The Nature of Mesolithic Activity at Selected Spring Sites in South West England

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Abstract

This thesis examines the nature of Mesolithic activity at five spring sites in south-west England. The springs have unusual properties and the lithics associated with each site have been assessed in order to investigate whether they are indicative of unusual, or even ritualistic, behaviour related to the property of the spring. As well as lithics, some of the springs are associated with other types of material culture and in some cases features such as pits are also present. This thesis brings together the different classes of archaeological evidence and situates their study within the context of the spring and the wider landscape.

Recently in Archaeology there has been an increasing interest in the significance of ‘natural places’, which has led to topographical features being seen as important, and sometimes even sacred, places in the landscape. By contrast, in Mesolithic studies, natural features such as springs are often predominantly viewed in a functional sense, as a source of potable water and a convenient focus for settlement. Occasionally however some sites, such as the Hot Spring, Bath one of the case studies presented here, have been suggested to be evidence of Mesolithic ritual behaviour. These polarised views usually arise from an analysis of lithic attributes and the contexts in which the lithics are found. The more unusual the context, and the better the quality of the artefact deposited into them, the more likely it will be equated with ‘ritual’ behaviour.

The unusual nature of the five springs examined here: two hot springs at Bath Spa and three tufa depositing springs at Langley’s Lane, Somerset, Cherhill, Wiltshire and Blashenwell Dorset, allowed that premise to be questioned and the results have demonstrated that aspects of mundane and ritual behaviour are virtually indistinguishable from the lithic record alone. Yet whilst there is a variance in the treatment of materials at springs with similar properties there are also certain commonalities between them, which may suggest that shared beliefs underpinned Mesolithic cosmologies, at least in the south-west region.

The springs of this study were features in what were dynamic Mesolithic landscapes and the findings suggest the practices that were carried out reflected and embodied that dynamism. Mesolithic activity at springs remains an understudied topic within British archaeology, despite the potential these sites offer to engage with theoretical concepts such as landscape, praxis, belief and cosmology. This study has attempted to redress this imbalance and reinforces the potential of springs to elicit information that will enrich current knowledge of Mesolithic lifescapes and landscapes.

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the one constant throughout my PhD journey.

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Chapter One: Introduction and an overview of Mesolithic Britain

Introduction

This thesis explores the nature of Mesolithic activity at selected spring sites in south west England. To facilitate this investigation, this chapter provides a general background to how Mesolithic archaeology found in close proximity to spring issue points has been interpreted, setting out the justification for why more work needs to be carried out at this type of site, and initially demonstrating the potential of spring sites to add to current understanding of the way in which early hunter-gatherers might have perceived their world. The aims and objectives of the work are then set out, followed by an outline of the thesis structure.

This introductory work is followed by an overview of the British Mesolithic, which provides the context into which the results and discussion of this work can be situated. It is necessary to look at the Mesolithic, how it is defined as a period, the way in which it has been studied and those aspects of the period that impact on this thesis. This work builds on the paradigm shifts that have taken place, both in archaeology in general and Mesolithic studies in particular, during the last twenty or so years. Mesolithic scholars in the past have operated in a framework of polarised extremes, where economic and environmental concerns have sat in opposition to less prosaic matters. This in part came about from insufficient physical evidence for the period, but also a reliance on anthropological studies of hunter-gatherers, itself situated in a dichotomous framework. The overall thesis builds on recent challenges to that premise and recognises that this approach is outmoded. As well as some background to the academic study of the Mesolithic, some themes are discussed in detail. These include the category of "hunter-gatherer" and the nature of Mesolithic belief and material culture, in particular lithics. The latter are discussed in chronological, technological, spatial and social terms and these themes are later revisited in the results and discussion chapters.

Mesolithic artefacts (especially lithics) are often associated with spring sites, including those with exaggerated properties such as thermal, tufa and salt springs, yet specific and explicit reference to springs as places where material culture was meaningfully constituted, in other words, where the association of artefacts with springs is not merely co-incidental, is altogether sparse in archaeological works. Examples of activity at springs, evidenced by lithic scatters and occasional excavated material, are recorded in grey literature or receive cursory mention in published reports (for example, Jacobi 1978), but no regional synthesis of spring related data has been published in any major review. More archaeological work has been carried out within the vicinity of some springs, for example, at the thermal springs of Bath Spa, due to their urban setting (See Chapter Four of this thesis), but still with little emphasis on integrating data related to the Mesolithic and placing it within a regional framework. Significantly more emphasis is placed on activity around springs in other prehistoric periods, especially the Bronze Age (for example, Bradley and Yates 2010) and also that dating to the Roman and Medieval periods. The emphasis on the latter periods is amply illustrated in the literature associated with the thermal springs of Bath, where only a small percentage of the overall documentation refers to Mesolithic activity (Cunliffe 1979, 1988, Cunliffe and Davenport 1985), though this has been slightly redressed in the recent publication of the New Royal Baths and Bellott's Hospital excavations (Davenport *et al.* 2007).

These and other springs are also the focus for non-archaeological study. Many accounts centre on esoteric activity at spring sites, drawing heavily from the realms of earth mysteries, and are often not academic in focus. Some are little more than a compendium or regional list (for example, Quinn 1999). Others are academic but tend to focus on the hydrogeology and sedimentology of springs, or associated subjects such as biodiversity (Gallois 2007, Stanton 1991, Pentecost 2005b, Stein and Farrand 2001). Tufa springs have received more consideration than other types in the archaeological literature (Evans 1975, 2003, Pentecost 1981, 1993, Goudie 1990, Goudie, Viles and Pentecost 1993, Davies and Robb 2002). This is attributable not just to the associated Mesolithic artefacts, for example, at Prestatyn, Flintshire and Blashenwell, Dorset (in Clark *et al.* 1938), but also because the molluscs found in tufaceous deposits are used as environmental indicators (Evans 1972, Davies 2008).
The potential of spring sites, especially those that issue tufa, to add depth to the Mesolithic environmental record was noted by Evan's in 1972 and even further back in 1944 by Clark, but their ideas have been largely overlooked by subsequent generations of archaeologists. The environment may not be an all-determining factor, but Mesolithic people lived at a time when there were extreme landscape changes. Some of these changes were visible during lifetimes and others took place over the long-term but many would have become embedded in memory, stories and cosmologies. These dynamic processes need to be taken into account in our dialogues about the Mesolithic.

There is also a need to recognise the capacity for all categories of lithic artefact to have meaning, including that normally seen as waste material from the knapping process. Whilst scatters of flint tools and debitage potentially have meaning, when deposited in contexts, including those which are not of anthropogenic origin, this meaning can be amplified, yet can be negated in interpretations if the lithic material is of 'poor quality' or just a few fragments of debitage. As Allen and Gardiner (in Davis and Wilson 2002) have implied, there needs to be re-examination of the contents of pit like features from old excavations and a recognition that seemingly natural features such as tree hollows associated with knapping debitage, or animal burrows with ‘scraps’ of flint in them, may be neither purely functional, nor circumstantial.

Moreover a recent Neolithic Studies Group seminar volume has demonstrated that the variability in Neolithic pit deposits is far more wide ranging than previously assumed (Anderson-Whymark and Thomas 2012). Pit related practice, during the Neolithic, included singular pits and those in lines and groups. There were pits with highly structured deposits and those with seemingly mundane, non-structured, everyday discard, to those with seemingly random patterning. The origin of pit digging in the Mesolithic is intimated at throughout the volume (Anderson-Whymark and Thomas 2012). It is suggested here in this thesis, that not only does pit digging have its origins in the Mesolithic but so does the variability in practise. It is possible that the practice of ‘opening up the ground’ stemmed from an interest in ‘natural’ openings’ in the earth, such as the springs of this study, and therefore Mesolithic activity and the range of deposition occurring at spring sites can seemingly offer some insight into later Neolithic practice.

The use of ethnographic analogy is a beneficial endeavour for Mesolithic archaeologists, despite its obvious drawbacks. The sheer range of examples for spring related practice is almost non-exhaustive but it does show that some generalities can be drawn between different cultures and coherent themes identified. This makes them an ideal subject for ethnographic comparison. Although recurrent themes add probability, odd examples of isolated practise show that there are innumerable possibilities. Indeed, upon investigating the world of springs, it was quickly realised that for every idea imagined, an ethnographic example could be found. These were so numerous that only a handful of the more pertinent could be explored here. Analogy on any scale is the archaeological version of the ’double-edged sword’. The archaeological imagination can be a fruitful source of ideas with which to explore the past, as it seems that most hypotheses can be substantiated. Where the focus is on less common subject matter, it would seem prudent to search out examples from as many, and as diverse a range of sources as possible, in order to identify consistent themes, or oddities, even if just to act as salutary warning. In Mesolithic archaeology (and indeed for many other branches of archaeology), this has not always been the case.

The recognition that so many Mesolithic sites are associated with springs may prove to be of benefit to researchers in the future. It is a feature that connects the sites, yet as shown here, they are not all the same, and there is scope for noting subtle differences in material assemblages and context. The potential preservation of organics in spring sediments is something that could also be exploited. Targeted research and excavation is needed at more spring sites to explore the potential contribution they can make to our understandings of the British Mesolithic. Where possible the springs themselves should also be examined as part of the research at a potential site. After all, we would not look at a flint scatter outside a cave and neglect to look in the cave for potential activity, yet we have largely neglected the potential of spring sites as repositories and foci for deposition during the British Mesolithic.

With these points in mind, this thesis aims to demonstrate some of the possibilities still to be realised for the Mesolithic period through a more considered analysis of Mesolithic activity associated with a selection of springs in south west England (see page 48 Methodology) and seeks to build on the paradigmatic shift of emphasis in Mesolithic archaeology as detailed later in this chapter.

From the examination of selected spring sites and their associated lithic assemblages, there is potential for extended discussion on how early Holocene hunter-gatherers might have interacted with their world (at least in the study area). The archaeological evidence found in the vicinity of the springs studied here supports the notion that they were meaningfully constituted places during the Mesolithic. Springs are not just physical entities in the landscape; they can provide the contextual information which is needed to extrapolate meaning from the artefactual evidence. Essentially, the way in which activities taking place around springs can be theorised potentially offers a glimpse into people's perceptions of the places they inhabited, for the water from some of these springs not only has intrinsically different properties in itself, but also has the *ability* to change the appearance of the surrounding landscape. The consideration of the place of water in the period, but with a major shift from the more usually considered sea and lake dominated scenarios also helps to illustrate the variability and dynamism that existed in Mesolithic Britain.

Where it is recorded, Mesolithic activity is all too often polarised into the disparate activity spheres of subsistence and/or ritual. The tendency to negate the meanings of these places through this fallacious consideration is magnified when considering springs with exaggerated properties. For example, Mesolithic flint scatters around the cold water spring at Birdcombe, Somerset are seen to represent encampments, convenient for water and the attraction of game (Gardiner 2000), whilst flint deposited in the Hot Spring, Bath, Somerset has acquired symbolic and ritual connotations (Davenport *et al.* 2007). This study attempts to realise alternative ways of thinking about springs in the Mesolithic landscape that is not rationalised within a dichotomous framework.

To achieve this a number of investigative strands can be explored. The make-up of the assemblages (lithics and other artefacts) can help to determine the nature of activity occurring at different spring localities. Using the general approach of *chaîne opératoire*; how artefacts were used, selected and deposited at these sites, can give insights into raw material procurement, the choices people made and the type of activities that were carried out. Extending the *chaîne opératoire* (pages 37, 248) to look at the post-depositional effects of these springs, that is whether artefacts and their associated contexts were significantly altered by taphonomic processes, may indicate an element of intentionality, or forward planning, by Mesolithic peoples. If there are/are not real differences between these and other springs, and/or other landscape locales, this will establish a baseline for interpretation in terms of questioning whether the dichotomous frameworks mentioned earlier and in Chapter Three, can be justified in any sense. Looking at the results and comparing those to the established view of Mesolithic Britain, has prompted suggestions for further research.

Aims and objectives

The main aim of this study is to see if the archaeological evidence found in the vicinity of five selected springs in south western Britain supports the notion that springs were meaningfully constituted places during the Mesolithic. Aspects of use cover the presence and the type of material culture, the nature of deposition, and the presence of significant archaeological features. A traditional approach to lithic analysis was employed supplemented by what can be termed a phenomenological approach to the sites. This is explained further in the methodology section in Chapter Two.

Aims

1. to compare and contrast the nature of Mesolithic activity at five selected spring sites in south western Britain

2. to situate the findings within a national context

3. to indicate the findings and rationalise them within a theoretical framework

4. to provide a framework for further research

Objectives

1. to determine how Mesolithic artefacts were used; selected and deposited at these sites

2. to see whether there is evidence for intra- and inter-site patterning of particular artefact types

3. to see if the nature of activity/deposition changed over time

4. To see if it is possible to take lithic assemblages and read off activity associated with ritual aspects of behaviour

5. To see if ritual behaviour can be distinguished from more mundane/practical behaviour

6. To use ethnographic analogy to understand what might be happening in Mesolithic contexts

7. To see how these spring sites fit in with existing theories about the Mesolithic landscape and world beliefs

Thesis Structure

Chapter One presents an overview of the Mesolithic, and considers the artefactual evidence available to archaeologists studying the period. It summarises the main paradigmatic approaches used by Mesolithic scholars and considers the conceptual category of hunter-gatherer, essentially explicating the homogeneity afforded to Mesolithic peoples through the, sometimes, poor use of ethnographic analogy. Chapter Two outlines the study, the methodology used and the theoretical approach taken in this thesis. An overview of the Mesolithic archaeology from the study area and associated environmental evidence is also presented. The concept of chaîne opératoire as it relates to this study is considered, as is the way lithic artefacts are recorded. Chapter Three considers landscape studies and the conceptualisation of water as it relates to this study.

Two main types of spring are discussed; thermal springs and tufa depositing springs, in chapters four and five respectively. For each type the results of analysis are presented along with discussion and some interpretation based on analogy with other springs, and watery places but also other materials such as stone. This is further expounded in Chapter Six, where the evidence found in association with these springs is compared and the previous four chapters are summarised. The discussion is broadened to consider the place of springs in the Mesolithic as a whole. It also considers the wider implications of the interpretations offered and their ramifications for the study of the British Mesolithic. Some suggestions for further research are also presented in the final chapter.

The Mesolithic of Britain: an overview

To contextualise and situate the results of this research, it is necessary to discuss first the British Mesolithic: how it is defined as a period, the way in which it has been studied and those aspects of the period that impact upon interpretation. The findings of this thesis build upon the paradigm shifts that have taken place, both in archaeology in general and Mesolithic studies in particular. Past explanations of Mesolithic behaviours have tended towards polarisation, where economic and environmental concerns have sat in opposition, and even usurped altogether, the 'non-functional' aspects of life. This in part has come about owing to a lack of physical evidence for the period and in part because of a reliance on anthropological studies of hunter-gatherers, often situated within dichotomous frameworks, to explain the archaeology of the Mesolithic. In this chapter, in addition to a summary of the Mesolithic and what characterises it as a period, some themes important to this study are elaborated upon: the definition of hunter-gatherers; ritual and religion and Mesolithic material culture, in particular lithics. The latter is discussed in chronological, technological, spatial and social terms and these are themes picked up in the results and discussion chapters.

The British Mesolithic is an archaeological entity commonly defined in chronological terms. A number of elements characterise the period and make it distinct in respect of its archaeology. Encompassing some four to five thousand years of habitation, the Mesolithic is afforded its chronological parameters in part by the onset of the Holocene, and to a certain extent, because of the main mode of subsistence (hunting and gathering) implemented. Convention dictates that the Mesolithic period started at around 10,000 BP (9,500cal BC), whilst its end dates are variable according to geographical location, but are seen to be marked by the introduction of the Neolithic at around 5500BP (4345cal BC). The early Mesolithic in the

British Isles is customarily marked by the introduction of broad blade stone tool industries similar to those of the European Maglemosian (Clark 1932, Jacobi 1978), and is dated at about 10,000 BP to 8,500 BP (9,500 - 7560 cal BC). The later Mesolithic is typified by a narrow blade industry and smaller microliths, which are more geometric in shape and comparable with the European Sauvettarian (Clark 1955, Jacobi 1976, Kozlowski 2009). This change in technology is closely correlated with environmental change, including the disappearance of the land bridge between Britain and the Continent at around 8,500 BP (7560 cal BC) and the onset of oak, hazel and lime dominated woodland (Moore 2003, Gaffney *et al.* 2009).

The British Mesolithic customarily ends at around 5,500- 5000BP (4345- 3780 cal BC) with the introduction of a Neolithic way of life. The transition between the two is not clearly understood and the Mesolithic-Neolithic transition has become a focus for concerted study in recent years, especially concerning aspects of subsistence, environment and ideology (for examples, see Woodman 2000, Allen *et al.* 2002, Blackford *et al.* 2003, Carver 2004, Whittle and Cummings 2007, Thomas 2008, Cummings and Harris 2011). Certainly it was a time of both rapid and gradual change in social practice which transformed the way people carried out their lives. The practices seen as Mesolithic would become Neolithic through the introduction of new material culture, new ways of dwelling in the landscape, the development of monumentality, and new ways of subsisting. This study, to some extent, questions whether there were aspects of Mesolithic praxis that can be considered precursors to what are usually seen as Neolithic traditions, for example, the digging of pits and the votive deposition of material culture.

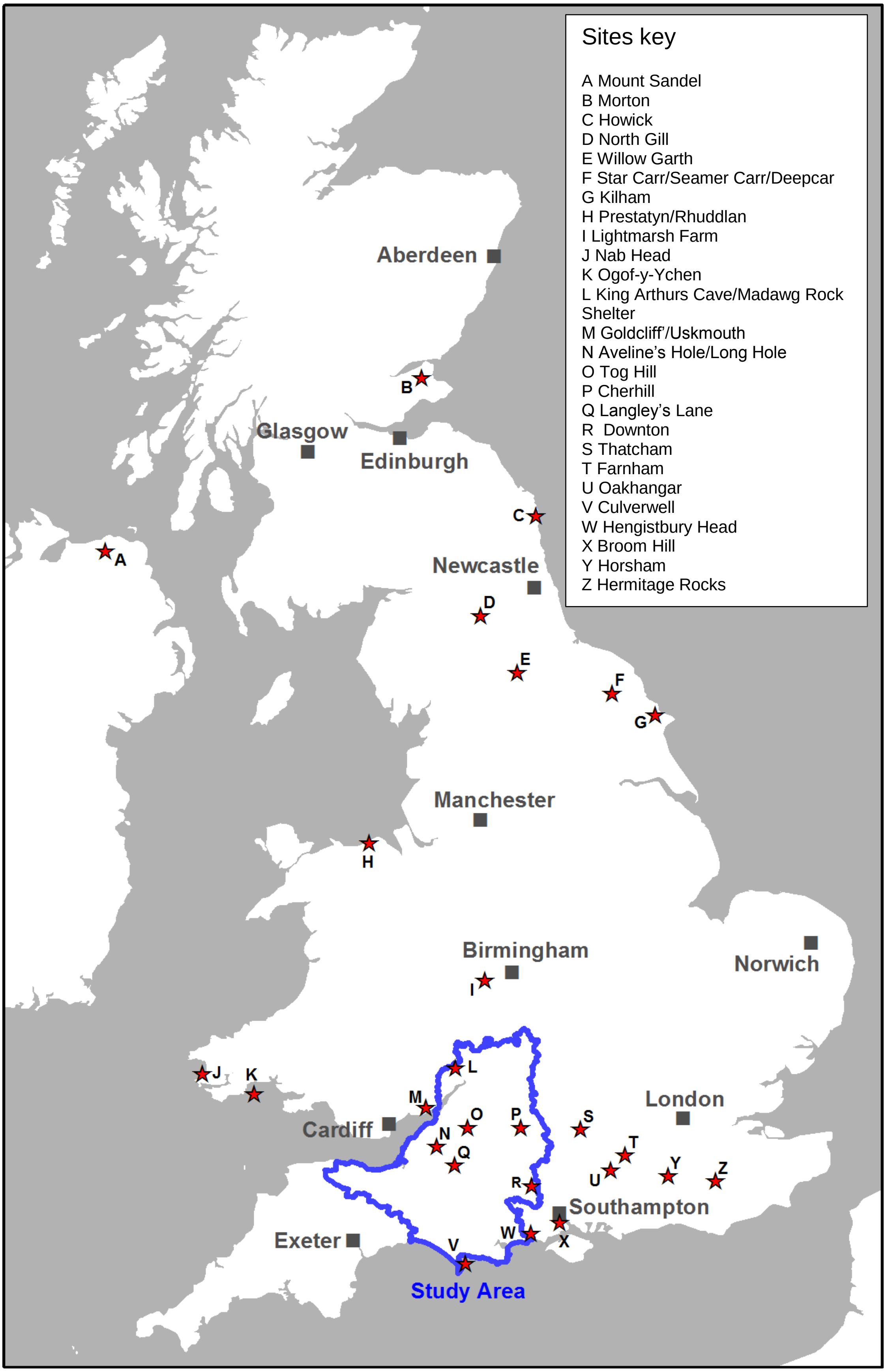
The Mesolithic period itself is further typified by notions of nomadic, hunter-gatherer peoples roaming the countryside procuring food and raw materials on a seasonal basis. There is only limited evidence for the settlements and dwellings that are attributable to the period elsewhere in Europe. A mobile lifestyle is indicated by the presence of small and well worked out flint cores and flint scatters, and these are often interpreted as the sites of temporary camps, especially when other archaeological features are not present.

Mesolithic technologies are characterised by blade dominated assemblages, which are seen as typical of post-glacial hunter-gatherers. Small microlithic implements were fashioned into increasingly geometric forms using soft hammers and punches made from the antler and bone of red deer. These microliths were subsequently hafted into a wooden shaft to make composite tools, as sometimes were the scrapers, piercers and awls associated with ‘domestic’ tasks. The tranchet adze was employed for wood working, and burins for engraving or scoring antler and bone. Flake tools are seen as less dominant in assemblages but often occur as core preparation and rejuvenation flakes, and in general knapping debitage. Other debitage includes the remnants of microlith production such as microburins and snapped and broken blades. It is however the microlith that is seen as an integral component of Mesolithic tool kits and a quintessential part of Mesolithic culture. These characteristic forms of stone tools (microliths, scrapers etc.) are in many ways the basic unit of analysis for the interpretation of Mesolithic sites. This can be problematic at sites such as Langley’s Lane, discussed in Chapter Five, where the lithics do not necessarily conform to rigid parameters often used in the quantification of assemblages. Some of the problems inherent in lithic analysis, such as the definition of bladelets, are discussed in Chapter Two.

These common elements have informed, and in some ways constrained, the way the archaeology of the British Mesolithic has been viewed. Traditional interpretations emphasised new environmental conditions synonymous with fresh challenges which had to be overcome in order to subsist (cf. Myers1989). Hunting, gathering, foraging and fishing, and the material expression of these through the production and use of new and distinct stone tool types, were seen as a reaction to a warming climate, rising sea levels, afforestation and the new flora and fauna that inhabited these rapidly changing isles. The Mesolithic tool kit was viewed as the perfect adaptation to what were new and alien environments (cf. Myers 1989). These ‘givens’ dominated the early discourse and pervaded Mesolithic studies, certainly up to the 1980s, and were at their strongest prior to the theoretical paradigm shift that came with the New Archaeology of the 1960s.

Earlier archaeologists, for example, Childe (1925) and Clarke (1978), pronounced the British Mesolithic meagre and impoverished compared to that of Europe, and described it as being in stark contrast with the Palaeolithic and Neolithic periods (cited in Milner and Woodman 2005). The Mesolithic people of Britain did not build great earthen or stone monuments, did not express themselves creatively through the sophisticated medium of art, and apparently lacked the organised settlements and cemeteries of continental Europe. The people appeared devoid of culture to such an extent that culture historians, such as Childe (1925), labelled the period the epipalaeolothic and considered it a mere developmental stepping stone as people transitioned from being Palaeolithic to Neolithic. The word Mesolithic did not find its way into common usage until the 1930s, when Grahame Clark published his works on European prehistory (for example, Clark 1939).

Figure 1.1: Sites mentioned in this chapter (showing study area outlined in blue)



The major consequence of this perceived cultural hiatus, related to the paucity of known sites and a lack of upstanding archaeology, was a British Mesolithic couched in negative terms (Milner and Woodman 2005). Hawkes and Hawkes cautioned the modern visitor, that if time travelling to Mesolithic Britain, they should only expect to see “poor little groups of hunters and food-gatherers” (1944:37). In essence, the period we know as the Mesolithic was little more than an evolutionary stage (Milner and Woodman 2005). It was perceived as a time when at the beginning of the period people were forced to come to terms with a changing and all determining environment and at the end were the passive receptors of neolithisation. This thesis considers the Mesolithic not as a period of evolutionary progression, but as a time when people started to alter their landscapes, and a time during which there were noticeable changes and/or a diversification in some practices (for example, in lithic production and the treatment of the dead). To some extent, this corresponded with changes in environmental conditions and an increased dynamism of landscape processes, such as the emergence of new springs and the formation of tufa (see Chapter Five).

It was the discovery of Star Carr in the late 1940’s that established a serious interest in the British Mesolithic as a period in its own right. The innovative multi-disciplinary approach taken to this site by Graham Clark (where he not only studied the artefacts but brought in experts to help place the site in its environmental context), set the methodological and theoretical stage on which the Mesolithic would be played for the next forty or so years. It was to become *the* site to which all others were compared, and would be judged superior in terms of the quality of evidence preserved in its peat rich deposits. The abundance of organic artefacts such as barbed antler points, antler frontlets, brushwood platforms, and other faunal remains are comparable to those found more usually in northern Europe. This almost plethoric quantity of evidence ensured interest in Star Carr would endure until the present day, with the site undergoing numerous reinterpretations (for example, Clark 1954, Mellars and Dark 1999, Conneller and Schadla-Hall 2003, Taylor *et al.* 2010). As new sites were unveiled, few matched it for its wealth of remains and it retained its status of being synonymous with the British Mesolithic for many years, effectively becoming a type site for the period. Despite the optimistic outlook of earlier archaeologists who considered that if the right preservation circumstances existed more Star Carr’s would be found, even the more extensive sites such as Thatcham, Berkshire (Wymer 1962, Healy *et al.* 1992) and Cherhill, North Wiltshire (Evans and Smith 1983) were not as abundant in organic remains.

Parallel developments in ecological studies from scholars such as Dimbleby (1961,1962, 1965), Simmons (1964,1969,1975), Simmons and Innes (1981) and Smith (1970), were to add further weight to the environmental emphasis that was to dictate Mesolithic studies for so long. The evidence for active disturbance of the environment during the Mesolithic cannot be disputed, although some ecologists have put this down to non-human agency (Vera 2000). Charcoal, lithic and pollen data supports the premise of both the creation and maintenance of woodland clearings by anthropogenically induced firing (Keef *et al.* 1965, Simmons and Innes 1981). Ecological studies of woodland suggest that natural clearings (dells and glades) would have been in existence during the early Holocene (Williams 2003, Whitehouse and Smith 2004), especially in chalkland areas. It is likely that Mesolithic people were maintaining these clearings, which were often situated at the edges of woodlands, rather than fire starting new ones (Williams 2003). Systematic burning stimulates the growth of new vegetation which is known to encourage the congregation of deer and other animals into these spaces, thus increasing the number of animals available to hunt at pre-determined locations. Furthermore, firing encourages the growth of hazel (*corylus avellana)* suggesting that the production of hazelnuts was also consciously encouraged (Moore 2003); similarly it has also been suggested the firing of oak woodland promotes an increase in the supply of acorns (Mason 2000). Early views saw these clearings at first as Mesolithic people trying to recreate the open environments of the Palaeolithic and then as economic devices to increase the resource carrying capacity of local habitats (see Chaplin 1975, Mellars 1975, Simmons 1975), thus strengthening environmental deterministic models of Mesolithic life.

The deliberate manipulation of the environment through the burning of vegetation is viewed as a largely later Mesolithic development, though Bush (1988:461) demonstrated that people may have been manipulating the environment in this way at around 8900 BP (8101 cal BC) at Willow Garth on the Yorkshire Wolds. Incidences seem to increase after about 7000 BP (5910 cal BC) (Myers 1989, Simmons and Innes1987, Spikins 1998) and most clearance episodes of woodland by burning date to around 5670 to 4890 BP (4525-3680 cal BC) (Mellars 1976). This may of course be a reflection on the available evidence, as the case for anthropogenic environmental change in the earlier period is sparse. However, this paucity also makes archaeological and ecological sense; the pre and early boreal coniferous forest would not have been as an attractive an environment for foraging ungulates to congregate as the later mixed deciduous woodlands (Mellars 1975). The evidence for anthropogenically induced environmental change suggests that people were aware their environment could be manipulated and altered. This may have impacted conceptually, for if people during the Mesolithic believed they could affect the world around them, then they might also have reasoned that the external environment exerted its own influence, which could also transform and control the lived in world. This may well have been a central tenet for the way people interacted with their landscapes and may have influenced behaviour and practise at certain sites, including the springs considered in this thesis (see page 73).

Early ecological studies also provided the impetus for Clark (1972) to propose his seasonal exploitation model for north-east Yorkshire in which economic rounds were based on annual cycles. Mesolithic people would have inhabited lowland areas in the late autumn, winter and spring, with upland areas occupied during the summer months when, Clark posits, they would have followed red deer as they moved to summer pastures. Jacobi (1979) suggested a similar model for south west Britain that was also based on the availability of animal resources and the movement of red deer. Although these prescriptive models of mobility are now questioned (Donahue and Lovis 2006, Evans *et al.* 2010) the notion of Mesolithic people following ungulates across the landscape led to the widespread adoption of Binfordian models of hunter-gatherer organisation, as used in anthropology. Societies were seen to conform to patterns of either 'residential' or 'logistical mobility' (Binford 1980) with the latter seen as archetypical of Mesolithic hunter-gatherers. Thus, these people would have inhabited camps and visited locales which had different and distinct functions according to the seasonal variations of the latitudinal zones they populated. That this distinction may not always be so clear cut is alluded to in Chapter Six.

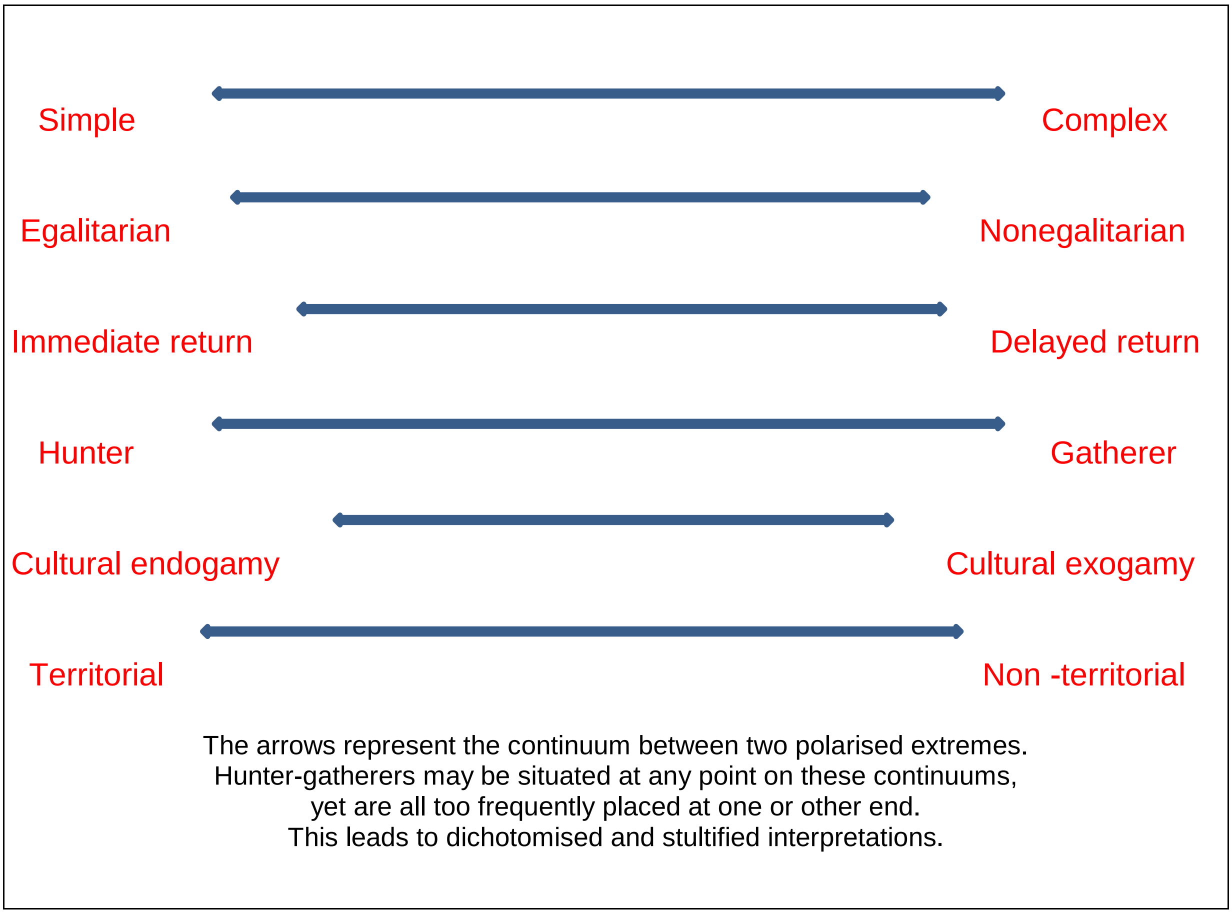
Anthropological studies such as those by Radcliffe-Brown (1930, 1931), Service (1966), Sahlins (1972), Binford (1968, 1980), Binford and Binford 1969, Lee and Devore (1968) and Ingold, Riches and Woodburn (1988a, 1988b) would provide the analogues against which archaeological hypotheses could be supported or refuted. Until the 1960s, anthropologists, like archaeologists, were mostly concerned with "subsistence, technology, demography, and socio-political organisation" (Yesner 1994:151). At this time the general perception of hunter-gatherers was of poor savages working themselves to the point of exhaustion and studies were dominated by notions of the male 'hunter' (for example, Service 1966) and the importance of meat procurement. These hunter-gatherers were typically organised into patrilineal bands (Radcliffe-Brown 1930).

At the 1966 *Man the Hunter* conference, the role of women as foragers and the importance of plant foods were discussed (Kelly 1995) eventually leading to works such as *Woman the Gatherer* (Dahlburg 1983) but it was at this conference that Sahlins really stimulated fresh debate with his idea of the 'original affluent society'. In this model hunter-gatherers lived an idealised life, where plant food was the focus of subsistence over meat, and leisure time was available. Woodburn in a number of papers (clarified in Woodburn1988) distinguished between immediate and delayed return societies, the latter being concomitant with affluent foragers who could use their free time to develop aspects of society not related to subsistence.

Interpretations in earlier schools of archaeological thought were influenced greatly by these works and some of the hunter-gatherer myths of the earlier ethnographies pervade Mesolithic archaeology to the present day. Although paradigms shifted in hunter-gatherer studies, interpretations of their lives are still constructed within a dichotomous framework (Figure 1.2. For a fuller explanation see page 17: The homogeneity myth). This approach was influenced by linguistic structuralism (see Sturrock 2008) and the theories of Levi-Strauss (for example, his 1958 work: Structural Anthropology). The reader is referred to Hodder 2007 for further explanation of the use of structuralism and related theories in archaeology, but in essence the premise of structuralism holds that the world is composed of binary opposites, and from the relationships between these dichotomies (for example: black/white, male/female) meaning can be extrapolated. Understanding dichotomies should in theory allow us to understand the structuring principles of a society. The results (chapters four and five) of this thesis, however, challenge the notion that hunter-gatherers in the Mesolithic can be categorised into, or operated within, such dichotomous frameworks.

So, Mesolithic scholars driven by the limited artefactual and environmental evidence available to them adhered to a paradigm of economic and environmental determinism. With hunter-gatherer anthropology operating in the same theoretical vacuum it is not surprising that this position became the dominant discourse for much of the duration of Mesolithic studies. This is not to say that there were not innovative and exciting ideas coming out of these earlier works, rather that the theoretical paradigms in which archaeologists operated at the time were limiting. Added to this, the numbers of people working in the field of Mesolithic studies was small compared to those working in the later periods. Indeed much of the forward-looking work on the Mesolithic was carried out later by those interested in the Neolithic, looking back to the Mesolithic for the first glimmers of Neolithic practise to explain the transition from hunter-gatherer to farmer (see Whittle and Cummings (2007) for a summary of early work). Few studies saw the transition from a Mesolithic point of view although there were exceptions (for examples, see Zvelebil 1986).

Figure 1.2: Some common dichotomies in hunter-gatherer studies



As a result, it was conceptually difficult to assign the period specific attributes that did not promote an overwhelming sense of homogeneity. This uniformity was partly borne out of the scale at which research was taking place in British archaeology prior to the 1990's. Up until this time there was an academic focus on sites, especially those with faunal remains that could yield lots of information. Certain regions and contexts were focussed on to the detriment of others and there was less consideration of smaller sites which would have helped to explain site variance.

Mesolithic archaeology is often associated with wetlands and indeed much of the work carried out to date has concentrated on this type of site. In the national context, wetland locales in the Vale of Pickering, Yorkshire, especially Star Carr, Seamer Carr and Deepcar, (see for example, Conneller 2000, Conneller and Schadla-Hall 2003) have probably received more attention than any other. Likewise, coastal sites, especially those on the west Scottish and Welsh coasts, reflect a scholarly interest in the shell middens and cave sites found there, examples of which include the midden at Morton, Fife (Coles 1971) and the cave site of

Ogof-y-Ycihen, Caldey Island, Pembrokeshire (Schulting and Richards 2002). Inland cave sites such as Aveline's Hole, Somerset (see Schulting 2005) also attract interest because of the early Mesolithic human remains it has produced. From these types of site it may be possible to extrapolate ideas about personhood and identity but the focus until extremely recently has still been very much on subsistence. Some of these sites have been studied more in relation to how and when people became Neolithic rather than what it means to be Mesolithic. This is especially true of some of the coastal sites where shell middens have been studied to glean information on the Mesolithic-Neolithic transition (for example, Cummings 2007). Some inland sites such as Thatcham, Berkshire (Wymer 1962, Healy *et al.* 1992) and Horsham, Sussex (Clark and Rankine 1939, Jacobi 1981) have also become synonymous with Mesolithic studies; the former due to its extensive faunal remains, including human bone, and the latter because of its microlith assemblages which assumed a prime role as chronological indicators. It is hardly surprising that the material evidence to be found at these sites led to an obvious bias towards research in certain regions, and also to their status in the Mesolithic possibly being exaggerated. The choice of study area for this thesis (see Chapter Two), and a focus on inland spring sites goes someway to addressing this bias.

Paradigm shifts

Whilst attitudes have shifted, some of the early perceptions of the period persist, but generally the Mesolithic is no longer considered the cultural backwater of British prehistory and indeed the last ten to fifteen years have seen it become firmly established as a research priority. The recent publication of several edited volumes serves to confirm this (Young 1999, Larsson *et al.* 2003, Milner and Woodman 2005, Conneller and Warren 2006, Bailey and Spikins 2008, McCartan *et al.* 2009). Certainly a thriving research culture in Mesolithic studies is now being driven by those engaged with the period in a more holistic way. As a wave of Post-Processualism engulfed mainstream archaeology, scholars from more interpretive schools of archaeological thought were increasingly showing how Mesolithic hunter-gatherers were people with symbolic and meaningful lives. Lithics were not just the technological result of adaptation to environment (Finlay 2000, Zvelebil 2003) and Mesolithic people were seen to have social lives or ‘lifeways’ (Young 1999).

Whilst site-based approaches had dominated Mesolithic studies in the earlier paradigms, new approaches concentrating on Mesolithic landscapes, and to some extent regions, have emerged. Notable examples include: The Vale of Pickering (Conneller and Schadla Hall

2003), the southern Hebrides (Mithen 2000), the North Western Sea Basin (Waddington 1999, Waddington and Pederson 2007), western Britain (Bell *et al.* 2007) and Doggerland (Gaffney, Thomson and Fitch 2007). The landscape approach has contributed to some fundamental changes in thinking. For example, Star Carr, once considered to be a type site, is now thought to be unique largely as a result of the extensive work carried out in the Vale of Pickering (for example: Conneller and Schadla-Hall 2003). These sites are being recognised for what they often are: exceptional places in wider landscapes that are a part of extensive schemes of interaction within that landscape. More recent discoveries such as the dwellings at Howick (Waddington *et al.* 2003) and Star Carr (Taylor *et al.* 2010) and the footprints at Goldcliff and Uskmouth (Bell *et al*. 2007, Aldhouse-Green *et al.* 1992) have provided fresh impetus for a lively inquiry into the complex lives of British hunter-gatherers. The Mesolithic is now increasingly seen as a diverse and fluid framework within which people operated during the earliest Holocene (for example, Kozlowski 2003, Milner and Woodman 2005, Warren in Conneller and Warren 2006). The springs of this study help to illustrate this diversity, for although sharing similar properties, their associated archaeology also demonstrate different reactions to similar phenomena. This was particularly noticeable at the tufa springs, where the act of deposition varies considerably between the sites (Chapter Five).

The homogeneity myth

Despite this paradigm shift, all too often the Mesolithic is still referred to as if it was an homogeneous entity with only small scale technological changes in lithic production indicating shifts in sociality and creating some chronological differentiation between the earlier and later Mesolithic. This does not mean there is no variance, and that it is not recognised, rather that there is a lack of spatial and temporal definition which causes archaeologists to concentrate on the commonalities of the period instead of the differences. Perhaps the most obvious homogenisation for the period is the focus on hunter-gatherer lifestyles and what appears to have been a distinct lack of crediting hunter-gatherers with agency and personhood by those responsible for peopling the Mesolithic.

The definition of what constitutes a hunter-gatherer lifestyle is not clear cut. However, egalitarian, nomadic societies who hunt for wild game, fish, and forage for vegetables, fruit and shellfish on a seasonal basis is the notion that prevails in British Mesolithic archaeology. Yet in reality, for both modern and prehistoric populations, hunter-gatherer peoples cover a spectrum of possibilities (Kelly 1995, Panter-Brick *et al.* 2001). From the Inuit of Antarctica to the Indians of North American to the Ju/'Hoansi of the Kalahari and the Aboriginals of Australia, hunter-gatherers are found all over the world in different climatic and environmental conditions and their material culture, although sharing similarities, is as varied as the range of flora and fauna that they exploit. They have a range of belief systems and organise their societies accordingly. Human behaviour is not universal and hunter-gatherers are as diverse in societal make-up, subsistence strategies, and cultural differences as they are in geographical location. Mesolithic hunter-gatherers may have been as equally diverse.

As Kelly points out, there is no such thing as a generic hunter-gatherer and the term is merely "a heuristic and pedagogical device" (1995:35). Many anthropologists and archaeologists agree that hunter-gatherer is a less than satisfactory category for theorising the lives of both past and present peoples (for example, Burch 1994, Panter-Brick *et al.* 2001, Pluciennik 2004). Unfortunately the problem of assigning people to certain cultural types is one that is almost inevitable in both disciplines. There seems to be no realistic solution to this semantic problem and at present we have to be content with a term that does not really adequately portray the life style(s) under study. This may be further compounded if we account for intra-group variability as well. Whilst getting to the nub of what a hunter-gatherer is might be considered a moot point, as the same issues are present when studying other forms of society, the use of hunter-gatherer ethnographies is not. These carry very real consequences for archaeological interpretation.

Generally scholars have tended to use historical and contemporary hunter-gatherer ethnographies to formulate analogies to explain Mesolithic lifeways. This is understandable as ethnographic analogy is a useful and profitable tool to archaeologists when used carefully. However, there has been a tendency to transmogrify the Mesolithic person into the generic hunter-gatherer (for example, Gardiner 2000), partly because there are no direct historic parallels for the British Mesolithic, and partly because indirect analogy is often based on the broadest similarities between the *cultures* under study.

Certain hunter-gatherer groups have commonly been used as analogues for Mesolithic peoples. These have tended to follow fashions in anthropology, when initially the Australian Aranda were considered the archetypal hunter-gathers and then successively the North American Shoshone, the Botswanan Ju/'hoansi and the Ache of Paraguay (Kelly 1995:2). Effectively this was the replacement of one stereotypical model of hunter-gatherers with another and eventually resulted in the generalised foraging model taking precedence in archaeological studies. Whilst anthropologists and archaeologists have since acknowledged diversity in contemporary and relic populations, mainstream Mesolithic archaeology has not caught up and unfortunately the same dichotomies still arise in both disciplines when hunter-gatherers are considered.

An important point to stress here is that whilst Mesolithic hunter-gatherer lifeways and associated material culture may share similarities, the evidence throughout Europe suggests we are dealing with “a highly differentiated phenomenon”(Kozlowski 2003: XXI).Yet, we do not generally see the Mesolithic period in Britain as highly differentiated, despite earlier suggestions that it probably was (for example, Rowley-Conwy 1986). This is in contrast to the subsequent Neolithic where it has been suggested that archaeologists are dealing with more than one Neolithic (see for example, Thomas 1999, Whittle 2003). There is no reason to assume the British situation was any less diverse than that of Europe, and so we need to consider that we are also dealing with multiple Mesolithics and therefore multiple narratives.

The homogeneity myth is sound justification for not exclusively adopting hunter-gatherer analogues, over all others, when discussing Mesolithic societies. As Feit (1994), Burch (1994) and others have discussed; the conceptual problem is not one that will go away but at least should be acknowledged so as not to situate Mesolithic peoples in typological boxes that serve to constrain interpretation. This study addresses these points and acknowledges that there is always a plurality of meaning. However, as described on pages 78-84, although not universal, recurrent themes can be identified which have a bearing on the way the springs of this study are interpreted. Most of these relate to hunter-gatherers, others relate to the wider human experience, but all were chosen carefully to reflect possibilities that may have existed in a diverse Mesolithic Britain.

Mesolithic belief (religion and ritual)

One of the key objectives of this thesis was to explore the possibility that some of the activities taking place at spring sites were of a ‘ritual’ or ‘religious’ nature. Little has been written on these themes with specific regard to the British Mesolithic, for the study of ritual and religion, especially in early prehistory, is problematic. This is partly owing to a lack of written records and the ephemeral nature of the physical evidence for the period, but also stems from unwillingness to engage with the theoretical complexities of ritual and religion, although this situation has improved notably (Insoll (2004, 2011). A synopsis of some of the key issues is presented here.

Religion, ritual and archaeology

There is not space here for a full discussion of the terms 'religion' and 'ritual' and how they are used in archaeology, the reader is therefore referred to works by Renfrew and Zubrow (1994), Bell (1992, 1997), Brück (1999), Insoll (2004, 2011) and Wesler (2012) for detailed discussion of these. Although various proponents have proffered definitions of religion and what it encompasses (for example, Tylor 1871, Durkheim 1915, Levi-Strauss 1958, Geertz, 1973, Southwold 1978), for the purpose of this study religion can be considered a codified, shared 'belief system' that forms a framework within which people can maintain social order and make sense of their world. Religion often incorporates the following elements: an omnipotent power or powers that control certain aspects of the world and govern human behaviour; a formal set of rules or a moral code which adherents to the religion follow; ritualised practices through which they express the 'obligations' of their religion; symbolic representations of the religion and an intermediary between the real world and the spiritual world. The term 'religion' is also connected to ideas about 'cult', 'superstition', 'mythology' and 'magic'. Irreligion, i.e. an absence of religious belief is also a very real phenomenon which cannot be discounted in accounts of the past.

Ritual is often confused with religion in some accounts of the past and it is important to note that whilst religious rituals occur, ritual can also be non-religious. Some general characteristics apply to ritual practices, Bell lists these as "formalism", "traditionalism", "invariance", "rule governance", "sacral symbolism" and "performance" (see Bell 1997: 138-169 for a full explanation of these terms). Bell (1997) has also identified six spheres of ritual action which with some modification could provide a useful framework for thinking about Mesolithic ritual behaviours: "rites of passage", "calendrical rites", "rites of exchange and communion", "rites of affliction", "political rites" and rites associated with "feasting, fasting and festivals" (see Bell 1997: 93-137 for a full explanation of these terms).

For historic societies it is relatively easy to study religion and ritual practise; for prehistoric societies it becomes more difficult. In many ways it is easier to talk about 'belief', that is what people might have thought about their worlds, rather than trying to assign behaviour into categories of 'religion' and 'ritual' and their various permutations. In this sense 'belief' becomes an inclusive term, for things people think and consequently act upon to maintain their world order. Belief may manifest itself in the archaeological record through the presence of particular objects in specific contexts. Certain places and landscapes may be considered as sacred and become the locations for the deposition of materials which may act as symbol and metaphor for aspects of belief. For example, the Kogi people of north Columbia are said to still leave small stones, as the Muisca did before them, as offerings in respect of the sacred mountains of the Sierra Nevada (Petitpierre 1975). Of course some ritual and religious behaviours, that is verbal and performative expressions of belief are not directly visible in the archaeological record (Chatterton in Conneller and Warren 2006).

Caution needs to be exercised in examining belief and associated ritual behaviours for the meanings of these are not universal even from an emic perspective (Bell 1997). Chatterton (after Lewis 1980 and Lane 2000) suggests that “ritual should be considered an aspect of action rather than a particular kind of action” (Chatterton in Conneller and Warren 2006:103) and this is a salutary piece of advice, although others have recognised that “theories about ritual come embedded in larger discourses” (Bell 1992:13). It is perhaps the “sense of ritual”, as it is influenced by belief and realised by its prehistoric proponents (Bell 1992) which is important to try and recognise in the archaeological record rather than to interpret the meaning of a ritualised act. Ritual is a constituent of both religious and secular life and these are not necessarily distinct from each other. However both are borne from a need to engage with the world, to maintain order and stability and to bring about desired outcomes.

Mesolithic belief

The study of religion and ritual in past hunter-gatherer societies is extremely difficult. A lack of written records, ephemeral archaeological evidence and the reluctance of some archaeologists to even consider the possibility that prehistoric people had religious lives has stultified this line of inquiry in the Mesolithic, although again the situation has improved over the last ten to fifteen years (Conneller in Insoll 2011). Where it is discussed, Mesolithic practise is generally considered ritual rather than religious and although theoretically scholars have moved on from the position where ‘ritual’ was an all-inclusive term for behaviour that could not be explained (Insoll 2011, Wesler 2012), there is still reluctance in the discourse to discuss Mesolithic ‘belief’ as part of the wider framework of Mesolithic material culture, action and praxis. Current knowledge of Mesolithic 'belief' is based on a range of archaeological evidence drawn from studies on the treatment of the dead, exceptional examples of material culture, and unusual landscape or anthropogenic features, enhanced by the application of ethnographic analogy.

Whether Mesolithic lives can be considered religious is open to philosophical debate but certain practices can be identified in the archaeological record that supports the existence of Mesolithic belief(s) and ritual behaviour. Concepts of animism, totemism and shamanism, as understood from examples in modern hunter-gatherer societies, dominate the discourse whilst lesser discussed but equally pertinent themes for example, cultish practise, belief in an afterlife and the use of 'magic' can also be of relevance. Hunter-gatherer cosmological schemes are used as a framework within which Mesolithic people might have also understood their worlds. Examples from the British Isles, bolstered by the evidence from European contexts, indicate that Mesolithic people had beliefs that were not just remnants of Palaeolithic ritual practice, or the precursor to Neolithic monumentality.

A rudimentary construal of Mesolithic belief can be constructed using the above themes. It is widely accepted that most hunter-gatherers imbue the natural world with supernatural qualities. Known as animism, this preposition forms the basis of most interpretations about Mesolithic belief. The concepts of totemism and shamanism are closely linked to animism but can also occur separately. The intimate relationships between the human, animal, plant, material and spiritual world(s) has formed the basis of most interpretations. The adoption of animals as totems is one such premise.

Fuglestvedt (2008) has proposed the existence of Late Mesolithic totemic clans in Norway based on stylised animal shaped rock art at distinct locations in the landscape. It has been suggested that the pits at Stonehenge were the sockets for large pine timbers that may have been carved with totemic symbols (Cleal *et al.* 2005). The Red Deer may have been the totemic animal for the people of Star Carr who deposited antler barbed points at the edge of Lake Flixton and literally were "becoming deer" (Conneller 2004) when they donned one of the twenty one pairs of antler frontlets found there (Clark 1954). The frontlets have also been associated with shamanic activity whereby shamans can communicate with tutelary animal spirits or gain access to the spirit world of the ancestors through communicating with animal guardians.

The late Mesolithic female burial from Bad Dürrenberg, Germany has been interpreted as that of a shaman (Porr and Olt 2006); the associated grave goods bearing close resemblance to the paraphernalia used by modern shamans. The carved sandstone pebbles bearing geometric designs and faces from Lepenski Vir, Serbia have been interpreted as evidence of a riverine cult (Srejović 1972). Complex cemetery sites such as that at Vedbaek, Denmark (Albrethsen and Brinch Peterson1976) suggest people may have had notions of an afterlife, or at least a set of beliefs associated with the dead. Rich grave goods and objects placed with the dead seems to be a later Mesolithic development, however, the early Mesolithic cemetery site of Aveline's Hole indicates some kind of belief concerning the dead was already in existence. Human bone, likely the result of excarnation, has also been found deposited into coastal shell middens, and is a late Mesolithic occurrence. Variation in how the dead were treated both temporally and geographically shows that different beliefs were probably current at the same time.

The majority of these examples involve the deposition of objects, animals or people either into, or adjacent to, earthly or watery contexts. These 'liminal' zones are reminiscent of tripartite cosmologies where the world consists of several layers, for example, an underworld, a top world and a sky world. These worlds may be reflected in the organisation of aspects of everyday life, for example, in the layout of settlements.

In summary, it can be stated that Mesolithic people likely had a set of beliefs about how their world operated and were probably aware their actions could affect the natural order of things. In essence, the Mesolithic world was probably a spiritual one, in at least the general sense of the word; even if they did not believe in a greater presence; every aspect of their world would have possessed some kind of *mana* and actions were carried out in certain ways so as not to upset the balance of that order.

The nature of the evidence

Part of this research asks if the nature of activities at the hot springs and tufa springs might be defined as being of a 'ritual' nature associated with possible beliefs that Mesolithic hunter-gatherers held about their world. This relies, in part, on the interpretation of the evidence to be found at the springs. To situate that evidence (as discussed in chapters four, five and six), the nature of material culture to be found in Mesolithic Britain, more generally, is now discussed.

Mesolithic material culture and evidence of dwelling

Examples of the types of material culture, features and other evidence (other than flint and chert, which is discussed on pages 25 to 35: Lithics), found in the British Mesolithic archaeological record, as discussed here, are given in Table 1.1.

The artefacts that dominate our discussions of the British Mesolithic are largely limited to those made of stone that survive as lithic scatters. These are often the only tangible material remains that can be used to extrapolate the information that allows us to write about Mesolithic lives. This is especially true for some regions of the isles: for example, the acidic soils to be found all over Cornwall means that there is a paucity of organic remains to supplement the lithic evidence (Berridge and Roberts1986). Some environments however, do lend themselves to the preservation of organic material. These include sites that have deposits of peat, tufa, or are otherwise waterlogged. These can yield bone, antler and wooden items, with faunal remains tending to be the most frequent. Wood is less common, being limited to sites with exceptional preservation.

Remains of non-mammalian food stuffs such as shellfish and hazelnuts are seemingly commonplace, although there is a recovery bias in play. Shell middens are of great interest to researchers of coastal sites and hazelnuts are frequently found carbonised in pits and hearth material, and both are durable when subjected to taphonomic processes. Fish and fowl are frequently recovered but plant remains are extremely infrequent. *Ornamental* objects such as shell necklaces, pierced Cowrie shells and shale beads are infrequent finds, usually recovered from caves and rock shelters. These site types also occasionally produce human remains but are rare with only a very few well known examples. Parietal art, mobiliary art and decorated items are extremely rare in the British Mesolithic record, and not all have been securely dated. Occasionally found are geological items such as fossils and non-worked stones, but these are only likely to be recognised as artefacts when found in features such as pits or when accompanying human remains.

Dwellings, or structures which might loosely be called houses, are more commonly found elsewhere in Europe, although there are now a relatively substantial number of examples in Britain including huts at Mount Sandel, County Londonderry (Woodman 1985) and Broom Hill, Hampshire (O'Malley and Jacobi 1978) Somewhat dubious shelters and sunken pit dwellings, for example at Farnham, Surrey (Clark 1934) are also found, although these examples have been recently re-interpreted as tree throws (Tolan-Smith 2008). Other than hearth remains and lithic scatters, evidence for anything that could strictly be termed settlement is rare. Despite the high potential for recovery in the right preservation circumstances, the evidence for the British Mesolithic is ephemeral compared to that of parts of Europe and lithic assemblages make up the bulk of analytical material for much of the period.

Even with this heavy bias toward lithics, there has been more of an emphasis on the potential of organics, with faunal remains acting as a focus for a significant amount of the research carried out (Warren in Conneller and Warren 2006). Although much of the organic material recovered from sites is not worked, for example, worked bone and antler is scarce at Thatcham despite its extensive faunal remains (Wymer 1962:351), it does provide an opportunity to acquire increasing numbers of radiocarbon dates. These can be used to add chronological resolution to lithic assemblages and the availability of absolute dates is an improving situation.

Lithics

For the Mesolithic, the lithic evidence is variable depending on where and how it is recovered, but generally the raw material exploited at that time consisted of flint, cherts and some locally derived stone. Typical assemblages can consist of cores, blades, scrapers, piercers, awls, burins, denticulates, other retouched blades and microliths, as well as debitage resulting from the knapping process. Adzes and axes for use on timber also appear in the archaeological record for the first time in Britain. Tools may also be found made from modified pebbles and stones (Mithen1999). A number of elements characterise Mesolithic assemblages. There is a preference for blade production, although flake tools are still produced, and flakes will make up a significant proportion of the debitage, especially where core preparation has taken place. Blades are smaller than those which were produced in the Upper Palaeolithic and the careful platform preparation needed to produce these is frequently noted on Mesolithic cores, which are often found in a worked out and exhausted state. This is usually equated with the mobility requirements of Mesolithic hunter-gatherers as is the production of retouched blades to use as microlithic components in composite tools such as harpoons (Myers 1989) and graters (Clarke 1978).

Table 1.1: The range of Mesolithic evidence found in Britain

Material remains	Examples of known sites
Faunal artefacts (e.g. bone pin fragments, bone awl, scrapers)	Thatcham, Berkshire (Wymer 1962, Healy *et al*. 1992), Goldcliff, Gwent and Glamorgan (Bell *et al*. 2007)
Human remains	Aveline's Hole, Somerset (Schulting 2005), Caldy Island, Pembrokeshire (Schulting and Richards 2002)
Wooden items (e.g. digging sticks, paddles)	Goldcliff, Gwent and Glamorgan (Bell *et al*. 2007), Star Carr, Yorkshire (Clark 1954, Mellars and Dark 1998)
Hazelnuts	Mount Sandel, County Londonderry (Woodman 1985) Kilham, Yorkshire (Manby 1976)
Shell middens	Culverwell, Dorset (Palmer 1999), Morton Fife (Coles 1971, Deith 1986)
Footprints	Goldcliff, Gwent and Glamorgan (Bell *et al*. 2007), Uskmouth, Gwent and Glamorgan (Aldhouse-Green *et al*. 1992)
Dwellings	Howick, Northumberland (Waddington *et al*. 2003), Star Carr, Yorkshire (Taylor *et al.* 2010)
Structures (evidenced as post holes)	Broom Hill, Hampshire (O'Malley and Jacobi 1978), Castle Meadow, Downton, Wiltshire (Higgs 1959)
Shale beads	Nab Head, Pembrokeshire (Gordon-Williams 1926, David 1989), Star Carr, Yorkshire (Clark 1954)
Cowrie shells	King Arthur's Cave, Gloucestershire (Barton 1997), Madawg Rock Shelter, Gloucestershire (Barton 1997)
Fossils	Aveline's Hole, Somerset (Donovan 1968), Langley's Lane, Somerset (Davies and Lewis forthcoming)
Parietal art	Aveline's Hole, Somerset (Mullan and Wilson 2004), Long Hole, Somerset (Mullan 2007)
Mobiliary art, incised pebbles	Nab Head, Pembrokeshire (Gordon-Williams 1926), Rhuddlan, Denbighshire (Berridge and Roberts 1994)
Hearth Remains	Oakhangar, Hampshire (Jacobi 1981), Downton, Wiltshire (Higgs 1959)
Lithic Scatters	Hengistbury Head, Dorset (Barton 1992), Tog Hill, Gloucestershire (Sykes and Whittle 1965)
Environmental remains (macrofossils)	Cherhill, Wiltshire (Evans and Smith 1983), North Gill, Yorkshire (Innes and Blackford 2003)

Once analysed, the nature of lithic assemblages can tell us much about the society that was using them. Lithics are one material that can inform archaeologists about many different aspects of life and have the potential to convey meaning. This is partly because they have been well studied; many theoretical and methodological concepts have emerged through the study of stone tools, and partly because, with few exceptions, they are ubiquitous to Mesolithic sites. For convenience the questions archaeologists can ask of lithics can be split into four broad areas or themes; chronological, technological, spatial and social. Whilst they should not be viewed in isolation from each other, for each is inextricably linked to the others, it is useful to outline them separately. These themes are picked up again in the results chapters (also see Chapter Two: methodology).

Stone tools as chronological indicators

It was the introduction of radiocarbon dating which proved crucial to contributing much needed chronological resolution to the Mesolithic. Jacobi (1973, 1976) originally made the case for an 'early' and 'later' Mesolithic (Jacobi 1978) based on the presence of particular microlithic forms supported by radiocarbon dates. Originally suggested as a schema for ridding the European Mesolithic of numerous overlapping cultural types, the terms have remained in common usage in Britain with clarifiers such as latest Mesolithic, middle Mesolithic also being used, especially when absolute dates are not available. The early and late Mesolithic are characterised by virtue of the lithics, especially microliths, typically found in assemblages from each of the time spans in question (Figures 1.3 and 1.4). Although there are some regional differences, early Mesolithic assemblages typically consist of larger, non-geometric, microlithic forms, transversely sharpened axes, steeply backed awls, end scrapers and burins. These assemblages, as demonstrated at Star Carr, may also contain barbed points of antler and bone (Myers1989).Three distinct typological groupings were recognised for the early Mesolithic, the 'Star Carr', 'Deepcar', and 'Horsham' assemblages' (Reynier 2005) which were dominated by broad blades and obliquely truncated (blunted) points. The former two groupings were dated to around 9,500 BP and the latter to around 9,000 BP (Reynier 1998, 2005).

At around 8650 BP there is a discernible change in tool typologies both in form and style, the nature of assemblages altering both in terms of debitage attributes and the raw materials utilised (Jacobi 1979, Jacobi and Pitts 1979, Jacobi 1978, Myers 1989). Assemblages in the later Mesolithic, classic examples of which include those of

Hermitage Rocks (Jacobi and Tebbut 1981) and Prestatyn, Flintshire (Clark *et al.* 1938), are characterised by narrow blade production and usually contain smaller geometric microlithic forms, such as scalene triangles, rods and rhomboids. Other tool types persist but there appears to be a large scale abandonment of antler and bone points (Myers 1989). In the very latest assemblages, toward the end of the period (sometimes referred to as the terminal Mesolithic), geometric microliths show a tendency towards extreme miniaturisation.

Whilst the general presumption (increasingly backed up by radiocarbon dates) is from larger, simpler forms to smaller geometric forms, it should be remembered that this is based on regional typologies (Mithen1999). Caution should be exercised in regions, such as Worcestershire, where Mesolithic assemblages have not been examined in great detail. For example, a radiocarbon date of 8004 to 7592 cal BC (OxA-4327) from charred hazelnuts found in a hearth at Lightmarsh Farm, Kidderminster, Worcestershire (Jackson *et al.* 1994) suggests that some regions adopted the geometric tradition earlier than others. Additionally, assemblages that have an absence of microliths or other distinct forms are more difficult to date without direct dating evidence. This can also be problematic where there are anomalies that do not fit the general models, for example, obliquely blunted points are sometimes found in later Mesolithic contexts, as demonstrated at Cherhill, Wiltshire (Pitts in Evans and Smith 1983), although they were once seen as a chronological indicator for earlier sites. This phenomenon is noted at some of the sites studied here, as well as others in the study area.

Mellars (1976) compared the typological aspects of various assemblages but with little respect to differing regional chronologies (though he was hampered by a lack of available radiocarbon dates at the time of his studies) and showed there were a series of assemblage types that were congruent with the early and late Mesolithic. Earlier assemblages consisted of a range of tool types and were considered ‘balanced’ whilst later assemblages were frequently scraper or microlith dominated, pointing toward increasing spatial differentiation between different task related activities in the later period (Mellars 1976, Myers 1987). There are no major and comprehensive studies that take into account the composition of debitage and how it might relate to chronological frameworks, other than a few metrical analyses such as that carried out by Jacobi and Pitts (1979) and Healy *et al.* (1992).These relate to southern England, and tend to be site rather than landscape orientated, and so again may not be applicable to all regions. Generally the shift from broad blade to narrow blade production accompanied by decreasing blade length, as evidenced in core related debitage, is seen as indicative of the shift from the earlier to the later Mesolithic.

The range of stone tools used by both earlier and later Mesolithic peoples consisted of many forms, yet none have attracted as much attention as the humble microlith. The modifications in microlith style from the earlier to later Mesolithic was once seen as indicative of the strategic adaptation to new environmental conditions but is now increasingly viewed in terms of changing ideologies and therefore corresponding social customs (for example, Finlay 2003, Warren in Conneller and Warren 2006, Bond in McCartan *et al.* 2010, Mills and Pannett in McCartan *et al.* 2010) Whatever the reasons, there are distinct technological differences between early and later Mesolithic toolkits and a discernible change in the overall design of composite tools.

Stone tools as technological indicators

Traditionally, modifications in lithic technology have been seen as "problem solving behaviour" (Myers 1989:91). In this model, climatic amelioration in the earliest Holocene gave rise to new woodland species of fauna and flora, which meant key locations for large scale kills were increasingly available. As a result of corresponding changes in animal behaviour, hunters could no longer rely on tracking animals that had predictable migratory routes. Hunting success was therefore constrained by less predictable and chance encounters and progressively woodier habitats suggests that animal resources could be procured more effectively with multiple element, composite tools. These according to Myers were a more "maintainable" and less risk set option and allowed changes from "interception" to "encounter" based hunting strategies (Myers cited in Torrence 1989:78). That there was a change in lithic technology and that it can be directly related to food procurement is not in dispute. At least some microliths were armatures for composite hunting weapons (Clark 1939, 1975, 1976), for example, the arrowhead complete with resin and shaft from Seamer Carr in the Vale of Pickering that dates to around 9,000 BP (David 1998). Microliths were also employed to make tools for other tasks and certainly the focus on microliths as armatures was initially over-emphasised. Use wear analysis has proved useful in challenging this *a priori*. At Thatcham, Grace (in Healy *et al.* 1992) demonstrated that of six microliths, only one was possibly a projectile point, whilst the remainder had been used for piercing and boring soft material including wood. Similarly at Star Carr, earlier work by Dumont (1985) showed that there was little or no wear on thirty one microliths examined. Although lack of wear is not conclusive evidence that microliths were never used as points, these and similar cases do indicate that microliths fulfilled alternative practical functions. This was highlighted by Clark (1976) and Finlay (2003) who examined grater boards from an ethnographic perspective adding weight to the premise that microliths could be used for plant processing.

Lithic debitage, as well as formal tool types such as denticulates, scrapers and awls, also changed form, coinciding with the move toward narrow blade industries and the propensity toward hafted tools. There is no doubt that this change in lithic technology from the earlier to the later Mesolithic was accompanied by changes in the way organic materials were also used. One obvious notable change in the archaeological record is the disappearance of antler barbed points toward the end of the early period. Myers suggests, with reference to the microliths which resembled the uniserial barb arrangement on antler points found *in situ* at Risby Warren V, Lincolnshire (Myers1989: 81), that geometric microliths hafted into wood were perhaps a direct replacement for antler barbed points (cf Mellars 1976: 396).This proposed replacement may demonstrate an economic need for cost and time effective hunting weapons, but also seems to indicate a shift in attitude toward red deer from the earlier Mesolithic. This may be borne out by the almost complete avoidance of the animal as a food resource in the Neolithic, where it appeared to have been a food that when consumed was bound by new conventions (Thomas 2004, Morris 2005) .This makes sense as isotopic analysis of human bone has indicated marked shifts in diet and consumption between the earlier and later Mesolithic and the subsequent Neolithic (for example, Schulting and Richards 2006). A large proportion of the assemblages looked at in this study typically consist of debitage and do not include many tools of 'standardised' types. This raises some questions as to how lithics are quantified, and is further discussed in Chapter Two.

Stone tools as spatial and site type indicators

Typically spring sites have been assigned as camp sites (where the springs are the focus for dwelling in a functional sense, for example, Birdcombe, Somerset (Gardiner 2000), or as 'other' , in that springs were places where votive deposition took place, for example the Hot Spring at Bath (Davenport 2007). Lithics are typically the medium through which site types are designated.

Figure 1.3: Early Mesolithic lithic artefacts from Star Carr (Clark 1954) not to scale

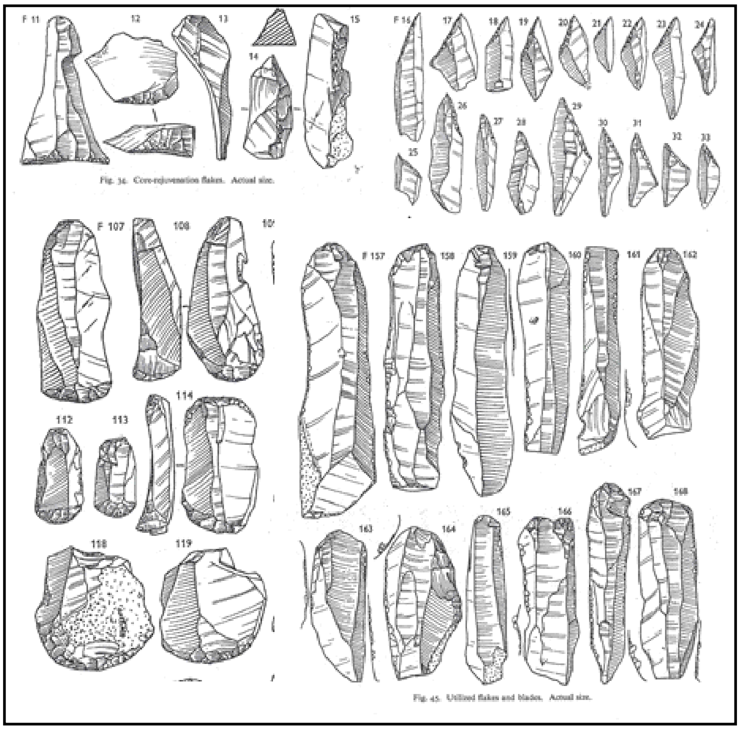
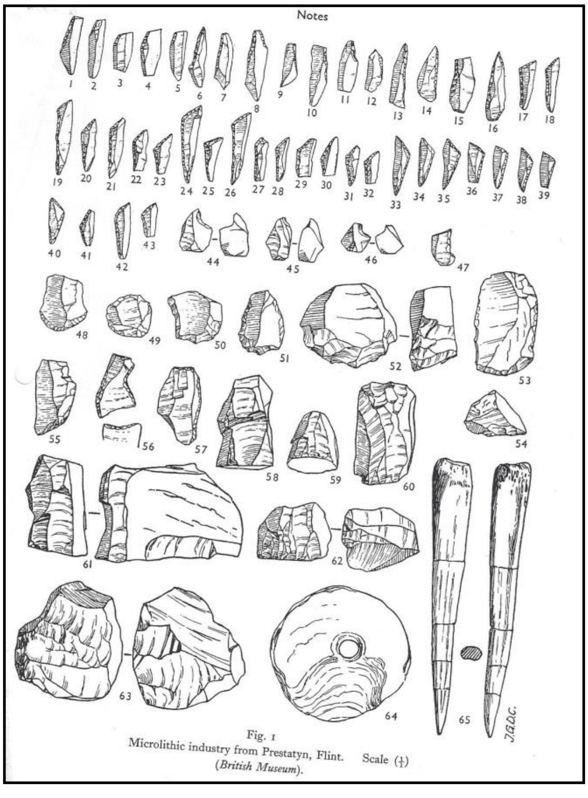


Figure 1.4: Late Mesolithic lithic artefacts from Prestatyn (Clark *et al.* 1938) not to scale



Generally distributions of lithic scatters are mapped, usually in two dimensions, and inform discourse centred on mobility, territory, raw material acquisition and social organisation. The presence of certain tool types and the composition of associated debitage is interpreted and sites assigned functional (domestic, resource procurement, aggregation) and temporal (short stay, permanent, revisited) status. In other words, the dialogue informs interpretations that allude to the types of activities taking place in particular spaces and the ways in which people moved around their landscape. Yet lithic scatters are not always spatially and temporally distinct from one another, making them notoriously difficult to interpret, and much of the work done to date on the British Mesolithic only points towards broad generalisations.

There is a significant difference in the numbers, size and locations of sites between the earlier and later Mesolithic, with later sites being more numerous, smaller, and occupying a more diverse range of habitats (Myers1986, 1989, Spikins 1998, Jacobi 1976, 1978, Reynier 1994, 1998), although there are of course exceptions to this general rule. Aside from chronological and technological differentiation, changes in lithic technology may also represent the emergence of new territories and distinct social groupings. Spikins (1999:10) suggests that changes in distribution patterns and the use of more localised raw materials in the later Mesolithic may also relate to reduced territory sizes and to the scheduling of resources. Previously this change was seen as a strategy for reducing the "cost" and "time" of gaining raw materials, thus increasing the time available for food procurement (Myers in Torrence 1989:78-91).

The general pattern for models of mobility in the Mesolithic was one of movement between specific locales in the landscape to procure resources on a seasonal basis, with specialised tasks and activities taking place at each location. This relates to the Binfordian models of mobility discussed briefly earlier and Mellars' ideas of types of lithic assemblages corresponding to different camp types. Type A (microlith dominated) represents hunting camps, Type B (balanced assemblages) relate to base camps and Type C (scraper dominated) hide preparation sites (Mellars 1976). It has been demonstrated that there are fundamental flaws in these categories and that sites rarely fall neatly into these three types (Conneller in Milner and Woodman 2005). The results of this research also dispute Mellar's hypothesis and is further discussed on page 237.

A number of points however, arise out of the basic preposition. In spatial terms, it implies that spaces and places carried distinctiveness for Mesolithic peoples, in other words certain activities happened at specific places, for there does seem to be variation in the utilisation of various locales between the earlier and later Mesolithic. Upland and lowland zones were differentiated for the earlier part of the period, whilst for the later period there seems to be more habitat variability and the number of sites recorded generally increases but they become smaller. However, even within a relatively small area there can be evidence of technologically distinct assemblages within close proximity of each other, in the case of Thatcham, for example, by only a few metres (Healy *et al.* 1992). This appears to represent a chronological and typological divide, and differing functions or activity areas for each part of the site.

Healy *et al.* (1992) posit two theories for this, either that there were specialist activities taking place in certain areas of the landscape at peripheral sites within the vicinity of a home base, or there were distinct activities happening at different sites at different times, but which were not necessarily specific to a particular locale. Despite the extensive typological and use wear analyses carried out on the assemblages from Thatcham, it is difficult to add finer resolution to the general interpretations that can be offered although Healy *et al.* (1992) are in favour of discrete activities taking place at various times, with the general consensus that the Thatcham sites were home bases with an emphasis on plant processing. This allows for different models of mobility. As Bradley (1978:98) suggested, the Kennet Valley "may have supported a semi-sedentary" population: certainly the abundance of resources and the presence of the balanced assemblages often associated with riverine sites, make this interpretation a logical one.

Despite the difficulty of adding a spatial dimension to people's lives, it is the conjectural notions that arise from the assignment of functional and temporal descriptors to places and spaces that mostly vitiates interpretation. Adding the label 'home base' to sites like Thatcham reinforces the implication that they belong to the domestic sphere and in effect 'home base' has become short hand for the mundane, practical and functional aspects of subsistence. It does not suggest that other types of activities might have also taken place at these sites. Archaeologically it does not make sense to assign a camp purely to the domestic, any more than to suggest hunting camps are places where only dealings related to hunting animals take place. As McFadyen (2007) suggests, Mesolithic people could have made themselves at home in other ways, through remembered connections between people, artefacts and place, and not necessarily by centring their lives at fixed locations in a landscape. She refers to this as "intimate spaces of encounter" whereby spaces, tasks and events are relational to each other, thus grounding people to place (2007: 124-125). More usually though, camps have been seen as disparate places linked by physical route ways, although the evidence of these may have long disappeared, rather than being part of a social network connected through people. Although the social is now receiving due attention from scholars, aspects of Mesolithic life are still often viewed primarily in spatial, temporal and technological terms, rendering the period somewhat socially sterile.

Stone tools as social indicators

An important aspect of this research concerns the social implications of the activity evidenced at the spring sites. This was perhaps the most difficult aspect to elucidate based on the evidence available. Many aspects of the social: age, gender, identity, personhood and social relations (Finlay 2003), are embedded in the temporal, technological and spatial and, inevitably, its discussion is limited by the constraints of these terms. Quite often it is only evident by default, for example, home bases are held to be suggestive of women and children whilst hunting camps allude to men. Traditional western sex and gender roles were once imposed onto Mesolithic people, and reinforced through poor use of ethnography. This lack of awareness held until the rise of feminist and gender archaeologies, and in particular was compounded by the history of Mesolithic research in which the microlith was synonymous with hunting and therefore with male activity. This position was actively challenged by Finlay (2000) amongst others, but the legacy of westernised gender bias continues very much into the present.

The production of stone implements in particular has been seen as an adult male activity, again reinforced by poor use of ethnography. There have been challenges to this premise (see Sternke 2005) with both women and children being seen as potential knappers of stone. Indeed, rather than an individual activity, Finlay posits that microlith production might have served as a social medium through which people conveyed a group identity, expressed through "multiple authorship" (2003:169). If this was the case then neither style or function may be important considerations *per se*, rather it is the aggregation of microlithic components into a hafted tool that can be seen as a metaphor for the group as a whole.

Microlith assemblages that are stylistically similar (Star Carr, Deepcar and Horsham types, for example, in the early Mesolithic) have been used to infer the existence of social groupings (Jacobi 1976, 1978, Reynier 1994, 1998). Conversely, Thomas (2007:429) suggests that "material culture similarity is not an index of social interaction…". Whatever the actual case may be, stone tools were created and used in the social world and therefore were part of a complex web of social interaction, Yet, it never seems to be considered that tool types other than microliths may also have more complex social implications, other than the oft quoted, stereotypical, gender-biased, assumptions about task based activities. For example, tools used for scraping, piercing and otherwise working animal skins, may well have been used in group situations, and thus these and other activities would have afforded opportunities to forge and cement social relations, as people interacted and co-operated (or not) with each other.

Tangible evidence for Mesolithic people interacting and co-existing, such as the footprints found along parts of the British coast, is rarely glimpsed in the archaeological record. The patterning of lithics at excavated sites is often the only visible clue for people coming together but, unfortunately, the functional is often emphasised over the social and lithic scatters are not seen in terms of people but technical actions. As interest in Mesolithic studies has gathered momentum, both in the academic and commercial worlds of archaeology, more dwellings and structures (post holes, platforms, and floors) are being discovered. These have potential to add depth to discussions of the social but the onus is still on lithics to determine the nature of dwelling in the British landscape.

Modifications evidenced in lithic technology are suggestive that patterns of change affected the lives of Mesolithic people. Whether these changes were economic, environmental or social, or a combination of these is harder to pinpoint, but all would have resulted in a degree of social change, however subtle. Finlay's (2000, 2003) work marked a turning point in approaches to lithics from the early Holocene. Rather than considering stone exclusively in technical, economical and functional terms, other aspects such the acoustic properties of flint are now explored from a social angle (for example, Cross *et al.* 2002). Stone is something that is experienced, seen and heard; people become connected through their material culture. Again the tools of ethnography can and have been used to further demonstrate social aspects of stone tool use, challenging assumptive reasoning about use, discard and gender relations (for example, Sillitoe and Hardy 2003).

Some further observations on approaches to artefact studies

Artefact and meaning

Material culture (artefacts) analysed in relation to its archaeological context (and other forms of evidence) are part of the framework within which archaeologists seek to find out about the past: about people, the choices they made, and the social and material world in which they operated. In other words, archaeologists seek to situate material culture into its social context. Depending on their theoretical standpoint the way archaeologists study artefacts varies. Culture-historic and Processual approaches to artefacts will not be discussed in detail here, as this thesis is more closely aligned to Post-Processual and Interpretative schools of thought, though archaeologists still use methods and some of the ideas developed during these earlier paradigms.

This thesis favours the position that "material culture is a human production and, as such it is charged with meaning and is structured in relation to social processes" (Tilley 1998:325). This means artefacts are active participants in networks of social practise and need to be understood in terms of context, for artefacts and people exist in relation to one another, as well as to the wider world in which they are situated. Artefacts are material (Hurcombe 2007), and as such are a reflection of the material world in which people exist, and have functional uses which are dictated by the properties from which those artefacts are made. They can also act as symbol (see Hodder 1989, 2005) and metaphor (see Tilley 1999), and therefore are transmitters of cultural meaning. As artefacts transmit cultural meaning, they can also be seen to mediate between contexts (cf. Tilley 1999) and are therefore dynamic. If we consider that contexts are not passive either for they are affected by taphonomic processes, and assigned meaning by people (which might not be mutual or static meaning), then it is logical that this position can be reversed and context can also mediate artefact. This can be further extended when people are introduced, as people also mediate between context and artefact and *vice versa*. Thus, a plurality of meanings is possible (cf. Whitley 1998). This precept becomes more complicated when it is considered that neither meaning, nor personhood (Fowler 2004) are fixed, but are mutable, transient and fluid. This dialectical position is fundamental to understanding the material culture of the Mesolithic. Through the examination of the recursive relationship between artefacts and context, it may be theoretically possible to discern the intent behind people's actions and therefore deduce meaning, albeit with the limitations of an etic perspective.

It has been long been intimated that hunter-gatherer peoples imbue the material world with animistic qualities (for example: Tylor 1871, Gilmore 1919, Bird–David 1991, Ingold 2006). Within this view, the natural world may be seen to have qualities akin to possessing life or spirit. By extension, people are also known to assign personalities, or personhoods, to artefacts, including those made from naturally occurring materials. One such material type is stone, from which artefacts can be fashioned, or can be artefact in its own right (unmodified or unworked) and its animate qualities in various hunter-gatherer and other ethnographies is well known (for example, the Siete Stones in Saami culture (Mulk in Carmichael *et al* 1994). In some ways this is expressed through the idea of things having social lives, and this tends to manifest itself in the form of artefact biographies in archaeology (Kopytoff 1986). The same schema can be applied to context; Bradley suggested that "we should turn our attention to the biographies of the different places [contexts] where that process happened" (2001:48). Theorising both artefact and contextual biographies is possible through the adoption of the *chaîne opératoire* as a methodological approach.

The *chaîne opératoire*

The *chaîne opératoire,* which translates simply as chains of operation, or operational sequences, refers to the sequential actions inherent in transforming raw materials into cultural artefacts. This usually incorporates three stages: raw material acquisition, the manufacture of artefacts, and their eventual discard. Although the concept, as it was originally used, took into account post-depositional effects upon artefacts, this aspect is increasingly neglected in archaeological accounts, largely because deposition is often seen as the intended end of an artefacts' life (Martinón-Torres 2002). Although Hurcombe (2007:24), for example, does hint at the possibilities of "extended artefact biographies", it is notions of curation, expediency and reuse that tend to be emphasised. This might also be attributable to the perceived linearity of the *chaîne opératoire* model, which should be thought of more as networks of connected chains, rather than linear trajectories through which artefacts and knowledge travel (cf. Finlay 2000:174). Neither should the chains be thought of as permanently linked, rather they should be seen as constantly connecting and disconnecting: thus always affecting artefact dynamics.

Using the *chaîne opératoire* is a dynamic approach, which explores not only the artefact but the actions behind the artefact; these actions are intricately linked to the human condition. The *chaîne opératoire* especially lends itself to studies of lithics in the landscape, where the links between artefact sequences are embedded both in the social context in which they are carried out, that is the landscape, and in a corporeal sense from the body, with *gesture* (knowledge and skill) inextricably linked to both the technical and the material. It is *gesture* that, as Leroi-Gourhan (1964) realised, shaped the external material world. If one recognises that the social world affects the material world, and this is articulated through *gesture*, or the transmission of skill and knowledge, then the *chaîne opératoire* is a direct expression of the social world. Recognised since the earliest inception of the concept by Mauss (1934), and in that other great Maussian legacy of *habitus,* this more interpretative aspect of *chaîne opératoire* often takes less precedence in Mesolithic studies than the more procedural and technical elements of stone knapping (for example, Grace in Healy *et al* 1992).

There is great potential for extending the *chaîne opératoire* beyond the usual parameters in order to come closer to understanding, or at least to gain an extra appreciation, of Mesolithic people's lifeways, and the ways in which they may have comprehended their worlds. It has been suggested that the *chaîne opératoire* could be the key to accessing an archaeology of mind (Schlanger in Renfrew and Zubrow 1994), and indeed it does seem to form a logical framework within which to situate the abstruse actions of Mesolithic people, or what might be termed the "ambiguity of gesture" (Chazan 2005). Living in the social world constantly demands that choices, based on memories, risks, consequences, needs and obligations, have to be made. If it is accepted that the social world is bound to the material world and that the chains in the *chaîne opératoire* are inextricably linked, then it is possible that at the procurement stage people were thinking about deposition and the taphonomic effects of the depositional environment or *vice versa*. Yet, in archaeology narratives often end with discard having followed a linear pattern from the context of production to the context of deposition.

So, to further our understanding of how people experienced their contemporary (prehistoric) landscapes, archaeologists must move beyond the *chaîne opératoire* to consider more closely the way in which artefacts were deposited, as well as take into account post-depositional processes. Whilst this aspect has not been ignored - artefact 'biographies', and taphonomic transforms are established research areas within archaeology - there is a need to take this aspect further; to realise that deposition does not always signify the end of the life of an artefact, and that post-depositional states may be intimately bound up with other links in the chain. This can be achieved, at least in part, by considering those dynamic landscape features that can physically alter the traces of human action. Watery places, such as springs and rivers, are one such category that can produce these changes and there is a strong archaeological case for deliberate artefact deposition in and around water. It may be that the dynamic nature of these environments, and their post-depositional *agency*, affected the actions and choices people made.

Leroi-Gourhan's notion of *la chaîne opératoire* is, therefore, a useful conceptual tool for lithic analysts, and has contributed greatly towards the understanding of the dynamic processes behind stone tool manufacture, use and deposition (for example, Finlay 2003, Chatterton in Conneller and Warren 2005). It paved the way to understanding the technological processes behind manufacture, but also gave rise to a notion of embodiment of stone artefacts, granting them life, via their transformation from flint nodule to flint tool, and ultimately death through discard; these processes intimately binding the material world and the social world. Whilst Leroi-Gourhan's version of the *chaîne opératoire* referred to technical procedure, there needs to be more emphasis on people, as integral to operational sequences, than in the original model. Dobres (2000) offers one such engendered view of the *chaîne opératoire* from a phenomenological perspective, one where it can be used as an analytical tool to detail artefact life histories but also to realise the social context within which material becomes artefact.

Scales of analysis within the *chaîne opératoire*

Embedded within the *chaîne opératoire* are analytical methods based on typologies. Typological analysis takes place at different scales and individual artefacts can be studied at both the macro and micro scale. In macro analysis, artefacts are classified according to particular visible morphological attributes for example, colour, form and extent of modification. There is no one widely accepted master list of attributes and whether analysts adopt a particular typology is dependent on the subjective position of the researcher. There have been many attempts to provide guidance and to bring some uniformity to approaches (for example, Andrefsky 1998, Inzian *et al* 1999). Clark's core (1960) and microlith (1934) typologies, and Jacobi's (1973) microlith typology have provided the main templates for classifying these two important diagnostic classes of artefact, but they are by no means comprehensive enough when carrying out regional studies, as Jacobi himself realised (1980).

Innovative methods of microanalysis were also developed in the latter half of the 20th century, allowing new insights into the functional aspects of stone tools. With the aid of high powered microscopes and reference samples provided through experimental archaeology, it has been possible to analyse both wear patterns and residues adhering to stone tools to allude to their function. Whilst not yet a perfect science, this approach has enabled researchers to further appreciate that form may not necessarily equal function. The use of microwear studies has allowed a greater appreciation for the range of activities that were carried out as part of prehistoric life and has exploded some myths centred on the use of certain types of lithics. This has been especially true for microliths, as previously discussed.

These approaches are usually quantitative in nature, and have led to stone tools being seen in terms of technology, economy and function (Minzoni-Deroche 1985). They have led to static artefact assessments which are essentially grounded in the artefact form itself and assemblages represent a snapshot in time, usually related to the discard stage. A typological approach is frequently employed for site specific studies, although these can be further examined as part of a wider framework of interaction by looking at their places in sequences of events. It is the *chaîne opératoire* that allows for contextualisation, whereas typological methods are tools of the abstract.

Chapter summary

This introductory narrative has set out, albeit in necessarily brief detail, the state of Mesolithic studies at the present time and outlined those aspects of the period that might help to determine the place of the spring-related archaeology detailed in this thesis. The methodology for this research is grounded in the way the Mesolithic is now studied in the early 21st century, where analytical methods are driven by theoretical concerns, and it is acknowledged that any archaeological study is constrained by current practice and the present-day knowledge base. In particular, whilst it is appreciated that sites are designated so by virtue of their material culture, springs are not just sites they are *context*. This research seeks to strike a balance between the necessary quantification of the lithic assemblages found at each of the sites, and the more qualitative, analogical emphasis on the human condition and the way in which people relate to landscape and water. These are now presented in chapters two and three respectively.

Chapter Two: An introduction to the study area and the methodology

The study area

The study area takes in part of south west England to include the historic counties of Somerset, Gloucestershire, Wiltshire and Dorset (Figure 2.1). This area is part of the region known generically as the South West of England, or simply the South West, and would also usually include Cornwall and Devon. The Historic Environment Records (HER) for the area are managed by both the County Councils and several unitary authorities including Bath and North East Somerset (BANES), North Somerset, Bournemouth, Poole, Swindon, Bristol, and South Gloucester (Hoskins *et al.* in Webster *et al*. 2008). There are also a number of regions defined by landscape character and the archaeology of these has also sometimes been summarised. The Severn Estuary (see Mullin, Brunning and Chadwick 2009), which lies in both the counties of Somerset and Gloucestershire, is one such area. Some landscapes were the focus for extensive archaeological projects, for example, 'The Somerset Levels Project' initiated by John and Bryony Coles in 1964. Landscape characterisation zones can be used by archaeologists as convenient parameters for description, but will also share, at least to some extent, geological, topographical and archaeological commonalities.

Geology

Although the South West as a region has a diverse geology (Figure 2.2), the study area itself can be considered unified by its chalk and limestone landscapes, in which large numbers of springs and other natural features, such as caves and karstic formations (for example, swallets) occur. Many of these springs have unusual properties, for example, the springs in Bath are particularly renowned for being the only hot springs in Britain, and the calcareous limestone in the region supports tufa forming springs. These types of springs do not occur in Cornwall or Devon to the same extent and therefore these counties were excluded from the study, both to ensure the project was manageable and because the archaeology of the Mesolithic and the geology (predominately granites and sandstones) of these counties is significantly different from those to the west and north. The geology of the study area is explored further within the relevant chapters.

Figure 2.1: The study area showing major Mesolithic site locations

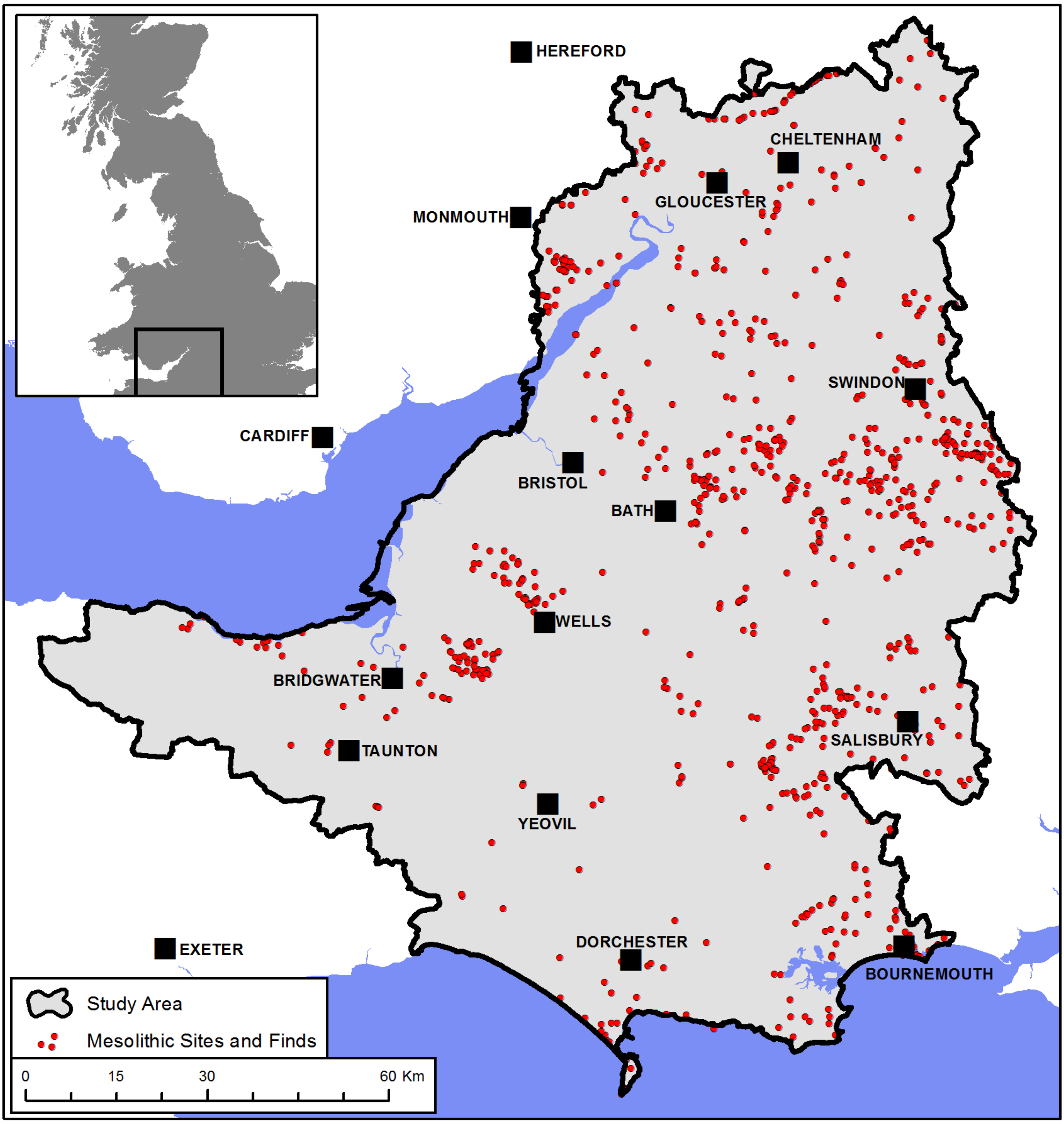
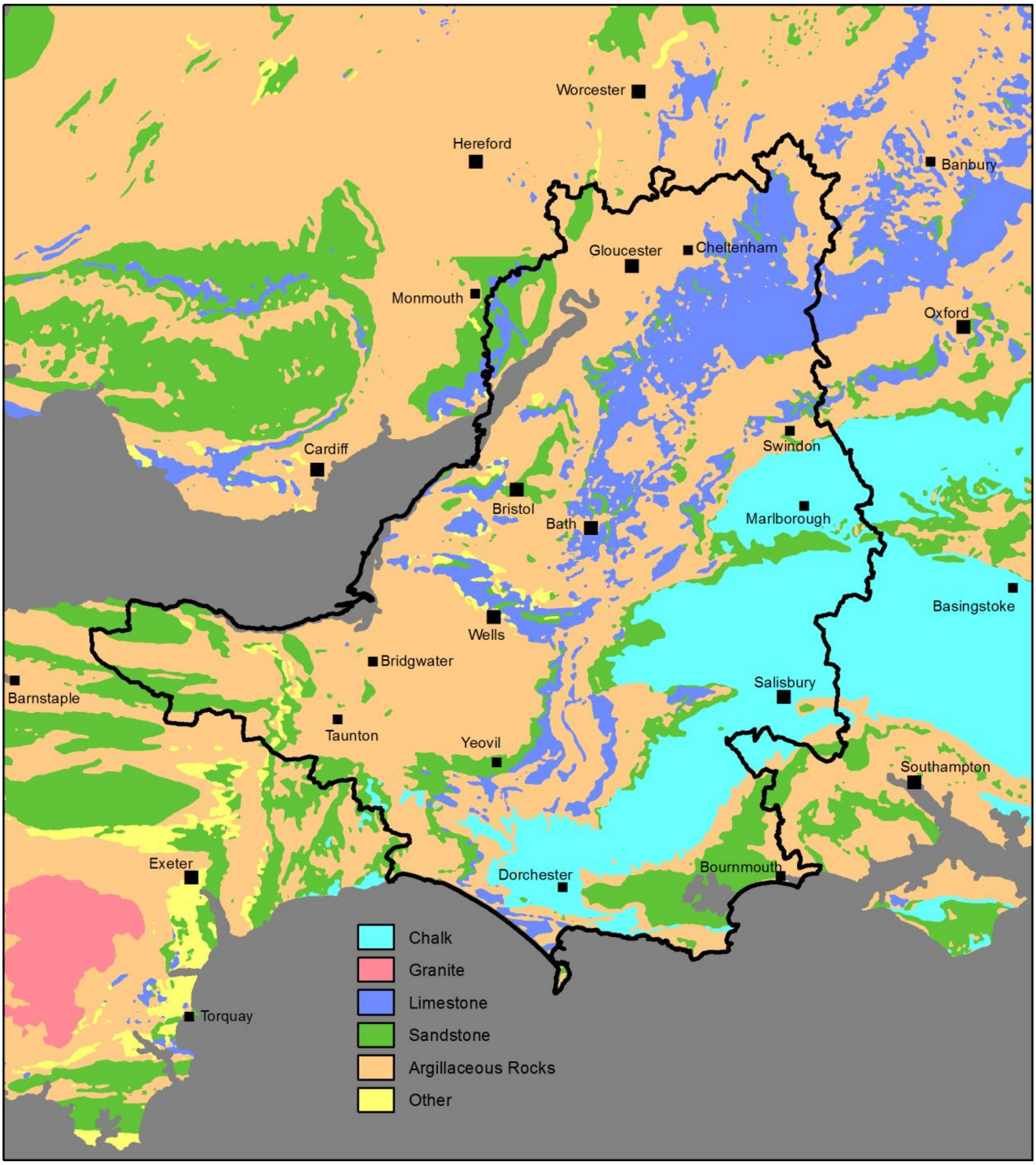


Figure 2.2: Geology of the study area



Mesolithic research

Some regions in the study area have been subject to more research and archaeological work on the Mesolithic than others. This is due partly to research bias but also to the nature of the archaeological resource of the South West in general. The sheer numbers of noteworthy sites in Somerset, Wiltshire and Dorset relating to other prehistoric periods, especially the Neolithic and Bronze Age, have contributed to this bias with prehistorians gravitating towards archaeologically rich landscapes, such as Cheddar Gorge, Stonehenge, Avebury and Cranborne Chase. Much of the Mesolithic archaeology in the study area was recovered during research excavations of sites in these 'honey pot' landscapes, although significantly more has been collected in the form of surface flint scatters and stray finds, as well as from commercial excavations.

Many Neolithic and Bronze Age monuments appear to have Mesolithic antecedents, implying that the places where they were constructed had significance prior to the Neolithic (see page 48 for further discussion). Mesolithic sites, important in their own right, do occur in the study area, but, as for other regions of the British Isles, the period is understudied and research has been somewhat stultified by a lack of upstanding archaeology and also by people's research interests. This position is slowly, but significantly, changing. There exists a coherent Mesolithic research framework for the South West published as the South West Archaeological Research Framework (SWARF) (Hoskins *et al.* in Webster *et al.* 2008:45) which details known sites of high archaeological potential, as well as recent research on less well known Mesolithic sites, for example by Bell *et al.* (2007) and Davies and Lewis (forthcoming). These recent studies have done much to highlight the prospect for further Mesolithic studies in the South West as a region.

Overview of the Mesolithic archaeological record in the study area

The early Mesolithic (approximately 10,000-8500BP)

Early Mesolithic sites in the South West are not particularly abundant compared to later ones. This is commensurate with the national picture and is a situation likely compounded by lack of county based research for the period in some of the study area. Gloucestershire is a case in point and is the county least renowned for its Mesolithic presence in general, and the early Mesolithic in particular. Where the early period is represented in Gloucestershire, it is either by occasional finds of obliquely blunted points

(Saville 1984, Hoskins *et al.* in Webster *et al.* 2008) or limited scatters of flint in unstratified contexts and mixed date assemblages. However, some significant and quite large sites are present and these are outlined below.

Despite a general paucity in the northwest of the region, early Mesolithic flint work, albeit from surface collection, is present in the mixed date assemblages from Tog Hill, Gloucestershire (Sykes and Whittle 1965) making it one of the most northerly significant early Mesolithic sites in the study area. Further flint finds dating to the early Mesolithic indicate a presence further north into Gloucestershire, with some significant finds to the west of the Severn Estuary from Alvington (Saville 1984), and from Siddington (Saville 1984) to the east. None of these are substantial assemblages however, with most being single (stray) finds, for example a blade from Newent and a microlith from Cherry Tree Lane, Cirencester (Darvill 1987).

Of all the sites in the region that indicate an early Mesolithic occupation, the cave site of Aveline's Hole, Burrington Combe on Mendip, Somerset is one of the best known and one of the most archaeologically rich (Jacobi 2005). Artefacts of interest include ammonite fossils, unmodified red deer teeth, and lithics, but it is the presence of skeletal remains from at least twenty one individuals, dating to *circa* 8460-8140 cal BC (GrA-various numbers) (Schulting *et al.* 2005: 227) that makes Aveline's the largest known Mesolithic cemetery in Britain. Further skeletal remains relating to the earlier Mesolithic have been recovered from other caves on Mendip and these are in close geographical proximity to Aveline's Hole. These include the almost complete skeleton of an individual from Gough's Cave dated to 8700-7750 cal BC (BM-525) (Stringer 1986) and the disarticulated remains of approximately four individuals from Badger Hole, with two individuals dating to 9120-8,300 cal BC (OxA-1459) and 8610-7830 cal BC (OxA-814) respectively(Schulting *et al.* 2005:231). Approximately four individuals recovered from Totty Pot Swallet, Cheddar, Somerset, including a child, have been dated to 7450-7040 cal BC (BM-2973) (Schulting *et al.* 2005). More recently, firm evidence of an early Mesolithic cemetery on the Somerset Levels, at Greylake, Middlezoy, was established when radiocarbon dating of two crania produced dates ranging from 8460-8360 cal BC (WK-30930) to 8835-8260 cal BC (WK-3093) (Brunning and Firth 2011). With bones from a minimum of five individuals, including long bones from both sexes, Greylake is set to become an early Mesolithic cemetery site of some importance, especially as it lies a mere twenty four kilometres south from Aveline's Hole and is the only 'open site' cemetery so far discovered in Britain.

Further early Mesolithic find spots on the Somerset Levels, just below Mendip, include assemblages of stone tools from numerous sites in the parishes of Middlezoy, Chedzoy, North Petherton (Wainwright 1960, Norman 1975, 1982 and 2002 respectively), and Shapwick (Wainwright 1960). These are all wetland sites and may indicate seasonal occupation (Hoskins *et al.* in Webster *et al.* 2008), but the character of the landscape itself is of considerable interest. Many of the flint finds are from the Burtle Beds, for example, Edington Burtle and Chedzoy Island. These are sand islands, now much eroded, that formed raised beach areas in the marshes, allowing Mesolithic people access to the plentiful resources of the levels (Hoskins *et al.* in Webster *et al.* 2008). The Burtle Beds are rich in archaeological potential and further excavations may yet allow additional elucidation of early Mesolithic life in South West England.

Flint assemblages from Mendip, including those at Rowberrow Cavern (Taylor 1926) and Hay Wood Cave (Everton and Everton 1972) also support the notion that the locality was of some importance during the early Mesolithic. Although not securely dated, rock markings at Aveline's Hole and nearby Long Hole are comparable to Scandinavian Mesolithic rock art (Mullan and Wilson 2004), and like the funerary remains are indicative of an interest in the landscape perhaps beyond the functional.

In North Somerset, there are indications of an early Mesolithic presence in the flintwork found at Birdcombe, Wraxall (Sykes and Whittle 1965, Gardiner 2001), although radiocarbon dates from the site are not commensurate with the flintwork (see Chapter Six). An important early assemblage, to the south east of Tog Hill, was recovered from the Hot Spring in the city of Bath, BANES (Davenport *et al.* 2007). This has been interpreted as a ritual deposit and is discussed further in Chapter Four.

The early Mesolithic is represented in the south of the study area in Dorset at coastal sites such as Hengistbury Head (Barton 1992) and the Isle of Portland (Palmer 1999). Inland, Cranborne Chase has produced early Mesolithic material, for example, St Giles Field, Down Farm (Allan and Gardiner in David and Wilson 2002) as have parts of the Allen Valley and the Avon Valley (French *et al.* 2007). The early Mesolithic material found at St Giles Field (Gussage St Michael) and Chalk Pit Field, Dorset may be even more significant considering their proximity to the terminals of the Dorset Cursus (Allan and Gardiner in David and Wilson 2002). Further evidence for possible non-functional activity in the early Mesolithic was also demonstrated at Strawberry Hill, Wiltshire, when a section of a ditch terminal was securely dated to 8930-8080 cal BC (OxA- 3040) (Allen and Gardiner in Davis and Wilson 2002).

Further north again, into Wiltshire, the early period is not so well represented by flint finds, though there are further significant features that point toward less functional aspects of early Mesolithic life. The five postholes in the Stonehenge car park dated to 8090-6590 cal BC (HAR-455, HAR456, GU-5109, OxA-4919, OxA-4920) (Cleal *et al.* 1995), interpreted as the sockets of large timber posts, may have been totems and/or indicate an early interest in monumentality (see Chapters One and Six).

Core tools: axes, adzes, and picks, were once considered to be an early Mesolithic phenomenon but they are also found on later Mesolithic sites. However, it is worth taking into consideration that the many stray finds of these tools, in the study area, quite possibly represent more evidence for an early Mesolithic presence. Many of these tools have been found on the Mendip Hills, for example at Priddy (Burrow *et al.* 1984) and Chewton Mendip, (Dennison 1985), and on the Cotswolds for example at Hampen, Shipton (Wymer 1977), and further west in the Forest of Dean area, for example at Littledean, Gloucestershire (Saville 1986), but also occur fairly frequently elsewhere in the study area.

The late Mesolithic (approximately 8,500-5,500BP)

By contrast, the later period is well represented throughout the region by lithic scatters and excavated material although evidence for funerary practise in the study area is limited. Important assemblages occur throughout the study area, although Gloucestershire is less rich in later Mesolithic material (except in the Cotswolds) than Somerset, Wiltshire and Dorset. This again may relate to bias in research. This bias has contributed especially to the rich late Mesolithic record in Somerset, where more excavated material has been recovered than in the other counties of the South West (Hoskins *et al.* in Webster *et al.* 2008).

There are a number of late Mesolithic sites on the Mendip Plateau, for example at Charterhouse (Lewis and Thompson 2007), and just off the eastern edge of the hills the site of Langley's Lane, Midsomer Norton has produced evidence of late Mesolithic 'ritual' practise (Davies and Lewis forthcoming). Extensive flint scatters have been found to the north west of that site at Clandown Farm, Midsomer Norton and in Bath (see Chapter Four).

The aforementioned ditch terminal at Strawberry Hill also produced a later Mesolithic date of 5560-5140 cal BC (OxA-3041), whilst numerous other pits on the Wiltshire chalk are also suspected to be Mesolithic in date (Allen and Gardiner in Davis and Wilson 2002). At the tufa spring site of Cherhill, Wiltshire, an intentionally dug hollow was found containing flint, stone and bone (Evans and Smith 1983), a possible, albeit loose, parallel for the activity occurring at Langley's Lane (for further discussion see Chapter Five). Possible structures, evidenced as post holes, were discovered at Castle Meadow, Downton in Wiltshire. Hearths and hearth pits have led to the interpretation that Castle Meadow was a major base camp (Higgs 1959).

On the Wiltshire-Somerset border and around Bath, the evidence for occupation is abundant with major sites occurring on the Downs and in the Cotswolds. These include the excavated site of Hazleton North (Saville1990) and surface scatters from Tog Hill (Sykes and Whittle 1965), Freezing Hill (Tratman 1973) and Henley Hill (South Gloucestershire HER 2010), Syreford Mill, Whittington (Darvill 2006), Troublehouse Covert, Cherrington (Wymer 1977), and Boldridge Farm, Long Newnton (Wymer 1977). In the Upper Thames Valley, significant assemblages have been collected from Leonard Stanley (Gracie 1939) and excavated at Horcott Quarry, Fairfield (Mullin 2009). Later Mesolithic assemblages are beginning to appear to the west of Gloucestershire, with those of Nedge Cop near the Forest of Dean (Saville 1986, Darvill 1987) and the many sites in the area around St Briavels, being possible links to sites further south on the western side of the Severn Estuary such as Goldcliff, Gwent and Glamorgan (Bell *et al.* 2007).

Hazleton North is a particularly significant site as it is the location of a Neolithic Cotswold-Severn long barrow under which, in the pre-cairn soil, was evidence of Mesolithic occupation. The assemblage appears to represent a knapping episode with the presence of bladelet cores, associated debitage and microliths. The seventy seven microliths belonged to the later Mesolithic and were edge-blunted and geometric types bearing a close resemblance to those from Syreford, Gloucestershire (Saville 1990). Saville (1990) suggests the site represents a temporary hunting camp where *in situ* knapping took place. The pre-cairn soil also contained early Neolithic activity, which although admixed in places was mostly differentiated spatially (Saville 1990). The construction of a long cairn over the top of this earlier activity suggests that re-occupation of the same site is more than fortuitous, and that people recognised an earlier significance to this place in the landscape. (See Chapters Three and Six for further discussion).

Coastal sites are common, with many on the south Dorset coast, for example, Culverwell (Palmer 1999) and Ulwell (Calkin 1952). On Exmoor, late assemblages have been found near the coast at Hawkcombe Head, Somerset and other sites in the Porlock region (Norman 1982, Riley and Wilson-North 2001). From their important environmental remains, some of these coastal sites appear to substantiate the notion that there was seasonal movement to the coast in autumn and winter. Features dating to the late Mesolithic on coastal sites include the only shell midden in the study area at Culverwell, Dorset (Thomas and Mannino 1999). Substantial later sites occur inland in Dorset, for example, the area around Corfe Castle including Blashenwell Tufa Pit (Chapter Five) and on Cranborne Chase, although the distribution of later Mesolithic flint work in the latter landscape is fairly diffuse compared to the earlier material (Hoskins *et al.* in Webster *et al.* 2008).

Overview of the Mesolithic Environment Record in the study area

Our understanding of the Mesolithic environment for much of the study area is not as detailed as it is for many other regions in Britain, and there are few complete environmental sequences that cover both the early and late period (Hoskins *et al.* in Webster *et al.* 2007). However, a number of studies have been carried out which allow some partial insight into the general landscape character, the habitats available to Mesolithic peoples, as well as other environmental factors, as they were during the early Holocene. Coupled with evidence from other comparable regions of Britain, there is enough information to outline, with some degree of confidence, how the physical landscape could have appeared during the Mesolithic in the study area.

The environmental evidence for specific areas is discussed in the relevant chapters, whilst here an overview of the general environmental and landscape character of the study area is presented. Certainly there was great diversity in the types of landscapes and their associated habitats that existed during both the early and the late Mesolithic in South West England. These landscape types can be defined in general terms for example, coastal, estuarine, marshland, moor, upland, lowland, riverine and karstic landscapes. Not only were these landscapes diverse but the environmental evidence also demonstrates that they changed character over the course of the Mesolithic. Some of these changes were quite rapid, others were more gradual, but certainly throughout the period there would have been noticeable changes, many of which would have been observable during a lifetime, or maybe remembered and passed on from one generation to another.

The nature of the environmental evidence

A substantial amount of geoarchaeological work has been carried out in the study area, where excavated sites have evidenced extensive sedimentological and biostratigraphical sequences, for example, from alluvial deposits, as well as revealing buried land surfaces which date to the Mesolithic. Sedimentary sequences have been obtained from the Severn Estuary (Allan and Rae 1987, Druce 2000) and coastal sites (Bell *et al.* 2007), whilst examples of Mesolithic buried soils, or palaeosols, include the land surfaces at Oldbury (Bell and Brown 2005), Langley's Lane (Davies and Lewis Forthcoming) and Charterhouse-on-Mendip (Todd 2004). Some geoarchaeological work has also been carried out at inland sites, especially in the river valleys, for example, around the Avon in Bath, BANES (Alan and Scaife 2010).

The limestone geology in the study area does not favour the preservation of pollen, although there are sequences available where peat and other acidic deposits (conducive to pollen preservation) occur, for example, on Exmoor, the Somerset Levels, and many of the river estuaries and valleys. Very few of these present complete sequences for the whole Mesolithic, although there are exceptions, for example, the work carried out in the Gordano Valley, Somerset (Jefferies *et al.* 1968, Hill *et al.* 2006). The majority of the data relates to the later Mesolithic, those obtained from locations on Exmoor (Francis and Slater 1990, Fyfe *et al*. 2003), at Shapwick (Tinsley 2002) and in the Severn Estuary (Druce 2000) being cases in point, although there are some excellent sequences for the earlier Mesolithic, for example, from the Upper Allen Valley, Dorset (French *et al.* 2005).

Molluscs are well preserved in the calcareous deposits of the region, especially in locations where there are tufa deposits, such as, Cherhill, Wiltshire, Blashenwell Dorset and Langley's Lane, Somerset. Allen (see French *et al.* 2003) has carried out work on the molluscs obtained from features on the Dorset and Wiltshire chalk, subsequently changing our understanding of the nature of chalklands during the Mesolithic. Much work has also been carried out on the tufa deposits in the vicinity of Ston Easton, Somerset (Willing 1985, Davis 2005).There is scope for further molluscan studies at other tufa sites and from the chalk, to further increase knowledge of Mesolithic landscapes, especially where pollen analysis is not viable (note: it is possible to obtain pollen from tufa but this has not been forthcoming in the study area).

These two categories of evidence have allowed the Mesolithic to be divided into a number of environmental zones and phases (Table 2.1) and allowed a general pattern of environmental change to be recognised for the British Isles as a whole (Table 2.2).

Table 2.1: Environmental zones in the Mesolithic

Period	Dates	Pollen Zones	Phase in Holocene Epoch
Early Mesolithic	10,000-8500 BP c.9660-7500 cal BC	IV	Pre-boreal
		V	Boreal
Late Mesolithic	8500-5,500BP c.7500-4000 cal BC	V and VI	Boreal
		VIIa	Atlantic

Table 2.2: Environmental change in the Mesolithic

Date approximate	Type of habitat	Main plant species	Retreating plant species	Environmental changes
10,000BP	Tundra gives way to open grassland, heath and shrubby plant species	Juniper, Willow, Pine, Birch, Hazel		Tundra and steppe landscapes begin to retreat northwards
9,000BP	Forest outlines are apparent. Coniferous trees dominate forest	Alder, Hazel	Pine, Birch	Afforestation, early anthropogenic clearance
8,000BP	Mixed deciduous forest begins to replace coniferous species	Alder, Oak, Lime	Pine becomes limited in range to northern Britain	Increased afforestation, increased anthropogenic clearance
5,000BP	Denser forest, but open canopy and mixed deciduous woodland	Oak, Lime, Hazel, Rowan, Brambles, Nettles	Elm	Increased peat and tufa formation, Elm decline, most anthropogenic clearance

The environment of the study area during the Mesolithic

The pollen and the molluscan data together with animal bones and other types of evidence, such as that associated with sea level change and sedimentation, provide a fairly comprehensive picture of the study area as a whole. In Britain, sea level rises of approximately one centimetre *per annum* accompanied the rapidly ameliorating temperatures of the early Mesolithic until approximately 7000-6500BP (Hoskins *et al.* in Webster *et al.* 2008). The situation in the South West of England has been shown to follow this general trend, with only some localised differences being documented (Hoskins *et al.* in Webster *et al.* 2008). Generally most present day coastal sites in Britain dating to the Mesolithic were several kilometres from the then contemporary coastline. That the early Holocene forest once extended much further is evidenced as 'submerged forest', for example, at Minehead and Porlock on the Somerset coastline (Bell *et al.* 2007).

Soil development increased during the early Mesolithic and it was this and climate amelioration which led to the development of woodland. The general pattern was very much one of coniferous woods with trees such as Pine, Birch and Willow being succeeded by the mixed deciduous woodlands of Oak, Lime, Hazel, Alder and Elm. By the end of the early Mesolithic, Exmoor, for example, in the far west of the study area, was a wooded environment dominated by Oak and Hazel, as were many other regions of upland, but this was not the case throughout the study area. The lowland areas in northern Somerset seem to have had a larger component of Lime than the more southerly areas (Jefferies *et al.* 1968), although this has also been noted for the Blackdown Hills in south Somerset (Hoskins *et al.* in Webster *et al.* 2008). However, the chalkland of Dorset remained less wooded and herbage and scrub more typical of chalk environments persisted (French *et al.* 2007). In the river valleys and floodplains, such as those of the Avon, Severn, Allenbourne and Kennet, the early Mesolithic sees a scenario of marshy wet conditions with Alder-Carr dominating, and the more typical boreal woodland confined somewhat to drier ground (Hoskins *et al.* in Webster *et al.* 2008).

The inundation of estuarine waters by the late Mesolithic led to the formation of salt marshes in the lowlands of Somerset. However, the increase in sea levels slowed down during the later Mesolithic when the climate ameliorated further, and these inundations became less frequent. Blanket peat and tufa formation increased and by the latest Mesolithic many of the marshy boggy areas had become enclosed more fully by Boreal woodland, although French *et al.* (2007) note that Pine may still have been fairly frequent as intermittent stands on the Dorset chalk.

A notable feature of the study area is the presence of what might be described as dramatic landscape features for example, Cheddar Gorge, the numerous caves and swallets on Mendip and the cliffs of the Somerset and Dorset coasts. Whilst Mesolithic people did not necessarily see these in the same way as modern people, these landscapes add to the sheer variety in the study area. There is an overwhelming sense that not only was there much diversity in the landscapes and habitat types that existed during the Mesolithic in the South West, but there were also a relatively vast range of resources available to Mesolithic people, in quite a small area. The environmental evidence for specific areas is further discussed in the relevant chapters.

Methodology

The main analytical tool employed in this thesis is the macro-scalar examination of the lithic assemblages associated with each site. Five springs in south west England that have what might be termed exaggerated properties were selected for study (Figure 2.3).These are the hot springs of Bath springs (Chapter Four) and tufaceous springs at Langley's Lane, Somerset, Cherhill, Wiltshire and Blashenwell, Dorset (Chapter Five). These springs were investigated and compared to each other and then compared with some other known spring sites with associated Mesolithic activity in both the study area and the British Isles more generally. These comparative sites include spring sites that lack these conspicuous attributes. The main spring sites selected for more in-depth discussion were chosen because there is more data available, including lithics and environmental evidence, for these than any others in the study area. An overview of some other spring sites (detailed in Chapter Six) takes information gleaned from excavation reports and the county HER's. The rationale for their selection is explained in the introduction to that chapter.

Whilst the project focusses on lithic assemblages, it also takes into account other classes of material evidence where it exists, including that sourced from environmental analysis. This has allowed for a fuller consideration of Mesolithic lives than using the lithic evidence alone. The study also adopts an experiential approach as well as the more traditional form of analysis and this allows for a more fluid assessment of the material, not quite so constrained by figures and measurements, but taking into account the sensual aspects of the assemblages (see page 55 of this thesis and Appendix Two).

Figure 2.3: The spring sites

Some theoretical considerations

Comments on phenomenological approaches

The research can be situated into more than one conceptual framework. Although predominantly a site based study, the springs should be viewed within the broader context of *landscape*, although that concept in itself seems outmoded (see Chapter Three). The study aims to take an empathetic approach to the evidence, drawing on phenomenological and experiential ways of looking at artefacts and landscape (also see Chapter Three). By taking into account the inherent properties of water and the way springs can affect the environment, in conjunction with a more experiential approach towards lithic analysis (one where the intrinsic qualities of the raw material, for example, its texture, colour and heat retentive properties are considered) we can think about ways in which Mesolithic peoples might have experienced their world. Because water is a universal phenomenon (although the way we experience it is not) there are endless possibilities to explore. Although archaeologists can never have a truly emic insight into Mesolithic worlds, water is a familiar element, and even modern archaeologists can at least appreciate some of the inherent qualities of water and stone that would have been familiar to Mesolithic people. Most of these qualities cannot be appreciated through empirical analysis and indeed to think about them in a positivist fashion is to neglect the value of human experience.

Phenomenological approaches in archaeology were made popular by Christopher Tilley who advocates an approach that allows archaeologists to think about "the manner in which people experience and understand the world" (Tilley 1994:11). However, the use of phenomenology in archaeology has been subject to critique (for example, Fleming 2005) and rightly so. A lack of a stringent methodology and the overemphasis on the visual were of particular concern yet this was to miss the point of phenomenological approaches which was to give archaeologists "tools with which to think and work" (Tilley 1994:74). Many more possibilities for interpreting the archaeological evidence can be realised by using phenomenological reasoning as a starting point. The way in which this study uses phenomenology does not conform rigidly to any one form of approach, rather it takes elements of the philosophies of Husserl (1999, 2001), Heidegger (1962,1982) Sartre (1970, 1989) and Merleau-Ponty (1989), as Tilley did (1994) and blends them to come up with an approach that seems appropriate for a study of the archaeological past.

This work takes the Husserlian (1999) notions of *epoché* (the bracketing or reducing of entities to their most basic elements) and eidetic reduction (thinking about these basic elements in as many ways as possible) as starting points, but acknowledges that the way we see and use these is moulded by our own experiences of being in the world (after Heidegger 1962), and that all experiences are embodied and existential (ideas developed by Merleau-Ponty (1989) after Husserl, Heidegger and Sartre). Unlike Husserl however, it is acknowledged here that experiences are structured through embodied actions and as archaeologists we can only consider others experience of the world through our own (Tilley 1994, Thomas 2002).

How this manifests itself for each of the particular types of spring in the study is detailed in the appropriate chapters but generally, it takes the idea of epoché (or bracketing) to reduce the experience of these springs down to those elements which would have been evident to Mesolithic peoples, for example all tufa springs deposit calcium carbonate (at least periodically), are wet and issue from the earth. Then using eidetic reasoning it is possible to think how these properties may have been perceived by Mesolithic peoples through utilising knowledge of our own embodied experiences as well as ethnographic and archaeological analogy as catalysts for interpretation. The same method is used when looking at the lithic assemblages although this is combined with a traditional typological approach. At the heart of the method lies empathy, for although not wishing to adopt an overwhelmingly phenomenological methodology in this thesis, it is important to consider how people perceived their world.

Experiencing a place, and being sensitive to dynamic landscapes in action, is of course a phenomenological approach, and subject to critique, but is one appropriate way to gain some insight into the types of environment people were experiencing in the rapidly changing world of the Mesolithic. Despite all the problems of applying phenomenology as an archaeological method or theoretical paradigm, those who use the approach do at least try and put themselves in the position of people who were in that world at a specific time. The experiential approach works for all types of springs, and is an important part of the discussion section in subsequent chapters. Observations can be extended to all the senses, not only the ocular, and this form of approach is invaluable in adding an extra dimension to archaeological interpretative strategies, and the analogical approaches employed in more traditional studies.

For that reason this study specifically rejects the excessive quantification of lithic assemblages inherent in many older works, for example Healy *et al.* 1992. Whilst the nature of assemblages has the potential to answer a lot of questions, and certainly helps to identify patterns in the archaeological record, it does not give us insight directly into all aspects of Mesolithic life. It could be said that numbers do not make narratives, people do and regardless of the best intentions of objective quantification, there will always be bias, due to the subjective position of the researcher.

Comments on the nature of lithic analysis

So, lithic analysis, despite being a quantitative endeavour, is always a subjective task. Even the most objective approaches sometimes rely on a ‘best fit’ model, and are always susceptible to the bias inherent in any research. The most obvious of these subjective parameters is colour, but also applies to descriptors such as large, small, thin, and thick. Neither do analysts always take into account the very real and emotive qualities of producing, using, or discarding lithic implements. Whilst it would be difficult to record this, these points serve as a reminder that the answers do not always lie in a positivist investigation. To explore this latter point within the analysis, it was necessary to embed a typological approach into a wider framework in which the *chaîne opératoire* takes precedence. Thus the analysis was mindful of the similarities and differences in morphological attributes and the stages of the reduction process at which artefacts were deposited, as well as the context from which the artefacts were recovered, and the effect of the post-depositional environment. By necessity some of this could only be recorded qualitatively, either because there is a lack of evidence in the first place, just like the aforementioned emotive qualities inherent in aspects of the *chaîne opératoire*, or because the evidence does not fit into neat typological boxes.

Whether a fully quantitative standard is desirable can be debated further. For example, the definition of a blade is usually a long flake with parallel sides where the length to breadth ratio is 2:1 (some researchers prefer a ratio of 5:2). Where a blade measures less than twelve millimetres in width, it is referred to as a bladelet. Yet, many blades and bladelets do not fit these parameters. For example, so called knapping errors may mean intended blades come out as rather flake like, yet were produced from a blade or bladelet core by those knapping the flint. If an intended bladelet from a bladelet core comes out at fourteen millimetres, it no longer typologically fits into the bladelet category, and would more likely become a flake for quantitative purposes, yet it is still really a bladelet and more qualitative assessments (those not bound rigidly by quantification) can allow for this.

An important consideration in the lithic analysis is the presence of other geological objects. As well as stone of varying lithology, fossils were also recovered from the vicinity of some of the springs detailed in this study. The context in which these geological objects are found, especially when in proven association with cultural artefacts, has a bearing on the subsequent interpretation of the total assemblage. It is not uncommon to find geological objects, other than the conchoidally fracturing silicates normally favoured for tool production, at Mesolithic sites. At Deepcar, Yorkshire for example, a variety of stones and pebbles were recovered during the excavations. These included lumps of haematite ore, a discoidal sandstone object and a number of fossils, all imported to the site from elsewhere (Radley and Mellars 1964:12). At Thatcham, Berkshire, pebbles and lumps of ochreous sandstone were recovered from excavated contexts, but also occurred naturally on site (Healy *et al.* 1992:47). It is the occurrence of the supposed naturally occurring materials that pose problems and seem to stultify the consideration of the presence of geological objects in Mesolithic contexts, although they are increasingly being recognised. It also has to be considered that geological objects of significance may have been overlooked by the untrained eye during the excavation process at some sites, although there is no way of quantifying this.

In the context of this study geological objects are defined as lithological artefacts not derived from flint or chert. These objects may show signs of being worked but more usually appear in a 'natural' state. Some geological objects appear to correspond to the underlying geology, whilst others seem to have been introduced to sites. All geological objects recovered and retained from the spring sites were considered in relation to geological origins and the distance between deposition and likely source. In some cases human interaction with the geological material was demonstrated by the context of deposition, and the circumstance of the finds acted as a framework for assessing their significance.

The method

The methodology devised for this study takes into account some of the problems inherent in lithic analysis as an empirical endeavour. As already mentioned, analysts go to much trouble to measure blades, but this can lead to erroneous assumptions. For example in a report by Brookes on assemblages from the Hot Spring, Bath, he notes "that the preferred blade width was approximately 10mm, with 20% of the blades from the site being of this width" (in Davenport *et al.* 2007:145). It is quite certain that Mesolithic peoples did not knap blades with rulers in hand, and as any assemblage is not a complete one, to assume there was a preference down to this level, I believe, is not viable. Moreover, because only complete blades were measured the figures, based on the recovered assemblage, are wrong. This is a small assemblage consisting of only 440 artefacts, of these sixty out of 127 blades were snapped and broken, and none re-fitted. The average blade width when taking into account the whole assemblage was nearer to twelve millimetres (see Chapter Four for more detail of this assemblage). However, because the size of blades and other debitage does enable the assignation of a broad date and allows insight into technological choices made by knappers, an approximate measurement is useful. Thus, a template (Figure 2.4) was devised in order to measure artefacts quickly. This allowed for the measurement of blades in three millimetre increments and other debitage in ten millimetre increments. The template permitted the average sizes of pieces in assemblages to be recorded and meant it was possible to negate the more subjective descriptors such as large and small during data collection.

In light of these comments each assemblage was assessed for the following:

- Context of deposition.
- Chronology (based on radiocarbon dates where available as well as assemblage attributes).
- Raw materials utilised.
- Morphological attributes.
- Functional attributes (only assigned where it is clear that an object can be assigned an accepted descriptor, for example, *side scraper*, and then with the caveat that form does not always equate with function).
- Pre-depositional alterations (modifications or changes that were made prior to deposition for example, retouch, edge damage, use wear, gloss).

- Post-depositional alterations (changes that occurred after deposition or re-deposition, for example, patination, edge damage, gloss, adherence of other material such as Calcium Carbonate).

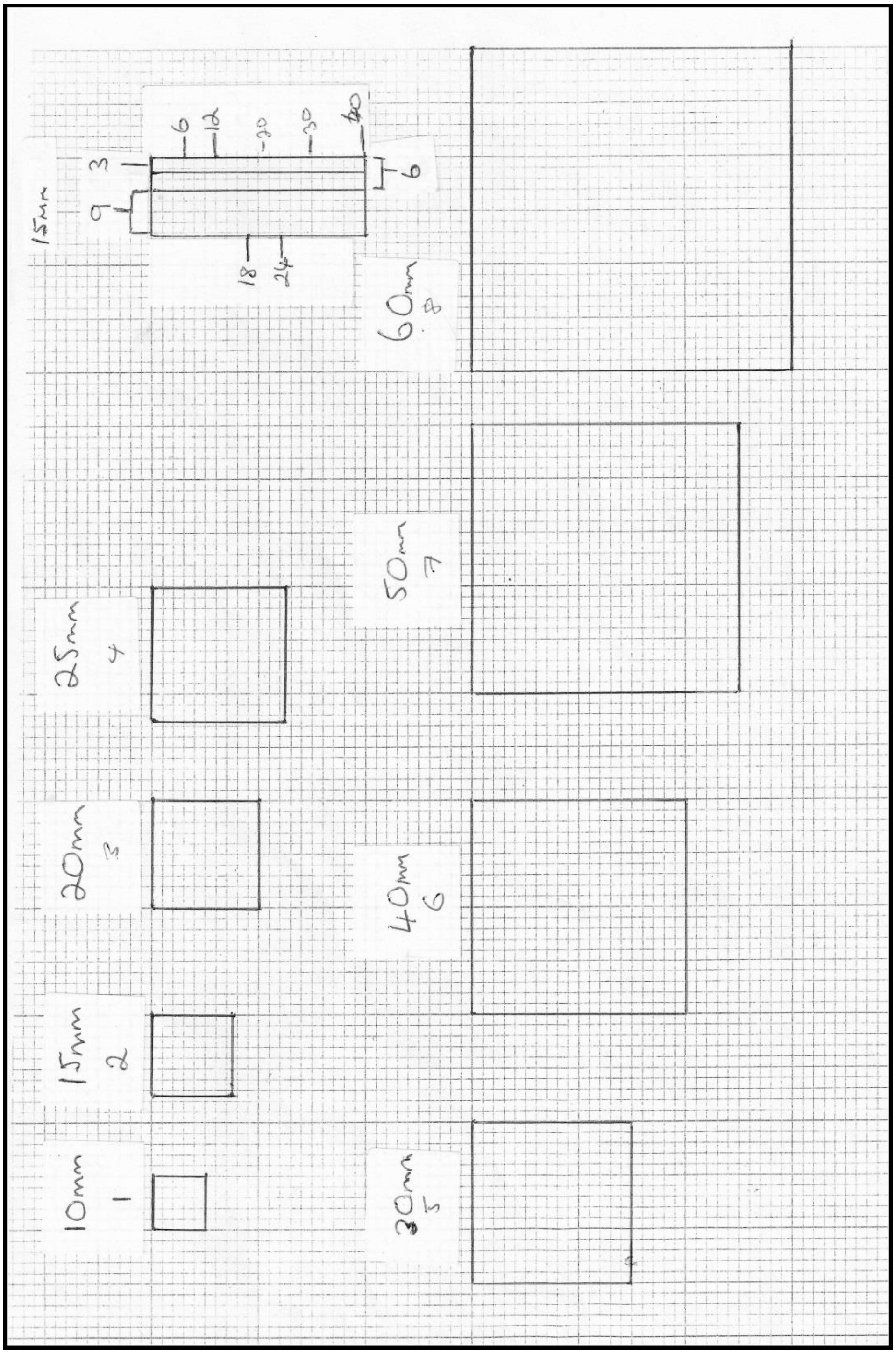
A combination of qualitative and quantitative approaches was used for the lithic analysis, which took place at the macro-scale, using the naked eye and a 10X magnification aid, where necessary. Lack of standardisation in lithic analysis means comparison is difficult without visiting all material first hand, and under similar conditions. For example, colour, already a subjective attribute, varies under different lighting conditions. In a way this is not a bad thing, for Mesolithic people too would have sensed their world under different circumstances, indeed we cannot be sure they even conceptualised colour in the way we do.

For each assemblage a qualitative assessment was made taking into account qualities that cannot really be quantified; or more accurately qualities that do not need to be recorded for single pieces, in order to gain an appreciation of the assemblage as a whole, and by context where relevant. This allows for a sensual engagement with the material which can negate the ambiguity between flint categories, as well as forming an overview of the similarities and differences in material (see Appendix Two for examples of this). It was felt to be more appropriate to describe all the lithics in ways that might reflect intentionality, so for the quantitative analysis of the individual pieces some traditional categorisations were retained, whilst others were rejected, for example, recording the weight of cores, or number of platforms, as it was regarded as being irrelevant to aim of this thesis.

The way that this transpires into the analysis is demonstrated by the following example. Rather than describing a core as ‘class B3 weighing 20 grams in black flint’ we need to think about the qualities of the object, its inherent properties, its colour and texture for example. Although we cannot think exactly like Mesolithic people, we can start to see that object in its context, for example a core that is exhausted and no longer workable might be seen differently to one that still has some use life. Certain attributes are present which can signify the physicality of this, for example stacking and failed removals. These can be described as present or not, but metrical analysis of these attributes is time consuming and would not add to this thesis.

The classificatory system for this thesis was adapted from existing typologies, including Jacobi's (1981) microlith typology. A more fully detailed breakdown of the categories used in the analysis, and the rationale for them, is detailed in Appendix One.

Figure 2.4: Template used in analysis (scanned copy)



Collation of data

Summary data is presented in the relevant chapters in tabular form (Figure 2.6), whilst the main body of data is presented in Appendix Two in tabular form (in the style shown in Figure 2.5). Modified pieces and further pieces of note, for example cores are detailed in a list of artefacts at the end of each table. For any sites not detailed in the chapters, the summary data is also included in Appendix Two.

The categories used in the tables are fully explained in Appendix One, but it should be noted that in all tables, flakes include chips, blades includes complete and broken examples, and 'other debitage' takes into account anything that cannot be assigned one of the other categories. Spalls and unintentional products of the knapping process, for example, shatter, are included in the 'other debitage category.

It should also be noted that some categories naturally overlap with each other; therefore the data for each column (or row) will not necessarily add up to 100% of the total number of the lithics. A retouched blade may be edge damaged and burnt, effectively fitting into three separate categories. There were also some artefacts where attributes were not distinct, especially in the case of the tufa springs where pieces were obscured by calcium carbonate. Therefore, the figures again may not add up to 100% of the total.

An important consideration with the analysis is the contextual information for the assemblages. These include features such as, pits, tree hollows and animal burrows, but also the springs themselves. These are detailed in the results section where they exist. The context within which the springs are situated, that is the landscape, is considered along with water in the next chapter.

Figure 2.5: Example of an assemblage breakdown table

Table *: Spring total assemblage breakdown

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	0	0	0	0	**0**
flakes broken	0	0	0	0	**0**
Blades	0	0	0	0	**0**
microliths and manufacture	0	0	0	0	**0**
other debitage	0	0	0	0	**0**
total	**0**	**0**	**0**	**0**	**0**

Figure 2.6: Example of table of results, Appendix Two

Table *: Lithic categories

Classification	Quantity
Cores	0
Core fragments	0
Flakes complete	0
Flakes broken	0
Blades and bladelets complete/broken	0
Microliths and microlith production	0
Other debitage	0
Total	0
Cortical Category	
Primary	0
Secondary	0
Tertiary	0
Indeterminate	0
Material	
Flint	0
Chert	0

Table* : Quantification

Debitage size mm^2	Quantity
00-10	0
10-20	0
20-30	0
30-40	0
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	0
9	0
12	0
15	0
> 15	0

Chapter Three: Landscape to waterscape

Site to landscape approaches

The publication *Research frameworks for the Palaeolithic and Mesolithic of Britain and Ireland* (Prehistoric Society 1999) underlined the need to examine large areas of landscape, as opposed to disparate and widely dispersed sites. Regional frameworks for each of the main regions in the British Isles have also highlighted those areas in particular need of further research. For example, the coverage of the Mesolithic in the south west of England has been patchy with the focus very much on coastal sites and cave sites, and the English Heritage commissioned, South West Archaeological Research Framework (SWARF) noted “the absence of a major synthesis” for the Mesolithic archaeology of the region (Webster *et al.* 2008:23). In reality a combination of site, landscape and regional approaches at relevant scales of analysis would be the ideal model to strive for.

In archaeology generally, there has been a shift from site-specific studies to considering the relationship between those sites in the wider context of the landscape. This trend has also been prevalent in Mesolithic archaeology, where scholars have successfully attempted to embrace the concept of landscape (for example Waddington 1999, Conneller and Schadla-Hall 2003), viewing it as a “taskscape” (Ingold 2000), in which people live their day to day lives and not just as a convenient context in which to situate site based studies.

Mesolithic studies have made use of the whole spectrum of landscape related paradigms and these theoretical approaches are diverse in the extreme. It is neither desirable, nor even possible, to cover in comprehensive detail all approaches to landscape here. Its extensive historiography is more than adequately covered in a plethora of edited and non-edited volumes, and in order to trace its development in archaeology reference should be made to the numerous introductory texts that cover the theoretical and methodological aspects of landscape studies (for example: Muir 1999, Johnson 2006, Wylie 2007). However, it is worth stating that considerations of landscape have followed a similar theoretical trajectory in geography, historical studies and archaeology, and a key number of themes have emerged: the aesthetic landscape, landscape as composition, landscape as text, landscape as palimpsest, landscape as taskscape, landscape as experience and the enculturation of the landscape. A tendency toward dichotomising landscape types has also become prevalent: natural and cultural, upland and lowland, secular and sacred, and wet and dry landscapes are of particular relevance to this study. All have been described and critiqued extensively elsewhere, albeit sometimes using alternative terminology (see for example: Ashmore and Knapp 1999, Ucko and Layton 1999, Bradley 2000, Head 2000, Robertson 2006) and so in this work they will be considered in relation to how they have been used, and may be further used, to illuminate insights into a Mesolithic world. Seminal works by Bradley (2000), Ingold (2000) and Tilley (1999) have certainly impacted upon the imagination of Mesolithic scholars, although themes such as natural places (Bradley 2000) have assumed an importance that may not be as helpful as one might hope, given the apparent primacy of the natural world to hunter-gatherer peoples.

Defining landscape

Scholars have struggled to come up with an all-encompassing definition of landscape, and it is generally agreed that it is an ambiguous term devoid of clarity and definitive meaning (Cosgrove 1984, Barnes and Duncan 1992). The word landscape is considered polysemic (Socco 1998, Bender 2001, Winchester *et al.* 2003), and landscape as a physical entity is itself complex with multiple meanings (Cooney 1999, Head 2000). However there is some consensus about the term even if it does lack a straightforward definition. It is agreed by most Post-Processual archaeologists and contemporary cultural geographers that landscape is a social construct (Head 2000), which is determined by the position of the social agent within it. The landscape is considered to be in constant flux, changing according to the temporal and spatial contexts under discussion, and whether viewed for example, from emic, etic or individual and collective perspectives. If this is the case it does not make sense to restrict the use of the term landscape or attempt to give it a definitive meaning. Moreover, no one way of looking at landscape can or should dominate another (Thomas 1993).The way in which landscape has been studied does have a bearing on archaeological interpretation, and this can be clearly seen as distinct paradigm shifts within Mesolithic studies as it has in archaeology in general.

Landscape paradigms

Whilst early investigations by geographers viewed landscape from the Germanic perspective of its etymological and territorial roots as *landschaft*, art historians were studying the representative landscapes or *landschap* of Italianate and Dutch painting which had emerged from the Renaissance and Enlightenment (Muir 1999). Added to this, Sauer (1925) articulated the concept of natural and cultural landscapes, which also had their etymological roots in German geography. These perspectives converged to give us a sense of landscape, and gave rise to the dualisms that have plagued western concepts of landscape ever since. In the one sense, landscape was a set of bounded lands, a physical area, in the other it was a visual and artistic perspective, a representation. These intellectual developments occurred in tandem with advances in cartography and, as Cosgrove (1985) points out, both are in essence governed by laws of composition and aesthetics. Together these were interpreted by western geographers as being ways that people constructed space and gained a detached visual perspective by being *seers, seeing a scene*. This chorological approach resulted in a static view of landscape, one that lacked "process or change" (Cosgrove 1985:57).

It was the notion of the *bruma* (Humboldt 1848) or 'haze' that veiled the landscape rendering it *mystifiable* (Cosgrove 1985, Cosgrove and Daniels 1988), that gave rise to the view that rather than composition and aesthetics governing landscape, it was the "inward process of the mind" (Humboldt 1848:347) or perception, along with cultural and political influences, that directed the way in which the subject viewed the landscape. This Humboldtian scientific model resulted in the shift toward attempting a more objective outlook, and would shape the way landscape was subsequently viewed from a semiotic perspective. Landscape in this approach could be viewed as a text, or palimpsest, which if one learnt to read it, would reveal the secrets of the historic landscape. Text was a construction of a particular set of meanings (Barnes and Duncan 1992, Duncan and Duncan 1988), and if one could find a way to see that which lay beyond the haze, then it would be possible to realise an objective view of the landscape and, indeed, read off those meanings. But one cannot simply read the landscape as a text, as espoused by Lewis (1979) and Meinig (1979), in order to elicit cultural meaning, for this still implies that one can separate subject and object (Barnes and Duncan 1992, Minca 2007). With these early approaches, a Cartesian divide emerged in landscape studies, and a noticeable conflict between the observed and the observer, nature and culture, place and space, representational and perceived and the personal versus the social were already in place (after Cosgrove 1985, Farinelli 1992).

Few western archaeologists would therefore disagree that the study of archaeological landscapes has much in common with either compositional notions of landscape (*landschaft*) or its artistic, aesthetic or literary qualities (*landschap*) and these early approaches have rightly been criticised for being overtly visual and wanting to conform to either subjectivity or objectivity. It is worth noting, as Cosgrove (1985) and Olwig (1996) point out, that critiquing these points is something of a fallacy for landscape art "was [indeed] a way of seeing" the world and created an "illusion of order and control" for the "detached spectator" (Cosgrove 1985: 55). It is not the concept that is at fault; rather it was its application to a theory of landscape. Moreover, the idea of landscape as was borne from the Germanic concept of *landschaft* and meaning an area of land with particularly strong ties to community, was a far cry from the landscapes of Giorgione or Constable.

It was Brueghel's and Patiner's paintings in the true *landschaft* style that were more closely aligned with the cultural landscapes of interest to archaeologists. They were not just scenic representations of topographical features, with an odd figure included for perspective, but showed villagers, burghers and farmers going about their daily work. Although these were still somewhat idealised representations, depicting a relatively perfect life, they never the less still portrayed cultural aspects of people's existence (Olwig 1996). It was these paintings that proved inspirational to Ingold (1993, 2000), leading him and others, to take a more anthropological look at landscapes as ways of 'being in the world'.

Whilst the visual aspect of landscape cannot be denied (after all it accounts for at least part of the sensory capabilities of the majority of active human agents) its overemphasis had led to metaphorical considerations of the landscape emphasised by the ocular (Wylie 2007). The notion of the gaze rather ignored the active agent; onlookers and participants were inherently passive. It was this that led to the inception of Ingold's taskscape and Heidegerrian notions of dwelling in the landscape: indeed Ingold urged us to step into Breughel's painting *The Harvesters* rather than gaze onto it (Ingold 1993, 2000). Ideas of engaging as an active agent with the environment, the embodiment of landscape, phenomenological approaches to landscape and cognitive inner landscapes would now dominate the discourse.

Ingold's taskscape can be critiqued from a semantic point of view. It implies that there are fixed desirable outcomes and the *task* of taskscape is closely related to work, chores and jobs. It does not allow for spontaneity, uncertainty or dynamic landscapes, but it does rid us of the notion of landscape as scenery, and begins to close the nature /culture divide. Landscapes could now be understood as lived in, immersive, and as networks of performance spaces (Rose 2002, Wylie 2002). The new dwelling perspectives allowed for a more "intimate and personal engagement" with the world (Bender 2001:75) a being in, or of, the world rather than a disparate element of it. Tilley (1994) advocated a more experiential approach to archaeological landscapes whereby they could be understood by immersing oneself in them, and by visiting those landscapes about which one is trying to compose a narrative. These new relational landscapes should have led to the ocular losing its supremacy, yet even phenomenological approaches were critiqued for not realising the goals of their proponents (for example, Fleming 2005). Although frequently cited, Tilley's study of the Neolithic chambered tombs of the Black Mountains, the Dorset Cursus and other prehistoric sites (1994) is a prime example, where visualisation has dominated over the other senses, despite the approach having a wider sensual premise.

Taking this approach one step further Edmonds (1999) took a novel approach to landscape by constructing a narrative to accompany his more traditional account of 'ancestral Neolithics' in which he attempted to view the Neolithic world from the perspective of the people who inhabited it. This does seem to be a more effective way of being in the prehistoric world than the "ambulatory [visual] encounters" (Bender 2001:83) taken by other proponents of experiential approaches. At least Edmonds considers the important role played by material culture, perhaps because of greater concern is not actually what landscape is or was but rather how people interact with their world, and how that is expressed through materiality. Enculturation of the landscape enables people to construct, and maintain order in their visible and hidden worlds, through the production, use and deposition of material culture (Jordan 2003, Zvelebil 2003) In this view, landscape becomes the medium for action and praxis in which people can express their social selves, communal identities, and personhoods. They are not just dwelling in a landscape, they are constantly evolving with it, they are at one with it, but also realise they can affect and be affected by it.

The idea of a cognitive landscape, one which we carry as an 'inner map' is not a new one (Abrahamsson 1999). These mental representations of places and spaces within the landscape are bound up with conceptual notions that have cultural meanings and may be directly or indirectly referenced to the topographical landscape. In this view landscape may be seen as something that is carried around within us. We take the landscape wherever we go, referencing new places to those that are known. Geographers such as Bruun have viewed cognitive landscapes as "a coherent, geographically grounded frame, through which we interpret the meaning of objects and events that can be connected to a specific area" (Bruun 1996 in Abrahamsson 1999:53). This type of cognitive landscape is well recognised in North American hunter-gatherer ethnographies, and is a useful way of thinking about how people perceive their landscape. Furthermore, as with the Aboriginals of Australasia, mind maps may also reference metaphorical landscapes, the *dreaming* of the Australian Aborigines being a well-known example (Flood 1983). This might imply that all landscapes, both real and imagined, are cultural.

Place and space

The terms ‘place’ and ‘space’ are used frequently in accounts of the archaeology of landscape but are yet more terms that are devoid of definitive meaning, and consequently have been discussed in great detail by human geographers (for example, Tuan 1974, Buttimer and Seamon 1980, Agnew 1987, Werlen 1993 and Massey 2005).The twists and turns of their ongoing debate have spilled over into archaeology where concepts of space and place, and of course time, are of huge significance. Sometimes the semantic fuzziness between space and place has been confusing and unhelpful, not least because for each term there are many definitions (Simpson 2012). Just as for the other ambiguous terms such as ‘landscape’ and ‘natural’ used in this study, both ‘place’ and ‘space’ should be considered social constructs. The way we use them in archaeology has come about partly through the methodologies employed within the discipline and partly from the theoretical perspectives.

Perhaps the singular most helpful way of conceptualising the difference is to consider “place philosophically distinct from space” where “place is a meaningful segment of space” (Agnew and Duncan 2011:237 after Tuan 1974, Buttimer and Seamon 1980, Relph 1986), but with the additional clarifier that space is a meaningful aspect of place. In geography the general consensus between scholars is that place can be seen as ‘location’, as ‘locale’ and that one can have a ‘sense of place’ (Agnew 1987). These can be usefully adapted to the concerns of archaeologists.

Places are indeed locations, often defined by the specific naming of that location, or through the enculturation of a bounded space, whether that boundary is physical or symbolic. The place then becomes ‘locale’ when it is enculturated with material things or through action and praxis. A ‘sense of place’ may be realised through experiencing and dwelling in that place. This perspective has given rise to the idea that places are social and can become significant, for example, through repeated visits; this in turn makes these places ‘persistent places’ in the landscape. These persistent places may then become connected through the structuration of landscape.

Yet, the concept of place does not resonate for every culture, for example, the Ongee of the Andaman Islands do not conceive their world in terms of places but through the space in which they move (Pandya 1990). The Inuit find their way through space to ‘place’ through their knowledge of the environment and the landscape in which they travel (MacDonald 1998), and likewise, the Hai||om have a similar mindset (Widlock 1997). For these cultures space is also meaningful, symbolic and enculturated, although it is often the movement itself not the places and spaces people move to, or through, that is important. In this sense space is performative and akin to Ingold’s ‘dwelling in the landscape (Ingold 2000). Neolithic scholars have explored the way in which people could have moved through their landscapes, for example in relation to monumentality where place is made so through the building of monuments, and the way people move through space to these places was at least in part determined by the placing of monuments within the landscape (Tilley 1994, Bradley 1998, Thomas 1999). One particular way that place has been discussed is the concept of ‘natural places’ (Bradley 2000) and this is also subject to critique.

Natural and cultural places

Theoreticians have long battled with the nature: culture dichotomy and it is a complex and difficult notion to deal with. It also exists in other forms, for example, wild: tame and agrios: domus (Hodder 1990). Nature as a concept is as difficult to define as landscape is, but on the whole it is also seen as a social construct, with multiple and relational meanings (Head 2000). Not helped by the association of hunter- gatherers with so called natural places, where an understanding of the ’natural’ environment is an ingredient of “indigenous knowledge” (Huckle and Martin 2001:42), the nature: culture dualism has persisted in western thought. Mesolithic people are seen as being at one with the environment, tied inextricably to it, their actions determined and bound by it, or conversely, as being in control of it and determining their own actions. A new problem also seems to have pervaded Mesolithic studies, one where the nature: culture dialectic has been displaced by the idea that the two concepts are inextricably linked, intimating that both can be reduced down to the other (after Descola 2005) All these positions have been heavily critiqued, and it is certain that ways of thinking about nature and culture are not universal. But, it is worth noting that even in hunter-gatherer societies such as the Ju ‘hoansi for example, nature is a social construct. It is assigned meaning through human and spiritual significance (Kelly 1995). Although this study offers no solution to the debate, it uses the terms natural and cultural in their broadest sense. Natural is used to refer to elements in the world that occur regardless of anthropogenic actions, and cultural for those elements that occur because of it. These parameters are fuzzy in many respects.

'Natural places' are often seen as the antecedent to cultural places (those imbued with cultural significance), as espoused by Bradley (2000) in his *The Archaeology of Natural Places*. Topographic features, such as caves, mountains, rocky outcrops rivers and springs, according to Bradley, were likely perceived as monumental and formed an integral part of people's cosmologies before deliberately created cultural monuments, such as stone circles. The term 'natural' is seen as misleading because once topographical features become imbued with social meaning, through appropriation, they are in a sense already cultural monuments (Bradley 2000). Spaces are transformed into places as they become imbued with cultural significance, and become important locales in the landscape. This is typical of hunter-gatherer societies who may physically alter 'natural' features into 'cultural' ones: rock markings are a well-known example of this, but equally places may become cultural in ways that cannot be identified in the archaeological record, for example the naming of a place.

Moreover, cultural places are often seen as communal places where people come together to perform certain actions, and to be involved in the social *milieu*. This is especially true of cultural places that are monumental in some respect. In the Neolithic, ideas of community and sociality were bound together in those places where monuments were built. These were places where people came together to carry out certain practices tied up intimately with ideology. This lack of monuments in the Mesolithic has led to a state where there is little discussion of any social interaction between groups at all, which tends to reinforce ideas of exogamy and separatism in hunter gatherer societies, rather than the aggregation of groups of people for social activities. Even in landscape terms, there is a tendency to view movement from place to place in terms of resource acquisition rather than for social purposes. Yet, there are visible and less visible signs in the landscape that suggest people did come together on occasions. Certainly, for the later Mesolithic, shell middens have been seen as symbolic of such aggregations, and it has also been suggested they are a precursor to Neolithic monumental structures (Cummings 2003).

'Natural places' such as caves, springs and mountains have assumed to some extent the character of monumental places (see Bradley 2000), and in this respect they are 'cultural places'. This is a semantic problem, which we could ignore, for it is difficult to come up with an alternative term for ‘natural features that have cultural significance (Bradley pers.comm 2010). Yet, distinguishing between a cave that is happened upon and used for an impromptu shelter and one that has acquired more prominent significance in the world view of its inhabitants is still problematic. We tend to give more weighting to those caves that were the repositories for human burial or the making of cave art. It is in these places that the cave is transformed, by virtue of its (superior) material culture, and the process of structured deposition (or enculturation) into something modern day western people might perceive as monumental. This implies all caves were not equal, and certainly this imbalance can be borne out from looking at ethnographical cases. If this is the case, then it might be considered that not all springs were equal either.

Environment as landscape

For Mesolithic studies the environment has both directed and constrained scholars in their attempts to paint a picture of Mesolithic lives. Palaeoecological evidence can be used to good effect to provide insights for example, into habitats and diet, yet in earlier studies it was more often used in a negative way, where the environment was a challenge, something that needed to be overcome so that people could carry out their day to day existence (cf. Myers 1989). Mesolithic scholars have attempted to erase the vestige traces of an earlier pre-occupation with environment and the resulting charges of environmental determinism levelled at them, yet environment: geology, fauna, flora, climate and weather are not only composite elements of the landscape context but also affect and are affected by human actions. The problem is further substantiated when it is appreciated that Mesolithic people did indeed alter their landscapes: leaving a scatter of stone, lighting a hearth and the active maintenance of woodland clearances are all cultural transformations. Moreover, these actions were intimately bound up with environment. As a constituent of most known hunter-gatherer belief systems, the environment (which here includes topographical features) contributes to significant aspects of ritual and religious practise and cosmologies, and is central to countless myths, legends and creation stories. It can, therefore, act as a cultural marker. As a result environment is both literal and allegorical (Winchester *et al.* 2003:11).

But as Head (2000) points out, archaeology lacks a terminology for environmental agency that is not determining. The environment is considered to have agency by many peoples and whilst we should not afford it added agency unnecessarily, as others have pointed out, Sauerien cultural determinism, where culture not environment has agency is equally flawed (Winchester *et al.* 2003:17). Environment may then be better simply considered as one of many aspects that contribute to what constitutes the world in which all societies operate, and therefore is integral to understanding those societies. It cannot be ignored, and brushed under the deterministic carpet, but should re-assume its position as fundamental to landscape, and people's lives.

Labels and dualisms still constrain our thinking in Mesolithic studies, even to see the environment as "contingency", for example (Parker and Pickett 1997:18) as opposed to determinism exchanges one polarised viewpoint for another. Yet, to understand the environment is paramount to understanding springs and their environs as depositional contexts and furthermore to understand how it may influence human actions is essential, especially when, in the Mesolithic, dynamic localised spring settings were being used for at least short term activities.

Deposition and context

Mesolithic sites range from the ephemeral, evidenced by occasional flint finds and surface scatters, to the more substantial features, artefacts and ecofacts revealed by excavations of both open air (coastal and inland, upland and lowland), and closed sites (caves and swallets). Thus the British Mesolithic is not devoid of context: hearths, caches, pits, tree throws and middens are just some of the features that add depth to the material evidence available to archaeologists. However, it is the way in which artefacts were deposited and the nature of the depositional context which defines, to some extent, the way in which archaeologists interpret assemblages and whether they afford them functional or ritual significance. The latter often alludes to some concordance with religious or spiritual belief, the former to economic and subsistence activities.

Some depositional environments, by default, seem to be synonymous with ritual activity. Watery places are one such context and are particularly well-known for some periods such as the Bronze Age (for example, see Bradley 1998). A relationship between deliberate deposition and water is also noted for the Mesolithic. This is evidenced, for example, at Star Carr and Thatcham where there seems to be deliberate deposition of artefacts at wet and dry boundaries, although this interpretation was contested by Mellars (2009) as being post-processual "moonshine". There is also circumstantial evidence that substantial numbers of tranchet axes were deliberately deposited into the Thames and Kennet rivers (Care 1979). This is supported by the occurrence and possible caching of other axes of Mesolithic age in pits at Farnham, Surrey (Clarke and Rankine 1939), and Culverwell, Dorset (Palmer 1999). Pit deposits also contain other kinds of materials. Examples include flint, at Southacre, Norfolk (Wymer 1996), burnt bone and hazelnuts, at Mount Sandel (Woodman 1985), midden material at Howick, Northumberland (Waddington *et al.* 2003), and a mixture of the three at Kilham, Yorkshire (Manby 1976). Shell middens, for example at Oransay, Morton, and Culverwell, have been shown to contain human and animal bone, and plant material, as well as the remains of the shellfish which give them their name (see for example, Milner, Craig and Bailey 2007). Whereas some examples of deposition at lake edges, or in rivers, could be interpreted as merely accidental, the creation of a shell midden is an accumulative and deliberate act. Some middens are also located in caves in Scotland, and caves are the repositories for human remains, such as the caves in the south west of England and Wales, for example, Aveline's Hole, Somerset (Schulting 2005) and Nanna's Cave on Caldey Island, Pembrokeshire (Schulting and Richards 2002).

The evidence is strong and in favour of the deliberate deposition of items during the Mesolithic. What is less clear is how these incidents were viewed by Mesolithic people conceptually. In other periods, deposits recovered from pits, water and caves are often viewed in ritual terms, for example, an axe in a pit dated to the Neolithic would be viewed as a votive or deliberate deposit, which had some ritual or symbolic purpose. The same cannot be said for similar deposits in the Mesolithic, which have often been viewed as economic caching, or activity areas. The caching of flint into pits has ethnographic analogues, for example, Sillitoe and Hardy (2003) have shown that the Wola Tribe of Papua New Guinea cache flint for further use, but rarely go back for it, so although there are economic connotations it does not necessarily follow that these deposits were purely of economic value.

In the aforementioned *chaîne opératoire* (Chapter One) some actions are predictable, undeviating and unalterable, whilst others are unpredictable and transitory. For all there is an inevitable element of human choice. Each choice has consequences, and with this comes an intimation of technological and social risk. Memories, desires, fears, and other cultural, environmental and societal forces may have affected these choices and the decisions reached may have been intended to mitigate any perceived risk. The action of depositing artefacts into a particular context is perhaps one way in which choices, risks and consequences manifest themselves in the archaeological record.

As already considered in Chapter One, the producers of stone tools did not necessarily consider the act of deposition the final stage of the *chaîne opératoire* and lithic artefacts in some contexts may be seen to be part of a wider set of processes that go beyond deposition. Finlayson (in Conneller and Warren 2006:176) hints at this when he says "objects can be placed and continue to have an active role in society". This statement is something of a platitude but is a point worthy of extension, and the discussion in Chapter Six will consider this in more detail.

Concerning the Mesolithic landscape

It can be asserted with reasonable confidence that some aspects of landscape study, as described (albeit in brief) above are more useful in unlocking the necessary information to understand the lives of past peoples than others, and the approaches adopted are necessarily determined by the temporal and spatial contexts being questioned. In making sense of the Mesolithic world one needs to make inferences about Mesolithic people, drawing not only from the material evidence left behind, in the form of lithic scatters for example, but also through the judicious use of analogy with historically documented, contemporary and archaeological examples of hunter-gatherers.

As is illustrated in general approaches to archaeology, Mesolithic scholars have drawn from the whole range of landscape paradigms, shifting from understanding landscape in a physical sense to considering it as a symbolic and a social entity. The 'dots on maps' approach that dominated the earlier, site specific, *modus operandi* to the Mesolithic viewed the physical landscape as formed of discreet areas, each with its own environmental peculiarities, expressed as habitats. The dots could be joined up to produce notions of territories and seasonal rounds, but the emphasis was on the dots and the lines that joined them, not the apparently barren spaces in between. To make sense of the activity occurring at particular places we must tease out various strands of the Mesolithic landscape and create an etic perspective of what is essentially an emic construct. As Winchester *et al.* (2003:5) note: "we are aware of many more places in the world, many more landscapes, than we have actually visited". No doubt this could have applied as much to people in the Mesolithic as it does today. One might assume people in the Mesolithic communicated oral histories, stories and myths which told of lands and lives, both real and imagined. Landscape awareness is fundamental to understanding and making sense of the world. Places, spaces, actions all exist within certain structuring principles including the contexts of physical landscapes and people's lifeways. These contexts are intertwined; one does not logically exist without the other. We might term this amalgamation a *lifescape.*

Cooney (1999:47) suggested people carry landscapes in their head: they can also be considered to carry their *lifescapes* and it is *lifescapes* that people, for example, see and hear, or what they feel beneath their feet. Nobody else can fully experience that person's *lifescape*, it is unique, albeit relational, and archaeologists need empathy as well as empirical methods to engage with them.

Lifescape then, may be a term which might better embrace the essence of what archaeologists attempt to discover and describe from the past. Although a number of attempts have been made to find more appropriate words to replace the ambiguous landscape such as Ingold's taskscape (1993, 2000), there has not been anything suggested that feels wholly adequate (and might never be). However, it can be acknowledged that lives take place as shared experiences and in a setting, which itself is an amalgamation of cultural and natural elements, relational, recursive and dialectic. People do not move within lifescapes they carry with them their lifescape, their experiences and their memories: some of which they will have in common with other people, other animals, plants and the elements. The landscape might then be considered the context in which those lifescapes interconnect with each other in the everyday lived in world.

In this thesis I have used landscape as both a contextual tool and as a being/dwelling in, or view of the world, and lifescape as a preferred term to describe the lives of people and what is experienced, which may or may not be shared. The former happens in respect to the latter, not just because of it, or despite it and it does not lie in opposition. Constituent parts of the world are elements of both landscapes and lifescapes. Water is very much a case in point.

Water in landscapes and lifescapes

Water is essential to the human condition, it permeates every aspect of life and people cannot survive without it. It is a constituent of many, if not all, of the numerous activities which are and were carried out by human beings in all spatial and temporal contexts and fulfils crucial roles in people's lifescapes, as well as being an important component in/of their landscapes. Yet, the way in which water is conceptualised and experienced is and was not universal (Strang 2005) and certainly all water is not the same. There are shared commonalities across cultures and certain themes are recurrent in both the real and physical engagement with the world as well in myth, legend and belief systems. These threads of continuity may be especially helpful when assessing waters importance to prehistoric communities, as long as it is understood that there are no universal structuring principles. Water would have been intrinsic to the fabric of Mesolithic life and would have been a phenomena both observed and experienced. Some, but not all, of the numerous activities related to water that were carried out are accessible through the archaeological record.

Potable (i.e. drinkable) water sources would have acted as a focus for Mesolithic dwelling, and the frequency of Mesolithic sites near springs and other fresh water sources would appear to support this. These and other watery places supported ecosystems that were exploited during the Mesolithic, and thus made attractive places for hunting, fishing and harvesting hydrophilic plants. Water would be needed for domestic activities such as cooking and would have been a vital component in less obvious undertakings, such as the transformation of mutable materials. Examples might include the softening of antler to make it workable (Osipowicz 2007), or the soaking of nettles to make twine (Karoll 2009).

Watercourses enable people to traverse landscapes with rivers, lakes and streams being used as navigable waterways. There is no doubt that Mesolithic people travelled on water at least to some extent (Andersen 1987, Burov 1996, Clark 1954), although little physical evidence, in the form of paddles and boats, has been found in the British Isles. Even so, watercourses likely acted as route markers, or watery pathways, and might have been means of showing the way to significant places in the landscape. These features would also have delineated landscapes. They joined, yet also set apart, the familiar and the unfamiliar; were maybe inviting but also foreboding, and acted as boundaries both permeable and impermeable. For example, lithic evidence in the Black Mountains, Wales may support the notion that Mesolithic people were using rivers as a means to formalise seasonal movement (cf. Barton *et al.* 1995), although this is an assumption based on what might be biased recovery.

Water may be encountered in various physical states. These states can, and usually do, exist simultaneously. Bodies of water and watercourses form part of the physical landscape: rivers, streams, brooks, seas, lakes, ponds, meres and bogs. Water falls from the sky as rain, sleet and hail and discharges from the ground in the form of seeps, geysers, and springs. In all of these states, water can be both fluid and free moving, static and still, frozen or semi-frozen, or can appear to be more ephemeral occurring as steam, mist or fog. Water has innate sensuous qualities with the visual perhaps being the most obvious (for example, it can be reflective, opaque, transparent). Water is often heard before it is seen (for example, with waterfalls and waves). It is not only the ocular and the aural that are stimulated; water is also olfactory (for example, sulphur springs) gustatory (for example, salt springs) and tactile, in that when touched the body perceives a sensation. These experiences can make the body feel good yet, conversely it can be less than pleasant. Water also changes the sensory perception of other aspects of the external environment, for example, dry track ways become wet and may cause feet to sink. It is impossible to finish a list like this which demonstrates the extreme diversity of human lifescapes that may be had in association with this most ubiquitous of elements (Strang 2005). This is further illustrated when we consider those aspects of water which are not literal.

Water occurs in actual and conceptual forms and acts as metaphor and symbol. For convenience water types can be split up into three main groups, meteorological water (for example rain), bodies of water (for example, lakes) and bodily water (such as, tears, urine and amniotic fluid). Whilst it is acknowledged that in most western cultures the latter are not strictly water at all, some peoples do not make this distinction. Therefore, it is important to acknowledge that water not only provides a metaphor for bodily fluids but may be seen as a life force, for example, to the Hopi, water is a life blood, or "the essence of the sacred" (Loftin 2003:11). Further categories in some cultures include good, bad and dead water, with the Maori being a well-known case of peoples who make this distinction; although this personification of water is also seen in western societies (see Strang 2005).

Many cultures, such as, the Khanty of Siberia (Jordan 2003), see water as a living entity and often have specific words such as *power*, *spirit*, and *mauri* to describe the inherent animate qualities of water. There may be very strict rules of engagement associated with water and watery places, and what may or may not happen there. Disregard of these can lead to negative consequences for example, a once abundant water source may dry up, thus it must be afforded due respect, perhaps in the form of a votive offering. Water can change its disposition, for example, the Taiariari River in New Zealand not only possesses an overall concept of *mauri*, it alters in character and has localised moods as it flows from source to mouth (Williams 2006:75). This change is also concurrent with the human life cycle: a spring transforms into a stream, then river, until it eventually flows into the sea, this mutability acting in itself as a metaphor for growth, transformation, birth and death. Water, especially that given an element of personification, can give, sustain and take life and its associations with birth, growth and death may be very powerful. It can act as ritual substance, to help the new born to grow both literally and spiritually. It can possess power to cure ailments, to cleanse or purify, either on its own or as a constituent of medicine, as well as having other therapeutic qualities. Ultimately watery places may also act as repositories for the dead, or pathways into other realms of existence.

Sometimes the personification associated with water takes the form of physical entities such as spirits, ancestors, deities, and nymphs. These dwellers in watery places may be benign or malignant and sometimes both. They may reward those who conduct themselves appropriately but in other situations can cause bad luck, illness, even death. These entities that dwell in watery places may become associated with liminality, and subsequently become protagonists in legends and creation myths. The water itself may also play an important part in cosmologies, belief systems and religions. Watery places and features can be portals to other worlds, or the junction between a world of the living and a world of the dead. In some cosmologies there even exists a watery world: for example, in Hopi cosmologies the water world (the blood of life) is one of three elemental worlds (the others being fire and air), which the Hopi pass through before they climb into the world where they will dwell (Blackstock 2001). Watery events such as floods, waves, or the drying up of water can also be a composite element in these.

A well know example of a watery place that encompasses many elements of the above is the River Ganges. This river is said to be the manifestation/ personification of the goddess Gangā, and hence the waters are purifying and healing, although ironically the Ganges is also one of the most polluted rivers in the world (Caso and Wolf 2010). The belief system surrounding the Ganges is complex but the veneration of the river which is really Gangā herself can be seen throughout Hindu cosmologies, and ritual, religious and profane activities. The Ganges flows not only in the real topographical world but also in the sacred realms of heaven and the underworld (for a complete account see Eck 1982). Offerings are made into the water, which brought about the birth of the ancestors, purifies the living, and allows the dead to live again. The river is ever changing, yet it retains a continuity of sameness, in this way again it also resembles the human lifecycle. In Hindu legend Gangā, when in human form, kills her own sons by drowning them in order to save them from the peril of having been born as mortals, and so that they can return to world of the gods (Foulston and Abbott 2009). Yet, the Ganges can also be seen as a functional entity, tied up in the sacred but still used for everyday activities such as washing clothes, and swimming for fun.

Water in archaeology

Despite the fact that water plays so many roles in people's lives, it is often only paid cursory attention when considering past human action. Subsequently the theorisation of watery places has moved on little in archaeology from the basic model proposed by Clark in his seminal article *Water in Antiquity* (1944), where he discusses three watery themes: the relationship between water and settlement; its effect on artefact preservation; and the historical persistence of the act of veneration. These themes have retained their emphasis and few works have explored the water as an entity in its own right since, although largely due to John and Bryony Coles (for example Coles and Coles 1989, 1996), the archaeology of wetlands is well established and these themes are constantly subject to examination and re-examination. However, the water itself has become subsidiary. Its wetness, fluidity, temperature, transparency and reflectivity, do not seem to feature in archaeological explanations. Rather, water has become a homogeneous entity, upon which, or into which, we situate our narratives.

Eloquent discussion of the medium of water in functional and ritual terms, as well as the importance of watery places, ensure Clark's paper is as relevant now as it was when it was first published. It is of course of its time and thus has become dated: the functional: ritual dichotomy as elucidated by Clark being particularly outmoded. Even in 1944 Clark recognised the importance of water as not only one of life's necessities but as an element that is inherently bound up in other functional and symbolic aspects of life. When in other archaeological periods springs have been considered as potent places as well as settlement sites, it is surprising that so little archaeological work has concentrated on these places as significant during the Mesolithic. Judging by the level of apparent activity around them, springs would have been very familiar to Mesolithic peoples and would have formed both part of their landscapes and lifescapes.

Springs in the landscape

Springs are a source of water and as such many of the general points outlined above in relation to water also apply to them. These aspects will be explored within anthropological frameworks in the subsequent chapters, but there are some more practical considerations for the archaeological study of springs, such as hydrological regimes, which need introduction.

Basic spring hydrology

There are geologically speaking two broad types of springs: those that emerge from perched aquifers and those that emerge as artesian springs (Davie 2003). The former situation gives way to the classic situation where an aquiclude prohibits the escape of water through the rock mass and therefore where the perched aquifer, aquiclude and ground surface meet water will emerge from the ground as a spring. If the water table becomes higher it will result in the spring emerging further up the hillside and further down if the water table is low. These springs are therefore dynamic. The aquiclude- geological impermeable layer may stretch for miles resulting in spring lines. The movement of these springs is not an overriding feature or insurmountable problem within the parameters of this study. These springs were likely to have flowed in the Mesolithic if they have Mesolithic artefacts associated with spring sediment.

The artesian spring results from a confined aquifer where water is held under pressure within a layer. If a fissure or borehole results then the water will be forced out until it meets the level of the pressure surface. These springs may well stop flowing if the pressure surface drops down dramatically. This does have some implications for this study. If artefacts have been deposited into a spring directly, they are likely to be *in situ*. If artefacts are found near to springs there may be a chance that the spring has migrated upslope (never down) and the artefacts were not related to the spring directly. A more serious implication for this type of study is later human impact, namely the abstraction of ground water near to the spring sites which would mean there is potential for ground water levels to drop and springs to potentially dry up (this was most probable in historic periods). Abstraction is the main reason why aquifers dry up and springs move but this was not a problem during the Mesolithic. Each case was considered independently, assessed for reliability and any cause for concern is outlined in the relevant chapters.

Essentially then springs are the point at which groundwater emerges from the Earth's surface. Spring waters may deposit sediment according to their hydrochemical makeup, and are the source of streams and pools of water. The sediments associated with springs can preserve ecological and cultural evidence, allowing a record of both habitat and anthropogenic activities taking place in their vicinity. For much of the study area, especially the Bath environs, and Somerset in general, evidence for the contemporary vegetation of the locality in the Mesolithic is sparse, and reference has to be made to other areas of the country where similar conditions have prevailed. Some sensible assumptions can be made according, for example, to the sedimentation in the immediate locality of the spring: it would be expected that tufa depositing springs would encourage the growth of plants that thrive in calcareous conditions. Hydrophytes are encouraged to grow where the ground surface is saturated, especially if the groundwater table is high (Ashley 2001). The sedimentation of springs has not been particularly well studied from an archaeological point of view, but the potential for organic preservation in spring sediment, particularly tufa has not gone unnoticed (Clark 1944, Evans 1972). Again the emphasis has been on the preservation of the artefacts and ecological remains, rather than on the qualities or properties of the springs themselves.

It is possible to construct a loose typology of springs based on a number of parameters. These include temperature, chemical composition and other physical properties. The simplest way, and adopted for this study, is where spring types are accorded those terms commonly used to describe them. These are further explained in the relevant chapters to avoid repetition, as are the Mesolithic habitats likely to have occurred at each of the spring sites in this study. However, it is worth noting that the Maori classify springs according to their spiritual rather than physical properties (Metge1979 cited in Williams 2006:77).

Chapter summary

Landscape then is a difficult concept to define, explain and conceptualise. However, we can think about it in terms of lifescapes and how people interacted with it. For example, to walk through woodland is a very different experience to walking along a beach. In the former the vegetation, which pervades the space, must be negotiated and requires a very different approach than would be needed to traverse an open beach landscape. Peoples' interaction with different landscapes would also trigger different sensory experiences. Wind blowing through trees inland is very different to wind blowing in off the sea on an exposed beach. There is also diversity within these landscapes: woodland may be thick and impenetrable in places, but elsewhere there would be clearings and open space.

People may have had particular sets of beliefs for dealing with particular environments and whilst we can never realise a truly emic understanding of how people negotiated their landscapes, we can do our best to empathise. This notion applies to springscapes too. One important aspect that should be stressed here is that all habitats, landscapes, places and spaces encompass a spectrum of possibilities. No two are the same and even the same site changes according to the weather and other variables. If we add to this the diverse nature of human experiences, then we cannot expect behaviour to be the same, let alone universal, even at similar sites. We can only hope for commonalities and perhaps some underlying factors that influenced the way people acted and thought; perhaps as they expressed shared 'rules' for particular sets of circumstances. This thesis seeks to discover if there were any prevailing conditions that affected the way Mesolithic people related to their landscapes whilst appreciating the variety that is inherent in all landscapes and therefore all lifescapes (see chapters four, five and six).

Chapter Four: the Bath hot springs and their environs

Introduction

Of all the springs that have ‘exaggerated’ properties it is probably hot springs that are the best known. Commonly referred to as thermal springs many were, and still are, the focus for spa development worldwide, and those at Bath in BANES (Bath and North East Somerset) are no exception. All three of the Bath hot springs have been utilised as bathing and spa facilities, as well as for less prosaic activities, from the Roman period onwards. However, only two have yielded substantial numbers of Mesolithic artefacts during the course of building renovations, archaeological and hydrogeological works. These are the Hot Spring, sometimes referred to as the Hetling Spring, and the Sacred Spring which is also known as the Kings Spring. The Cross Bath Spring has produced little direct evidence for Mesolithic occupation and has not undergone excavation to any extent in modern times, although material has been recovered in the vicinity from Beau and Bath Street (Figure 4.1). The fact that all the aforementioned sites are practically contiguous rather precludes an actual lack of Mesolithic activity at the Cross Bath Spring. This chapter focuses on the Hot Spring and Sacred Spring but it is quite possible that during the Mesolithic all three were viewed in a similar way. They might even have been considered a single entity rather than three distinct springs. The way people might have conceptualised the springs is discussed further from page 142 onwards. It should also be considered that during the Mesolithic there may have been further seepages of hot spring water in the area, a phenomenon that still sometimes occurs today when the ground is disturbed (Kellaway 1994).

Thermal Springs

Thermal springs are those where groundwater is heated by geothermal energy before it emerges from the ground. They occur across the globe in all five continents and whilst some countries are renowned for their thermal (hot) springs, for example, the United States of America, Japan and Iceland, others are less well known. Importantly, not all thermal springs are actually hot and in the British Isles only the three Bath springs can be truly classified as such. They emerge at an average and constant temperature of between approximately 41 and 47°C (Kellaway 1994), but even these are fairly cool in comparison to many of those occurring elsewhere in the world. For example, the Deildartunguhver

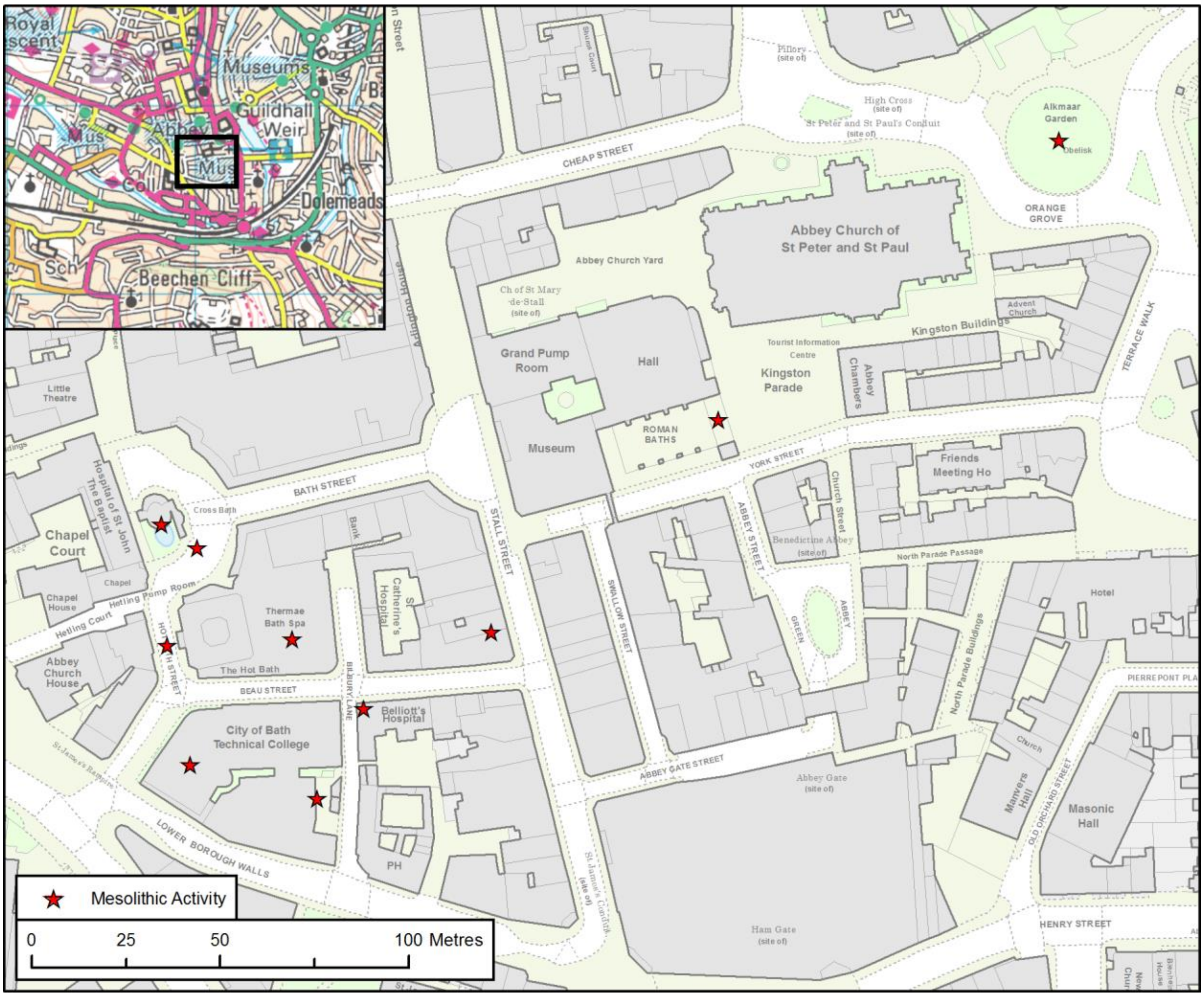
Spring, in Reykholtsdalur, Iceland, emerges at nearly 100°C (Steinthórsson and Thorarinsson 2007:350). In comparison, the hottest of the three Bath springs reaches only 46-47°C (Gallois 2006), although this still gives it a mean temperature some 20 to 35°C above the norm of 10 to 11 °C for cold water springs. In addition to the Bath hot springs there are a number of other thermal springs in the study area and elsewhere in the British Isles. These include Hotwells, Bristol; Taff's Well, Cardiff; Vespasian's Camp, Wiltshire; Matlock Bath, Derbyshire and Tunbridge Wells, Kent. Some are warm springs, for example, at St Ann's Well[1] in Buxton, Derbyshire the waters emerge at a temperature of around 28°C. There is an ongoing scholarly debate as to what constitutes a thermal spring and how they might be further categorised to provide a clear, concise, and objective terminology of practical use to hydrologists and others (see for example: Edmund *et al.* 1968, Burgess *et al.* 1991, Stanton 1991, Pentecost 1999, Pentecost *et al.* 2003). Describing thermal springs as warm, hot, or cold is problematic due to the difficulty of defining temperature attributes in an objective way. Some scholars completely reject the term 'thermal' spring altogether (see Pentecost *et al.* 2003). For the purpose of this study the use of the classification suggested by Pentecost (2005a), in which he proposes four types of spring according to temperature parameters, seemed to be the most practical. Springs that emerge at temperatures above the mean annual air temperatures of their surroundings can be termed *superambient*, those that arise close to air temperature are *ambient*, and *cold* springs are below ambient. Springs rising above body temperature (36.7°C) retain their traditional, if not somewhat "anthropocentric", classification of *hot* springs (Pentecost *et al.* 2003:1444).

The terms *cold*, *ambient*, *superambient* and *hot* are adopted from here on in with the caveat that they are subjective terms. Whilst scientific studies might require statistical data and temperature parameters for each spring category, archaeological studies are about people and therefore it is not wholly inappropriate to use terms relational to the human body. This too can be variable according to circumstance. Spring waters are hotter or colder depending on the time of day and year, as well as being affected by localised conditions. Ultimately temperatures fluctuate in relation to core body temperature, albeit conceptually. Using these parameters, the Bath Springs in this study are indeed hot springs, and therefore it is appropriate to use the term in place of the more ambiguous descriptor of 'thermal' spring. This also allows for analogical comparison using examples of other similar springs around the world which helps to provide a conceptual framework

[1] Note: the source of the spring lies in Eagle parade and is piped to St Ann's Well.

for the way in which the hot springs of Bath were possibly used, and for how they might have been appropriated into people's landscapes and lifescapes during the Mesolithic.

Figure 4.1: Sites with Mesolithic activity in the centre of Bath



Location

The three hot springs are in close geographical proximity to each other (Figure 4.2 and 4.3). They occupy an area of approximately twenty by eighty metres in the centre of Bath and lie just westwards of a meandering loop of the River Avon (Gallois 2007).They are less than 300 metres away from the banks of the river at approximately NGR ST 750647 and seventeen metres AOD (Kellaway 1994).The city itself is almost enclosed by high ground which in turn is punctuated by numerous rivers, brooks, and streams. To the north-west lies the Lansdown Ridge which forms the southernmost end of the Cotswold Escarpment. Prominent features along Lansdown Ridge, from west to east, include Dean Hill, Kelston Round Hill, Lansdown Plateau (the highest point in the south Cotswolds at 238 metres AOD (Kellaway 1994)), and Little Solsbury Hill. To the west, Stantonbury Hill and Winsbury Hill form high points along the Avon valley. Beyond these Dundry Hill is noticeable high ground from the Bath Downs on the otherwise flat Bristol Plain. The River Avon also forms a valley landscape to the east of Bath with Bathampton Down commanding the higher ground. Hinton Blewett, Newton St Loe, and Twerton Plateaus lie to the south-west whilst approximately twelve kilometres in the same direction are the Mendip Hills. It is the Mendips that are postulated by hydrologists (Kellaway 1991, Stanton 1991, Gallois 2007) to be the source of the meteoric waters that feed the Bath hot springs. To the immediate south lies Odd Down. The whole area is well served by major rivers, namely the Avon, Cam, Frome, Axe, and Chew, and all are within a thirty five kilometre radius of the springs. Additionally, the site of the Langley's Lane tufa spring (Chapter Five) is less than fifteen kilometres to the south west of Bath. As well as the hot springs, numerous cold water springs emerge from the hillsides surrounding the city "where clay beds occur in the Oolite sequence" (Tratman 1973:165).

Figure 4.2 Location map showing Bath Spa and its environs

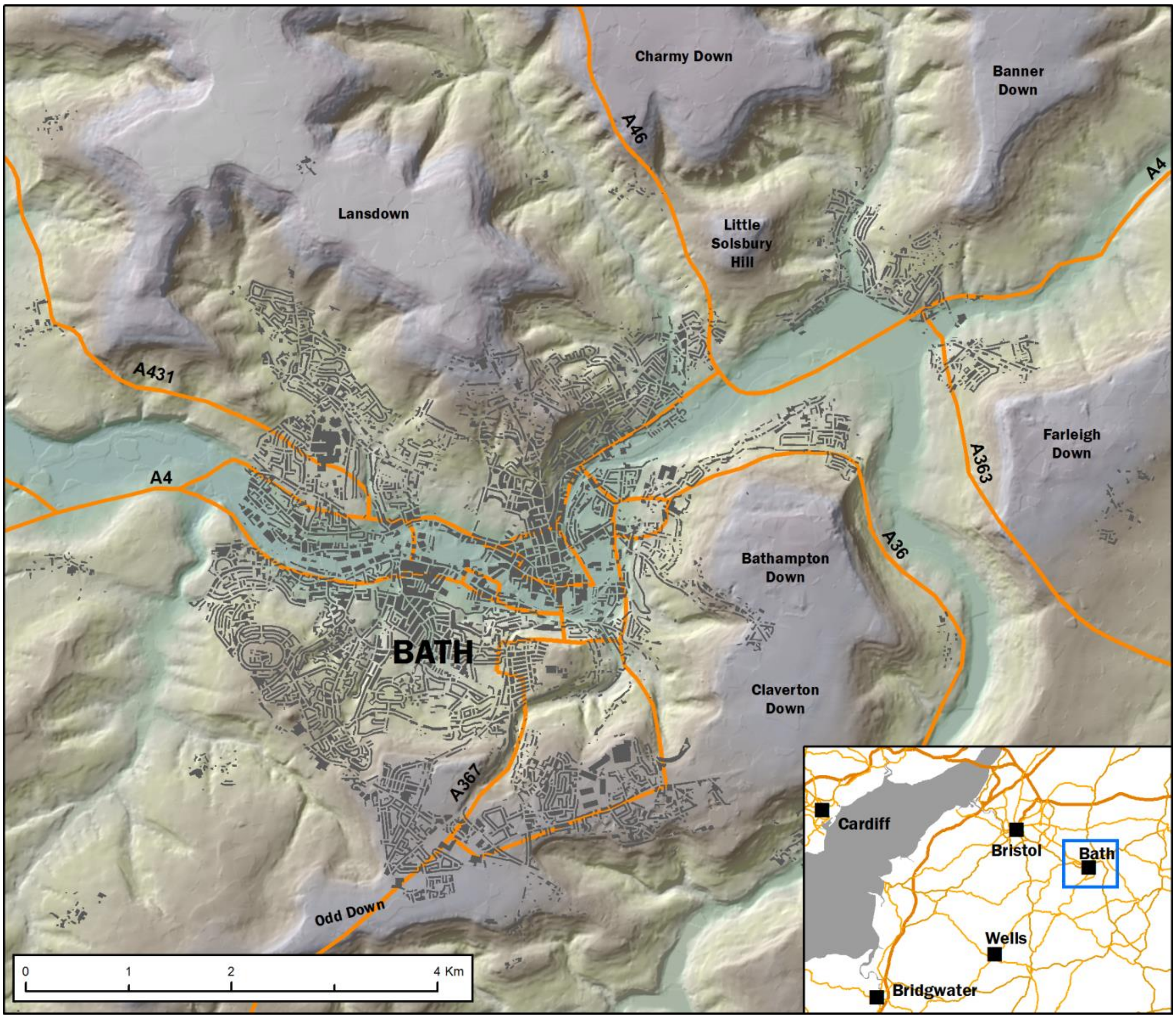
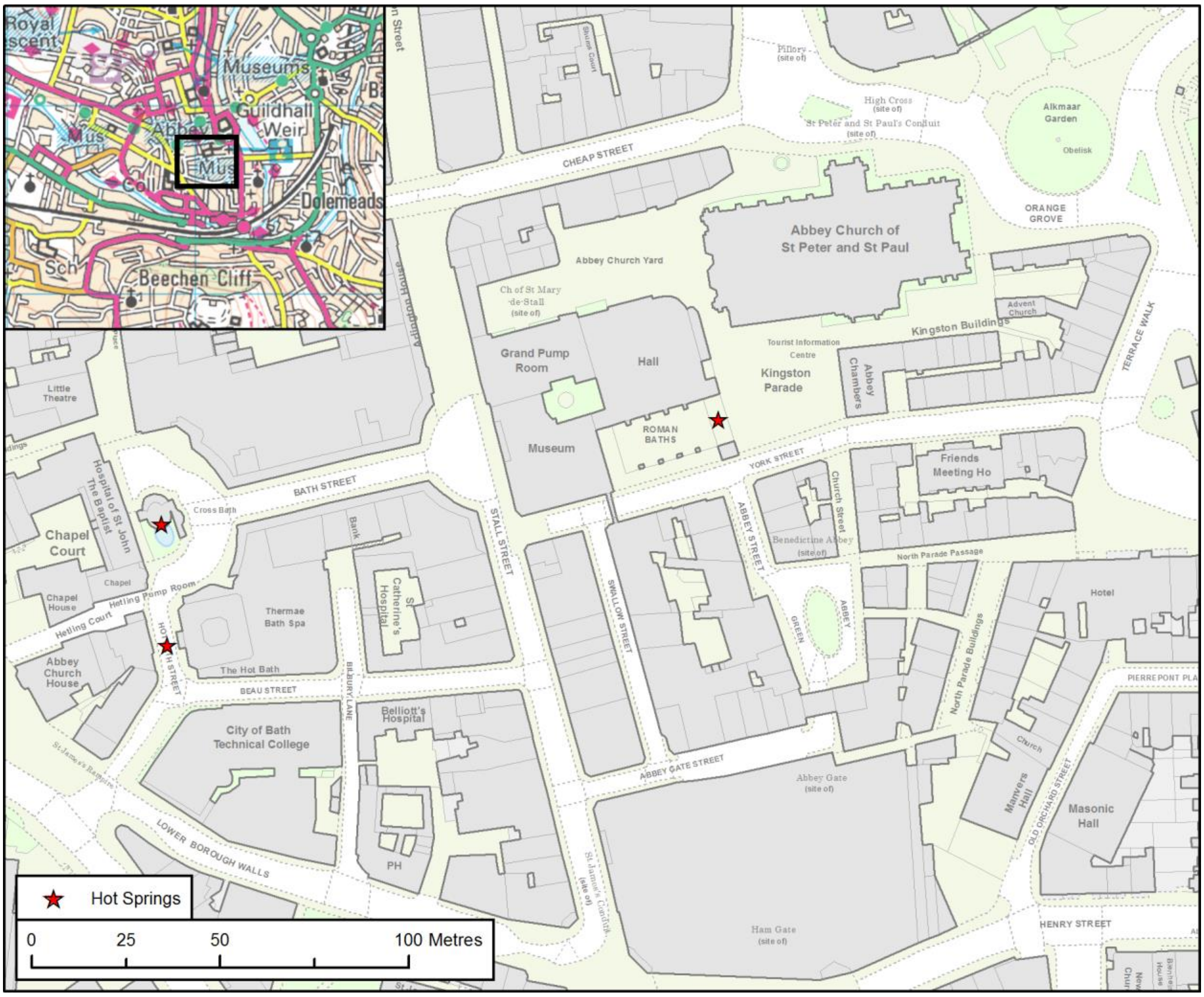


Figure 4.3 Location map showing the hot springs



The geology of Bath and its environs

In topographical terms Bath is a low relief landscape. It lies in a dip on the eastern edge of a basinal structure, which contains a complete succession of carboniferous deposits, some 4000 metres thick (Kellaway and Welch1993, Gallois 2006). In the centre of Bath the solid geology comprises mostly of limestone bedrock overlain by clay, terrace gravels, and alluvium (Jordan in Davenport *et al.* 2007). Groundwater finds its way into cavities in the underlying Carboniferous Limestone and through the Avon gravels to eventually issue in the form of springs. The superficial geology of Bath is complex, although excavation and borehole data from locations adjacent to the springs have shown that the centre of Bath largely consists of alluvial deposits, which for the most part are formed of Mercia and

Charmouth Mudstones, Tea Green Marl, and White and Blue Lias (Gallois 2006, 2007). These alluvial deposits started to develop into soils during the Mesolithic at around 9200BP and continued forming throughout the Mesolithic and into the Neolithic (Jordan in Davenport *et al.* 2007). First noted during excavation work in 1963 (Cunliffe 1979), these deposits and the palaeosols are stratigraphically at the base of the known sequence of archaeological activity in the centre of Bath.

The hills surrounding Bath are of limestone geology and only the surface deposits vary according to location. To the north, toward the Cotswolds, the thin calcareous loams that overlie the Oolitic Limestone give way to deeper clay soils on the steep valley sides. To the west the valley sides are lower and consist mainly of Keuper Marl and Head deposits. To the east and south the surface deposits of the steep valley sides comprise of Fullers Earth and Lias clays overlain by Oolitic Limestone on the higher ground. The south is more variable with the undulating slopes of Englishcombe being of rubbly Oolitic limestone with intervening clay deposits, whilst toward Newton St Loe the geology consists of White and Blue Lias and clays. In the lower River Avon valley the deposits are largely alluvium and gravel as found in the centre of Bath (after Gallois 2006, 2007).

Hydrogeology

The water chemistry of the Bath springs has been well documented and the spring's elemental and ionic composition has been described by Stanton and Kellaway (in Kellaway 1991). In relation to this thesis the presence of Si (Silica) and Fe (Iron) seem to be of significance (see pages 102-3 and 143). The results of stable isotope analysis suggest the spring water is of a meteoric source that precipitated many thousands of years ago in a "temperate, post-glacial climate" (Gallois 2006:170). Different models have arisen to explain how rainfall is transformed into the groundwater which makes its way through the Carboniferous Limestone aquifer to eventually emerge as hot waters in central Bath[2] (Stanton1991, Kellaway 1991, Gallois 2006, 2007). The spring water is of a meteoric source that precipitated many thousands of years ago in a "temperate, post-glacial climate" (Gallois 2006:170).

2

The models are not relevant to this study but reference should be made to Gallois 2006 and 2007 for further explanation.

Other springs in the locality (including Hotwells and Jacobs Well which are both approximately sixteen kilometres away) also emerge from the same limestone aquifer. They share similar geochemical properties to the hot springs but are considerably cooler as the geothermally heated water is diluted with colder surface groundwater (Andrews *et al.* 1982, Kellaway 1991). Therefore, complicated hydrogeology and geology aside, the main reason for the existence of the three Bath hot springs is due to the unique nature of the geology of Bath (Gallois 2006). It is only in the central area that the limestone aquifer is close enough to the ground surface for the sub-surface hot water to emerge before it has the chance to mix with colder surface groundwater. It is this that makes the Bath hot springs unique in the British Isles.

Modern records relating to the flow rates and temperature of the hot springs date to 1978 and more general written records are known from the seventeenth century (Stanton in Kellaway 1991). These historical records suggest that the flow rate of the springs, currently about 60M^3/hr and equivalent to a small stream (Gallois 2006), is slower than it was but that the water temperature has remained constant (Kellaway 1991, Gallois 2006). Thus it can be postulated that the hydrological regime of the Bath springs might have changed to some extent but this applies to flow rates rather than temperature. Kellaway, when referring to Roman occupation, has suggested that sands and gravels deposited around the springs would have had a “dampening down effect” causing the formation of small tributaries and extending the area inundated by the spring waters (Kellaway 1991:104). Furthermore, during episodes of inundation, water from the River Avon would have filled the spring basin and ‘dumped’ sediments forming a residual deposit. X-Ray Diffraction (XRD) analysis of deposits near the Hot Spring has suggested that the buried soil and spring related deposits are of a similar mineralogy to the river alluvium built up during intermittent flooding episodes (Jordan in Davenport *et al.* 2007). The same prehistoric soils were also dated using Optical Stimulated Luminescence (OSL) with the assay coming out at 9210 ± 520BP (OxL-1036) to 5788± 330 BP (OxL-1035) for the formation of the buried soil that overlies the Avon gravels (Jordan in Davenport *et al.* 2007:13). This places it firmly into the Mesolithic and the early Neolithic.

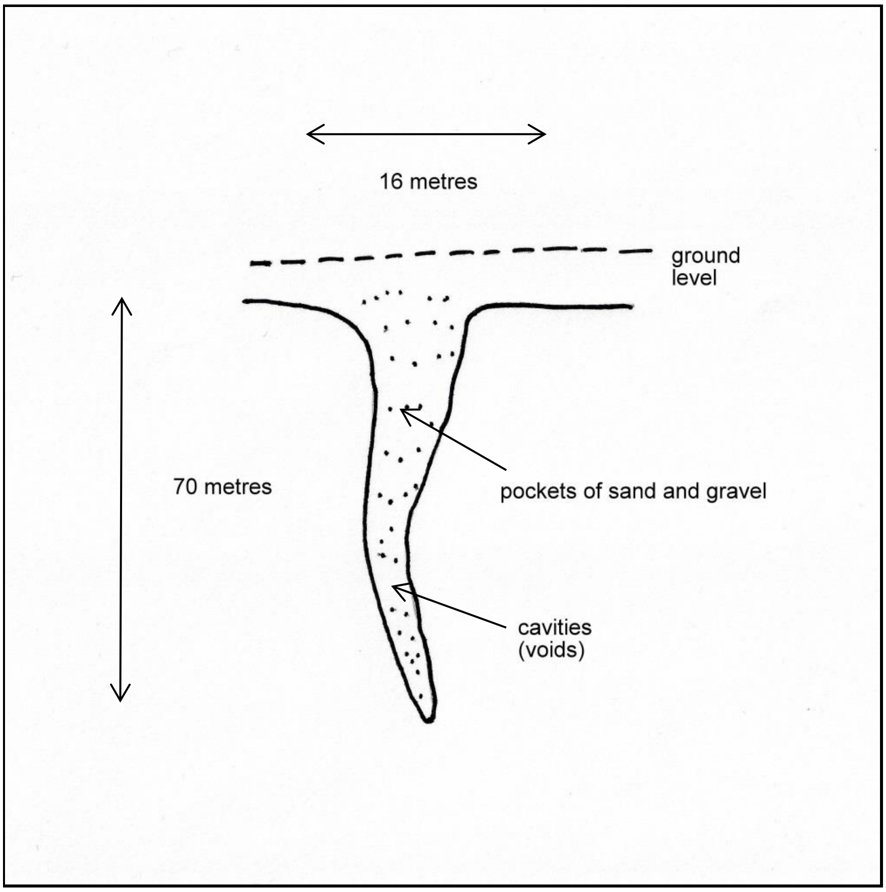
In their natural state the springs would have bubbled up from the Avon gravels through large pipes (see Figure 4.4), evolving from “warm seepages” in the late Pleistocene (Gallois 2007:746) to the present day springs for which there is no evidence of containment until the Roman period (Davenport *et al.* 2007). During the Mesolithic it is likely the springs formed pools of warm water in hollows in the newly developed soils which were then periodically inundated by the river flood waters. The runoff from the springs would likely have flowed downstream southwards into the river (Kellaway 1991:105). This seems to have been confirmed during the excavations at Southgate, when a palaeochannel running from the general direction of the springs was discovered (pers.com Bruno Barber 2009). It should be noted that the Avon has changed course in relation to the springs over time, but not enough to duly affect a summation that the palaeochannel acted as a conduit for the spring water. During the Roman period the river was approximately 100 metres from its current position to the north-west (Kellaway 1991, Jordan in Davenport *et al.* 2007) and in Roman and Medieval Bath the ground gently sloped from the springs toward the river (Kellaway 1994) adding weight to this preposition. Thus it seems the springs' hydrological regimes were subject to some variability and this might have affected the way in which they were perceived over time.

The picture obtained from excavations and geological research is not clear enough to postulate further but it can be stated that at least some of the general characteristics of the springs have in all probability remained unchanged for many thousands of years. What is not in doubt is that hot water emerged from the ground and that this was almost certainly a unique phenomenon in the British Isles, then as it is now. However, it should be remembered that people could move freely between Britain and Mainland Europe during the Early Mesolithic and by the Late Mesolithic could easily have used water transport to cross major water courses. Therefore, it cannot be precluded that people visiting the Bath Springs might also have experienced hot springs elsewhere in Europe or beyond.

The hydrogeology and related stratigraphy of the Bath springs is more than adequately understood. This is presented here in simplified graphic form (Figure 4.4). The 'spring pipes' of all three hot springs are believed to be inverted conical features, also known as collapse structures, filled with silt, sand, river gravel and clastic rocks through which the groundwater percolates. The pipes are thought to be up to seventy metres deep (Stanton in Kellaway 1991, Kellaway 1994, Gallois 2006). These deposits are loosely packed and partially fill cavities/solution pipes (Gallois 2007) in the Carboniferous Limestone. The thermal waters issue through the gravel filled pipes from these cavities.

Figure 4.4: Diagrammatic representation of the Sacred Spring pipe

(after Kellaway 1991:114)



Evidence for the Mesolithic environment of Bath, its springs and environs

Little is known specifically about the nature of the Mesolithic environment at Bath or the surrounding Downs. Palaeoenvironmental remains, which may elucidate the necessary detail, are present in the alluvial deposits but not in sufficient enough quantities to render a comprehensive account of the prehistoric environment (Davenport *et al.* 2007). At best it can be assumed that the wider landscape was analogous to comparable areas of Britain, from where the Mesolithic environmental picture is clearer.

There is of course no comparative in Britain for the immediate area around the hot springs, which would have likely been perceived as a microcosm of differentness, although some limited evidence for the immediate spring environs was recovered during the excavations at the New Royal Baths and Bellot's Hospital in 1998 and 1999 (Davenport *et al.* 2007).This included a small number of pollen grains (discussed further in the interpretation section on page 143). As for the Bath environs, it can be assumed with some confidence that the steep valley sides surrounding Bath were at least lightly covered in woodland and scrub, and those areas in the river valleys were wet and marsh like.

Historical and archaeological work carried out at the hot springs of Bath

Prior to the twentieth century, remedial work was carried out during both the eighteenth and nineteenth centuries on many of the existing built structures relating to the springs, but no mention is made of flint artefacts being recovered from any of the hot spring sites. Full accounts of this work are detailed in Cunliffe and Davenport 1985 and Davenport *et al.* 2007.The most recent work at the Sacred Spring was carried out by Cunliffe in 1979 and 1980 during excavations of the Roman Baths and Temple of Sulis Minerva (Cunliffe and Davenport 1985). A flint report relating to some of the material recovered from these excavations was prepared by Verna Care (1985) and some relevant unpublished material also exists in Cunliffe's site notebooks. Lithic material was recovered in 1999 from the Hot Spring during bore holing operations and examined by Ian Brooks of Engineering Archaeological Services; the full report was published in Davenport *et al.* 2007.

A series of excavations were also carried out in the immediate vicinity of the springs at the Cross Bath and neighbouring Bath and Beau Street, between 1984 and 1989 (Davenport *et al.* 1999) as well as at the nearby site of the New Royal Baths development in 1998 and 1999 (Davenport *et al.* 2007). Several other excavations in the city including those at the Roman Baths complex off Stall Street have also evidenced Mesolithic activity. The majority of the lithic analysis from these was also carried out by Brooks on behalf of the Bath Archaeological Trust. The most recent excavations by the Museum of London Archaeology Service (MoLAS) took place in 2009 and 2010 in the Southgate area of Bath, adjacent to the River Avon. Here, many thousands of artefacts relating to the Mesolithic and Neolithic were recovered. Unfortunately permission was denied to view the assemblages from this excavation and therefore it does not contribute to this study. The

Southgate material will no doubt shed yet more light on the Mesolithic archaeology of this area and it will be necessary to review this work in light of the new evidence when it is forthcoming. It may yet provide some further insight into possible relationships between the springs and the River Avon, especially during the later Mesolithic and early Neolithic to which the Southgate archaeology seems to pertain (pers.com Bruno Barber 2009).

Whilst the excavations, along the adjacent sites of Bath and Beau Street, Bellot's Hospital, and the Roman Baths Complex, all provide evidence of Mesolithic activity in the immediate locale of the hot springs, not all were carried out with the intention of investigating prehistoric contexts. Prior to this study, no synthesis of the separate but proximate excavations in the city has been carried out (pers. com Peter Davenport 2008). Because they were excavated from separate sites, the lithic assemblages have never been considered together for a more holistic interpretation. This has meant that up to now knowledge of Mesolithic activity in Bath consisted mostly of disparate data and possibly meaningless generalisations. Additionally, as a result of the assemblages being treated as separate entities and interpreted in their own light, a number of assumptions had arisen which have led to a dichotomous interpretation of the Mesolithic activity around the springs, as espoused in Davenport *et al.* (2007:151-152) and discussed here on pages 139-141.

Results and site summaries

Each assemblage, including those sites that make up the rest of the Bath environs, is summarised individually here in the results and site summaries section, and should be referred to in conjunction with Appendix Two. They are then compared in more depth in the discussion section. The four largest assemblages from the centre of Bath were used as the basis for interpretation. These were the Hot Spring, the Sacred Spring, Bath Street, and the New Royal Baths (Spa 98) assemblages. The discussion relates to these four main sites in particular, but is supplemented using comparative data and examples from the remaining sites. The Mesolithic use of the hot springs is then interpreted in light of these discussions, they are considered in their immediate landscape context, before finally being related to the wider historic and ethnographic use of hot springs.

The Hot Spring

Lithic material was recovered from the Hot Spring (Table 4.1) during bore holing work carried out in 1999 as part of the preparation work for the Thermae Spa redevelopment (Davenport *et al.* 2007:9), and a full report on the lithics was published after being examined by Brooks (Davenport *et al.* 2007). The major focus of Brooks' work was the investigation of the possible heat treatment of the flint and the identification of the raw material constituents of the assemblage. It was noticeable that some diagnostic pieces were not identified/detailed in his report for example, some of the smaller core rejuvenation flakes, crested flakes and some of the spurred pieces (confirmed by Dr Hugo Lamdin-Whymark pers.com), which are pertinent to this study. Whilst there were some differences with some of Brooks' analysis in relation to this work, it is acknowledged that our research agendas were markedly different, hence the disparities.

494 pieces were recovered from a skip full of slurry which had been pumped from a 230 millimetre borehole inserted approximately five to twelve metres below ground level into the spring pipe. The flints recovered represent a partial sample of what was deposited into the spring, although the assemblage is remarkably coherent given the nature of recovery. Of these original 494 artefacts, ten are now missing as a result of destructive analysis carried out by Brooks (Davenport *et al.* 2007) and 147 pieces were separated out as being the thermally produced, edge damaged gravel flint of the type found in the vicinity of the river Avon and which form part of the spring's natural deposits (Figure 4.5). The remaining 337 pieces were felt to be worthy of further analysis, whilst the aforementioned thermally flaked pieces were considered here as a sub-assemblage and subject to only a more general consideration. Any pieces that were of thermal origin (natural gravel flint) but may have been utilised, or modified through anthropogenic means, were considered as part of the main assemblage.

The raw material in the main Hot Spring assemblage can be roughly split into two broad categories: brown, black and grey flint, both opaque and translucent, of a sufficiently fine quality to suggest it originated from a chalk source, and poorer quality flint and miscellaneous cherts most of which could have been sourced from the local river gravels or from the Bath Downs. Much of the assemblage is remarkably coherent given the nature of their context with the majority of the chalk flint blades macroscopically appearing to have been derived from just a few nodules. The similarities between some of the chalk flint blades and bladelets may indicate that deposition of these occurred as discreet episodes, although given the nature of recovery, this will remain a 'maybe.' This observation does not apply to the whole assemblage, and unfortunately there is no stratigraphical resolution to add weight to any preposition.

Table 4.1: Hot Spring total assemblage breakdown

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	2	0	0	0	**2**
core fragments	1	1	0	0	**2**
flakes complete	33	42	9	3	**78**
flakes broken	29	13	1	0	**41**
blades	58	63	17	1	**127**
microliths and manufacture	0	9	10	0	**10**
other debitage	34	24	10	13	**77**
total	**157**	**152**	**47**	**17**	**337**

Figures 4.5: Examples of Hot Spring flint: thermal pieces

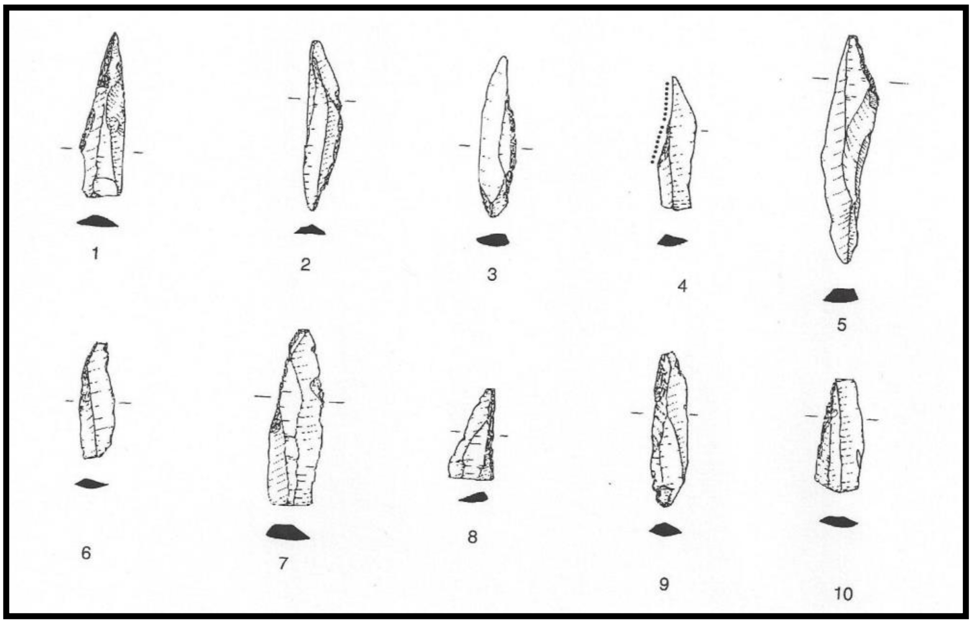
Whilst more than half of the assemblage is surprisingly fresh and unrolled, with crisp edges, at least thirty three of the remaining pieces are edge damaged in such a way as to suggest utilisation (regular evenly spaced removals, striations, edge damage being in the expected places). The number could theoretically be higher. Some edge damage might be attributable to post-depositional processes, but with the significant variance between 'edge damaged' and 'non-edge damaged' in the assemblage it is a reasonable assumption that edge damage equates with utilisation to a high degree of certainty. Edge damage from non-utilisation may have occurred before deposition, but again this would mean the flint had been through some kind of transformation process before it found its way into the spring pipe. The evidence therefore suggests that at least some flints were knapped with the aim of being utilised before deposition.

A number of formally retouched pieces were recovered. These included three small scrapers made on miscellaneous pieces of debitage; a broken blade bifacially retouched down one lateral edge, but otherwise not typologically diagnostic; some spurred pieces, some possible piercers, and ten microliths (Figure 4.6, 4.7). These have been compared to the Deepcar obliquely blunted points (Figure 4.6) in previous analyses (Brooks in Davenport *et al.* 2007), which typologically date to the earlier Mesolithic (Reynier 1998). However, the Hot Spring microliths seem to be made on smaller narrower bladelets than the Deepcar obliquely blunted points. The retouch on the Deepcar examples also seems to extend further down the piece than those from the Hot Spring. The longer more slender Deepcar forms which resemble the Hot Spring microliths more faithfully often have retouch down their leading edge, which the Hot Spring microliths do not.

It should be noted that obliquely blunted points are also sometimes found in later Mesolithic contexts (Pitts in Evans and Smith 1983) for example, at Cherhill, North Wiltshire (which is approximately thirty kilometres away from Bath, see also Chapter Five) and it is suggested here that there is as much affinity with the microlith assemblages from some of the southern English regions as from Yorkshire. Some good matches were noted (personal observation) with microliths from assemblages recovered from locations near to Bath including Shapwick, Somerset, Cherhill, Wiltshire and Downton, Wiltshire (the Bath and Cherhill microliths are compared side by side in Figure 4.8). Pitts (in Evans and Smith 1983) has suggested that assemblages consisting of geometric microliths and obliquely blunted points, and dominated by bladelets, represent a late Mesolithic southern regional variation, with other examples being found in Berkshire and Wiltshire, for example, Wawcott III, Berkshire (Froom1976). Also due to their context it cannot be assumed that all the microliths are necessarily contemporary with each other. So, whilst the microlith assemblage from the Hot Spring does suggest an early presence in the Maglemosian tradition, it should be borne in mind that this could be a southern variation that may at least in part be later than the Deepcar assemblage.

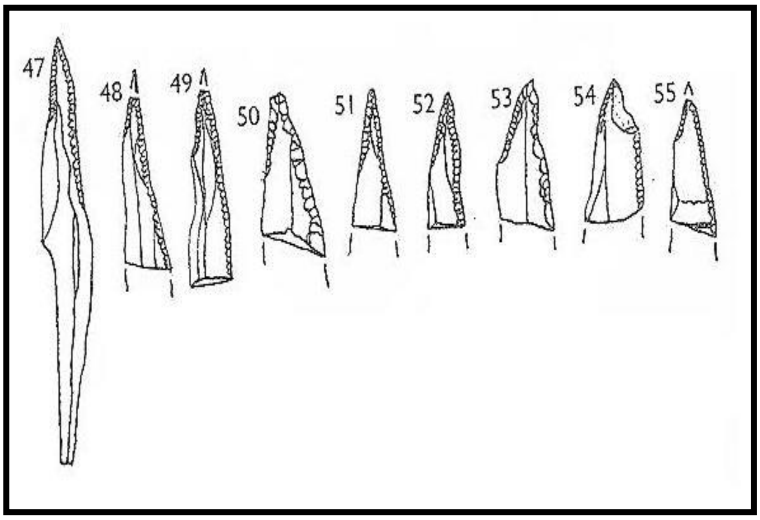
Figures 4.6: Illustrations of Microliths from the Hot Spring (1) and Deepcar (2)

(1)



(Brooks in Davenport *et al.* 2007)

(2)



(Radley and Mellars 1964)

Figure 4.7: Microliths from the Hot Spring

Figure 4.8: Microliths from the Hot Spring (bottom) and Cherhill (top)

It is also suggested here that there is a later Mesolithic component to the assemblage further supporting the hypothesis. Whilst no very small geometric microliths were recovered, 107 small bladelets were retrieved, with the majority between six and twelve millimetres in width. Of these, forty nine were broken. None of the scrapers were made on blades in the early Mesolithic tradition. Five crested blades (none of which were more than forty millimetres in length) and twelve small core rejuvenation flakes (with narrow dorsal scars) also point towards the production of small, well prepared, bladelet cores at or near the spring. Whilst it cannot be completely disregarded that cores were perhaps being knapped to the point of exhaustion in 'readiness' for deposition, given that some pieces were utilised before deposition into the spring pipe, there is a strong possibility that these artefacts were the by-product of knapping near to the spring and the resulting flakes were used in the immediate vicinity.

Most of the chalk flint is fresh and unrolled. Little patination on the surface suggests the spring water's chemical composition does not unduly affect the flint, other than the deposition of silica gloss onto the flint surface (Figure 4.9). This most noticeable feature on twenty one of the blades does not generally cover the whole piece but is found mostly at the proximal and distal ends and less frequently on the lateral margins. It also occurs on both ventral and dorsal surfaces precluding it from being a macroscopic sign of heat treatment, as this type of gloss only occurs on the dorsal surface (pers.com Dr Hugo Lamdin–Whymark). Although the gloss appears to resemble the type of desert gloss which occurs when stones are highly polished through long periods of agitation in sand (pers.com Dr Hugo Lamdin–Whymark), it does not fully explain the differential position of the gloss. The gloss tends to be most concentrated where there has been more stress placed on the flint during knapping, which would equate to the proximal and distal ends and the lateral margins. Silica occurs in the spring waters at a concentration of 0.97± 0.1% of the total composition (calculation pers.com Dr Sarah Hall after Stanton in Kellaway 1991:134), and these molecules would cluster towards the flints fractured surfaces (pers.com Dr Brian Meredith). This might also explain why the thermally fractured (naturally occurring) flint tends to become glossy to a greater extent. This explanation is offered as an alternative to Brooks' hypothesis in which he proposes a proportion of the flint was heat treated before deposition. 4% of the total assemblage from the Hot Spring did show obvious macroscopic signs of burning yet the glossing does not occur on the expected surfaces of the flint that would normally support heat treatment of the flint (pers.com Dr Hugo Lamdin–Whymark).

There were other lithological materials recovered from the Hot Spring pipe. Interestingly several amorphous lumps of tufa, retrieved from the borehole slurry, have been attributed to Roman deposition due to the frequent use of the material as a building stone during the period. It may be possible that these were not Roman deposits at all, but Mesolithic given the extensive evidence of Mesolithic activity at tufa deposits (see Chapter Five). Additionally, fossils (although not retained by the excavators and therefore not examined here), were said to have derived from the eroding Lower Lias clay, again these could have been deliberate deposits. A handful of charred hazelnuts also recovered from the slurry equally could date to the period. Very limited evidence of *Corylus* growing near the spring during the Mesolithic was obtained from the adjacent Spa excavations (Davenport *et al.* 2007). Unfortunately, owing to the nature of the context, the provenance of these artefacts can never be ascertained. It is interesting though that neither tufa nor fossils were recovered from the Roman contexts during the excavation of the Sacred Spring, nor are they seemingly associated with any other Roman votive deposit in Bath.

Flint from the Hot Spring showing gloss

The most interesting thing about the Hot Spring assemblage is its context and the fact that it was deliberately deposited into the spring pipe. That this is the case is not in doubt, the nature of the pipe as an inverted conical structure (Figure 4.4) means the surface area at the top of the pipe is large enough to ensure that the flint could be deposited without too much regard to accuracy. Whilst there would be some 'exchange' and 'displacement' of deposits at the spring pool's edge, this volume of flint would not find its way into the spring pipe by 'accident' (see also page 93). The volume of water issuing from the pipe would be enough to stop this happening to a great degree; therefore flint would have to be put, to some extent, towards where the waters issued from the surface. Gravity would be enough to allow deposits to 'fall' into the spring pipe, but deposits at the edge of the spring pool would not have been sucked back into the pipe and certainly the coherent nature of the assemblage supports this. Whilst it cannot be assumed that people in the past knew that the flint they put into the spring pool would find its way down a long pipe, it can be ascertained with some confidence that they knew it was going into the spring and at the point where the spring issued. That this was still happening during the Roman period with the deposition of coins strengthens the proposition.

The Sacred Spring

The Sacred Spring was partially excavated during the excavations of the Roman Baths in 1979 and 1980 (Cunliffe and Davenport 1985). The lithic material came from the spring related deposits (on the slopes immediately adjacent to the pipe) rather than out of the spring pipe itself, as was the case for the Hot Spring. Care produced a report on the 1979 lithic assemblage; however, the 1980 assemblage was not published, and no record of such a report was found in the site archive. 354 artefacts were available for re-examination from the unrecorded number of lithic artefacts which were recovered during the two seasons of excavation. Of these 157 were thermal flakes and separated out: there were forty seven suspect pieces which were also set aside due to being so ambiguous. Of the remaining 150 artefacts, three were burnt amorphous lumps and 147 were analysed more fully (Table 4.2).

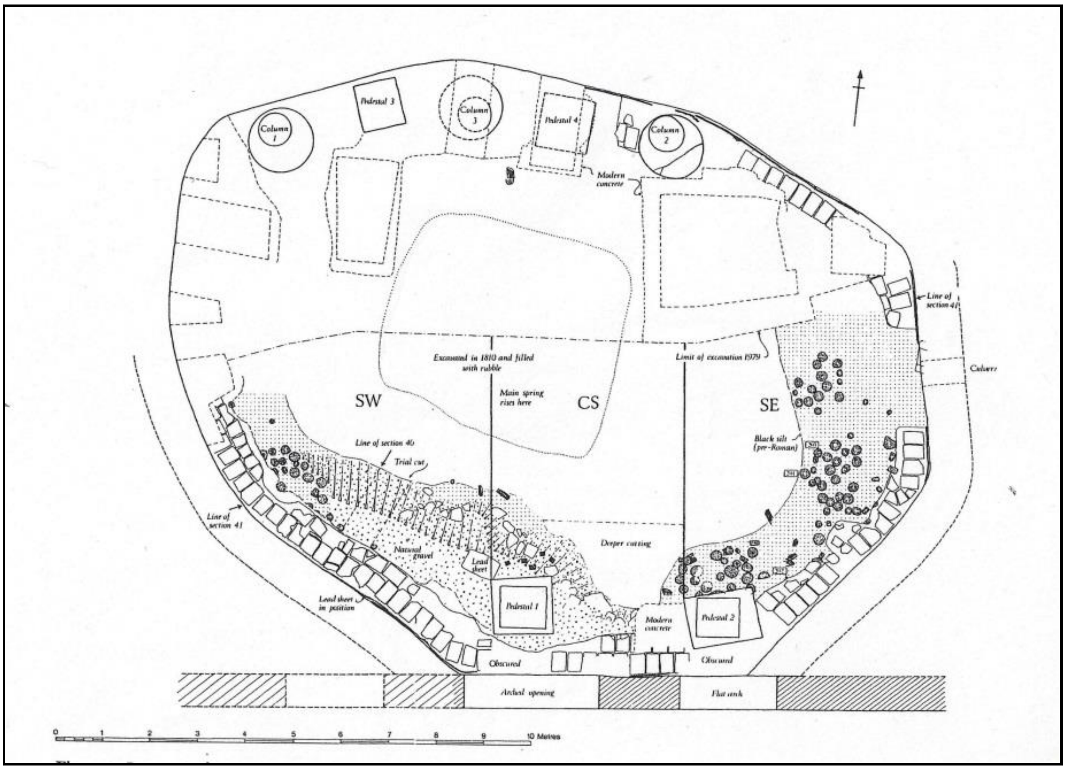
Table 4.2: Sacred Spring total assemblage breakdown

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	7	32	13	0	**43**
flakes broken	6	4	0	1	**10**
blades	5	55	17	2	**65**
microliths and manufacture	0	5	7	0	**7**
other debitage	12	5	5	1	**21**
total	**30**	**101**	**42**	**4**	**146**

The lithics are treated here as a holistic entity and only briefly discussed in relation to specific contexts. Although Cunliffe had divided the area of excavation into three numbered segments (the central area around the spring (CS) and the areas to the southwest (SW) and south-east (SE) of the central area (Figure 4.10), they were not specific stratified contexts. Although a way of spatially defining artefact distribution, their use has to be limited owing to the constantly moving spring sediments, the result of the spring waters constantly issuing under pressure (Cunliffe 1985:4).

The lithics were distributed throughout the spring deposits, although more concentrated in the central section, and all were within one to five metres of the spring pipe, although the Sacred Spring lithics have not been viewed as a deliberate deposit in the same way as the Hot Spring flint. It is likely they were not *in situ* (i.e. used in the place they were discarded and were likely displaced through taphonomic processes). A likely scenario is that the flint recovered during excavation was left around the spring pool, where it subsequently became incorporated into the sediments, or it was put into the pool but did not find its way down the pipe. Alternatively, the flint from the Sacred Spring may have been displaced during episodes of renovation work carried out at the spring at various points in its history (see Kellaway 1991 and Davenport *et al.* 2007 for detail). If this is the case then there is a high possibility that flints could be recovered from the Sacred Spring pipe too.

Figure 4.10: Plan of Sacred Spring excavation from Cunliffe and Davenport 1985:3



The black peaty deposits that formed the prehistoric soils were cut into by Roman contexts, but a possible pre-Roman structure, in the form of a gravel ridge with inserted larger stones, is purported by Cunliffe to be a "man-made causeway" (Cunliffe and Davenport 1985:1). On the basis of Iron Age coins found within 'tossing' distance from the ridge, the structure is assumed by Cunliffe to be Iron Age.

Like the Hot Spring, there are broadly two classes of material present in the assemblage: locally obtainable gravel flints and imported chalk flint. That this is imported is attested to by the nature of the cortex on several pieces, being whiter, chalkier and of variable thickness. It certainly does not resemble the cortical surfaces of river worn gravels, although local flint gravels were also being utilised. The flint ranges from browns through to grey and black and from opaque to translucent. There are also ten pieces of chert, the majority of these are Greensand Chert, but there is also a single flake of Portland Chert.

There is more variation in the raw materials than for the Hot Spring and the assemblage almost certainly represents several episodes of activity.

The general character of the Sacred Spring lithics (broad blades (Figure 4.11) and obliquely blunted points) suggests an early Mesolithic date, but again there is a later component, evidenced typologically by some of the microliths and smaller bladelets present (Figure 4.12, 4.14). Although other reports attest to only two microliths from the spring (Care1985, Brooks in Davenport *et al*. 2007) there were actually more in the assemblage: eight obliquely blunted points, typologically of an early date, and one crescent, possibly late Mesolithic. The points were fashioned from both black and translucent brown flint, whilst the crescent was made from grey chert.

The formally retouched tools included eight scrapers. Six of these were comfortably Mesolithic, and suggest an early to mid-Mesolithic date (two end, one side, two made on core rejuvenation flakes and one indeterminate) but, two larger discoidal scrapers (Figure 4.13) made on core rejuvenation flakes, typologically could date to the Late Neolithic (as suggested by Care 1985). However, as both are made on cortical flakes, one of which is the product of a bladelet core, there is a possibility they are late Mesolithic or early Neolithic. The other formally retouched pieces included four piercers and two multi-functional tools, which appear to incorporate cutting, scraping and piercing elements. Black and grey flint seems to have been favoured for tool production with 50% and 35% of the tools in those materials respectively, whilst only 15% of tools were produced in brown flints.

Although there were no formal cores present in the sample, there is ample evidence that ready prepared nodules of flint were likely knapped near or at the Sacred Spring, with 30% of the flakes and blades being core rejuvenations and plunging flakes. This figure only applies if plunging flakes are considered as core rejuvenations and deliberate, rather than as knapping errors. If they are taken to be knapping errors then just fewer than 5%, or six flakes, indicate core rejuvenation. The former situation is favoured in this thesis, as core rejuvenation is a strategic part of the knapping process.

The single crested blade, less than fifty millimetres long and only six millimetres wide, also suggests the preparation of a small bladelet core. This is a distinct later component to the lithic material and indeed 50% of the total assemblage indicates bladelet production, either as bladelets or bladelet scars.

Although local material is abundant in the river gravels some effort was made to fully utilise the imported material. Of the flakes and blades 17% displays signs of hinge and stepped fractures and even the crested blade had some additional retouch.

There is very little patination on many of the worked pieces, but where it is present it tends to be deeper as opposed to incipient. A significantly higher relative number of pieces are edge damaged and/or utilised compared to the Hot Spring assemblage; 15% of the total assemblage as opposed to 7%. Although glossing is not entirely absent from the Sacred Spring assemblage, it tends to be limited to thermally fractured pieces. This may be due to context as discussed for the Hot Spring.

Other artefacts, including fossils, were recovered from the Sacred Spring deposits. These were ten belemnites, thirteen gryphaea, two corals, five pieces of coal, two pieces of iron pyrites, one piece of calcium carbonate, and two unidentified stones. Although these could have been from the natural geology (the coal excluded), fossils and other geological phenomena are known to have been deliberately brought onto Mesolithic sites, and sometimes elements of the local geology were also afforded significance beyond the functional. This is further discussed in Chapter Six, as geological materials have also been recovered from tufa springs (Chapter Five).

Figures 4.11: Blades from the Sacred Spring

Figures 4.12: Modified thermal flakes from the Sacred Spring

Figure 4.13: Discoidal scrapers from the Sacred Spring

Figures 4.14: Blades and bladelets from the Sacred Spring

Figures 4.15: Microlith from the Sacred Spring

The Cross Bath Spring

As noted already, the Cross Bath Spring has only been directly associated with two lithic artefacts. This seems to reflect the lack of modern day excavations as opposed to a lack of prehistoric activity *per se*. The two flints (Table 4.3) were recovered during the 1988-89 excavations (Davenport *et al.* 2007) and consisted of one crested bladelet of translucent grey flint and one dark grey to black core fragment, both indicative of knapping activity and dating typologically to the late Mesolithic. Although extremely small this assemblage shows people were at the Cross Bath Spring in some capacity. The assemblages from the adjacent Bath Street and Beau Street further substantiate this.

Table 4.3: Cross Spring total assemblage breakdown

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	1	0	0	0	**1**
flakes complete	0	0	0	0	**0**
flakes broken	0	0	0	0	**0**
blades	1	0	0	0	**1**
microliths and manufacture	0	0	0	0	**0**
other debitage	0	0	0	0	**0**
total	**2**	**0**	**0**	**0**	**2**

Bath Street

During the Bath Street excavations that took place between 1984 and 1989 (Davenport 1999) a total of 275 flint and chert artefacts were recovered (Table 4.4), although the original flint report carried out by Brooks detailed only 245 of these and only 235 of the artefacts from the original assemblage were available for re-examination. These artefacts came from both post-Mesolithic contexts and from the Mesolithic “thin sandy buried soil” (Brooks in Davenport 1999:105).

The assemblage as a whole is late Mesolithic in character and dominated by blade and bladelet manufacture (Figure 4.16). 71% of the total assemblage has dorsal scars supporting the observation. The raw material utilised consists of both waterworn gravel flint and chalk flint, evidenced through the cortical pieces present as well as the quality of some of the flint. The range of raw materials, similar to the Hot and Sacred springs, consists of grey flints through to blacks and browns and much of the material is also translucent. Brooks suggests the size of the debitage and the waterworn cortex on some pieces indicates the primary use of local gravel flint, however, the general appearance of the assemblage does not preclude the use of small prepared nodules being brought to the site from a chalk flint source: indeed several artefacts had the remnants of a thick, white, chalk cortex, not sourced from river gravels.

Table 4.4: Bath Street total assemblage breakdown

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	4	0	0	0	**4**
core fragments	5	0	0	0	**5**
flakes complete	51	12	12	1	**73**
flakes broken	11	0	0	0	**11**
blades	63	25	17	2	**103**
microliths and manufacture	1	0	4	0	**5**
other debitage	27	5	2	1	**34**
total	**162**	**42**	**35**	**4**	**235**

Five cores, six core fragments, a crested flake and forty core rejuvenation flakes (twenty two if the plunging flakes are not counted), including a core tablet, attest to knapping cores on the site (whilst Brooks records seven cores and seven worked lumps, these may be more accurately described as cores and core fragments). These account for 22% of the total assemblage. The production of bladelets for microliths is evident from the large numbers of snapped bladelets, which included sixteen proximal, seven medial and sixteen distal sections, with very few larger blade-like elements present. The three microliths are all late Mesolithic types: two rods and a crescent (Brooks in Davenport 1999) and a single microburin attested to microlith production using the microburin technique.

Although the number of formally retouched recognisable tools was few, limited to the microliths, scrapers and piercer, there was evidence of the manufacture of a burin and a number of more expedient piercer-like and burin-like flakes as well modified blades that showed signs of utilisation but were not formally retouched. In total 12% of the assemblage was either formally retouched or had undergone some modification, whilst 18% showed signs of edge damage and /or utilisation. There were no pieces that had gloss, further strengthening the suggestion that gloss on the Hot Spring and Sacred Spring flints resulted from being in the spring water and deposits, rather than being a result of heat treatment.

Although the majority of the assemblage was recovered from residual contexts, thirty four of the total number of artefacts came from an area overlying the natural, “a hard, crusty, sandy, yellowy clay with linear gravel-filled water channels” (Bath Archaeological Trust: Bath Street 1986 context register ‘natural area 1A’). This deposit is effectively the Mesolithic soil surface and produced twenty five blades, six flakes, two core rejuvenation flakes, and a burin spall. Of the blades, sixteen were incomplete and ten were nine millimetres or less in width. Two of the distal and one of the proximal fragments were almost definitely microburins (but as they were slightly ambiguous, for the sake of clarity have not been recorded as such here). Regardless, the evidence suggests people were making microliths and small tools during the late Mesolithic. There seems to be no diagnostic sign of earlier activity on the Bath Street site.

Figures 4.16: examples of the flint artefacts from Bath Street

New Royal Baths, Spa 98

During 1998 and 1999 extensive excavations were carried out on the site of Bellot's Hospital and as part of the redevelopment of the Thermae Spa. These excavations overlap to some extent with the earlier excavations on Bath Street (page 111) and Beau Street (page 117), with the Bellot's Hospital site being slightly further out on Bilbury Lane, although no Mesolithic artefacts were recorded from the latter site. All the sites are within 100 metres of the Hot Spring. Unlike the previous excavations, one of the research aims was to investigate the prehistoric landscape and environment of the springs, yet elucidation of these was minimal due to poor preservation of pollen, molluscs and other macrofossils (Davenport *et al.* 2007:7, 14). The prehistoric buried soils were favourably preserved where they were not truncated by later occupation phases, whilst soil analysis (described on page 92) has helped to form a more complete picture of the Mesolithic landscape than might otherwise have been available (Davenport *et al.* 2007). These were the series of excavations that included the borehole work on the Hot Spring and the flint was also analysed by Brooks and published in Davenport *et al.* 2007.

994 artefacts were recovered from the Spa 98 site during the excavations. 742 of these were from the prehistoric buried soil with the remainder being from the later deposits. Of these 424 were re-examined for this study (this was the number of flints present in all the bags numbered from 300 to 399) (Table 4.5) whilst the rest were subject to more general assessment in conjunction with Brooks' report. The sampled material related mainly to those contexts that were possible Mesolithic features and those which related directly to the palaeosol. Those that were not re-analysed related to later contexts. The figures given here only relate to this sampled assemblage but are supplemented by information given in Brooks' report if it adds to the interpretation. The flints were described by Davenport as not having any particular patterning and being evenly distributed throughout the prehistoric buried soils, although he did note that some were vertically orientated and that there were concentrations of artefacts in some areas (Davenport *et al.* 2007).

A wide range of raw materials was used on the Spa site and Brooks identified a minimum of thirty five flint and chert types. The raw materials can more sensibly be separated into three main categories: imported chalk flint, locally available flint nodules and various miscellaneous cherts. Occasional use of thermal flakes can be noted (Figure 4.17). This simpler classification is commensurate with the other investigated sites described in this chapter.

Table 4.5: Spa 98 total assemblage breakdown

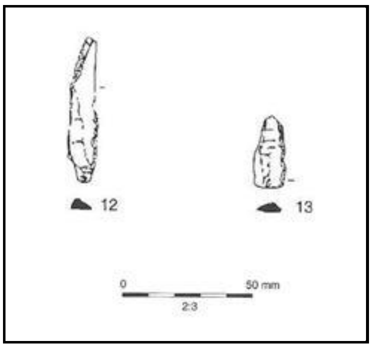
Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	2	1	1	1	**6**
core fragments	3	0	0	2	**5**
flakes complete	75	37	34	15	**112**
flakes broken	2	2	2	1	**6**
blades	18	16	5	2	**38**
microliths and manufacture	4	0	0	0	**4**
other debitage	200	10	7	33	**241**
total	**304**	**66**	**49**	**54**	**412**

The six cores, five core fragments, ten core rejuvenation flakes, a crested flake and fifty of the flakes had blade/let scars on their dorsal surfaces. Along with the diagnostic tools of seven scrapers (three side, three end and one side/end), four microburins, one burin and nineteen other modified pieces, the assemblage suggests a later Mesolithic site where knapping, microlith production and other tool production probably took place. Two microliths, noted in Brook's report but which were not available for re-examination, are also typologically later Mesolithic. These were described as a rod and a broken microlith in the report, but the microlith illustrated does not appear to be a typical rod, and is obliquely blunted (see figure 4.18).

Some artefacts related to earlier and later phases of activity in the area. These include a flake which Brooks attributes to the Palaeolithic found in the gravels under the palaeosol and a fragment of a polished axe of Neolithic date. The small scraper which Brooks (in Davenport *et al.* 2007:22) ascribes to the Bronze Age, although found in a residual context, would not sit uncomfortably in a Mesolithic assemblage. The other scrapers in the assemblage, like those from Bath Street, are of late Mesolithic types, mostly made on more 'flake like' pieces, rather than blades. Of the modified pieces 13% were produced from black flint, 52% percent from grey flint and 35% from brown flint. 16% of the assemblage showed macroscopic signs of edge damage or utilisation. One blade had a spot of gloss on its surface suggesting use, but again this was not of the same nature as the glossing on the Hot Spring assemblage.

Figure 4.17: thermal flake from New Royal Baths (Spa 98)

Figure 4.18 the microliths as illustrated in Davenport *et al.* 2007



Beau Street

Forty six flint artefacts (Table 4.6) were recovered from five contexts in the Beau Street excavations during 1988 and 1989. These were on the site of the numerous Baths that have occupied Beau Street (John Wood the Younger's Hot Bath 1776, Decimus Burton's Tepid Bath 1830 and the modern Beau Street Baths dating to 1927 and refurbished in 1956). The excavations took place under what was Burton's pool and the deepest part of the 1956 baths. One main trench (IV) included two 1988 trial trenches (I and III - northern half of disused spa swimming pool) and a further three smaller trenches (II on the site of the old Hot Bath, V which was adjacent to Bath Street and VI adjacent to Bilbury Lane). The assemblage of forty six artefacts was reported on by Brooks in Davenport 1999 (although he only lists forty two artefacts[3]) was re-examined here as a holistic entity. Thirty two of these were from the buried soil and the rest were residual, i.e. from post-Mesolithic deposits.

Table 4.6: Beau Street total assemblage breakdown

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	2	0	0	0	**2**
core fragments	0	0	0	0	**0**
flakes complete	25	0	1	1	**27**
flakes broken	4	0	0	0	**4**
blades	6	0	0	0	**6**
microliths and manufacture	0	0	0	0	**0**
other debitage	6	0	0	1	**7**
total	**43**	**0**	**1**	**2**	**46**

The raw materials represented in the assemblage are reminiscent of the wide range used at the other sites in the city and consisted of mostly flint and a single chert flake. The flints

[3] this appears to relate to the omission of four miscellaneous pieces of flint from Brooks' report

ranged from translucent greys and browns through to yellowy brown. The presence of chalk flint, in addition to pieces with thin pitted cortex, show that imported raw materials were being worked as well the more expediently obtained local river gravels.

Like the Bath Street assemblage, the Beau Street assemblage is evidence of a later Mesolithic presence (Figure 4.19). Although no microliths were found in the assemblage, the production of small microlithic blades is attested to by the flakes, at least ten of which have come from bladelet cores, as well as the bladelets present. The two bladelet cores (one of which was more irregular), the single crested flake and core rejuvenations (represented by at least four core rejuvenation flakes and a plunging blade) are indicative of the care and determination taken to knap the better quality material and there are few knapping errors represented by hinged and fractured removals, indicating the probable skill of the knappers. The irregular worked core, with core preparation on two faces and obvious failed attempts at removing bladelets, also shows that despite the availability of local material, the imported chalk flint was worked to exhaustion where possible.

A small side/end scraper was the only piece that could be considered indicative of the production of formally retouched finished tools and again there was no evidence of glossing in this assemblage.

Figure 4.19: Examples of Beau Street flint including crested bladelet (left)

Hat and Feather (HF)

Sixty one flints (Table 4.7) were excavated from various contexts during 1991 from the site of the Hat and Feather behind London Street and approximately one kilometre from the hot springs (unpublished archives, Bath Archaeological Trust). Of all the assemblages examined for this chapter this is the least convincing in terms of its Mesolithic content. However a few pieces are likely to relate to the late Mesolithic, the crested bladelet being the most indicative example present. The core fragment, four core rejuvenation flakes and one broken flake all exhibit bladelet scars, whilst most of the retouched pieces could be late Mesolithic or early Neolithic. These included a microdenticulated miscellaneous piece of flint, a multi-purpose tool and two notched flakes. A further retouched flake is likely to be of late Neolithic or early Bronze Age origin. An otherwise un-datable scraper made on a flake of orangey gravel flint is reminiscent of some of the retouched gravel flint from the Sacred Spring but this could be co-incidental.

Table 4.7: HF total assemblage breakdown

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	1	0	0	0	**1**
flakes complete	16	3	7	1	**26**
flakes broken	1	0	0	0	**1**
blades	1	0	0	0	**1**
microliths and manufacture	0	0	0	0	**0**
other debitage	30	0	1	1	**32**
total	**49**	**3**	**8**	**2**	**61**

Given the limited size of the assemblage and the lack of blade elements, it is difficult to typologically date it as a whole, but there is little doubt that at least some of it indicates a Mesolithic presence as well as later activity. It is slightly further away from the springs than the aforementioned city sites which are producing more substantial assemblages, although it is fairly near the river. The raw materials consist of Avon gravels, some flint pebbles, imported chalk flint and a few pieces of chert.

Abbey Heritage Centre (AHC)

Twenty one artefacts (Table 4.8) were recovered from the Abbey Heritage Centre excavations, located approximately 300 metres from the hot springs. Of these most were from intrusive and later phases with the possible exception being two flints from context 117 which was described as “mixed blue-grey clay with lumps of limestone overlying the natural” (Davenport 1991). This context produced a broken flint blade with edge damage indicating possible utilisation, and a core trimming flake, both of which had narrow dorsal scars typical of late Mesolithic assemblages.

Table 4.8: AHC total assemblage breakdown

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	1	0	0	0	**1**
flakes complete	1	0	1	0	**2**
flakes broken	0	0	0	0	**0**
blades	0	3	1	2	**4**
microliths and manufacture	0	0	0	0	**0**
other debitage	3	7	3	3	**14**
total	**5**	**10**	**5**	**5**	**21**

A microdenticulate was the only wholly diagnostic tool to indicate a Mesolithic presence, although a very thin retouched flake which formed a piercing point was also present and was most likely of Mesolithic /early Neolithic origin. Although most of the assemblage was retrieved from disturbed contexts none of it would be out of place in a Mesolithic context. The presence of a crested blade, a core rejuvenation flake and miscellaneous debitage suggests some knapping activity took place in this location. There was some evidence of the expedient use of thermal flakes of the local flint gravels in the assemblage.

At the nearby site of 2 Abbey Street during excavations in 1981 -1982 (Davenport 1991) a further sixteen artefacts were found. Of these nothing was obviously attributable to the Mesolithic and all the flints were residual. The raw material varied between ‘nasty’ nodular non-worked gravels and chert and one worked nodular lump. There was no decent chalk flint in this assemblage and was not deemed worthy of additional quantification. It was noted in the publication that some artefacts were once found here but have subsequently been lost.

Bath Orange Grove (BOG)

Bath Orange Grove lies just beyond Stall Street almost adjacent to the Sacred Spring. Mentioned but not detailed in Davenport *et al.* (1991), this is a small assemblage of nine artefacts (Table 4.9), that contains a core rejuvenation flake, a side scraper, and a backed blade, suggesting that knapping and tool production were carried out in this location. The lack of uniformity in the raw material suggests a range of secondary sources were utilised. The assemblage likely dates to the later Mesolithic and is very much like that from Bath Street: if the two were mixed it would not be obvious.

Table 4.9: BOG total assemblage breakdown

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	2	1	2	0	**5**
flakes broken	0	0	0	0	**0**
blades	2	2	1	0	**2**
microliths and manufacture	0	0	0	0	**0**
other debitage	2	0	0	0	**2**
total	**6**	**3**	**3**	**0**	**9**

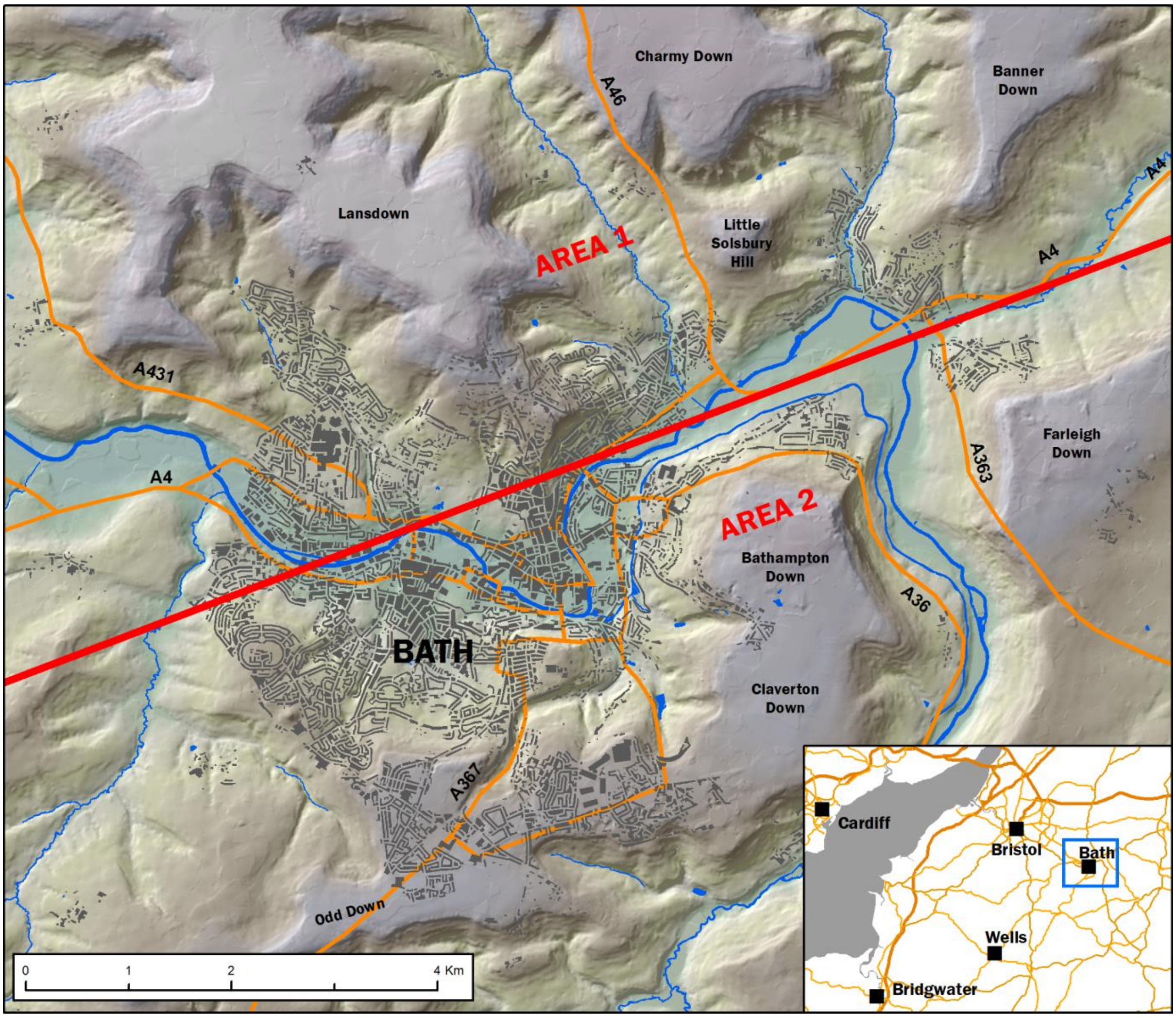
The Bath environs and its archaeology

Several Mesolithic sites occur on the hills and downs that immediately surround the city of Bath (Figure 4.20). The details of these are outlined in Appendix Two. Various sources were referred to in order to gain the information detailed in the appendix including the county HER's, museum archives, published and unpublished sources. The detail gained is variable, but despite this there was enough information to say something meaningful about the assemblages. Most of the assemblages described in the appendix and discussed in this section are the result of flint collecting activity during the first half of the twentieth century, namely by Falconer, Gardner and Shore (Tratman 1973), with very few resulting from excavations. Thus the majority of these assemblages are subject to the usual caveats of being multi-period surface finds, mostly from ploughed fields and inevitably will have suffered from collection bias. All three collectors tended to favour upland sites where the thin soils would yield visible artefacts when the fields were ploughed (Tratman 1973). Whilst most of these assemblages are too small on their own to be of any great significance, as a group they may be considered indicative of fairly extensive use of the Downs by Mesolithic people. To some extent they illustrate the types of activities that people appeared to have carried out in the uplands surrounding Bath. For ease of comparison the areas surrounding Bath were split into two landscape areas (Figure 4.20) each consisting of a number of sites. The two areas differ from each other in some respects.

Area One to the north and west of Bath, namely Lansdown, Charmy Down and Bannerdown (Figure 4.20), encompasses the southern end of the Cotswolds and comprises Oolitic Limestone plateaus, separated by steep sided valleys. The plateaus generally are above 180 metres AOD and are relatively flat and level. There is a high concentration of cold water springs on this part of the Downs. The area is also known for the later prehistoric features on Charmy Down (Bronze Age barrows) and Solsbury Hill (Iron Age hill fort).

The recovery of at least 117 microliths from Area One is suggestive of resource procurement and materials processing and is perhaps indicative of the hunting of large mammals in the uplands. Scrapers, backed blades and retouched flakes suggest that at least some processing, maybe of these, also took place. A single microburin is described from the area, but the small size of these artefacts suggests they may have easily been missed, and this and the presence of bladelet cores on Lansdown and Bannerdown suggest that some knapping, perhaps the preparation of microliths, was carried out. All the material from Area One is deeply patinated, as a result of being in the thin, loamy soils and is typical of chalk flint patination. Figure 4.21 illustrates typical assemblages from Lansdown.

Figure 4.20: Map of the Bath environs showing Bath and landscape Areas One and Two



Most of the activity in this area is concentrated in the east toward Lansdown (see Figure 4.23 and 4.24). Whilst some of this is probably due to collection bias and the masking of Mesolithic activity on Charmy Down by later prehistoric activity, it should be noted that this concentration appears to cluster around the cold water springs on Lansdown, whilst approximately half way between the location of lithic scatters on Freezing Hill and Henley Hill lays Hamswell (NGR ST733714), also the location of several cold water springs.

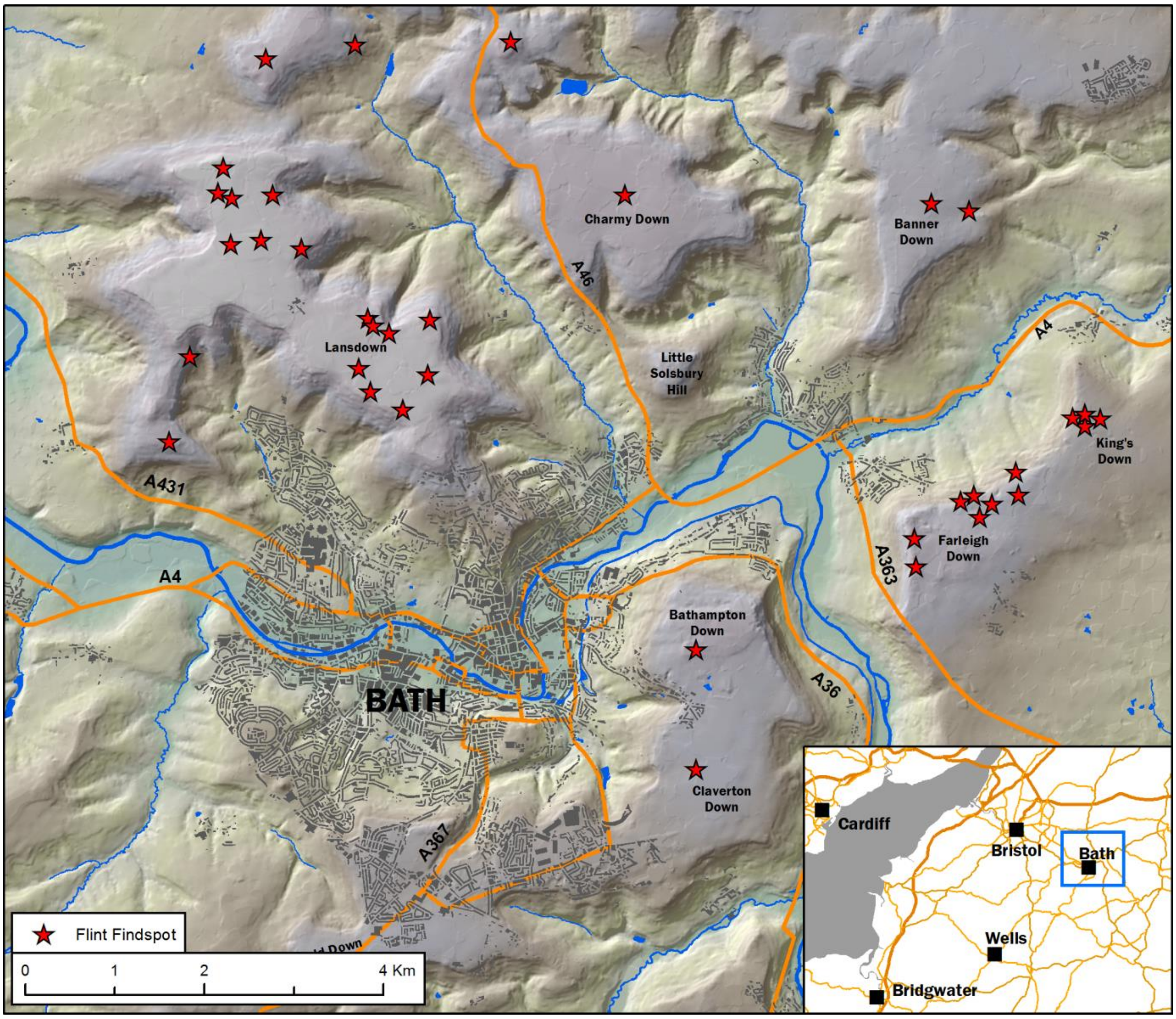
Area Two, to the east and southeast of Bath (Figure 4.20), is a landscape composed of the relatively flat plateaus of Bathampton Down, Claverton Down and Farleigh Down. Some springs emerge from the gradually sloping sides of the Downs but do not develop into major water courses, although the River Avon splits the Downs here in a north-south direction. A significant feature of this area is the presence of quaternary outcrops of flint (Donovan 1995). These flint outcrops are not present in Area One and are discussed in more detail on pages 130-133.

There is also a substantial Mesolithic presence in Area Two with a variety of implements present. These include scrapers, flakes, blades, core rejuvenation flakes, microliths, microburins and retouched flakes. Whilst most of the assemblages are of mixed date, at least twelve microliths, and thin flakes with dorsal scars indicating bladelet production, are indicative of a Mesolithic date. The assemblage from Farleigh Down seems particularly convincing. There appears to be more core rejuvenation flakes in this landscape than there are in Area One, but fewer cores seem to have been noted. Collection bias aside, this may indicate that cores were prepared here and carried elsewhere for use. Again the assemblages are all deeply patinated and the raw material seems to have come from chalk flint sources. Figure 4.22 illustrates typical flint from Bathampton and Claverton Down.

Figure 4.21a: Flint from Area One

Figure 4.22: Flint from Area Two

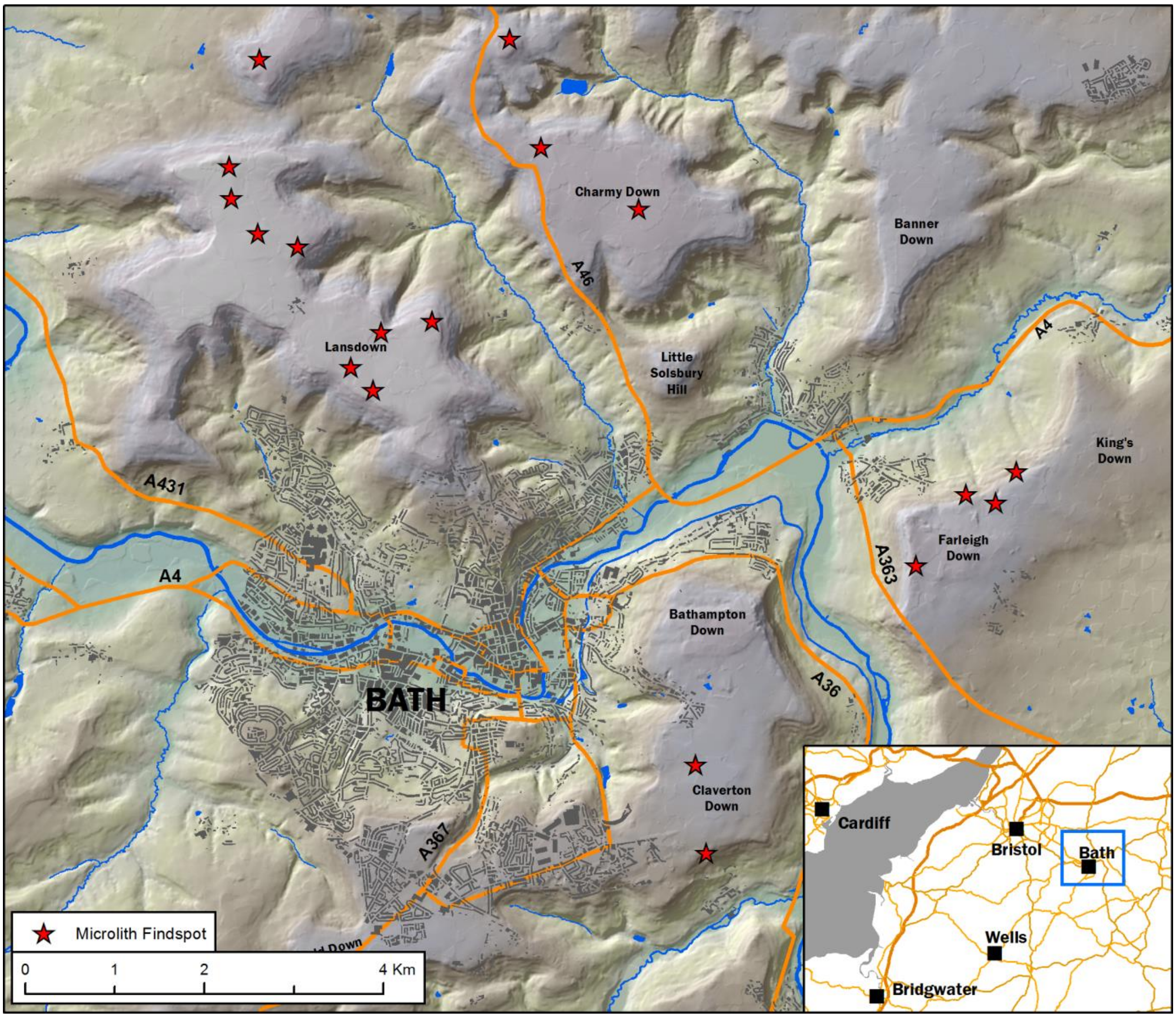
Figure 4.23: map of Mesolithic flint find spots in the Bath environs



Bath Environs Summary

Overall the lithics are evidence for a considerable Mesolithic presence on the Downs surrounding Bath. Topographically the Bath environs all seems fairly similar, though there are subtle landscape differences between areas One and Two as intimated above, namely the presence of clusters of springs in Area One and the availability of quaternary flint outcrops in Area Two. However, this seems to have no bearing upon the types of activities carried out in both areas and if anything there appears to be more activity around the cold springs in Area One. No microliths have seemingly been recovered from Bannerdown in Area One, or Kingsdown and Bathampton Down in Area Two, but this is as likely to do with recovery bias as anything else. It seems in reality that there was little difference between the activities happening on any of the Downs. The ways in which the assemblages on the Downs and those of the hot springs and their immediate vicinity differ is not particularly marked. The most noticeable difference is the heavily patinated nature of the Bath Downs assemblages compared to the relative lack or slight patination on the hot springs flint.

Figure 4.24: map of microlith find spots in the Bath environs



It can be assumed that activity relating to the procurement of food (in the form of microliths), the processing of materials (in the form of scrapers), and the knapping of flakes took place on all the surrounding plateaus that overlook the Bath hot springs. The evidence is stronger in some areas than others, but this is most likely due to recovery bias and not to avoidance during the Mesolithic. The large assemblages, on Lansdown and

Farleigh Down in particular, suggest that people used the Downs on more than a transient basis. The relatively large numbers of scrapers and microliths recorded from the Downs suggest that resources available both on the plateaus and slopes of the hills were abundant. Raw material was available for lithic production on the southern and eastern Downs. Potable water supplies in the form of cold water springs were plentiful, especially in the north and west, and hunting and foraging opportunities would have been more than ample. The ground on the Downs was free draining and would have been suitable to set up camps and from which to survey the surrounding landscape.

It would be tempting then to suggest that more permanent base camps were situated on the Downs, whilst the Avon valley below the foothills would have provided important habitats for further resource procurement. This would be commensurate with the partial model offered by Brooks who suggests that the Hot Springs were visited for the procurement of river gravel flint for knapping and to take advantage of the flora and fauna available. In this model the springs were places where hunting camps were set up, tool repair and manufacture were carried out, and hunting parties stayed (Brooks in Davenport 1999:106, Davenport *et al.* 2007). That this happened is not in question as indeed the evidence does point towards that scenario in part. However, it cannot be assumed that camps in the river valley were of such a transient nature and those in the Downs were more permanent. The Hot Springs would have been a focal point in the landscape and when people travelled to them they would have stopped off at favoured places in order to rest and eat, and maybe to prepare themselves for their visit to the springs. The sites on the Downs may represent places where some of the population resided whilst those who visited the springs did so. The concentrations of activity on the Downs surrounding Bath may, for example, represent seasonal movement from one site to another over many years, perhaps by several related family groups, and/or may indicate routes taken by 'tribal' groups from other areas on their way to the hot springs. Unfortunately, without a lot more work on both the available assemblages and further investigative work such as extensive surveys and targeted excavations, the resolution is not great enough to postulate further.

Discussion: the hot springs in context

Raw Material

The raw materials used for lithic production in the Bath environs typically fit into three categories, locally sourced gravel flint, imported chalk flint, and miscellaneous chert and pebble flints of local and possibly imported origin. Chert seems to make up less than 2% of the lithic material and so the discussion here will mainly focus on the use of chalk flint and gravel flint. At the Bath Springs, there are two main distinctive classes of raw material in use, naturally occurring Avon gravels, which can be found in the locality of the springs and (imported?) chalk flint. It has been suggested by Brooks (in Davenport *et al.* 2007) that the better quality chalk flint was also obtained from the Avon gravels and thermally treated to improve its flaking properties. This position is contestable.

Those items made from the thermally flaked, naturally occurring, flint gravels that occur locally are distinctive in their appearance (See Figure 4.5 on page 98). Flint pebbles and small nodules, which could be knapped, have also been used. These seem to have been grubbed from the local Avon gravels and is possibly evidenced, at the New Royal Baths (Spa 98) excavation, in the form of tree throws. However, the smaller flint pebbles from the Quaternary river gravels and alluvial deposits are not particularly suitable for blade and bladelet production. Some larger pebbles and cobbles were noted around the springs (Davenport *et al.* 2007) but if enough larger nodules of locally sourced flint were available, then we might expect to see more primary removals, larger cortical flakes and blades and more evidence of worked and tested larger nodules at the sites near the springs. Longer blades are present than could be produced easily from the average size of raw material available from the river gravels, including at least two examples of flakes which exhibit broad blade removals up to 20mm in width. Many of the blades in the spring related assemblages are made of a better quality chalk flint than would be grubbed from secondary deposits; the presence of thick chalky cortex on some of the flint would support this. Given that this seems to also be the case in the wider Bath Environs, the evidence indicates that some larger chalk nodules were sourced for knapping from elsewhere.

Tables 4.10 and 4.11 demonstrate that there are very few primary cortical flakes or large pieces of debitage in the four main Bath assemblages, indicating that large nodules were not prepared at these sites. Additionally the complete absence of any large, cortical flakes at the springs suggests it is likely that large nodules were not brought in and core preparation took place elsewhere. Nodules of a size more indicative of the ones used for some of the Bath assemblages can be found on the Marlborough Downs and Salisbury Plain (Figure 4.26).The nearest tertiary outcrops of chalk flint today are found south-east of Marlborough approximately forty kilometres away from Bath and it is known that prehistoric people transported raw materials from the tertiary outcrops on the chalk downs to Somerset during prehistory (Lewis 2011). Occasional nodules of chalk flint are found on the Downs surrounding Bath (Tratman 1978:168), but it is likely that cores made from larger nodules such as the one shown in Figure 4.26, which could be found in the Wessex chalk, or clay-with–flints in Wiltshire, would have been better suited to producing the better quality blades present at the Hot Spring.

Table 4.10: Debitage size at the four main sites (expressed by %)

Debitage Size/mm^2	10	20	30	40	50	60
Hot Spring	**2**	**45**	**37**	**14**	**1**	**0**
Sacred Spring	**0**	**15**	**44**	**31**	**9**	**0**
Spa 98	**19**	**36**	**29**	**12**	**3**	**>1**
Bath Street	**2**	**43**	**31**	**17**	**6**	**>1**

Table 4.11: Relative percentages of cortical pieces in assemblages from Bath

Cortical Descriptor	Primary %	Secondary %	Tertiary %
Hot Spring	**2**	**23**	**74**
Sacred Spring	**>1**	**25**	**74**
Spa 98	**4**	**40**	**53**
Bath Street	**2**	**36**	**62**

Figure 4.25: Flint nodule from Salisbury Plain

Otherwise, naturally occurring flint pebbles and occurrences of "unrolled nodular flint" (Donovan 1995:117), have also been recorded at Combe Down (Tratman 1973), Bathampton Down, Claverton Down, Farleigh Down, Kingsdown, and on the plateau between Midford and Freshford (Donovan 1995). These pebbles are derived from chalk deposits, likely of glacial or peri-glacial origin, and occur at the surface (Donavon 2005). This flint tends to be brown or ochreous in colour and sometimes reddish to grey (Donovan 1995:117), which would compare favourably to some of the flint in the Bath Spring assemblages. The pebbles vary between angular and subangular, and smooth and rounded, the former are more abundant, and in surviving deposits can be up to ten centimetres across.

It is then possible that the deposits on Bathampton Down, Farleigh Down and Kingsdown were the sources for some of the flint being used by Mesolithic people at the Bath springs and on the surrounding downs. This material would have been visible on the surface in places, and are still noted now on occasion (Donovan 2005). That it is not so visible today does not preclude its use, as the once more abundant sources would have been depleted quite rapidly owing to both prehistoric and historic activities on the Downs. This source of flint and chert would have been most beneficial for expedient use, or to make small implements when other flint was not available.

Other materials have been noted in the surface deposits on Bathampton Down and near Hayes Wood, including black, brown and honey coloured cherts, small pieces of coal and belemnites derived from Oxford Clay indicating a probable source for the glacial deposits (Donovan 1995). This also may well be the source of the coal and belemnites recovered from the Sacred Spring deposits and further evidence that people during the Mesolithic 'transported' elements of their landscapes (see main discussion, Chapter Six).

The variety in the lithic assemblages supports the theory that both in the uplands and at the hot springs people were using imported flint and locally derived sources. Whether this difference in raw material represents a chronological divide, a difference in tasks carried out, or groups of people visiting the springs from different localities can be debated. It is known that during the later Mesolithic, people made much more use of local materials and the size of tools negated the need for large imported nodules as might be seen during the Neolithic (Saville 1982). The most reasonable explanation then for the lack of primary cortical flakes (of chalk flint), is that if groups of people were sourcing flint from tertiary chalk flint sources, for example, the Wessex chalk, they were coming to the springs perhaps not just with prepared cores but with a supply of ready knapped blades. Given that these blades are found in the Sacred Spring and Hot Spring this scenario might apply mainly to the earlier Mesolithic, and might also explain the lack of cores in the spring assemblages.

The presence of small core rejuvenation flakes, and crested blades implies at least some knapping took place at or near the spring during the late Mesolithic, but more locally derived material from nearer the springs was also used. Retouched thermal flakes and some roughly worked lumps are testament to this, and as Brooks suggests (in Davenport *et al.* 2007) people probably grubbed for local flint in the area of tree throws such as the ones to the south-east of the Hot Spring (Davenport *et al.* 2007).

Chronology

Until now the Hot Spring and Sacred Spring assemblages have been interpreted as early Mesolithic, whilst the Bath Street and New Royal Baths assemblages as (generally) later Mesolithic. Here it is suggested that the human activity associated most directly with the two springs spans the chronological divide and that there was a continuity of interest in the springs from the earlier to the later period. From the results of the typological analysis, there seems little doubt that people had deposited at least some flint into the Hot Spring pipe and at the Sacred Spring during the late Mesolithic as well as the early Mesolithic. Table 4.12 shows the percentage of blade widths at the four main Bath sites are concentrated in the nine to twelve millimetre range, suggesting a late Mesolithic technology dominates.

It is not clear though from typological analysis alone whether deposition was steadily continuous over the whole period or whether episodes were more intermittent. If Brooks' calculation of 12,000/m² regarding the posited density of flintwork in the Hot Spring pipe (in Davenport *et al.* 2007) is correct then indeed, this could indicate a very long period of continuous deposition. It is however possible that this figure is a gross overestimate.

Table 4.12: Blade widths shown as percentages

Blade width/mm	3	6	9	12	15	>15
Hot Spring	0	7	30	45	19	3
Sacred Spring	0	3	15	37	24	21
Spa 98	0	0	24	24	24	28
Bath Street	2	9	19	41	18	10

The spring pipes consist of cavities filled with gravels through which the water has to make its way to the surface. It was not an empty repository waiting to be filled. Over thousands of years after soils developed in the later Mesolithic, the pipes would gradually have become choked with the sands and gravels, although not to an extent that prevented the spring waters issuing, and not to a level that prevented the deposition of flint into the Hot Spring during the Mesolithic, and coins and other objects in later periods. Problematically, much of the slurry from bore holing the spring pipe was not retained and was washed away. If we can assume some stratigraphical resolution within the pipe (whereby deposited material would find a level at which it would settle into the cavities, and later material would be above earlier material) then this would mean that much of the later material, bar that at the junction with the earlier deposits was washed away. However if Brooks' calculation is correct then we are looking at a density of flintwork that is not commensurate with the amount excavated from the other sites. If this is the case then unless archaeologists have completely 'missed' the main lithic working areas in Bath it is entirely possible that much of the lithic material, once no longer needed, was then deposited into the spring pipes.

Over time the 'catchment' area for the spring waters would have reached an optimum, as would soil development, making the area around the springs more suitable for occupation and increasing the range of activities that might be carried out there. In the early Mesolithic, when people came to the springs the onset of soil development had only just started. It is possible then that in the earlier period the ground was less boggy, better drained and clearer of vegetation, allowing slightly easier access to the area of the spring pipe. In the later Mesolithic the ground was boggier and may have forced people to carry out activities slightly further out from the centre of the springs. This may have been part of the reason why only a small amount of flint in the spring pipe at the Hot Spring relates to the later Mesolithic. The causeway at the Sacred Spring might even relate to this episode of the ground becoming wetter, although no similar causeway has been found near the Hot Spring.

It seems likely that deposition in and at the springs occurred over a period of time which spans the junction of the early and later Mesolithic. The absence of any very small geometric microliths in any of the Bath assemblages suggests that if people were frequenting the springs in the latest Mesolithic, they were certainly not making, or depositing, microliths in the vicinity. The numbers of flints, even taking into account the Bath and Beau Street sites is not great. This may support the notion that people visited the Bath springs with more in mind than the production of stone tools and the prospect of good resource procurement. In summary it can be stated that there was at least some continuity in practise from the early to the late Mesolithic at the springs, but it cannot be assumed people were relating to them in the same way.

General nature of activity implied by the lithic assemblage

The emphasis on formally retouched tools in lithic analysis often belies the use of more expedient tools, that is non-retouched flakes and those which have had minimal abrasion, against a rough stone for example, to blunt their edges. If we take into account that many of these pieces may also be considered as tools then they provide an indicator of activity at the springs that does not limit the springs to being a source of lithic raw materials and a temporary hunting camp. Likewise, with no organic remains preserved here, tools such as skin scrapers made from bone, wooden digging sticks, or antler artefacts, are missing from the archaeological record.

Likewise, there is no evidence for structures that would imply that people camped adjacent to the springs for any extended length of time, although again this could be due to differential preservation, or because shelters were ephemeral in nature. It makes logistical sense that large base camps would not be situated around the hot springs themselves. This could be for many reasons, not least that the area immediately around the springs would be wet underfoot and not particularly suitable for long term encampments. Camps might have been seasonal and less substantial summer shelters would not necessarily leave archaeological traces. The Washo, for example, situate their winter camps at hot springs, although winter shelters are of sturdier structure than summer ones, so might be expected to be present archaeologically (Dodds 2009). However, as it seems the location afforded increased hunting and foraging opportunities, then camps of some sort on the higher and therefore dryer ground, slightly away from actual spring waters might be expected. The density of some of the flint scatters on the Bath Downs suggests that there were encampments on the hills even if structures do not survive.

The lithics from the Downs and in Bath itself, elucidates a human presence but does not tell us where people were living, where they were coming from and how frequently they visited these places. What can be implied is that the springs were known places in the landscape, probably by many groups. They would have been named, discussed and formed an integral part of the known world. Their uniqueness in the British Isles is likely to have made them a focal point in what might be considered a wider Mesolithic 'sacred landscape'. This is further discussed in Chapter Six. The incidence of knapping errors seems to increase the nearer the springs one gets (see table 4.13), although they occur on at least some of the pieces from most of the investigated sites to some degree. These pieces seem to be most prevalent where there are the greatest numbers of naturally occurring thermally fractured flint. This occurs in particular at the Sacred Spring, where there is also the greatest incidence of retouched thermal flakes. However, that they occur mostly on the assemblages from the Sacred Spring and the Hot Spring may not be entirely down to the quality of the available raw material.

Whilst not wanting to make sweeping generalisations concerning gender and knapping, it has to be considered that some of these knapping ‘errors’ and the more expedient use of retouched thermal flakes and unretouched flakes may be the work of novice knappers. Traditionally, by implication this would have meant children and women (see Finlay 1997, Sternke 2005, Shea 2006, Stapert 2007, Weedman 2007). However, this is an outmoded although not unproven assumption. There is good ethnographical evidence that women make skilled knappers, for example, Arthur has shown in her work on the Konso tribe of Ethiopia that women are proficient and sophisticated knappers (Arthur 2010). Older women teach their daughters to knap, whom whilst acquiring the skill make many knapping errors including spurred and broken pieces. However, by the time they are twenty, they are practically expert. As the women become much older at around seventy they begin to lose the skill, once again producing pieces that are reminiscent of novice knappers (Arthur 2010:236-237). Conversely some of the flint work at the hot springs is extremely accomplished, especially the fine knapping of some of the microlithic elements. Although Brooks notes the difficulty of working with the local material, the knapping errors are not confined to the locally sourced flint. It is suggested here that we may be seeing material produced by more than one group of people within a social network. In many cultures, including hunter-gatherers, tasks are distributed according to gender, although clearly this does not have to equate with biological sex, even though the two may be connected.

Table 4.13 knapping errors

%	Fractures	Hinged Flakes	Hinged Blade/lets	Stepped Flakes	Stepped Blade/lets
Hot Spring	**7**	**16**	**3**	**3**	**1**
Sacred Spring	**15**	**6**	**7**	**3**	**6**
Bath Street	**3**	**4**	**4**	**0**	**0**
Spa 98	**<1**	**2**	**2**	**0**	**0**

It has to be considered that the springs were an appropriate place to learn the art of knapping: flaking quality can be improved by soaking nodules in water and water could also have been used to dampen down the dust created during knapping. Certainly the hot springs would have been good places to spend leisure time, and this aspect of hunter-gatherer lives needs to be acknowledged (see page 239).

The types of practical activities that might be carried out at hot springs are not limited to hunting for game and foraging for plants. The range of tools present at the Bath springs including those that lacked formal retouch, but would be perfectly fit for purpose, and the numbers of which were obviously utilised, suggest a range of activities around the processing of materials. This may have included both animal and plant derived materials. In British archaeology, when considering the processing of animal skins, there seems to be an emphasis on dry scraping, and scraping tools limited to those made from lithics, even though bone and antler scrapers have been evident from Mesolithic sites, for example, the auroch bone scraper from Star Carr (Clark 1954), and various mammalian bone scrapers from Goldcliff (Bell *et al.* 2007). If tools made from organic materials were used for this task at the sites under investigation then fewer lithic scrapers might be found. It should be noted that the spring waters and sediments are not particularly conducive to organic preservation, so whilst the evidence suggests few scraping tools, it does not mean these activities occurred infrequently.

Animal skins can be dry scraped, wet scraped and smoked during processing. The method used very much depends on the animal but it is possible that skins might have been worked near to the springs. Sharper blades can also be used to remove the flesh. A few retouched piercers and a number of more burin-like pointed blades also suggest that skins might have been processed to make functional items, such as clothing or bags. The use of hot spring water to aid the skin working process can be seen in North America, where for example, the Washo tribes prepared skins by “soaking in water, often hot springs” (Richards 1996:157). Animal carcasses are also more easily processed after soaking in hot water. Wilder (1995) describes the use of hot water to make for the easy removal of deer hooves from the rest of the animal, a process that is more difficult with dry or cold carcasses. Whilst the method for processing whole animals is relatively unknown for the Mesolithic, the working of antler is documented in Mesolithic contexts. To work antler successfully it is better softened (Osipowicz 2007), and the warm spring waters would be ideal for this purpose. Burins and burin-like blades that would be suitable for graving and other tasks form part of the assemblages near the springs and it is tempting to think that these and the piercer and cutting elements of the lithics were used for processing animal parts into various products.

Owen (in Donald and Hurcombe 2000) succinctly expresses the need to consider the use of lithic tools on softer animal parts, such as fish and birds, which do not leave the same traces of use wear as harder materials. Ethnographically there is much evidence for use of these animals, for their meat, scales and feathers, and given the nature of the springs and their close proximity to the River Avon, the procurement of these is a real consideration. Better understood is the working of plant fibres in warm water, ethnographic evidence for which is abundant. For example the Māori's use hot pools to soften flax to make it suitable for processing (Pohatu 2010). Barks, roots and herbaceous plants are all used as materials for making everyday items as well as for food use and again lithic tools can be used to process these materials.

Taphonomic processes: glossing

The differential glossing of artefacts placed in and around the Bath springs could well have some implications for interpretation, but is more likely an archaeological 'red herring'. It is tentatively suggested here that the adherence of silica would serve to keep flint in a 'fresh state' enhancing its use for further knapping, and given that the most coherent part of the assemblage is also the least edge damaged, it is a possibility this flint was being stored (perhaps in a bag) in the waters for future use. Whether this property of the spring was particularly known to Mesolithic peoples is of course unknown, yet flint caches are documented both archaeologically and ethnographically (see page 75). It is therefore possible that good flint was cached for further use, maybe by people, maybe by a deity.

Deposition: votive or functional?

It has been suggested by Brooks (in Davenport *et al.* 2007), that the lithic assemblages from the Hot Spring and the Sacred Spring are "obviously distinct" from each other (Davenport *et al*. 2007:148), with the lithic assemblages representing two disparate activities. The implication being the Hot Spring deposit is of a votive nature, and the Sacred Spring is not. However, this assumption appears to be based on limited consideration of the material found during the two seasons of excavation at the Sacred Spring and probably (as it is not explicitly stated) purely on the flint report prepared by Care (1985). Her report does not relate to all the material from the Sacred Spring, as it is based only on the 1979 season of excavation, and then, it seems, only on a partial sample.

Here it is suggested that the two assemblages are similar on several counts: raw materials, lithic technology, and typology. The two assemblages seem to be dramatically different only in terms of the depth of patination, the freshness of the chalk flint, the degree of edge damage and the quantity of glossed pieces. This may be a contextual difference, for example, there is more edge damage on the Hot Spring pieces suggesting that at least some flint that had 'outlived' its usefulness was deposited into the spring pipe (see page 99 for discussion). The pattern is not so clear cut though, because signs of working, utilisation and edge damage are present at the Sacred Spring. This observation may support the view that depositing flint into the spring pipes was some kind of highly structured or votive deposition; however more functional purposes should not be overlooked. As is commonly noted in the archaeological literature, flint is sharp and uncomfortable to step on, and represents less of a hazard if it is kept away from living and working areas. The thermally fractured reworked pieces at the Sacred Spring, which were retouched after being rolled (Care 1985) are not so sharp and therefore, do not present the same risk.

The most significant difference however still has to be in terms of context, the lithics from the Hot Spring were recovered from the spring pipe, whilst the Sacred Spring flint was excavated from the surrounding deposits. The lithics from the two springs are more similar than previously assumed (by Brooks in Davenport *et al.* 2007), so it seems that other factors account for what was happening at the springs in terms of deposition. This seems a reasonable assumption, as even in the Hot Spring assemblage there are artefacts that do not fit into a category of high quality chalk flint, which is what was cited (in Davenport *et al.* 2007) as being the main constituent of the Hot Spring assemblage and a contributing factor in its deposition into the Hot Spring pipe. Perhaps what was happening at these places was more fundamental. For example, one of the most noticeable properties of flint, after its capacity to fracture predictably, is its ability to retain heat, prompting an enquiry as to whether people were depositing flint into the spring pipe to keep the waters hot. Certainly prehistoric societies were very aware of the heat retaining properties of flints and cherts and it would make sense to 'feed' the spring the very substance that would ensure it retained its properties. In this respect all flint whether thermally fractured and locally occurring, or deliberately knapped and originating kilometres away can fulfil the same requirement.

Several points can be confidently ascertained:

- People visited the Bath hot springs during both the early and the late Mesolithic.

- There is no evidence of encampments, other than lithic scatters. The extent of the lithic assemblages does however suggest people stopped at the springs to carry out various activities.

- There is no real difference between the assemblages at the Sacred Spring and the Hot Spring, other than by context.

- Ethnographic analogy with past and contemporary societies suggests people often frequent hot springs for more than one purpose. Although there are no universals, the most frequent recorded uses of hot springs are for cooking, bathing, for social intercourse, and to take the healing waters, either directly or indirectly.
- Hot springs are often associated with one or more deities, or granted important spiritual meaning in many societies.

The nature of the assemblages is not in itself enough to justify a division between ritual and non-ritual activities. The split then seems entirely a contextual endeavour; the Hot Spring has been interpreted as a structured deposit, which somehow by implication, affords it the status of a votive deposit, whilst by contrast, the Sacred Spring material is seen as more functional, a place where subsistence tasks were carried out. However, there is not any differential deposition by artefact type as might be seen elsewhere and certainly the material culture going into the spring pipe is not the Mesolithic equivalent of the Bronze Age sword, or Neolithic axe head. This might be read in two ways: it could be that actually these springs are so special that all this material is representational of the many facets of Mesolithic life: the tools they made, the locales they inhabited, the activities they carried out; all had meaning and indeed made a suitable votive offering. Or we might see this as not being about votive deposition at all. These deposits were just another form of discard, and the springs fulfilled other functions: people went to the hot springs to take advantage of the warm water, and the steam it created, for medicinal, cleansing or therapeutic purposes; they gathered there using it as a foci for activities perhaps centring around liminality, or because it was a suitable locale for taking advantage of the abundant, but different resources, of the springs and the nearby river.

Interpretation: the Mesolithic Bath Hot Springs

To discuss the nature of activity at the hot springs of Bath during the Mesolithic, it seems pertinent to try and imagine how people might have perceived the location and the environment they would be encountering, both upon approach and when in close proximity. People might have used topographical markers in the landscape to get to the hot springs; either way the myriad of rivers and the nature of the general topography would make them fairly easy to find. Indeed, when people were travelling to the springs from any distance, it is most likely that their position would have been noticeable long before they were reached. For one of the most obvious features of the springs is that the immediate area around them would have been shrouded in mist for much of the day, especially during the cold of morning and evening, and in the colder months. From the high ground surrounding the springs this phenomenon would have marked their position in the landscape. It has been suggested that this might have been a strange and even frightening spectacle to encounter (Davenport *et al.* 2007) yet, this was probably not such an unusual sight in the Mesolithic landscape as one might suppose. Even at cold springs, as well as other watery places, the warmth of the morning sun will result in the evaporation of water to create mist. From a distance perhaps the real difference between the hot springs and other watery places would be the sheer quantity of water vapour produced. It is tempting however, to think that during the winter months the effect would be magnified and it would be at this time of year that the springs would really stand out, the mist perhaps evoking a sense of otherness and difference in the distance.

As people got closer to the springs this sense of difference might have been exaggerated. In hot spring locations around the world different flora and fauna can occur to that found elsewhere and very specialised ecosystems develop (Holt 2007). Although the palaeoenvironmental evidence for the Bath springs is sparse, analogy with other hot springs would suggest that the immediate environs would have been rich in vegetation;

the warm waters would have encouraged the growth of water plants and made it an attractive habitat for animals, including wildfowl, to frequent. The importance of wildfowl to Mesolithic peoples is rarely discussed, with more dominant discussions relating to the procurement of large mammals. It is suggested here that not only would wildfowl add to the richness of Mesolithic diets, they would have been an important part of the character of the location adding to the atmosphere evoked already by the springs. Whilst it is was not possible to pinpoint particular species that might have visited Britain's hot springs that would not be found as readily at any other suitable wetland site, it is known that water birds are particularly attracted to warmer waters, as the opportunities for feeding are increased.

The hot water bubbling from the ground would have filled its own basin and likely then dispersed, perhaps making further pools of water, perhaps channelising and forming small tributaries whilst the deposits nearest to the springs would have been water logged on a semi-permanent basis. Further out there would have been more soil development and dryer ground, evidenced by data from the New Royal Baths excavations (Davenport *et al.* 2007). To the south-east of that site, tree throws and hollows were present. The wet conditions seem to have supported alder-carr vegetation (Davenport *et al.* 2007) as found elsewhere under similar conditions. Macroscopic remains, in minute quantities, of oak, alder, *corylus*, brackens and ferns, as well as heather (*Calluna vulgaris)*, *Poaceae sp*. and *Lactucae sp.* were found in the palaeosol. Davenport postulates that the heather was brought on to site from elsewhere for roofing or flooring material (Davenport *et al.* 2007), yet *Calluna vulgaris* does grow in well drained moister environments as well as on dry heath (Ellenberg and Strutt 1998). If it was growing near the springs in the dryer areas, it would have been very attractive to browsing animals, such as deer. It is also a plant that has medicinal properties (Panda 2004:237) and the flowers can be used to make a yellow dye (Mairet 1916). Other characteristics of *Calluna* are its astringent and cleansing properties (Lindley 1853:454).

The chemical composition of the spring waters may have well stained some materials above ground a rust colour, as they do the light coloured Bath Stone of the Roman Baths, where the Sacred Spring emerges today (Kellaway 1991:100). Iron is present in the spring waters and "ochreous iron staining, iron hydroxide sludges and encrustations are among the most prominent features of the hot springs" (Stanton in Kellaway 1991:134). The spring waters would have had a sulphurous odour. Whilst the smell is often perceived as unpleasant to the olfactory sensibilities of modern, western humans, it cannot be assumed this was the case for Mesolithic peoples. Clearly, the odorous waters would be a feature of the springs that would be noticeable but not necessarily having the connotations of being foul smelling.

Hot Springs and Steam

It is not then difficult to envisage how the hot springs at Bath attracted the interest of Mesolithic peoples, or how they might have become embedded in their cultural lives. Hot springs, where they occur in the rest of the world, have long fascinated humans and captured their imaginations. Hot, bubbling waters that emerge from the ground have the effect of shrouding the locale in mist, are associated with what might seem strange and exotic, but definitely abundant, vegetation and therefore are attractive places for animals to congregate. The hot waters were maybe not as suitable for drinking to quench thirst, compared to the cold and ambient springs on the surrounding high ground, but could satisfy needs beyond immediate survival. It is known from other cultures, both past and contemporary, that hot springs fulfil a number of practical functions, and often have mythological connotations, supernatural powers, medicinal and healing properties.

Such are the benefits of hot springs people have often sought to recreate them through constructing warm baths, steam baths, sweat lodges and saunas. In Europe these constructions are known from the 1st century BC (Barfield and Hodder 1987). Archaeologically, the earliest evidence for the occurrence of the use of 'humanly induced' steam in Britain may be the structures known as 'burnt mounds' which occur over much of Britain and northern Europe near watercourses.

Many past and contemporary communities, including hunter-gatherers, are known to have constructed sweat lodges and similar structures, and to take advantage of natural warm and hot spring pools. Interestingly there is ethnographic evidence for Native Americans in California building lodges over pools to concentrate the hot water vapour (Lund 1995). Archaeologically it would be difficult to see this; if such structures were used they would probably have been both temporary and made from organic materials. Because the spring deposits were always going to be moving to some degree, one would not expect the archaeological footprint of structures to be preserved.

Hot springs offer a ready supply of naturally hot water. The Māori's of Rotorua district are known to have cooked food in hot spring pools. Although the most common method was to use cooking pits heated with hot stones, Māori's who lived near hot springs would immerse vegetables enclosed in flax bags hung from poles into the pools (Del Mar 1924:132). Similarly the Ngāti Tūwharetoa people in the same district use cabbage leaves as vessels to hold food cooked in hot springs. This practice is not confined to the hot springs of New Zealand and comparable cases can be cited from North America, Scandinavia and Japan. The Māori's of Rotorua also wash clothes in pools. Creating a hollow for water from the hot springs to drain into, the resulting pools are then dammed up and allowed to cool until the water reaches a comfortable temperature.

People might visit hot springs for washing, ablution and immersion, yet this is not a universal human trait for there are examples of "non-washing people" including the Chuckchee, the Koryak and the Evenki (Lopatin1960). Some peoples are known never to swim and these include the Evenki, Orochee and Goldi people (Lopatin 1922). It cannot therefore be assumed that immersion into water was necessarily a given for Mesolithic peoples. However, if we accept swimming and immersion are a more common trait, and recorded for many Eurasian peoples, then it is possible that Mesolithic peoples were using the hot spring pools for relaxation and social intercourse or, perhaps like the Māori's sometimes do, used the springs water just to "warm themselves" (Pohatu 2010:3). Some cultures favoured the steam bath over immersion using the steam to cleanse rather than the water itself. This is recorded by Herodotus, where the Scythians were said to use steam rather than immerse in water for bodily cleansing (Lopatin 1960). Steam baths fulfil the same functions as immersion baths, and for many peoples, including many Native American tribes and the peoples of Scandinavia and Russia; the social aspect is one of the most important.

Of course bathing, whether directly or indirectly, is not only a functional activity. It can be used to cleanse and to purify as part of rituals associated with the sacred, and can be closely linked to one of the main reasons people might use hot springs, which is for their medicinal, therapeutic and healing properties. The latter is not confined to modern day use, for the beneficial aspects of both bathing in and drinking mineral rich waters from hot springs has been recorded for many societies from the North Americas to Eurasia. It was often one of the prime reasons for visiting such places. Hot springs were healing sites for many North American peoples, and were neutral safe spaces for otherwise territorial societies (Lund 1995). It is not only the mineral content of the spring water which can be high, for the spring deposits are also mineral rich. It is not unknown for people to use 'muds' for many applications, from its use in construction of dwellings to a pigment for dying weaving materials (Pohatu 2010). People even bathe in the muds for their beneficial qualities as opposed to the water itself (Lund 1995). This was known practise for the

Pomos and the Mayacmas of California and for the tribes who utilised Warm Springs in Georgia (Lund 1995). The latter is an interesting example, as it shows that cooler springs, in the case of Warm Springs 31°C, can be used in a similar way to the hotter springs, such as Castigoga in California, which emerges at nearly 100°C. This does not apply everywhere though. The Māori of Te Puia Springs have very strict rules as to what activities are carried out at which hot springs and pools (Pohatu 2010), with each pool in the area being designated for a specific activity. Certain rules of engagement at each may also be in place, for example, the Māori's do not place their heads under the waters of hot springs as this is considered particularly dangerous; sickness can be caused outweighing other benefits. A modern parallel can be drawn with the occurrence of the amoeba *Naegleria fowleri* in the Roman Baths in Bath, which forced their eventual closure as a spa facility.

Hot springs are associated with myth and legend, for many North American Indian tribes they were sacred places where the "Great Spirit" resided. At Harrison in British Columbia, Canada, it was "Keekwully Tybee who sent up the medicine waters all hot from below" (Lund 1995:12). These legends also encompass aspects of hot springs that are not directly to do with the water. For example, the Icelandic Sagas speak of swans, believed to be Valkyries, which came to the hot springs to use their restorative powers (Conway 1994). Certainly in Iceland ducks and other waterfowl use hot springs as feeding grounds and there is no reason to think this was not the case at the Bath hot springs, albeit to a lesser degree. It has been suggested that Mesolithic people might have had relations with wildfowl beyond the functional, the most famous example being the Vedbaek swan wing burial (Albrethson and Brinch Petersen 1976) but many more examples of bird associations are cited by Mannermaa (2008). This may indicate a spiritual connection with the swan, or waterfowl in general. Birds are liminal creatures in many cultures, and water birds even more so.

The belief that hot springs were places where deities or supernatural beings dwelled is widespread. By the Iron Age and Roman periods there are many examples of personified deities who presided over hot springs. These deities often had more than one 'responsibility', so for example *Luxovius* was the tutelary deity for the hot healing springs in Luxeuil in France, but was also a god of light (Aldhouse-Green 1996). Sometimes places had more than one deity, or the deity had a consort, for example, *Luxovious* had *Bricta*. *Sirona* and the *Sky horseman* were also worshipped at Luxeuil (Aldhouse-Green 1996). Whether the hot springs of Bath harboured these deities during the Mesolithic is debatable. There is no substantial evidence for personification of the 'otherworldly' during this time, although the concept does exist for some hunter-gatherers (Lund 1995). Perhaps the springs were considered entities in themselves, they might have possessed agency more akin to the notion of animism. The bubbling waters, water vapour and other sensual qualities of the hot spring waters would have given them a sense of 'living' things with characteristics that might have afforded them 'personhood' but how this might have been made manifest is entirely conjecture.

Certainly, springs convey a sense of liminality, and therefore things not of the earthly world may dwell there, and this is no less true for hot springs. Steam can be used as an agent for altering conscious experience into unconscious experience of the type associated with shamanic activity, and is also a way of crossing liminal boundaries. That this may have been the case at Bath is posited by Davenport (Davenport *et al.* 2007:149), with references to work by Cummings (2000) and Bradley (2000), where springs can be seen as metaphors for journeys to other worlds and altering transitional states. Very little reference to shamanic activity at hot springs is evident in the literature, even in those societies that readily practise something akin to shamanism, such as some North American and Amazonian tribes. The Shipibo, Anashinko, Machiguenga and Mestizo people of the Amazon make use of steam baths infused with herbs to expel pathogens from the body. *Vapadoras*, as they are known, whom practise this healing are not shamans but medical practitioners (Beyer 2009).

The evidence for Mesolithic 'shamanistic' activity is strong (see Chapter One) but there is far less surety in considering states of intoxication and archaeologically there is very little evidence for the Mesolithic use of medicines or healing practises. Examples are known though, for example, the technique of trepanation has been carried out from the Mesolithic onwards, examples being known from approximately 7300- 6200 BC (Cartwright 2004). Mithen *et al.* (2001) have suggested that the remains of Lesser Celandine found in a Mesolithic pit at Staosnaig, Colonsay, may indicate its use as a possible healing plant, although it is also nutritionally valuable.

In Britain, what are termed 'votive offerings' into and around the hot springs are known from the late Iron Age and Roman period but earlier examples are found elsewhere, for example, from the Bronze Age in Italy (Cremonesi 2007). For example, Bronze Age pottery vessels containing food stuffs were deposited in the Grotta dello Sventatoio, which is actually a thermal cave. The cave might be more strictly called a geothermal phenomenon rather than a hot spring *per se.* although it has been suggested it is the steam emanating from the cave that attracted the attention of people (Cremonesi

2007:226). Other parallels may be found at springs elsewhere in Europe, and beyond. One such example is the hot springs at Bourbonne-les-Bains in France where depositing objects directly into, or in the vicinity of, the springs has been recorded (Grant and Sauer 2006). These deposits included several thousand Roman coins (Sauer 2005); certainly votive deposits made by healing cults during the Roman period often focussed on hot springs (Rüpke 2007:161).

A further reference to springs as liminal places and one where deposition is an important element is the use of hot springs in the Yellowstone Area, to dispose of some important members of the Shoshone tribe's dead (Campbell 2011) "where, depending on water chemistry the bodies might be dissolved rapidly by acids or eerily encrusted in pale deposits" (Campbell 2011:50). Whilst there is no evidence of this for the Bath Hot Springs, it demonstrates further the importance attached to these places by people that may not be archaeologically visible.

A continuity of interest in the Bath hot springs

Human activity at the Bath hot springs has a long history both written and evidenced by archaeological finds. Other than the Mesolithic, it is not until the Iron Age that there is any real archaeological evidence of the interest shown in the hot springs that is more than co-incidental, though the Neolithic and Bronze Age levels were likely reduced or removed from the area by later Iron Age and Roman activity. According to legend the springs were reputed to have been discovered by Prince Bladud in the 9th Century BC (Geoffrey of Monmouth in *Historia Regum Brittaniae* 1136 cited in Gallois 2006). The spring waters so impressed Bladud, healing his pigs and his own leprosy, that he was said to have founded the city and later dedicated a temple to the Celtic goddess *Sul*. How accurate this is, is of course debatable, especially as when he later became King, he apparently mastered the art of flying (Geoffrey of Monmouth in *Historia Regum Brittaniae* 1136 cited in Gallois 2006).

Certainly the goddess *Sul* was a tutelary deity for medicine and fertility during the Iron Age and there is evidence for votive deposits of coins into the Sacred Spring dating to this period (Cunliffe 1983). The Romans came to Bath sometime after AD43, where they constructed the famous baths and temple, which they dedicated to the now Romanised goddess *Sulis Minerva* and the settlement became *Aquae Sulis* (Campbell 2011). Various offerings were made to the deity, these included coins, gems, objects of adornment, spindle whorls and the famous lead curses. *Sulis* had the power to heal and to grant fertility, hence some of the votive deposits might have been a 'gift', but she could also exact justice on wrongdoers (Billington and Aldhouse-Green 1996). The lead curses deposited into the Sacred Spring bore the written expression of people's wishes for the aid of the goddess to that end. Most of the more unusual objects have been found from Roman votive deposition into the Sacred Spring; the Hot Spring however, has yielded mainly Roman coins and a few badly fragmented objects but no curses. Davenport has made a case for differential usage of the two springs, at about the mid-second century, stating that it was probably the construction of a vaulted chamber around the Hot Spring that restricted access to the spring for the more casual visitor (Davenport *et al.* 2007), whereas the Sacred Spring was on the site of the Roman Baths and adjacent to the temple. Corney suggests though that the springs "may have been treated in very similar ways in Roman times" (in Davenport *et al.* 2007:149).

The evidence for immediate post-Roman activity at the springs is limited and it is not really until the eighteenth century that there is good documented or archaeological evidence once again for the springs being used as bathing and spa facilities. In 1738 the Royal Mineral Water Hospital was established as a centre for the cure of many medical complaints suffered by the Georgian population. Various bathing facilities were also built, and the belief in the water cure endured to such a degree that the therapeutic benefits of the spring waters were offered by the National Health Service until 1973. At present, the New Royal Baths (Thermae Spa) offer the benefits of bathing in the healing waters of the hot springs and one can still drink piped spring water on visiting the Roman Baths on Stall Street.

This potted history of the springs demonstrates that they have been an important location for religious, ritual and practical activities for at least 2000 years. Whilst we cannot project this history directly back onto the Mesolithic, it implies a continuity of interest in the hot waters and suggests that people visit hot springs for many reasons, including to bathe, for therapeutic and medicinal healing, to carry out practical tasks, and because they were spiritual places incorporated into their 'belief systems'. Combined with the aforementioned ethnographic and archaeological evidence, the analogues with which to interpret the Mesolithic assemblages are almost infinite.

Chapter Summary

A more in-depth comparison between the Hot Spring, and Sacred Spring assemblages, and other Mesolithic assemblages clustered around the springs, has helped to clarify some of the initial questions asked in this thesis. The Hot Spring and Sacred Spring assemblages have been said to represent two different spheres of activity, where the Hot Spring lithics signify votive deposition, and the Sacred Spring denotes mundane and practical actions (Davenport *et al.* 2007). This consideration that flint was deposited into the Hot Spring as some kind of votive deposit is certainly not resolved and is still a matter for debate. We do not know whether the Sacred Spring pipe and the Cross Bath Spring pipe, were used as repositories for deposition and therefore it cannot be assumed the Hot Spring was treated differently. The immediate deposits around the Hot Spring have never been investigated and so it is possible that retouched thermal flints were used there, which have not been discovered. The possibility certainly exists as the occasional worked thermal flake occurred in the Hot Spring assemblage.

Whilst it was thought that there was a significant distinction between the Sacred Spring and Hot Spring assemblages it seemed reasonable conjecture to interpret the Hot Spring deposit as highly structured and unique ‘votive’ deposition(s). The new analysis suggests this distinction no longer exists. There is no evidence at any of the other sites in the centre of Bath that seem to evidence ‘ritual’ activity, which does strengthen the case that there was some kind of structured deposition into the springs themselves.

It has been intimated that deposition into the Hot Spring pipe was an early Mesolithic phenomenon (Davenport *et al.* 2007). Whilst the spring deposits do have an earlier Mesolithic component which is lacking at the other city sites, there is also a late Mesolithic component to the assemblages which suggests a continuity of interest in the springs. The paucity of early Mesolithic material in the other city sites may be explained by the fact that people related to the springs differently during the earlier part of the period. Perhaps it was the case that they became more embedded into people’s lifescapes and cosmologies as time progressed; the springs perhaps entwined into a more complex way of viewing of the landscape, as they became part of people’s histories.

Good quality imported chalk flint makes up a proportion of the lithic assemblages from the spring deposits. This is in contrast to the other sites in the city, where the lithics were more often derived from the river gravels. This may not be such a significant difference, and might just reflect the general tendency for late Mesolithic people to make more use of locally available stone. However, it may also indicate that the springs were known of by many people outside of the immediate area, who imported flint as well as making expedient use of the local sources.

The nature of the assemblages still does not support the general view that the two springs represent two distinct spheres of Mesolithic life. Therefore, it is not viable to relate a narrative where the Sacred Spring was used for functional activities and the Hot Spring for ritual ones. In Chapter Six, the discussion incorporates aspects of this chapter to make further observations about Mesolithic peoples, springs and landscapes.

Chapter Five: tufa depositing springs

Introduction

Owing to the calcareous nature of its limestone geology, tufa and travertine depositing springs are abundant in the study area. Many of these springs are associated with Mesolithic artefacts and three such sites were chosen as the focus for this chapter: Langley's Lane, Midsomer Norton in Somerset, Blashenwell Pit in Dorset and Oliver's Field, Cherhill in Wiltshire. Some other tufa springs, both inside and outside of the study area, are also referred to, for example, Frocester, Gloucestershire (Price 2004) and Bryn Newdd, Prestatyn, Denbighshire (Bell *et al.* 2007). It is noteworthy that minor tufa formation sometimes occurs in mineral rich springs even where calcite is not the dominant mineral, for example, the Hot Spring at Bath (Pentecost 1995:33) and the Chalice Well, Glastonbury, both in Somerset (Rahtz 1964), are known to deposit a small amount of tufa. Other forms of tufa and travertine outcrops also occur throughout the British Isles, such as, river valley tufas. Some key sites of this type include Holywell Combe, Kent (Preece and Bridgland 1998), Bossington, Hampshire (Davies and Griffiths 2005), and Newlands Cross, County Dublin (Preece *et al.* 1986) and some of these are also referred to for the purpose of discussion (See Figure 5.1 and Table 5.1).

The study of tufa

The majority of studies carried out on tufa springs as well as other types of tufa deposit have concentrated on the environmental aspect, for they are of great interest to archaeologists and others studying Pleistocene and Holocene palaeoenvironments and anthropogenically-induced environmental change. Pollen sequences and other types of floral remains, for example leaf imprints, may be obtained from tufa deposits where preservation is conducive, whilst freshwater and terrestrial snails are preserved in the calcium rich deposits and are excellent autochthonous, environmental indicators. The technique of molluscan analysis has been employed by geologists studying the Quaternary Period since the nineteenth century, but it was not until *Land Snails in Archaeology* (Evans 1972) was published that the method was adopted more widely by archaeologists. Evans' volume highlighted the importance of tufa as an environmental indicator and as a preservation environment for macro-fossils. He also cited earlier works by Clark *et al.* (1938) and Kerney (1959); both of which described snail faunas associated with tufaceous deposits and lithic industries.

Most tufa springs associated with anthropogenic activity appear to have been frequented during the later Mesolithic. This is indicated by the presence of geometric microliths, particularly small scalene triangles, combined with radiocarbon dates. There is also evidence of continued use of some of these sites after the Mesolithic into the early Neolithic and beyond. However, the main phases of activity at these springs appear to have occurred during the late Mesolithic; this is not unexpected as most tufa in the British Isles formed during the early Holocene. Often tufa deposits seal palaeosols containing artefacts that date to the Mesolithic, suggesting people were attracted to these sites prior to any extensive deposition having taken place.

More recently the less prosaic aspects of tufa deposits, as metaphor and symbol, have been explored in more detail (Evans 1999, Davies and Robb 2002, Davies 2008). This is discussed further here on page 223.

Tufa formation

Tufa is a calcium carbonate precipitate ($CaCO_3$) formed by the degassing of calcium rich water. Its formation is thought to be aided by biotic activity, whereby photosynthesis, occurring in bryophytes and algae, aids the trapping and binding of calcites (Pentecost 1981:365, Pentecost 1993:23). Rainfall and temperature affect the rate of tufa formation, with mean air temperatures above 5°C and high levels of precipitation being most conducive to this process.

Tufa deposits occur throughout the British Isles in limestone geology. Although the most extensive deposition took place during the early Holocene some deposits are relatively recent and are still actively forming. These include several examples in the Shelsley Walsh area of the Teme Valley, Worcestershire and many examples in Yorkshire (Pentecost 1993, Pentecost *et al.* 2000). A few examples can also be dated to the Pleistocene and these include the interglacial deposits at Hitchin, Hertfordshire (Kerney 1959) and Icklingham, Suffolk (Holyoak *et al.* 1983). Dates of *c.*8000-5000BP are commonly cited as the period for optimum tufa deposition in Britain (Goudie 1990, Parker and Goudie 2007). Increased precipitation and consequently a rising water table, as well as higher temperatures in this period (which came to be known as the ‘climatic optimum’) led to tufa forming in swampy areas of low lying woodland (Evans 1972). Tufa deposits also formed in more open settings, for example, extensive molluscan analysis at Bossington, Hampshire has produced evidence that most formation at that site took place in more open, non-wooded environments (Davies and Griffiths 2005, Davies 2008:94).

The decline in tufa formation is thought to coincide with increased anthropogenic woodland clearance as well as climate change in the mid-Holocene (Goudie *et al.* 1993). Some deposits, intensively quarried from the Roman period onwards, have all but disappeared. That they were once present is sometimes evidenced in local architecture, for tufa and travertine make excellent building stone, or by extant but depleted deposits (Potter 2000). Certainly both anthropogenic and climatic influences have affected the rate of tufa formation in the British Isles. Although the exact circumstances for its relative decline are still, as yet, subject to debate, some researchers favour climate change as the main cause at least for certain localised deposits (for example, Wehrli *et al.* 2010).

The rate of tufa formation has been estimated at between approximately 1.3 and 16.5 centimetres per one hundred years, depending on the location of the deposit and the grade of tufa (Preece and Bridgland 1998, Davies 2008:99). One centimetre of tufa may be equal to just twenty years, as estimated at Bossington, Hampshire (Davies and Griffiths 2005, Davies 2008). Mesolithic archaeology can be sealed by, or contained within, tufa deposits which at present allows for the relative dating of tufas. However, much work needs to be done on refining sampling methods in the field and on the chronometric dating of tufas to enhance temporal resolution and allow for more accurate dating of Mesolithic occupation.

The classification of tufas and travertines

Tufa occurs in various forms according to the conditions of deposition and ranges from soft, friable tufas through to hard, rock like, travertine (Figure 5.2). The classification of tufas and travertines into types is notoriously difficult (Alonso-Zarzà and Tanner 2009), although many schemes based on geochemical and physical properties have been suggested and some are outlined in brief here. A sub-division into meteogene and thermogene types is initially useful. Meteogene deposits are those derived from soil borne carbon dioxide and affected by climatic factors. The tufa deposits in the study area fall into this category. Thermogene (or hydrothermal) deposits that result from ‘thermally generated’ carbon dioxide are associated mainly with hot springs, occur outside the

British Isles and are affected less by climate (Pentecost 1993,1995, 2005b). Some deposits that occur in the British Isles, for example at Matlock Bath, Derbyshire, are known as thermo-meteogene as they derive from thermal springs but the amount of thermally generated carbon dioxide is relatively low.

Classification into autochthonous (set down where formed) and allochthonous (found away from where formed) deposits were suggested by Pentecost and Viles (1994), the former includes several classes of tufa and travertine deposits, to which the spring deposited tufas in this study belong (Pentecost 1995, 2005b). Pentecost lists these as: paludal, cascade, barrage, crusted, cemented and clastic deposits (see Pentecost 1995 and 2005b for further explanation of these terms). Tufa deposits may also be classified (albeit it somewhat loosely) according to the depositional conditions they formed under. If deposited under 'quiet' conditions where water is relatively slow flowing, then tufa may be quite soft and granular, whilst faster deposition leads to the formation of nodular and oncoidal tufas (Davies 2008).

The terms tufa and travertine are relatively interchangeable. In this thesis 'tufa' refers to all deposits that are soft, friable, granular, nodular or oncoidal, whilst 'travertine' will refer to hardened forms that are rock like and associated with palludal deposits. Although Pentecost (2005b) recommends that the term travertine should be adopted more widely to avoid cross-cultural confusion, in Britain the term 'tufa' in relation to calcareous spring deposits is commonly used. Here a more phenomenological consideration of tufa is preferred to any rigid categorisation, in order to try and appreciate these environments from a Mesolithic perspective. The sensual qualities of tufa, its appearance and texture are considered and the way in which it transformed the landscape is also discussed.

Figure 5.1 Map of tufa deposits mentioned in the text (refer to Table 5.1)

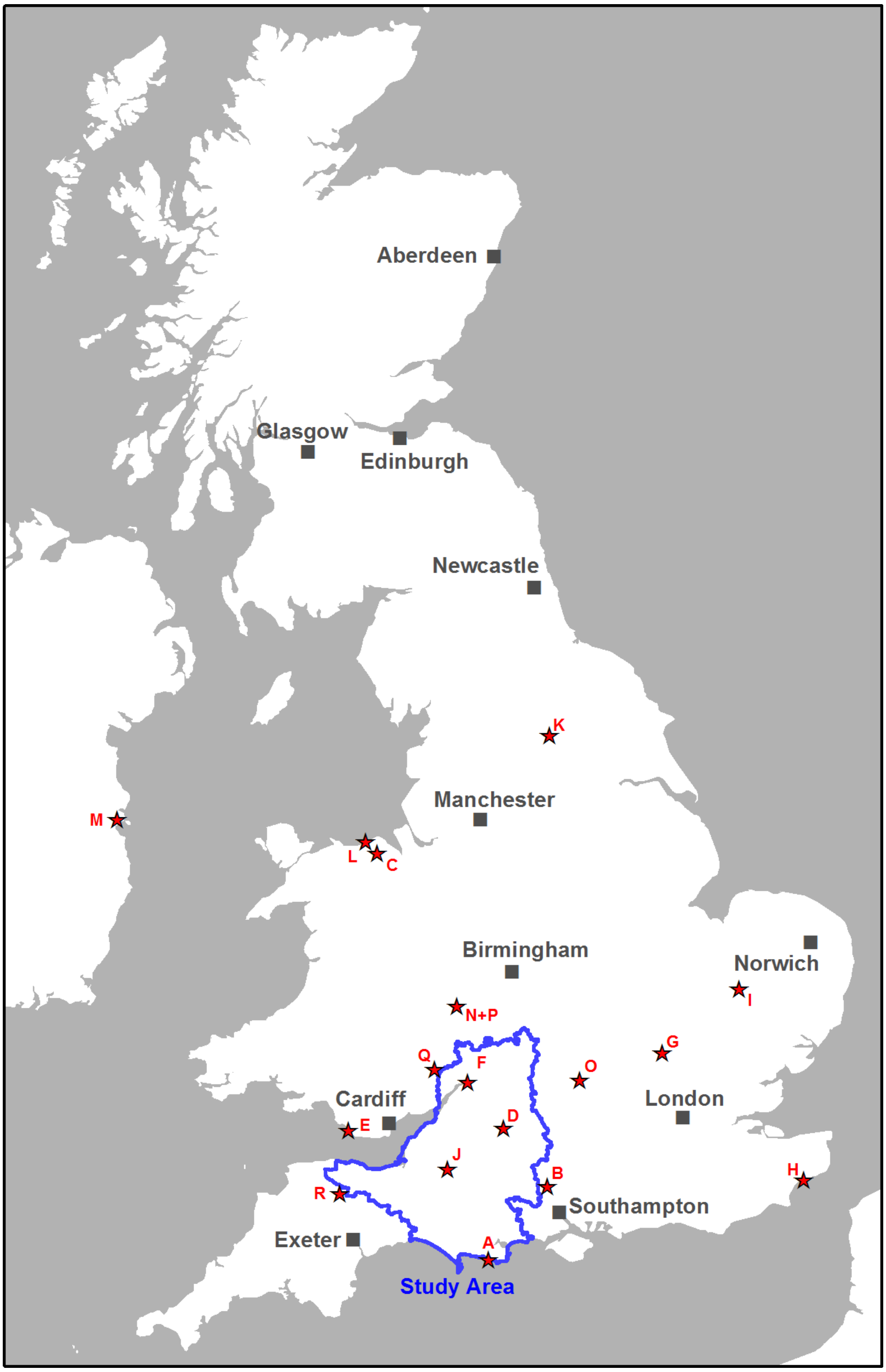


Table 5.1: tufa sites mentioned in this chapter

Site	County	Approximate dates for the onset of tufa formation and cessation	Mesolithic artefacts	Bibliographic reference	ID
Blashenwell	Dorset	*c.* 9000BP to 5000BP	lithics and faunal remains	Preece 1980	a
Bossington	Hampshire	*c.* 9340BP to 6750BP	charcoal *	Davies and Griffiths 2005	b
Caerwys	Clwyd	late glacial to *c*. 6000BP	non known	Pedley 1987	c
Cherhill	Wiltshire	*c.* 7230BP	Mesolithic artefacts	Evans and Smith 1983	d
Cwm Nash	Glamorgan	not known but post-glacial	Mesolithic artefacts	Preece and Bridgland 1998	e
Frocester	Gloucester	not known but early Holocene	lithics	Price 2004	f
Hitchen	Hampshire	not known but late glacial	stray find	Kerney 1959	g
Holywell Combe	Kent	*c.*11530BP to *c.*6000BP	marine shells** stray find	Preece and Bridgland 1998	h
Icklingham	Suffolk	not known but post-glacial	none known	Holyoak *et al.* 1983	i
Langley's Lane	Somerset	*c.* 8500BP to not known	lithics and faunal remains	Davies and Lewis 2005	j
Knaresborough	Yorkshire	not known to present	none known	Pentecost 1991	k
Prestatyn	Denbighshire	*c.*8700BP to unknown	lithics and faunal remains	Clark 1938, Bell *et al.* 2007	l
Newlands Cross	County Dublin	*c.* 9720BP to *c.*7000BP	stray find	Preece *et al.* 1986	m
Shelsley Walsh	Worcestershire	*c.* 6700BP to present	none known	Pentecost *et al.* 2000	n
Sidlings Copse	Oxfordshire	*c.*9300BP to *c.*5065BP	none known	Preece and Day 1994	o
Southstone Rock	Worcestershire	*c.*6700BP to present	none known	Pentecost *et al.* 2000	p
The Biblins***	Herefordshire	not known to present	none known	none known	q

* The charcoal is of Mesolithic date, but may not be anthropogenic; it does however correspond with an increase in open country mollusca.

** Although not strictly Mesolithic artefacts they were found in the upper levels of the tufa which ceased at around 6000BP.

***This site is included as it was visited for a phenomenological perspective.

Figure 5.2: grades of tufas

Hardened tufa

Friable tufa **(Photo courtesy of Dr Jodie Lewis)**

Oncoidal tufa

Results and site summaries

Three tufa depositing spring sites (Langley's Lane, Blashenwell and Cherhill) were examined in detail for this study. The results of the lithic analyses and a summary of the sites are presented in this chapter and other sites used for comparative purposes are mentioned where relevant. The three springs are then considered within the wider framework of other tufa deposits in both the study area and the British Isles more generally. As for the Bath hot springs, their position in a wider theoretical landscape context is reflected upon in Chapter Six.

Langley's Lane, Midsomer Norton, Somerset

Location

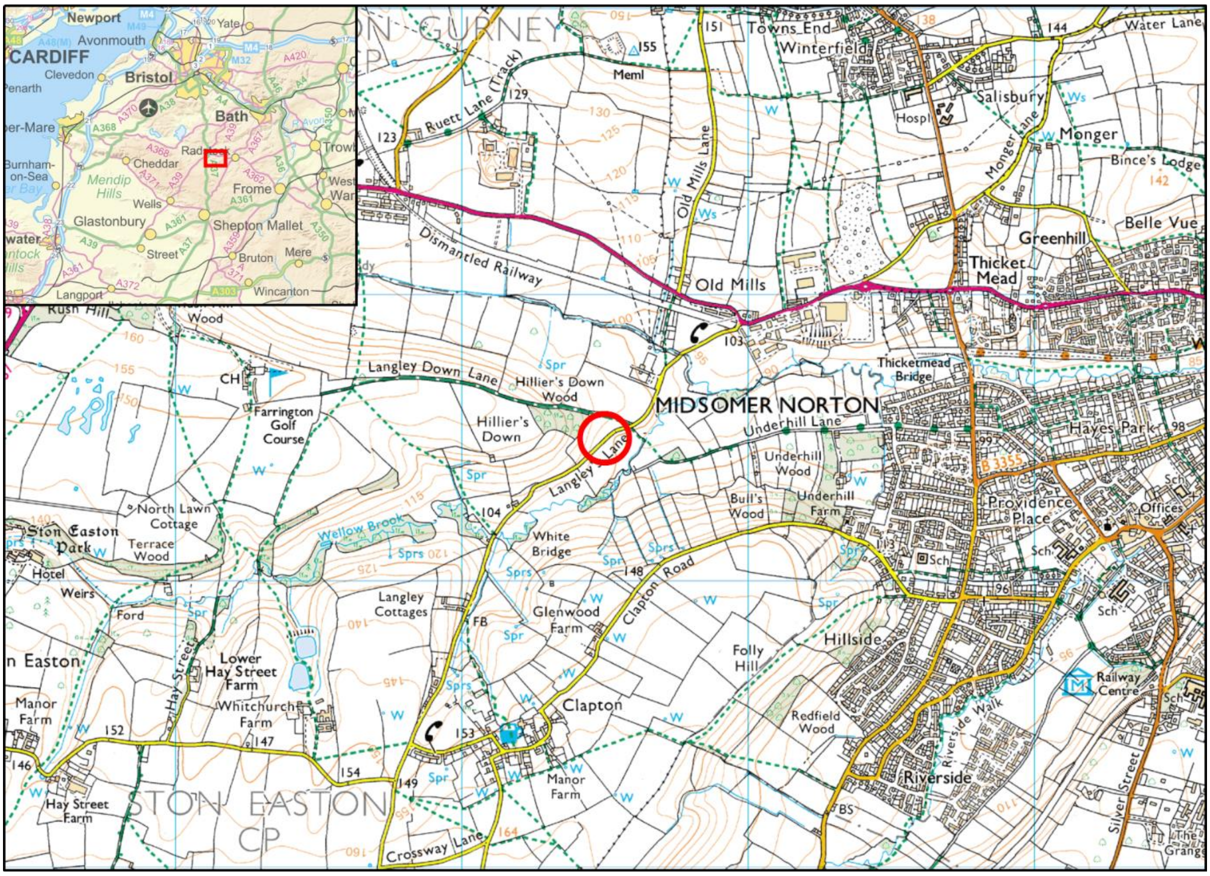
The Langley's Lane spring site (NGR ST 645545) lies at the foot of the Mendip Hills to the west of Midsomer Norton in the Radstock district of Somerset. The excavation site was situated just north of the Wellow Brook Valley at a height of approximately 120 metres AOD (Figure 5.3). The brook itself flows in an easterly direction across the Northern Mendip plateau, and then northward towards the lowlands of Midsomer Norton (Hardy 1999:45). The Carboniferous limestone Mendip Hills are approximately 250 -300 metres AOD and stretch from the Severn Estuary in the west to the Somerset borders in the east. They are the source of numerous calcium rich spring lines that result in tufa formation in the valleys.

Geology and hydrogeology

The underlying geology at Langley's Lane is Lower Lias Clay over white and blue Lias limestone. The drift geology is alluvium and calcareous tufa overlying Keuper Marl. The Wellow Valley tufa has a temporal range spanning some 9000 years (Willing 1985), and is still forming in places owing to active spring systems. In some areas of the valley the tufa deposits are up to five metres in depth (Willing 1985), although at Langley's Lane spring the tufa is approximately a metre deep (site archive). The Langley's Lane spring once issued at the interface between the valley side and the valley bottom, and is one of many that emerged or are still emerging in this section of the Wellow Valley.

The site of the spring is now only visible as a mound of tufa, which appears, from molluscan analysis data, to have started forming post 8,500BP (Davis 2005, Law 2012). The spring pipe itself is evident as a channel of pure tufaceous deposit, emerging from an iron rich palaeosol. This is overlain by clay and tufa deposits of varying composition, which in turn underlies a sandy subsoil. The tufa at Langley's Lane varies between soft and friable, granular and oncoidal. The oncoids formed owing to accretion around plant stems rather than resulting from the rolling action of fast moving water.

Figure 5.3: location map showing the site of the Langley's Lane spring



Historical and archaeological work carried out

Both archaeological and palaeoenvironmental work has been carried out in the vicinity of the spring. In 2004 and 2005 Davies and Lewis (2005, forthcoming) carried out research excavations at Langley's Lane designed to test Lewis' theory of oppositions and contrast in ritual activity between swallet hole inlet systems and springline outlet systems (Dr Jodie Lewis pers. com). Mesolithic artefacts were discovered in association with the spring deposits during these excavations and prior to this flint artefacts had been found in the vicinity of the spring when a non-systematic field survey of the area was conducted. These surface artefacts ranged in date from Mesolithic to Bronze Age.

Some investigations into the environmental history of this section of the Wellow Valley were carried out by the Quaternary Research Centre, Bath Spa University and Willing (1985). Willing conducted molluscan analyses of areas near to the Wellow Brook at Clapton, whilst Davis (2005) carried out a molluscan analysis immediately adjacent to the spring issue point, as part of the wider remit of the 2004 excavation and further molluscan analyses was undertaken on material from the 2005 excavation (Law 2012). These reports are detailed in the full excavation report (Davies and Lewis forthcoming), and have provided some evidence for the Mesolithic environment at Langley's Lane.

Evidence for the Mesolithic environment

Environmental change at the Langley's Lane tufa spring follows the same general pattern as most other tufa deposits. Molluscan analysis by Davis (2005) and Law (2012) has shown that in the immediate vicinity of the spring, conditions changed from being fairly open and lightly vegetated to more wooded, but still with open areas, by the onset of tufa deposition at around 8,500BP. The ground became increasingly damp and marshy but there were no large pools of water, although the molluscan analyses suggest the presence of occasional 'puddles'. Tufa deposition slowed as the tree canopy apparently thinned out, possibly due to anthropogenic influences, and eventually extensive opening up of the environment coincided with tufa deposition ceasing altogether. Large mammalian fauna including boar, auroch, and red deer, all animals that are found in boreal woodland, were present in the Mesolithic levels further supporting the molluscan evidence.

Lithic analysis

The lithics were collected over the course of two seasons of excavation. Due to the fine resolution of the stratigraphy, the assemblage is likely to represent a high percentage of the total population of lithic items deposited. Here, a general overview of the total sampled assemblage and a more nuanced analysis of some contexts, taking into account other material evidence, are presented. Excavated from both stratified and unstratified contexts, 1168 flint and chert artefacts were available for examination for this thesis. Other geological artefacts were also identified (see Tables in Appendix Two). For the purpose of this study only the palaeosol, the tufa and some of the features are considered in some detail, although an overview of the whole assemblage is presented. It should be noted that what is presented here is my own interpretation based on attending the excavation, some post excavation work, the available site archive, and from discussion with Dr Jodie Lewis, and may not reflect the views of the excavators.

The palaeosol

Sixty six flint artefacts (Table 5.2) were found in the palaeosol which is an iron rich rendzina, the surface of which dated to pre- 5984- 5808 cal BC (UBA- 20199). There was no evidence for the start date of soil formation. Animal burrows and pits were cut into the palaeosol, in places near the edge of the on-lapping tufa deposit. Not all of these contained finds and some of these are discussed on pages 170-183. The two context numbers from the palaeosol correspond to top of the palaeosol underlying the tufa (3031) and the palaeosol proper (3029).

The only microlith found at the top of the palaeosol below the tufa (3031) was a very small rod-like, micro-scalene triangle, which is best described as a hybrid of types 6 and 7b (Jacobi 1978) (Figure 5.20). The bladelets and flakes are late Mesolithic and the core fragment appears to have been utilised expediently (Figure 5.4). Five burnt pieces and a calcined fragment were also present.

Table 5.2: Langley's Lane palaeosol (3031)

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	0	0	0	0	**0**
core fragments	0	1	0	0	**1**
flakes complete	6	0	0	0	**6**
flakes broken	0	0	0	0	**0**
Blades	4	0	0	0	**4**
microliths and manufacture	0	0	1	0	**1**
other debitage	11	0	0	5	**16**
Total	**21**	**1**	**1**	**5**	**28**

Figure 5.4: Artefacts from the top of the palaeosol (3031)

Table 5.3: Langley's Lane palaeosol (3029)

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	1	0	0	0	**1**
core fragments	0	0	0	0	**0**
flakes complete	9	2	0	0	**11**
flakes broken	4	1	1	0	**6**
Blades	3	0	1	0	**4**
microliths and manufacture	0	0	0	0	**0**
other debitage	8	1	2	5	**16**
Total	**25**	**4**	**4**	**5**	**38**

Figure 5.5: Artefacts from the palaeosol (3029)

The only core in the palaeosol (3029) (Table 5.3) was an irregular chunk from which small bladelets had been struck. Stacking was evident where failed attempts at bladelet removals had been made. A core rejuvenation flake showed similar attributes and signs of utilisation. These pieces (Figure 5.5) and the cortex on some pieces seem to indicate a paucity of available raw material for knapping. Five pieces of knapping waste were burnt. One very small medial bladelet fragment and the thin bladelet scars on the pieces from both contexts of the palaeosol suggest the production of microliths.

The tufa

The tufa deposit varies in thickness and its total extent was not defined. Some of the spring water was channelised leading to the formation of a tufa filled ‘gully’ from which the tufa seems to have spread. The tufa at the bottom of this gully and the spring spout was more oncoidal and laminar than that overlying it suggesting that the flow of water was faster at first causing it to ‘cut into’ the palaeosol and gradually became quieter leading to the deposition of finer, more friable tufa over time.

Tufa layer (1007)

This tufa overlay the palaeosol (3031) in parts of the site, was creamy white in colour and of a friable consistency. A cluster of fifteen flints (Table 5.4, Figure 5.6), an animal tooth, bone and an angular chunk of tufa covered Lias were recovered from this tufa. A radiocarbon date from *Bos sp.* bone came out at 6494-6351 cal BC (UBA-20293) dating the tufa to the late Mesolithic, which is agreeable with the width of the dorsal scars on the core rejuvenation flake and the size of the thin flakes and bladelets. The pieces are all patinated, some quite deeply and a larger primary flake suggests that these pieces were all derived from chalk flint.

Table 5.4: Langley's Lane tufa (1007)

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	9	0	0	0	**9**
flakes broken	1	0	0	0	**1**
Blades	2	1	1	1	**4**
microliths and manufacture	0	0	0	0	**0**
other debitage	1	0	0	0	**1**
Total	**12**	**1**	**1**	**1**	**15**

Figure 5.6: Artefacts from the tufa (1007)

Top of tufa below subsoil (1008)

This deposit was orangey-brown in colour with whiter tufaceous inclusions, which in places lay above the creamier more friable tufa (1007) and seems to be evidence of an intermittent or drying out phase in the sequence of events at Langley's Lane. Eighty three pieces (Table 5.5) were recovered from this context and although dominated by flakes and other debitage, the assemblage is clearly of late Mesolithic date. The cores again are roughly worked out with bladelet removals and signs of attempted but failed removals. Four pieces show signs of formal retouch, but do not fall into formal categories, and a further five pieces have been used expediently. No microliths were recovered from this context but a microburin and possibly some of the small bladelet fragments again indicate that they were produced. A lump of ironstone, four pieces of sandstone and a quartz clast were also recovered from this tufa layer (Figure 5.7), along with a piece of tufa that resembles bone, and fragments of bone identified as Bos *sp.*

Table 5.5 Langley's Lane tufa below subsoil (1008)

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	3	0	0	0	**3**
core fragments	4	0	0	0	**4**
flakes complete	14	4	0	2	**19**
flakes broken	7	0	0	0	**7**
Blades	10	3	4	1	**16**
microliths and manufacture	1	0	0	0	**1**
other debitage	29	1	0	3	**33**
Total	**68**	**8**	**4**	**6**	**83**

Figure 5.7: Artefacts from the tufa (1008)

Tufa layer 3002

This was a beige-brown to creamish-white tufa with clay, and containing frequent pieces of oncoidal tufa, that overlay the palaeosol in parts of the site. Sixty six pieces of flint, six pieces of chert (Table 5.6) and thirteen stones (Figure 5.8) were recovered from this context. The only formal tool was a scraper made on a miscellaneous piece of debitage. It is 'unfinished', although would be perfectly serviceable, and therefore does not fit into the usual categories employed for scrapers. It is possible that the piece was left this way deliberately as the unretouched part would make a good expedient point perhaps for piercing. The presence of bladelets and small dorsal scars on the core fragments, suggests a late Mesolithic date for this assemblage. The chert is mostly greensand but a small flake of Portland chert is also present, along with red haematite stained sandstone, some haematite clasts, yellow sandstone, a piece of micrite and a piece of limestone.

Table 5.6: Langley's Lane assemblage tufa (3002)

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	0	0	0	0	**0**
core fragments	2	0	0	0	**2**
flakes complete	12	2	1	2	**17**
flakes broken	4	12	0	0	**16**
Blades	3	2	0	0	**5**
microliths and manufacture	0	0	0	0	**0**
other debitage	24	2	1	6	**32**
Total	**45**	**18**	**2**	**8**	**72**

Figure 5.8: Artefacts from the tufa (3002)

Features

Several interesting features were excavated, including pits that contained finds, empty pits and discrete spreads of tufa and clay that sometimes contained finds. A representative sample of these is outlined here.

Shallow cut (1049) [1048]

This shallow feature cut into the palaeosol, some 0.5 m by 0.25 m and 0.03 m to 0.08 m deep, was filled by soft, brown clay and contained twenty six stones, seventeen flints (Table 5.7) and two belemnites (Figure 5.9 and 5.22). It disappeared under the trench edge, so was not fully excavated, and there is a possibility it was recut (site archive).

Table 5.7: Langley's Lane shallow cut (1049) [1048]

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	4	4	0	1	**9**
flakes broken	0	3	0	0	**3**
Blades	0	3	0	0	**3**
microliths and manufacture	0	0	0	0	**0**
other debitage	2	0	0	0	**2**
Total	**6**	**10**	**0**	**1**	**17**

There is no apparent patterning to the flints in this cut, which contained no formally retouched items, although ten artefacts were edge damaged and at least two of those had wear indicative of utilisation. The flint varied in stages of patination, suggesting that this was not material from a single core, one flake was burnt and tufa was adhering to ten pieces. The stones consisted of various red and yellow sandstones, a piece of ironstone and four pieces of limestone including some small fragments of lias. The belemnites were fifteen and twenty millimetres in length and both damaged at the tips.

Figure 5.9: Artefacts from shallow cut (1049) [1048]

Pit (3028) [3030]

This was a small pit some 0.13 m in diameter and 0.14 m deep, filled by a brownish clay turning greener toward the bottom possibly owing to the admixing of degraded limestone that made up approximately 75% of the fill. Nineteen flints (Table 5.8), a fragmented bone and a piece of micaceous sandstone, which glistens when turned to the light (Figure 5.10), were in the fill. There is no patterning to the flint, which is late Mesolithic. The core is roughly worked and lightly burnt and a core rejuvenation flake exhibits signs of stacking. Otherwise, there is a mixture of pieces, with only one flake showing signs of being shaped for utilisation (not formal retouch).

Figure 5.10: Artefacts from the pit (3028) [3030]

Table 5.8: Langley's Lane pit (3028) [3030]

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	0	0	0	1	**1**
core fragments	0	0	0	0	**0**
flakes complete	6	0	1	1	**8**
flakes broken	1	0	0	1	**2**
Blades	4	0	0	0	**4**
microliths and manufacture	0	0	0	0	**0**
other debitage	3	1	1	0	**4**
Total	**15**	**1**	**1**	**3**	**19**

Pit (3011) [3012]

This was the remains of a sub semi-circular pit, cut into the top of a still active soil (3003) which overlay bedrock but effectively was level with the top of the palaeosol. At 1.00 m in diameter, it was truncated by the trench edge, and the surviving fill was approximately 0.05 m deep and contained fourteen flint and two chert artefacts (Table 5.9) animal teeth, bone and four stones (Figure 5.11). A cluster of flint was also found on the periphery of the pit. This pit had been cut into by another smaller clay filled pit, some 0.25 m in diameter and 0.12 m deep. This second pit also seems to have been cut into and it is here that a discrete lens of tufa (3015), described on page 181, looks to have been deliberately deposited. A small spread of clay (3009), also page 179, was adjacent to these features.

There is no patterning to the flint in this pit. There is an unfinished microlith of a late Mesolithic aspect and one flake appears to have been modified, but not formally retouched. It does not correspond to a formal tool category, but looks to have been used for cutting. The stones include a piece of sandstone which has some yellow staining, a fragment of calcareous mudstone or limestone and an unidentified stone.

Table 5.9: Langley's Lane assemblage (3011) [3012]

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	3	1	1	1	**5**
flakes broken	2	0	0	0	**2**
Blades	1	0	0	0	**1**
microliths and manufacture	0	0	1	0	**1**
other debitage	5	0	0	2	**7**
Total	**12**	**0**	**1**	**3**	**16**

Figure 5.11: Artefacts from pit (3011) [3012]

Pit (3005) [3006]

This was a small semi-circular pit cut into the palaeosol (3031), some 1.33 m by 0.96 m and 0.9 m in depth, filled with dark reddish clay, which contained five pieces of flint, three of which were small fragments possibly removed from the core and a bladelet, which are late Mesolithic (Table 5.10, Figure 5.12). The core is an irregular bladelet core, with stacking and has been worked to complete exhaustion.

Table 5.10: Langley's Lane pit 3005 [3006]

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	1	0	0	0	**1**
core fragments	0	0	0	0	**0**
flakes complete	1	0	0	0	**1**
flakes broken	1	0	0	0	**1**
Blades	0	0	0	0	**0**
microliths and manufacture	0	0	0	0	**0**
other debitage	2	0	0	0	**2**
Total	**5**	**0**	**0**	**0**	**5**

Figure 5.12: Artefacts from pit 3005 [3006]

Pit (3026) [3027]

This was a small semi-circular pit cut into the palaeosol (3029), 0.35 m by 0.17 m and 0.19 m deep. It contained charcoal (5% of fill), eight pieces of flint (Table 5.11) and twelve stones (Figure 5.13), which were at the bottom of the pit and filled with a fine graded sediment. This pit underlay the tufa edge and may have respected a previous tufa boundary (site archive). There is no patterning to the flint in the deposit, which contains one piece of burnt flint and a modified blade, which appears to have been fashioned into a tool for piercing. As for many other pieces in the Langley's Lane assemblage, the working on this item does not fall under the remit of formal retouch, and has been minimally worked to obtain the required form. The stones included seven pieces of yellow sandstone, a piece of red mudstone, a piece of iron rich stone, a small piece of quartz, a chert like stone and one unidentifiable stone.

Table 5.11: Langley's Lane assemblage (3026) [3027]

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	2	1	0	1	**4**
flakes broken	0	0	0	0	**0**
blades	0	1	1	0	**1**
microliths and manufacture	0	0	0	0	**0**
other debitage	3	0	0	0	**3**
total	**5**	**2**	**1**	**1**	**8**

Figure 5.13: Artefacts from (3026) [3027]

Outer remains of a pit (3019) [3020]

This was the remains of a pit-like feature into which pit [3027] (see page 175) had been cut. Pit [3027] was also cut into the palaeosol (3029). This feature [3020], filled with a brownish clay, contained six flints and eight stones. Two of the flint flakes are from pebble flint and the stones include quartz, sandstones, ironstone and a tiny piece of coal (Table 5.12, Figure 5.14).

Table 5.12: Langley's Lane assemblage (3019) [3020]

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	3	0	0	0	**3**
flakes broken	1	0	0	0	**1**
Blades	0	0	0	0	**0**
microliths and manufacture	0	0	0	0	**0**
other debitage	2	0	0	0	**2**
Total	**6**	**0**	**0**	**0**	**6**

Figure 5.14: Artefacts from (3019) [3020]

Pit (3025) (3007) [3008]

This irregularly cut pit, 0.27 m by 0.15 m which cut into a second pit, contained a 'ball' fashioned from a coarse and sandy tufa (3007), with occasional charcoal inclusions, and was further filled by a tufaceous clay (3025). The pit seemed to have been cut to respect the on-lapping tufa deposit. The deliberately fashioned, tufa 'ball' was approximately 0.08 m in diameter. It was not as 'ball like' as the example found in pit [1032] (see page 182) and a piece of flint had been placed into its centre. Six flints, an animal tooth, and nine stones were found in the fill of the pit (Table 5.13, Figure 5.15). The microlith, a truncated rod (type 6: Jacobi 1978), was the only retouched piece amongst pieces of knapping debitage. The stones consisted of four pieces of ironstone, one of which had quartz clasts, three pieces of yellow micaceous sandstones and two unidentified stones. Again, there is no apparent patterning in this context.

Table 5.13: Langley's Lane assemblage (3025) (3007) [3008]

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	3	0	0	0	**3**
flakes broken	0	0	0	0	**0**
Blades	0	0	0	0	**0**
microliths and manufacture	0	0	1	0	**1**
other debitage	1	0	0	1	**2**
Total	**4**	**0**	**1**	**1**	**6**

Figure 5.15: Artefacts from pit 3007 3025 [3008]

Clay spread (3009)

This was a discrete spread of brown clay (3009), surrounded by tufa, some 0.05 m by 0.03 m and 0.04 m deep, which had within it three pieces of flint and some small stones (Table 5.14, Figure 5.16). The core was made on a cortical chunk of flint and has been worked down to a state of exhaustion for the production of small bladelets, one of which was possibly the example found next to it in the clay spread. The more significant items here may be the piece of red ironstone, which appears to be burnt, ten pieces of yellow sandstone, a small fragment of quartz, and three miscellaneous small stones. The ironstone contains quartz-like inclusions which shine when turned to the light.

Table 5.14: Langley's Lane assemblage (3009)

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	1	0	0	0	**1**
core fragments	0	0	0	0	**0**
flakes complete	0	0	0	0	**0**
flakes broken	0	0	0	0	**0**
Blades	1	0	0	0	**1**
microliths and manufacture	0	0	0	0	**0**
other debitage	1	0	0	0	**1**
Total	**3**	**0**	**0**	**0**	**3**

Figure 5.16: Artefacts from (3009)

Tufa lens (3015)

This discrete lens of mid-yellowish, white tufa approximately 0.05 metres in diameter and 0.035 metres deep, found within a brownish red, clay deposit (3013) contained six pieces of flint, none of which is worked (Table 5.15, Figure 5.17). One piece of cortical debitage had quartz like inclusions in the cortex and glistens when turned to the light.

Table 5.15: Langley's Lane assemblage (3015)

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	1	0	0	0	**1**
flakes broken	0	0	0	0	**0**
Blades	2	0	0	1	**3**
microliths and manufacture	0	0	0	0	**0**
other debitage	1	0	0	1	**2**
Total	**4**	**0**	**0**	**2**	**6**

Figure 5.17: Artefacts from (3015)

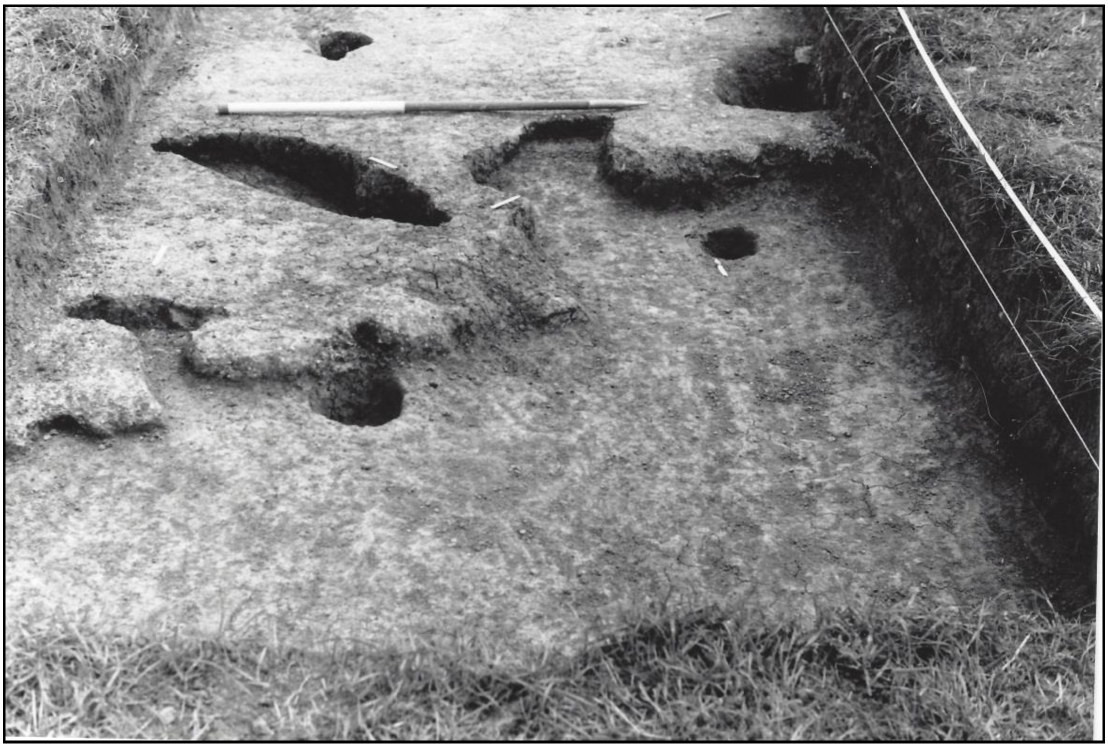
Pit [1032]

This pit contained a deliberately shaped ball of tufa (1033) (Figure 5.18) and was also filled by silty clay with tufaceous inclusions. There were no other artefacts recovered. The tufa ball was an extremely pure tufaceous deposit. The molluscan fauna from the ball was analysed (Davis 2005) and found to differ markedly from the other tufas sampled from the site and from the lower Wellow Brook valley when compared with sequences recorded by Willing 1985). It is therefore wholly possible that the tufa to make this ball was taken from an area not immediately adjacent to the Langley's Lane spring perhaps coming from a different deposit elsewhere.

Figure 5.18: tufa ball in pit [1032] (replica in hand)

(photo courtesy of Dr Jodie Lewis)

Figure 5.19: Pits at Langley's Lane respecting the tufa edge



(photo courtesy of Dr Jodie Lewis)

Further contexts

A number of slightly amorphous features were also excavated. Some of these were animal burrows, and others appeared to be pits but were not distinct and contained no finds. At least two more actual pits were excavated that contained no finds. It is possible these once had organic materials in them that have since disappeared. Some of the animal burrows did contain finds (for example, see 1010 [1026] in Appendix Two) and whilst this is very likely due to taphonomic processes, there is a possibility some of these materials were deliberately deposited into what were naturally occurring features.

Total Assemblage Analysis

Table 5.16: Langley's Lane total sampled assemblage

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	20	1	2	1	**23**
core fragments	21	2	0	3	**25**
flakes complete	223	50	38	15	**311**
flakes broken	108	24	6	3	**140**
Blades	100	24	15	6	**136**
microliths and manufacture	1	0	20	0	**21**
other debitage	383	16	19	98	**512**
Total	**856**	**117**	**100**	**126**	**1168**

Raw material

A range of raw materials are present in the Langley's Lane assemblage. The majority of the worked lithics are of flint (97%), with some use of cherts (3%) including greensand chert, a mottled brown-grey chert and a single flake of Portland chert. At least some of the flint appears to have been obtained directly from a chalk source. This flint varies in colour from mottled grey to brown and black. It can be surmised that at least some of this material was obtained from chalk with flints; the Marlborough Downs are some forty kilometres away and are a likely source of origin. Whilst some of the cortical pieces are chalky, other debitage is characteristic of flint pebbles from secondary sources.

The raw material, other than the pebble flint, seems to have been brought to site as small, prepared nodules, which would have required minimal trimming to produce useable flakes. There does not appear to be much evidence of larger nodules being imported, with the largest primary flakes (5% of the total assemblage) present being less than sixty millimetres across (Table 5.17). This may be further substantiated by the fact that all the cores are exhausted, and worked out to the point where removals appear to have been attempted where there was little chance of success. Concave faces, repeated stacking, hinged removals and bashed edges indicate the effort expended to attempt removal of further flakes. Additionally, it appears that core rejuvenation flakes were not discarded but re-prepared for use as cores, whilst cortical chunks were occasionally used to produce bladelets. This seems to suggest that there was little raw material to be had at this site and what was there was used intensively. Indeed, there are no naturally occurring flint sources in this area of Somerset, and it should be considered that this location was never a camp of any permanence, negating the need to 'stockpile' or cache raw material. Mesolithic flint has also been noted nearby in other parts of the district of Radstock, where it occurs in significant concentrations (personal observations), and it is there perhaps that more permanent camps were set up.

Table 5.17: Debitage size

Debitage Size/mm2	10	20	30	40	50	60	70
Total %	19	46	25	9	1	<1	0

Chronology and technology

Generally the assemblage is of late Mesolithic date, with a possible early Neolithic component; this has largely been deduced on typological grounds. The presence of small geometric scalene triangles, indicate a post 8,500 BP date for occupation at the site. The twenty microliths are of major interest in this assemblage (Figure 5.20). They make up just fewer than 2% of the total number of lithics, and outnumber the other formal tool types present. The microliths consist mainly of scalene triangles and rods, as well as an equilateral triangle and some indeterminate types, and are all between 3mm and 6mm in width, and most are less than 15mm in length, which would suggest they were a component of composite tools. Some of the scalene-micro triangles are type 7b and fit comfortably into Jacobi’s Sussex Wealden microliths typology (Jacobi 1978), others are potentially type 6 / type 7 hybrids and /or could be better described as truncated rods. It is also highly unusual to find micro-scalene triangles in Somerset (pers. com Abigail Bryant). The microliths are evenly spread throughout the assemblage, and are present in contexts that represent both structured and unstructured deposition. The presence of microburins and bladelet fragments attest to the manufacture of microliths at the site. The earliest secure context is the rendzina palaeosol, the surface of which can be dated typologically to the later Mesolithic by the presence of a rod-like micro-scalene triangle. This would fit favourably with the radiocarbon dates of 6494-6351 cal BC (UBA-20293) and 5984- 5808 cal BC (UBA- 20199) taken from the tufa.

Other formally retouched tool types include scrapers, blades probably used for cutting, piercers, gravers and a single denticulate. The majority of the tools present however are more expedient, with minimal formal retouch having been used, for example, to produce scraping edges and piercing points. It seems to have been the case that on cutting blades, the simple act of using abrasive action against a stone has resulted in producing the backing required on the opposite lateral edge, to protect the hand or for hafting. The assemblage includes other classic Mesolithic characteristics: careful core preparation, the utilisation of cortical pieces, and a marked tendency toward narrow blade and bladelet production (Table 5.18). Although, at least one piece in the sampled assemblage is early Neolithic (a broadly leaf shaped, arrowhead) this was recovered from the subsoil.

Table 5.18: Blade widths shown as percentages

Blade width/mm	**3**	**6**	**9**	**12**	**15**	**15**
Total %	9	18	26	28	12	7

Figure 5.20: Microliths and piercer (top right) from various contexts

The majority of the cores do not conform to the classic core types expected of the period, and can be generally described as multifaceted and irregular. Most have been used to produce bladelets, likely for microlith production, although this does not preclude their earlier use as the raw material for the production of flakes and blades some of which are present in the assemblage. Some of the smaller bladelet cores exhibit signs of careful platform preparation and the difficulty of working cores of this size demonstrates some proficiency. By contrast many of the larger cores were less well prepared and may indicate more expedient use or were perhaps worked by less experienced knappers. The latter point may also be true in terms of the aforementioned knapping 'errors' evident on the cores. As for the Bath Hot Spring (Chapter Four), this may represent the work of novice knappers; however, the lack of raw material favours the explanation that raw material was at a premium and therefore worked to exhaustion.

General nature of activity implied by the lithic assemblages and other evidence

There are implications for this site from the lithic evidence alone. It appears that Langley's Lane might have been frequented by one or more groups, not for any great length of time and they made repeat visits. That the lithics were spread throughout the tufa mound indicates approximately one thousand years of occupation based on an estimated rate of tufa deposition of five centimetres per one hundred years. However, based on an average rate of tufa deposition (based on other known sites) of seven centimetres per one hundred years, this could represent as little as 300 years of time. These figures apply only to the excavated area of the site, as the tufa deposit varied in thickness over the general area (auger data, site archive). The presence of re-cut pits also suggests that the site was visited on more than one occasion and that not all the features are contemporary.

Activities involving lithic material appear to lean toward but not limited to food procurement and preparation, which might have included the preparation of shafts for hafting points and plant processing. The remains of large animals suggests that deer, auroch and boar were probably consumed near to the spring and signs of knapping activity suggest that at least some of the tools needed to process the carcasses were produced on site. Some burnt flint,11% of the total assemblage, and small pieces of charcoal in some of the deposits (personal observation and site archive) seems to indicate that people stopped in this location for a long enough period to make fires, although evidence of hearths were not found.

The presence of archaeological features, including the pits and a deliberately placed spread of stones makes this site more than a temporary 'one stop' hunting camp. The ground was wet and it would seem to have been more practical to have sited a camp slightly further away from the spring issue point. These points imply that people were not taking the more practical option and that they were at the spring for other reasons too. The pit deposits are the most obvious indicator of this and the ball of tufa that was found in the one is an unprecedented discovery that indeed seems to indicate that some kind of activity of a non-functional nature took place.

Taphonomic processes

Many pieces have tufa adhering to their surfaces (Figure 5.21). This applies to 7% of the total assemblage. Ten pieces (12%) of the tufa covered pieces were found in the shallow cut [1048]. Other than a single piece from pit [3012], all the other pieces were recovered from deposits.

Figure 5.21: flint from Langley's Lane with tufa adhering

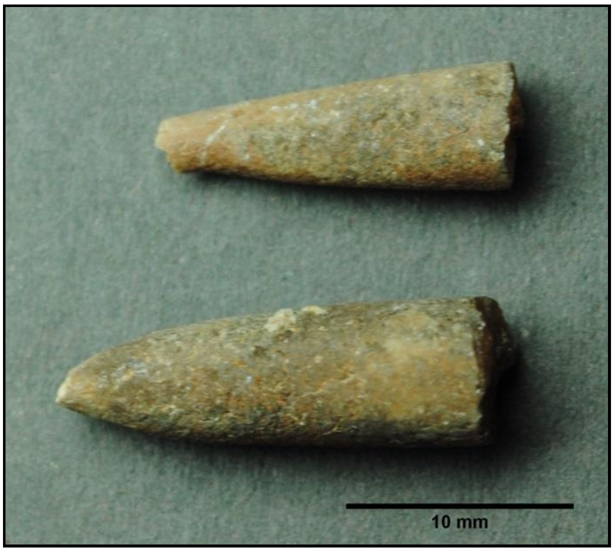
Deposition: votive or functional?

It has already been intimated, both here and by Lewis and Davies (2005) that Langley's Lane was a site where structured deposition possibly of a votive nature took place. Certainly the pit deposits are of utmost importance and do seem to indicate a 'ritual' element to the site. Even if the flint, bones and stones in the pits could be explained in functional terms, the tufa 'balls', the spreads of clay and tufa, and those pits which apparently contained nothing suggest an intimate engagement with the earth, which has little practical purpose. The question of whether the 'balls' of tufa had meaning is almost rhetorical, but that these were placed in pits and obviously shaped by the human hand grants them unrequited status in the Mesolithic world, and no parallels are known. They might have been a symbolic representation for the moon, or another celestial body. Alternatively, the resultant shape might have been fortuitous and they may simply represent the material they are made from, that is the tufa itself, for it is a powerful metaphor in its own right (see page 223).

The geological pieces, along with flint and chert artefacts and bone, are constituent components of structured deposits at the site. All are derived from Carboniferous geology, and consist of numerous red and yellow sandstones, with more occasional haematites, quartz, coal and fossils (see Appendix Two for full lists by context). Although apparently diverse in nature, there is a possibility that they could all have been picked up from one of a few localised areas in the region where all these materials occur together. Bradley (2000) and Lewis (2008, 2011) have explored the notion of transplanting elements of the landscape from one location to another and this could be in essence what is occurring here (the same could apply to the tufa and clay described above). The interplay of colour and texture may have some bearing on the choice of these materials, or there may be an altogether more functional explanation: many of these pieces, for example, the coal and haematites could have been used as pigment, Interestingly the two belemnites appear to have what might be use damage at their pointed ends, again indicating that prior to deposition these may have had a practical purpose, they would make excellent tools in their own right, for example, as fabricators. The belemnites are also reminiscent of the ends of antler tines, and given the special role of deer in Mesolithic lives, it is not outside the realms of possibility that they were used as fossil charms for this reason (see Conneller 2004, 2011).

The significance of the geological pieces, the pits and their contents is further discussed in Chapter Six

Figure 5.22: The *belemnites*

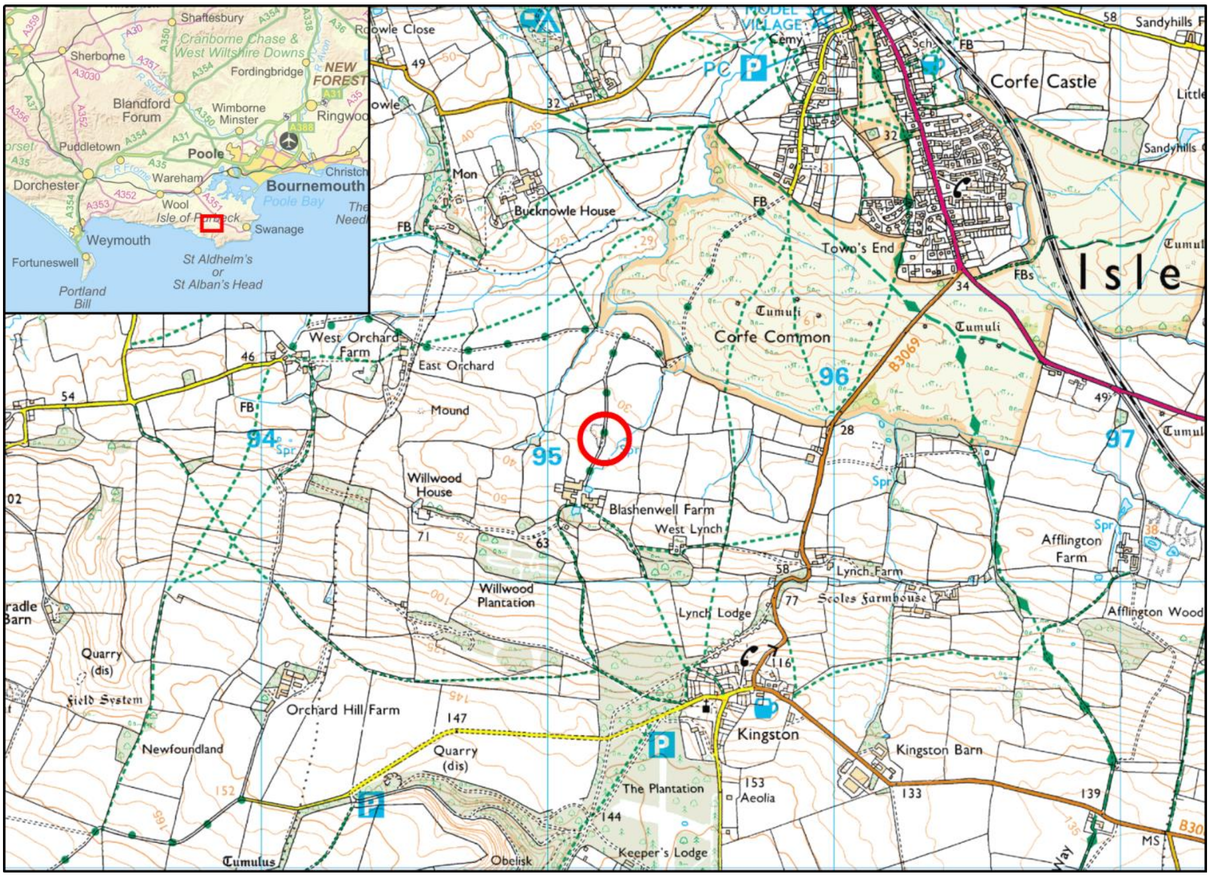


Blashenwell Pit, Dorset

Location

Blashenwell Pit (NGR SY952805) lies in the Corfe valley, approximately two and a half kilometres southwest of Corfe in Dorset, in the region known as the Isle of Purbeck (Figure 5.23). The spring is located to the north-east of Blashenwell Farm at approximately forty metres AOD. The site was first remarked upon in 1886 by Mansel-Pleydell who noted flint and bone in a large marl pit dug into the tufa. However, the deposit was not examined for its archaeology until ten years later by Reid (1896) (see page 192). The pit that contained the lithics, and a second smaller pit, 200 metres to the north east, are shown as chalk pits on early Ordnance Survey maps. The excavated areas represent a very small part of the total area of tufa deposit (Figure 5.23). The pits are no longer open, although the larger of the two is visible as a bank.

Figure 5.23: Location map showing the site of Blashenwell Pit.



Blashenwell geology and hydrogeology

The Isle of Purbeck is a peninsula that is separated geologically from the rest of Dorset by the Purbeck Hills; these are a ridge of chalk-with-flints and effectively the southern reach of the same chalk bands that make up the Downs of Wiltshire and Dorset. Blashenwell lies to the eastern end of this chalk ridge. The lowland landscape is composed of Wealden Clays in the Corfe valley which itself lies north of the Jurassic limestone plain. The same Jurassic limestone forms the coastline surrounding the west, south and east of the Isle of Purbeck.

The Corfe River runs in a southerly direction and splits into two brooks which have effectively cut through the chalk to form the hill upon which now stands the Medieval Corfe Castle. This natural opening in the chalk ridge was the only lowland route from the Isle of Purbeck to the rest of the mainland. It is near to this hill that the Blashenwell tufa depositing spring is situated and one can surmise that the hill and the watery cuttings through the chalk would have been distinctive topographical features during the Mesolithic, perhaps acting as markers in the landscape.

The spring at Blashenwell still issues periodically but no longer deposits the tufa which is up to four metres thick in places and around eight hectares in area (Clark *et al.* 1938, Preece 1980). Worked flint and charcoal occurred in greater concentrations toward the middle of the deposit (Reid 1896: 70) suggesting that tufa was still forming after the main phase of Mesolithic activity at the site had ceased. Preece (1980), based on radiocarbon dates, estimates that tufa first formed at around 9400BP and would have ceased just after 5000BP. This is commensurate with other British early Holocene tufa deposits. During this time the runoff from the spring flowed over low ground into a small brook that eventually joined the Corfe River (Preece 1980). Elevated ground in the form of a small ridge overlooks the site.

Historical and archaeological work carried out

The site was first described by geologist Mansel-Pleydell (1886) who noted the presence of worked flints and animal bone in the tufa from the marl pits, although his main interest was the geological nature of the tufa deposit and the molluscan fauna. Later, Reid 'excavated' an area of the marl pit, recovering the lithics referred to in this thesis. He described the deposit as a 'kitchen midden' because of the faunal remains, on which he also made further observations (1896: 72). Reid also remarked that the archaeological remains (the lithics) belonged to "a very low race" (1896: 72). He further noted that the same lithic technology was present throughout the tufa deposit, ascribing it to an uncultured early Neolithic tribe, lacking sophisticated material culture such as pottery (Reid 1896), a logical assumption at that time as the Mesolithic was not recognised widely as a period in its own right (see Chapter One).

The lithics have previously been examined in some detail (Reid 1896, 1897, Clark *et al.* 1938, Bond 1941, Wymer 1977). Preece (1980) re-examined these previous works as part of a wider interest in tufa deposits, building on previous assessments of the molluscan fauna by Kennard (in Clark *et al.* 1938) and Bury (1950). Based on an assessment of Reid's observations, Francine (1961) proposed a simplified stratigraphical sequence for the site. Preece improved on this through selective auguring and excavation carried out for the purpose of molluscan sampling (Figure 5.24).

Despite these works and mention of Blashenwell Pit in the wider literature, there have been no very recent excavations carried out at the site, which is now designated as a Site of Special Scientific Interest (SSSI). The potential for more work at Blashenwell is great. The extensive tufa deposit may have sealed any features of Mesolithic date that might be present and there is little evidence of further activity at the site until the Roman period, aside of a polished Neolithic axe recovered from the surface (Brown 1970).

Evidence for the Mesolithic environment

Although charcoal was present throughout the tufa deposit (Reid 1896, Clark *et al.* 1938), no formal charcoal identification has ever been carried out. However, oak, elm, and hazel leaf and nut prints in the tufa, identified by Reid (1896), indicate a wooded environment. The results of molluscan faunal analysis (Kennard in Clark *et al.* 1938, Bury 1950, Preece 1980) support the presence of woodland or scrub, with very damp ground but no permanent pools or standing water (Kennard in Clark *et al.* 1938, Preece 1980). It has been suggested both by both Reid (1896) and Preece (1980) that the spring, on occasion, did not issue. Grey horizons in the tufa are interpreted as intermittent episodes of drying out of the ground surface during phases of spring inactivity by Preece and this makes sense in light of the molluscan evidence (Preece1980).

Figure 5.24: Stratigraphy

(1)

	Feet.
Black soil: at its base Roman coins, Romano-British pottery, shells of oyster, whelk, cockle, *Helix aspersa*, *H. ericetorum*, *H. virgata*, &c.	1
Hard tufa with leaves of hazel, elm, and oak, land-shells, flint-flakes, and charcoal. Granular tufa, fairly soft, flint-flakes, bones of pig and deer, limpets and other marine shells, land snails, including *Clausilia laminata*, *Bulimus montanus*, &c., much charcoal. Loamy and marly tufa, with small land-shells, occasional *Limnæa truncatula*, rare flint-flakes, and charcoal. Loam with stony base.	8

(2)

cm's	deposit
0-25	modern rendzina soil
25-40	light brownish grey tufa
40-50	light grey tufa
50-70	light brownish grey tufa
70-112	soft light grey tufa
112 -142	light brownish grey tufa
142-300	light grey tufa, nodular
300	Weald Clay

Descriptions of the stratigraphy of Blashenwell Farm Pit by (1) Reid (extract from1896:69) and (2) adapted from Preece (1980:347).

Although the stratigraphic sequences are not from the same part of the site Reid's 'granular tufa' relates to approximately 40- 112 cm and his 'loamy and marly tufa' to 112-300 cm approximately in Preece's section.

The bones of large mammalian fauna, including boar, red and roe deer, and auroch, which were more prevalent in the middle of the deposit, and concomitant with the flint and charcoal (Reid 1896:70), were identified by Newton (Reid 1896:71). Marine shells (limpets and periwinkles) were also present, the nearest source of which today is Chapman's Pool, some three kilometres from Blashenwell (A Mesolithic chert pick is recorded from here on the Dorset HER). The remains of Peppery Furrow Shell, found with the other marine shells, would have been sourced from an intertidal source, although this would probably have been a feature of the valley landscape when the coastline was further out than it stands now (Reid 1896, Preece1980). The environmental remains and the molluscan evidence taken together suggest the spring was situated in open marshy ground which developed into shaded woodland during the main phases of Mesolithic activity. This is commensurate with other Holocene tufa sites.

Lithic analysis

At least several hundred artefacts have been recovered from Blashenwell Pit since the nineteenth century and four to five hundred 'flakes' were collected from the marl pit and described briefly by Reid (1896). A Mesolithic axe, two microliths and a further two pieces of debitage have been reported as stray finds (Preece 1980). Unfortunately, not all these artefacts were retained or are in public collections, however, a total of 128 artefacts were available for examination at Devizes Museum, and these and information from published works (mainly Clark *et al.* 1938, Preece 1980 and Wymer 1977) were used to make an assessment of the total assemblage from Blashenwell Pit (Table 5.19).

Table 5.19: Blashenwell Pit total assemblage breakdown

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	7	0	0	1	**8**
core fragments	3	0	0	0	**3**
flakes complete	29	10	9	2	**49**
flakes broken	5	0	1	0	**6**
Blades	22	1	1	0	**24**
microliths and manufacture	1	1	4	0	**5**
other debitage	28	0	0	3	**31**
Total	**95**	**12**	**15**	**6**	**126***

* Two flint adzes (as listed in Appendix Two) are not included in this table.

Raw material

Of the sample examined, the majority of the assemblage is chalk flint; this dominance is also reflected in observations made by Reid (1896) and Clark (Clark *et al.* 1938). Most of the flint is patinated (28%) or deeply patinated (55%) and grey to black in colour, where it has been exposed through damage or the removal of the tufa coating. The nearest source of this flint is the 'chalk with flints' on the Purbeck Hills, at the foot of which is the Blashenwell spring site. Only one artefact in the sampled assemblage had cortex, which was thin and pitted, although Clark (Clark *et al.* 1938) noted that the cortical pieces he had examined were from beach pebbles. Given that the site is so close to both the chalk and sources of beach flint, it appears that people were obtaining the raw material that suited their needs from their immediate locality. Seven pieces of Portland chert: two larger flakes, a medial bladelet section, one smaller flake (possibly a microburin), and three miscellaneous artefacts, represent 5% of the sampled assemblage (shown from left to right in Figure 5.25). These might well be from the Portland area given its relatively close distance to Blashenwell, less than thirty kilometres away. This suggests that either a separate group of people travelled to Blashenwell from that area, or it was part of an overall territory occupied by the people who used the Corfe Valley.

Figure 5.25: Portland chert artefacts

Chronology and technology

This is a typically Mesolithic blade dominated assemblage and the blade widths suggest a later Mesolithic technology dominates with 78% of the blade elements being twelve millimetres in width or less (Table 5.20). The evidence for microlith production all points toward a late Mesolithic date, the presence of microburins (two in the sampled assemblage and up to three more recorded by Clark *et al.* 1938) is testament to microliths being produced during the knapping episodes that were carried out (Figure 5.26). The microliths themselves consisted of a broken microtriangle and two possible mishits /unfinished examples made on narrow bladelets. The adzes, two from the sampled assemblage and the example found by Rankine (1962), might be early Mesolithic, although examples are sometimes found in later assemblages. Given that there appears to be no evidence of early Mesolithic activity at Blashenwell, this might well be the case here. However, it cannot be discounted that there was an earlier Mesolithic presence at the site owing to the general paucity of investigative work carried out beyond the areas of the marl pits. A radiocarbon date of 6450 ±150BP (5658 cal BC) (BM-89) from auroch bone associated with the main concentrations of lithics, from the middle of the tufa deposit also points to late Mesolithic activity.

Table 5.20: Blade widths

Blade width/mm	3	6	9	12	15	15
Total %	3	11	39	25	11	11

Figure 5.26: evidence for production of microliths

13% of the sampled assemblage (including the adzes) is retouched items, although if the calculations included the five hundred flakes considered by Reid (1896), a more realistic figure of around 3% could be calculated. The retouched items in the sampled assemblage included scrapers (one side, one end and one side/end), two backed bladelets and some modified flakes and bladelets that cannot be assigned to formal categories including some with piercing points and a burin type piece. Two scrapers (left and centre, Figure 5.27) and at least one other retouched non-formal item are made on core rejuvenation flakes.

Figure 5.27: Blashenwell scrapers

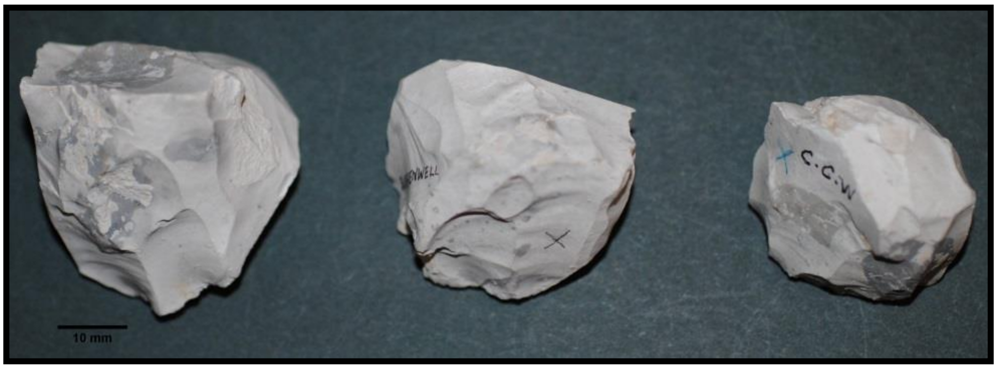
The majority of the flakes are thin with small bulbs of percussion, indicating soft hammers were probably used for knapping. The core preparation flakes tend to be thicker with larger bulbs of percussion implying hard stone hammers were perhaps used for initial core working. Apart from one classic bladelet core, the cores are all multiplatform and roughly worked (Figure 5.28) and a lack of primary flakes indicates small prepared nodules and perhaps cores were probably brought to the site for further use. Secondary flakes account for only 19% of the total assemblage and most of the pieces are not particularly large further supporting this preposition (Table 5.21).

Table 5.21: Debitage size

Debitage Size/mm2	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Total %*	>2	31	18	23	20	4	0

*the percentages do not add up to 100% due to the adzes and larger flakes not being included here

Figure 5.28: Blashenwell cores



The flakes found by Reid (1896) may have been core trimming debitage as he states: “flaking was evidently done on the spot” and he also describes some of the flakes as “chips” (Reid 1896:7). The modification of core rejuvenation flakes rather than new blanks might indicate that the people who were at Blashenwell were not overly concerned about raw material selection for lithic tools. One might surmise that they were close enough to seek out new flint on the Purbeck Hills if they had chosen to. This seems to suggest that people made conscious decisions about raw material selection and that distance from source was not necessarily a determining factor. In essence, it may also mean that expediency and functionality was more important than the aestheticism of the item.

General nature of activity implied by the lithic assemblages and other evidence

A number of activities can be implied from the evidence. It is likely that fires were made as 5% of the total lithic assemblage was burnt and small pieces of charcoal were evidently scattered in the tufa (Reid 1896). This may be evidence for short term encampments at those times when there was periodic drying out of the tufa surface. Animal bone and marine shells allude to the consumption of foodstuffs and a number of microliths, scrapers, piercers and a burin like piece suggest the processing of materials at the site. These materials probably included two pieces of worked bone recorded by Wymer (1977), although the lack of any firm dating on these makes this speculative at best.

The presence of microburins (one in the sampled assemblage and up to three more recorded by Clark *et al.* 1938) is testament to microliths being produced during the knapping episodes that were carried out. In regard to the shellfish found at Blashenwell, Bond (1941) described one of the artefacts as being a ‘limpet scoop’. This is actually a standard plunging blade, although this does not preclude its use for this purpose, as broken limpet (and periwinkle) shells were “common” (Reid 1896). The adzes (Figure 5.29) and sharpening flakes indicate some form of woodworking took place at the site or nearby.

Figure 5.29: flint adze

Taphonomic processes

Compared to the other two main sites examined for this chapter, the Blashenwell Pit tufa deposit was extensive and would have been the size of a small lake, albeit marshy, swampish land rather than an actual pool of water. The nature of such a deposit means that all objects discarded into the tufa were likely to become covered in calcareous deposit at least to some degree and this appears to have been the case (Figure 5.30). Reid (1897) describes cleaning off the tufa coating with acid to look for signs of retouch and evidence of formal tools, hence the fresh appearance of some of the sampled flint, although 51% of the sampled assemblage still had tufa adhering to at least some surfaces.

Figure 5.30: close up of tufa adhering to flint

Deposition: votive or functional?

There is nothing about the assemblages from Blashenwell Pit that might obviously indicate votive deposition. No features were uncovered during the limited works that have taken place and the only real context is the tufa. Reid (1896) suggested that debris, both lithic and faunal, was thrown into the water from the adjacent ridge, implying casual discard rather than structured deposition. His inference is not wholly in accordance with the environmental evidence, as there was not a body of water, as such, to throw the flint into. It is perhaps more likely that Mesolithic people made use of the intermittent dryer phases, when tufa deposition appears to have slowed, and discarded items, perhaps even where they sat, maybe realising that when the conditions changed again this material would be covered up and hidden. Even if the tufa spring was of no especial cultural significance, other than as a source of fresh water close to different types of ecological habitats, the tufaceous covering of the land could not have escaped the notice of the people that stopped here.

Oliver's Field Cherhill, Wiltshire

Location

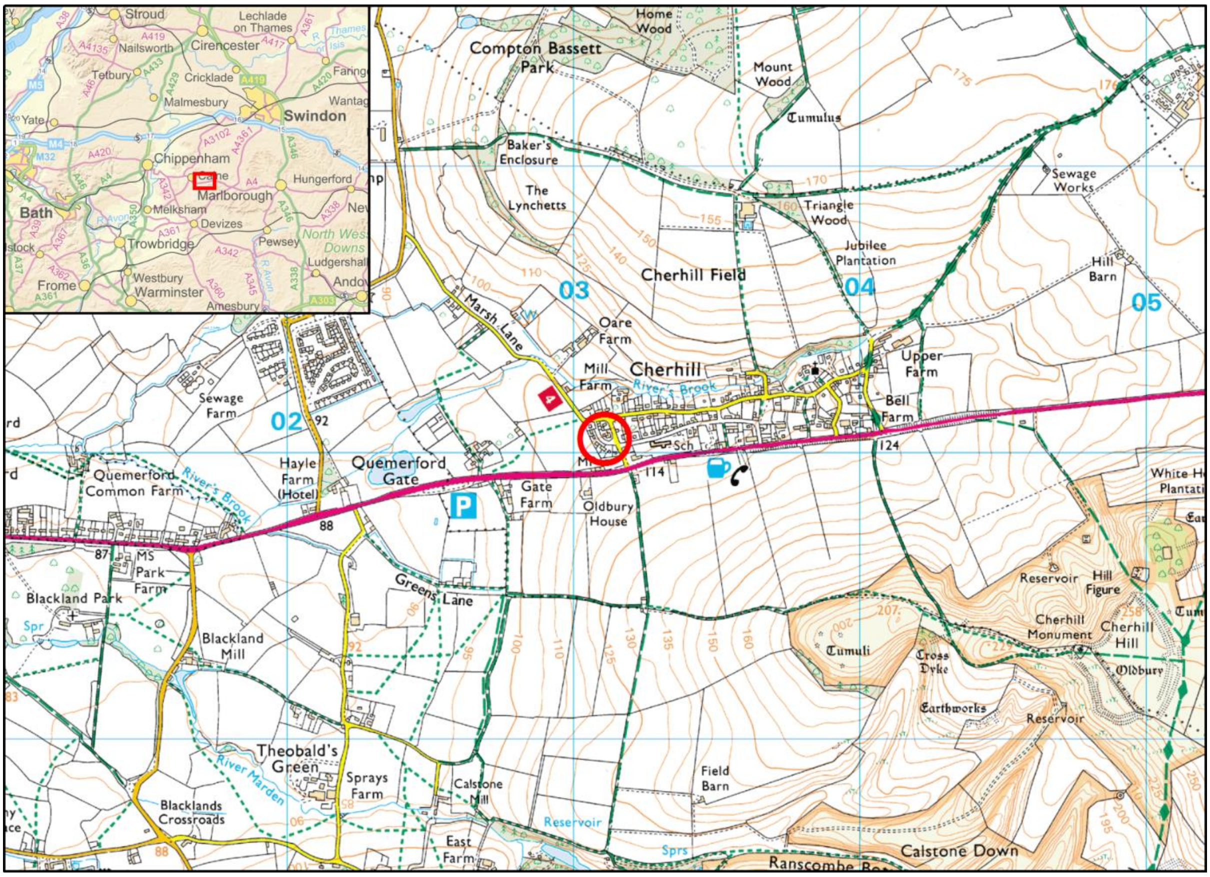
The site of the tufa spring deposit at Oliver's Field (NGR SU03117005) lies northwest of Cherhill Hill, at about 105 metres AOD, in a broad valley at the western edge of the village of Cherhill (Figure 5.31). Approximately two hundred metres to the north is a small stream called River's Brook which also rises from a nearby spring (Evans and Smith 1983). The excavated area covered approximately 750 metres square and is now covered by a housing estate. Cherhill is approximately eight kilometres from Avebury and a significant amount of Mesolithic flint has been found in the surrounding landscapes (Wiltshire HER).

Geology and hydrogeology

The main geology is of Gault Clay overlain by chalk (Coombe Rock). Secondary geological deposits include Upper and Lower Greensand and Kimmeridge Clay, and the Quaternary deposits are composed of tufa and soil horizons. The tufa deposit at Cherhill is not an homogeneous deposit, but rather it is formed of hummocks and lenses of white tufa which is browner in colour nearer the soil horizons. The deposit according to Evans and Smith (1983) was approximately half a metre deep, in places lay in patches over the buried soil and in some areas was quite a compact deposit. That the tufa was laid down 'quietly' is demonstrated by its accretion around plant stems (also a positive sign that the area was vegetated), rather than being the rolling 'oncoidal' type formed in faster conditions (Evans 1983). The deposit varied between 'soft and silky' tufa to 'nodular' tufa and as Evans notes, was probably laid down intermittently. This implies groundwater on occasion seeped from the spring issue points rather than being a fast flowing channelised source. The tufa was dated to 7230 ±140 (5840 cal BC) (BM-447) using charcoal from an organic horizon at the base of the tufa (Evans and Smith 1983).

Underlying the tufa was a Mesolithic palaeosol. This was a "grey to dark grey calcareous loam" approximately a third of a metre deep, mostly level and occasionally merging into the tufa. A two metre area where soil was absent and there was much iron staining was the site of the spring issue point. There was some iron staining at the base of this buried soil (Evans and Smith1983:48) implying that the spring was issuing at the onset of soil formation and before it deposited tufa.

Figure 5.31: Location of Oliver’s Field



Historical and archaeological work carried out

Evans and Smith excavated the site of Oliver's Field, Cherhill in 1967 over one season, in lieu of a housing development. The report was published in 1983 and included a flint report by Mike Pitts and an animal bone report by Caroline Grigson. The site evidenced both Mesolithic and Neolithic activity in the form of lithic assemblages and both worked and non-worked animal bone. A molluscan analysis was published by Evans (in Evans and Smith 1983). Evans also made extensive notes on the nature of the tufa deposit and these are held in the site archive at Devizes Museum, Wiltshire. No work has been carried out at the site since and is unlikely to be investigated further owing to the housing development.

Evidence for the Mesolithic environment

The molluscan analysis by Evans (in Evans and Smith1983) has shown that the overall pattern of environmental change was one of transition, from open country to closed woodland. Although Evans originally stated that results of the analysis were likely due to the mixing of shells, it is now known to be a pattern seen at other tufa sites. During the earlier and middle Mesolithic the ground would have been damp and marshy but large open pools were absent. In the upper layers the snail fauna consisted of freshwater species and ostracods suggesting conditions became wetter. However, woodland species still dominated the assemblage at this time, thus indicating by the end of the Mesolithic the site was one of swampy woodland (Evans in Evan's and Smith 1983).

Worked flint and animal bone were present throughout the tufa but not in the deepest part (Evans and Smith 1983:52). Evans and Smith (1983) suggest this was because material was washed or thrown into the tufa from the adjacent sloping ground, rather than the tufa deposits being 'working surfaces'. This is a sensible assumption as the areas with tufa would have been wetter than the surrounding soils. However, the supposition in Evans and Smith (1983;75) that "all Mesolithic flintwork was first deposited before tufa formation" seems unlikely as although the Mesolithic deposits were disturbed by the Neolithic activity the site archives state that Mesolithic flintwork was found throughout the undisturbed tufa as well as in the truncated deposits (personal observation). The 'quiet' conditions of deposition (Evans and Smith1983) would also mean less taphonomic movement of artefacts.

Impressions of plant leaves in the tufa included deciduous trees, reeds, grasses, sedges, mosses, liverworts and filaments of blue-green algae (Evans and Smith 1983:52). Charcoal fragments included hazel nut shells, yew and Rosaceae *sp*. These identifications, although not down to genus, are indicative of the same type of conditions as shown by the molluscan analyses. The small faunal remains included frogs, snakes, bank vole, shrew and wood vole further substantiating the other environmental evidence (Evans and Smith 1983:50, 106). Other faunal remains from secure Mesolithic contexts, likely procured for meat, included auroch, boar, red and roe deer. Smaller fauna included hare, an unidentified small carnivore and birds, again all fauna that would be present in open woodland. Dogs were also present, evidenced through bone remains and tooth marks on a few bones. Although the dog bones were recovered from mixed Mesolithic/Neolithic contexts, there is a strong possibility these were of Mesolithic origin (Grigson in Evans and Smith 1983:111).

Lithic analysis

Over 130kg (actual numbers not available) of flint pieces in the Cherhill assemblages (Pitts' in Evans and Smith 1983: 72) prevented an in-depth analysis of more than the stratified Mesolithic contexts (the buried soil and the hollow) and a sample of lithics from the tufa deposit. Of these the whole assemblage from the 'hollow' was examined, and the Mesolithic buried soil and the tufa deposit were sampled. A number of microliths from other contexts were also looked at to ascertain a date range for the Mesolithic occupation of the site as a whole (owing to their role as chronological indicators). The results of this analysis are used in conjunction with Pitts' original flint report (in Evans and Smith 1983) in order to make some observations about the site.

The 'working hollow'

The irregular "shallow hollow dug into the Coombe Rock" and "overlain by tufa" (Evans and Smith 1983:50), was approximately 1 m in length with a variable width of between 0.5 m and 1 m. It was described by Evan's and Smith as being a "working hollow" presumably because it contained worked flint, much of which was burnt (although this was not mentioned in Evans and Smith's report), twelve sarsen rock fragments, one small piece of tufa and some animal bone (Evans and Smith 1983:50 and site archive).

473 pieces of flint were recovered from the hollow and all were re-examined here. The full range of debitage: cores, core fragments, flakes, blades and shatter, expected at a knapping site was present (Table 5.22, Figure 5.32), although the only recognisable formal tool types recovered from the hollow were two microliths, one of which was typologically a Jacobi 5c and the other an indeterminate type but of late Mesolithic aspect. A further eleven pieces had some degree of retouch but do not fall into formal categories.

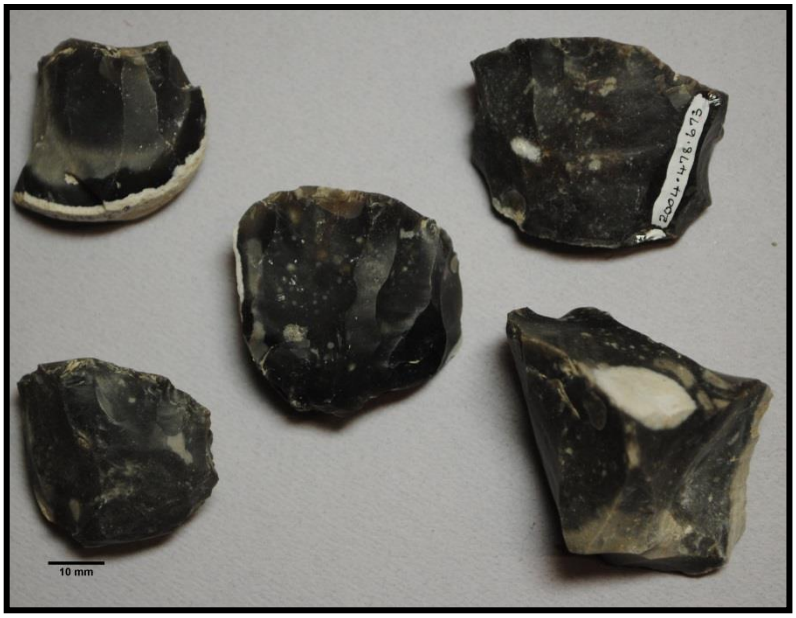
All the raw material in the hollow was chalk flint, with mostly complete flakes and miscellaneous debitage ('other debitage') dominating the assemblage. Although flakes outnumbered blades, the five cores are best described as bladelet cores, although not of classic Mesolithic forms, and dateable to the late Mesolithic (Figure 5.33). The assemblage as a whole is typical of this period with many pieces exhibiting bladelet scars and signs of soft hammer production. Blades and microliths together make up almost 9% of the total assemblage, suggesting that blades and bladelets were mostly removed and used elsewhere. 3% of the pieces were modified or retouched and 3% of the assemblage showed signs of utilisation or edge damage. 20**%** of the flint in the hollow was burnt, and may indicate the presence of a hearth elsewhere at the site, as it was seemingly deposited into the hollow rather than being burnt *in situ*.

Figure 5.32: a selection of flint from the hollow

Table 5.22: Oliver's Field (working hollow)

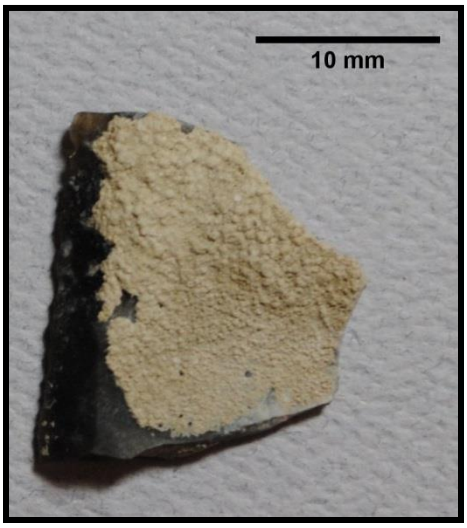
Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	5	0	0	0	**5**
core fragments	18	0	0	0	**18**
flakes complete	117	8	4	70	**199**
flakes broken	22	0	0	0	**22**
Blades	29	1	7	2	**39**
microliths and manufacture	0	0	2	0	**2**
other debitage	160	4	1	23	**188**
Total	**351**	**13**	**14**	**95**	**473**

Figure5.33: cores from the hollow



The assemblage is commensurate with what would be expected from knapping episodes and so Evans and Smith (1983) were at least semi-accurate in their assumption that this was a “working hollow”, but perhaps only in the sense that it contained knapped flint. Evans and Smith (1983) do not really explain what they mean by a “working hollow”, but one assumes they mean it as denoting a context of production. However, the hollow was not really big enough to sit in and knap, and it does not explain the presence of the burnt flint, twelve pieces of sarsen, the tufa or the animal bone. Moreover, it was a deliberately dug feature into the natural, and the only such feature found dating to the Mesolithic at the site. Where deliberately dug features have been found in other Mesolithic contexts, in other locations, they tend to be contexts for deposition. It is therefore argued here, that it might be the case, that this hollow was a context for structured deposition rather than production, and that the deposit may have been ‘votive’ in nature, although the excavation archive does not allow further elucidation of this point beyond speculation.

Figure 5.34: retouched piece with tufa adhering from the hollow



The buried soil

Just fifty eight artefacts, all of chalk flint similar to that from the hollow, were recovered from the buried soil (Table 5.23). This number is relatively low compared to other contexts, owing in part to post-Mesolithic disturbance over much of the site (Evans and Smith 1983). The Mesolithic stratigraphy (the buried soil and the overlying tufa deposit) was cut through by four irregular linear features and two pits which were dated to the Neolithic period (Evans and Smith 1983). The ditch cuts (as they are called in Evans and Smith 1983) disturbed some of the Mesolithic flint from the tufa and the palaeosol which became incorporated into the ditch fill.

The buried soil was not particularly deep, up to 0.35 m in places with generally the top 0.08 m containing Mesolithic material (Evans and Smith 1983:50). It is notable that there were few artefacts in the area where the overlying tufa was thickest and that some artefacts were at a vertical angle in the soil (Evans and Smith 1983). It is suggested here that the paucity of material here was due to the increasingly wet nature of the ground surface; people would probably have located themselves a little away from the marshy area to carry out activities. The vertical positioning of artefacts could also be taphonomic rather than intentional.

Table 5.23: Oliver's Field (palaeosol)

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	5	4	0	1	**11**
flakes broken	2	0	0	0	**2**
Blades	4	12	5	2	**18**
microliths and manufacture	0	1	14	0	**15**
other debitage	5	1	0	6	**12**
Total	**16**	**18**	**19**	**9**	**58**

More than 25% of the assemblage is composed of microliths, whilst a further 25% is made up of bladelets, six of which were broken and all of which, with one exception, were less than twelve millimetres wide (Figure 5.35). Of the microliths, nine were obliquely blunted points (class 1 types: Jacobi 1978) suggesting an early Mesolithic date, some were scalene triangles (type 7's: Jacobi 1978) and other miscellaneous geometric forms, some of which were broken. Other than the obliquely blunted points, the assemblage is consistent with a late Mesolithic date, but as mentioned elsewhere in this thesis and by Pitts (in Evans and Smith 1983) it is suggested that obliquely blunted points are part of a regional pattern for the late Mesolithic.

Figure 5.35: bladelets and flakes from the palaeosol

The tufa

A total of 185 pieces of chalk derived flint from areas of undisturbed tufa were examined here (Table 5.24). Four pieces of sarsen and one piece of purplish sandstone were also recorded in the site archive as coming from the Mesolithic tufa. The assemblage from the tufa is again attributable to the late Mesolithic, and includes bladelet and multiplatform cores, one sub-triangular microlith, one broken microlith and two obliquely blunted points. Again, the obliquely blunted points would normally be considered an early Mesolithic phenomena but are almost certainly later in this context. The assemblage would also suggest some knapping activity took place after tufa deposition had started indicating that Mesolithic people did not totally abandon the site when it became wetter, as was suggested to be the case by Evans and Smith (1983).

Table 5.24: Oliver's Field (tufa)

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	9	0	0	0	**9**
core fragments	22	0	1	0	**23**
flakes complete	42	2	6	0	**50**
flakes broken	12	0	0	0	**12**
Blades	19	8	2	0	**29**
microliths and manufacture	0	0	4	0	**4**
other debitage	33	0	0	25	**58**
Total	**137**	**10**	**13**	**25**	**185**

Other contexts

The 'other contexts' examined here were all mixed assemblages, that contained both Mesolithic and Neolithic artefacts. A total of 291 artefacts (Table 5.25) assigned to 'other contexts' but typologically of Mesolithic date were looked at (these had been separated out in the archive into a single box of 'Mesolithic flint' by the excavators, conveniently making a sample).

The sample contained a total of 137 blades and microliths of obvious Mesolithic date, but no cores and only one core fragment. A scan through the remaining archive suggests that because many of the cores did not conform to the classic Mesolithic types, as was the case at the Langley's Lane site (see page 187 this thesis), they were therefore assigned to a later period when sorted into categories by the excavators. Some of the cores, and indeed some of the other pieces, in the non-sampled archive would have sat well in a Mesolithic assemblage (personal observation), but due to their obvious ambiguity none of these pieces were included in the analysis here. Despite the lack of cores the material is typologically Mesolithic and further demonstrates the extent of Mesolithic activity at the site. The nature of the assemblage, being from mixed contexts and only a sample, precludes any comment on artefact patterning or the high number of retouched items.

Table 5.25: Oliver's Field (other contexts)

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	0	0	0	0	**0**
core fragments	1	0	0	0	**1**
flakes complete	13	54	18	2	**79**
flakes broken	1	7	0	0	**8**
Blades	19	76	20	0	**100**
microliths and manufacture	5	9	32	0	**37**
other debitage	14	43	4	3	**66**
Total	**53**	**189**	**74**	**5**	**291**

However, the microliths are very clearly mostly of a late Mesolithic character (Figure 5.36) and include scalene triangles (type 7's: Jacobi 1978) and rods (type 6: Jacobi 1978), a boat shaped form (type 6c: Jacobi 1978), miscellaneous and fragmented geometric forms (see Appendix Two for full list), with occasional broad blade types. The presence of microburins in 'other contexts' again attests to the manufacture of microliths at the site.

Figure 5.36: Selection of microliths from ‘other contexts’

Total assemblage analysis

A total of 1007 artefacts were analysed for this thesis (Table 5.26) and the assemblage as a whole is now considered.

Table 5.26: Oliver's Field total assemblage breakdown

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
Cores	14	0	0	0	**14**
core fragments	41	0	1	0	**42**
flakes complete	177	68	28	73	**339**
flakes broken	37	7	0	0	**44**
Blades	71	97	34	4	**186**
microliths and manufacture	5	10	52	0	**58**
other debitage	212	48	5	57	**324**
Total	**557**	**230**	**120**	**134**	**1007**

Raw material

Most of the raw material used at Cherhill during the Mesolithic was chalk flint, with chert use confined to only two pieces in the sampled assemblage, and five pieces altogether (Pitts in Evans and Smith1983). The two pieces in the sampled assemblage were typically late Mesolithic scalene triangles (see Figure 5.36 top right, third photograph) made of Portland Chert and broadly corresponded with Jacobi's microlith type 7b (Jacobi 1978), the raw material for which may have been sourced from the Upper Portland Beds, some twelve kilometres away (Pitts in Evans and Smith 1983:79). The chalk deposits adjacent to the site are barren of flint, other than small irregular lumps, and it is really only the upper chalk, some ten kilometres from Oliver's Field, that produces sizeable pieces of flint more suitable for knapping (Pitts in Evans and Smith 1983:76). The general nature of the debitage suggests that it was this source that was probably used; however, the more expedient use of the nearer sources cannot be discounted.

There are few large core preparation flakes in the assemblage and the lack of primary cortical flakes suggests the main preparation of nodules was carried out away from the site. Table 5.27 shows that the majority of core knapping elements lie in the thirty to fifty millimetre range. The numbers of cortical pieces outnumber the non-cortical ones implying that the size of nodules used in the Mesolithic assemblage were quite small. Although Pitts reports tested nodules at the site (in Evans and Smith 1983:73), it seems doubtful that the better worked cores were made from nodules of the size available. This does not of course discount their use altogether but they might be considered more suitable for expedient manufacture of flakes rather than bladelets.

Table 5. 27: Debitage and cortical values of core preparation and rejuvenation flakes

Debitage and cortical value: tertiary (T) secondary (S) primary (P)												
	3T	3S	3P	4T	4S	4P	5T	5S	5P	6T	6S	6P
Core	2	1	-	3	1	-	5	-	-	-	-	-
core fragment	3	-	-	5	16	-	1	8	-	-	7	-
core rejuvenation	3	2	-	2	3	-	2	1	-	-	-	-
core trimming	2	-	-	5	13	-	2	19	-	-	2	1

Chronology and technology

The assemblage as a whole is of late Mesolithic character which is in accordance with the only radiocarbon date of 7230 ±140 (5840 cal BC) (BM-447) from the base of the tufa (Evans and Smith 1983). The presence of bladelet cores, microburins and related debitage support this. The main chronological indicators are the microliths, of which there are both early (obliquely blunted points) and late (geometric) types. This would not be expected if the site followed the general patterns for microlith development throughout the British Mesolithic. However, Pitts' proposition that the Cherhill microliths are part of a regionally localised phenomenon (Pitts in Evans and Smith 1983:72) where geometric types and obliquely blunted points are present together seems to hold. Both types occurred throughout the stratified contexts, although it is noticeable that the blade widths become relatively narrower as they move up the stratigraphic sequence (Table 5. 28). The number of obliquely blunted points decreases from nine in the buried soil, to two in the tufa, and two in mixed contexts. Perhaps at Cherhill we are seeing the transition from a continued use of obliquely blunted points together with new geometric forms at the start of the late Mesolithic, to their gradual phasing out, and the resulting dominance of geometric forms. A similar situation occurs at Wawcott III, Berkshire (Switsur and Jacobi 1979, Pitts in Evans and Smith 1983:72) and Downton, Wiltshire (Higgs 1959, Switsur and Jacobi 1979).

Table 5.28: blade widths numbers expressed as %

blade width/mm	3	6	9	12	15	>15
buried soil	-	3	28	25	34	10
Hollow	-	10	10	29	36	15
Tufa	-	16	62	19	-	3
other contexts	4	17	30	30	14	5

Taphonomic processes

As was the case at the other sites, tufa is adhering to many of the pieces in the assemblage with 7% of the total assemblage exhibiting this trait. Interestingly more than 70% of those pieces were from the Mesolithic hollow (Figure 5.37). As discussed earlier, this was the only Mesolithic feature cut into the Combe Rock and subsequently covered over by tufa. The lack of dating evidence means that we cannot ascertain the time between the digging of the hollow and the tufa sealing it, although the tufa covered pieces from the hollow suggests tufa was actively forming at the time of their deposition.

Figure 5.37: Flint from hollow with tufa adhering

General nature of activity implied by the lithic assemblages and other evidence

Evans and Smith (1983:81) have suggested that during the Mesolithic the Cherhill site was a "major base camp" owing to the "large quantity of flint debitage". Compared to other sites the 1007 Mesolithic pieces seems rather paltry, see for example, 20,000 at Thatcham (Wymer 1962, Healy *et al.* 1992), 23,000 at Deepcar (Radley and Mellars1964) and 18,000 at Howick (Waddington *et al.* 2003), even taking into account differences in site scale. The significant number of microliths at Cherhill suggests that this was a place at which the production of either hunting projectiles or composite tools for materials processing was carried out. This is substantiated by the fact that 20% of the microliths were edge damaged and suggests that microliths were used here as well. Scrapers, burins, and serrated pieces also suggest the working of materials, perhaps in this case animal carcasses. Consumption of food stuffs is certainly attested to by the presence of auroch, boar, red and roe deer bones and there appears to have been local use of fire, evidenced by the burnt flint and small amounts of charcoal present throughout the deposits (Evans and Smith 1983). Although no adzes were recovered at Cherhill, three axe sharpening flakes suggest some woodworking activity may have taken place near the site.

The evidence suggests that when people stopped at the spring they knapped flint, made tools including microliths and hunted animals. The Cherhill site was perhaps not a major base camp owing to the paucity of features relating to sustained Mesolithic occupation, such as hearths and more permanent structures, but the evidence does suggest that people stayed at this site for a period of time and/or it sustained a number of visits. Regardless of its residential status, Cherhill seems to have been a significant place in the landscape, not least for resource procurement.

Deposition: votive or functional?

There is no obvious evidence for votive deposition associated with the Mesolithic activity at Oliver's Field. However, the hollow might have been a structured deposit (refer to page 205-208 of this thesis), and may not have been purely functional, as Evans and Smith (1983) imply. A further indication of the significance of this site may well lie in the subsequent Neolithic activity.

At around 4715 ± 90 (2765cal BC) (BM-493) Neolithic people came to Cherhill, where they dug irregular linear features, 'ditches', into the tufa and palaeosol, uncovering traces of previous activity in the form of flints and bones. Into the bottom of one of these ditches they dug two small circular pits, one of which was 0.25 m in diameter and 0.12 m deep and contained nothing but ditch fill. The other, 0.30m in diameter and 0.16 m deep, contained a fragment of early Neolithic pottery, a worked bone, an animal tooth, flint flakes and cores of Mesolithic character, twenty four fragments of Sarsen and a piece of grit. This pit was overlain by five slabs of sarsen, whilst the empty pit had four small slabs of Sarsen placed adjacent to it (Evans and Smith 1983:55).

That the later pit deposits reflect the earlier deposit from the Mesolithic hollow (flint, bone, and sarsen fragments) might be purely co-incidental, but it is further acknowledgment that Cherhill was an important place in the landscape, perhaps one that Neolithic people who came to this place recognised as a place used by their ancestors.

Langley's Lane, Blashenwell and Cherhill:

Here the three tufa springs, their lithic assemblages and related activities are compared, for although the three sites share some traits there are also noticeable differences. In order to add further context, they should be considered where possible, in relation to Mesolithic activity at other tufa springs. That little can be said about most other tufa springs in regards to the Mesolithic serves to highlight the paucity of relevant work carried out for the period at these places, despite their potential for the elucidation of Mesolithic lives.

The tufa depositing springs of Malham Tarn, Yorkshire are one example of an area with intense Mesolithic activity but the springs themselves have not been investigated to further elucidate any role they may have played. A similar situation occurs in other areas of Britain. Even in north Wales where there are extensive tufa deposits and important Mesolithic sites occur, such as Rhuddlan (Berridge and Roberts in Quinnell *et al.* 1994), there has been no concerted effort to investigate the nearby tufas at Caerwys, despite the Mesolithic presence further along the coast at Prestatyn. In Worcestershire and Herefordshire, there are many tufa depositing springs but none of these have ever been excavated or associated directly with Mesolithic activity, partly because the Mesolithic of these counties is under-researched. The potential for Mesolithic activity for example, at the spring deposited tufa site of the Biblins, Herefordshire, adjacent to the River Wye itself, is great. It is only a few hundred metres from the Wye Valley caves, including King Arthur's Cave, where much late Mesolithic flint has been recovered (Barton 1993, 1994, 1995, 1996, 1997). The situation is a little better in places like the Kennet Valley where river valley tufas occur, but it is not generally the tufa itself that has attracted archaeologists to investigate these sites. The spring and river valley tufas have been investigated for environmental purposes and archaeology is not the main concern, despite the great number of Mesolithic sites in the Kennet Valley.

Given that tufa springs and tufa deposits appear to offer high potential for discovering Mesolithic activity, are likely to preserve organics, and seal both features and palaeosols, it is surprising that so little work has been carried out at these sites. Only the Langley's Lane tufa spring site has been investigated deliberately for its Mesolithic archaeology. Many sites warrant further work, and others should be investigated for their potential. Unfortunately, many of these places are now protected for their biodiversity value, as is the case at Blashenwell. Whilst this may not hinder the archaeological progress completely, it will make it more difficult to access this promising archaeological resource.

Typologically, the Mesolithic activity at all three sites can be seen to date to the late Mesolithic, with very little evidence of earlier activity, other than the adzes found near Blashenwell and the obliquely blunted points from Cherhill. As explained previously the adzes may be later and the obliquely blunted points are almost certainly an element of late Mesolithic assemblages in the southern regions of England (Pitts in Evans and Smith 1983, Jacobi 1978, Norman 2003). The radiocarbon dates and the biostratigraphy from all of the sites support this supposition.

The Langley's Lane microliths are typologically very late with only micro-scalene triangles and rod like forms present, whereas the Cherhill microliths reflect an earlier phase, although they still fit into a regionally late Mesolithic pattern for microlith production. At the Blashenwell tufa there is not so much direct evidence for microlith production but again the assemblage points toward a late Mesolithic date.

This late activity is reflected in the microlithic artefacts recovered from some other tufa springs. For example, outside the study area at the spring deposited tufa at Bryn Newyd, Prestatyn, Denbighshire in North Wales, excavations have produced activity dating to the very latest Mesolithic and spanning the Mesolithic-Neolithic transition (Clark *et al.* 1938, Clark 1939, Davies 1949, David 1991, Bell *et al.* 2007). Here Mesolithic people knapped flint, on the middle of one of three tufa islands, the debris of which was eventually covered up by approximately another 0.60 m of tufa deposit. The micro-scalene triangles from Prestatyn are a similar size to those of Langley's Lane; however the rod-like microlithic element is absent. Similarly, at Frocester in Gloucestershire (Price 2004), flint dating to the late Mesolithic, found in the vicinity of a tufa depositing spring, included micro-scalene triangles.

Whilst not directly associated with the spring itself, it does indicate a presence in the landscape, and the area in the immediate vicinity of the spring would warrant further investigation. There is a possibility that some plough damaged features (pits and hollows), adjacent to the spring fed stream, were of Mesolithic date (Darvill in Price 2004:236).

The presence of lithics in the buried soil at both Langley's Lane and Cherhill suggests that at both these sites there was an interest shown prior to extensive tufa deposition. At Blashenwell, no buried soil associated with a Mesolithic presence, has yet been discovered, this is not wholly unexpected, given that tufa deposition started some one to two thousand years earlier, the deposits are much deeper and extensive excavations have not been carried out.

The flint and chert assemblages from Langley's Lane, Blashenwell and Cherhill, suggest that Mesolithic people carried out a similar range of activities, that might be termed 'practical' or 'functional', at all three springs. The evidence for flint knapping and food procurement is plentiful enough, so as to suggest these were common enough activities at all three sites. The evidence for materials processing, through artefacts such as serrated blades, scrapers, awls and burins, is strongest at Cherhill, but does occur at Langley's Lane and Blashenwell. There are occasional indications that other activities such as woodworking were carried out: at Blashenwell in the form of adzes and at Cherhill from the axe sharpening flakes, but, there is no real evidence for this at Langley's Lane. Where it is available, these activities are reflected in the assemblages from Bryn Newyd and Frocester and suggest that people carried out what were everyday activities at tufa springs, as they did elsewhere.

There is more limited evidence for 'ritual' practise. The Langley's Lane deposits are of international importance, especially the occurrence of the tufa 'balls', for which there are no direct parallels. One might expect similar manipulation of the environment to have taken place at other tufa sites; yet, **L**angley's Lane is something of an anomaly, for it is the only one of the three main sites examined in this chapter, where tangible evidence for Mesolithic structured deposits, which are possibly of a votive nature, has been found. It may be that this is down to a number of factors, such as the scale of the site, a lack of targeted excavation at the other sites, or perhaps more likely, that tufa springs in the landscape were not all treated in the same way. In other words, the way in which ritual manifests itself in the archaeological record may not be as straightforward as the digging of round pits and the placing of objects into them.

Assuming a temporal scale of activity that took place over at least 1000 years, and possibly up to 3,000-4000 years, when the three sites are considered together, then it can be surmised that even if there were some shared beliefs, people would have found different ways to engage with these over time. For example, at Blashenwell, if the discard of material into the tufa deposits is considered as purposeful rather than casual discard, then it is possible this was a place where deposition was structured to some degree. In other words, the tufaceous deposit was an appropriate place for depositing materials that were no longer of practical use. At Cherhill, we are seeing the digging of an irregular hollow, into which objects appear to have been deposited and at Langley's Lane there appears to be more highly structured deposits. Whilst not wanting to impose an evolutionary sequence upon these three sites, it is possible that at Blashenwell, Cherhill and Langley's Lane respectively, we are seeing different reactions to a similar phenomenon, which is the presence of tufa.

However, even this most obvious commonality is variable; for example, tufa varies in texture, colour and rate of deposition. Noticeable changes in these qualities can be seen in the stratigraphic sequence for the individual sites, and therefore one might expect different responses to distinct circumstances, especially when it is considered that it was not the same people visiting all three sites. Although the discard of materials at each of the sites may be seen as quite different, in a sense they all involve the reincorporation of materials into the fabric of the landscape, a landscape which was dynamic, changing and transforming. This theme of reincorporation is further discussed in Chapter Six.

Interpretation: Possible meanings of tufa springs

Given that most tufa deposition took place at a fairly rapid rate during the early Holocene, it does not take much of an imaginative leap to envisage that its formation may have had a profound impact upon the Mesolithic psyche. This is discussed further in relation to environmental change and dynamic landscapes in Chapter Six; here the discussion is centred on the tufa itself.

Phenomenological perspectives

Tufa is a material that can be seen to change physical states with the naked eye. It emerges from the ground as a dissolved substance, sometimes evident as milky white waters (if discharge is heavy), and transforms into a soft friable substance which coats the ground and surrounding vegetation in layers of carbonate (Figure 5.8). Once exposed to the air, it hardens off to become rock like, literally petrifying those objects it has coated. Although the rate of tufa deposition can be fairly constant, it can also be extremely rapid and conversely there may be intervening episodes of cessation. These qualities make tufa a transmutable and in some ways a liminal substance. Liminal substances are those which are between states. The tufa goes through an ambiguous stage of being neither water nor stone, and in the case of tufa springs, it also emerges from a liminal place, adding to its abstruse nature.

Figure 5.38: How the ground may have appeared during the Mesolithic as tufa deposition started

Whilst tufa and travertine deposits in the British Isles are not that common today, one needs to imagine a time when the precipitation of calcium carbonate was at its zenith. Of the few tufa deposits still actively forming today, some are visitor attractions, for example, Mother Shipton's Well, Knaresborough, Yorkshire, where tourists pay to place objects in the petrifying waters (Pentecost (1981:382) notes there is no actual replacement of material with carbonates so it is really a process of encrustation, rather than petrification). Others are less well known and perhaps allow us to gain a more emic perspective. The Biblins in the Wye Valley, Herefordshire is one such place where it is possible to carry out such observations.

For example, a leaf dropped into the spring waters was covered in tufaceous deposits in a matter of seconds (personal observation), forcing an appreciation of the rapidity of what are observable processes. Elsewhere, at another spring fed tufa deposit, near Shelsley Walsh, Worcestershire, recent storms resulted in the upheaval of a tree to reveal glaringly white friable tufa over bedrock (a substrate devoid of organic material) beneath its roots (personal observation). This whiteness is in stark contrast to the rather more muddied colours of tufa forming in other circumstances: for example, at the Biblins, where a myriad of browns may be observed as the calcium rich waters merge with the 'soils'. At Southstone Rock, Worcestershire, the vegetation (of Bryophytes, algae's, lichens, shrubs and trees) allows an appreciation of how tufa, although rapidly forming, is still offset by other materials, so even where tufa formation is so rapid it can render a landscape white, it will still be punctuated by the browns and greens of the vegetation. Where tufa formation is quite slow, the substrates and organic material can mix with the tufa and colour it into browns and greys (Figure 5.39).

Figure 5.39 contrasting tufas and vegetation

Tufa as symbol

The significance of tufa has not gone un-noted. Davies and Robb have suggested that an interest in the symbolic and material aspects of tufa and tufa springs may well have extended back into prehistory; citing the case of a tufa deposit sealing a cremation in a

Bronze Age Barrow in Somerset (in Davies and Robb 2002 after Williams 1947). A Mesolithic interest seems to be confirmed by the pit deposits present at the Langley's Lane site and more generally by the extensive presence of Mesolithic activity at other tufa sites. However, before considering some of the ways tufa springs might have been conceptualised by Mesolithic people it is worth noting those properties of tufa that have been appropriated by later peoples and the conceptual themes they appear to encompass. There are two main points of interest: one is the use of tufa as building stone; the other is the petrification of materials placed in the calcium rich waters.

Tufas and travertines have long been used as building materials. The Romans incorporated it into their buildings, both in Britain and the wider Roman Empire, whilst during the Medieval period, it was used in many church buildings (Pentecost 1981, Potter 2000). Tufa is very light, easily carved and, for example, in the case of church vaulting is a functionally appropriate material to use. In Italy, it was readily available and used widely in early buildings, temples and tombs, although it was replaced by travertine and marble as the preferred building stone for later buildings. As Davies and Robb (2002) note, it was not usually the main component of either Roman or Medieval buildings in Britain, although many exceptions exist such as the tufa built church of St Andrew's near Shelsley Walsh, Worcestershire (Pentecost 2005). More usually the tufa elements were minor additions to the fabric of a building, such as the occasional blocks used in Roman temples, especially in the foundations (Evans 1999). In the case of Medieval churches, tufa was used for occasional building blocks, decorative elements, vaulting, and fonts (Potter 2000).

Evans (1999) has suggested that tufa is a metaphor for rebirth, hence its use in temples and church architecture, especially fonts (quoted in Davies and Robb 2002). Davies and Robb also suggest that this use of tufa in buildings is part of "transferring the power of place from one location to another" (2002:183) and that the tufa has symbolic connotations that are not necessarily connected with the utilitarian. However, it is worth noting that some utilitarian buildings are constructed from tufa, for example, the late nineteenth century lodge at Shelsley Walsh (Pentecost 2005), and this might be entirely due to the availability of locally sourced deposits rather than there being any symbolic meaning.

One of the most interesting properties of tufa is the resulting petrification of objects placed around or immersed in the calcium rich waters. At Mother Shipton's Well in Yorkshire, tourists can place objects under the dripping waters and witness them turned to stone before their eyes. The same phenomena can still be seen today at many other petrifying springs. As noted earlier, this can be a relatively quick process and one that can be seen easily with the naked eye. Davies and Robb (2002) suggest the “spiritual significance” of this could be the “transformation of the occult (invisible) properties of the water into visible physical form” (2002:183).

The persistent conceptual themes in these examples are those of liminality and transformation. It is suggested here that these might have also been the overriding themes in Mesolithic conceptualisations of tufa depositing springs. Assuming they were perceived differently to other types of spring (although some aspects might also be shared perceptions) perhaps the visible properties of tufa are the ones most likely to have impinged on Mesolithic consciousness. During the Mesolithic, probably more so than any other period, the petrification of vegetation and other objects placed in the vicinity of tufa springs would have been very noticeable to people frequenting areas of limestone geology. In some ways this is reminiscent of those limestone caves that grow stone in the form of stalagmites and stalactites. To the observer it would seem that plants and other objects were literally turning into stone as they were covered by the waters. This phenomenon would have also included flint objects deposited into the waters. In the case of flint artefacts a coating of tufa is somewhat reminiscent of the cortex that coats nodules of flint (see Figure 5.40).

Some societies that practice animism, for example, the Ojibwa (Hallowell 1960) see stone as a ‘living’ entity. If it is considered that the cortex could be seen as the ‘skin’ of the flint, perhaps then a tufa coating is like the stone re-growing its skin (figure 5.40). This might then render flint, at the end of its useful functional life, as ‘new born’, ‘reborn’, or perhaps enabled it to return it to a state where it might be suitable to re-reside in the ground. This cortical ‘skin’ might even be likened to the vernix that coats a new-born baby.

Figure 5.40: Flint ‘re-growing its skin’

Of course tufa does not only coat objects as it forms, it literally is water becoming stone, or stone growing. It is not difficult to see how this embodiment of tufa could be entwined into cosmologies and ways of explaining the world for those people who came across it. There are many ethnographic examples of stone in general, and to some extent the carbonates of petrifying springs being thought of in this manner (Pentecost 2005b). For example, the concept of stoniness permeates Andean cosmology, for example, the first beings emerge from topographical features which include geological features, such as caves and springs, stones turned into warriors, punishment could be meted through petrification and stones could have inherent power (Paternosto 1996).

Stone and the act of petrification and are also associated with death, past lives, or ancestors. This is a recognised concept in Neolithic archaeology where analogies are drawn between megalithic monuments such as Stonehenge with the Malagasy belief that stones are ancestors (Parker Pearson and Ramilisonina 2003). This is also a notion familiar to hunter-gatherers, for example, Australian Aborigines associate rocks and minerals with the bodily substances of their ancestors (Boivin 2004).

These are powerful metaphors, which correspond with Evans' idea about tufa being a metaphor for new life and allow us to see tufa deposits as landscapes of renewal, birth or rebirth, as places where stone grows and materials are in a state of liminality. If this is/was the case then they may also have been suitable places for life events (those that occur at liminal times) to take place. These might include occasions around childbirth, puberty and death. Initiations, sacrifices (votive deposition) and special ceremonies may have taken place to celebrate/commemorate these events.

The ways these classes of event manifest themselves in the archaeological record is ephemeral at best and during the Mesolithic tend to be minimal. Certain types of evidence might be expected at sites where life events take place. One of these is the conspicuous consumption of foodstuffs and certainly there is evidence for this at tufa deposits, for example, bones and flint implements used for the processing and procurement of such provisions. Another is signs of 'ritual' practise and structured deposition. At Langley's Lane this is almost certainly in evidence from the pit deposits and possibly evident at Cherhill in the case of the hollow. However, ritual, as discussed earlier, may not be so tangible or so visible in the archaeological record.

One property of tufa that has not been explored elsewhere is its potential use as a pigment for the body (tested by students on the Langley's Lane excavations: personal observation) and on other material culture. White is not often seen in the Mesolithic archaeological record, although we know that pigments were used. For example, red ochre especially is associated with contexts of death, elsewhere in Europe such as that used in burials at the late Mesolithic cemeteries of the Iron Gates, the Danube and north-western Europe (see Grünberg 2000 for a comprehensive account). Whilst no ethnographic examples of using tufa as a pigment seem to have been recorded, there is lots of evidence for white pigments being used in ceremonies around liminal times. One such example is the Mescalero puberty ceremony, where white clays are used (Farrer 1987). Numerous other examples may be cited, but a particularly interesting observation by Gifford affords a nice example of how people engage with and appropriate the geological world. In the central Miwok of California during the Akantoto dance, the dancer covers himself in the white "powdered human legbones" (in reality an unnamed white mineral of the local geology) which he digs from a hole in the ground (Gifford 1955 cited by Robinson in Boivin and Owic 2004:97).

It has already been noted that tufa can resemble stone but oncoidal tufas are also reminiscent of bone (personal observation and one noted by staff and students on the Langley's Lane excavation) and even the more friable tufa when hardened can resemble bone (personal observation) (Figure 5.41). The propensity for non-osseous material to resemble bone has been noted by Tilley (2010). He proposes that the "stone bones" (perhaps those of the ancestors), that are found in the soils of the southern chalk lands may have been the reason for Early Neolithic monuments being built there (Tilley 2010:54-55) It is suggested here that something similar may have been happening at tufa sites during the late Mesolithic.

Figure 5.41 tufa 'bones' (left) animal bones (right)

Chapter Summary

Although the presence of tufa connects the three sites, the nature of the activity that occurred at them varies from that which might be considered purely functional, for example, at Blashenwell to activity that seems to indicate behaviour of a ritual nature. To a certain degree some of this is down to the scale of the excavation and other investigation at each of the three sites and possibly to the extent of tufa deposition at each. Yet, there do seem to be some differences in the way people were engaging with the landscape.

None of the lithic assemblages at these sites are particularly remarkable, taken on their own, all are indicative of everyday activites such as flint knapping and food consumption, for which evidence is found at most Mesolithic sites. It is the treatment of materials and the context of deposits that indicates that something unusual may have happened at these sites. It seems that the way people enculturated tufa springscapes was through the reincorporation of materials into the earth. At these sites, this need not necessarily manifest itself in the archaeological record in the explicit form of structured deposits, for the tufa itself was possibly also a suitable context for deposition. Therefore, it is suggested here that it was the presence of tufa that attracted people, not least because the transformation of tufaceous waters into stone was an observable process. For Mesolithic hunter-gatherers, water and stone were vital elements inherent to life sustaining activities, whilst the qualities of tufa lend themselves to being a metaphor for lifecycles, both human and otherwise.

Analogical comparison from a wide range of ethnographic and historic sources suggests that the themes discussed in this chapter do have currency and that tufa depositing sites with Mesolithic activity in Britain can elicit information that will enhance the Mesolithic record, especially in southern England where peat deposits are not so common.

Chapter Six: Conclusions

Introduction

This chapter advances the discussion of the thesis content explored in chapters one to five. An assessment of other springs found both inside and outside the study area provides some additional context and then the results from the five springs studied for this thesis are summarised and compared under the headings of chronology, technology, site types, sociality and deposition. The thesis objectives, as detailed in Chapter One are then revisited, essentially broadening the discussion offered in the results chapters (four and five). Finally, some concluding remarks, including future directions and potential for further research at spring sites with Mesolithic activity, are presented.

This thesis has examined Mesolithic activity at two types of springs with exaggerated properties: hot springs and tufa depositing springs. Whilst there are other springs with distinct attributes, these are the only examples in the study area where significant archaeological work has been carried out (an exception is the unpublished site of Vespasian's Camp, see page 234 for further comment). This makes it difficult to compare the activities at the hot and tufa springs with other "unusual" springs in the region. Where work has been carried out at "normal" spring sites and Mesolithic material found it is often little discussed, being seen as incidental to the main archaeological periods under investigation. For example, Mesolithic flints were recovered from near the springs rising in Wells, Somerset during the Wells Cathedral excavations, which were focused on the medieval archaeology (Rodwell 2001). These were published but not considered to be of any great significance. In other cases, the material remains largely unpublished, with the only information being a short HER entry with little detail or a cursory mention on a website. The latter is illustrated by the brief note that Mesolithic material has been found near the group of five spring sites at Belchalwell, Okeford Fitzpaine in Dorset: of interest here is the fact that one is a petrifying spring and two are chalybeate springs (Belchalwell.org.uk). In other cases, Mesolithic sites have been excavated but adjacent springs are not considered to be of any particular importance beyond the mundane, such as at Birdcombe, in Wraxall, North Somerset (Sykes and Whittle 1960, Gardiner 2001 and see page 231).

Later historic activity at many springs adds to the problematic nature of investigating Mesolithic activity. At the tufa depositing springs of Springhead in Kent, the Mesolithic activity is masked by the presence of the Roman temple (Hardy *et al.* 2011). The appropriation of springs as holy wells during the medieval period led to the building of well furniture and sometimes churches, precluding any further investigation. Abstraction and urbanisation, as well as the difficulty of excavating active spring systems add to the difficulties. Despite these drawbacks, a small selection of pertinent examples are referred to in this chapter to help contextualise the findings.

(Note, in the discussion the wording ‘all sites’ and ‘five sites’ refers to the five main springs under investigation in this thesis, that is the Hot Spring, the Sacred Spring, Langley’s Lane, Blashenwell Pit and Cherhill).

Other springs with unusual properties in the study area

Some examples are outlined here in order to illustrate the presence of other springs that can also be considered as unusual landscape features in the study area. Some of these have definite Mesolithic activity associated with them whilst others show only a Mesolithic presence in the wider environs which may, however, still be linked to the way that the springs were perceived and used.

One of the largest Mesolithic sites in North Somerset is Birdcombe, in the parish of Wraxall (ST475718). It lies on a southern facing slope of the limestone Failand Ridge, some eight kilometres from the present coastline, and was therefore an inland site during the Mesolithic. There are spring lines on the ridge and the site of Birdcombe lies in close proximity to two of those springs. It is noticeable that very little is made of this fact in the published literature. The smaller of the springs is a cold water spring that feeds a pool, the larger, known as the ‘Whirly Pool’, is a bubbling spring fed pool.

The site was excavated in the 1950’s by Sykes and Whittle (1960) and then again in 1997 by Gardiner (2001). In excess of 3000 flint and chert artefacts were recovered from these excavations, which included cores, microliths, an awl and scrapers. Sykes and Whittle (1960) recovered large quantities of flint debitage, and retouched items which included twenty one microliths, from the area of the small cold water spring. Surprisingly the area immediately adjacent to the Whirly Pool spring has never been excavated.

The presence of approximately twenty-two obliquely blunted points, side/end scrapers on blades, and two awls (one a *meche de foret),* would suggest an early Mesolithic presence. A broken Horsham point is the only other typological indication of earlier activity, whilst the rest of the assemblage is of late Mesolithic date. The microliths included scalene triangles and lanceolate/rod forms, the latter of which are found in late assemblages. Radiocarbon dates for the site date the latest activity to 4358-4047 cal BC (Beta-147106) and 3637-3362 cal BC (Beta-147105), which suggests activity here spanned the Mesolithic-Neolithic transition, although no early Neolithic activity was recovered here. The radiocarbon dates from Birdcombe were not all from sealed contexts, so the dates need to be treated as indicative, however, the Mesolithic activity was sealed by a metre of colluvium and it is probable that Birdcombe represents some of the last vestiges of a ‘purely’ Mesolithic lifestyle in the British Isles.

It was noted by Gardiner (2001) that the obliquely blunted points were stratigraphically below the geometric types, but other artefacts such as the end scrapers, more typical of the early Mesolithic, were found in contexts with later types. It is feasible that Birdcombe also reflects the regional differences in lithic assemblages highlighted for south east and parts of south west England.

Other than a few greensand chert items and some unusual artefacts apparently of Carboniferous limestone (Gardiner 2001), the majority of the flint originated from a chalk source, postulated by Gardiner (2001) to have come from the Marlborough Downs. Given the proximity of locally available beach flint, there seems to have been effort expended by people at Birdcombe to obtain quality chalk flint for knapping purposes. Given that this site is further away from the chalk than any of the five springs looked at here, it is a good example of distance from source not necessarily determining raw material selection. Activities taking place at Birdcombe included the knapping and production of microliths, which were probably hafted into composite tools, and the scrapers and awl suggest the processing of materials. Concentrations of charcoal (mostly oak and hazel) and flint indicate burning of some sort probably occurred at the site but no evidence of actual hearths was found (Gardiner 2001).

Birdcombe is the largest occupation site so far discovered in the North Somerset area, yet there are springs all along the Failand Ridge and the resources available to Mesolithic people would have been similar anywhere in the general location. It seems feasible that one of the reasons they chose this spot was the presence not only of a cold water spring, but also of a bubbling spring, which until it was disturbed by abstraction in 1888 was said to have shot water high into the air on occasion (anecdotal reference).With the renewed interest in the significance of place, additional targeted work at the Whirly Pool would be warranted.

Some other bubbling springs with associated Mesolithic activity have been noted in the study area, with that of Springhead, Fontmell Magna, Dorset being a prime example. Springhead is one of several springs that become the Fontmell Brook and eventually join the River Stour. Late Mesolithic artefacts have been found here but as yet, no other published detail exists for these, although some limited work is being undertaken currently as part of a schools project in conjunction with 'CBA (Council for British Archaeology) Wessex' (Richards and Riley 2012).

Chalybeate springs are those that have a high iron content. The ferrous nature of the water means that the water from these springs issues an orangey-red colour and in the right circumstances can stain the surrounding vegetation. The Chalice Well, Glastonbury, Somerset, also known as the 'blood spring', has long been celebrated for its healing properties. This now enclosed chalybeate spring which emerges between Chalice Hill and Tor Hill, gained its name owing to its reddish waters. Twenty Mesolithic flints were recovered here by Rahtz (1964) during excavations to investigate the history of the associated gardens. These consisted of one core, four core fragments, six blade fragments, one retouched blade, four flint flakes, one chert flake and three pieces of debitage. None of these were *in situ* but indicate that there was at least some Mesolithic activity around the spring, which seems to have included knapping activity and the production of flint tools and microliths. It is likely these represent a small fraction of what may have been a more extensive 'visit'. A further thirty seven flint and chert artefacts, including four cores, found during excavations at nearby Glastonbury Abbey (cited in Rahtz 1964) also indicate a wider Mesolithic presence. It is not hard to imagine that the 'blood red' waters would have attracted Mesolithic people, just as they do modern 'well worshippers' today. The presence of small amounts of tufa in the spring deposits as well as the reddish brown iron deposit precipitate may have been an added attraction.

There are very few examples of mud springs in the British Isles. The best known are the five springs at Templar's Firs, Wooton Basset, Wiltshire (SU078815), which cover an area of about 0.8 hectares. These springs issue clay in suspension, i.e. mud, under artesian pressure and bring up fossils of Jurassic origin including belemnites and ammonites that still retain their iridescent aragonite shells, which wash into the adjacent stream (Bristow *et al.* 2000, Hart *et al.* 2006). Whilst no evidence of Mesolithic activity has been found in direct association with these springs, which is not entirely surprising as they have been known to 'swallow' cows and 'remove' geologist's boots, flint has been recovered not far away at Red Lodge (SU065832) indicating that Mesolithic people were in the area. The age of these mud springs is not known, the only known estimates stand at a very conservative 200 to 300 years, based on the date of an enclosure wall and ditch around the site (Stanton 1995 cited in Hart *et al.* 2006). However, given that the springs are most active when the water table is high and in winter, the fact that the 'waters' emerge from vents some twenty metres deep, and that further inactive examples are being found elsewhere, that some of these were active during the Mesolithic is not an impossibility. Further examples include unnamed sites less than two kilometres away from the Templar's Firs site, and Greenham Common, Berkshire (Baird 2002). The evidence for Mesolithic activity in the vicinity of these mud springs is circumstantial at best, but it is certainly possible that springs like these existed during the Mesolithic and one wonders what people would have made of mud emerging from the ground at high pressure.

Recent excavations at the Iron Age hill fort of Vespasian's Camp, Wiltshire (SU146417) by David Jacques and the Open University (2011) have uncovered extensive numbers of Mesolithic flint in association with the super-ambient (warm) spring. At least 9000 pieces of flint, some of which was burnt, was found with a large quantity of auroch bone and charcoal. The site has yet to be published and therefore the detail available is sparse, but this appears to have been a place where the conspicuous consumption of auroch, some of which was cooked (from the appearance of the bone) took place during the late Mesolithic from about 7355 ± 30 BP/6250 cal BC (SUERC- 33649) over a period of at least a thousand years. At present, the site is interpreted as a base camp where repeated visits were made. That the numbers of flints are from only two small trenches (six by four and four by 2 metres) suggests that there may yet be more Mesolithic activity to be discovered. It is difficult to comment further on the suggestion that this was a base camp, until the site has been published. That the spring is just over three kilometres from Stonehenge does seem to be further evidence that this landscape was of particular importance in the Mesolithic (also see Parker-Pearson 2012). It also adds weight to the importance of carrying out work at spring sites. A visual appraisal of some of the flint recovered from this excavation (personal observation of some of the finds, which are still to be fully analysed) suggests the use of good chalk flint and is very much in contrast to the assemblages from the hot springs and tufa springs looked at for this thesis. This site was investigated with an initial Iron Age focus, but is one of the most significant Mesolithic discoveries in Wiltshire and beyond. Super-ambient springs occur elsewhere, for example, Cheltenham Spa, but the urban character of most of these places has meant that there has been little archaeological work carried out. Additionally, the super-ambient springs at Hotwells and Jacob's Well in Bristol would warrant further investigative work, to see if there is Mesolithic potential for these sites.

Saline springs are not common in the study area and none have been associated with Mesolithic artefacts as far as can be ascertained. However, slightly further afield Mesolithic flint has been recovered at the salt spring at Droitwich Spa, Worcestershire and the site has been interpreted as attracting Mesolithic people because large mammals would use the spring as a salt lick (Jackson and Dalwood 2007).

A summary and comparative analysis of the lithic assemblages from the five selected springs

The results from the analysis of the five springs are summarised and compared here, in relation to several broad themes identified throughout the thesis (chronology, technology, site type, sociality and deposition), the main commonalities and differences between the sites are reiterated. However, this general appraisal comes with the caveat that the circumstances in which the assemblages were recovered and, indeed the contexts they were recovered from, are quite different. Whilst the springs are very different from each other in a number of ways for example, geographical location, topographic position, and in the physical properties they exhibit, they share the basic essential elements of being wet and issuing from the earth. Their properties are unusual compared to the majority of springs in Britain and whilst they are certainly not the same, they can all be considered unusual landscape features.

The flint recovered from the Hot Spring pipe and the Sacred Spring deposits includes an assortment of material: retouched and unretouched flakes and blades, shatter, cores (only at the Sacred Spring) and microliths, thermally fractured flint, chalk flint and chert, utilised and apparently non-utilised pieces, as well as burnt material. A similar set of lithic material was noted for the tufa springs. The numbers of retouched pieces for each spring are listed in Appendix Two. At Langley's Lane, and possibly at Cherhill, there is evidence of structured deposition into pits and hollows. These deposits contain a mix of materials including flint (mostly knapping debitage), stones, fossils and bone.

Chronology

Through typological dating of the lithics and chronometric dating it was possible to assign the five sites broad dates for occupation / main phases of activity. The earliest activity took place at the Bath hot springs where the lithics include both an early (broad blade microliths) and a late component (small narrow bladelets and bladelet scars).The typological evidence is supported by dates, obtained from Optical Stimulated Luminescence (OSL), of 9210 ± 520BP (OxL-1036) and 5788± 330 BP (OxL-1035) for the formation of soils around the springs (Jordan in Davenport *et al.* 2007:13); these soils being conducive to the growth of vegetation, which in turn would support other resources. Both hot springs were active during the early Mesolithic, and continue to be active to the present day. It seems reasonable for there to have been an interest in the springs during the whole of the Mesolithic period.

The activity at the tufa springs took place mostly during the later Mesolithic and the start of this activity seems commensurate with the onset of tufa formation at two of the sites, Cherhill at around c.7230BP and Langley's Lane post 8500BP. At Blashenwell Pit, although tufa may have been forming at around 9000BP, a radiocarbon date of 6450 ±150BP (5658 cal BC) (BM-89) from auroch bone associated with the lithics also supports a late Mesolithic presence. The Langley's Lane spring evidenced the latest activity, with extreme miniaturisation of the microliths typologically supporting this premise. There was no evidence at the tufa springs for activity taking place prior to the onset of tufa deposition. At Langley's Lane, activity and interest in the tufa deposits seems to have ceased by the end of the Mesolithic (with the exception of one early Bronze Age date) , whilst at Cherhill, it continued into the Neolithic and at Blashenwell Pit into the Romano-British period.

Technology

The lithic assemblages from the five sites seem to indicate expediency rather than an overriding concern with the intentional production of finished, formal or aesthetically pleasing tool types. This is especially noticeable at the Langley's Lane spring, but is also feature of the lithics from the Bath springs, where rolled thermal flakes were utilised. Although good chalk flint was used at all the sites, there is a noticeable component to each of the lithic assemblages that indicates raw material choice was not necessarily an important factor for the making of stone tools. The knapping strategies employed at the five sites also appear to reflect this. Formally retouched tools only make up a small percentage of the total numbers of lithics from the five springs (see table in Appendix Two) the partial modification of miscellaneous pieces of flint seems to have sufficed. Microliths seem to have been the one exception to this, with most examples from all five sites reflecting careful production. This might be expected if one considers the immediate nature of hunting and to some extent the associated procurement of resources. For example, poorly made armatures may result in unclean kills, whereas minimal retouch and expedient flakes make perfectly adequate tools for most processing tasks.

These observations might imply that the main reason for visiting these springs was neither economic nor functional. This does not mean the necessity for implements, with which to carry out tasks, was negated, but knapping and tool production do not appear to have been the prime motivation for being at these places, despite the need to procure and consume foodstuffs or maintain tools and equipment.

Site types

From the lithics alone, it is impossible to ascertain site types for the five springs, even allowing for the fact that none of these sites were excavated to their fullest extent and the lithics are only ever a sample of a more complete assemblage. Mellars devised the notion of sites fitting into three broad types: Type A (microlith dominated) hunting camps, Type B (balanced assemblages) base camps and Type C (scraper dominated) hide preparation sites (Mellars 1976). The legitimacy of this model has been challenged elsewhere (Conneller in Milner and Woodman 2005) and the results of this study might also refute Mellars premise. If this traditional (economic) model is used then the Hot Spring, Langley's Lane and Cherhill might be considered hunting camps and the Sacred Spring and Blashenwell would be considered base camps (Table 6.1). This cannot be realistically supported, unless one wishes to assign broadly economic and functional meaning to these places, whilst ignoring important contextual information. The nature of deposition, especially at the Hot Spring and Langley's Lane, suggests non-functional activity took place and that carrying out of other tasks was not a prime reason for dwelling at these places. The deposits made there are highly unusual in the British Mesolithic archaeological record. However, to assign these springs as 'ritual' or 'sacred' sites and the remaining springs, those that seem to lack obvious deposition into pits and pipes, as 'non-sacred' is equally flawed.

The interpretations offered in this thesis allow for the presence of ritualised acts (for example, the deposition of material culture into, not only pits and pipes, but also into spring deposits) embodied in what appear to be the more mundane, everyday activities of Mesolithic people. If anything the evidence from the springs examined here demonstrates the futility of trying to fit Mesolithic sites into pre-defined categories. It seems far more productive to consider the evidence in a more holistic way.

Figure 6.1 site types according to Mellars (1976) model

Site	Hot Spring	Sacred Spring	Langley's Lane	Blashenwell Pit	Cherhill
Microliths	10	9	20	2	16*
Scrapers	3	8	3	3	2
Site type	A	B	A	B	A

*Note: the numbers of microliths here do not include those found in 'other contexts' in order to produce a more balanced comparison of the lithic samples.

Sociality

The social implications of the evidence were somewhat harder to ascertain than any other aspect. Certainly, the lithics would suggest that aggregations of people visited all five springs over extended periods of time and that these places probably retained their significance over a number of generations. Who these people were is more difficult to gauge. It has been suggested here that select groups of people visited the springs of this study for purposes that went beyond the functional, but did not exclude it. The hot springs may have been places for recreation, relaxation and activities that could have included bathing, the therapeutic use of water, and the working of materials. If this was the case, then one might expect visitors to the hot springs to have encompassed a broad cross-section of a population: men, women, children, the elderly, and that they visited the springs perhaps as a familial or tribal group.

If, as suggested here and in part by Evans (1999), tufa springs are/were places associated with birth, rebirth and renewal and that meaning had any significance to Mesolithic people, then these springs may have been considered liminal places in the landscape. If this was the case, then tufa springs might have attracted only a particular section of a society: possibly those entering a liminal time in their lives, for example women in childbirth, adolescents, those nearing death. Certainly the numbers of lithics at the tufa springs (being considerably less than what is found at other camps) would support this premise, although this does not indicate exactly who frequented these sites and why.

Unfortunately, it is difficult to expand further on the social implications of this and little of certainty can be ascertained. However, one facet of people's social lives, not yet considered but worthy of comment, is that of leisure time. At least some of the activity occurring at spring sites, especially at the hot springs may fit into this category. Sahlins (1968, 1972) proposed the concept of the "original affluent society" where hunter-gatherers spend much of their time engaging in less than necessary activities - essentially leisure. Whilst a full review is not permissible here, it certainly needs to be considered that time spent, for example at the hot springs of Bath, included activities that might be called 'down time' today. These may have been places where people congregated for social exchange, the sharing of ideas, the meeting of reproductive partners, gossip, or rest and relaxation with the aid of the hot waters

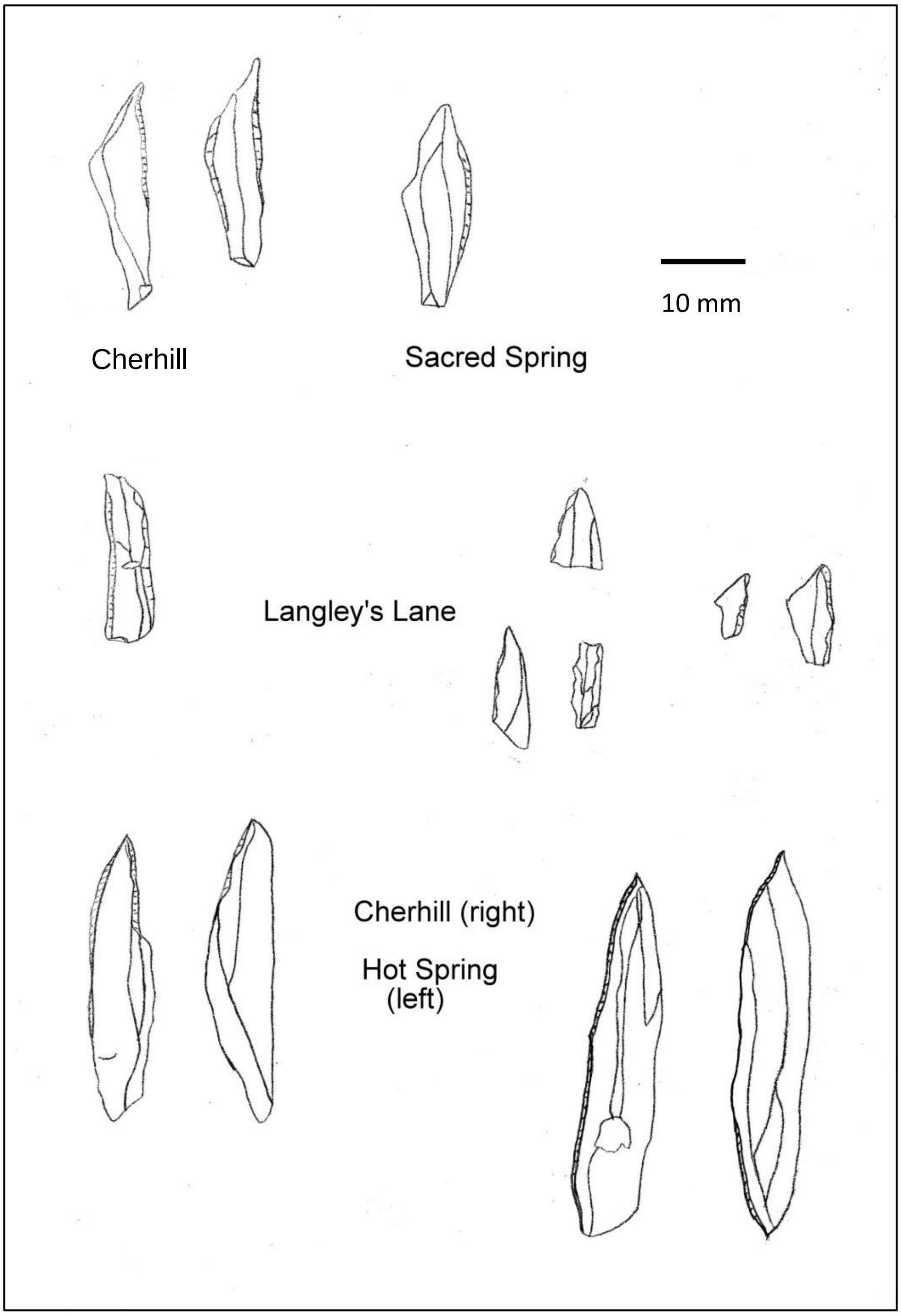
Deposition

The nature of deposition varies considerably between the five springs. At the Hot Spring and Langley's Lane, the deposition of artefacts is highly structured. That into the Hot Spring pipe seems to echo deposition into the swallet at Farnham (Clarke and Rankin 1939), whereas at Langley's Lane artefacts were placed into deliberately dug pits. This contrasts with what appears to be more casual discard at the Sacred Spring, Blashenwell Pit and Cherhill. However, it has been proposed here that discard at these other springs may not be as casual as first supposed. Neither does differential recovery of the lithics at the Sacred Spring preclude deposition into the spring pipe there, as it has not been subject to investigation. The apparent casual discard into the tufa at Blashenwell may in fact be a structured deposit, but does not take a form archaeologists would normally view as structured. Similarly at Cherhill, the pit that was interpreted as a context of production may actually be a depositional context.

Further remarks

In regards to production and consumption these spring sites are similar to what might be expected at many other Mesolithic sites. The range of activities carried out and the resources that were procured are indicative of basic requirements of life, but are not evident at a scale that would indicate these places were a focal point for persistent and regular dwelling. The depositional contexts are more unusual and the springs themselves exhibit properties not seen at many other Mesolithic sites. The observations made in this section are expanded upon in the remainder of this chapter, where the thesis objectives are revisited and some conclusions are drawn. It should be noted that the discussion may relate to more than one objective, and in that case will have been included where it feels most appropriate.

Figure 6.2 Microlith Illustrations for comparative purposes



Thesis objectives revisited

To determine how Mesolithic artefacts were used; selected and deposited at these sites

The activities taking place at all five springs can be categorised under the general themes of production, consumption and deposition. Regardless of any prime purpose for visiting these places, an assortment of tasks were carried out: knapping, preparation and repair of tools, the procurement of food and materials for processing and consumption, and the deposition of artefacts, sometimes it seems, in proscribed ways. The presence of microliths, scrapers, awls/piercers and knapping debitage at all five sites, as well as evidence of structured and non-structured deposition attests to this.

As discussed previously, the lithic assemblages from all five sites suggest convenience was an intentional strategy. People seem to have made items to use expediently to meet their immediate needs, rather than travelling to these sites specifically to knap flint or to produce items solely for deposition. It also appears that although lithics were used for activities ranging from production to deposition, people were not overly-concerned with using high quality flint, even where it was locally available. A range of tasks were seemingly carried out, regardless of the availability of larger nodules or better quality stone (although tools derived from plants may also have been used and not survived in the archaeological record). This suggests the production of stone tools, or even their subsequent use, was not the primary reason for being at these places, though this did not preclude the deposition of knapped flint in a structured fashion into pits, pipes and hollows after the event.

The idea that Mesolithic people dug pits for anything more than food storage, the economic caching of raw materials, and as bases for shelters, is quite recent. Occasionally pits dated to the Mesolithic have been assigned ‘ritual’ status, especially in Europe, but other than the Stonehenge pits, in Britain it is a relatively unknown phenomenon. Allen and Gardiner (in David and Wilson 2002) recently highlighted a number of pit features that have been dated to the Mesolithic, or potentially could be, in the chalk landscapes of southern Britain. Elsewhere, pits that would once have been typically assigned to the Neolithic have been shown to have Mesolithic antecedents, for example the pit alignment at Warren Fields, Crathes, Aberdeenshire (Murray *et al.* 2009).

Certainly the pits at Langley’s Lane do not fit into any economic model of pit function and little has been written about pit digging in Mesolithic Britain that goes beyond the practical and functional. For considerations beyond this we must look to Neolithic scholars, such as

Julian Thomas, who have suggested a model which accounts for the Neolithic practice of pit digging (Thomas 1991, 1999). Whilst Thomas recognises that pit digging took place in the Mesolithic, it is normally seen as starting in earnest in the Neolithic with an "increased interest in opening up the earth" and engaging with what is essentially the periphery of two worlds: above ground and below it (Thomas 1999:69-73). Thomas proposes that pits dug in the early Neolithic were primarily about establishing the significance of place (Thomas 1999), and would have been part of a process involving the commemoration of an event or person(s) at a particular location in the landscape, thus "committing an event to social memory" (Thomas 1999:73). By the later Neolithic, Thomas suggests that the act of digging the pit became more important. Rather than it being a commemorative act, the removal of the earth and placing things in the resulting feature became the event (Thomas 1999: 73). He also suggests that the range of materials that went into later pits, as well as the number of pits being dug, is indicative of the increasing importance on pits and their contents to convey complex social messages (Thomas 1999: 72).

The act of pit digging must surely now be recognised as a tradition that has its roots in the Mesolithic, especially the latter part of the period. Recent examples found in Britain include North Park Farm Quarry, Bletchingley, Surrey, an interesting example, where a series of Mesolithic pits were found in a hollow approximately one hectare in area (Guinness 2012) and Flixton School House Farm in the Vale of Pickering (Taylor and Grey Jones 2009). The phenomenon of making holes in the ground is not confined to 'circular' pits either. Allen and Gardiner (in David and Wilson 2002) cite several examples where irregular features have been dug. Such features are found at Langley's Lane and at Cherhill. 'Ready-dug' features such as animal burrows and tree throws may also have been recognised as suitable places for deposition during the Mesolithic, though the presence of flints in the latter is often explained as fortuitous (for example, Tolan-Smith 2008: 150).

Deposition that in some ways parallel the activity at the hot springs and tufa springs can be recognised from other Mesolithic sites. For example, the concept of the deliberate deposit: nearly 19,000 pieces of flint (approximately 9,000 of which were burnt) along with an axe and sharpening flakes, were made into a 'swallow hole' at Farnham (Clarke and Rankine 1939 cited in Chatterton 2006). Features near structures in Downton (Higgs 1959) and Farnham (Clarke and Rankine 1939) contained flint debitage and animal bone. Chatterton (2006) interprets these as midden pits, although he sees them as not purely functional but rather as a 'ritual' expression of the importance afforded to those materials deposited. He suggests the animals and plants are "consumed" materials and the treatment they received was out of respect for the living world (Chatterton 2006: 117). There is no reason this premise might not also apply to the stone given that it also has animistic properties in many hunter-gatherer cosmologies.

However Mesolithic people chose to put material culture into the earth, whether it was into a deliberately dug pit, or a natural feature such as the Hot Spring pipe, there is the sense that they somehow recognised the world was not composed purely of what they could see, but also a world they could not access (or would not access), but with which they could engage via those ‘portals’ that connected two realms of existence. If we recognize that the deposits into the pits at Langley’s and the hollow at Cherhill were deliberate and we accept that the significance of the pits, hollows and springs was that they connect the lived in world with a world of ‘other’, then there must be some significance to the deposits that went into them. In the case of Langley’s, the deposits were made up of flint and chert, animal bone and geofacts: stones of varying lithology and fossils. A similar pattern was seen at Cherhill, and circumstantially at Bath (a lack of animal remains here could well be due to the acid waters of the hot springs meaning they were not preserved). The overriding feature of all of these deposits was that no one type of artefact seemed to take precedence over any other in terms of importance, especially in terms of the lithics. A retouched bladelet, for example, was not noticeably a more or less significant item for deposition than a piece of burnt flint, or an amorphous lump of ironstone.

At some of the sites there is material engagement with the locales in other ways. At Langley’s Lane, there is evidence of active manipulation of tufa. Soft friable tufa was fashioned into ball like shapes and placed into pits, and it seems that discrete spreads of tufa and clay were placed on the ground surface. At Cherhill, some hardened tufa was placed in the hollow with other materials, and at Bath, there is evidence, although circumstantial, for hardened tufa having been deposited into the hot spring pipe.

The spreads of clay at Langley’s Lane are small compared to features that have been interpreted as clay floors, elsewhere. For example, at Hawkcombe Head, a so-called ‘clay floor’ contained microliths and debitage and measured 2m by 2.2m and 0.09m in depth (Gardiner in Waddington and Pederson 2007:88). The clay floor was deliberately laid though, and if the assumption that surrounding features were postholes that supported a structure is correct then a functional explanation is viable. However, Gardiner (in Waddington and Pederson 2007:88) proposes that the clay came from a boggy area of ground nearby and therefore it cannot be discounted that even if laid for practical reasons, that act of transplanting materials from one place to another was of significance. This is further discussed on page 260.

To see whether there is evidence for intra- and inter-site patterning of particular artefact types

Analysis of the available data showed no real evidence for 'logical' and clear-cut artefact patterning at any of the five springs looked at here. Even at the Hot Spring and Langley's Lane, where there is more than circumstantial evidence for the selection of particular items to be placed into structured contexts, the patterning of these objects is not clear. In other words it seems that there were no immediate criteria to be satisfied when selecting items for deposition. If anything the apparent lack of patterning, as can be derived from typological analysis, has been identified as an important factor here.

It may have been the combinations of materials - flint, stone and bone, tufa and fossils - that had meaning, a mingling of individual properties and a transformation into something new, the transformation aided by the particular properties of these spring sites. Other organic items derived from plants may also have been deposited. Whilst we see these materials as being quite different and all having distinguishing characteristics, this may not have been the case for Mesolithic peoples. As Tilley (2010) commented for bones and stones in the Wessex chalk, it is noticeable that the materials deposited at these springs share similarities, both with each other and with the springs themselves, and therefore may be linked conceptually.

At the tufa depositing springs these links are particularly perceptible, for tufa resembles both bone and stone (personal observation and shared by others, see Figure 5.41). As detailed in Chapter Five, tufa adhering to flint looks a lot like the cortex that coats flint nodules. The vegetation, as it is encrusted becomes stone like; it is as if rock grows out of the ground and the physical landscape is transformed, soft becomes hard, water becomes stone. Other more subtle similarities with lifecycles can be made. The vernix coating a new born baby is very like a tufa coating, and the common use of white pigmentation in ceremonies around birth, death and growth, may have some of its origins in this natural phenomenon. Tufa may then be a powerful metaphor for new life, transformation and change. Less obvious are those links with phenomena such as the hot springs, but even there a conceptual link can be made between the heat retaining properties of flint and the hot water emerging from the gravels at Bath. It is possible that deposition of flint into this context was about maintaining the warmth of the water, just as the human body must be fed, so too was the 'entity' that kept the spring warm: an underground sun perhaps.

Although there is a distinct lack of patterning in terms of shared typological characteristics, and no rigidly defined, repeated sets of attributes that seem to determine the selection, consumption and deposition of materials at these sites, the potential for patterning in conceptual terms does seem to exist. How archaeologists go about identifying these is not necessarily a straight forward endeavour and the situation may not be helped by trying to impose a system of 'logical' patterning, from a modern, western perspective.

To see if it is possible to take lithic assemblages and read off activity associated with ritual aspects of behaviour

Analysing any lithic assemblage without due regard to context will not furnish a researcher with much information about behaviour beyond the technological aspects of lithic production. Yet, even with contextual information, deciding whether an assemblage has an element of ritual inherent within it, or is in any way associated with such behaviour, is fraught with difficulties.

The importance of debitage has been noted by analysts such as Andrefsky (1998), for it gives valuable clues to the nature of lithic assemblages. However, archaeologists tend to give more weight to those pieces that they perceive as important: retouched pieces, those made from good chalk flint and items that have potential for 'curation'. There are plentiful examples, apparently pertaining to ritual behaviour, of axes/adzes/picks being deposited into both pits and watery contexts during the Mesolithic, Notable examples include the Thames picks (Care 1979); the axe in a pit at Farnham (Clarke and Rankine 1939) and the Culverwell picks (Palmer 1999). These deposits are in stark contrast to those found at the sites examined here. Certainly at these springs it seems to be the treatment, not the form, of the artefacts, which allows the exploration of this significance.

It is noticeable that the flint deposited into the Hot Spring pipe represents pieces from all stages of the knapping process: debitage and finished tools, whilst the flint placed in the pits and hollows at Langley's Lane was mostly the debitage normally categorised as knapping waste: shatter, unretouched flakes, chips and burnt flint. A similar situation is noted for the Sacred Spring and at Blashenwell, although it was the spring deposits themselves that were the contexts for deposition in those cases. None of the artefacts that were deposited into these particular contexts stands out as being especially remarkable.

It should be made clear that just because archaeologists do not regard these artefacts as particularly ‘special’, as they are not the equivalent of the polished axe, or the retouched sickle blade, and do not conform to an aesthetic or functional ideal, it does not mean they did not have inherent meaning to the Mesolithic people who produced them. Hampton (1999) has noted that the Dani of Papua New Guinea do not have large nodules of chert or flint available, so instead rely on small, non-retouched flakes for most tasks:

“The sharp, unretouched, edges of individual flakes(1.5 to 3.5cm long dimension) are used for numerous tasks: cutting and shaping, incising, boring, splitting and drilling bamboo, wood, bone, reed, and shell tools and adornments…the cultural significance of this tiny tool is out of proportion to the very small size of the cutting flakes” (Hampton 1999:297)

It appears that the lithics, as specific objects in themselves, do not always allow for the recognition of ‘ritual behaviour’. This may be particularly pertinent to Mesolithic contexts. Indeed, the nature of assemblages at the hot springs and tufa springs and the way they were treated suggests the bias towards only fine items being perceived as significant should be re-considered.

To see if ‘ritual’ behaviour can be distinguished from more mundane/practical behaviour

Lithics by themselves do not elucidate all the necessary information to understand Mesolithic people’s cosmologies and beliefs, or how they conceptualised springs. Context is all important and may allow us to identify practices that are not necessarily linked to everyday survival. For Mesolithic sites, those contexts can be difficult to see, for even an ordinary and mundane feature; a hearth pit for example, can have aspects of ritual and belief associated with it. However, dynamic landscapes such as the springs of this study are unusual features in the landscape and it is possible to say that these may have affected people’s perception of their landscape.

These features are so unusual that they might have only been encountered in a few places (or only one in the case of Bath) in the dwelled in landscape. They appeared to have elicited behaviour that can be said to have included aspects of ‘ritual’ action, perhaps to mitigate perceived consequences, or because as suggested on page 238, these sites were considered liminal places in the landscape and therefore may have been frequented during ambiguous periods of people’s lives. One way of trying to distinguish ritual behaviour from that which was more mundane is to compare the nature of activity at apparently unusual spring sites with so called normal cold water springs, and more ‘typical’ Mesolithic sites.

The total recovered assemblages from the five spring sites examined here do not seem to conform to what might be expected at base camps or places where there were large aggregations of people. The numbers of lithics are not particularly great, even when temporal and spatial scales are taken into account, and allowing for the fact that only a sample of the sites in question were excavated. The numbers are small, even when compared to some other spring sites in the study area. For example, at the two cold water springs at Hawkcombe Head, on Exmoor, Somerset, in excess of 8000 pieces of flint have been recovered during surface collections and excavations (Wainwright 1960, Norman 1982, Gardiner in Waddington and Pederson 2007, ARS Ltd 2011).The flintwork from Hawkcombe Head is undoubtedly late Mesolithic in character. An early Mesolithic burin found in the 2011 excavations (ARS Ltd 2011:19) is dubious and would be better identified as a truncated bladelet with the proximal end present and edge damage (confirmed by Dr David Mullin). The microliths recovered from Hawkcombe Head are consistent with the radiocarbon dates obtained from various excavated features, including a hearth 6390-6210 cal BC SUERC-2970 (GU-11979), a post hole 6760-6500 cal BC SUERC-2968 (GU-11978) (Gardiner in Waddington and Pederson 2007), and an occupation floor 5311-5073 cal BC SUERC-37347 (GU-26131) (ARS Ltd 2011). These dates are roughly contemporary with the late activity occurring at the study sites. It may well be that Hawkcombe Head was a typical base camp (Gardiner in Waddington and Pederson 2007), and noticeably contrasts with the spring sites examined for this thesis.

Other cold water springs in the study area are also associated with Mesolithic activity to some degree and are probably also the sites of larger encampments. Many of the more substantial sites appear to be in locations where there are clusters of springs, or spring lines, perhaps indicating that these acted as markers in the landscape and focal points for activity. Tog Hill, Cold Ashton, Gloucestershire is the largest known site with Mesolithic surface scatters in Gloucestershire and lies some six kilometres north-east of the Bath hot springs. At the foot of the escarpment from where the flints were collected over approximately eight hectares (mostly by Sykes and Whittle 1965), are several cold-water springs. 1148 pieces of flint recovered from surface collection were described in Sykes and Whittle’s report, unfortunately, they discarded debitage that did not show signs of secondary working or use (Sykes and Whittle 1965:6) and this has obvious implications for any overall assessment of the assemblage, which is potentially much larger given no excavations have taken place there either. Although the majority of the flint recorded is diagnostic of the early and late Mesolithic, there were later Neolithic and Bronze Age flints present, indicating a (possibly discontinuous) presence on Tog Hill over a long period.

The range of flint artefacts from Tog Hill (not including the discarded debitage) included seventy-two cores, in excess of 200 blades, bladelets and flakes, sixty-five obliquely blunted points and three geometric microliths including a rod and two scalene triangles. Microburins, in conjunction with small bladelets and flakes with narrow dorsal scars, attest to the production of more late Mesolithic microliths at the site. Although the obliquely blunted points and the majority of flake tools would suggest an early date, there is definitely also a later presence. A number of burins and pointed flake tools are suggestive of the scoring of bone or other materials and a single axe sharpening flake is indicative of woodworking, perhaps at the site (Sykes and Whittle 1960).

Hawkcombe Head and Tog Hill seem typical of the range and types of flint implements one would expect from regularly visited/occupied sites and landscapes in the study area. The lithics present at the five spring sites examined for this thesis are not completely atypical in terms of the range of lithics present; however, the nature of the sites in terms of their (hydro) geological properties, and the contexts of deposition are.

Extending the c*haîne opératoire*

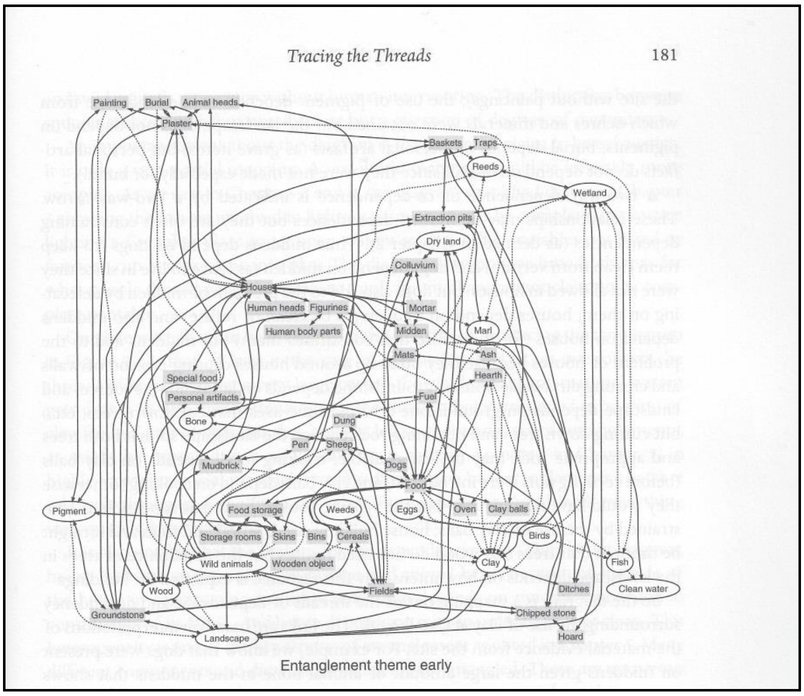
Regardless of whether we consider the activity at these spring sites as ritual/ sacred behaviour, functional, both, or otherwise, there are implications for how we apply the concept of the c*haîne opératoire* to Mesolithic activity at these places. As described in Chapter One, the c*haîne opératoire* often ends after the linear sequence of raw material acquisition, production, consumption and deposition. Yet, if we acknowledge Mesolithic people had a sense of the past, then they also may have had a sense of the future and did things with intent. It may be assumed that they were mindful of at least some of the post-depositional effects upon the materials they deposited. So for example, they were aware that at least some of the deposits, whether structured deposition or casual discard, made in the vicinity of tufa springs would eventually become covered by tufa.

There are risks and consequences to not carrying out certain actions, one makes a votive deposit, not only as a mark of respect but to negate or promote certain outcomes. Unless these actions were never pre-meditated, then people would have been aware of these perhaps at the production stage, even during the procurement of raw materials. They may even have believed that in order to preserve a source of production or procurement, certain actions have to be carried out, in order to maintain the re-production of the world: more a cyclical than linear *chaîne opératoire.*

These cyclical chaîne opératoires converge with Ian Hodder's entanglement theory (Hodder 2012). Within a framework of entanglement, Hodder describes human behaviour and material culture as a "tension between the historical build-up of ever more intricate constraining dependencies and the open and contingent nature of entanglements" (Hodder 2012:112). In short, people and things are constantly interacting with each other creating a myriad of possibilities, this means that *chaîne opératoires* are never straightforward, for at each stage 'things happen', circumstances change and people and material culture have agency which affect those *chaîne opératoires*. Chaîne opératoires then can be seen as the separate threads of entanglement, where each chaîne is dependent on and relational to the remaining chaînes. In this respect 'ritual behaviour' such as digging pits and depositing material culture into them cannot be divorced from other aspects of life.

In Hodder's entanglement theory, this interplay, between people and their interactions with 'things, is a "heterogeneous" entity but locating "entanglements" (Figure 6.1) is not an uncomplicated endeavour (Hodder 2012:112), and for periods such as the Mesolithic, where so much evidence is ephemeral, it is much easier to discern the chaînes as singular entities rather than complex entanglements. However, the springs of this study have shown potential to unlock Mesolithic 'entanglements'.

Figure 6.1: ‘Tanglegram’ (Hodder 2012:181)



To see if the nature of activity/deposition changed over time

The evidence, as explored here, seems to suggest relatively small groups visited the hot springs and the tufa springs over a period of time, where they engaged in particular activities potentially linked to the properties of those places. What is still not entirely clear is the time scale over which this happened, for discerning the finer temporality of events is notoriously difficult in Mesolithic archaeology. As discussed in Chapter One, the availability of radiocarbon dates is an improving situation, but microlith typologies are still relied on quite heavily.

Analysis of the lithics from the Bath hot springs has evidenced both an early and late component to the assemblages, suggesting a long tradition of visiting the springs, during which time flint typologically dating to the early and the late Mesolithic was deposited into the Hot Spring pipe, and possibly the Sacred Spring pipe too. The flintwork suggests the deposition of flints took place over a period of perhaps one thousand years and probably spanned the transition in lithic style that mark the period. Otherwise, it is not possible to add any real resolution and the period of deposition could well be shorter or longer, although the fact that the potential numbers of flints, maybe upwards of 12,000/m² favour the latter. What can be ascertained from the lithics is that the hot springs seemed to have retained importance for people over the early and later part of the Mesolithic. Although many aspects of the environment were changing, the springs were hot and remained a constant in an otherwise altering landscape. It seems then the reason people visited was to take advantage of the properties of the hot springs themselves, even if the meanings of the springs, or the activities taking place there, did not stay fixed over such a long period.

The case at the tufa springs is slightly different, in that an interest is shown in these places seemingly only from the late Mesolithic onwards. The main phases of Mesolithic activity at Langley's Lane, Blashenwell Pit and Cherhill seem to correlate with active tufa deposition at the sites. It is therefore likely that tufa deposition had started by the time people were visiting the sites and was one of the main reasons people were there. At all three spring sites tufa deposition had slowed or stopped completely by the end of the Mesolithic, although there was some continuity of interest beyond the period. These were dynamic landscapes, where changes and transformations occurred over individual lifetimes.

This study has not been able to further determine if there was real or significant change in the nature of deposition or other activity over time, even between similar sites. This may imply that people were having similar experiences, and perhaps assigning similar meanings to particular places over a long period of time. This may not be as far-fetched as it first seems; as discussed in Chapter Three, recurrent themes can be traced through time and space, ones where people relate to watery places in similar ways. However, everything discussed so far (essentially people's lifescapes) took place in the wider context of landscape, and this does have a bearing on the overall interpretation of these sites and what is happening at them.

The study area is extremely diverse in terms of the variety of topographical landscapes and therefore the habitats and environmental niches within it. The dramatic nature of landscape features such as Cheddar Gorge contrast with the uniformity of the chalklands of Wiltshire and Dorset. Springs, caves and swallets abound in the landscape. Essentially this is and was a landscape of contrasts.

The way people connected with at least some aspects of the landscape seemed to have altered, during the substitution of early Mesolithic practices for later ones, for example, the changes in lithic technology. This transformation perhaps reflects not only a shift in cultural practice, but also possibly indicates a diversification in people's cosmologies. It seems that all these aspects of life altered in accord with the rapidly changing nature of the Mesolithic landscape, and these landscape changes had an effect on people's perceptions of their world. In other words people reacted to what was happening around them, within the places they lived.

The way the landscape changed during the Mesolithic was discussed in general terms in Chapter One. Archaeologists have shied away from considering cultural changes that mark out late Mesolithic communities from earlier ones as a product of the environment, for fear of being labelled environmentally deterministic. However, it seems that the pendulum has swung too far in the opposite direction and we are left with a situation where the environment had no bearing upon Mesolithic lives. The period was however one of dramatic landscape changes and even more importantly those landscapes were dynamic. Moreover, dynamic landscapes and environmental changes tend to be incorporated into religious beliefs, world views, and changing ideologies. This has been recognised for coastal communities at around the Mesolithic-Neolithic transition, when people appeared to shun seafood at a time of rapidly increasing sea levels (Thomas 2003, Richard and Schulting 2006), yet we do not always think of inland communities having similar experiences. Of course at the time of the transition we are looking at the start of huge changes in ideological thinking, action and praxis, yet there was an earlier transformation in practice between the early Mesolithic into the late Mesolithic, which is particularly pertinent to the study area, and that is the treatment of the dead and the changing use of cave sites.

The dead are visible in the study area, albeit in small numbers during the early Mesolithic, however, by the late Mesolithic there is little evidence for the dead at all. This is a situation reflected in other parts of Britain, although not necessarily the case in the rest of Europe. The caves of the Mendip region of Somerset were a repository for the dead in the study area, with Aveline's Hole, Totty Pot, Gough's Cave and Badger Hole all having produced early Mesolithic human remains. The only other evidence for particular treatment of the dead at this time comes from the possible open-air cemetery at Greylake, Middlezoy in the Somerset Levels (see page 45 of this thesis). After about 7000BP, the visible curation of the dead seems to go out of favour. One possibility is that exposure to the elements was seen as an appropriate way of reincorporating the dead back into the earth, perhaps the reason why there is some evidence of human remains in shell middens dating to the late Mesolithic. This changing visibility of the dead is paralleled by a lack of other forms of late Mesolithic activity in the caves of the study area. It seems that people were deliberately avoiding these places, perhaps because there they would encounter remains of the past. Perhaps, these places became taboo, or avoidance was a mark of respect, although the concept of taboo is very difficult to find evidence for in the archaeological record (Milner in Insoll 2011). It may be because rising sea levels made coastal caves elsewhere inaccessible, or less desirable, places for deposition of the dead that the idea was translated inland. That this might not be the case all over Britain is hinted at by the presence of later Mesolithic shell middens in caves in the Oban region of Scotland (Hardy and Wickham Jones 2002).

When considering Mesolithic people, there has been a tendency to deny them a sense of history and in archaeological narratives, they seem to dwell in their own present. Yet, Mesolithic people had histories (Chatterton 2006) and they could encounter their own past(s).The resonance of memory cannot just be the preserve of Neolithic people, for Mesolithic people also had family, kin and ancestors, they too witnessed events and lived in a changing world. Digging pits and practising other forms of deposition even during the Mesolithic might have represented acts of commemoration as well as the marking and enculturation of place. These were conscious acts that acknowledged dwelling in the landscape in a more tangible form than scattered material remains. Structured deposition incorporated 'a presence of the past', which emphasised the significance of place as more than areas of previous dwelling.

The Mesolithic can be viewed as a crucial time of transformation: of people, lifescapes, landscapes and materials. The treatment of materials during this time may mirror the lifecycles of people and the landscape itself. Just as people transform as they are born, grow, and die, so to do animals, vegetation, flint objects and the landscape itself. This notion of transformation may have been important in understanding and ordering the world. To maintain the world order, people and things may have been treated in a certain way. In this respect the placement of material culture into the earth is an embodiment of the transformative nature of Mesolithic life and reflects the transition of human states from birth to death. Just as humans are born, but eventually their bones were placed into caves, swallets and maybe other liminal places, lithics were brought to life through knapping before their eventual discard sometimes in particular places. Whilst such ideas may have had currency throughout the Mesolithic, by the late Mesolithic there appears to have been more diversity in deposition (e.g. with pit and shell midden deposits) which might have reflected, but also contributed to, new and extended ways of thinking about the world.

So, whilst there seems to be little difference in the way the hot springs were treated from the early and late Mesolithic, and at the tufa springs the early Mesolithic cannot really be commented upon, it is difficult to say that there was a difference in the way these springs were treated as the Mesolithic progressed. What can be ascertained is that at both types of spring, the activities occurring there may, in part, reflect a wider diversification in Mesolithic practice, but one where there was still a measure of continuity.

To use ethnographic analogy to understand what might be happening in Mesolithic contexts

Some sites, such as Langley's Lane and the Hot Spring of this thesis, are so unusual, in terms of the nature of deposition found, that it seems obvious something extraordinary is happening there, but to try and make sense of this, more than the lithics and their contextual setting is needed. Although much maligned in recent years for poor use, ethnographic analogy is a useful tool with which to try and understand to some extent what might be happening in these places. Thousands of examples of people's interactions with springs and water in general, from all over the world and throughout time, can be gleaned from ethnographic, archaeological and historical sources, and show us the many ways in which springs have been conceptualised and used. Some of these are outlined in Chapter Three, where it is also noted that although there are no universals, recurrent themes can be identified: the animistic qualities and the personification of water; bodily sustenance; healing thirst; therapy, water's liminal qualities (which feed into cosmological beliefs) and its multi-sensory nature.

The water itself is the one factor that connects all the sites. Many aspects of the properties of water were discussed in Chapter Three, and therefore will not be repeated *ad verbatim* here. However, as espoused in that chapter, spring waters have properties far beyond being wet and issuing from the earth. Water impinges on all the senses and is therefore open to multi-sensory interactions. This engagement with the spring water is often forgotten about in accounts of the Mesolithic. These sensual qualities allow water to take on characteristics that reflect human traits and emotions, as well as mirroring human lifecycles. The following example serves to illustrate the way in which water so readily lends itself to exploration in ethnographic contexts.

Ritual practice embedded within watery contexts may not only be to do with the deposition of items, but the way things behave when they are deposited into those contexts; they are moving entities and water is not a passive participant, it has its own agency. One such example is the Xhosa River Ceremony (South Africa), which takes place during the initiation of tribal healers. This involves the deposition of objects meaningful to the tribe into a pool. The way these objects move and the patterns they make on the water's surface are indicative of the will of the ancestors (Bührmann 1987). Archaeologically, it would only be possible to see the end outcome of this ritual, that is the final resting place of those artefacts in the pool's sediments, but this example does serve to show that it is the process that artefacts undergo which is of importance rather than the eventual outcome of a particular set of actions. In the case of the Xhosa, it is the acceptance of the items deposited and the approval of the ancestors that is the prime outcome of this ritual.

Other aspects of water are also forgotten in accounts of the past: the warmth of the hot spring water; the textures of the tufa deposits; the reflectivity of water, whether that be faces or celestial bodies; its ability to absorb colours of the landscape and the way it can distort. These are all factors that may have played a role in Mesolithic perceptions of the world. Although difficult to validate, it is tempting to see features such as the hot springs associated with the sun, which itself is integral to many cosmologies. By contrast, the tufa balls at Langley's Lane may be representations of the Moon, and given that the effect of the moon reflecting from the tufa would have been quite dramatic, this is an interesting consideration. It is difficult to say more about these suppositions because the sky and the elements are not something often discussed for the Mesolithic. Yet, these are an important aspect of the world for hunter-gatherers, for the sky allows people to navigate their way, not only of the physical world but the metaphorical world too, and the elements reflect everything that is important to maintain a hunter-gatherer lifestyle. Although water is only one aspect of these elements, it merges somewhat with other elements, especially in the case of some of the springs described in this thesis, and in the case of all springs the association between water and the earth is particularly marked.

Whilst ethnographic analogy must be used with caution (see ref for a useful critique), there is no doubt that it is still an extremely valuable tool for Mesolithic archaeologists, especially when dealing with what are almost ubiquitous substances such as water and stone. It allows us to explore alternative engagements with the world, to give credence to elucidation, but to also highlight shortcomings and assumptive errors in those same interpretations. Rather than shunning ethnography, the study of springs has shown that it can be embraced, as long as it is not used in a deterministic manner, with too narrow a focus, or assuming any universality. Indeed, the use of analogy has been seen as useful for the understanding of timber and stone monuments of the Neolithic (Parker-Pearson and Ramilisonina 1998), and exploring ideas of substances related to worlds of the living and those of the ancestors.

To see how these spring sites fit in with existing theories about the Mesolithic landscape and world beliefs

Mesolithic world views

The archaeology of the spring sites examined here can be interpreted within a broad framework of current knowledge of hunter-gatherer belief systems. It is Zvelebil's work (for example, 1996, 2003, 2008) on northern Eurasian hunter-gatherer groups that provides the structure for this framework (which is summarised succinctly by Conneller in Insoll 2011:364-365), and although, hunter-gatherer belief systems are diverse, fluid, and certainly not universal, Zvelebil has noted there are some themes that may be considered as the basic tenets of hunter-gatherer world views. If we are to make further inroads into explorations of Mesolithic world views, then there is no avoiding these broad themes. Whilst this may seem to confine us to generalities, on a positive note it does help to avoid particularistic and perhaps unhelpful interpretations.

Zvelebil has proposed a temporal link between northern Eurasian hunter-gatherer religions, based on anthropological and archaeological studies of groups of people such as the Evenki and the Khanty, and Mesolithic belief systems. The various elements of Zvelebil's model do to a large extent transcend time and space, and there is also congruence with non-Eurasian hunter-gatherer groups. The re-occurring themes, some drawn from Zvelebil's model and some partly related to it, that have recently been used to think about Mesolithic belief can be identified as cosmology, cosmogony, the supernatural, reciprocity, animals, shamanism, totemism, lifecycles, and landscape enculturation, including toponymy.

In hunter-gatherer societies, cosmological concepts of the world tend to consist of multi-partite worlds, usually three but sometimes more. These tend to be composed of a world of the living, a world of the dead, and a world of spirits and are commonly referred to as upper, middle and lower worlds. These worlds are linked, often by rivers, trees and other similar features. The other realms of the cosmos often mirror features of the lived in world, so the spring that issues above ground and eventually becomes a river, might itself be borne from an underworld river: the spring then connects two spheres, that of the physical and literal world and that of an unseen and metaphorical world.

All religions have at the heart of them a cosmogenic myth, that tells how the world came into being, and often origin stories are a central tenet to that religion. It may be echoed in the ritual practices carried out and reflected in the treatment of material culture which eventually becomes part of the archaeological record. This aspect of hunter-gatherer belief systems is one of the most difficult to relate to the Mesolithic archaeological record. It is not inconceivable though that myth, stories and other forms of oral expression as well as performative actions such as dances, grew around cosmogonies that told of the creation of a Mesolithic 'sacred' landscape'. The topography of the study area: cliffs, caves, swallets, hills, valleys, rivers and hot springs, and the dynamism of the landscape within it: encroaching sea levels and tufa and peat formation, would especially lend themselves to the development of cosmogenic myths.

The world is seen as being inhabited by the supernatural, sometimes called by such terms as power and mana, in hunter-gatherer societies. This is usually visible in what anthropologists have termed animism, whereby humans, animals, plants and stone have some kind of essence or soul. This is inherent in all things and therefore there is no distinction between nature and culture as perceived by the modern western world. If Mesolithic people subscribed to this concept, then this might explain the makeup of the various types of material culture that make suitable deposits, and that there appears to be no real hierarchy to those deposits. The springs of this study could also have mana, and whilst the evidence for supernatural beings is not something we see explicitly in Mesolithic contexts, it seems that votive depositions were perhaps made in regard to the power inherent in watery contexts such as springs. Maybe it was this power that eventually became personified into deities, ancestors and other supernatural beings.

Reciprocity between animals and humans is a trait seen in all hunter-gatherer societies. It has been explored to some extent by Conneller (2004) in regards to the relationship between human and deer at Star Carr. There is scope for extending the concept of reciprocity, which includes traits such as mutual respect, beyond animals to plants, other materials such as stone, the elementals of air, fire, water and earth. Reciprocity may be evidenced at the springs of this study, for example to feed the springs at Bath with flint ensures they will continue to provide warm water (flints can heat water), to place flints in a tufa spring ensures that supplies of flint are reborn (if tufa was likened to cortex).

Certain animals may have particular resonance in cosmological schemes; these are often animals that can transcend the lived in and other worlds, such as birds, particularly water birds. Animals may also act as totemic symbols or be active participants in shamanistic rituals, tutelary spirits and guardians of other worlds. It may well be that animals that burrow into the earth had totemic significance accounting for some of the deposits of material culture into burrows and other natural features such as hollows and tree throws during the Mesolithic. The digging of pits may have developed from mimicking the natural features.

These features, like caves, swallets and springs, may also represent places in the earth where spirits could be communed with. For instance, to the Mescalero Apache, springs allow contact with the spirit dimension because the water has only just emerged from the ground (Carmichael in Carmichael *et al.* 1994).

In northern Eurasian schemas, there is often a religious specialist: a shaman who acts as a medium between the lived in human world and other worlds. They are associated with a range of paraphernalia such as drums, charms (for example, stones and fossils) and masks, for which there is circumstantial evidence in Mesolithic contexts. In British contexts, there is little to indicate that groups had their own shaman or equivalent spiritual guide, but the evidence does suggest that some of the activities that would be carried out by these characters were part of Mesolithic ritual practice. Being underwater is one way that shamans describe the sensation they experience when entering an altered state of consciousness (Lewis-Williams in Whitley *et al.* 2008). Sometimes this experience is also likened to being in a vortex or going through a tunnel, and water, especially that which swirls and bubbles is an obvious metaphor for this (Bradley 2000). Davenport surmised a shamanistic link with the Hot Spring at Bath for this reason (Davenport *et al.* 2007).

Hunter-gatherer belief systems are closely linked to lifecycles: birth, growth (including events such as puberty, coming of age, and the finding of reproductive partners), and death. These life events are the focus for celebration, initiations, and rites of passage. At these times more predictable phases of human lifecycles are punctuated by bouts of liminality and are a time of ambiguity in the human condition. During these liminal phases people can transcend boundaries or worlds. These may be particularly dangerous times, but the risks associated with them can be negated to some extent by the performing of rites.

Some places in the landscape are also considered to be liminal. These may be seen as powerful and dangerous, as places where one world may be connected to another and where acts of negotiation may have to be carried out. These often occur at hydrological, geological, and environmental boundaries. The sea, caves and tops of hills or mountains are examples of liminal places. Malevolent or benevolent spirits may dwell in these locations, and acts of appeasement or a votive offering is often appropriate. Springs are a classic example and places and instances of such actions proliferate, not only in hunter-gatherer societies but nearly all cultures across time and space. For example, in Madagascar, some springs may be inhabited by *vazimba* which are malevolent spirits that need to be appeased by making votive offerings (Graeber 2007).

The deposits made at the hot springs and the tufa springs may be recognised as 'ritual' and outside the realms of functional necessity, but the reasons and meanings for those deposits are harder to interpret. Of the categories of ritual types posited by Bell: "rites of passage", "calendrical rites", "rites of exchange and communion", "rites of affliction", "political rites" and "rites associated with "feasting, fasting and festivals" (Bell 1997: 93-137), it is rites of passage that are often associated with liminality. These may include elements of negotiation, separation and incorporation. The deposits at the tufa and hot springs may represent acts of negotiation with spirits that dwell in an underworld, making them sacrificial or votive deposits. An element of choice is involved; some artefacts are separated out from the general milieu of 'stuff' and incorporated with other artefacts into pits, pipes and hollows.

Slightly outside of Zvelebil's model are notions of toponymy and internal mapping of the world. Topographical features and celestial bodies are integral to these concepts for hunter-gatherers, in the way in which they engage with the world and make sense of it. These are intimately connected to space and place. They can apply to the lived in world and other realms. Hunter-gatherer connection to place owing to their geological, topographical and hydrogeological (in the case of watery places) attributes is common. These places are often named and become pivotal in the way people conceive the world, thus they become incorporated into world views and belief systems. The Stó:lō of British Columbia, for example have a spring (one of many sacred spring sites) named *Xwith-'kw'em*, which literally translates as 'sores' due to its healing properties (Mohs in Carmichael *et al.* 1994). Associated with these places, may be certain rules of engagement and the performance of associated rites. A common feature of sacred places in hunter-gatherer societies is restricted access (Wesler 2012), such as is the case in many Aboriginal sites, some of which are "secret-sacred" (Carmichael et al. 1994) and unknown even to other Aboriginal groups.

The Mesolithic landscape

Ways of looking at the Mesolithic landscape have tended to focus on either the physical landscape or the conceptual landscape. A further way of considering landscape use is the transplanting of landscape (Bradley2000, Lewis 2008, 2011), including physical elements of that landscape from one place to another. At Langley's Lane and Cherhill, and circumstantially at the Bath springs, stones and fossils make up part of the deposits. Thus, these geological pieces are artefacts, not just 'geofacts', they must then have had some significance to the Mesolithic people that deposited them. There are many examples of people such as Native American tribes using fossils and stones as charms, amulets, or objects of power (Hampton 1999, Mayor 2005, 2007). The Dani of Papua New Guinea pick up river worn stones which they curate: at a later point in time, they might infuse some of them with power and use them for “special purposes” (Hampton 1999:49). The fact that the geological pieces from Langley’s are all rolled, without angular edges, suggests they are waterworn. Perhaps they too were obtained from a watery context, possibly a river or stream, to be used as charms or objects of power, prior to their eventual deposition. They may also have served as objects for the transference of the power of place and they are tangible evidence of people engaging with landscape seemingly beyond functional needs.

Conneller (2011) has explored the possible significance of fossils being linked to spirit animals during the Palaeolithic and Mesolithic, drawing an analogy between the representation of animals on cave walls and fossils that emerge from stones. Fossils are a composite element of flint, chalk and limestone and can appear during flint procurement and knapping: (Conneller 2011). Just as features of cave walls were incorporated in to Palaeolithic depictions of animals, and interpreted as surfacing from the underworld by Clottes (cited in Conneller 2011), fossils materialising from flint could be construed in the same way. Fossils representing mythical creatures are a common theme for many peoples, and records can be cited from earliest antiquity adding strength to this analogy (Mayor 2007). The link between springs and fossils is a tangible one and fossils emerge from many limestone springs in the study area, for example, star shaped crinoids bubble up from Star Well in Wiltshire (Mayor 2007).

Lewis (2008, 2011) has suggested for the site of Charterhouse, Somerset that one of the reasons for intensive early and late Mesolithic activity in the area was that individuals/groups were attracted to the galena (lead ore) in the ground. The heavy lumps of shiny silvery grey galena are very distinct and would have been an obvious feature of this landscape, revealed wherever the ground was disturbed. Parallels can be drawn with the stones at Langley’s Lane, for example, the iron stone is heavy and metallic, the quartz and micaseous sandstones glitter in the light.

Bradley (2000) and Lewis (2008, 2011) have both discussed the notion of transplanting elements of the landscape from one location to another. This may indicate the transfer of properties of place, imbuing one location with the power of another. The notion has also been applied to later periods. A connection between the megalithic bluestones at Stonehenge and the springs, near the source of their origins in the Preseli Hills, in North Pembrokeshire, was made by Darvill and Wainwright (2005). In this case they posit a link between the healing properties possessed by the Preseli springs, which was transferred to the Stonehenge landscape via the bluestones (also see Darvill 2006).

Concluding remarks and future directions

This thesis has explored the nature of Mesolithic activity at five spring sites in south west England. Many springs, including these five, were foci for deposition during the Mesolithic but incidences seem particularly marked at sites where the springs have distinct properties which make them 'stand out' in the landscape, for example, their warmth, in the case of the Bath springs, and the formation of tufa deposits at Cherhill, Blashenwell and Langley's Lane. Whilst it was not possible to discern fully the complex entanglement of Mesolithic activity from the lithic (and other artefact) assemblages alone, the contexts of deposition: pits, pipes and hollows were of an unusual enough nature to suggest an aspect of 'ritualised' behaviour took place. However, the nature of the deposition at these springs, whilst in some cases highly unusual, does not wholly indicate that these sites were part of a separate and distinct sacred landscape sitting in opposition to the mundane and practical aspects of life. Rather, they were places where the sacred and profane occupied the same spheres of existence.

Yet, the dynamic nature of these spring landscapes provoked responses that indicate Mesolithic people were likely to have operated within a wider cosmological framework of belief, as is common to most contemporary and historical hunter-gatherers. Importantly, the thesis material has shown that these responses took a variety of forms, thus supporting the idea of there being multiple Mesolithics and multiple narratives to be told. Ethnography can be used to extrapolate the archaeological evidence and spring landscapes have been shown to especially lend themselves to this treatment.

Mesolithic research would greatly benefit from further excavation of the spring sites mentioned in this thesis. Unfortunately, the potential for further work at the Bath hot springs is limited by the urban nature of the sites. The Sacred Spring is part of the Roman Temple Complex and a World Heritage Site, and the Hot Spring is now part of the new Thermae Spa. It is unlikely that these sites will be excavated again in the near future. However, the upland areas surrounding Bath have had very limited work carried out and a programme of research driven surveys and excavation would help to elucidate further the use of the landscape surrounding the hot springs. Whilst work at the hot springs is unlikely, unless remedial or reparation work is carried out, a number of thermal springs both in the study area and outside it, could be surveyed for signs of prehistoric activity, especially those in landscapes of high archaeological potential. These include the Hotwells spring and Jacobs Well in the study area.

Tufa springs are extremely likely to be associated with Mesolithic activity, and although the spring at Cherhill is no longer accessible, both Langley's Lane and Blashenwell Pit warrant further research. The tufa deposits at Blashenwell Pit are extensive. Further research into the Mesolithic activity there might initially concentrate on areas as close to the original spring issue point and immediate to the original marl pits, moving to other areas after further exploratory survey. Blashenwell Pit is a multi-period site and therefore has potential for looking at how the use of these places has changed over time. At Langley’s Lane, opening up more of the site would be beneficial for example, to see if there are further pit deposits. The Wellow valley, near which the Langley’s lane spring is located, contains more tufa deposits and targeted survey for archaeology would be a worthwhile endeavour. Away from the Wellow, near Clandown, approximately five kilometres away, several Mesolithic flint scatters have been found near to another tufa forming spring. This site has great potential. In close geographic proximity, it is possible that it was the people who visited Langley’s Lane also frequented the land around Clandown.

Targeted survey around other tufa depositing springs, both in the study area and beyond, should be carried out to identify suitable sites for excavation. Desk based assessment, field walking or rapid surface surveys should indicate whether there was a prehistoric presence. Detailed auguring and topographical surveys will allow features such as tufa mounds, which build up over spring issue points, to be identified. Excavations ideally should be targeted at points where there were boundaries between wet and dry deposits and where there are palaeosols. Excavating at finer temporal resolutions is possible at tufa springs, where a centimetre of deposit may indicate a period of just twenty years. Careful excavation to identify changes in the tufa, which can also indicate episodes of standstill activity, could potentially allow finer chronologies to be produced for the Mesolithic.

Excavation strategies should allow for the collection of both archaeological and environmental data, especially as the ideal methods for obtaining these can be conflicting. Ideally tufa sediments should be excavated in five centimetre spits when obtaining samples for environmental analysis, but this level of working may be difficult when excavating archaeological contexts. Certainly, where the tufa changes consistency or colour, this is likely to indicate changing environmental conditions and care should be taken when excavating at these boundaries. Where features are present these should be excavated archaeologically and samples of fills should be retained for environmental analysis.

It seems that many springs with exaggerated properties, for example chalybeate, saline and bubbling springs, attracted the attention of Mesolithic people and therefore where these occur in areas where there is a known Mesolithic presence, these should also be treated as possible contexts for activity. It would be prudent to treat cold water springs in the same way. Although excavating into and around active springs is not an easy endeavour, sampling of spring deposits should take place where possible, as well investigating for deposition into or around any surviving channels and pipes, especially in areas where there are notable concentrations of lithic material. Features at any Mesolithic site that appear 'natural' such as tree hollows and animal burrows, should be treated as possible contexts for deposition, for if they were a precursor to more formal depositional practise, then only careful excavation is likely to reveal this possibility. The results of this study demonstrate that structured deposits include items that do not always conform to an aesthetic or formalised ideal and this is just the sort of 'debris' that finds its way into such 'natural' features.

Additionally, using springs as a focus for study opens up not only some relatively unexplored avenues of enquiry but also gives an opportunity to (re)examine broader theoretical concepts such as those associated with landscape studies, the archaeology of watery places, hunter-gatherer archaeologies, the deposition of material culture, and the use of analogy in prehistoric contexts.

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Appendix One

Detailed breakdown of the lithic analysis

Each assemblage was examined on a qualitative basis as a holistic entity and then analysed quantitatively. Where there were a large number of pieces associated with a site, a representative proportion of the total assemblage was sampled. It was not possible to standardise the sampling strategy rigidly due to the variations in contexts and assemblage types, therefore the rationale for sampling is discussed in the relevant chapters.

The quantitative values were recorded in a spreadsheet and are included at the back of this thesis on disc. Some attributes in the spreadsheet were abbreviated and these are detailed below, under the relevant sections in the form *Black* (bl), where the bracketed value was entered into the spreadsheet in place of the full descriptor.

The general attributes recorded (after Andrefsky 1998 and Butler 2005) were as follows:

Raw Materials

Raw materials can be broken down into two broad groups; conchoidally fracturing material and other lithologies. The conchoidally fracturing materials were subdivided into the raw material types: flint and chert. Other lithologies were recorded using standard geological terms, for example ‘sandstone’.

Colour

This was recorded for unpatinated, and where visible on patinated/stained, material. Colour is a subjective attribute and the light conditions were variable owing to different archive environments, therefore each assemblage was considered as an entity in its own right and in general terms rather than using shade specific descriptors.

Black (bl)
Brown (br)
Grey (gr)

Translucent (tr)
Mottled (mot)

Light (l)
Dark (d)

Other colours were recorded in full for example 'yellow' and combinations were used such as tr br for translucent brown or yellowy br for yellowy brown.

Reduction stage

Cortical coverage is usually recorded as primary, secondary and tertiary. Along with debitage size, the intent was mainly to determine the stages of knapping involved. To ease the process of measuring debitage a template was devised against which each piece could be compared and size recorded in 10 millimetre increments (Figure 2.4). Blade widths were measured in a similar way using 3 millimetre increments (Figure 2.4). This made the process quicker without losing too much resolution. The presence of cores, core tablets, core rejuvenation flakes and crested blades are positive indicators for flake and blade production and can indicate flake technologies (see below for definitions).

Cortex

Along with colour the cortical analysis of flint may point towards the provenance of the materials under study, for example a battered, pitted, or very worn cortical surface may represent beach or river pebbles. When considering whole assemblages, the presence of a high number of cortical flakes and a bias towards larger flakes can indicate core and nodule preparation. This is dependent on raw material type and abundance, for example more cortical pieces may be present if the raw material used was predominantly pebble flint (Andrefsky 1998:109). So whilst the presence of a high ratio of cortical pieces may be taken to signify knapping episodes at the site in question, the assignment of primary, secondary and tertiary categories were also used here to illicit whether there were choices being made about the selection of material for deposition.

All pieces were assigned cortical categories, where it could be ascertained:

Primary (p): between 50 and 100% of the dorsal surface is covered with cortex.

Secondary (s): between 0 and 50% of the dorsal surface is covered with cortex.

Tertiary (t): no cortex present.

Cortical pieces were given the following descriptors:

Rough (r)
Smooth (s)
Pitted (p)
Worn (w)
Thin (tn): less than 3mm in width.
Thick (tk): more than 3mm in width.

Type

The following descriptors were used:

Nodule: complete nodules, unworked.

Tested nodule: any nodule with less than three removals.

Core: nodules from which flakes, blades and other debitage material have been removed. They show signs of working such as platforms and negative flake scars. Cores can be informal or formal; that is some kind of platform preparation has taken place. The former may indicate a more expedient usage (Andrefsky 1998:137). Although cores can be subdivided using the typology developed by Clark for the Neolithic site of Hurst Fen (Clark and Higgs 1960), it is an unwieldy system, more useful for analysts studying lithic technologies rather than the general nature of assemblages. Cores were therefore classified to take account of types generally found in Mesolithic assemblages (clarification was added where necessary under additional comments) as follows:

Multiplatform: flakes removed from more than one face.

Uni-directional: flakes removed in one direction only.

Bi-directional: flakes removed in two directions.

Keeled: core shaped like the keel of a boat.

Cone: core shaped like a cone.

Cylindrical: core shaped like a cylinder.

Regular: flakes removed in a logical fashion from around the core.

Irregular: flakes removed in a haphazard fashion from the core.

Blade core: a core from which blades have been removed.

Bladelet core: a core from which bladelets have been removed.

Core tablet: a thick flake with small negative scars and remnants of the exhausted striking platform.

Core rejuvenation flake (crf): a flake that has been removed to remove an exhausted striking platform, in order to create a new one.

Core fragment: a piece that has come away from a core but cannot be assigned as a core, core tablet or core rejuvenation flake.

Crested blade: a diagnostically distinct blade or bladelet removed from a core to assist flaking, features of crested blades include a triangular cross section, and uni or bi-lateral flake removals.

Flake: These are pieces removed from the objective piece (a core, nodule or another flake) and have the following diagnostic features: a striking platform, a bulb of percussion, flake scars and an obvious ventral surface. Flakes can be further subdivided into complete flakes and broken flakes. Broken flakes are labelled as such when they have a recognisable attributes indicating the piece was a true flake. Step, hinge and plunging terminations were also noted as well as any other feature of interest such as evidence of stacking, where numerous attempts have been made to remove flakes form cores.

Chip - *diagnostic flakes with a diameter of less than 10mm.*

Some flakes can be further subdivided into blades and bladelets:

Blade: A diagnostic flake where the length of the piece is twice its width.

Bladelet: A small flake, which exhibits all the features of a blade, but the width, is less than twelve millimetres.

Where incomplete flakes were recognisable as being a section of blade or bladelet, i.e. they exhibited parallel edges and have dorsal ridges; they were labelled according to which section of the piece they belong to. Although some analysts prefer not to record incomplete blades/bladelets, as these are such a characteristic feature of a Mesolithic assemblage, it seemed prudent to do so.

Proximal: retains a striking platform and a bulb of percussion.

Medial: no bulb or termination features present.

Distal: termination features.

Indeterminate: used if it was not possible to assign one of the above categories for any reason.

Notes: everything removed from a nodule or prepared core may be considered debitage but usually the term is used as a category that is synonymous with waste material, that is pieces resulting from the knapping process that were not used further. In this study it will refer to all pieces that cannot be assigned one of the above categories, regardless of whether there has been any additional modification, utilisation or retouch.

Most knapping episodes tend to produce pieces that cannot be assigned one of the above categories. Some analysts use the terms shatter for any piece that cannot be diagnosed as a flake, i.e. with no obvious point of removal or bulbs and angular shatter for blocky pieces usually with more than two sides. Here the term *miscellaneous* with the additional descriptor of *debitage* is used to cover these two categories. *Miscellaneous* used on its own indicates that a piece does not fit into one of the main types but looks to have been modified or used expediently. The latter cases are clarified under additional comments.

Function

Where it was possible to assign function (or at least perceived function) then this was recorded. Only those pieces that could be assigned according to strict morphological distinctions based on their form were categorised in this manner. Retouch is used in functional analyses to signify formal tools and was given the following descriptors:

Direct retouch, indirect retouch: flakes removal initiated from ventral, dorsal faces respectively
Unifacial retouch, bifacial retouch: flakes removed from one or both faces
Edge retouch: along lateral
Abrupt retouch: angle less than 90 degrees
Semi-abrupt retouch: angle about 45 degrees
Invasive retouch: angle about or less than 10 degrees
Continuous retouch: extends along the worked edge
Discontinuous retouch: does not extend along the worked edge

The position of retouch was recorded according to standard flake terminology:

Proximal end
Distal end
Right lateral
Left lateral

The following formal pieces were recorded:

Scrapers: classified as *end, double ended, side, side end, discoidal*

Piercers/awls: rare on Mesolithic sites but when found tend to be smaller than those from other periods

Knife/cutting blade: blunted back or *backed blade*

Notched piece: in the Mesolithic not usually more than 10mm wide or 2-7mm deep

Microdenticulate: usually early Mesolithic and made on blades.
Denticulate: in the area of study, usually late Mesolithic.

Truncated piece: common in Mesolithic assemblages.

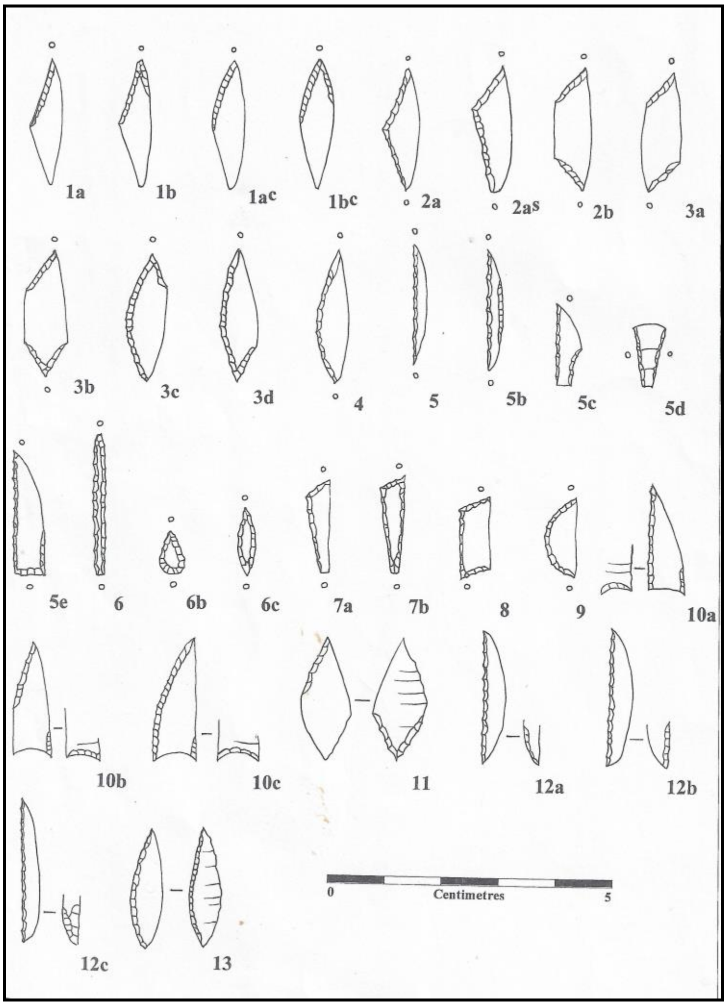
*Microlith: t*hese were classified in accordance with Jacobi's classificatory scheme developed in 1978 (Jacobi 1978, Butler 2005). Thirteen types of microliths can be split into four major classes: broad blade, narrow blade, hollow based and inversely retouched, and further sub-divided into the types shown in Figure A1
Microburin: the waste product from microlith manufacture.

Burin: an engraving tool used for scoring bone and antler.

Burin spall: the blade like piece removed from a flake or blade to make a burin.

Adze, axe, pick: large core tools used for woodworking.

Figure A1: Jacobi's (1978) microlith typology



Chronology

The overall assemblage was viewed to make a chronological assessment. This was then supported using the results of quantification of the samples.

Pre and post-depositional alterations

Patination was recorded along with any other post depositional changes, such as the adherence of substances including tufa. Burnt material was also recorded.

Patination, heat alteration and gloss

Patinated material is the consequence of chemical and mechanical weathering processes. The colour of patination, staining and the natural polishing of artefacts points towards the post-depositional environment of the assemblages. The presence of patina is not a reliable indicator of age.

Alteration was recorded as follows:

None (n): no patination.

Incipient (I): the artefact only has slight patination.

Patinated (p): the artefact is patinated on most of its surface.

Deeply patinated (d): the artefact is completely weathered and is patinated over its entire surface.

Gloss: the artefact has a polished surface, usually as a result of mechanical weathering i.e. rolled in water or sand.

Polish: the artefact has a polished surface, usually as a result of anthropogenic modification or use.

Burnt: the artefact has undergone some thermally related change.

Condition

See *flake, blade, and bladelet* for completeness.

Any piece that displays edge damage that appears to be caused through expedient use or post depositional wear, that is, not thought to be deliberate retouch will be recorded as edge damaged. When a piece appears to have signs of utilisation, it was noted under additional comments.

Additional comments

No type list can cover all eventualities unless it is to be so large and unwieldy it becomes impractical. Therefore additional comments were recorded to clarify further the attributes recorded above.

Figures

All figures: illustrations, photographs and diagrams not produced by the author are acknowledged in the text.

APPENDIX TWO

Contents

Abbreviations used in this appendix:

Historic Environment Record (HER)
Museum archive examined by the author (M)
Bath and North East Somerset (BANES)

Examples of ‘phenomenological’ insights during flint analysis and site visits

The following extracts are examples of qualitative notes (reflective remarks) from the analysis of selected lithic assemblages associated with the spring sites of this study. The represent examples of the observations made that cannot be quantified in the strictest terms, yet may provide useful insights into the nature of Mesolithic activity. Some observations were also collected during site visits and examples of these are also given. These are essentially descriptive in nature and have been edited from the original hand written ‘scribbles’ to make sense to the reader.

Qualitative observations: flint assemblages

“[the] tufa coating resembles flint cortex, [it is] like the skin of the flint has grown back” “

“[seeing] the assemblage as a whole, there is nothing striking about it…the flint is well worked, and in some cases has been overworked, the cores are Mesolithic, but not classic… the stones are ‘scrappy’ lumps and if in any way aesthetic then Mesolithic people certainly do not share our modern sense of aestheticism”

“[the most noticeable quality is] nothing about this assemblage suggests people held modified, worked or used pieces in more regard than ‘debitage’… importance placed on worked items as components of structured deposits…misguided perhaps?”

“all the geological pieces are small and waterworn, none are local to the site, the question being, were they like that when people picked them up?”

“[the] blades in this assemblage immediately stand out, many do not conform to the standard 2:1 ratio and appear more flake like, yet everything about the assemblage is Mesolithic… bladelet scars, obvious intent on bladelet production…overworked material suggests lack of raw material is cause…”

“[the] ‘clinking’ [of flints] in the bag and it’s appearance immediately suggests a chalk sourced flint (contrary to official site report)”

“[I am] struck by the warmth of the flint in the bag, remember digs where flint got hot in the sun… hot springs make flint hot perhaps?”
“gloss is not typical, certainly not like that from use, more like that which might occur if flints had been rolling around in sand (but not all over, so can’t be that …)”

Qualitative observations: site visits

The Biblins, Wye Valley
“The spring is flowing but is not particularly fast (it’s been a really dry summer) and I was not expecting any active tufa deposition but right before our eyes [in reality about 3 to 5 minutes] a leaf we placed in the water was coated with a thin layer of tufa. It struck me that at the height of tufa deposition during the Mesolithic, that this was a process that would have been very much visible to the naked eye...”

Southstone Rock, Teme Valley
“It’s [the travertine deposit] not what I expected: grey, stained with reds and browns from the iron in the waters and not the glaring whiteness where the landscape has been rendered so, by the calcified waters” (note: refer to Davies and Robb 2002).
“Vegetation contrasts dramatically with the whiteness of actively forming tufa, the Mesolithic landscape must have been like this…browns, greens… however white the tufa may have been, the colours of trees, lichens, mosses must have stood in contrast…”

Hot Spring, Bath
“it is a cold day and the steam rising from the pool is thick and dense…imagine that this made them stand out particularly in winter, was not like this when here earlier… the springs are/were dynamic entities”

Hot Spring, BANES (M)

Lithic categories

Classification	Quantity
Cores	2
Core fragments	2
Flakes complete	78
Flakes broken	41
Blades and bladelets complete/broken	127
Microliths and microlith production	10
Miscellaneous	77
Total	337
Cortical Category	
Primary	8
Secondary	79
Tertiary	250
Indeterminate	0
Material	
Flint	335
Chert	2

Quantification

Debitage size	Quantity
10	7
20	153
30	126
40	47
50	4
60	0
70	0
80	0
Blade Widths / mm	
3	0
6	9
9	39
12	59
15	25
> 15	4

Table * Artefact list

Artefacts
1 x bladelet core (some small flake removals)
1 x bladelet core (some small flake removals
5 x crested blades
1 x retouched bladelet
1 x plunging blade with micro-retouch
1 x backed blade
3 x bladelets with micro-retouch
10 obliquely blunted points
1 x retouched fragment
12 x core rejuvenations
3 x indeterminate scrapers

Sacred Spring, BANES (M)

Lithic categories

Classification	Quantity
Cores	**0**
Core fragments	**0**
Flakes complete	**43**
Flakes broken	**10**
Blades and bladelets complete/broken	**65**
Microliths and microlith production	**7**
Miscellaneous	**21**
Total	**146**
Cortical Category	
Primary	1
Secondary	35
Tertiary	105
Indeterminate	0
Material	
Flint	136
Chert	10

Quantification

Debitage size	Quantity
1	0
2	1
3	21
4	35
5	29
6	46
7	13
8	0
Blade Widths / mm	
3	0
6	2
9	11
12	28
15	18
> 15	15

Artefact list

Artefacts
1 x end scraper (notched) 1 x crested blade 1 x microlith (crescent) 8 x obliquely blunted points 9 x backed blade 6x core rejuvenation flake 2 x retouched thermal flake 1 x scraper (indeterminate) 2 x discoidal scraper 1 x side scraper 2 x end scraper 1 x micro-scraper 1 x retouched fragment
4 x piercer

Cross Bath Spring, BANES (M)

Lithic categories

Classification	Quantity
Cores	0
Core fragments	1
Flakes complete	0
Flakes broken	0
Blades and bladelets complete/broken	1
Microliths and microlith production	0
Miscellaneous	0
Total	2
Cortical Category	
Primary	0
Secondary	1
Tertiary	1
Indeterminate	0
Material	
Flint	2
Chert	0

Quantification

Debitage size	Quantity
1	0
2	0
3	0
4	1
5	1
6	0
7	0
8	0
Blade Widths / mm	
3	0
6	0
9	0
12	1
15	0
> 15	0

Artefact list

Artefacts
1 x crested bladelet

Bath Street, BANES (M)

Lithic categories

Classification	Quantity
Cores	4
Core fragments	6
Flakes complete	75
Flakes broken	10
Blades and bladelets complete/broken	100
Microliths and microlith production	4
Miscellaneous	35
Total	235
Cortical Category	
Primary	4
Secondary	84
Tertiary	147
Indeterminate	0
Material	
Flint	232
Chert	3

Quantification

Debitage size	Quantity
1	6
2	43
3	58
4	37
5	36
6	41
7	13
8	1
Blade Widths / mm	
3	2
6	8
9	17
12	36
15	16
> 15	9

Artefact list

Artefacts
1x lump of tufa
3x bladelet core
1 x multi-directional core
1x microlith (rod like)
1 x microlith 1a
1 x microlith 1bc (but on narrow bladelet)
1 x micro-scraper made on proximal bladelet section
1 x microburin
1 x burin spall
1 x notched core rejuvenation flake
1 x notched (small) flake
1 x notched blade
1 x side scraper
1 scraper made on a core rejuvenation flake
1 x crested bladelet
1 x backed blade
1 x blade retouched on left lateral
1 x retouched distal section of bladelet
1 x retouched blade fragment
1x retouched flake – expedient piercer
1 x modified broken flake – expedient piercer
1 x retouched fragment

Spa 98, BANES (M)

Lithic categories

Classification	Quantity
Cores	6
Core fragments	5
Flakes complete	116
Flakes broken	6
Blades and bladelets complete/broken	39
Microliths and microlith production	4
Miscellaneous	249
Total	424
Cortical Category	
Primary	15
Secondary	94
Tertiary	125
Indeterminate	67
Material	
Flint	420
Chert	4

Quantification

Debitage size	Quantity
1	60
2	53
3	61
4	59
5	32
6	38
7	10
8	1
Blade Widths / mm	
3	0
6	7
9	7
12	7
15	8
> 15	0

Artefact list

Artefacts
2 x bladelet core
1 x unidirectional core
1 x bi-directional bladelet core
1 x uni-directional bladelet core
1 x multi-platform core
1 x side/end scraper
3 x side scraper
1 x side scraper made on thermal flake
2 x end scraper
1 x serrated thermal flake
1 x backed blade (abrasive retouch)
1 x miscellaneous retouched bladelet
2 x retouched plunging blade
3 x distal microburin
1 x retouched thermal flake
6 x retouched flake
1 x miscellaneous modified piece expedient piercer
1 x modified thermal flake expedient piercer and notch
1 x retouched flake -n point
1 x retouched flake - knife?
1 x burin
1 x obliquely blunted point (narrow bladelet) 1 x broken microlith

Beau Street, BANES (M)

Lithic categories

Classification	Quantity
Cores	2
Core fragments	0
Flakes complete	27
Flakes broken	4
Blades and bladelets complete/broken	6
Microliths and microlith production	0
Miscellaneous	7
Total	46
Cortical Category	
Primary	2
Secondary	14
Tertiary	28
Indeterminate	6
Material	
Flint	45
Chert	1

Quantification

Debitage size	Quantity
1	0
2	1
3	6
4	11
5	4
6	4
7	2
8	0
Blade Widths / mm	
3	0
6	1
9	2
12	2
15	1
> 15	0

Artefact list

Artefacts
1 x bladelet core 1 x side/end scraper 1 x crested blade 1 x worked lump with core preparation on two faces

Hat and Feather, BANES (M)

Lithic categories

Classification	Quantity
Cores	**0**
Core fragments	**1**
Flakes complete	**26**
Flakes broken	**1**
Blades and bladelets complete/broken	**1**
Microliths and microlith production	**0**
Miscellaneous	**32**
Total	**61**
Cortical Category	
Primary	4
Secondary	25
Tertiary	24
Indeterminate	0
Material	
Flint	58
Chert	3

Quantification

Debitage size	Quantity
1	0
2	0
3	5
4	17
5	15
6	16
7	2
8	0
Blade Widths / mm	
3	0
6	0
9	0
12	1
15	0
> 15	0

Artefact list

Artefacts
1 x crested bladelet

Abbey Heritage Centre, BANES (M)

Lithic categories

Classification	Quantity
Cores	**0**
Core fragments	**1**
Flakes complete	**2**
Flakes broken	**0**
Blades and bladelets complete/broken	**4**
Microliths and microlith production	**0**
Miscellaneous	**14**
Total	**21**
Cortical Category	
Primary	0
Secondary	6
Tertiary	14
Indeterminate	1
Material	
Flint	20
Chert	1

Quantification

Debitage size	Quantity
1	0
2	0
3	2
4	8
5	5
6	7
7	0
8	0
Blade Widths / mm	
3	0
6	0
9	1
12	1
15	0
> 15	2

Artefact list

Artefacts
1 x crested blade 1 x core rejuvenation flake 1 x microdenticulate

Bath Orange Grove, BANES (M)

Lithic categories

Classification	Quantity
Cores	0
Core fragments	0
Flakes complete	5
Flakes broken	0
Blades and bladelets complete/broken	2
Microliths and microlith production	0
Miscellaneous	2
Total	9
Cortical Category	
Primary	0
Secondary	3
Tertiary	3
Indeterminate	3
Material	
Flint	7
Chert	2

Quantification

Debitage size	Quantity
1	0
2	0
3	0
4	2
5	3
6	2
7	0
8	0
Blade Widths / mm	
3	0
6	0
9	0
12	1
15	0
> 15	1

Artefact list

Artefacts
1 x side scraper **1 x** core rejuvenation flake **1 x** backed blade

Lansdown (ST722702): The HER records a flint scatter of unknown size but includes two scrapers in dark grey flint, one of which was reworked and two microliths (Roberts 1981).

Derby Point (ST717702): This is the site of a possible Bronze Age barrow evidenced as burnt bone (Tratman 1973:161). 150 flint items were found here by Falconer and are described as scrapers, flakes and cores (Tratman 1973:160). Seven microliths were recorded by Shore, so at least some of this assemblage is of Mesolithic date.

Golf Course, Lansdown (ST720693)

The HER records finds of two scrapers, one retouched flake (knife), blades and some utilised items of probable Mesolithic date

Emdene and Lansdown Poultry Farm (ST732678)

The HER records an un-described spread of flint from three areas centred on the grid reference.

North of Lansdowne Poultry Farm (ST735683)

The HER records a spread of flint, that includes Mesolithic material of mixed date from three areas centred on the grid reference.

Big Down (ST724698) (M)

This is a “small site at the head of a valley where there are springs” (Tratman 1973:161) to the north west of Upper Lansdown. The assemblage would comfortably fit into a Mesolithic context and all appear to have been made on grey to dark grey flint (evidenced where full patination has not occurred, or by post-depositional damage).This raw material could have been either sourced from flint outcrops from Area Two or from further to the south and east from the Wiltshire Downs. A further thirteen microliths were found on Big Down by Shore (Tratman 1973). The four semi-discoidal scrapers typologically can be assigned to the Mesolithic, (although it is acknowledged that being from an unstratified context they could also effectively date to the Neolithic or Bronze Age), though the multi-platform bladelet core and retouched distal bladelet section is further positive evidence that the assemblage can generally be assigned a Mesolithic date.

Total assemblage breakdown Big Down

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	1	0	0	0	**1**
core fragments	0	0	0	0	**0**
flakes complete	0	0	4	0	**4**
flakes broken	0	0	0	0	**0**
blades	0	0	1	0	**1**
microliths and manufacture	0	0	0	0	**0**
other debitage	0	1	0	0	**1**
total	**1**	**1**	**5**	**0**	**7**

Artefact list

Artefacts
1 x multi-platform bladelet core 4 x semi-discoidal scrapers T 3 DP 1 x retouched blade

The Slates (ST722693)

An unspecified number of microliths were collected by Falconer from this site (Tratman 1973)

Langridge Lane (ST726693)

Forty one microliths were collected from here by Falconer (40) and Shore (1). A microburin was found nearby at ST726694 (Falconer 1924).

Upper Langridge Farm (ST 737685)

Upper Langridge Farm consists of several sites clustered around a number of springs and situated at the head of a north sloping valley (Tratman 1973). Two of these sites have yielded microliths. Extensive scatters of flint were collected from four fields known as 30 Acre Field, 20 Acre Field, 12 Acre Field and Mushroom Field. A fifth site is of an unknown location (Tratman 1973:161).

30 Acre Field (ST737683)

One microlith collected by Shore (Tratman 1973)

20 Acre Field) (ST733691

Falconer collected several microliths and a further seven were collected by Shore (Tratman 1973)

North of Upper Langridge

Thirteen microliths, unknown collector, recorded on the HER

Charlcombe Grove Farm (ST731684) (M)

The farm is on the edge of the Lansdown Plateau and the site of the flint scatter, which was distributed over one field, lies approximately 200 metres from a spring (Tratman 1973:161). Four microliths were collected from here by Shore. Three scrapers were available for examination, two of these were standard Mesolithic types (a semi-discoidal scraper made on a core rejuvenation flake and a side scraper made on a blade), the third could possibly be Bronze Age but would also fit into a Mesolithic assemblage.

Total assemblage breakdown Charlcombe Grove Farm

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	0	0	1	0	**1**
flakes broken	0	0	1	0	**1**
blades	0	0	1	0	**1**
microliths and manufacture	0	0	0	0	**0**
other debitage	0	0	0	0	**0**
total	**0**	**0**	**3**	**0**	**3**

Artefact list

Artefacts
1 x side scraper made on a blade 1 half discoidal scraper 1 discoidal scraper

Great Down (ST711686)

One microlith is recorded as being found by Shore (Tratman 1973).

Weston Lane (ST728683)

The HER records a flint find spot and one microlith is known to have been collected by Shore (Tratman 1973).

Kelston Round Hill (ST716680)

A number of flints of Mesolithic date were found by Gardner towards the northern end of the hill (Palmer 1966).

Kelston Road (ST711672 and ST708671)

Two scatters of flint included Mesolithic material and were found approximately 275 metres apart towards the southern end of Kelston Round Hill (Palmer 1966).

Flock Down (ST732678) (M)

Two main sites have been identified on Flock Down and are known as Flock Down 1 (a scatter of flint and two barrows (Grinsell 1971) – Charlcombe 10 and 10a) and Flock Down 2 (scatters of flints). Three microliths recovered by Falconer (1) and Shore (2) all came from Flock Down 1 (Tratman 1973). Two scrapers were available for examination and both are typologically of Mesolithic date.

Total assemblage breakdown Flock Down, Lansdown

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	0	0	1	0	**1**
flakes broken	0	0	0	0	**0**
blades	0	0	1	0	**1**
microliths and manufacture	0	0	0	0	**0**
other debitage	0	0	0	0	**0**
total	**0**	**0**	**2**	**0**	**2**

Artefact list

Artefacts
1 x side scraper 1 x side/end scraper

Little Down Field (ST725702) (M)

This is a small assemblage that consists of twelve pieces and a core fragment, flakes and miscellaneous debitage. The core fragment and the secondary flakes indicate the working of small nodules perhaps on or near the site.

Total assemblage breakdown Little Down Field

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	1	0	0	0	**1**
flakes complete	2	0	3	0	**5**
flakes broken	2	0	0	0	**2**
blades	0	1	0	0	**1**
microliths and manufacture	0	0	0	0	**0**
other debitage	3	0	0	0	**3**
total	**8**	**1**	**3**	**0**	**12**

Artefact list

Artefacts
1 x end scraper 1 x end scraper 1 x scraper/burin

Charmy Down (ST7670) (M)

A small group of flint finds that included two later Mesolithic microliths (rectangular) from NGR ST766697 (Grimes 1960, Robert 1980 HER), seven flints including a scraper and two retouched blades from NGR ST7597000 (Grimes 1960, HER) and blades and retouched/ re-utilised flakes from NGR ST761702 (Grimes 1960,HER). Microliths have been collected from various locations on Charmy Down by Falconer (unspecified number) and Shore (at least eight) (Tratman 1973:162-3).

Twenty three flints that could be assigned typologically as Mesolithic were examined from Charmy Down. There were no cores in this small assemblage but two core trimming flakes, including one primary flake, a core fragment and two core rejuvenations suggest the working of nodules. One of the rejuvenation flakes had evidence of failed attempts to remove bladelets, and a hinged flake also had dorsal scars. The only tool was a finely backed blade. A further miscellaneous piece of flint had been retouched after patination and may point toward reuse in later prehistory. The presence of bladelet fragments (medial sections) points towards microlith manufacture. Three further pieces from a pit to the west of the Bronze Age Barrow included a modified retouched blade and a well worked out multiplatform core with flake and bladelet scars, which would both typologically date to the late Mesolithic.

Total assemblage breakdown Charmy Down

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	1	0	0	0	**1**
flakes complete	8	1	0	0	**9**
flakes broken	0	0	0	0	**0**
blades	4	0	1	0	**5**
microliths and manufacture	0	0	0	0	**0**
other debitage	6	0	1	1	**8**
total	**19**	**1**	**2**	**1**	**23**

Artefact list

Artefacts
1 x backed bladelet
1 x miscellaneous retouched fragment
1 x core rejuvenation flake

Hartley Farm, Batheaston (ST751703 (M)

Five microliths were found by Shore here (Tratman 1978). A stray find of a semi-discoidal scraper, which was slightly cortical, is very likely to be Mesolithic.

Total assemblage breakdown Hartley Farm

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	0	0	1	0	**1**
flakes broken	0	0	0	0	**0**
blades	0	0	0	0	**0**
microliths and manufacture	0	0	0	0	**0**
other debitage	0	0	0	0	**0**
total	**0**	**0**	**1**	**0**	**1**

Artefact list

Artefacts
1x semi-discoidal scraper (probably Mesolithic)

East of Hartley Cottage, Batheaston (ST755703)

The HER records an unspecified number of flints found approximately 450 metres to the east and southeast of Hartley Farm.

Upper Northend Farm (ST782693)

The HER records one obliquely blunted point of early Mesolithic date, found on Hollies Lane (Bath Archaeological Trust 1991).

Freezing Hill, Cold Ashton (ST722714)

A concentration of flint with microliths was recorded here by Falconer (Tratman 1973:162).The flint was scattered over a field but the microliths were concentrated in the north-west section near to the bank of a possible Iron Age earthwork. A further microlith was collected by Shore (Tratman 1973:162).

Henley Hill, Cold Ashton (ST750715)(M)

A substantial number of lithics have been recorded from Henley Hill, including cores, flakes and approximately 200 scrapers. Two microliths were also found here by Falconer (Tratman 1978). A number of flints of mixed date have been noted in the area since and these include Mesolithic material recovered in 2008 from a field survey, which is noted on the HER but otherwise unpublished. The only piece available for examination was a conical bladelet core which is clearly Mesolithic and taken together with the microliths indicates a Mesolithic presence.

Total assemblage breakdown Henley Hill

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	1	0	0	0	**1**
core fragments	0	0	0	0	**0**
flakes complete	0	0	1	0	**0**
flakes broken	0	0	0	0	**0**
blades	0	0	0	0	**0**
microliths and manufacture	0	0	0	0	**0**
other debitage	0	0	0	0	**0**
total	**0**	**0**	**0**	**0**	**1**

Artefact list

Artefacts
1x conical bladelet core

Bannerdown (ST798697) (M)

A total of thirty three flints collected by Falconer were examined (twenty nine pieces from 1937-1938 and four pieces from 1912). The cores, core fragments, plunging bladelet and core rejuvenation flake all positively indicate that knapping probably occurred on Bannerdown. The bladelets, cores and microliths are comfortably late Mesolithic, and thin flaking suggests the soft hammer production typical of Mesolithic industries. The whole assemblage was deeply patinated and this and the fineness of the knapping of the material from Bannerdown suggest a primary source of chalk flint. The dimensions of the cores were very similar (up to fifty millimetres), which would suggest that the size of nodules were not very big and the presence of a small amount of cortex on two of the cores substantiates this. Sixty five percent of the blade elements were twelve millimetres or less in width with thirty eight percent of those being of nine millimetres or less in width. The size of these and the presence of bladelet sections, four proximal and two distal (one was classified as a blade at fifteen millimetres in width) also suggest microliths were prepared on Bannerdown. The HER also records a tranchet adze at ST791685.

Total assemblage breakdown Bannerdown

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	5	0	0	0	**5**
core fragments	1	0	1	0	**2**
flakes complete	0	2	1	0	**2**
flakes broken	0	0	0	0	**0**
blades	0	15	1	0	**16**
microliths and manufacture	1	0	3	0	**4**
other debitage	0	0	0	0	**0**
total	**2**	**17**	**6**	**0**	**33**

Artefact list

Artefacts
2 x opposing platform core 3 x multiplatform core 2 x microlith crescent 1 x microlith rod 1 x burin 1 core rejuvenation flake 1 x retouched miscellaneous fragment

Bathampton Down Reservoir Site (ST751649) (M)

Subject to only a general assessment, this assemblage consisted of 49 pieces which would sit comfortably in a Mesolithic context, with the one exception being a broken bifacial and retouched blade fragment, which appears to have been broken post- patination. Some of the core fragments, four out of eleven pieces have bladelet scars, and out of the remaining seven, two are thermally fractured. One of these appears to be entirely natural. Of the other ten core fragments; all are forty millimetres or less on the debitage scale and seem to have originated from small cores.

Up to 27 of the remaining pieces are small flakes, with characteristics of blade technology. The assemblage seems to consist dominantly of soft hammer worked pieces. The majority are patinated to a bluey white, as are many of the core fragments, and the likely origin of the raw material is a chalk flint source. This is substantiated where post–taphonomic processes have caused some of the patinated surfaces to flake off, to reveal a good quality black flint. The biface has been worked from the same quality flint. This observation applies to most of the pieces although there occasional artefacts of secondary sources. A piercer was the only diagnostic tool.

Hampton Down (M)

One artefact from an unknown location on Hampton Down, a semi-discoidal scraper, would fit into a Mesolithic assemblage.

Total assemblage breakdown Hampton Down

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	0	0	1	0	**1**
flakes broken	0	0	0	0	**0**
blades	0	0	0	0	**0**
microliths and manufacture	0	0	0	0	**0**
other debitage	0	0	0	0	**0**
total	**0**	**0**	**1**	**0**	**1**

Artefact list

Artefacts
1x semi-discoidal scraper (probably Mesolithic)

Claverton Down (ST771635) (M)

Several mixed assemblage collections containing Mesolithic material have been collected from Claverton Down (Davenport and Lewcun 2001). It is known that a substantial amount of this was found by both Falconer and Shore but there exists no extensive details of these finds other than the one microlith found by Shore and the several (number unspecified) by Falconer. The HER records the collection as including hundreds of scrapers and flakes, microburins, denticulated flakes and an awl. Flints from later periods were also present and included numerous arrowheads of Neolithic leaf-shaped, and Bronze Age barbed and tanged types.

Only one artefact was available for examination: a thumbnail scraper. Although usually interpreted as Bronze Age implements, thumbnail type scrapers are found in Mesolithic contexts and this example could well be Mesolithic, especially as it is not retouched completely around its perimeter

Total assemblage breakdown Claverton Down

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	0	0	1	0	**1**
flakes broken	0	0	0	0	**0**
blades	0	0	0	0	**0**
microliths and manufacture	0	0	0	0	**0**
other debitage	0	0	0	0	**0**
total	**0**	**0**	**1**	**0**	**1**

Artefact list

Artefacts
1x thumbnail (possibly Mesolithic, usually interpreted as Bronze Age

Conkwell (ST792624) (M)

There are only three pieces in this assemblage but one of these is a core rejuvenation flake and the other a distal fragment of a blade, both have dorsal scars and all are typically Mesolithic. Flints were also found here by Falconer but there are no further details other than that they included four Mesolithic unretouched blades.

Total assemblage breakdown Conkwell

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	0	1	1	0	**1**
flakes broken	0	0	0	0	**0**
blades	1	0	0	0	**1**
microliths and manufacture	0	0	0	0	**0**
other debitage	1	0	0	0	**1**
total	**2**	**0**	**1**	**0**	**3**

Artefact list

Artefacts
1 x core rejuvenation flake

Hayes Wood Enclosure, Freshford (**ST772608**) (M)

At the southern end of the plateau, Hayes Wood is the site of an Iron Age rectangular enclosure, where some trial excavations by Stone and Wicks (1936) revealed five pieces of typologically Mesolithic flint. Although this was an extremely small assemblage a large cortical core rejuvenation flake and a piece of miscellaneous debitage suggest knapping might have been carried out in this location. The backed blade is typically Mesolithic and the scrapers, although not particularly diagnostic would fit easily into a Mesolithic assemblage. All the pieces were of good chalk flint.

Total assemblage breakdown Hayes Wood Enclosure

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	1	0	2	0	**3**
flakes broken	0	0	0	0	**0**
blades	1	0	0	0	**1**
microliths and manufacture	0	0	0	0	**0**
other debitage	1	0	0	0	**1**
total	**3**	**0**	**2**	**0**	**5**

Artefact list

Artefacts
2 x scraper 1 x backed blade

Farleigh Down (M)

This assemblage of twenty four artefacts, including an end scraper, from near Bathford, collected by Stone in 1918, would not look out of place in a Mesolithic collection and is similar in character to the assemblage from Bath Street. Flakes and blades were thin suggesting production using a soft hammer and dorsal scars indicate bladelet production. Although no cores were present, a number of core rejuvenation flakes suggest knapping took place on Farleigh Down. The small size of these and the presence of hinge fractures and stacking on several pieces would suggest that raw material was not in abundance or that the tertiary flint scatters on the Down were not of good knappable quality. This is further substantiated where cortical pieces were present. The cortex was variable, although mostly thin, suggesting secondary sources. Flints that were not deeply patinated varied from light grey through to translucent brown. Four microliths were collected by Falconer from the area.

Total assemblage breakdown Farleigh Down

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	4	7	2	0	**13**
flakes broken	1	2	0	0	**3**
blades	8	0	1	0	**9**
microliths and manufacture	0	0	0	0	**0**
other debitage	0	0	0	0	**0**
total	**13**	**9**	**3**	**0**	**23**

Artefact list

Artefacts
1 x end scraper 2 x core rejuvenation flake 1 x burin

Twinhoe Green, Wellow (M)

Only one piece was available for examination, this was a cortical burnt chunk stray with blade and bladelet scars easily attributable to the Mesolithic.

Total assemblage breakdown Twinhoe Green

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	1	**1**
core fragments	0	0	0	0	**0**
flakes complete	0	0	0	0	**0**
flakes broken	0	0	0	0	**0**
blades	0	0	0	0	**0**
microliths and manufacture	0	0	0	0	**0**
other debitage	0	0	0	0	**0**
total	**1**	**0**	**0**	**0**	**1**

Artefact list

Artefacts
1x worked, cortical, burnt chunk (core)

Kings Down

A number of unspecified implements with sites recorded by Shore (later types only recorded) and Falconer (no details) (Tratman 1973:164). No microliths

Soapleaze

Six microliths were recorded by Falconer

The Glades

One microlith was recorded by Falconer

Conkwell

Wymer and Bonsall (1977) note that a number of flints found in this location included four unretouched Mesolithic blades, which probably relates to the flints found here by Falconer (according to Tratman 1978). Three artefacts were located for examination, one of these is a core rejuvenation flake and the other a distal fragment of a blade, both have dorsal scars and both are typical of Mesolithic assemblages.

Total assemblage breakdown Conkwell

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	0	1	0	0	**1**
flakes broken	0	0	0	0	**0**
blades	1	0	0	0	**1**
microliths and manufacture	0	0	0	0	**0**
other debitage	1	0	0	0	**1**
total	**2**	**1**	**0**	**0**	**3**

Artefact list

Artefacts
1 x core rejuvenation flake

Monkton Farleigh

Wymer and Bonsall (1977) record a microlith from Inwoods, Monkton Farlegh. A bladelet core, five unretouched flakes and two core rejuvenation flakes were found at NGR ST805655 (Wiltshire HER)

Blashenwell Farm Pit, Dorset

Lithic categories

Classification	Quantity
Cores	10
Core fragments	3
Flakes complete	49
Flakes broken	6
Blades and bladelets complete/broken	24
Microliths and microlith production	5
Miscellaneous	31
Total	128
Cortical Category	
Primary	2
Secondary	24
Tertiary	96
Indeterminate	6
Material	
Flint	121
Chert	7

Quantification

Debitage size/mm^2	Quantity
00-10	2
10-20	40
20-30	23
30-40	30
40-50	26
50-60	5
60-70	0
70-80	0
Blade Widths / mm	
3	1
6	3
9	11
12	7
15	3
> 15	3

Artefact list

Artefacts
2x flint adze
1 x multi-platform core
1 x blade core roughly worked
5 x multiplatform core
1 x multiplatform bladelet core
1 x microburin (dorsal)
1 x microburin
1 x microlith
1 x backed bladelet
1 x microlith
1 x burin like point
1 x retouched core rejuvenation flake
1 x side scraper made on a core tablet
1 x end scraper made on a core rejuvenation flake
1 x side/end scraper
2 x piercers
1 x bladelet modified to a point at distal end
1x modified flint flake

Oliver's Field, Cherhill, Wiltshire [Mesolithic Hollow]

Lithic categories

Classification	Quantity
Cores	**5**
Core fragments	**18**
Flakes complete	**199**
Flakes broken	**22**
Blades and bladelets complete/broken	**39**
Microliths and microlith production	**2**
Miscellaneous	**188**
Total	473
Cortical Category	
Primary	4
Secondary	132
Tertiary	284
Indeterminate	53
Material	
Flint	473
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	18
10-20	86
20-30	113
30-40	84
40-50	65
50-60	82
60-70	20
70-80	5
Blade Widths / mm	
3	0
6	4
9	4
12	12
15	15
> 15	6

Artefact list

Artefacts
12 x Sarsen fragments piece of tufa animal bone fragments 5 x bladelet cores 1 x microlith (5c) 1 x microlith (indeterminate, late)

Oliver’s Field, Cherhill, Wiltshire [tufa deposit]

Lithic categories

Classification	Quantity
Cores	**9**
Core fragments	**23**
Flakes complete	**50**
Flakes broken	**12**
Blades and bladelets complete/broken	**29**
Microliths and microlith production	**4**
Miscellaneous	**58**
Total	185
Cortical Category	
Primary	5
Secondary	65
Tertiary	87
Indeterminate	3
Material	
Flint	185
Chert	0

Quantification

Debitage size	Quantity
1	4
2	7
3	26
4	32
5	38
6	47
7	26
8	5
Blade Widths / mm	
3	0
6	1
9	9
12	8
15	11
> 15	3

Artefact list

Artefacts
4 x sarsen fragments 1 x purplish sandstone 2 x core multiplatform 1 x core irregular 2 x obliquely blunted point 1 x microlith (sub triangular) 1 x microlith (broken) 2 x side scraper 2 x burin

Oliver's Field, Cherhill, Wiltshire [Buried soil]

Lithic categories

Classification	Quantity
Cores	**0**
Core fragments	**0**
Flakes complete	**11**
Flakes broken	**2**
Blades and bladelets complete/broken	**18**
Microliths and microlith production	**15**
Miscellaneous	**12**
Total	58
Cortical Category	
Primary	0
Secondary	11
Tertiary	44
Indeterminate	3
Material	
Flint	58
Chert	0

Quantification

Debitage size	Quantity
1	5
2	13
3	20
4	11
5	4
6	5
7	0
8	0
Blade Widths / mm	
3	0
6	5
9	20
12	6
15	0
> 15	1

Artefact list

Artefacts
9 x obliquely blunted points 2 x microlith (scalene triangles) 2 x microlith (3a and 3b) 1 x microlith (indeterminate 1 x microlith (tip)

Oliver's Field, Cherhill, Wiltshire [other contexts]

Lithic categories

Classification	Quantity
Cores	**0**
Core fragments	**1**
Flakes complete	**79**
Flakes broken	**8**
Blades and bladelets complete/broken	**100**
Microliths and microlith production	**37**
Miscellaneous	**66**
Total	291
Cortical Category	
Primary	4
Secondary	88
Tertiary	148
Indeterminate	3
Material	
Flint	291
Chert	0

Quantification

Debitage size	Quantity
1	1
2	45
3	61
4	81
5	48
6	37
7	15
8	2
Blade Widths / mm	
3	7
6	22
9	40
12	39
15	18
> 15	6

Artefact list

Artefacts
1 x burin
1 x borer
4 x microburin
1 x piercer

Langley's Lane, Somerset [top of palaeosol] 3031

Lithic categories

Classification	Quantity
Cores	**0**
Core fragments	**1**
Flakes complete	**6**
Flakes broken	**0**
Blades and bladelets complete/broken	**4**
Microliths and microlith production	**1**
Miscellaneous	**16**
Total	28
Cortical Category	
Primary	2
Secondary	9
Tertiary	17
Indeterminate	0
Material	
Flint	28
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	5
10-20	17
20-30	3
30-40	2
40-50	1
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	1
6	2
9	2
12	0
15	0
> 15	0

Artefact list

Artefacts
1 x microlith (broken rod type 6 or hybrid type 6 and 7b

Langley's, Lane, Somerset palaeosol 3029

Lithic categories

Classification	Quantity
Cores	1
Core fragments	0
Flakes complete	11
Flakes broken	6
Blades and bladelets complete/broken	4
Microliths and microlith production	0
Miscellaneous	16
Total	38
Cortical Category	
Primary	2
Secondary	12
Tertiary	23
Indeterminate	1
Material	
Flint	38
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	2
10-20	12
20-30	19
30-40	4
40-50	1
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	1
9	1
12	2
15	0
> 15	0

Artefact list

Artefacts
1 x uid stone 1 x uid object -bone 1 x irregular core 1 x broken flake with micro-retouch 2 x retouched fragment 2 x core rejuvenation flake 1 x retouched blade (burin like)

Langley's, Lane, Somerset 3004

Lithic categories

Classification	Quantity
Cores	1
Core fragments	0
Flakes complete	15
Flakes broken	2
Blades and bladelets complete/broken	7
Microliths and microlith production	1
Miscellaneous	10
Total	36
Cortical Category	
Primary	1
Secondary	12
Tertiary	22
Indeterminate	1
Material	
Flint	31
Chert	5

Quantification

Debitage size	Quantity
1	1
2	13
3	15
4	5
5	2
6	0
7	0
8	0
Blade Widths / mm	
3	1
6	0
9	4
12	1
15	1
> 15	1

Artefact list

Artefacts
iron ore
coal
quartz
blue-grey shale/mudstone
lower lias? Tufa adhering
fine grained sandstone, angular
2 x conglomeratic sandstone with coarse clasts
fine grained, well cemented grey-white sandstones
2 x miscellaneous stones
1 x microlith microscalene triangle
3 x core rejuvenation flake, 1 with retouch
2 x irregular flakes with scraper retouch
1 x notched flake

Langley's Lane (palaeosol) 3004

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	1	0	0	0	1
core fragments	0	0	0	0	0
flakes complete	11	0	2	2	15
flakes broken	1	0	1	0	2
blades	6	0	1	0	7
microliths and manufacture	0	0	1	0	1
other debitage	8	1	0	1	10
total	27	1	5	3	36

Langley’s, Lane, Somerset clay spread 3009

Lithic categories

Classification	Quantity
Cores	1
Core fragments	0
Flakes complete	0
Flakes broken	0
Blades and bladelets complete/broken	1
Microliths and microlith production	0
Miscellaneous	1
Total	3
Cortical Category	
Primary	0
Secondary	1
Tertiary	2
Indeterminate	0
Material	
Flint	3
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	0
10-20	2
20-30	1
30-40	0
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	1
9	0
12	0
15	0
> 15	0

Artefact list

Artefacts
red ironstone (can be referred to as red iron stained sandstone, possibly burnt 10 x fine to medium grained sandstone, yellow quartz miscellaneous core 1 x bladelet core

Langley’s, Lane, Somerset tufa lens 3015

Lithic categories

Classification	Quantity
Cores	0
Core fragments	0
Flakes complete	1
Flakes broken	0
Blades and bladelets complete/broken	3
Microliths and microlith production	0
Miscellaneous	2
Total	6
Cortical Category	
Primary	0
Secondary	1
Tertiary	5
Indeterminate	0
Material	
Flint	6
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	1
10-20	4
20-30	1
30-40	0
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	1
9	2
12	0
15	0
> 15	0

Artefact list

Artefacts
1 piece of miscellaneous flint with ‘quartz’ inclusion

Langley's, Lane, Somerset pit fill [3020] 3019

Lithic categories

Classification	Quantity
Cores	0
Core fragments	0
Flakes complete	3
Flakes broken	1
Blades and bladelets complete/broken	0
Microliths and microlith production	0
Miscellaneous	2
Total	6
Cortical Category	
Primary	1
Secondary	2
Tertiary	3
Indeterminate	0
Material	
Flint	6
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	3
10-20	1
20-30	0
30-40	4
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	0
9	0
12	0
15	0
> 15	0

Artefact list

Artefacts
quartz
coal
iron stained sandstones
fine grained sandstone
iron
green brown sandstone
miscellaneous -shale based
1 x core rejuvenation flake

Langley's, Lane, Somerset fill of animal burrow [1026] 1010

Lithic categories

Classification	Quantity
Cores	0
Core fragments	3
Flakes complete	13
Flakes broken	7
Blades and bladelets complete/broken	4
Microliths and microlith production	0
Miscellaneous	6
Total	34
Cortical Category	
Primary	3
Secondary	7
Tertiary	24
Indeterminate	0
Material	
Flint	34
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	2
10-20	20
20-30	8
30-40	4
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	0
9	2
12	1
15	1
> 15	0

Artefact list

Artefacts
1 x core rejuvenation flake

Langley's Lane 1010 [1026]

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	1	0	0	2	**3**
flakes complete	9	4	1	0	**13**
flakes broken	7	1	0	0	**8**
blades	3	1	0	0	**4**
microliths and manufacture	0	0	0	0	**0**
other debitage	5	1	0	0	**6**
total	**25**	**7**	**1**	**2**	**34**

Langley's, Lane, Somerset pit [3008] 3007

Lithic categories

Classification	Quantity
Cores	0
Core fragments	0
Flakes complete	3
Flakes broken	0
Blades and bladelets complete/broken	0
Microliths and microlith production	1
Miscellaneous	2
Total	6
Cortical Category	
Primary	0
Secondary	1
Tertiary	5
Indeterminate	0
Material	
Flint	6
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	2
10-20	3
20-30	1
30-40	0
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	1
6	0
9	0
12	0
15	0
> 15	0

Artefact list

Artefacts
3 x ironstone
ironstone with quartz clasts
2 x miscellaneous (too small)
3 x micaceous yellow fine to medium grained sandstones
1 x microlith (truncated rod)

Langley's Lane, Somerset [tufa 1007]

Lithic categories

Classification	Quantity
Cores	**0**
Core fragments	**0**
Flakes complete	**9**
Flakes broken	**1**
Blades and bladelets complete/broken	**4**
Microliths and microlith production	**0**
Miscellaneous	**1**
Total	15
Cortical Category	
Primary	2
Secondary	6
Tertiary	7
Indeterminate	0
Material	
Flint	15
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	1
10-20	2
20-30	7
30-40	2
40-50	2
50-60	1
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	0
9	1
12	1
15	0
> 15	1

Artefact list

Artefacts
a lump of lias with tufa over most of its surface
animal tooth
bone *Bos sp.*
1 x plunging blade with retouch 2 x core rejuvenation flake

Langley's Lane, Somerset [top of tufa below subsoil 1008]

Lithic categories

Classification	Quantity
Cores	**3**
Core fragments	**4**
Flakes complete	**19**
Flakes broken	**7**
Blades and bladelets complete/broken	**16**
Microliths and microlith production	**1**
Miscellaneous	**33**
Total	83
Cortical Category	
Primary	3
Secondary	12
Tertiary	67
Indeterminate	1
Material	
Flint	82
Chert	1

Quantification

Debitage size/mm^2	Quantity
00-10	16
10-20	39
20-30	21
30-40	7
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	2
9	7
12	0
15	5
> 15	3

Artefact list

Artefacts
a piece of tufa resembling bone
ironstone, likely carboniferous
carboniferous sandstone
2 x sandstone, random
quartz clast
bone *Bos sp.*
1 x multidirectional core
1 x bi-diectional core
1 x notched blade
1 x notched flake
1 x retouched flake (spokeshave)
1 x proximal microburin

Langley's, Lane, Somerset [top of tufa 3002]

Lithic categories

Classification	Quantity
Cores	0
Core fragments	2
Flakes complete	17
Flakes broken	16
Blades and bladelets complete/broken	5
Microliths and microlith production	0
Miscellaneous	32
Total	72
Cortical Category	
Primary	2
Secondary	18
Tertiary	47
Indeterminate	5
Material	
Flint	66
Chert	6

Quantification

Debitage size/mm^2	Quantity
00-10	9
10-20	32
20-30	21
30-40	7
40-50	8
50-60	2
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	1
9	2
12	2
15	0
> 15	0

Artefact list

Artefacts
'carboniferous' red haematite stained sandstone with some haematite clasts
yellowy fine grained sandstone, likely 'carboniferous'
micrite, fine grained
limestone (unknown source)
miscellaneous
1 x miscellaneous scraper 3 x core rejuvenation flake
1 x flake with micro retouch

Langley's Lane, Somerset [shallow cut 1049]

Lithic categories

Classification	Quantity
Cores	**0**
Core fragments	**0**
Flakes complete	**9**
Flakes broken	**3**
Blades and bladelets complete/broken	**3**
Microliths and microlith production	**0**
Miscellaneous	**2**
Total	17
Cortical Category	
Primary	0
Secondary	9
Tertiary	8
Indeterminate	0
Material	
Flint	17
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	0
10-20	8
20-30	8
30-40	0
40-50	1
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	0
9	1
12	1
15	0
> 15	1

Artefact list

Artefacts
2 x belemnites with broken tips
2 x coarse sandstone red (grit?)
ironstone
2 x limestone (carboniferous) clasts: one larger and one smaller piece
4 x blue lias/lower limestone shale?
medium/coarse grained well cemented sandstone, quartz arenite
carboniferous' sandstone, fine to medium grained brown/yellow
yellow greywacke mudstone or very fine sandstone with calcite vein
miscellaneous similar to the greywacke mudstone
3 x miscellaneous sandstones
4 x calcareous mudstones, creamy
5 x fine to medium grained sandstones
miscellaneous mica/sandstone
1 x broken flake with minimal retouch
1 x backed bladelet

Langley's Lane, Somerset 3028 [3030]

Lithic categories

Classification	Quantity
Cores	**1**
Core fragments	**0**
Flakes complete	**8**
Flakes broken	**2**
Blades and bladelets complete/broken	**4**
Microliths and microlith production	**0**
Miscellaneous	**4**
Total	19
Cortical Category	
Primary	1
Secondary	4
Tertiary	13
Indeterminate	1
Material	
Flint	19
Chert	1

Quantification

Debitage size/mm^2	Quantity
00-10	1
10-20	8
20-30	8
30-40	2
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	1
9	0
12	3
15	0
> 15	0

Artefact list

Artefacts
a piece of fragmented micaseous sandstone
very lightly burnt core of grey flint, irregular working 6PT
note: 75% of the fill was degraded limestone
1 x irregular nodular core 2 x core rejuvenation flake

Langley's Lane, Somerset [pit 3012] 3011

Lithic categories

Classification	Quantity
Cores	0
Core fragments	0
Flakes complete	5
Flakes broken	2
Blades and bladelets complete/broken	1
Microliths and microlith production	1
Miscellaneous	7
Total	16
Cortical Category	
Primary	10
Secondary	6
Tertiary	0
Indeterminate	0
Material	
Flint	14
Chert	2

Quantification

Debitage size/mm^2	Quantity
00-10	4
10-20	10
20-30	2
30-40	0
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	2
9	0
12	0
15	0
> 15	0

Artefact list

Artefacts
tooth
bone
calcareous marl stone – argillaceous limestone
sandstone stained yellow
miscellaneous
1 x microlith (unfinished)

Langley's Lane, Somerset 3026 [3027]

Lithic categories

Classification	Quantity
Cores	**0**
Core fragments	**0**
Flakes complete	**4**
Flakes broken	**0**
Blades and bladelets complete/broken	**1**
Microliths and microlith production	**0**
Miscellaneous	**3**
Total	8
Cortical Category	
Primary	0
Secondary	3
Tertiary	5
Indeterminate	0
Material	
Flint	8
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	2
10-20	2
20-30	3
30-40	1
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	0
9	0
12	0
15	1
> 15	0

Artefact list

Artefacts
7 x micaceous yellow fine to medium grained sandstones
red mudstone
iron
cherty flint
quartz
unidentified stone
1 x retouched bladelet (piercer?)

Langley’s Lane, Somerset 3005 [3006]

Lithic categories

Classification	Quantity
Cores	**1**
Core fragments	**0**
Flakes complete	**1**
Flakes broken	**1**
Blades and bladelets complete/broken	**0**
Microliths and microlith production	**0**
Miscellaneous	**2**
Total	5
Cortical Category	
Primary	0
Secondary	2
Tertiary	3
Indeterminate	0
Material	
Flint	5
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	3
10-20	1
20-30	0
30-40	1
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	0
9	0
12	0
15	0
> 15	0

Artefact list

Artefacts
1 x irregular bi-directional core

Langley's, Lane, Somerset clay lump overlying tufa 3024

Lithic categories

Classification	Quantity
Cores	0
Core fragments	0
Flakes complete	0
Flakes broken	1
Blades and bladelets complete/broken	0
Microliths and microlith production	0
Miscellaneous	1
Total	2
Cortical Category	
Primary	0
Secondary	1
Tertiary	1
Indeterminate	0
Material	
Flint	2
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	0
10-20	2
20-30	0
30-40	0
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	0
9	0
12	0
15	0
> 15	0

Artefact list

Artefacts
fine to medium grained red stained sandstone with mica

Langley's Lane 3024

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	0	0	0	0	**0**
flakes broken	1	0	0	0	**1**
blades	0	0	0	0	**0**
microliths and manufacture	0	0	0	0	**0**
other debitage	1	0	0	0	**1**
total	**2**	**0**	**0**	**0**	**2**

Langley's, Lane, Somerset 3021

Lithic categories

Classification	Quantity
Cores	1
Core fragments	0
Flakes complete	3
Flakes broken	0
Blades and bladelets complete/broken	0
Microliths and microlith production	0
Miscellaneous	0
Total	4
Cortical Category	
Primary	1
Secondary	2
Tertiary	1
Indeterminate	0
Material	
Flint	4
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	0
10-20	1
20-30	1
30-40	2
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	0
9	0
12	0
15	0
> 15	0

Artefact list

Artefacts
1 x irregular core, bidirectional

Langley's Lane 3021

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	1	0	0	0	**1**
core fragments	0	0	0	0	**0**
flakes complete	1	1	1	0	**3**
flakes broken	0	0	0	0	**0**
blades	0	0	0	0	**0**
microliths and manufacture	0	0	0	0	**0**
other debitage	0	0	0	0	**0**
total	**2**	**1**	**1**	**0**	**4**

Langley's, Lane, Somerset 3003

Lithic categories

Classification	Quantity
Cores	0
Core fragments	0
Flakes complete	24
Flakes broken	6
Blades and bladelets complete/broken	22
Microliths and microlith production	6
Miscellaneous	54
Total	112
Cortical Category	
Primary	5
Secondary	31
Tertiary	76
Indeterminate	0
Material	
Flint	111
Chert	1

Quantification

Debitage size/mm^2	Quantity
00-10	37
10-20	51
20-30	20
30-40	3
40-50	1
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	5
6	7
9	4
12	7
15	1
> 15	0

Artefact list

Artefacts
2 x unidentified stone 1 x retouched flake 1 x retouched broken blade (‘nosed’) 1 x crested blade 1x microlith (truncated rod) 2 x microlith (scalene triangle) 1x microlith (equilateral) 2x microlith (rod)

Langley’s Lane 3003

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	21	1	1	1	**24**
flakes broken	5	0	1	0	**6**
blades	21	0	0	1	**22**
microliths and manufacture	0	0	6	0	**6**
other debitage	38	0	0	16	**54**
total	**85**	**1**	**8**	**18**	**112**

Langley's, Lane, Somerset 3002 disturbed area

Lithic categories

Classification	Quantity
Cores	1
Core fragments	1
Flakes complete	6
Flakes broken	1
Blades and bladelets complete/broken	1
Microliths and microlith production	0
Miscellaneous	4
Total	14
Cortical Category	
Primary	0
Secondary	7
Tertiary	7
Indeterminate	0
Material	
Flint	14
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	1
10-20	2
20-30	7
30-40	3
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	0
9	0
12	1
15	0
> 15	0

Artefact list

Artefacts
1 x decayed stone 1 x irregular core (made on fragment), further modified scraper retouch on thin edge 1 x end scraper 1 x modified blade (point)

Langley's Lane 3002 disturbed area

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	1	0	**1**
core fragments	1	0	0	0	**1**
flakes complete	4	1	1	1	**6**
flakes broken	1	0	0	0	**1**
blades	1	0	0	0	**1**
microliths and manufacture	0	0	0	0	**0**
other debitage	4	0	0	0	**4**
total	**11**	**1**	**2**	**1**	**14**

Langley's, Lane, Somerset 3013

Lithic categories

Classification	Quantity
Cores	0
Core fragments	1
Flakes complete	8
Flakes broken	2
Blades and bladelets complete/broken	0
Microliths and microlith production	2
Miscellaneous	10
Total	23
Cortical Category	
Primary	0
Secondary	6
Tertiary	17
Indeterminate	0
Material	
Flint	22
Chert	1

Quantification

Debitage size/mm^2	Quantity
00-10	8
10-20	9
20-30	5
30-40	1
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	0
9	0
12	0
15	0
> 15	0

Artefact list

Artefacts
4 geology to add 1x microlith (scalene micro-triangle) 1 x side scraper 1 x flake with micro-retouch

Langley's Lane 3013

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	1	0	0	0	**1**
flakes complete	6	0	2	0	**8**
flakes broken	2	0	0	0	**2**
blades	0	0	0	0	**0**
microliths and manufacture	1	0	1	0	**2**
other debitage	6	2	0	2	**10**
total	**16**	**2**	**3**	**2**	**23**

Langley's, Lane, Somerset unstratified

Lithic categories

Classification	Quantity
Cores	10
Core fragments	9
Flakes complete	94
Flakes broken	56
Blades and bladelets complete/broken	25
Microliths and microlith production	6
Miscellaneous	201
Total	401
Cortical Category	
Primary	22
Secondary	126
Tertiary	250
Indeterminate	3
Material	
Flint	390
Chert	11

Quantification

Debitage size/mm^2	Quantity
00-10	78
10-20	196
20-30	86
30-40	37
40-50	3
50-60	1
60-70	0
70-80	0
Blade Widths / mm	
3	4
6	5
9	6
12	13
15	3
> 15	0

Artefact list

Artefacts
2 x microlith (scalene triangle 1 x microlith (rod) 1 x microlith (1 x microlith (miscellaneous) 1 x retouched plunging blade 2 x notched flakes 9 x retouched flakes 1 x flake with micro-retouch 1 x backed blade

Langley's Lane unstratified

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	9	1	1	0	**10**
core fragments	8	1	0	0	**9**
flakes complete	58	22	16	3	**94**
flakes broken	48	6	1	1	**56**
blades	18	5	4	2	**25**
microliths and manufacture	0	0	6	0	**6**
other debitage	147	3	9	43	**201**
total	**288**	**38**	**37**	**49**	**401**

Langley's Lane, Somerset 1005 [1023]

Lithic categories

Classification	Quantity
Cores	**0**
Core fragments	**0**
Flakes complete	**4**
Flakes broken	**1**
Blades and bladelets complete/broken	**1**
Microliths and microlith production	**0**
Miscellaneous	**6**
Total	**12**
Cortical Category	
Primary	1
Secondary	7
Tertiary	4
Indeterminate	0
Material	
Flint	11
Chert	1

Quantification

Debitage size/mm^2	Quantity
00-10	0
10-20	5
20-30	4
30-40	3
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	0
9	0
12	0
15	1
> 15	0

Artefact list

Artefacts
1 x animal tooth 1 x bone plus fragments 1 x retouched flake

Langley's Lane 1005

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	2	2	2	0	**4**
flakes broken	1	0	0	0	**1**
blades	1	0	0	0	**1**
microliths and manufacture	0	0	0	0	**0**
other debitage	3	0	0	3	**6**
total	**7**	**2**	**2**	**3**	**12**

Langley’s Lane, Somerset 1006 [1025]

Lithic categories

Classification	Quantity
Cores	**1**
Core fragments	**1**
Flakes complete	**14**
Flakes broken	**6**
Blades and bladelets complete/broken	**6**
Microliths and microlith production	**2**
Miscellaneous	**7**
Total	**37**
Cortical Category	
Primary	1
Secondary	8
Tertiary	26
Indeterminate	0
Material	
Flint	35
Chert	2

Quantification

Debitage size/mm^2	Quantity
00-10	7
10-20	17
20-30	5
30-40	7
40-50	1
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	1
6	2
9	1
12	2
15	1
> 15	1

Artefact list

Artefacts
1 x retouched flake 3 x core rejuvenation flake

Langley's Lane 1006

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	1	0	0	0	**1**
core fragments	1	0	0	0	**1**
flakes complete	11	1	1	0	**12**
flakes broken	6	0	0	0	**6**
blades	3	3	0	0	**6**
microliths and manufacture	0	0	2	0	**2**
other debitage	6	2	1	1	**9**
total	**28**	**6**	**4**	**1**	**37**

Langley’s Lane, Somerset 1001

Lithic categories

Classification	Quantity
Cores	**1**
Core fragments	**3**
Flakes complete	**26**
Flakes broken	**14**
Blades and bladelets complete/broken	**19**
Microliths and microlith production	**0**
Other debitage	**63**
Total	**126**
Cortical Category	
Primary	3
Secondary	30
Tertiary	93
Indeterminate	0
Material	
Flint	122
Chert	4

Quantification

Debitage size/mm^2	Quantity
00-10	28
10-20	63
20-30	31
30-40	4
40-50	1
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	1
9	4
12	6
15	3
> 15	2

Artefact list

Artefacts
leaf shaped arrowhead (Neolithic) 3 x retouched fragments 1 x backed blade 2x retouched blade 1 x retouched core rejuvenation flake 1 x core rejuvenation flake 4 x retouched flake

Table 5.*: Langley's Lane 1001

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	1	0	0	0	**1**
core fragments	2	0	0	1	**3**
flakes complete	19	4	5	0	**26**
flakes broken	11	1	1	1	**14**
blades	14	3	3	0	**19**
microliths and manufacture	0	0	0	0	**0**
other debitage	53	1	3	6	**63**
total	**100**	**9**	**12**	**8**	**126**

Langley’s Lane, Somerset 3017

Lithic categories

Classification	Quantity
Cores	**0**
Core fragments	**0**
Flakes complete	**1**
Flakes broken	**0**
Blades and bladelets complete/broken	**0**
Microliths and microlith production	**0**
Other debitage	**0**
Total	**1**
Cortical Category	
Primary	0
Secondary	0
Tertiary	1
Indeterminate	0
Material	
Flint	1
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	0
10-20	0
20-30	0
30-40	1
40-50	0
50-60	0
60-70	0
70-80	0
Blade Widths / mm	
3	0
6	0
9	0
12	0
15	0
> 15	0

Langley's Lane 3017

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	0	0	0	0	**0**
core fragments	0	0	0	0	**0**
flakes complete	1	0	0	0	**1**
flakes broken	0	0	0	0	**0**
blades	0	0	0	0	**0**
microliths and manufacture	0	0	0	0	**0**
other debitage	0	0	0	0	**0**
total	**1**	**0**	**0**	**0**	**1**

Langley's Lane, Somerset: small finds, various contexts

Lithic categories

Classification	Quantity
Cores	**1**
Core fragments	**0**
Flakes complete	**7**
Flakes broken	**4**
Blades and bladelets complete/broken	**5**
Microliths and microlith production	**2**
Other debitage	**25**
Total	**44**
Cortical Category	
Primary	1
Secondary	10
Tertiary	29
Indeterminate	4
Material	
Flint	44
Chert	0

Quantification

Debitage size/mm^2	Quantity
00-10	6
10-20	23
20-30	11
30-40	0
40-50	1
50-60	3
60-70	0
70-80	0
Blade Widths / mm	
3	1
6	1
9	1
12	1
15	0
> 15	1

Artefact list

Artefacts
1 x microlith (crescent)
1 x microlith (truncated rod)
2x core rejuvenation flake 1 x retouched fragment

Langley's Lane small finds, various contexts

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	1	0	0	0	**1**
core fragments	0	0	0	0	**0**
flakes complete	6	1	1	0	**7**
flakes broken	4	0	0	0	**4**
blades	3	2	0	0	**5**
microliths and manufacture	0	0	2	0	**2**
other debitage	19	1	2	3	**25**
total	**33**	**4**	**5**	**3**	**44**

Langley's Lane, Somerset: total sampled assemblage

Lithic categories

Classification	Quantity
Cores	23
Core fragments	25
Flakes complete	311
Flakes broken	140
Blades and bladelets complete/broken	136
Microliths and microlith production	21
Other debitage	512
Total	1168
Cortical Category	
Primary	61
Secondary	333
Tertiary	756
Indeterminate	18
Material	
Flint	1133
Chert	35

Quantification

Debitage size/mm^2	Quantity
00-10	217
10-20	542
20-30	288
30-40	100
40-50	16
50-60	5
60-70	0
70-80	0
Blade Widths / mm	
3	14
6	26
9	38
12	41
15	17
> 15	10

Langley's Lane total sampled assemblage

Lithic category	Not utilised, modified or burnt	Utilised or edge damage	Modified or retouched	Burnt	Total
cores	20	1	2	1	**23**
core fragments	21	2	0	3	**25**
flakes complete	223	50	38	15	**311**
flakes broken	108	24	6	3	**140**
blades	100	24	15	6	**136**
microliths and manufacture	1	0	20	0	**21**
other debitage	383	16	19	98	**512**
total	**856**	**117**	**100**	**126**	**1168**