

People and Water:

**A study of the relationship between humans and rivers in the
Mesolithic and Neolithic with particular reference to that within the
Thames Basin**

Volume 1

Fiona M Haughey

University College London

I, Fiona M Haughey, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Fiona M Haughey

30 May 2009

ABSTRACT

People and Water: A study of the relationship between humans and rivers in the Mesolithic and Neolithic with particular reference to that within the Thames Basin

Rivers and their associated wetlands and lakes form a major component in the landscape and yet discussions concerning their usage in early prehistory are rarely undertaken in Britain and Ireland. Exceptions to this have included the work on the Severn, the Shannon and the Humber estuaries. The Thames forms one of the biggest river systems within England and yet modern writers have undervalued it as a resource of early communities. The work within the Thames basin had been somewhat piecemeal with, until recently, attention being focussed primarily on the non-tidal parts of the river system. A consideration of the Mesolithic period had also not been undertaken.

The relationship between hunter-gatherers and early farming communities and freshwater resources is examined within two major themes. The first is that of an economic nature (provider of sustenance and raw materials, communication, transport, choice of settlement site) and the second, experiential/symbolic (ritual deposition, sacred and burial sites, rock art). The two themes are not mutually exclusive and the points of overlap are also considered.

Understanding of the archaeological record within the Thames basin is approached by the use of ethnographic analogy and archaeological comparison within a number of world regions. The ethnographic material is drawn from communities based on rivers in Australia, the Amazon basin and a number of locations in North America. The archaeological information is primarily from Europe (Britain and Ireland, the North European Plain and the Central European Uplands). Two other areas are briefly examined, namely Old World rivers (the Euphrates, the Jordan and the Nile) and a number of New World sites in North America.

Attributes of the themes are drawn out from both the ethnographical and archaeological material. The Thames material is outlined and conclusions drawn in light of these attributes.

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CHAPTER 1

INTRODUCTION

1.0 *Rivers were made for wise men to contemplate; and fools to pass without consideration.*

(Thacker 1909, 12)

1.1 Introduction

This study is concerned with the archaeology of rivers. It explores the attraction that waterways have been for humans from the earliest archaeological periods and the ways that appeal has been expressed through a variety of media. My research uses the Thames and its Basin as the core study area but draws on evidence from a wide range of other rivers across the rest of NW Europe. The application of analogous discourse of communities in Australia and the Americas as well as an examination of the Old World rivers of the Nile, the Euphrates and the Jordan opens up the debate as to the relationship between hunter-gatherer and early farming societies, and their nearby watercourses. Fish (an aquatic resource underrated by commentators on prehistoric societies) and the equipment used to catch them are brought to the fore and placed in their correct position in the subsistence strategy in the post-glacial period. Rivers can be seen to be at the centre of life and consideration during the Mesolithic and Neolithic periods, rather than at the margins.

1.2 Approaches to water

Water is one commodity that humans cannot do without and it is the lack of water that will kill more quickly than lack of food. It makes up two-thirds of the human body and it is also the first sound that is heard in the womb other than the mother's heartbeat. The ripple of a running stream, the thunder of deep falls, the crash of a thunder storm and the muffling silence of falling snow are all sounds of water in its various forms with which people are familiar. It is an element that is both predictable (the twice daily tides) and unpredictable (a flash flood or a tsunami). It does not impinge greatly on the life of the average urban-dweller. The water that flows from the tap in the kitchen, particularly in the western world, is often pumped from many miles away so connection with its source is intangible. Approximately 70% of the Earth is covered with water

with 97% of that saline or marine and the rest comprising freshwater in the form of lakes, river, streams and the like. The remainder of the Earth's surface has been, and continues to be, shaped by the effects of water in its diverse guises with rivers being the most conspicuous form.

Modern thinking of landscape tends to distort our view of what it was like to inhabit, in the past, that landscape with all that it entailed. There is today what might be termed a generic approach to rivers by which they are often defined as barriers (where they inhibit passage), boundaries (which divide one side or people from another), liminal spaces (that are at the extremities of being) and sites for sacred deposition (that involve setting apart items from the common or secular). They feature rarely in discussions of landscape and, in archaeological treatises their stereotypical image is frequently re-rehearsed.

Rivers with their implied movement actually are the one linking factor within the concept and gamut of wetlands. They flow through most of the other settings: lakes, marshland, peatlands eventually ending within an estuarine setting. This movement itself is a cause for concern in terms of the preservation, in that rivers may be considered self-excavating trenches, the erosion of which we cannot control. And when this is exacerbated with a tidal element, such as on the London Thames, then the archaeology must be considered under constant threat. They are also the poorer relative within the wetlands stable from an archaeological point of view, so to speak, with the more accessible and predictable peat and marshlands being the areas of first choice. The connection between prehistoric communities and rivers is one found at both economic and experiential/symbolic levels. The fluctuating balance of these two aspects traces this relationship in discernible ways upon closer examination of settlement patterns and practices. The river was a central element in the lives of early prehistoric people and it is sometimes necessary to look in the floodplains under alluvium deposits in order to understand this more fully.

From a physical point of view, rivers are often perceived as not impinging on the consciousness or just a backdrop. They are seen as a passive part of the background to a landscape in which humans hunted, walked, knapped, built fires, erected monuments and eventually began to deliberately plant seeds. The presence of Mesolithic sites by water such as at Three Ways Wharf (Lewis 1991) and Star Carr (Clark 1954; Mellars &

Dark 1998) appears to be happenstance for the most part and while the land economy is discussed at great length, that pertaining to the aquatic resources is not even broached. In the Neolithic, attention in the Thames Basin has been primarily on the monumental architecture but from a land-based viewpoint, and artefact scatters of either those on the land or those retrieved from the water but not the two together.

It is necessary to examine this position and to pull rivers to centre stage. To paraphrase, [a river] ‘is not a static thing. It is constantly transforming and shifting, with changes, physical, territorial and conceptual wrought by time and people’ and ‘experience of [rivers] is a subjective thing’ (Kilfeather 2003, 38). Rivers are dynamic entities and their effect on local communities in the prehistoric periods has been greatly under-rated. The stance taken for this study will be from the vantage point of the river – how it is utilised, how people respond to it and how this changes through time.

1.3 Aims and objectives

The principal aim of this study is to investigate the relationship of between humans and rivers in the Mesolithic and Neolithic via a study of the Thames Basin and the associated river systems. In other words, to explore the dual aspects of this correlation (economic and experiential/symbolic) among hunter-gatherer and early farming communities by exploring the following questions:

- (a) Does this close relationship between rivers and humans exist?
- (b) What are the reasons for such substantial evidence of human presence found in close proximity to water, and rivers in particular?
- (c) Is there was a traceable change through time in the way that relationship was expressed?
- (d) Is there a formal relationship between Neolithic monumental features and water?

In order to achieve these aims, it will be necessary to examine evidence of both direct and indirect types:

Direct evidence will include a presentation of original archaeological data gathered by myself of finds recovered from the London Thames dating to the Mesolithic and Neolithic periods. The database of these artefacts includes 1046 entries (many of them multiple) of a range of finds from flint and stone tools, human remains, horn and antler, ceramic and shell now found in museum collections in England and abroad. These finds

are ones to which a provenance can be given to within 500m. There are many other finds whose provenance is either missing or too general to be of archaeological value and these have not been included (see **Appendix 1** for details of the database, collection policy and the database itself).

Other direct evidence is that from the Sites and Monuments Records (SMRs) found in the various counties or statutory bodies within the Thames Basin (for further information see **Ch 4**).

Indirect evidence will be via ethnographic and ethnohistorical analogy. This will be constructed after reviewing information from a number of communities found in Australia and N & S America. Archaeological comparison will also be employed by examination of records from sites in Europe and N America, and also the ‘Old World’ rivers of the Euphrates, the Jordan and the Nile.

The intention is not to maintain that rivers were the only place people lived, but more to show their importance and why they were a chosen area in the past.

1.4 Area of study

The core area of study is the Thames Basin (**Ch 4**). This will build on my own research of the Thames foreshore within Greater London undertaken since 1993 and the subject of a number of published articles (see below) as well as an undergraduate dissertation (Haughey 1996). Previously researches using the Thames as a focus have been comparatively small in range. Volumes on the quaternary geology of the river have examined the terracing that occurred as the Thames moved south from its original route to the North Sea via the Vale of St Albans and the sequencing is now understood albeit with two interpretations (Bridgland 1994; Bridgland *et al* 1995; Gibbard 1985; 1994). The lower Thames as a region has seen more detailed sediment and environmental information than other parts of the Basin (for example Bridgland *et al* 1995, Devoy 1979; Bates & Whittaker 2004). Other studies have been artefact-based – principally dredged from the river. The ensuing publications for the most part consist of catalogues of finds without reference to the context of the river itself. Examples of these for the Mesolithic and Neolithic include Field 1989, and Adkins & Jackson 1978. In the recent years a number of synthetic volumes have been published on some of the Neolithic

monuments (for example: causewayed enclosures (Oswald *et al* 2001), cursus monuments in the upper Thames (Barclay *et al* 2003a)). The rest have been individual site reports with little or no connection to the river system within they are located. Further details of earlier publications are reviewed in **Ch 4**.

The Thames has been viewed as a barrier (Sidell *et al* 2000, 49; Field 2004, 158) and the London section as a backwater (Wilkinson & Sidell 2007). Attention has been sporadic and while often involving riverside locations, the Thames and its considerable number of tributaries have been sidelined in the ensuing discussions. On the other hand, finds from the river have been disregarded when land sites have been considered and so in order to gain a more rounded and comprehensive picture, the Basin will be considered as a whole. Evidence of a prehistoric presence in valley bottoms in particular has been discussed for some time (for example, Robinson & Lambrick 1983; Evans 1992). Recent work in the intertidal zone of the London Thames (Haughey 1999; 2000; 2003; 2007b; Milne *et al* 1997) and large area excavations in the Middle Thames (for example Allen 1995; Allen *et al* 1997; Allen *et al* 2004; Allen & Welsh 1998; Lewis *et al* 2006; Needham 1991; 1992; 2000) have enabled the opening up of the long-overdue debate of the relationship between rivers and human settlement in prehistory.

The analogy and comparative material referred to above will set the background to these deliberations. The main discussion (Ch 6) looks at the relationship between hunter-gatherers and early farming communities and freshwater resources within two major themes. The first is that of an economic nature (choice of location, subsistence, accessibility, transport, trade, communications) and the second, experiential/symbolic (approaches to life and death, sensory attributes of rivers, monuments, creation of significant landscapes, votive objects). The two themes are not mutually exclusive and the points of overlap are also considered. The term 'subsistence' covers a broad spectrum and has for the most part centred on land and/or marine elements, and plants. In this study the use of aquatic resources will be highlighted and will concentrate on exploring the riverine aspects of the human diet. Although land animals will be mentioned there will not be an analysis of the amount of non-aquatic components. In addition, methods of land animal procurement will not be discussed as the use of spears and arrowheads is familiar.

1.5 Period of study

The period of investigation in the following study will be that of the later hunter-gatherers and early farming communities. In Britain, this is the Mesolithic and Neolithic periods 8000-2000BC. It had been intended originally to cover the whole Stone Age period but during the early part of research when attention was more focussed on the London Thames, the number of finds from the Palaeolithic in general was small (101 of which 15 are considered debatable) making it impossible to draw conclusions in any statistically meaningful way. It was also decided not to include the Bronze Age or Iron Age, although there are references to features from these periods in the text. Human response to rivers seems to alter in the Bronze Age and again in the Iron Age, so it was felt that these periods required their own study (see **7.2c** below; Haughey 2007a).

Traditionally the Upper Palaeolithic and Mesolithic periods, and the Neolithic and Bronze Age periods are studied together; the first pair considered hunter-gatherer communities and mobile, with the second pair being more sedentary and undertaking farming. This academic division suggests a greater partition than actually exists, resulting, in more recent years, with much debate about the Mesolithic-Neolithic transition. By looking across this artificial divide, it was hoped to observe changes over time that were not necessarily involved with subsistence or technology. In addition, by exploring both periods, it opens the possibility of looking at the distribution within the Thames Basin of axes which have been variously described as being used for woodworking (Mesolithic) and for ritual deposition (Neolithic).

1.6 Outline of thesis

These two methods of analogy and comparison will be applied in the following investigations, where the following three categories of information have been selected:

1 Ethnographic, ethnohistorical and archaeological data (Chapter 3)

Anthropological studies do not 'possess a long time scale and are unlikely to acquire one now that the isolation of traditional societies is breaking down' (Bradley 1984, 3). Historical sources are therefore also needed in order to counter balance this shortness

and in some cases, it has been possible to access written records stretching back over several hundred years. Other countries whose chronology is such that there are still people living a way of life and using a level of technology which can be considered prehistoric, are more fortunate in that they have examples still visible against which archaeological evidence can be compared. There are problems in dealing with what appears to be unchanging continuity and so careful examination of the data gathered from such a source is essential. Where written accounts from the past few hundred years are extant, these can be used to extract a record of how such people lived economically and in what ways they sought to express themselves ritualistically. These accounts, themselves, can possibly be accused of bias, given that they were written principally by outsiders, probably from Europe and their view of the local societies will be seen from a so-called 'civilised' viewpoint. The concept of the 'noble savage' so prevalent in the 1700s and 1800s would have been reflected in accounts written at the time (for example, Lorant 1965). However, it must be borne in mind that it is not possible totally to *reconstruct human society by extrapolating backward from living hunter-gatherers* (Kelly 1995, xii). This is too simplistic an approach to what is a complex situation.

Archaeological comparison within similar areas to those studied for ethnographic information will also be considered as well as looking at three Old World rivers (the Egyptian Nile, the Euphrates and the Jordan).

2 Archaeological data from the case study area of the Thames basin (Chapter 4)

Until recently the Thames basin has been discussed primarily in terms of the region in the upper Thames valley with the assumption that this information could be applied to the rest of the river (Holgate 1988). The modern divisions within the Basin bear little resemblance to that in the early prehistoric periods. It is important to first consider the whole before focussing on the particular. Also there have been a number of advances in research in the area since Holgate's overview of the Neolithic in 1988 and no similar work undertaken for the Mesolithic period. Work since 1995 on the tidal stretches of the Thames within the London basin as well as those within the floodplain have added greatly to our knowledge of the early prehistoric periods.

3 The archaeology of the Thames basin within its European setting (Chapter 5)

An examination of the archaeological information from a range of sites and countries enables direct comparison between the various locations. The range reviewed includes comparative material from hunter-gatherer and early farming societies in Britain and NW Europe on rivers and lakes. Archaeological comparisons from these areas have great value as they are the nearest to the Thames both in climate, environment and ecology.

4 Discussion (Chapter 6)

This chapter will contain two parts:

- 1) To examine the attributes for analogy set out in **Ch 3** and compare and contrast these with those from the Thames and the European data

- 2) Following this, the data gathered will be used to discuss the relationship humans developed with rivers both economically and experientially/symbolically in the Mesolithic (hunter-gatherer) and Neolithic (early farming) periods within a number of themes:

- **Locations of choice**
- **Subsistence strategies**
- **Accessibility, transport, trade and communications**

- **The river as an approach to life and death**
- **The river and monuments**
- **The river and the creation of significant landscapes**
- **The river and ritual deposition**
- **The river as a sensory entity**

Finally consideration will be given to the theme:

People and rivers – crossing the ‘divide’ between economic and symbolic

5 Conclusion (Chapter 7)

The research questions posed in **1.3** above will be discussed in response to the findings of Chapters 3-7. In conclusion, areas of further research will be outlined.

6 Appendices

Three appendices have been included:

Appendix 1 - Mesolithic and Neolithic finds from the London Thames

(A database of finds from the tidal reaches of the Thames within the Metropolis currently found within a number of museums)

Appendix 2 - Fish species and fishing equipment

(A catalogue of fish species referred to in the text of the thesis and an illustrated list of fishing equipment)

Appendix 3 - Mesolithic and Neolithic archaeology of Britain, Ireland and NW Europe
Supplementary information

(Expanded information for sites referred to in **Ch 5**)

1.7 Dating

For British data, the following approximate dating system will be used where relevant:

Upper Palaeolithic 36000-8000 BC

Mesolithic

 Early 8000-6500BC

 Late 6500-4000BC

Neolithic

 Early 4000-3200 BC

 Late 3200-2000 BC

Bronze Age	2000-c650 BC
Iron Age	c650 BC – AD 43
Roman	AD 43 -410
Saxon	AD 410-1066

Note on radio-carbon dates:

Given the synthetic nature of the research undertaken for this study, not only spanning across the globe but also using accounts written at a range of times, the recorded dating of periods and artefacts is in some cases less than would be considered today as acceptable. In these cases, approximate calibration has been applied where precise dating has not been available.

I am grateful to Jane Sidell for calibrating the dates where possible, using OxCal v.3.10 (Bronk Ramsey 1995; 2001) and the IntCal 04 calibration curve (Reimer *et al*, 2004).

2.1 Introduction

The setting of this thesis, with its main theme of rivers, might be considered best placed within the confines of wetland research but there is a danger in this in that it suggests that such research should not be considered part of the mainstream archaeological picture. This division has stretched to most areas of archaeology, to the detriment of both wetland and mainstream disciplines. Until very recently, the two areas of theoretical and wetland archaeology did not greatly overlap. In the former, discussion of landscape can be seen to be almost exclusively that of dry land locations and dealt with within a variety of theoretical frameworks including phenomenology (for example, Tilley 1994, Thomas 1996a). Wetlands, by contrast, were treated almost exclusively from a pragmatic point of view, not surprising given the often spectacular discoveries made within wetland zones on a worldwide scale (for example, Coles & Coles 1995, Purdy 2001, Van de Noort & O'Sullivan 2006, 10). Publication of these sites is often, as in the case of Ireland, in a dedicated journal, causing an even greater separation from mainstream thought (Ó Néill 2003, 57). This divide between theoretical and, what might be termed, practical archaeology is not exclusive to wetland archaeology. As Van de Noort and O'Sullivan have stated 'this dislike of theory building, and an unwillingness to engage with theoretical archaeology, is shared with many other colleagues who gather the primary data through excavation and survey, both wet and dry' (Van de Noort & O'Sullivan 2006, 26).

In the past few years, a number of attempts have been made to bring the two together and to generate theoretical discussion within the wetland community. The two most notable attempts took place at the Theoretical Archaeology Group (TAG) annual conference held in Dublin in 2001 and at the Scottish Wetland Archaeology Programme (SWAP) conference in Edinburgh in 2005. In the former a session was held specifically looking at wetland archaeology within a theoretical framework; its abstract included the following sentences:

Wetland archaeology has often been criticized in the past for its apparent adherence to empirical approaches and for the environmental or economic basis of most of its explanatory models. On the other hand, post-processual archaeologists have tended to

ignore wetland archaeology, seeing both its practice and results as marginal and peripheral to their own interests.

(A. O'Sullivan, A. Brown & R. Van de Noort, session organisers).

A number of the papers from this session were published in the *Journal of Wetland Archaeology* in 2003. In the more recent conference, theoretical papers were called for within the conference abstract. It is interesting to note that amongst the 56 papers, which were presented, only 4 were theoretical in nature and 2 of those were in the opening plenary sessions (Barber *et al*, 2007) There has been a reluctance by many of those who work within wetland archaeology to embrace theoretical argument.

2.2 View of Landscape

Wetlands exist as part of a larger physical landscape and so it is important to briefly explore this area of discussion in order to suggest a basis for theoretical research.

Landscape as a cultural concept, has its roots in Europe. Much has been written about its genesis and as a topic of archaeological discourse (for example Darvill & Gojda 2001b, 1-2; Cummings & Whittle 2004b, 10-11, 15-16). There are, of course, two types of landscape to 'simultaneously encounter': the *real* and physical one, and the *perceived* and sensory one (Muir 1999, 115, Muir's italics). That these two strands can exist at the same time does not preclude them being seen as very different entities but it must be noted that separate studies of 'cultural landscape ...from the physical geography is highly artificial' (Coones 1985, 5). The first category is typified in Aston's *Interpreting the landscape* (1985). It is, however, the second type which has been the catalyst for much archaeological debate, as well as in other disciplines such as human geography (for example, Relph 1989, Muir 1999, 271ff, Johnson 2007). In the 1970s, the name became 'virtually synonymous with the term environment' but by the 1980s, this somewhat narrow definition was already being questioned (Cummings & Darvill 2004b, 11). The publication of Tilley's volume in 1994, hard on the heels of Bender's *Landscape: politics and perceptions* in 1993 were both particularly influential, 'addressing the theoretical implications of a landscape archaeology' (Cummings & Darvill 2004b, 11).

Tilley's volume, *Phenomenology of landscape*, contains a number of aspects of landscape archaeology which may be termed 'missed opportunities' as far as a discussion of wetland archaeology and rivers in particular are concerned. With a view to

addressing this, a closer view will be taken of what Tilley does cover and points for consideration raised. It was published in 1994 and although it is now over a decade old, some of the views expressed continue to be debated and built on in more recent work. It is not intended here to critique the book as a stimulating and thorough review was published in 1998 (Brück 1998). Brück points out the disjuncture between the theoretical approach in Part I and the application in Part II (Brück 1998, 25). She does, however, describe the book as *an exciting attempt to tackle some of the pressing issues in post-processual archaeology* (Brück 1998, 34). It is the enthusiasm in this last statement that makes the book a useful volume to examine, in spite of its shortcomings.

In brief, Tilley defines phenomenology as involving *the understanding and description of things as they are experienced by a subject* (Tilley 1994, 12). Tilley's stance is taken from the landscape within which hunter-gatherer and fishers resided and not from what, until that point, had been the more traditional areas of settlement, subsistence and the various technologies (Tilley 1994, 22). As he states *myths, cosmology and symbolism is largely deemed irrelevant to what is going on* (Tilley 1994, 22). Tilley, in turn, looks from the landscape to the people, suggesting it is the landscape itself which drives the way the people in traditional studies, respond by movement and choice of site (Tilley 1994, 24). As Brück notes, however, in spite of Tilley's early discussion of the necessity of linking ideology and economy, the result in Part II is purely a discussion of the *cosmological realm* (Brück 1998, 33).

Tilley's fault, if it may be called that, is that he causes the pendulum to swing too far in the opposite direction. From looking at only the practical, the mundane and in some senses the easier options of monument building, tool kits and bone evidence, Tilley has moved to viewing the landscape exclusively from a more emotional, and idealistic stance, thus falling into the snare referred to above. The reader is presented with an 'either/or' situation when in fact the choice involves both. The knowledge of a landscape is gained through its use and a relationship of continuous use probably through generations. Tilley touches on this when he describes locales as places *created and known through common experience, symbols and meanings* (Tilley 1994, 18). The 'common experiences' need not necessarily be only those which are shared with others but also those which have a dual meaning – symbolic and practical. The one does not necessarily exclude the other, nor does it automatically include it. So some places could have a single use or meaning to a particular person or group, while others may possess a

dual quality that may appear in tandem or singularly at points during the seasons. The one key element is that of fluidity of meaning over time. Some locales may gradually gain a reputation for a particular aspect and this might just as easily change or fall out of use over time.

He discusses the importance of naming and identifying places in order to maintain an identity (Tilley 1994, 18), but this is only true as long as that meaning can be handed on to succeeding generations. It is the people that give identity to parts of the landscape, not the landscape itself, and this can only really be attained by moving through or living within it.

Tilley's key question is *why were particular locations chosen for habitation and the erection of monuments as opposed to others?* (Tilley 1994, 1) He chooses as his example *the location of Mesolithic sites and Neolithic cairns and mounds and their internal chambers in relation to dominant features in the surrounding landscape* – the first of these 'dominant features' listed is rivers (Tilley 1994, 2). What is interesting in his discourse is the limited discussion about the actual location of his selected sites within his three areas of SW Wales, the Black Mountains and the chalk downlands in southern England. In Chapter 3 (Tilley 1994, 76ff), one of the five Mesolithic locales he identifies in SW Wales is 'places on flat-land or sand-dune areas in river estuaries or localised marshy areas created by streams' (Tilley 1994, 80). Chapter 4 (Tilley 1994, 111ff) concentrates on the Usk and Wye valleys in the Black Mountains and has four Mesolithic location categories of which three are closely associated with water in one guise or another (Tilley 1994, 113). His final example is Cranborne Chase with two out of four Mesolithic locales associated with water (Tilley 1994, 146). This connection between his chosen sites and wetlands of varying sorts does not enter Tilley's discussion of the Mesolithic apart from a passing reference to the axes of the Usk and Wye valleys being 'paths of movement' (Tilley 1994, 142). Even his analysis of the Neolithic material is bereft of any such connection apart from, again, that in the Black Mountains where 50% of the monuments he examines are situated in either a lowland or an intermediate location along or above the river valleys (Tilley 1994, 121). He does state in passing that the major rivers and their tributaries are visible from all the sites, but fails to examine this fact more closely (Tilley 1994, 121). Tilley interprets these monuments as "*hypothetical*" territorial demarcation ...related to the flows of river

courses and notes what he says is *their complete lack of regularity* in their orientation (Tilley 1994, 122-3).

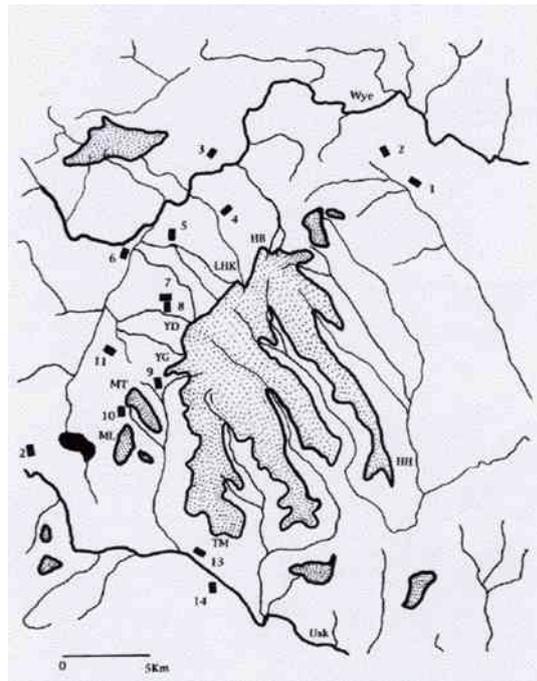


Figure 1 The distribution of long cairns in the Black Mountains. (Tilley 1994, 122)

(Numbers and letters refer to cairns and locations discussed in Tilley 1994)

In fact the cairns mirror the various rivers and streams in the area by either lying parallel to the water flow or at right-angles, as discussed above and can be seen in Figure 1.

The rivers curve as they flow, hence the variety in direction. Tilley suggests only five are placed in this way because they are low-lying (Tilley 1994, 24) but it is possible to argue that more follow the river course and that regardless of whether they are placed low into the valley (to be nearer to the water) or higher up (to see the water flow more clearly), the river would have played an important part in their location. He suggests that the orientation of the majority of the cairns is towards prominent spurs of the Black Mountains, but it might equally be posited that they do, in fact, face or lie parallel to the moving water (Tilley 1994, 124).

What is not clear is why there is this apparent disregard of the wetland and river parts of the landscapes Tilley has selected. He himself has said that the choice was led by *a desire to work in interesting locations* and not one that deliberately avoided certain features (Chris Tilley, pers. comm.). It is noticeable, however, that Tilley deals only with static features in his dialogue – mountains, spurs, hills and human-made elements still visible after c6000 years in the form of monuments and flint scatters – which

'behave' in a predictable way. Wetlands and rivers have the potential to be unpredictable, to move, to dry-up or to spread, at the very least. They are dynamic environments unlike other topographic features. They also conversely have the potential to be stable – in that they normally stay within the same valley and their flow is predictable given the appropriate weather, although other wetlands are possibly less so.

A landscape is a series of named locales, a set of relational places linked by paths, movements and narratives (Tilley 1994, 34). Paths in this context can also include waterways which are 'roads' or travelways in their own right. This linking is formed through human usage of the landscape both physically, by means of actual movement, and experientially/symbolically as significance and meaning are endowed to that landscape. These two strands are not exclusive - they can overlay each other or exist side by side, making the whole concept of landscape holistic. It is this dualism in approach that can be described as 'the Being of the body' as discussed by Merleau-Ponty, which is part of the underpinning of Tilley's arguments in Part I of his volume (Merleau-Ponty 1962, 304). In addition, given that the human encounter with the landscape of the Thames valley, during the early prehistoric period, for example, would have been of an immediate nature for the most part, and a detailed understanding of what lay beyond hunting or trading areas could have been limited. Therefore the appreciation of the landscape may have been limited to very specific zones albeit potentially large in size - in other words, a *personal* landscape. These personal elements dictate the use of the landscape but conversely, elements within the landscape dictate that personal use. For example, extremely high and barren mountains will not encourage exploration or long stay, but fertile and well-watered lowlands will.

While the above comments are negative in tone, the outworking of Tilley's discourse has much to recommend itself, even if it appears to exclude areas pertinent to this study. The 'missed opportunities' referred to above are those of taking his theoretical viewpoint to its more logical physical conclusion, given the three areas he has chosen to examine. He also equates what he finds to only a part of the surrounding landscape, missing out key factors which more than any others, have shaped that landscape. This closer look at what Tilley has written points to the potential of what could be achieved if this application is made and will be one of the methods used in the ensuing study. His view of the need to incorporate what we feel and respond to in the world around is of as

much importance as the material remains that are left behind. It is these 'responsive methods' as referred to by Relph that are important in identifying the landscape within which Mesolithic and Neolithic people moved and lived (Relph 1989, 150). The three case studies that Tilley utilizes in his archaeological discussion consist predominantly of sites which are located on heights, set above the surrounding countryside, providing the possibility of long vistas and intervisibility with other locales. Until the advent of aerial exploration in its various forms, the only way people could experience the wider landscape was from available heights. River systems would have been viewed in part from such vantage points but knowledge would principally have been gained from personal contact with each segment. Landscapes, however, are not all comprised of only elevated locations - the dips, hollows and vales form just as important a part as do the heights. In fact the 'hidden-ness' of the latter might display an additional facet of the landscape which is often understated. Even in more level terrain, tree-cover might conceal places that are not required to be open for all to see. Inaccessibility is not a prerequisite for hidden-ness.

In brief, Tilley defines phenomenology as involving *the understanding and description of things as they are experienced by a subject* (Tilley 1994, 12).

'All human activity takes place in the landscape; landscape is not simply a backdrop to this' and this involvement with the landscape can be traced through an examination of the archaeological remains within any given area (Cummings & Whittle 2004b, 12). River systems, their place within the landscape (which changes as the water flows through the various localities), their rate of flow, their shallowness or deepness, and their life-giving properties, are all things which will have influenced human activity within the landscape both in a materialistic or practical capacity but also in an experiential or symbolic way. Taking the standpoint that phenomenology explores 'sensory aspects of past human experience' (Hamilton & Whitehouse 2006, 32), the roles played by vision, sound and touch in connection with Neolithic monuments will be outlined and discussed (see **Ch 6** below).

2.3 Previous work on rivers

One of the more obvious foci of attention on river systems has been environmental, and more specifically sedimentological (for example Maddy *et al* 2001). This study discussed a number of river basins of varying sizes in N & S America, Europe, N Africa

and the UK, and concentrated on palaeochannels and climate change. Only a small number of papers include a discussion of the human impact upon the river basins (for example Howard *et al*, Pastre *et al*, and Woodward *et al* 2001). Two volumes produced a decade apart have tried to bridge this gap (Needham & Macklin 1992, Howard *et al* 2003). Needham & Macklin's volume may be described as a landmark publication with its bringing together of sediment studies in the UK with the appropriate archaeology research. This opened up the wider discussion as to the existence of hidden deposits beneath the alluvium which hitherto were unsuspected. The follow-up volume in 2003 widened the discussion to include Europe and briefly, the USA, but continued, for the most part, to combine environmental and archaeological data. All of these treatises discussed the pragmatic aspects of working within riverine scenarios and any theoretical viewpoints do not feature.

Edmonds' *Ancestral geographies of the Neolithic* (1999) had the potential to discuss a theoretical approach to rivers but fell short of including rivers *per se* within the concept of 'geography'. The few brief mentions that Edmonds included about this significant feature of the landscape are confined to referring to them as 'boundaries or places for spiritual communication' but with no following elucidation (p21), or places where hazel grew (p75), or the places where greater numbers of enclosure have been uncovered but again with no further comment (p85). Elsewhere in discussing enclosures again he notes that Etton 'may have witnessed limited residence' (p111) and that Abingdon is 'situated between two watercourses' (p148) but in neither case does he refer to the reasons for either scenario. Geographies here are strictly land formations.

Bradley's *An Archaeology of Natural Places* (2000) investigates the role that caves, mountains, springs and rivers have in European prehistory. One criticism of the book is the 'one size fits all' approach that Bradley takes when discussing practices across the periods of prehistory. He does not include the Mesolithic in his account but covers the Neolithic, Bronze and Iron Ages as well as parts of the classical period (p20ff, 64ff). Rivers are seen principally as places for votive deposition throughout (p37) (see also 2.4 below), although he does refer to Tilley's use of them as a marker for the lie of monuments (p 36, Tilley 1994). The artefacts that Bradley mentions are mostly made of metal, bronze specifically (p54), although he does include some Neolithic examples (p118). He does however equate the building of monuments in 'sacred landscapes' with

the ritual deposition of Neolithic artefacts ‘in peripheral places’ (p154) but does not see a direct link between the two scenarios.

A number of treatises have been written based on specific areas. Robert Van de Noort, in his synthetic volume *The Humber Wetlands* (2004) notes that in the Mesolithic and Early Neolithic ‘the wetlandswere exploited to a greater extent rather than the uplands’ (p38) but doesn’t give further details as to which part of the wetlands were more favoured during this time. He also notes in his conclusion that these wetlands presented ‘a paradox’ where they were both ‘economically valuable’ and ‘linked to ancestor cults and spiritual activity’ (p165). He does not however, denote whether this paradox is relevant across all periods or some in particular – an important point to notice when considering the wetlands across both prehistoric and historic times. Is he suggesting that this attitude is as relevant in the Mesolithic period as in the Medieval? He also does not examine the different types of wetland (rivers, meres etc) with their respective archaeological evidence to see if there is any difference of use over time.

Aidan O’Sullivan began to touch on the relationship between Mesolithic and Neolithic people and the Shannon in *Foragers, Farmers and Fishers in a coastal landscape* (O’Sullivan 2001, 3-4, 253-254). He too noted that ‘economic subsistence and symbolic activities’ could have taken place at the same time (O’Sullivan 2001, 254) but does not expand upon this thought. Similarly, Nigel Brown’s work on the Chelmer Valley and Blackwater estuary in Essex, fails to build on the close proximity of Neolithic structures and monuments to water – which potentially could have built on the ‘missed opportunities’ within Tilley’s work above (Brown 1997).

A more clearly theoretical approach was undertaken by Tony Brown in his paper focussing on ‘riverine islands’ (Brown 2003). Here are islands formed in a multi-channel setting, with evidence of use dating from the Mesolithic period. Brown falls into a similar mindset as Bradley in that he sees usage of such islands as rarely being for resources, ‘instead such location **must** have meaning on ritual or societal terms’ (Brown 2003, 13, emphasis mine). Again, this is a ‘one size fits all’ approach, which by its very declaration removes serious consideration of any other reason for use for such places.

A recent publication from a conference held in 1999 explored Neolithic archaeology in the intertidal zone (Sidell & Haughey 2007). The majority of the papers were

concerned with coastal settings with two covering aspects of the London Thames (Wilkinson & Sidell 2007; Haughey 2007b). A more detailed examination of these locations is included in **Ch4**.

2.4 Votive offerings

The examples above have been concerned with landscape and the monuments found within it. There is another side to the argument which has not so far been raised – that of intentional deposition of artefacts into rivers. Interest in watery places of all types can be traced in most continents around the globe, as can be seen in ethnographic studies, where rivers and the human response to them is often part of every day living and where the economic uses of the water resources and the experiential responses are intermingled (see **Ch 3** below). Previously it had been accepted that it was only in NW Europe in the past that this appeal was extended further and included the deposition of a range of objects into the various wetlands (JD Hill pers. comm.). More recent research now indicates that this practice has been noted also in the lakes of North Italy (Ruth Whitehouse pers. comm.). Many books have been written about aspects of the subject, covering a number of prehistoric periods. Wait discussed Iron Age examples (1985); bog bodies in both Britain and Europe have been the subject of a number of volumes (for example Glob 1971, Turner & Scaife 1995); pots retrieved from wetland sites have also been the focus of attention (for example Koch 1998) and finds from the Thames have spawned a range of studies. Ehrenberg considered Bronze Age metal work (Ehrenberg 1980). Examples relevant to the current thesis include that by Adkins and Jackson in 1978 (Neolithic axes) and Field in 1989 (Mesolithic Thames picks and tranchet axes). Adkins and Jackson's study typifies the narrowness of this variety of study. The axes discussed are only from the current Thames river bed and those on the dryland or in the various floodplains are ignored. While it is a useful catalogue, there is a great need to open the vista to examine the locale holistically rather than to keep a closed view. Field's work too has produced difficulties. The data he uses is based on entries from Wymer's *Gazetteer of Mesolithic sites in England and Wales* where the grid references for sites on the Thames are often given as the nearest bridge, providing a false impression of clusters of finds (Field 1989, 15; Wymer 1977).

One book above all, however, has been highly influential in shaping the current thinking about finds from watery places and, given its emphasis on those objects from the

Thames, it will be considered in some depth here. In 1990, Richard Bradley published a book entitled *The Passage of Arms* in which he examined finds from watery places in NW Europe. In 1998 a second edition was produced with an additional chapter which included some Mesolithic information. Bradley's book has become a benchmark for discussion of artefacts recovered from rivers and watery places. It is this book that is cited by Van de Noort and O'Sullivan as an example of the non-involvement by the wetlands community in the major debate in respect of depositions in watery places (Van de Noort & O'Sullivan 2006, 148).

The material considered was principally from the Bronze Age although Bradley makes considerable reference to the Neolithic period and to Iron Age artefacts. His main contention is that the artefacts have found their way into the rivers and other similar places as a form of votive offering. He advocates the designation of a specific class of finds – those that have been recovered from rivers citing 'the quantity, fine condition and restricted range of the objects' (Bradley 1998, 123). In order to support this viewpoint, he dismisses in a few paragraphs any other reason for the deposition of the artefact. Reference is made to a range of reasons for the objects finding their way into rivers. They include accidental loss from boats and river crossings, loss of weaponry during battles, erosion from settlements or burials on the adjacent banks, and the results of flash floods. Bradley's rebuttal of these arguments seems more pertinent to the Bronze and Iron Age material, with his discussion of weaponry, settlements and naval engagements (Bradley 1998, 24). He notes that *settlement sites rarely produce whole objects of the quality of those in the river* and that shafted spearheads would have floated, thus becoming recoverable, but his main argument is the sheer volume of material that has been retrieved. The one mention at this juncture of Neolithic material is that of axes in Adkins and Jackson's volume (1978). What Bradley does not take into account is the shifting pattern of the river and the increasing tidal range, which has resulted in the swamped former dry land surfaces becoming part of the modern river bed. He also has not considered the effects of drainage channels on land deposits, leaching the smaller artefacts into the river.

One aspect, which sometimes can get lost within the greater scheme of things, in this type of research as undertaken by Bradley, is that, with the nature of prehistoric archaeology and its many missing 'jigsaw' pieces, all anyone can hope to suggest is what *might* have been the reason behind what is perceived as a particular type of

behaviour. The theory Bradley is presenting here has much to recommend it but, as with others promoted before and since, is one that has been quoted by many others since then almost as a given fact (for example, Museum of London 2000, 74; Van de Noort 2004, 93; Cooney 2000; Cooney & Mandal 1998). This said, it is not the intention here to dispute the efficacy of Bradley's theory, which after all has much to recommend it, but to challenge some of the assumptions underpinning his final interpretation. While some theories appear to be more acceptable than others, none should be considered as cast in stone. With continued research and fieldwork, the 'goalposts', as it were, are in a state of almost constant shift. As more information is gathered by a whole range of means, clarification can come to particular areas and yet more questions about others can be posed. Whilst Bradley does add a few pages of what might be called 'overhauling' in the 2nd edition, including finally an acknowledgement of the large numbers of Mesolithic objects (Bradley 1998), his basic premise does not alter. Bradley also concentrates on the artefacts with only occasional reference to sites. This is a mistake as it removes the importance of the *context* of these finds from the discussion. A number of the finds from the Thames that he cites, for example, do not have a provenance other than the general one of the river. Given that the river system stretches for over 500 kms from source to estuary and even within the London basin it runs for 50kms, this is too wide an area to discuss the location of the artefacts.

Bradley draws on a too-large canvas picking up either isolated examples or complete data sets across a broad landscape. He takes the standpoint that, by and large, similar things are happening at about the same time over the whole of NW Europe – a viewpoint which on reflection might be considered somewhat insecure. Just as it cannot be assumed that the human response to differing types of water sources is always the same, so it cannot be expected that people from a range of locales across the geographically variable European landmass will always do the same things in the same manner. Gordon Barclay in a paper discussing the Neolithic cultures in Britain emphasised that there were more than just two – Wessex and Orkadian (Barclay 2000). He suggested that every region had its own variant, making each one unique. It seems that this is a concept which should be applied pan-Europe for more than just the Neolithic.

Bradley's argument also needs to be applied from the general to the particular – both in terms of topographical region and chronological period. After all, a theory or

interpretation should bear close examination and application to a specific situation. As noted above, it seems that Bradley's arguments have been accepted at face value and sometimes applied without detailed examination of the particular circumstances. The Thames with its material culture is probably the most quoted river in the book (for example, Bradley 1990, 108-9, 122, 172), with the majority of the finds coming from the stretch which runs through the metropolis. At the time he was writing, detailed research on the London Thames was just beginning and as yet very little has been published. So, while the dredged finds he discusses were known, their context was not. It is this contextual material that will be part of the discussion in **Ch 4** below.

Even with this lack, what is surprising is that Bradley makes no reference to the riverside site at Runnymede on the Thames, excavated from 1987. This was principally a Bronze Age site set between former channels of the river, which also had significant Neolithic deposits. The first major publication of the site did not come out until 1991 but before that there had been a considerable number of smaller pieces produced including an informative article in 1985 (Needham 1985). After 1991 there were two major publications from the British Museum on the work at Runnymede which could have been considered by Bradley in his 1998 edition (for example Needham 1991, Needham and Spence 1996). He does, however, include the metalwork assemblage from the nearby site of Petters Lane (Needham 1990), in which he seems to separate artefact from context as discussed above. Another important site missing from the second edition is that at Dorney, Buckinghamshire where the building of a rowing lake for Eton College has revealed a great deal of the prehistoric riverscape of the Thames as well as enormous numbers of artefacts ranging from the Mesolithic period through to the Roman period. While it is still in preparation for final publication, much has appeared as a series of interim reports (for example Allen & West 1997).

Topographically the Thames now bears little resemblance to what would have been visible at the various stages of the prehistoric period. Work undertaken during the building of the Jubilee Line extension along with excavations on sites adjacent to the Thames has begun to show that it initially comprised a series of braided channels and islands (Sidell *et al* 2000, 106ff). Forests and woodlands on Neolithic and Bronze Age land surfaces can now be seen on the Thames foreshore, such as in the City, and at Erith with 1600 trees (see **Ch 4** below) (Haughey 1999, 17-18, Seel 2001). The tidal range is extending in line with a gradual global warming and prehistoric land surfaces,

particularly those of the Neolithic period hidden for many thousands of years, can now be seen at low tide (Milne *et al* 1983, 22). In the Mesolithic, central London would have looked very different with a completely altered alignment (Sidell *et al* 2000, 108). The key thought to extract from this changing topography is that while artefacts may have been retrieved from the Thames, it is very difficult to be certain that they originally went *into* the river as a primary place of deposition. This concept is one mentioned by Torbrügge in a 1971 article that Bradley uses to underpin many of his arguments, but which is apparently missing from Bradley's own book (Torbrügge 1971, 19).

Bradley refers to a lack of everyday objects from the watery places, preferring to discuss what may be called high status items. This seems a little unusual given the range of what Needham calls domestic artefacts from Runnymede (rings, pins, buttons etc). This assemblage is complemented by that found in Syon Reach at Old England, near Brentford. 300 metal artefacts of a domestic nature (such as pins, rings, buttons, tweezers, sickles and brooches/fibulas), now held in museums, have been retrieved from the tidal Thames within the Greater London area. None of these are referred to even in the second edition of the Bradley's book. It is interesting to note that at Dorney where there were Bronze Age cremation burial sites as well as what appear to be deliberately deposited faunal remains, swords which are so prolific everywhere else are conspicuous by their absence. While the current treatise is not concerned with artefacts of metal, 'everyday objects' in the Mesolithic and Neolithic may include flakes, small tools and the like. Bradley discusses axes, which form only part of the number of stone/flint objects retrieved from the tidal London Thames during the dredging operations. Out of a total data set of 830 artefacts, 211 are axes of which 16 are early Mesolithic, 73 Mesolithic, 2 Mesolithic/Neolithic, 4 early Neolithic, 115 Neolithic and 1 late Neolithic. Bradley's discussion concentrates on the Neolithic examples, which by no means can all be considered 'high status' such as those of jade, or highly polished for example. Also those axes which are not now within a watery context nor were in the past need to be compared with those that were to see if there is any significant difference in distribution, type or context.

It is the manner of retrieval which gives a somewhat skewed view of what was originally deposited in a variety of ways. The Thames material in antiquarian collections was for the most part procured either directly from the dredgers or via such people as GF Lawrence or Fenton, antiquarian collectors and dealers who operated

in the middle and lower Thames Basin. These collections now form the basis of those within such places as the British Museum and the Museum of London. Plainly, the dredgermen treated the objects they found in much the same way demolition men do today with the material extracted from building sites – as earners of additional money. On the Thames the situation got so bad that by 1935 the men were heavily fined by their employers if they were found selling artefacts, as noted by a disgruntled Lawrence to Dr CT Currelly, the then Director of the Royal Ontario Museum, in a letter dated 4 January 1935. The dredgermen picked up items that would sell and were obvious. Swords were a good case in point, and handaxes but not microliths of which there is only one recorded from the Thames material, or potsherds of which there are only 30 from the prehistoric periods. Skeletal material was sought by many but the recognition of human bone is not easy by the untutored eye, which may be one reason why so many skulls (indisputably human) have been noted. Bradley with Gordon subjected six skulls to C14 dating of which 4 were found to be from the Bronze Age (Bradley & Gordon 1988). Bradley lays great stress on this in his book (Bradley 1990, 108-109), but the statistical balance here seems a little lacking. He speaks about 300 skulls – only 183 of which can be reasonably provenanced – and to draw conclusions from the dating of four seems suspect. Since then another skull, the first *in situ* from the foreshore at Chelsea has been dated to the Bronze Age (1830-1610 cal BC, OxA-11087; 1760-1530 cal BC OxA-11086) and a further one to the Neolithic period (2460-2140 cal BC OxA-14728). While it is significant that there have now been 5 skulls firmly dated to the Bronze Age, more work and dating are needed to build upon this.

In spite of these details, Bradley's book has much to commend it and many of the points he raises opens up areas of further research. The main 'fault' is that of extremism, in a similar way to Tilley. The pendulum is allowed to swing from the state of all river finds being considered accidental loss or from erosion, to that of all being labelled 'votive offerings' – the 'one size fits all' approach referred to in 2.3 above. In addition, his approach, while seeming to be very particular, is actually too general in outlook given the information now to hand. It is also important not to assume that all practices, rituals and habits are undertaken by all people wherever they live. By blinkering himself to other reasons, Bradley weakens his argument when his theory is applied to the particular. Bradley himself realised the limitations of his research (Bradley 1998, xxx).

2.5 Recent developments

2006 saw the publication of the first book attempting to actively bridge the gap between theory and wetland archaeology, *Rethinking wetland archaeology* (Van de Noort & O'Sullivan 2006). The authors began by explaining why it is important to include theoretical discussion within the parameters of wetland archaeology and how the protagonists, by apparently almost avoiding such debate, have placed the discipline outside the mainstream dialogue (Van de Noort & O'Sullivan 2006, 9ff). What cannot be avoided is the realisation that wetland archaeologists have sidelined themselves as well as the discipline in the process, to the detriment of both. Van de Noort and O'Sullivan then go on to discuss a number of possible theoretical approaches, namely landscape (Van de Noort & O'Sullivan 2006, 32ff), social identity (Van de Noort & O'Sullivan 2006, 65ff) and material culture (Van de Noort & O'Sullivan 2006, 89ff). It is a useful start to opening the debate, but it must be seen as an overview of the potential, a beginning rather than a final pronouncement, and the authors do outline a number of ways to encourage this new approach (Van de Noort & O'Sullivan 2006, 146ff). One point that they raise is particularly apposite here. They state that 'wetlands also contain added-value archaeology on a range of other topics' and illustrate this by reference to what are called 'landscapes on the edge' (Van de Noort & O'Sullivan 2006, 148). They also point out that much of the debate surrounding sacred landscapes ('on the edge') in ideological and symbolic terms has taken place outwith the wetlands community, rather than them being involved in the core discussion (Van de Noort & O'Sullivan 2006, 148). One other important point to mention is the way wetlands are discussed as a homogenous whole when in fact they comprise a number of distinct entities – these differences have been discussed in **Ch1** above. This is another example of 'one size fits all'.

2.6 Approach and themes

With this in mind, the approach that I will take in this research will be from an inclusive, rather than an exclusive standpoint. While the primary focus will be on rivers and wetlands, the overall intention in the Thames case study is to set that data within the framework of the basin as a whole. In other words, to aim to place the wetlands back within their dry land context. It is not enough just to look at the river in isolation, as this is as bad as ignoring it completely. By looking at the landscape within which the

river lies, as well as the Thames and its tributaries themselves, a more holistic approach will be taken. In addition, by first examining other waterways in a number of other locations and seeking to draw conclusions as to their usage by hunter-gatherer and early farming communities, I will apply that information to the case study in order to create a balanced viewpoint of early human responses to rivers.

Two major themes will be explored in the following chapters. The first is the use of the river economically (which includes not only the water but also the fish, animals, plants, trees and other resources, the use for transport, trade and communication, and the choice of site for settlement). The second is the use of the river experientially/symbolically (this includes the river itself having special meaning in the form of sacred or liminal places and being used for ritual deposition).

To have selected one theme above the other would have created a dichotomy, similar to that outlined above in the discussions elsewhere in this chapter of the volumes by Tilley and Bradley. To have solely examined the relationship between rivers in the context of landscape and the ensuing human response is only one half of the whole picture. Equally, to have discussed the finds that have been recovered from rivers in isolation without reference neither to those from adjacent dry lands nor to the dry lands themselves would have similarly only revealed part of the whole view. It is important to take a flexible and integrated approach to both these two aspects so that all the evidence available can be included and discussed giving a rounded stance, rather than just a single perspective.

In both books discussed in depth, the authors can be accused of applying their individual cases too broadly. Tilley moves decisively away from the mundane to the experiential/symbolic. Bradley can only accept that finds from rivers have to be votive in origin. It is this viewpoint that is damaging to archaeological interpretation. What is more helpful to the argument is to avoid applying a dichotomous stance. In Tilley's case, by only concentrating on the mythical and symbolic aspects, it excludes the more practical and mundane, leading to a biased viewpoint. Bradley's stand would be infinitely more rounded if it acknowledged that while some artefacts have been deliberately deposited, others might have arrived in the river by less intentional means.

An extension of this discussion about the two sides can be found in Edmonds' *Ancestral geographies of the Neolithic* where he states *we assume that these spheres can be bracketed with one another: on one side a ritual world full of symbolic meaning: on the other a pragmatic, common-sense world of getting on with things and making a living* (Edmonds 1999, 8). The person who could fit into both Tilley's and Bradley's worlds is probably one who would identify with these two 'opposing' facets. Edmonds goes on to say *we create.....a division between sacred and secular, ceremonial and everyday, public and domestic* (Edmonds 1999, 9). This begs the question: is it wrong to assume that at this time or period, things were thus divided or is it just an imposition of current modern thinking? Or should not a more closely entwined behaviour be expected in the Mesolithic and Neolithic?

Yet this last approach might be one that could aid interpretation in areas where hard evidence is sometimes nebulous. One particular session which ran at the World Archaeology Congress (WAC5) at Washington in 2003, had a theme that fitted into this last statement and may be considered a third or alternative way. It is worthwhile here noting the session abstract:

Glimpses of a landscape's past

This session will consider cultural perceptions of landscape that hover between the fully physical and the wholly intangible, where peoples' views of the past are only slightly anchored by physical remains - places where past human use and impact has been subtle, or has left only slight traces. Capturing these ephemeral and almost intangible layers of landscape requires us to recognise the contribution of the insubstantial or the ephemeral, as well as of the monumental or the permanent to our understanding of landscape, look at how intangible values can arise from human activity and its vestiges as well as from natural features or spiritual attitudes, use archaeological, historical and other material aspects of the landscape to create personal or social responses as well as scientific responses.

Looking at landscape from this perspective will broaden appreciation of what cultural landscape means, and crystallise the debate about relativity and multiple values. Concentration on physical attributes (boundaries, buildings, earthworks) can lead to the privileging of scientific or economic values of landscape at the expense of 'softer' associative, personal and collective views. Ethnographical attributes tend to be sectorial, sometimes in an exclusive way. If a middle zone can be defined - where

limited physicality underpins or is underpinned by perception, then new perceptions will be possible, and landscape appreciation and conservation will be more inclusive. This is not merely a search for ways to classify landscapes that do not fall into the conventional categories. It is a search for ways to describe another layer of meaning for any piece of landscape, in addition to any other label it may be given.

(Session organised by Ellen Lee, Graham Fairclough and Tony English, WAC5 2003)

While not all aspects under discussion in this abstract will be covered within the confines of this thesis, what was interesting about this approach was the acceptability of having to deal with what might be termed ‘hints’ of former use. To extend this viewpoint, it is not implicit that the more symbolic aspects are more elusive than the practical (Ruth Whitehouse pers.comm).

Two areas of discussion are worth a comment at this point. The first is:

Concentration on physical attributes (boundaries, buildings, earthworks) can lead to the privileging of scientific or economic values of landscape at the expense of 'softer' associative, personal and collective views.

The problem in England, particularly, is that the wealth of evidence for the Neolithic is principally monumental in nature and it is the volume and variety of these remains that have somewhat blinkered our view of the period as a whole. Lack of settlement sites to study has led to a lop-sided view of what life must have been like in the Neolithic. On the other hand, in the Mesolithic the lack of almost anything other than flint tool scatters and debitage, and organic tools has led to potential misunderstanding of what living in that period entailed. Researchers have been blinded, not so much by the information as by their interpretation of it. Conversely, it can be seen that Tilley’s volume does deal with monuments but his approach cannot be accused of *the privileging of scientific or economic values*. Overseas the evidence available is sometimes more balanced in its density and range, and therefore in order to attain a more balanced viewpoint, it behoves the researcher to extract such information as they can from the nearest countries and others that are similar in climate and influences.

The second area is:

Ethnographical attributes tend to be sectorial, sometimes in an exclusive way.

While in principle this statement bears a lot of truth, this should not either inhibit the use of ethnographic evidence if used judiciously. Information gathered in this disparate

way needs to be used carefully, as discussed below but it can add an extra dimension to the picture.

Edmonds says in reference to the Neolithic *yet for all our disciplinary rigour and our technical accomplishment, it is a difficult world to capture: fragmentary and elusive* (Edmonds 1999, 5). When the range of information that has been collated for the period is considered, it only gives a small view of life in the Neolithic. There are huge gaps in the knowledge that is available, not least the somewhat vexed question of where people were living and details of their day to day life. With the immense breadth and volume of monumental evidence, it might be thought that here, at least, the area of ritual and symbolism might be better understood, but this is only partly true. When the question of the human relationship with landscape is raised, the answer is again only partially complete. Landscape studies have been selective in their approaches – Stonehenge and its environs seems a particular favourite (for example Thomas 1991, 163ff, Barrett 1994). Consideration of rivers has not really entered into the equation very much.

In this context, the Mesolithic, with no monumental features but with its flint scatters and presumed kill sites, is in an even worse position of being understood in anything other than at a subsistence level. The land economy has been the subject of discussion (for example Three Ways Wharf, Uxbridge and Star Carr (Lewis 1991, Lewis *et al* 1992; Mellars & Dark 1998)) but there has been no case posited for a direct link with water resources in spite of the location of both these sites. This begs the following questions:

- (a) *Does this close relationship between rivers and humans exist?*
- (b) *What are the reasons for such substantial evidence of human presence found in close proximity to water, and rivers in particular?*
- (c) *Is there a traceable change through time in the relationship between rivers and humans?*
- (d) *Is there a formal relationship between Neolithic monumental features and water?*

Both direct and indirect evidence will be examined. The latter includes rock art and the role of the senses (vision, sound and touch) in understanding the monumental structures.

2.7 Methodology

In order to provide a framework within which to discuss these questions, two principal methods of investigation will be employed: ethnographic analogy and archaeological comparison.

2.7.1 Ethnographic analogy

A history written as Analogue is an account written in the present, which weaves together the traces of the past in a web of rationalisation (Thomas 1991, 5).

The use of analogy as a tool within archaeological interpretation is an issue that has been debated heavily over the past decades (see below). Its application here will be to gain the widest possible understanding of different ways of doing things within arrangements of similarly situated communities. The information gained will provide ideas for interpretation but not for direct comparison.

The need for an analogy

When someone is seeking to interpret archaeological evidence from the prehistoric period, they are almost always at a disadvantage when compared to those working within the historic periods. In the later periods, there are often written sources and illustrations that may be found carved in stone, cast in glass or metal, or in paintings, for example, which help give a more detailed description of both the day-to-day life and the more ritualistic aspects of the former society. In spite of the necessity of having to validate the written records which may appear in various guises and may also be biased, they do supply the opportunity to flesh out the physical evidence which has been excavated out of the ground. In Britain, apart from the Iron Age, which overlaps with the Roman period, all the earlier periods can only be judged by the surviving material culture. For a variety of reasons this may be diminished or of a reduced range, which could lead to a skewed opinion of the way of life of those prehistoric people. This is never more apparent than when dealing with the archaeology within London and from the Thames where excavation is limited and frequently truncated, and where the artefacts recovered from the river are a selection made by way of someone else's criteria. The problem with material in the London Thames basin is that much would

appear to have either been lost or ignored or not yet retrieved because it is still below the alluvium. Where deep excavations do take place, the evidence uncovered indicates what is probably being missed on other more shallow sites (for example Gifford *et al*, 2001; Oxford Archaeological Unit, 2000). The other riparian parts of the Thames basin have not been subject to the intensity of study as that applied to the inter-tidal stretch. Therefore in this study given the knowledge available, it is necessary to make use of other comparative material which can be placed alongside that from the London Thames area and the Thames basin as a whole.

The definition and parameters

Using the widest possible range of evidence enables a general picture to be built up of the use of rivers and wetlands by hunter-gatherers and early farmers. It would seem to be beneficial to examine ethnohistorical and ethnographic records of other countries where major river systems have been utilised, but even this approach needs to be handled with caution. An analogy is an agreement or similarity, especially in a limited number of features and a comparison to show such a similarity. It is a form of reasoning in which a similarity between two or more things is inferred from a known similarity between them in other aspects (Collins 1995, 43).

The use of this technique within archaeology has produced a disparate spectrum of views in a debate ranging over the past few decades as to its value and misuse. These arguments have been rehearsed elsewhere and will not be discussed in great detail here although a brief outline will be given. Binford laid out his example of the archaeological use of analogy with a discussion on smudge pits and hide smoking amongst North American Indians (Binford 1967). He set out the 'logical steps' that he used in his analysis that included building a formal analogy from ethnographic information, an examination of the archaeological features, the building and testing of hypotheses of behaviour between the two, and the results accrued (Binford 1967, 9-10). He concludes that 'analogy serves to provoke certain types of questions which can, on investigation, lead to the recognition of more comprehensive ranges of order in the archaeological record' (Binford 1967, 10).

Ucko contributed the debate with a discussion of the use of ethnography and archaeological interpretation of funerary remains (1969). He comments that 'a one-to-

one correlation' between the modern patterns and the ancient records can only be found in exceptional cases (Ucko 1969, 262-263). One of the most pertinent points he makes is the suggestion that 'one of the prime results of the use of ethnographic parallels is to take the archaeologist back to his own material' (Ucko 1969, 264). In other words, the use of ethnographic analogy can result in a closer examination of the original archaeological data, a process that may refine the number of possible interpretations that can be drawn.

Hodder (1982) outlines a variety of possible approaches and advocates its use as an archaeological tool. His distinction between formal and relational analogies is very pertinent here. Hodder defines a formal analogy as a situation where 'two objects...have common properties, they probably also have other similarities' (Hodder 1982, 16). The likely pitfalls here are manifest. He suggests that the argument, using formal analogy, loses strength because those observed similarities may, in fact, be only 'fortuitous or accidental' (Hodder 1982, 16). In addition, the choice of those examples might lead to only favourable comparisons, rather than giving a less biased starting point. Hodder's description of a relational analogy presents a stronger case in the use of this tool. He defines it as determining 'some natural or cultural link between different aspects of the analogy' (Hodder 1982, 16).

Orme in 1981 gave a practical viewpoint to an archaeologist seeking to explore the value and methodology of utilising the analogical tool (Orme 1981, 1ff). She outlined five categories (piecemeal use of parallels, ethnohistorical studies, ethnoarchaeology, ethnographic background and models, and comparative studies focussed on the past) (Orme 1981, 21). There are considerable overlaps between the various categories.

Gould (1980) argues against the use of analogy, listing all the pitfalls. A 'dialogue' between Gould and Watson (1982) provided an opportunity for both sides of the argument to be debated (Gould & Watson 1982). Wylie's answer to this discussion suggests that the basic differences between each of their approaches is a) that of definition of analogy, with Gould's being tighter than Watson's, and b) that of terminology (Wylie 1982, 385-386). While they come from what appear to be opposing standpoints, the final result of their dialogue is that they acknowledge a greater degree of agreement than might have been accepted (Gould & Watson 1982, 376; Wylie 1982, 385).

Wylie (1985) examines viewpoints and also the history of the use of analogy. In spite of the early misuses in which ethnographic evidence was selected by prehistorians to suit their own interpretations, she concludes that ‘analogical inference is not radically faulty or categorically misleading’ (Wylie 1985, 72, 107).

‘There are criteria and associated methodological strategies for strengthening and evaluating analogical inferences, if not for “proving” them, that clearly provide a basis for weeding out and decisively rejecting those cases of false analogy that originally inspired the reaction against analogy.’

(Wylie 1985, 107)

Wylie also suggests the use of ‘a stock of analogs (sic)’ as a general reference guide (Wylie 1985, 76).

Potential pitfalls relevant to this thesis, include an example where the connection seems more tenuous as can be seen in Jochim's work on salmon fishing in the Upper Rhine region (Jochim 1979). The use of a coastal fishing industry in NW Canada and that of the past 500 years on the Upper Rhine are used to form the series of models Jochim constructs for examination against that of the Mesolithic evidence (Jochim 1979, 219-221). The Upper Rhine is in SW Germany, many hundreds of kilometres inland from the Atlantic coast, in stark contrast to the Canadian example. The historical data, too, present difficulties in that they are not dealing with a comparable hunter-gatherer society, but rather one that became increasingly more industrialised as time progressed, and it was the effects of pollution, canalization and the building of hydro-electric dams that finally caused the salmon to disappear from the region (Jochim 1979, 221).

Another danger is that of selecting regions for comparison because they appear to fit what is being looked for in the analogy. It is important to begin looking in societies that appear to bear most resemblance to that which is being studied but the connections or links that are noted, need to be more than accidental or circumstantial. Also no society today, however ‘primitive’, can ever truly be said to parallel those in the prehistoric periods of Britain, for example. One such problem might be embodied in the question: are modern Africans or New Guineans more like prehistoric Europeans than we are?

2.7.2 Archaeological comparison

The use of comparison as a tool to interpretation in archaeological research is too well-known a technique to require a detailed discussion of its use as analytical method. There are, of course, pitfalls which should be avoided if possible. One is the assumption that because a particular *modus operandi* can be detected on one site, that this can be applied universally to all other sites without due consideration. An extension of this is the need to be careful when using this information in dissimilar circumstances without due consideration of all the variables involved. A second pitfall is that noted above in the discussion of analogy – the choosing of sites to examine because they will ‘fit’ the argument the researcher is seeking to define.

2.8 Conclusion

By utilising the combination of archaeological methods (including direct archaeological interpretation of my own specific data gathered from the Thames foreshore over the past decade, as well as comparison with other archaeological contexts) with the use of ethnographic analogy, the range of potential information is much wider and in greater depth. When all the different methods reviewed point in similar directions, the argument for understanding the relationship between humans and rivers in the early prehistoric periods is enormously strengthened. Where there is disparity, the results will be the basis for a more balanced assessment than if one method alone was used.

CHAPTER 3

ETHNOLOGY, ETHNOHISTORY AND NON-EUROPEAN ARCHAEOLOGY

3.1 Analogy and comparison

As outlined in the previous chapter, discussion here will be undertaken using an analogical approach to examine a number of modern ethnographic and ethnohistorical communities, and archaeological comparison with a selected number of rivers on other continents. The methodology utilised is discussed in 3.3 below and with a range of societies from Australia, the Near East and S & N America. The locations and peoples are quite disparate and may seem unconnected because of their distance and chronological differences. In fact the similarities are more obvious than may initially appear. Firstly, the chosen river systems are equivalent in size to that of the Thames and the lifestyles of the historic communities selected are more than comparable with those from prehistory. Secondly, the methods of harvesting the rivers have changed little over the past millennia and the evidence available of equipment shows that freshwater fish are still being caught by rod and line, by nets and by fishtraps and weirs as they were in the Mesolithic period in Europe. By and large in the western world, poison is not used but it is not unlikely that it was used in the past. The only changes to equipment are the material that is used now including plastics and reinforced metals, and the introduction of the reel. While the societies might vary, the fishing equipment is highly comparable.

The choice of the right route to take in deciding on which type of analogy would be most appropriate in this situation is coloured by these similarities. As discussed in **Ch 2**, the cross-cultural methodology is not the best method to use. Instead, a more relational approach has much to offer as advocated by Hodder (1982, 16). Beginning with the technical aspects of fishing, and then examining lifestyles and belief systems, it is hoped to widen the understanding of the use and usage of fish and fishing.

3.2 The definition and parameters

Parallels of behaviour both economically and experientially have been sought both from a range of places around the globe, and available ethnohistorical and ethnographic accounts. Also the size of the river systems has been chosen to be as near parallel that of the Thames as possible. The Amazon itself, and the Mississippi, for example, are

much larger than the Thames and so the tributaries are the focus here, or only a part of the main system. The term 'economic' is used to describe the variety of ways the river impinges on the lives and is used by prehistoric society, such as fishing, hunting, use of raw materials from within and by the river, trade, transport, siting of settlements and how it related to early attempts of agriculture. 'Experiential/symbolic' can also be described as sensory and ritual and includes the way the river was seen as part of a system of rituals, beliefs, myths as well as how it was perceived within a pantheon of nature spirits and gods. These two facets have been chosen as they seem to cover most aspects of prehistoric life and are the ones potentially most easily identifiable from the records and information available.

3.3 Methodology

Data in this chapter has been gathered not from personal fieldwork but by examining that undertaken by others. By investigating accounts written over the past 400+ years from a variety of sources and by searching through published and unpublished archaeological material, it has been possible to produce the following material and to draw conclusions of behaviour within riverine locations.

It is not feasible to examine ethnographic or ethnohistorical evidence from rivers within Britain as there are no areas which still contain societies that exist at a hunter-gatherer or early farming level and so it has been necessary to look outside the region for comparisons (Zvelebil 1998, 13). The problem then arises of the difference in climate and other impacts on the environment that will have an effect on the lifestyle of the river people. Examples have been chosen, therefore, with a range of climatic conditions from around the globe for comparison working on the assumption that if there are similarities under such circumstances then they are worthy of analogical study.

Archaeological comparison potentially suffers as well when looked on pan-globally:

Quite apart from the linguistic problems, the assembling of disparate sources of evidence, the choosing from the vast body of data those elements which are significant to the overall discussion, and the combining of contrasting methodological approaches and widely differing interpretations into one coherent narrative which cuts across the

artificially created boundaries, are all unenviable tasks, even when they are sweetened by the uniqueness of the undertaking. (Midgley 1992, xiv)

Before selecting which regions to examine in detail it is necessary to draw up a list of criteria to apply to potential regions and these are as follows:

- The regions selected should contain a major river system or series of systems similar in size to that seen within the Thames basin, bearing in mind that during the Mesolithic and Neolithic periods the Thames was not tidal.
- Preferably both hunter/gatherer and early farming communities should be represented.
- Ethnohistorical records should be available.
- Modern ethnographic observations should be available.

These criteria were the ideal to aim for but, as is common, were not always able to be applied in their entirety. They did, however, provide a basis for the selection of the case studies to be discussed and used in the building up of the analogies and comparisons.

Ethnohistorical records can be found within the accounts of the European explorers who travelled not only across the Atlantic ocean to North and South America but also to Australia and the Near East. They were searching initially for trade routes for exotic spices and goods, and latterly, after the discoveries of the Inca and Aztec empires, for gold and other precious items. Accounts written about Australia tended to be written by those undertaking exploration (for example, Mitchell 1838a,b, 1848), whereas those describing events in the Americas were written by a variety of people, only some of whom had actually taken part in the expeditions and not always at the time. In the case of the de Soto expedition, for example, one of the authors wrote the account 20 years after the event.

The ethnographic studies have included doctoral theses and other studies of particular tribes and their spiritual beliefs. The Australian material includes several of the former which are unpublished and from which there is no later published material; the so-called 'grey area' and which it is difficult, sometimes impossible, to access (Jeannette Hope, pers. comm.). The South American information includes several detailed accounts of some of the tribes examining not only the day-to-day events but also the experiential or

symbolic aspects of their lives as it is still possible, in the Amazon Basin, to find those who are living in a similar way to their prehistoric forefathers. The groups which are discussed are living by the tributaries of the Amazon – not on or near the Amazon itself. The flooding that occurs annually along the main river effects the whole pattern of life as can be seen in Harris' studies (Harris 1998; 2000). This major inundation is not replicated in the same way on the Thames during the Mesolithic and Neolithic (see **Ch 4**) and so the people living in the Parú are not considered in this study.

Archaeological evidence also suffers from both differing levels and/or lack of publication. Evidence of fish remains, for example, are often scanty, and only found in an appendix. Rarely is there any assumption of use of riverine or aquatic resources especially for inland waters. Greater emphasis (or in some cases the only emphasis) is placed on land mammals or plant resources. Problems of preservation of both aquatic remains and recognition of the equipment used to catch them have caused a noticeable bias against any expectation of subsistence within water resources.

The regions and rivers selected for examination are as follows:

- **Australia** (Murray/Darling, Alligator) (**3.4**)
- **Old World** (Euphrates, Jordan Valley, Egyptian Nile) (**3.5**)
- **New World – S America** (Amazon basin) (**3.6**)
- **New World – N America** (NW Pacific coast, Mississippi, Lower Colorado) (**3.7**)

Each of the selected case studies will be examined in the two ways mentioned above. These are firstly, by looking at the economic elements of each society with comparative results drawn up into a table (**3.4 – 3.7**). The experiential/symbolic aspects such as treatment of the dead, ritual, myth, symbolism etc will be treated as a whole by looking at themes, which are similar or otherwise within each chosen study (**3.8**). Where possible information will be placed within sections which then can be compared more easily. Finally, in **3.9**, conclusions will be drawn as to the range of analogies and comparisons that the evidence can sustain.

3.4 Australia

Background

A discussion of the ethnography of the Aboriginal people of Australia is fraught with difficulties. On the one hand, ‘virtually no Aboriginal groups have lived a traditional hunter-gatherer life since the great drought of the 1950s drove the last few desert people to seek water and food in government settlements and mission stations’ (Flood 1997, 144). This, of course, does not include those resettled in Arnhem Land in the north-east of the country. On the other, many of the places which are sacred (such as rock shelters, cemeteries, rock art sites) have continued to be used, in some cases, to the present day. In this context, ritual is often seen as conservative and changing less than other aspects of life. The approach taken will be one of treating the material as a whole where there is evidence of continuity of use. Also, while the Murray-Darling is in the largest drainage basin in the country, other rivers have seen similar if not equal intensive use over a long period. Attention, therefore, will be primarily focussed on the Murray-Darling but where the discussion warrants it, other areas such as the Alligator will also be included.

History and Topography

The Murray-Darling basin is the major river system of Australia (Hope 1993, 183). Peterson suggests that the drainage basin should be considered in the light of ‘an important determinant of regional groupings’ (Peterson 1976, 61). It is a circular plain bounded to the east and south by highlands of the Great Dividing range and at some 1,036,000 square kilometres in size, it is slightly more than one-seventh of the continent (Pardoe 1995, 696). It can be divided into two basic landscapes – the ‘riverina’ or riverine plain to the east and the Mallee to the west of the Murray and the Lachlan rivers. It comprises the main river, the Murray, which drains from its head in the south-east corner of New South Wales in an east - west direction and a number of major tributaries including the Lachlan, the Murrumbidgee and the Darling. This latter at 1600kms long, rises at Wentworth, flowing from a north-easterly direction and has its own tributaries draining from the highlands. The plain is very shallow with the land in the riverina area semi-arid. For over 800 kilometres, the river crosses the plains of the Darling basin and is inhabited by groups known as ‘Bagundji’ or ‘river people’

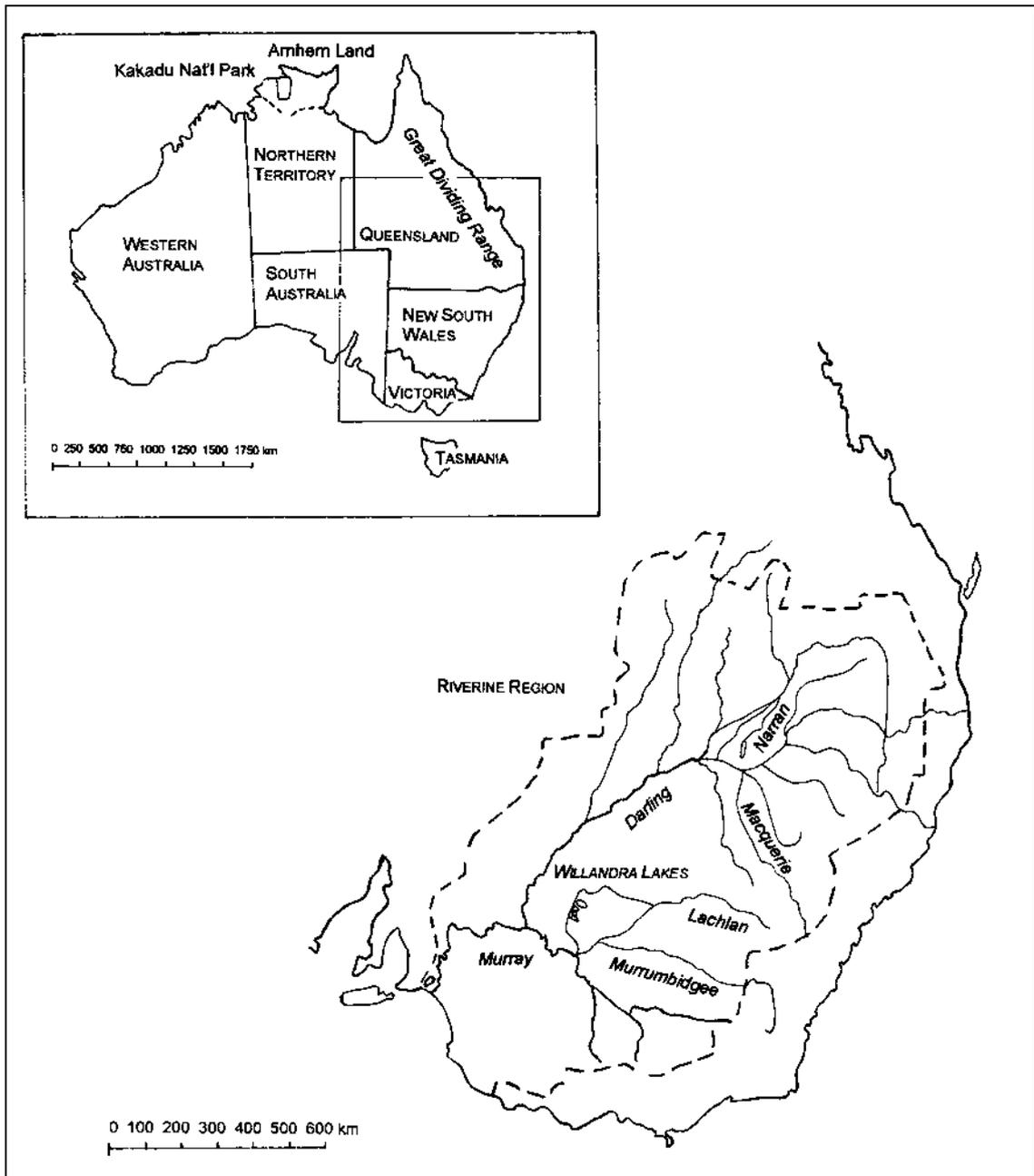


Figure 2 Australia

(Lourandos 1997, 54). The basin as a whole consists almost completely of water-transported alluvial and lacustrine sediments (Pels 1971, 38). The Mallee is adjacent to the more productive Murray and contains small perennial rivers, swamp and wetlands. Both of the major arms have anabranch systems, that is, streams and rivers branching from the main channel and rejoining at a later stage. The rivers also meander a great

deal which resulted in the anabranches and may have shifted their beds at times in the past (Hope 1993, 183).

When the first people arrived from Asia over 50,000 years ago, the continental shelf was much larger than at present although still surrounded by water (Flood 1995, 5). The icesheets forming in the northern hemisphere caused the sea-level to drop. The colonisation of Australia was probably initially along the coast and then up the rivers, using the natural route-ways into the interior (Flood 1997, 140). It is likely that many of the earliest sites were located on the continental shelf and were subsequently lost when the waters rose again (Flood 1995, 281). The lower part of the basin was subject to inundation and lakes were formed in the Willandra region approximately 40000 years ago, allowing for exploitation of fish, shellfish and small land animals. The 13 interconnecting dry lake basins that are all that is left of this lacustral stage, have been subject to archaeological attention and a series of radiocarbon dates from 31 locations of charcoal, midden material and human bone have shown a human presence in the area from as little as c.35000 cal BC - AD 1647 –1520 (Johnston & Clark 1998, 111-113). Many of the lakes have lunettes or crescent-shaped dunes of sand or clay and it is often from these that the archaeological material has been recovered.

The Aboriginal people in this area were hunter-gatherer-fishers living by the rivers when they were in flood and returning to the bush when the riverine resources began to fall off. Their pattern appears to have been to camp near the lakes in the spring when the emu eggs were being hatched. In the hot summers, they fished the rivers and gathered shellfish until the fish and eels ceased to run and in the winters moved into the arid surroundings and hunted land game (Flood 1995, 54). Evidence of shell middens litters the lunettes as well as at the coast (for example, Coleman 1982, 1; Balme 1995). Historical sources recorded this seasonal pattern in the nineteenth century (Flood 1995, 247).

Aquatic resources

Eels (*Anguilla australis occidentalis*) were a major source of food in south-east Australia and on the Mallee in particular. They migrated upstream in the spring to inland feeding grounds and returned downstream in the autumn to spawn in the tropics. Sometimes they were speared but frequently they were caught in traps which could

extend across the river or stream (Presland 1994, 75). Elaborate stone canals, still extant, were constructed on Lake Condal in Western Victoria and these siphoned the eels into specific routes (Jackomos & Dowell 1991, 40; Flood 1995, 242). These traps also helped to retain water in times of drought or drained off excess waters when there were floods (Lourandos 1980, 254). Other fish caught elsewhere included silver barramundi (*Lates calcarifer*) – a freshwater fish that spawns in saltwater estuaries, saratoga (*scelropages jardini*), fork-tail catfish (*Hexanematichthys leplaspis*), eel-tail catfish (various *Neosilurus* spp) and mullet (*Liza dussumieri*, *Liza diadema*) (Taçon 1989, 241).

The smaller fish were caught by netting. On the Darling river in the nineteenth century, Aborigines used to set up nets made from bulrush reeds (*typha*) 100 metres long to catch perch (*plectroplites ambiguus*). Stone traps with funnel-shaped baskets (Presland 1994, 76), and weirs can still be seen on the east coast of Queensland which have been used to catch salt water fish such as the barramundi (*Lates calcarifer*) spawning in estuaries. The problem lies in dating the structures; adjacent shell middens in close association have been used at Booral, for example, producing a date range of 1640-1380 cal BC to cal AD 980-1220 (Bowen 1998, 42). Other methods used inland to catch the larger fish, such as the Murray cod (*Maccullochella macquariensis*) include spearing (Flood 1995, 53-4). Poison was also used to stupefy the fish in many parts of the continent and particularly in New South Wales and Queensland (Banfield 1909, 54-58; MacPherson 1932, 157-161).

In the south-west of the country, marine fish played a major role in the subsistence of the Aborigines. Evidence of a range of methods of catching the fish in estuaries and coastal waters includes tidal weirs, traps, fish drives and spearing by individuals can be found in accounts from the 1830s until modern times (Dortch 1997, 16-17). Freshwater fishing, however, with only one potential native food species (a catfish) was a 'minor subsistence activity' (Dortch 1997, 17). In contrast the inland areas were heavily exploited as the freshwater wetlands, lakes and streams which feature extensively on the coastal plain provided water fowl, frogs, crustaceans, turtles and bush roots (Dortch 1997, 17).

Animal resources

Animals known to have been hunted include possums, pademelon or scrub wallaby, koalas, red kangaroos, bandicoots and kangaroo rats (Campbell 1978, 93; Flannery 1995, 212 –214). Birds that were hunted included emu and brush turkey. The former were lured into nets by the use of an emu trumpet – a shorter kind of didgeridoo (Kennedy 1932, 154). Waterfowl were snared on large nets slung across water courses (Lourandos 1997, 55). Or by stealth:

The natives under cover of weeds and water-lilies, had watched the paddling of their [the ducks'] feet, then stealthily rose and deftly grasped them while swimming, wrung their necks, and put them in the weeds.

(McMaugh 1931, 13)

Returning boomerangs were used when hunting ducks and swans were driven into the reeds. In the early part of the year, eggs and fledglings would be available (Campbell 1978, 93).

Plant resources

While gathering of seeds was widespread across Australia, it was a predominant activity in the arid and semi-arid areas and particularly in the belt of grasslands which swept around the country from west to east (Kirk 1981, 75) These grasslands spread into the south-east and gathering the seeds was an important activity for the Bagundji in the Darling basin. Mitchell in the early part of the 1800s noticed great heaps of grass (or millet *Panicum laevinode*) which had been gathered and placed near the Darling (Mitchell 1848, 98). He described the seeds of the millet 'a red-stalked coral-like plant' as being small and black 'like fine gunpowder' with a sweet, pleasant taste and a nutty flavour (Mitchell 1848, 98). Wet grindstones were used to make seed cakes or the seed itself could be stored in skin bags until required (Allen 1974, 314, Tindale 1974,106; 1977, 346; Kirk 1981, 75). The food from the scrublands was also gathered. Acacia seeds were harvested, fruits were pulped and the seeds of the kurrajong and quandong kernels were cracked but the grass-seed economy was more efficient in extraction terms making the grasslands the more populated of the two types of areas (Kirk 1981, 76). Tubers were, however, the main staple vegetable on the Murray where there were many

reed beds (Kirk 1981,75). The starchy root of the balyan, (a rhizoma of bulrush which is a monocotyledonous plant) was used to make cakes after drying and grinding. An alternative method was to roast them whole. They were gathered in great bundles in pieces of net (Mitchell 1838b, 61, 133). Yams and water lilies were either cooked or eaten raw, fruits were gathered, tree shoots and leaves were dried, and gum from acacia, *Eucalyptus mannifera*, and the sandalwood, *Myoporum platycarpum*, was collected and eaten (Kirk 1981, 74).

The Australian aborigines were hunter-gatherer-fisher peoples who did not, as was the case in other parts of the world, begin to domesticate either crops or animals. Evidence has shown that the three ‘preadaptations’ required for the origin of domestication as postulated by Flannery in 1969 were in place; that is, exploiting a more broad spectrum of edible wild resources, development of a ground stone technology and the development of storage facilities (Flannery 1969, 77-8). Those in the Murray-Darling basin did gather wild cereals but remained hunter-gatherer-fishers. The arguments as to why this should be the case are rehearsed elsewhere and are not necessary to the current discussion, but it is sufficient to say that that they were ‘probably in some form of equilibrium with the food supply’ (Allen 1974, 317).

‘Gardens’

What is interesting are the earth mounds, or so-called gardens, that are found in south-east Australia along the banks of the Murray river and some of its southern tributaries but not the Darling (although some are located on the Macquarie, one of its tributaries) (Balme & Beck 1996, 45-6). The first appearance of the mounds seems to have been in c.550 cal BC, which coincided with a rise in lake levels, and may suggest a shift to a warmer climate (Williams 1987, 319). They have been described as ‘pre-European heaps of raised dirt’ and consist of charcoal-rich sediments and fragments of burnt clay (Balme & Beck 1996, 39). Over a thousand of these mounds have been found in southeastern Australia, although as noted above their distribution is not uniform. Work undertaken during the 1980s by Elizabeth Williams concentrated on three areas in central southwestern Victoria (Williams 1985, 1987, 1988). Basal dates for these mounds indicated that none of those chosen for study were more than 2,500 years old and in one area near Mount William, a date of only 300 years was recorded (Williams 1988, 217). This does not suggest that the occupation of the site was recent, only that

the mounds were constructed at a later date (Lourandos 1997, 216). Williams, on the basis of limited personal excavation in which one mound was found to have remains of a possible structure and cooking pits and another to have a ditch, suggests that these were baking/cooking places, hut foundations and were ‘primarily used as ovens, although some sites were also used as camping places’ (Williams 1985, 78; 1988, 212). While they bear similarities to the garden mounds of Papua New Guinea used for growing sweet potatoes, the mounds in Australia have little evidence of later use for agriculture (Balme & Beck 1996, 46).

Artefacts and trade

Artefacts that are known to have been used on the Lower Murray river and south-eastern regions at the time of European penetration include bark canoes which are simple craft suited to the inland waterways (Mulvaney 1975, 96). They are made from a single sheet of bark stripped from a tree which is usually the river red gum (*Eucalyptus camaldulensis*) with its thick bark (Presland 1994, 76). These trees line the rivers and a stone axe would be used to remove the bark that is then heated over a fire to produce the curved shape (Presland 1994, 76). Some of the best examples of ‘canoe’ trees ie trees with scars remaining after cutting, are along the eastern bank of the Murray opposite Blanchetown where 19 can be seen (Flood 1990, 202). Mitchell recorded a similar event on the Darling in 1838:

‘a boat made of sheet of bark with clay at each end; with a fire in it;
propelled with a spear while standing erect, striking either side of boat’

(Mitchell 1838a, 221)

Other artefacts include paddles, for example, one of native pear (*Xylomelum pyriforme*) (Enright 1932, 103). Bull roarers or whirlers were made from a flat slab of wood either lanceolate or long-oval in shape, with a hole pierced at one end to which string was tied. One use is discussed in the section on corroborees below. Baskets, nets and containers were made from reeds and bulrush fibres, and skins were used to make bags used for storage (Allen, 1972 plate 3.2).

‘Then, as now, it seems women were equipped with digging sticks, men with spears and boomerangs’ (Flood 1995, 147). Returning boomerangs made of curved shaped wood were used when hunting (Cranstone 1973, 16). Spears were tipped with bone or stone

which may be the only part of the artefact to survive (Flood 1995, 246). The women's universal tool is still a digging stick, that is a sharpened stake *c.* 1.23m in length. It is used for digging up grubs, roots, edible ants and burrowing animals (Cranstone 1973, 17; Tindale 1974, frontispiece, 12). All these artefacts are organic items and survival rates are low. The paddle noted above, for example, survived because it was dragged from water (Enright 1932, 103).

Artefacts that have a higher chance of surviving are those made of stone. These include the grindstones referred to above, which have a long history of use and also have been found in archaeological contexts always in close association with water (Hope 1993, 195). 'Grinding of seeds to be mixed with water and made into dough was traditionally a woman's activity in Aboriginal Australia' (Flood 1995, 278). For the central Darling area, they would have had to be transported at least 50-300km, implying that there were extensive trade connections (Hope 1993, 195). There are no local stone sources at all along the lower Darling down the junction with the Murray but at Willandra, silcrete has been quarried and exported. Backed blades had disappeared from the Lower Murray valley sites by *c.* 1750 cal BC but were still present in northern New South Wales in the sixteenth century AD and in the Darling basin until approximately one hundred years ago (Allen 1972, 354). They were used as spear barbs for both hunting and fighting (Flood 1995, 224). Other stone artefacts include cylindro-conical stones which have been compared to phalli but whose function is not fully understood and are unique items of the Darling river material culture (Allen 1972, 39-40). Stone adze flakes have a long history in Australia but in the desert areas rather than the Murray-Darling basin.

What has spread over all over mainland Australia over the last few thousand years has been ground-edge axes (Flood 1995, 226). These hafted axes or hatchets were seen by the nineteenth-century Europeans as 'the most useful implement possessed by the Aborigines' (Smyth 1878, 379). There were many quarries in the south-east corner of the country (Binns & McBryde 1972; 63-67; McBryde 1984, 268). Those from quarries in the northern New South Wales were primarily exported to the adjacent areas within the Great Dividing Range and a much smaller number made their way downstream to sites on the Darling river but no further than Terryawynnia, having travelled many hundreds of kilometres from the source of the stone (Binns & McBryde 1972, 48).

Corroborees

Distribution of the axes as referred to above. was more than just a trading enterprise. McBryde suggests that 'strong social determinants [were] operating on both the production of stone and on its distribution through the exchange practised by societies in south-eastern Australia' (McBryde 1984, 282). Ethnohistorical evidence for the location of ceremonial meeting places, or 'boras', sites show many are in the south-east (McBryde 1984, 279).

The ceremonies or corroborees, such as for the initiation of young men, appear to have provided major contexts for exchange (Wright 1923, 59). The observers from the nineteenth and early twentieth centuries noted the 'economic orientation of intertribal activities, although not exclusively so' (Mulvaney 1976, 73). The spread of prestige goods was tied in with exchanges at more esoteric levels. While greenstone axes were one type of commodity, many other items were carried to the intertribal gatherings and exchanges within Australia as a whole. The only criteria seem to have been that the items were portable and durable. Boomerangs, bullroarers, red ochre, sandstone slabs and shell pendants were just some of the items (Mulvaney 1976, 80). Bull roarers were commonly used at ceremonies and at corroborees (Kennedy 1932, 155-6).

Division of labour

Allen noted that among the Bagundji there were few tasks on the river specifically restricted to men except for the spearing of fish (Allen 1972, 50). Spears were associated with hunting and this was seen as the male preserve, although women would have been used as beaters etc. There were, however, a large number of tasks generally done by women but occasionally by men. Shellfish such as freshwater mussels were usually gathered by women but when they were the major food source available, men would be involved in their collection (Kirk 1981, 74). Similarly with the yabbies, both sexes would take part in gathering when they were the main dietary component (Allen 1972, 50). Men and women set nets and hauled the catch in when dealing with birds or animals but the fixed nets and weirs were left to women. In some places, catching fish (except by spear) was left entirely to the women (Allen 1972, 51). The roots, dug out of the lagoons and swamps, were available only for a short time so all the labour was done by everyone. In Australia as a whole the division of labour is much more marked than

along the Darling particularly in drier places like the northern Arnhem Land (Flood 1995, 259). The sharp division amongst the Bagundji came with ceremonial events or initiations when certain sequences would only be known to one sex or the other.

3.5 The Old World

3.5.1. The Euphrates

The name 'Mesopotamia' is derived from the Greek, meaning '(the land) between the rivers' and is a region of western Asia defined by the Euphrates and Tigris rivers with their tributaries. Although the Euphrates is not the largest of the world rivers it is one that has played an important role in human history especially when considering urban civilizations.

There is very little known about what was happening within Mesopotamia before the Neolithic. One reason seems to be that researchers are much more interested in beginnings of agriculture than looking at what was happening in earlier periods and so how they used piscine resources or related to the rivers and wetlands is not really discussed. Another possible reason is that the Mesolithic and early Neolithic sites of lower Mesopotamia appear to be either drowned in the Shatt al-Arab (which during this period was dryland) or buried beneath layers of alluvium as very few traces have been found (Harriet Crawford, personal communication). Many authors make vague references to what might be termed 'early people' (for example Mellaart 1965, 11-13; Adams 1981, 1; Kreuzer 1984, 593) but there are no references to specific sites. These early people, by 5000 BC, had begun to inhabit the alluvial plain and left traces of settlements and primitive irrigation canals. They relied largely on fish, birds and small animals but they also grew barley

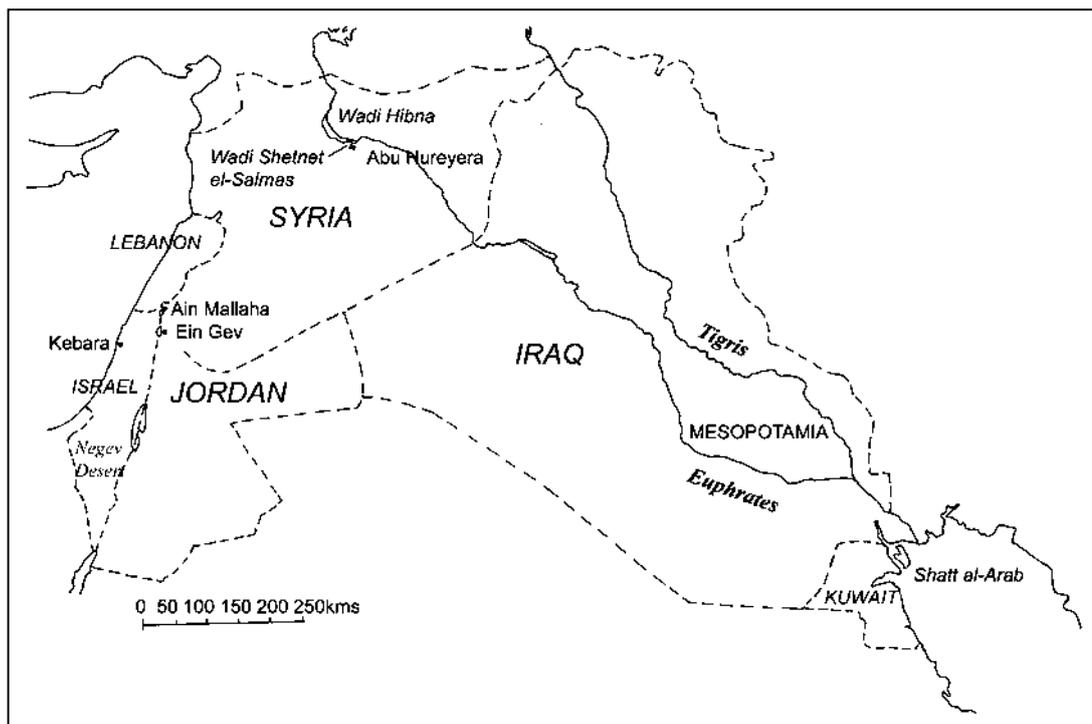
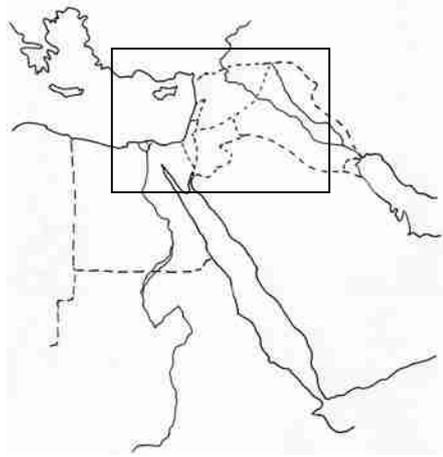


Figure 3 Sites in the Fertile Crescent

While there is little to be found in the Shatt al-Arab and lower Mesopotamia of hunter-gatherers and early farming communities, further upstream on the Euphrates and in the Levant not only is there evidence of these to be found but also indications of the transition from one state to the other. Hunter-gatherers have been seen traditionally as highly mobile societies but in parts of the Near East they are more sedentary and it may be that this should be taken as the closer model for how they should be viewed. Prior to c12,450 cal BC populations were small and widely dispersed although possible food processing artefacts and presence of hut foundations at En Gev suggest that some sites may have been occupied for longer periods (Moore 1985, 12). By c10,000 cal BC, there

was a growth in population and while traditional methods of food procurement were intensified, people were becoming more sedentary at the same time as the climate was becoming warmer (Moore 1985, 13).

Abu Hureyra is one site now finally published more than 20 years after the excavation, which demonstrates quite clearly a transition from a hunter-gatherer to an early farming subsistence pattern. Sited on the lowest of the Euphrates terraces, it rises above the adjacent floodplain with its meandering river (Moore *et al* 2000, 28). With the Euphrates so close to Abu Hureyra, as well as the adjacent confluence of the Wadi Shetnet es-Salmas and the Wadi Hibna (that drain into the main river on the north side of the settlement) an active watercourse 11,500 years ago, it is difficult to comprehend that piscine and riverine resources were not utilised. While it has been acknowledged that large fish can be seen in the Euphrates, it has been posited that the early inhabitants of Abu Hureyra did not choose to tap this resource (Tony Legge pers. comm) - a view that seems contrary to the normal pattern of behaviour of hunter-gatherer communities where all resources are utilised. There are a number of notched pebbles in various stages of manufacture and possible use at the site. They are similar to some found at Ain Mallaha, a lakeside site in the Levant (Moore *et al* 2000, 176). It has been suggested that they are sinkers to weigh down fishing lines and nets, and are comparable with similar artefacts in North America and NW Europe (Moore *et al* 2000, 176 figure 7.15). The scarcity of actual fish must also be set in the context of the bad survival rate for the bone generally. Much of it had to be conserved as it was being lifted, such was its fragile state (Moore *et al*, 2000, 101; Gordon Hillman pers. comm.). In addition there is a suggestion that the many kilos of heavy fraction accumulated during the flotation process (Fagan 1995, 105) were possibly not examined in the same detail as that of the light fraction (Sue Colledge pers. comm). This could have resulted in an imbalance in the final analysis.

The Euphrates valley near Abu Hureyra was very wide and with the various channels of the river snaking across the valley bottom, what has been described as 'a mass of back-swamps' would have been evident (Moore *et al*, 2000, 70). It is in this area that stands, probably extensive in size, of a range of reeds would have flourished very much as they do today. These include the common reed (*Phragmites australis*) and the reedmace or bulrush (*Typha*), both of which had an important part to play in the local economy; the former for thatch for houses, basketry, mats and weaving, and the latter as an important

food staple (Moore *et al* 2000, 71, 119). At Kebara, a type site for an Epipalaeolithic culture, there is evidence for fishing in the form of hooks during the Natufian early farming phase (Moore *et al*, 2000, 163). There is, however, no evidence for actual fish. Weights for fishing nets have also been recorded at Mallaha, another Natufian site (Nadel *et al* 1994, 456).

3.5.2 The Jordan Valley

Two sites found within the Jordan valley are worth noting here: Ohalo II on the southwestern edge of Sea of Galilee and Netiv Hagdud on the western bank of the Jordan itself to the north of Jericho.

Ohalo II

This is an Early Epipalaeolithic (c19,000 cal BC) site only exposed when the Sea of Galilee was at unusually low levels in 1989 (Nadel & Hershkovitz 1991, 632). It has been described as a Kebaran site (see above) similar to others within the Levantine area and has rich deposits of subsistence and artefact debris within a number of shallow storage pits. While a number of the Kebaran sites have produced some evidence of fish bones, Ohalo demonstrates ‘an economy balanced by freshwater fish’ (Nadel & Hershkovitz 1991, 633). The section excavated on the site revealed two kidney-shaped structures and another pear-shaped, surrounded by a series of hearths and a grave containing a 35yr-old disabled male (Nadel *et al* 1994, 451).

The diet of the occupants of Ohalo was wide and varied. Basalt bowls and pestles complement the thousands of carbonised seeds which include wild barley and wheat. Faunal remains also include land mammals (deer, gazelle and rodents) as well as birds and turtle (Nadel & Hershkovitz 1991, 633). The birds formed an important part of the diet with 488 species being identified with many of these from aquatic types (ducks, geese and swans) and large in size (Simmons & Nadel 1998, 82-84). Fishbones have been found in probable association with twisted cord fragments which may have been nets or bags in which the fish may have been stored in a ‘dried, smoked or unprocessed’ condition (Nadel *et al* 1994, 455). Identification as to species of some of the bone has shown it to be Cyprinidae and some *Barbus* with all elements of the skeleton present. The sizing indicates small fish (many between 10-20cm in length) which suggests netting or traps as a means of capture (Nadel *et al* 1994, 455).

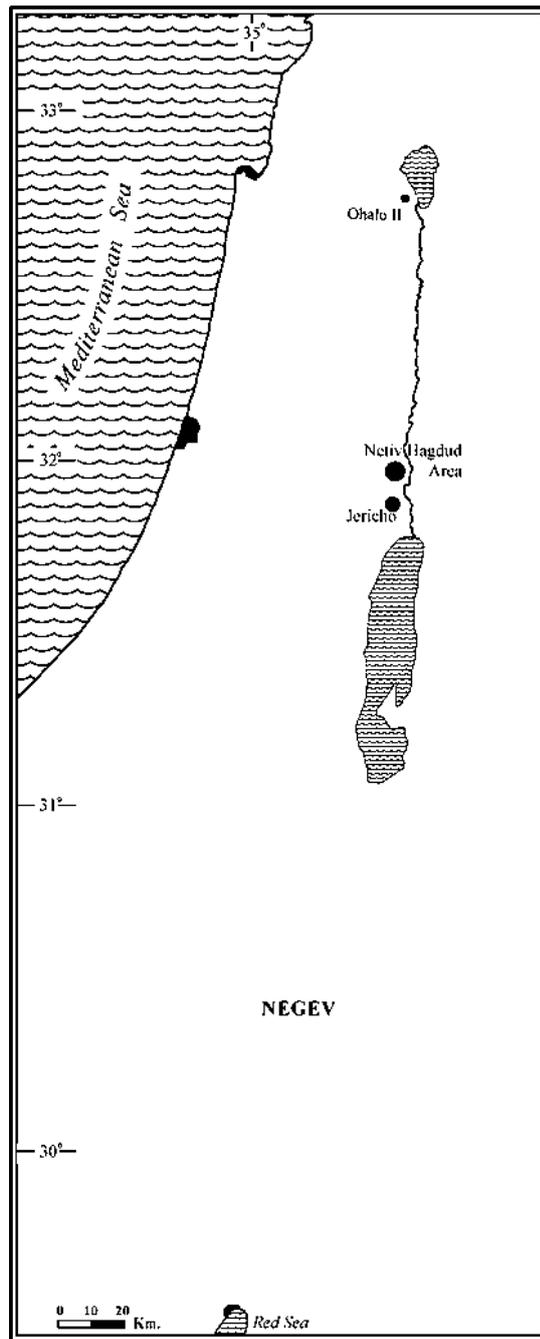


Figure 4 Ohalo II and Netiv Hagdud

The migratory patterns of the avians was no doubt one of the main reasons for the siting of Ohalo II but indications are that the site was occupied for much of the year due, no doubt, the regular availability of fish (Simmons & Nadel 1998, 88-89).

Netiv Hagdud

This Early Neolithic (c9500 cal BC) site lies at the point the Wadi el-Baquar enters the Salibiya basin on the eastern side of the lower Jordan valley (Bar-Yosef & Gopher 1997, 1). A number of oval and round structures were excavated on the site and in a deep sounding, preservation of plant and animal bone remains was extensive (Bar-Yosef & Gopher 1997, vi).

Over 800 specimens of freshwater mollusc were recovered suggesting that the site lay in an area of wide-ranging water sources including open bodies that may have been turbulent (Tchernov 1994, 10). This proximity to water is reinforced by the remains of freshwater crabs (*Potoman fluviatilis*) which were also retrieved but their presence raises a number of questions. Were they caught by humans or by other non-human predators and then brought to the site? Or did they come themselves to scavenge? Or is the answer somewhere between two (Tchernov 1994, 11)?

Fish evidence is slight – ‘a few vertebrae, scales and a pharyngeal arch’ – and identified as small Cypriniform (Tchernov 1994, 11). While it has been suggested the lack of large fish remains, as well as larger numbers, indicate that there was no reliance on fish as a source of protein (Tchernov 1994, 11), this may have more to do with the preservation of the evidence rather than an actual choice of diet.

The presence of avians is similar to that at Ohalo II – unsurprising given the position of Netiv Hagdud on the migratory pathway (Bar-Yosef & Gopher 1997, 6). Aquatic examples are also noted but the site report lacks the detailed information concerning size, numbers and seasonality available for Ohalo II. Indications are that the site was occupied year round (Tchernov 1994, 86).

3.5.3 The Nile within Egypt

The Nile flows northwards for 6741km from the headwaters in central Africa to the delta in the eastern Mediterranean sea. It is different from the other rivers that are discussed in this chapter in that it has no tributaries within the borders of Egypt, the stretch that is under discussion here

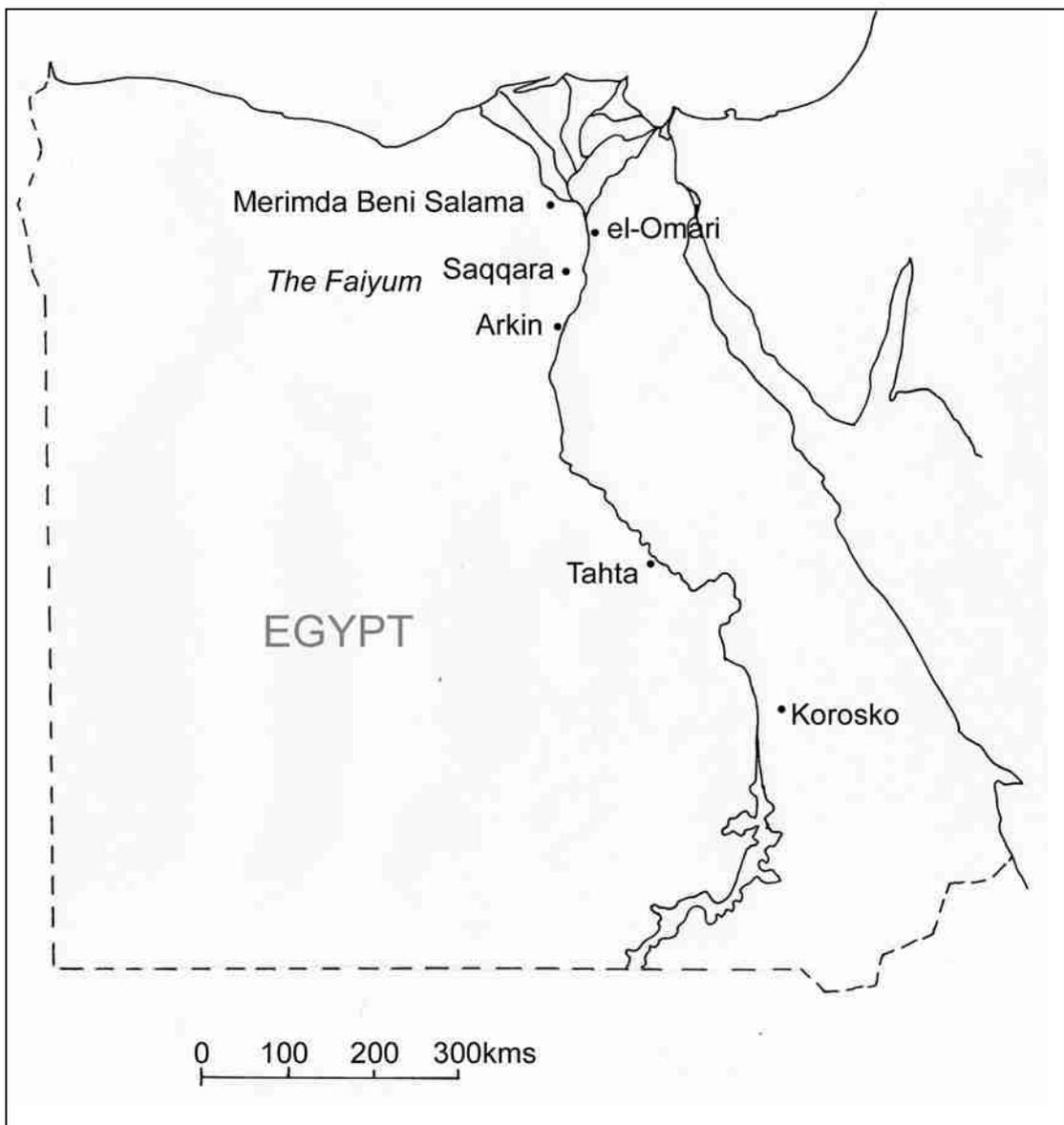
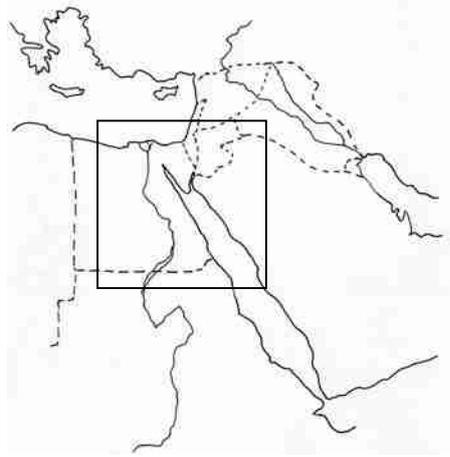


Figure 5 The Nile in Egypt

At the glacial maximum, the river was ‘a highly seasonal braided channel system’ and even up to 5000 years ago there were a number of channels still extant (Brown 1997, 7). The floodplain is narrow with a maximum width of 2km along the slightly meandering river and is formed by silt deposition (Hassan 1997, 59). The actual pattern of the floodplain has altered over time as the silt (ranging in amounts from 40 to 100 million tons *per annum*) is affected by continued deposition and also erosion, causing occasional back-swamps to form such as that at Saqqara and Tahta (Brown 1997, 9; Hassan 1997, 59-60). The richness of the deposits albeit, with the problem of flooding, were attractive for agrarian use.

The evidence available for prehistoric use of the Nile valley has shown that the Egyptians were ‘well acquainted with their environment and made good use of the indigenous animals of the Nile valley’ (Brewer & Friedman 1989, 5). The earliest farming communities date from 4800 BC at Merimda Beni Salama (Hassan 1997, 4). Use of the piscine resources at this time, however, can only be seen archaeologically in a limited number of places. This would appear to not be an indicator of actual usage of the river but rather a result of preservation of the evidence (Brewer & Friedman 1989, 1). Certainly the later records from the Predynastic periods onwards demonstrate an intense use of the resources available in the Nile and from its banks. Illustrations within tombs enable identification of piscine species, methods of fishing, vessels, food preparation and the use of fish in ritual contexts (Brewer & Friedman 1989). They are also recorded in written records by both Egyptians and foreigners (Kreuzer 1984, 607-617). Hunting of waterfowl in the riverside marshes and river animals (such as hippopotamus) also features in tomb paintings, as well as the use of reeds and other river plants as can be seen in examples at the British Museum. This later use of the resources of the Nile has built upon an earlier foundation from the prehistoric period.

The Faiyum, a lake in a large depression, lies to the west of the upper Nile and was once much bigger than at present. Today the lake is brackish and lies in the north-west quadrant of the depression but in the past snail, fish and diatom evidence indicates that it was freshwater (Hassan 1986, 493-494). It has stratified deposits, which have been lain down over several thousand years, and is joined by a channel, the Bahr Yusef, which flows northwards from the Nile for *c.*180 kms. The Qarunian layers which date to *c.*7550-7000 cal BC – 6680-6440 cal BC have no evidence of plant or animal domestication. There is also a lack of pottery and backed blades are characteristic

(Brewer & Friedman 1989, 6). The Neolithic layers (c5700-4900 cal BC to 4250-3600 cal BC) in the Faiyum seem to demonstrate more of a 'village-like' economy (Brewer & Friedman 1989, 6). They contain many faunal remains including pig, sheep, goat and dog, as well as more river-based examples such as hippopotamus, turtle, crocodile and fish (which are probably Nile perch) (Gautier 1976, 370). Lithics from one of the sites in the Faiyum have been linked to use in fish processing (Brewer & Friedman 1989, 6). There is no evidence of permanent habitations in this period although there is an abundance of hearths and pits, as well as debris from food, pot and lithics (Hassan 1988, 148). Shelters were probably of an ephemeral nature such as wigwams or windbreaks.

Fish from the Faiyum include the Nile catfish *Clarias* spp. and the Nile perch *Lates niloticus*. The relatively large *Clarias* lived in the shallow, swampy environments around the edge of the prehistoric lakes and can be speared, caught by hand or netted, while *Lates* preferred the deeper more oxygenated waters and when smaller than 40cm in length required netting or angling to be caught (Brewer & Friedman 1989, 6-7). Unilaterally barbed harpoons have also been found in the Neolithic levels. In the Faiyum, the abundance of fish formed 'a profitable and inexpensive economy, but at the same time retarded agricultural developments and favoured a shifting, mobile settlement pattern' (Hassan 1986, 498). It must be noted however, that in the Neolithic, this area has some of the earliest ceramic bearing sites as well as remains of cultivated plants and domesticated animals (Hassan 1986, 498).

Sites predating food production from c.10000 to 5500 cal BC from the Faiyum in the north of the country to Arkin, Nubia in the south provide evidence for fishing, hunting and foraging (Hassan 1986, 490; 1988, 143-144; 1998). Location of settlements, subsistence strategies and preservation of archaeological material have all been affected by river action sometimes adversely (Hassan 1988, 143, 146; 1997, 41; 1998). In the high water stages of the fluctuating river levels, this made fishing and exploitation of aquatic plants a viable subsistence option, although this advantage suffered during low Nile episodes (Hassan 1988, 146). The importance of fish in the human diet can be seen in the final stages of the Stone Age. Catfish Cave situated near Korosko has 38 complete and fragmentary bone points, each with a single row of barbs associated with microlith debitage as well as much fish bone (mostly catfish). Of the bone material in the cave, fish bone comprises 95.2% and has been dated to c.6400 BC (Clark 1971, 46). Further south in the Nubia area, early sites in the form of camps have been found next

to the Nile and some of these have also included burials. Many of these camps have been found with fish remains of *Clarias* probably caught by use of a weir as can be seen in modern Africa (Clark 1971, 43-44).

Plant resources available on the Nile would have included the water lily (*Nymphaea lotus*) and reed mace (*Typha* sp.). The starchy rhizomes from each plant are edible as other parts. Reed mace is used additionally as a fuel, for weaving and the fruiting bulb as fibrous wadding. There are many other seed bearing plants to be found adjacent to the river on the floodplain as well as trees and shrubs (Clark 1971, 64-71).

There is little archaeological evidence for fishing equipment in the early periods which probably relates to preservation conditions rather than any inherent lack of artefacts. Most of the materials used would have been organic in nature (reeds, netting and the like). Weir fishtraps with cones are well-documented in later wall paintings (Brewer & Friedman 1989, 32-38). Barricade traps (into which fish would have been herded prior to being speared or handcaught) would have been suitable in the Faiyum and the delta where a large supply of reeds or sticks and a gradually sloping bed would be available. Physical evidence other than that gathered from ethnographic descriptions is not published (Brewer & Friedman 1989, 31-32). The faunal remains from the Faiyum point to nets being the primary fishing tool particularly those from the deeper water (Brewer & Friedman 1989,7). The first complete example of netting which comes from Neolithic el-Omari in the delta where this was probably the dominant form of fishing technique, given the number of limestone sinkers with a central groove recovered from the site (Brewer & Friedman 1989, 38). Net weights have also been recorded from the Faiyum and Khartoum (Brewer & Friedman 1989, 104). Bone fishhooks from Middle Egypt and el-Omari, noted as 'prehistoric' are currently found in the British Museum and the Egyptian Museum, Cairo (Brewer & Friedman 1989, 27).

The nearby Negev desert in this period was wetter than today with active watercourses. Nets, basketwork traps, harpoons, and fish hooks have been found and indications are that some groups were beginning to become semi-sedentary (Arkell 1975, 6-29). Agriculture, 'initially a subsidiary activity to herding, fowling, fishing and hunting' rose to a prominent position later during the Middle Pre-dynastic period in the mid-fourth millennium BC, which also saw the emergence of boat transport on the Nile primarily for the moving of grain (Hassan 1988, 167-168).

3.6 New World – S America

Background and topography

Geographically the Amazon river with the Orinoco to the north dominates the continent of South America. It drains from the Andes in the west to the Atlantic Ocean in the east. Its total length is slightly shorter than either the Nile or the Mississippi/Missouri rivers (Lathrap 1970, 22). Tributaries, both the north and south of the main river, are ‘great rivers in their own right’ (Lathrap 1970, 24). The river systems in South America are such that at times of inundation most of the great rivers would be inter-connectable and it would have been possible for the canoeing tribes, as Lathrap describes them, to travel enormous distances from the north of the continent almost to the south and to be used as a major avenue of communication (Lathrap 1970, 24). The river has a flow five times that of the Congo, 12 times that of the Mississippi and of all the water annually received into the world oceans, the Amazon’s contribution is almost a fifth (Meggers 1971, 3). The average water flow through the mouth is 12,860 million litres per second (Lathrap 1970, 22). ‘It discharges as much water into the Atlantic every 24 hours as the Thames carries past London in a year’ (Meggers 1971, 3)

The basin, however, in a similar fashion to the Murray-Darling has a shallow slope, dropping just less than 200metres in 3680kms from Iquitos on the eastern Peru border to the mouth of the Amazon. The width of the Amazon below Manaus is sometimes 15 kms and even the main tributaries reach 1km wide (Lathrap 1970, 25). The large island of Marajó which lies in the mouth has revealed, through soundings, a depth of sediment accumulation of c.3877m which is almost as far below sea-level as the elevation at La Paz, Bolivia, is above (Meggers 1971, 3). This sediment has come down from the higher reaches and has in part, choked and submerged the earlier delta of the Amazon. The original bed of the river is situated below sea level up as far as Manaus (Lathrap 1970, 25-26).

The main tributaries include the Xingú, Tapajós, Madeira, Juruá, Ucayali, Marañon, Napo, Putumayo, Caquetá/Japura and the Negro/Branco. Each of these has many smaller tributaries. The basin can be divided into two areas: the *várzea* (floodplain) and the *terra firme* (upland or interfluvial). The former area is a narrow stretch where

subsistence alternates between abundance and scarcity, in rhythm with the rise and fall of the river.



Figure 6 Amazon and its tributaries.

1. Apaporis 2. Branco 3. Japurá 4. Juruá 5. Javari 6. Madeira 7. Marañon 8. Napo 9. Negro 10. Putamayo 11. Tapajós 12. Ucayali 13. Urubamba 14. Vaupés 15. Xingu

The latter region is much bigger and, although the resources are thinly spread, they are continuously available (Meggers 1971, 4). The ethnohistorical records describe, for the most part, the *várzea* as most of the authors were on or near the main rivers. As the impact of colonialism altered and changed the lives of the indigenous people, it is to the areas within the *terra firme* that modern ethnographers and anthropologists have needed

to look to find people who are still living lives similar to those encountered in the 1500s.

The *várzea* consisted of the flooded riverbanks and islands, swamps, side channels and ox-bow lakes. It was a very attractive area to humans as its agricultural potential and protein resources are even now immense. The alluvium on the floodplain is very fertile, making it useful for growing manioc. The rivers are full of fish and the banks have turtle, rodents, birds and mammals (Hemming 1978, 190). In contrast, at this time, the *terra firme* was probably not highly populated and it is only in recent times that these areas have opened up as noted above. The forest covers the ground and it is only by removing this that cultivation is possible.

History

The mouth of the Amazon was first seen by Europeans from Spain in 1500, a few months before the Portuguese landed further down the Brazilian coast (Hemming 1978, 71). It was not until 1541/2 that Europeans sailed the full length of the river from the Upper Napo to the mouth and the Atlantic. Gonzalo Pizarro, the brother of the Spaniard, Francisco Pizarro, who overthrew the Inca emperor Atahualpa and the Inca empire, was given permission to seek for a land reputed to be full of gold and riches, El Dorado (Hemming 1978, 186). Doomed to failure, the expedition camped at the Upper Napo and a brigantine was built using nails made from any metal scrounged in the camp. Capt. Francisco de Orellana took the boat to find food and, claiming that he had been swept downstream on a river that was in full flood, he sailed the length of the Amazon in an 8 month journey (Hemming 1978, 187).

By the time the Spaniards and later other Europeans arrived, villages were strung out along the Amazon often in close proximity, with some covering long stretches along the river. The main native settlements were inland but in one place a village stretched for six miles along the banks (Hemming 1978, 189). The Spaniards reached the Atlantic on August 26th 1542. 'The most striking aspect of their voyage was the vast numbers of Indian villages along the river' (Hemming 1978, 194). Even in the deserted backwaters were more villages. The food that they were offered by the Indians included turtles (which were not only eaten but the carapaces were also used), turkeys, parrots, maize, yucca, sweet potatoes and yams, beans and peanuts, avocados, pineapple, peppers and

gourds. Fruits were also available, and game birds and dried fish. Cotton material was also given to the Spaniards.

Other travellers recorded the fish which was the main food of the Indians, in addition to the hundreds of turtles that they kept. They shot fish with arrows attached to wooden floats. When the river subsided, they used poison to stun the fish in the resulting small lakes, left behind by the receding waters. The electric eel and the manatee were other prey in the water but land animals included tapirs, deer, peccaries, monkeys, coatis and armadillos that could be found in the forest adjacent to the river. As well as cotton products, ceramics were traded. The Omagua produced a pottery with polychrome finishes and the Caripuna and Zurina were renown for stools carved in animal shapes and throwing sticks (Hemming 1978, 232-233). Trade was conducted by canoe which was either a dugout or bark type. The dugouts were made from fallen trees which would be taken from the river and once the waters had receded, would be carved out using stone or turtle shell tools. The lighter bark canoes could be carried between the tributary lakes and rivers, in similar fashion to the European coracle (Hemming 1978, 233).

Fishing

Fishing produces one of the most important and reliable non-plant protein sources in the area (for example, Hugh-Jones 1979, 171). There is fish available all year round but when the rivers are in flood catching them can be difficult (Roosevelt 1980, 109; Descola 1993, 138-139). Varieties include catfish, paiche (*Arapaima gigas*) and piraña, as well as aquatic turtles, caimans and the manatee or sea cow (Lathrap 1970, 35). Equipment used to catch or trap the fish ranged from rods, hook and line, and dams and traps of a range of shapes and sizes. Poison in the form of ichthyotoxic or piscicides is also used in pools (Moran 1993, 78). The fish are asphyxiated in the resulting milky coloured water and can be easily captured in large quantities in what is often a communal event (Descola 1993, 138). The fish are dried and often pounded into meal for storage. Other food processing methods include salting and smoking (Roosevelt 1980, 105; Descola 1993, 140).

Hunting

Hunting in the basin was formerly and still is restricted to wild creatures, as animal husbandry has not been practised by the hunter-gatherers (Roosevelt 1980, 92, Descola 1993, 122-133). Small animals such as deer, monkeys, armadillos, peccaries, rodents, sloths, tapirs and squirrels are still hunted as well as snakes and game. Methods include traps of various types, blow pipes with poisoned darts and bows and arrows intended to kill the prey (Hugh-Jones 1979, 10). Hunting is not as effective in the production of protein as fishing or gathering plants because it requires a high level of energy to capture the prey successfully (Roosevelt 1980, 94).

Gathering

The gathering of wild plants and larvae of insects was undertaken by the Amazonian tribes but while it was a significant contribution to their diet it was as unpredictable as hunting, as not only were the plant and animal species seasonal, they also required looking for within the verdant forest (Hugh-Jones 1979, 171). Women with their gardens to care for, child-rearing chores and cooking to undertake, were not the prime exponents of foraging. For the Achuar Jivaros who live in the north-west corner of the Amazon basin on tributaries of the Marañon, there was a particular season when productive fishing was not possible and animals were still lean following the winter shortages, forcing them to rely on 'the time of wild fruits' (Descola 1993, 139). In the Pirá-paraná area on the Apaporis, a tributary of the Japura, men provided the larger quantity of wild food when compared with that produced by the women (Hugh-Jones 1979, 173).

Gardens

Within the forest, an early form of agriculture has become an important part of Indian life. Many groups still live their aboriginal lifestyle in the Amazon forest. Examples include the Tukano near the river Vaupés and those much further west in the Pirá-paraná area, as well as the Achuar mentioned above and the Machiguenga who live on a tributary of the Urubamba in Peru (Hugh-Jones 1979, Descola 1993, Johnson 1983, Reichel-Dolmatoff 1996). They practice swidden or slash-and-burn techniques to clear a patch of land or garden in order to grow plants for subsistence (Descola 1993, 85;

Reichel-Dolmatoff 1996). Each family has five or six gardens, usually near running water, which are managed by the women. Each garden will have a life of only a few years and so all that is planted there will have a short growth life (Reichel-Dolmatoff 1996, 68ff). The range of products will include bitter manioc, pineapple, sugarcane, peppers and ichthyotoxic plants for fishing. Narcotics such as tobacco were also grown for use in ceremonies by the shaman and the men (Hugh-Jones 1979, 226; Reichel-Dolmatoff 1996, 160).

Artefacts

The range of artefacts produced and used by the various tribes is very large. An indication of these can be seen listed in trade below. Many of the artefacts however were not for trade but were made for a particular task to hand and then discarded (Descola 1993, 136). While Descola is specifically referring to the Achuar, there is no reason to expect the situation to be any different with other tribes such as the Tukano, for example.

Trade

With the rivers within the Amazon basin and the canoes each village possessed providing a readily available transport system, a large trade network existed successfully in the region. An example of the wide range of this network can be seen in the production of ceramics among the Shipibo who live in the Peruvian area to the western end of the river system. The pots which are identified as Shipibo require clays and slips of various types to produce and these come from a variety of places from within half a day's journey to c.107kms away down the Ucayali river (Lathrap 1973, 171-172). Roth wrote in 1924 about tribal networks that spread from the north-eastern corner of tropical South America which typified the range of materials available for trade:

‘The Otomac women were noted for their clay pots; the Arekuna for their cotton and blowpipes; the Makusi for their currare poison; the Maionkong and Tauma for both cassava graters and hunting dogs; the Warrau for their corials; the Waiwai for their fibre of tucum and kuraua; the Guinau for their hammocks, cassava graters, aprons, girdles of human hair, and feather decorations; the Oyapock River natives for their ‘spleene and

mateate' stones. Nothing came amiss, a market being always forthcoming sooner or later for everything...'

(Roth 1924, 635)

The particular trade network that these integrated with measured roughly 1600kms north to south and east to west in an oval shape and also articulated with the main system in the Amazon (Lathrap 1973, 172). Over 90% of the materials that were traded were perishable and so it is impossible to estimate how much was being transported throughout the Amazon basin from material evidence available (Lathrap 1973, 173).

Local trading existed between nearby communities where most of the commodities such as pepper, tobacco, basketry and pottery could 'equally have been produced at home' (Hugh-Jones 1979, 1690). Other items included ritual paraphernalia that were part of a continuous exchange between geographically distant communities who were related through marriage. This type of exchange includes the wild food produced by men as can be seen amongst the Pirá-pararaná Tukano (Hugh-Jones 1979, 170).

Division of labour

The division of labour is very clear. The men hunt and fish, and they make the clearings for the gardens and fire them (Reichel-Dolmatoff 1996, 20). Both hunting and fishing are highly ritualised processes. Women are in charge of the horticulture, which equally has its rituals and supply the daily food. Women are allowed to aid the men when poison is used when fishing but they do not administer the actual substance. Instead they are allowed to aid in the collecting or 'harvesting' the asphyxiated fish (Hugh-Jones 1979, 171). Both sexes gather forest fruits, wild honey and insects although men are the main contributors. Only men may smoke their prey, make ritual objects or grow and prepare ritual substances such as tobacco, coca and hallucinogens (Reichel-Dolmatoff 1996, 20).

A discussion of the ritual aspects is included in **3.8.5** below. Suffice it to say that the women process and prepare the daily food while the men are only involved in food preparation at the level of ritual.

Women amongst the Achuar were also responsible for the nurturing and care of the dogs that were used when hunting or for protection (Descola 1993, 81). The condition of the dogs under her care was considered to reflect the capability of the woman. It must be noted however that the animals remained the property of her husband and that apart from the pups, trade in dogs was undertaken only by the men as these animals were considered items of value (Descola 1993, 82).

3.7 New World – N America

This section comprises three parts:

3.7.1 *The Gulf of Mexico*

3.7.2 *The Mississippi and its mid-west confluences*

3.7.3 *The NW Pacific coast*

While there are many riverine and wetland regions in North America that have relevant archaeological evidence, three areas have been selected to be examined more closely. The Gulf of Mexico consists of sites in Florida, on the Mississippi and the Lower Colorado.

The Midwest comprises the Mississippi and the American mid-west where there are major confluences with the rivers Ohio, Missouri and Tennessee within the Central Mississippi drainage system that have provided resources for early indigenous people. This choice was selected as an inland river setting to contrast with the other two more coastal examples. The NW Pacific coast section includes ethnographic discussion of the Colombia, Yukon and Koyukuk rivers and archaeological information from the Hoko river.

3.7.1 Gulf of Mexico

Florida

Background and topography

The Mississippi river forms the focus of an extensive system which reaches right the way across the United States of America from the Gulf of Mexico in the south-east to the Great Lakes on the Canadian border in the north-east of the country. On its west-

east axis it reaches from New York State to beyond the Dakotas and Oklahoma, a total of 31 States and 2 Canadian province. While, archaeologically speaking, there has been a lot discovered about certain stretches of the river (for example, the American Bottom cutting through the states of Missouri and Tennessee),

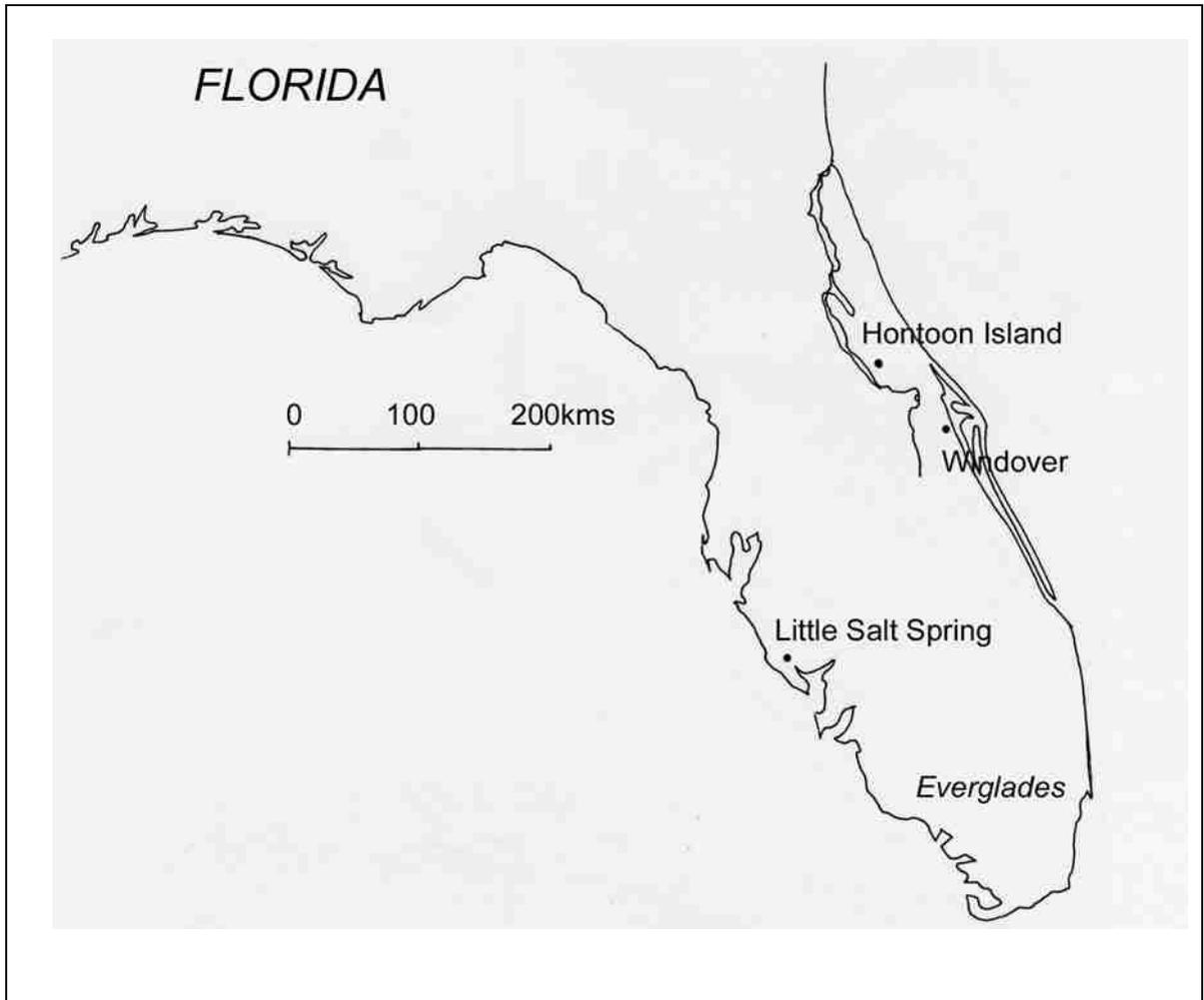


Figure 7 Florida

the ethnohistorical records are derived from the various accounts written about the Spanish expeditions in the area. The principal expedition was that led by Hernando de Soto (Galloway 1997; Hudson 1997a). This began in Florida in 1539 and after travelling overland, sailed down the Mississippi, across the Gulf of Mexico in 1543 in a hastily constructed vessel. With so many rivers being crossed by the large expedition including tributaries of the Mississippi, it was felt that there could be many observations of the local Indian tribes and their way of life. Unfortunately, only one account of the four known was written by someone who participated in the event, Hernández de Biedma, and is ‘a firsthand, contemporary, succinct, and straightforward report of the events he witnessed’ (Altman 1997, 3). Even his account, from an ethnohistorian’s viewpoint, is lacking in many details of the indigenous people and their way of life.

History

As de Soto moved inland he encountered a series of cultures which, while displaying differences from each other, also had similarities. The overall name given to these cultures is that of *Mississippian* and is particularly noted for the building of mounds. Later as the expedition travelled down the Mississippi, it is recorded that they were given food (pecan nuts, fish and persimmons) and as in earlier accounts before, the Indians became more aggressive towards the Spaniards. This echoes the changing reaction to the Spaniards in the Amazon basin in section 3.3 above. De Soto died in 1542 at Guahoya on the Mississippi river although it was another twelve months before the survivors of the expedition reached Mexico.

The Ozita

The Spaniards travelled through many of these cultural areas but with only little detail it is difficult to comment on them individually. The first people the expedition encountered were living at the mouth of the Little Manatee river in a place called Ozita, (in the Safety Harbour culture area). The shell midden here measured 1.80m high and 18.5m in diameter. They built small burial platforms which mirrored to some extent those in the north. They made cups of the *Busycon* shells found in the Gulf of Mexico and ceramic vessels with temper of sand and grit in the form of open, cazuela and globular bowls, as well as more highly decorated ceramics with rectilinear and curvilinear motifs (Hudson 1997a, 70-71). The people of this area were more dependent on wild foods than those north of the Withlacoochee river and no trace so far has been found of maize or American corn agriculture.

The Alachua

These south-eastern Indians were organised into chiefdoms and were ‘favoured-soil horticulturists who supplemented their larder by hunting and collecting wild foods’ (Hudson 1997b, 316). De Soto’s army did not carry much food and so was forced to pillage from the surrounding countryside (Hudson 1997b, 439, 318). The variation in the quality of the soils meant that the Indians with their need to cultivate, were only able to inhabit certain areas resulting in clusters of sites separated by uninhabited areas of wilderness that were sometimes very large in size (Hudson 1997b, 316-317). As de

Soto moved towards north Florida, he began to encounter those people who cultivated maize and references are frequently made to his demands from villagers of their maize stocks to feed his troops. The timing of the start of the expedition's trek north fortuitously coincided with the ripening of the maize (Hudson 1997a, 89).

Other types of subsistence used by those in the Alachua area included small fish (probably caught using nets) such as catfish, blue gill, bream and sunfish. Deer was the main animal they hunted but others such as rabbit, raccoon, opossum, muskrat, bear and squirrel also featured. Hickory nuts, palm berries, chinquapin or chestnut and acorns were collected (Hudson 1997a, 105-106).

Central Mississippi

Although the expedition continued to cross many rivers, it is not until they reached the Central Valley of the Mississippi in 1541 two years after they had landed in Florida, that details of sufficient quantity began to emerge about the way of life of the indigenous people to provide any comparative material. The meanders of the Mississippi provided a fertile soil for cultivation. The men of Quizquiz were working in the maize fields while the women were back in the town when they were surprised by the arrival of de Soto. This maize, when shelled, could be stored so pits were dug into the ground capable of holding *c.*227 litres (Hudson 1997a, 280). Hunting for white-tailed deer, raccoons, rabbits and turkeys as well as a large range of fish and migratory waterfowl with the ever-present wood ducks also meant they had protein in abundance (Hudson 1997a 278). Items traded for included salt, chert and flint (for cutting tools), conch shells from the Gulf, native copper from the Great Lakes, mica, hematite and galena (a white pigment). Many of these items were used for both everyday living and as ceremonial objects (Hudson 1997a, 279). Their pottery with crushed mussel shells was of very high quality. The Spaniards found woven shawls and skins at Quizquiz.

Artefacts

Arrowheads, used for hunting as well as against the Spaniards at such places as Uzachile and Mabila, were made of chert, flint or sometimes antler tips and they were either triangular or stemmed with a serrated edge (Hudson 1997a, 115, 238-239, 280). Arrows were also used for hunting. Other references are made to the Indians having

dugout canoes and rafts, for example near to Tocaste, which was not far from the river Withlacoochee (Hudson 1997a, 99, 299). The houses of the elite were built on mounds in many of the settlements (Hudson 1997a, 283).

Dugout canoes were utilised when storming the explorers' boats in the later stages of the expedition when they were sailing down the Mississippi. Weapons of shields (of cane) with arrows were carried as well as feather head-dresses and ochre was applied (Hudson 1997a, 285-286).

Resources and trade routes

The local variations would depend on the available resources. Coastal groups would concentrate on shellfish and fish; inland groups alternatively sometimes would make the white-tailed deer their focus. Some areas, where stone was easily available, would use this for their weapons and implements but others would have to use fire-hardened wood or imported stone (Galloway 1995, 35). Although the river systems, such as the Lower Mississippi and the Alabama-Tombigbee were primary trade routes, there is evidence that the land route which became the Natchez Trace (running from the Mississippi to the headwaters of the Tombigbee) was being used at this time as well as other east-west trails (Galloway 1995, 35).

The Lower Colorado Valley in the south-west of North America with reference to tribes living on rivers in the northern part of California

Background

The Yuma live on the Lower Colorado river in an area very similar in size to that which they were occupying when first contacted by Europeans, from the Needles, California to the gulf of California. Below Fort Yuma, the river spreads out to form a delta for the final 80kms to the present gulf head. The river and the delta flow over deep alluvium and not bedrock. The floodplain is limited by bluffs which border the valley (Forde 1965, 90). The Yuma way of life and culture was little affected until the mid-1850s when the caravan trail reached Southern California. After this time their economic

circumstance changed drastically although their religion and non-material culture remained unchanged until fairly recently (Forde 1965, 88).

Topography and vegetation

A flood season occurs each year usually from the end of April to reach its peak in June, fed by waters from western Colorado. The siltload of the river is very heavy, being far higher than the Mississippi or the Nile with an annual burden of over 1,016,040 tonnes spread out over the delta and river flats (Forde 1965, 90). The landscape above the bluffs is arid and semi-arid or 'mesa' and is in stark contrast to the fertile valley below. The 1775-1776 account describes the Yuma as living in the bottom lands and on the banks of the Colorado which at this point in its course was fresh water (Forde 1965, 94).

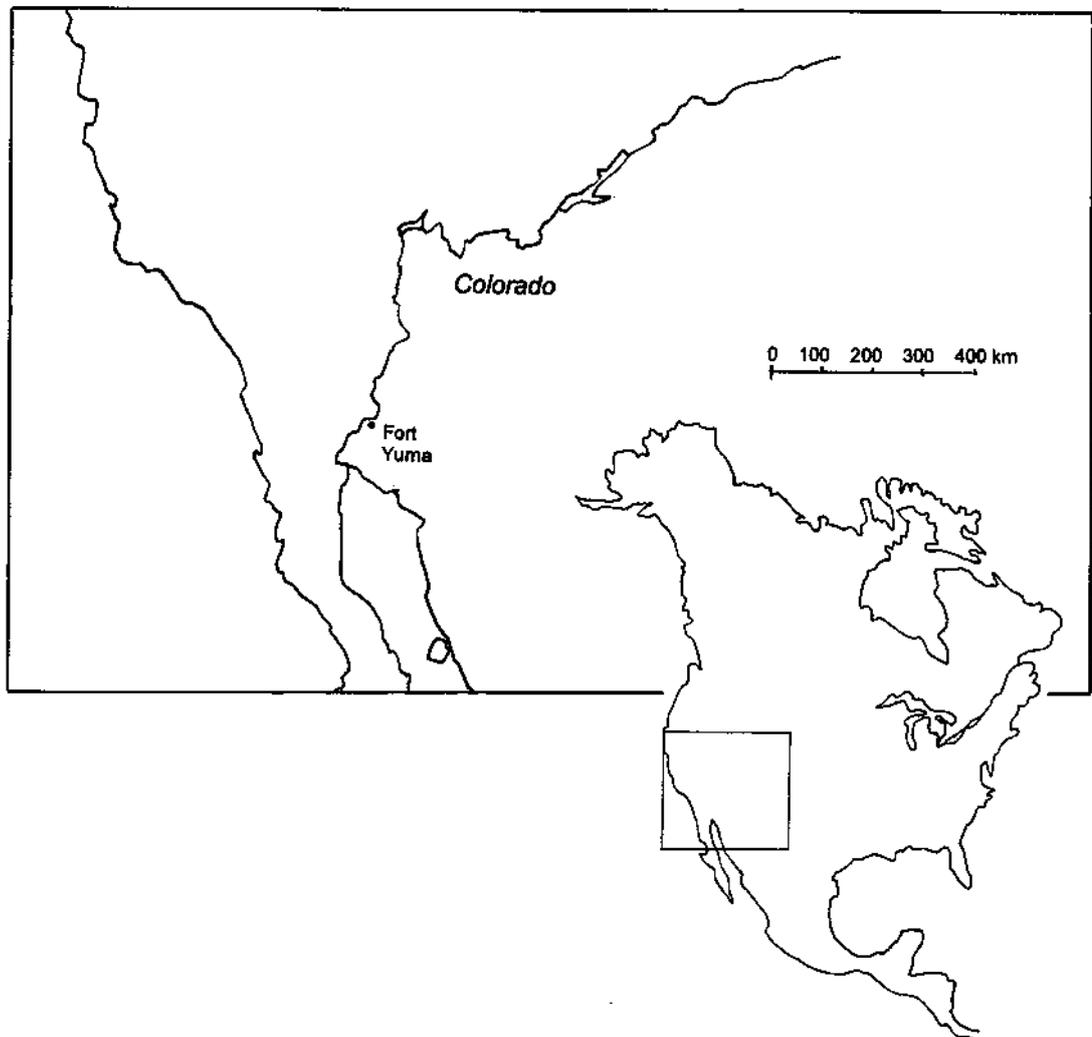


Figure 8 Fort Yuma and the Colorado

The vegetation in the valley was almost jungle-like in its density with trees of cottonwood (*Populus macdougalii*), willow (*Prosopis velutinea*), mesquite (*P. pubescens*) and sycamore and thickets of arrowweed (*Pluchea sericea*). The cottonwoods lined the main channel in thick belts just above the swamp and the willows clustered both at the water's edge and in clumps in natural depressions watered by flooding. The mesquite with their deep roots grew near the base of the bluffs and the mud banks of the meandering channels were overgrown with rushes and reeds (*Phragmites*) (Forde 1965, 91).

Fishing

It was noted that 'the river appears to only have a small amount of fish, and this is bony' (Forde 1965, 94). Two large fish ones, a humpback *c.*30-45cm in length and a white 'salmon' *c.*90cm and a number of smaller fish (eg bony tail, less than 30cm in length) were caught in the Colorado. The humpback was sometimes caught using flightless arrows and the small fish with cactus-spine hooks, but the most common method for all types was by using nets and traps in the swamps in the flood season (Forde 1965, 119). Nets were of two types: the drag net and the scoop. The drag net was rectangular in shape sometimes up to 10m in length and 1.20m in width, made of woven willow-bark twine with vertical rods of arrowwood attached in the body of the net and two end poles of tougher willow or mesquite. It was usually hauled by two men who, after dragging the net vertically for some distance, brought the two end poles together before recovering the fish. The scoop net was smaller, on a fixed frame and was pushed through the water. Traps were built on shelving banks, semicircular in shape and were *c.*1.5m high. Bait was in the form of crushed watermelon seeds (Forde 1965, 119,120).

Hunting

The land game which may have been more abundant in the pre-contact stage, was by the later period limited in species. Deer and antelope, rabbits beavers and muskrats could be found and although in an earlier period may have played an important role in the subsistence of the Yuma, by the late 1770s did not form a significant part of the economy. The people of the Lower Colorado were different from those of the Plains in 'their indifference to the chase' (Forde 1965, 107). Water birds were more valued for

their plumage (Forde 1965, 91). Horses were probably introduced at the beginning of the seventeenth century by an early explorer and, although highly esteemed as show animals, were more frequently eaten. When the Yuma were hunting which was undertaken in winter, they used bows and arrows which were tipped with triangular stone arrowheads lashed in place by sinews (Forde 1965, 171). Rabbits, however, were shot all year round.

Gathering

Wild seeds were gathered from the valley bottom as well as on or near the mesas. Some were sown on less fertile areas (Forde 1965, 113). The mesquite and screw bean were important subsistence items particularly in lean years and because of this, the trees were not owned by any one family. The beans were pounded and made into cakes which could be stored indefinitely. Tobacco was gathered in small quantities from where it grew wild near the mesa and was used in healing and birthing situations (Forde 1965, 117).

Agriculture

The inundation by the Colorado up to 2kms either side of the main stream allowed for a wide strip of fertile ground which could be used for cultivating crops. The times when this did not occur resulted in a shortage of food for the Yuma. Maize, beans, pumpkins, melons and grasses were grown latterly and Font recorded maize, orimuni beans, tepary beans, cantaloupes, watermelons and very large calabashes. These latter were dried in strips. Wheat and barley were noted later but in the sixteenth century beans and wheat were not known to the Lower Colorado people. While these accounts imply a high level of agriculture, in fact their method of planting was very simple with no rituals or ceremonies. Two tools, a dibbler and a weed cutter, were used made of mesquite.

Artefacts

Apart from the artefacts already mentioned the Yuma had chipped stone knives, which sufficed as a utilitarian implement. There is no suggestion that they ever had ground stone tools. Ceramics included ladles, flat bowls, round cooking pots and serving bowls and large bowls c.1.5m across. Coiling was the technique used and lugs were made.

Firing was undertaken on an open fire (Forde 1965, 123-124). Basketry made from willow, arrowweed and reeds using coils produced three forms: a large tray, bowl and a storage basket. Weaving, using coarse willow-bark strips (breechcloths and small blankets) and rabbit skin strips (blankets) was occasionally supplemented by cotton obtained from another group, the Pima (Forde 1965, 126). Blankets were traded.

Transport

Travel on the river was extensive, but the Yuma had no canoes or boats. The large ceramic bowls referred to above were used to ferry children and goods across the river, with a swimmer pushing it ahead of himself. Single cottonwood logs were occasionally used to carry a small party or load down river and individuals would travel using a form of semi-submerged float. Rafts were made of cottonwood logs or bundles of reeds, bound with hide thongs or twine. Larger reed rafts 'as large as a house' were more buoyant than the smaller ones and more easily constructed. On longer journeys earth was placed at the rear to accommodate a fire for cooking (Forde 1965, 127). Other groups who lived within the Lower Colorado hinterland travelled extensively but the Yuma tended to confine themselves to the Colorado valley.

Division of labour

Men and boys were trained as warriors, as the Yuma along with many groups in the south-west had a tradition of warfare with their neighbours. Their weapons included the spear, the feathered staff, arrows and the club. It was men that were the hunters and fished the river (Forde 1965, 118,120). They also played games such as the ball game (similar to football), archery and the pole and hop game. Others such as the ring and pin game were played by both sexes (Forde 1965, 132-133). Women fetched water, ground maize and carried burdens in nets on their backs supported by a headband.

It is not recorded who processed the animal or fish protein.

Florida wetlands

A drastic reduction in the Indian population of Florida followed close on the 'discovery' of the New World by Christopher Columbus in AD 1492 and by AD 1700 the Indian

cultures of the area had been 'wiped out' information being found in only a few references in the Spanish and French accounts (Purdy 1991, ix). It is only with work in wetland areas over the last 150 years that this 'lost' heritage has been uncovered in the form of paddles and canoes, human figures, carvings of animals such as panthers and otters, and complicated burial platforms at places such as Fort Centre (Purdy 1991, 72, 79, 89, 94). Other materials such as deer antler, bone (from both land and aquatic sources) and plant (for basketry and mats) have also been excavated from similar deposits (Purdy 1991, 73). The wetlands of Florida have produced many organic archaeological finds since Frank Hamilton Cushing first began a series of expeditions to uncover the truth of the tales he had heard of 'incredible artefacts' in the late 19th century (Doran 1992, 125). Locations vary from the inland Everglades to the coastal and underwater sites with these latter having been flooded by rising sea-levels and often have a sequence of levels of occupation. The range of dates are from c.9500 cal BC to the point of historic contact, post-AD 1492. Many of the sites have human remains and some have what might be called 'cemeteries' in shallow ponds or water-saturated deposits, a practice of burial confined in N America to South Florida (Doran 1992, 128; Purdy 1992, 116). These are not riverine sites, although Little Salt Spring did begin to issue water with the rise in sea-level and encroachment of salinity. The burials were normally staked into position. Windover is the most spectacular of the sites, dating to the Archaic period and is the earliest by a thousand years of the cemetery sites (Purdy 1992, 116).

Of the 168 bodies recovered thus far from the burial pool at Windover, half are children, all originally wrapped in grass mats or other coverings prior to being staked to the bottom (Coles & Coles 1989, 175, fig X). Fabrics, twined and woven, as well as wooden, bone and antler objects have survived although flesh, skin and hair have not (Coles & Coles 1989, 173). 90 individuals have brain tissue preserved and in some, evidence of their final meal has survived in the abdomen. Most of these indicate a diet comprising edible fleshy fruits and prickly-pear cactus as well as a few seeds of holly and black nightshade. The latter were used in traditional drinks of the historic southeastern Indians (Coles & Coles 1989, 173). The abdomens of two individuals (an adult male and a small child) contain a very different commodity – large amounts of crushed fish bone (Coles & Coles 1989, 174). Stable isotope analyses undertaken on human bone from the site indicate a freshwater aquatic-based diet rather than marine (Doran 1992, 131). Faunal remains extracted from the peat surrounding the burials include

many species that would require a complete or partial aquatic condition to survive (Doran & Dickel 1988, 280ff). The majority of the fish are freshwater species and include sunfish, bass and catfish. Reptiles and fish comprise the largest portions of the vertebrates (Doran & Dickel 1988, 281-282).

Trackways, so evident in Britain and Ireland, are not in evidence, so far, in North America (Nicholas 1998, 36). The extensive wetlands in Florida restricted transport primarily to boats and the like and the state 'has the oldest and the largest number of prehistoric watercraft in the world' (Purdy 1992, 121). There are more than 200 canoes, with all but the most recent being made from pine in at least six different styles (5% are made from cypress) and they date from more than 5000 years ago to the 19th century (Purdy 1991, 273; 1992, 121). Purdy in her discussion of the canoes asserts that they provide 'information about the growth and utilization of aquatic resources' by the indigenous people of Florida and that they impinge on 'many realms of Indian culture including economic, social and ritual' (Purdy 1992, 121).

Access to parts of the landscape may have been inhibited, not just by difficulties of transport but also by more cultural aspects that can only be surmised. Windover and other similar sites could have been separated by location from the settlement sites as well as by 'special spiritual values' (Nicholas 1998, 36). Places for such disposal of the dead were obviously of significance, given the archaeological evidence for the careful preparation undertaken prior to burial with the addition of artefacts, and positioning the corpse on a mat after being wrapped in textiles, and the method of securing the bodies with stakes.

While fish bones have been found at a number of sites (for example, Doran & Dickel 1988, 282), there is not much evidence of actual fishing in the early periods. The unidentified crushed fish bones found in the abdomen of the two of the bodies at Windover referred to above is one example. A fragment of a fish weir has been discovered at the west end of Owens Pond in Lake County and fish hooks at Hontoon Island (Purdy 1991, 239, 129). Many freshwater shell middens have also been uncovered, for example, at Hontoon Island (Purdy 1991, 105). Most of the bone tools found, used larger bones than those from fish. This does not suggest that fish were not utilised, just that the evidence has not survived. Unilaterally barbed points made from deer antler, similar to those found at Star Carr and other locations, were almost certainly

used for fishing as was a single fish gouge of bone (Doran 2002, 103). It has also been suggested that the absence of fish hooks and nets at Windover, which are found on many other Florida sites, could simply be that ‘they may have been so common that the thought of including them in the burial ceremony was inappropriate’ (Doran 2002, 19). On the other hand, 18 catfish vertebrae were used to form a necklace, as were 10 pierced shells. In addition, another necklace included 43 shell beads and a third comprised a single catfish vertebrae bead (Doran 2002, 107). The plentiful water resources would have formed an important part of the economy of the early indigenous people. Reeds and plants with bast fibres were used to make the mats, baskets and cordage found on many of the waterlogged sites. Some of the animals and birds chosen for carving include those for whom water was also important. Examples include otters, pelicans and waterfowl (Purdy 1991, 110, 121).

3.7.2 The Mississippi and its mid-west confluences

Work in the floodplain of the Central Mississippi drainage system with its preservation of organic material has aided understanding of hunter-gatherers and sedentism within North America. In other places, a paucity of good faunal and floral remains has resulted in the investigation of only the settlements and their component features, thus ‘limiting the range in the material inventory’ (Brown 1983, 8). Settlement patterns within the Archaic period have been a major area of study for archaeologists because of the known close connection between ‘the size, location, duration of settlement, and the economic activities carried out at each settlement’ (Brown 1983, 7-8).

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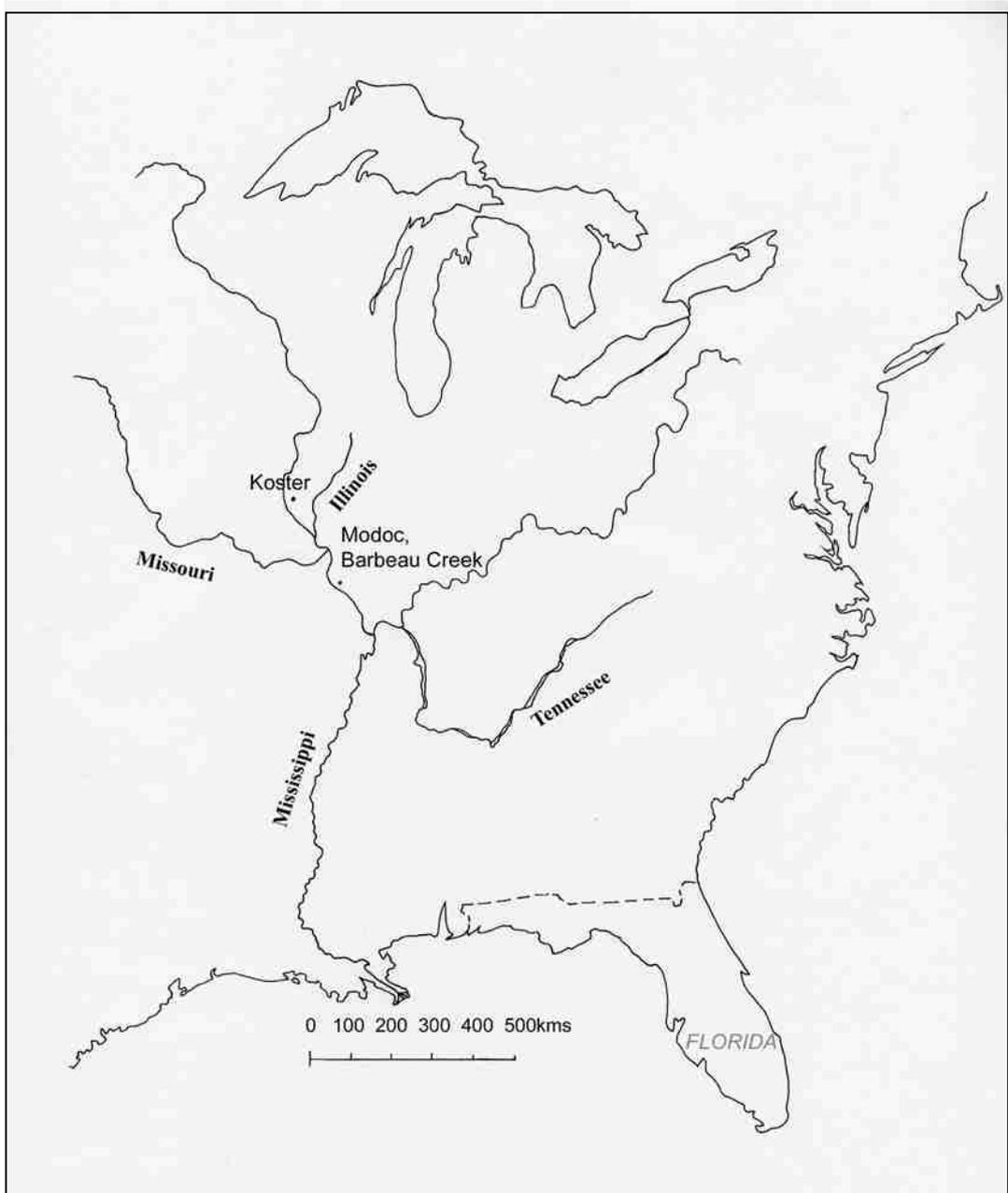


Figure 9 N America Midwest

Modoc and Koster typify the concept of a single, long-term multi-seasonal camp, based in the floodplain. They are two early sites occupied throughout the Archaic period and adjacent to major rivers that have shown, in the available faunal evidence, a growing utilisation of fish and water resources from c.5800 cal BC onwards. This trend showed an increasing dependence on fish, waterfowl and shellfish (Brown 1983, 7). Modoc has a well-stratified sediment layer 8.2m thick first excavated during the 1950s (Brown 1983, 6). Modoc is situated in the lower Mississippi River bottomlands 'at the base of bluffs of the Mississippi River valley at the junction with the smaller Barbeau Creek' (Styles *et al* 1983, 267). The river would have had, as now, oxbows, creeks and marshes as well as the main channel. It was in an area of considerable resources. The bluffs were at this time covered with a wide range of heavy timber while the forest on the bottomlands included many species that were tolerant of flooding. Dryland fauna of all sizes which included deer, varieties of wolf, rodents and turkey, were matched by riverine fauna of racoon, river otter, beaver, mink and swamp rabbit (Styles *et al* 1983, 268). Waterfowl used the river in the spring and autumn migrations.

The rock shelter shows three distinct periods of occupation. The earliest, radiocarbon dated to c.8-7000 BC indicates exploitation of the local chert outcrop (Styles *et al* 1983, 283). The middle stratum (c.6700-5580 BC) shows that short-term camps were the main feature. The Middle Archaic upper layer (c.5000 BC) suggests 'an intensive, more permanent habitation' (Styles *et al* 1983, 284). A policy of using finer mesh during sieving in the more recent excavation led to a greater density of fish bone being retrieved. Results from the middle and upper layers imply that areas of what was termed 'quiet-water habitats' were being exploited (Styles *et al* 1983, 287). Most of the fish were small in size, suggesting that the methods of procurement were nonselective, involving seine netting, trapping and other sorts of netting and would have taken place, most likely, during the spawning seasons in the spring and autumn (Styles *et al* 1983, 288). The increase in aquatic usage may be related to their stability as a resource when compared to other dryland fauna, to the growth in population in the floodplain and to the changes in technology that would have made the catching and processing of fish more efficient.

Koster is situated on the eastern margins of the lower Illinois River valley within a colluvial and alluvial fan at the mouth, just north of its confluence with the Mississippi

River near St Louis (Phillips 1983, 2, fig 1.1). The fan deposits from the Illinois have produced a nearly continuous stratigraphic record for the Holocene period with occupation levels beginning with early Archaic and continuing through to the Historic period (Brown & Vierra 1983, 175; Wiant *et al* 1983, 156). Like Modoc, there was an increasing dependence on aquatic resources in the move from the early to middle Archaic. Backwater lakes provided ready reservoirs of fish, shellfish and waterfowl along with marshlands plants and tubers, and wild seeds (Brown & Vierra 1983, 172). Again, as with Modoc, the security of these resources would have dictated their primary selection against other forms of food procurement. This security in its turn would have drawn mobile hunter-gatherers to the area and also encouraged a semi-sedentary lifestyle.

Artefacts retrieved include a large number of lithic projectile points of a range of sizes made during the later part of the early and all phases of the middle Archaic (Brown & Vierra 1983, 182). Spears would have used for not only land animals but also for catching fish. Tools made from antler and bone have also been found throughout the deposits and include a bone fish hook. Turtle carapaces were used for making cups and mussel shells for pendants and spoons (Brown & Vierra 1983, 183, 185). Pits used for steaming mussels and a clam shell midden were found in the second middle Archaic phase. The third middle phase included a series of shallow pit ovens which were associated with roasting of both meat and shellfish (Brown & Vierra 1983, 181-185).

Faunal remains in the early Archaic and the first middle Archaic phase, while showing exploitation of riverine resources also included small mammals. None of the evidence indicated a particular concentration of either specific habitats or species. It is only in the second middle Archaic that a distinctive use of the backwaters can be seen but the species found did not include those typical of the spring (largemouth bass) or autumn (migratory waterfowl), which suggests that the site was not occupied at these times (Brown & Vierra 1983, 188). It is in this phase too that nut and seed procurement becomes evident. In the third middle Archaic phase, a thousand years later 'a single base camp became the centre from which many environmental zones could be exploited on a scheduled basis' and was occupied all year round (Brown & Vierra 1983, 189). The backwater areas were heavily exploited for fish (including the largemouth bass), shell fish and migratory waterfowl. The main channel of the Illinois was also fished for varieties of catfish and the deep pools for drum and white bass.

3.7.3 NW Pacific

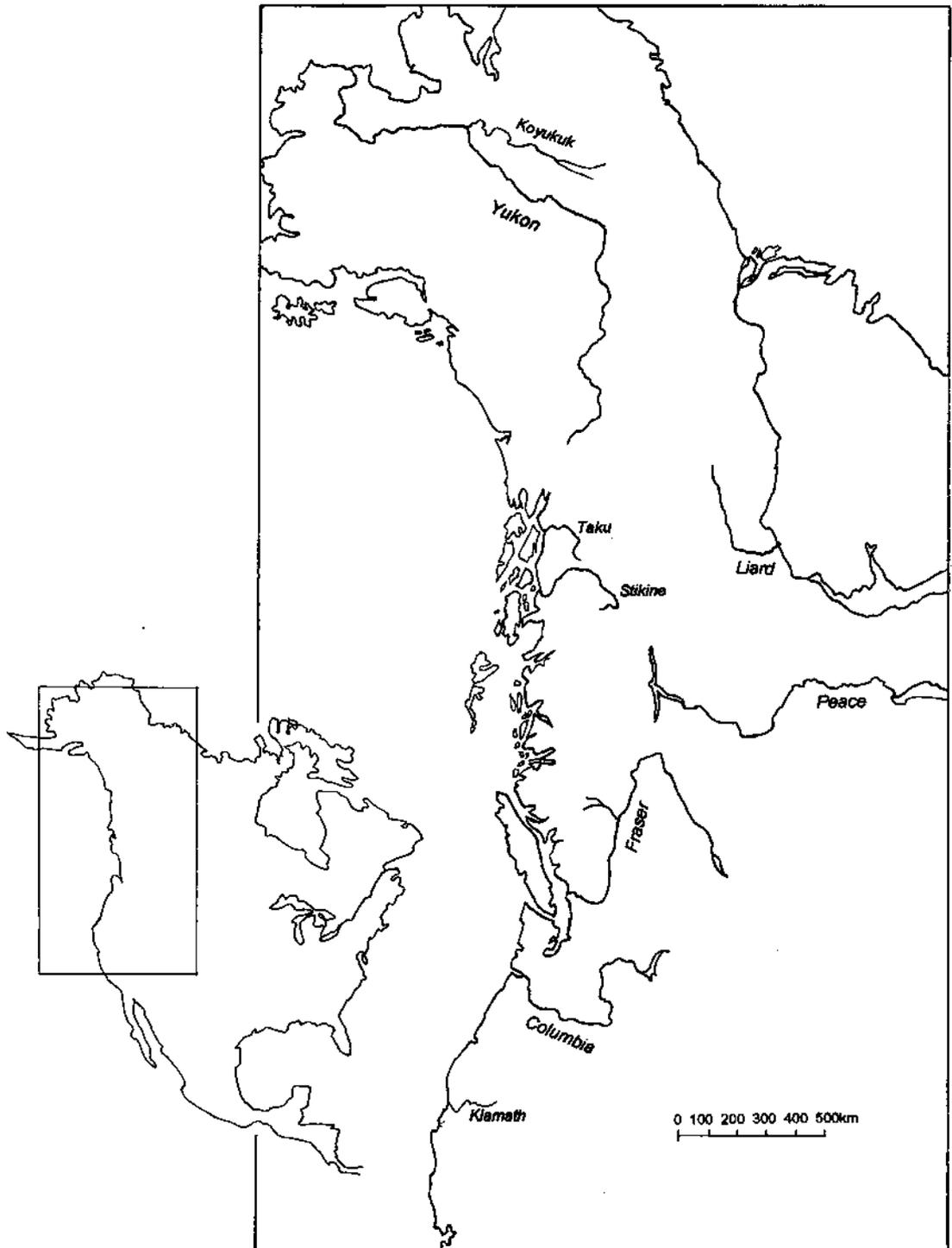


Figure 10 NW America

Background

Like all the previous case studies, this final example looks at a culture and way of life which only reflects what went before. The arrival of Europeans in most parts of the world heralded for the indigenous inhabitants the beginning of the deprivation 'of their resources: territory, water, wildlife, fish, language, religion, even their children' (Brody 1981, x).

This region includes British Columbia in Canada and parts of Alaska, Washington and Oregon in the United States of America. It is an area that has major rivers draining westwards into the North Pacific (such as the Taku, the Stikine, the Fraser and the Columbia) and the Bering Straits (the Yukon and the Koyukuk), and also rivers flowing eastwards to inland lakes, such as the Peace and the Liard. These major drainage systems were of paramount importance to the various groups of Indians who lived in this area in the past and in most cases continue to do so. They were hunter-gatherers for whom their primary source of protein was from the rivers in the form of fish. Utilisation of the salmonids, herring and smelt which are plentiful in the region has 'formed the cornerstone for a remarkable cultural phenomenon generally known as the Northwest Coast Culture' (Olson & Hubbard 1984, 920). The earliest inhabitants would have been small groups of nomadic foragers and these later became collectors 'who undertook seasonal foraging as part of the system' (Lohse & Sammons-Lohse 1986, 121; Carlson 1995, 15). The timing of this change is debatable with estimates varying from c.1700 cal BC to 2,500/5,000 cal BC (Carlson 1995, 15-16).

In spite of the current use of modern weapons, many groups continue to live their lives very close to that of their forefathers. This has been made possible primarily by the predictable anadromous fish resources within the region. The methods of catching and processing these have not, for the most part, been affected a great deal by the use of modern materials. North America's largest land carnivore, the Alaskan brown bear, may have attained its great size of over c.2.40m tall because of the abundant supply of fish protein (Olson & Hubbard 1984, 920). Land animals were hunted too and it is likely that there is nowhere else in N America where there is country still rich in what had been there in times past – where moose, elk, caribou and deer still tread on the old buffalo trails (Brody 1981, 20). However, in the last 150 years there have not been the great herds of buffalo or caribou as these were hunted almost to extinction by the advent

from Europe of the rifle and the horse before conservation policies were imposed (Hunn 1995, 138). Also the weapons used to hunt them, the spear and the spear thrower (*atlatl*) have been superseded by first the ubiquitous bow and arrow and later by the aforementioned rifle (Hunn 1995, 21).

The Tlingit culture particularly is unique in the level of organisation that was achieved based upon a hunter-gatherer economy where the abundance of easily obtainable food enabled the indigenous population to ‘devote to such things as maintaining a highly complex social system, totem pole and wood carving, trade and warfare’ (Olson & Hubbard 1984, 920).

Fishing

Modern ethnographic studies have demonstrated that fish and fishing still play an important role in the lives of the indigenous people. Even with the advent and demands of commercial fishing along the coast, ‘a salmon run at its peak is an impressive spectacle. In former times it must have been awe-inspiring’ (Drucker 1965, 13). Between the Peace and Liard rivers which lie to the east of the area under consideration and in which the marine salmon do not run, the local tribe, the Beavers, unlike those living on or near the coast, live on a series of reserves (Drucker 1955, 33, Brody 1981). The fish that they catch are the rainbow trout, Dolly Varden, grayling and Rocky Mountain whitefish (Brody 1981, 8). Many of the people try to live the traditional life of hunting and fishing although use of western tools and technology such as nylon fishing line and rifles has been adopted. Brody, in his book, describes one of the many hunting trips that he undertook with members of the Beavers (Brody 1981, 35-43). Hunting trips were not simple one-objective occasions – opportunistic methods were used to take time to try to both fish and hunt over a series of days. The people spoke about dreaming and its relevance to successful hunting. ‘Old-timers’ who were successful hunters in days gone by, first dreamed of the hunting trail and the animal or fish they would catch. They would then go out, find the trail and re-encounter in reality the dream-animal or fish. There would be no need to seek for the prey as they would have certainty about what they would catch and where it would be found (Brody 1981, 44).

The Koyukon who live in an area which spans the Yukon and Koyukuk rivers of Alaska set nets along the rivers to catch not only the salmon but also pike and whitefish in the summer and autumn (Nelson 1986, 10-11). In the early part of the year, families establish camps along the river which they occupy when the salmon begin to run in late June. In the autumn the nets are left in place until just before the rivers freeze and with use of a seine, large quantities of whitefish are caught. Even when the ice has come, gill nets are set beneath the ice on the many lakes to catch fish before there is a total freeze. The amount of fish caught overall in a good year is prodigious.

The Fraser river has been in the past, and still is, 'one of the greatest producers of salmon in the world' (Kew 1992, 178). There are five species of Pacific salmon currently in the Fraser: chinook (*Oncorhynchus tshawytscha*), coho (*O.kisutch*), chum (*O. keta*), pink (*O. gorbuscha*) and sockeye (*O. nerka*). Many of these are also found on the Columbia. After being hatched in freshwater, the fish journey to the sea before returning as adults to spawn in their natal streams. For the indigenous people, the regular and predictable return of each run of salmon meant that they could be relied upon as the major protein element of the people's subsistence. A group or clan would have their own specific fishing spots on the rivers and streams (Turner 1992, 418). A range of methods were employed to catch the fish from duo-and multi-pronged spears to large dip nets, nets set across the waterway, weirs of willow and stone, and seine nets (Hunn 1995, 119). There is evidence for complex fishing gear on the Columbia river in the form of weights for seines and points for harpoons, dated to c.8000/5800 cal BC (Hunn 1995, 119). These methods are still used today by the local people (Hunn 1995, 124-125). Stunning the fish by applying selected poisons to the water in small quiet streams was another technique used on the Columbia (Hunn 1995, 113). Suckers who lived on the river bottoms and lamprey eels were also caught mostly by dip-netting. The Karok on the lower Klamath rivet also used large dipnets to catch salmon. (Drucker 1955, pl 1).

The equipment used by Tlingit had a high degree of sophistication in order to catch large numbers of fish. Some of it was specialised in that particular hooks and rakes were designed for use with one sort of fish. Canoes were used in the estuaries and between the islands of what is known as the 'Alaskan panhandle' for halibut while large basket-like traps were placed across streams for salmon which were guided in by fence weirs (Olson & Hubbard 1984, 919, 929, 930). In addition they used dip and scoop

nets, seines, gill and small hand nets. Other groups such as the Kwakiutl constructed salmon traps as well using poles with a range of designs to fit varying sizes of streams. Stone weirs were constructed on the coast and in small streams, spears and gaffs were employed.

In addition to the piscines, the Tlingit also collected uni- and bi-valves, crustaceans, seaweed and other small sea creatures as well as hunting seals and sea lions (Olson & Hubbard 1984, 930).

Hunting

Hunting included deer, elk, yellow-bellied marmot and ground squirrel. Jackrabbits and cottontails were normally trapped by the use of long nets into which they were driven (Hunn 1995, 143). Trapping (used for beaver, muskrat and otter) was not a regular event being used only when fur was needed in the Columbia region but further north it was used latterly by both white and indigenous trappers in the 1920s and 1930s as a form of income when fur prices were buoyant (Brody 1981, 86-87; Hunn 1995, 142-143).

In Alaska, the Koyukon trap a great deal more than in other areas for the fur as well as the meat. The former is used for commercial as well as personal purposes (Nelson 1986, 12). Hunting for large game is undertaken by them too and in the depths of the cold season, snares are set for snowshoe hares (Nelson 1986, 12).

Grouse, ptarmigan and waterfowl were also hunted by most of the groups within the study area by a variety of methods (Drucker 1955, 51; Olson & Hubbard 1984, 928; Nelson 1986, 11). However, they were never abundantly available all year round and subsequently were not a major contributor to the diet (Olson & Hubbard 1984, 928; Nelson 1986, 11-12). Feathers themselves were valued for use with arrows, aesthetic and religious purposes (Hunn 1995, 144-146).

Gathering

Root plants were harvested by using the digging stick, between March and July. These provide a large component of the Columbia Plateau Indians' diet. Other seasonal plants

included fruits, berries and nuts (Hunn 1995, 176, 178). The Koyukon also gathered blueberries and cranberries in late August (Nelson 1986, 11). The Tlingit gathered a wide range of berries as well as seaweed, wild celery and “Indian’ rice in abundance (Olson & Hubbard 1984, 930). The collection of berries was labour intensive requiring large quantities to be gathered to gain a comparatively food value.

Processing

Processing of foodstuffs was generally done at the place of collection. Amongst the Columbia Plain Indians, fish would be dried and ground into powder. Roots were dried, cached and later taken back to the village sites. Drying reduced the weight of the load by two-thirds. Some of the fruits were ground and then dried which removed, in some cases, the toxic cyanide compounds. Berries were dried slowly over fires (Hunn 1995, 120-134). In Alaska, processing was similarly undertaken by the river and the split fish were placed on drying racks producing enough in a good year to feed both humans and animals over the long winter season (Nelson 1986, 10). The offal was often utilised by the children as bait to catch whitefish. The meat from hunting was hung in smokehouses before being naturally frozen as the winter arrives (Nelson 1986, 12).

In the southern part of the study area, acorns were processed into an edible gruel and food would be boiled in watertight boxes or baskets or steam cooked in shallow stone lined pits. Fish and meat would be broiled over open fires. Berries were made into cakes or preserved in whale oil (Drucker 1955, 54-55). The NW Coast Indians are known for their containers used for storage and cooking, and their food preparation techniques (Heyardahl 1952).

Division of labour

In the Columbia Plain men fished and hunted the large game. Women gathered the roots and plants and were responsible for the processing of all the different types of foods. They ‘contributed at least half the total food supply’ by their efforts (Hunn 1995, 122). Their knowledge, skill and expertise were equal to that needed for fishing and hunting. On the Fraser and Liard, it was men that undertook the hunting (Brody 1981).

This seems also to have been a common division of labour amongst many of the groups living near the coast. The Tlingit, in addition, had slaves of both sexes who were without rights and were valuable in the procurement of food (Olson & Hubbard 1984, 933).

The Koyukon women were the principal managers of the fishing camps and did most of the fishing and related work. They also often went with the men by canoe to take part in the moose kills in the autumn and they participated in the trapping, although in this activity men dominated in the winter months (Nelson 1986, 10-12).

The Hoko river

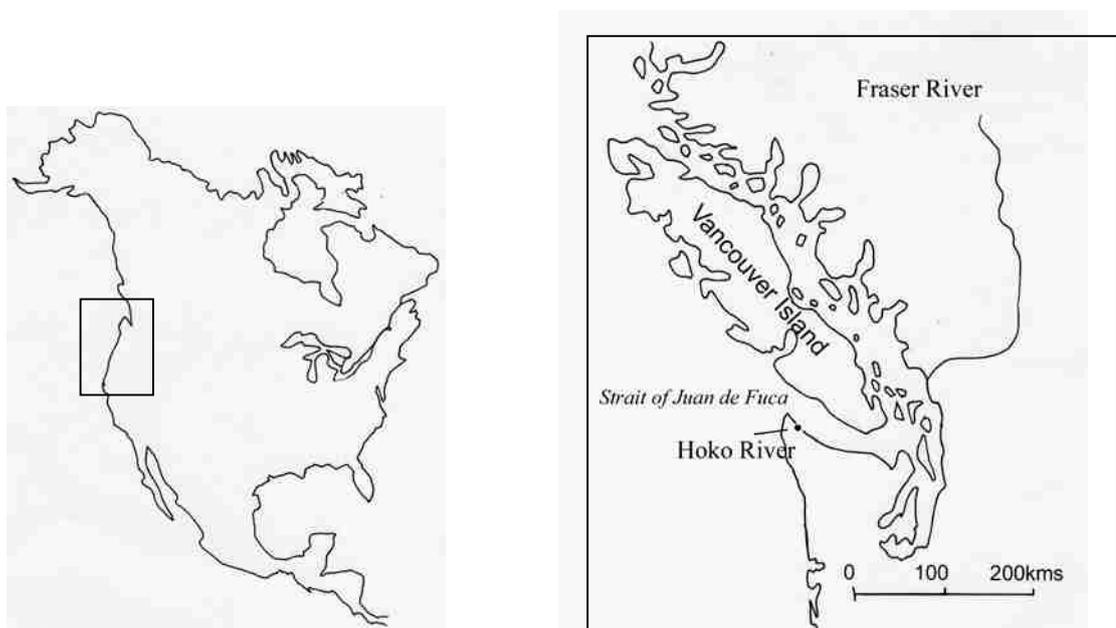


Figure 11 The Hoko river

NW Pacific hunter-gatherers were in this area after the withdrawal of the ice sheets, at *c.*10,000 cal BC. Evidence has suggested that they were travelling up from the Lower Fraser canyon in the spring to hunt and also to fish using projectile points and microblades made from a dark coloured vitreous basalt (Stryd & Rousseau 1996). Trade in obsidian from northern Oregon is documented from *c.*8000 cal BC (Carlson 1991, 118). Skeletal evidence from both the coast and the inland plateau show use of cemeteries over a long period of time (Carlson 1995, 16) and carbon isotope analysis of a large sample has shown unsurprisingly that on the coast 90% of the protein in the diet

was from the sea. Even upriver on the Fraser, two skeletons from near Clinton dated *c.*3750 cal BC show 37-38% marine protein in their diet. While the evidence from the coast cannot differentiate salmon protein from the rest, information from the Fraser can only indicate such a source (Carlson 1991, 120). In addition more recent prehistoric skeletons on the Fraser show much higher levels as well as a noticeable decrease in marine protein the further upriver. Salmon is the only marine species to reach this far inland. Throughout the prehistoric period post-*c.*6500 cal BC, evidence for salmon use in the form of bones has been recovered in archaeological contexts indicating the value placed on the fish (Carlson 1991, 119).

The Northwest coast and its associated rivers are still areas where the indigenous hunter-gatherer communities practise a semi-sedentary lifestyle. This is a continuation of an existence that can be traced back several thousand years, in some cases. The people have formed 'highly complex societies based solely on hunting, fishing and gathering' (Croes 1992, 99). Compared with the events in Florida, the indigenous population here were more fortunate in that they were left relatively undisturbed until the late eighteenth century and much more of their culture remains intact (Purdy 1991, ix). Work on what are referred to as 'wet' sites which included both underwater and adjacent floodplain sites in the Northwest coast area flourished in the 1970s and has allowed quantitative analysis to be undertaken on the basis of what had been retrieved. Croes states 'we have determined that Northwest coast wet sites typically produce 90-95% perishable artefacts, with only 5-10% being the previously predominant stone, bone and shell artefacts' (Croes 1992, 101-102). He concludes that the other 90% were made from what he calls the 'major media of material culture' in this area, that is wood and fibre. All this has been dated from 3000 years ago to modern times.

One of the most extensively investigated sites is that on the Hoko River, Washington State, which drains into the Strait of Juan de Fuca opposite the southern end of Vancouver Island (Croes 1988, 131). Rescue excavation in the form of a joint project between the local tribe, the Makahs, and Washington State University, was undertaken between 1973 and 1989 with research efforts continuing for many years after (Croes 1999, 59). The site comprised two chronologically different areas: a river mouth site within a rock shelter used between AD *c.*1100 and 1900 cal BC, and a site further upstream with both dry and wet components dating from *c.*1150 to 500 cal BC (Croes 1988, 131). The modern Hoko river is known for its late summer and autumn salmon

run and the evidence from the two sites shows that the people came here to fish, although salmon was only one species caught (Coles & Coles 1989, 62). The rock shelter contained over 3.3 vertical metres of shell midden, in a fairly undisturbed condition, which comprised over 1,300 distinct strata. The large amounts of fishbone recorded suggest that roundfish/rockfish were the main type caught followed by salmon and small amounts of halibut/flatfish (Croes 1988, 132-133).

The wet/dry site was originally located on a river point bar and its shore which would have formerly provided a grassy meadow for the settlement (Croes 1988, 148; 1992, 102). While the dry site yielded only stone artefacts (quartz microblades, and a range of points), features such as floors, pits, fire-cracked flint and quartz microlith manufacturing areas were also recorded (Croes 1988, 131). In comparison, the wet site found on the edge of the Hoko River had 25 layers of well-preserved organic material including discards as well as faunal and shellfish remains. 90% of the artefacts retrieved from this site were organic in nature and included clothing (shredded cedar bark capes and skirts, two styles of hat, woven garments), basketry, cordage, mats and carved wooden objects (Croes 1988, 131ff; 1992, 108). One class of organic object missing from Hoko is the bentwood box, which is very common on other Northwest coastal sites and is used frequently in cooking, storage and water buckets. Croes suggests that at Hoko this may have been replaced at least as a cooking container by the use of sandstone slab lined pits found on the site, with the possible addition of a leather lining (Croes 1992, 107-108).

Subsistence within the area displays an emphasis on fishing with hunting being a secondary source of food procurement (Croes 1992, 102). Elk and deer faunal remains have been recovered as well as those from sea lion and fur seal but even with the addition of shellfish and waterfowl, fish still provided approximately 80% of the food resources (Croes 1988, 143,145). The site shows evidence of food processing with drying racks and tools as well as storage baskets used when transporting the fish (Croes 1988, 145-146). Analysis of red blood cell residue from a number of the hafted-microlith blades made from vein quartz and green jasper has identified fish blood on some of them (Croes 1988, 146; 1999, 63). The fish were both marine and freshwater varieties with the late summer/autumn catches being almost completely salmon making their way upstream to spawn. Halibut seems to have dominated in the earlier parts of the year (Croes 1988, 143).

Plentiful evidence of fishing equipment can be found within the organic material assemblage. Over 350 bentwood and composite fish-hooks, both types with double twisted spruce root string leaders, have been retrieved from the Hoko wet site (Croes 1999, 61). Cedar split-wood line-floats, which have been recovered as well, complete the picture of hook-and-line fishing (Croes 1988, 146). Four sites within the area, including the Hoko river location have produced fibre nets demonstrating a use of this technology over the last 3000 years (Croes 1992, 102). Some were used as salmon gill nets, others as part of rigid fishweirs. Baskets as well as being used to transport processed fish in the form of open wrapped pack shapes, have been found as small tightly-woven models which are interpreted as fish-hook bags (Croes 1988, 146). Projectile points have been recovered from the Hoko site. Some bifacially flaked and ground stone tools are typical of what is known as the Locarno Beach Phase and date to c.1150-500 cal BC. The wet site on the Hoko River also has seventeen wooden barbed points but interestingly enough no examples in bone although other artefacts of bone were preserved in these deposits emphasising the choice of material (Croes 1992, 104). The seventeen comprise harpoons and fixed points with only one bilaterally barbed. Wooden shafts and possible atlatls have also been found at the site.

The presence of living shelters constructed using poles and bulrush matting, and drying racks have been extrapolated from the postholes excavated on the dry part of the site (Croes 1988, 148). Manufacturing equipment and debris such as adze blades, wooden wedges and thousands of wood chips have also been found, indicating on-site production of many of the organic artefacts (Croes 1988, 149). While evidence of canoes have been found at other sites on the North West coast, Hoko River only has fragments of split and carved cedar, and possible parts of gunnels as well as suitable tools and wood debitage (Croes 1992, 108). The positioning of the site on a navigable river and with evidence of deep-sea fishing would indicate that canoes were the main means of transport.

Zoomorphic carvings particularly on the wooden harpoons have been recorded with the backbone formed with the line guards and the space below the barbs being carved into a diamond shaped eye (typical of this area) and the mouth and tongue being formed out of the barbs and point (Croes 1992, 109). Similar carvings can be seen on a device, which has been interpreted as a fish lure. Other patterns more geometric in style often with

associated notches have been noted on other lure-type objects as well as possible blanket or hairpins. One artefact (now lost) was a wooden mat creaser in the form of two kingfishers carved beak to beak (Croes 1992, 109).

3.8 Experiential/symbolic

3.8.1 *Background*

I had thought prior to the current research being undertaken that rivers, waterholes and lakes would have featured noticeably in the myths of people living adjacent to and dependent on such places and those animals and reptiles associated with water may have appeared also to a significant degree. When something is an important constituent of their life and lifestyle, it would not seem unreasonable for it to be a part (if not a major feature) of any folktales or ritual events that affect a particular tribe or group of indigenous people. In regions such as that of the Darling basin in Australia where the river runs through semi-arid countryside for over 800 kilometres, it would have appeared probable that the value of water would be a feature included in myths and that the Darling itself might be the recipient of votive offerings or ritual practices among the Aborigines.

With these thoughts in mind, it was decided to examine a range of attributes that could be placed under the heading of 'experiential'. Discussion will be undertaken thematically rather than region by region and topics to be covered are the following:

- myths, creation and cosmology
- sacred places and special rites
- treatment of the dead
- ritual and votive objects and practices

3.8.2 *Myths and cosmology*

Myths or folktales are more than just stories passed on from one generation to another. At a simplistic level, the storyteller who relates the myths uses them to explain the origin of the tribe or group and to describe the reasons behind any prescribed behaviour. They also are used to enhance the position of the storyteller or shaman within the

society. Animals and reptiles with which the people are familiar often appear in the myths as gods and with human attributes of speech and emotions. Creation stories of humans, topographical features and equipment, feature in many societies in one form or another.

The Amazon basin

The Tukano in the Amazon see life as being controlled by a 'Master of animals' through whom life is lived on various levels or dimensions. One of these is the 'fish-dimension (or 'water-dimension') which includes all rivers, streams creeks, lakes and swamps with all species of fish and aquatic creatures (Reichel-Dolmatoff 1996, 44). This 'Master of Fish' and also 'Fish women' who appear in the myths of the Shipibo are malevolent and must be killed before being cut into pieces (Roe 1982, 143). It is not possible for someone to go hunting or fishing whenever they choose – it is necessary to have preparation time before hand. A control is exerted by the village shaman on over-hunting or over-fishing and food restrictions are in place over many everyday circumstances such as pregnancies and menstruation, and during mourning periods (Reichel-Dolmatoff 1976, 313).

In the picture of the celestial world, rivers appear both underground (as the river of death with no fish and not good to drink) and as celestial (rivers of life, rebirth, eternal youth, teeming with fish) (Roe 1982, 135-136). Both these aspects of rivers are reflected in their comparison (as both a river of death and rejuvenation) with the Milky Way where death is both the origin and destination of life in the cycle of rebirth (Roe 1982, 262). The anaconda, seen frequently in the waters of the Amazon, is another symbol of the Milky Way and it is also seen as having a dualistic role between men and women. On the one hand it is an erect phallus and on the other, when after ejaculation, the penis becomes flaccid, is 'injured' and softness (a sign of women) is triumphant, the anaconda is seen as 'loathsome' or rejected by the river (Roe 1982, 170-172). Anacondas are central to the Pirá-paraná myths where they are seen in various guises (Water Anaconda People or *Makuna* and Fish Anaconda People or *Bará*) along the journeys that all the people have to undergo (Hugh-Jones 1979, 33ff). The creation of what Hugh-Jones calls descent groups or movement of anacondas and ancestors takes place within a water/river context.

process	starting point	boundary	path	boundary	end	movement
Creation of descent groups (movement of anacondas/ ancestors)	House beyond water door	Water door	Milk river	Port (river to land)	Original house sites	East – West [NB this is the direction of flow of the Amazon river]

Table 1 Water Anaconda people (Hugh-Jones 1979, 127)

In Shipibo culture, women first came from the river (hence the term ‘fish women’) and so the association of the anaconda with the river explains why it also seen as female (Roe 1982, 165). Among the Tukano, woman is seen as the land and it is man that is created from a whirlpool (Reichel-Dolmatoff 1996, 28). The Achuar believe that there are beings (of both sexes) called Tsunki who live in the river and seek to gain a stronghold over the humans by beguiling them down under the water to visit their homes or by having sex with them. They appear in dreams usually to the men (Descola 1993, 141-143).

The creation of the women’s gardens and the planting of manioc in Amazonia is also explained in myths (for example Descola 1997, 90-91, 183). This may indicate why the gardens themselves are treated, by most groups, as special places.

Lower Colorado

To the Yuma of the Lower Colorado, the river, even though it was important for their actual existence, features only peripherally in their myths as the ‘sweat’ or ‘blood’ of Kumastamxo, or appearing when the Creator drove a stick into the ground. ‘It is not personified and has no associated spirits’ (Forde 1965, 110). Similarly the introduction of wheat or maize has no legends or myths unlike in other groups such as the Pueblo people and there seem to have been no rites or ceremonies to assure the success of the crops. Water is seen to be there before creation as Kwikummat (the father of

Kumastamxo) and Blind-Old-Man emerged from the water before dryland, the moon, a star and people were made. The Yuma man who had been made out of mud was named Marxokuvek and later in the story he died near Yuma. He was burnt on a mountain and Kumastamxo sank into the earth where he remained for four days then emerged as four types of eagles. The keruk or mourning ritual which re-enacts parts of the creation story originally took place some months after the death of an important person but latterly it became an annual autumn event.

NW Pacific

Alexander Teit wrote about a journey he had made in 1900 across the north and west parts of the Fraser in NW Canada and collected many myths of the Shuswap tribe. Of the ones he recounts only one, the story of the Salmon-boy, deals with the river. In it the boy falls into the Fraser and goes downstream to where the salmon live. After a while he is turned into a salmon himself to make the dangerous journey back upstream to his grandfather (Teit 1909, 690). The rivers, and salmon, in particular, are mentioned in the retelling of the conception of the world in which Coyote is sent by the Old-One into the world. “Probably his greatest work was the introducing of salmon into the rivers, and the making of fishing places. All the best fishing places on the large rivers were made by him’ (Teit 1909, 595).

In Aboriginal North America, fish are seen in many places on the western coast and in a large region encompassing the area between the Great Lakes and Hudson Bay, as ‘supernatural masters’. In other places, primarily those occupied by the Inuit, the seal takes that title. “The concept of master of the fish was stimulated by fishing ... It would have been more prominent had not vision quest and belief in personal guardian spirits as well as agricultural ceremonialism displaced it in large areas’ (Hultkrantz 1984, 882).

Australia

On the Murray-Darling, there is very little reference in the rich heritage of myths discussed in the so-called ‘Dreamtime’ of rivers, waterholes or aquatic creatures. One of the few that does is also one of the earliest and concerns the Murray telling of its creation. Ngurunderi, in a bark canoe, pursued a giant Murray cod which formed the

river as it swam along by sweeping its tail from side to side. The cod was called That-yu-kul and he left the Murray and made another track through the Mallee and down past the Grampians into Victoria. Ngurunderi was also responsible for changing the Bookoomurri (primitive beings) into animals: two of which formed the Willandra Creek (Berndt & Berndt 1964, 203-4; Allen 1972, 107). The story of Goolayyahlee, the pelican describes the making of the stone fish traps and the creation of nets. It begins before the Daens (a tribal group) had nets or the traps and they had to build walls of 'poligonum and grass mixed together, across the creek' catching the fish in their hands after driving them down to the wall. Goolayyahlee was seen with a net but he would not say from where he had obtained it. Goolayyahlee was secretly swallowing twine from bark of the Noongah tree and vomiting up the nets. The name of the tribe became Gooayyahlee, which means 'having a net' (Langloh Parker 1898, 57-60).

Rock art, particularly in Arnhem Land as discussed above, shows a much more intimate relationship between fish, humans and mythical figures of the Dreamtime. Fish are said to have been involved with creation, birth and rebirth and the eating of certain parts of barramundi, for example, had to follow particular rituals for anyone other than old men (Taçon 1989, 242).

Conclusion

In the myths of each group, the particular rivers under consideration were not for the most part referred to by name. The exception was the story of the creation of the Murray river. Also none of the rivers have become 'personified' or have 'associated spirits' to extend Forde's description of the Lower Colorado (Forde 1965, 110). Bearing in mind the importance of the rivers for their survival, it seems strange to someone of the twenty-first century that the indigenous people did not accord the waterways some sort of mythological status corresponding to their economic value. In London, the appellation of 'Old Father Thames' and subsequent personification in cartoons and the like, is something accepted without thought in spite of the fact that the river is not seen in the modern world as a deity.

The name of the Columbia river given by the Indians is *Nch'i-wána* which simply means 'big river'. Hunn's comment on the practice of naming objects could very well be applied to all the groups under discussion.

“Columbia River Indians do not usually name mountains and rivers as such. For non-Indians, a focus on specific mountains and rivers as things of importance implies a cartographic perspective, one in which the observer is placed above the landscape as if in flight. The Indians’ land-based perspective named instead specific places on a mountain or along a river *where things happened*. It was a practical rather than a purely abstract geography, naming culturally significant places, the site of important events or activities, whether of the present or the myth age.”

(Hunn 1995, 93) [Author’s emphasis]

The Koyukon have a similar approach to their landscape comprising as it does not only the two main rivers but also many lakes and minor waterways. For them, indeed, the ‘geographic orientation is based on rivers, not on the compass points used by Westerners’ (Nelson 1986, 36). The four cardinal directions are used mainly for wind direction. The river is used as the key reference point for direction and distance as well as the river current (Nelson 1986, 36).

The rivers referred to by the Amazonian Indians are not specific rivers but their view puts the value of waterways in general at the centre of the whole cosmos.

Fish, particularly in Arnhem land, have the potential to be more closely involved with those living by them or eating them.

3.8.3 *Sacred places and special rites*

Sacred places may be ones hidden away allowing access only to a select few. Others may be ones that are more overt but still have ritual attached to their use by either sex. Rites are equally varied. Male initiation rites were undertaken are with only the men as witnesses. Women have rites of their own which maybe attached to puberty and menstruation and which may affect their day-to-day living. While there is considerable anthropological data about sacred places, the connection between rivers and sacred places needs to be explored a little more. The position of rivers within the cosmos may be significant too, in that they were points of reference, topographically speaking.

Australia

The Australian 'boras' referred to in above were used in the distribution of axes and exchange of other goods (McBryde 1984, 282) but as already indicated their use extended beyond this more commercial aspect of Aboriginal life. A bora ground usually consisted of two circles surrounded by earth-banks with a pathway linking them. While one circle would be a public place where corroborees and preliminary ceremonies took place, the other would be hidden and 'secret,' and be where further rites of initiation would take place amongst the men (Gunn 1909, 90)). The ceremonies or corroborees would be attended frequently by various tribes, usually of the same tribal tongue.

The Amazon basin

Landing places, which are the contact point with the rest of the world for the Tukano villagers in the Amazon, are also the places at which they are intimately involved with the river. It is here that sexual activity is undertaken (not in their houses) and has a ritual/erotic atmosphere when compared to the rest of the village (Reichel-Dolmatoff 1996, 140). It is where the 'Master of the fish' seduces women who walk alone, causing them to die before changing into a shoal of fish or fish women (Roe 1982, 232). The connection between licentious behaviour and the river can be seen in many tribes in the Amazon basin.

The gardens of many of the Amazonian women are bound by very tight constraints as to their usage. Men are allowed to be involved only at the earliest preparatory stage. Thereafter, each garden becomes very much a female domain with the exception of narcotic plants. 'Men are not welcome in gardens' (Descola 1993, 85). Among the Achuar, women even grow the ritual narcotic plants and each stage of production in the garden including positioning of the plants and their relationship with each other, is prescribed behaviour (Descola 1993, 84ff). It should be noted, however, that the trapping of animals that steal from the Achuar gardens is undertaken by men as it constitutes a hunting activity (Descola 1993, 88).

The Tukano, while treating the gardens as a 'close' women's preserve do not have such tight restrictions on male access. Certain activities such as childbirth are encouraged to take place in the gardens while menstruating women have to stay away because during

this period they are infertile and it may affect the growth of the plants (Reichel-Dolmatoff 1996, 74-75)

Among the Pirá-paraná, there is practise of using old longhouse sites to plant a variety of produce. The areas within a longhouse which is still extant are prescribed with basically the women's area and door being towards the rounded back end of the house behind a ritual screen. The male parts of the house are at the square-ended front of the house and include a ritual dancing area and fires for processing narcotics (Hugh-Jones 1979, 47). When the abandoned house ground is laid out for cultivation, those plants associated with men (for example, tobacco) is placed in the traditional male areas and likewise plants associated with women (for example, peppers) are placed in the female areas (Hugh-Jones 1979, 229).

Bathing by the Achuar men and defecating in the river is the final stage in the morning purge which begins with vomiting after the consumption of a drink made from the *wayus* plant (Descola 1993, 47, 49). While they are bathing the men shout out, proclaiming their strength and power. It is a ritual by which the Achuar have found a way of 'wiping out the past and being reborn into the world each morning, refreshed by the bodily amnesia' (Descola 1993, 49).

Lower Colorado

The keruk grounds discussed earlier were special places set aside for the enactment of the mourning ceremony which had an important place in the Yuma annual calendar. These were found near rivers.

NW Pacific

A potlatch is 'a competitive ceremonial activity among certain North American Indians, involving a lavish distribution of gifts to emphasise the wealth and status of the chief or clan. [from *patshatl* a present; C19th of Amerind origin]' (Collins 1995, 1047). While the siting of a potlatch may be in a variety of places in a physical sense, the event itself created its own 'special place' wherever it was held. 'It should be remembered that in group reciprocity such as this, the acceptance of gifts from a host makes the recipient

indebted to the giver' (Olson & Hubbard 1984, 932). Equally the host has to ensure that sufficient resources (both in refreshments and lavish gifts) are available for the guests which may be large in number or else this would cause embarrassment or insult. The Tlingit and the Koyukon were two of the groups that held potlatches (Olson & Hubbard 1984, 932-933; Nelson 1986, 6). Rank and formality were the keynote procedures at these events, rather than one of mystery (Drucker 1965, 56-61).

As is common with many hunter-gatherer groups, girls in this region upon reaching their menarche were placed into seclusion. The duration of the seclusion varied in different places but was usually lengthy. At the completion of her menses, the girl was required to undergo ritual bathing to purify herself. Boys too, in many areas had to take a daily bath in the chilly waters of the rivers and the sea to prepare themselves for adult life (Drucker 1965, 99-101).

Conclusion

Special places may be actual physical locations but they may be formed by a particular group meeting or gathering. Four groups are listed as having meeting or special places in which a range of activities takes place. Boras in Australia are used for a variety of events including initiation rites, trade and exchange, and other ceremonies.

The mourning ceremony at the keruk ground is a re-enactment of a myth which involves mock fighting and set rituals. It took place in a large clearing in the bush which runs along the sides of the Colorado and comprised three days of preparation with one day of activity. The events of the day were prescribed and entailed mock battles, dancing and singing (Forde 1965, 223-244).

The landing place to the Tukano is a special place where not only does the world interact with the villagers but they themselves fulfil certain acts (such as sexual activity) and rituals which are intertwined with their everyday lives. They meet with the 'Master of the Animals' in all his guises in clearings in the forest. For the Pirá-paraná, the longhouse had special meaning and even when in a state of abandonment, the ritual spaces needed to be observed.

Potlatches were not necessarily restricted to one special place, although with such a great gathering of people, large buildings were essential. The potlatch itself was a 'special place' created by those who were meeting in which reciprocity was enacted between the host and guests to establish a debt in the host's favour.

Ritual cleansing and purification by bathing was practised by several groups as an important facet of rebirth at the start of an event or day, or as a protection against the malignant effect of puberty.

3.8.4 *Treatment of the dead*

The attitude towards death and the disposal of the dead by hunter-gatherer and early farming communities are two areas considered with a view to examining any association with rivers or main watercourses.

Australia

The way that the Aborigines have dealt with their dead is one area where the river may have influenced the siting of ceremonial activity. Colin Pardoe has examined the evidence available on the river Murray. Sites with burials and cremations collectively dated from 13,000 years ago to modern day lie with one exception within the Murray corridor and they first appear in the late Pleistocene (Hope 1993, 195). There are other burials on the Willandra lakes but Pardoe does not consider these to be cemeteries within the definition he has set (Pardoe 1998, 193). All of the cemeteries have between 40 and 200 burials. Pardoe suggests that the cemeteries are 'tied' to the river in its role as a lifeline for food and water in times of drought (Pardoe 1998, 197). The suggestion has been made that the repeatedly used burial grounds along the Murray may indicate stability in land ownership (Lourandos 1997, 235; Pardoe 1998, 208-210).

The Amazon basin

Among the Tukano, canoe burials or pit burials were the norm, and were sometimes sited within the maloca itself. Funeral ceremonies were of little import and old people were sometimes abandoned as soon as they had ceased to be able to produce food for

their households on an uninhabited river island or in the deep forest (Reichel-Dolmatoff 1976, 312; 1996, 24). Mounds were not built, for the most part, within the basin. Only a few areas around the periphery of the basin practised this culture. The large island, Marajo, at the mouth of the river was one of these areas but the majority of Indians did not build mounds (Roosevelt 1991, 8).

The Achuar bury their dead within their communal dwelling. Women are buried beneath their sleeping place or *peak*. Men for whom it is their whole domain are left in solitude in the hut and the rest of the family moves out to live with others of the family group (Descola 1993, 378). After the burial, which includes leaving food offerings, the relatives and friends go down to the river for a ceremonial bathe to cleanse the participants from being tainted by the corpse (Descola 1993, 379-380).

The Pirá-paraná also bury their dead within their longhouses with the women being placed by the entrance to the family section and the men in the centre of the house (Hugh-Jones 1979, 109). Unlike the Achuar, the longhouse is not abandoned after a male burial. The body is placed in a crouched position in a hammock and then in a canoe cut in two with one half over the top. The men undertake the burial while the women mourn. Grave goods which are buried with the men include them wearing their ritual dance ornaments and with the women, a basket containing personal objects such as a mirror and paint. After the burial the house is cleansed by the shaman by using tobacco smoke and beeswax and giving the mourners snuff (Hugh-Jones 1979, 109-110).

Mississippi and the SW United States of America

One major cultural shift which had begun to appear was the forsaking of the mound building tradition in the Moundville area on the Tombigbee and the Alabama rivers. This accompanied a spreading out of the population from the hierarchical centres and villages back into tribal groups in large villages spread equidistantly across the landscape (Galloway 1995, 63). One characteristic of this new phase was the method of burial. They no longer used mounds and instead placed infants or disarticulated adults within ceramic urns. Not surprisingly, this practice became known as the 'Burial Urn Culture' and sites with evidence of this can be seen clustering along some of the rivers.

Lower Colorado

The Yuma, like others in the Lower Colorado, cremated their dead after a day of mourning. Previously a pit would have been dug near the house which itself would be fired later but by the early part of the twentieth century a special cremation ground was being used on the reservation. The trough-shaped pit was lined with wood and mourning commenced as soon as everyone necessary was present. After the fire had burnt down, any large pieces of wood would be removed and the rest placed in a pit and covered with loose earth (Forde 1965, 207-212).

Conclusion

The dead are treated in a variety of ways. Cremation followed by burial occurs at different stages in three of the groups. In Australia, cremations are also buried near interments in cemeteries near the rivers. The urn burials in the Mississippi/Alabama area were all found adjacent to the rivers. The villages, which had mound burials and also those which had pit burials, were equally situated near water. Among the Tukano, the attitude to old age seems to be somewhat cavalier with the abandonment of old people in the forest or on uninhabited islands. The Achuar and the Pirá-paraná on the other hand bury the dead within their dwellings, which in turn are situated near to rivers.

3.8.5 Ritual and votive objects and practices

Objects often take on special meaning when they are used in prescribed rituals and as votive offerings. They may not be unusual or rare items – merely ones that are used a particular way. Where rivers and watercourses feature within myths and folktales or where they obviously played an important part within the everyday life of groups of people, it is possible that votive offerings may be deposited within them. Alternatively they may be associated with particular practices. This section examines the available literature and discusses the use of votive and ritual objects and practices.

Australia

In Australia the rivers are only mentioned in a peripheral way amongst all the myths and tales which are circulated amongst the tribes. Although water was of profound

importance, the waterholes and the major rivers appear not to have been personified or deified, there is not an oral or written tradition of votive offerings being deposited in watery places. The lack of tradition of this happening seems to be borne out by the negative evidence obtained from the dredging operations which have been undertaken over the past on the major rivers. This does not preclude any ritual deposition having taken place in the past but with there being no apparent tradition of it happening and no immediate obvious evidence in the form of artefacts to indicate that it had, it would seem unlikely that it actually occurred. Deposition of objects into rivers is not a class that is noticeable within archaeological records in Australia (Jeannette Hope pers comm.).

‘Rock art has been noticed in Australia by non-Aboriginal since the First Fleet’ (Chippendale 1998, 285). Chippendale goes on to say that in 1788, the First Governor of New South Wales, Capt Arthur Phillip, noted ‘ in the neighbourhood of Botany Bay and Port Jackson....fish were often represented’ (Chippendale 1998, 285). This fascination with fish can also be found on sites in Kakadu National Park, Western Arnhem Land, an area noted for its richness of rock art (Taçon & Blockwell 1995). Kakadu straddles a number of major rivers within the freshwater wetland system of the Alligator Rivers floodplain (Taçon & Blockwell 1995, 678). The climatic and physical changes to this area are well documented (for example Taçon & Blockwell 1995, 676-680) and will not be discussed here. What is interesting to note is the paucity of material culture (confined principally to stone tools and ochre pieces) in stratigraphic sequences dating from c.13000 cal BC (Taçon & Blockwell 1995, 680-683). Rock art appears in the earliest phases and changes significantly through time (Taçon 1989, 237). One of the difficulties in dating some of the rock art (both sculptured and painted) is the renewing and repainting which has continued into modern times (Taçon 1989, 237; 1992). Pertinent to this study are the Holocene paintings, particularly the X-ray art where ‘both internal and external features of subjects are portrayed and ...that Aborigines identify with most closely’ (Taçon 1989, 237). These images appear not only on rock but also on bark and have been dated from c.1150 cal BC (Taçon 1989, 238). Of the 2379 paintings examined by Taçon between 1985 and 1987, 62% were of fish, being found at 75% of the 316 art sites. Humans comprised 11.92%, macropods 4.16%, turtles 3.46% and the rest comprised 35 other depictions mostly of mythical creatures (Taçon 1989, 238).

Discussion with Aboriginal elders has shown that the fish and animal painting would have taken place after they had been caught and 43 fish species have been identified (see 2.3 above) (Taçon 1989, 241). Barramundi undergo sex change from male to female at about 2 years of age – a change which is noted in the stories of the Dreamtime (Taçon 1989, 241). They are also said to have created the East Alligator River, and with the fork-tail catfish feature prominently in ceremonial activities (Taçon 1989, 242). Saratoga and fork-tail catfish are both buccal incubators (that is where the eggs are incubated in the mouth), a method of reproduction attributed to the Rainbow Serpent in the Dreamtime (Taçon 1989, 241).

Fish, in Arnhem Land, were seen as being closely involved with oral and mystic literature, and were identified with water, reproduction, birth, deaths, and reincarnation, as well as being equated in some places with the human soul (Taçon 1989, 243). One group, the Kunwinjku, describes female coitus as ‘netting a fish’, with a symbolic linking between penises/fish and nets/legs ((Taçon 1989, 244). Elsewhere, a newborn child is described as a small fish (Taçon 1989, 244). The X-ray art, by showing both internal and external parts of fish, visually demonstrated the ‘transformational processes intrinsic to the belief system’ (Taçon 1989, 245).

NW Pacific

Among the Koyukon, prayers are said to the river and to the ice as breakup begins after the winter. This is in order to encourage the river and ice to move along easily and do no harm by flooding (Nelson 1986, 37). Some of the Koyukon have elaborate ritual observances for their dealings with fish, whether catching, eating or disposing of the remains afterwards (Nelson 1986, 68).

In northwest California, native American Indians who lived on the anadromous fish resources of the major freshwater river drainage of the area had highly ritualised regulations within their fishing activities (Swezey & Heizer 1984, 974ff). The Yurok first-salmon ceremony was performed at Welkwäu, at the mouth of Klamath river before which no salmon could be caught although it was permitted to fish for other species. The person selected had to pretend to spear the first salmon seen and then secured the next which was then cooked in the ceremonial house before being ritually consumed. It was only after this that the salmon season was declared open (Swezey &

Heizer 1984, 976-977). Other groups such as the Karok and the Hupa had similar rituals and it was only after these three ceremonies were over that fish weirs and dams could be constructed across the river. (Swezey & Heizer 1984, 977). Such first-salmon rites are noticeably absent from the groups living further north on the Pacific coast (Swezey & Heizer 1984, 987).

The Amazon basin

Bull roarers were also found in the Amazon among the Desana, a Tukano group. They are used in association with erotic activities involving the *Uacú* tree, its flowers and fruit. Tukano men also wear tassels made from the yellow tail-feathers of the Oropendola bird and their shamans use stick-rattles, staffs and two-pronged cigar holders (Reichel-Dolmatoff 1996, 116-117). The Pirá-paraná men use feather head-dresses, monkey-fur tassels, macaw feathers, pig-teeth belts and fruits for ritual dance ornaments (Hugh-Jones 1979, 59, 109, 197, 263). Exchanges of this paraphernalia were given at communal rituals between distant groups (Hugh-Jones 1979, 170). The Achuar women have necklaces and dancing belts with bells. The men wear coils of jaguar teeth (Descola 1993, 220, 257, 393).

In the Amazon, vomiting was undertaken by men from the Pirá-paraná and the Ashuar prior to undergoing initiation or daily ceremonial cleansing (Hugh-Jones 1979, 143-144; Descola 1993, 49).

Lower Colorado

Among the Yuma, little information was available, although it was noted that the plumage of water birds was more valued than the flesh (Forde 1965, 91).

Conclusion

Evidence of votive offerings being deposited in the rivers was not forthcoming. This may be due to the organic nature of the deposits but it also could imply a lack of ritual deposition in this particular way. Where there are more detailed accounts of activities by shamans, there is no reference to this type of activity. The ritual objects used by

both men and women also were made from organic material such as feathers and wood, although some were more robust (such as teeth).

Offerings may be more esoteric than actual physical items. It is possible that the tightly prescribed behaviour of some of the groups should be considered a votive action rather than the more normally accepted prestige items.

3.9 Discussion

Hunter-Gatherers and Complexity

It may be noticed from the above case studies that some of those selected for consideration were not what be might termed ‘pure’ hunter-gatherers. The Yuma and those from the Mississippi and associated rivers also grew maize which would have involved a commitment to sedentism for a least part of the year. Lee and Devore made two assumptions about hunter-gatherers:

(1) they live in small groups and

(2) they move around a lot

(Lee & Devore 1968a, 11)

Neither of these of these presuppositions can be applied to any but the Australian aborigines and even this group appears to be temporarily sedentary during the months of plenty on the Murray and the Darling. It is probable that river environments would favour sedentism. It is this view of hunter-gatherer groups in general which has dominated thinking about the early prehistoric period. The arguments about the ethnographic value of those considered to be examples of this lifestyle have been rehearsed elsewhere (for example, Lee & Devore 1968a, 4-5) and are not the subject of this discourse.

The selection of the five chosen groups is not one that could be condoned *en bloc* by Murdock who, when discussing the world’s hunting and gathering peoples, excluded the Indians of the NW Pacific Coast (with those more inland) and ones he calls ‘incipient tillers’ that practice a form of agriculture but who obtain ‘more of their food supply from hunting, fishing and gathering and show a clear preference for hunting over tillage’ (Murdock 1968, 15). This seems too simplified an approach to what is a complex situation. The people who were living at this time sought the most efficient

and productive way to produce enough food on which to survive. Whether their food was from a context that would be considered acceptable by the standard set by Murdock is immaterial. What is more appropriate is that implied by Price and Brown when they coined the phrase 'hunter-gatherer complexity' (Price & Brown 1985b). Specialisation in food resources (such as fish, maize), constraints on availability of resources (such as that caused by growth in surrounding populations) and an awareness that not all hunter-gatherer communities have remained at 'band' level of development requires a wider approach to be taken in understanding this complexity (Price & Brown 1985b, 5, 16). In any case, when looking for analogies for the Mesolithic and Neolithic people on the Thames it is impossible to make *a priori* assumptions about whether they were 'pure' foragers or not. The idea of a 'simple' hunter-gatherer society is a modern viewpoint and as Kelly says 'living hunter-gatherers are not the alter ego of Western civilization; ...they are not humanity in a state of nature....do not preserve an ancient way of life' (Kelly 1995, *xii*).

Table 2 gives a concentrated view of the four area groups and prepares the way for comparisons between them. It is not a definitive statement but opens up the possibility for drawing conclusions and defining a model. Where no information has been found to fill a box it has been left empty but this action should not indicate that the vacancy is caused by anything other than lack of data. For example, the hunters in the Lower Colorado are noted as having gathered a range of wild seeds but the accounts do not detail the equipment used in this task

Table 2 *Ethnographic, ethnohistorical and non-European archaeological studies*

	Australia	Near East	S America	N America
Mobility	Small groups		Only by hunters	Groups/only hunters
Seasonality of movement	Migrated from summer camps to hinterland in winter	Established sites	Remained within same area because of location constraints	Established camps near rivers; hunting/gathering camps during spring/autumn
Fishing - range	Eels, Murray cod, perch, freshwater shell fish	Cyprinidae, Barbus, freshwater molluscs, freshwater crabs, turtles, catfish, perch,	Electric eel, manatee, piranha, turtle, caiman, paiche, catfish, shellfish	Catfish, blue gill, bream, sunfish, humpback, salmon, rainbow trout, Dolly Varden, pike, grayling, lamprey, eels, whitefish, molluscs, crustaceans
Fishing - equipment	Spear, traps, weirs, canals, nets, poison, hook/line	Nets, traps, netsinkers, hooks, harpoons,	Traps, rods, dams, hook/line, poison	Range of nets, including drag, scoop, dip and seine, rakes, pronged spear, weirs of stone and wood, harpoon, line/hooks, traps, gaffs, poisons
Hunting- range	Emu, possums, wallaby, koalas, kangaroos, rats, bandicoots, waterfowl, brush turkey	Deer, gazelle, avians, rodents, waterfowl, hippo, crocodile, turtle	Turkey, game, deer, armadillo, peccaries, rodents, tapirs, squirrel, sloth	Deer, rabbits, hares, raccoons, turkeys, birds, water birds, gamebirds, opossum, beavers, muskrat, elk/moose, marmot, ground squirrel, otter, seals
Hunting - equipment	Spear with thrower, nets, boomerangs		Traps, blow pipes/poison darts, bow/arrow	Spears with thrower, bow/arrows, traps, snares, nets
Gathering - range	Millet and acacia seed, fruit, kurrajongs & quandong kernels, tubers, yams, water lilies	Wide range of seeds including wild barley and wheat, reeds, waterlily	Bitter manioc, pineapple, sugarcane, peppers, fish poisons, narcotics, forest fruits, wild honey, insects/larvae	Hickory nuts, palm berries, chestnuts, acorns, wild seeds, tobacco, roots, seaweed, wild celery, Indian rice
Gathering - equipment	Grinding stones, digging sticks, skin bags,	Baskets	Digging sticks, baskets	Digging sticks, baskets, skins
Processing	Grinding seeds, cooking & roasting roots, pulping fruit, storing in nets, skins	Basalt bowls and pestles, hearths for smoking/drying, lithics	Fish dried/pounded, salting, smoking	Done at place of collection: corn in storage pits, drying/ground, meat smoked/frozen, melons/squashes cut into strips/dried, beans pounded stored as cakes

Agriculture	Possible 'gardens'	Pig, sheep, goat	Gardens	Maize, pumpkins, melons, beans
Trade - distance	SE Australia, at large gatherings		Along rivers, long distance as needed as well as in local area	Within local area; along land routes rather than river system
Trade - items	Stone axes, grind stones, boomerangs, ochre, shell pendants, sandstone slabs		Any items for which there is a market: such as tobacco, ritual paraphernalia, clay pots, blowpipes	Ceramics, marine shells, native copper, salt, chert/flint, mica, haematite, galena, cotton, blankets, obsidian, fish/foodstuffs, furs, blankets
Artefacts	Spear with thrower tipped with bone/stone, bark canoes, paddles, bull roarers, boomerangs, digging sticks, baskets, nets, bags, reed containers, grindstones, backed blades, stone phalli, adzes, ground stone axes	Basalt bowls and pestles, baskets, mats	Blow pipes, bow/arrow, digging sticks, baskets, canoes	Ceramics, spears/throwers, shawls, skins, stone weapons/implements or fire hardened wood, dugout canoes, feather headdresses, shields, totems poles, basketry, carrying nets, clubs, arrows
Division of labour - men	Spearing of fish, hunting		Hunting, fishing, clear/fire gardens, smoke prey, make ritual objects, prepare ritual substances (tobacco, coca, hallucinogens)	Fishing, hunting, some worked in corn fields
Division of labour - women	Shellfish, freshwater crayfish, fixed nest and weirs		Horticulture, cooking/supplying daily food, collecting fish when poisoned, manufacture of pots	Fetches water, ground roots/corn, carrying burdens, food processing; Koyukon women in charge of fishing camps/fishing/related work
Shared labour	Shellfish, freshwater crayfish when major source of food, set loose nets, hauled in catch, roots		Gathering of wild food (forest fruits, wild honey, insects), although men main contributors	Games, although some for only me; slaves undertook any work; Koyukon women went with men to trap/moose kills
Use of fire	Cyclical burning of long grass and undergrowth	Cooking	To clear gardens, swidden	Cooking/food processing
Meeting places	Boras near rivers for ceremonies, exchange, initiation		Landing places, clearing in forest	Re-enactment mourning ceremony held on keruk ground near river; potlatches in houses

Comparisons

The groups varied in size from the small family units of Australia to the towns of the Mississippi. The seasonal round to collect prey and fish or to gather seeds, varied from the whole unit moving to the appropriate site (such as the Australians or Canadians) to a smaller unit for hunting as in the remainder. In the latter cases, fishing was often undertaken at particular spots and was more predictable in its results.

Hunting

Each group hunted for a reasonable range of animals, although the lists given may only be a part of what was actually caught and, in the case of the Lower Colorado and NW Pacific, did not constitute a major part of the diet. The blowpipe with poison darts appears to have taken the place of the spear with its thrower within the confines of the Amazonian forest and the Australians created the boomerang instead of the bow and arrow (which may reflect on the type of raw material available). Apart from this, hunting equipment appears to be fairly consistent.

Fishing

Fishing, in all cases apart from the Lower Colorado seems to have played an important part in the diet of these groups. During the summer months in Australia, subsistence has been heavily biased towards aquatic resources for over 30,000 years and in Canada it was a main component throughout the last 11000 to 9000 years. This can possibly be reflected in the more sophisticated methods used to catch the fish – canals and stone weirs which were useful during times of lower water levels for retaining fish and also required a greater effort to build, enabling them to be used for many years. In the Lower Colorado, fishing was undertaken for a smaller number of species.

Gathering

While all of the plant produce which was gathered was used, in some cases it contributed more to the subsistence needed than to others. In the NW Pacific area, for example, the roots and plants gathered by the women contributed almost half the daily food required by the people. At the other extreme, it appears to have been of less

importance than fishing. The equipment used, where noted appears to be the standard digging stick and containers of various types.

Agriculture

Agriculture albeit at various levels features in many of the groups, from wild seed replanting to maize production. Specific places set aside for cultivation in the form of mounds, gardens and fields are noted. The mounds probably had a series of uses. The gardens were a female preserve with much ritualised activity involved in the nurturing of the plants. Traditional hunter-gatherer activities and early farming were not seen as mutually exclusive events. Sponsel's comment about the Amazonian forest societies seems pertinent for all the groups under consideration: '...that for indigenous societies....foraging and farming are overlapping, interdependent, contemporaneous, coequal, and complementary' (Sponsel 1989, 45).

Processing

Processing of the various types of foodstuff involved dehydrating the commodity either by natural sunshine or by applied heat and then storing in bags or pits. Grinding and pounding (of fish as well as plant resources) was very common. Smoking was used for animal or fish protein.

Artefacts

The range of artefacts produced by the groups is obviously incomplete although some lists are more so than others. It merely gives an indication of what has been available. The provision of a vessel to use on the river is interesting. Three groups have canoes ranging from the very light bark canoe to the dugout. Those on the Lower Colorado, in spite of the presence of trees, prefer either rafts or more dubious forms of travel (huge ceramic pots or half-submerged logs and bundles). This type of transport has implications for travel and trade in that it is possible to ship downstream but the return method must have been by foot and would have taken much longer. It may have been that crossing the river was the most crucial aspect in some case.

Division of labour

‘Hunter-gatherer societies were cast as sexually egalitarian societies, ones where men and women were equal. But is it true that women and men contribute equally to the diet? Do they both do the same amount of work? Do men always hunt and women always gather?’ (Kelly 1995, 262). The answer to the first two questions within the bounds of the current research has to be No and to the third question Usually. In fact the division of labour broke along what must be acknowledged are the more traditional lines. The men primarily did work that required the spear, that is hunting and fishing. In some areas, women, however, were involved with fishing.

In the Amazon they could help with ‘harvesting’ poisoned fish and among the Koyukon in Alaska, women were in charge of the fishing and associated camps. It is difficult to determine what the men on the Mississippi did as a particular task. Fish was regularly offered to the Spaniards but there are no records how this fish was caught. Women gathered foodstuffs including shellfish and in the case of the Australians worked those places with fixed nets on the river. Shared labour was more intense where shellfish, for example, was the major food resource at a particular time. Women undertook food preparation, in the main, although it was the men who were responsible for preparing ritual substances, although not always necessarily the gathering, and in the Amazon only men were allowed to smoke the prey from hunting.

The equality of the sexes in general can also be challenged. Women in the Amazon occupy a low status in society; a state which is further enhanced by the fact that the sons and not the daughters can inherit their gardens. A similar pattern of male domination can be seen in the Lower Colorado where it is the men who have control over the hunting and fishing and the women who are the burden carriers. In the NW Pacific, it is more common for the men to dominate the society and the women to occupy a position just above the slaves.

Trade

Trade spread out often along the rivers but certainly not as the only or even primary route. In Australia, people travelled by foot, and within other groups, on roads or routes

which cut across rivers. In the Mississippi area routes also cut across the main rivers. In the Lower Colorado, the people seemed to restrict themselves, unlike their neighbours, to stay within the valley. A range of items was traded and not just those which might be called prestigious. In the Amazon, as long as there was a market, an item would be sold. In Canada, trade was undertaken even with artefacts that other local groups possessed as a form of ritual trade and exchange.

Fire

Fire was used in some places to maintain the quality of the ground. In Australia it cleared away long grass and undergrowth which, with the new shoots, would encourage prey to come to eat. In the Amazon, slash-and-burn techniques (or swidden) were used when preparing the gardens for the women. For others fire was just a medium for food processing.

3.10 Model building

3.10.1 Approach to analogy

The above discussion shows that while there is not a uniform approach to a hunter-gatherer/early farming lifestyle, there are more similarities than differences among the various groups considered.

‘...Data from ethnographically known foragers are still useful to archaeologists in constructing models to be tested with archaeological data. We cannot allow ethnographic data to “tyrannize” our reconstructions of the past, but at the same time we cannot forego a rich source of ideas and hypotheses’

(Kelly 1995, xiii).

It is with this approach in mind that a series of analogies will be suggested of how these prehistoric communities relate or formerly related to the rivers within their geographical areas.

3.10.2 The analogies

The lists are divided into the two sections discussed above, that is the economic and experiential or symbolic attributes of the hunter-gatherer/early farmer lifestyle of major rivers systems around the world.

Economic attributes

- Temporarily sedentary during summer and winter at a base camp were normally near running water and with access to sustainable food resource
- In spring and autumn, migration was undertaken in whole group or a part to procurement locations before returning to base camp
- Until the advent of animal husbandry, fishing was the preferred form of protein
- Aquatic resources were generally more predictable than animal resources
- The use of fishing nets, traps, weirs etc resulted in a greater yield for less effort when compared with hunting
- Whilst hunting was seen as a male preserve, fishing was sometimes undertaken by women as well
- Where the surrounding landscape was difficult to travel through, rivers were the main routeway and in other situations was the faster alternative
- Agriculture was normally begun in places where there was fertile alluvium

Experiential/symbolic

- Rivers did not normally become objects of veneration although they may have formed part of myths
- Fish in certain societies held a particular place between the real and symbolic worlds
- Special places could have been on or adjacent to rivers at places where everyday life and the mystical one meet
- Cemeteries or burial places were found close to running water
- Ritual deposition in rivers was not a common phenomenon on the global scale
- Belief systems of those groups that were examined living near water did not appear to vary from those in non-watery places.

3.10.3 Conclusion

Apart from their obvious role as a water resource, rivers provided a focus for many aspects of the hunter-gatherer/early farmer's way of life. Not only were they a source of valuable protein in the form of fish and other edible aquatics but plants which grew at the edges of the rivers, such as bulrushes, provided starch for consumption, waterfowl lived on the water and it was a place where both humans and animals come to drink.

Rivers were places that for all their importance as a water resource were not places of veneration and were neither personified nor deified. Their role in some myths has meant that locations where people and water met, such as landing places, may have had special significance. It is the explorers and travellers coming into the hunter-gatherer and early farming communities, possessing a greater view of the world as a whole, who endowed the major river systems around the globe with a status beyond that given by the indigenous people. Acuña wrote the following quotation of the Amazon in 1859 and this could easily have been applied to any of the other rivers that have been previously discussed:

‘.if the Ganges irrigates all India,....if the Nile irrigates and fertilises a great part of Africa: the river of the Amazons waters more extensive regions, fertilises more plains, supports more people, and augments by its floods a mightier ocean: it only wants, in order to surpass them in felicity, that its source should be in Paradise.’ (Acuña 1859, 61)

Within these constraints, a series of analogies will be suggested of how these prehistoric communities relate or formerly related to the rivers within their geographical areas.

4.1 Introduction

Southern Britain and parts of the Thames Basin have attracted a lot of archaeological attention in the past which may provoke the comment of ‘why another study of this area?’ The answer is three-fold:

- i) This view of the whole examines something that previously has not been looked for or sought. Human interaction with rivers has been accepted but from a perspective that relates more to modern periods than the early prehistoric. Also rivers, *per se*, have rarely taken centre stage in such discussions. It has been that on land which has dominated debate, rather than focussing on water systems. By choosing to concentrate on the rivers themselves and to begin with the perspective **from** the water, it is hoped to view relationships with the surrounding archaeology through new eyes.
- ii) As there has been work undertaken on both survey and excavation in the Thames Basin, this gives access to considerable sources of data for review.
- iii) The Thames foreshore within Greater London has been my personal study and excavation area since 1993 and so it is with a wish to set that data within its natural context that I have chosen to examine the whole Basin.

This chapter will examine a number of physical aspects of the Thames Basin as a whole (4.2 – 4.7). A brief review of earlier research (4.8) will be followed by a more detailed exploration of the Mesolithic and Neolithic periods (4.9 – 4.11) and finally a conclusion (4.12).

Frequently the Basin has, for administrative purposes, been divided into three regions (upper, middle and lower) (for example Holgate 1988, 202; Bridgland 1994). The approach taken in this thesis will be to look at the area as whole, period by period (see section 4.9 below). However, as other data will be utilised, the divisions are as follows (see Figure 12). The Upper Thames is deemed to be from the source of the river to where it flows through the Goring Gap, between the Chiltern Hills to the north and the Berkshire Downs to the south. The division between the Middle and Lower Thames is less easily defined. It has variously been described at the point at which the river enters the west side of the London conurbation, at Teddington Lock (where the river becomes tidal), in central London, and at the point the Thames exits the metropolis on the eastern side (for example Holgate 1988, 15; Bates & Whittaker 2004, 50). For the purposes of

In the non-tidal section of the Thames, there are 38 main tributaries with 9 principal ones still remaining below Teddington. In central London, a number of the rivers and streams have been forced underground, particularly on the north bank (Barton 1992, 14).

The drainage of the Thames begins in the Cotswolds which form the western rim of the Basin. In Figure 12 the extent of the upper part is seen to be encompassed between the Cotswold and Chiltern hills, and the Berkshire and Marlborough Downs. The river then narrows to a single channel as it passes through the Goring Gap, to immediately expand again as it traverses the flatter middle Thames valley. The North Downs act as a southern boundary in this part of the Basin as the river heads for the Metropolis and the estuary in the east. Once in Greater London, the Thames becomes nowadays nothing more than an urban, tidal canal, hemmed in on all sides by development begun in the Roman period.

4.3 Geology

The following Figure 13 shows the main geological features of the Thames Basin with Figure 14 showing a cross-section A-B. The chalk bed within the majority of the Basin lies is very clearly delineated. The quaternary deposits discussed below primarily overlie the Upper Chalk which latter comprise the oldest rocks within the Basin (Upper Cretaceous Age) (Robinson & Wilson 1987, 255). These are in turn banded by the Greensand groups.

The London Basin lies between the chalk hills of the Chilterns to the north and the North Downs to the south (Bates & Whittaker 2004, 50-52).

4.4 Quaternary Geology

The quaternary geology of the Thames Basin has been well researched over the past two decades and the discussion will not be rehearsed again here (Bridgland 1994; Gibbard 1985, 1994). The terrace system, formed at least in part by the effects of glaciation have been closely examined and while the final interpretations (particularly within Greater London) may vary, the overall view is of a series of identifiable deposits laid down as the rivers moved and/or embedded themselves in the landscape from the middle Pleistocene period onwards (Museum of London 2000, 13-14; Bates &

Whittaker 2004, 53). An extensive tract of alluvium overlies the younger gravel terraces, which were mostly formed during the postglacial rise in sea-level (Robinson & Wilson 1987, 255) (Figure 15).

The main deposits of glacial (till), fluvial and alluvial material cut across the Basin in two swathes in roughly a south-west to north-east direction (see Figure 15). The Anglian glacial till only reaches the northern fringes of the Basin and it is the post-Anglian fluvial deposits that dominate the area (Sumbler 1996, 110ff). Holocene alluviation is only noted separately in the lower Thames area in Figure 15 but is also found further upstream in the areas of the post-Anglian fluvial deposits (Sumbler 1996, 112). Lambrick recorded the alluviation in the upper Thames as a result of shifting channels, back swamps and fringing swamps along the various tributaries (Lambrick 1984, 809-810).

The number of fluvial and alluvial deposits that are present are an indication of the difficulties for archaeological excavation within the Basin. The depth, for example in Greater London can be up to 9m (for example Gifford *et al* 2001), effectively masking the early prehistoric periods and potentially leading to a bias away from an expectation of their presence within the conurbation (see Wilkinson & Sidell 2007 for an example of this thinking).

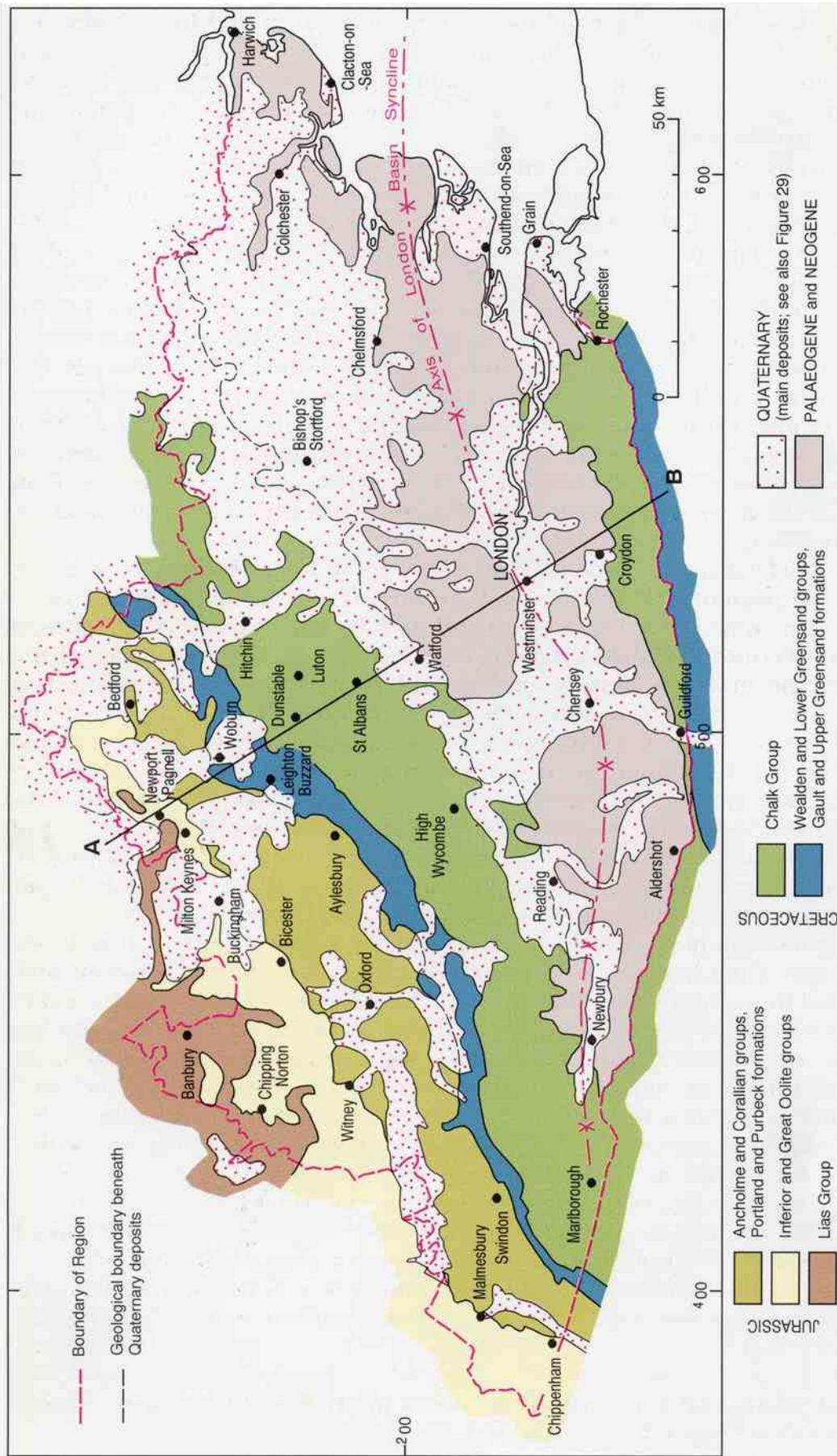


Figure 13 Geology of the Thames Basin (Sumbler 1996, 2)

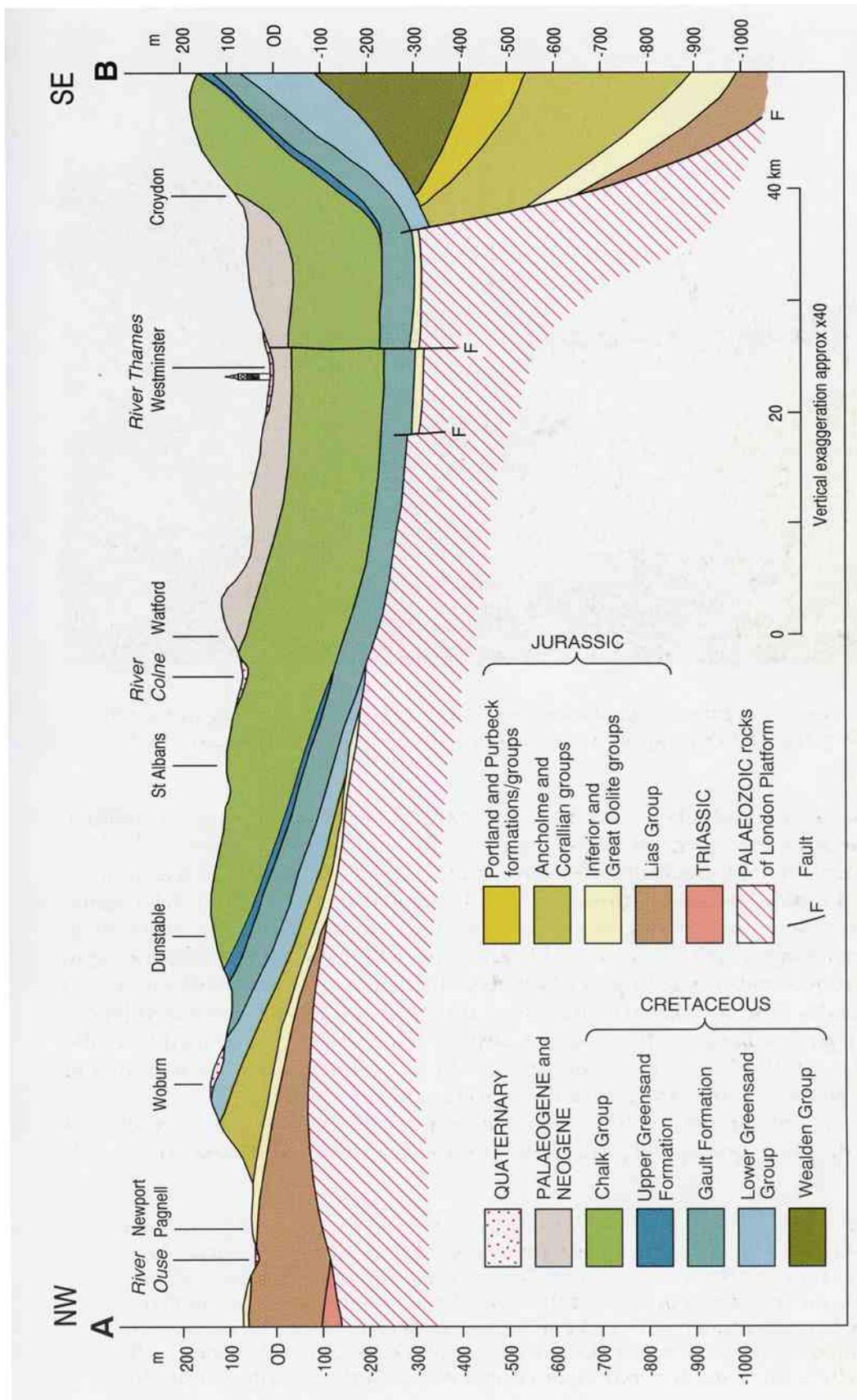


Figure 14 Geological cross-section of Thames Basin (Sumbler 1996, 5)

4.5 Hydrology

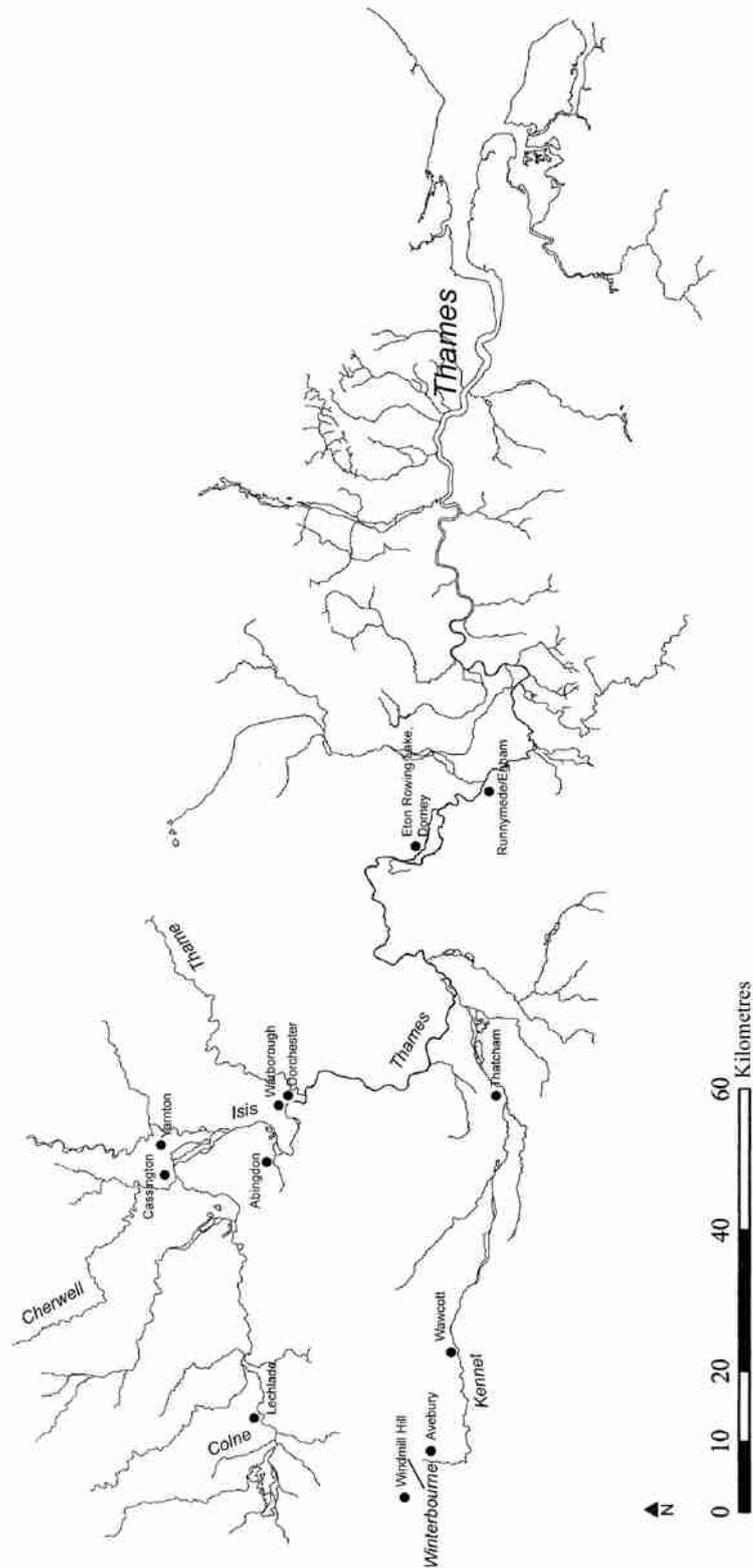


Figure 16 Places mentioned in the text – Upper and Middle Thames Basin

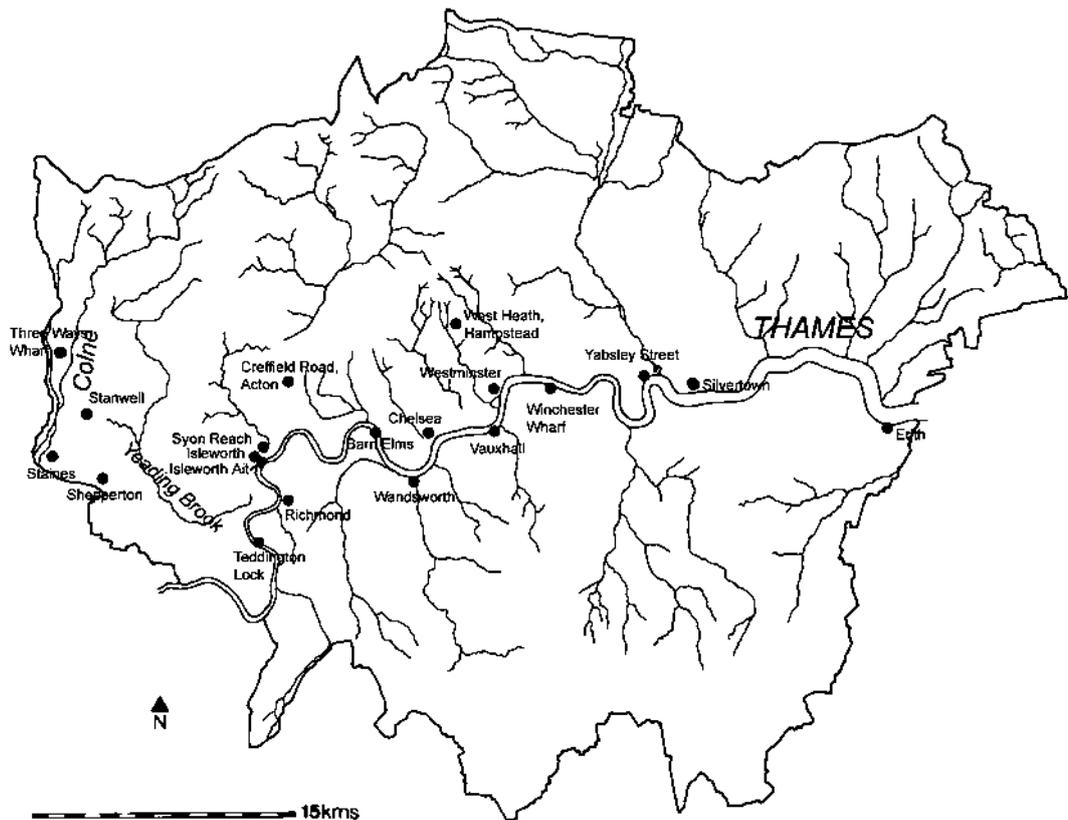


Figure 17 Greater London and the sites and rivers discussed in the text

The current river pattern, particularly in the middle and lower Thames, are the result of changes in drainage during the Quaternary (Bates & Whittaker 2004, 53). It is almost impossible to estimate the total drainage of the river complex as so much water is drawn off from the Thames and some of the tributaries before it reaches the tideway below Teddington. In the past, the river was non-tidal and a meandering system, anabranching with many islands. The various channels shifted and so thus did the islands. Relicts of this early system can still be seen in a variety of places within the Basin and modern examples include those at Dorchester and on the Colne (see Figure 18 and Figure 19). Archaeological investigation on adjacent dry land have uncovered ancient channels with Dorney providing one of the clearest examples (see Figure 27 below).

Other locations have come to light within the Metropolis as a result of the work on the Jubilee Line Extension in the 1990s where the line of the Thames itself (see 4.8 below), during the Mesolithic period was found to have run much further south than its current position, and the Tyburn delta proved to be quite extensive for much of prehistory (see Figure 29 below). Islands (or aits and eyots) within Greater London have also been in

state of flux as a result of shifting erosion patterns, potentially removing archaeological evidence from early periods (see 4.11.2 below).

The Thames river current is quite powerful, especially where today there is much embanking. Even in the rural areas, very little remains of natural riverbank – in Greater London this is reduced to the water meadows at Isleworth which are now a designated Site of Scientific Special Interest (SSSI) (Steve Colclough, pers. comm.). It is also in this area of the Thames that the river retains some indications of its earlier formation with a wide shallow bed especially visible at very low tides and during times of

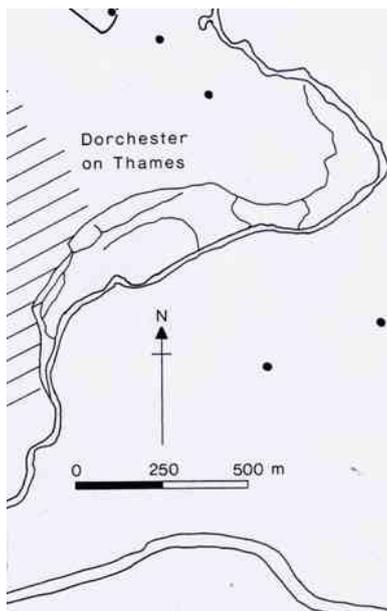


Figure 18 Dorchester

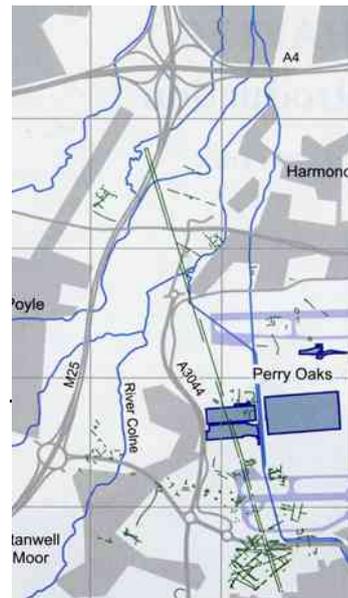


Figure 19 The Colne system

drought. The combination of the fluvial and tidal currents which have been affecting the Lower Thames since before the tidal head made its way so far upstream, have continued to erode the river bed. Also adverse weather conditions, such as the excess rainfall over winter 2002/3, can cause flooding not only in those areas directly affected but also those further downstream, particularly those regions which lie within the London clay belt. The excessive water which came through Teddington Lock during 2002/3 caused stripping of the foreshore deposits throughout the entire length of the estuary.

While the timing and arrival of estuarine conditions on the Thames continues to be under discussion, in the Mesolithic and Neolithic, it was definitely still a meandering freshwater environment (Sidell *et al* 2000, 122). The effects of the tidal push were being felt only as flooding and slowing down of the dynamics of the water leading to depositing of organic material. In the lower Thames and the greater London area in

particular, the meandering river would have exposed areas of previously submerged land during the early Holocene as well as swamping former dry land (Sidell *et al* 2002, 49). The change in water levels as a result of post-glacial melt and the various phases of regression changes in the river and its floodplain would have had a great effect on its use by humans (Milne *et al* 1997, 131; Sidell *et al* 2000; 16; Sidell 2003) Currently the floodplain at its maximum in the region measures 4.5km, which is a substantial width when considering the potential depth of overburden that lies on the early archaeology (Milne *et al* 1997, 134; Bates & Whittaker 2004, 64).

4.6 Sedimentology

Research into the sedimentological sequence across the Thames Basin is piecemeal in that it has been site-, rather than region-based (Martin Bates pers. comm.). The Greater London area and the lower Thames have received the most attention over the past decades. The biggest single project that has been undertaken is on the extension to the Jubilee Underground line which involved a major environmental research based on a series of sites across the central and eastern parts of the metropolis (Sidell *et al* 2000). In addition, the building of the Channel Tunnel Rail Link and the parallel work undertaken on the A13 in a great arc across NE London has provided an excellent opportunity to undertake detailed environmental work in the area of the Metropolis (for example Gifford *nd*; Bates & Barham 1995; Bates & Whittaker 2004).

The braided system of the river which was evident in the Devensian Late Glacial (MIS 2) but as this period closed (c11,000 cal BC), a considerable number of these channels were no longer in use (Thomas *et al* 2006, 10). At the beginning of the Holocene, the sandy eyots known along the river ‘started forming....under the freshwater regime’ (Thomas *et al* 2006, 10). The Thames at this stage was a meandering river in which mineral clay/silts were laid down, in places overlying the sand beds (Sidell *et al* 2000, 108). In the upper Thames the accretion associated with this would not occur until c2000 cal BP (Sidell *et al* 2000, 108). The marine incursions into the lower Thames began to be felt during the later Neolithic period (Sidell *et al* 2000, 110, figure 4.7). The resultant peat and estuarine clay-silts can be traced visibly along the foreshore of the tidal Thames.

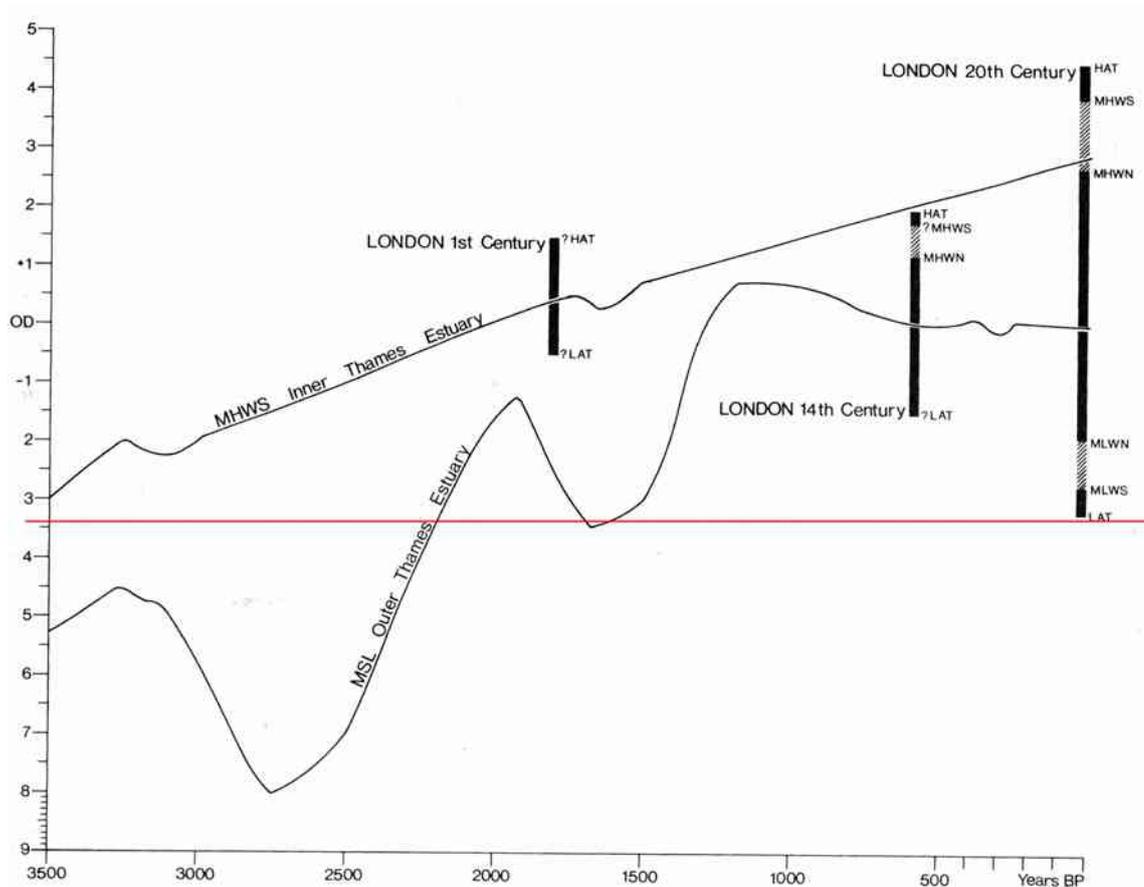


Figure 20 Tidal ranges and the ancient foreshore (adapted from Milne *et al* 1983, 22)

As can be seen by the red line in the above figure, the current tidal range of 7m in the lower Thames means that the land surfaces visible in the Neolithic are once again to be seen on the foreshore at low tides (Haughey 2000, 223). This is born out by the number of forests and woodlands dated to the Neolithic visible in the inter-tidal zone from locations at Richmond and all the way down to Erith – from one end of Greater London to the other (Haughey 1999, 17-18). It also indicates that as the tidal range continues to grow, Mesolithic land surfaces will begin to be exposed and the numbers of Mesolithic tools will potentially swell as occupation levels and kill sites are revealed. Indications are that this may have already have begun at the western end of the tidal Thames. Peat beds formed in part when the dynamic of the water slowed as the tidal current began to push its way upstream, resulting in the organic material held in suspension dropping to the bed of the river, as well as extensive fenland due to localised waterlogging within backswamps (essentially topographic depressions of low relief) on the river margins, or within abandoned tributary river channels (palaeochannels) (Jane Sidell pers.comm., Nick Branch pers.comm)

The ones at Richmond have been dated to 10360-9050 cal. BC (GU 5629). Further downstream at Barn Elms, dates of the peat are later (7040-6540 cal. BC GU 5730, and 7000-6540 cal BC (GU 5729) (Haughey 2000, 225). In fact the further downstream the peat bed lies, the younger it appears to be. At Winchester Wharf, which lies opposite the City, a cut timber buried in the peat and visible at extreme low water has been dated to 3910-3530 cal BC (Beta-147039) and an alder stump found at the point the peat bed emerges from under the current gravel overburden to 3720-3510 cal BC (Beta-148236). Upstream at Chelsea, a less substantial peat bed has dates ranging from 3650-3370 cal BC at the top to 3940-3650 cal BC at the base (OxA-7033, OxA-7034). The largest submerged forest has been noted on the foreshore at Erith where over 1600 trees and root systems lie exposed at low tide. The basal and upper age of the peat in which the trees are rooted dates to 2580-2190 cal BC to 1000 -790 cal BC (Beta-147033, Beta-147031) (Seel 2001, Haughey 2003, 64).

Further upstream changes were later in arriving. Alluviation did not commence in the Middle Thames until the later Neolithic/Bronze Age and even later in the Upper Thames (Allen *et al* 1997, 118).

4.7 Vegetation

While the Thames Basin has been the focus of attention in many studies (for example, see 4.8 below), one problem has been achieving the wider and overall view of the system when examining such topics as vegetation, as here, zoology and the like. The divisions referred to above have concentrated research within parts of the Basin, especially the upper region, and the conurbation in the lower Thames has acted as a masking device and hindered investigations. Even Holgate's attempt to examine the Neolithic of the Basin (1988), was selective in those areas under consideration with the upper reaches having the lion's share. Records of individual sites are, of course, available but investigating all of these and drawing an account of the overall picture is worthy of a research degree for each topic and thus will not be attempted here. An overview will be given of the upper Thames area and a closer look at the evidence available at some of the sites in the middle and lower Thames. I have decided to look particularly at the tree species, given the potential evidence for structures and artefacts in the Mesolithic and Neolithic periods, and not undertake an examination of seeds etc. The rationale behind this choice is that the main thrust of this research is not the growth

of agriculture within the Basin and it is of more importance to concentrate on the river resources.

In the Mesolithic, the upper Thames has pollen data which shows a sequence that begins with *Betula*, *Salix* and *Pinus* in the pre-Boreal. At the beginning of the Boreal, numbers of the first two begin to fall, *Pinus* dominates, and *Corylus* and *Ulmus* appear. By the end of the Boreal, *Betula* had almost disappeared, *Pinus* was beginning to decline and *Quercus* was first present. During this time, there was a marked shift from forests of *Pinus/Ulmus* with *Corylus* to those with *Quercus/Ulmus*, *Tilia* and *Alnus* (Robinson & Wilson 1987, 26).

In the Neolithic the tree fauna are less clear in the upper Thames as the pollen sequence is more difficult to determine. During the earlier part of the period, places of what is described as a 'shaded environment' are suggested and charcoal that has been found at a number of sites in Oxfordshire are of *Quercus*, *Fraxinus*, *Corylus* and *Prunus* (Robinson & Wilson 1987, 30). In the later Neolithic, the effects of the floodplain alluviation reduced the pollen sequence to predominately *Alnus* with *Tilia* and *Quercus* (Robinson & Wilson 1987, 31).

The vegetation of Greater London area remained largely unchanged throughout the Neolithic particularly with *Quercus/Tilia* dominating the upland and *Quercus/Corylus* in the lowlands, and alder carr spreading through much of the floodplain in the Late Neolithic (Wilkinson & Sidell 2007, 71). The site at Perry Oaks produced a range of tree species in the Neolithic period with 'a mixed, deciduous woodland, dominated by oak and hazel' (Lewis *et al* 2006, 65). In addition there was *Alnus* with *Betula*, *Pinus* and *Fraxinus* on the wetter river edges and *Tilia* and *Ulmus* within the locality (Lewis *et al* 2006, 65).

The current tidal reaches of the lower Thames have been subject to erosion over the years and as seen in Figure 20 above, the current lowest tides are now exposing the Neolithic land surfaces and in time those from the Mesolithic also will be available to view and examine. Submerged forests have been exposed in the peat beds noted above and are gradually eroding away. One such woodland has been recorded on the foreshore Winchester Wharf (TAS zone FSW12) which lies between Cannon Street and London Bridges and has the following species: *Fraxinus*, *Ulmus*, *Quercus*, *Betula* with

Alnus dominating and a single *Pinus*. The 1600 trees at Erith noted above include *Fraxinus*, *Ulmus*, *Quercus*, *Betula*, *Alnus* and *Taxus baccata* (Seel 2001, 215ff).

4.8 Previous Research

Earlier accounts of the Mesolithic and Neolithic periods within the Thames Basin have been sporadic in spread. Vulliamy discussed that found within the old county of Middlesex (Vulliamy 1930). GF Lawrence wrote an account of finds from the middle and lower Thames but without much detail of their actual findspots (Lawrence 1929). The later prehistoric and historic periods, even at this time, were the focus of attention (for example Thacker 1909; 1914; 1920; Wheeler 1979, Wheeler 1929). Holgate in 1988 took a wide synthetic approach to Neolithic settlement but concentrated much of his attention on the Upper and very little on the Lower Thames region (Holgate 1988). This was understandable given where research had been undertaken at that point in time. The upper reaches of the Thames valley have been the subject of systematic surface collection during field survey as well as intense aerial photography and in a number of places, large scale excavation (Holgate 1984, 104). The river gravel terraces have shown extensive cropmarks in both the Upper and the Middle Thames (Benson 1974; Gates 1975; Leech 1977). In these areas too, archaeology has benefited from the effects of gravel extraction. Work by Oxford Archaeology has produced a series of site specific volumes (for example, Muir & Robert 1994) as well as more synthetic ones (for example, Barclay *et al* 2003a).

The Middle Thames, until recently, had not received a lot of attention but now there is a series of volumes of work undertaken over the past decade by Wessex Archaeology (for example Andrews & Crockett, 1996; Lobb & Rose 1996), as well as others by Oxford Archaeology (for example, Hey 1996; Foreman *et al* 2002).

In the Lower Thames, London, in prehistoric terms, had been somewhat blighted by a report produced in 1973 on the state of archaeology in the City. In it the writers state that ‘no evidence for other than transitory occupation during the prehistoric period has ever come to light’ (Biddle & Hudson 1973, 9). This attitude was not challenged until the late 1980s when a case was put forward for a prehistory for central London in the light of work taking place beneath the alluvium overburden (Merriman 1987; 1992). Until this point, the alluvial blanket that covered large areas of the Thames floodplain, particularly in the Metropolis was deemed to be the ‘natural’ below which would only

be found archaeologically sterile deposits. In addition, work in the lower Thames area and the Metropolis is affected by the inherent difficulties of the urban sprawl. The Thames itself, as a result of over a century of dredging operations in the navigable reaches, not only in London but up as far as Lechlade, had produced considerable amounts of prehistoric material (Lawrence 1929, Noel-Hume 1956) and was until recent times the source of almost all the Neolithic material within Greater London (Macdonald 1976, 19); an observation which was echoed in 1989 about the Mesolithic (Field 1989, 1). 2000 saw the long-awaited publication of a round-up of London's archaeological knowledge up until that date which demonstrated the wealth of prehistoric material that had been either previously published or recorded in the Greater London Sites & Monuments Record (GLSMR) (Museum of London 2000). A further useful synthesis has been a volume produced in 2004 which has examined the Neolithic of the South East, which while not totally comprehensive, is a summary of a great deal of recent work undertaken in the region (Cotton & Field 2004, xvii).

There recently has been a spate of long-term projects which have added substantially to the archaeological record. The building of the Channel Tunnel rail link and work carried out on the A13 have carved parallel arcs through the NE part of London (Gifford *et al* 2001.). The work on the Jubilee line mentioned above is another project (Sidell *et al* 2000). English Heritage has funded the publication of a number of previously unpublished excavations (Sidell *et al* 2002). In addition, a major survey, the Thames Archaeological Survey (TAS) was undertaken between 1995 and 1999 on the Thames foreshore within the tidal reaches of Greater London (Webber 1996, 1997). Very little of this has yet been published for any period (thus far only Cowie & Eastmond 1997a, 1997b; Haughey 1999). The relevant information from the survey will be included in the following discussion.

4.9 Archaeology of the Thames Basin

Unlike these other researches, this study will examine the Basin as whole and look at the evidence by period rather than following the more traditional upper-middle-lower Thames divisions. Viewing the Basin in this way produces more resonance with the information gained elsewhere (as in Chapters 3 & 5) where the technological level is of key importance. The chronology for the archaeological periods under discussion is outlined in Table 3 below.

MIS	Epoch	Stage	Period	Cultural Period	Dates Cal BC
1	Holocene	Flandrian	Pre-Boreal/ Boreal/Atlantic	Mesolithic	c9500- c4200
1	Holocene	Flandrian	Atlantic/Sub- Boreal	Neolithic	c4200- c2500

Table 3 Chronology of the Early British Prehistory (after Museum of London 2000, 20)

At the start of the Mesolithic period, the landscape was occupied by hunter-gatherer-fisher communities and by the end of the Neolithic, as the age of metal is approaching, the beginnings of agricultural and husbandry were being felt. The following discussion is not concerned with assessing the subsistence effects of either, the hunting and gathering, or the outworkings of domestication. It is concentrating on the way the people who lived during these periods related to the rivers and how the rivers related to them. An overview of each of the periods will be examined, followed by a closer look at a number of sites throughout the Basin. I have collected data from a number of sources for use in this section, including investigating the Sites and Monuments Records (SMRs) for the counties or part counties through which the Thames river system flows (Gloucestershire, Wiltshire, Berkshire, Oxfordshire, Buckinghamshire, Hertfordshire, Kent, Essex and Surrey) as well as the one for Greater London (GLSMR). I have also created a database of prehistoric finds retrieved from the London Thames and its foreshore by examining collections held at a wide range of museums in England and also in Toronto, Canada. The quality of these finds is, in many cases, unparalleled and some are unique objects found only in the Thames. The full database includes over 5000 entries, although only c2000 are pertinent to this study. **Appendix 1** contains a catalogue of the relevant artefacts and a key to the database which also includes a list of the 14 museums.

As with the ethnographic material discussed in **Ch3** above, one problem with the Thames material has been the late publication of a number of key sites. Dorney is one example of this, where there has yet to be a full report written about the findings uncovered during excavations for the Eton Rowing Lake. There are a number of interim articles but no detailed volume dealing with the early prehistoric finds (for example Allen 1995, 2000; Allen *et al* 1997). Allen *et al* 2004 is the most substantial report to date, found in Cotton & Field 2004. Yarnton is another example where there are internal reports (Hey 1993, 1994, 1996) and a volume dealing with the Saxon and Medieval material (Hey 2004); that dealing with the Neolithic and Bronze Age periods is still in abeyance.

On the other hand, the fact that there have been two major projects at Runnymede and Dorney in the middle Thames area in the recent decades has shown the potential for further equally productive work on the river margins. Runnymede is now finally published. The interim reports, in the case of Dorney, give a good indication of what is available albeit initially only of the Neolithic. We await a similar report on the Mesolithic evidence.

4.10 Mesolithic

In the post-glacial period, as a result of changes in the vegetation cover and a decline in sedimentation, the Thames valley floor was comparatively dry and thus much more accessible from the Mesolithic through to the Bronze Age (Allen *et al* 1997, 118).

4.10.1 Artefacts

Evidence from this period in the Thames Basin is principally artefacts manufactured from flint with others of antler, bone and horn. Organic artefacts of wood/bark, woven materials and animal skins are unknown thus far in this area. Figure 21 shows the spread of axes, adzes and Thames picks which will be discussed in more depth below.

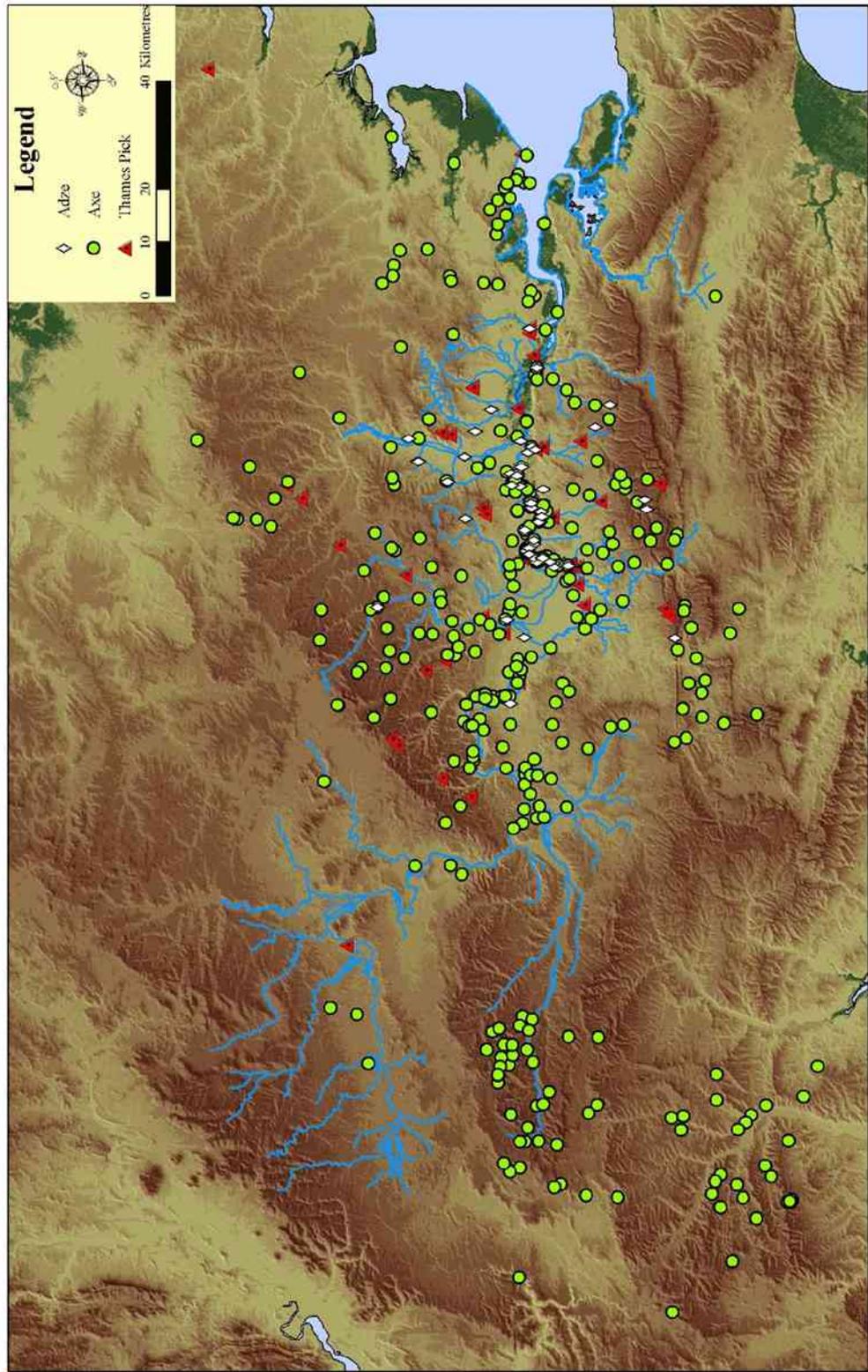


Figure 21 All Mesolithic Axes, Adzes and Thames picks

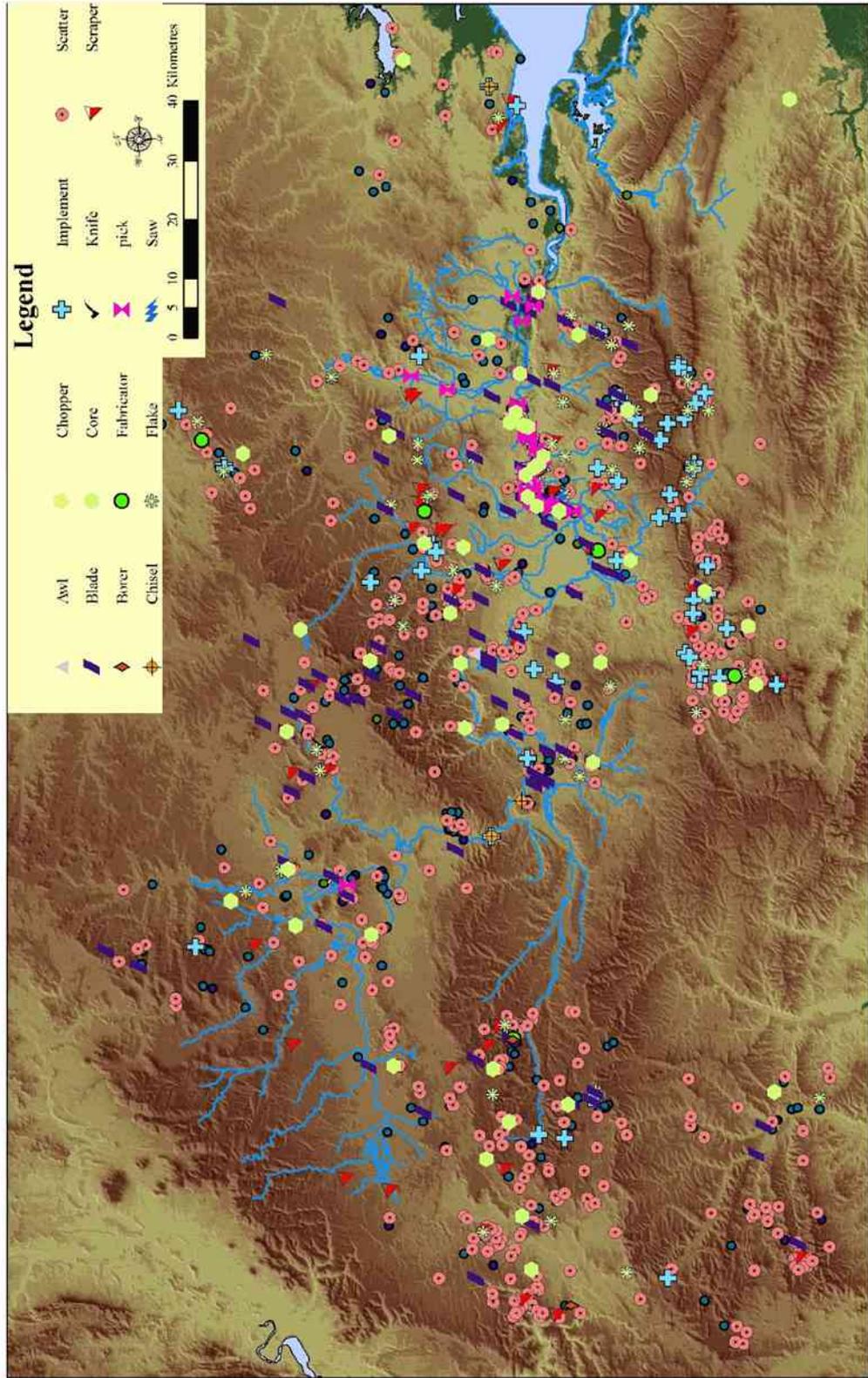


Figure 22 Mesolithic Flint Objects

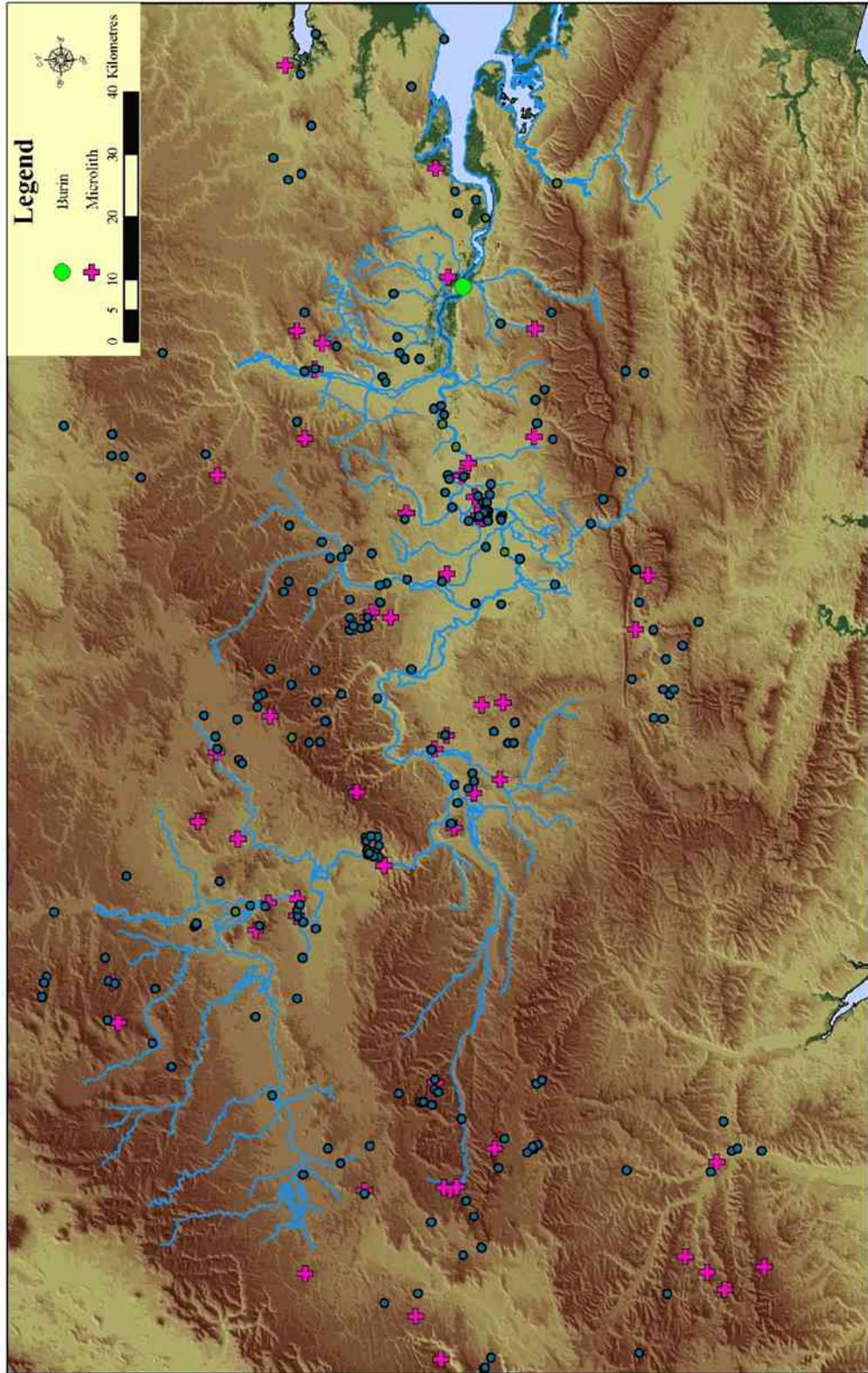


Figure 23 Mesolithic Microliths and Burins

Figure 22 above shows other flint objects which seem to indicate a predilection for both uphill sites and conversely riverside locations, with a preference for the latter. The majority of cores and almost two-thirds of the blades are in river valley contexts, scatters too in many places follow the line of the water. The numbers of microliths and burins (Figure 23) are clearly less than would be expected in watery contexts. Dredgermen, being the main agent of object recovery from the rivers, have not collected such small items probably through lack of recognition.

Two harpoons are recorded on the Greater London Sites and Monuments record as having come from the Thames at Battersea and Wandsworth respectively (see **Appendix 2** – Figure 112). They are made from antler and one has coarse teeth. They have been dated to the Mesolithic period. In addition, a point fragment (Museum of London accession no. A.4907) with a barb on one side, made from an antler tine and dated to c8000 ±85 cal BC (OxA 3736) was recovered from the Thames at Wandsworth. It has been described as part of fishing and fowling gear. Another point (Museum of London accession no. A.11729) made from a split bone, barbless and found in the river at Battersea, has been interpreted as part of fishing tackle.

One aspect not to be overlooked is the movement of the rivers throughout the Mesolithic period. Figure 24 illustrates this quite clearly. The Jubilee Line Extension environment project produced the evidence noted here in central London – showing that the Thames flowed further south than at present. The bulk of the artefacts which have been retrieved from the current river were actually abandoned in a dry land context. Those that were genuinely in a watery context were in two clear clusters – the one to the west (upstream) would have been in the delta of the Tyburn and possible association with now extinct gravel islands or even fishtraps. That in the centre of the figure is probably associated with the mouth of the Walbrook and maybe, again, connected with another fishtrap. An example of the possible misinterpretation of the deposition of artefacts can be seen at Winchester Wharf where 3 Mesolithic adzes were recovered in the 1990s near to the entrance to St Mary Overie dock (Cotton & Green 2004, 123). It was suggested that this ‘may hint at deliberate deposition, an explanation more usually invoked with regard to Neolithic and later material’ (Cotton & Green 2004, 123). Given the knowledge available since 2000 that during the Mesolithic this was not a riverine context, such a ‘hint’ might be considered somewhat wide of the mark and more akin to the ‘one-size-fits-all’ approach discussed in **Ch 2**.

4.10.2 Specific sites:

Runnymede Bridge

Investigation on this site began in 1975 ahead of the work on the M25 involving the construction a bridge over the Thames at Runnymede and continued until 1989 with salvage and then research phases. The Egham area, within which the site lies, is low-lying resulting in a meandering river, with chalk downs to the south and the Chilterns to the north (Longley 1980, 1). While principally noted for its Late Bronze Age material, Runnymede Bridge site has produced significant amounts of Neolithic data as well as some from the Mesolithic and has been extensively published (for example Longley 1980; Needham 1991, 2000; Needham & Spence 1996). Only part of the extensive site was excavated and 'it is thought that extensive unexcavated prehistoric deposits probably remain buried' (Needham 1991, 15). Excavation was undertaken in two phases: salvage in 1975-1980 and research in 1984-1989.

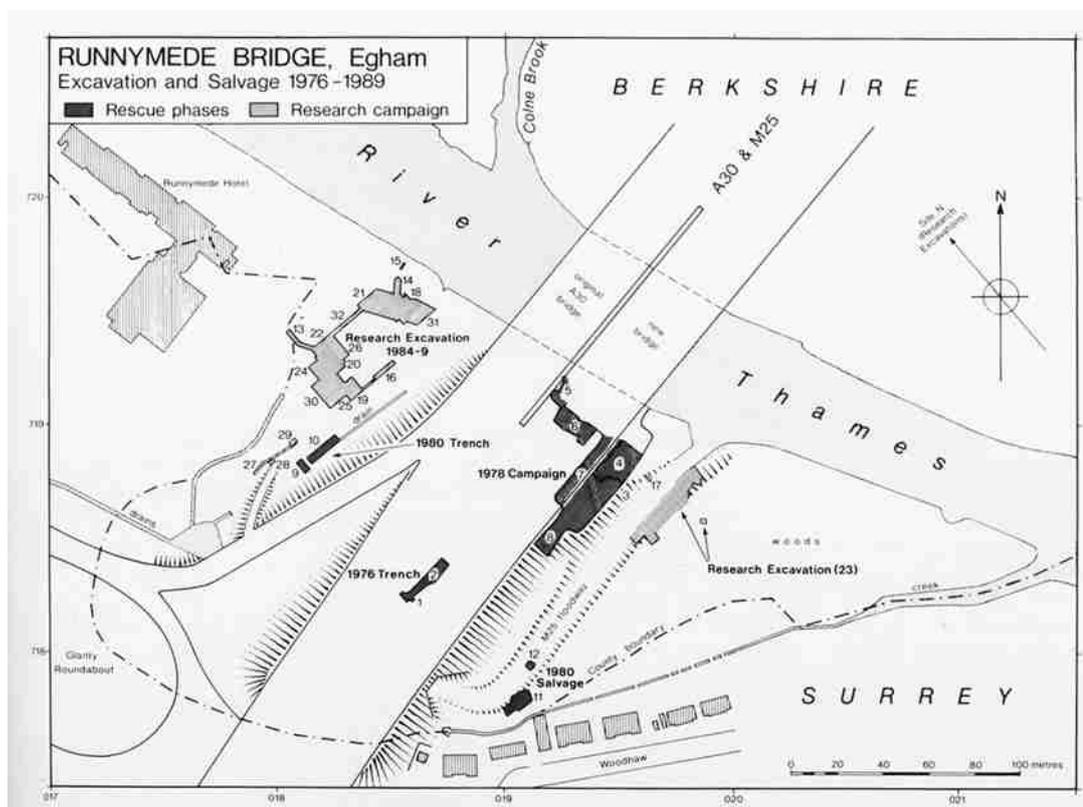


Figure 25 Excavations at Runnymede (Needham 1992, 251)

The stratigraphic progression at Runnymede has been dated from the Mesolithic through to post-Bronze Age (Needham 1991, 26-2). The configurations of the river system in the area have been explored and a sequence suggested covering the period from the 8th millennium BC to 1870 AD (Needham 2000, 222-231). The character of the river gradually changed from an anastomosed system to that of a simple channel

with tributaries (Needham 2000, 222-3). In the Mesolithic and Neolithic periods, human activity took place on what gradually became an island set within a multi-channel riverscape.

The Mesolithic at Runnymede in the form of the recovered artefacts appears to have been concentrated on the 'island' between the two arms of the Thames (Figure 26). What has survived the shifting topography/hydrology and later disturbance, is a small number of flint tools and flakes and while it might be described as ephemeral in nature, does indicate a presence here in the centre of the river complex at an early date (Needham 1991, 125-7, 133).

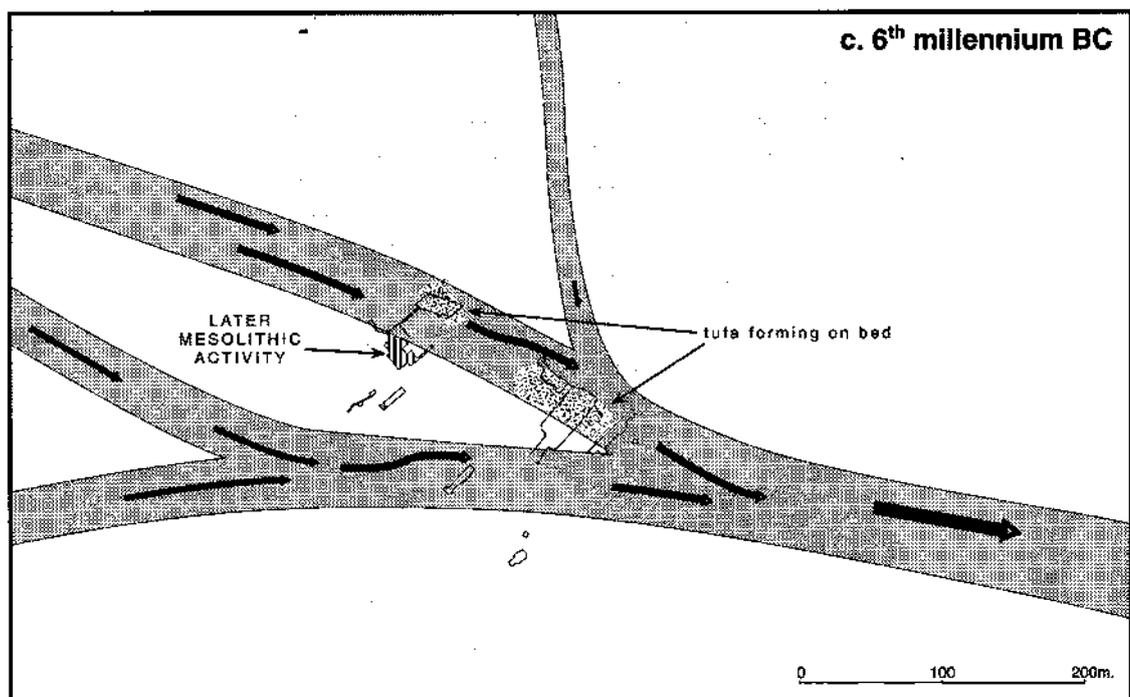


Figure 26 Runnymede showing the Mesolithic phase (Needham 2000, 224)

Eton Rowing Lake, Dorney

This site lies within a bend of the Thames and was excavated in advance of gravel extraction prior to the construction of an Olympic-sized rowing lake with its return stretch, for Eton College. Desk-top investigations had disclosed the presence of a possible causwayed enclosure on the upstream side of the site as well as later prehistoric evidence and so a large number of evaluation trenches were dug all over the area (Allen & Welsh 1996, 23). Full excavation took place between 1995 and 2000 and a series of interim reports published (Allen 1995; 2000; Allen & Welsh 1996; 1997; 1998; Allen *et*

al 1997; Allen *et al* 2004). Unfortunately, only a volume of the Anglo-Saxon to post-Medieval periods has been published to date (Foreman *et al* 2002) and that covering the Mesolithic and Neolithic is still awaited. It is a very rich site producing abundant material from the Mesolithic period onwards. The Eton Rowing Lake site revealed a number of palaeochannels of the Thames (see Figure 27 below) which showed use right through until they silted up towards the end of the Iron Age (Allen & Welsh 1998, 81).

In the figure below, the three areas of Mesolithic activity are seen, all by relict channels but the illustration does not indicate the concentration of material uncovered. The dense area (measuring in excess of 2000m² containing flint and animal bones fragments on the north side of Basin R was probably much larger in the Early Mesolithic before it was covered by alluvium and corresponds to that marked on the opposite bank of the modern Thames. The Basin R stratum was overlain by *in situ* Late Mesolithic deposits and others dating from the Early Neolithic to the Bronze Age (Allen & Welsh 1996, 23). The deposits included hearths, horizons of flint knapping, scatters of pots and animal bone. It was obviously a place of importance that was in continuous use, if not occupation.

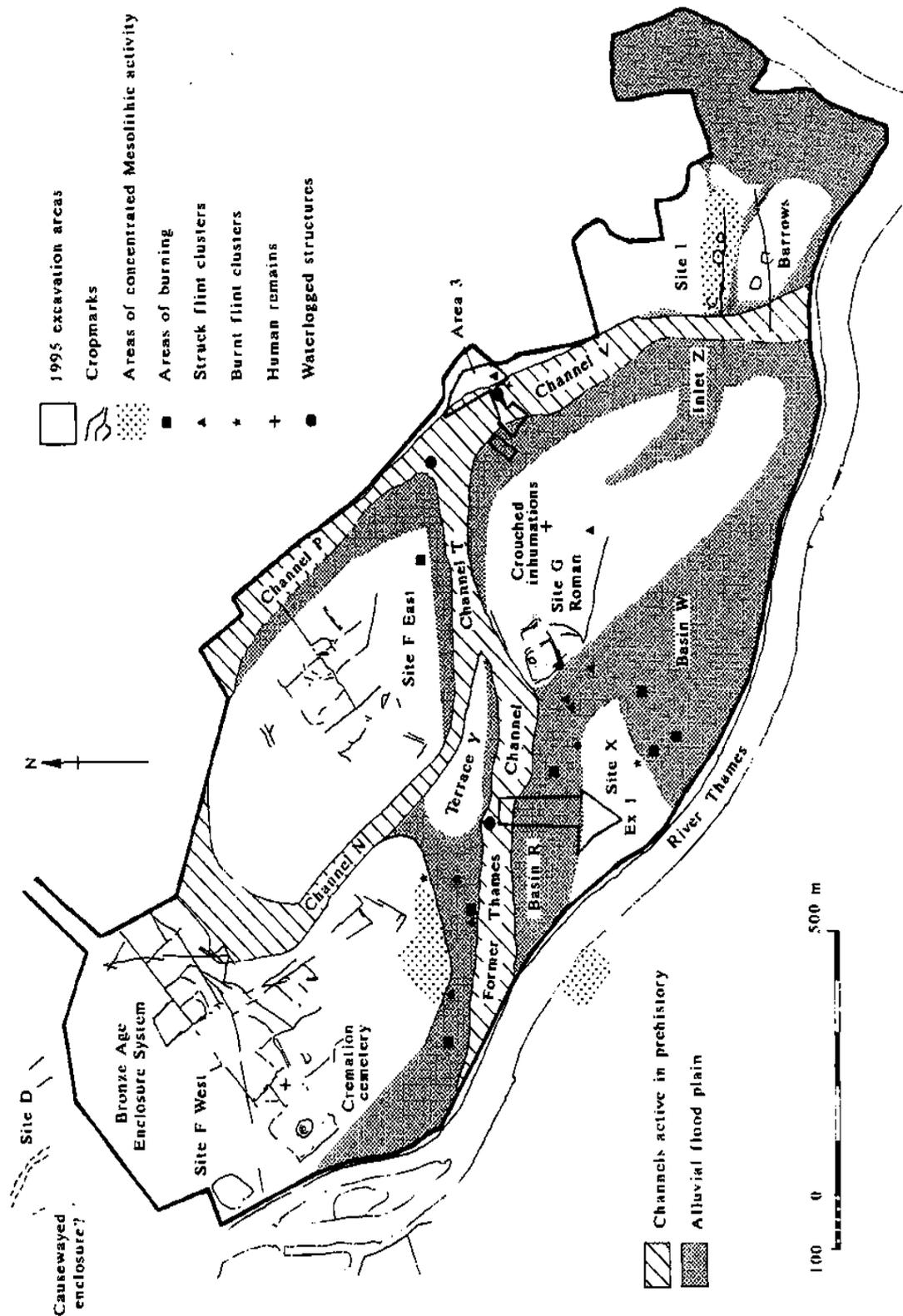


Figure 27 Dorney, Mesolithic concentrations with remains from later periods (Allen & Welsh 1996, 25)

These three areas are not the only Mesolithic evidence found; they are just the concentrated zones. The surface of the gravel terrace Ex1 (between Basin R and W) is pockmarked with hollows and tree throws, which when excavated produced

assemblages of Mesolithic flints, 2 Mesolithic picks or axes, 2 Early Neolithic leaf-shaped points and other retouched tools (Allen & Welsh 1996, 23).

Holgate, as observed by Allen *et al*, suggested that later Mesolithic settlement in the Thames valley is ‘centred upon base camps by the river’ (Holgate 1988, 129-33; Allen *et al* 2004, 94). Allen *et al*, writing 16 years after Holgate, noted that ‘there are no large base camps such as existed at the Rowing Course in the Early Mesolithic’ (Allen *et al* 2004, 94).

Kennet valley

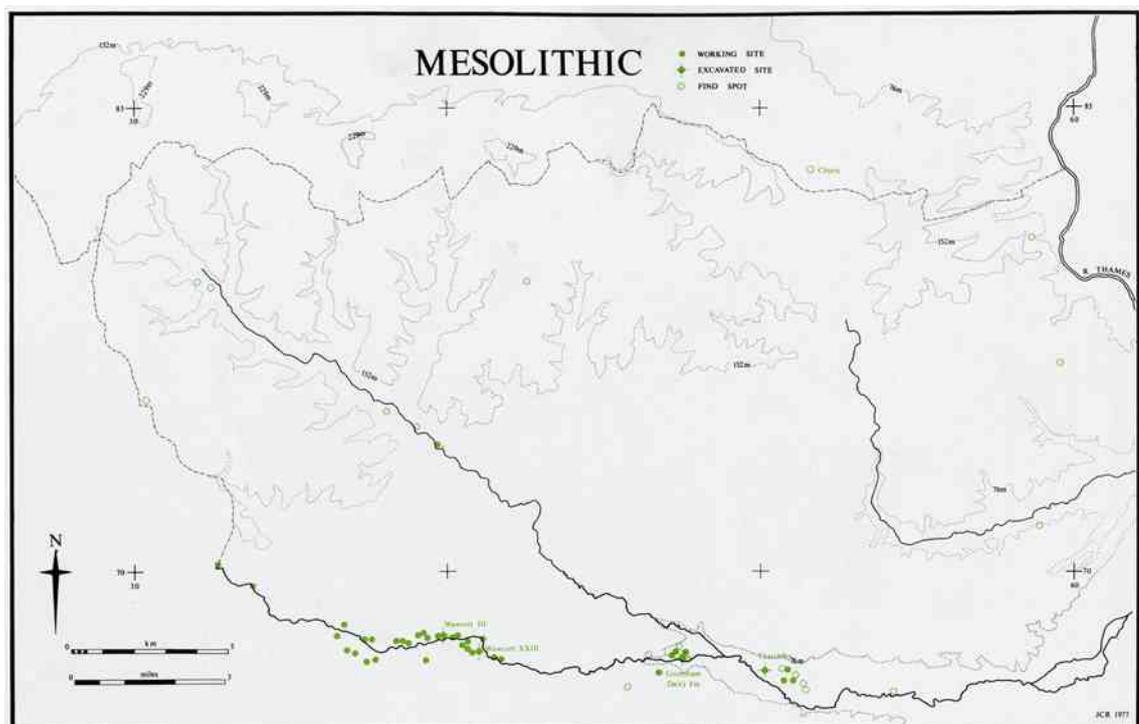


Figure 28 Kennet valley – Mesolithic (Richards 1978, 28)

The Kennet flows in a west-east direction across Wiltshire and Berkshire before joining the Thames near Reading. In places, particularly at confluences with lesser tributaries it is an abraded system, with relicts of palaeochannels and earlier courses of the river occasionally still traceable (for example, Healy *et al* 1992, 42, figure 1). The river valley and adjacent areas are the location of a number of Mesolithic and Neolithic sites (for example From 1976, 3, figure 1b; Richards 1978, 28; Birbeck 2000, 10). The Kennet itself provided not only flint from the river gravels but also subsistence and communication routes (Richards 1978, 29).

Around Wawcott, a number of Mesolithic sites have been discovered, initially as the result of fieldwalking (Froom 1976, 1). The area would have consisted of channels with mudflat islands, a shallow river with areas of reeds and rushes, set within a well-wooded valley (Froom 1976, 10). At Wawcott III, indications of flooding, in the form of silt layers, imply that settlement at the water's edge was at least partly seasonal. There were no post holes detected in the main clay layer over the site, although this does not exclude the possibility of some having been *in situ* in later strata which were eroded during flooding events (Froom 1976, 16). Subsistence in the area is indicated by the presence of aurochs, deer and boar at Wawcott XXIII with additional suggestions of wild fowl at the water margins as well as fish (including salmon), crayfish (*Astacus fluviatilis*) and molluscs (Froom 1976, 14).

As is common with the majority of Mesolithic locations in Britain, the principal find was flint (in excess of 90,000 pieces at Wawcott III alone in the form of microliths, axes, core flakes and blades (Froom 1976, 8, 17ff), but with no use-wear analysis undertaken, any hypothesis as to their use cannot easily be constructed.

Further downstream at Thatcham is a Mesolithic site which lies just south of the confluence with the Lambourn and was first examined in 1920. Subsequent work at the location included that undertaken by Wymer in the late 1950s (Wymer 1959) and by Healy *et al* in 1989 (Healy *et al* 1992, 43). Placed at the edge of a fen adjacent to a river channel in the Mesolithic period, Thatcham has produced a flint assemblage, bone and antler implements and hearths as well as sedimentary evidence (Healy *et al* 1992, 43, 58ff). In 1989, a series of sample trenches was examined in part of the site (see Healy *et al* 1992, 45 for details of the sample strategy). The flints from this excavation did not include tranchet tools, and only one projectile point, which has led to the suggestion that 'hunting was under represented' (Healy *et al* 1992, 58). There was, however, a significant amount of use-wear on tools from 4 different contexts as seen in the table below:

Context	245	251	325	228
Cutting soft	1	6	7	2
Cutting meat		2		
Cutting hide		2	1	1
Scraping hide			1	2
Cutting/scraping hide		1		
Cutting/scraping fish	1	1		
Scraping soft wood	1	1		
Cutting wood		3	2	4
Scraping wood	2	4	2	2
Whittling wood	1	1		
Boring wood	1		1	
Grooving wood		1		
Scraping antler	2	1		
Boring antler		1		
Grooving bone		1		
Scraping bone	2	1		
Projectile		1		
Piercing soft	1		1	
Scraping soft	1			
Piercing medium		1		
Boring medium	1		2	
Grooving medium	1			
Scraping medium		1		1
Scraping hard		1		
Piercing		1		

Table 4 Results of usewear analysis at Thatcham (Healy et al 1992, 58).

Context 245 was in the southern part of the site (on a gravel bluff), with the other 3 grouped in the northern area, within the relict river channel. The results described could easily fit a number of tasks undertaken so it is of great interest that fish processing is specifically mentioned as occurring in both parts of the site. In addition, other results may also have been associated with fish and fishing. For example, *cutting soft* and *scraping soft* could occur during parts of piscine preparation as well as in dealing with animals. The wood-preparation wear could be from the production of fish traps or weirs, or drying racks, or rods. The bone that was found in 1989 was small in quantity and badly preserved, resulting in none being identified as to species (Healy *et al* 1992, 53). The lack of projectile points could be real but not reflect original absence, in that this might (given its location) be a fishing site rather than one specifically for hunting. The rewards of hunting (shown now in the form of antler and bone) could have been brought into the site from elsewhere. The hearths and organic implements found by Wymer suggest it might also be a settlement and the fact that much of the tool assemblage is associated with processing seems to reinforce this idea. The results thus

obtained at Thatcham from microwear studies caused Birbeck to comment on a comparable flint assemblage from a site on the Lambourn 'It is extremely difficult....to determine the full range of activities on site, particularly as microwear studies have shown that similar artefacts can have a multitude of different functions' (Birbeck 2000, 16). The location of the Mesolithic site near to a river channel is commensurate with those found on the Humber (Van de Noort *et al* 2001, 247).

Healy noted that there was a concentration of sites of this date along the Kennet and suggested that they all might be short-stay camps (Healy *et al* 1992, 70). Most of these sites have been recorded in the middle and lower reaches of the river, with relatively little from the upper Kennet (Powell *et al* 1996, 10). Paucity of resources has been one explanation offered but others have argued that 'the survival and retrieval of evidence might be misleading' (Powell *et al* 1996, 10). The Mesolithic presence in this part of the Kennet valley mostly comprises a number of isolated flint finds principally from the end of the period (Pollard & Reynolds 2002, 21). There are a small number of concentrations that suggest a longer occupancy. One such site is to be found 300m from Avebury by the Winterbourne, where there is flint work of both Late Mesolithic and Early Neolithic types (Pollard & Reynolds 2002, 21-3; Gillings & Pollard 2004, 24ff).

Greater London

In spite of the obvious restrictions of working within a densely occupied urban environment, Greater London has produced a wide range of archaeological data and outwith the view in 1973, continues to surprise with the depth of deposit from the prehistoric periods onwards, still available (Biddle & Hudson 1973). An additional problem, for those working on the foreshore, is the fact that the lower Thames is principally an estuary, with its tidal head held artificially at Teddington Lock.

The meandering river of the past poses problems for archaeologists today. As noted earlier, the Thames in Central London during the Mesolithic ran further south than its present course (see Figure 24 above).

Westminster too, looked very different at the confluence of the Thames and Tyburn rivers. All of this begs the question as to the deposition of many of the dredged finds. If an object did not go into water but came out of water, was it still ritually deposited?

The woodlands on today's foreshore are clear indication of land, rather than river, and objects from both the Mesolithic and Neolithic periods are still being picked up from the surfaces (for example, Cotton & Merriman 1991, 38-43).



Figure 29 Reconstruction of the Westminster area in the Mesolithic (top) and Neolithic (bottom) (Sidell et al 2000, 62)

Work undertaken recently on Thorney Island, has produced a range of artefacts dating from the Mesolithic through to the Bronze Age (Thomas *et al*, 2006, 23ff). While the majority of the material was dated to the Late Neolithic/Early Bronze Age, considerable numbers of Late Mesolithic lithics were recovered from the northern and eastern sides of the site which would have overlooked the freshwater river, comprising pick, axes,

flakes, microliths, adze fragments and blade cores (Thomas *et al*, 2006, 27). The authors of the report suggested that this might have been short-stay foraging site but noted both ‘a localised cooking area’ and that ‘the small-scale nature of the archaeological work needs to be borne in mind’ (Thomas *et al*, 2006, 28).

Other Mesolithic sites will be briefly examined within the Greater London area (Three Ways Wharf, Perry Oaks, Creffield Road, West Heath and Erith). In addition 12 other sites across the period will be mentioned.

Three Ways Wharf is a site set within the Colne river system on the extreme west of the Greater London area (Figure 30 below). It is one amongst several Mesolithic sites near or on this complex of rivers that run south into the Thames. In this way it is similar to the Kennet, as noted above. Finds include four scatters of *in situ* flint and animal bone remains. One of the two major scatters (‘C’) is Early Mesolithic in character with c7000 flint and the c2000 faunal remains predominately red deer with some evidence of charring (Lewis 1991, 253).

A thermoluminescence date of $c.7000 \pm 800$ cal BC (OxTL 772f) was produced from burnt flint (Lewis *et al* 1992, 239). An examination of the flint has shown that there is evidence of individual knapping areas and that there might be at least two microlith production areas. Three Ways Wharf has been interpreted as a hunting and food processing site (Lewis 1991, 253).

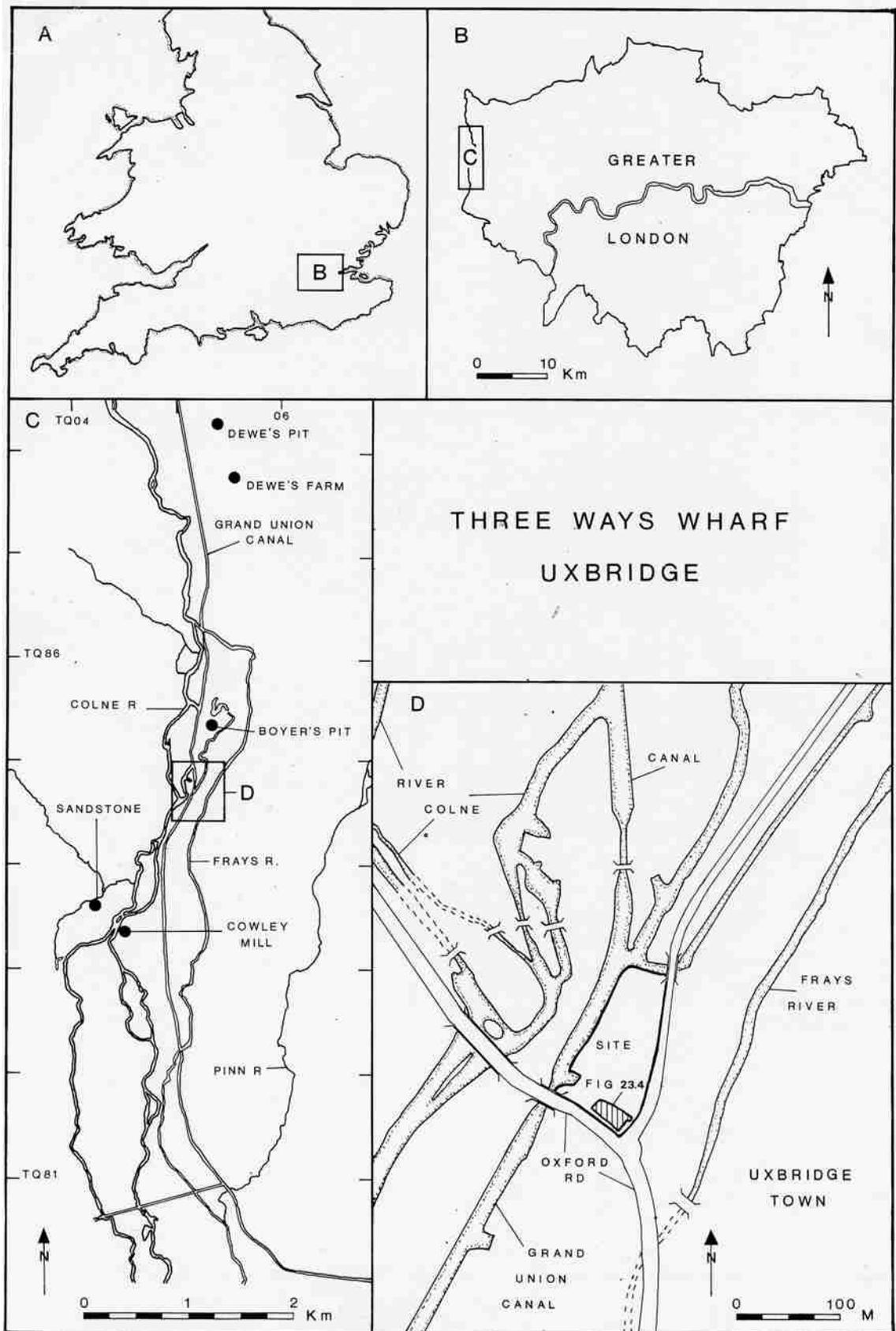


Figure 30 Three Ways Wharf (Lewis 1991, 247)

Creffield Road, Acton in the London Borough of Ealing is a multi-period site with artefacts from the Mesolithic predominating, a few Neolithic flints and a later prehistoric sherd. The site is near Middle Palaeolithic locations dug in 1887 and 1974/5 (Bazely et al 1991, 17-18). It is the location that is most interesting here. It is by an abraded river system on the Lynch Hill gravels and is overlain by alluvial/colluvial deposits (Bazely et al 1991, 17).

West Heath, Hampstead comprised a large flint assemblage dated on stylistic grounds to the early Mesolithic. The 61155 pieces included microliths, burins, scrapers, points, cores and flakes together with 3 axes (Collins & Lorimer 1989, 17). The site lies by the side of a stream that in historic times has been dammed to form a pond (Collins & Lorimer 1989, 11). Unfortunately there were no organic remains in the form of bone or wood finds from the site.

These three sites illustrate the fact that it is the Early Mesolithic which has a significant presence in Greater London, particularly in river valleys and alluvial deposits and it is the later part of the period that is more elusive in any great concentration (Lewis 2000, 54-5). The slight exception to this is to the east where a number of both Early and Late Mesolithic sites, as well as some from the Early and late Neolithic, are to be found. The location of these eastern sites are either by water, on eyots or their margins, or adjacent to the floodplain (Bates & Whittaker 2004, 66-70). It is interesting to note the Late Mesolithic sites in the Colne valley lie in the tributaries of the river and the Early Mesolithic are to be found in the Lower Colne (Lewis et al 1992, 244) (see Figure 31 below). It is possible that in the future, on the Thames foreshore this might alter as erosion continues to 'excavate' the prehistoric land surface. Finds from this period have already been either dredged or recovered from the current river bed, although whether these were wet or dry sites in the Mesolithic is impossible now to estimate. Confluences are also favoured places as well as islands (Field 1989, 15; Ridgeway & Meddens 2001, 286-7) so continued survey of these areas with also the possibility of excavation may reveal more on the Mesolithic use of Greater London.

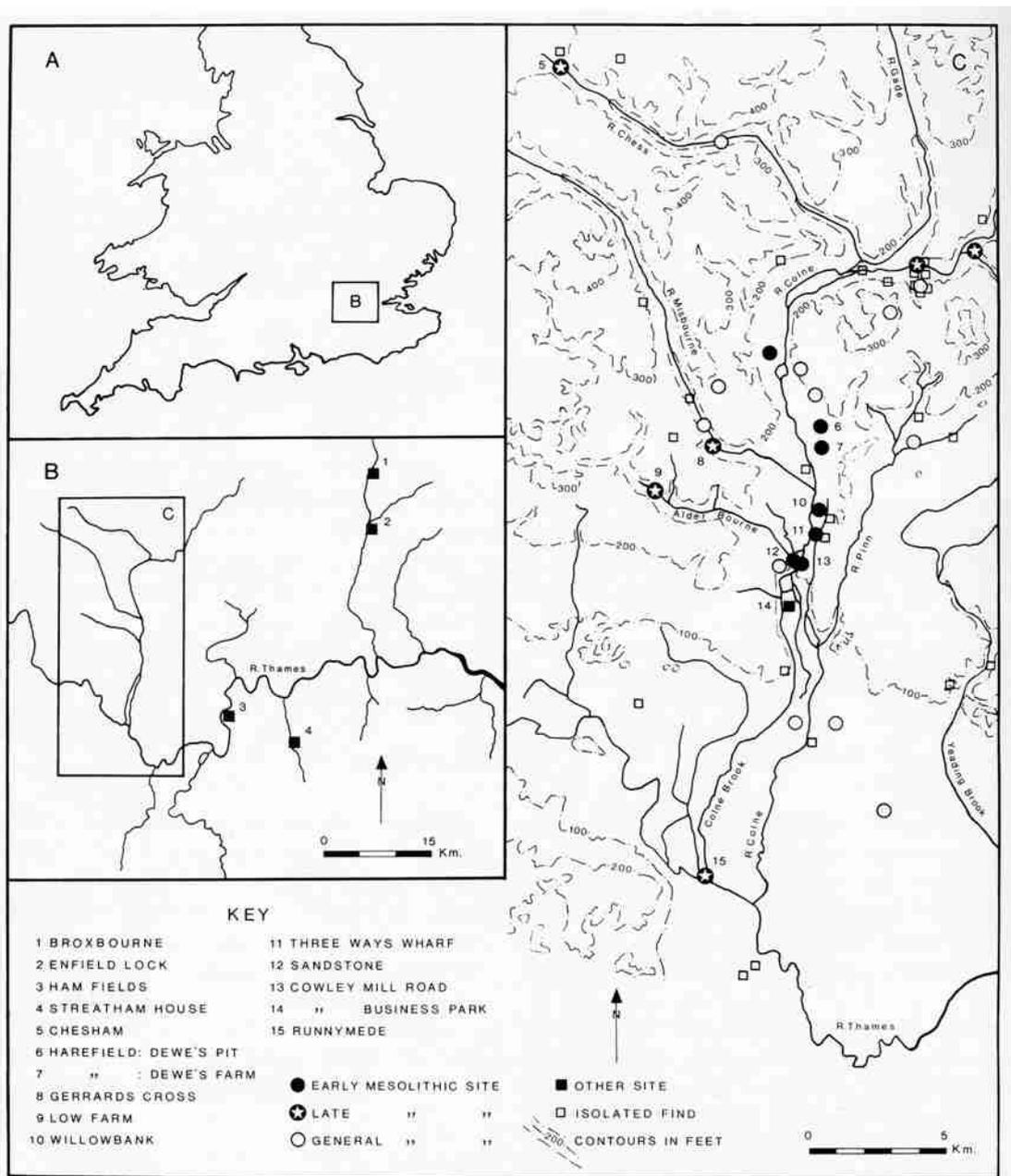


Figure 31 Mesolithic sites on the Colne river system (Lewis *et al* 1992, 236)

The Heathrow site at Perry Oaks lies near to the anabranching Colne network. The airport itself is bounded on the east by the Crane and the west by the Colne system. It is only to the north that the approach is free of watercourses (see Lewis *et al* 2006, 5). The site shows evidence of human presence in *c*6600 cal BC, with a series of pits which were filled with burnt unstruck flint (Lewis & Welsh 2004, 105). The location was near to a stream ('classic-hunter gatherer' siting) on the edge of the Colne floodplain (Barrett *et al* 2000, 195-6). The pits were also in an area that was re-used in the Neolithic period as will be discussed below (see Figure 45). In total, the number of flint artefacts here did not exceed 80 (Lewis *et al* 2006, 28).

At Erith, which lies at the downstream extent of Greater London, near the Kent border, *in situ* Mesolithic flint tools (tranchet axe, flakes, awl and cores) were found under peat on a site near the river (Bennell 1998, 13-15).

The table below shows a number of selected sites that have been recorded in the lower Greater London area and downstream towards the mouth of the Thames.

	Site	Grid reference	period	Environment	Cultural evidence
1	B&Q, Old Kent Road	TQ 5344 1778	Early Mesolithic	Ridge overlooking southern shore of Late Glacial lake	2 scatters including cores, flakes, retouched tools, hearths, red deer bone
2	47-67 Hopton St, Southwark	TQ 3185 8040	Mesolithic	Adjoining stream on margin of sand island	Burnt flint, flakes, bone
3	283 Tooley St	TQ 3375 7977	Mesolithic	On NE sloping edge of eyot, adjacent to channel	Tranchet axe, core, blades and flakes
4	Ebbsfleet Valley	TQ 6165 7420	Later Mesolithic	Edge of brackish water channel	Struck flints, burnt flints, hazel nut shells, charcoal
5	A13 Movers Lane	TQ 4530 8330	Late Mesolithic	Sand/gravel terrace immediately adjacent to floodplain margin	Extensive ditches, pits, post holes
6	Crouch, Essex	TQ 8026 9561	Late Mesolithic	On valley floor adjacent to early channel	Burnt flint, retouched blades and cores
7	Hunts House, Guys hospital	TQ 3275 7995	Late Mesolithic	Possibly adjoining steam channel between two eyots	Burnt flint, flakes
8	1-2 Three Oak Lane, Horsleydown	TQ 3365 7984	Late Mesolithic	On eyot edge	Microliths, core, blades
9	10-16 Lafone St, Horsleydown	TQ 3370 7980	Late Mesolithic/Early Neolithic	Eastern edge of sandy island	Tranchet axe, flakes
10	Butlers Wharf, Horsleydown	TQ 3375 7989	Late Mesolithic/Neolithic	Eyot margin, open woodland, channel between two islands	Microlith, tranchet axe, piercer
11	A13 Woolwich Manor Way	TQ 4249 8220	Late Mesolithic/Early Neolithic	Valley bottom, associated with peat forming alder fen	Burnt flint

Table 5 Mesolithic sites (adapted from Bates & Whittaker 2004, 66-70, Appendix 1: Selected gazetteer of sites in the Lower Thames and Thames estuary) (Numbers continuous with *Table 8 Neolithic sites* below)

There is a grouping of the sites around the Horsleydown eyot from the late Mesolithic into the Neolithic period (nos. 9-11) and four other sites very close by (nos. 1-3, 7) which span the whole Mesolithic period. What is significant is the fact that they are all

adjacent to watercourses. Half of the sites have evidence of burning and one site (5) has possible settlement indicators.

4.11 Neolithic

During this period the effects of the encroaching tidal incursion began to make themselves felt in the lower Thames area. The floodplain became increasingly wetter as a result of this and the flow became more low energy.

4.11.1 Artefacts

Artefacts from this period comprise a greater range than those from the Mesolithic with the introduction of ceramics. For the most part, these latter will not be discussed here as those retrieved from watery locations within the Basin form what might be termed a skewed presence. The method of recovery by the dredgers meant that small numbers of complete or near complete vessels were retrieved (only 4 within the London Thames, for example) and potsherds (likewise 55) as can be seen in **Appendix 1** are almost a rarity compared with the average land site. The numbers therefore give an immediate bias towards the non-riparian contexts which would give a false impression of the archaeological record.

The small number of potsherds recovered from the river, are due, no doubt, to the lack of saleability of pieces of pot to the purchasing antiquarian collectors. Some recently discovered potsherds include a base fragment of Grooved Ware (Museum of London accession no. A.27166) recovered from Strand-on-the-Green, on the north bank of the Thames, downstream from Kew Bridge. This piece was subject to residue analysis which showed that the pot had been used with fish and milk. Others include a number of pieces of Neolithic pottery which were collected from the foreshore within the same confined area downstream from Tower Bridge at Chambers Wharf, Bermondsey (TQ 3430 7975) and were identified as coming from 3 vessels: an undecorated open bowl, a decorated Peterborough Ware/Mortlake type bowl and a decorated Peterborough Ware/Mortlake-Fengate type bowl (Cotton & Green 2004, 131-134). Those which I recovered came from a hollow within an area of alder carr roots and were unabraded.

Organic objects have been recovered from the foreshore. A 'beater' (Museum of London accession no. 99.119) made from alder and found in a peat/clay bed at Chelsea has been variously interpreted as a club for flax processing, a lethal weapon or as a

priest to stun or kill wildfowl, animals and fish (Webber 2004, 126). It has been dated to the early Neolithic (3530-3340 BC).



Figure 32 Neolithic alder wood club or beater (Museum of London)

Another wooden object, the Dagenham Idol was found by the Thames in marshland, is made of *Pinus sylvestris* and dated to the Late Neolithic (2459-2110 cal BC).

Looking at Figure 33, it is clear that there are more Neolithic find spots than in the Mesolithic but this needs to be balanced against the large amount of monumental features of the later period. The spread too, seems to more grouped than in the Mesolithic with clear clusters in a number of places around the Basin, not all of them on the rivers.

Figure 34 shows the flint objects (excluding axes, adzes etc which are discussed in section 4.11.4 below) with the majority of sites being described as ‘scatters’. The heights of the North, Berkshire and Marlborough Downs, and the Chilterns show a particular attraction but so does the majority of the river system. The apparent clustering on the London Thames again must be set against the methods of collection. The distribution of arrowheads (Figure 35) does demonstrate a more even cover within the Basin than the other flint objects, although there are three clusterings: in west London/Colne system, in the Goring Gap and at the confluence of the Thames and the Thame. Two of these are what I have termed ‘significant landscapes’ (see **Ch 6** below) and the Gap may well have been a contested area given its controlling position between the heights and the upper and middle sections of the Thames.

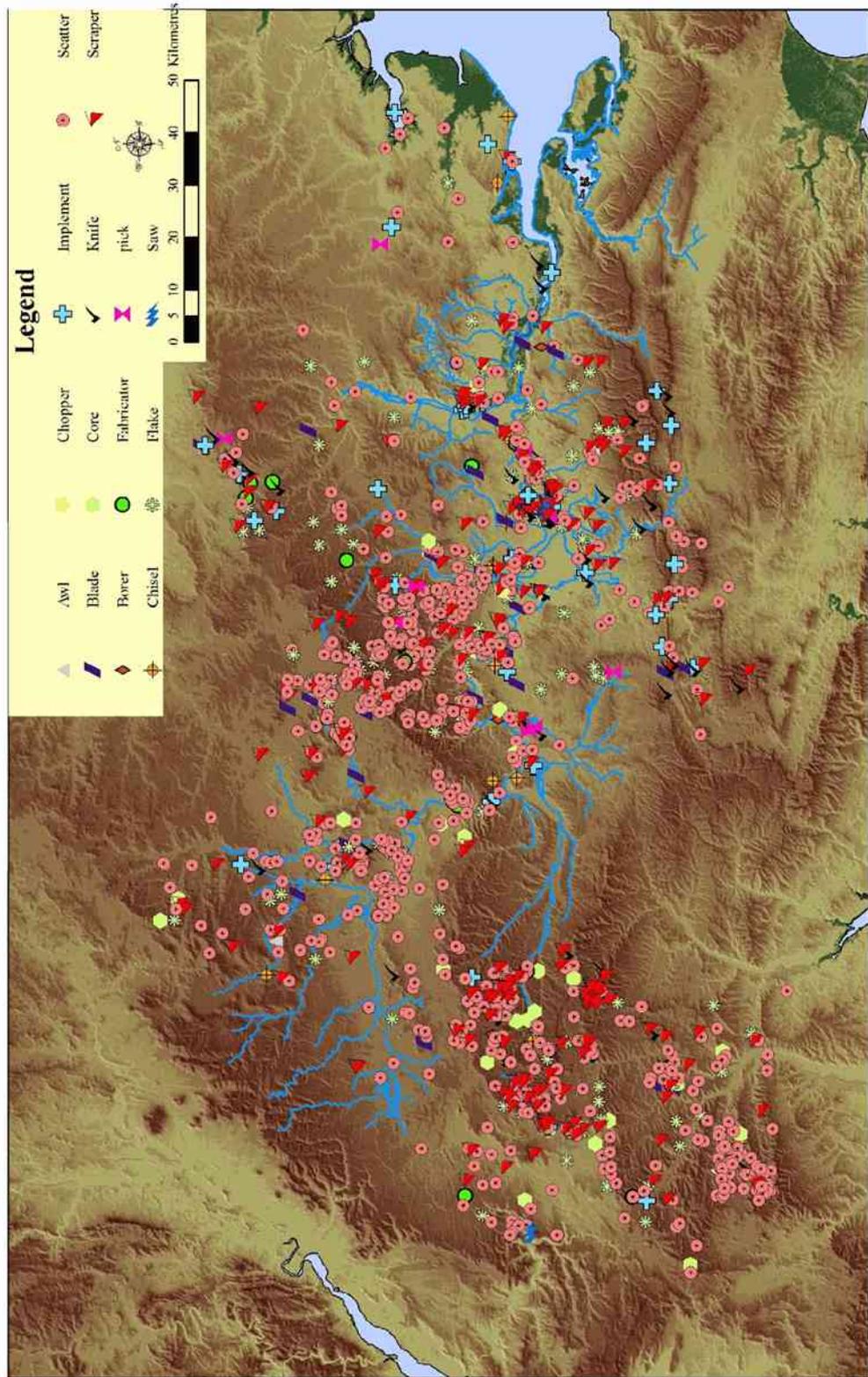


Figure 34 Neolithic flint objects

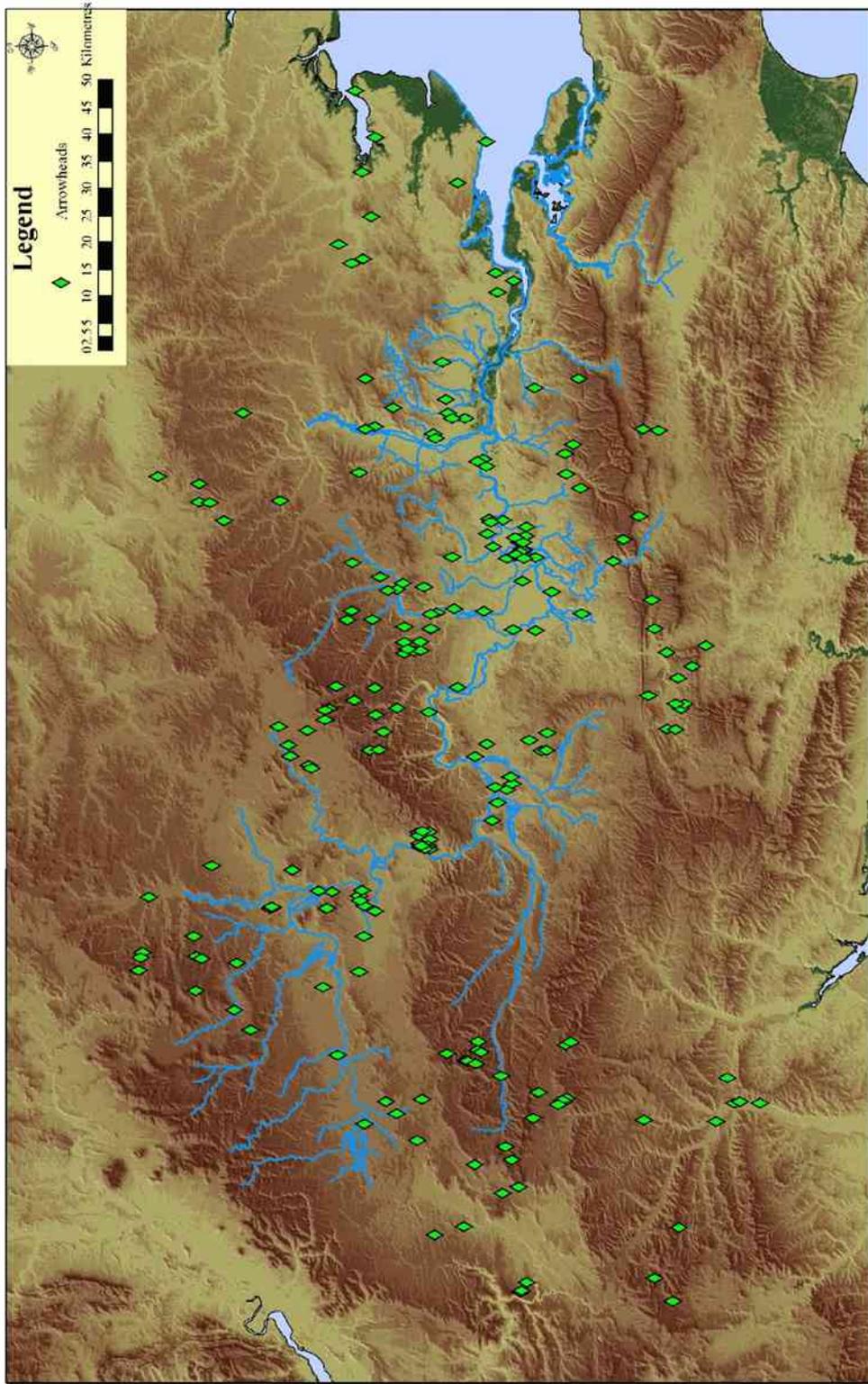


Figure 35 Neolithic Arrowheads

4.11.2 Specific sites:

Yarnton

Gravel extraction in the region between Yarnton and Cassington, begun in the late 1990s, saw the chance to investigate a riverside landscape, producing evidence from the Neolithic to the Medieval period (Allen *et al* 1997, 119ff). What has been published shows that the area excavated contains a number of palaeochannels of the Thames and was one favoured for settlement in the Neolithic and Bronze Age before a rise in water table forced a removal to a higher terrace (Allen *et al* 1997, 120-121). Occupation in the Neolithic is confined to clusters of pits containing what are described as ‘substantial assemblages’ of Peterborough and Grooved ware with Beaker examples (Allen *et al* 1997, 123). A building, rectangular in shape was uncovered in 1996, containing a hearth with Peterborough ware and associated human bone (Allen *et al* 1997, 123).

Dorchester

The Neolithic and Bronze Age complex at Dorchester is set on a gravel terrace within a bend of the Thames (on two sides) and the Thame (Bradley & Chambers 1988, 274). It comprises a cursus and a number of enclosures from the Neolithic period. Like many of the sites under discussion, gravel extraction in advance of later construction work precipitated the archaeological investigation (Whittle *et al* 1992, 143). Detailed discussion of each of the features contained within the complex is covered elsewhere and will not be repeated here (Bradley & Holgate 1984; Bradley & Chambers 1988; Whittle *et al* 1992).

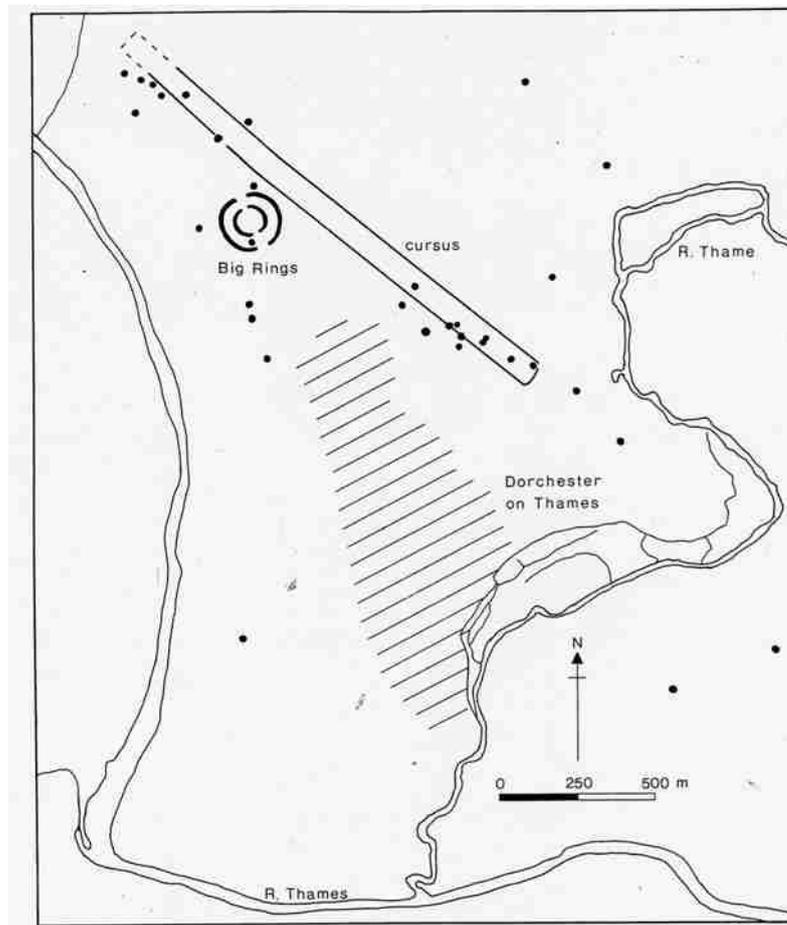


Figure 36 Dorchester on Thames complex (Bradley & Chambers 1988, 275)

The cursus lies at a NW-SE line in excess of 1.6km long across the top of the bend in the river. It both runs near to the Thames (at western end) and the Thame (at the eastern end). It overlies, apparently deliberately, 4 earlier enclosures situated at the ends of the cursus (Bradley & Chambers 1988, 277). The NW end of the monument has never been found and it has been suggested that it would have terminated at a stream that runs into the Thames a short distance from the known incomplete end (Bradley & Chambers 1988, 275). The Thame is at this stage an anabranching system and it is possible that this might explain the position of the SE terminal. A henge monument, known as Big Rings, lies to the south of the cursus between it and the Thames and with entrances roughly on the same NW-SE alignment.

This river-defined area proved to be very popular in the historic periods too, with a Roman town being built here and evidence of long-term use in the cropmarks visible by way of aerial photography.

Runnymede Bridge

Structures

In the Neolithic, the mid-channel bar as seen in Figure 36 may have been formed by the action of the Colne Brook meeting the northern arm of the Thames. This phenomenon is known further down the Thames at Vauxhall where the Tyburn entered the main river (Jane Sidell pers. comm.). Behind the bar, it is likely that the water thus sheltered may have moved at a slower pace, providing a suitable location for catching fish. Slack, or slacker water, or places where the effect of the current can cause back-eddies are often used to site fishtraps. One example on the Thames which utilises this effect can be found at Isleworth, where an Anglo-Saxon fishtrap (see Figure 110 in **Appendix 2**) lies between the Middlesex bank and the downstream end of Isleworth Ait.

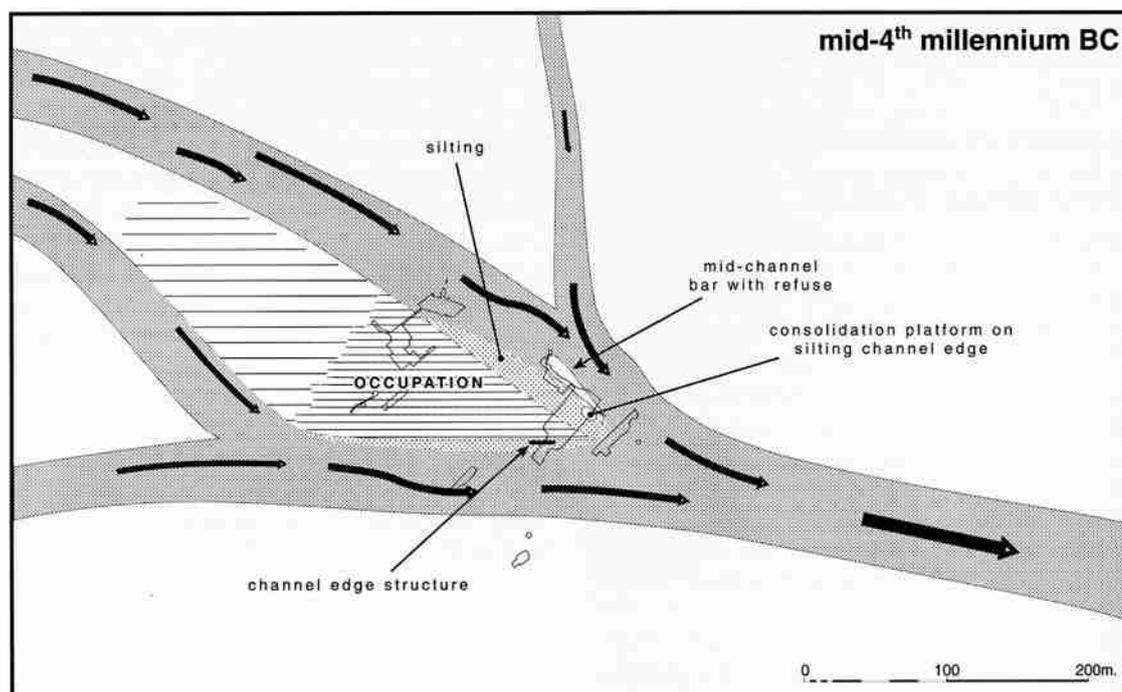


Figure 37 Runnymede in the Early Neolithic phase (Needham 2000, 224)

Timbers dated to the Neolithic period in association with brushwood, have been recorded in Area 4 of the site (Needham 1991, 38). What is particularly noteworthy are the two rows of stakes, two of which have been radio carbon dated - S1 has been dated to 3650-3100 cal BC (HAR – 6132), and S4 to 3950-3520 cal BC (HAR-6128).

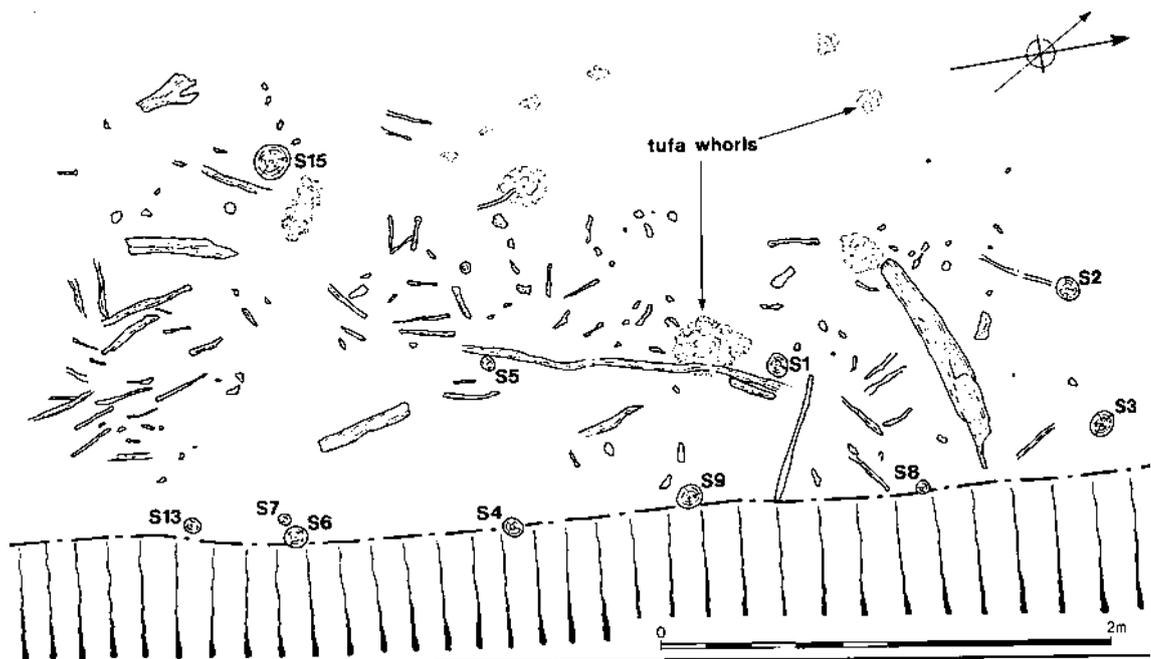


Figure 38 Structure at Runnymede (Needham 1991, 38)

Needham has interpreted this structure as a ‘consolidated platform’ (Needham 2000, 224) but it could also be described as part of a fishtrap. The stakes are of oak (*Quercus sp.*) but the brushwood is unidentified as to species. The shape of the proposed fishtrap is similar to one recorded and dated at Vauxhall in Central London, where an arm of an Iron Age example (800-150cal BC GU 5724; 760-400 cal BC GU 5723) is still to be found *in situ* with some wattle traceable between the stakes (Haughey 1999, 19) (see Figure 109 in **Appendix 2**). While the Runnymede stakes are slightly thicker (c.10cm in diameter as opposed 8cm at Vauxhall), the shape of their alignment is the same.

Area 6 which lies upstream from Area 4 also has examples of Middle Neolithic timber:

Trench 1 (with smaller pieces of wood, bone, flint & pottery)

- Timber no. F168 (length over 2m) 3960-3520 cal BC
- F202 (at least 2m) 3770-3378 cal BC
- F204 fragment
- F205 fragment

Trench 2 (with a number of smaller pieces of wood)

- Timber no. 184 (41cm, diameter 9.6cm)

None of these appears to be *in situ* and F204 and F184 have clear evidence of being worked. Trench 1 finds were recovered from the upper lenses of a sandy bar and have been interpreted as waterborne deposits. While all the timbers have suffered from water

erosion and only a small number have been formally identified as being worked (Needham 1991, 140, 142), a number of others seem to have been deliberately shaped (for example, F168 and F202 have tapering ends). It is possible that these were stakes, now eroded out of position, and were used in some form of river-side construction such as a drying rack for meat and fish, or part of a frame, with shallow foundations (see Figure 120 **Appendix 2** for example of a drying rack). Given the location of all these timbers and the nearness to possible water turbulence in the Bronze Age, then any light-weight construction near the water's edge could easily have been dislodged, or at the very least highly disturbed.

Artefacts

In addition to a number of flint tools and debitage, stone tools, a bone awl and Early Neolithic pottery, a piece of worked bark with possible stitch holes was recovered from the site. This latter measured 32 x 27.5cm (Needham 1991, 141). Five polished stone axes were also retrieved from the Middle Neolithic levels (Needham 1985, 130-131).

Subsistence

The Neolithic layers produced animal remains stratigraphically dated to the Middle and Late section of the period (Needham 1991, 327ff). Representative samples of ox, sheep and pig were recorded as well as dog and a flatfish vertebra (Needham 1991, 327).

Following the later research excavations, reports were published in 1994 (which contained all the fishbone) and 1996 (Serjeantson *et al* 1994, Serjeantson 1996).

What should be also noted is the following extract:

‘Sieving was possible only on a very limited scale on site, but recovery by hand of a number of smaller sesamoids, cyprinid pharyngeal teeth and enough minute fragments.....suggest a high retrieval from trowelling. There remains the possibility that some of the fauna, such as wild mammals, amphibian and fish, are missing.’

(Needham, 1991, 327). This contrasts somewhat with the comment made in Serjeantson *et al* where it is stated that ‘a substantial proportion of the sediments were sieved’ (Serjeantson *et al* 1994, 332). A detailed discussion of the fishbone evidence *per se* can be found below in **Ch 6** below.

	number	%
Cattle	972	42.59
Sheep/goat	186	8.15
Pig	1046	45.84
Horse	3	0.13
Dog	4	0.18
Red deer	43	1.88
Roe deer	6	0.26
Wild pig	2	0.09
Wild ox	2	0.09
Badger	2	0.09
Fox	1	0.04
Beaver	3	0.13
Rodent	3	0.13
Bird	6	0.26
Fish	3	0.13
Cow/horse size	1355	
Sheep/pig size	1850	
Fox/cat size	4	
Unidentified	8782	
TOTAL	14273	

Table 6 Neolithic bone from Runnymede (Serjeantson *et al* 1994, 336)

The 3 fish noted in the table above (Table 6), comprised 2 pike (*Esox lucius*) and 1 salmonid (*Salmo sp*), with the pike described as ‘very big’ in size as can be seen in the comparison Table 7 below (Serjeantson *et al* 1994, 335)

Table 3. Palatine bone of pike from Neolithic Runnymede, A19, context 582: measurement of oral end compared with some large modern fish. Measurement points as shown in Figure 3. TL = total length.

Provenance	L oral part of palatine in mm	TL (mm)	weight
Runnymede Neolithic	25.1		
Wraysbury reservoir Surrey	28.3	not known	not known
Lough Conn Ireland 1920	26.1	not known	24 kg
Britain, recent, no provenance	21.4	1,030	not known
Britain, recent, no provenance	19.1	970	not known

Table 7 Pike bone from Runnymede (Serjeantson *et al* 1994, 336).

What is interesting to note is that food residues containing fish oils have been found on Neolithic potsherds at Runnymede (Needham & Evans 1987, 25). Of the 8 positive results achieved during examination of the residues, 2 were wood resin, 1 was pork fat, 1 beeswax and 2 were shown to be from fish (ie 25%). While the authors suggest that this evidence for fish-based foods is 'revealing, from the site perspective', they consider, as negligible, the available evidence at Runnymede for a fishing economy (Needham & Evans 1987, 26).

Dorney

The two figures below show the range of Neolithic evidence that has been uncovered at Dorney as well as that within the surrounding area. The two causewayed enclosures which act like bookends to the main Dorney site are indicated by the hatched lines. That on the upstream/left side is Dorney, (classified as 'probable') and the other on the downstream/right side is Eton Wick (certain) (Oswald *et al* 2001, 149). One other enclosure is found in the Early Neolithic in Area 6 (A6). Both Ex1 and A6 continued to be attractive throughout the Neolithic with pits, lithic clusters and middens (Allen & Welsh 1997, 31, 75).

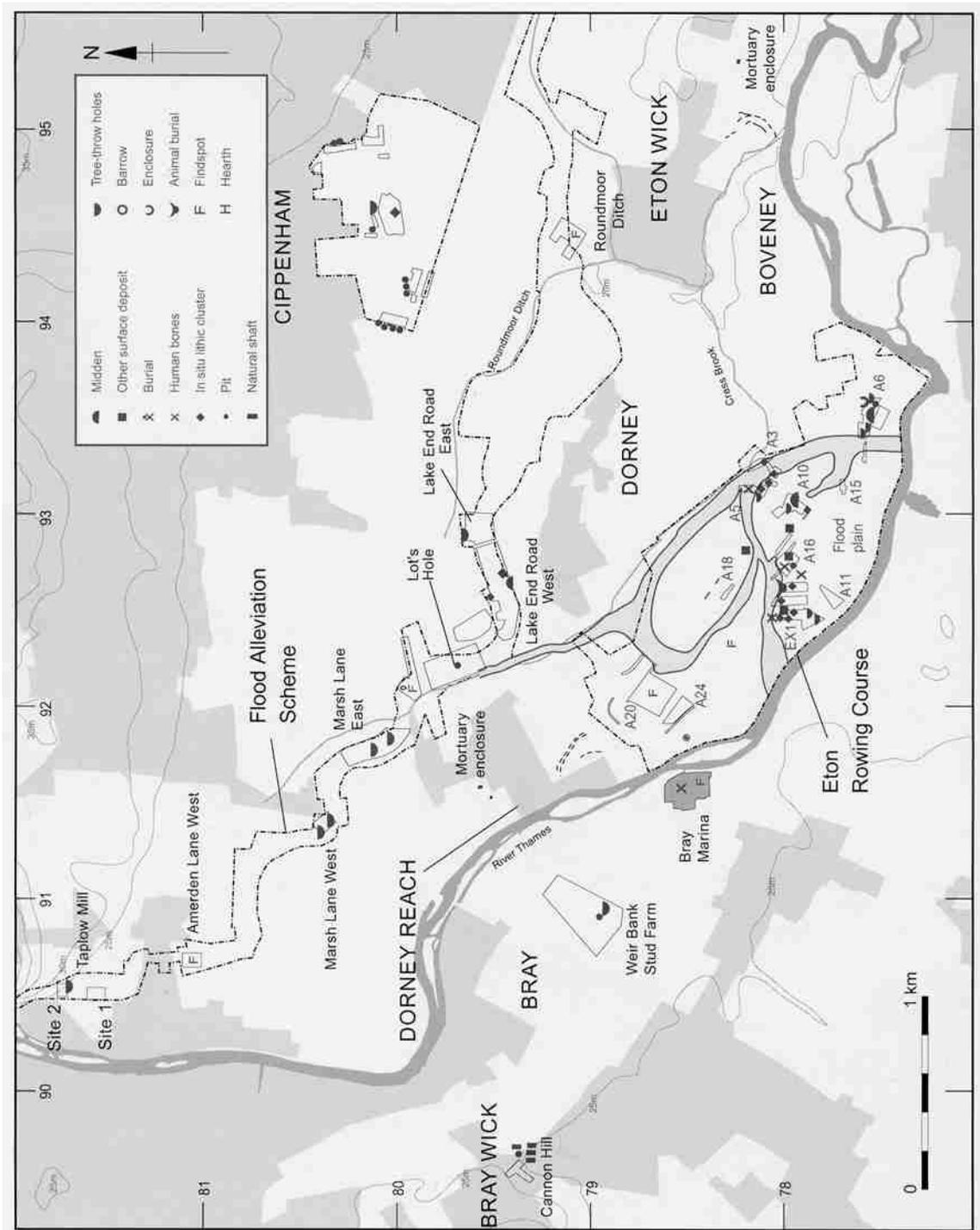


Figure 39 Early Neolithic sites at Dorney and surrounding area (Allen et al 2004, 86)

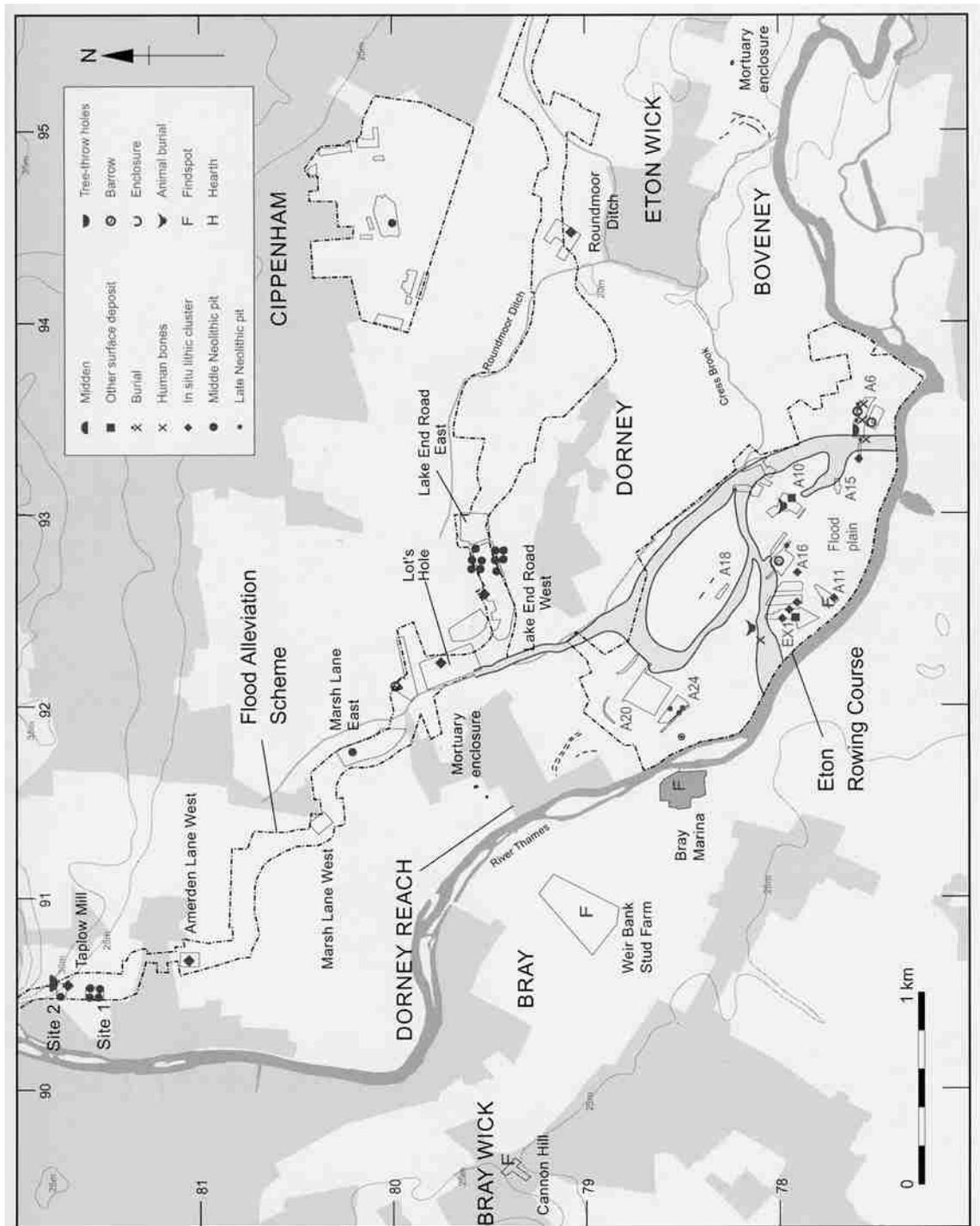


Figure 40 M and L Neolithic sites at Dorney and surrounding area (Allen et al 2004, 87)

What is notable is the number of sites of human bone, especially in the Early Neolithic. The north edge of Ex1 is particularly favoured and two others are similarly in or near to the river (one off the SE tip of A5 and the other on the opposite bank of the modern

Thames in the Bray marina). Even in the later part of the period, human bone was recovered from just north of Ex1 as well as adjacent to A6. This latter site also was the site of two barrows. In addition to the bone deposits, there are two mortuary enclosures, almost mirroring the causewayed enclosures, either side of the main Dorney site.

What is significant about the site at Dorney is the large numbers of Neolithic flint and stone artefacts found – those from Areas 6 and 10 alone comprise 23,000 and 3500. The high level of wear usage (50-65%) suggests that this site was in use over a long period of time throughout the whole Neolithic, and interestingly, the authors of the report suggest that there was ‘no evidence of the selective deposition characteristic of ‘ceremonial’ deposits’ (Allen *et al* 2004, 90). They posit that the polished axe fragments, for example, were not ritually broken but damaged through use.

The lack of detailed information thus far, concerning the non-human bone, plant remains, food residues and organic finds hampers a full appreciation of the site for all periods. Allen *et al* 2004 does include more data but this only covers the Neolithic period. There are two points which have bearing on this study. Firstly is the mention of bones of pike being found at Dorney, leading to the supposition that fishing was being undertaken during the Neolithic. There is no indication of where on site the bones were recovered, except there is a mention of a pike bone being found in association with a Middle Neolithic crouched burial in A6. Secondly, domesticated dog bones were found in the early Neolithic channel to the north of Ex1 (see Figure 38 above).

Kennet valley

In the early Neolithic the landscape would have been wooded with a mixture of species (for example hazel, elm, oak, alder and lime) and would have contained ‘clearings, pathways and stones’ (Gillings & Pollard 2004, 29). It would also have contained the rivers, a point which is often missed. This area had an early Neolithic presence, characterised by scatters of flint and pottery which have been overlain and obliterated by later construction on the site, although 5 locations within 0.5km of the Avebury site can still be traced (Gillings & Pollard 2004, 34). One such spread can be found within the henge itself.

The Avebury world heritage site dominates the area surrounding the upper reaches of the Kennet (Powell *et al* 1996, 11). While the causewayed enclosures will be discussed elsewhere (see section 4.11.3 below), the positioning of the Avebury complex in relation to the river will be examined here. The henge itself stands on a low ridge at the confluence of three shallow valleys, through which run the Winterbourne, the Kennet and smaller watercourses (Pollard & Reynolds 2002, 16). The dating and development at Avebury even after many years of investigation and application of a variety of dating techniques is still less than certain especially when considering the relationship between the henge and other parts of the complex (Pitt & Whittle 1992, 210-11). The monumental features associated with the Early Neolithic (causewayed enclosures and long barrows) are found within the Avebury environs, rather than within the complex itself.

Windmill Hill causewayed enclosure lies 2km north of Avebury, overlooking the Winterbourne. Knap Hill and Rybury can be found c6km south, lying approximately 4km apart (see section 4.11.3 below). There is a significant number of long barrows (both megalithic and non megalithic) within the area. A number of them (West Kennet, East Kennet, Beckhampton Plantation, White Barrow and Horslip) lie parallel to the various watercourses, while others (Millbarrow, Shelving Stone and Devil's Den) are at right angles. Longstones and South Street do both.

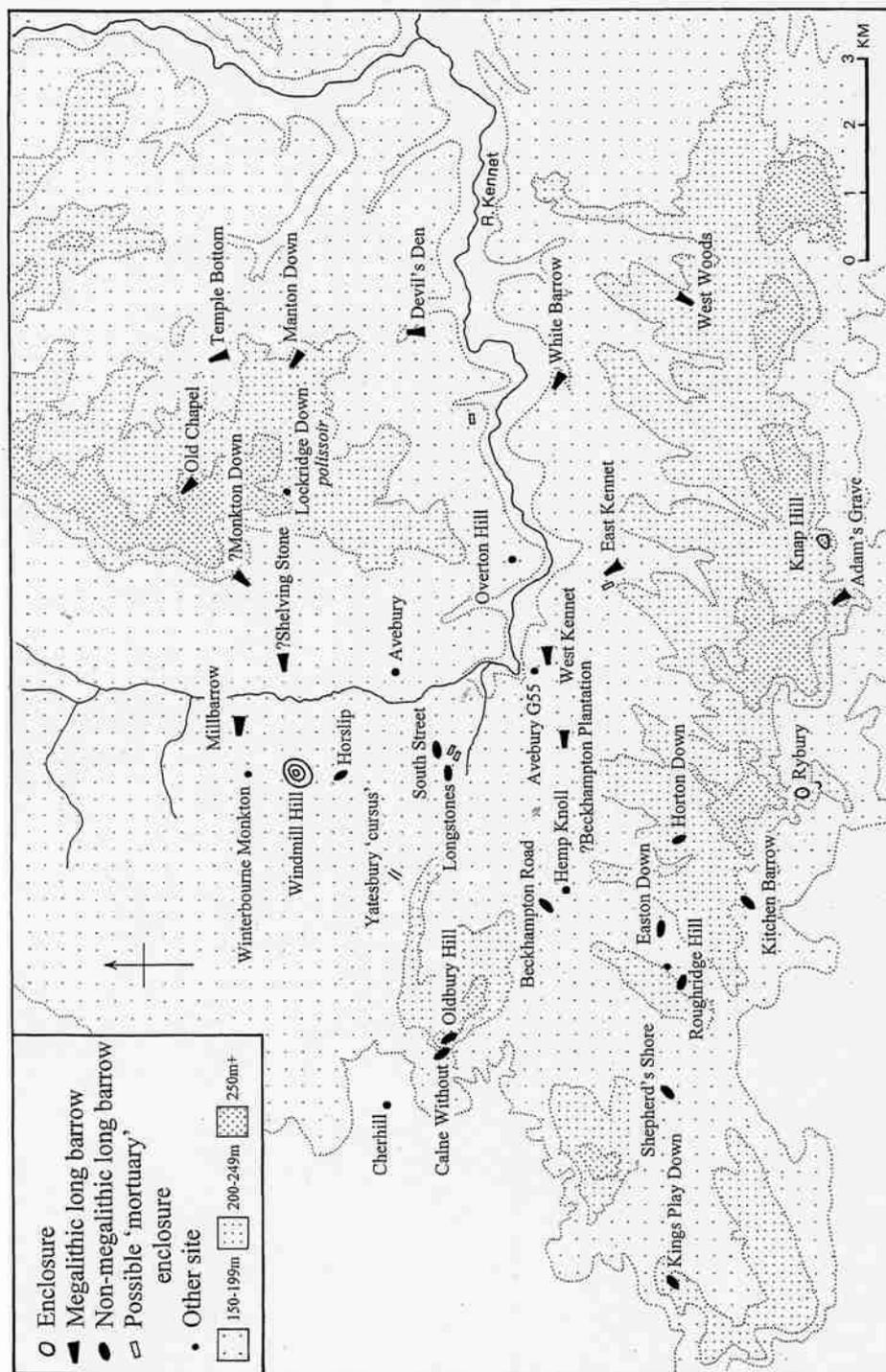


Figure 41 Early Neolithic in the Avebury area (Pollard & Reynolds 2002, 28)

It was in the later part of the period that the complex gradually evolved and by the end of the Neolithic, the pattern of the structures that is recognisable today will have been laid out. The process and order of the building and construction are discussed elsewhere and will not be repeated here (for example Smith 1965, Burl 2002, Gillings & Pollard 2004).

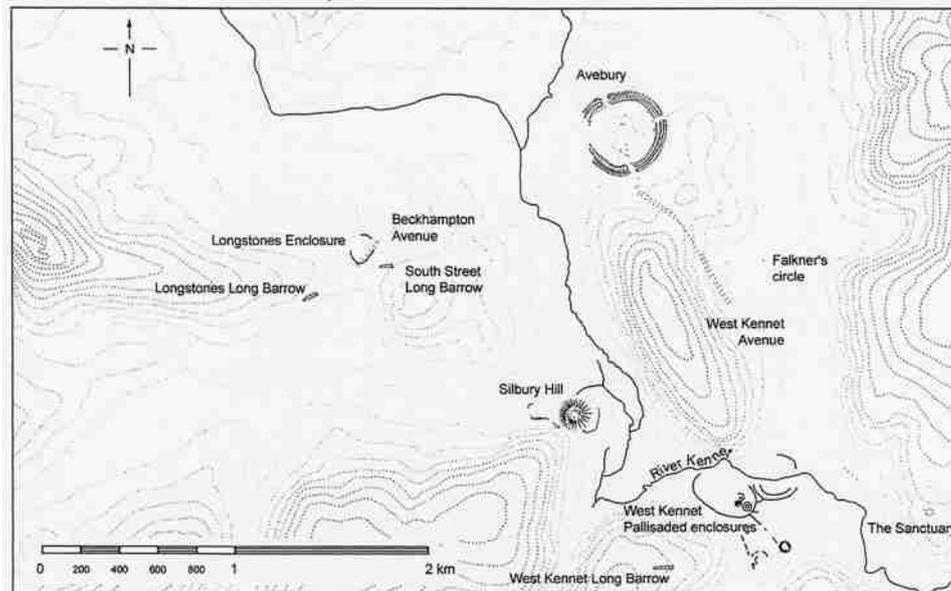


Figure 42 Later Neolithic in the Avebury area (Pollard & Reynolds 2002, 82)

It comprises the henge, two megalithic avenues, the Sanctuary, Silbury Hill, the West Kennet palisade structures, the Beckhampton enclosure and Falkner's circle (Pollard & Reynolds 2002, 81). The position of the complex around the Kennet is noteworthy. The West Kennet Avenue follows the line of the river towards the Sanctuary, which sits above the Kennet. The Beckhampton Avenue, on the other hand, crosses the river just below the confluence, terminating in the enclosure. Silbury Hill has been built within a curve of the river and the palisade enclosures span the Kennet. Each of the enclosures is different from the others, either in actual construction or in the use of material.

The Beckhampton Avenue was constructed after the building and later flattening of the enclosure (Pollard & Reynolds 2002, 98). The 'linking' of the enclosure and henge was therefore more of a memory than an actuality. It also is not certain that the Avenues radiated out from Avebury – as Gillings & Pollard note, this view 'is merely a convention' (Gillings & Pollard 2004, 77). Did they lead **to**, rather than **from**, the henge – or did they, in fact, do both? Was crossing the Winterbourne significant? Was the shadowing of the river by the West Kennet Avenue intentional? The fact that both of the terminals of this Avenue overlooked the river might have been important to those constructing the complex.

The palisade enclosures, which are passed closely by the West Kennet Avenue and would have been visible from the Sanctuary, are a more recent discovery. One spans the river and the other appears to have included the river in its outline. Given the

seasonal nature of the upper parts of the Kennet it is possible that they may have been constructed during a dry period but this is by no means clear (Whittle & Smith 1990, 364; Pollard & Reynolds 2002, 113).

What is clear is the connection between the complex as a whole as well as its various components to the many watercourses in the area.

Greater London

The evidence for the Neolithic in London has been described as having moved, in recent times, from ‘practically nothing’ to ‘a moderate amount’ (Sidell & Wilkinson 2004, 48). It has also been mooted that during this period, London might have been considered ‘the backwater of Neolithic Britain’ (Wilkinson & Sidell 2007). A discussion of the role the Greater London region played in the Neolithic period, as well as the Mesolithic from a riparian viewpoint will be undertaken in the following chapter (**Ch 5**). This section will set the scene by examining a number of sites in the area to look at the way people related to the river in a number of ways.

Two burials have been noted – one at the western end of the region, Shepperton (very near to the rivers Ash and Thames) and another near the eastern end at Yabsley St, on the Isle of Dogs, opposite the Millennium Dome. The Shepperton woman, aged between 30 and 40, was excavated in 1989 in a ditch of a henge and radiocarbon dated to the Early Neolithic (3650-3100 cal BC OxA-4061) (Museum of London, nd web page). Artefacts include faunal remains of a dog’s skull and 6 red deer antlers, pottery and red ochre. An avenue of pits or posts came past the henge and ran down to the River Ash (Burnham 2005).

The burial at Yabsley St was found as peat was being removed during an evaluation. Lying flexed within a wood grave lining, the skeleton (possibly female) was found in association with a flint knife and an Early Neolithic pot. Wood from the lining has been dated to c4000BC (TVAS 2004). Yabsley St lies only metres from the current north bank of the Thames.

An Early Neolithic skull (a female c25yrs old) was retrieved from the Thames near Battersea bridge and dated to 3800-3100 cal BC (OxA-1199). It comprises an incomplete cranium with a cut mark over left brow. Another, recently radiocarbon

dated and as yet not identified as to gender was recovered from the Syon – Isleworth foreshore is Late Neolithic (2460-2140 cal BC OxA-14728).

What is noteworthy is that all four were found near water and three were probably both female and Early Neolithic in date.

Other Early Neolithic evidence has been recovered from Chiswick eyot, The south-east end of the island has since eroded away but 45 blades, 192 flakes, 7 scrapers and other assorted pieces were found there, a number with affinities to the Early Neolithic (Jon Cotton, pers. comm.; see **Appendix 1** for details). The A13 /Channel Tunnel Rail Link excavations produced a significant Early Neolithic scatter at Woolwich Manor Way with a scatter of artefacts (flakes, pottery (Mildenhall type) and charred cereal grains (emmer and possibly einkorn), hazel nut shells and chaff fragments (Gifford n.d. 38).

The work undertaken on Thorney Island, Westminster, referred to above (see Figure 29) included Later Neolithic/Early Bronze Age material. A number of features (ditch, pits, postholes, stakeholes) as well as pottery, and struck and burnt flint attest to a long period of accumulation and on the island during this period. Stakeholes were found on two sites on the eastern side of the island, hinting of the possibility of fish-related activities taking place here.

Trackways in the greater London region are primarily Bronze Age in date (Meddens 1996, Seel 2001, 185) but Silvertown, a site adjacent to the Thames below the Isle of Dogs in East London has produced one of Late Neolithic date (3340-2900 cal BC GU 4407) (Crockett *et al* 2002). The partly uncovered trackway lies near the base of a peat layer, and those timbers that were exposed comprised alder and ash (Crockett *et al* 2002, 192). Wilkinson & Sidell wrote ‘the almost complete absence of Late Neolithic trackways (Silvertown is the exception) within the carr woodland suggests that these areas did not have the same value for the contemporary communities as similar environments did elsewhere in Britain, for example the Somerset Levels’ (Wilkinson & Sidell 2007). This rather subjective point of view begs the question: what if there are trackways and we’re just not recognising and finding them? Further discussion of this topic can be found in **Ch 7**.

While monumental structures have yet to be recorded within the majority of Greater London, there has been a significant number found in West London at the edges of the region. This area is bounded by the Colne river complex to the west, the Thames curves across the south and round to the east, and Yeading Brook/the Crane cover the east side. Within this area have been found an array of Neolithic monumental structures. The Staines causewayed enclosure lies between the southern arms of the Colne and the Thames (Robertson-Mackay 1987). Stanwell cursus (the second longest in Britain) slashes across the Heathrow complex near to a horseshoe shaped enclosure, a small barrow cemetery and hengiform structure (Lewis & Welsh 2004, 107-109). The Shepperton henge and burial lie to the south adjacent to the Thames. To the northside of the airport, lies a Late Neolithic complex of a mortuary enclosure, a double ring-ditch and a large well (Crockett 2001).

The following Table 8 lists 14 sites that span from late Mesolithic to Early Bronze Age. A similar comparison might be made here as was made with the Mesolithic sites in Table 5 above – once again islands (eyots) and water form a focus of attention at all points during the period.

	Site	Grid Reference	Period	Environment	Cultural evidence
9	10-16 Lafone St, Horsleydown	TQ 3370 7980	Late Mesolithic/Early Neolithic	Eastern edge of sandy island	Tranchet axe, flakes
10	Butlers Wharf, Horsleydown	TQ 3375 7989	Late Mesolithic/Neolithic	Eyot margin, open woodland, channel between two islands	Microlith, tranchet axe, piercer
11	A13 Woolwich Manor Way	TQ 4249 8220	Late Mesolithic/Early Neolithic	Valley bottom, associated with peat forming alder fen	Burnt flint
12	Crouch, Essex	TQ 8026 9561	Early Neolithic	On valley floor adjacent to earlier channel	Polished axe, pottery
13	A13 Movers Lane	TQ 4530 8330	Early Neolithic	Sand/gravel terrace immediately adjacent to floodplain margin	Extensive ditches, pits, post holes, ceramics
14	A13 Woolwich Manor Way	TQ 4249 8220	Early Neolithic	Valley bottom, associated with peat forming alder fen	Mildenhall pottery, hazelnuts, processed grain, burnt flint and assemblage
15	Purfleet	TQ 545 7871	Neolithic	On valley floor within deciduous woodland	Polished axe, chisels, saw, aurochs bone

16	Ebbsfleet Valley	TQ 6165 7420	Neolithic	Edge of brackish water channel	Flint assemblage, Ebbsfleet Ware pottery, wooden stakes
17	1-2 Three Oak Lane, Horsleydown	TQ 3365 7984	Late Neolithic	On eyot edge	Grooved wear, daub, rubber stone, cattle bone, arrowhead, interrupted ditches
18	Hunts House, Guys hospital	TQ 3275 7995	Late Neolithic	Possibly adjoining steam channel between two eyots	Burnt flint, flakes, ard marks
19	A13 Woolwich Manor Way	TQ 4249 8220	Late Neolithic	Valley bottom, associated with peat forming alder fen	Sherd
20	10-16 Lafone St, Horsleydown	TQ 3370 7980	Late Neolithic/ Early Bronze Age	Eastern edge of sandy island	Pottery, ard marks
21	Wolseley St	TQ 3397 9775	Late Neolithic/ Early Bronze Age	Associated with alluvial clay	Ard marks, Peterborough Ware pottery, lithic assemblage
22	47-67 Hopton St, Southwark	TQ 3185 8040	Late Neolithic and Early Bronze Age	Adjoining stream on margin of sand island	Flakes, pottery, ard marks, post and stakehole structures

Table 8 Neolithic sites (adapted from Bates & Whittaker 2004, 66-70, Appendix 1: Selected gazetteer of sites in the Lower Thames and Thames estuary) (Numbers continuous with *Table 5 Mesolithic sites* above)

Ard marks make their appearance later in the sequence, utilising for agriculture the potentially richer margins on the river margins. The rubber noted at (17) echoes the siting of other food processing items from the Neolithic recovered in the Thames Basin (see Figure 43).

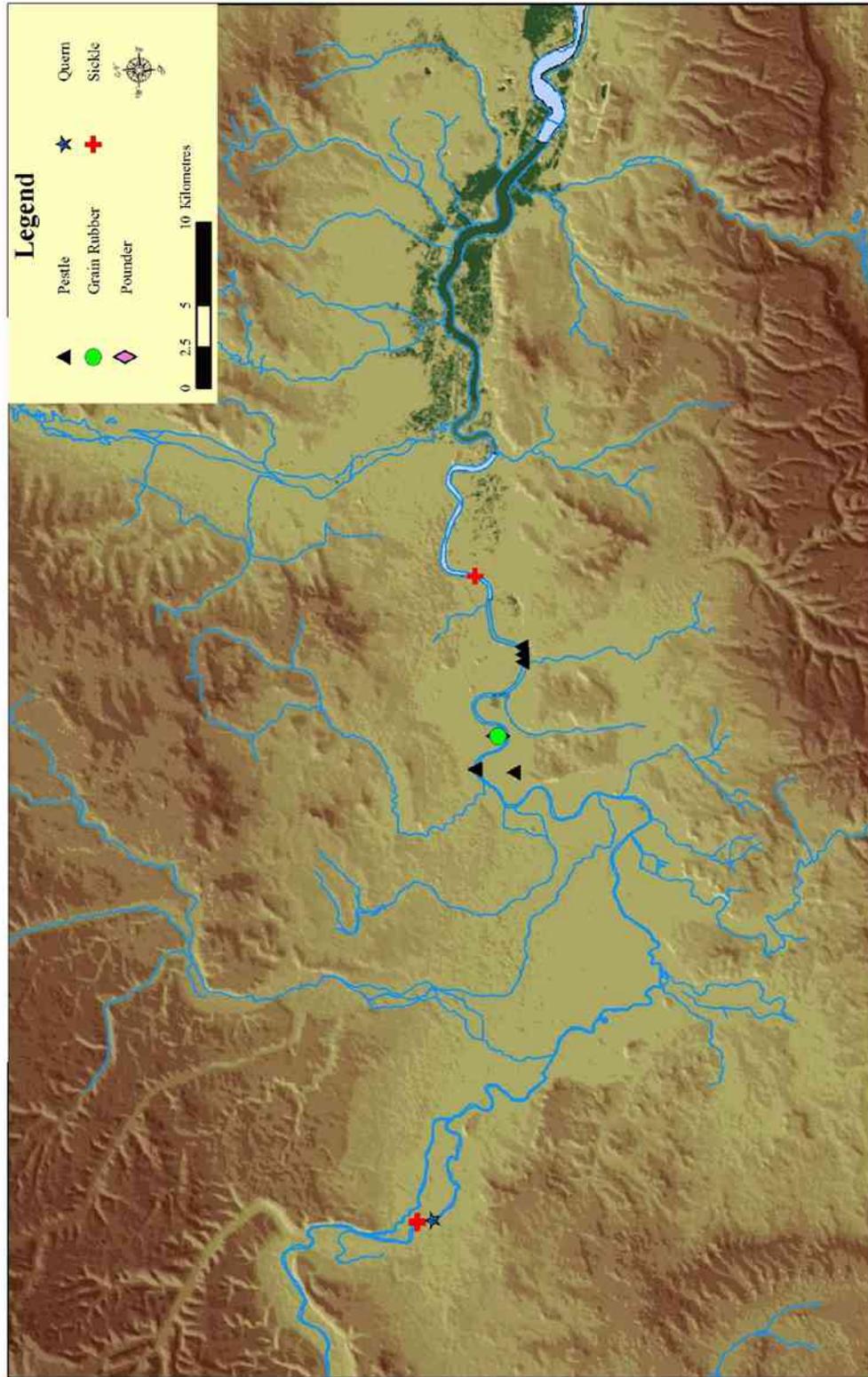


Figure 43 Neolithic grain rubbers, pestle, pounder, querns and sickles

The wooden stakes in (16) suggest a fishtrap and the stakeholes recorded at (22) may indicate drying racks given the location of the site. The initial interpretation of these stakeholes was for (temporary dwellings, huts, enclosures, fence lines or similar structures' (Ridgeway 1999, 74). A closer examination in Figure 44 reveals two possible rows just under a metre apart and very reminiscent of the drying rack in Figure 120, Appendix 2.

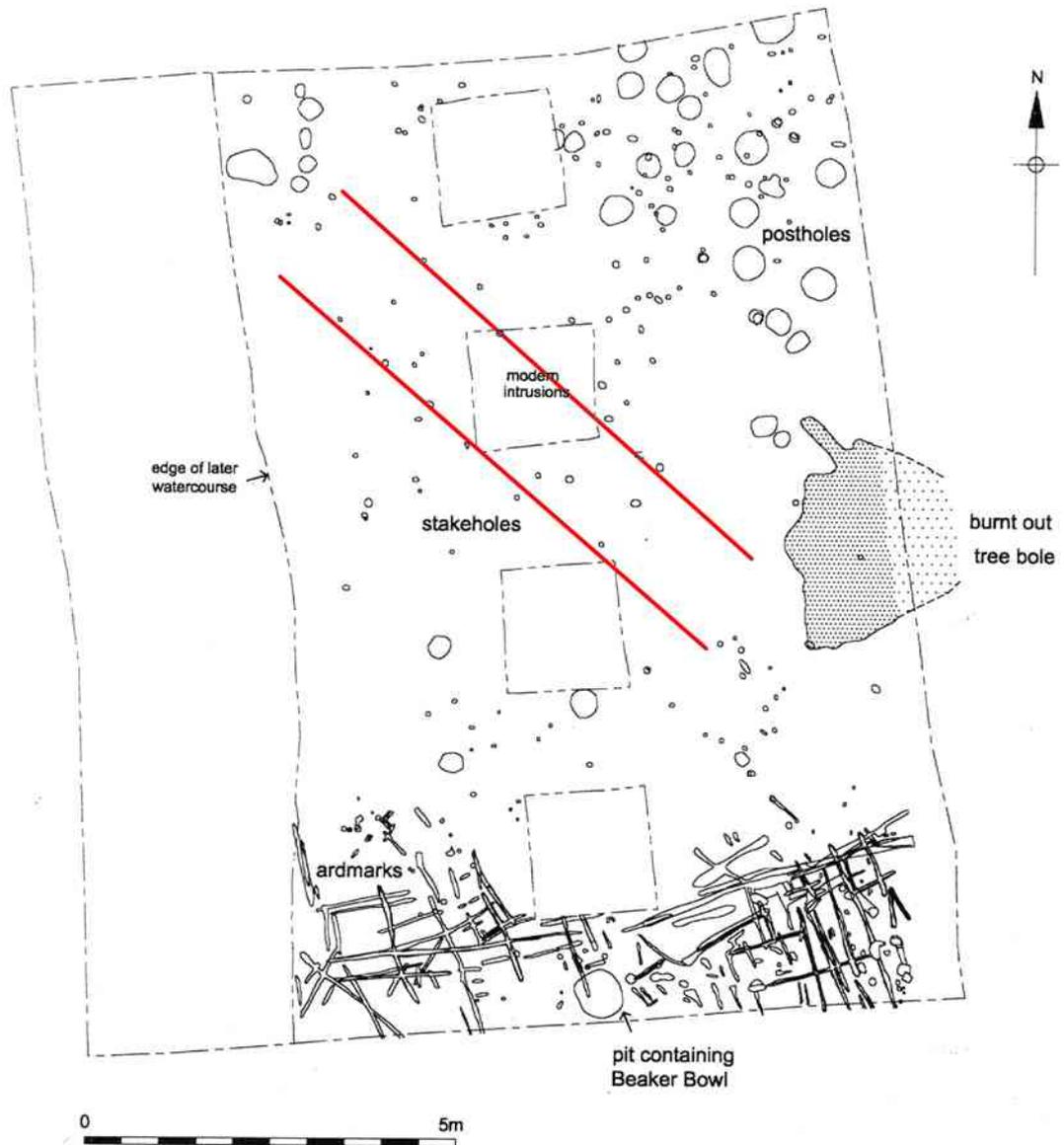


Figure 44 The prehistoric features excavated in Area 1, Hopton Street (Ridgeway 1999, 75, Figure 5). (Red lines added for clarification)

4.11.3 Monuments

Neolithic monuments are found all around the Thames Basin and so it seemed pertinent to examine some of these here in a more expansive way, rather than dealing with them piecemeal in the above discussion.

Causewayed enclosures

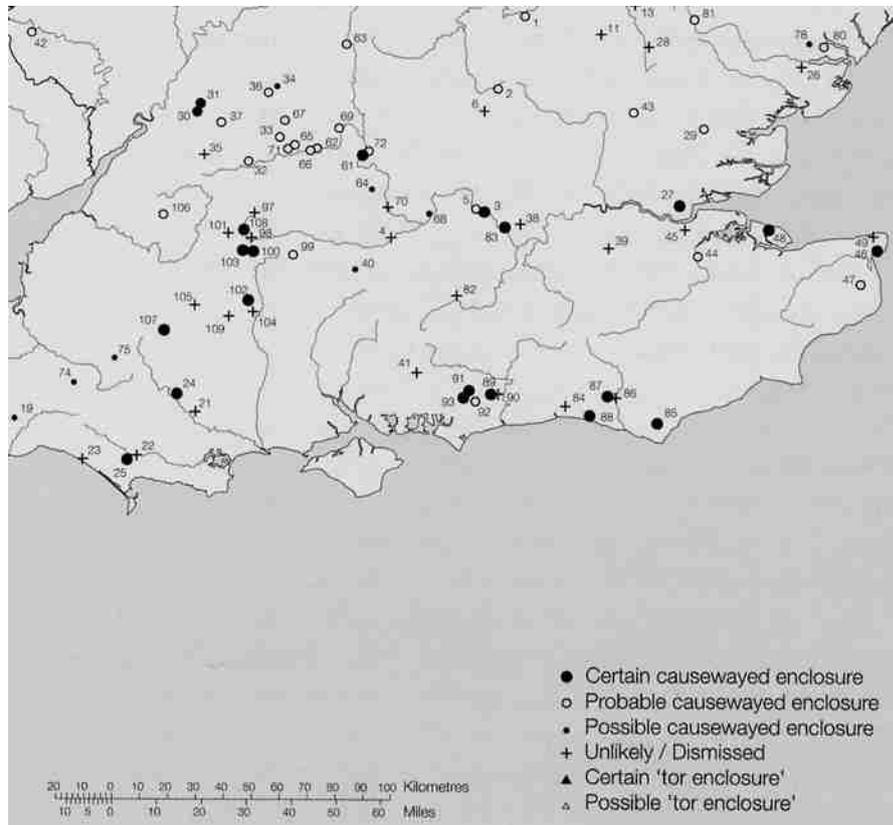


Figure 45 Causewayed enclosures (Oswald *et al* 2001, xii)

This class of monument belongs to the earlier Neolithic ‘but not to its very earliest stages’ with c3700 to 3300 BC marking its peak (Oswald *et al* 2001, 3). Of the 111 possible examples known in England to date, it is noticeable that 49 or 44.14% are to be found within the Thames Basin (Oswald *et al* 2001, 149-157). Close examination undertaken by Oswald *et al* has divided these into the following categories:

Causewayed enclosure status	Nos.
Certain - c	12
Very probable - v pr	13
Probable - pr	7
Possible - pos	2
Unlikely - u	7
Dismissed - d	8
Total	49

Table 9 Thames Basin causewayed enclosures

With 69% being in the ‘possible’ or above category this is a very high concentration of these types of monuments within a clearly defined are. A more detailed discussion on the role of causewayed enclosures and their relationship to rivers is undertaken in **Ch 6** below. There has been much written previously about methods of construction, variety in types and sizes (for example, Andersen 1997; Oswald *et al* 2001) and these arguments will not be rehearsed here again. This section will include an examination of those principally found within the Thames Basin with their position in the landscape and to each other.

Using the numbering system used in Oswald *et al* 2001, the following enclosures found within the Thames Basin are:

No.	Name	Status	County/Region	Location
3	Eton Wick	c	Berks	By Thames
5	Dorney	pr	Berks	By Thames
27	Orsett	c	Essex	By tributary of Thames
31	Crickley Hill	c	Glos	On height, overlooking waterways
32	Down Ampney	v pr	Glos	Near Ampney Brook
33	Eastleach	v pr	Glos	Near River Leach & Broadwell Brook
34	Icomb Hill	pos	Glos	On height, overlooking River Dirkler, tributary of the Windrush
36	Salmonsbury	pr	Glos	Between Rivers Dirkler & Windrush
37	Southmore	v pr	Glos	Near Ampney Brook
38	East Bedfont	dis	Greater London	Adjacent to Heathrow complex, between Rivers Colne & Crane
39	West Wickham Bromley	dis	Greater London	On the spring line, in an area of streams and small rivers
45	Chalk	u	Kent	Destroyed quarry site overlooking Thames estuary
48	Kingsborough Farm	c	Kent	Overlooking Thames estuary
61	Abingdon	c	Oxfordshire	Between two arms of a small tributary of Isis (Thames)
62	Aston Cote Shifford & Chimney	v pr	Oxfordshire	Near Burroway Brook
63	Banbury	pr	Oxfordshire	Near River Cherwell
64	Blewburton Hill	pos	Oxfordshire	Near Mill Brook
65	Broadwell	v pr	Oxfordshire	Near Broadwell Brook and others

66	Buckland	v pr	Oxfordshire	On Thames/Isis
67	Burford	v pr	Oxfordshire	Approximately 2km from Windrush, overlooking
68	Eye and Dinsden	pr	Oxfordshire	Near Thames
69	Eynsham	v pr	Oxfordshire	Near Lamb Brook and others
70	Goring	u	Oxfordshire	Near Thames
71	Langford	v pr	Oxfordshire	Near Langford Brook, Rivers Thames and Leach
72	Radley	pr	Oxfordshire	By Thames/Isis
83	Staines	c	Surrey	By Thames, Colne, Colnbrooke brook, & Wraysbury
97	Beckhampton	u	Wilts	Near Kennet
99	Crofton	v pr	Wilts	Straddles River Dunn
100	Knap Hill	c	Wilts	On height, looking N to Kennet, S to streams, small rivers
103	Ryburn	c	Wilts	On height, looking N to Kennet, S to streams, small rivers
108	Windmill Hill	c	Wilts	Overlooking Winterbourne/Kennet

Table 10 Causewayed enclosures and their locations

East Bedfont (38) and West Wickham (39) have been dismissed by Oswald *et al* but their locations are worth noting as structures within Greater London albeit of potentially later prehistoric date. East Bedfont stands next to the complex currently lying under Heathrow airport. West Wickham lies on the north side of the heights in south London which have shown considerable evidence in the Neolithic (Grimes 1978, Map 3; Museum of London 2000, Map 3).

What is noticeable is the limited spread of the enclosures within the Basin. There has often been discussion as to the dearth of monumental evidence in Greater London, put down to problems of site preservation and identification (Museum of London 2000, 66) and yet having looked at the spread of sites, this lack does not seem extraordinary. Surrey and the relevant parts of Hertfordshire and Buckinghamshire, as well as tracts of Berkshire, do not feature at all.

The choice of location is also notable. With a few exceptions, all the sites are on or very near watercourses. The exceptions are found on heights from which it would have been possible to see rivers or streams. Salmonsbury and Abingdon lie between two arms of a river, Crofton straddles the Dunn and Buckland utilises the Thames on its northern curve. The site at Staines is almost completely surrounded by water. The relationship between the enclosures and associated watercourses is patent.

A number of sites are near to each other:

Enclosure nos	River/location
3 & 5	Thames
32 & 37	Ampney Brook
33, 65 & 71	Leach, Broadwell & Langford Brooks
61 & 72	Thames/Isis
97 & 108	Kennet
100 & 103	Heights overlooking Kennet

Table 11 Adjacent causewayed enclosures

Those at Dorney, for example (3 & 5), appear to be bracketing the site between them. Although the monument class is different, this grouping resonates with those in Ireland, where Knowth, Dowth and Newgrange are in a similar arrangement on the Bend on the Boyne (see **Ch 5** below).

Cursus Monuments

Cursus are a Neolithic monument peculiar to Britain and Ireland (Jon Cotton pers. comm.; Jane Sidell pers. comm.) The nearest parallels in continental Europe are long mortuary enclosures whose construction and content is quite different. As with the causewayed enclosures above, a more detailed discussion will take place in **Ch 6** below. This section will describe those within the Thames Basin and their relationship with the landscape. Their construction and physical characteristics have been outlined elsewhere (for example Harding & Barclay 1999; Barclay & Brereton 2003) and will not be re-rehearsed here. Cursus were being constructed at the same time as the causewayed enclosures, that is, in the earlier part of the Neolithic period.

While they are frequently found in many parts of the country (Yorkshire, Scotland and in the Midlands, for example, but not Sussex and parts of eastern England), they are not uniformly spread across the Thames Basin. Their numbers are much smaller than causewayed enclosures too. As with Oswald *et al*, a process of reappraisal has been undertaken with those monuments designated as cursus, resulting in some being redefined as field ditches, mortuary enclosures, trackways, bank barrows and the like (Barclay & Brereton 2003, 216). The number now accepted in the Upper Thames valley as probable or certain is 10.

No.	Cursus	Relationship to major river	Relationship to tributary
1	Benson	Oblique	Coaxial
2	Buscot Wick	Parallel	Coaxial/perpendicular
3	Dorchester-on-Thames	Parallel	Coaxial/perpendicular
4	Drayton North	Parallel	Coaxial
5	Drayton St Leonard	Coaxial/oblique	-
6	Drayton South (Sutton Courtenay)	Coaxial	-
7	Lechlade	Parallel	-
8	North Stoke	Parallel	-
9	South Stoke	Coaxial/Parallel	-
10	Stadhampton	Parallel	Coaxial/perpendicular

Table 12 *Cursus of the upper Thames, probable and possible* (Barclay & Brereton 2003, 221)

In many cases, the cursus, if extended, would seem to cross the river/tributary. At Dorchester, for example, what later were recategorised as trackways, or at best possible cursus, on the downstream side of the Thames at Warborough, appeared to be continuations of the line/direction of the main cursus (Whittle *et al* 1992, 146; Barclay & Brereton 2003, 216).

While not uniform in all cases, confluences (here of the Leach, the Ock and the Thame with the Thames) are places that attracted builders of the cursus monuments. What also is noticeable is that cursus and causewayed enclosures were not built in close proximity. One cursus was formerly thought to have been located at Abingdon within the locality of a causwayed enclosure but this was dismissed as a possible cursus as long ago as 1985.

In the Middle and Lower Thames Basin, cursus monuments are rare. The only certain ones at present are at Sonning (Berks), Stanwell (LB of Hillingdon) and Springfield (Essex) although it has been suggested that the Cherwell and the Kennet may have examples, as yet unconfirmed (Barclay *et al* 2003b, 234). Stanwell cursus is a 4km structure (second only in size to the Dorset cursus) which cuts across parts of the Colne system (the Colne itself and the Poyle which lies in the middle of the complex) (Figure 45)

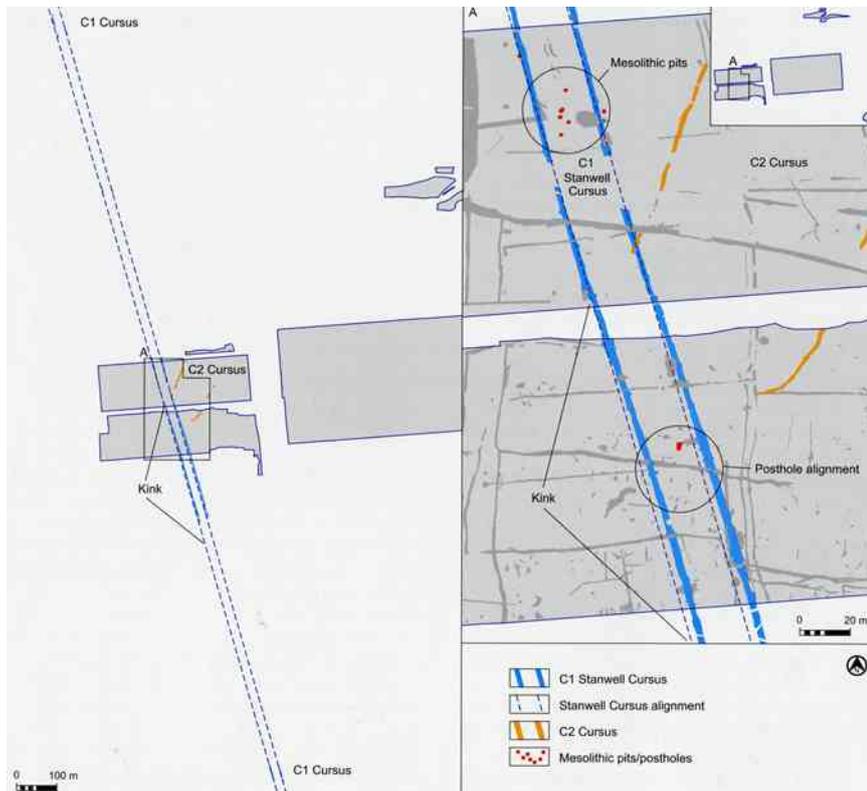


Figure 46 Stanwell cursus (Lewis *et al* 2006, 30)

It comprises 2 parallel ditches c20m apart, seems to terminate at its northerly end and is orientated NNW-SSE. During the Terminal 5 excavations at Perry Oaks referred to above another smaller cursus was revealed which runs NNE-SSW and which terminates at its southern end at the main cursus (Lewis *et al* 2006, 29). This second structure is only 60m wide and has an estimated length of at least 480m. Dates for both features suggest construction took place between 3600 and 3300 BC and that they were contemporary (Lewis *et al* 2006, 29).

The question most pertinent here is concerned with the direction of ‘flow’ along these apparent pathways. The description by the authors of the excavation report placed the direction as NNW-SSE and NNE-SSW – indicating away from the rivers (in the case of the main cursus), and away from the main cursus and the rivers (in the case of the smaller structure). If the directions were reversed, the pathway of the smaller cursus would be approaching the main one and facing directly the Colne. The main cursus would, in turn, be the way to approach the Colne system and cross it not once, but twice. Were the Neolithic people who used these monuments walking to the water (as the main focus of attention) or away from it?

Henges

In Britain these are normally placed with the late Neolithic period and while they are found in sites throughout the country do not feature greatly within the Thames Basin (Richards 1996, 319). Where they do appear, I have referred to them within the main text and have not discussed them as a separate class of monuments. Jackson, with particular reference to those found on Orkney, posited the importance of henges with water but with a paucity of sites within the Basin, this viewpoint could not be meaningfully explored (Jackson 1996).

Megalithic tombs

These structures are a feature of Neolithic society but I chose not to include them in this study as few in the Thames Basin are associated with water, being principally placed on heights rather than in lowland contexts. Those on the Medway, just outside the Basin, comprise the only group in eastern England. Those mentioned by Tilley in Wales (see *Figure 1*) are near to water (the geography dictates this outwith any intentionality).

4.12 A case study - Stone tools

In addition to the monuments above, one artefact type will be examined across the region and from both periods. Axes, particularly polished and ground stone varieties, are as closely identified with the Neolithic as tranchet and Thames picks are with the Mesolithic. There has been much discussion as to the ritual deposition of Neolithic axes in the Thames (Bradley 1990) as outlined in **Ch 2**. Much less attention has been paid to those from the Mesolithic as indicated by Field (1989), although Bradley did include a brief discussion as to their presence in his second edition of *The Passage of Arms* (1998). It would seem apposite to discuss these tools in more detail with a Basin-wide view-point. As with the monuments above, more detailed discussion will be undertaken in section **6.2.4** below. One particular problem especially with chance finds is that of provenancing accurately. Excavation will at the least give a close find spot, and more recently a grid reference with the use of total stations and the like. Dredged items, particularly those from the Thames, have also been considered difficult to provenance. This is amply demonstrated in *The archaeology of Greater London* where there is regular reference to river finds and their quality in the text (for example Museum of London 2000, 66) and yet they are deliberately not included on any of the maps. Wymer in his *Gazetteer of Mesolithic sites in England and Wales* (1977) appears to

have used the bridges and locks as reference points on the Thames as can be seen in the slightly artificial grouping Field plotted in his study of Mesolithic core tools (1989). This is not to say that the tools were not found within the area, just that their tight grouping could be misleading. Examination of the artefacts and of the original accession registers, as I have done in the creation of a database of all prehistoric finds from the tidal Thames, has elicited more information than just that included in the museum index (both card and electronic) which has enabled in many cases, a more accurate provenance to be assigned (see **Appendix 1** for more details).

Mesolithic axes, adzes picks and Thames picks found within the Thames Basin, number 732 entries, making 863 artefacts in total. It was decided to incorporate all these categories as nomenclature of objects between the different recording bodies is not as standardized as it might be hoped. What is one SMR's pick, is another's adze so it was felt better to include them all. Similarly in the Neolithic, it was decided to include the 43 adzes and 19 picks as often the description would be 'axe/adze' or 'pick/axe'. The number of axes *et al* from the Neolithic is 1641 entries producing 1760 artefacts in total, over double those from the Mesolithic.

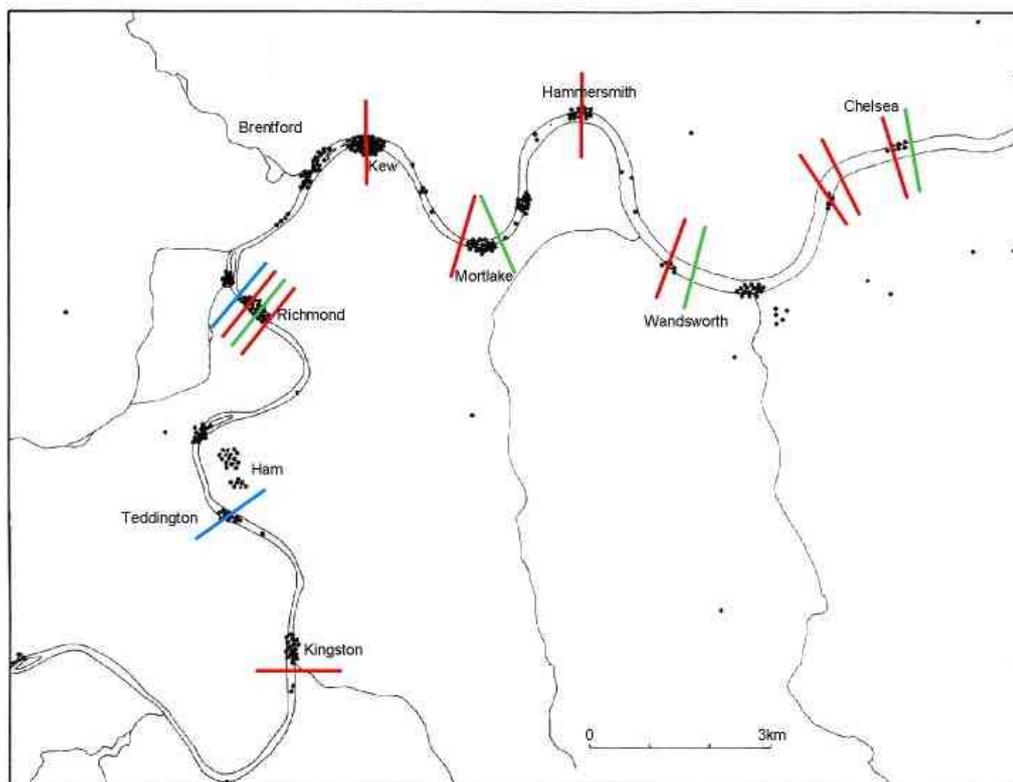


Figure 47 Geographical distribution of core tools in West London (Field 1989, 15) (the lines indicating road bridges, railway bridges and locks are added for this study).

Figure 21 above shows the distribution of Mesolithic axes in the Thames Basin, adzes and picks. It can be seen that the spread is not uniform over the Basin during the Mesolithic, with a number of groupings in specific areas. Some are clearly in river valleys but this is not all by any means. The apparent grouping of adzes within the Greater London area may be more to do with the nomenclature used by those categorizing the objects than a genuine cluster.

In central London particularly, with the Thames being south of its current bed in the Mesolithic period, it adds confusion into the seeming concentration on the tidal reaches (Sidell *et al* 2000, 108). In addition 4 of these axes were found in association with skulls on the Richmond foreshore, and 1 was found in Orsett causwayed enclosure. The majority of the tools were made from flint and over 75% were tranchet axes.

Of the 863 Mesolithic artefacts, those directly associated with modern rivers are as follows:

Nos	River/river deposit
1	Blackwater, Essex
1	Ravensborne
1	Lodden
2	Kennet
183	Thames
7	Alluvium (Surrey)
4	River terrace
199	

Table 13 Mesolithic axe riverine locations

This is 23% of the total which is not an insignificant number but not necessarily enough to state that they were ritually deposited. Given all the caveats concerning the movement of the river itself and the pre-selection of these artefacts by the dredgermen, their find spots might be considered more fortuitous than particularly intentional. In addition, if, as appears, the rivers were locations of choice in this early period, the presence of stone tools should hardly be considered unexpected.

Figure 48 indicates those of the Neolithic period which have been found in the Thames Basin.

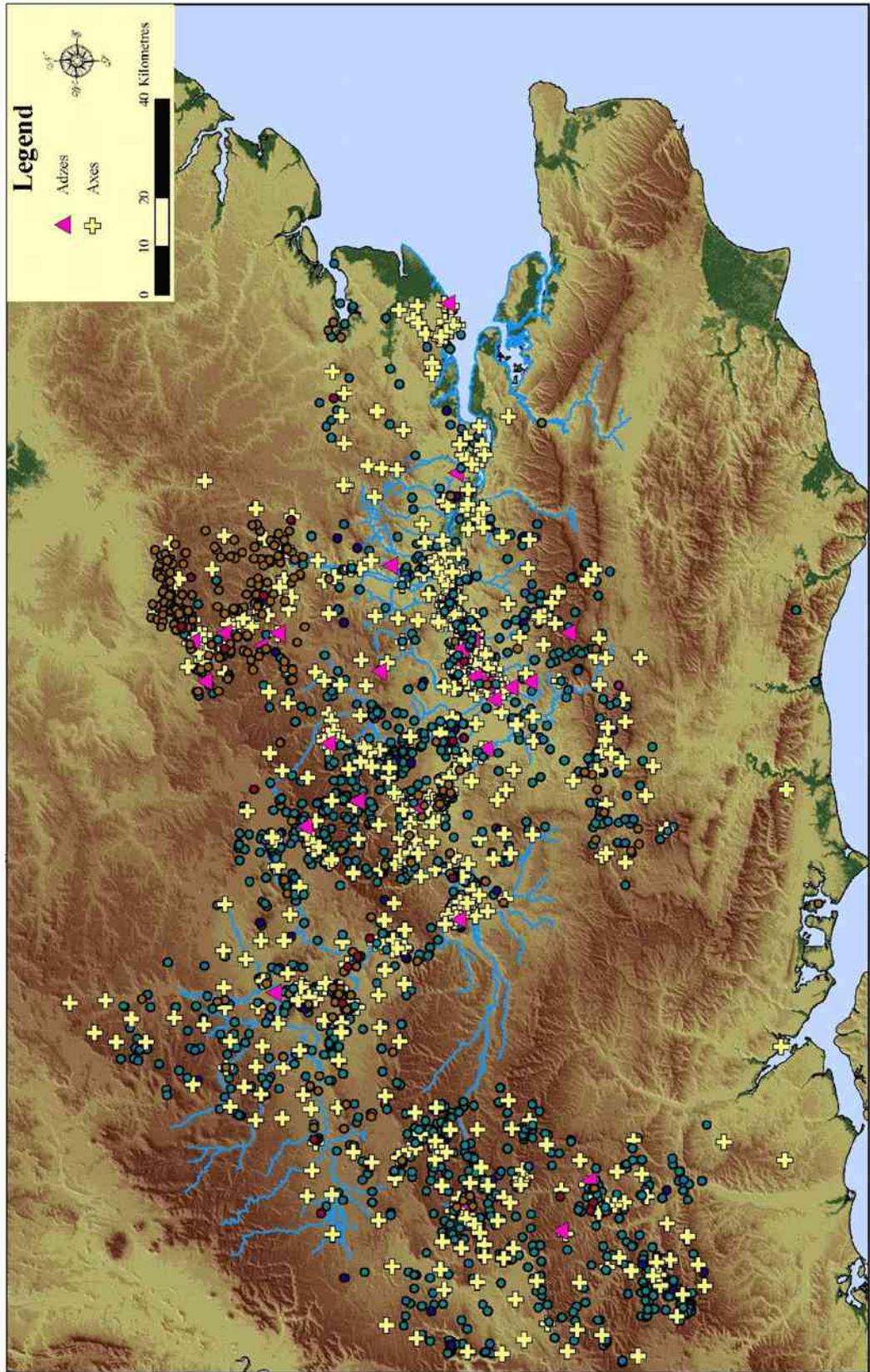


Figure 48 All Neolithic Axes and Adzes

The spread of axes and adzes in the Neolithic seems to be more uniform, although the effects of dredging can be seen in the clusters at various places on the Thames. There is a greater spread of adzes, although the actuality of this must be considered carefully. Those within Greater London, particularly, are seen to be more than just from the river. It has been posited that there are very few axes recovered from the dry land of the metropolis (Jon Cotton pers. comm.) when compared with the river finds. In fact the number (while not even) is certainly comparable.

In the Neolithic, trade in the form of axes can be seen:

Group no	Nos
I	8
IA	4
III	1
IIIA	2
IV	3
IVA	4
VI	14 + 1 in alluvium
VII	3
IX	1
XII	2
XVIII	1
XIX	1
	45

Table 14 Traded Neolithic axes

Five more exotic examples were made from jade, jadeite, quartzite, basalt and rholite, and one other used stone Bwch Mawr, from Caernarfon in N Wales.

Those from riverine context are as follows

Nos	River/river deposit
1	Lodden
2	Gade
1 in alluvium	Wey
1	Lea
1	Colne
2	Hertford
1	Colnbrook
512	Thames
2	Alluvium
11	River terrace
532	

Table 15 Neolithic axes from river contexts

This is 32.4% of the whole, which while not a small number does not dominate the spread of the artefacts. In addition, the length of the Thames must be considered when looking at the amount recovered and the dredging; an operation not common on the other rivers.

In both Figure 34 (above) and Figure 49 (below), the concentration of artefacts in the Thames is obvious. While it is not possible to dismiss this focus, the aforementioned caveat must be added. Unlike the land areas where a substantial number of the axes are chance finds in both periods, the Thames saw intensive dredging within a 150 year period during which the attention of antiquarians and collectors was upon the dredgers (for example Lawrence 1929). This has resulted in an ensemble of artefacts that is somewhat skewed in its type and numbers. As the finds were sold on by the dredger men, only those in demand by the antiquarians and hence 'valuable' were recovered. In a database, I have collated from Thames finds in museums (see **Appendix 1**), there are for example only 50 sherds of Neolithic pottery and 2 Mesolithic microliths – the former passed over, presumably for whole pots and the latter just not visible to the naked eye during the dredging. Given the average quantities of each usually recovered from excavation, the bias of the finds from the Thames is obvious.

4.13 Conclusion

While the following chapter will be the setting for a discussion involving much that has appeared here, a certain number of more general conclusions can be drawn.

Topographically the three regions of the Thames Basin can be seen as different – more so with the Upper and Lower than with the Middle, but still distinct enough to warrant the division. The Thames and its tributaries in all parts of the Basin have undergone changes during both the Mesolithic and Neolithic periods which have had a considerable effect on the human interaction with the rivers and the surrounding landscape. There has been constant involvement between humans and the various rivers from the earliest Mesolithic through to the end of the Neolithic, which can be charted in their choice of site location (short term and long term camps, occupation and subsistence). The nature of this rapport has changed considerably but slowly over time and might be seen as ‘inclusive’ rather than ‘exclusive’ in that the rivers are core to the relationship and not outside it. Economically, there is little direct evidence of the use of aquatic resources and this may be due to lack of preservation, lack of recognition of equipment and/or lack of adequate research. Experientially and symbolically, there is no doubt of the importance of rivers but the expression of this relationship needs to be explored more in the following chapter.

One point that needs to be considered here is that of continuity of place. This in itself depends a great deal on the approach that is given to each period. The changes as outlined above between the beginning of the Mesolithic and the end of the Neolithic do not help in deciding at which point (in modern parlance) that people cross from one period to another, or indicate what might be seen to be a transition site. For example, if a site has evidence of both Mesolithic AND Neolithic, is that considered a transition site, or is it merely that on two (or more) occasions over these periods, this particular place held attractions for the people in the area? It is noticeable in the Tables 5 and 8, where a number of sites were recorded, that some sites were noted as Late Mesolithic, Late Mesolithic/Early Neolithic, Late Mesolithic and Early Neolithic, Early Neolithic, Neolithic etc. Of these, only one category could possibly be a transition site (Late Mesolithic/Early Neolithic) and where there is only lithic evidence to consider, this designation would perhaps seem unsafe. Given this, there are no sites that are truly transition sites within the Thames Basin, thus far, in my opinion. There are many that

have both periods present in the archaeological record but these have not adequately demonstrated the evolution from the Mesolithic to the Neolithic needed.

The continuity of place, on the other hand, or the usage of a good site, can be seen in a number of places such as at Heathrow, Dorney and to a limited extent at Runnymede. In other locations, such as the Kennet and the Colne, certain places were favoured in the Mesolithic but not in the Neolithic, and vice versa. Changes in the hydrology seem to have dictated this change and this will be explored further in **Ch 6**. While the number of major sites in both periods is comparatively small and sporadic in their spread across the region, artefacts (as exemplified by the axes) are found almost everywhere, suggesting that the current state of knowledge is more than imperfect.

Water locations would appear to have had considerable 'draw' during the Mesolithic period for human activity, although there is less evidence for the early part of the period. In spite of the siting of a number of artefact scatters on the North Downs and the Marlborough/Berkshire Downs (see Figure 48), the consistent relationship between human presence and the river system is patent. In the Neolithic, this is even more obvious with the connection between monumentality and water in the early part of the period.

4.14 Attributes of the Thames Basin

The following is a list of attributes of the Thames Basin. This list will be used in **Ch 5** where discussion will compare and contrast these with the evidence from NW Europe. **Ch 6** will begin with an examination of the economic and symbolic attributes drawn from the ethnographic and ethnohistorical sources and a comparison with those from the archaeological sources of the Thames Basin and NW Europe.

Economic

- Evidence for use of river resources:
 - Specialist equipment (fishtraps, harpoons, spears/arrowheads)
 - Subsistence (fishbone, fish residues)
- Location of choice (by rivers, on islands)
- Continuity of place (use in both periods)
- Trade (axes, from British and foreign locations)

Symbolic

- Monuments (proximity to water)
- Burials (in/adjacent to river)
- Ritual deposition (Dagenham idol)

The archaeology of the Thames basin within its European setting

5.1 Introduction

An examination of the archaeological information from a range of sites and countries enables direct comparison between the various locations. The range reviewed includes comparative material from hunter-gatherer and early farming societies in Britain and NW Europe on rivers and lakes. Archaeological comparisons from these areas have great value as they are the nearest to the Thames both in climate, environment and ecology.

Following the examination of modern ethnographic, ethnohistorical and selected archaeological data in **Ch 3** and the drawing up of a series of analogies, it is necessary to look at archaeological evidence from other river and wetland systems nearer to the Thames Basin. While no research programme has deliberately targeted these types of areas, with the exception of the wetland surveys within Britain and Ireland, there is more than sufficient information that can be extracted from excavation undertaken in a range of locations associated with rivers and the like within NW Europe.

There is no suggestion here that rivers were the only sites for habitation in the Mesolithic or in the Neolithic. The cases discussed in the following chapter represent a selection of sites that *are* situated in river valleys, bottoms and estuaries in order to ascertain the mode of living and how they used the resources which were available within the locality. The selection of a place to stay or merely use for a few hours is dependent on many factors and the closeness of the river with its myriad resources represents a deliberate choice of location on the part of the Mesolithic and Neolithic communities. This chapter will explore that choice using the archaeological evidence that is available.

One point to note is the comparison undertaken, particularly on some sites on Continental Europe, between the weight/numbers of animal bone and that of fish bone. The greater 'value' to the subsistence regime is placed on those types of bone that are greater in accumulated weight. This by default places fish and other aquatic resources at the bottom of the food procurement ladder as the weight of fish bone is negligible when compared with an aurochs' leg bone, for example. This is especially noticeable

in the description of the various sustenance elements recovered from the sites in SW Germany (below) where their percentages of the collective whole are used to indicate the ‘importance ‘ to the diet. While looking at the changes through time, Jochim notes that when looking at the remains of both fish and bird, and by placing (as he does) an emphasis on the weight of the recovered bone, the amount and size of actual species and their importance to diet may be underestimated (Jochim 1998, 166, 168). There is no denying the volume of large mammal material in each of the strata and hence their importance in the food chain. Assessing the importance of certain foodstuffs by weight is a method comparable to sherd counts in ceramics. When discussing the subsistence value differences between a fish and a deer using bone weight as a key element gives an obvious bias to the larger animal.

I have retained these percentages in the site description to indicate the range of aquatic and waterfowl but not to suggest that they indicated the comparative amounts consumed.

5.2 Difficulties with the synthesis

A number of difficulties with this type of synthesis are immediately apparent, which coalesce into three main areas. They are:

the problem of differing chronologies

The westward spread across Europe of both people and technological advances has meant that Britain has been a ‘late developer’ when compared with the Near East, for example. Each country and geographic region has its own nomenclatures and cultures for stages during the Mesolithic and Neolithic periods and while many of these overlap with their near-neighbours, others are area-specific. The decision, however, to use levels of technology and subsistence as a baseline, as discussed in **Ch 1**, has cut across this morass of terms and cultures and concentrated attention on the information available rather than the terminology that has been applied to it.

the difficulties of comparing a range of recording methods

The quotation first noted in **Ch3** by Midgley is equally applicable to this research:

Quite apart from the linguistic problems, the assembling of disparate sources of evidence, the choosing from the vast body of data those elements which are significant to the overall discussion, and the combining of contrasting methodological approaches and widely differing interpretations into one coherent narrative which cuts across the artificially created boundaries, are all unenviable tasks, even when they are sweetened by the uniqueness of the undertaking. (Midgley 1992, xiv)

The emphasis, for example, on particular aspects uncovered in an excavation can alter an interpretation of that site. An illustration of this can be found in the different explanations given for the site of Noyen-sur-Seine below. What must be borne in mind also is the effect that the differing political entities in Europe have had upon archaeology over the last few hundred years. In some cases, Germany for example, the approach to archaeology is still somewhat coloured by events and research policies that happened before and during World War II. Also, in the former Eastern bloc during the Soviet era, there was a well-developed archaeological approach but one within a Marxist framework. Unfortunately this has led to gaps within the available knowledge in certain countries and different emphasis in interpretation.

This disparity should not, however, be allowed to cloud the issue. Given that the archaeological record itself is only a partial account and indicator of what can be known of life during the Mesolithic and Neolithic periods, it is still possible to tease out where necessary information that can be utilised in this research.

the dilemma of site selection

Given the number of rivers and other areas associated with water, not only in Europe but also on every continent around the world bar Antarctica, the potential amount of sites which could be examined, was enormous. The criteria used in the selection are listed below but before these were applied a major decision was taken concerning two types of sites: wetlands and coastal venues.

Wetlands

Bearing in mind the discoveries made on the Thames as to the appearance of the floodplain during the Neolithic and Mesolithic periods, it is important not to just examine rivers for information but also to look within the adjacent wetlands. The braided channels and islands system which was how the Thames functioned in its earlier years is not too far from the wetlands that can still be seen as relicts around Britain and

Ireland (for example the Gearagh, Brown 1997, 124-127). The importance of these areas to an understanding of the prehistoric periods cannot be overemphasised and is well attested by work undertaken and recently reported upon in several regions around England, namely the Somerset levels, the Fenlands, the Northwest wetlands and the Humber estuary. Work in the floodplain of the lower Thames, under the alluvial layers several metres thick, has, and continues to produce evidence of early occupation (for example Crockett *et al*, 2002; Gifford *et al* 2001, 38), in addition to those areas on the non-tidal stretches (for example Allen *et al* 2004). This must not be seen as a shift from one type of site to another and in fact some of the wetland areas have shown continued use over the last 5000 years with a range of settlement sites located within and around the swamps. As Nicholas says ‘the attraction of these wetlands didn’t decrease, that of other areas simply increased’ (Nicholas 1998, 42). It is with this in mind that wetlands will be included in the following discussion of archaeological information.

Coastal sites

Coastal sites, on the other hand, when only marine resources were used, were excluded but those such as the ones in Denmark discussed below were included as there was a demonstrable link with freshwater resources.

5.3 Approaches

The approach taken is to outline briefly the archaeology from the various locations and then to examine the sites collectively through the lens of the information uncovered in the Thames. There will be two principal criteria used: evidence likely to be similar to that in the Basin and evidence which is likely to be dissimilar. It is important to discuss both facets of the evidence as it may indicate, for example, that which may be missing in the available archaeological record, that which may take a different stance or that which is found in a range of places outside of the Basin. The information included in this chapter will be primarily set out in a series of tables with dialogue where pertinent. Figures comprising maps of the areas under discussion have been included in this chapter but many of the place names and sites are only discussed in detail elsewhere. The expanded text (where appropriate) of the sites is to be found in **Appendix 3** under the same headings as listed below.

The sites chosen for a closer examination in this chapter include a number from Britain and Ireland as well as from mainland Europe. The criteria for their selection are similar to those used in **Ch 3** where the ethnographic, ethnohistorical and archaeological material from non-European river systems was examined and are as follows:

The regions selected should contain a major river system or series of systems similar to that seen within the Thames basin.

- Wetland and lakeside locations could also be considered where appropriate.
- Preferably both hunter/gatherer and early farming communities should be represented.
- Sites should be adjacent to or within easy reach of watercourses.

The sites listed below are a sample of material that is available. It is not my intention here to mention every site that has been recorded by a river, estuary or wetland in Europe. That task is far beyond the reach of this research. Instead a range of sites within a number of countries which have relevant information have been selected. The reason for the inclusion of Britain and Ireland needs no explanation. (The term 'Ireland', for the purposes of this research is taken to mean the whole of the island rather than just the political region of the southern two-thirds.) The decision to examine those from the European landmass for the most part north of the Alps came from the understanding that this region had much in common with Britain and Ireland. The effects of post-glacial activity combined with a roughly similar chronology and climate in much of the area made comparisons useful and worthwhile.

Britain:

Star Carr and the Vale of Pickering

The Humber estuary

The Great Ouse

The Somerset Levels

The Severn estuary

Langstone harbour

The Solent

Ireland:

Mt Sandel, County Londonderry

Lough Borra, County Offary

The Shannon estuary, Counties Clare, Limerick & Kerry

Brugh na Bóinne, County Meath

North European Plain:

Poland and eastern Baltic zones

Denmark

N Germany

The Rhine/Meuse delta

Central European Uplands:

Bohemia in the Czech Republic

SW Germany

The Iron Gates Gorge on the river Danube

Seine basin:

Noyen sur Seine, France

Each region has a map of locations which are referred to in the text below and also in **Appendix 3**.

5.4 Economic evidence

5.4.1 *British Isles*

Star Carr is sited on the edge of the former Lake Flixton in the Vale of Pickering, North Yorkshire and was first excavated in 1949-1951 by the late Sir Grahame Clark. It is most well known for the antler artifacts it produced, particularly the headdress so far unique in Britain (Clark 1954).

The Humber estuary was the focus of a major survey undertaken in the 1990s and the beginning part of this century. The estuary itself comprises a number of large tributaries draining into the Humber prior to it discharging into the North Sea.

The Great Ouse is the main component of a river system that drains SW to NE into the Wash and covers much of the Fenland area of eastern England.

The Somerset Levels are an area of wetlands in SW England that have been the focus of attention since the mid-1880s and latterly by Bryony and John Coles. Peat extraction is the main drive behind the excavation policy.

The Severn estuary forms the head of the inlet of the Bristol Channel that divides England from South Wales and has been the subject of inter-tidal survey for over 25 years. The majority of sites are to be found on the Welsh side of the estuary.

Langstone harbour is a large, shallow, marine inlet on the south coast of England, situated between Portsmouth harbour to the west and the much larger Chichester harbour to the east. The Langstone Harbour Archaeological Survey project (LHASP) was begun in 1993.

Two locations on the Solent will be examined:

Wootton Quarr, on the NE corner of the Isle of Wight, comprises a site which lies partially underwater and on the neighbouring foreshore.

Bouldner Cliff is formerly a dryland location and now an underwater site found off the NW corner of the Isle of Wight.

Table 16 lists the economic data from the British Isles.

The sites chosen in Britain are quite widespread (Figures 50-56) and yet they almost all have evidence of use from the early Mesolithic onwards. Islands particularly are locations of choice and most seem to indicate either a long-stay site such as Star Carr or ones that been the object of repeated visitation such as the Ouse and the Severn. Also 5 of the sites show usage in both the Mesolithic and Neolithic periods. Fishing equipment is most obvious at Wootton Quarr with its Neolithic fishtraps but others such as Star Carr have evidence both of structures and harpoons, leisters, netweights and potentially water vessels. Fishbones have only been found at three sites (Severn, Bouldner Cliff

Table 16. British economic data

Site	Location	Period/date	Evidence for fishing, processing	Fish species	Evidence for use of other water resources	Structures	Other finds
<i>Star Carr/Vale of Pickering</i>	Lakeside peninsula	Early Mesolithic	Microwear analysis, antler harpoons, leisters, barbs, bark roll netweights	Cyprinidae	Waterfowl bones, paddle	Wooden platform, slipway	Flint assemblages, antler mattocks/splinters
<i>Humber estuary</i>	Mesolithic/early Neolithic – on sand/gravel islands in or adjacent to river; late Neolithic – on adjacent dryland	From early Mesolithic onwards	Bone/antler harpoons			Causeway, fishing/fowling structure	Mesolithic flint/stone artefacts often with large assemblages; Neolithic flint assemblages & polished/ground stone axes
<i>Great Ouse</i>	Sand ridges adjacent to rivers; in areas almost surrounded by water	From early Mesolithic onwards				Monuments, barrows, cursus, ring ditches	Artefact scatters/assemblages
<i>Somerset Levels</i>	Wetland with islands of sand/gravel/rock	Early Mesolithic onwards			Microwear evidence for use of reeds, paddles; later Mesolithic fish, waterbirds, shellfish.	Neolithic trackways, slipways	Large Mesolithic flint collection; imported Neolithic jadeite axe; bows; mattocks, digging sticks
<i>Severn Estuary</i>	Island; freshwater/reed swamp	Predominantly Mesolithic	Fishbone, burnt bone from cooking and suggesting fish were brought whole to site	Eel, smelt, sticklebacks, flatfish	Mallard bones; amphibian bones, otter; antler mattock possibly for digging cockles		Lithics, red deer, pig
<i>Bouldner Cliff</i>	By river, cliff base	Early Mesolithic				Fishbones from meal	Lithics including burnt, submerged forest of oak with hazel
<i>Langstone Harbour</i>	Inland basin drained by freshwater rivers and with islands, forest	Early Mesolithic, early Neolithic					Lithics and stone tools from islands/intertidal zone; cattle, sheep/goat; hearths and burnt flint
<i>Wootton Quarr</i>	Rivers, streams and land surfaces	Neolithic	Conical fishtraps			Jetties, trackways	Lithic scatters including axes and picks, burnt flint

and the Vale of Pickering) although not in large quantities so far. Processing the fish by cooking is seen at Bouldner Cliff and on the Severn. Trade in the form of axes can be seen at the Somerset Levels with a foreign jadeite example and other British ones on the Humber estuary.



Figure 50 Overview of British Isles

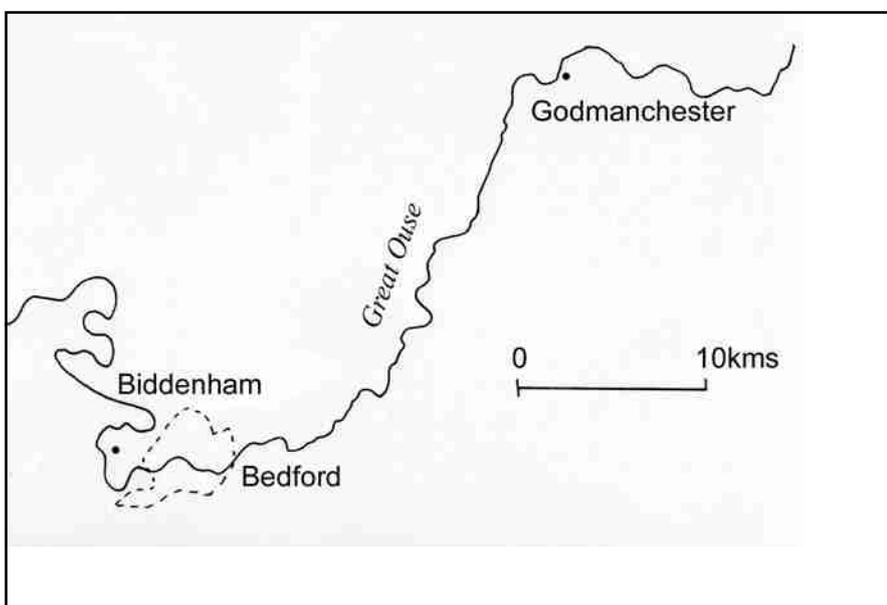


Figure 51 The Biddenham Loop

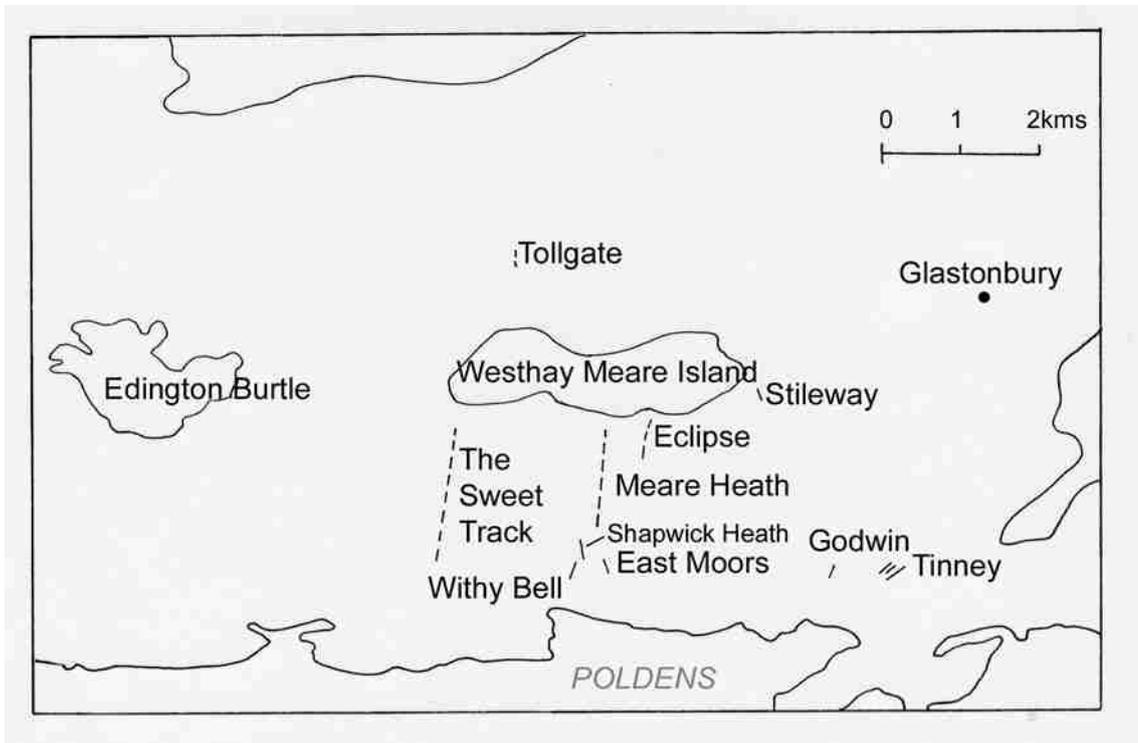
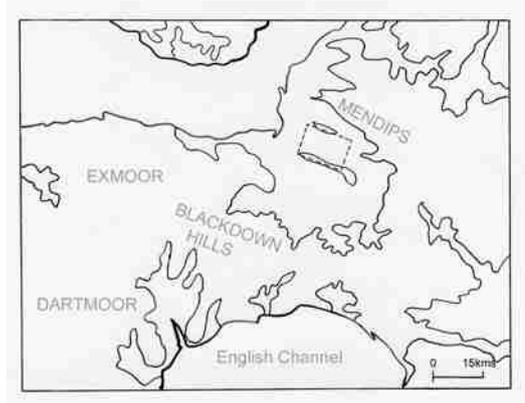


Figure 52 The Brue Valley, Somerset Levels

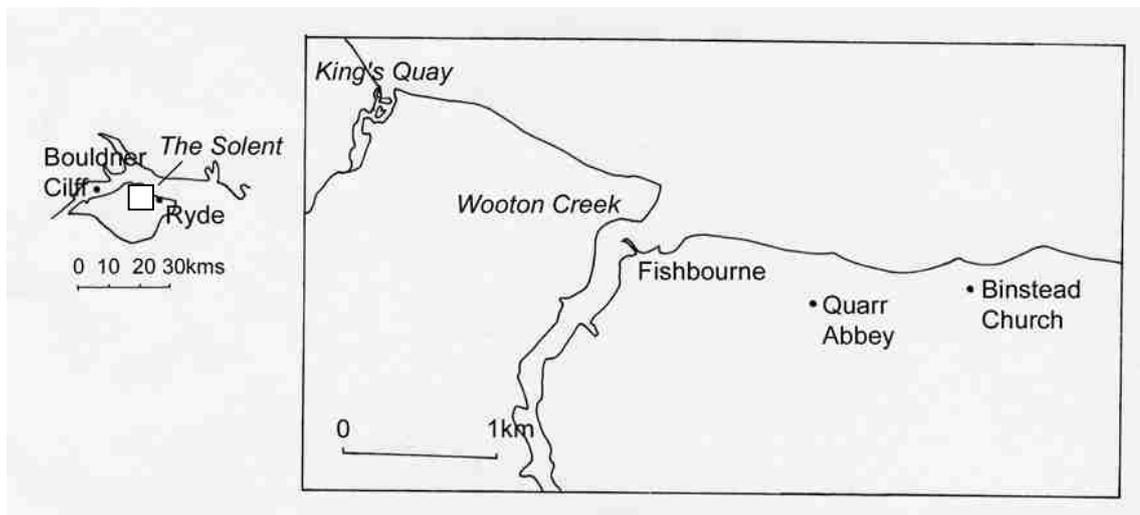


Figure 53 Wootton Quarr Survey Area

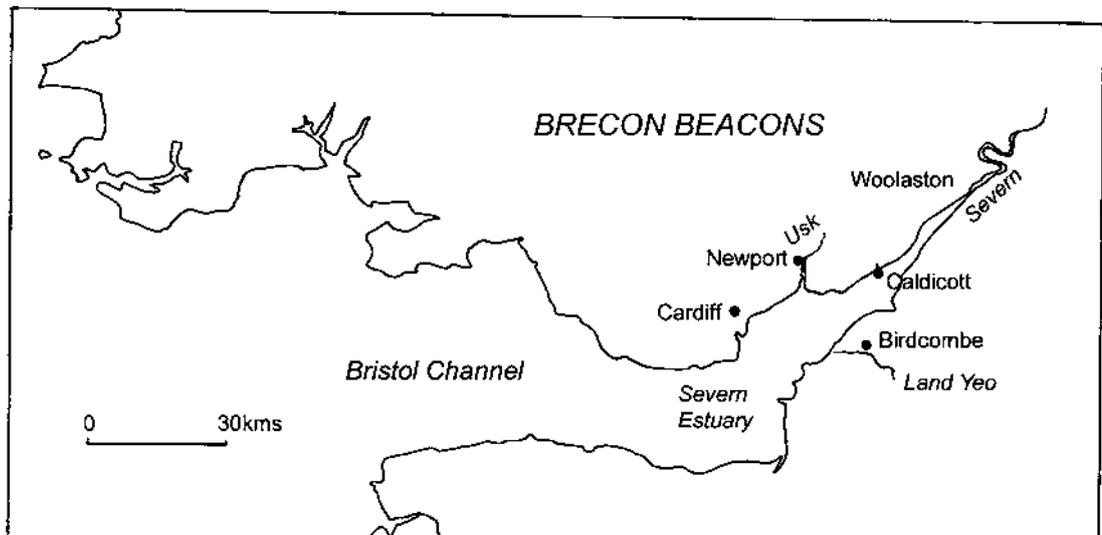


Figure 54 The Severn Estuary

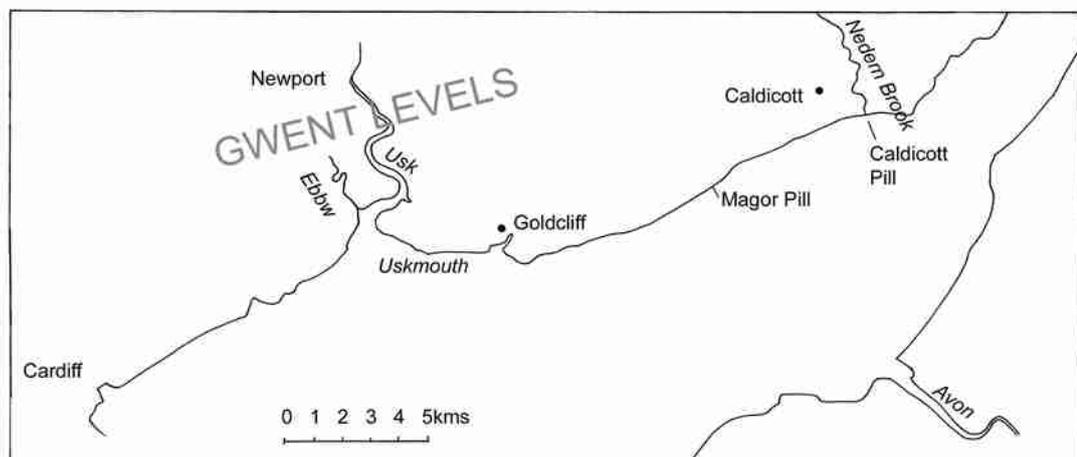


Figure 55 The Gwent Levels

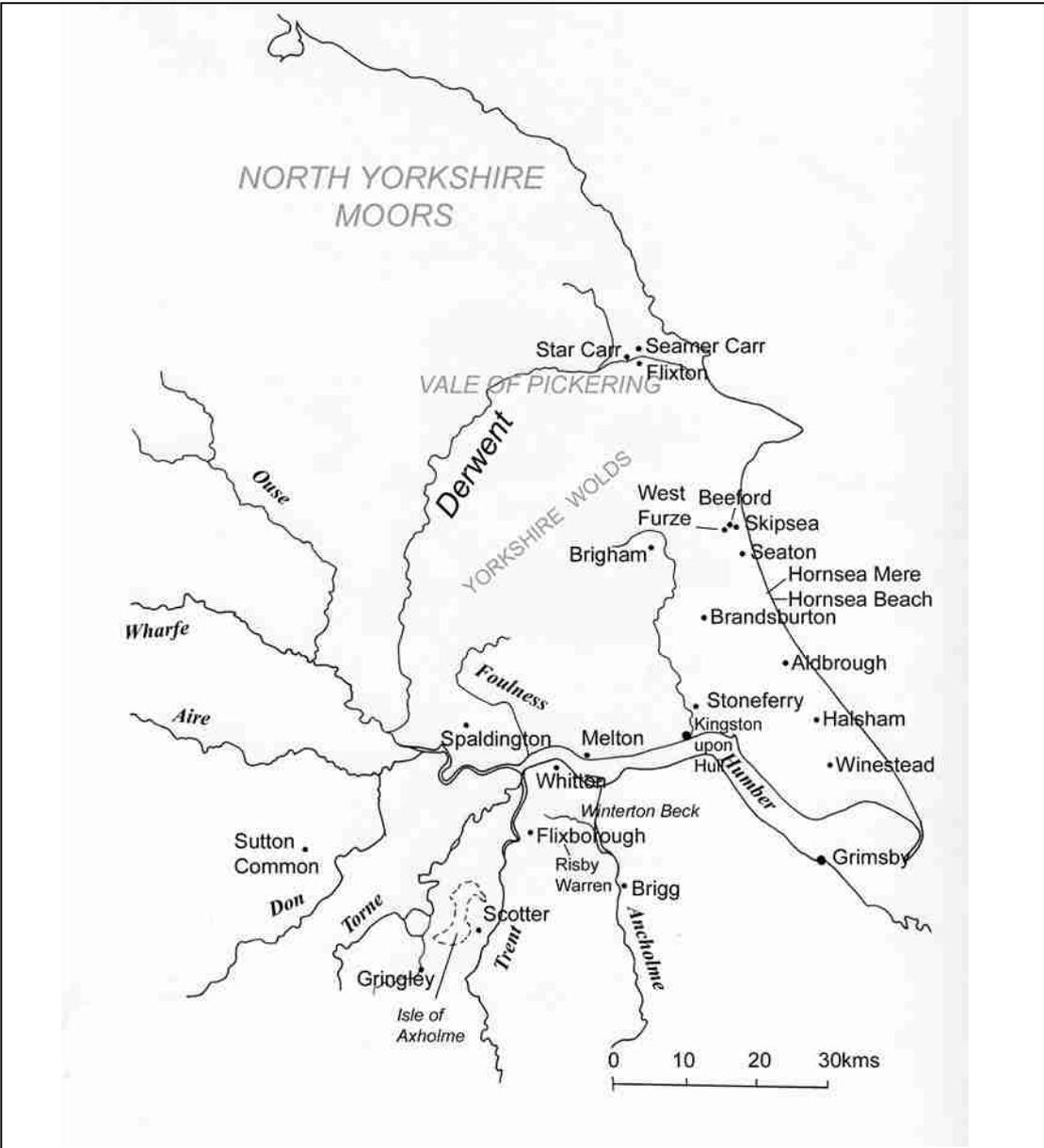


Figure 56 The Humber Estuary

5.4.2 *Ireland*

There are a large number of sites known from both the Mesolithic and the Neolithic period, of which only a small number will be mentioned below (see Figure 57). Those discussed from the Mesolithic (Mount Sandel and Lough Boora) both had direct evidence of the use of the adjacent water for subsistence (rather than the remainder for which it was implied). The number of sites by rivers and lakes does, however, show a selection of site which implies a range of uses other than subsistence. The ease of transport and trade may have been factors as well as those more ritual in character. An interesting observation in the distribution of Early and Late Mesolithic locations is the fact that the later sites are more low-lying than the earlier ones (Woodman 1986, 15). As Cooney and Grogan note, this could be a change in locational choice or alternatively it could indicate that the earlier sites are buried beneath alluvium in the valley bottoms (Cooney & Grogan 1994, 16).

‘The density of finds of stone axes in Ireland is currently three times that of Wales/mid-west England and four times that of Scotland’ (Cooney & Mandal 1998, 28). The number in Ireland has now reached over 20,000 and they date from not only the Neolithic period but also the Mesolithic and Bronze Age (Cooney & Mandal 1998, 1, 28). It has established that flaked and ground stone axes can be dated from the Early Mesolithic in Ireland (Sheridan *et al* 1992, 400, 404). An important aspect of the Irish Stone Axe Project (ISAP) set up in 1990 has been the number of axes recovered from rivers bed contexts (44.5%) and bogs (11.8%) as well, to a lesser extent, from banks of rivers, lake shores, lakes and coastal settings (Cooney & Mandal 1998, 34-36; Sheridan *et al* 1992, 406).

The majority of the axes are found in former antiquarian collections, so the bias of location of these finds probably has been as result of the collectors’ focus rather than a reality (Cooney & Mandal 1998, 30). Dredging and draining operations in major drainage programmes which have taken place over the past 160 years have produced 47% of the axes from various parts of the country, particularly the Bann, Shannon and Barrow rivers (Sheridan *et al* 1992, 392-393; Cooney & Mandal 1998, 32-33). While 90% of the total number of axes can be classed as ‘accidental discoveries’ (the remainder are from archaeological excavations), their mode of deposition can range

from accidental loss to deliberate deposition (Cooney & Mandal 1998, 33). The comparison with the finds from the tidal Thames is evident.

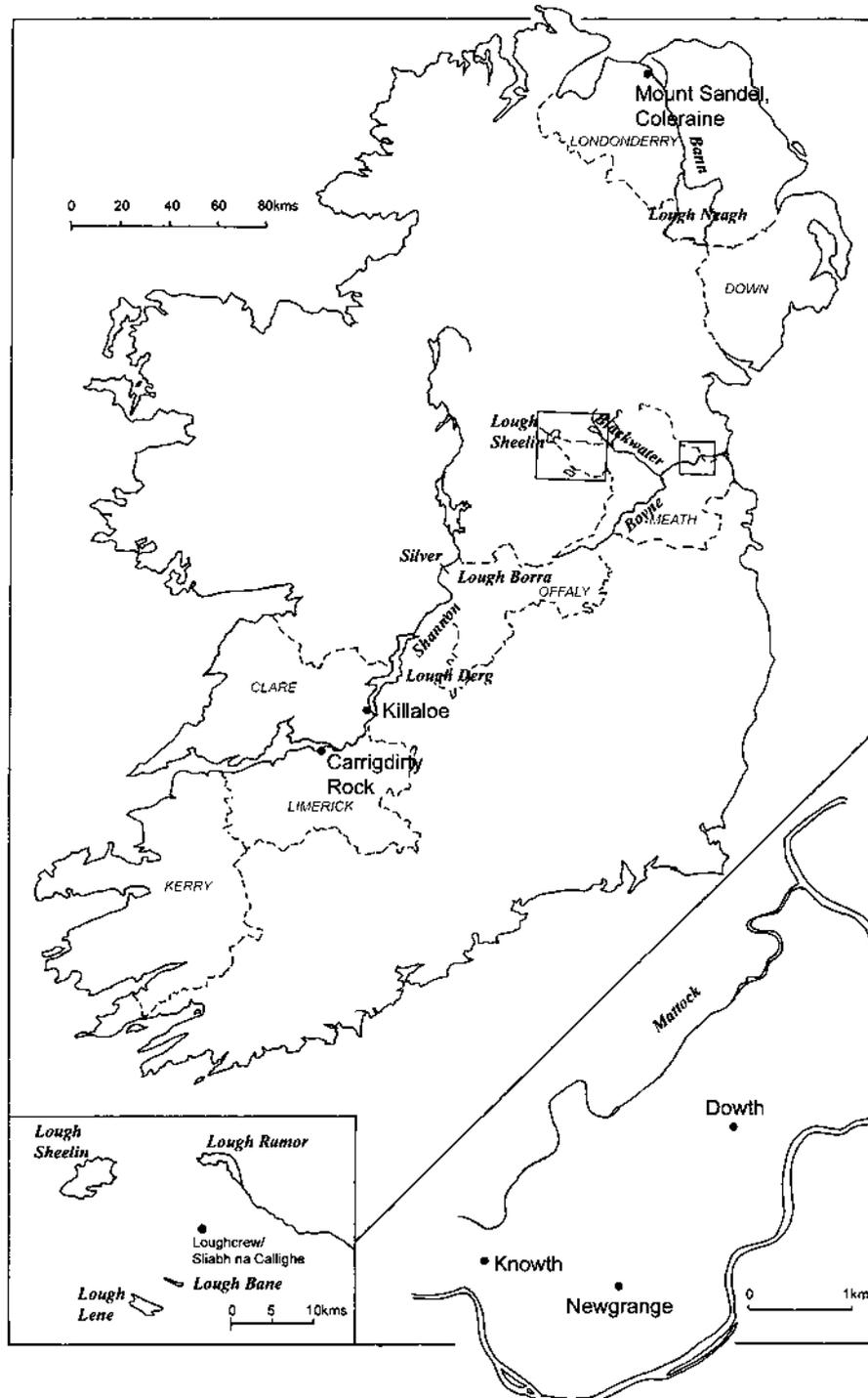


Figure 57 Sites and rivers in Ireland

Table 17. Irish economic data

Site	Location	Period/date	Evidence for fishing, processing	Fish species	Evidence for use of other water resources	Structures	Other finds
<i>Mt. Sandel</i>	Riverside	Predominantly early Mesolithic	Fishbones	Salmonids, trout, bass, eel, plaice	Waterfowl	Hut circles	Hearths, pits, flint assemblages, wood fowl and wild pig bone; Neolithic potsherds
<i>Lough Boora</i>	Lakeside	Early Mesolithic	Fishbones	Eel, brown trout	Waterfowl	Trackway, structure	Human skull fragment and clavicle
<i>Shannon Estuary</i>	Freshwater wetland	Late Mesolithic onwards			Dugout canoe fragment; swan bone		
<i>Brugh na Bóinne</i>	Riverside within bend	Late Mesolithic onwards		Salmon		Settlement, passage tombs, cemetery	

Mt Sandel, Co. Londonderry lies on a gravel ridge parallel to the river Bann which flows from Lough Neagh to the NE coast of Co. Londonderry. It is predominantly an early Mesolithic site but does have evidence from the Neolithic onwards in an area still known for the salmon today.

Lough Borra, Co. Offaly is a site situated on a post-glacial lake which is connected to the Shannon by way of the Boora and Silver rivers. It is described as a settlement site by people who utilised all the local resources available.

The Shannon estuary marks the final stages of one of the longest rivers in Britain and Ireland. In the Mesolithic, it was primarily a freshwater landscape, 'possibly dissected by tidal creeks' (O'Sullivan 2000a, 157). A site which spans the Mesolithic/Neolithic transition is that at Carrigdirty rock on the Shannon estuary (O'Sullivan 2000a, 156ff; 2001 69ff).

Brugh na Bóinne, Co Meath lies in a curve of the river Boyne and while it has seen human activity from the late Mesolithic period, it is principally known for its Neolithic passage tomb cemetery.

Again, these sites are widespread with two having beginnings in the early Mesolithic and two in the later part of the period. The two early sites have actual fishbone evidence as well as waterfowl and the others are known to have had fish nearby.

5.4.3 North European Plain:

The North European Plain is a continuous physiographical unit stretching eastwards from the lower Rhine as it enters the North Sea in the southern Netherlands to where it 'merges imperceptibly into the vast Plains of Russia' (Midgley 1992, 1). It is crossed by many rivers flowing north and north-west into the Baltic and North Seas. These rivers break up the landscape into smaller zones which demonstrate a range of differences in the form of peat, heathland, marshland, black and brown soils for example, all of which have been inhabited by early people. Preservation of features and artefacts, too, has varied across the region with the best organic material unsurprisingly, being recovered in the peat and marshlands areas.



Figure 58 Europe - general view and main rivers

Poland and eastern Baltic zones

Research underwater in the lakes and rivers in Poland has produced a range of structures and artefacts dating from the Mesolithic period onwards. Those from the basins of the Vistula and the Odra have included settlements generally on sandy inlets or wide river valleys, bridges, wooden boats, pottery and metal artefacts, and cult figures (Bukowski 1980, 181, 184, 187). In north-west Poland, survey has been undertaken in the region between the lower Vistula and Neman rivers, building on accidental finds previously noted. The first four sites are within the Mazurian Lakes region, which has a wide variety of wetland environments (Brzeziński 1992, 74).

Table 18 Poland and eastern Baltic States economic data

Name of site/location	Date	Type of site	Finds	Fish evidence	Fish equipment found/inferred	Other subsistence	References
Dubka, on large island, 550m from shoreline, now Łąkiśtaswińskie peat bog	Palaeolithic-Halstatt	Primarily fishing site, initially all-year round, later occasional	Flint tools, wooden platforms, canoes, amber pendants, arrowheads, artefacts of bone, antler wood, pottery from c3590±80 bc GD-5942 onwards	Pike, perch, roach, bream, 24,500 fish bones	Spears, fish nets, fish hooks	62,000 animal bone from Mesolithic/Neolithic, fowl, eggs, tortoise, mammals (aurochs, wild boar, elk, horse dog, roe/red deer); hunting deer in Boreal, elk in Atlantic	Brzeziński 1992, 75; Gumiński 1998, 103-6; Sulgostowska 1998, 104-6
Latjy, on a small island, 100m from shore line	Palaeolithic-Halstatt	Hunting site, spring occupancy	Extensive burnt bone, microburins & small number of microliths; arrowheads			Mammal bones including roe, red deer, wild boar, horse; organic remains	Sulgostowska 1998, 104-6
Tlokowo, on the shore of a small lake	Mesolithic	Primarily fishing site, spring occupancy	Flint tools; bone, antler, wood artefacts; arrowheads	pike	spears	Mammal bones including roe/red deer; organic remains	Sulgostowska 1998, 104-6
Miluki, on the shore of Haleckie Lake near the outlet of the Elk River	Palaeolithic-Halstatt		Flint tools; bone, antler, wood artefacts; arrowheads			Mammal bones including roe/red deer; organic remains	Sulgostowska 1998, 104-6
Mokracz, sand dune	Mesolithic	Settlement	Huts, hearths			No organics but tools suggest hunting for birds, small mammals, fishing	Niesiołowska-Śreniowska 1990, 314
Całowanie, in Vistula valley, in channel, on island, 30km from Warsaw	Palaeolithic to Mesolithic c9400-8300 BP	Series of re-occupation, Mesolithic material on island	Large lithic assemblages, reed beds in Mesolithic (<i>typha angustifolia</i> , <i>typha latifolia</i>)			No organic because of peat deposit	Schild 1985, 90-91, 95
Zvenjnieki II	Mesolithic, Boreal	Waterside site	Arrowheads, flax, rich bone and antler assemblage	Pike, bream, tench, perch (summer months)	Harpoons, fish spears, compound fish hooks	Millet; Land cultivation tools – digging sticks, mattocks, pounders, cutting boards	Zagorska & Zagorskis 1989

All the sites have evidence of long, if not continual, occupancy over the Mesolithic and in some cases the Neolithic too. They range from island to waterside locations and a number were described as fishing sites. The equipment available exceeded that currently from Britain and the Thames in that fish hooks have been recovered and the species of fish caught is a wider range. Dubka is a good example of a ‘well-rounded’ site in that fish, while an important part of the menu, form only part of the subsistence of the people living on the island.

Evidence suggests that in the Mesolithic fishing was a major occupation with fishbone exceeding 50% of all other bone assemblages in the later end of the period but during the Neolithic the proportion declines until it reached only 10% (Gumiński 1998, 105). In reverse ratio the number of animal bones increased in the same period to 90% (Gumiński 1998, 106).

Denmark

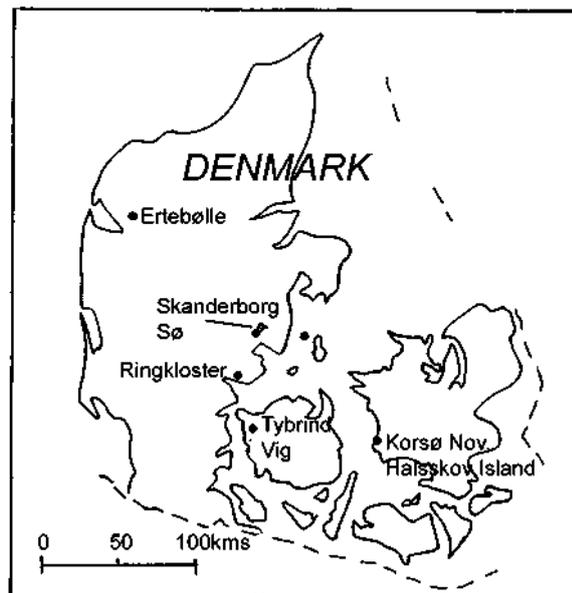


Figure 59 Denmark

In the early Mesolithic (Maglemosian) period, Denmark and the southern area of Sweden were joined as a result of the lower sea-level. During the post-glacial period the region underwent a series of transformations resulting from the effects of isostatic and eustatic rise. It was not until *c.*6000 BC that the channel between the Ancylus Lake and the Kattegat finally and permanently divided Sweden from Denmark (Pedersen *et al* 1997, 26-28). Coastal settlement sites are well known throughout the region and further north into Norway and Sweden (for example, Jonsson 1986, Rowley-Conwy 1999, 140-142). A large number of Early Mesolithic sites, however, were probably wiped out during the marine transgression and regression phases (Larsson 1990, 263).

The late Mesolithic Ertebølle Culture (*c.*4600-3200 bc) is ‘one of the most thoroughly investigated Mesolithic cultures in Northern Europe’ and covers an area including Denmark and S Sweden (Andersen 1985, 52; Tilley 1996, 9ff). Known particularly for its coastal settlements, the *køkkenmøddinger*, inland sites have also been investigated (Andersen 1994-5, 13). Given the many changes in the region with the effects of isostatic and eustatic rise, former coastlines and associated sites can be found inland in the northern part of Denmark, while those in the central and southern areas are now submerged (Andersen 1985, 52). The current water level divides the sites into those underwater and those on dryland but ‘there is no difference in principle between the Mesolithic settlements above water and those below’ (Andersen 2000, 12).

A wide range of fish have been identified from coastal Mesolithic sites in Denmark and while 75% are marine species, 17% are freshwater and 7% are migratory (Enghoff 1995, 68). A quarter of the fish are potentially from inland contexts. A similar dependence can be seen in Sweden where some coastal lagoon sites, such as Skateholm, demonstrate the greater use of freshwater species (Tilley 1996, 26).

Good preservation has resulted in a wide range of wooden fishing implements from the Mesolithic being recorded. The equipment suggests two fishing strategies - individual fishing and large group techniques – although there could easily have been a general utilisation of some implements by both methods. Individual fishing would involve the use of rod/line/bone fish hook, eel and leister spears. Groups would have been required to construct nets, traps, baskets and weirs, although the actual usage once they were in place could possibly have been undertaken by a smaller number of people. The basket traps of the Mesolithic and Neolithic periods were initially the only indicator of what

might be termed 'passive' fishing (Pedersen 1995, 75). Research in the early part of the 1990s, however, uncovered a number of fixed wooden structures, particularly in sheltered coastal waters, thus expanding the range of such equipment (Pedersen 1995, 75; Mertens 1998, 47). The use of a range of stationary fishing structures indicates at least a seasonal sedentism on the behalf of the user-communities. The majority of the structures as well as a number of the basket traps found on coastal and inland sites date to the Middle Neolithic period with a small number being Mesolithic (Pedersen 1995, 80).

In addition boats with paddles, maintenance equipment such as net needles and cleaners, and evidence for drying/smoking racks have also been identified (Mertens 1998, 49). Dugout canoes would have been 'the main means of transporting heavy goods and maintaining personal contacts' as well as facilitating fishing, and examples dating to the Neolithic (to add to those from the Mesolithic referred to by Mertens) have been found in former freshwater areas which are now bogs, such as Store Åmose (Koch 1998, 141).

Three sites are considered in Table 19 -Tybrind Vig (a small cove or small bay, *vig*) , Ertebølle (the type-site for the late Mesolithic culture), and Ringkloster (an inland, freshwater site). In addition, sites on the Storebælt ('*Great Belt*') will be considered. This is a major channel which lies between the islands of Fyn and Zealand, and was the site of the main routeway for water draining from the Ancylus Lake to the Kattegat during the period *c.*8400 cal BC (Pedersen *et al* 1997, 23). Archaeological investigations were undertaken in the years 1987-1990 in advance of the building of a bridge and tunnel spanning the Storebælt. A number of sites dating to both the early and late Mesolithic periods and into the Neolithic were recorded both on the seabed and on dryland. Finds include settlements, votive offerings, casual losses, evidence of fishing (weirs), graves and evidence of trade (Pedersen *et al* 1997).

Table 19 Danish sites

Name of site/ location	Date	Type of site	Finds	Fish evidence	Fish equipment found/inferred	Other subsistence	References
Tybrind Vig, in bay in Western Fyn	Ertebølle late Mesolithic	One of a series of settlements	Evidence for reeds, landing area	Marine: seal, porpoise, whale, spurdog. Anadromous: eel; shellfish; burnt fish remains in pot	2 dugout canoes with fireplaces, split ash paddles, some decorated, possible fishtraps, fish weir, points, bone fish hooks, wooden leister prongs, fragments of rope	Red/roe deer, wild pig, hazelnuts, acorns	Andersen 1985; Trolle-Lassen 1984; Tilley 1996,
Ertebølle, in N Jutland bay	Ertebølle, c3900-3250 cal BC	Settlement	Large shell midden	Freshwater: cyprinids (roach, rudd 67.31%, perch 2.77%, sticklebacks 0.25%, pike 0.27%). Anadromous: eels 17.31%, salmon/trout 0.13%	Fishtraps, seine netting		Andersen 1995; Enghoff 1986; Ingrem 2000
Ringkloster, inland, by freshwater lake, Skanderborg Sø which has a number of Mesolithic sites	Ertebølle with evidence from the early Mesolithic period, plus some dated to early Neolithic	Settlement but multi-occupancy, with discard midden in adjacent lake	Good preservation of organic artefacts: bone (points, daggers, curved knives), antler (axes, batons, chisels), wood (elm bows, hazel arrow fragments, a hawthorn axe handle, ash spears, oak digging sticks & 3 wedges); flint scatters; pottery from Ertebølle ceramic phase and Neolithic Funnel Beaker	Marine (3%): dolphin, oysters, cod, pollack, plaice, dab, flounder. Anadromous (1%): salmon, trout, eel; Freshwater: pike 26.89%, perch, ruffe 12.32%, cyprinids (56.96%): roach, rudd, white & common beam, bivalves	Ash paddle, fragments of a dugout canoe, possible fishtrap made from hazel stakes, netting, rod/line	Wild boar, aurochs red deer; for fur: pine marten, otter, wild cat, badger fox; hazelnuts, seeds, fruits from waterlily, dogwood, hawthorn, lime; red-throated diver, sea eagle, swan	Andersen 1994-5, Enghoff 1994-5
The Storebælt	Early to Late Mesolithic - Neolithic	Settlements, cemetery	Graves, hearths, flint/stone artefacts, pottery, bone/wood/antler objects, digging stick	Eel	Fishtraps, leisters, paddles, logboat		Petersen <i>et al</i> 1997

N Germany

Friesack is a small town situated some 60 km northwest of Berlin (see Figure 60 below). In the Mesolithic period the site of Friesack 4 was situated in a wetland landscape of low hills, lakes and ponds (Gramsch 1992, 65). Situated on the shore of a former lake, it shows evidence of being visited and abandoned over a period of approximately 1000 years, consistent with seasonal exploitation of the local resources during the period March to May (Gramsch 1992, 65; Coles & Coles 1995, 13). Use of the site was not on a regular basis with '10 to 20 occupation episodes in every two to three centuries, interspersed by a century or so with no evidence for people's presence' (Coles & Coles 1995, 13). Whittle, however, suggests that the site should not be designated a short-stay camp (Whittle 1996, 33).

The occupancy site has not survived, although faunal and artefactual evidence has been recovered from the adjacent lake (Gramsch 1992, 66; Whittle 1996, 33). Flint and antler axeheads complete with wooden hafts, pine wood arrows and spears and a birch bark container have been retrieved along with a series of projectile points retaining, in many cases, their hafting (Coles & Coles 1995, 13-15). Many antler and bone artefacts were used as ornaments including 34 perforated teeth from a wide range of both terrestrial and water animals as well as humans (Gramsch 1992, 68). Other pieces include decorated antler and bone fragments (Gramsch 1992, 69, Figure 8.5). Direct use of water resources can be seen in 2 paddles (one of rowanwood), fragments of a dugout canoe and a birch-bark net float (Coles & Coles 1989, 93, 94; Gramsch 1992, 68).

Subsistence included large game (red and roe deer, pig with some elk and aurochs) and water game (significant numbers of beaver and pond tortoise) (Gramsch 1992, 69; Whittle 1996, 33). Large species of waterfowl were also hunted. Evidence for fish is 'not numerous' but includes pike and catfish, both producers of substantial meat (Gramsch 1992, 69; Whittle 1996, 33). While plant fibres were used for making nets and baskets, there is no immediate evidence for the use of plants for food (Whittle 1996, 33). The nets would have had a range of uses – for catching waterfowl, for fish traps (although pike would have been caught with the aid of fishhooks or leisters) and plant collecting (Coles & Coles 1995, 14). The method of net construction changed too –

from knotless in the earlier and later Mesolithic period and knotted in the middle Mesolithic with string and rope techniques altering accordingly (Coles & Coles 1995, 15 Figure 13).

The Rhine/Meuse delta



Figure 60 The Netherlands

The Rhine/Meuse delta stretches inland for about 100km and for 200km along the coast and composed of a series of zones ranging from the coastal dune barrier, through estuarine, fresh water tidal area, peat, rivers, inland dunes, sedimentation and uplands regions (Louwe Kooijmans 1993, 72-73). It did not exist in the Mesolithic period as it 'just formed a part of the wide North European Plain' (Louwe Kooijmans 1976, 233). Before c.6000 BC Britain was joined to Europe by a land bridge as a consequence of the take-up of water from the North Sea into the ice sheets. It has been hypothesised that the Thames and Rhine joined together out in the 'North Sea Plain' before draining into the much reduced North Sea.

In a survey of the 6000 Meuse valley flint assemblages within the confines of the Netherlands, Mesolithic and Neolithic material was examined, with the majority coming from surface collecting although an unspecified number of excavations were referred to *en passant* (Wansleben & Verhart 1990, 391; Louwe Kooijmans 1998, 409). The authors concentrated on the Late Mesolithic period as well as three cultural sub-periods spanning the Neolithic. Results of all four sub-periods show concentrations of flints within a band 10kms either side of the Rur and its confluence with the Meuse at Roermund – a point not commented on by the authors.

The coastal region, which includes the delta, was subject to cycles of marine transgression/regression and the resultant salt marshes/estuarine creek systems and freshwater marshes were attractive for settlement from the early post-glacial period onwards (Midgley 1992, 4). The delta and the lower Rhine area are situated between 'three major spheres of cultural development' (Louwe Kooijmans 1976, 227). To the north there is the late Mesolithic Ertebølle in Denmark and the *Trichterbecherkultur* (TRB) of the North German Plain. To the south and west, there was the Paris basin and Belgium, the Seine-Oise-Marne and the Bandkeramik, and the central sphere of the Rhine and the German mountain zone with the *Linearbandkeramik* (LBK), Rössen and Michelsberg (Louwe Kooijmans 1976, 227). Additionally there are three geographical regions within the area: the loess-covered hills and river valleys in the south; the area north of the loess mainly flat 'consisting of fluvial, fluvio-glacial sands, gravels and tills, covered for the greater part by late glacial sands'; and the Holocene sedimentation in the delta (Louwe Kooijmans 1998, 407-408). Two distinct communities existed – on the loess and on the northern sands (Louwe Kooijmans 1998, 409). It is those on the sands which are pertinent to this study. The research that has been undertaken over the

past 30 years within the region has been well-documented (for example, Louwe Kooijmans 1976, 1987, 1998, 1999) and so the following discussion will only include that which is relevant to the subject within view.

Finds have been recorded from a range of locations. Dredging at major ports (Europoort, for example) has produced evidence over a number of years. In the delta the majority of sites have been found on the *donken* or outcropping tops of extensive complexes of late Glacial dunes which were very attractive to settlers from the prehistoric periods onwards (Louwe Kooijmans 1999, 114). While the prehistoric camp sites themselves have been ‘deeply disturbed by post-depositional processes’, the refuse that was generated has been preserved where it had been placed in the surrounding marshland (Louwe Kooijmans 1999, 114). A major rail link between Rotterdam and Germany, the *Betuweroute*, has resulted in extensive archaeological research along the longitudinal Rhine-Meuse delta. Nineteen sites along the route have provided evidence for Mesolithic and Neolithic occupation in the western part of the transect. The first major publication of this work is expected within the next twelve months (Mol 2003).

Table 20 represents a number of Mesolithic sites, particularly in the delta area with its high preservation rates. One of the problems encountered has been the dating of the material. Information available often did not provide data in a form other than a general period (for example ‘early Mesolithic’) but this does not preclude using such data. The inference is clear that occupants of sites in the delta during this period were utilising all the local resources available to them – not merely just those from the dry land.

Table 20 Mesolithic sites on the Rhine/Meuse delta

Name of site/location	Date	Type of site	Finds	Fish evidence	Fish equipment found/inferred	Other subsistence	References
Europoort, Rotterdam	Early Mesolithic	dredged material	430 artefacts including barbed points (used to hunt fish, birds and land animals)		2 fishhooks.		Louwe Kooijmans 1976, 233; 1987, 230; 1999, 119. Verhart 1988, 146). Verhart 1988, 149ff, 187)
Swifterbant , on a river dune	Mesolithic	settlement	Hearths, flints, use of reeds on living surfaces				Louwe Kooijmans 1987, 230, 1998, 416
Hardinxveld-Glessendam, edge of river dune, adjacent to wetlands	c5500-4000 cal BC	Seasonal occupation	flint and blade industry, an elm bow, several burials, small number of very early Swiftbant pottery.	Freshwater/anadromous fishbone comprise 83.9% of faunal remains: bass, roach, tench, catfish, sturgeon, salmon, sea trout; Shad 1.6%; Marine: 0.1%; food processing evidence from burnt fish.	canoes, ash paddles, a fishtrap,	Faunal remains bird and wild animals.	Beerenhout 2001a, 306, 310; 2001b, 248, Louwe Kooijmans 1999, 116-117; Mol 2003.

Table 21 Neolithic sites in the Netherlands

Name of site/location	Date	Type of site	Finds	Fish evidence	Fish equipment found/inferred	Other subsistence	References
Hazendonk, a small outcropping dune	C3900-1900 cal BC		Ceramics, worked bone and flint	Anadromous: sturgeon, salmon, alicia shad; Freshwater: pike, catfish, eel, perch, tench, rudd, roach, ruffe, bream, ide, burbot, barbel		Bird and mammal bone, unidentified, cereal grains	Louwe Kooijmans 1976, 259; 1987, 231-233; 1993, 109
Wateringen 4, on top of a dune at -3.5m OD	Middle Neolithic c3500 cal BC	All year round occupancy;	Pits, hearths, 97 post holes, watering holes and wells; charred and waterlogged botanical remains include a wide range of species covering most categories of water types.	Marine: mullet, flounder, flat fish (plaice); pike, Anadromous: eel, sturgeon, salmon, sea trout; Freshwater: bream, carp;			Raemaekers <i>et al.</i> , 1997, 143, 146ff, 152-153, 163
Bergenschenhoek, located at -8m OD, on a living platform 3x4m on a former freshwater or brackish lake	Early/Mid Neolithic c3450 cal BC, series of occasional occupancies	Short term fowling and fishing camp,	Surface reinforced by reeds, long pointed arrows	Pike, catfish, eel, perch, roach, bream, tench, carp	3 cone fishtraps from red dogwood/rope; possibly parts of canoes; leisters	Collecting of fruits and nuts; also hunting of aquatic mammals (grey seal and otter);	Louwe Kooijmans 1976, 259; 1987, 238, 240

Swifterbant, series of sites on top of river dunes adjacent to a creek system (Site S3 representative of the rest)	c3400-3200 cal BC	Settlement	Considered a type-site for Early Neolithic pottery of the region; clusters of stakeholes of diameter 12cm or less	Marine: mullet, flounder; Anadromous: sturgeon, salmon; Freshwater: pike, catfish, eel, perch, tench, rudd, roach, ruffe, bream		Cattle, pigs, charred grains of naked Barley and Emmer wheat; wild animals: red deer, elk, aurochs, brown bear, polecat. Water animals: otter and beaver. Fruits and nuts also gathered.	Louwe Kooijmans 1987, 235, 237; 1993, 109
Kolhom	Late Neolithic			Marine: mullet, cod, flatfish; Anadromous: sturgeon			Louwe Kooijmans 1993, 109
Vlaardingen	Late Neolithic			Marine: mullet; Anadromous: sturgeon; Freshwater: pike	Plaited fish trap, remains of a net for fishing; sturgeon weir		Louwe Kooijmans 1987, 248; 1993, 109
Hekelingen III	Late Neolithic		Yew bow, flint arrowheads, imported oval flint axe	Marine: mullet; Anadromous: sturgeon, eel; Freshwater: pike, catfish, perch, tench, rudd, roach	Possible sturgeon weir, clay net sinkers, ash-wood paddle		Louwe Kooijmans 1987, 247, fig 150; 1993, 109

In the Neolithic period (see Table 21 above) the dune sites continued to be important settlement and subsistence bases. With the exception of Hekelingen III and Kolhorn, the fish bone results were obtained from partly sieved samples, suggesting that possibly more species and greater numbers would have been recorded had the full sample been processed.

Table 22 (p251-2) below gives an overview of the archaeological information from the North European Plain.

5.4.4 *Central European Uplands:*

The Central European Uplands run west-east across the continent south of the North European Plain. The Alps lie to the south in the western part. Luxembourg and NE France mark the western extent and Romania the east. The mountains of the Vosges and Schwarzwald lie in France and Germany and the Carpathians, on the south side of which lies the Iron Gates Gorge of the Danube, occupy much of Romania. Sites found in Bohemia in the Czech Republic, SW Germany and the Iron Gates Gorge on the river Danube are discussed in this section.

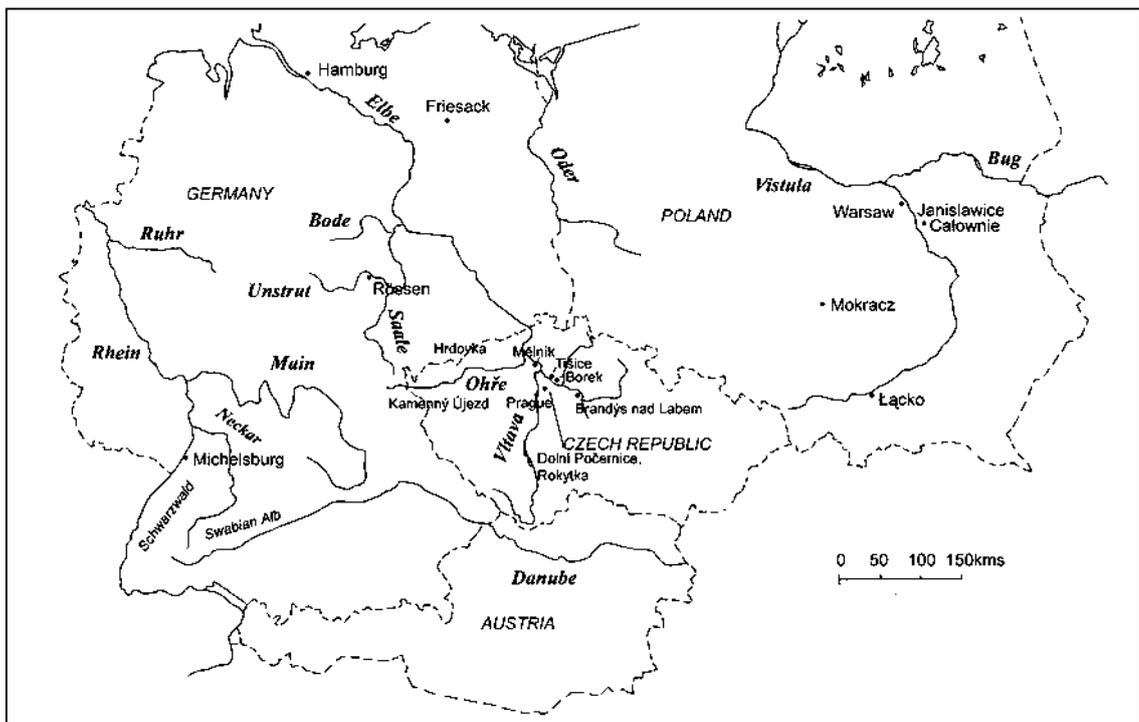


Figure 61 Central Europe

Bohemia in the Czech Republic

The river Elbe rises in the northern part of the Czech Republic and flows north-west through Germany, entering the North Sea at Hamburg. It is 1165 km long. The Czech name for the river is the Labe and it is this name that will be used here as the region under discussion lies entirely within the Czech Republic borders. The valley of the middle Labe is one that has been the subject of a series of studies particularly over the past decade and while much has been published in Czech, there is a significant amount available in translation as well as those written originally in English to aid meaningful discussion. The help of Marek Zvelebil and Dagmar Dreslerová is gratefully acknowledged.

The *Ancient Landscape Reconstruction in Northern Bohemia* programme (ALRNB), set up in 1990 a few months after the fall of the communist regime, closely examined two main transects – one which is in the northern part of the Czech Republic and the other which crosses the Labe between the towns of Brandýs nad Labem and Mělník before continuing south to below Prague (Zvelebil *et al* 1993, 93; Dreslerová 1995, 106). It is the surface surveys undertaken in this second transect which has provided information for the following discussion. In addition three sites along this stretch of the Labe have been excavated over the past fifteen years and produced Mesolithic and Neolithic material (Dreslerová 1995, 106). The floodplain here is up to 1km wide with rounded sand dunes occasionally poking through the alluvial overburden several metres in depth. While the river naturally has a tendency to meander (oxbows are evident on aerial photographs), the course of the Labe has been artificially modified over the past few hundred years (Dreslerová 1995, 106).

Previous work undertaken on the Mesolithic period in Bohemia had concluded that ‘the greater part of Mesolithic sites are to be found in the proximity of rivers, fishing being mostly important’ (Vencl 1971, 186). Vencl examined 42 Czech sites out of a total of approximately 170 for location and evidence of subsistence. None of them were more than 500m above sea-level although he did not rule out the possibility of such occurrences (Vencl 1971, 186). He demonstrated that there were eight variants in location of sites ranging from the top of rocky hills to sand banks adjacent to rivers (Vencl 1971, 179). He suggested that nearness to a main watercourse was not a prime factor in the choice of situation, to be in the vicinity of springs and fountains was

acceptable and that those that were found by streams and rivers did not necessarily provide evidence of fishing (Vencl 1971, 186). While the lack of preservation of fishbone (he mentions only one site) or organic fishing equipment is obviously a contributing factor to his argument, he also states that many of the sites were between 300-1000m away from the nearest river or placed on a high headland above the water. This, however, he admits, would have not presented an obstacle to those in the Mesolithic (Vencl 1971, 187). Some of the sites were placed on high rocky enclaves, which may have equally necessitated hunting at a distance. However 'the Mesolithic is one of the least known periods of Bohemian prehistory' (Vencl 1994, 19). This may be as result of the various specialised surveys that have been undertaken – resulting in a certain randomness in the spread of knowledge (Vencl 1994, 19). It must also be borne in mind that particularly in the floodplains changes in the river regimes has removed much of that which pertains to the Mesolithic (Dreslerová 1995, 125-126; 2001). In the middle Labe, numbers of Mesolithic finds are small and sites are mostly linked to the Würm/Riss sands (Dreslerová 1995, 125)

Dreslerová's substantial article published in 1995 has produced the most comprehensive study of the archaeology of the middle Labe area to date and it is from this that much of the following information has been taken (Dreslerová 1995). The stretch of the river at Borek near Mělník has produced ten different locations of finds all found within former channels of the Labe dating from the prehistoric period onwards (Dreslerová 1995, 109). A palaeochannel excavated in the 1980s was bridged by fishing weirs - 7 posts sunk vertically into the bed and fastened by wattle at 0.5m below water-level (Dreslerová 1995, 112). 5 axes and 2 battle-axes from the late Neolithic have been recovered from the same channel allegedly near the posts and 5 other axes were dredged out of sands adjacent to the channel (Dreslerová 1995, 112-113).

Further upstream near Tišice, a flooded sand and gravel quarry has yielded via dredging late Neolithic pottery fragments, 2 stone axes and an antler hoe (Dreslerová 1995, 116). These are all from near a palaeomeander of the Labe. Less than a 100m away from the recovery site is the edge of the so-called 'Riss' river terrace on which prehistoric settlement was concentrated throughout the prehistoric period (Dreslerová 1995, 117).

The third site is upstream near the confluence of the Labe and the Pšovka rivers and has produced a part of an Early-Middle Neolithic vessel and a battle of the same date.

Further north of the river Ohře in the Czech republic, the Lomský-Potok project began in the 1970s and a series of sites of the early and middle Neolithic periods were found all in the 'immediate vicinity of the main watercourses' but not on tributaries or minor watercourses (Beneš 1991, 180). The sites are substantial in size, *c.*15 hectares, and have architecture in the form of post-holes, silos, pits etc (Beneš 1991, 180). Burial locations also follow the line of the rivers apart from a small number situated on a tongue of land between two main groups and visible from the rivers (Zvelebil & Beneš 1997, 34-35).

Other sites include a series of late Neolithic Corded Ware burials found at Dolní Počernice, Prague (35m above the Rotytka valley) and at Hrdovka in the north (on a slightly elevated plateau connected to the alluvium of the Loučenský creek) (Beneš 1995, 135).

Dreslerová notes that the Neolithic finds along the Labe, Main and Rhine 'constitute a high percentage of the material recovered' (Dreslerová 1995, 127). Given the problems with shifting floodplains and eroding on the rivers during the Mesolithic and Neolithic, she opines that the finds would have found their way into the rivers via 'slope and river-bed erosion, from locations along the river course' (Dreslerová 1995, 127).

The cultural preference for settlement within the river valleys is difficult to explain without further detailed research. What is clear is that in the reconstruction of the character of the floodplain, the open surface which can be traced, would not have produced good soils or continuous vegetation cover. Both of these would have been necessary for agriculture and for cattle meadows (Dreslerová 1995, 128). Dreslerová suggests that the simplest explanation for the density of settlement along the river was the availability of fishing and that 'specialised fishing/animal husbandry' communities were, along with terrace settlements, part of a larger economic unit' (Dreslerová 1995, 128).

SW Germany

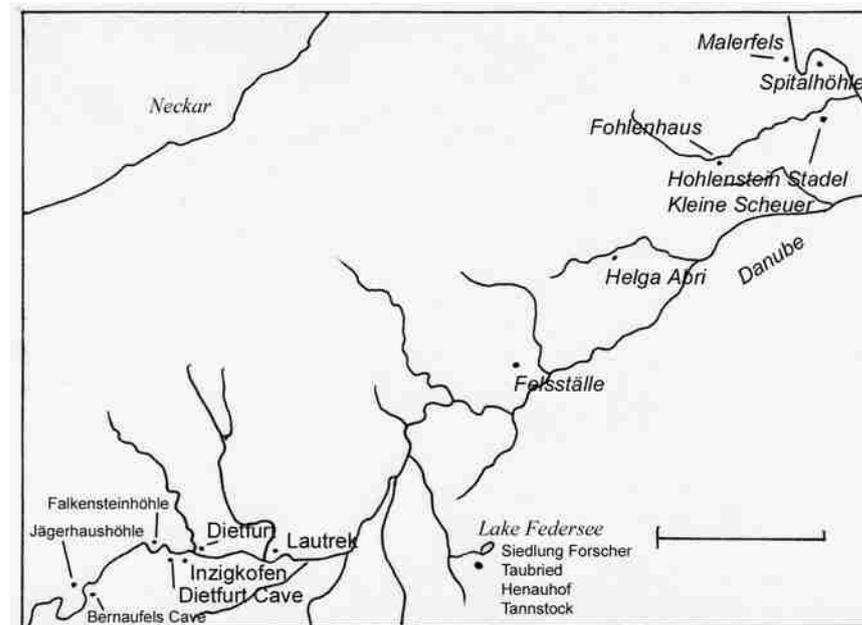


Figure 62 Southwest Germany

At the western end of the central uplands is an area that encompasses most of SW Germany. Three major rivers, the Rhine, the Danube and the Neckar, drain through the region and Lake Constance/Bodensee is situated in the south (Jochim 1998, 32). In between the rivers and the lake is a range of uplands – the Black Forest, the Swabian Alb and the Alpine foothills – with two areas of lowlands (the Rhine lowlands and the Oberschwaben) (Jochim 1998, 32-33). Tributaries flow across all types of topography.

There are abundant early Mesolithic sites within SW Germany (10300-7800 bp)- this period is known locally as the *Beuronien* and is typified by the abundance of microliths (Jochim 1998, 57-58). In the Rhine valley, sites are strung out along the entire length both close to and set back from the river itself near the many tributaries (Jochim 1998, 62). In the Neckar drainage area, sites seem to be a long way from water sources but Jochim suggests that this may be due to sites on the valley floors being buried under alluvium (Jochim 1998, 66). Both the Neckar and the Danube underwent downcutting through most of the whole Mesolithic period and recent work on the Neckar near Rottenburg indicates that alluvial sites do exist (Jochim 1998, 66). Those that have been recorded on the hills may only represent a portion of actual Mesolithic sites.

Sites of the early Mesolithic with their subsistence evidence include:

Falkensteinhöhle (38% of bone identified with 75% large mammals – red/roe deer, boar, fish 10%, 2% birds; hazelnuts, mussel)

Inzigkofen (2% birds, 10% fish, mussel shells)

Felsställe (birds 1%, fish 10%)

Helga-Abri with beaver, fish and bird shell remains

Fohlenhaus (perforated fish teeth)

Malerfels (small mammals and at least 6 species of fish dominating in level 1b, dated to 9560 ± 250 bp with waterfowl and grouse)

Spitalhöhle (dominance of fish and bird in a hut or windbreak)

Other sites add extra dimensions to the picture in the Early Mesolithic period. At Dietfurt Cave, 1661 fishbones have been recovered, of which 407 could be identified to ten different species. It has been suggested from the available evidence that the fish had been filleted after being caught in the spring while the charred hazelnuts indicate collection in the autumn.

The deliberate choice in middle Germany of riverine locations can be seen in the early Neolithic period. TRB pottery has been recovered from large burial mounds between the Elbe and Saale rivers, following for the most part the many tributaries of each as well as the Ohre, Bode and Unstrut rivers (Midgley 1992, 184).

The Federsee is a lake in the Oberschwaben that in the Mesolithic period was many times bigger than today (Jochim 1998, 80, fig 26). A history of fieldwalking around the former lakeshore resulted in the discovery of a large number of sites (Jochim 1998, 81). What Jochim describes as ‘the richest sites’ appear to be concentrated in particular areas on the lakeshore which have certain attributes in common:

- the shorelines they occupy are convoluted with bays and peninsulas
- they are sited by outlet streams or inlets
- they are sheltered from the prevailing westerly winds which sweep across the lake

(Jochim 1998, 81).

The result of this would have been easy access to a range of resources, both floral and faunal, which would have included good fishing in the stream mouths and in the shallow waters. Protection from the wind during storms would have been given

(Jochim 1998, 81). Similarly, many of the sites on Lake Constance were located adjacent to the inflowing streams or in the extreme west end where there are marshy regions (Jochim 1998, 83). In the Early Mesolithic phase of Siedlung Forscher, bones from pike and other unidentified fish were recovered plus a smooth bone point which suggests line fishing (Jochim 1998, 82). Similar points have been found at Henauhof Northwest and Tannstock (Jochim 1998, 105).

The Late Mesolithic is of a shorter duration than the Early period with fewer sites (Jochim 1998, 87). Among the finds associated with this period is the addition of antler working kit which produced amongst other things, barbed harpoons such as that found at Bernaufels Cave, near the Danube, as well as axes/adzes (Jochim 1998, 94). With little exception all the sites are located adjacent to water sources with valley floor/edge and lakeshore predominating (Jochim 1998, 89 Table 5).

Late Mesolithic sites include:

Falkensteinhöhle – 16% fish bone, some shellfish, antler harpoons, perforated teeth and shell (with the later having been transported from the Mainz Basin (200 kms. to the north-west) and the Mediterranean (possibly via the Rhone over a distance of 600 kms.) (Jochim 1998, 95).

Inzigkofen – large mammals, 12% fishbone, 7% bird (waterfowl and game), shellfish; 2 barbed antler harpoons, 1 bone point

Lautrech – (5480-5320 cal BC 6440 ± 45 bp), 830 bones comprising 85% fish (spring catches), bird 1%; 2 bone points, 1 bone pendant (Jochim 1998, 96).

Sites on the Federsee with evidence for fishing in the late Mesolithic are scarce:

Henauhof Nord I – 20 fish bone fragments (Jochim 1998, 180)

At Henauhof Nord II - a roll of birch bark filled with clay and gravel has been interpreted as a net weight for fishing (Jochim 1998, 96, 98).

Both of them have been interpreted as short-term spring/summer fishing camps.

Henauhof Nord West (HNW) – this site is more prolific with pike, wells catfish, bream, a wide range of waterfowl and a large number of bone point fragments (Jochim 1998, 141-148)

The deliberate choosing of lakeside or riverside venues cannot be ignored along with the availability of piscine and avian resources. Plant remains, too, are currently missing from the archaeological record, although two grindstones found in Stratum 3 suggests links with farming communities (Jochim 1998, 166).

The Iron Gates Gorge on the river Danube

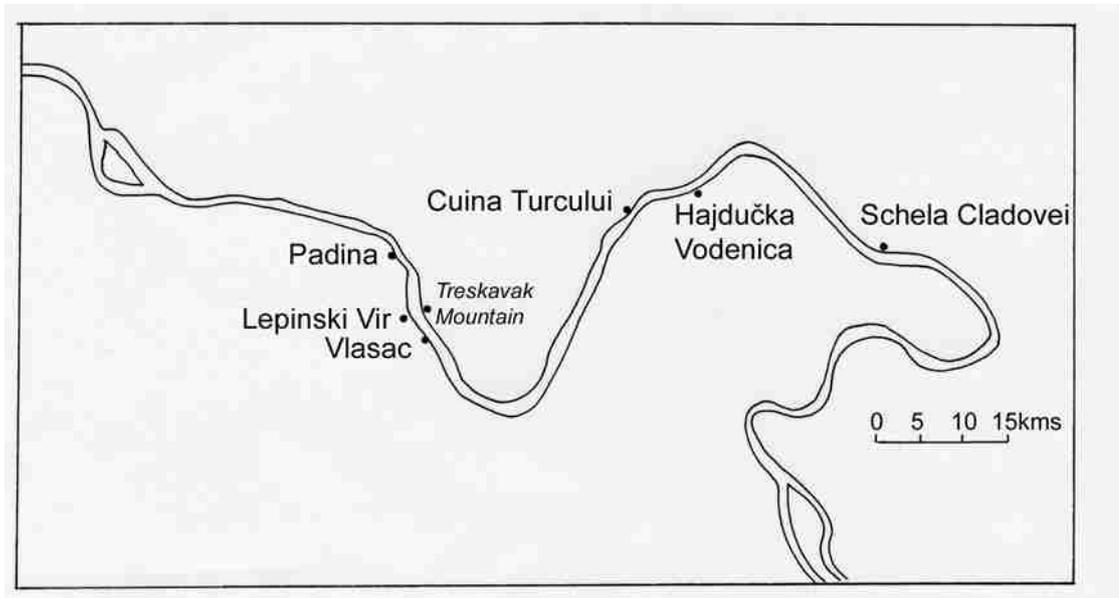


Figure 63 Iron Gates Gorge

After the river Danube rises in the central upland region in SW Germany, it flows eastwards crossing through the Balkans before entering the Black Sea at the northern Romanian border. Along parts of its length, it acts as an international boundary between Slovakia and Hungary, Romania with Bulgaria and Romania with Serbia. It is along this last modern boundary that the Iron Gates region (or Đerdap/Djerdap) and its hinterland can be found where much archaeological investigation has been undertaken since the 1960s. It consists of four gorges and three small valleys, over a distance of c.130 kms (Radovanović 1996, 17) (Figure 62).

V. Gordon Childe wrote briefly about this region in 1929 in his book *The Danube in prehistory* (Childe 1929). He refers, in passing, to the Iron Gates as the ‘natural way into the closed basin of the Middle Danube’ and suggests that the ‘shoals of sturgeon and other fish would themselves supply a motive for the voyage up-stream’ from the lower parts of the river (Childe 1929, 27). Research has suggested that the Black Sea

was a freshwater lake until the marine incursion from the Mediterranean in c.5500 cal BC rather than in c8000 cal BC as previously thought (Ryan *et al* 1997, 119, 124). This would imply that the Mesolithic period on the Danube saw exploitation of freshwater piscine resources and it was not until after c5500 cal BC that Neolithic people could have had access to marine fish (Bonsall *et al* 2000, 121).

Radovanović in her analysis of the Mesolithic in the Iron Gates concludes that while fish ‘played only the special role of *vital resource*’, they did not play a dominant one (Radovanović 1996, 37, 314 – her emphasis). By this, it has been taken to mean that although she did not think fish formed a major part of the diet, they did have an impact on the more spiritual side of those living in the Iron Gates. Her discussion on the evidence of fish remains is limited to a single page and her view of fish as a resource is coloured by her discussion of the larger game:

‘- the main fishing season (coinciding with migration of red deer to higher altitudes) in the summertime was one of the possible reasons for establishing camps on the riverbanks in greater numbers than before’ (Radovanović 1996, 55-56).

However, the settlements she is considering are very much permanent habitation sites with almost continuous use from the Mesolithic to Early Neolithic and not seasonal camps, which suggests that the selection of chosen sites may have more to do with the river and its resources. Anadromous fishing too is seen by Radovanović not as an important subsistence activity in its own right but rather akin to gathering in that it can be predicted (Radovanović & Voytek 1997, 23). This definition, however, could also be levelled against those relying on cervid migration routes where predictability is crucial to survival.

The gorge is formed where the Danube cuts through the junction of the Carpathian and Balkan mountains and archaeologically consists of a number of open-air sites on both banks of the river (Bonsall *et al* 1997, 51). The relationship of the people to the river can be seen with the sites which were selected for the establishment of long-term settlements. The most well known of these is that at Lepenski Vir, whose relationship to the river can be demonstrated with the modern name given to the settlement. The anadromous Danube sturgeon or beluga which moves up into the Danube from the Black Sea to spawn in the early summer, is caught not only for the meat it provides but also for its roe (or caviar) and its bladder for glue (Radovanović 1996, 50). Another member of the *Acipenser* family, the sterlet, is similarly caught for these three resources

and while it lives in the Danube, moves upstream to spawn. In total, ten species of fish have been identified along with other fresh water-based food resources such as the European pond terrapin, otter, beaver and mussel and snails. Migratory and non-migratory water bird faunal remains are also in evidence with species including swan, goose, mallard, teal, duck, red- and black-throated divers, egret and pelican. Avian varieties that prefer wooded riverbank (white tailed eagle, goosander, cormorant, black kite) have also been recovered (Radovanović 1996, 49). The piscine resources prefer a range of habitats varying from slow waters and whirlpools, clear and muddy waters, deep and shallow depths, indicating that all parts of the river provided elements of the diet during the Mesolithic.

Pottery, found at a range of sites along the Danube and made with local clay, includes dishes which have been described as dishes for large fish (those at Lepenski Vir are interpreted as primarily being used for sacrificial purposes) (Borić 1999, 53). There has been much discussion that ceramics have been found in what appear to be secure Mesolithic contexts as well as in Early Neolithic settings (Radovanović 1996, 282). It has been taken as a sign of contact with Neolithic groups elsewhere and an indicator of trade with Neolithic communities elsewhere (Roksandić 2000, 17). Padina is noteworthy for the large number of pots found in the Early Neolithic strata (Borić 1999, 53)

Table 22 below gives an overview of information from the Central European Uplands.

5.4.5 Seine basin:

The Seine is the second largest river in France, rising on the Plateau de Langres and flowing north-west through Paris to drain into the English Channel. It is 776km in length. Of all the rivers and wetlands under discussion it is the one that bears the closest comparison with the Thames and its basin in respect of its size, shape and longitudinal location. The site of Noyen-sur-Seine is, moreover, one of the few sites that demonstrate the use of river resources by hunter-gatherer communities.

Noyen-sur-Seine is a valley-bottom site situated in the upper reaches of the river Seine about 100km upstream from Paris (Figure 63). Work in the upper Seine and its confluence, the Yonne, began in the 1970s with an examination of the Middle Neolithic

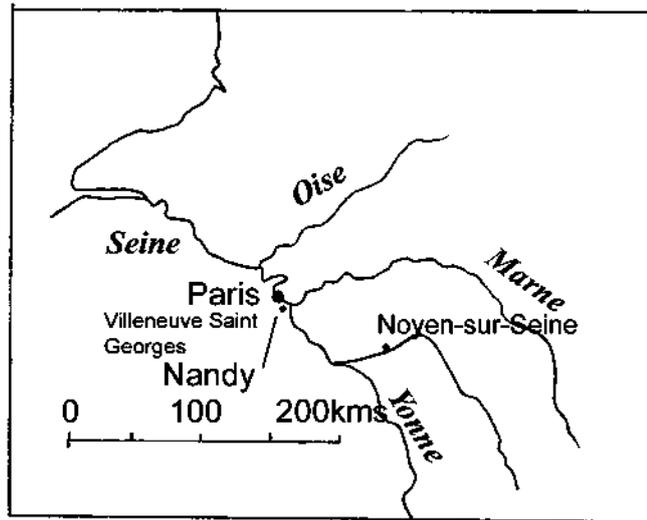


Figure 64 Noyen-sur-Seine

enclosures situated beside the rivers, often utilising the meanders (Mordant & Mordant 1988). The site at Noyen has two phases of construction – the earlier, a series of palisades cutting across the neck of a loop in a palaeochannel of the Seine and the later, a causewayed enclosure on the north bank of the loop

The current line of the Seine skirts around the site. Noyen has both Mesolithic and Neolithic phases dating from c7000 cal BC (Whittle, 1996, 29). While Mesolithic research in the Paris basin is well-known on the open, sandy sites, the work on the river bottoms is of a much more recent date and Noyen is remarkable for the deposits which span a long time period (Mordant & Mordant 1992, 55-56). It lies within an area that has a range of geological features – plateaux and terraces, loess, chalky dry hills, wetlands and river (Mordant & Mordant 1992, 56). The Seine floodplain at this point is 6-7km across and in the post-glacial period had many active channels, although it is not known whether it had an active braided channel system (Whittle 1996, 29,31).

Noyen was the first acknowledged wetland Mesolithic site in France, found in the search for Neolithic organic material in the mid-1980s, following the discovery of a causewayed enclosure (Mordant & Mordant 1992, 56; Coles & Coles 1995, 16, plate If). The site at this time was set within active but varied channels (Whittle 1996, 29). The Neolithic phase is what might be termed a ‘dry’ site archaeologically speaking with organic preservation lacking. Mesolithic remains were found in four main areas on the edges of peaty ponds and channels. There is a gap of approximately a thousand years between the two main phases of the Mesolithic period. There was no evidence of

domestic structures but the rubbish deposited during this period has produced a range of artefacts, structures and faunal and plant remains. There are *c.*3000 mammal bones - the majority of which comprise red deer principally with wild pig, roe deer, and aurochs (Mordant & Mordant 1992, 59). Those from the middle Mesolithic indicate the use of Noyen as a base camp during autumn and spring, with butchered parts of the hunted animals being returned here from the killing places (Mordant & Mordant 1992, 59; Whittle 1996, 29). Some aquatic species were also recognised – beaver, otter and turtles. In the late Mesolithic, wild pig became the most common hunted animal (Mordant & Mordant 1992, 59-60).

Although Mordant and Mordant, who excavated the site between 1983-88, noted that fishing was a major activity throughout the period, this is not stressed by Whittle who appears to prefer to place an emphasis on the hunting undertaken during this period (Marinval-Vogne *et al* 1989, 373, Mordant & Mordant 1992, 59, Whittle 1996, 29-31). In the earlier part of the Mesolithic period, eel was the dominant species and the fishtraps recovered from the palaeochannel (dated to *c.*7250-6600 cal BC Gif-6633) point to the method used to catch them in the summer months (Coles & Coles 1995, 17). Six large fragments have been excavated and all but one are made from willow with a simple cone shape, 0.85m in length with diameters ranging from 0.3-0.4m (Mordant & Mordant 1992, 61). The sixth is made from privet, which was also used for a rim of a basket (Coles & Coles 1995, 17, plates Ig, Ih). The eel appears to have been smoke cured over a fireplace as many of the vertebrae have traces of burning (Mordant & Mordant 1992, 59, Whittle 1996, 31). A piece of willow hurdle, *c.*1m² in size (interpreted as part of a light shelter) seems more likely to be of a section of fishtrap (compare with Pedersen 1995) (Mordant & Mordant 1992, 61). In the later Mesolithic layers, there is no evidence for fishtraps which seemed to have been replaced by the use of bone fish hooks; pike became the dominant species at this stage (Coles & Coles 1995, 17).

A canoe, 5m in length, of a similar date to the fishtraps, was retrieved from the bottom of a channel (Whittle 1996, 31). It was carved out of a pine trunk and shows marks from the use of a tranchet tool with the addition of fire to hollow it out (Mordant & Mordant 1992, 61). It is one of the oldest canoes in Europe, radiocarbon dated to 7150-6550 cal BC (Gif-6559) (Mordant & Mordant 1992, 61; Coles & Coles 1995, 17). It

was noted that ‘the Noyen dugout provides a high technology for wood use and a regular practice of navigation on the river Seine’ (Mordant & Mordant 1992, 61).

River (beaver and otter) and terrestrial animals were also hunted. The difference between what was caught/hunted and eaten is clear between the early and late Mesolithic occupation layers – ‘pike rather than eel for fish, pork for meat, kebabs or stew as a method of cooking rather than meat roasted on the bone’ (Coles & Coles 1995, 18). The reasons for this may be due to changes in resources and climate, and developments over time in domestic technology but it could also be due to the range of choice within the wetlands (Coles & Coles 1995, 18).

The Middle Neolithic was a time of major architectural building with a four-phase rampart across the neck of the loop and a causewayed camp along the north bank (Mordant & Mordant 1977, 234; 1988, 238ff). The third phase produced a rich range of material culture – ceramics, lithics, faunal material, human bones and figurine fragments ((Mordant & Mordant 1977, 247-248; 1988, 24

Table 22 summarizes the economic information from the European sites discussed above.

Table 22 European economic data

Site	Location	Period/Date	Evidence for fishing, processing	Fish species	Evidence for use of other water resources	Structures	Other Finds
North European Plain							
<i>Poland/ East Baltic</i>	Wetland, lakeside, island, confluence, sand dune	Mesolithic, Neolithic	Fishbone/scales, fish spears, harpoons, fish hooks, bark floaters, stone sinkers, traps, weirs, rods, creels	Pike, perch, roach, bream, tench, carp	Wooden projectiles for fowling, tortoises	Wooden platforms, huts, hearths	Flint assemblages, ceramics, bone assemblages
<i>Denmark</i>	Estuaries, lakeside	Mesolithic, Neolithic	Fishbone, netsinkers, fish hooks, leisters, nets, traps, weirs, points	Pike, tench, cyprinids, eel, salmon/trout, perch, ruffe, freshwater bivalves	Willow bast fibres, canoes, paddles; duck, beaver; waterlilies; red-throated diver, swan, sea eagle, dolphin, oysters, shell	Drying racks, wooden and stone platforms, islands, causewayed enclosures	Ceramics, axes, antler, artefacts, bows, arrows, spears, digging sticks; flint artefacts
<i>N Germany</i>	Lakeside	Mesolithic	Fishbone, nets, birch-bark net float	Pike, catfish	Paddles, canoe; beaver, pond tortoise, waterfowl, reed baskets		Perforated teeth for land/water mammals; arrows, spears, axeheads, birch bark container
<i>Rhine/Meuse</i>	Donken	Mesolithic, Late Neolithic	Fishhooks, harpoons, cone/plaited fishtrap, leisters, sturgeon weir, net, net sinkers	Bass, roach, tench, catfish, salmon, sturgeon, seatrout, shad; burnt fish bone; mullet, flounder, pike, eel, perch, tench rudd, carp, burbot	Paddle, reeds for flooring, canoes; beaver, otter; swan, gooseander, goldeneye, widgeon, eider, divers, duck, mallard, crane, cormorants, white-tailed eagles, teal	Pits, hearths, post holes, watering holes; canoe	Bows, arrows and arrowheads, axes, flint assemblages, cereals
Central European Uplands							
<i>Bohemia</i>	Riverside, sand, dunes, terraces; near to water sources	Mesolithic, Neolithic	Fishing weirs			Silos, postholes	Ceramics, axes, flint assemblage, antler hoe

<i>SW Germany</i>	Riverside, lakeside	Mesolithic, Neolithic	Fishbone, perforated fish teeth, fish vertebrae, stationary net, bone points, harpoons	Salmon, pike, wels catfish, bream	River mussel, dusk, teal, goldeneye, gooseander, cormorant, duck, coot, pochard, grey heron, beaver		Wooden spear, adzes/axes, worked bone and antler, lithics, potsherds
<i>Iron Gates</i>	River terraces in gorge	Primarily Mesolithic with a short Neolithic phase	Fishbone, bone fish hooks, net weights; drying/smoking pits, harpoons	Sturgeon/beluga, sterlet, wels catfish, carp, 6 other unnamed species	Swan, goose, mallard, teal, duck, red/black throated divers, egret, pelican; terrapin, otter, beaver, mussel, water snails	A variety of house structures, altars	Stone 'priests,' decorated objects/sculptures in bone, antler, stone; large dishes for fish; red deer (right bank), wild pig (left), woodland birds
<i>Seine Basin</i>							
<i>Noyen sur Seine</i>	Valley bottom/river loop	Mesolithic, Neolithic	Basket fishtraps, bone fish hooks	Eel, pike	Beaver, otter, turtles; willow for traps; canoes	Palisades, causewayed enclosure	Animal bone, antler tools, flint assemblage, ceramics, wolf, fox, aurochs, roe and red deer, pig, wild cat, animal hides

5.4.6 *Conclusion*

Tables 16, 17 and 22 have demonstrated the range of archaeological evidence that can be found in Britain, Ireland and NW Europe. It can be seen that it differs in many ways from that found within the Thames but it also is comparable in some respects. First, the similarities will be outlined and then the differences.

Similarities

Specialist equipment (fishtraps, harpoons, spears/arrowheads)

The variety of fishing equipment recovered from these other sites indicates the amount of evidence that is potentially missing in the Thames Basin. Organic items such as basketry, bark floaters, nets and associated wooden structures have been located in a range of different sites across Europe – some of them underwater, others in alluvial deposits. There should be an expectation of their appearance in excavations in similar locations, not a surprise when they are found. Wooden structures in the form of stakeholes should not be assumed to be granaries and the like but a serious contender for forms of drying racks, especially when found near to water. Similarly, the net sinkers, potentially confused with semi-worked stone, need to be sought for and recognised. Harpoons too should be identified as such, rather than confused with spears for use on land mammals, and points, leisters and rods which are evident in almost all areas, noted.

Subsistence (fishbone, fish residues)

The quantities of fishbone found suggests that a greater effort to sieve samples should be undertaken elsewhere. In addition, Neolithic ceramics should be examined for residues in addition to use-wear analysis of flint and stone tools – in places where bone preservation is poor, this would provide the route to identifying the presence of fish in the diet. The modern lack of faunal remains may not necessarily indicate that fishing and fowling were not undertaken in the past.

Location of choice (by rivers, on islands)

Considerable numbers of sites in the Mesolithic and early Neolithic are found near to water and islands or peninsulas are particularly attractive. Loops such as the Boyne and Noyen compare well with Dorney. Sand dunes or donken are reminiscent of the sandy

islands in Southwark, London. There is more to this selection than just animal watering places or the need for water.

Continuity of place (use in both periods)

A significant numbers of sites were obviously attractive at points during both periods in a similar way to Dorney and the various sites in Greater London. Noyen is one clear example, and others include Lepenski Vir, Ringkloster, Dubka and Swifterbant.

Trade (axes, from British and foreign locations)

This is more difficult to trace. There is the suggestion of trade in the Iron Gates Gorge, and in Denmark, fresh fish have been brought to the sites from inland. There are a number of references to axes but this is not so easy to trace as the Neolithic examples in England or those in Ireland. Dugout canoes at Ringkloster, Tybrind Vig and Noyen indicate travel and perhaps trading could be one purpose.

Differences

The most obvious ‘difference’ is the range and quantity of both fishing equipment and fish themselves when compared with that from the Thames Basin. This must be set against the expectation, in Europe at least, of finding them. In Greater London, for example, it has been suggested that there may have been a taboo on eating fish in the Neolithic (Jane Sidell pers. comm.) and the misconception that in the Mesolithic the rivers in Britain were not restocked after the last glaciation (Wheeler 1978 – see Ch 6) has led to a lack of anticipation of finding either the fish or the equipment used to catch them.

The range of fish species which have been recovered (given the difficulties in preservation and retrieval) indicates a broad-based approach to subsistence. While some are seasonal, others would have been available all year round.

In addition, on the Continent there is more evidence of settlements in the Mesolithic period. The presence of hearths, floors and platforms indicate more than an ephemeral hunting camp. Occupation of these sites for more than just short-stay periods or servicing them from nearby settlements is suggested by the use of basket traps and fish weirs. Drying racks and smoking pits used in the processing of fish would also indicate storage and use in the long term of the final products. Some of the sites were used

seasonally (such as Hardinxveld-Glessendam and Bergenschenhoek) and others changed use from permanent to seasonal use (Dubka). With flint scatters being the main indicator of a Mesolithic site in the Thames Basin, it is difficult to interpret whether this is the evidence of long term usage or intermittent.

Given that the examples discussed above are only a small number of the available sites, it is interesting to note that all across northern Europe, there is a similarity of the use of water-based sites in location, subsistence and equipment and its use.

5.5 Experiential/Symbolic

The sites considered above relate to water in an economic way in that they utilize it for subsistence, trade and communication, materials and transport, for example. There is, however, another face of this relationship between the communities and the various guises in which water can appear. As discussed in **Chs 1 & 2**, rivers, bogs and lakes are often perceived as repositories of votive offerings and it is this symbolic aspect which now will be explored. In the Thames Basin, three experiential/symbolic attributes were drawn from the evidence available:

- Monuments (proximity to water)
- Burials (in/adjacent to river)
- Ritual deposition (Dagenham idol)

Discussion will take place here under six headings: location, structures (which two sections will include the monuments referred to above), human remains (burials) and offerings (ritual deposition). The other two sections are on statuary, and rock art, neither of have so far been found in the Thames Basin.

5.5.1 Location

Loops and bends of rivers are other sites of choice as well as inland, particularly in the Neolithic but also in the Mesolithic. Tight loops on the Ouse and the Seine are illustrations of this. In other places, the topography itself is used with the river to create a separate area. The Brugh na Bóinne is a good example, with the river and a tributary to the west, south and east of the site and a shale ridge of which part has been utilised by Neolithic builders, to the north. The Ouse has similar locations where the 'open

side' is protected by ring ditches and the like. Within these protected areas monuments have been constructed, which in the case of those on the Boyne are built over an earlier settlement. This is not to say that these areas will have been placed at the periphery or outside of the community who were responsible for their creation. It is possible that they may have been constructed within the society rather than at its extremities (Malim 2000, 81). The rivers were a key part of existence not only for the water (for animals and humans), but for the aquatic resources (of vegetable, piscine and animal), for communication and for trade, and for grazing. They would be a focal part of the life and therefore use for ceremonial and burial activities is logical (Malim 2000, 81). Headlands that stretch out into lakes and locations at confluences are variants on the 'protected landscape' theme where the presence of water surrounds a significant portion of the occupation site – a duality of purpose that could equally apply to all the 'protected sites'. Star Carr is one such example. Mellars sees the preferred location from an economic point of view (Mellars & Dark 1998, 226-228) but there may be other and additional rationales behind this selection. He is somewhat dismissive of ideological reasons behind the choice of this headland which, given the stag frontlets for which Star Carr is known, would suggest a somewhat narrow viewpoint (Mellars & Dark 1998, 228; Clark 1954, 168-175).

In Ireland, the area already mentioned, within which the main activity at Brugh na Bóinne is located, is defined mainly by the Boyne circling around from the south-west to the north-east and with the river Mattock which flows across from the north-west to join the Boyne in the north-east corner of the region (Eogan 1986, 13; Cooney 2000, 29, Figure 2.3). Apart from one section of slightly raised ground to the west the site is surrounded by water. Knowth and Dowth are on higher ground but all the major and minor constructions overlook or are near to the water (Stout 2002, 22). The selection of the site both for settlement and then as a cemetery was surely influenced by the proximity to the river and its rich agricultural silts and aquatic resources in the first instance (Eogan 1991, 107). Of the three main tombs, the entrances of Knowth and Dowth face predominantly west or east, towards the arms of the river either side of the bend with the central group at Newgrange which are nearest to the river and whose tombs face within the arc SE to SSW - all pointing at the curve of the Boyne itself. This would appear to be intentional on the part of the builders.

With the exception of Wootton Quarr, all the sites discussed above were used during the Mesolithic period and in the majority of cases continued into the Neolithic and beyond. Islands, ridges adjacent to rivers, peninsulas and bends of rivers were chosen locations for long- and short-term settlements particularly during the Mesolithic and early Neolithic periods. In the late Neolithic and subsequent periods, choice of location moved to dryer ground but still within a near reach of rivers and wetlands (as illustrated repeatedly by the evidence in the Humber estuary). The reasons suggested for the location of the Later Neolithic sites appear on the evidence seen here, to be agricultural in nature and are connected to the need for drier ground with access to summer salt marsh grazing. On the other hand, a discussion of the siting of the earlier hunter-gatherer camps near water has usually centred on the availability of game at their watering places. The Early Mesolithic sites of Mt Sandel and Star Carr are both seen in this light but at a closer inspection this blanket interpretation may be, in fact, only part of the reason for the choice of location. The Early Mesolithic site at Bouldner Cliff is perhaps more typical of this period and its immediate use of local resources. There is an obvious attraction to sites which have access to water as a basic requirement. Given the rise in sea-level throughout the periods under review, these Early Mesolithic riverside sites, once inland, are probably now submerged as those are in the Solent. Star Carr may not be the norm, but an exception.

The location of sites may have more than just economic implications as discussed above. Once fishing weirs and traps are in place, it is not necessary for those servicing the structures to be living too close to the water. Hunters equally do not need to be living near watering places to catch their prey. The Late Neolithic and Bronze Age sites in the Humber estuary, for example, are at a distance away from the rivers and yet evidence suggests that cattle were brought down to the salt marshes for grazing. It is noticeable how many of the Mesolithic and Early Neolithic sites there are situated either on islands in the river or marshland, or on ridges and terraces immediately adjacent to the water. This can be seen on the Humber, the Ouse, the Somerset Levels, and in Langstone harbour in Britain. Overseas locations include many in Poland, the Rhine-Meuse delta and the Iron Gates.

To compare this with the Thames Basin, the deliberate selection of location is patent – Dorney in a loop of the river is bracketed by two causewayed enclosures and the positioning of the complex at Dorchester. The way the upper part of the Kennet is

enclosed by a series of monuments requires us to rethink the concept of landscape architecture, it is on such a grand scale. However, even in the Mesolithic, the choice of location has meaning. The placing of the early Mesolithic sites in one part of the Colne system and the later part in another was not accidental. The siting of the Stanwell cursus to run over the two collections of Mesolithic pits is more than happenstance.

5.5.2 Structures

This term is not used to include domestic structures but refers to those which may have symbolic connotations. Included are platforms built alongside and over water, such as that at Star Carr and the various ‘islands’ in Denmark. In the Neolithic period it is noticeable that many megalithic monuments and the like were built alongside rivers or within protected areas (see **Ch 6** below) that may also have overlooked the watercourse. In the case of causewayed enclosures, while they were often within these separated zones, they sometimes formed them (as in the Danish examples). The Neolithic phase at Noyen-sur-Seine saw a similar construction.

In **Ch 2** above, mention was made of the Dorset cursus and its visible contact with water during the Neolithic period in three locations along its 10kms length (Tilley 1994, 173ff; Brophy 2000, 64). A simple realignment of the monument would have meant it could have avoided these and so begs the question ‘why?’ Could sound be one key to answering that conundrum? Any movement of water produces sound. Walking through water for example cannot be done quietly with ease – it is possible but difficult. The resonance that is heard can be seen at a number of levels. On the three locations on the Dorset cursus for example, where water would have had to have been traversed, movement would have been very audible not only to those walking through the water but to others some distance away, perhaps on other parts of the monument. In two of those places it was also necessary to climb down a cliff to reach the water, so the wetlands would have also been visible to those travelling along the monument prior to their being reached as well as heard (Haughey 2007a). The use of sound in prehistoric societies has begun to be explored in a number of ways (for example, Watson & Keating 2000) but this has tended to be humanly-manufactured sound, rather than that naturally produced. In monumental circles, stones often can act as sound boards and on Orkney, for example, many of these are near water. Stone built tombs and barrows all possess the facility to act as resonators of sound although most of the work undertaken

on this particular aspect has been concerned with humanly generated sound radiating out from within the structure (see Ch 6 below). Further discussion on the sensory aspects of rivers – sound, touch and vision – is found in **Ch 6**.

The causewayed enclosures discussed in **Ch 4** above, are to be found in other locations near water in Europe. Denmark saw them appear, in the earlier part of the Neolithic period), in a similar style to those in Britain. Those which have been identified are ‘characteristically located on low promontories at valley bottoms surrounded on two or three sides by rivers, streams or bogs’ (Tilley 1996, 280). Noyen saw a structure built across a tight bend in the river Seine and while not a causewayed enclosure, it is not too dissimilar. While it is not part of this research to discuss the contents of the enclosures, their location so close to water seems pertinent, as does the fact that their construction forms a ‘protected place’ within the landscape (see **Ch 6** below).

5.5.3 Burials

These have been recovered in a variety of circumstances from both Mesolithic and Neolithic periods. Cemeteries (that is several burials together) alongside the river in the form of basic interments or burial within monuments such as barrows or tombs occur in a wide range of locations including the Ouse and the Boyne, the Zgłowiączka (Poland), the Rhine-Meuse delta, the Ohře (Bohemia), between the Elbe and the Saarle (Germany) and in the Iron Gates gorge. Often there is a correlation between the watercourse and the positioning of the body. Those on the Ohře are aligned with the river, as are a significant number on the Danube, where others have been placed to face the water. In some cases there is evidence of settlement at or near the site but others appear to be in isolation. How much this refers to the lack of discovery or to the actual state of affairs is debatable.

Human crania have also been recovered, often fragmentary. The Severn has one of Neolithic date as does the Shannon. These could possibly be the final remains of riverside burial sites. Other examples are leave less room for doubt. So-called ‘nests of skulls’ have been recorded in SW Germany and crania have been found under floors of houses in the Iron Gates. Human bone including skulls and long bones were found at Noyen-sur-Seine with possible defleshing cutmarks.

There are many burials in settlement sites of the Iron Gates. Those at Lepenski Vir often include heads buried under the house floors, mandibles near hearths, neonatal skeletons at the back of houses, between and beside houses (Srejić 1972, 122; Radovanović 1996, 174-187; Roksandić 2000, 29-33). One burial consisted of a body 'lying on its back with the legs bent and knees apart so as to fill the whole grave with a triangular-trapezoidal shape' (Hodder 1990, 27). Following the shape of the houses the broader end of the grave faced east and the skull was propped up to look east, copying the sculptured heads within the houses (Hodder 1990, 27). One male burial at Lepenski Vir, two at Padina and one Vlasac were interred in a sitting position and facing the Danube (Borić 1999, 61). Perhaps some of the most interesting burials are those at Vlasac where extended bodies were placed variously with heads towards the river, feet towards the river and heads pointing downstream parallel to the Danube (Radovanović 1996, 187-219; Borić 1999, 61). This has led to discussion of the ideological nature of the river and the Iron Gates. Radovanović sees the positioning of those lying parallel to the Danube as 'symbolizing the notion of souls going down the river' (Borić 1999, 61).

It is not the intention here to discuss the deposits of human remains which have been recorded in the various bogs that are found within Denmark and N Germany. They begin to appear in the early Neolithic and several have been found with dugout canoes suggesting that these may actually be burials rather than sacrifices (Koch 1998, 156). Some show 'clear traces of violent death' and include men, women and children found both singly and in groups (Tilley 1996, 97, 99).

Hohlenstein Stadel and Kleine Scheuer in SW Germany are a cave and adjacent rock shelter situated in the valley Lone, once a tributary of the Danube. At the entrance to the cave is a pit that contained three skulls (a male, a female and a child), partially covered in red ochre, dated to the Early Mesolithic c9875 bp (Jochim 1998, 77). Cutmarks on the two adult skulls and associated vertebrae suggested that the heads had been forcibly removed from the bodies (Jochim 1998, 77). They all faced southwest and the female was surrounded by ornamental fish teeth as at Dietfurt and Fohlenhaus.

Thus far there have been a limited number of burials and human remains found in association with the Thames river system. Those referred to above in Greater London are probably the nearest indication that we have of a connection between the river and

mortuary remains and these date to the Neolithic. It may be that by tracing the earlier path of the Thames in the metropolis that more may be found of Mesolithic date.

5.5.4 Offerings

This specifically refers to items placed within water. As discussed in **Ch 2**, not all objects which have been retrieved from a modern watercourse will necessarily have been deposited in antiquity into such a location. Also the method of deposition may not have been intentional. Those that are mentioned in this section would appear to have been deliberately placed with the intention of non-retrieval. Objects have a value which is attributed to them by the owner or their communities both local and regional. This value may be measured by rarity, prestige, usefulness, history of exchange or longevity of ownership, to suggest a number of possibilities. The reasons for ritual deposition of an item are equally wide ranging and include as grave goods or offerings to a deity. The varying combinations of value and reason means that almost anything can be deposited almost anywhere. Three categories will be considered: effigies and carvings, axes, and pots and their contents.

a) Effigies and carvings.

The so-called wooden ‘god-dolly’ found beneath a trackway on the Somerset Levels could possibly be an effigy, although as noted, its intentionality is unclear. Those found in Poland (which also includes those from bone, clay and amber) and in the Rhine-Meuse delta are less ambiguous (for example, the wooden statuette found at Willemstad is dated to c2500 cal BC (van Es & Casparie 1968). Given that many of these are made from organic material, it is possible others have not survived in spite of the effects of waterlogging. They are humanoid in appearance and as such may be the forerunners of other figurines which have been dated to the Bronze Age and later, such as that from Roos Carr in the Humber estuary, (Coles 1990, 315-319, 326; Fenwick H. *et al* 1995, 150; Coles & Coles 1995, 70-72). Most of those from Britain are similar in shape and are single figures (Coles & Coles 1995, 70). Polish wetlands have preserved a range of artefacts including household utensils with similar decorations of fish, beaver and waterbirds. Whether there is any ideological significance in the choice of this type of decoration is open to debate. Artefacts from the Iron Gates, however, do have symbolic drawings of fish and water-related images on antler, bone and stone.

The Dagenham idol seen here below, made of pine and found in marshes near to the Thames, is the only effigy that we have of this early date (c2500 cal BC) in the Thames Basin.



Figure 65 The Dagenham Idol (Colchester Museum)

b) Stone and flint axes

There has been a large number of axes from both the Mesolithic and Neolithic periods recovered from water-related sites across Europe although how many of these have been deliberately deposited is questionable. On many sites in the Humber estuary these have been interpreted as evidence for forest clearance rather than with any ritual connotation. Dredging has produced many axes. That on the Labe, in Bohemia recovered a number of early to middle Neolithic battle axes. Dredging and drainage on the Shannon and the Bann has produced over a thousand examples from a number of periods and the total known to date from the whole of Ireland has been found mainly in watery contexts such as riverbeds, bogs, banks, lake shores and lakes. Two points of information may qualify this plethora of Irish evidence. The axes have been retrieved from modern locations which may not necessarily mirror those from the early prehistoric period and also Ireland has an inordinate number of potential ‘watery contexts’ making the recovery from a dryland site more rare.

The 98 Neolithic axes and picks recovered from the current foreshore at the Wootton Quarr site may have originally been deposited on an inland landscape with oak forest, the coastline at this time situated 2-4kms north of that of today. It was only in the Late Neolithic that marshy conditions impacted on the local environment with rising sealevels. The antiquarian, Hubert Poole, posited the idea of submerged land surfaces, particularly off the northern coast. It is notable that the large amount of flint material found in the Quarr palaeochannel comprises several thousand flakes and only 70 tools.

Those axes which have been imported from considerable distance either from within or without a particular country are those which may be considered prestige artefacts. 'Such exotic items stand out clearly from the range of local products' (Bradley 1998, 44). The European examples are all Neolithic in date. They include the Alpine jadeite axe found adjacent to the Sweet Track in Somerset, the Group VI, XVIII and XX axes from sites on the Humber estuary and the 'chocolate' flint from the Holy Cross Mountains in Poland.

Finds associated with human remains include a small axe or chisel found near to the human skull fragment on the Shannon estuary and another polished axe was recovered from the Linkardstown burial.

There is a danger with stone axe studies that the Neolithic examples cloud the view and are given 'added significance' when compared with those from the Mesolithic 'as the lifestyle of sedentary hunter-gatherers changed and attention shifted from a largely coastal economy to a greater commitment to the *land*' (Bradley 1998, 73 – his italics). The manufacturing of wooden structures in the Mesolithic including those for possible ritual activities as well as for catching fish, utilised axes for the woodland management and wood cutting involved. Those Mesolithic axes found in a watery context could therefore have also had 'added significance' – a point of view that Bradley began to address in the second edition of his book *The Passage of Arms*, published eight years after the first (Bradley 1998, xvii). Koch records a number of Mesolithic axes that appear to have been deposited 'in wetland areas under the same circumstances as the Neolithic offerings' and notes that they are rather 'spectacular' (Koch 1998, 157). Alternatively, not all Neolithic axes (often considered ritually deposited) have to be votive offerings. It is a question of balance between the two arguments. As noted in **Ch**

4, the axes on the Thames Basin have been given undue prominence as result of so many being recovered by dredging from the river.

c) Pots and their contents.

Bradley also included the possibility that ‘Ertebølle pottery may have played a role in Mesolithic society’ in the very short revision of his discussion of votive offerings in bogs (Bradley 1998, xvii). Koch suggests that two such finds could be included from wetland sites in Jutland (Koch 1998, 157). The remainder under consideration here date to the Neolithic period. The various finds from Denmark suggest that this was common practice during this time although it did not proceed at the same pace throughout the period and while many seem to be intended as votive, not all examples can be described thus. Other locations include those from Bohemia and the Somerset Levels as well as from burial contexts in Ireland. Where the pots have been either excavated or retrieved *in situ* from peat diggings, it is possible to be fairly confident as to the conditions of deposition. Unfortunately, a number have been recovered by what Koch calls unknown circumstances and so the context is lost (Koch 1998, 157).

A final observation on the beginnings of oblations in watery places comes from Bradley who concludes that “it may be more helpful to suggest that offerings of organic material and artefacts were first made by hunter-gatherers and these practices were *transformed* during the Neolithic period, when they were undertaken on an increasingly large scale’ (Bradley 1998, xviii).

5.5.5 Rock art

In the Neolithic, with the potential change in attitude towards rivers and water resources, the introduction of rock art particularly into tombs is quite significant. What is interpreted as the pictorial representation of the moving water in the form of wavy, zigzag or serpentiform lines as well as the ‘ripples’ of the concentric rings brings the water into the heart of the tombs. Just as the light of the winter solstice has been noted shining into the central chamber at Newgrange on the Boyne (Stout 2002, 44, 47), so it is possible that the sound of the nearby river could penetrate into the heart of the monument as demonstrated by the physical notation on the stones.

Continuing the discussion begun in **Ch 3** above, the various incidences of rock art (that is, the zigzag/wavy lines and/or concentric circles) currently known from megalithic monuments in NW Europe will be outlined here. In the Iberian peninsula, the wavy line motif (described in its two versions as vertical and horizontal serpentiforms), has been recorded at a total of 60 locations out of a possible 156 (Shee Twohig, 1981, 24-26). The vertical ones are fairly evenly distributed between the region bounded by the Mondego and the Douro, and that north of the Douro stretching into the NW corner of the peninsula, while the horizontal type is heavily concentrated in the latter northern area (Shee Twohig, 1981, 14-15, 26). While a number are found near the west and north coasts of Portugal and Spain, the majority would appear to be near to rivers of varying sizes. Significantly, three-quarters of the megalithic rock art in the peninsula has been found in passage graves with the remaining 25% being recorded on menhirs, standing stones and other sorts of tombs (Shee Twohig, 1981, 13). This ratio of distribution can be seen in Brittany, in NW France with 126 out of 169 sites being located in passage tombs (Shee Twohig, 1981, 56-57). Here wavy lines can be found at 28 locations, the majority of which are currently to be found at coastal or island locations with a small number in a riverine situation, such as Colpo on the Oust (Shee Twohig, 1981).

Rock art is one medium that can illustrate the importance of water and its sound (Haughey, 2007a). British rock art studies has principally involved carved or pecked surfaces, although the use of pigment in sheltered locations has more recently been detected. At present, the spread of known sites is uneven across the country (for example Beckensall 1999, fig 1) but this does not suggest that its use was not more uniform, merely that the current findspots are not definitive. It is intended here to briefly discuss the location and style of a few of those sites which have already been recorded. The range of symbols uses follows that found in other parts of NW Europe (for example Shee Twohig 1981, 23, 27; Beckensall 1999, 13ff).

Two that are consistent in appearance are the concentric rings (that vary from 2 rings to in excess of 5) and the so-called serpentine lines or grooves (which in Britain tend to be a single sinuous or zigzag line). Zigzags and wavy-lines, circles and arcs are found in profusion feature at many sites, not all in water-related regions but the contention is that they do have a base in the movement and shape of water. Concentric circles can be seen as symbolising the ripples when an object is dropped into water. Rivers and wetlands are often perceived as places of ritual deposition. Dropping, throwing or even placing

votive offerings in such a context would result in ripples being visible. A zigzag, single or multiples, could be a euphemism for a river or for ripples on the water (Haughey 2007a).

In N Yorkshire, for example, decorated rocks can be found in association with the sources of the Wharfe and Aire rivers – either adjacent to the water, on nearby raised land or within a 5km distance (Beckensall 1999, 69). Further downstream, clusters of sites can be found less than 0.5km away from the Wharfe but situated 100m above, overlooking the watercourse. In addition, a handful of examples lie adjacent to the tributaries of the Aire (Beckensall 1999, 71). In Scotland, in a further example on Tayside, locations have proliferated along the steep sides of the valley as well as by the river itself, with 45 sites within a 30km stretch (Beckensall 1999, 112-3).

Rock art examples are found in the Boyne in profusion, particularly at Knowth and Newgrange, within the monuments and on the surrounding kerbstones. Two of these latter at Knowth for example, (after Eogan 1986, plate 61) combine a number of ciphers, which suggest could almost be seen as ‘plans’ of the Boyne site with the river and the three main tombs plus the satellite graves. One reason for the deliberate orientation of the tombs might be connected with the movement of the sound of the river itself, echoing inside the monuments (Haughey 2007a). The range of circles and arcs can be seen on a number of stones (after Eogan 1986, pp 158-9, 162-3, 161). While the more complex rock carving can be seen easily on kerbstones surrounding the tombs (such as Figure 4(i) after Eogan 1986, plate III) the most ornate ones, particularly one at Newgrange (Figure 4(ii) after O’Keilly 1982, 181) tend to be found deep inside the tombs. The decorated stones appear to indicate the points at which the sounds of the nearby water could still be heard within the tombs as well as without (Haughey 2007a). The zig-zag or serpentine lines and concentric circles referred to above are to be found here in profusion.

5.5.6 Figurines and statues

On the Danube, sculptures and stone altars with painted or pecked showing fish or symbolic water patterns have been found on some of the sites in the Iron Gates in the Mesolithic layers. Padina has what are interpreted as two stone altars including one that has what has been described as a fishbone motif (Radovanović 1996, 140). Vlasac has

several boulders including some painted red and another with ‘an engraved motif of a net within two bands and a schematic human figure’ (Radovanović 1996, 157). This latter decoration appears to be more like a v-shaped fishtrap rather than a net for seine netting, for example. Hajdučka Vodenica has decorated boulders as well with fishbone motifs being found on one of greenish igneous rock and a sandstone ovoid with a pair of conical hollows and parallel zig-zag lines. Cuina Turcului has two massive boulders of sandstone, one of which is decorated with meander motifs which could be interpreted as waves, pathways or river (Radovanović 1996, 159).

Lepenski Vir has produced the largest number of sculptures and structures interpreted as altars, all made from quartzite sandstone with silica impregnation, which eroded out from a single geological formation not far from the settlement (Radovanović 1996, 140). Some of the boulders appear to have secondary pigmentation or signs of burning. The carved decoration varies from waving lines, meanders and fishhooks to faces. These faces seem to have a close affinity with features found on fish with their thick pouting lips and goggling eyes (for example, Figure 60 and Srejšović 1972, plates 47, 52 and 53).



Figure 66 Mesolithic sculpture from Lepenski Vir (Srejšović 1972, plate 52)

Others have a fish-like cone shape (Radovanović 1996, 148, figure 3.55) or decoration like scales (Srejović 1972, plate VII) or in wavy lines suggestive of either stylised scales or water (Radovanović 1996, 149, figure 3.56). The different interpretations of what appear to be similar carvings arouses interest. A stone interpreted as an altar from house no. 45 is described by the excavator, Srejović, as being ‘carved in the likeness of a fish (perhaps a carp?)’ with its circular hollow and concentric lines (Srejović 1972, plate 41). A not-too-dissimilar carving from the so-called sanctuary of house no. 51 is described as showing ‘a vulva in a specific physiological state, before giving birth, with its anatomical details’ (Srejović 1972, plate 38). While accepting that it is difficult to judge such detail without viewing the object itself and also that any symbolic carving could easily have a multiplicity of meanings from a modern point of view, it is interesting how comparatively little of the decoration is described as relating to the river and its contents. Beluga and wels catfish can grow to enormous lengths and while no beluga were recorded at Lepenski Vir, they would have had to pass the site to get upstream as far as Padina where evidence has been found. Wels catfish faunal remains have been found at all Mesolithic phases at Lepenski Vir (Radovanović 1996, 56). This is not to deny the significance of land animals to the hunter-gatherer communities in the Iron Gates Gorge. As seen above, red deer and aurochs were hunted and remains of antlers have been found in both as grave goods and as deposits within the various houses (Radovanović 1996, 53, 157, 200) One altar (from house no.33) is carved in the form of a possible deer’s head and another has been named ‘the deer in the forest’ although this interpretation is open to question (Srejović 1972, plates 42, 54). What are interpreted as sacrificial offerings of deer and fish have been recovered from some of the houses and a number of the graves at Lepenski Vir (Srejović 1972, 120; Hodder 1990, 27, 29).

In the east Baltic and Polish region, the wetlands have preserved many organic artefacts including household utensils (ladles, bowls, spoons etc) as well as effigies. Some of the finds include decoration, particularly in the form of zoomorphic sculpture (including, for example, elk-headed terminals, bears, snakes, fish, beaver and water-birds) as well as designs on bone and, occasionally, wood. Polished stone, amber and clay are other mediums used as surfaces for artwork. Human effigies have been found in clay, amber and bone but the two life-sized wooden idols found at sites near the Latvian coast are exceptional (Zvelebil 1987, 110).

5.6 Discussion

At the conclusion to **Ch 3**, a series of analogies were drawn from the ethnographic, ethnohistorical and non-European material under discussion and in **Ch 4** a similar exercise was undertaken with the Thames Basin data.. It would seem pertinent to undertake the same exercise with the archaeological information that has been examined above. Following the earlier format and mirroring above, the attributes will be divided into economic and symbolic aspects, although there are points which could sit in both lists.

A number of the attributes included in the previous chapter could also apply here: Where the surrounding landscape is difficult to travel through, rivers are the main routeway and in other situations is the faster alternative.

Use of fishing nets, traps, weirs etc resulted in a greater yield for less effort when compared with hunting.

Economic attributes

- In the Mesolithic and Early Neolithic, the sites of choice were either in the river/wetland (islands, dunes, ridges) or immediately adjacent (river terrace/confluence). In the Late Neolithic, sites were close by water resources.
- Fish and waterfowl are as common as, and a more predictable resource than animal and plant remains.
- Fishing equipment has remained virtually unchanged since the Mesolithic, is universal in design and particular in its usage.
- Catching and processing fish can require a commitment to a particular area or region

Symbolic attributes

- Rivers in the Mesolithic and Neolithic may be central to a community rather than peripheral or a boundary.
- Loops, bends, islands, dunes may be 'protected areas' within floodplains.
- Structures are found by or projecting out into water.
- Burials and cemeteries show an affinity to water.

- Mesolithic and Neolithic objects found in watery contexts may have equal ‘added significance’.

5.7 Conclusion

It is not my intention here to suggest that rivers, wetlands and the like played a major part, largely unsung, in the Mesolithic and Neolithic periods in a variety of ways. The use of aquatic resources - piscine, avian and floral – contributed to the way of life of both the hunter-gatherer and early farming groups economically and symbolically. The preferred choice of location by many communities was within or adjacent to rivers and other water sources as attested by the archaeological evidence.

The material of the Thames Basin is mirrored in many ways by that found in the rest of Britain and Ireland, and mainland Europe. There are certain aspects which have yet to be found in the Basin (namely statuary and rock art). While it would probably be unreal to expect rock art to be discovered for these periods in the metropolis should excavators reach the bedrock, it is highly possible for it to be found further out into the Basin itself, particularly where there are projects such as that at Dorney being undertaken. Large scale excavation, especially where palaeochannels will be exposed, has the potential to find evidence of equipment and fish species as noted in abundance in Europe. Rock art and the more ephemeral side of life are waiting there to be found.

6.1 Introduction

In **Ch 3**, an analogy was drawn of economic and experiential/symbolic attributes extracted from the ethnographic, ethnohistorical and non-European archaeological data. **Ch 4** produced a similar list of attributes from the Thames. In this chapter, these two lists will be examined and compared, looking first at the economic data and then the experiential/symbolic. In conclusion, consideration will be made at crossing the divide between economic and symbolic.

6.2 Economic attributes

From **Ch 3**, the economic attributes are as follows:

- 1 Temporarily sedentary during summer and winter at a base camp normally near running water and with access to sustainable food resource
- 2 In spring and autumn, migration was undertaken in a whole group or a part to procurement locations before returning to base camp
- 3 Until the advent of animal husbandry, fishing was the preferred form of protein
- 4 Aquatic resources were generally more predictable than animal resources
- 5 The use of fishing nets, traps, weirs etc resulted in a greater yield for less effort when compared with hunting
- 6 Whilst hunting was seen as a male preserve, fishing was sometimes undertaken by women as well
- 7 Where the surrounding landscape was difficult to travel through, rivers were the main routeway and in other situations was the faster alternative
- 8 Agriculture was normally begun in places where there was fertile alluvium

Those from the Thames in **Ch 4** are:

- a) Evidence for use of river resources:
 - Specialist equipment (fishtraps, harpoons, spears/arrowheads)
 - Subsistence (fishbone, fish residues)

- b) Location of choice (by rivers, on islands)
- c) Continuity of place (use in both periods)
- d) Trade (axes, from British and foreign locations)

The following discussion is based around these two sets of attributes (1-8 and a-d) with the relevant points from each being extracted and placed at the start of each section.

6.2.1 *Locations of choice:*

- 1* Temporarily sedentary during summer and winter at a base camp were normally near running water and with access to sustainable food resource
- 2* In spring and autumn, migration was undertaken in whole group or a part to procurement locations before returning to base camp
- b)* Location of choice (by rivers, on islands)
- c)* Continuity of place (use in both periods)

The occupation of an archaeological site is difficult to judge. If the residents are returning year on year to a particular site then it can initially be difficult to distinguish between that and one that has been continually occupied. Examination of animal bones may indicate the age at death, indicating whether a spring/summer occupancy, for example or an autumn/winter one. The presence of migratory birds and knowledge of their breeding habits will indicate other times of occupancy. Plant evidence is another method but the storage of certain foods over the year could bias our understanding of the periods a site was in use.

This also does not take into account the concept of base camps, from which mobile groups could be sent out at the right season to hunt, gather and fish. This method of procurement may have been the norm in the Mesolithic and so the choice of location may have more to do with a need for a good base site with a sure supply of water than one where food was instantly available. Food could easily be transported from where it grazed or grew, whereas water needed to be accessible where the people were based. Much has been said of certain sites being located by water because this was where animals came to drink – Star Carr and Lepenski Vir are two examples. In practice, to

place a settlement where the animals came to water would actually discourage them and so there must be other reasons for this careful choice of location.

The selection of site for a settlement or a hunting camp, for example, is not just determined by the availability of water. This could be accessed also from springs or humanly-made wells. In the Mesolithic and Early Neolithic, however, there is ample evidence to show that rivers were locations of choice in many regions around Britain and also abroad. The Humber estuary had a noticeable presence on each of its many tributaries (Van de Noort *et al* 2000, 246). The Shannon, the Ouse, the Severn and the Bann show clear evidence of the Mesolithic with the first three rivers also having Neolithic phases too. In Ireland over 72% of Mesolithic sites are in close proximity to water (Stout 2000, 19). Even the Somerset Levels and Langstone Harbour demonstrate evidence of both periods.

Delta areas such as the Rhine/Meuse with its islands were logical choices for settlement or hunting camps given the wealth of local resources both all-year round and migratory. On the other hand, sites on the Danube both in the Iron Gates gorge and the headwaters in the Black Forest region of Germany, on the Labe/Elbe, the Ohře and the Seine were less obvious preferences. They were selected as suitable locations for a variety of purposes.

In the Thames Basin, the numbers of both early and late Mesolithic sites adjacent to the water is conspicuous as can be seen for example on the Kennet and the Colne. In Greater London, “[the topographic data] also suggests tantalising evidence for a north to south channel, presumably draining the south London area passing through Camberwell and Elephant and Castle, to a confluence with the Thames at Borough. It is notable that Mesolithic finds cluster along the eastern side of this route” (Sidell *et al* 2000, 107). With the increasing rate of erosion on the foreshore of the estuarine lower Thames, the expectation of more Mesolithic material emerging is high.

The work in the Dorney area of the Middle Thames Valley indicated that, in general, early Neolithic activity lay close to the Thames (Allen *et al* 2004, 93). This contrasts with the views expressed that in the Neolithic period, London and the Thames was a backwater (Wilkinson & Sidell 2007) and that there was no early Neolithic in London

(Jane Sidell pers. comm.). Early Neolithic evidence in London can be seen on islands (such as Chiswick eyot) and at the edge of the floodplain.

The locations of choice in the Mesolithic and early Neolithic periods were adjacent to rivers and on islands in the rivers – as can be seen too by the work on the Humber estuary, the Somerset Levels, the Iron Gates gorge and Noyen-sur-Seine, for example. The monumental features (discussed below in more detail) of the earlier Neolithic provided a link between the river and the people that took into account the changing regime of the water. In the later part of the Neolithic, there seems to have been a movement back from the water's edge which again can be seen on the Humber. With the beginnings of agriculture beginning to affect subsistence strategies, the river margins or at the least the floodplain continued to be attractive in the later Neolithic (see below).

Continuity of place in this context can be seen at a number of locations around the Basin. For a variety of meanings, and a meaning that may change over time, people used particular sites at points throughout the periods. This is not to suggest continual or continuous occupation, more to show that the attraction of a particular site was strong enough for it to be revisited during the Mesolithic and the Neolithic. I would suggest that part of this attraction was the knowledge of the availability of food resources as well as the usefulness of the site itself. It is often possible to see the continuity of use from the Mesolithic through to the later period (Field 2004, 156). Noyen-sur-Seine is one example in Europe, and the complex in the Heathrow area and that at Dorney are others within the Thames Basin. In all these cases, the earlier material lies directly beneath the later, indicating either the possible memory of the Mesolithic site or, perhaps more likely, the reuse of a good location. Similarly, on the Boyne, there was first use of the rich resources in the area before the ritual phase was begun.

Houses in early prehistory are rare occurrences in Britain. Examples include Mt Sandel and the remains of a Mesolithic shelter and a Neolithic house uncovered in advance of work for the Channel Tunnel Rail Link near White Stone, on the Medway, in Kent on the fringes of the Thames Basin (Hayden nd). While the number of sites country-wide has increased slowly over the past decade, the corpus of Neolithic houses in England is still woefully small (Thomas 1996b, 1ff). Holgate in his study of the Upper Thames

valley in 1988, used flint and pot scatters as indicators of settlement (Holgate 1988, 28ff). It is Holgate's criteria which have been utilised in this research.

The importance of islands in the Mesolithic and Early Neolithic cannot be understated and their potential for information about subsistence, structures, and social organisation. Unfortunately given the constant shifting river channels and (re)formation of islands that happened during this time, along with erosion of the sand and gravel islands as well as burial of landscapes, many sites will have been lost either completely or buried under deep overburden of alluvial deposits. The eyots on the Thames are clear illustrations of this problem, especially the one at Chiswick and another at Shadwell. The redefining of the north and south banks of rivers as palaeochannels silted up and the main river channel settled elsewhere, has meant problems in recognising such locations for archaeologists at the same time as providing opportunities to excavate river sites that were no longer under water. Islands are often formed where two tributaries enter a main channel in close proximity – Vauxhall is one example, as is Runnymede. The former site is no longer there as it has been removed during the dredging operations on the Thames, but the latter can be found on what is now dry land.

6.2.2 Subsistence strategies

- 3 *Until the advent of animal husbandry, fishing was the preferred form of protein*
- 4 *Aquatic resources were generally more predictable than animal resources*
- 5 *The use of fishing nets, traps, weirs etc resulted in a greater yield for less effort when compared with hunting*

a) *Evidence for use of river resources:*

Specialist equipment (fishtraps, harpoons, spears/arrowheads)

Subsistence (fishbone, fish residues)

Successful subsistence is the legacy of using all the resources available. Those available in the British Mesolithic and Neolithic include land (red deer, roe deer, aurochs, wild boar) and domestic (cattle, pig) animals, along with migrant and non-migratory birds (including red-throated diver, sea eagle, mallard, tufted duck, bittern, Bewick's swan, goosander, golden eye, widgeon, eider, widgeon, duck, crane, mute swan, and cormorants). Equipment for hunting and fowling would in some cases be

similar to those used to catch fish – spears, arrows and traps with nets used specifically with birds.

Plant sources included cultivated cereals as well as wild fruits such as hazelnuts, fruits from waterlily, dogwood and hawthorn. Baskets would have been utilised when gathering foodstuffs.

The principal commodity described in this section is the aquatic resources that were available in the Mesolithic and Neolithic periods. The aim, here, is to put into context with physical evidence the notion that those resources **were** utilised in the river systems rather than just assuming that usage. This attitude of assumption can be seen on the Humber and the Somerset Levels. A list of fish and the equipment used to catch them is listed in **Appendix 2**.

Waterside sites have often been described as those giving easy access to animal watering places (Star Carr and Lepenski Vir being two examples) but this may be just one reason for location choice. On the other hand, perhaps if you were trying to catch animals the last place you want to put your habitation is where they come to water, as mentioned above. Antler barbed points found at Holderness were interpreted as being used for hunting land animals. They are also compared with similar examples found at Star Carr (see Ch 4), which Clark interpreted as leister spears, used for catching eels and fish. Mesolithic harpoons have been recovered from the London Thames (see **Appendix 2**).

The Mesolithic is termed a hunter-gatherer period principally because bone is its major subsistence deposit but with the bad preservation of plant and fish evidence, ‘it may well be that the importance of hunting in temperate Europe has been over estimated’ (Cooney & Grogan 1994, 7). Tilley agreed with this point of view:

‘It is extremely difficult to assess the relative contributions of plant and animal foods in the diet of the Mesolithic populations. There is an obvious bias in the archaeological record in that plant food remains are not usually preserved whereas bones are. In much of the archaeological literature there is a systematic bias emphasising meat eating and the role of hunting.’ (Tilley 1996, 25).

While it is obvious that land animals (both domesticated and wild) constitute a significant part of the diet of most hunter-gatherer and early farming communities, what has not been so clear is the role aquatic resources play in the early prehistoric economy. This section, therefore, will concentrate principally on the latter.

Wheeler's deduction that there were no pike in the Mesolithic at Star Carr has not allowed for any further developments since (Wheeler 1978). It is possible that archaeological advances and knowledge accrued in the 30 years since he published his article might give a different result if the evidence was re-examined today. Wheeler's assertion has often been expanded by others to mean that there were no fish at all at Star Carr and even no fish in England during the Mesolithic (Coles & Coles 1989, 95; Tim Schadla-Hall pers. comm.) *Cyprinidae* found at Seamer Carr since then as well as evidence for fish processing at Thatcham in Mesolithic has opened the debate once again. It is not much but it is a beginning. If you are not expecting to find evidence then you don't really look hard or at all.

Preservation (or the lack) of fishbone has been the topic of much debate:

'....we should not forget that fishbones and fishscales rarely preserve well, and are often difficult to see in a wet excavation. Hence their absence may be an archaeological phenomenon rather than an actual one' (Coles & Coles 1989, 95).

'Salmon is rarely present in the fish spectra of Mesolithic sites. Because of the physiological decalcification most skeleton parts are preserved badly. The vertebrae survive reasonably well but break easily, making identification of the salmon even harder' (Verhart 1988, 187 footnote 154).

More recent work by Serjeatson *et al*, while discussing Neolithic and Iron Age sites, suggests a similar famine of fish during this later period but the evidence that he uses can be interpreted also in the opposite way. Fish residues from cooking pots and pike, salmon and cyprinid bones at Runnymede indicate that fishing **was** being undertaken, albeit there is no evidence of quantities or apparently of method, unless the Neolithic stakes in Area 4 do form part of a collapsed fishtrap. To use an analogy, the numbers of human bone and skeletons found in both the Mesolithic and Neolithic periods, are not indicative of the total number of people in England at that time. Most Mesolithic sites

have no human remains at all and those from Neolithic contexts tend to be from a restrictive type of location. This does not mean that there were no people at these sites, on the contrary the very fact that there is evidence of humanly modified flint or clay indicates that very thing. Where Serjeantson suggests in the case of fish, that the little known evidence can be disregarded, McKinley at a site across the river from Runnymede at Bray, when discussing the presence of only one cremation considers it ‘a minimum’ (McKinley 1995, 34). In addition, the discrepancy between Serjeantson’s and Needham’s views of the collection policy at Runnymede (see above) suggests that more may have been found if other areas had been sampled and sieved. Similarly collection on the Severn at Goldcliff, was regrettably truncated and results were poorer as a result (Bell with Allen *et al* 2000, 36). Use-wear analysis at Thatcham and at Seamer Carr paves the way to future investigations when considering the role of fish in early diets.

Isotopic analysis has been used to examine dietary elements in bone, especially human (see **Ch 7**). Thus far only the signature for land animals and marine resources has been investigated, meaning that the input into the human diet of freshwater components has been largely overlooked (for example as in Richards & Schulting 2003). This is because of the difficulties in isolating the relevant factors and δ^{15} values from the bone (Rick Schulting pers. comm., Tamsin O’Connell pers. comm.) but it is an area that needs to be addressed and to be given a high priority in the research on human diet. One of the few exceptions is the study by Dufour, Bocherens and Mariotti (1999).

Fish bones are especially susceptible to being eaten by dogs and foxes, which are known to have been present at Star Carr, Seamer Carr, Thatcham and Dorney: ‘Preservation of bone may give a bias in amounts of each fish. Salmonids, for example, have fatty bones which can disintegrate more easily than other species, as the fat turns into fatty acids and also these types of bone are preferred by foxes and dogs’ (Enghoff, 1986, 67-68).

The canine bone from Seamer Carr was subject to isotope analysis which showed that the diet of the dog was principally marine in content (Clutton-Brock & Noe-Nygaard 1990). Given that the faunal remains were found at a site which had evidence of freshwater fish, it is unlikely that the dog did not eat locally too.

Fish bones too are much more easily disposed of than say those of an aurochs or a deer. In addition, they have little if any role for reuse. Fish found in freshwater contexts in Britain tend to be smaller than those found on the Danube, for example, where the Wells catfish run. Pike bones are probably the most substantial and these have been found at Runnymede and Dorney, with the former being considered large even in comparison with modern examples (Serjeantson *et al*, 1994, 336). Bone tools are normally made from a variety of mammal bones and it is usually just the vertebrae from fish that are used for necklaces and the like. Most fish bone, at least in Britain, is too small for to be used as tools and there may have been a deliberate discard policy, unlike those from deer or cattle, for example. They easily fracture and crush, and where the ground is acidic will disappear in the same way that other bones, both animal and human, will. Eating fish usually means either filleting the fish, which can involve removal of bone prior to eating or discarding the bone afterwards. The skin of freshwater fish (unlike shark, for example), has no secondary usage and often is eaten with the flesh. Shell fish, on the other hand, have a high survival rate as can be seen by the middens on Oronsay, Southern Hebrides (Mellars 1987), at sites in Denmark or on the Hoko river, but the majority of this shell comes from saltwater species, which are not under consideration here.

Given the proliferation of salmon clearly entering freshwater for spawning in the early Mesolithic at Mt Sandel in Ireland, it seems somewhat misguided to assume that in Britain there would not be any fish at all, particularly on the more southerly Thames with its easy access for anadromous species. The site at Bouldner Cliff suggests that there is potential for a number of such sites in offshore shallow waters. While the survival rate of fish bone evidence is low, perhaps we should be looking for the equipment used to act as indicator. That from Europe has survived well and as fishing equipment has changed remarkably little over 10,000 years or more, perhaps we should be looking for that rather than the actual fish themselves. Wootton Quarr has an example of a fishtrap from the Neolithic and Noyen sur Seine has others from the early Mesolithic. Such evidence is currently missing from the Thames Basin apart from the possible trap at Runnymede, but this paucity may have more to do with lack of recognition than an actuality.

A more detailed description of the equipment used to catch fish as well as a catalogue of the various species referred to in the text can be found in **Appendix 2**. A brief list of

the smaller tools utilised includes hooks of bone and wood; dip, drag, hand and seine nets from reeds and bast fibres; spears, leister spears and harpoons of wood, antler and flint; arrows with bark floats and rods. It is clear that the majority of this equipment is made from organic material and so lack of good preservation conditions means that the bulk of examples will not survive. The site on the Hoko is a good illustration of the difference in preservation between a dry and a wet location. The dry site produced very little more than stakeholes and stone tools, whereas the wet site contained a wide variety of objects made from organic materials (such as baskets, wooden fish hooks, boxes etc). In addition, understanding or recognising the artefacts for what they are is not as easy as it should be. The antler harpoons from Star Carr and Holderness are more akin to those used to catch fish, rather than those for animals. Single barbed points are not appropriate for deer etc (Geoff Smith pers comm.) but they are suitable for fish. Ordinary spears can be used for either task, while leisters are exclusively used for fish (principally salmon and eel). Some of the points from Star Carr could have been intended for leister spears.

Nets are rarely found, although the basketry associated with standing traps is well known from all periods from the Mesolithic through to modern day. Traps have been typically made from wooden stakes with wattle threaded between them and a basket to live-catch the fish. Other materials include stone for the 'arms' again with a woven basket (as in Australia and Medieval Ireland). Traps are an extremely common method as they do not require attention while in use, in other words, they are passive fishers. All the other methods described above are 'active', needing human involvement at every stage of their use. As such they are quite labour intensive. Live-trapping fish means that the traps need only be checked periodically and will almost always produce consumables. In that way, they are ideal as a regular provider of food whereas hunting may not be so predictable. The Thames has been the chosen location in the historic periods for many traps, with Anglo-Saxon and Norman examples still extant if not in use, on the foreshore in Greater London (Thacker 1920; Webber 2004).

Other methods of fishing include the use of poison and this has been used in a wide range of locations to stun the fish before gathering them in by hand. Recorded incidents are in such diverse places as Australia, the Amazon Basin and the NW Pacific coast. There is no direct archaeological evidence available as yet for its use in the Mesolithic

and Neolithic in Britain or elsewhere in Europe but studies in the future may identify appropriate toxic plants.

Other sorts of equipment include drying/smoking racks and vessels. Vessels are dealt with below. Racks may very well have been light, almost ephemeral structures. All that may remain of them is a series of small stake holes in a regular pattern which may also have evidence of fires and burning. It is probable that the possibility of these on an archaeological site is not taken into consideration. Fish remains themselves are so rare that there is almost an assumption of their absence. There would be no need for them to be near to water, although it is likely as fish needs to be processed quickly before it begins to go bad. The Roman made a spicy fish sauce and in more modern times techniques of salting and freezing are applied. In the past drying and smoking/kippering would have produced a food resource that was long lasting, easily transportable and nourishing. In the NW Pacific, these methods are still used today.

Evidence from the Thames Basin has shown that examination of food residues and use-wear analysis are vital tools in the search for indications of piscine resources. It is also important to keep an open mind when faced with stake- and post-holes and to be prepared for a range of interpretations including racks and fish traps. Stakes, such as those at Runnymede, that are clearly manufactured, or remains of stake-built constructions should be regarded as potential river-related structures rather than agricultural or domestic.

One more attribute should be mentioned here:

8 *Agriculture was normally begun in places where there was fertile alluvium*

The Nile valley is a good example of where agriculture has utilised the fertile alluvium left after the river has flooded. The crops flourished on the rich soils on the floodplain. The Neolithic people of the Thames Basin were similarly able to take advantage of the soils within the floodplain. Ard marks have been recorded on the sandy islands of Southwark (see **Ch 4** above) demonstrating continual use of the eyots into the late Neolithic. Processing equipment (see Figure 42) including querns, rubbers, pestles and sickles have been found on or near the Thames.

6.2.3 *Division of labour*

6 *Whilst hunting was seen as a male preserve, fishing was sometimes undertaken by women as well*

While information on the division of labour has been recorded from the ethnographical sources, it is almost invisible in the archaeological record. Without studies of human remains for evidence of injuries and wear to the bone through tasks undertaken, it is impossible to know which person performed which tasks in the daily round. Tradition has given women the gathering, gardening and more home-based tasks, occupied as it would seem they are with child-rearing. Men have been seen as the hunter, the flint-knapper and the one undertaking the physically demanding tasks. Owen, in her study of gender and division of labour, used fishing in the European Upper Palaeolithic as a basis for discussion (Owen 2005). Owen studied Inuit groups of the North American Sub-Arctic region and compared her findings with archaeological data from SW Germany. She demonstrated that fishing in some areas was downgraded by earlier ethnographers from being a variant of hunting, to being of lesser worth and on a par with gathering (Owen 2005, 15ff). This may have more to do with the fact that many of the early ethnographers were male and their informants were often male, potentially biased against from the worth of work done by women. In fact, sometimes the ‘value’ of fishing would alter with the change of gender of the people undertaking the task (Owen 2005, 17). While a detailed synopsis of Owen’s volume is not relevant here, it is worth taking on board the main thrust of her work, that is that the role of women particularly in prehistory has been downplayed and that of the men heightened as a result of ‘distorting the past’ in earlier studies (Owen 2005, 7ff).

6.2.4 *Accessibility, transport, trade and communications*

7 *Where the surrounding landscape was difficult to travel through, rivers were the main routeway and in other situations was the faster alternative*

d) *Trade (axes, from British and foreign locations)*

Accessibility

At this stage, it is probable that most rivers in Britain, if not in Europe, were fordable or, at the very least, easily traversable. The Thames comprised a series of channels and

islands and even as the result of the rise in sea-level began to affect inland waterways towards the latter part of the periods under review, the rivers involved spread across the landscape, rather than cut down into the river bed. Similar flooding in the Humber area demonstrates this (Figure 67).

Modern views of such an unpredictable landscape would see the river as a barrier (Sidell *et al* 2002, 49) and yet this is not necessarily the response of people living in the Mesolithic and Neolithic. In spite of the movement of the Thames within its floodplain, this seemed to happen over a period of time (as at Dorney with the silting up of the palaeochannels), rather than instantaneously. The constraints we have today are very different from those in the past and in many ways we have cut ourselves off from the natural world around us. The effects of the internal combustion engine precludes us crossing rivers in any other way than by a bridge or a ferry. In Greater London, the first bridge was built during the early part of the Roman period but the next did not arrive for over 1700 years. Yet, the river did not present a barrier to the people on either side and the eyots, still evident today, were places of choice, requiring crossing the water to get to them. The response of people to rivers changes over time so that by the Iron Age the water courses have become barriers, or at the least boundaries between one group of people and another (Haughey 2007a) but at this earlier point in time, evidence suggests that rivers were central to society, rather than marginal. Field describes the Thames as ‘massive and powerful, not to mention dangerous’ (Field 2004, 158) but this is to approach the river from a modern viewpoint. Forging the rivers would have been possible in most places apart from, probably, the mouth area where currents often cause quicksand to form. On the Boyne in Ireland there are two ancient fording places which have allowed either access to the site or access from the site to the river (Stout 2002, 11). Confluences were also locations of choice and it is possible that the sites placed thus, may have been on an island formed between the main river and a delta of tributaries.



Figure 67 The Derwent in flood (Neil Mitchell)

Living on and by the water in the Thames Basin would have enabled a relationship to be formed other than just that of a provider. Crossing the river as seen in the discussion below on monuments and special landscapes would not be the ‘problem’ we would perceive today.

Transport

Canoes and other vessels are also missing from the corpus of artefacts in Britain for these periods. Examples from the Mesolithic have been found in the Storebælt and in France but not in the UK in intact contexts. Yet after 6000 BC, boats were the only method of contact with both mainland Europe and Ireland. In the past canoes have been found and displayed in museums but these, for the most part have not been dated and many of them, lacking conservation, have disintegrated and have long since disappeared. Other sorts of vessels may have included a coracle-type, that is with a lightweight frame and a waterproof covering but again, no firm evidence has been found in the UK. This is not to say that there were no boats, merely that thus far none have been recorded of the earlier periods.

It is true that rivers offered the least problems in transport (at least before wheels appeared in the archaeological record in Britain, and also the tree cover). The navigability of the rivers would have dictated how far it was possible to take a potential vessel but not all rivers would have been navigable, with some being too shallow in places or not clear of natural obstacles such as rocks, falls, and trees. The laying down of peat at intervals in both the Mesolithic and the Neolithic would have created additional obstacles. There is a general assumption that any river would have been used for transport and ethnographic evidence supports this view but the case is not yet proven for the Thames particularly. The extensive tree cover might have hindered other methods of transport.

Trade

Archaeologically, in Neolithic Britain, pottery apart, it is not easy to evaluate the amount of trade that was being undertaken between the various communities and almost impossible to detect in the Mesolithic. While there are diverse forms of flint and certain types of stone are region-specific, the majority of artefacts and the materials they are made from in the earlier period are ubiquitous. Trade is more easily traced in the Amazon, for example, or Australia. Chocolate flint in mainland Europe, for example, could be traced to the Holy Cross Mountains in Poland.

In the Thames Basin, trade can be exemplified in the form of Neolithic axes (as referred to in above). Along with six others of more exotic manufacture made from jade, jadeite, quartzite, basalt and rholite, and Bwch Mawr, from Caernarfon in N Wales, the following stone axes were recovered from the Thames Basin area (Table 23).

This indicates axes that have travelled from outside mainland Britain, and from N & Mid Wales, and from N & SW England – not inconsiderable distances. While the Thames system is extensive, it would have required substantial overland travel for these axes to have reached SE England. The temptation is to assume that they were all prestige items and yet if you look at the spread of Groups I & VI, the most common in the table above, it is noticeable how those from the Thames disappear beneath the weight of the rest of the country (Figure 68).

Group no	Origin	Nos
I	Penzance, Cornwall	8
IA	SW England	4
III	Marazion, Cornwall	1
IIIA	SW England	2
IV	Callington, Cornwall	3
IVA	SW England	4
VI	Great Langdale, Cumbria	14 + 1 in alluvium
VII	Caernarvonshire	3
IX	Tievebulliagh/Rathlin Island, co Antrim	1
XII	Shropshire/Powys border	2
XVIII	Whin Sill, N England	1
XIX	Cornwall/SW England	1
		45

Table 23 Imported Neolithic axes in the Thames Basin (distribution information taken from Clough & Cummins 1988, 7-9)

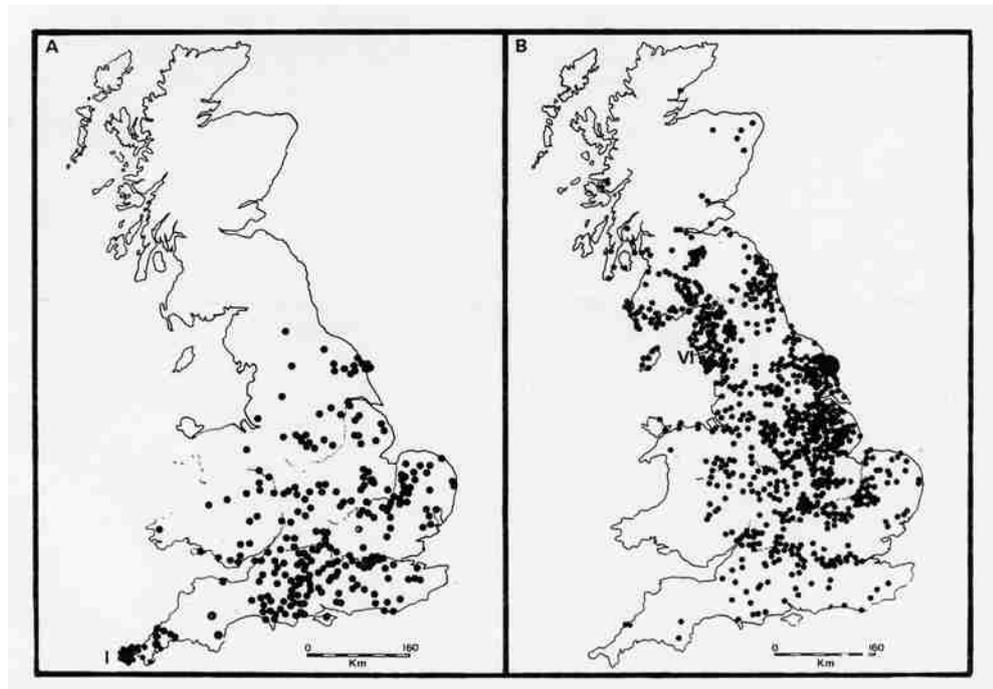


Figure 68 Group I and VI axes (Bradley & Edmonds 1993, 45)

This does not necessarily lower their 'value' but does show that they were more common than at first sight.

There is no way of knowing how the trade was accomplished but some at least (such as that from co Antrim in N Ireland) would have required some sort of water transport. In addition, the jadeite axe came from the Piedmont area, in the Italian Alps.

Communications

People have seen rivers as route ways; in other words, a passageway within the landscape rather than an end location in itself. Tilley describes a landscape as ‘a series of named locales, a set of relational places linked by paths, movements and narratives’ (Tilley 1994, 34). Edmonds describes what could be termed ‘prescribed pathways’ – ones which have been predetermined (Edmonds 1999, 7). Paul Davies goes one further and talks of ‘landscapes of fear’ which he elaborates as ‘a fear of surroundings is commonplace in the Mesolithic’, hence the need for prescribed routes and paths (Paul Davies pers. comm.). The fact that people would intentionally choose to stay by/on rivers rather than merely using them as pathways might be a surprise to those who think of landscape only in terms of hills and plains. Rivers were route ways but they were also places of settlement, long- or short-term. In my opinion, the evidence supports the idea that in the Mesolithic and Neolithic, people were actively choosing to live by or on rivers, rather than just using them as pathways.

Were the trackways as recorded in the Neolithic always going somewhere? By this, I mean, were they always joining two locations together - A to B? One trackway at least on the Somerset Levels (see Appendix 3) just went out into Levels with no other end point. It could have been for collecting reeds or food but could also have been just to go onto wet areas. The Sweet Track is known for the jadeite axe found nearby as well as a number of potential offerings. Trackways may have been not only utilitarian in nature but also symbolic and experiential in being the means of connecting people with the river, or in the case of the Levels, with the wetland. See below for more discussion on pathways.

One other use of the river could have been as an indicator of direction, a necessary marker in a landscape which was at least in the early period, probably heavily wooded. The Koyukon in the NW Pacific use the Fraser as the key reference point for direction and further south, on the Columbia, the *Nch'i-wána* (‘big river’) is named because it is a place *where things happened*. There is no way of knowing whether these attributes were embodied in the Thames, for example, but the fact that people retained knowledge

of earlier camps or monuments (such as at Heathrow) and frequently returned to the same sites after considerable gaps of time, demonstrates a living memory of the riverscape which was handed down from generation to generation.

6.3 Experiential and symbolic attributes

The discussion in this section will be based on a series of themes followed by a concluding paragraph. Symbolic and experiential material is difficult to quantify. Each society has its own slant in this respect which may not make an obvious impact on the archaeological record, or which it might be hard to discern clearly. Our view is also clouded by our own 21st Century attitude to such things and which may, again, make it hard to recognise the ephemeral nature of some symbolic actions. The discussion in **Ch 3** on the various myths involving rivers and fish cannot be replicated here with the archaeological material as we can only imply/suggest what might have been the approach taken by the Mesolithic and Neolithic people – there is not enough data (even in places where the ‘evidence’ seems overwhelming, such as the tombs on the Boyne) to detail this with any certainty. So in this section not only will the physical remains be explored for indications of symbolic meaning but there will also be suggestions of approaches that might have been made in phenomenological terms.

Analogy

- 1 *Rivers did not normally become objects of veneration although they may have formed part of myths*
- 2 *Fish in certain societies held a particular place between the real and symbolic worlds*
- 3 *Special places could have been on or adjacent to rivers at places where everyday life and the mystical one meet*
- 4 *Cemeteries or burial places were found close to running water*
- 5 *Ritual deposition in rivers was not a common phenomenon on the global scale*
- 6 *Belief systems of those groups that were examined living near water did not appear to vary from those in non-watery places.*

Thames

- a) *Monuments (proximity to water)*

- b) *Burials (in/adjacent to river)*
- c) *Ritual deposition (Dagenham idol)*

The themes that will be discussed in this section are as follows:

- **The river as an approach to life and death**
- **The river and monuments**
- **The river and the creation of significant landscapes**
- **The river and ritual deposition**
- **The river as a sensory entity**

6.3.1 *The river as an approach to life and death*

4 *Cemeteries or burial places were found close to running water*

- b) *Burials (in/adjacent to river)*

Rivers physically, have a source (a beginning) and a point at which they disgorge into either a larger river or lake, or into a marine context (an end). This, today, is very obvious from maps and the knowledge gathered by those who created them. In the past, especially where a river system is large, this may have not been so clear. The sheer size and spread of a river and its tributaries might preclude people knowing a great deal about a system on a personal level, although information/hearsay from others might have been passed on. Knowing the river from the ground level, rather than from above would also influence the view held by the Mesolithic and Neolithic people living on its banks. As has been noted there are few heights within the Thames Basin and given the tree cover over much of the region, a view of the river even from these hills would have been severely restricted. For those living by the river, this would have meant that the water flow at the point of entry would have been their ‘beginning’ and where it left their ‘end’.

The approach that we take today towards life and death, in all probability, was very different from that in the Mesolithic and Neolithic periods so it is necessary to look outside the accepted ‘norm’, so to speak. Looking at ethnographic examples, amongst

groups within the Amazon Basin, rivers and fish feature centrally in myths dealing with not only life and death, but also hunting and subsistence strategies. Rivers according to the Tukano are both life and death, whereas amongst the Shipibo, women are fish and the Achuar say both sexes come from the river. Landing places amongst the Tukano are the place where they are intimately involved with the river both economically and experientially. Anacondas, semi-aquatic snakes perhaps used as a metaphor for rivers also feature in myths. This resonates closer to home with Stukeley's interpretation of the complex at Avebury within the Thames Basin. While his ideas are not considered seriously today and until recently the existence of the Beckhampton Avenue was doubtful, the concept of snakes especially in the context of the Kennet is appealing:

So that at length I discovered the mystery of it, properly speaking, which was, that the whole figure represented a snake transmitted through a circle. This is an hieroglyphic or symbol of highest note and antiquity.³

"In order to put this design in execution, the founders well studied their ground; and to make their representation more natural, they artfully carried it over a variety of elevations and depressures, which, with the curvature of the avenues, produces sufficiently the desired effect. To make it still more elegant and picture-like, the head of the snake is carried up the southern promontory of Hackpen hill towards the village of West Kennet; nay, the very name of the hill is derived from this circumstance, of which we may well say with Lucan, lib. vii:

*"Hinc ara veteris caenis; Janua vetustas,
Materisque ni signata nomine terrae,
Sed usura dedit cognomina cellibus tibi.*

Again the tail of the snake is conducted in the descending valley below Beckhampton."

"Thus our antiquity divides itself into three great parts, which will be our rule in describing this work. The circle at Avebury, the forepart of the snake, leading towards Kennet, which I call Kennet avenue; the hinder part of the snake leading towards Beckhampton, which I call Beckhampton avenue; for they may be well look'd on as avenues to the great temple at Avebury, which just must be most eminently called the Temple."

Figure 69 Stukeley's description of Avebury (Hoare 1819, 66)

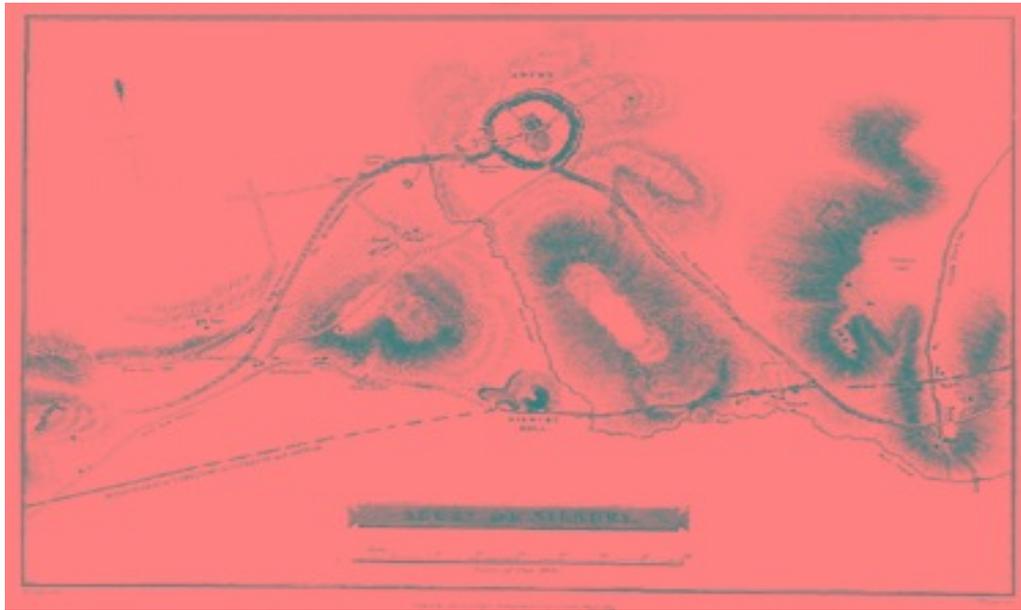


Figure 70 Stukeley's plan (Hoare 1819, 71)

This attitude towards waterways may have been carried through into folk tales with the anthropomorphism of certain rivers for example, the Mississippi (Ol' Man river) and the Thames (Father Thames). This concept of a life-giving river places it at the centre, rather than in the margins. The river can be seen as liminal, without being marginal, where everyday life runs in tandem with an experiential existence. Fish in Australia are portrayed in the rock art in Arnhem Land and relate to the cycle of birth and rebirth as well as creation. The unique sculptures at Lepenski Vir portray fish as well as more abstract designs in an incredibly visual way, with some of the faces being almost anthropomorphised.

Seeing the waterways as rivers of death, is the flipside from looking as from life. Australian aborigines were buried in cemeteries by the Murray, tied to river as a lifeline for food and water. At Lepenski Vir, Mesolithic burials lie adjacent to the Danube (at right angles or parallel) as do the Neolithic long cairns in the Black Mountains, Wales in relation to the waterways (Tilley 1994, 122). Other cemeteries include the Neolithic one at Brugh na Bóinne and those alongside the Ohře. In the Thames Basin, this trend clearly continues. At Dorney a series of Early Neolithic sites have been found close to the water channel, indicating a marked preference for that location as well. The four individual Neolithic burials in Greater London all lie very close to the waterway and its foreshore. All these burials are in close association with a river whereas Windover, Florida has an Archaic period pond cemetery. While the number of cemeteries

mentioned here is small, it is just an indication of what can be found, often with the individuals lying parallel to the watercourse or at right-angles to it. In some ways, this choice of direction is similar to that of the cursus monuments which frequently cut across the waterway or lie parallel to it. There seems to be a deliberate preference for riverside sites. This does not preclude the river itself being used as a depository for bones but there is not any conclusive evidence of this in the Mesolithic and Neolithic periods and not in the Thames Basin as yet.

6.3.2 *The river and monuments*

a) Monuments (proximity to water)

While there are no monuments known from the Mesolithic period, in the Neolithic these provide the most visible presence. Here three classes of monuments will be examined which are found in the Thames Basin, with one also found in NW Europe. These are possibly the most enigmatic of the monuments found in the Neolithic and I will seek to propose a new viewpoint as to their meaning.

Causewayed enclosures

A significant number of causwayed enclosures as seen above in **Ch 4** are found in close association with waterways, particularly the Thames, and metaphorically speaking bring the water onto the land in a more accessible way. Those examples found on heights have the potential to view rivers from parts of the enclosures. The ditches themselves might be seen as symbolising the river and the causeways as the fording places across the river. The fact that some (for example, Etton, Cambridgeshire) were intentionally placed to be susceptible to flooding periodically seems to support this interpretation. Deliberate depositions into the ditches parallel deposition into the rivers. While some of the enclosures ‘touch’ the adjacent river (Abingdon, for example) this might be seen as an even closer tie between the dry river and the wet river. It has been suggested that boats would have been used to access enclosures lying close to the Trent and this argument could be applied to those on the Thames also. It could be interpreted as the need to approach either the river through the enclosure or conversely the enclosure via the river but does not indicate the need to avoid the water. Symbolically the need to go

through the water to reach the enclosure would bring the river onto the land, so to speak.

Similar Neolithic enclosures are found in Europe which suggests that this close relationship with rivers is not just restricted to Britain. They include the two Sarup examples straddling the land between two arms of a river in Denmark and the one at Noyen sur Seine which lies in a similar position on the Seine.

Cursus monuments

As discussed in Ch 4, these monuments country-wide seem to have a clear relationship with rivers (Oswald *et al* 2001, 135). Brophy noted this close association, even to the extent of some cursus monuments being occasionally inundated (Brophy 2000, 65) which resonates with causewayed enclosures such as Etton that are similarly afflicted. In the Thames Basin, they are not found in very close proximity to the causewayed enclosures, but again at Etton, two cursuses lie close together near (and in the case of the Etton cursus, on top of) the enclosure.

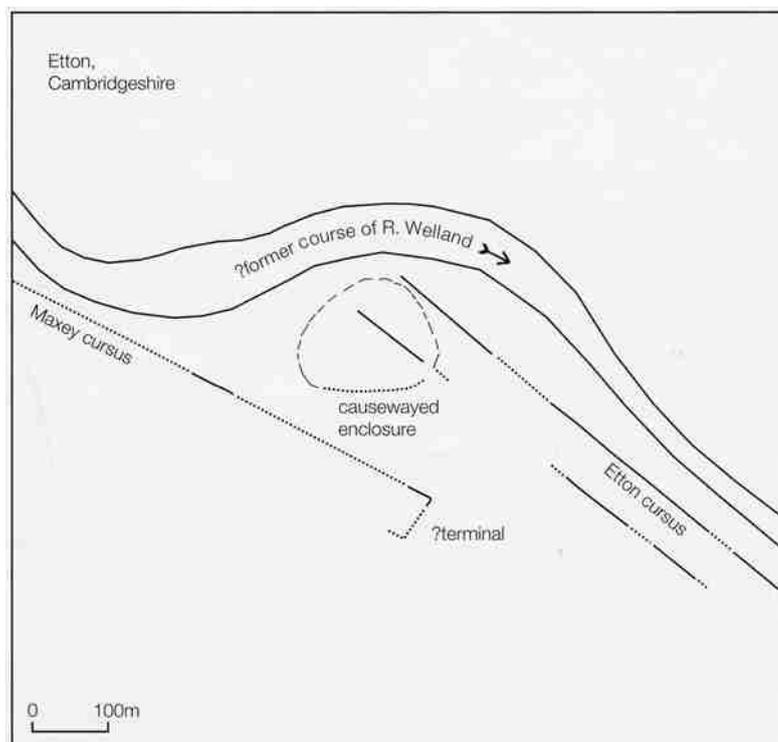


Figure 71 Etton/Maxey complex (Oswald et al 2001, 135)

The two cursuses follow the line of the Welland while the causewayed enclosure lies within a curve of the river. Short of placing the monuments across the Welland, the complex could have not been more closely involved with the river.

6.3.3 *The river and the creation of significant landscapes*

3 Special places could have been on or adjacent to rivers at places where everyday life and the mystical one meet

It has often been said that there are no Neolithic monuments in London (Museum of London 2000). By implication it is as if the rest of the country is full of them, which is in fact not the case. Actually, when the known causewayed enclosures and cursus monuments are plotted in the Thames Basin, it very quickly becomes apparent that there are large tracts of the Basin that currently have no examples. This may all change in time or it may be that any that were there have been removed by agriculture and the like, or alternatively lie beneath a great depth of alluvial deposits. However given the aerial photography which has covered much of the basin and the cropmarks recorded on the gravel areas in particular (see Benson 1974; Gates 1975; Leech 1977), and the excavations which continue apace in all the urban environments, it would seem somewhat unlikely. The exception to this is those areas lying under alluvium, which in Greater London is up to 9m in depth.

While looking at all the monuments it is possible to see a number of distinct groupings. In the Thames basin, the following all lie within a bend comprising the noted rivers:

Avebury – the Kennet

Heathrow area – the Thames, the Colne river complex, Yeading brook/the Crane

Dorchester – the Thames, the Thame

Dorney – the Thames

Yarnton/Cassington – the Thames, the Evenlode

All consist of a series of monuments, which may not be contemporary. Two have a direct earlier Mesolithic phase (Heathrow and Dorney). The remainder have Mesolithic sites nearby. Heathrow is almost completely surrounded by water; the Dorchester complex cuts off an area of land within the bend; Dorney is bracketed at either end with both a causewayed enclosure and a mortuary enclosure; Avebury uses avenues to

complement the Kennet; Yarnton/Cassington is slightly less compact than the others but lies within two curves of the Thames and the Evenlode.

None of them are identical but each seems to have evolved over a period of time, and extends into the Bronze Age. Their locations seem to have been deliberately chosen to take advantage of the topography and more specifically the rivers. All of them lie on the north side of the main river.

Avebury and Heathrow both have what might be earlier phases. While there are Mesolithic postholes underneath the lie of the Stanwell cursus, the main presence for this period is adjacent to the site in the Colne valley complex (see Figure 31 above). In this case the earlier Mesolithic is lower down the river and the later is more into the headwaters. On the Kennet this split can also be seen (Richards 1978). In the Neolithic, the focus on the Kennet is clearly in the upper reaches.

What I think we are seeing here are what I would term *significant landscapes* – areas that have meaning but not ones that are cut off or removed from the communities that they serve. In the Mesolithic, the river is the focus for all parts of life – subsistence, settlement, work camps, hunting camps and perhaps ritual activity too. As the water levels rose, people moved to sites that were still on the rivers but in slightly drier areas, as on the Colne. With continued changing hydrology in the Neolithic, attention moved to sites adjacent to the river. Again the Colne complex is a good illustration of this concentration through time. The people merely moved their focus from the waterways themselves to the land which was enclosed by them. The causewayed enclosures with their separated ditches took on the attributes of the river, with the exception that they were dry at least most of the time. The ditches themselves became the river – these can be seen connecting to the water at places like Abingdon, Buckland, Crofton, Staines and Dorney. They become the recipient of offerings, just as the river may have been. The causeways themselves become the ‘ford’ to cross into the centre of the enclosure. The enclosures are seen, therefore, as a metaphor for the river at a time when water levels and possible flooding would have been unpredictable. Parts of the one at Etton in Cambridgeshire were, in fact, regularly flooded as noted above.

Taking this analogy a little further, cursus monuments, which frequently traverse the river or at the very least point towards it, can also be seen as ‘dry’ rivers. Brophy first

postulated this notion when considering Scottish examples (Brophy 2000). Those in the Thames Basin lie either parallel to the main channel or are perpendicular (see Table 12 above). They often point towards rivers, such as that at Dorchester and where the upstream end of the cursus ends close to a tributary of the Thames. Cursus and causewayed enclosures usually do not appear on the same site which may mean that the ‘task’ they do is complementary and so does not need replicating.

One interesting observation can be made of the Dorset Cursus, the monument that Tilley sought to experience by walking along its 12 mile length (Tilley 1994, 170ff). The cursus itself crosses some sort of water source that would have been extant in the Neolithic period, three times along its run which Tilley briefly notes in passing (Tilley 1994, 174, 185). If the line of the cursus, during its various construction phases, had been shifted slightly, these obstacles might have been avoided and those walking along the monument as posited by Tilley, would not have had wet feet. The fact that this is so and that the builders of the monument deliberately chose to pass through three wet places has a significance that has hitherto gone unnoticed or ignored.

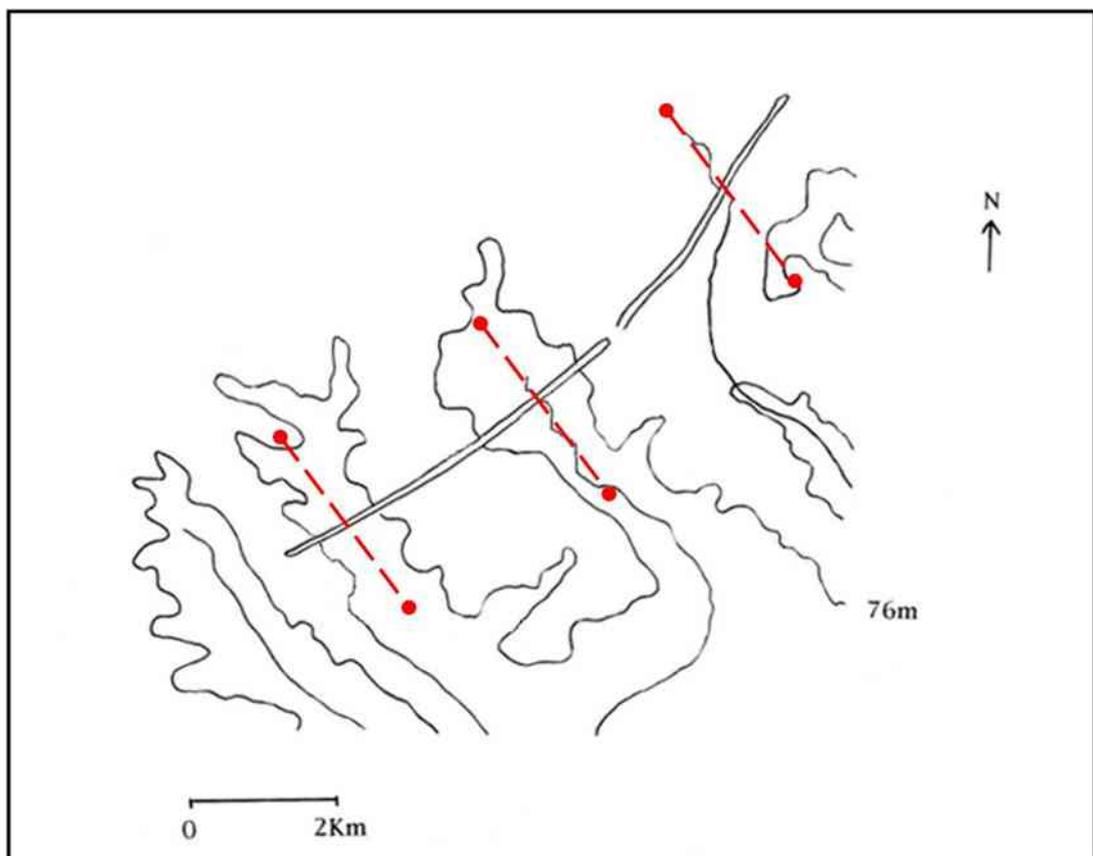


Figure 72 The Dorset cursus (adapted from Tilley 1994)
(the red dashed lines indicate the watercourses or marshland)

Two other significant landscapes not in the Thames Basin are worth noting here for comparative purposes. The first is at Brugh na Bóinne, in Ireland, where the bend of the river Boyne, a tributary the Mattock, and a ridge of carboniferous shales contrive to create a significant landscape, containing the Newgrange, Knowth and Dowth passage grave complexes, which have earlier phases beginning in the Mesolithic. In fact, the landscape at Dorney is reminiscent of this arrangement at Brugh na Bóinne.

The second area is on the Avon which runs due south from Wiltshire to the south coast. Near the headwaters of the Avon, lies Marden henge, the largest in Britain at 14 hectares, which uses the river as part of the enclosure. Further downstream lie Durrington Walls henge and then Stonehenge, both sites with many other monuments nearby and on the west side of the Avon. Late Neolithic henges typically are not quite as close to rivers as are the causewayed enclosures and the cursus monuments which they post-date – Marden being an obvious exception. Stonehenge has an early Mesolithic phase comprising 3 tall posts in a row in what is now the carpark. (Darvill 2006, 64). Stonehenge itself lies on the interfluvium between the Avon and the Till. If the posts were as tall as the excavator suggested, it is possible that these could have been viewed from the Avon.

Durrington Walls has an avenue (some 20m wide and 100m long) which connects the henge to the river (Parker Pearson *et al*, 2006). The avenue at Stonehenge is more recent, dating to the Bronze Age, and sweeps round in a curve towards the Avon.

Continuing the earlier discussion on trackways, it is important to note also these avenues. Shepperton henge which lies within the area of the Heathrow complex, has an avenue of pits or posts that go past the henge and run down to the River Ash (Burnham 2005). Avebury has two avenues – one cutting across the Kennet and one parallel.

All these avenues are Late Neolithic or older. They are built at a time when people are stepping back a little from the river – for reasons probably of rising water or the constraints of early agriculture – but the need to keep contact with the water is still there. Avenues are constructed to help provide that link, connecting with both the henges and the rivers. Traditionally, the avenue at Stonehenge has been seen as being

used to connect the river TO the henge and when travelling along the avenue, much thought would be given to the approaching view of the monument. What if, in fact, the avenue was meant to connect the henge to the river, rather than the river to the henge? This would mean that the correct way to travel along the avenue would be from the monument down to the river. The same argument applies to the other henges. It is not just a question of semantics but one of discovering what is the main focus – is it the henge (and earlier monuments) or is it the river? In the latter case, the walk towards the river would be the more important, rather than that to the henge. The avenues could therefore be seen as a means of seeking to (re)establish the connection between the river and the significant landscape.

Crossing a river by means of a ford might have been a part of the relationship with the monument. The potential symbolism of ‘crossing the river’ need not be laboured here. In the past, when the ford was the principal method of crossing rivers (unlike today where bridges separate people from the water), crossing from one bank to another was probably not the ‘difficulty’ as perceived in modern thought. Oswald *et al* discuss a method of approaching the causewayed enclosures with the use of a boat or vessel (Oswald *et al* 2001), and it is a valid suggestion but another is to travel by foot and to physically go through the water en route to the enclosure. It is on a par with walking down the Dorset cursus and crossing water at three different locations. Also as discussed below, walking or wading through water is not a silent affair. The two fords on the Boyne, mentioned above, might be seen as the approaches to the Brugh na Bóinne significant landscape. While there are no formal avenues, these might be considered to fulfill the same role.

We might see these areas as exclusive, with limited access only for a particular tranche of Neolithic society but I would argue that on the contrary, significant landscapes are seeking to be inclusive. There is a clear attempt to keep the river in a central if increasingly liminal place. The presence of water does not inhibit people going into these areas and each of them has land access.

Ethnographically, there are special places such as the boras in Australia but these tend to be connected with puberty rituals for both sexes. Gatherings, like the NW Pacific potlatches or Australian corroborees may have more in common with the early use of

the significant landscapes but the underlying motives for holding these gatherings do not dictate that they necessarily be held within specific places.

6.3.4 *The river and ritual deposition*

5 *Ritual deposition in rivers was not a common phenomenon on the global scale*

c) *Ritual deposition (Dagenham idol)*

The main reason for specifically looking at axes in **Ch 5** is that they have been cited as votive offerings particularly on the Thames (Bradley 1998). Also they are the most conspicuous objects, especially those that have been ground and polished, and traded in some cases those places not only far away in Britain but overseas as well. On the Humber there are also axes from other locations (Group VI – 12, Group XX – 1, Group XVIII – 1). Some of these axes may have been considered valued objects. Pots and their possible contents from stray finds and dredgers are difficult to assess in anything like real quantities because of their perceived ‘value’ in the modern world. Antiquarian collectors were not interested in potsherds, just in the whole or nearly whole vessels, and so the number of complete recorded pots from the Thames foreshore in Greater London is only 4. Until recently the number of potsherds was equally small but now there is somewhere in the region of 50-60. Given the numbers of ceramic remains found on the average Neolithic site, this is pitiful and cannot be considered at all representative. With the Neolithic land surfaces being exposed once more, it is noticeable that more sherds are being recovered, although the window of opportunity to find them is narrow with the continued erosion. This is also true of axes from both Mesolithic and Neolithic periods – for examples of both see Cotton & Green 2004. The selection of artefacts that have been recovered is only a sample of what was originally available and must be understood as such. There are, for example, only 5 Mesolithic microliths recorded from the Great London foreshore.

Bradley’s assertion that finds from rivers belong to a class of votive offerings does not take into account, in the Thames basin, of the natural movement of the river within its floodplain throughout the Mesolithic and Neolithic periods. Just because an object came out of the river, does not mean that it went into the river in its original deposition.

In the Mesolithic of Greater London, almost all the findspots of material including axes are in river valleys (see Figure 48 above).

This is because river valleys may have been locations of choice, and the finds were residue from those settlements and camps, not necessarily because they were ritually deposited in the river. In addition, finds from the Surrey bank, opposite the City, have been recovered from an area that saw immense change in the Mesolithic (see Figure 24).

When looking at a plot of axes from both periods (see Figures 21 and 47), the concentration of examples from the London Thames is conspicuously obvious but this needs to be set within the context of their finding. All the navigable Thames has been dredged, and in fact it is only recently that work ceased on the non-tidal stretches (Rachael Hill, pers. comm.). The work on the tideway was probably more brutal as the amount of river traffic was much higher. Dredging leads to slumping on the riverbed, which then requires more dredging and this would explain the ‘missing’ strata on the foreshore now, with little or no evidence of Bronze Age or Iron Age layers, in spite of the wealth of artefacts from these periods which have been recovered in the past. The dredgers too, would have cut through to the earlier prehistoric strata, hence the number of objects recovered. Dredging was undertaken to provide a navigable channel but the work was not just concentrated in one area but often cleared from one side of the river to the other and no doubt disturbed the prehistoric forests now visible, and eroding fast, on many parts of the foreshore. Finds, including axes from both periods, are continuing to be exposed as the inter-tidal zone erodes at an ever increasing rate (Cotton & Green, 2004; Cotton & Merriman, 1991; Cotton & Wood, 1996).

Are all these finds really votive offerings or is it a case of ‘one size fits all’? The short answer has to be that some are and some are not, but how to tell which is which is almost impossible as they are out of context. In addition, the ‘value’ of an object to the donor may not be in its perfect unused condition but in the fact that it had belonged to a forefather and had been in use for many years. So without a firm context and other ‘offerings’, the nature of these finds is undefined and should be accepted as such. Koch defines in her field of work, single pots as chance loss but several as deliberate deposition (Koch 1998, 132). This is equally being subjective as to interpretation. All views are, of course, subjective – this discourse notwithstanding – but to be so emphatic

as to which is votive or not, is to be unnecessarily dogmatic in a situation of mere ideas. It is clear that there is a class of finds from watery places but Bradley seeks to compare items from undisturbed wetland and bog deposits found often in intact context with others which have been extracted and selected from a dredgers' bucket. In addition with Bradley advocating that all finds from wet places were votive offering, this acts as a straightjacket to any other interpretation. Just as Wheeler's approach to the post-glacial restocking of rivers needs a re-appraisal so does Bradley's approach to votive offerings in watery places. In the case of the axes, there is clearly a ritual element with some of them such as those, for example, in mint condition that have been imported from overseas or ones which are very long and highly polished.

6.3.5 The river as a sensory entity

The human response to landscape and to objects is primarily one of the senses – what can be heard and seen as well as to a lesser extent, what can be touched and what things feel like. This section briefly examines these sensory actions. The sense of smell will not be discussed because this is more subjective than the others.

Sound

Sound is the first of the senses acquired in the womb (through the fluid in which a foetus is suspended) and is the last to leave us, as doctors inform us. Sound, in association with water can be detected in a number of ways. First, there is the sound of the water itself as it moves along the riverbed or down a rockface in the form of a waterfall. The sound of water, even when the water itself cannot be seen, is incredibly compelling and evocative. In addition, the movement of water by human agency always creates sound. Secondly, sound travels across water with great clarity so activities held one side of a watercourse will be heard by those on the other. Thirdly, sound travels through water, so movement by humans in and on water can be 'heard' by fish etc (Haughey 2007a).

The archaeological study of sound has been concerned with sound travelling out from tombs and monuments (Watson & Keating 2000). More recent work involves research of the audioscape of an area defined geographically rivers (Mills 2005). Mills records sounds in an area in S Romania encompassing part of the Teleorman river and a main

tributary, the Clanița. While recording animals, birds and people there is no mention of the sounds of the river and sounds as both people and animals cross the water/ford (Mills 2005, 85). As outlined above in **Ch 5**, rock art might be seen as a silent sound from the Neolithic period. Just as the sound of water may be heard when the source itself is hidden, then rock art can be described as that sound made visible. The decorated Late Neolithic Grooved ware is associated with the rock art of the Brugh na Bóinne and might be considered another part of the ‘voice’.

Vision

Kenneth Brophy argued that a cursus monument may be seen as representing rivers within a ritual or ceremonial setting and of the two reasons that he put forward, one was practical (you don't need to get your feet wet whilst walking the length of a cursus) and one visual (the white sheen of water is similar to newly stripped chalk or gravel) (Brophy 2000). Water acts like a mirror and so is a good reflector of light. Moving water especially presents a flickering appearance which can have an hypnotic effect. It is only with the advent of human flight (balloon ascents and planes with helicopters) that rivers systems can be seen in their entirety. Prior to this the widest view could only be gained from a nearby height. Tree cover too, would restrict scrutiny of the water and even when on the waterway itself, given the way the majority meander in their course, views would be inhibited to that between one bend and another.

Approaches to the visual on an average river can be seen in 3 stages which will be the same now as in the past:

- 1 Not seen – this is the unknown, that an observer is unaware, something that hasn't been seen as yet
- 2 Seen in part – this is the visible section that has the ‘known’ behind and the ‘unseen’ ahead
- 3 Not seen but known – this is that behind, that which you have already seen but is now out of sight as you travel along the river

In this last stage, there is an awareness of what is now hidden from view. This knowing is not 'all-knowing' - more a state of being 'mindful' of what there is and, importantly what there might be out of sight. . These two facets of awareness can be examined in the following ways:

(i) knowledge of what has been:

found (structures, features, environmental evidence etc)

deposited (artefacts either deliberately or accidentally)

resourced (aquatic vertebrates and invertebrates, waterfowl, wetland vegetation)

(ii) knowledge of what might be:

predicted (by the use of models, analogies)

unexpected (chance finds, eroded sites)

expected (known situations, known history)

anticipated (the returning of resources)

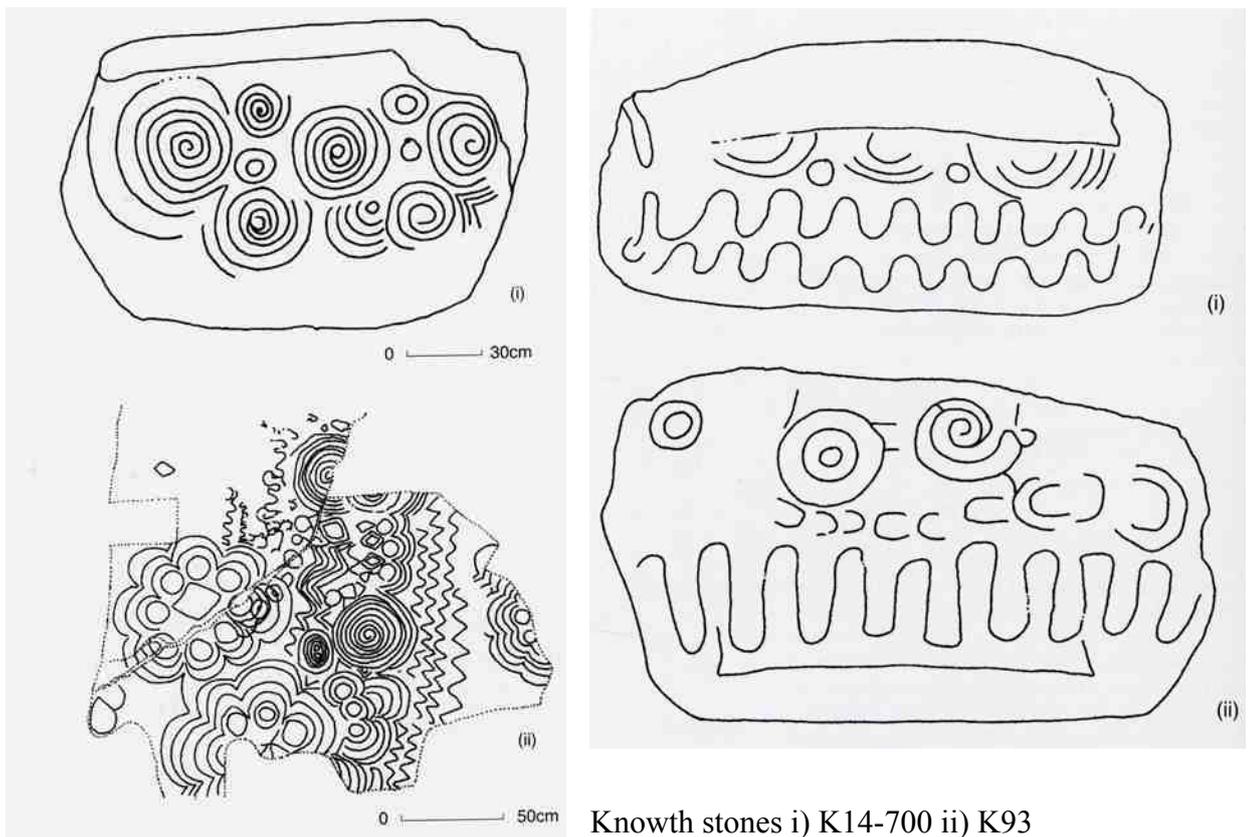
It is these two strands of awareness which can be applied together that may have dictated, and still do dictate amongst some groups their behaviour towards rivers. The Tukano in S America live their lives by applying both facets simultaneously, so that each act – fetching water, going to bathe for example, - takes on a parallel experiential meaning.

There are also those sites which are both in full view and yet away from prying eyes. Islands were used sometimes as depositional locations for burials. These sites were only accessible by crossing the water channel so while they were in view, they were also out of sight - known but hidden. This may apply to the significant landscapes discussed below. The people themselves might be still living in close proximity to the actual rivers but the ‘dry rivers’ on the adjacent land in the form of monumental architecture could have been out of sight – known but hidden.

In addition, the view will be different wherever you are in relation to the river – from above the river, adjacent to the river, in the river, on an island or a vessel on the river as well as looking across, up and down the river. So too, will the view change from the stance taken within or without of the monuments and how you move through them, as Tilley found on the Dorset Cursus. In addition, while inter-visibility researches have

concentrated, not unexpectedly, on areas with heights, comparable riverine studies have not so far been broached. The view of the river from the significant landscapes may have given the feeling of almost being surrounded by water – Dorchester being a good example of this.

The visual sense is applied literally to rock art. The view of the river here might be considered similar to a map or plan, drawn on a smaller scale than the original (see. The interpretation of all facets of the map may now be lost but the presence of the river seems clear.



Knowth stones i) K14-700 ii) K93

i) Knowth K56; ii) Newgrange, roofstone

Figure 73 Possible maps in stone from the Boyne (Haughey 2007a, 122, 124)

Touch

In our daily lives we are constantly handling water, but in early prehistoric terms, moving through the water itself would have definitely constituted touching the water. People would have felt the water as they passed through it. Moving along the Dorset

curtus would have required touching the water three times. Crossing over (through) the watercourse for whatever reason would have meant intimate contact with the water. The feel of the water, either as a person walks or wades through it, or as they place a hand in it, can be very sensual but also cold, possibly dirty or slimy and even uninviting. This sensation could be a similar one experienced when touching the rock art, particularly that within tombs. In some cases, where light is absent, the sense of touch may be the means to guide a person into the centre and so could have required physical contact to trace the patterns.

The Lepenski Vir sculptures which were created using pecking as a modelling tool, must have felt very rough to the touch and with several being placed within the various houses, it is possible that touch would have been the main means of contact with them. Other rock art found in the Iberian peninsula and in Ireland has this tactile quality, given that much is found inside caves or tombs where light may be an issue at times (see **Ch 5** above). Rock art where the decoration has been incised or pecked may be meant to be 'read' by touch. Just as a rosary is 'read' with the fingers, so may possibly these types of art which are hidden away designed to be interpreted by the touch of a finger. Other examples found out in the open air, often of cup and ring type, are perhaps appreciated in a more visual way but even these may be approached through touch.

6.4 Conclusion

People and rivers – crossing the 'divide' between the economic and symbolic faces of waterways.

- 1 *Rivers did not normally become objects of veneration although they may have formed part of myths*
- 2 *Fish in certain societies held a particular place between the real and symbolic worlds*

Discussion in the preceding pages has dealt with the economic aspects and those classed as experiential/symbolic in separate categories. This has been purely from administrative convenience and ease of dealing with the data across the periods and the geographic spread. In reality, these two facets would overlap and also run parallel with each other in the daily lives of the Mesolithic and Neolithic people. Just as the modern

Tukano tribe live the secular and sacred aspects of their lives in tandem (see **Ch 3** above), so it is probable that in the early prehistoric periods, life in the Thames Basin was played out in a similar fashion. The landing place on the river to the Tukano is where ritual, the rest of the world and day-to-day living intertwine. In modern society, we separate for the most part the secular side from the sacred and so understanding a life where there is no such separation can be difficult to comprehend. Burial of the dead inside the house and facing the river would be considered unacceptable in Western society and yet the norm in Lepenski Vir.

The range of evidence available from the Thames Basin for the Mesolithic and Neolithic is clearly incomplete and what is there is not necessarily in large quantities but it has more enough to begin to suggest how people during these periods related to rivers. There is direct and indirect confirmation of the presence of fish, some signs of how they were caught and processed and information about the range of tools they utilised. We can deduce where the people chose to live and why, and whether these sites attracted occupancy over time. There are indications of trade and later, agriculture. In the Neolithic, there are significant numbers of monumental architecture – in some instances, the largest numbers thus far in Britain – and their relationship with water in the early part of the period is clearly transparent.

What are missing from the record are the complete range of fishing equipment and the different species of fish themselves. This is not atypical of sites in the Britain, considering most of the attention thus far has been on coastal and estuarine locations, and not on inland waterways. There are exceptions to this (such as the Ouse and the Trent) but these are rare. Other aids absent in exploring these periods are an overview within the Basin of the faunal and floral data (rather than on a site-by-site basis, as at present), and a similar treatment of the sedimentological data for the upper and middle Thames as there is for the lower Thames region. The phenomenological discussion of the sensory approach is an area of research that has only begun in a limited number of earlier studies (for example: Tilley 1994, Brophy 2000, Watson & Keating 2000, Mills 2005). The range of monumental structures involved is restricted with the application to the Thames not yet undertaken and as will be discussed in the following chapter, this area is one in which much work remains to be done.

7.1 Résumé

People and Water: A study of the relationship between humans and rivers in the Mesolithic and Neolithic with particular reference to that within the Thames Basin

The uniqueness of this study lies in its concentration on rivers (as opposed to the rest of the gamut of wetland systems), the detailed view of the Mesolithic *and* the Neolithic (as opposed to Palaeolithic/Mesolithic and Neolithic/Bronze Age), the bringing together of land and water archaeological data in the Thames Basin, and the focus on aquatic resources as a substantial core of the subsistence regime. What became clear during the research for this study was the close affinity between rivers and humans from the early prehistoric periods and the fact that that relationship was not static but gradually altered over time in tune with changes to the water table and to a lesser extent to the subsistence technology employed. Whereas previously it seemed that the technological adjustment would have been responsible for the step back from the river's edge, upon closer inspection it may, in fact, have been the rising water which affected the change. This is true within the Thames Basin which has been the main river system under scrutiny, and it requires a similar detailed examination of other systems to see if this result is replicated elsewhere.

In the introduction, I wrote 'by looking across this artificial divide [that is, between the Mesolithic and Neolithic periods], it was hoped to observe changes over time that were not necessarily involved with subsistence or technology' and the conclusion drawn above seems to demonstrate this. The major change in subsistence procurement methodology begun in the Neolithic period was not necessarily the driving force behind the change of involvement with the surrounding landscape. That alteration of expression began in the Late Mesolithic, as can be seen in the Colne valley complex although the alteration was not enough at that stage to demand movement to slightly raised ground next or near to the rivers. As the 'dry rivers' or river-substitutes in the form of Early Neolithic causewayed enclosures and cursus monuments continued the close connection with the rivers, the henge monuments in the latter part of the period, and through into the Bronze Age, marked the taking of another step away from the

water's edge. Here the contact was kept through the use of avenues or in wetland areas possibly trackways.

Looking at the subsistence, it can be demonstrated that the use of freshwater aquatic resources has been underrated. While the quantity of information currently available for the Mesolithic in Britain is small, it is varied – fishbone, usewear and a potential fishtrap – which suggests that time is right for a re-examination of the post-glacial restocking of the rivers. Data from Ireland and Scotland has shown that they restocked very quickly and so it seems unlikely that England, and the clear confirmation of fishtraps. A paucity of firm evidence within Britain has resulted from a lack of expectation which has led to potential misinterpretation of fishtrap remains along with bad preservation of fishbone and possibly less than effective collection methodologies. Considering the plethora of evidence from mainland Europe and the data that has been collected here, a review of sites on or near rivers on a greater scale than has been possible here is worth pursuing in the near future. Ethnographic studies have demonstrated the importance of fish in the diet amongst a range of groups around the world and archaeologically the use of freshwater elements has been clearly seen alongside land mammals and a range of marine resources. It is obvious that fish were only part of the early prehistoric diet, as is the case today, but it is a significant source of protein that is overlooked by archaeologists in Britain, by and large. Barrett *et al* described Perry Oaks, Heathrow in its location by a stream and on the edge of the Colne floodplain as ‘a classic hunter gatherer siting’ (Barrett *et al* 2000, 195-6). This neatly illustrates the typical viewpoint taken of the inland subsistence strategy in the early prehistoric periods, confining it that obtained from the land. Those sites considered ‘classic hunter gatherer’ may well also be what could be termed ‘classic hunter gatherer and fisher’ locations.

The attitude taken to rivers tends to be at least partially coloured by the modern archaeological view in which they often defined as barriers, boundaries, liminal spaces and sites for sacred deposition. As the human approach changes through time, these different facets can indeed be traced but in the early prehistoric periods, the response is one of inclusion rather than exclusion. At this stage, the river is not a barrier (neither physically nor symbolically) or is it a boundary. These aspects come later in the metal eras (see below). Although in a central position physically, the river might have been

considered symbolically liminal and it is probable that some objects were deliberately deposited in its water.

7.2 Answers

In **Ch 2**, four questions were posed concerning the relationship between rivers and humans, answers to which were to be sought amongst the ethnographic and archaeological data discussed in **Chs 3, 4 and 5**. Following the analysis and discussion in **Ch 6** now is the time to revisit those questions. Answers, in some cases, overlapped and this will be indicated below.

(a) Does a close relationship between rivers and humans exist?

Both ethnographical and archaeological evidence point quite clearly to the importance of rivers to humans. Modern people, living in towns where drinking water, for example, is piped in from reservoirs situated miles away have lost contact with this most primeval of requirements. In the past, living by the river established a close bond with the moving water and the resources it provided. Passage along the river or crossing from one side to the other, using the water or extracting fish etc from it were all part of a close relationship which demonstrated itself in a variety of ways through time. The bond between humans and rivers was very strong as this study has shown, both in economic terms as a provider and in experiential/symbolic ways as an entity in its own right.

(b) What are the reasons for such substantial evidence of human presence found in close proximity to water, and rivers in particular?

The reasons may be seen as two-fold as indicated in the objectives of this study: economic and experiential/symbolic. These two aspects will be briefly discussed here.

Economic

The amount of evidence available may be small, at least in Britain and the Thames in particular, but there is sufficient to show that fish were part of the subsistence strategy. With the exception of anadromous species, fish would be available for most of the year, unlike migratory animals and could be live-trapped in static low-maintenance fishtraps. The current data comes from both the Mesolithic and Neolithic so this is not just

relevant to one period. In addition the comparative material shows a range of archaeological information including bone, structures and artefacts, examples of which have already been found in Britain, suggesting that the possibility of further discoveries is potentially high. Also piscines particularly need to be processed quickly after being caught, although once dried, smoked or salted will last a long time. So, one reason for lingering near the place of catching the fish was to deal with the preservation.

However, this becomes a chicken-and-egg argument. Was the choice of location because the fish were available or did the availability of fish become obvious after settlement? The answer is probably in the affirmative for both questions so the process would have been self-reinforcing. While animals need to drink from the water resources, that alone would not be reason enough for people to live close to rivers. In fact, the presence of humans itself could act as a deterrent to their prey.

Experiential/symbolic

The need to be close to the river is demonstrated by the closeness of the monuments to the water particularly in the early Neolithic, and even in the later part of the period connection between the henges and the river was maintained by means of avenues or trackways. Far from being at the margins of life, rivers were central, albeit liminal, presence.

c) Is there a traceable change through time in the relationship between rivers and humans?

The answer to this question has to be an emphatic 'yes'. In the Mesolithic, sites are found adjacent to rivers and on the islands in the watercourses. This can be seen quite clearly on the Kennet and the Colne, where clusters of sites can be found, some short stay but others more long term. Towards the end of the Mesolithic there is a shift towards the headwaters, following a gradually rise in the water table which led in the Early Neolithic to construction on the adjacent banks. **6.3.3** above gives a detailed breakdown of the close link between causewayed enclosures and the river, as well as that between cursus monuments and watercourses and will not be repeated here. It illustrates the close relationship between humans and rivers and the adjustments made over time to cope with changing topographical conditions. The appearance of avenues connecting henge monuments to rivers is also important as it marks a third stage in the

relationship across time, as another step was taken back from the water's edge. This change continues into the Bronze Age and beyond.

In the Bronze Age, the people moved back to the river but in a more guarded way. The unease of the relationship is clearly demonstrated by the appearance of barriers between humans and the river. At Runnymede for example, there is a long riverside structure which provided both a walkway and a wall behind which the people lived (Needham 1991). In Greater London, there are a number of features – a platform at Atlas Wharf on the isle of Dogs, structures at Westminster and the earliest bridge at Vauxhall (Thomas *et al* 2006; Haughey 1999). This latter structure probably provided the means of crossing from the bank to a former gravel island. A similar but larger platform at Flag Fen was the means by which possible appeasement was given to the river in the form of offerings (Pryor 2001) and it is possible that the one at Atlas Wharf might have been for the same purpose in the later Bronze Age. Crossing or going out onto the water by dry means took on a greater importance. Contact with the water may have been kept for particular occasions such as ritual deposition of objects or burials. Islands were both the portal for death (such as the cremation cemetery at Dorney Allen & Welsh 1998) or for safety (such as at Snowy Fielder Waye, Isleworth Bell 1996). Items dredged from the London Thames include over 900 bronze and copper objects of which over 500 are weaponry.



Figure 74 Bronze shield, from Wandsworth (Museum of London)

In the Iron Age, use of the river for subsistence can be seen by the fishtrap at Vauxhall (Haughey 1999) but iron objects, subject to rusting, are more rare, with only 110 recovered from the London Thames. The survival rate of iron is very low but other metals are more enduring. The Battersea shield is the most well-known but a number of daggers, unique to the Thames, are equally worthy of renown.



Figure 75 Iron Age dagger in sheath

In the Iron Age, the river became a boundary, used to separate different tribes from each other. At this time they were at the margins of communities, rather than as in the earlier lithic periods, at the centre albeit in a liminal capacity.

(d) Is there a formal relationship between Neolithic monumental features and water

The choice of location of the Neolithic monuments is quite specific. Causewayed enclosures (with a few exceptions) are built very close to the water, sometimes on gravel islands, others around encompassing the river or stream, and often in the fork between two arms of the watercourses. This is not accidental and neither is the

positioning of the cursus monuments, similarly dated to the early Neolithic. These emulate, or it may be the other way round, the lie of the burials noted in **Ch 6** above. They are to be found parallel to the rivers, or at right angles and it is in this last position that they also often cross the river. In the case of the Dorset cursus set high up on Cranborne Chase, it crosses through three areas that would have been wetlands and streams in the Neolithic in apparently a deliberate positioning on the landscape.

This choice of venue is partially sensory – that is within the sight, sound and physical contact of the watercourses. In some cases, the locations are almost totally surrounded by water (such as at Heathrow in West London, and on the Brugh na Bóinne, Ireland. In the later Neolithic with the building of henges, these too are linked with water even if they do not lie as close to water as the earlier monuments. A number have been connected to the nearby rivers with avenues (Avebury, Durrington walls, Shepperton, and, in the Bronze Age, Stonehenge).

What indirect evidence can be found to demonstrate the link between people and rivers?

Ch 2 also raised the possibility of indirect evidence, examples of which are discussed here.

Rock art

Thus far, no rock art has been identified within the Thames Basin but this does not preclude this happening in the future. Rock art in the later Neolithic in a number of locations suggests a method of bringing the river and the water (in the form of sound and also vision) into places in which you would not expect to be able to hear it running. Or alternatively, the carvings are in places which overlook rivers. The so-called serpentine form and the concentric circles may be a shorthand for the water as it moves. In addition, the sculptures at Lepenski Vir on the Danube. many of which are in the form of fish, are another indirect link to the adjacent Danube.

Burials

The rock art within the tombs at Brugh na Bóinne links with other burials which point the way to the river. The earliest examples I have used in Europe are on the Danube dated to the Mesolithic and these lie either at right angles to the river or lie parallel to the water. In Australia on the Murray, cemeteries are found next to water as are the

ritual mourning *keruk* grounds in the Lower Colorado. In the Neolithic, in the Black Mountains, long cairns either follow the curve of the river or similarly lie at right angles and in London a number of burials (primarily female) have been found in close proximity to the Thames. While these examples are scattered in locations across the globe, it suggests more than just happenstance as to the repetitive waterside locations.

Trade

Trade in the Thames Basin particularly of axes, although there is no evidence of the means utilised, took place with mainland Europe and Northern Ireland, indicating some form of waterborne vessel. Within England itself, trade between north and south as well as parts of Wales is also suggestive of river travel.

Monuments

While a significant number of the causewayed enclosures in Britain are located in close proximity to rivers, a number are positioned on heights. While this may seem removed from water, in fact, the vista from them almost always includes a view of a river. Some are positioned in interfluves. This could be coincidental but with the position of those down in the valleys this seems unlikely.

7.3 Future research

In conclusion I would like to include a number of areas of future research that might be taken in examining the role of rivers within prehistory. This is not a definitive list – it addresses a number of the concerns that have been raised during the course of preparing for this enquiry. This study has only been able to show the potential of such investigation and to open the debate into an area of research hitherto either ignored or not given the credence and prominence it merits. While some of the points are Thames-centric, they are equally applicable to other rivers and their estuaries.

- 1) A re-examination of evidence of post-glacial freshwater and anadromous fish in Britain needs to be undertaken in the light of evidence uncovered since 1978. Comparable data from Europe and Ireland points to re-stocking of the rivers and lakes a lot earlier than previously thought. While this is of interest in itself, it also a key element in our understanding of the subsistence strategy of the post-glacial communities of NW Europe. The tantalising glimpses of the evidence visible in the Thames Basin

and other parts of Britain point the way to a more thorough and detailed research of fish during this period.

2) Along with this, stable isotopic $\delta^{15}\text{N}$ analysis of human bone as well as animal (dog) bone for the signature of freshwater fish is vital as lack of this evidence has hampered acceptance of the role of non-marine aquatic resources in human diet. The significance of this can be seen in a graph of results from work undertaken by Dufour *et al* published in 1999 during which an examination of isotopic values in bone collagen of freshwater fish was undertaken.

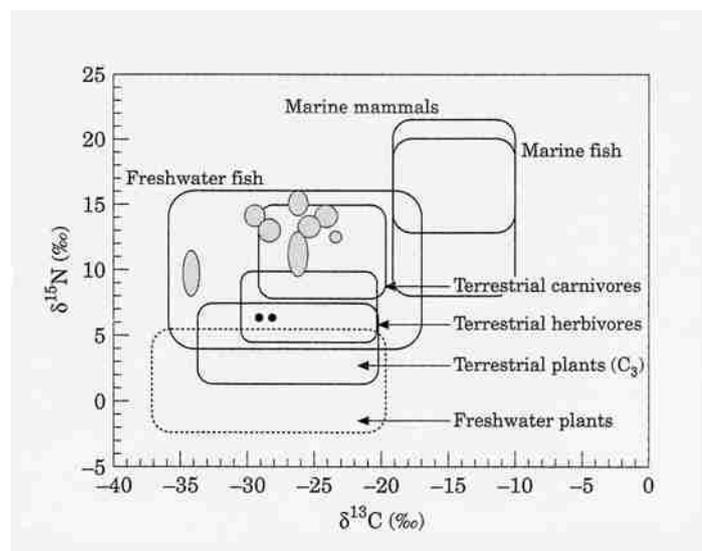


Figure 76 Isotopic values of bone (Dufour *et al* 1999, 623)

This demonstrates the natural variations in major dietary resources of Eurasia, and several important points can be observed. While marine mammals and fish have almost unique values of both $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$, that of freshwater fish have a wide enough range to contain those pertaining to terrestrial herbivores and carnivores as well as a large number of terrestrial plants. Freshwater plants also overlap but to a lesser extent (Dufour *et al* 1999, 623). This would suggest the possibility of confusion in interpreting evidence from bone collagen given the predilection for assuming that subsistence was achieved from the results of either hunting or foraging/agriculture. The correct place of freshwater resources within the dietary regime of early prehistoric communities could be clarified by such research.

3) Two additional research tools underused in this area are those of examination of usewear and residue analysis on flints and ceramics, techniques which have much to offer in this field and should be undertaken more often especially on the earlier prehistoric sites. The evidence found at Thatcham and Runnymede provided information not achievable in other ways. Waterside sites would benefit from such examination and analysis, enabling a better understanding of the various aspects of the subsistence regime. Residue analysis along with identification of plants might be able to pinpoint the use of poisons in trapping fish. Understanding the use of toxins as a fishing ‘tool’ in the present (as seen in **Ch 3**) highlights their possible application in the past, as yet unrecognised in the archaeological record.

4) The preceding points indicate that there is a need for excavators to be open to the possibility of evidence of fishing, equipment and use of riparian resources and less dismissive of where that evidence is slight. Archaeologists need to re-evaluate sites for potential fishing equipment (stakes, bark rolls/weights, basketry, nets etc) and they need to be actively looking for Mesolithic freshwater sites which may be found on modern coastal locations, by current freshwater rivers and in the intertidal zones on estuaries for freshwater sites – this includes in areas of palaeochannels now on dryland locations as well as those preserved underwater. If this expectation of the use of river resources in a wide variety of ways is brought to the fore, then it maybe that will be recognised in the field.

5) The prompt publishing of riverside sites, especially those prehistoric in date, is urgently needed. Interim reports are useful but cannot divulge all the information that is required. To this end I intend the publication of a number of sites on the London Thames over the next 18 months.

6) Identification of fishing related structures on the Thames, as with those in other fluvial and estuarine contexts, has been severely hampered by a lack of a dating policy. The remains of timber structures located on riverbanks or on foreshores especially on the tidal Thames have the potential to be of early date, in spite of their similarity to other more recent examples find nearby and the application of a strategy of radiocarbon dating and/or dendrochronology where possible would greatly enhance out knowledge.

Two illustrative examples are worth noting here, albeit of later periods. At Vauxhall, a bridge substructure dated to the mid Bronze Age (1750-1535 cal BC Beta-122970) remains extant, visible at low tide with an Iron Age fishtrap (780-170 cal BC GU-5724) (Haughey 1999). These timber structures lie near to 19th century crane bases and 18th century mooring posts, and could easily be considered of these periods instead of several millennia earlier. At Winchester Wharf, a jetty substructure was initially thought to be of 1120AD in date after consultation of John Stow's *Survey of London* (Stow 1876). Carbon 14 dating and later woodworking evidence have placed it firmly in the early Roman period (c.160 cal BC-220AD) (Damian Goodbourne pers comm.). The number of unidentified structures could be potentially quite large. It is not enough now to merely record the timber posts on the foreshore – it is important to take the important step of dating them by any means possible.

7) In addition to those relating to fishing, other structures are currently considered 'missing' from the Thames foreshore and in other settings. There are, for example, many trackways in the Greater London area dating to the Bronze Age (such as Meddens 1996; Seel 2001). It is possible that there are trackways (particularly any of Neolithic in date) lying unrecognised on the Thames foreshore. The effects of the dual currents on the river (fluvial and tidal) as well as the potentially devastating effects of passing boat wash can destroy something as fragile as a brushwood trackway to an unrecognisable mass of wood very quickly. Ivor Noel Hume discovered this in the 1950s while working at a site on Syon Reach. Having just uncovered a wattle feature and photographed it, the river caused the break up of the structure before it could be drawn *in situ* (Noel Hume 1956, 43-4). With this in mind, an examination of some of the Neolithic peatbeds on the foreshore has produced relicts of possible trackway-type constructions.



Figure 77 Winchester Wharf, Southwark – possible trackway in peat

For example, this site on Bankside shows evidence of a number of brushwood/timbers lying in a semi-orderly fashion within the peat



Figure 78 Bankside ‘structural’ remains



Figure 79 Putney – possible structure

Similarly, this photo is from a possible structure at Putney, within the peat. The holes that can be seen in the peat ‘ledge’ are those left when the water turbulence has forced the wood originally contained therein, out. These holes are a common sight on both the peat beds on the river and those of clay. It is, of course, possible that the wood that is encased in the deposits could be water-borne refuse added as the layer was being formed through water action. In some cases this may very well be the correct interpretation but in others the number of holes, their orientation and the fact that there is some evidence of staking may indicate an intentionality rather than accidental event. Further research needs to be carried out before the river erodes possible examples completely.

Trackways in the floodplain (in a similar way to those in the Somerset Levels) can give indications of movement in the landscape and to sites of possible importance. A planned survey of the peatbeds to record such potential structures is very important before the evidence erodes away.

8) An extension in phenomenological studies specifically based on rivers would broaden our perception of them in a number of ways and the way people related to them over time. Opening the debate by examining briefly sound, sight and touch in relation to water is just a beginning, not a conclusion. Inter-visibility studies between sites and nearest rivers would add an extra element into landscape studies and widen the perception of movement through the landscape (see Tilley 1994). It is not enough to

discuss inter-visibility and movement in places where there may not be the hindrance of tree cover or other obstacles.

9) The synthetic approach to this examination has been useful, enabling patterns of behaviour to be monitored over time and a similar methodology could be applied to other periods such as the Bronze Age and Iron Age and into the historic periods (as noted above). The changing human response to rivers can then be traced from the earliest periods onwards, enabling an overall pattern to emerge

10) The recognition of significant landscapes within the Thames Basin is an important step towards our understanding of the relationship between humans and rivers in the Neolithic period. This raises the question as to whether they are unique to the Thames system or are they found elsewhere in England? In the Basin itself, can more be identified with further excavation, is the spread significant in its distribution and are there any on the south bank of the Thames? There is a need to look for more of these particularly in Greater London. The most likely area seems to be that defined by the river Lea and the Isle of Dogs. The digging during construction of the docklands has removed a great deal of evidence but there are hints in the burial at Yabsley St and the nearby trackway at Silvertown.

7.4 Conclusion

This study has opened up the debate as to the role played by rivers in early prehistory and their vital position both within the subsistence regime and the symbolic approach of humans at that time. It has shown that far from being marginal, they were actually at the centre of those living in the Mesolithic and Neolithic periods. Even changes within the river system did not affect the response of the people, just the outworkings.

One final point is to indicate the need for haste in the suggested further research. The dynamic qualities of rivers, especially in the estuarine sections, means that erosion is a constant threat and so work should be concentrated in these locations before information is lost. While palaeochannels are often found on the adjacent dry land, there is still the potential of archaeological data to be recovered from the current river bed and it is this that needs to be explored and recorded before it is no longer available.

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