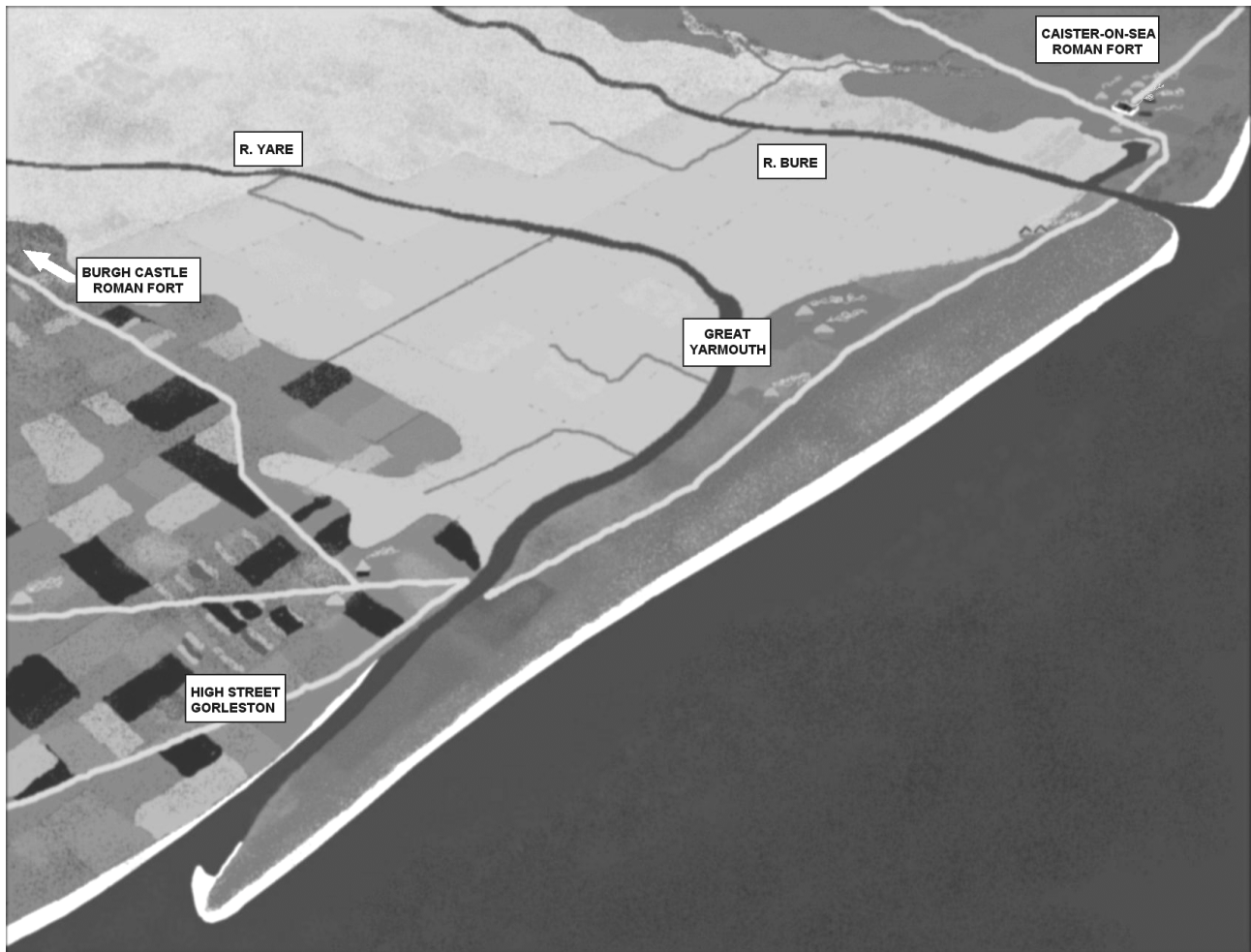


Figure 10. Imaginative reconstruction of Great Yarmouth in the later Roman period, seen from the southeast.

A new icon?

In an alternative reconstruction (Fig. 10) the Great Yarmouth bar is in place. The major rivers cut through it in about their mediaeval positions. The marsh has, at this time, become dry enough to be used for grazing. The higher ground of Lothingland, left, is cultivated within a planned field system⁸. I even venture to suggest that some existing roads may have had a Roman origin.

This picture cannot pretend to be believable in every detail. For example, it may well exaggerate the extent of dry land in the lower part of the wetland. However, despite its lack of certainty, I hope it will stimulate further research and debate. Was Great Yarmouth really the town that grew out of the sea? Or does it sit on long-established natural causeway that, in the Roman period, was already linking the uplands to the north and south of the lower part of the Broads wetland?

There are other possible avenues for research. I would like to suggest the importance of further study of the Thurne valley and coast. What was the relationship of this area to the rest of the wetland in the Roman period? A borehole section along the beach between Waxham and Winterton would be valuable, even if, as seems likely, it failed to reveal more archaeological material. Study of the dunes immediately north of Winterton might confirm, as has been suspected, that they are older than the other dunes. Perhaps they closed the direct outlet to the sea before the Roman period. While these are not primarily archaeological projects, they may be crucial for the proper understanding, in its geological context, of the archaeological material that we already have.

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Further Reading

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Notes

¹ I hasten to say that in using the word "ordinary" I do not intend to be offensive. The sense is that employed by Charles Darwin in his *Origin of Species*. For him, the ordinary theory was the one most commonly believed.

² Flegg and Lothingland are the areas of higher ground lying respectively north and south of Great Yarmouth.

³ The idea of barrier destruction may have been new, but the idea of an open estuary is not. John Ayton has kindly told me of Mosby's reference to "a shallow bay or estuary" in *Land of Britain, Norfolk* (1938), p.106, and of Blake, Cartwright *et al.*'s diagram, similar to that in the museum, in *The Norfolk We Live In* (1958). We should also not discount the even earlier depiction in the Hutch Map of sea creatures disporting themselves in what are now the Halvergate Marshes.

⁴ Descriptions and location maps for NHER entries are available at <http://www.heritage.norfolk.gov.uk/>. Supporting material is available at Gressenhall, and has been consulted in the course of gathering the information presented here.

⁵ This description corresponds in date of discovery, and generally in the description of the finds, to the site catalogued as NHER 8406. The elevation also corresponds, but the location of NHER 8406 is given as south of Winterton Ness, not north. This confusion may be due to lack of agreement about the position of the Ness itself. I have adopted that consistently used by the Ordnance Survey.

⁶ This find was reported in *Norfolk Archaeology* (2006), but the geological context was not described.

⁷ At <http://www.suffolk.gov.uk/Environment/Archaeology/FieldProjects/> (accessed 30 July 2007)

⁸ There is evidence for a planned Roman field system, at about the orientation shown, in some parts of Lothingland. See particularly NHER 43495 and NHER 43591.