FURTHER BRONZE AGE STRUCTURES AT RUMNEY GREAT WHARF, WENTLOOGE LEVEL

by Nigel Nayling
with contributions from Astrid Caseldine and Kate Barrow

Excavations and survey on the intertidally-exposed peat shelves at Rumney Great Wharf on the Wentlooge Level of the Gwent Levels have recovered widespread evidence for human activity during the Bronze Age. This study examined the archaeological potential of both large and small palaeochannels in the vicinity of such sites, as well as excavating a small structure under imminent threat from coastal erosion and recovering the last wooden elements of a previously-excavated, possible roundhouse.

Introduction

This field project sought to assess the archaeological potential of some of the very many palaeochannels exposed on the foreshore of the Gwent Levels (Bell *et al* 2000) through the examination of a limited number of sites where previous fieldwork had indicated the presence of later prehistoric occupation or activity in the vicinity of both substantial and minor palaeochannels. Excavation of palaeochannels at Goldcliff (Bell *et al* 2000), the riverine site of Caldicot (Nayling and Caseldine 1997) and at Magor Pill (Allen and Rippon 1997, Nayling 1998) have shown that artefactual material may be more prolific in the associated palaeochannels than at the occupation site itself. The foreshore at Rumney Great Wharf was chosen as fieldwork by Allen (1996) had recorded sites dated to the Bronze Age some of which appeared to indicate close association with contemporary palaeochannels, and subsequent survey as part of the Gwent Intertidal Peat Survey (Bell and Neumann 1997b, 1998) had identified additional sites in the area. Erosion by the sea, and the placement of hard rock sea-defences along parts of the mud cliff were seen as threats to the long-term survival of many of these sites, encouraging excavation before remaining structural evidence was irrevocably degraded. Primary research objectives included the excavation of selected palaeochannel features adjacent to known prehistoric occupation sites, the recovery of associated environmental samples, and the recovery of organic components from threatened occupation sites for comparative and dating purposes.

Throughout this report, sites/structures are described using codes assigned during the Intertidal Peat Survey (Neumann *et al* 2000, eg Ru-6) where appropriate. Where these had also previously been investigated by Allen (1996), they are also referred to by the codes assigned at that time (RGW1-3).

Substantial palaeochannel

During field work in the early 1990's, Allen (1996) identified a number of prehistoric sites on the foreshore at Rumney Great Wharf, including a substantial deposit of occupation debris and possible evidence for a shelter adjacent to a large palaeochannel up to 15 m wide. This site, designated RGW1, yielded fire-damaged sandstone pebbles and cobbles, charcoal, a small bone assemblage, fragmentary pottery sherds and possible structural evidence in the form of two roughly cylindrical holes exposed by erosion (Figure 1). A radiocarbon determination from charcoal collected from the surface of the deposit (2250+/- 60 BP (Beta-39437)) appears rather late compared with the pottery assemblage which could be comfortably assigned a latest Bronze Age date on typological grounds, more consistent with a radiocarbon determination of 2890+/- 50 BP (Beta-44058) from the underlying peat. Allen (1996, 10) accepts that the later radiocarbon date may reflect contamination. The site has now been eroded away by the sea and partially obscured by the placement of dumps of large rubble along the face of the eroding mud cliff in an attempt to resist coastal erosion.

Two adjacent, east-west oriented trenches were excavated just seaward of the block-stone revetting of the mud cliff close to the presumed location of this late prehistoric occupation site (Figure 1: Ru-1). The excavations were carried out with the hope of recovering associated artefactual material encapsulated within palaeochannel deposits visible on the foreshore as a gap in the intertidal peat shelf at least 15 m wide, and to more closely characterise the nature of the palaeochannel itself.

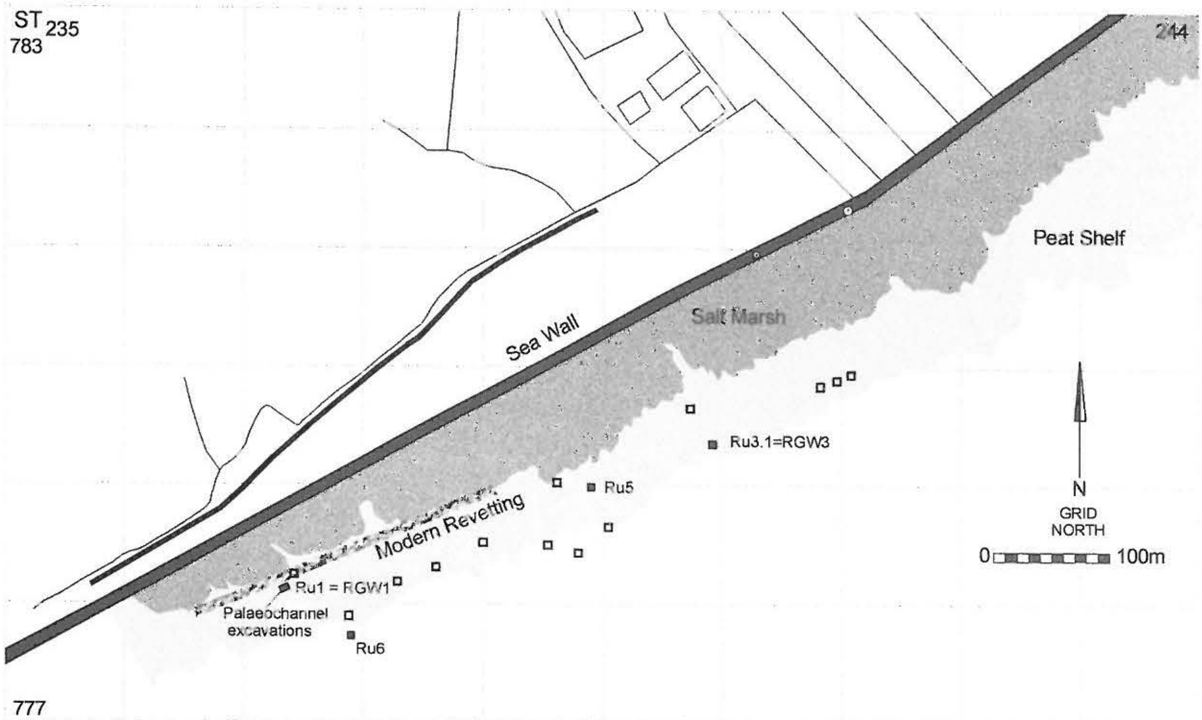


Figure 1: Rumney Great Wharf: location map. Sites within the report are marked by filled rectangles. Other sites (unfilled rectangles) were identified by the Intertidal Peat Survey (after Neumann and Taylor 2000, Map 2). Co-ordinates given relate to the Ordnance Survey national grid.

The first trench was excavated unstratigraphically, over a length of 10 m, westwards from the eastern edge of the palaeochannel complex to a maximum depth of 0.95 m below the present foreshore surface. The stratigraphy exposed in section was characterised by the presence of slumps of the middle Wentlooge Formation peat and clays at the eastern edge of the palaeochannel - a common feature seen along the edges of palaeochannels exposed on the foreshore of the Gwent Levels (Allen and Rippon 1997)- a steep palaeochannel interface defined by concentrations of dark (manganese?) staining and largely undifferentiated palaeochannel fills of dark grey silty clays. Towards the western end of the trench, some subdivision of the palaeochannel fills was possible where relatively inorganic silty clays alternated with dark greenish grey bands of peaty clay. No bands of coarse sediments (e.g. sands or gravels) or concentrations of wood or stone which might have been expected in association with a channel bed contemporary with and adjacent to prehistoric occupation were identified. Subsequent stratigraphic excavation of an adjacent second trench to a similar depth, whilst confirming the localised presence of alternating bands of inorganic silty clay and peaty clay fills of the palaeochannel did not lead to the recovery of any artefacts or the identification of a clear palaeochannel bed. Attempts to extend stratigraphic observations to depths of 2 m below the present foreshore surface produced ambiguous results. Deposits over 1.2 m below the surface were consistently defined as clean grey clays but it is unclear whether these represent undisturbed Wentlooge Formation clays or later palaeochannel infill.

During a period of relatively mud-free conditions at the end of fieldwork, the remains of an oak post in the vicinity of site RGW1 were noted and removed for more detailed study. This roundwood oak post (W055, Figure 2), with a maximum diameter of 210 mm, had been cross-cut to produce a blunt end, which exhibited numerous concave tool facets consistent with the use of a palstave or socketed axe. Dendrochronological measurement of a sample from the timber produced a 64-year tree-ring width sequence, which has not dated against prehistoric or later sequences from Britain or Ireland.

Discussion

The limited excavations carried out in the palaeochannel adjacent to the occupation site recorded by Allen suggest that channel beds contemporary with the site's occupation do not survive near the present foreshore surface and are

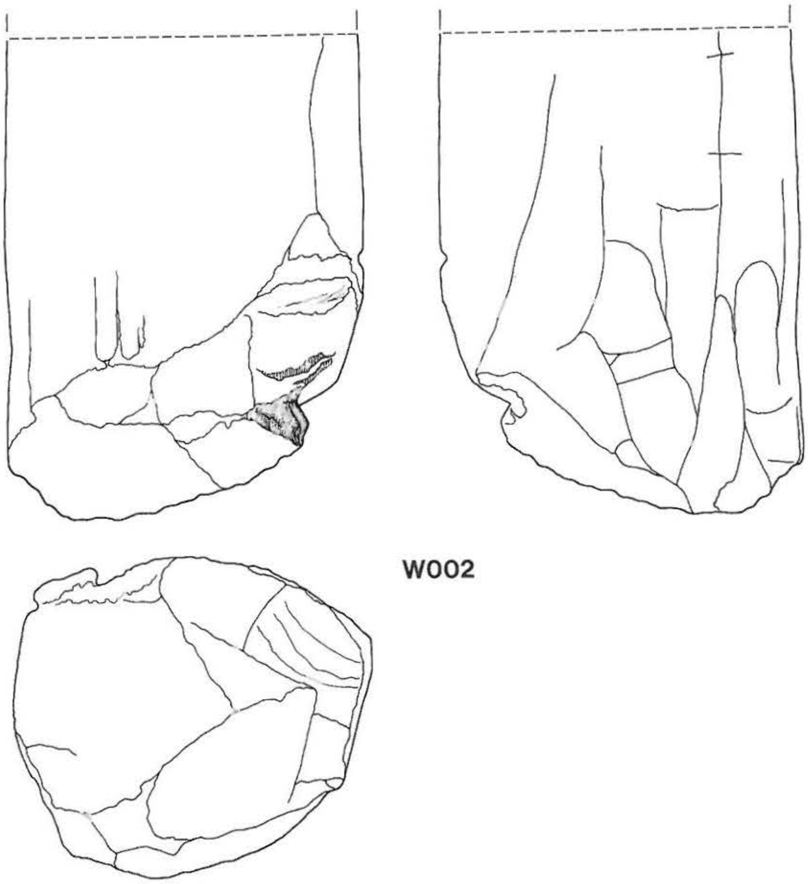


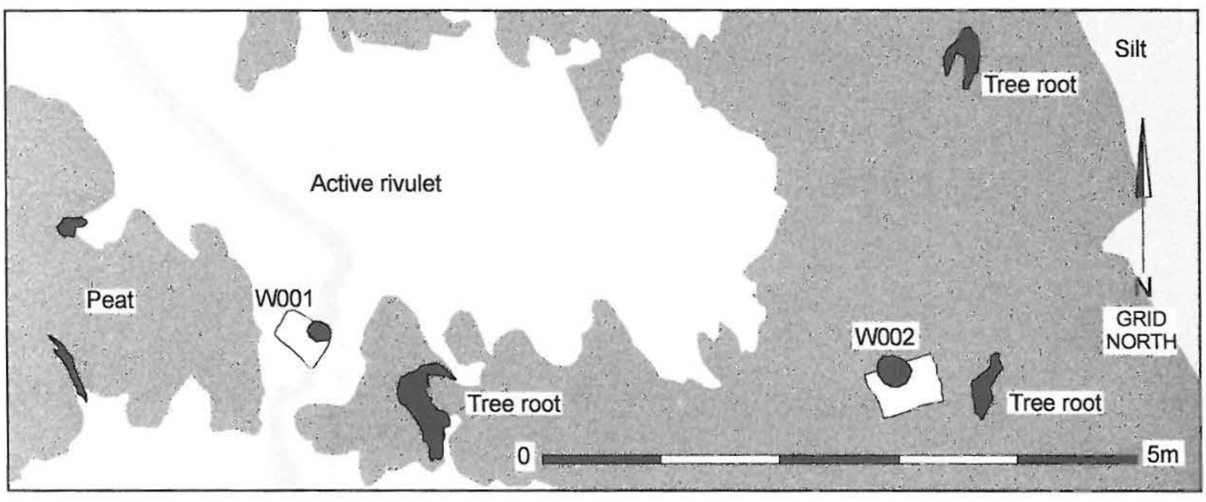
Figure 2: Upright recovered in the vicinity of site Rumney-1. Scale 1:4.

therefore not under immediate threat from coastal erosion. The difficulties of excavating trenches in the intertidal zone beyond depths of *c.* 0.5 m generally preclude the effective use of traditional methods of excavation for the investigation of deep palaeochannel complexes. The close similarities between many palaeochannel fills and Wentlooge Formation clays which have not been subjected to weathering also makes interpretation of auger transects problematic especially where former bed levels are not defined either by coarse sediments or organically enriched horizons. This encourages the assessment and application of remote sensing techniques in the investigation of these alluvial features. Increasingly, cost-effective sub-bottom profiling techniques using transducers trawled by boats using differential global positioning systems (DGPS) are being applied to analysis of palaeochannel complexes which are either permanently below water or only intertidally exposed. The use of 'Chirp' sub-bottom profiling has proved useful in a number of recent studies undertaken by the Centre for Maritime Archaeology in Roskilde, including geomorphological survey and analysis of historic shipping channels where the River Oder discharges into the Baltic (Indruszewski 1998).

Structure Rumney-3 (=RGW3)

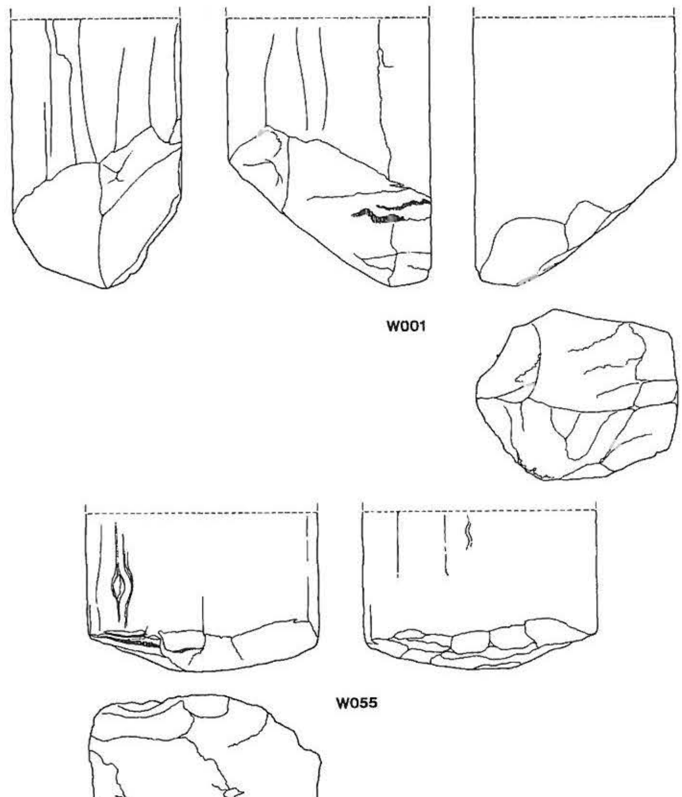
During initial field walking of the area in order to identify suitable sites for investigation, the previously investigated site of a possible Bronze Age building, described by Allen (1996, 8-9, fig. 4), was found to have been largely destroyed by coastal erosion (Figure 1, Ru-3). The silt overlying the main peat horizon, from which the majority of the finds described

Figure 3: Remains of structure Rumney-3 and location of posts recovered.



by Allen had been recovered, had been extensively eroded and much of the peat itself had been stripped away (Figure 3). Only two of the original oak posts remained *in situ* and were deemed to be under imminent threat from erosion by the sea and were removed for detailed study. Both uprights exhibited considerable secondary working including longitudinal trimming of the half split parent timber and steep to straight cutting angles on their bases where the timbers had been cut across the grain to create blunt ends (Figure 4). It seems probable that these timbers had been hewn in this manner to create uprights, which would be resistant to sinkage in the underlying, relatively soft sediment. This would appear to be a recurrent feature associated with larger uprights within later prehistoric buildings encountered in the intertidal zone of the Gwent Levels such as those at Goldcliff and Redwick (Bell pers. comm.), and more recently at the inland site of Greenmoor Arch. The tool facets were somewhat 'bruised' and obscured by concentrations of insoluble (iron?) salts but were clearly concave and consistent with the use of a palstave or socketed axe. Samples from both timbers were subjected to dendrochronological analysis producing two tree-ring width curves of 69 and 93 years. Neither dated, however, against prehistoric sequences from Britain or Ireland.

Figure 4: Uprights recovered from structure Rumney-3. Scale 1:4.



The demise of this structure stresses the eroding nature of the peat shelf at Rumney Great Wharf and highlights the vulnerability of peat exposures even when a tall shelf is absent.

Structure Rumney-5

This structure had been noted during the Intertidal Peat Survey (Figure 1, Ru-5), described as a post setting comprising "split timber wooden posts located at right angles to and within a palaeochannel, essentially blocking it", and was briefly described by Bell and Neumann (1997b, 8, fig. 4). In addition to the large palaeochannel described above, the peat shelf at Rumney is also crossed by numerous, narrow, curving, silt-filled channels visible as ridges with concave upper surfaces slightly above the level of the adjacent peat. Similar channels have also been observed at Peterstone, Cold Harbour and Collister Pill and have been interpreted as survivals of the natural drainage of raised bog and carr wetlands, infilled with silts by marine transgressions starting in the later Bronze Age (Neumann 2000, 303-311).

The palaeochannel survived as a sinuous linear feature, some 0.35 m above the surrounding, compressed and eroded peat shelf. Prior to excavation, the structure appeared to consist of two rows of posts running across the palaeo-channel (Figure 5). A contiguous monolith sample (001*) was taken through these deposits from 3.15 m to 3.65 m OD (see Caseldine and Barrow below), to clarify the nature and depth of the palaeochannel stratigraphy and characterise the contemporary environment. Foll-owing excavation, the wood was recovered for species identification and study of wood technology. Descriptions of the toolmark evidence given below follow established methods for the description of tool facets and point types (e.g. Coles and Orme 1985, Brunning and O'Sullivan 1997). The results are also summarised in Table 1.

The northern (upstream?) row consisted of four split, driven uprights. Three of these were split (two one-sixth splits, one a quarter-split) ash posts with maximum widths of 66-80 mm and worked points driven down to base heights of 2.95-3.05 m OD. These exhibited finely worked wedge, wedge-variant and pencil points with very shallow cutting angles implying care taken to produce sharp, easily driven stakes. Well-preserved tool facets on the pencil-pointed stake (W016) were slightly concave with a maximum width of 48 mm. In contrast with these, the fourth stake (W017), which had a base height of 3.28 m OD and could conceivably be a repair, was a quarter-split

Figure 5: Structure Rumney-5: plan, elevations and sections.

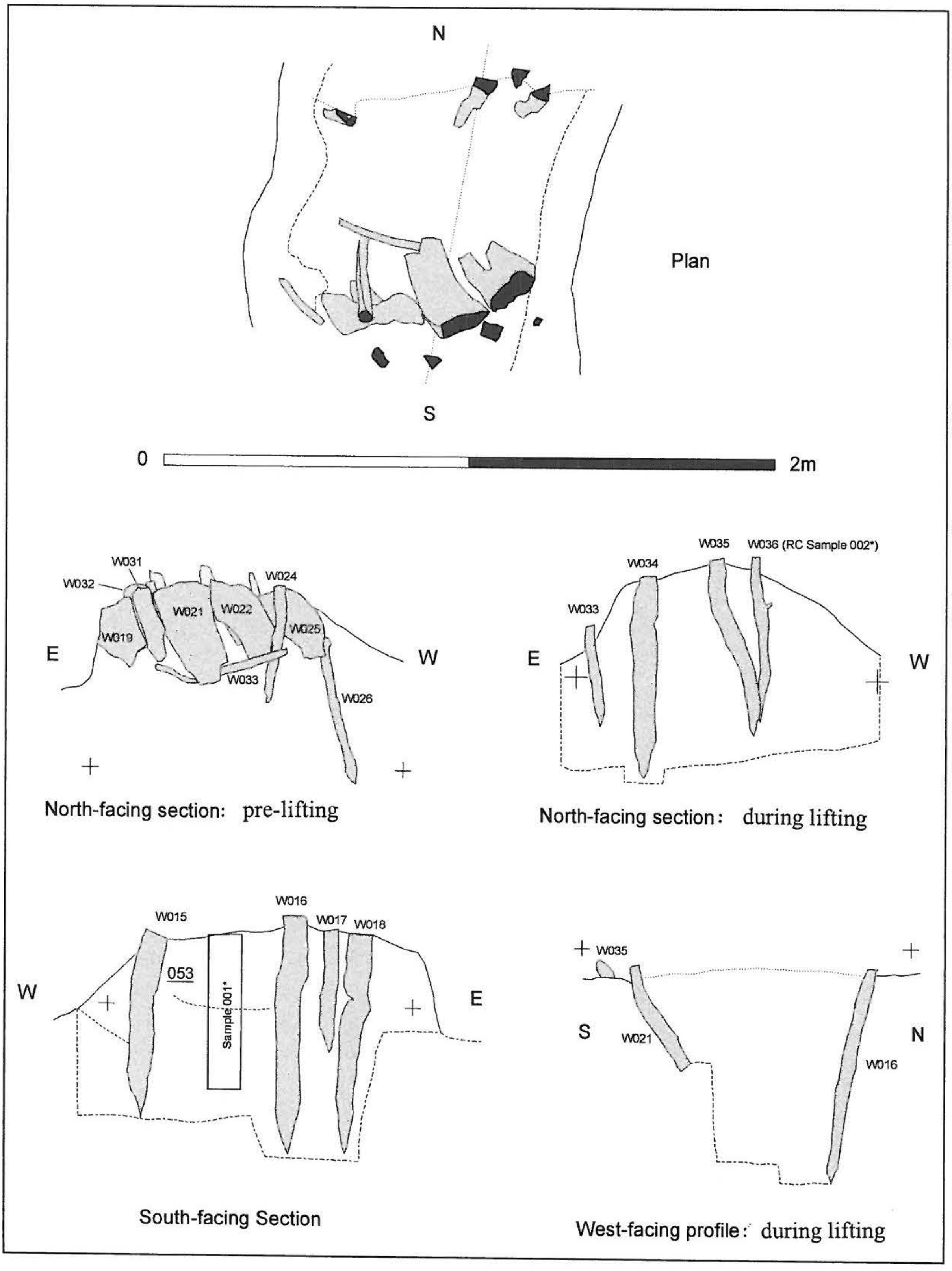


Table 1: Wood from structure Rumney-5

Wood No.	Conversion	Length (mm)	Width (mm)	Thickness (mm)	Description	Species	Point
15	Split (1/2)	605	70	32	Upright from northern row	Ash	W1+1
16	Split (1/6)	710	75	47	Upright from northern row	Ash	P1+1+2+1
17	Split (1/4)	475	80	53	Upright from northern row.	Lime	C1
18	Split (1/6)	655	66	40	Upright from northern row	Ash	WV2+1
19	Split (1/2)	260	198	50	Slab	Lime	
20	Intermediate	275	85	45	Slab	Lime	
21	Tangential	425	207	55	Slab	Lime	
22	Radial	440	155	105	Slab	Lime	
23	Roundwood	200	22	20	Roundwood, collapsed retaining stake	Ash	C1
24	Split (1/4)	460	53	26	Retaining upright	Ash	
25	Split (1/16)	175	82	15	Thin radial 'slab'	Willow	
26	Split (1/4)	558	44	31	Retaining upright	Ash	P5
27					Part of 'slab' group	Bark	
28	Roundwood	175	22	20	Roundwood, possibly fragment of W023	Ash	
29	Split	80	25	9	Fragment, part of 'slab' group	Lime	
30	Radial	205	110	15	Slab	Lime	
31	Radial	205	110	24	Slab	Willow	
32	Radial	305	110	35	Slab	Lime	
33	Split (1/4)	309	47	28	Upright from southern row	Ash	C2
34	Split (1/6)	715	70	47	Upright from southern row	Ash	WV3+3
35	Split (1/4)	620	55	42	Upright from southern row	Ash	W1+1
36	Roundwood	532	45	35	Upright, southern row. Total sample for radioacrbon	Ash	C3

piece of lime which tapered to a radial section at its base with no sign of secondary working to produce a well-finished point. The contemporary bed level of the small palaeochannel could not be identified with confidence although a number of sloping, organic laminae may relate to this. Hence context 053, the number assigned to the silt exposed in the excavated section, could be a conflation of earlier Wentlooge Formation clay, cut by the palaeochannel, and overlying channel infill (see Figure 5, and Caseldine and Barrow below).

The southern (downstream?) row was more complex than anticipated from its pre-excavation appearance, comprising four uprights (W033-W036), against which vertical 'slabs' of wood had possibly been retained by three, partially-collapsed uprights (W023, W024, and W026). The southernmost group of posts comprised quarter-split (2), sixth-split and radially-split ash stakes with maximum widths of 45-70 mm with worked points driven down to base heights of 3.01-3.18 m OD. All the stakes exhibited evidence for secondary working of their bases producing chisel (2), wedge and wedge-variant points. The well-preserved wedge-variant point (W034) exhibited slightly concave tool facets with very shallow cutting angles and a maximum surviving width of 38 mm. Stake W036 was submitted in its entirety for radiocarbon dating (see below). Resting against this row of stakes were at least six poorly-preserved slabs of wood and associated fragments (W019-W022, W025, and W029-W032) predominantly lime but also willow (*Salix/Populus* spp.). These exhibited a variety of conversions including half, tangential, intermediate and radial splits from knotty wood with numerous side-branches present. There was no clear evidence of secondary working.

These slabs of wood appear to have been held in position by three ash stakes. One (W023 and associated fragment W028), a roundwood stake with a diameter of 22 mm and a chisel point had collapsed into a near horizontal position. The other two stakes were both quarter-split ash, one (W024) tapering along its split-lines with no evidence for secondary working, and the other (W026) exhibiting a rather abraded pencil point with very shallow cutting angles and concave facets.

The sample from upright W36 gave a delta corrected radiocarbon date of 2750+/-60BP, calibrated to 1010- 810 cal BC at two standard deviations (Bronk Ramsey 1994, Stuiver and Kra 1986).

Interpretation

This structure bears a superficial resemblance to similar sub-rectangular settings of posts observed elsewhere on the Gwent Levels foreshore during the intertidal survey, such as the structure described (1998, 15) and illustrated (1997a, fig. 2.j) by Bell and Neumann at Peterstone (also see Neumann *et al* 2000). Such structures have been very tentatively linked with fishing activities, perhaps acting as anchors for fish traps of some unknown form. The Rumney structure has shown, upon excavation, greater complexity than was initially apparent with the southern group of timbers, comprising rough slabs of wood retained by a double row of ash stakes. Such an arrangement would have impeded the flow of water, causing localised deepening of water within the channel. If it is assumed that this southern concentration of timbers represents the downstream group, the northern row of stakes could have caught debris floating downstream, preventing it from becoming entangled in the southern group of timbers. Such an arrangement is reminiscent of a sluice gate and could have functioned in a number of ways. Ponding of water could have facilitated the drawing of water with a bucket or hide bag, or provided a suitable location for the watering of livestock. Alternatively, the structure could have acted as a fish trap by preventing the passage of fish downstream, and allowing them to be collected with hand nets.

The palaeobotanical evidence (see Caseldine and Barrow below) supports interpretation of the lower clays into which the stakes were driven as Wentlooge Formation clays forming the bed of the contemporary palaeochannel, with the upper sediments representing accretion of sediment within the channel. These different deposits could not be readily distinguished in the field, leading to their description as a single context (053). Both pollen and plant macrofossil evidence point to a variety of habitats in the vicinity including saltmarsh, reed swamp and carr woodland. Whilst the willow could have been derived from the immediate surroundings, the ash and lime used in the structure is unlikely to have thrived in the wetland habitats indicated. This suggests that these resources were gathered from dryland zones at some distance from the site, implying both forethought and species selection. The evidence of woodworking technology indicates careful secondary working of split wood to produce sharp stakes suitable for secure driving into the channel bed using bronze blades such as socketed axes or palstaves with their characteristically convex blade profiles.

Structure Rumney-6

This structure had been noted during the Intertidal Peat Survey (site number Ru-6, Figure 1), described as a post setting "approximately 1 x 1m square setting of oak timbers driven (through the main peat shelf) into the grey marine clay" (Neumann *et al* 2000, 292).

The structure was located immediately seaward of the eroded edge of the main peat shelf. It would appear that the uprights had been driven through the peat when the latter had extended further to the south, as a small 'island' of this peat had survived within the shelter of the uprights. These timbers, forming an irregular ellipse *c* 1 m wide (east-west) by *c* 1.6 m long (Figure 6), comprised 17 split alder driven uprights, some with worked points. The surviving portion of the timbers (generally eroded down to 2.8-2.9 m OD with base heights of *c* 2.4-2.55 m OD) suggest the uprights had been driven in at a variety of angles, through a ground surface at 3.1 m OD or above, so that the timbers sloped inwards, towards their tops. Details of the individual timbers are given in Table 2.

Whilst all the timbers used in this structure had been split from the parent alder wood, less than half the timbers exhibited toolmarks consistent with secondary hewing of the wood to produce points to assist driving. The angles of cutting of these secondary facets were either shallow or medium suggesting a relative lack of concern with producing sharp points to assist in driving. Where tool facets were sufficiently well-preserved to allow recording of their shape, they were generally concave. Wood number W48 was totally sampled for radiocarbon dating (sample number 003*) giving a delta-corrected radiocarbon date of 3130+/-60BP, calibrated to 1530-1260 cal BC at two standard deviations (Bronk Ramsey 1994, Stuiver and Kra 1986).

The three timbers forming the northern face of the structure (W037, W050, W050) sloped up towards the south at angles of 40-50° from the horizontal, whilst the remaining timbers, forming an irregular U-shape to the south were either near vertical or sloped inwards at angles of 70-85° from the horizontal.

Natural wood found within the surviving 'island' of peat was identified as alder and birch (see Caseldine and Barrow below).

Interpretation

The use of alder, a wood present in the adjacent peat, suggests usage of resources available in the immediate vicinity. The very limited evidence for

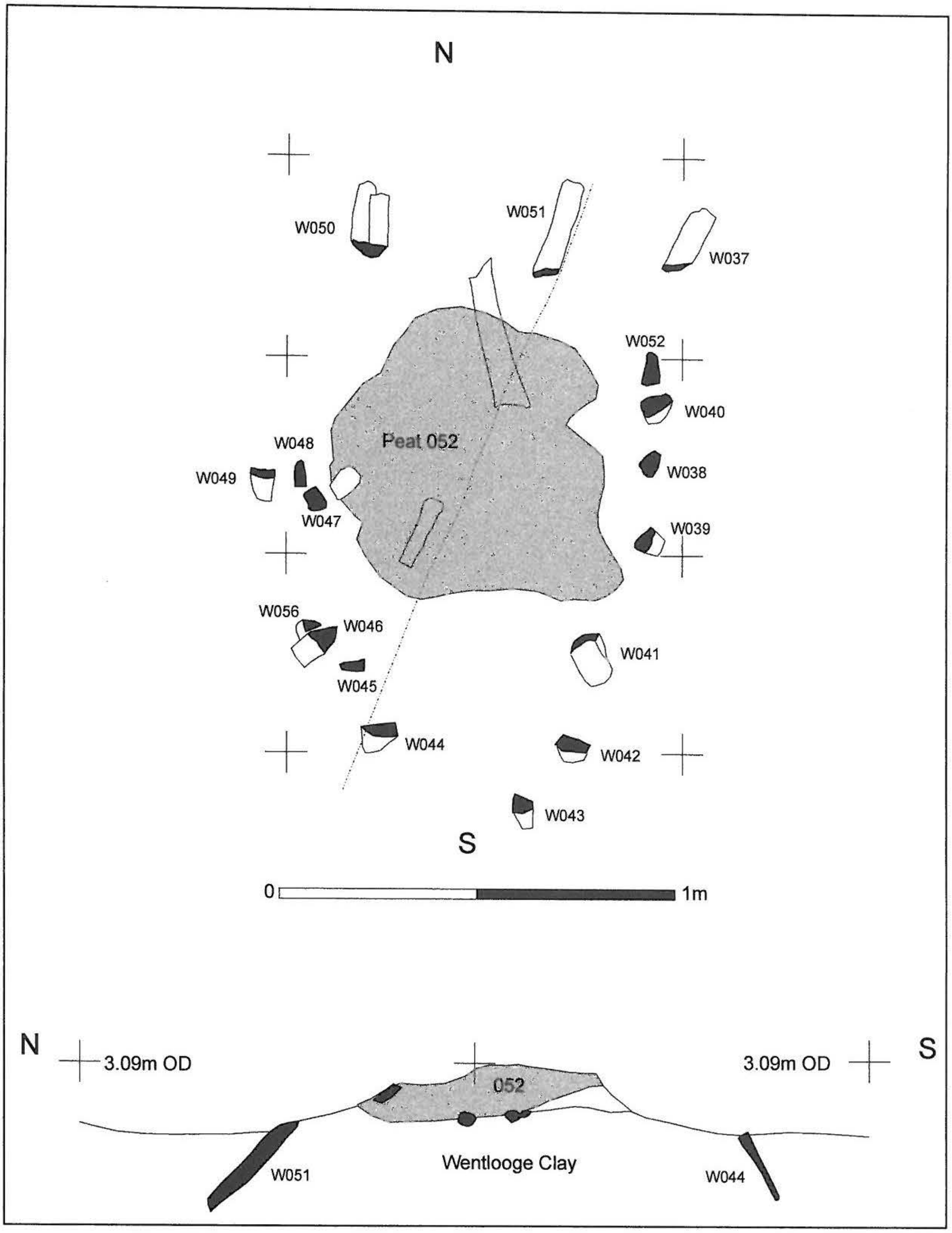


Figure 6. Structure Rumney 6: plan and section.

woodworking beyond splitting of the parent wood implies a relatively 'rough and ready' approach to the construction perhaps encouraged by the relatively soft nature of the contemporary peat surface although the stakes were driven/pushed through the peat into the denser Wentlooge clay below.

No artefactual material was recovered which might have pointed to the function of this structure. In the absence of any apparent parallels, either from the Gwent Levels or further afield, tentative interpretation as a temporary shelter or hide is suggested. Although its size hardly provides spacious

Table 2: Wood from structure Rumney-6

Wood No.	Conversion	Length (mm)	Width (mm)	Thickness (mm)	Species	Point (and angle of cutting and facet character)	Angle from horizintal
37	Tangential	192	98	27	Alder		45
38	Split (1/4)	455	80	49	Alder	C1?,steep	Vertical
39	Tangential	442	81	42	Alder	C2, medium concave	Vertical
40	Intermediate	315	97	56	Alder	C2, medium concave	Vertical
41	Tangential	278	120	51	Alder		70
42	Tangential	338	95	53	Alder	W1+1,shallow, near flat	85
43	Intermediate	314	72	39	Alder		75
44	Tangential	338	110	46	Alder		75
45	Radial	340	90	31	Alder	C2, shallow concave	85
46	Split (1/6)	345	87	75	Alder	W3+1, shallow slightly concave	75
47	Tangential	467	94	47	Alder		Vertical
48	Radial	395	78	37	Alder		Vertical
49	Intermediate	395	77	28	Alder		70
50	Tangential	250	42	34	Alder		50
51	Tangential	330	81	30	Alder		40
52	Tangential	255	90	39	Alder		Vertical
56	Intermediate	361	80	32	Alder	C1+1, medium concave	75

accommodation, a single person of moderate stature could have entered the structure through its more open northern end, and curled up within it. Such a structure could have provided a modicum of protection from the prevailing weather without requiring a major investment of effort, meeting the needs of a hunter or someone shepherding livestock in seasonal wetland grazing.

Conclusions

This limited piece of fieldwork emphasises a number of issues relating to the prehistoric archaeological resource exposed on the Gwent Levels foreshore.

The peat shelf at Rumney has clearly undergone erosion and degradation over the decade since the beginning of structured archaeological fieldwork. The seaward face of the shallow peat shelf has retreated, leaving structures such as Ru-6 isolated on small 'islands' of peat. The general peat surface has also suffered, with its erosion possibly accelerated by the presence of mobile stone from both degrading modern structures and post-medieval features, particularly in the vicinity of Ru-3. This latter point suggests that the composition of modern defences to saltmarsh erosion, such as the revetment to the mud cliff at Rumney (Figure 1), need to be designed with the potential impact to adjacent archaeological features in mind.

Excavation of the large palaeochannel proved both time-consuming and relatively unproductive. Although adjacent to an area of prehistoric activity (Ru-1), and a feature from which stratified prehistoric pottery has been recovered during sporadic site visits (Upton pers. comm.), no artefact spreads of the type encountered at the Caldicot site were discovered. Periodic monitoring, possibly complemented by research into the effectiveness of various remote-sensing technologies, would appear to be more productive approaches than traditional excavation. In contrast, the small excavations required to investigate structureRu-5 revealed a degree of structural complexity not apparent from its un-excavated appearance. Work both here and on small structures exposed in other palaeochannel surfaces on the Gwent foreshore (Allen and Bell this volume, Neumann *et al* 2000) show how much can be achieved by limited excavation complemented by appropriate environmental studies. Logistically, such procedures are not particularly problematic unless the structures are either particularly large or require removal for further study and preservation (such as the Magor Pill medieval boat). At present, the interpretation of these structures presents a greater challenge. With the excavation of further structures, it may prove possible to at least classify site types, even if their function remains a matter of debate.

A final comment on the application of dendrochronology is perhaps pertinent. None of the three tree-ring sequences measured from timbers from Ru-1 and Ru-3 have cross-matched against previously-dated chronologies from the Gwent Levels or elsewhere. There are a number of possible explanations. Firstly, the tree-ring sequences are relatively short - sequences of 100 or more rings are far more likely to cross-match against contemporary datasets than such short curves. Secondly, only a small number of samples were available. Well-replicated site master curves constructed from numerous tree-ring sequences from individual structures (such as building 6 at Goldcliff, Hillam 2000) are more likely to date against external sequences than single samples. Finally, it may be that the measured sequences are derived from material dating to the middle Bronze Age, whereas dated prehistoric sequences from archaeological features on the Gwent Levels are presently limited to the later Bronze Age and Iron Age. The application of dendrochronology as a tool in the dating of prehistoric sites on the Severn Levels will only develop through the study of suitable, substantial wood assemblages (whether natural 'submerged forests' or man-made structures) from which long, well-replicated regional chronologies, capable of being dated against sequences from other wetlands in Britain and Ireland, can be constructed.

The Palaeobotanical Evidence from Rumney Great Wharf

By Astrid Caseldine and Kate Barrow

Samples for environmental analysis and wood identification were taken from various structures at Rumney Great Wharf. Structure Rumney-5 was a post setting associated with a small palaeochannel, although the contemporary bed level of the channel could not be determined with certainty during excavation. As a result, a monolith (Figure 5) was taken through the deposits associated with the northern row of posts to see if pollen and plant macrofossils would help to elucidate this problem, as well as provide evidence for the general environmental conditions. In addition wood was identified from structures Ru-5 and Ru-6. Both are considered to be Bronze Age in date. The stratigraphy of monolith 001 from structure Ru-5 (defined in the field as context 053) was as follows:

0-25 cm	Blue grey silty clay with organic inclusions.
25-31.5 cm	Transitional layer. Blue grey clay less silty than above.
31.5-50 cm	Blue grey clay with wood fragments running vertically through it.

Methods

Pollen analysis

Four subsamples were taken for analysis from monolith 001 from structure Ru-5. The samples were prepared following standard procedures (Moore *et al* (1991), including disaggregation in sodium hydroxide, treatment with hydrofluoric acid and micro-sieving to remove minerogenic material, and acetolysis to remove cellulose. *Lycopodium* tablets were added to enable pollen concentrations to be determined. The pollen was mounted in silicone oil and counted using a Leitz Laborlux binocular microscope. A count of around 300 total land pollen (TLP) grains was achieved in the top two samples but pollen was much sparser in the lower two samples and the count was based on 700 *Lycopodium* spores. Identification was by reference to modern comparative material and identification keys including Moore *et al* (1991). Nomenclature is based on Bennett (1994), Bennett *et al* (1994) and Moore *et al* (1991). The pollen diagram (Figure 7) was prepared using Tilia and TiliaGraph (Grimm 1991).

Plant macrofossil analysis

Two 100 ml samples were examined for plant macrofossil remains from monolith 001 from structure Ru-5. The samples were soaked in water, with hydrogen peroxide added to aid disaggregation of the clay, and then washed through a stack of sieves with 2 mm, 1 mm, 500 micron and 250 micron mesh. The remains were sorted and identified using a Wild M5stereo-microscope. Identification was by comparison with modern reference material and standard identification texts including Schoch *et al* (1988) and Berggren (1981). The results are presented in Table 3. Nomenclature follows Stace (1991).

Table 3. Plant macrofossils from Structure Ru-5

Sample depth (cm)	**42-38**	**20-15**
Sample size (ml)	**100**	**100**
Wood	+	+
Monocot. remains	+	+
Atriplex spp. (oraches)	-	13
Mentha arvensis/ *M. aquatica* (corn/water mint)	-	1
Juncus gerardii Loisel. (saltmarsh rush)	-	10+
Poaceae (grasses)	-	1

+=present

Wood identification

Samples were examined from structures Ru-5 and Ru-6 and from peat associated with Ru-6. Transverse, transverse longitudinal and radial longitudinal sections were cut and the wood identified using a Leitz binocular microscope using magnifications up to x250. Identification was by comparison with modern type material and identification texts such as Schweingruber (1990). The results are given in Table 4.

Table 4. Wood identification results

Taxa	Ru-5	Ru-6	Peat from near Ru-6
Betula spp. (birch)	-	-	3
Alnus glutinosa (L.) Gaertner (alder)	-	16	3
Tilia spp. (lime)	8	-	-
Salix/Populus (willow/poplar)	2	-	-
Fraxinus excelsior L. (ash)	11	-	-

Pollen zonation

One zone, subdivided in two, has been recognised (Figure 7).

RGW.1a The subzone is characterised by a total tree pollen count of more than 50%TLP. *Quercus* and *Pinus* are relatively frequent. *Betula* is absent. Poaceae values are around 10%TLP. Chenopodiaceae pollen is well represented.

RGW.1b Total tree pollen values are around 30-40% TLP. *Quercus* and *Pinus* decrease and *Alnus* increases. *Betula* is present. Poaceae values increase to more than 30% TLP. Chenopodiaceae pollen continues to be well represented. Herbaceous taxa are more frequent.

Discussion

Pollen from alluvial sediments, whether riverine or marine, because of a more complex taphonomic history, presents greater difficulties of interpretation than that from a peat deposit. Reworking may lead to a mixture of contemporary and older pollen and the results should be viewed with a degree of caution. However, Chenopodiaceae pollen is well represented throughout the diagram suggesting saltmarsh and an estuarine/marine influence locally. Other taxa indicative of saltmarsh include *Aster*-type, *Plantago maritima*, *Pcoronopus* and *Glaux maritima*. Fresh water is indicated by the presence of *Sparganium*-type, *Typha angustifolia* and *Potamogeton*-type pollen, although certain *Potamogeton* species can

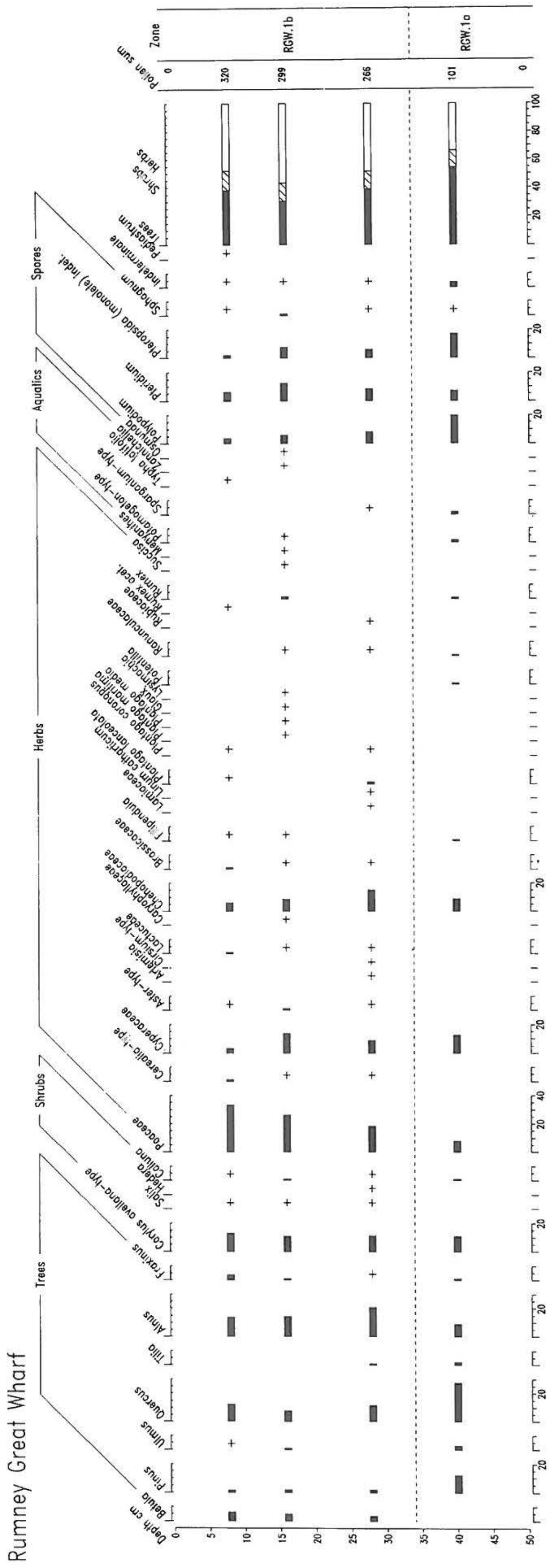


Figure 7: Pollen diagram for monolith 001 from structure Rumney-5.

tolerate brackish water and *Triglochin maritima* is included in this pollen type. *Zannichellia*, typically found in rivers and streams, also occurs in either fresh or brackish water. A noticeable difference occurs between the lowest sample, zone RGW.1a, and the remaining samples, zone RGW.1b, which may be related to a change in the depositional environment. Higher *Pinus*, *Ulmus*, *Quercus* and *Tilia* values are recorded in RGW.1a than in zone RGW.1b. Similarly, *Polypodium* and Pteropsida spores are more frequent in zone RGW.1a. Over-representation of *Pinus* is common in estuarine/marine sediments. A decline in *Pinus* in RGW.1b may therefore suggest a reduced marine influence and also, possibly, a discontinuity in date between the sediments. An increase in Poaceae may represent an increase in reedswamp and a fresher water influence, although the increase could also represent an increase in dryland grassland in the area. *Quercus*, *Ulmus* and *Tilia* all show a decline compared with the previous zone, suggesting a decrease in dryland woodland. At the same time, an increase in *Alnus* suggests an expansion in carr woodland, perhaps growing along the edge of the palaeochannel further upstream. The appearance of *Betula* and *Salix* probably also relates to carr woodland. Evidence for cereal cultivation and pastoralism/grassland in the area is provided by taxa such as Cerealia-type, *Plantago lanceolata*, *Linum catharticum*, *Rumex* and *Potentilla*. The difference in arboreal pollen, more frequent Poaceae and greater range of herbaceous taxa in RGW.1b than RGW.1a appears to support the archaeological observation that there were two distinct deposits and to confirm the stratigraphic change. It seems probable that zone RGW.1a is from earlier Wentlooge clay deposits and that RGW.1b is contemporary with the structure and later palaeochannel fills. It is possible that the palaeochannel fills incorporate both earlier Wentlooge clay and eroded peat. However, *Atriplex* seeds in the plant macrofossil sample (15-20 cm) from the palaeochannel fill, whilst absent from the sample (38-43 cm) from the lower clay, suggests that the Chenopodiaceae pollen from the palaeochannel reflects contemporary saltmarsh rather than reworked pollen from earlier clay. *Juncus gerardii* seeds also indicate saltmarsh, whilst *Phragmites* remains and a seed of *Mentha aquatica/arvensis* indicate the presence of reedswamp.

The three taxa identified in the wood from structure Ru-5, *Tilia*, *Fraxinus* and *Salix/Populus* are all present in the pollen record from zone RGW.1b. Similarly, *Alnus* and *Betula* are represented in the pollen record from RGW1b and structure Ru-6 comprised *Alnus*. *Alnus* and *Betula* were identified from the associated peat, suggesting the use of local carr woodland.

Comparison with other sites

The pollen record from structure Ru-5 shows some similarities with that from the Bronze Age plank structure 1124 at Goldcliff (Caseldine 2000), also associated with a palaeochannel cut into clays. At Caldicot the pollen from palaeochannel deposits shows a less strong estuarine influence (Caseldine and Barrow 1997). Elsewhere in the region at Goldcliff West and Buildings 1-4 at Goldcliff (Caseldine 2000) and Barland's Farm (Walker *et al* 1998) raised bog persisted whilst at Vurlong Reen (Walker *et al* 1998) sedge and reedswamp communities existed, reflecting the differing wetland conditions at this time.

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Nigel Nayling,
Department of Archaeology,
University of Wales,
LAMPETER
Ceredigion,
Wales
SA48 7ED

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