SOLENT THAMES RESEARCH FRAMEWORK
ENVIRONMENTAL AND ARCHAEOLOGICAL SCIENCE - INTRODUCTORY COMMENTS

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Introduction

Understanding and defining the human lived-in landscape, its natural and humanly exploited resources and economy, farming and food production (i.e. the discipline we sometimes call 'environmental archaeology' (see Luff &Rowley Conwy 1994) must not be divorced from aspects of cultural, artefactual and social archaeology (Bradley 1978, 2; Allen 1996). Nevertheless, because of the number of specialists and the fact environmental archaeology has been considered an 'interest group' of its own, both environmental archaeology and archaeological science have sometimes been given research agenda in their own right (e.g. Hampshire, Allen 1996; South West, Wilkinson & Straker 2008; and archaeological science, Bayley 1998). It has been deemed, for the purposes of this research agenda that those topics should be fully embraced within the chronological dialogue of the research agenda. However, some topographical zones of the Thames-Solent corridor are distinctly more conducive to preservation of palaeo-environmental information or macrofossils (see Allen 1996). These topographic zones will be dealt in summary below, but in terms of 'environmental archaeology' nevertheless there are some comments of an introductory nature that are over-arching and embrace all periods. Certainly Luff & Rowley Conwy (1994) dislike the term 'environmental archaeology', but its longevity of use and the wide umbrella nature of the term are useful. In this review the broad 'environmental' discipline is divided into two distinct, but not wholly separate themes, of land-use and landscape on the one hand, and of economy and diet on the other, as has been done previously (e.g. Hampshire Environmental Archaeology review; Allen 1996). In general the focus is more directed on the former (i.e. land-use and landscape) than the latter in this paper, as archaeologists engage with information about diet and economy more readily and the information is often more readily digestible or accessible.

Chronologically environmental archaeology is clearly more heavily (and integrally) involved with the earlier periods: prehistorians have a long record of, by necessity, dealing with issues of landscapes and land-uses that differ markedly from those we engage with today. In the historic periods environmental and scientific archaeology are more concentrated upon issues of diet and economy and these should be engaged much more fully than is regularly the case. But this engagement should always be within a directed framework, whether commercial or research, rather than being just a data-gathering exercise. Studies of landscape and land-use development have often been far more efficacious and productive in terms of providing results that are immediately understandable and usable to the archaeologist leading a project,

though interpretations provided by the component specific scientific analyses have not always been so readily accessible or immediately evidently relevant. Nevertheless there are a number of environmental and scientific themes that are generally applicable, regardless of the period, and these are set out below in summary:-

- During all periods we need to define, at a much higher spatial resolution than before, the nature of the local landscape and land-use than thitherto, and then use these site-specific data to re-evaluate and redefine regional ad chronological trends.

- Our understanding of food procurement economies is generally woefully poor except at the general level. If we are to advance in our understanding of communities and society in the past then this is an area that requires concerted attention.

- Advances in archaeological science are now having earth-shattering effects on our comprehension of diet, mobility and origin. Isotope analysis is isolating main dietary component (meat, plant and fish/marine composting) while other isotope suites are defining the high state of mobility within what may be large portions of prehistoric communities, as seen in the case of Cranborne lady and children found on the chalk at Monkton-up-Wimborne in Dorset (Green 2000), but who were brought-up on, and revisited, Mendip (Mongomery *et al.* 2000).

- Chronology. No longer are radiocarbon dates needed to confirm the longevity of an established chronological epoch, and rarely to confirm that any item or event merely belonged to that period. Recent advances using Bayesian analysis now allows us to examine events at the generational scale in the Neolithic (Bayliss & Whittle 2007), and the results are destroying long held assumptions of longevity of monuments or social activities.

- Spatial awareness. Developer funded applied research archaeology is confined to the spatial parameters of the development threat. But then most research-led archaeological fieldwork is also spatially constrained by the assumptions of the researcher or pre-conceived framework of spatial distribution of activity. Commercial archaeology, however, does produce the opportunity for serendipitous discovery. Development is not always in the location of known archaeology, and the lack of recorded finds in a topographical zone may re-enforce a pre-conceived absence, ensuring areas are low priority. Chance finds in dry valleys (e.g. Allen 2005) and concerted research on the slopes of the Thames valley (Yates 1999) now allow these to be added to prehistoric settlement and land-use patterns and force us to re-evaluation of these regions and topographic zones.

Although research themes can be addressed and specifically targeted, commercial archaeology is innately prone to unforeseen and unexpected finds despite the highly computerised and numerous SMR or HER records held by development control authorities.

For instance the location of a commercial archaeological project is precisely defined by the developer and development needs. Where these coincide with areas of few archaeological records we assume little or no archaeological return, and we must be acutely aware that this lack of records may result from a deficiency of former archaeological investigation and enquiry. Thus areas of the interfluves of the Kennet valley now seem to be the location of a number of later prehistoric sites, and are often charcoal-rich and associated with industrial activities. Only recently have these areas such as this been recognised as of archaeological value, and our comprehension of the commensurate evidence of palaeo-environmental, landscape, land-use and the wider farming economy, of these areas is even more tardy. Lacunae such has these need identifying, targeting and reviewing ensuring that such areas or topographical locations are rapidly highlighted in the HER records, and become fully engaged in development control decisions.

Physiographic and topographic zones

Although the period by period review adequately covers the main points of future research and attention, from the environmental and geoarchaeological perspective in particular, the main building blocks or topographic zones have distinct and separate sedimentary and preservational characteristics which are directly relevant to the nature and acquisition of data. Further, in some areas burial beneath colluvial, alluvial and marine sediments removes sites, cultural evidence and palaeo-environmental evidence from our immediate reconnaissance and should not be overlooked. Both long- and short-term projects have clearly demonstrated the highly biased nature of the immediately valuable archaeological resource (e.g. Allen & Gardiner 2000; Allen 1988) and are starting to indicate patterns where whole classes of human activity are specifically located in areas which have been subjected to burial and preservation of sorts and which radically change our view of activity in entire epochs (e.g. Beaker/Chalcolithic see Allen 2005). The Solent Thames corridor has been divided into six basic crude topographical zones (Fig. 4), in which some of the principal topographic forms, palaeo-environmental preservational characteristics and geoarchaeological potential are summarily outlined.

1. Chalklands

Hampshire, Berkshire Downs, Chilterns

Topography, Form and Palaeo-environmental preservation and geoarchaeological potential

The chalklands generally form one of the most significant ‘uplands of these parts of lowland Britain. They typically comprising a scarp edge or scarp slope and more gently dipping or plateau upland, bisected by a dendritic pattern of dry valleys of varying size, form and amplification. In places the chalk is mantled by drift deposits of clay-with-flints or Tertiary Clays and gravels, which give rise to locally more acidic soils (e.g. brown earths or argillic brown earths), rather than the characteristic calcareous rendzina- form soils that mantle much of this landform. The calcareous nature of the chalk, and thus the soils and deposits derived from it, provide potentially ideal preservation for bone and shell including land snails. In

contrast, its free-draining nature leads to generally dry and heavily bioturbated soils and deposits in which pollen preservation is sparse and waterlogging rare, and thus the preservation of insect remains is extremely rare, if not unknown. Geoarchaeologically, understanding the soil history of these areas has been demonstrated to be of crucial importance (French *et al.* 2007), and the presence of localised calcareous colluvium provides significant palaeo-environmental opportunities as well as sealing and masking key locations in the landscape, often burying archaeological sites and evidence.

The Hampshire chalklands, surprisingly have had relatively little palaeo-environmental attention in comparison with the central Wessex chalklands (e.g. Dorchester, Cranborne Chase, Stonehenge and Avebury), yet these may form the boundary between two major ecological and cultural zones. To the west are areas redolent in henges and henge-type monuments and with Grooved Ware while, in contrast, Sussex contains few or no incontrovertible henges on the chalk, and Grooved ware is conspicuous by its absence. At the same time the early woodlands are seen to differ; that in the Wessex regions contain a mosaic of woodland and woodland openings, whilst Sussex seems to contain a more uniform woodland cover (Allen & Gardiner 2009). Clearly the boundaries of this zone, if such exist, may be present through the Thames – Solent region; indeed the Thames-Solent region *is* that boundary.

In contrast the Berkshire – Chiltern Downs (e.g. Whiteleaf Hill) have seen some major single-site palaeo-environmental studies, and a number of small-scale projects, but the density is generally low and the presence of synthetic overviews almost totally absent. The chalklands are considered to be well-studied, but this is not always true (see major new interpretations of the Wessex chalk and South Downs, Allen & Scaife 2007; Allen & Gardiner 2009) and is less so of the Berkshire Downs, Marlborough Downs and Chilterns.

2a. River Valleys / Corridors

<u>Class 1 rivers: Avon, Thames, Thame, Colne, Test, Itchen, Great Ouse</u>

River valleys by their very nature often cut though, or provide a division between physiographic and topographic zones; they are both boundaries and corridors. Individually they are largely defined by the geology through which they cut and over which they run; this circumscribes the shape and form of the valley, as well and bed form and load and the nature of any resultant alluvium.

Often rich soils may be found on the floodplain, there is water to drink from the river and pools on its margins, food (fish and fowl) and resources (reeds, clay, gravels, flint) and the natural topographic corridor it forms. These features attract past human populations to visit, exploit, and utilise these character components. Such activities vary from periodic short-term visits, to seasonal use, to long-term non-settlement activities, and in places, to longer-term settlement and industrial uses.

In economic terms, therefore, the significance of these areas is clear. In palaeo-environmental and geoarchaeological terms these are potentially very rich and highly significant. River valleys provide two main landscape elements; the former channels and the channel itself, and the floodplain and floodplain islands. River courses and channels wander across floodplains stripping out sediment and archaeological activity, sorting and transporting elements of them downstream. Unless channel avulsion (rapid channel abandonment and creation of new) occurs, channel forms may be tens or hundreds of metres across; cutting on one side and infilling on the other. Abandoned and infilled channels provide long sedimentary and palaeo-environmental records of the watercourse itself, and the local and extra local environment via a combination of the sedimentological, land and fresh-water mollusc, plant and insect remains, and pollen (e.g. Anslows Cottages, Butterworth & Lobb 1992), and Testwood, Hampshire (Fitzpatrick *et al.* 1996). The floodplains may provide long sequences through overbank floodplain and alluvium, and in areas of high water table these may be waterlogged (containing waterlogged plant remains and insects, as well as pollen and land and fresh-water Mollusca), or even peat. The latter can vary from small local buried 'pools' to wide and complex expanses, such as at Denham, Colne and Rushbrook valleys, Bucks. Peat provides not only the opportunity for waterlogged remains and very good, long and detailed pollen sequences, but also the potential to date the onset, changes within and the demise of these landscape events. With their potential to reflect local, extra local and sub-regional land-use and environment, the palaeo-environmental evidence in these locations can be of major regional or national significance. This is further heightened by the potential of human activity to be present, exceptionally well-preserved and interstratifed in these sequences (e.g. Runneymede)

2b. Stream courses and valleys

Stream courses and valleys provide similar opportunities to those in the major class one river valleys, but just on a smaller scale. That does not mean that the potential for palaeo-environmental preservation or presence is any less, nor that deeper and longer palaeo-environmental sequences exist; more that the scale of human activity may be smaller. On this basis alone, this is considered to be a separate, sub-group of the major river courses.

3. Claylands and 'upland' gravels

<u>New Forest, North Oxfordshire and North Buckinghamshire Vales, Thames basin</u>

These form large expanses of undulating ground along the coastal fringes of the Solent and New Forest to the London Basin and the Vales of Central and North Oxfordshire and North Buckinghamshire (Northamptonshire Vale, Upper Thames Vale, White Horse Vale etc). These are on varied geologies ranging from clays to sands and gravels, but generally provide low relief landforms, although varying considerably in drainage and water retention properties. Nevertheless, these zones are characterised by their heterogeneous low relief, and relatively acid soils, often related to present of former major drainage systems. In general bone and shell survival is variable and, with local exceptions, land and fresh-water molluscs survival is poor. Nevertheless charred remains are often present, and the potential of highly

localised water logging with the preservation of waterlogged plant remains and insects and of pollen sequences is high. These areas provide one of the widest expanses of long and intermittent use through prehistory and early history. As zones, however, we have little synthetic work on each of these regions as whole, even if specific long-term and large research projects (e.g. Vale of the White Horse) have studied one part of a specific area.

4. Limestone ridge

Costwolds

The Costwolds running east-west through Oxfordshire and Buckinghamshire provide a unique and distinctive stony hard landscape. They form upland with higher relief than the surrounding areas, and sharper forms than many other zones on the Solent- Thames corridor. Today the slow weathering Inferior and Great Oolitic limestone give rise to relatively thin, non-calcareous soils, but have been proven to generate moderate thickness of non-calcareous colluvium in dry valleys and at footslopes, especially in, for instance, Gloucestershire and West Oxfordshire. The preservation of bone and shell is moderate; land snails are poorly preserved as a result of the slow weathering and release of calcium carbonate of the limestone. On the whole, like the chalklands, these are freely to moderately freely draining with little potential for waterlogging (except in local and exceptional circumstances). Consequently insects and waterlogged plant remains are scarce except in stream and water courses traversing or draining from the Cotswolds. Our economic information in terms of animals bones and charred seeds is moderate compared with other zones, but that of the specific landscape character and land-use is general sparser.

5. Intertidal

Solent margins of Hampshire and Isle of Wight

Topography, Form and Palaeo-environmental preservation and geoarchaeological potential
The present intertidal zones are low-lying areas poorly surveyed in archaeological terms, in which the potential of exceptional palaeo-environment and archaeological preservation exists. Although not found on the Solent margins, recent work in the Severn Estuary and Welsh coastline have recovered lines of prehistoric human footprints and animal tracks (e.g. Bell 2007). The potential certainly exists along the Solent margins, but the research and level of enquiry to search them out, and other important finds, does not. High water tables provide the possibility of preservation by waterlogging as well as the presence of most other proxy palaeo-environmental indicators. The low-lying and marine nature of these areas today, however, were completely different landscapes and with fundamentally different environmental characteristics in early historic and prehistoric periods. Although costal today and in recent historic times, in many cases these may have only been near coastal. The natural inlet of Langstone harbour, for instance, was once open dry lowland, with small freshwater streams flowing across a wider and deeper coastal plain (Allen & Gardiner 2000).

Surveys of the largely muddy foreshores around Langstone Harbour (Allen & Gardiner 2000) and between Wootton and Quarr, Isle of Wight (Tomalin *et al.* forthcoming) are the only

significant coastal margin surveys to date. The potential of other intertidal foreshore areas has yet to be explored from both an environmental and palaeo-environmental perspective. This zone is a narrow and temporary, physiographic zone that represents a current landscape, and not necessarily that of the past, nor future, landscape. The potential to find evidence of submerged forests and nationally significant palaeo-environmental and palaeo-ecumenical evidence is high. These areas also contain the potential to obtain dated sea-level index points to refine the Solent sea-level curves (e.g. Long& Tooley 1995; Long *et al*. 2000) and general sea-level curves specific to defined study areas.

6. Current Marine

Solent

The current seabed and is an under-explored archaeological and palaeo-environmental resource. This is largely due to the difficulty and expense in access to these benthic landforms and landscapes. However for the Palaeolithic through to the end of the Mesolithic large areas of the Solent was dry land or lowland with high groundwater tables. Recent sub-bottom profiling and coring off the West Sussex coast has revealed peats and land surfaces of a Mesolithic date under in excess of 30m of water. There is no reason why such preservation does not occur in the Solent or off the Isle of Wight coast. In geoarchaeological terms, just defining the nature and altitude of the benthic landscape in relation to know sea-levels provides a large landmass that was one habitable. We have yet to get to grips with this landscape conceptually let alone define the clearly rich palaeo-environmental and palaeo-economic evidence that will be preserved there.

The sea bed also provides the last resting place of a number of land-based artefacts washed out to sea, as well as larger artefacts and marine vessels such as the Mary Rose AD 1545 (e.g. Gardiner with Allen 2005) and the Invincible AD 1758 (Bingeman in press). Whilst an detailed strategy and huge effort in sampling and analysing the waterlogged palaeo-environmental remains and them scientific data was expended with huger rewards from the *Mary Rose*, (Gardiner with Allen 2005, 302-650) the same potential was not exploited for the excavations of the Invincible. The potential of recovering good palaeo-economic evidence relating to food-production in southern English is high, but so too is the potential, in time to recover early Historic or prehistoric vessels – see for instance the Dover boat. The endeavours on the Mary Rose essentially a project of the 1970s and 1980s showed the huge resource scarcely tapped in terms of palaeo-environmental and palaeo-economic data.

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