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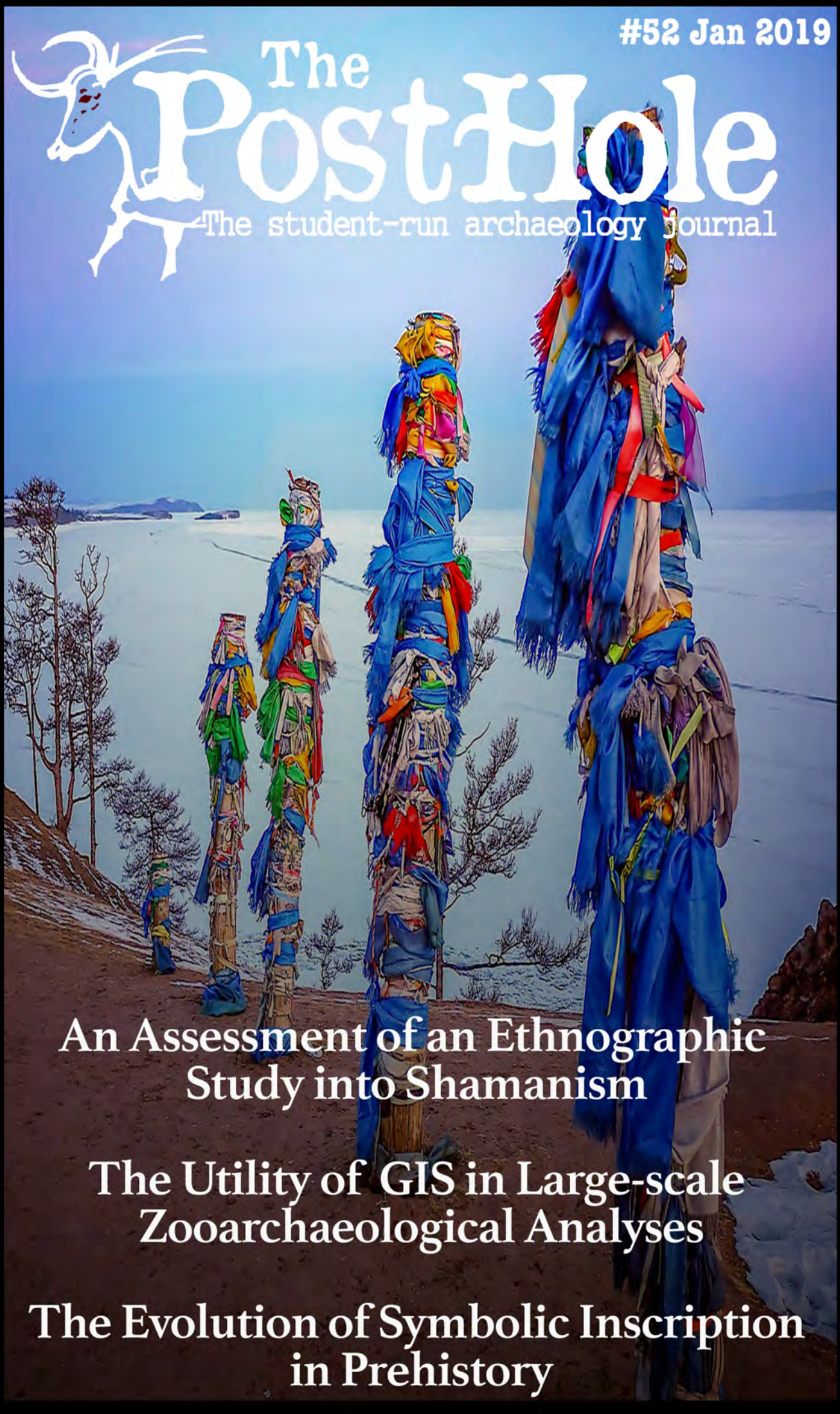

An Assessment of an Ethnographic Study into Shamanism

The Utility of GIS in Large-scale Zooarchaeological Analyses

The Evolution of Symbolic Inscription in Prehistory

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The Post Hole was shortlisted for 'The Best Public Presentation of Archaeology,' and 'Highly Commended' by the British Archaeological Awards in July 2014.

Editorial Staff

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Editorial: Making Women Visible

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The roles of women in the past has long been one of the most hotly debated topics in archaeology. One needs only to look at the responses surrounding the identification of the Birka warrior as female (Hedenstierna-Jonson *et al.* 2017), ranging from enthusiastic support to abject denial, to begin to understand the tensions surrounding the subject. Often, women are relegated to a sort of neutral identity, especially in medieval contexts, and evidence can often be twisted to fit with preconceptions of female roles in the period; for example, Gilchrist's (1997) observation of a symbol which, although seen as a holy book in male contexts, was dismissed as a workbox when found in a female context.

However, a recent paper co-authored by researchers at the University of York has offered an opportunity to re-examine these biases, revealing evidence of women's involvement in medieval manuscript production. (Radini *et al.* 2019). An 11th-12th century female burial in a women's monastery in Germany was discovered with traces of lapis lazuli in her teeth, suggesting repeated exposure to this rare and valuable art material imported from Afghanistan. Radini *et al*. suggest that this may have come from the woman repeatedly re-shaping the brush with her lips to keep it sharp whilst working on illuminated manuscripts. This evidence offers a fascinating counter to assumptions that the creation of these manuscripts was a specifically male task, and insight into the life of religious women during the early medieval period.

This year's Jorvik Viking Festival is also focusing on the roles and lives of women during the early medieval period, highlighting several figures from the sagas who showcase many different facets of female identity, from seeress to settler. It is fantastic to have such a high-profile event

shedding light on these often-overlooked stories, allowing women to finally take their place within narratives of the past.

In this month's issue we have several articles showcasing different approaches to understanding symbolism and religious practice, both in prehistoric and contemporary indigenous societies, alongside new research into the use of GIS, and the impact of a king's burial on archaeological interpretations.

My Editor's Choice this issue is Andrew Langley's critique of Peter Jordan's ethnographic work on the Khanty people of Siberia, an intriguing conceptual study of shamanistic belief systems and their role in aiding the understanding of prehistoric lifeways. Also in this issue, Heather Barrass examines mortuary rites and rituals in the Mesolithic; our incoming Submissions Editor Laura Koski offers a fascinating study of the use of GIS in zooarchaeology in North America; Kevin Claxton reviews the impact of Richard III's discovery on understandings of his final battle at Bosworth, and Joseph O'Grady provides a survey of the development of symbolic inscription in prehistory and its implications for understanding societies and shamanism in the past.

Finally, I would like to offer my heartfelt thanks to the members of our editorial team for whom this was their final issue, for all their hard work and dedication to *The Post Hole* and wish them the best of luck for the future. I would also like to welcome our new editors who will be taking over from Issue 53 and look forward to working with them to maintain the high standard of the journal. As part of our new editorial team I am delighted to welcome the Digital Content Editors who will be running our new blog, shortly to be launched on our website under *The Post Hole Extra*. This is designed to showcase pieces on personal experiences in archaeology, career advice, and responses to archaeological news and media: please follow our social media accounts on Twitter (@ThePostHole) and Facebook (The Post Hole) to keep up to date.

We are currently accepting submissions for our March issue! If you would like to share your thoughts, research or experience on a wide range of archaeological topics, please submit your work to submissions@theposthole.org. For guidance on submission, please visit our author advice page at www.theposthole.org/authors.

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Peter Jordan & Khanty Material Culture: A Critical Assessment of an Ethnographic Study into Shamanism

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Introduction

This paper will critically assess work by Peter Jordan on the material culture of shamanism. Chapter Six of *The Archaeology of Shamanism* (Jordan 2003) is entitled: *The materiality of shamanism as a worldview: Praxis, artefacts and landscape.* Jordan's focus is on his long-term ethnographic study subjects, the Khanty people of Siberia. This paper will review, assess and evaluate his work, both in terms of its ethnographic and methodological foundations, and its implications for archaeological interpretation.

In general, Peter Jordan's work is fascinating due to its deep and subtle engagement with Siberian foraging communities. What makes this work particularly interesting is the focus on how material culture can provide rich insights into shamanic belief systems. Trying to tease apart cosmology, belief, social structures and material culture is fraught with difficulty; Jordan aims to examine materials and landscapes within a framework of cosmology. This reveals patterns of deposition which otherwise appear inexplicable.

Shamanism & Belief

The chapter opens with an introduction to shamanism and the cosmology of the Khanty peoples. Shamans and shamanism have become contentious and diluted terms in the popular consciousness, often with little to no reference to their origins (Francfort, Hamayon & Bahn 2001). Often evoked as a primitive form of religion, Jordan understands shamanism to be a more fluid conception of belief. Following Hultkrantz (1973, 1978), he pivots the definition around a 'complex' of values which ultimately rest on the idea of a specialist who uses helper spirits to

access supernatural realms by means of altered or ecstatic forms of consciousness. This loose description then allows the Khanty to belong to the group of Siberian peoples who make use of such a phenomenon without direct recourse to the word *šaman*, which they lack in their vocabulary. Jordan stresses the cosmological and everyday significance of such a belief structure and argues that it differs from a standard conception of religion (Pentikäinen 1996). One crucial difference is the layered way in which cosmology, material culture and landscape become indivisible. After this general outline, Jordan elucidates the Khanty understanding of shamanism, not least by sketching a cosmological and spiritual map (*Figure 1*). The physical relationships between the landscape and beliefs of the Khanty are startlingly direct. Their inner representation of the cosmos as having three tiers is mapped out thus: the upper world is governed by a master force called *Torum* who is the source of goodness, the middle world is the realm of humans, animals, good and evil, and the lower world is black and home to sickness, ruled by *Kyn Lung.* Connecting these realms is the river Ob' which runs through the human world from the upper to the lower world, with the warmer south being the home of *Torum* and the colder north the home of *Kyn Lung.* In this way the landscape is the cosmology; the Khanty dead live and dwell past the river to the frozen north. The Khanty understand that animate beings contain a form of soul called *lil* which can become loose, ill or lost through dreaming, theft and the thoughtless discarding of personal possessions. To possess some form of animation is to have *lilenky,* a term describing animals, plants, rocks, rivers and other objects. This ontological depiction of animation is crucial to understanding how the Khanty engage with their materials and environment. This opening ethnography of Khanty shamanism helps orient the reader to the landscape in which the group live - the river is a potent connection between sources of

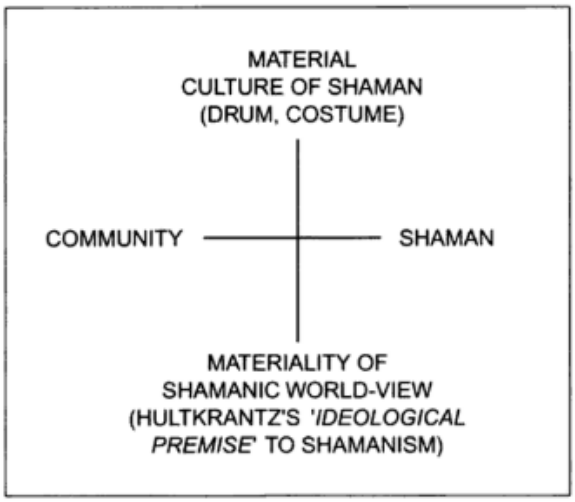

Figure 1: Conceptual map of the social and material aspects of Khanty shamanism (Jordan 2003).

abundance and of sickness, between the living and the dead. By widening the scope of material culture to include landscape and cosmology, Jordan allows the all-encompassing nature of their beliefs to come to the fore, and this lends later interpretations a real explanatory power. The downside to this totality is that it offers limited scope for alternative explanations of material culture practices. Methodologically, this approach exists within the framework of 'standpoint epistemology' (SE) - the theory of knowledge that takes the intersubjective reality of individuals and groups as a valid source of truth (Stoetzler & Yuval-Davis 2002; S. Harding 2004; S. G. Harding 2004). The Khanty have particular beliefs as to the nature of their existence and the nature of the world they inhabit. SE allows Jordan to build a rich description of their beliefs and present them as a construction in which the Khanty find meaning and understand their reality. The key theory here is that reality is relative to the observer and that inter-subjectivity dismisses the need for an objective standard of reference (Bowell 2011; Hartsock 1998). More recently, this methodology has moved from feminist studies into the creation of 'indigenous standpoints', with researchers facilitating epistemic claims by marginalised societies (Foley 2006; Foley *et al*. 2003; Nakata *et al.* 2007; Moreton-Robinson 2013). The strength of ethnoarchaeology in this kind of research is that it provides the epistemological groundwork of human behaviour, which can result in otherwise puzzling or inexplicable depositions or assemblages. The disadvantages of using SE are plentiful, but within ethnoarchaeology it allows scholars to ascribe single static identities onto studied subjects without allowing for disagreements and tensions between individuals. An obvious place this could occur would be when assessing the strength of belief within the Khanty as to their shamanistic worldview. It may be necessary to be reminded that, even within animistic belief systems, there remains room for dissent, ridicule and ironic detachment (Willerslev 2013).

Khanty Society

Jordan moves from describing the shamanic worldview to more detailed descriptions of the Khanty themselves and the broader social roles of shamans. Individual shamans are permitted to have two main functions within Khanty society, to be the 'reflector' of the particular cultural

constructions and customs of the Khanty and to be the sole agent of negotiation between the upper and lower worlds with regards to people's health. However, it is also the case that shamans are often marginal figures, and a multitude of other interactions (such as animal taboos and the influence of deceased relatives) are of more importance to an individual's wellbeing. The history of the Khanty is briefly illuminated through an examination of three key periods: the period of Russian expansion, taxation and economic regulation; the period of Soviet oppression of shamans and shamanism; and the period of mineral extractive industry. Each is reported to have caused profound changes in Khanty society which resonate up to the present, particularly in the manner of *yurt* living, which severed the living chain of shamanic tradition. Ethnography can only become more productive and focused when the historical contexts of particular people are taken into consideration, so this reflection on Khanty history adds weight to the conclusions that Jordan draws. His description of shamanism, however, could be teased out and more critically assessed.

The early definition of shamanism as a complex of values gives way to a definition of shamanism as 'ideological', largely influenced by Hultkrantz (1996). Describing shamanism as ideological seems to be in contradiction to the looser, fluid schema of shamanism as a complex of values. Hultkrantz himself was inclined to generalise Eurasian and Palaeo-American shamanism as sharing ideological foundations which have persisted since the Palaeolithic (Kehoe 1996). Jordan's ethnoarchaeological research doesn't seem to mesh easily with this idea of an unbroken historical chain of ideology reaching into prehistory, especially in light of his own historical contextualising for the Khanty. In their work on the history of state and shaman relationships, Thomas and Humphrey (1996; 1994) question how valid shamanism can really be given the influence of Chinese, Mongol, Islamic and Russian empires in Siberia. But if shamanism cannot be reduced to ideology, and if scholars cannot be certain as to the exact influence of outside forces on the Khanty, authority for the nature of Khanty shamanism rests solely with the people themselves. The crux of the matter is then laid bare - why does Jordan

seek to use the ideological premise to ground the Khanty belief system? Why does the Khanty's own description not suffice?

Khanty Material Culture & Landscape

The next section hones in on Khanty material culture and their relationship with the landscape. The Khanty are summarised as a semi-nomadic egalitarian group who aggregate in the summer and spend the winter hunting in the *taiga* forests. In order to secure success for the hunt each family must provide gifts or *pory* to the forest spirit *Wuhnt Lung,* who in turn ensures access to game animals. The raised islands in the boggy terrain are considered potent places to propound *pory,* which can include depositing bones or bottles, consuming elk heads or vodka, draping white sheets from trees or sometimes dispatching live reindeer as a sacrifice (*Figure 2*). Other ritualised interactions with the landscape include the carving, curation and deposition of wooden anthropomorphic dolls, the building of wooden houses in sanctified stretches of woodland, and the visiting and placation of related souls in cemeteries. Together, these link into a network of sacred or spiritually important sites which are maintained in the face of human engagement with *taiga* resources, particularly the hunting of game animals. Alongside the landscape there are also highly formalised routines for the killing, butchery, consumption and disposal of animals and animal parts. Since each animal is watched over and owned by a particular spirit, the Khanty take great pains to observe correct ritual and not to damage the equilibrium between the animal and human world. To alter these relations would be to invite a number of undesirable consequences, including the failure of the hunt.

Figure 2: An example of a sacrificial offering (Jordan 2003).

This type of ecological and animistic engagement between the human, spirit and animal worlds has been more closely studied in recent decades. Of particular interest has been the highlighting

of animistic ontological claims or 'flat ontologies' (VanPool & Newsome 2012; Alberti et al. 2011; Halbmayer 2012; Bird-David 1999; Costa & Fausto 2010; E. V. de Castro 1998; E. B. V. de Castro 2004). The academic focus on materials, objects, networks, affects and physical properties has been dubbed 'the ontological turn', but includes a variety of methodological approaches including Object-Oriented Ontology and Actor-Network Theory (Hemmings 2005; Morton 2011; Munro 2009; Callon & Blackwell 2007). Parsing aside, the more abstract use of flat or relational ontologies away from a study of animism proper reveals a rich and growing body of research into the nature of animistic beliefs. This has allowed Jordan to engage with the Khanty on their own terms concerning their beliefs and activities within the landscape. Terms like 'equilibrium', 'mediation', 'ecological,' and 'relationships' make sense within a general framework where personhood is a more distributed concept and agency built into the landscape itself. Jordan never uses the term animism in this work, but the form of shamanic worldview the Khanty inhabit is a synonym for animism, albeit with its own distinct acculturations. While Jordan is not seeking to analyse Khanty material culture through an academic notion of relational ontology, he nevertheless brings in both Ingold and Bourdieu to reinforce his conclusions. Ingold's work on animism and Northern hunter-gatherers blends a more abstract materiality focused on objects with discrete animistic belief systems (Ingold 2011, 1986). While this is less important for Jordan's methodology in analysing the Khanty, it is relevant in his conclusions. The lessons being drawn from the Khanty are that shamanistic material culture leaves behind unusual and obscure traces on the landscape which can only be explained by archaeologists sympathetic to the belief systems that may be responsible. It can be tempting to use animistic belief systems simply to explain the inexplicable (Mellars 2009). This is where the academic focus on ontology, effect and objects can be more useful, providing agency to artefacts without necessitating that the culture which manufactured them is shamanistic or animistic (Conneller 2004).

There is a methodological distinction between what could be called 'academic animism' and 'cultural animism'. Allowing the Khanty to explain their culture by permitting cultural animism is a strength of Jordan's chapter, but it sets up a potential equivocation between the academic and

the cultural. Given that one of the aims of the work is to provide researchers with interpretative tools, there is a failure here to parse out terminology. Another potential oversight is the description of material practices as only belonging to a particular set of intentions on the part of the Khanty. Jordan focuses heavily on the health and hunting aspects of the depositions and taboos, but other researchers in Northern Eurasian ethnography have noted the animistic logic to leave visible traces of offerings and symbols can also be part of territorial marking and defense (Bicho, Detry & Price 2015; Sellers 2010). Platforms, animal bones, tree stumps, tree markings and burials can all be demarcations of territory both against the living and the dead (Grøn, Turov & Klokkernes 2008). There is also the undiscussed possibility that deposition and taboo might be driven by intentions outside of the shamanic framework - hygiene, competition, rivalry, personal arguments, romance, friendship and all the myriad reasons why humans behave in seemingly unfathomable ways. The Khanty are as capable of rational and irrational thought and behaviour as any other human society, therefore it is unlikely that all their activity can be subsumed by one generalised framework. Ultimately, Jordan is successful in his conclusions. The incorporation of some degree of sympathy on the part of archaeologists towards shamanic material culture can only help with future interpretations. He makes a solid case, building from abstract principles through to concrete deposition examples, and traces connections between them which seem legitimate and insightful. The concerns about using ethnography in archaeological interpretation will always remain, but in this instance looking to cultural beliefs as an explanation for more ephemeral or puzzling assemblages has already proved invaluable. One especially fruitful location has been the Mesolithic site of Star Carr, where the use of shamanic and animistic principles has helped build a case for such practices in prehistory through the material culture left behind, including pendants (Milner et al. 2016) and antler headdresses (Little et al. 2016). Across the Mesolithic literature, shamanic interpretations have been widely accepted for human burials (Porr & Alt 2006; Schmidt & Voss 2000), animal bone curation and burial (Mannermaa 2013; Overton & Hamilakis 2013) and human-animal interactions (Borić 2003). Jordan's work in helping to develop a more nuanced and subtle

approach to archaeological interpretation has certainly been welcomed and will be used for years to come.

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Mesolithic Mortuary Rites: An Evaluation of the Practices of Inhumation & Disarticulation

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Introduction

Mortuary rites are one of the quintessential sources of evidence in the archaeological record for understanding human behaviour and ideologies of the time, particularly in the case of prehistory where there are no written records and often very limited evidence in comparison to historical periods. Nilsson Stutz (2003, 81) states that "the ways that the living handle the cadaver relates to attitudes toward the body, the self and other, the dead and the living, culture and nature, order and disorder, and the present, the future and the past." This highlights that mortuary practices are a key place for archaeologists to start in terms of making inferences about social organisation, relationships, political structures, ideologies, religious beliefs, economy and technology. Jacobi (2003, 810) emphasizes that in prehistory it is the location of the bodies, the skeletal remains and perhaps the grave goods within the burials that remain once a culture and society has gone. Archaeologists are unable to authenticate what words were said, what actions were performed, and who had surrounded the bodies and witnessed the mortuary practices. However, the varying different ways of treating the body after death in prehistory can tell us a great deal about customs, ideologies and beliefs at the time, through interpretation and often comparisons with ethnography.

Mesolithic Burials

As with any period, there is huge variability with the treatment of the body after death, depending on a number of factors such as location and group identity. It is critical to remember when analysing the evidence that this likely represents only a small percentage of a larger population,

and one form of mortuary practice was perhaps not a single practice expressive of common behaviour for that society, rather one choice out of many – just like today. This essay will examine what inhumation and disarticulation can tell us about mortuary customs, ideologies and beliefs within the Mesolithic, a period that has arguably been neglected within prehistory (Blinkhorn & Milner 2014).

Inhumation, sometimes referred to as formal burial, can be defined as "the creation of an artificial place for the purposes of containing a corpse" (Pettitt 2011, 9). It consists of a three-stage process which can be summarised as: the excavation of an artificial pit to serve as a grave, internment of the body and finally the covering of the body with the extracted sediment (Pettitt 2011, 9). The Mesolithic period saw a significant rise in the use of cemeteries, defined as "places given over in the main or entirely to the dead, with little or no evidence of settlement" (Pettitt 2011, 10). These are often associated with the beginnings of human complexity (Conneller 2013), though Nilsson Stutz (2003) encourages us to remember that a complex society does not always perform complex mortuary practices and vice versa.

Burial Variations

Vedbaek-Bogebakken, dated to 5900BP, and Skateholm I and II, dated to 6290 – 5930BP and 6910-6000BP respectively, are amongst the largest and best-known burial ensembles from this period in Northern Europe, along with sites such as Oleni'Ostrov (O'Shea & Zvelebil 1984; Jacobs 1995) and Zvejnieki (Zagorska 2016). These two extremely rich Scandinavian sites tell archaeologists huge amounts about Mesolithic ideas, beliefs and customs due to their excellent preservation and wide varieties of evidence. For example, it is interesting to note that within the burial numbers at Vedbaek there is a noticeable absence of children and adolescents, with only adults and infants being represented (as in *Figure 1*). Strassburg (2000) proposes various interpretations for this relationship between presence and absence seen at Vedbaek, suggesting that children were more likely to be disarticulated and deposited in the lake-edge contexts. He

then suggests that this indicates older children and adolescents had achieved separation from their parents prior to their death but had not quite developed the full social persona necessary for burial at the cemetery. Infants, however, were still seen as part of their parents and were not yet individual persons, hence their burial alongside adults, presumably their parents. This use of space can also express a distinction between 'normal' and 'deviant' burials, with Cole suggesting that the general age and sex profile of the burials are not representative of an ordinary population; instead there is a large population consisting of those in mid-life and perhaps those who died in childbirth, as well as again the lack of children and mature adults (Parker Pearson 2003; Strassburg 2000).

Figure 1: Adult and Infant Burial at Vedbaek (National Museum of Denmark 2019).

Dogs and Domestication in Burial Contexts

The domestication of dogs within prehistory is extremely interesting, and burials containing dogs give great insight many aspects of prehistoric life including social relationships and ideologies. Variability in the treatment of dogs, particularly at Skateholm, is in many ways equivalent to the treatment of humans. Much like humans, not all dogs were buried, and were therefore specifically selected for burial and only represent a small percentage of a larger population (Conneller 2013). Similarly to infant burials, dog burials are often carefully arranged and prepared (see *Figure 2*), and could be buried either flexed or extended, whole or part. Often, they are buried close to a human who may appear to be their owner

Figure 2: Dog Burial at Skateholm (Morey 2006).

perhaps symbolising how important dogs were to people and daily life in these societies (Morey 2006).

These burials have been explained, like some cases of human burials, as a way of disposing of the remains in a hygienic manner, away from the general living space. However, when considering the degree of care and preparation that has been put into some of these burials, as well as the overall number found, it appears to become much more symbolic and meaningful for these communities. When compared with the other burials at Vedbaek and Skateholm, particularly those with infants, these burials raise interesting questions regarding whether some dogs were considered more powerful or socially complete than other members of society; for example children, which are completely absent in these Scandinavian cemeteries. Another idea is that, in some instances, dogs were buried in place of their owner to 'fill in' for the fact that a body could not be transported to the burial site. Furthermore, this high level of care towards dogs demonstrates that inter-species relations were arguably important to Mesolithic people and sometimes equal to inter-personal relationships.

Post-Mortem Transformations

Nilsson Stutz (2003) argues that the transformation of people after death is performed through the following methods in order to maintain personhood and identity in death:

1. A concern with the maintenance of an intact body through burial
2. An attempt to arrange the cadaver in the position of the living (e.g. sitting/lying)
3. Concern shown in wrapping/lifting the body from the grave structure
4. An attempt to hide the messy, dangerous and disturbing process of decay from the living

The Latvian site of Zvejnieki, dating to 9000-3500BP, holds 330 burials (Zargoska 2016) and is a perfect example of how burial traditions express the economic, social and cultural characteristics of the society. The large number of burials and individuals allows potential patterns and links to be observed. For example, there is significant evidence from the site indicative of some bodies being wrapped pre-internment, particularly burial 93 (Zargoska 2016). This adult male is buried

in a light grey grave with small stones surrounding the grave limits and a layer of red ochre surrounding the skeleton, along with rich grave goods. However, the way the bones have come to rest after decomposition indicates that the body was wrapped before burial (Zargoska 2016). Although it is hard to say what material was used to wrap the bodies, possibly fur or bark (perhaps paralleling other sites in Eastern Denmark), it is undeniable that this practice occurred and had meaning. The fact that not all bodies were wrapped implies that this was a selective process for certain members of the group. When the evidence is weighed up – wrapping, red ochre, grave goods, orientation, space, structure and character of the grave it may be reasonable to suggest that this is indicative of high status. When considering sites like Zvejnieki, Vedbaek and Skateholm, it is appropriate to agree with Nilsson Stutz's (2003) statement regarding how a body is transformed after death to maintain their identity. However, in some cases, this could appear to be temporary once the deceased has clean bones and is sometimes seen when old burials are disturbed, and care is not taken to restore their integrity (see *Figure 3*).

Figure 3: Graves 323/325 cutting across grave 330 (Nilsson Stutz, Larsson & Zargoska 2013).

Additionally, it is important to note that these arguments for transformation cannot be extended across the entirety of Europe due to the evidence for disarticulation as a way of transformation and destruction. The processes of disarticulation, excarnation and de-fleshing, for example, did not try to hide the messy, dangerous and disturbing process of decay and decomposition from the living. Instead, embracing and witnessing these aspects seemed to be an essential element of these mortuary practices: for example, people pushing either partially or fully decayed bodies aside at Téviec and Hoëdic in order to make room for new bodies (Conneller 2013).

Disarticulation as Transformation

Disarticulation, simply the separation of two bones at their joint, is another common funerary practice that was undertaken during the European Mesolithic (Bailey & Spikins 2008), with key sites for evidence including Téviec and Hoëdic, Skateholm, Abri des Autours and Grotte Margaux as well as Gross Ofnet. Cauwe (2001) argues that disarticulation of human bodies was a Western European funerary tradition that spanned from the late Palaeolithic right up into the Neolithic and is often closely related to other mortuary practices such as cannibalism and secondary burial. His extensive work at Grotte Margaux and Abri des Autours, dating to around the ninth millennium, highlights the possibility of links with secondary burial due to the fact that each individual at Grotte Margaux is uniquely incomplete which taphonomy cannot explain. The distribution of red ochre on the bones, but not the grave surface, suggests that the bodies decomposed outside of the tomb and thus were disarticulated outside of it, perhaps for excarnation (Cauwe 2001, 151). Although we cannot be completely certain about why this was happening or what it meant, we can make educated inferences by looking at different aspects of the site. For example, the demography of those buried at the site is interesting. There is a lack of children and adolescents, and it appears that all those buried here are women and possibly genetically related (Cauwe 2001, 151). These characteristics suggest that this site does not represent a tragedy, instead showing that there were specific criteria - perhaps from ritual, cultural or social requirements – which led to the bodies being treated in such a way at this site. However, it is also important to note that, even within this site, the treatment between individuals varied, suggesting that beliefs and ideas were diverse on an even smaller basis (Cauwe 2001). Similarly to Grotte Margaux, the site of Abri des Autours highlights varied mortuary treatment within a group. Unlike Grotte Margaux, children are present, but are treated separately and differently from adults. This signifies that the community clearly had different perspectives of the two age groups but also that within a wider culture ideas, although similar, also varied (Cauwe 2001, 155).

Violence or Care?

Figure 4: Largest collection of skulls at Ofnet Cave (Probst 1999, 179 in Hofmann 2005, 194).

The ambiguous site of Groβe Ofnet, dating to between 6460 and 6180 BC, has the largest collection of human remains from the Mesolithic in the region of Bavaria (Hofmann 2005). It consists of two collections of skulls, totalling 34 individuals, buried carefully in pits (see *Figure 4*). A popular explanation is that Ofnet is evidence of a massacre of a rival tribe, often supported by the head injuries and assumption of violent death, with the heads being kept as trophies after being cut off soon after death, shown by the presence of vertebrae (Hofmann 2005, 195). However, Hofmann (2005) presents several alternative ideas whilst highlighting the negative effects of sensationalism since Ofnet appeals to our emotions, not our logic whilst defying easy and standard explanations. Perhaps they did die violently, but care was taken to bury the heads: whether this was out of respect or fear of revenge, is uncertain.-Whatever the reason, it is clear that this process was irrevocably transformative, with individuals dismembered and transformed by ceasing to exist as a living person and being made into a mass of dead flesh (Hofmann 2005). Although it could be argued to be a process of change and transition, it could also be seen as destructive, aggressive and frightening. Ofnet cave is arguably a site of conflicted emotions, highlighting how, even in prehistory, death and its effects were not a straightforward process. It is neither a site of mutilation and burial lacking motivation, nor a site of simple ritual with hushed reverence and peaceful symbolism (Hofmann 2005). In actuality it is a site of huge complexity, overflowing with personal beliefs, ideas and emotions wherein the appearance of deceased individuals had to be dealt with, perhaps in similar ways but for different reasons. Was individuality preserved here with the face, the most individual and recognisable feature, or was this representative of something transcending individuality with the arrangement in tight

clusters?

In conclusion, it is evident that inhumation and disarticulation can raise significant questions about mortuary customs, ideologies and beliefs within Mesolithic communities. It is undeniable that death creates both a strong and contradictory emotional response for the people left behind, and this can be seen as one reason for the need of ritual practices in order for a gradual acceptance to occur at individual, societal and symbolic levels (Stutz 2003, 57). It is necessary for those left behind in the community after the dramatic change associated with someone's passing to continue to uphold society by dealing with the cadaver along with the emotions. It is through the mortuary customs and body processing that the reallocation of responsibilities, obligations and other aspects of social connections disrupted by death are dealt with, and as a result "mortuary rituals have a consequent community effect" (Stutz 2003, 70) because they go beyond personal grief towards a recognition and display of political order.

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The Utility of GIS in Large-Scale Zooarchaeological Analyses: A Case Study Focusing on a Mixed Context Site in the Midwestern United States

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Introduction

The following is a case study exploring how ArcGIS was incorporated in the zooarchaeological analysis of Coney Island of the West (21CR164): a 32-acre island in Lake Waconia, Waconia, Carver County, Minnesota in the Midwestern United States. Coney Island is a multi-component site spanning prehistoric to historic usage, followed by modern use by the occasional trespasser. The expansive nature of the site, as well as its multiple phases of occupation, make it an ideal candidate for a spatial analysis study. This paper is not intended to be a discussion regarding the zooarchaeological methods involved in the analysis of the faunal material but is rather a focus on the valuable potential for the use of Geographic Information Systems (GIS) in a zooarchaeological context. For a detailed discussion of methodology, faunal identifications, and their implications for resource procurement and subsistence practices please refer to the paper *Bone Tools, Elk Dishes, and Life on the Lake: A Zooarchaeological Analysis of Coney Island of the West (21CR164), Waconia, Carver County, Minnesota* (Koski 2018).

This case study is by no means the first instance in which GIS spatial analysis has been used in a zooarchaeological context, but it is one of relatively few examples worldwide. The technique is growing, however, and this paper is intended to be just one more example of why this method should be more heavily utilized on the whole. One of the few published examples of the method regards El Mirón Cave in eastern Cantabria, Spain (Arroyo 2009). Within the paper, Marín Arroyo highlights the strong point that while GIS has been heavily utilized for archaeological site predictive modelling, mapping of known sites for future development planning and research, or for catchment area definition, the mapping software has actually been utilized relatively

minimally in the visual display and organization of single archaeological site material distributions (Arroyo 2009, 507). In an attempt to both address this discrepancy, and to discover if spatial analysis could prove useful for the understanding of this individual site, a specific zooarchaeological GIS was prepared. An extra step including factorial and local density analyses was also completed as a means of reinforcing the overall site interpretation (Arroyo 2009). This study is of particular relevance to the Coney Island case study due to the fact that both sites contained mixed contexts from different periods and separating out the faunal material into context and activity areas was heavily aided by spatial analysis.

One of the most impressive examples of the method's implementation on a regional scale was its use in the Paraná River flood plain (Sartori et al. 2014). In this study, Sartori et al. mapped the taxonomic data from twenty-six different sites within the flood plain in an attempt to discern the similarities and differences in wildlife resource utilization across those hunting, gathering, and fishing within the region. The resulting data allowed for both micro-regional and macro-regional spatial and temporal comparisons across sites and aided in some understanding of the distribution of species within the flood plain in the past (Sartori 2014). Sartori's study was completed on a grander scale than that of Coney Island, but the taxonomic GIS data generated for the island would be of great use to a regional scale zooarchaeological model for the state of Minnesota or the greater Midwest in the future.

Site Background

This review of the island's background is summarized and focuses on the elements important specifically to the faunal and spatial analysis of the site. For a thorough accounting of the site's known history and prehistory, see the report *A Phase I Cultural Resource Assessment of the Proposed Lake Waconia Regional Park, Coney Island of the West, Waconia, Carver County, Minnesota* by Blondo Consulting (Blondo, Wolf & Koski 2017).

The site was already listed in the *National Register of Historic Places* (CR-WAT-001) before Blondo Consulting was contracted to research and survey the site in the fall of 2016. It is listed for containing the remains of a well-document historic resort that has been referred to in the past

as Coney Island Hotel and later Paradise Isle Resort (Waconia Heritage Association 1986). The resort was initially developed between 1884 and 1886, marking the first recorded consistent usage of the island (Waconia Heritage Association 1986).

Figure 1. Location of Coney Island of the West (21CR164). Author's own.

The previous pre-contact occupation was discovered during Blondo Consulting's Phase I survey of 2016 and was further explored during the Phase II survey of 2017. Pre-contact materials included lithic and ceramic fragments mixed with a variety of faunal material. The potential period(s) and cultural origins of the pre-contact material is not directly relevant to the topic of this discussion and will therefore not be discussed in detail. For those interested, the report *The Phase II Additional Analysis of the Coney Island of the West Site (Site 21CR0164), Waconia, Carver County, Minnesota* (Blondo & Wolf 2018) discusses the pre-contact artefact analysis at length.

Methods

One of the most valuable mapping measures that helped give greater context to the faunal assemblage was investigating historic maps for the island to examine how its use has changed

over time. Today, the entirety of the island is surrounded by a slim beachline, but 1940 aerial imagery located at the University of Minnesota John R. Borchert Map Library revealed that the beach once extended much further. Aerial imagery for successive years up until the modern day indicates that the water level has slowly risen since the mid-twentieth century, shrinking the usable portions of the island. The beach area available in the 1940s extends as much as approximately 25 meters out at the southwestern peak, and as much as 100 meters out on the north eastern edge (*Figure 2*). It should be noted that vegetation visible in the aerial imagery is slight on the extra beach areas when compared to the heavy vegetation on the main body of the island that can be seen today. It is important when interpreting distribution of faunal

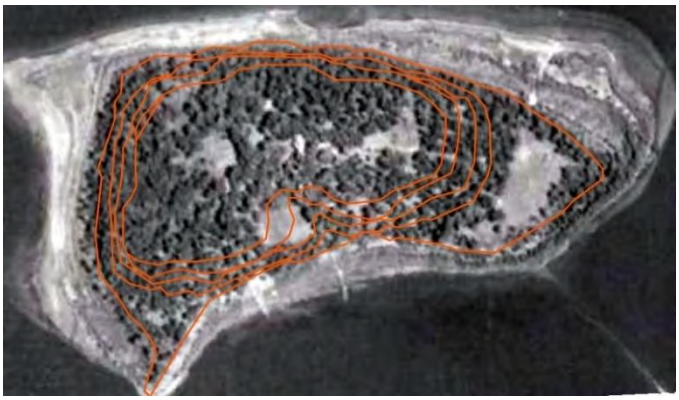
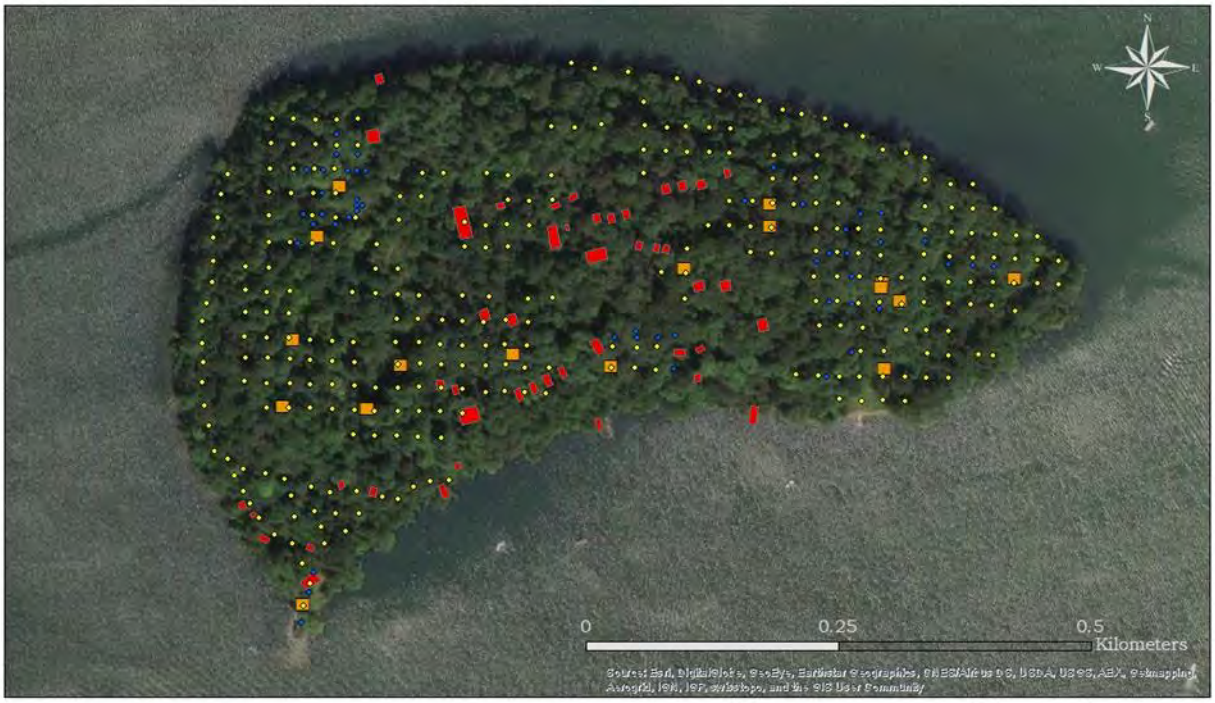


Figure 2: 1940s aerial imagery of Coney Island of the West, courtesy of the John R. Borchert Map Library of the University of Minnesota – Twin Cities. Contour lines drawn by the author using a USGS topo map overlay are represented by the orange lines. Top of photo is north.



All Recorded Historic Structure Locations and Completed Excavation
Coney Island of the West (21CR164), Waconia, Minnesota, United States

Phase I Shovel Tests · Phase II Shovel Tests ■ Phase II Test Units ■ Historic Structures

Cartographer: Laura Kotki; Date: December, 27, 2018.

Figure 3: Overview of site and mapped excavation work. Author's

material to understand that the beach areas that are accessible at low lake depths may have been intermittently available over the past thousands of years that the island has existed, indicating other faunal deposits may be present along these submerged beachlines.

After both seasons of fieldwork were completed, all first season shovel test (n = 305), second season test unit (n = 18), and second season shovel test (n = 47), locations were drawn into ArcMap by the author utilizing a georeferenced hand-drawn field map created by Dr. Jeremy Nienow, one of the Principal Investigators for the project (*Figure 3*). Test units were one meter by one meter and were excavated twenty centimetres past culturally sterile soils. Attribute tables were created for the shovel test and test unit shapefiles. Since depths were not consistently recorded for artefacts recovered from shovel tests, the shovel test attribute table consisted of only five entered data columns: shovel test number, a positive/negative column, and columns named 'historic,' 'prehistoric,' and 'faunal' (*Figure 4*). Faunal was designated as a separate category because at this stage it was unclear whether the material was prehistoric, historic, or natural in origin. If materials were recovered from a shovel test, a 'yes' would be entered in the positive column; if not, a 'no'. If any of the aforementioned materials were recovered from a shovel test, a 'yes' was entered into the appropriate historic/prehistoric/faunal cell. This original shovel test map was then queried, searched, clipped, and symbolized to aid in excavation planning for the next season. Areas with highest activity potential were identified, and the next season's test units were strategically placed within and around those areas.

Table

shoveltests

FID	Shape *	OBJECTID	STP_Number	Pos_Neg	Historic	Prehistori	Faunal
0	Point	1	1	Positive	Yes	Yes	Yes
1	Point	2	2	Positive	Yes	No	No
2	Point	3	3	Positive	Yes	No	No
3	Point	4	4	Positive	Yes	No	No
4	Point	5	5	Negative	No	No	No
5	Point	6	6	Negative	No	No	No
6	Point	7	7	Negative	No	No	No
7	Point	8	8	Positive	No	No	Yes
8	Point	9	9	Negative	No	No	No
9	Point	10	10	Positive	Yes	No	Yes
10	Point	11	11	Positive	Yes	No	No
11	Point	12	12	Negative	No	No	No
12	Point	13	13	Positive	Yes	No	No
13	Point	14	14	Negative	No	No	No
14	Point	15	15	Positive	Yes	No	No
15	Point	16	16	Negative	No	No	No
16	Point	17	17	Negative	No	No	No
17	Point	18	18	Negative	No	No	No
18	Point	19	19	Negative	No	No	No
19	Point	20	20	Negative	No	No	No
20	Point	21	21	Negative	No	No	No

1 (0 out of 303 Selected)

shoveltests

Figure 4: Example of the Phase I Shovel Test Attribute Table. Author's own.

the appropriate historic/prehistoric/faunal cell. This original shovel test map was then queried, searched, clipped, and symbolized to aid in excavation planning for the next season. Areas with highest activity potential were identified, and the next season's test units were strategically placed within and around those areas.

Due to the greater amount of spatial data recorded during test unit excavation in the second field season, the test attribute tables were more complex than the shovel test pits (*Figure 5*). Two

Table

Phase_II_Units

FID	Shape	Unit_Numbe	Level_1_Ma	Level_1_So
0	Point	1	Negative	10YR2/1 Silty Clay Loam
1	Point	2	Historic	10YR2/1 Silty Clay Loam
2	Point	3	Faunal	10YR2/1 Silty Clay Loam
3	Point	4	Historic	10YR2/1 Silty Clay Loam
4	Point	5	Negative	10YR2/1 Silty Clay Loam
5	Point	6	Faunal, Historic	10YR2/1 Silty Clay Loam
6	Point	7	Faunal, Historic	10YR2/1 Silty Clay Loam
7	Point	8	Historic	10YR2/1 Silty Clay Loam
8	Point	9	Faunal	10YR2/1 Silty Clay Loam
9	Point	10	Historic	10YR2/1 Silty Clay Loam
10	Point	11	Negative	10YR2/1 Silty Clay Loam
11	Point	12	Historic	10YR2/1 Sandy Loam
12	Point	14	Faunal	10YR2/1 Silty Clay Loam
13	Point	13	Faunal, Historic	10YR2/1 Sandy Loam
14	Point	15	Historic	10YR3/1 Sandy Loam
15	Point	16	Historic	10YR2/1 Silty Clay Loam
16	Point	17	Negative	10YR2/1 Sandy Clay Loam
17	Point	18	Historic	10YR2/1 Silty Clay Loam

(0 out of 18 Selected)

Phase_II_Units

Figure 5. Example of Test Unit Attribute Table. Author's Own.

columns were created for each level of every test unit (each level having been five centimetres in depth). The first column for each level listed the types of materials recovered from the test unit using the same terminology as the first season: 'historic', 'prehistoric', or 'faunal'. The second column for each level contained soil type information recorded in the field (colours referenced using a Munsell soil colour book). This second column was required because there was a notable amount of soil disturbance and fill episodes recorded during the island's resort era, and some of those fill soils were recorded as having been shipped in from the mainland. The soil information mapped at each level was to help in identifying typical soils for different areas of the island, which soils may have been moved from elsewhere on the island, and which soils were potentially foreign to the island. This information was then used to determine artefact deposits that were potentially no longer *in situ*, and where they may have originated. Maps were then also created displaying the recorded material content level by level across the island to track the potential for soil depth and type consistencies between cultural periods of the island. This portion of the GIS mapping was the first step in spatially analysing the origins of the faunal material, and whether it may have been deposited prehistorically, historically, or naturally.

It should be noted that the faunal material was examined for cultural modifications in order to aid in determining which material may be cultural and which may be natural. However, the effects recorded included burning/calcification, spiral fracturing, cut marks, rodent gnawing, etc. These effects could occur in a prehistoric or historic setting and are not truly indicative of either. This is why the spatial analysis played the key role that it did in the overall understanding of past activities on the island. Another method some may use to determine cultural versus natural

deposits is the faunal material's association with other cultural remains. While this *can* be a useful measure, there are some caveats that the author has found to be frequently overlooked. The first issue with this assumption is that in wild areas, such as Coney Island of the West, temporary campsites, and even long-term sites, will always be susceptible to naturally deposited materials within the same stratigraphic level. Humans may have kept the area clean while occupying it, but carcasses or carcass portions can always be deposited soon after that occupation has ended. Taphonomic processes may disturb the carcass to the degree that it would not classify as an Animal Bone Group upon excavation, and the materials are assigned to the cultural activity of the area. Conversely, scant amounts of bone recovered with an absence of clear cultural material may be interpreted as a natural deposit when it may just as likely have been a brief midden deposited far from the occupation area to avoid scavengers or the unpleasant smell, or the individuals involved happened to leave no other refuse during a brief campsite occupation. Both are dangerous assumptions that are simply too easy to make.

In an attempt to avoid this, the author chose to look closely at the contexts in which faunal material was recovered with either or both prehistoric and historic material, when it was recovered on its own, the vertical soil types and depth in which the material resided, and the horizontal patterning of material deposition across the island. These methods reaped benefits for understanding areas of activity across the island and determining the cultural or natural origins of the material to a reasonable degree of certainty. For the sake of brevity, the results discussed in this paper will cover the two areas of the island in which this spatial analytical methodology revealed the most useful and interesting conclusions that may not have been otherwise revealed without a detailed study of spatial distribution of the faunal material. For clarity, these areas are divided into Area A and Area B. All GIS mapping and analysis was completed by the author, except the non-extant historic building locations which were generated and provided by Carver County Parks and Recreation Department.

Results

Area A

This first area is located at the southwestern tip of the island on a short peninsula (*Figure 6*). While it is the smallest area, it contains the highest amount of faunal material recovered from the island by far (n = 56 percent), with an exceptional amount of taxonomic diversity, cultural modifications, and a relatively small quantity of associated prehistoric ceramic and lithic materials (see *Appendix*).

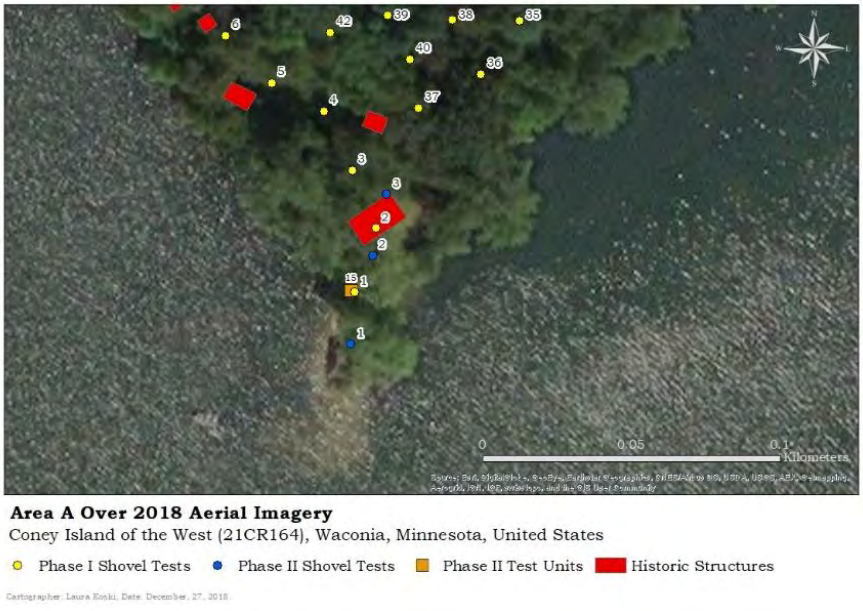


Figure 6: Illustration of Excavation Completed in Area A
Author's own.

While the diversity is impressive, its spatial context must be explored. Approximately 27 percent of the faunal assemblage in this area was recovered from TU 15 (n = 79), while approximately 72 percent was recovered from Phase II ST3 (n = 205). This disparity is notable, especially when considering the TU was one meter by one meter, and faunal material was identified at a depth of 75 centimetres below surface. Additionally, Phase II ST3 was only approximately 40 to 50 centimetres in diameter, and the faunal material remained consistently dense to 120 centimetres below surface. The faunal material in TU 15 was recovered between 10 and 75 centimetres with varying densities and taxonomy by level, but in Phase II ST3 the faunal material was incredibly dense throughout with a balanced taxonomic mix regardless of depth, along with a mixture of

historic glass and asphalt shingle, and prehistoric lithic material throughout. It is also important to note that TU 15 consisted of defined stratigraphic levels throughout while Phase II ST3 contained one sandy soil type for the entirety of the 120 centimetres. A quick check for this soil across other soil types recorded at varying depths across the island utilizing the GIS data revealed that it was not identified elsewhere during the investigation.

All of the above makes it clear that Phase II ST3 is comprised of fill soils from an unknown location. This makes the shovel test an out of context anomaly that unfortunately contained approximately 40 percent of the total faunal assemblage. However, an investigation of the historic use of this peninsula utilizing the aforementioned 1940 aerial imagery provided a viable answer.

While Area A was not used as part of the overall resort, it was privately owned by Frenchman Emile Amblard beginning around 1893 up until his death around 1914 (Waconia Heritage Association 1986; Bingham 1915). Amblard was infatuated with his island property and built a number of structures. Of specific interest to this analysis is the sea wall he built up around his estate (Waconia Heritage Association 1986). Remnants of this wall are observable today. During the fieldwork it was noted that the area within the existing sea wall is heavily built up; ultimately standing roughly a meter above the lake level near the area Phase II ST3 was excavated. This would confirm that fill soils would have had to come from somewhere to build the earth up behind the sea wall in such a way. Transporting fill soils from the mainland at the time would have been a costly and clumsy ordeal. Therefore, a likely possibility is that the sandy fill soils originated along one of the extended beach areas that are visible in the 1940s aerial imagery, but underwater today (see Figure 2). This is also supported by the fact that the majority of taxa identified within Phase II ST3 were recovered from elsewhere on the island.

If the sandy fill soils identified within ST3 do originate from the extended beaches of Coney Island, then the location where the cultural and faunal materials originate would comprise by far

the majority of animal resources utilized on the island. The animal resources procured and processed prehistorically at the original campsite could include river otter, American badger, racoon, beaver, muskrat, rabbit, elk, deer, snapping turtle, swan, mallard, wood duck, northern pike, muskellunge, pumpkinseed, and others that could not be identified during analysis. This diversity of large land mammal, small land mammal, aquatic mammal, waterfowl, turtle and fish could imply a wide variety of resource procurement strategies ranging from bow and arrow to clubbing, netting, hook and line fishing, and spear hunting. The diversity of species also suggests this camp could have been used in all seasons and was perhaps returned to several times in the same year to take advantage of the seasonal animal resources available on the island, in the lake, and on the surrounding mainland.

Area B

Area B is located on the north-western corner of the island (*Figure 7*). Bordering the area on the north and west sides is a tall and steep slope that leads down to a slim beach meeting the waterline. The remains in this area consisted of a light scatter of bone belonging to deer, duck, great blue heron, turtle, and a great deal of fish (see *Appendix*).

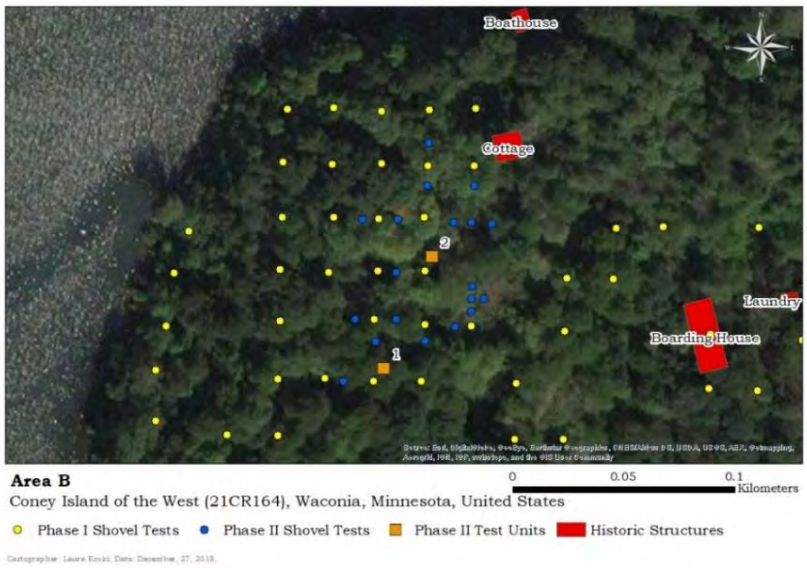


Figure 7: Illustration of Excavation Work in Area B. Author's own.

Fish represented both the greatest quantity of remains (n = 105) and diversity of taxa which included black/brown/yellow bullhead, pumpkinseed, *Lepomis macrochirus* (bluegill), *Lepomis*

sp. (small sunfish), *Perca flavescens* (yellow perch), *Castostomus commersonii* (white sucker), and *Poxomis* sp. (crappie).

While working through the cultural material to identify the faunal remains, it became evident that a number of shovel tests contained only faunal material mixed with no prehistoric or historic cultural material (note in *Figures 8* and *9* the larger light blue dots are the highlighted query results). The faunal material in question was comprised nearly entirely of various cranial elements of medium to small fish remains including bluegill, pumpkinseed, white sucker, and yellow perch. This raised the question of whether these fish remains were culturally or naturally deposited. The remaining faunal material was identified in context with prehistoric materials starting at similar depths in TU 1 and TU 2, and therefore these remains were not included in the spatial analysis undertaken to investigate the pattern.

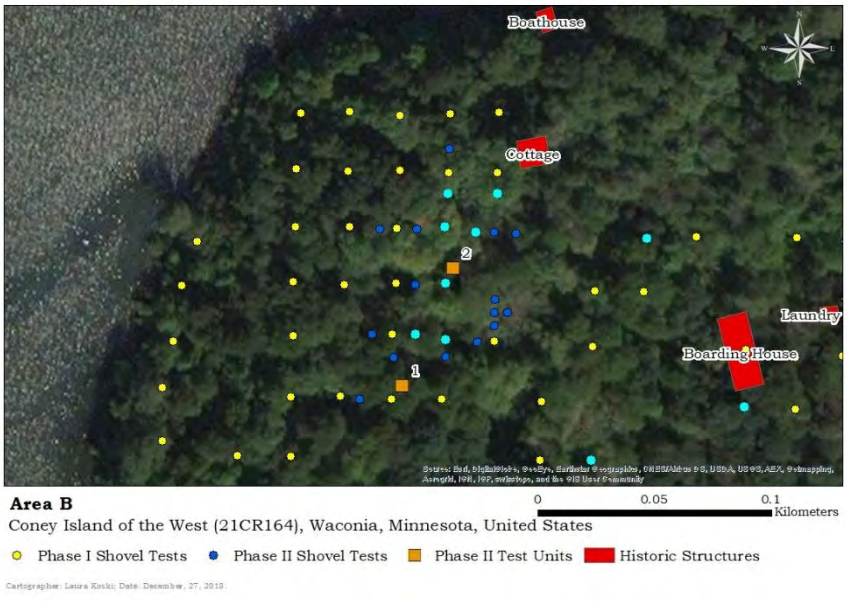


Figure 8: Query results for Shovel Tests with Faunal Remains but no Historic or Prehistoric Cultural Material. Author's own.

As can be seen in the Area B maps, there is a non-extant cottage mapped just to the northeast of this area with an associated dock down at the water's edge. The first test was to determine if these fish remains were remnants of the resident cleaning or eating their fish near the cottage. Another query was completed to discern the extent of historic cultural material (maybe the fisherman left his beer bottles where he cleaned his fish). This found nearly no historic material

across the entire area, and absolutely none in context with the scattered fish remains. To follow-up, another query was completed to determine the extent of prehistoric cultural material. Again, this was found to be extremely scant. *Figure 9* demonstrates the query displaying all shovel tests that contained neither historic nor prehistoric material. Scant historic materials were nearly only identified in Unit 2, while prehistoric materials started consistently at the same levels between both Units 1 and 2. This implied that very little historic material-related activity occurred in this area of the island. It could also indicate that the residents cleaned up their debris well, but if they did the fish carcasses must have been a severe oversight.

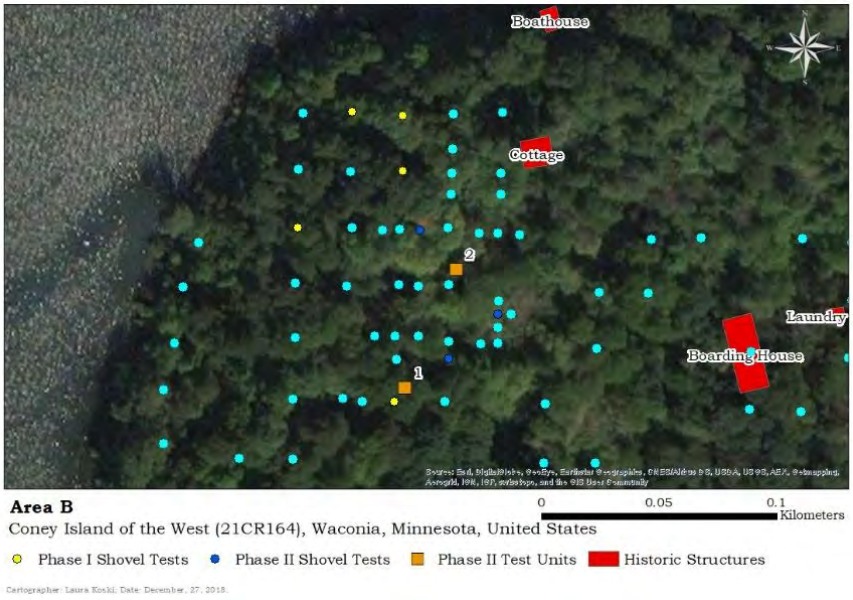


Figure 9. Illustration of Query Results for Shovel Tests Containing no Prehistoric or Historic Cultural Material. Author's own.

The next consideration was the varying depth of the fish remains. The remains were recovered approximately between ground surface and 60 centimetres below ground surface. The depositing activity would need to occur over several hundred years for remains to accumulate at such varying depths, which would pre-date recorded Euro-American historic activity on the island. The last factor left to consider was the taxa represented in the deposits. All taxa represent medium to small size fish, and most, including the sunfish (bluegill and pumpkinseed) and yellow perch, are favoured cormorant prey. This last factor leads the investigation to its most reasonable explanation for the unusual fish deposit.

Tree-nesting waterfowl, such as cormorants (*Phalacrocorax auritus*), have been observed frequently on Coney Island for at least one hundred years (Williams 2011; Meersman 2012). Cormorants nest in groups of hundreds at a time mixed with other waterfowl like great blue heron (also recorded on the island). These fish are preferred catches for cormorants due to their tasty flesh, manageable size, and the fact that they are easily caught by a variety of waterfowl while they are sunning in schools near the shore (Hundt, Simons & Pereira 2013). Once caught, the cormorant will quickly swallow the fish, possibly catch a few more, then head back to its nest in the tree tops. This fish will either be regurgitated to feed the chicks of the flock, or the cormorant will regurgitate the undigestible skeletal remains over the side of the nest, and let it fall to the ground beneath (Hundt, Simons & Pereira 2013). The consistent density of fish remains in these levels scattered across the island's north western corner would align well with the general size of cormorant roosting areas, and the fact that cormorants will annually return to their favoured nesting spots (Williams 2011; Meersman 2012; Hundt, Simons & Pereira 2013). This location is near the shore but is tucked into the tree-break of the island in such a way that the nests would be protected from the strong wings that often graced the north western corner of the island. Lastly, cormorant and great blue heron remains were recovered in low frequencies in context with prehistoric materials on the island during excavation, indicating that cormorants would have been nesting on the island over the several hundred-year time span the fish deposits would have accumulated.

Conclusion

GIS has a clear and present role in modern archaeological understanding, and fortunately professionals in the field are utilizing it to a steadily greater degree over time. The goal of this paper, however, is to encourage more frequent use within zooarchaeological analysis in particular. The zooarchaeologist has a slightly more complex role than that of the ceramic or lithic analyst in that the cultural relationship between that of the fauna in question and humans is typically more dubious; requiring a more thoughtful and investigative analysis. Spatial analysis is

just one such tool that should be on the belt of any zooarchaeologist willing to pursue it. It opens informative windows that are otherwise kept tightly shut when the analyst consistently maintains a protocol strictly bent on identifying taxa, measurements, and taphonomic modification. Humans and animals have always lived within, organized, and utilized their space in ways we cannot understand without studying the patterns, consistencies and inconsistencies of that space. It is time that serious faunal analyses begin to give that sense of space more weight in the greater scheme of archaeological analysis.

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Appendix

Table. 1 Area A Faunal Assemblage NISP

Taxon			NISP
Unidentified			9
Class Mammalia			
(n = 168)			
Mammal, undifferentiated			44
Large mammal			49
Mid-large mammal			10
Medium Mammal			16
Small Mammal			7
	Order Rodentia		
	Castoridae	*Castor canadensis* (beaver)	8
	Cricetidae	*Ondatra zibethicus* (muskrat)	1
	Leporidae		1
	Leporidae	*Lepus americanus* (snowshoe hare)	1
	Leporidae	*Sylvilagus floridanus* (cottontail rabbit)	1
	Order Carnivora		
	Mustelidae	*Taxidea taxus* (American badger)	4
	Mustilidae	*Lontra canadensis* (river otter)	1
	Procyonidae	*Procyon lotor* (raccoon)	2
	Order Artiodactyla		
	Artiodactyle, undifferentiated		2
	Bovidae		2

Table. 1 Area A Faunal Assemblage NISP

Taxon			NISP
	Bovidae	*Capra hircus/Ovis aries* (goat or sheep)	1
	Cervidae	*Cervus canadensis* (elk)	4
	Cervidae	*Odocoileus* sp. (deer)	14
Class Aves **(n = 67)**			
Aves, undifferentiated			15
Large Aves, undifferentiated			2
Medium Aves, undifferentiated			14
Small Aves, undifferentiated			2
	Order Anseriformes		
	Anatidae	*Anas platyrhynchos* (mallard)	3
	Anatidae	*Aix sponsa* (wood duck)	3
	Anatidae	*Cygnus* sp. (swan)	4
Class Reptilia **(n = 51)**			
	Order Testudines		
	Chelydridae	*Chelydra serpentina* (snapping turtle)	41

Table. 1 Area A Faunal Assemblage NISP

Taxon			NISP
Class Osteichthyes (n = 105)			
Osteichthyes, undifferentiated			9
	Order Perciformes		
	Centrarchidae	*Lepomis gibbosus* (pumpkinseed)	1
	Centrarchidae	*Micropterus salmoides* (largemouth bass)	1
	Centrarchidae	*Micropterus* sp. (largermouth or smallmouth bass)	3
	Order Siluriformes		
	Ictaluridae	*Ameiurus* sp. (black/brown/yellow bullhead)	1
	Order Esociformes		
	Esocidae	*Esox lucius* (northern pike)	6
	Exodidae	*Esox masquinongy* (muskellunge)	1
Bivalvia (n = 10)			10

King Richard's Field: The Impact of the Discovery of Richard III and the Finds from Bosworth Battlefield

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Introduction

The Battle of Bosworth has long been viewed as an iconic moment in British history: immortalised by Shakespeare, the battle saw the last death in battle of a reigning English monarch, the end of three decades of civil war, and the beginning of the Tudor dynasty (Burne 1950, 286; Foard & Curry 2013, xiii; Battlefields Trust 2016). The recent announcements of the discovery and identification of the Richard III's skeleton under a car park in Leicester and artefacts from the Bosworth battlefield have received much publicity (Mack 2014; Elton 2015). Archaeological investigation appears to have proved the location of the battlefield, some 3 kilometres away from the traditional site (Foard 2010, 26), and the skeleton has been subject to a great deal of scientific analysis, as well as public debate. The recent controversial decision by Historic England to allow development on the edge of the battlefield (Johnson 2018) has kept

Figure 1: Artist's impression of the Battle of Bosworth (Palmer 2016).

Bosworth in the public eye and brought into question the wider issue of the protection of England's battlefields. Beginning with an introduction to battlefield archaeology and the impact of the battle itself, this article will discuss the impact of investigations at Bosworth and the search for Richard's remains, and how evidence relating to these discoveries has implications for research within the field of battlefield archaeology.

Battlefield Archaeology and the Battle of Bosworth

Britain is a landscape dominated by war (Lynch & Cooksey 2007, 19), but until recently the study of battles and conflict has been the exclusive domain of the military historian, leading to what Carman (2012, 15) describes as 'a linear narrative of cause and effect [and] a highly functionalist interpretation'. Using archaeological principles to study ancient or historical conflict can provide evidence of what actually occurred on a particular day at a particular time (Sutherland & Holst 2005, 3). The study of battlefield archaeology is a relatively new discipline, although it can trace its foundations back to the pioneering work during the 19th century of Edward Fitzgerald and Sir John George Woodford at Naseby and Agincourt respectively (Sutherland 2005, 247; Sutherland & Holst 2005, 13; Sutherland 2015, 190). Originating with the ground-breaking research at Little Bighorn in the USA in the early 1980s (*Figure 2*) (Scott *et al*. 1989; Sivilich & Scott 2010), battlefield archaeology began in Britain with the investigations at Naseby and Towton in the mid-1990s (Sutherland & Holst 2005, 13-14; Foard 2012, 14; Foard & Morris 2012, xii; Carman 2012, 812).

Figure 2: Archaeological survey being carried out at the Little Bighorn battlefield in 1984, one of the first examples of battlefield archaeology (Reece 2015).

Since then, there have been significant advances in the approaches and methodology used in the practice of battlefield archaeology, such as the but like other specialist disciplines, it is not without its complexities (Foard 2007, 134; Scott *et al*. 2007, 1; Sivilich & Scott 2010). Therefore, battlefield archaeology requires a multi-disciplinary

approach, including the study of documentation, landscape, artefacts, and spatial analysis (Foard 2007, 133). Between 2005 and 2010, this approach was used to discover the location of arguably one of the most famous English battles: The Battle of Bosworth (Foard & Curry 2013, xiii-xv).

The Battle of Bosworth in 1485 was one of the last of a series of battles fought across England between 1455 and 1487 (*Figure 3*), a period that would later become known as the Wars of the Roses (Pollard 2001, 5; Foard & Morris 2012, 81). The outcome of the battle is well known: Richard was killed during the battle and Henry Tudor was crowned King Henry VII, ushering in a Tudor dynasty that ruled England and Wales for over a hundred years (Burne 1950, 286; Bennett 1985, 1; Foard & Curry 2013, xiii; *Battlefields Trust* 2016). Although Henry was forced to defend his crown two years later at the Battle of Stoke Field, his victory at Bosworth is considered to have been the final chapter in the Wars of the Roses, ending 30 years of English civil war (Burne 1950, 305; Bennett 1987, 3; Pollard 2001, 35; Foard & Curry 2013, xiii).

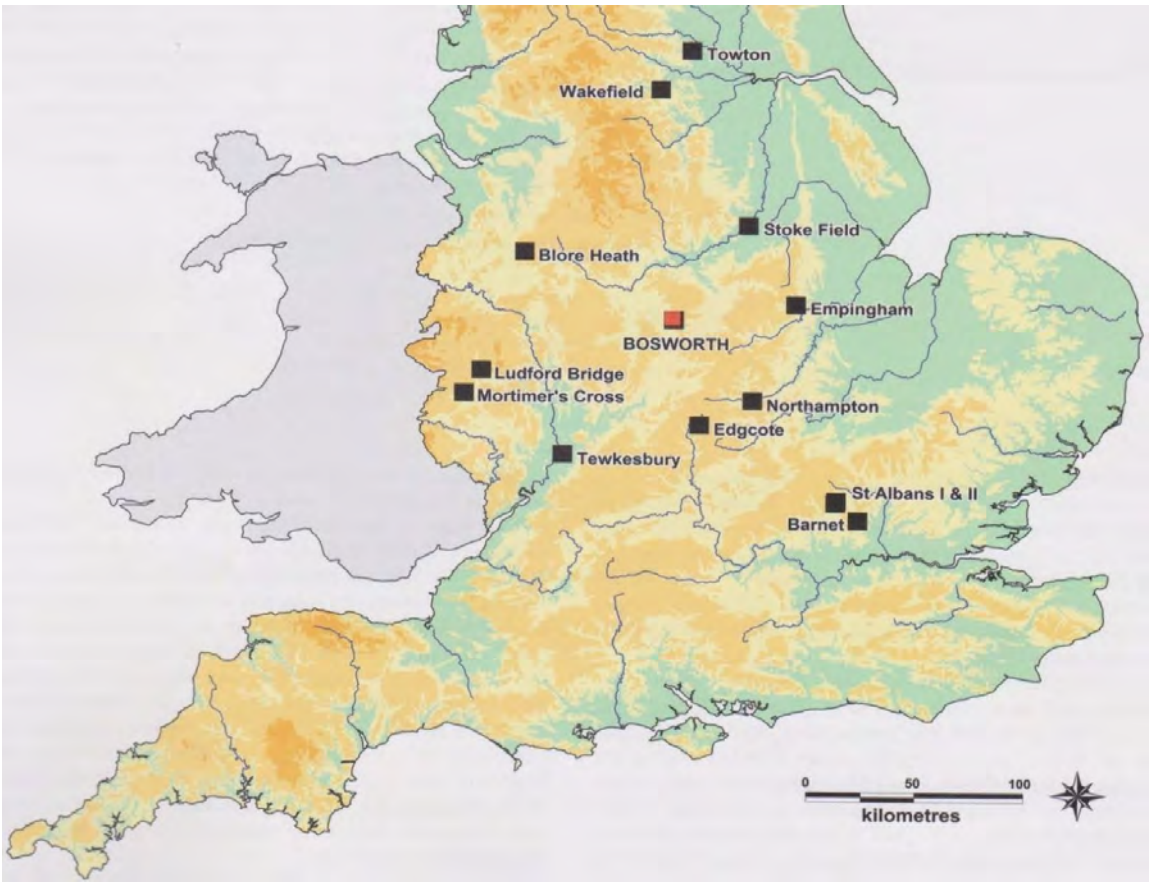

Figure 3: Map of England showing some of the major battles of the Wars of the Roses, with Bosworth highlighted in red (after Foard & Curry 2013, xiv).

Richard's remains disappeared shortly after the battle, rumoured to have been thrown in a river or buried somewhere in Leicester (Buckley *et al*. 2013a, 15; 2013b, 520; Langley 2014, 21), but the location of the battle remained well known as the site became an area of interest for many who wished to visit the battlefield. However, memory of the battle became obscured over time so that, by the 18th century, it was thought that the battle had taken place on Ambion Hill (Hutton 1788, 54-55; Foard & Curry 2013, xv). It was not until the late 20th century that historians began to question the location of the battle (Bennett 1985, 14; Foss 1988, 21-22; Foss 1998, 21-23; Jones 2002, 148; Foard & Curry 2013, xv). When plans were made to refurbish the visitor centre on the site, a project was set up to use battlefield archaeology to locate the true site of the battle (Foard & Curry 213, xvi). Just one year after the Bosworth project finished, a team from University of Leicester Archaeological Services was commissioned to carry out a desk-based assessment to review the historical and archaeological evidence for Greyfriars priory in Leicester (Buckley *et al*. 2013a, 15; 2013b, 520-521; Langley 2014, 21-22). This was the first step in the search for the lost remains of Richard III, a search that attracted large amounts of public and media interest, both during the investigations and following the recovery, identification, and subsequent burial of the skeleton (Mack 2014; Elton 2015; Warzynski 2016a; Warzynski 2016b).

Impact of the Discoveries of Richard III and the Bosworth Battlefield

The two separate archaeological investigations over a seven-year period that saw the discoveries of the apparent remains of Richard III and artefacts suggesting the location of the Bosworth battlefield (see *Figure 4*) have had a significant impact in many areas. The media coverage given to Richard III alone has seen a major increase in the popularity of archaeology in

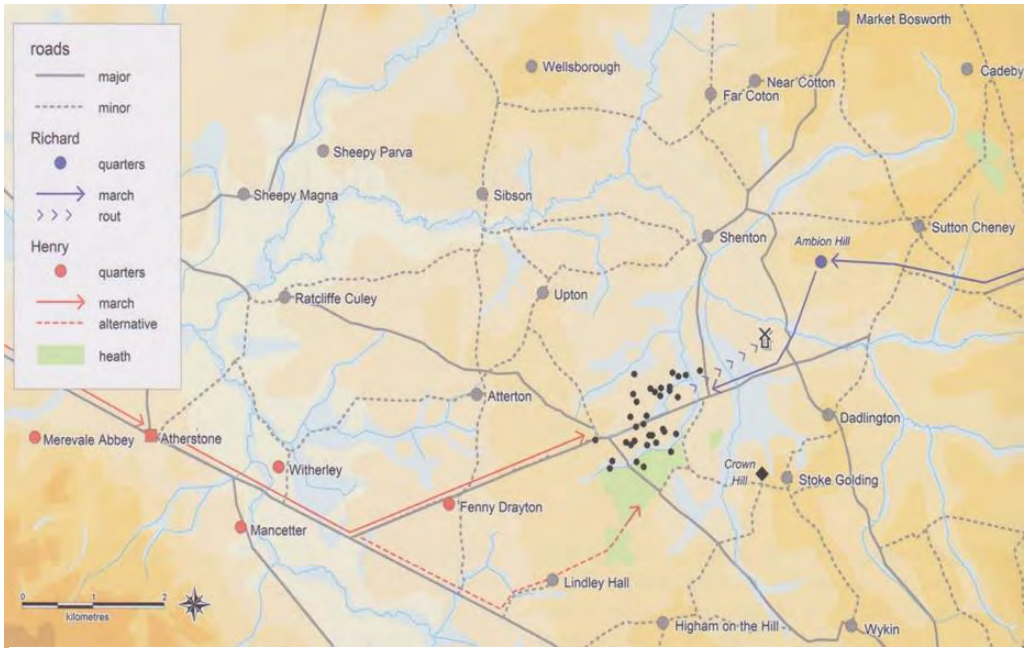

Figure 4: Alternative perspective on the action of the Battle of Bosworth, showing the approach routes of both armies and the distribution of round shot, approximately 3 kilometres south-west of Ambion Hill (after Foard and Curry 2013, 180).

general and, for the city of Leicester, the discovery of Richard has led to a substantial boost to the local tourism and economy (Mack 2014; Warzynski 2016a; 2016b). However, at Bosworth, the Bosworth Battlefield Heritage Centre and associated tours remain on and around Ambion Hill. Whilst the tour guides acknowledge and highlight the investigations at the site, and that it is no longer thought to have taken place on Ambion Hill, tours of the new location are restricted to a small number per year (Whitehead 2016).

Bosworth Battlefield

The investigations at Bosworth provide a textbook example of how to research and systematically survey a medieval battlefield. Over the course of five years, the battlefield archaeologists used data from historical documents and maps, landscape archaeology, metal detecting survey, and ballistics and scientific analysis to formally identify the site of the Battle of Bosworth (Foard & Curry 2013, xiii-xx). However, this approach was only possible due to the

project receiving significant funding from the Heritage Lottery Fund (Foard & Curry 2013, xvi). An element of luck also played a part: the first piece of confirmed battlefield evidence (*Figure 5*) was found in the last few days of the original timetable (Foard 2010; Foard & Curry 2013, xviii). Had the timescale for the project been just a week shorter, no evidence would have been found from the battlefield and the end result of the project would have only established areas where no evidence of the battle had been found. The Bosworth project team also benefited from a considerable amount of contemporary and secondary documentary sources referring to the battle. The significance of the battle was recognised even from an early stage, and much work has already been dedicated to it. For example, on Saxton's 1576 map of England (*Figure 6*), Bosworth or 'King Richard's Field' is the only battle site given on the map (Foard & Curry 2013, 1). The abundance of documentary evidence proved useful in helping the project focus on search areas (Foard & Curry 2013, 1-16). The project can be considered a success, having used a multi-disciplinary approach to battlefield archaeology to uncover the location of the battlefield and provided a new insight into the archaeology of English medieval battles involving the use of gunpowder weapons, which prior to this primarily existed only in the work at Towton (Sutherland & Schmidt 2003, 15-20). The project also raised important methodological issues concerning battlefield archaeology, particularly the inadequacy of metal detecting in 10 meter transects in

Figure 5: The lead shot found in the closing stages of the Bosworth project which provided the first evidence of the battlefield (after Foard & Curry 2013, xix).

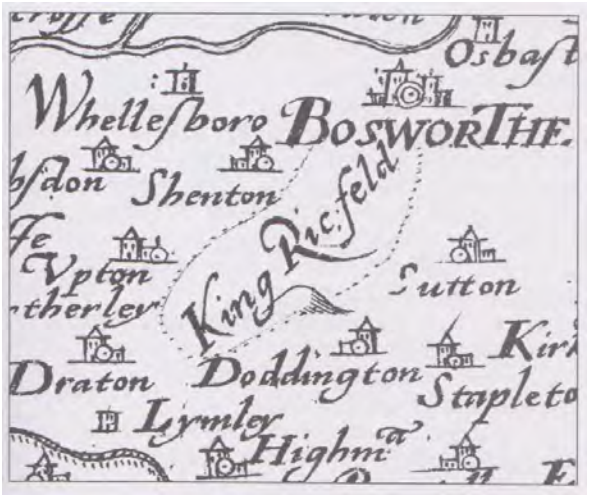

Figure 6: Extract from Saxton's 1576 map of England showing the location of the Battle of Bosworth as 'King Ric. feld' (after Foard & Curry 2013, 3).

non-ferrous mode (Foard & Curry 2013, 195). However, the investigations are not entirely conclusive. The flat plain where evidence of the battle has been found matches the contemporary descriptions of the battlefield, but the site lies in Upton, not Dadlington, where many contemporary sources claim the battle took place. There is also the now famous silver-gilt boar badge (*Figure* 7), found on the battlefield, claimed to be 'sufficient in its own right to quell any lingering doubt that the battlefield has been located' (Foard & Curry 2013, 124).

Figure 7: The silver-gilt boar badge found at the battlefield (after Foard & Curry 2013, 124).

Whilst it is likely the badge represents someone of high status in Richard III's retinue, it may not necessarily indicate the location of the battlefield. It is known that the Bosworth battlefield site attracted many visitors after the battle (Foard & Curry 2013, 2). The badge could simply be another result of tourism – dropped or discarded by one of Richard's former supporters visiting the site – and therefore may not relate directly to the battle (Sutherland 2014, 1000).

In August 2018, a planning application was submitted for construction of a track for autonomous vehicle testing on the edge of the Bosworth battlefield (Humphrys 2018). The application and subsequent acceptance by Hinckley and Bosworth Borough Council on the advice of Historic England caused outrage amongst many (Johnston 2018), including the Battlefields Trust (Humphys 2018; Battlefields Trust 2018a; 2018b) and the Richard III Society (BBC News 2018; Richard III Society 2018), even prompting a debate in Parliament (D'Arcy 2018). The Battlefields Trust in particular, whose remit is to campaign both locally and nationally to defend battlefields from inappropriate development or even destruction, penned a statement of opposition which not only fought for the protection of the battlefield but also called into question the methodology used to judge the risk posed to the site (Battlefields Trust 2018b). Although the application to build the test track has been accepted, the debate is far from over and has raised questions about the way in which assessments on the registration and protection of battlefields in England are

carried out. There are around 200 potential battlefield sites in England alone, yet only 46 of these are currently registered as protected areas (Foard and Morris 2012, 175-179. The Battlefields Trust has long argued for greater protection of the 46 registered sites but also for the means to register further sites, and has used this new threat to Bosworth to repeat calls to Historic England to reinstate the Battlefield Panel, abolished in 2015, in order to provide specialist battlefield expertise when it comes to applications such as these (Battlefield Trust 2018b). What outcome this will have for the future of England's battlefields remains to be seen, but the reaction to this development continues to highlight the importance of this battlefield, and the risks posed to similar sites across the country.

The King in the Car Park

The discovery of skeleton 1 in the Choir at Greyfriars in Leicester in 2012 (*Figure 8*), later confidently identified as the remains of King Richard III, attracted worldwide attention (Kennedy 2013; University of Leicester 2013). The considerable amount of media coverage of Richard's

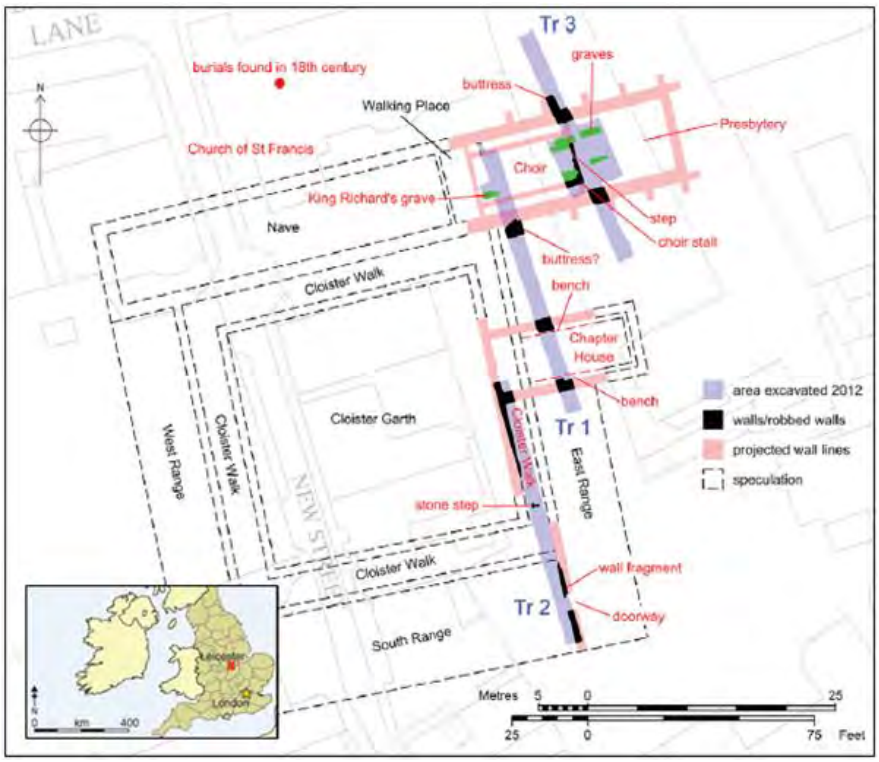

Figure 8: Interpretation of the Greyfriars site over a modern map of Leicester, with Richard III's grave shown in the West end of the Choir, and (inset) Leicester's location in England (after Buckley et al. 2013b, 519 and 526).

discovery and reburial has also impacted archaeology due to the legal battle resulting in the decision to bury his remains in Leicester (Mohamed 2013). The original plan to reinter Richard's body in Leicester Cathedral was in keeping with the archaeological precedent that human remains be reburied in the nearest consecrated ground (Carson *et al.* 2014, 37; Pitts 2015). Burial in Leicester Cathedral was a condition of the exhumation license given by the Ministry of Justice, should Richard's remains be found (Carson *et al.* 2014, 38). The extended court battle over the right to bury Richard's remains in Leicester Cathedral raised the issue of the legal and ethical concerns over archaeologically excavated human remains (Mohamed 2013).

Concerns have also been raised over the identity of the remains. Whilst the archaeologists at ULAS state 'beyond reasonable doubt that Skeleton 1 is the remains of King Richard III' (King *et al.* 2014, 2), some academics remain unconvinced. Historian Michael Hicks and archaeologist Martin Biddle have both called the findings into question: Hicks stated that none of the evidence can prove beyond reasonable doubt that the skeleton is Richard, in particular questioning the DNA and radiocarbon evidence (McFarnon 2014; Milmo 2014). Biddle suggests that 'something akin to a coroner's court should be set up to consider all the evidence' (quoted in McFarnon 2014). Author Dominic Selwood (2015) wrote an article for *The Telegraph* arguing the case against the identification of Richard, using some of the objections raised by Hicks and Biddle. A scan of the comments section of the article reveals a clear stubbornness from the public to acknowledge that there could be any uncertainty over the identity of the remains. The media frenzy surrounding the identity of Richard has reached a point where to question the results leads to a critical backlash from the public. However, Hicks, Biddle, and Selwood all raise valid points. Although much of the evidence does point towards the skeleton being the remains of Richard III, it cannot be conclusively proved: the DNA evidence only shows that the skeleton was descended from the female line of Richard's maternal grandmother, who had 16 children, and the radiocarbon dating and trauma analysis only demonstrate that the individual appears to have died in battle during the period of the Wars of the Roses, meaning there is no 100%

certainty it is Richard III (King *et al.* 2014, 1-3; McFarnon 2014; Milmo 2014; Appleby *et al.* 2015, 253).

Regardless of the skeleton's identity, it is from the battle trauma found on the skeleton that archaeology has benefited most. Prior to the discovery of this particular skeleton, the best examples for medieval battle trauma were in the mass graves found at Towton, excavated between 1996 and 2005, where a number of individuals believed to have been killed at the Battle of Towton displayed evidence of battle trauma (Novak 2000, 91-100; Sutherland 2016, 79). If the skeleton is that of the king killed at Bosworth, then it is possible to use the extensive weapon trauma found on the skeleton, particularly the skull (*Figure 9*), to compare and support the evidence of similar injuries found on the individuals at Towton (Sutherland 2016, 82-84). It is also possible to describe, in detail, exactly how the last English king to die in battle was killed, including the weapons used to strike the fatal blows (Buckley *et al.* 2013b, 536; Appleby *et al.* 2015, 257-258; Sutherland 2016, 85-86).

Figure 9: The skull of Richard III, showing some of the evidence of the weapon trauma inflicted during the battle (Buckley et al. 201a, 14-15).

Conclusions

The reported discoveries of Richard III and the true location of the Bosworth battlefield have had both positive and negative effects on the study of battlefield archaeology. The investigations at the Bosworth site have provided an excellent template for the methodology of battlefield archaeology on a medieval battle site, but require sufficient funding, time, and enough historical documentation to allow for such a full and thorough survey. Even this thorough multi-disciplinary

approach has left questions about the battlefield site. The discovery of Richard's skeleton provided a relatively unique opportunity to study the remains of a known/named victim of battle trauma, comparable with those from Towton. But whilst the general public and many academics remain convinced of the identity of the bones found at Grey Friars, there are some who are not wholly convinced by the claim that it is the lost king. Due to the intense media coverage of the event, to even question the possibility that the skeleton may not be Richard can draw criticism. Although the publicity around Richard's discovery and identification have led to a rise in interest in archaeology and the subject of medieval warfare, it has not been without controversy, with the year-long legal battle over the burial place of the King's skeleton displaying some of the disagreeable outcomes of excavating human remains, and the acceptance of a development application that may destroy part of the Bosworth battlefield has only continued to fuel the interest and controversy around this nationally important site.

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The Evolution of Symbolic Inscription in Prehistory

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Introduction

For the majority of human prehistory, inscription is the only manifestation of symbolic behaviour visible in the archaeological record. Symbolic behaviour is one of the few unchallenged markers of behavioural modernity (Texier *et al.* 2010). Its combination of symbols (symbolic inscription), language and abstract thinking are described as the "constitutive features of humanity" (Burduckiewicz 2014, 398). This essay will examine the emergence and development of different types of symbolic inscription, ranging from the Middle Palaeolithic to the Mesolithic. These include ornamentation, use of pigments, and abstract and figurative depictions (art), in both portable and parietal forms. Explanations for the motivations behind these features will also be investigated. Regarding the emergence of symbolic inscription in the Middle Palaeolithic, this essay will have a broad geographic focus. Contrastingly, the focus for the discussion of the later period will be restricted to Europe due to the quantity of data.

The Lower Palaeolithic

The Lower Palaeolithic appears to have witnessed the cognitive origins of symbolic behaviour (Burduckiewicz 2014). Evidence of this is provided in such few cases however, that despite issues of preservation, symbolic behaviour was likely not understood on a group level and played no part in social interactions between hominins. Regardless, the lack of comparable examples for these finds, and their vast temporal isolation from the next instances of symbolic behaviour in the record, mean that studies would be speculative. Examples include a geometric

engraving on a shell dated to 450 kya, Acheulian petroglyphs from Auditorium Cave (India), and the possible Berekhat Ram Acheulian 'figurine' from Israel, a pebble believed to resemble an anthropomorphic form which was transported far from its origin (Bahn 1997).

The Middle Palaeolithic

It is in the Middle Palaeolithic where clear evidence is first found for the sustained production by cultures of symbolic inscription. Use of ochre and pigments, particularly red ochre or haematite, is one of the most enduring themes in prehistoric symbolism, likely due to the rarity of the colour in nature and its form as a natural paint. At the site of Maastricht-Belvedere in the Netherlands, red ochre, in a liquid solution spilled onto the ground surface, is dated to 200-250 kya. This peculiar use by Neanderthals is in the "same time range as early ochre use in the African record" by *Homo sapiens* populations. (Roebroeks *et al.* 2012, 1889). At Pinnacle Point in South Africa, pieces of red ochre dated to 164 kya show more conventional signs of use, displaying marks suggesting the pieces were ground and scraped (Marean *et al.* 2007). The use of ochre for symbolic purposes in early cases such as these is not definite. Ethnographically, red ochre is known to be used for a number of more utilitarian purposes, such as medication and insect repellent (Roebroeks *et al.* 2012). It was also used in the African Middle Stone age as an ingredient in adhesive used for hafting tools (Wadley *et al.* 2009). Ochre seen later in the record, however, is found in overwhelmingly symbolic contexts. It is present in one of the earliest *Homo sapiens* burial sites, Qafzeh in Israel (~100,000 kya), both in one grave and in a "defined area of ochre processing" in a cave (Pettitt 2011, 68). Some of the earliest instances of abstract art, discussed below, also involve ochre. The record therefore indicates that the use of ochre at early sites like Pinnacle Point was likely symbolic in nature, perhaps involving the daubing of ochre on the body or the depiction of abstract signs on hides.

Another key form of symbolic inscription emerging in the Middle Palaeolithic is the use of ornamentation. The earliest documented ornaments are mollusc shells, possibly associated with

some of the earliest *Homo sapiens* burials at Skhul in Israel, dated to around 120kya. These are naturally perforated and "likely… represent modern human behaviour" (Bar-Yosef Mayer *et al.* 2009, 313). A more definite case of early ornamentation is seen at Qafzeh Cave, Israel, where naturally perforated shells, collected at least 35 km from the site, bear wear patterns consistent with being strung. Some are also stained with ochre. They are dated to 92 kya. (Bar-Yosef Mayer *et al.* 2009). Like the use of pigments, the use of ornamentation in the Middle Palaeolithic also emerges across Europe and Africa in a relatively similar time frame. A comparable early European example of ornamentation comes from Cueva de los Aviones in Spain, where similar shells, perforated and bearing traces of ochre, were found in a layer dated to 115 kya (Hoffmann *et al.* 2018a; see *Figure 1*). A shell containing a mixture of different pigments was also found, possibly a paint cup, along with a bone point bearing pigment traces on its tip, possibly used to pierce painted hides or apply pigment itself (Zilhão *et al.* 2010). More diverse types of ornamentation are also observed later in the Middle Palaeolithic. Cut marks on bird bones at Fumane Cave in Italy, dated to 44 kya, indicate "the intentional removal of large feathers by Neanderthals" (Peresani *et al.* 2011, 3888). Complementing this, cut marks on eagle bones dated to ~50 kya at Rio Secco Cave in Italy and Mandrin Cave in France, indicate that eagle claws were deliberately detached from the feet. An "attractive hypothesis" here is the suspension and ornamental display of the claws, something seen in the ethnographic record (Romandini *et al.* 2014, 2). In addition to practices of ornamentation and pigment use, the earliest evidence for a tradition of abstract geometrical design comes from Blombos Cave in South Africa. Complex geometric engravings have been found on pieces of ochre in levels ranging from 100 to 75 kya (see *Figure 2*). Designs include cross-hatching, dendritic forms and right-angled juxtapositions (Henshilwood *et*

Figure 1: Neanderthal ornamentation from Cueva de los Aviones (Hoffmann et al. (2018a).

Figure 2: Engraved ochre from Blombos Cave (Henshilwood 2009).

Figure 3: Abstract Neanderthal art at La Pasiega (Hoffmann et al. 2018b).

al. 2009). Henshilwood *et al.* (2009, 45) mention five other sites from the African Middle Stone Age that have produced artefacts with similar engravings and conclude that "the Blombos Cave engravings are not isolated cases". The 270 fragments of engraved ostrich eggshell from Howiesons Poort dated to ~ 60 kya represent a similar tradition lasting several thousand years (Texier *et al.* 2010). Comparable abstract designs are also known from the same period in the parietal art of Neanderthal Iberia, with a ladder like linear motif from La Pasiega and a hand stencil from Maltravieso, both dated to at least 64 kya (Hoffmann *et al.* 2018b; see *Figure 3*). Symbolic inscription was likely much more widespread on organic materials; Henshilwood *et al.* (2009) suggest that the Blombos engravings could have been templates for designs produced on a wider range of materials using the ochre power. However, systems of symbolic inscription in the Middle Palaeolithic do not display the level of unity associated with more structured symbolic systems (Henshilwood *et al.* 2009), such as early forms of writing. Although we will never be able to precisely decipher their meanings, we can consider their purpose. Cognitive development can be seen clearly throughout the Palaeolithic in the archaeological record, in the increasingly advanced technical skills of early hominins and their expanding understanding of, and ability to master, their environment. The appearance of symbolism is direct evidence of further cognitive developments that allowed information, likely relating to social interactions, to be stored in objects external to the human brain (d'Errico *et al.* 2003). Both individual status and group sentiment could be indicated via symbolism. Symbolism, while surely facilitated by language, allowed the expression and exploration of concepts previously restricted by lack of a more complex language, and likely developed alongside it.

Figure 4: The 'lion-man' of Stadel Cave (Kind et al. 2014).

The Upper Palaeolithic

The movement of *Homo sapiens* eastwards through Europe and the appearance of their Aurignacian culture defines the beginnings of the subsequent Upper Palaeolithic period. This began in Eastern Europe around 45 kya, and by 27 kya the last of the Neanderthals had perished in Iberia, their final refugia (Lewis-Williams 2002). Symbolic inscription in this period is defined by the appearance of figurative art among *Homo sapiens* populations, in both portable and parietal forms. Abstract symbolism continued to flourish alongside it.

The use of ornamentation continued to diversify throughout the Upper Palaeolithic. From the beginning of the Aurignacian, stone, ivory and teeth, both animal and human, were perforated and shaped to form a wide range of ornaments (White 1989).

The first form of figurative art to emerge was the three-dimensional sculpture. The earliest examples of this tradition are the Aurignacian ivory figurines of the Swabian Jura in southwestern Germany, the oldest being the therianthropic 'lion-man' figurine of Stadel Cave, dated to ~40 kya (Kind *et al.* 2014; see *Figure 4*). Other examples include the 'Venus' of Hohle Fels, a microcephalic female figurine with exaggerated sexual characteristics, dated to ~35 kya (Nowell & Chang 2014), and depictions of a horse's head and a diving waterfowl, both older than 30 kya (Conard 2003). Female or 'Venus' figurines, like the example from Hohle Fels, are one of the most enduring themes in Upper Palaeolithic sculpture. Concentrated in the Gravettian period (~27 - 20 kya) and distributed across Europe, their design varies, with regional differences in the choice of body parts accentuated and the design of clothing depicted (Soffer *et al.* 2000). The most prolific form of sculpture in the Upper Palaeolithic consists of naturalistic animal carvings on bone, antler and ivory (see *Figure 5)*. Functional examples include decorated tools such as

spear throwers, but the majority are non-utilitarian. Production of these pieces was at its height during the Magdalenian period around 20 – 13.7 kya (Sieveking 1991). Engraved stone plaquettes also featuring animal depictions, predominantly horse and deer, complement these designs and are found throughout the Upper Palaeolithic (Sieveking 1991). Distribution of these pieces is largely centred in Western Europe (Laming-Emperaire 1959).

Figure 5: Bone Ibex head from La Garma (Arias 2009).

The use of abstract design continued to flourish in the Upper Palaeolithic in conjunction with the use of figurative images, and the two were often combined. Many of the Aurignacian ivory animal statuettes from Germany are engraved with abstract designs, such as chevrons and crosses (White 1989; see *Figure 6*).

Figure 6: Aurignacian sculpture from Vogelherd (White 1989).

Abstract designs are also noted on numerous other portable artefacts throughout the Upper Palaeolithic, including Aurignacian bone plaques, Solutrean stone slates and Magdalenian bone/antler pieces (Marshack 1972; Sieveking 1991). Abstract design is also merged with figurative depiction in the Magdalenian, through the production of highly stylized schematic images of women, found across central and Western Europe (Fiedorczuk *et al.* 2007).

In addition to its use in portable artworks, the figurative representation of animals also developed in the parietal art of the Upper Palaeolithic. Largely confined to the caves of southern France and northern Spain (Laming-Emperaire 1959), these enigmatic images, both painted and engraved, are some of the most outstanding in the prehistoric record. The animals depicted "rarely correspond to the preys killed and eaten on habitation sites" (Clottes 2013, 11). The species focus varies but mainly involves horse and bovids in the main galleries, with more

dangerous species such as lions depicted less frequently and further into the caves. Therianthropic figures appear rarely and are depicted in very simple fashion. No elements of landscape are depicted, and panels are often palimpsests of images with little concern shown for overlap (Laming-Emperaire 1959). The irregular cave walls, “far from hampering the artists, would seem to have guided and inspired them” (Laming-Emperaire 1959, 28), with many animals seeming to emerge from, or be constrained by, natural features of the rock. A number of abstract symbols also frequently appear alongside the figurative depictions, including latticed signs, dendritic forms, punctuations, tectiforms and claviforms (see *Figure* 7). Some are thought to represent weapons and traps, but the majority are more ambiguous (Laming-Emperaire 1959; Sieveking & Sieveking 1962).

Figure 7: Red deer stag and abstract signs from Lascaux (Leroi-Gourhan 1968a).

During the Upper Palaeolithic, “population densities may have equalled those of the first agricultural communities” (Lewis-Williams 2002). In light of these increasing populations, and the sharing of the landscape with Neanderthal communities in the early Upper Palaeolithic, figurative depictions likely emerged in symbolic inscription due to increasingly complex social relations necessitating symbols which held more information. People were living in greater densities and likely interacting more than at any previous point in history, developing complicated social identities and displaying these in their art. The social nature of Upper Palaeolithic art becomes apparent when examining its temporal distribution. For example, parietal emblematic art, concerned with group identity, was favoured during the conditions of refugia after the last glacial maximum, when social tensions were at their highest. Portable art, instead of an assertive style, emphasised individual identity and is more widely distributed temporally (Barton *et al.* 1994).

Figurative symbolism likely developed alongside fully modern language or was enabled by its development. In Mithen’s ‘Prehistory of the Mind’, modern language is the ‘vandal’ that breaks

the walls between the separate, specific intelligences of the human mind, allowing new levels of abstract thought and enabling the figurative depictions of the Upper Palaeolithic (Mithen 1996).

In the Middle Palaeolithic it was only possible to consider the purpose of symbolic inscription. In contrast, the structured nature of Upper Palaeolithic parietal art, with regards to compositional style and features, allows us to look past its purpose as the transmission and recording of social information and consider its meaning. Early ideas included the notion of sympathetic hunting magic, but as "only 15% of Upper Palaeolithic bison images seem to be wounded or dying" (Lewis-Williams 2002, 47), this interpretation seems flawed. Other scholars, such as Leroi-Gourhan (1982), utilised complex structural examination of the art in order to explore meaning. Leroi-Gourhan (1968b, 174) described the structure of binary oppositions he found in the art as "the expression of ideas concerning the natural and supernatural organisation of the living world". Arguably the most convincing interpretation is that of Clottes (2013) and Lewis Williams (2002), who suggest the entoptic phenomenon of shamanistic trance states as the motivation for these depictions.

The key principles of ethnographically observable shamanism, taken from Zvelebil (2008, 43-44), involve belief in "a three tier universe of the upper world (sky), the middle world (earth) and the underworld (underground)". The underworld also corresponds with water. These three vertical tiers are also seen to exist on a horizontal level. Belief in spirits is central, and "relationships of exchange and reciprocity… occur through communication with supernatural spirits" (Zvelebil 2008, 44). Shamans, through the entrance into altered states of consciousness, move between worlds and communicate with the spirits (Zvelebil 2008).

This shamanistic interpretation explains the subterranean nature of the art, with caves being liminal spaces between worlds, and the taking of inspiration from the natural surface as the result of entranced shamans perceiving the spirits in the shapes of the cave walls. Therianthropic figures represent the shamans themselves communing with the spirit world: practices of fluting (Van Gelder & Sharpe 2009) and the insertion of items into cracks in the cave

wall represent attempts to interact with the 'veil' over the spirit world (Clottes 2013). Further evidence supporting this shamanistic interpretation is the continuity between the artistic traditions of the Magdalenian and Maglemosian cultures (Clarke 1936; Veil *et al.* 2012), in light of the acknowledged shamanism in Mesolithic northern Europe (Zvelebil 2008).

The 'trance states' of shamans, used as a tool to move between the three worlds of their belief system and commune with the supernatural world (Zvelebil 2008) are seemingly not fanciful imaginations, but very real altered states of consciousness. Investigations into the acoustics of the early Neolithic long barrow tomb of West Kennet (Marshall 2016), have revealed that resonance produced inside the central passage of the tomb by various sounds, such as drum beats or vocal chanting, can be of such low frequencies that the brainwaves of people inside the tomb can be altered as they entrain , or oscillate in time with, these frequencies. This alteration of the speed of brain waves can naturally produce altered states of consciousness. Marshall (2016) has reported visual anomalies such as the apparent movement of stones of the barrow, and the appearance of 'passages' opening within these stones as a result of frequencies generated by the chambers in the tomb. The natural resonance of caves used in the Upper Palaeolithic could therefore be used to enable altered states of consciousness, with the art possibly acting to stimulate visual anomalies, or alternatively produced as a record of perceived trance visions resultant from these altered states of consciousness. Acoustic investigation of the properties of Upper Palaeolithic cave sites is therefore of paramount importance. Altered states of consciousness are also not solely produced by acoustic phenomena; the use of many species of psychedelic plants to reach altered states of consciousness are well documented ethnographically, a classic example being the use of Ayahuasca in the Amazon (Talin & Sanabria 2017). Knowledge of a wide variety of plants and their various properties is ancient, dating back to "at least 77 kya in South Africa" (Villa *et al.* 2012). Liminal spaces such as caves may have been focus of ritual activity of this kind, with the lack of light aiding the perception of entoptic phenomenon produced by altered states of consciousness.

Visions produced by these altered states of consciousness include “iridescent geometric percepts” followed by full, culturally specific hallucinations (Lewis-Williams 2014, 637). That visions of this nature were the inspiration for many Upper Palaeolithic, and later Mesolithic images, is definitely a worthy hypothesis.

The Mesolithic

The following Mesolithic period, its beginning defined by the end of the Younger Dryas (Milner & Mithen 2009), saw the disappearance of the famed parietal art of the Upper Palaeolithic. The retreat of the glaciers resulted in population dispersal, distributing the complex social body of Upper Palaeolithic in Western Europe. This, combined with the extinctions of the megafauna which were popular subjects of the art, resulted in the style fading.

Abstract designs are the most prominent in this period, seen on many Scandinavian amber pendants (Toft & Brinch Petersen 2013) and on numerous pieces of antler and bone, often tools (Clark 1936). Small stones, such as the Azilian and Rhuddlan pebbles (Pluciennik 2008, Milner *et al.* 2016) also feature abstract designs. Clarke (1936) recognized 24 types of geometric motifs and three techniques of engraving, distributed on items across northern Europe from the early Mesolithic Maglemosian culture.

Figurative depiction persist largely in small ornaments and sculptures in the classic mediums. However, the use of amber does emerge. Examples of figurative depictions include amber animal figurines from Scandinavia (Vang Petersen 2013; see *Figure 8*), an anthropomorphic figurine likely representing a wrapped corpse from Estonia (Jonucks 2016), and the Oleni Island figurines from Russia, which include therianthropic depictions and an unusual

Figure 8: Amber bear and pendant found on Fano (Vang Petersen 2013).

anthropomorphic figurine with two faces (Popova 2001).

Parietal art does not disappear entirely in the Mesolithic. Many open air rock art sites are known from northern Europe and Siberia and combine anthropomorphic figures, animals and abstract designs, along with depictions of boats, tools and weapons (Zvelebil 2008). Two lines of engraved crosses at Aveline's Hole, Somerset, represent one of the only instances of Mesolithic parietal art in Britain (Milner *et al.* 2016). Interestingly, similar "indeterminate vertical linear markings" (Pluciennik 2008, 356) are also seen on Italian and Sicilian cave walls. Naturalistic depictions of humans and animals are also seen around Sicily (Pluciennik 2008).

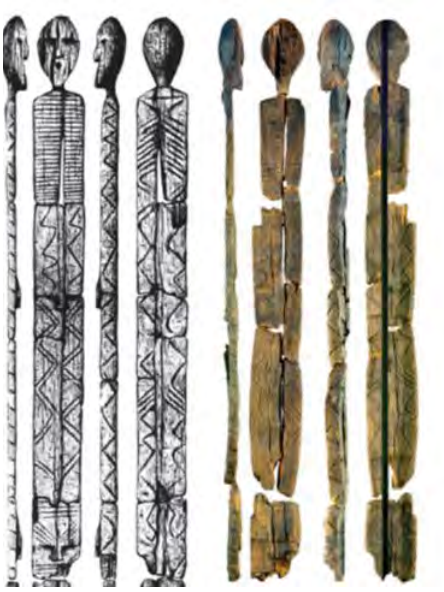

Figure 9: The Shigir Idol (Chairkina 2014).

Unlike the previous Palaeolithic periods, the more recent Mesolithic record includes examples of organic artefacts that have survived in exceptional conditions. These represent rare examples of symbolic inscription in the medium that it was probably most common. The Shigir idol from Russia is a massively tall and thin wooden sculpture, probably originally over 4 metres high and around 25cm wide, covered in geometric designs and faces, and ending with a three-dimensional carving of a head (Chairkina 2014; see *Figure 9*). Imposing sculptures like the Shigir idol may once have dotted the Mesolithic landscape, present for example in the large Mesolithic post holes excavated near Stonehenge (Jacques *et al.* 2014). Other organic symbolic artefacts include 21 red deer antler frontlets from Star Carr, pierced for use as masks (Milner & Mithen 2009). These were likely used by shamans, who often "take the shape of… the elk or deer" (Zvelebil 2008) to represent their connection with animal spirits.

Shamanism & Symbolism

The shamanistic world view seems the most likely motive behind the majority of symbolic inscription in the Mesolithic. Belief in the shamanistic three-tier world of water, earth and sky can

be seen in many aspects of the Mesolithic record, including the location of ritual sites on coastal zones where land and water met, and the burial of the dead on islands 'beyond the water' (Larsson 2004, Zvelebil 2008, 45). Water birds, a common theme in burials and figurative representation, and snakes, seen represented in the Oleni Island figures, were depicted due to the belief that these animals had the ability to pass between the tiers of the world (Zvelebil 2008). The bones of seals, which also pass between tiers, are seen deposited in close proximity to human remains at the Cnoc Coig midden on Oronsay (Meiklejohn *et al.* 2005).

The deposition of animal images is observed ethnographically among shamanistic peoples in order to appease spirits (Zvelebil 2008); the deposition of amber animal figurines in wetland areas in the Mesolithic (Vang Petersen 2013) could have performed a similar role, wetlands being liminal areas, like caves, where the world tiers cross and spirits may be found.

Direct evidence of shamanism can also be found in the Mesolithic. At Bad Durrenberg, Germany, an adult woman was found with a highly unusual assemblage of grave goods, including 65 fragments of tortoise shell (Porr & Alt 2006), also present in a Natufian shaman burial (Grosman *et al.* 2008). The unusual assemblage was what first led to the skeleton being classified as a shaman. Subsequently however, neurological disorders were identified on the Bad Durrenberg skeleton "which might have caused variants of altered states of consciousness" (Porr & Alt 2006, 395), the key component of shamanism. Possible shaman burials, clearly differentiated from others in terms of posture and grave inclusions, are also recorded at a number of other sites including Olenii Ostrov and Skateholm (Zvelebil 2008). "Anthropomorphic figures with drums and other musical instruments" (Zvelebil 2008, 49) are noted in a number of petroglyphs and are thought to represent shamans.

Further evidence to support this shamanistic interpretation of the symbolic record of the Mesolithic is the evidence of ethnographically documented shamanistic beliefs. "Northern hunter-gatherer and reindeer herding communities in northeast Europe and western Siberia can serve as an analogy for the earlier belief systems of prehistoric communities in circum-Baltic

Europe" (Zvelebil 2008, 42). Zvelebil (2008, 42-43) argues that ethnographic analogy with these modern shamanistic societies "is valid" due to the prehistoric and ethnohistorical communities sharing "broadly similar temporal, practical and cosmological structures".

The Emergence of Symbolism

In conclusion, progression and development of symbolic inscription can clearly be observed between the Middle Palaeolithic and the Mesolithic. The Lower Palaeolithic likely holds the cognitive origins of the human capability for symbolism as it gives us our earliest examples of the practice. It is the Middle Palaeolithic, however, where symbolic inscription appears to become a key social factor. In this period we see the earliest evidence for societal traditions of abstract symbolic inscription. Likely before the advent of fully modern language, symbolism at this stage allowed societies to explore and express new social concepts and possibly to consider their place in the world. The Upper Palaeolithic saw the emergence of figurative art loaded with symbolism, reflecting the increasing social integration of European communities. Exploration of altered states of consciousness likely began as the fully modern mind emerged along with modern language. The Mesolithic, a period defined by environmental changes, saw a continuing exploration of shamanism as people sought balance in a changing world. Themes alter however, reflecting the changing fauna and landscape of the Holocene world and the evolution of nomadic societies. The underlying inspiration behind the art seems to remain however as the shamanistic world-view.

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