MAGOR PILL, GWENT: THE GEOARCHAEOLOGY OF A LATE FLANDRIAN TIDAL PALAEOCHANNEL

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Introduction

There is increasing evidence to suggest that much human activity on the Severn Levels has been focused on the tidal channels or pills which, as in British salt marshes generally, reach from the open sea through many branches far into the interior of the coastal wetlands. In Gwent, in the upper reaches of Caldicot Pill, Bronze Age structures are associated with a major tidally influenced palaeochannel (Parry 1991; Nayling 1992a, 1992b, 1993), and apparently contemporaneous palaeochannels lie near the Iron Age wooden buildings on the coast at Goldcliff (Bell 1992b, 1993b). The spectacular Romano-British boat discovered at Barland's Farm (Llandevenny) is preserved in association with stone and timber wharfage deep in a substantial palaeochannel lying close to the upland margin of a wide wetland (p. 59; Lawler and Nayling 1993). The dispersed Romano-British settlement at Oldbury-on-Severn, on the Avon-Gloucestershire levels, is associated with large, branching palaeochannels, at least one of which was active at the time (Allen and Fulford 1992). A medieval stone and timber quay survives to the present-day in the channel of the extant Grange Pill (Woolaston) on the right bank of the Severn Estuary (Fulford *et al.* 1992). Allen and Fulford (1993) gave evidence of a simpler structure of a similar function and date preserved on the abandoned course of Hill Pill on the opposite bank of the estuary. Iron ore from the Forest of Dean appears to have been among the goods transported to this place.

Our purpose in this paper is to add to the above evidence by describing the geoarchaeology of Magor Pill on the shores of the Caldicot Level between Chepstow and Newport (Figure 22a). Although little has been published on Magor Pill and its surroundings, certain aspects of this complex site are well known to archaeologists of the Severn Levels through the pioneering and informally communicated activities of Mr Derek Upton of Caldicot. Nash-Williams (1951) recorded from the intertidal zone between Magor Pill and Caldicot Pill some 800 m to the southwest a strew of Romano-British and medieval pottery, but the implicit claim by Locke (1970-71) that some of the material was observed in a primary context may be doubted on several grounds. The Romano-British pottery and bones reported by Boon (1967) from the site of the Sewage Treatment Works do appear to have occured in a primary context, although on the grounds of their altitude (*c.* 3.6 m OD) probably having been discarded into a channel or field drain. Of undoubted preservation in a similar primary context is the Iron Age occupation debris recorded by Whittle *et al.* (1989) to the northeast of Magor Pill. Courtney (1986-87) described some of the transposed medieval pottery found on the shore at Magor Pill and re-emphasized the likelihood that the pill is the site of the medieval port of Abergwaitha. Our work allows these various discoveries and contexts to be linked in a coherent manner which provides a basis for understanding the character and evolution of the site as a whole.

The shore at Magor Pill on the Gwent coast (Figure 22a, b) has a complex topography (Figure 22c) dominated by the rubble and concrete sea wall rising to an elevation of about 10 m OD. The high (*c.* 7.2 m OD), intermediate (*c.* 6.7 m OD) and low (*c.* 5

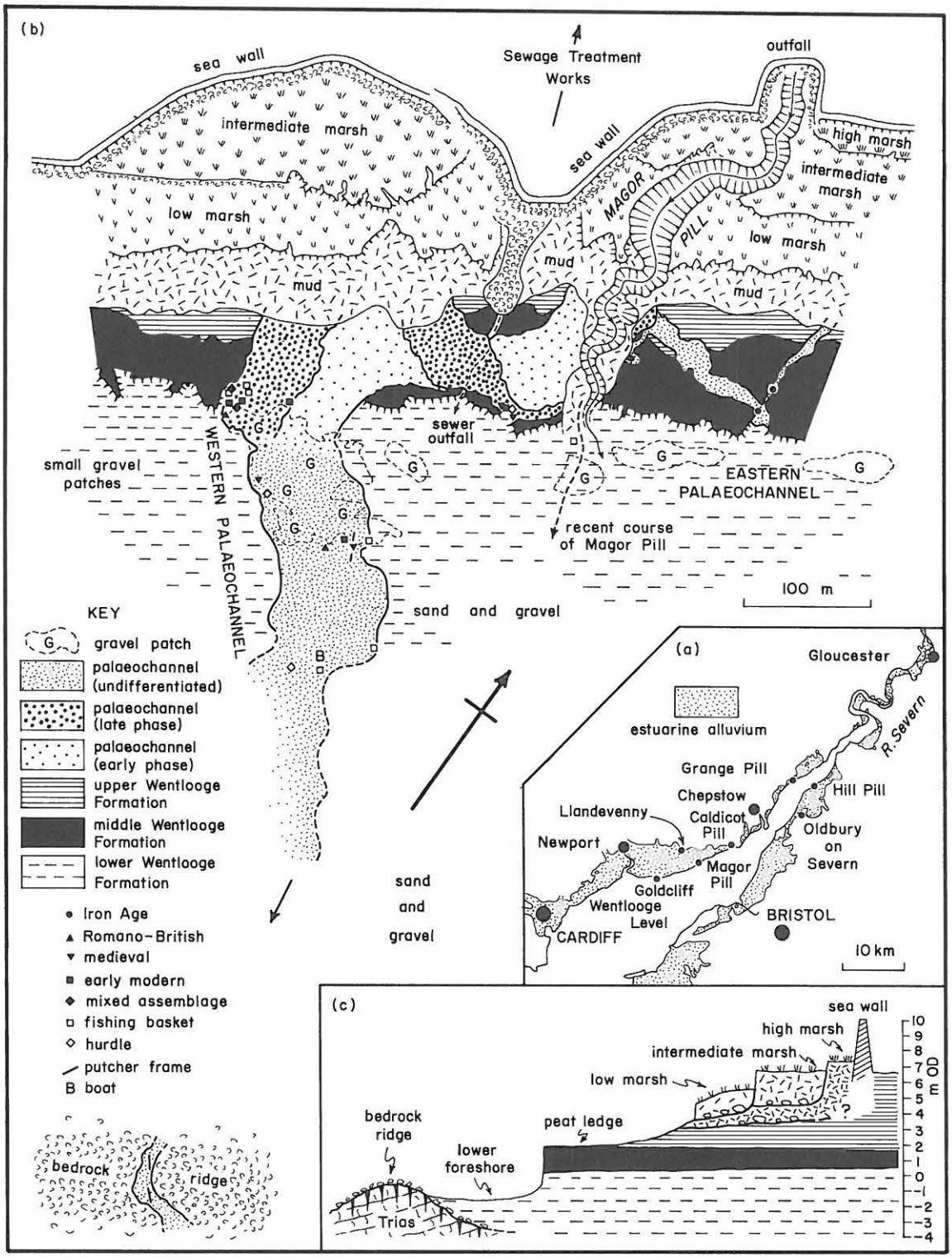

Figure 22 Magor Pill and its setting. (a) The Severn Estuary showing Magor Pill and other localities mentioned. (b) Geoarchaeology of Magor Pill in the intertidal zone. (c) Schematic profile across the shore at Magor Pill exclusive of the palaeochannels.

m OD) salt marshes to seaward represent respectively Allen and Rae's (1987) Rumney, Awre and Northwick Formations, each with an erosional base. Beneath the fields inland of the sea wall, and below these salt marsh deposits on the shore, occurs the Wentlooge Formation (Allen and Rae 1987), representing the greater part of the Flandrian. The informally named upper Wentlooge Formation, measuring about 4.6 m in thickness at the Sewage Treatment Works (Locke 1970-71), consists of green and brown mottled estuarine silts passing down into pale green silts, only the latter being exposed intertidally beneath modern mud and the deposits of the active salt marshes. At the works, the peat which forms the middle Wentlooge Formation, correlating to the main peat at Goldcliff (Smith and Morgan 1989), is recorded as 1.22 m thick. On the cliff marking the seaward edge of the intertidal peat ledge (*c*. 1.8 m OD) this deposit measures 1.47-1.62 m and is divided by an extensive lens of pale green estuarine silts. The lower Wentlooge Formation at the works consists of silts 3.05 m thick. Exposed in their position on the lower foreshore below the peat ledge are pale green estuarine silts which include at least one root bed. Far out on the foreshore, rising to an elevation of about -0.5 m OD above a wide depression to landward at about -1.5 m OD, is a low ridge on which red mudrocks and thin sandstones of the Mercia Mudstone Group (Trias) are seen to be penetrated by numerous ice-wedge casts and overlain by what appears to be largely frost-shattered debris (see also Allen 1987a). Between the Wentlooge Formation and the rock head at the works occurs 2.13 m of red clay (?head) and gravel (?interglacial raised beach). The main palaeochannel we shall describe cuts through all levels in the sequence.

Eastern Palaeochannel

The eastern palaeochannel (Figure 22b), joined by branches from the north and south, diverges sharply away across the peat ledge from the course of the modern Magor Pill. Cutting down from an unknown horizon within the upper Wentlooge Formation, and bottoming out at or a little below the base of the peat, it is filled with pale green estuarine silts which, near the edge of the peat shelf, afforded us fire-fractured pebbles and the jaw of a horse. From approximately the same location, and also from an excavation across the branch to the north, Whittle *et al.* (1989) recorded late Iron Age pottery and other occupation debris. No Iron Age structures or other signs of occupation of that date are known from the adjoining peat surfaces, which therefore by then were probably covered by silt.

The eastern palaeochannel bends sharply to the south close to where it is cut by the outer edge of the peat ledge (Figure 22b). Here, on the outside of the bend, the surface of the peat reveals a series of parallel, curving fractures, on the inner of which there has been slight downward displacement of large curved slices of peat and silt (Figure 23). Modern erosion has exhumed from the silts infilling the palaeochannel a number of large, back-tilted rafts of silt and peat which had slid into the channel when active (Figure 24), as can be seen today on the banks of the pills crossing the Severn Levels (Allen 1985).

Western Palaeochannel

If the channel filled with greenish brown silts that crosses the bedrock ridge is included, in view of its general alignment, the main palaeochannel at Magor Pill is a comparatively straight feature over most of its length, but with a pronounced S-bend, partly obscured by salt-marsh deposits and modern mud, at its northwestern end (Figure 22b). The outer limit of the sediment complex filling the palaeochannel is readily identified as a visible contact at

Figure 23 Magor Pill: Bank-parallel fractures on the surface of the peat and displaced silt-peat rafts at the outer bend in the eastern palaeochannel.

Figure 24 Magor Pill: Exhumed back-tilted slice of silt and peat in fill of bend in eastern palaeochannel.

the level of the peat ledge and in many places over the inner part of the lower foreshore. Elsewhere on the foreshore, where the cover of modern sediments is thin, the position of the boundary was fairly readily identified by test-pitting. Further out on the foreshore, the edge of the palaeochannel complex was taken to be defined by irregularly curving strews of large blocks and rafts of peat which had been traced from the edge of the peat ledge. The better exposed of these were seen to be back-tilted slices of peat with pale green silts which had slid into the channel when active (see Figures 23 and 24), again reminding us of mass-movements recorded from the extant tidal channels of the Severn Levels (Allen 1985).

The western palaeochannel was not always occupied by Magor Pill. That the modern Magor Pill at one time cut across the peat ledge for a further 100 m beyond the present margin of the shelf is demonstrated by a closely spaced, double row of peat blocks and rafts extending outward from the ledge (Figure 22b).

At the level of the peat ledge, the estuarine silts filling the western palaeochannel are divisible into two phases, the earlier brown-green in colour and the later pale brown. These phases are increasingly difficult to separate as the palaeochannel is traced on to the lower foreshore, partly because of the increasingly thick and extensive cover of gravel and sand, but also because of the growing development of brown mottles and patches in the brownish-green deposits. The silts of the two colours, with pale brown predominating, appear to have no systematic distribution on the lower foreshore, where no attempt has been made to map the two phases separately.

The brownish-green silts attributed to the early palaeochannel phase are exposed in the cores of the two meanders detected on the peat ledge (Figure 22b). They yielded no artefacts, but narrow, bark-covered roundwood excavated from the deposits gave conventional (uncalibrated) radio-carbon dates between 1580±60 BP (Beta-71596) and 1010±50 BP (Beta-71597), implying that considerable but slow meander growth took place between late Roman and late 'Dark Age' times.

The pale brown silts of the late phase are exposed at the level of the peat ledge in the sharp bends which mark the last position occupied by the active channel, partly encircling cores of early-phase deposits (Figure 22b). Blocks and rafts of peat occur among the silts where the late-phase channel lay up against the peat bed present in the Wentlooge Formation. The erosional base of the palaeochannel, exposed in a number of places, is a sharp, uneven, longitudinally grooved surface strewn with subangular to rounded lumps of green, and some brown, silt and peat, together with scattered stones and other debris. A similar conglomeratic mixture also occurs within the silts at a number of horizons upward from the base. Artefacts of a range of periods, and occasionally in a mixed-period assemblage, were found stratified among these coarse basal and higher deposits in the late-phase palaeo-channel (Figure 22b). At one place there was a small cluster of Romano-British sherds, at two others fragments of cooking pots and glazed wares of medieval (twelfth-sixteenth centuries) date, and at a further four pottery and clay tobacco pipes of the early modern period (seventeenth-eighteenth centuries). At one location, medieval and early modern items were associated together. In terms of preservation, the pottery ranged from almost pristine to severely water-worn. The larger stratified objects recorded are three, finely woven fishing baskets of wood (Figure 25), resembling medieval baskets recorded by Godbold and Turner (1992) from Sudbrook Point, a small portion of a hurdle-like structure of roundwood, perhaps part of

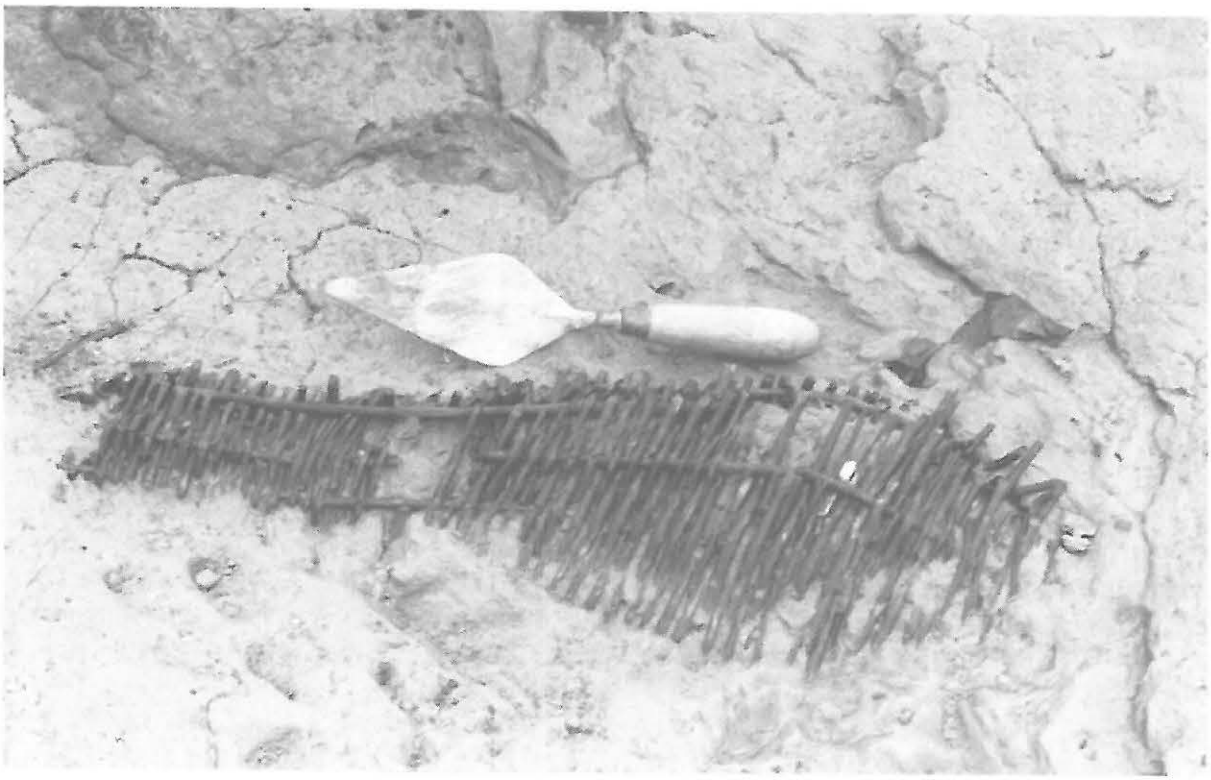

Figure 25 Magor Pill: Partly exposed woven fishing basket in silts of western palaeochannel.

Figure 26 Magor Pill: Part of woven, hurdle-like structure (mid eighteenth century) stratified in silts of western palaeochannel.

a larger fish trap or fishing hedge, and a few bones and teeth of domestic animals. A piece of bark-covered roundwood excavated from pale brown silts relatively high up in the fill of the second bend gave a conventional radiocarbon age of 140±40 BP (Beta-71594), implying that the late-phase palaeochannel was being silted up as late as the early nineteenth century.

Similar artefacts and assemblages are stratified in the silts which fill the palaeochannel where it crosses the lower foreshore (Figure 22b). Romano-British pottery was recovered from one location, medieval ceramics from two places, and early modern wares from a fourth. Evidence of water-wear was again common. Flat-lying, hurdle-like structures (Figure 26), perhaps originally parts of fishing hedges, were present in two locations, the wood from one affording a conventional radiocarbon date of 220±50 BP (Beta-72001). Perhaps the most intriguing find from the foreshore is the (?)forward part of a substantial wooden boat. What can be seen above the surface of the silt is the stem and some of the ribs and planking of a vessel perhaps originally about 10 m long and with a beam of perhaps 3 m. Also embedded in the silts at the site of the boat were another fishing basket and an upturned cattle skull. In view of the character of the ceramic assemblages stratified in the palaeochannel fill, the boat is less likely to be either Romano-British or early modern than medieval.

A seventh larger fishing basket is exposed on the lower foreshore among peat blocks marking the most recent channel of Magor Pill (Figure 22b). With at least one and possibly two stakes attached, although not in place, it resembled a putt as described by Green (1992).

Rows of wooden stakes possibly recording putcher frames were the only artefacts discovered in association with the silts filling the palaeochannel that crosses the bedrock ridge far out on the lower foreshore (Figure 22b). A similar row of stakes was found on the outcrop of the palaeochannel nearer the peat ledge.

Gravel Patches

Covering the lower foreshore close to the edge of the peat ledge are patches of semi-mobile gravel ranging in extent from as little as a few square metres to about one hectare (Figure 22b). They consists of well rounded pebbles and cobbles of lithologies typical of the Pleistocene fluvial gravels of the outer Severn Estuary. The clasts appear to be mobile in general only under the most severe wave and tidal conditions. The largest patch stretches erosively across the outcrop of the western palaeochannel where it crosses the lower foreshore.

The gravel patches yield a few modern artefacts, chiefly of plastic or glass, but an abundance of Iron Age, Romano-British, mainly medieval, and early modern pottery, in addition to the bones and teeth of domestic animals. The Iron Age pottery is chiefly a black ware with large, calcite inclusions. The Romano-British part of the assemblage consists of cooking pots, fine and coarse tablewares and mortaria, and is dominated by Southeast Dorset BB1. A variety of grey wares is present, and there are Samian and Severn Valley, Gloucester region and Oxfordshire products. The medieval element is mainly of early (eleventh-fourteenth century) date and dominated by cooking pots originating in the Malvern and Bristol areas, with very little in the way of such local products as Glamorgan and Penhow Castle wares. Many of the fragments of glazed ridge tiles are also likely to be medieval. That portion of the assemblage of early modern date is overwhelmingly dominated by imported products, with North Devon Gravel Tempered Ware, South Somerset Ware and Malvern Chase ware mainly in evidence. Regardless of age, the preservation of the sherds varies from nearly pristine

(rare) to severely water-worn (common). Commonly, edges and corners are fully rounded, and washes, colour coatings and glazes are worn and in some instances totally removed, except under rims, in grooves and from other protected places on the vessels. The bones and teeth accompanying these sherds are predominantly those of cattle, with horse and sheep contributing substantial but subordinate proportions. One human femur of unknown age was recovered. The bones represent all parts of the body from the head to the extremities of the limbs and, with the exception of a solitary cattle tibia, which appears to have been sawn, display no marks attributable to butchery or food preparation. In addition to the cow skull already mentioned, six isolated bones (3 horse, 2 sheep, 1 cattle) were found stratified at a number of places in the pale brown silts of the late-phase palaeochannel. Wedged under and against a peat block in the pale brown silts of the first meander loop of the late-phase palaeochannel was an articulated cattle skeleton.

Discussion

The evidence we have sketched points to lengthy human activity focused on Magor Pill on the Gwent coast. That evidence, and the activities toward which it points, must be viewed against what can be inferred about the response of the coast to geological and other environmental factors.

Coastal retreat in response to an upward-moving relative sea level seems to have been the long-term, underlying trend. Our experience elsewhere in the Severn Estuary teaches us that the freshwater and tidal drainage is channelized, that is, confined to deep pills, only where there are adjoining salt marshes or high tidal mudflats. If it is accepted that the palaeochannel which crosses the bedrock ridge was once part of Magor Pill, then the coast at one stage in the Flandrian lay more than 800 m further seaward than the line of the present sea wall (Figure 22b). By the early Iron Age, the outer edge of the wetlands certainly stood at least 500 m off the present line, for this is the distance to the outermost surviving peat rafts along the margins of the western palaeochannel, and the youngest peat has a conventional radiocarbon age of 2430±70 BP (Beta-73058). The sea wall visible today betwen Magor Pill and Newport cuts across the agricultural landscape to define numerous fields of small size and arkward shape, and for this reason, as was noted elsewhere (Allen and Fulford 1986), is almost certainly in a set-back position possibly a substantial distance inland from its initial line, reminding one of the fate of sea defences on the Wentlooge Level to the southwest (Allen and Fulford 1986; Allen 1990b; Rippon 1995). However, the seabanks at Magor Pill had become stabilized by the mid eighteenth century (e.g. Newport Reference Library M430/912), and the presence of the erosively-based Rumney Formation on the coast points to a temporary phase of salt-marsh growth beginning in the seventeenth century which can also be paralleled from the Wentlooge Level.

Over most of a clearly lengthy period of retreat, Magor Pill occupied the western palaeochannel, but by the mid eighteenth century the straight course across the peat ledge (Figure 22b) had been assumed (Newport Reference Library M430/912). This straight channel could have been the result of some exceptional natural event, but it is perhaps more likely to represent a deliberate diversion intended to protect the sea wall from attack by the northward-growing meander to the west. A diversionary cut was recently made on Goldcliff Pill for this reason.

The abundant and wide-ranging artefacts we recovered from the gravel patches are no more than 'archaeological pebbles' transposed from primary contexts, no doubt at a

variety of times, into the intertidal zone and there reworked and blended by wave and tidal currents. Coastal retreat, to which we have already alluded, is the only driving force which can account for such protracted and comprehensive transposition. Some of the Iron Age material could have been derived from the eastern palaeochannel and any adjoining occupation levels, and the western palaeochannel is clearly an immediate source of Romano-British, medieval and early modern artefacts, as well as perhaps the bulk of the bones and teeth. Although stratified in this context, however, their mode of preservation and occasional presence as mixed assemblages strongly indicates that the primary occupation deposits lay elsewhere in the vicinity of Magor Pill. Artefacts could have been washed into the palaeochannel by storms and floods or reached its deeper parts through bank collapse; some could have been discarded from boats which entered the pill.

Although because of severe coastal erosion no primary occupation deposits remain exposed at Magor Pill, much can be reconstructed about human activities there by combining the evidence from the gravel patches with that from the western palaeochannel. The character of our pottery assemblage, together with the evidence of Nash-Williams (1951) and Boon (1967), points to the presence of a possibly somewhat dispersed Romano-British settlement at Magor Pill. Given the dominance of BB1, this settlement must have been in contact, probably by ship through Magor Pill, with the opposite bank of the Severn Estuary to which these wares could have been brought overland. Courtney's (1986-87) view that Magor Pill is the site of the medieval port of Abergwaitha (see also Wood 1914; Robinson 1972), abandoned by the early fourteenth century, is supported by the medieval element in the ceramic assemblage, with its emphasis on early and imported wares. The fragments of ridge tiles recovered hint at the presence of storehouses if not also dwellings along the pill. There is some later medieval and much early modern material, however, and there seems therefore to have been eventually a revival of economic activity. Judging from the sources of the pottery, and the character of the assemblage of bones and teeth, plausibly recording mortalities at the site, this was linked to the flourishing sea trade in store cattle and other domestic animals from certain ports and landing places on the Gwent coast across the Bristol Channel to the West of England (Matthews 1900; Skeel 1926; Lewis 1927; Bettey 1983). Longshore fishing seems also to have been an important activity in the area, judging from the fishing baskets and other woven wooden objects we recorded from the western palaeochannel.

Magor Pill has no economic role today but, like a number of other tidal channels in the Severn Levels, has during certain periods in the past been the location of substantial human activities. The detection of palaeo-channels in the intertidal zone and the defended wetland landscape could therefore prove a useful tool for the archaeological prospection of this challenging and threatened environment of great geological dynamism.

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