

Revealing Our Vibrant Past

Science, Materiality and the Neolithic

OLIVER J.T. HARRIS

Introduction

IT IS NOW MORE THAN TEN YEARS since Andrew Jones (2002) published his book *Archaeological Theory and Scientific Practice*. It has stood the test of time, and indeed now looks rather prophetic; among other things it foreshadows symmetrical archaeology (Witmore 2007, Olsen *et al.* 2012). The central tenet of the book is that archaeology at that time was dominated by two cultures, much as wider academia had been famously described by C.P. Snow in 1959 (1959). On the one hand stood archaeological science and on the other archaeological theory (cf. Parikh and Hall 2012). The former saw itself as dealing with static, inanimate objects bequeathed from the past that could, given the correct application of technique, yield up their secrets (Jones 2002, 169). The latter saw itself as dealing with issues of meaning, human agency and interpretation, and as engaging with fluid, animate subjects (Jones 2002, 169). The book not only diagnosed this condition, but correctly recognised it as hugely disabling. The oppositions on which this divide was predicated – science versus theory, nature versus culture, object versus subject and so on – were modernist constructs, and thus the arguments that flew back and forth across it did not engage with a debate about the actual nature of the past.

Over ten years later it might feel as if these oppositions are less central to archaeological discourse (see Robb this volume, Chapter 2). The theory wars of the 1980s and 1990s appear to have ceased, and most participants on both sides are content to concede that both science and theory have much to offer archaeology. Furthermore, there has been an increased willingness by a new generation of scholars to draw on both complex social theory and detailed scientific analysis (see Robb this volume). However, much like the divisions between North and South Korea, simmering tensions remain, and no real peace has been agreed. The boundaries between the two sides have not been done away with; instead a

negotiated compromise keeps both happy. In this chapter I want to suggest that in the end it is neither enough simply to keep the peace, nor are efforts at bridging the divide going to be successful (Webmoor and Witmore 2008). What we need is to start from a different, non-dichotomous, perspective, and I will outline what one such version of this might look like, drawing on Jane Bennett's (2010) notion of vibrant matter, as well as the increasingly important concept of assemblage.

Such a move is particularly apposite in the context of the subject of this volume, early farming. The Neolithic perhaps more than any period remains beset by oppositional thought: farmers versus foragers, incomers versus indigenous people, domestic versus wild, and so on. It is also a period which has seen numerous outstanding applications of scientific techniques that open up the possibility for a range of new connections to be drawn, and understandings to be developed. So in this chapter I aim to do three things. First, I will reiterate the evidence that archaeological thought has tended to be dichotomous and oppositional, particularly in relation to the Neolithic, and why this is so problematic. Secondly, I will set out how we can undercut these oppositions by taking up a different position in relation to archaeological material and by embracing a different ontology. Thirdly, I will look at the Late Mesolithic and Early Neolithic of Britain to outline some of the ways in which this new ontology can open up possibilities for different understandings of the past.

The tenacity of oppositional thinking

Dichotomies have become the *bête noire* of archaeological thought in recent years. Emerging from archaeology's relationship with modernity, and drawing on traditions of thought going back via Descartes to Plato, they have been diagnosed as the fundamental stumbling block to understanding the past (Jones 2002, 2012; Olsen *et al.* 2012; Thomas 1996, 2004). The analysis of these dichotomies, and the problems they bring, has been widely debated, and so only a brief summary is offered here. Beginning with the fundamental opposition between person and world, they structure our understandings of nature and culture, body and mind, outside and inside, and so on. Archaeologists have lurched from privileging one side of these dichotomies to the other, arguing that what matters are the ideas in people's heads and how they express them, or that it is people's engagement with the natural world that really drives history, or that it is the way people understand symbols and meanings that really matters (see Robb this volume). Throughout the history of archaeological thought the modernist dichotomies that structure the understandings have remained in place, and archaeologists have simply argued about which side of the divide matters. The separation between archaeological theory and archaeological science matches itself neatly on to these oppositions.

Nowhere has this been more true than in the study of the Neolithic because it is here, above all periods, that archaeologists have tended to identify the past in terms of these dichotomies (Pollard 2004, 56). Think of the major debates that structure our arguments around farming and one finds that they map neatly on to different sides of a dichotomous debate (Borić 2005). As Borić (2005) has pointed out, the very opposition between farmer and forager starts this off, but it runs through our oppositions of wild and domestic foodstuffs, incomers versus locals, and so on. Is the Neolithic primarily a way of getting food (an engagement with the natural world) or a set of belief systems (a cultural package)? Should we pin the blame for its spread on active farmers (subjects) dominating passive hunter gatherers (objects), or is it the other way around (with the identification of subjects and objects reversed)? The reason that debate over the start of agriculture has been so fierce is precisely because it frames itself around the very dichotomies that structure our thought.

Issues with oppositions

As many authors have pointed out, however, these dichotomies are not neutral descriptors but hugely problematic modernist assumptions (Latour 1993, Thomas 2004). The oppositions they describe emerge not from scientific investigation but from a series of compromises reached in the seventeenth century to keep science and politics – or if you like nature and culture – apart from one another (Latour 1993). In terms of the Neolithic this means that the oppositions between domestic and wild, farmer and forager, nature and culture, are our *impositions* on to the material; they are acts of what Latour (1993) calls purification, which disguises the way in which these things are never clearly separate. Imposing these assumptions on to the past has a series of significant issues for us as archaeologists. First, it essentialises and universalises a single way of thinking about the world, imposing it on all times and places. Secondly, it actively prevents us from understanding the past, because of the way in which these essentialised assumptions impose barriers on to our engagements. The emphasis placed upon humanity within modernity, that we (humans) are uniquely special, given culture and language in a way that raises us above all other creatures, means that the contributions of other beings – both ‘animate’ and ‘inanimate’ in traditional terms – are lost to us (Ingold 2007, Olsen *et al.* 2012). Thirdly, we waste lots of effort on pointless intellectual debates. We wrestle with how to resolve the dichotomy between forager and farmer, with whether the prime movers were indigenous or outsider, with whether domestic animals or wild ones provided more of an economic resource. The terms of these debates mean they are irresolvable, simply because they spring from our preconceptions, not from our engagement with the material. This does not mean that we should ignore the differences between animals which we currently categorise as domesticated and those which we currently

categorise as wild, for example. It does mean that we should attend to the specific differences that exist between different animal species, rather than lumping them together into two purified, and artificial groups (Pollard 2006, 136–7).

Fundamentally, an uncritical reliance on dichotomies also keeps archaeology itself polarised into two camps, with on the one side the scientists providing data, and on the other theorists offering interpretation, even when the same archaeologist plays both roles. This opposition too is of our making. New data alone can never resolve the questions we have about the past and nor can new theories. We need to rethink the very basis on which we think about our discipline and about the past.

New ways forward?

Luckily, archaeology is currently equipped to do exactly that thanks to a range of new ways of engaging with the past that have emerged over the last decade and more. If previous archaeological debates have been fundamentally about epistemology – how we know the world – these new discourses focus on ontology – what the world actually is. Although manifestly variable and different from one another, these approaches share a rejection of the dominant modernist tropes touched on above, and seek to engage with the past in a way that attends to its material and non-representational qualities. A detailed review of the various approaches would be an article – or more likely a book – in itself, but some that might be mentioned within this include: symmetrical archaeology (e.g. Olsen *et al.* 2012, Witmore 2007), drawing on the work of Latour, and to a lesser extent thinkers like Harman and Whitehead; ideas of local ontologies (Alberti and Marshall 2009, Conneller 2011), drawing on Viveiros de Castro, Ingold and Barad; assemblage theory (Harris 2013, 2014; Harrison 2011; Jones 2012; Normark 2008, 2009, 2010; Lucas 2012), drawing on Deleuze, DeLanda and Bennett; phenomenology (Cobb 2008, Thomas 1996, Olsen 2010), drawing on Heidegger; relational realism (Fowler 2013), drawing on Deleuze, Latour and Barad; and entanglement (Hodder 2012). The fact that several authors occur in different sections should indicate that these different approaches have a lot in common with one another. They are all broadly focused on relations and materials, reject idealism, essentialism and human exceptionalism, and attempt to understand the world outside standard ideas of naturalism or social constructivism. There are significant differences between these approaches as well – it would be disingenuous to pretend otherwise – but for the sake of the argument here they can be linked to one another as part of an emergent ‘ontological turn’ (Alberti *et al.* 2011; see Harris and Robb 2012 for a broader discussion of this phenomenon in anthropology and archaeology). Rather than attempt any further analysis of these approaches, however, the swiftest way forward is to outline those that I find most useful, and which are of particular relevance to the question here. These are approaches drawing on the notion of

assemblage, and with it ideas of 'vibrant matter' (Bennett 2010). As Jones (2012, 200) has noted, this offers us the best chance of reconciling our understandings of both science and theory, not as competing enterprises, but two mutually linked ways of attending to the complexities of the past.

Vibrant matter and assemblages

Let us start with matter itself. In the traditional understanding of matter, it is something inanimate, a non-living substance that awaits the enlivening touch of humanity to transform it into something meaningful. Most of our conceptions of archaeological objects rest on this distinction; raw materials (clay, flint, bone) are passive and inert until human beings arrive to shape them in particular ways, producing them as that bizarre mixture of culture and nature which we refer to as material culture (Thomas 2007). This is the 'hylomorphic' model of matter, which goes back to Aristotle (Ingold 2013). This position firmly associates matter with nature and opposes it to culture, the stuff of human beings. Even positions advocating object agency (e.g. Gell 1998) maintain this distinction, requiring as they do the addition of human beings to the mix to add the 'magical mind-dust' of agency to the equation (Ingold 2007, 11). Both scientists and theorists have tended to treat things in this manner. For scientists the properties of materials, the contents of pots, and the isotopic signature of bones are all information encoded within the fixed nature of matter. For theorists, although matter can take on meaningful properties, this is only in conjunction with human beings; it is what they add to the equation, a cultural layer seemingly floating on top of the natural materials underneath (Ingold 2013). So a pot is understood as the imposition of human mind on to malleable clay, whether this is the shape of the pot itself, the contents added to it or the meanings attached to the decoration on the outside (Jones 2012, 100).

What if we took a different view, however? What if we emphasised not the hylomorphic model which separates matter and form, nature and culture, but instead emphasised the morphogenetic capabilities of materials? Both the anthropologist Tim Ingold and the political ecologist Jane Bennett have recently urged us to do precisely this: to think of the way in which materials themselves are animate, always in flow. Materials, in this perspective, are not static, nor are they fixed. Their properties are not somehow innately contained within them – a form of essence – but rather emerge through their relationships with the world. They are, as Ingold (2007, 15) puts it, 'histories'. Focusing on these vibrant materials pulls us away from thinking about the world in terms of people and objects, culture and nature, and asks us to attend to the flow of life itself, to the way in which things are always in the process of becoming something else. From this perspective the pot is no longer a fixed object produced as finished article by the imposition of form on to matter by a human agent. Instead it is a particular moment – an event – in the flow

of materials from clay extraction site, temper source, the cow that provided the milk, the human that helped to bring these things together, and so on. This history continues through fragmentation, deposition, excavation, cataloguing, drawing and analysis. Instead of a bounded object, therefore, it is in Heidegger's term a gathering, or as I prefer to see it, an assemblage.

Assemblages, taken broadly from the work of Deleuze and Guattari (2004), offer a particular way of thinking about the world, and in this case about the materials which archaeologists uncover (Lucas 2012). Assemblages are the temporary gathering together of all manner of different kinds of relations, different kinds of materials, signs, utterances, meanings and ideas (Deleuze and Parnet 2007). Assemblages have a number of important characteristics. They are relational, but exceed the terms of their relations – they are more than the sum of their parts (DeLanda 2006). This means that they are also real (cf. Fowler 2013). That is, they are not just the product of their analysis but carry real ontological weight. Assemblages are also four-fold in form, or, put another way, they are tetravalent (Deleuze and Guittari 2004, 556; Dewsbury 2011). They have physical (or machinic) form (dimension one), but also expressive qualities (dimension two) and are also both simultaneously both coming together and moving apart (territorialising and deterritorialising: two further dimensions; see Harris 2013; Lucas 2012, 199). Thus our pot brings together physical bodies of clay, temper and milk; expressive decorations that can evoke meanings and emotions as well as symbolising ideas of connectedness and community; and it is the coming together of the substances listed, and the slow process of their breaking apart. Thinking about assemblages in this way has a series of critical advantages. First, it forces us to concentrate on relations over essences; that is, we are not concerned with some essential form of our pot – some kind of 'pothood' – but with the way in which it gathers together these different elements. Secondly, because this process is in flow, this is not a static measuring of a fixed thing, but the identification of something emergent in the world; in this it differs from the more static network analysis of Bruno Latour (1999; cf. Harman 2009; Harris 2013, 2014). Thirdly, assemblages work at multiple scales (DeLanda 2006; see Robb this volume on the importance of a multi-scalar approach), so we can think not only of the pot but also pottery traditions and archaeological sites as an assemblage; even concepts like 'the European Neolithic' are assemblages. This allows us additionally to engage with the reality of these concepts rather than dismissing them as imposed conceptions of the archaeologist. Fourthly, and perhaps most crucially here, assemblages 'bridge work between philosophy, science and social theory' (Dewsbury 2011, 149). Rather than treating these as different elements, assemblages place science and theory, nature and culture, within a single flat ontology amenable to analysis and engagement in the same way (DeLanda 2002, 2006, 2010).

Changing the focus of enquiry

Thus switching our focus to assemblages allows us to begin from a different ontological position. There are four key consequences of this for my argument here.

First, we can begin from a non-dichotomous standpoint. As emphasised above, this is not about reducing all elements of the world to being the same, but rather about understanding difference as emergent from relationships rather than pre-figuring them as terms of analysis. Thus cows and aurochs are different because of the relations in which they are enmeshed (which include relations with human beings, but also landscapes, plants, DNA and other factors). Equally pots and clay are different not because one is 'cultural' and the other 'natural', but because the former are caught up in relations (with humans, substances used as temper, traditions of potting, or animals through the liquids they hold) with which the latter is not.

Secondly, this allows us to escape from some of the most debilitating conundrums of research on the Neolithic. Whether wild or domestic plants were of particular importance, for example, becomes replaced by questions about whether barley, wheat, crab apples, hazelnuts or any other plant one cares to mention were part of more or less intensive relationships during this period, and how this changed through time. As Ingold (2000, chapter 5) has so cogently argued, the key difference between what we think of as wild and domestic is the degree to which humans are involved in the conditions of growth – and the degree therefore to which other organisms help grow humans. Different forms of care are crucial here, and rather than examining generic categories, we have a new relationship between specific plants and specific groups of people to explore.

Thirdly, more broadly, this approach places science and theory on a single ontological footing, and does not regard them as two separate parts of an enterprise. That this can have significant impact is demonstrated by Joanna Sofaer's recent book (2006). Here Sofaer demonstrates that only by understanding the human body both through theory and through osteological information (both understood as similar forms of engagement with the material) can we hope to understand bodies in the past (and see Robb and Harris 2013). This means that archaeology is primarily about attending to the relations which we can trace in the present that survive from the past, the relations that endure (Fowler 2014). Tracing these relations happens in the field, when we excavate a feature and record the items that have been placed in a particular context together. It happens in the library when we link different sites together through reading reports and comparing other ideas and interpretations. It also – crucially – happens in the laboratory as we trace the vibrancy of matter. Different isotope signatures do not 'represent' different dietary practices in the past, but are parts of the relationships produced through those past practices which endure in the present. The decay of ^{14}C atoms measured does not solely 'represent' evidence for the date of the death of a piece of organic matter, but also is one way in

which we as archaeologists can attend to the histories of vibrant matter. All these practices are thus ontologically equivalent.

Finally, authorship of the past is now more evenly distributed. The past is neither a passive object out there awaiting the enlivening touch of archaeologists, nor is it something purely constructed in the present, a relativist nightmare in which anything goes. Instead the past itself is a relational assemblage produced by all manner of materials, humans, animals, plants, scientific machinery and so on, past and present, coming together (cf. Olsen *et al.* 2012, Witmore 2012). The residues of the past that stretch into the present (Lucas 2012) mean that we as archaeologists are not free to build assemblages as we see fit. Instead we take our part in the active making of the past through the movement of our trowels, the testing of our machinery, our explorations of social and philosophical theory (cf. Latour 1999). These things bring us into correspondence (Ingold 2013) with the pot sherds, isotope signatures, animal bone assemblages, monuments and people of the past and it is through the collective negotiation and endeavour of *all* these elements that potential pasts emerge – never fixed or final, but never utterly fluid either. This democratic vision of past-making places data and interpretation on the same ontological level, both emergent in the present, and neither are simply free to be bent to the archaeologist's will (Witmore 2012).

Enlivening the past

How might these ideas work in practice? As in other areas of Europe, the debate in Britain around the transition to agriculture has been locked into opposed, dualistic camps, arguing back and forth about whether it represent a radical economic disjuncture with a new fully farming, settled economy coming from the outside, or new world view taken up with new material culture (for a review see Cummings and Harris 2011). Whilst we now know much more about the temporality of this transition (after Whittle *et al.* 2011), and have seen a number of attempts at mediating the dispute (Cummings and Harris 2011, Garrow and Sturt 2011, Whittle *et al.* 2011), we may be no closer to a resolution. Rather than focus on the transition itself here, however, I want to concern myself with how the line of thinking developed in this chapter can add to (note not replace) our current understandings of the differences and similarities between the Mesolithic and the Neolithic in Britain. To do this I want to compare two sites from either side of the divide, the shell midden of Cnoc Coig on Oronsay (Mellars 1987), and the midden underlying the chambered tomb of Ascott-under-Wychwood (Benson and Whittle 2007). In both cases I will examine these sites as tetravalent assemblages, in order to consider both similarities and differences in how materials and companion species (*sensu* Haraway 2008) emerged in these periods and how an understanding of vibrant matter allows us to situate both science and theory on an equal footing. Rethinking

the Mesolithic and the Neolithic in these terms will allow us to conceptualise the differences between them that do not rest on artificial modernist dichotomies.

Assembling Cnoc Coig

The shell midden at Cnoc Coig most probably dates to between 4300 and 3800 cal BC,¹ and was in use for perhaps 200 years (Richards and Sheridan 2000, Meiklejohn *et al.* 2005). The site is made up of a large deposit of shells and other materials as well as features including over 50 hearths and two possible structures (Mellars 1987). Deposits of cowrie shell beads, human bones, remnants of butchery, antler tools and so on were also included within the midden. The dominant resources were fish and shellfish (supported by the stable isotope analysis (Richards and Mellars 1998)) but large numbers of seals were also consumed on site. Other animals present included otters, which appear largely to have been hunted for their fur rather than for meat (Grigson and Mellars 1987, 277), and parts of red deer and wild boar. The deer were not native to Oronsay and are likely to have come from further afield, perhaps from the island of Jura (Mithen and Finlayson 1991). Notably two different populations of this animal seem to have been drawn upon, and the parts of their bodies incorporated into the site suggest that they were mainly present for use as tools rather than as foodstuffs (Grigson and Mellars 1987, 252, 260). As an archaeological assemblage, the Cnoc Coig midden can be seen as incorporating multiple materials, from wood and stone through to shell and bone (Cobb 2008, 262).

What about the more theoretical take on assemblage which I have advocated here? Assemblages, as I noted above, have four dimensions (Dewsbury 2011), and each of these can be detected in the process of the midden's becoming. The first of these dimensions are the physical or machinic relationships. Here we can think about the physical connections formed by interweaving materials, the acts of placing substances together, the gathering of multiple elements of the Mesolithic world into a single place. The processes and practices of fishing, hunting and consumption are revealed in this element of the assemblage. The second dimension of an assemblage is the way in which it allows 'the collective assemblage of enunciation of acts and statements' (Dewsbury 2011, 150), what I called above the expressive dimension. This can be seen most clearly in Cnoc Coig in the famous juxtaposition of a human hand and seal flipper (Meiklejohn *et al.* 2005). As authors such as Warren (2005, 147) have noted, this seems to express an equivalence

¹ Two sets of radiocarbon dates are available, those from charcoal obtained as part of the original publication and more recent AMS dates from human bone (Richards and Sheridan 2000). The former suggest a date of between 4700 and 4000 cal BC, whilst the latter suggest the dating above. Although the discrepancy in these dates is worrying, the lack of offsets of the latter dates, and the spatial placing of human bones deep within the midden, suggest that for the moment the more recent dates, 4300–3800 cal BC, are more reliable (Meiklejohn *et al.* 2005, 98).

between human beings and seals. Specifically, the way in which the assemblage is gathered together here reveals the manner in which the seal flipper is treated like a human hand (and judging by the normal treatment of seal bones, not vice versa (Meiklejohn *et al.* 2005, 99)). Here we have seal-becoming-human expressed through the physical assembling of these items, and these represent just some of the meaningful juxtapositions created throughout the midden's history (Cobb 2008, 262–3). It should be clear here that the physical juxtaposition and the expressive content of the assemblage are not opposed to one another but form a dimension along which we can analyse different assemblages.

The other two dimensions are the way in which assemblages are stabilised (territorialised) and also simultaneously break apart and are destabilised (deteritorialised). In the midden at Cnoc Coig we can detect the ways in which multiple other places are tied together and linked into the assemblage: the origins of at least two different deer populations, the places where seals basked and were hunted, the rocks on which shellfish were gathered, or the beaches where flint pebbles could be found. These all indicate the way in which different temporalities were tied into these different materials yet bound into a single place. The similarity of diet of the people whose partial remains were interred in the midden (Richards and Mellars 1998) reveals the way in which a community territorialised itself through shared consumption. Simultaneously the decay of material within the midden helped it to territorialise, to reach out from itself and to leave the assemblage. Other parts of the people who were deposited here were taken away and disposed of elsewhere, separating out lines of relations that escaped away from the boundaries of this assemblage (cf. Cobb 2008, 281).

The assemblage of animals and humans, the materials they produce together, and the materials brought in from elsewhere produced the midden at Cnoc Coig. This assemblage reveals these animals, most explicitly – or expressively – seals, as companion species with human beings in this period, a becoming-with that led to these different bodies helping to produce the Mesolithic site as we understand it today. This approach does not divorce cultural and natural perspectives, social and economic practices, or humans and animals. Rather it recognises the way in which shared practices involving and authored by a host of 'animate' and 'inanimate' materials allowed this kind of becoming to emerge, and break apart, through time.

Assembling Ascott-under-Wychwood

At Ascott-under-Wychwood, a Neolithic midden was formed prior to the construction of a megalithic tomb. This latter event will not be part of the analysis here.² The midden was formed from the gathering of multiple materials including

² Though of course it is similarly amenable to an examination rooted in assemblage theory.

contemporary flint tools, older microliths, animal bone, pottery, fire, timber and earth (McFadyen *et al.* 2007; Whittle 2007a, 345). It was probably assembled between 3950 and 3800 cal BC and was probably in use for less than a century (Bayliss *et al.* 2007, 33; McFadyen *et al.* 2007, 35). It formed above a series of earlier pits and above and around two linear post structures (McFadyen *et al.* 2007). Specific connections were drawn here between different materials and different parts of the site, and care was taken in the assembly of these different materials (McFadyen 2007, 351). As McFadyen (2007, 351) has powerfully argued, the practices at the timber structure and in the formation of the midden were connected to multiple elements of people's lives including:

grassland, the cutting of turf, woodland, the cutting and working of wood, the setting of posts through cut turf, flint, the working of flint, animals, the butchery of animals, charcoal, the burning of wood on hearths and the roasting of red deer and pig, clay, the making of pottery, the keeping of milk in pots, stone, the making of quern stones, and perhaps the growing and managing of plants.

Can we add to this through our analysis of tetravalent assemblages? The physical connections are well drawn out in the analysis by McFadyen (2007, 351–2), showing the way in which the material structure of timber, pits and midden gathered together the disparate elements of Neolithic life (cf. Pollard 2008, 56). The expressive elements are revealed in some of these connections, in particular the association of flint axe flakes with deer bone, and in the comparable burning of flint and pig bones. Alongside deer and pig, parts of other animals became entwined in the midden including cows, which were the most dominant animal in terms of numbers. In recent analyses authors have often promoted the social understandings of animals, particularly cattle, and their roles as metaphors for kinship (e.g. Ray and Thomas 2003), as ancestors (e.g. Jones and Richards 2003) or as means for thinking through the Neolithic world (e.g. Whittle 2003). It is not my intention to deny the importance of these interpretations. The association of deer and axes in particular speaks of deliberate associations being expressed between these materials (McFadyen 2007).

The other dimensions of the assemblage can be traced as well. Territorialisation worked at multiple scales. On the one hand specific connections were bound together in the pits, notably between burnt pig bones and burnt flints. At a higher scale we see the manner in which multiple clay sources were drawn upon (Barclay and Case 2007), and these vessels in turn brought together not only milk, but also pig fats (notably in vessel 3, which was found in pits 9 and 13; Barclay and Case 2007, 269). In smaller numbers other animals were of importance too, including fox, boar and wild cat, each tied into the assemblage through single canines (Mulville and Grigson 2007, 239). One can dwell further on the potential expressive qualities of these elements of the assemblage (Pollard 2004). The territorialisation of multiple animals is also indicated not only between species (whether wild or

domestic in our terms) but in variation *between* animals of the same species. One pig sampled for stable isotopes revealed that it had an unusually low nitrogen isotopic value, suggesting a markedly different diet from others, whilst another had significantly higher than normal values for the same isotope (Hedges *et al.* 2007, 259–60). Thus different animals here – defined not by species but by relationships to food and people – were gathered into the assemblage.

Further acts of territorialisation bound not only multiple materials but multiple temporalities together; as Whittle (2007b) has rightly recognised, the inclusion of older microliths forms perhaps the best example of this. Here we see the importance of the differential axes of the assemblage. Whether people meant to include the microliths or not (and this can be debated) will tell us whether this forms part of the *expressive* dimension of the assemblage, but their physical, machinic, connection demonstrates their territorialisation regardless. Other temporalities were bound in through the decay of the wood in the post lines, the rotting organic materials and so on. These acted simultaneously to allow elements to leave the assemblage, to be deterritorialised, as did the way fire consumed the flesh around animal bones and the removal of parts of the axes not deposited.

The midden at Ascott-under-Wychwood was an assemblage of multiple materials, once again produced through the actions of those materials themselves, and the animals and humans they bound together. Multiple animals were in the process of becoming-with people, of being companion species (Haraway 2008). Cattle and pigs in particular, but also red deer and other animals, reveal their roles in the making of Neolithic life, and the isotopic analysis of their material remains also suggests that different animals of the same species played differing roles. It is the vibrancy of these materials that allows us to detect these enduring relations. Thus I would disagree with Whittle when he argues that ‘it is not the materials themselves but their contexts and transformations which matter’ (2007a, 345). The materials do matter – as do their contexts and transformations – because they gather together and assemble the Neolithic, and we do not require people at the time to have been aware of all of their relationships and connections to trace these in the present.

Changing assemblages

What are the differences and similarities between these assemblages, and how does this figure in the context of the larger scale assemblages that we refer to as the Mesolithic and Neolithic? Both Whittle (2007b) and Pollard (1999) have commented on the similarities between Mesolithic and Neolithic middens. More broadly, Vicki Cummings and I have also argued for continuities in practices across the division (Cummings and Harris 2011). Viewing these sites as tetravalent assemblages means that we can push this further; both act to territorialise the diverse elements of the worlds in similar ways. At both sites deer and boar play minor roles,

and at both people expressed themselves through the juxtaposition of alternative material elements, but in both cases differing kinds of association were in play.³ This is not, however, a switch between nature and culture, but concerns the different kinds of specific animals and plants brought together, and particularly the different intensities of engagement with them. As Pollard (2006, 139) has noted, this is captured in the less intense ways that ‘wild’ animals were ‘entwined in the fabric of social life’.

Yet dwelling on the similarities between these middens is not to deny that simultaneously there are crucial differences. The practices at both are clearly very different. One involves large-scale fishing, hunting seals, gathering shellfish and skinning otters. The other involves herding cattle, milking cattle, flaking polished flint axes, and making and using pottery. There are huge differences in landscape setting and the kinds of environments that can be drawn into the assemblages at each site. Yet the differences are greater even than this. As we move up in scale we can detect how these two sites capture elements of the broader differing character of Mesolithic and Neolithic worlds, and of the way in which different relationships of varying intensities produced differing kinds of assemblages that came together and moved apart in the past. One is Mesolithic and one is Neolithic, and these differences do matter; they are real (cf. Lucas 2012, 177). How can we avoid denying the drama of this change, its historical importance, whilst still seeing both sites as relational assemblages with similarities? How can we do this without lurching back to seeing one as nature and the other as culture?

The answer is that the change between the Mesolithic and the Neolithic represents a ‘phase transition’ (DeLanda 2002, 2006) in the kinds of assemblages which people, plants, places, animals and materials were in the process of becoming. A phase transition is the term used to describe how relatively minor changes can amount to significant differences in material form (DeLanda 2002). For example, heating water two degrees from 19 to 21°C produces no significant change in the material. However, heating it from 99 to 101°C has a much more significant effect, although the increase in energy itself is no greater in the second case. Throughout the Mesolithic there would have been changes in the nature of the assemblages and relationships that existed. The heavy marine-dominated lifestyles evidenced at Cnoc Coig, for example, may reveal a specifically Late Mesolithic way of living, untypical of earlier forms (Mithen 2000). This was not, however, a phase transition; the practices at Cnoc Coig remain Mesolithic. The transition to the Neolithic, however, had longer lasting, more substantial, and, in the end, irreversible

³ One other element is worth commenting on. Neolithic assemblages are often seen as being far more wide-ranging, or heterogeneous than their Mesolithic forebears (e.g. Hodder 2006). Of course, in terms of weight of artefacts this is true, but in overall terms we do not see a simple progression from less to more complex relationships, but rather the replacement of one set of things with another. There is no teleological sense of progress here (cf. Fowles 2010).

consequences (cf. Robb 2013). Just like the differences and similarities between water and steam, we can appreciate how the Mesolithic and the Neolithic are very different from one another, without imposing an ontological gap between the two, and thus also embrace their manifest similarities. Although I have not discussed actual transition itself here, I suggest that starting from this non-dichotomous position, from a place able to appreciate the processes that produced both the similarities and differences between the periods in a way that does not rest on tired old dichotomies, is an essential first step in building towards a more complex understanding of the mechanism of change itself. That, however, is for another time.

Conclusion

Turning to assemblages and vibrant matter allows us to approach our understandings of the past in new ways. Taking a fundamentally relational approach, which embraces both science and theory on an equal footing, allows us to rethink our imposed categories and to develop different ways of discussing key moments of change. Nowhere is this more crucial than in the transition to farming. No other period in archaeology, with the possible exception of the emergence of modern humans at the start of the Palaeolithic, maps itself quite so neatly on to our assumptions about how the world works: that nature is opposed to culture, that data require interpretation, that change emerges from a single cause with an active agent (a subject) acting on a passive recipient (an object), and that the world of materials is mute and lifeless requiring the animating touch of the human to bring it to life. We have spent the best part of 60 years debating this transition and yet still seem stuck in the same terms. To get out of this, to explore other ways of thinking, we do not need more data; we need a different starting point.

One possibility for such a starting point has been outlined here, and many others are now available in the archaeological literature (see discussion above). What such approaches are *not* about is fourfold. First, they are not about suppressing difference, or denying the very real changes that took place in the past. These changes need to be understood as material outcomes of altered relationships, however, not as transformations of idealised groups. Secondly, they are not about denying the vital role of science to the archaeological endeavour. On the contrary, assemblage theory draws explicitly on complexity theory, chaos theory, non-Euclidian geometry and others; it is precisely suited to undercutting the great divide between science and the arts (DeLanda 2002, 2006, 2010; Webmoor and Witmoor 2008). Thirdly, they are not about denying the progress that archaeological work has undoubtedly made over the last 150 years, or about demanding that we start all over again. Finally, this is not about ignoring the importance of what people thought and felt, since the expressive elements of an assemblage are as important as any other, but it is about

placing things, people, animals, places, plants, their association, territorialisation and deterritorialisation on an equal ontological footing, to reveal the different kinds of becoming, and the different kinds of becoming-with that existed in the past (cf. Pollard 2004, 66). Fundamentally, what a turn to assemblages and vibrant matter does offer is the potential for a new engagement that does not write off half our knowledge as theoretical waffling and the other half as empiricist essentialism. In turning to this approach, we will not produce data that subsequently require interpretation, facts that need theory, or nature that needs culture, but rather narratives of the vibrant materials that form our pasts, presents and futures.

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