
Introduction

The Cognitive Life of Things: Archaeology, Material Engagement and the Extended Mind

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Things ‘full of gods’

Things have always occupied such a special place in the life of humans that they seem an inseparable component of human thought and sociality. And yet, in spite of our deep immersion in this material medium (Schiffer & Miller 1999, 4), or maybe because of it, things remain little understood as an aspect of human intelligence and culture. It seems as if the ‘immediate, sensual and assimilable’ nature of the materiality that surrounds us makes any attempt at comprehending its vital role extremely difficult (Miller 1987, 3). One could say that things are to human intelligence as the eye is to sight, i.e. constitutive and yet invisible. Since the early years of our childhood we constantly think *through* things, actively engaging our surrounding material environment, but we very rarely become explicitly aware of the action potential of this engagement in the shaping of our minds and brains. Put somehow differently, things are very good-to-think-*with* or *through*, but not so good-to-think-*about*. The more time you spent thinking *about* things the less of a thing and the more of an object or category they become. Categories are more intelligible and familiar but they have very little to tell us about the qualities and powers of the things and materials that make up our everyday worlds of thought and action. Things work best when in motion and unnoticed. They also work best over the long term accumulating biographies and capturing time. In all its materiality Heidegger’s ‘thingness of things’ (1971) seem to resist any attempt to be understood as bounded, self-contained entity or quality.

Seen from a different angle, this ongoing ‘tyranny of the dichotomy between humans and nonhumans’ (Latour 1994, 795; 1999) has a number of negative implications that might be useful to point out. Two of these are particular relevant to our purposes in this book. The first concerns the way that the artificial line

between persons and things or mind and the material world, has kept our deeply rooted Cartesian visions and modes of thinking at a safe distance from our long-evolved ‘cyborg’ character (Clark 2003; 2008b). The history of thought — at least in the West — has always been in favour of essences, and the problem of essences is that they always come before existence and material engagement. The second implication related to the dichotomy between humans and things is that it has blinded philosophy and the cognitive sciences to the pervasive, diachronic influence and transformative potential of things in human life. As the famous metallurgist and historian of materials Cyril Stanley Smith, points out in his *Matter Versus Materials* ‘[t]hrough most of history, matter has been a concern of metaphysics more than physics, and materials of neither’ (1968, 638). To a large extent philosophy and the cognitive sciences remain oblivious to the medium that envelops and shapes humanity and epistemically agnostic of its properties and active role in human life and evolution.

Apparently, this common attitude and implicit stance to the world of things needs to change, and in fact, it has been changing, especially during the last decades. It is now widely recognized by many disciplines that in ways that we have yet fully to understand, material culture shapes the manner in which people act, perceive and think. As a consequence, it is becoming of paramount importance to come up with new cross-disciplinary synergies, capable of transforming our understanding of the relation and co-evolution of brains, bodies and things.

Moreover, granted the particularities of the task ahead of us, one could suggest that it is inevitable, and maybe also advisable, that archaeology, given its natural preoccupation with the material medium and the long-term, should carry the principal burden of such a transformation. Bear in mind that, although this is a novel and challenging a task it remains nonethe-

less well rooted in the history of archaeological discourse and practice. To take just a single characteristic example, one could refer to the work of André Leroi-Gourhan, pointing out decades ago ‘the uniquely human phenomenon of exteriorization of the organs involved in the carrying out of technics’ (1993 [1964], 258). For Leroi-Gourhan, human evolution has been oriented towards placing *outside* what in the rest of the animal world is achieved *inside* (Leroi-Gourhan 1993 [1964], 235). His early insights on the ‘freeing’ of tools and on the operational synergy of tool and ‘gesture’ can certainly be seen to anticipate many subsequent philosophical arguments on the extended and distributed character of human cognition that can be found underlying most chapters of this volume.

Moving to another distinctive example — one which in fact furnished the inspiration for the title of this book — Ajoin Appadurai’s (1986) *The Social Life of Things* was probably the first explicit attempt to battle the prevailing tendency to limit conceptions of the social to interactions between persons, rather than between persons and things. Appadurai’s book pointed out the various unnoticed ways in which things, like persons, have social lives. It thus introduced the biographical dimension of artefacts (Kopytoff 1986; Gosden & Marshall 1999; Hoskins 1998; 2006) which has proven very influential among archaeologists and anthropologists. The stimulus offered by that book was soon followed by a number of other influential works in the archaeology (e.g. Buchli 2004; DeMarrais *et al.* 2004; Gosden 1994; 2004; 2005; Jones 2004; Knappett 2002; 2005; Meskell 2005; Miller 2005a,b; Olsen 2003; Preucel 2006; Renfrew & Scarre 1998; Tilley 1994; Thomas 1996; 2004; Wylie 2002) and anthropology of material culture (Appadurai 2006; Hutchins 1995; Hoskins 1998; Henare *et al.* 2007; Ingold 2007a; 2008a,b; Sperber 2007).

The contribution of those early archaeological and anthropological studies in bringing about the animate character of the mundane artefact and in helping us understand ‘what do objects want’ (Gosden 2005) is undeniable. Nonetheless, an argument can be made that these first attempts to reveal the material core of the social universe have often undermined the active nature of material culture by placing the ‘social’ over the material. As a result, things, very often become a mere passive substratum for the social to project or imprint itself upon (see also discussion for a symmetric archaeology: Webmoor & Witmore 2008; Webmoor 2007; Shanks 2007). Thus, for instance, Appadurai’s focus on the intimate linkages between commodities and sociality, successful as it may have been in revealing the dynamic and transactional character of ‘things-in-motion’ (Appadurai 1986, 5), nonetheless kept that

motion a prisoner of some ‘closed’ social universe. But surely this ‘motion’ must have some effect or leakage to the human mind. Even Alfred Gell’s subsequent famous treatment of object-agency and extended selfhood fails to consider the huge implications that the proposed ‘isomorphy of structure’ between mind or consciousness and the material world holds for the study of mind. Extremely powerful metaphors, such as Gell’s description of the Kula exchange system as ‘a form of cognition’ where ‘internal’ and ‘outside’ transactions have fused together (1998, 231–2) are left hanging somehow in a parallel anthropological universe. Yet, as far as the study of mind as an extended and distributed phenomenon is concerned, the distance between Gell’s example of New Zealand Maori meeting houses (1998) and Otto’s notebook from the famous Clark & Chalmers’ paper (1998) discussed below, is closer than one might think.

Arguably an important dimension of the ontology of things was left untouched: that is, the relationship or interface between cognition and material culture. But as long as we fail to pay proper attention to this crucial domain of human phenomenology, the much advocated ‘return to things’ will remain only partially realized. It was our strong conviction of the importance of the cognitive dimension of this interaction that motivated our efforts for some years now to establish a new theoretical foundations that could help us overcome the numerous problems and pitfalls that common-sense ideas about minds and things encompass. Material Engagement Theory (MET) (Malafouris 2004; 2005; Renfrew 2004; 2006; 2007), which forms the basis for this volume, represents our ongoing attempt to redress the balance of the cognitive equation by bringing materiality into the cognitive fold. The present publication is part of this ongoing project of Material Engagement. The purpose of this interdisciplinary volume, which derives from a symposium that took place in the McDonald Institute for Archaeological Research, Cambridge (7–9 April 2006), is to further our understanding of minds and things by placing its focus explicitly upon the cognitive efficacy and the dynamics of past and present material culture. What do things do for the mind? How is human thought built into and executed through things? What is the role of the brain in our embodied engagements with things? What kind of relationships and what types of interactions can be used to describe the vital connections between brains, bodies and things? Are things component parts or external media of human cognition? These challenging questions are explored through a series of innovative papers, attempting to develop a more detailed understanding and classification of the possible affective links between cognition

and material culture. We also need to clarify that our shift in focus from the social to the cognitive life of things does not mean to imply that we ontologically separate two realms of experience, i.e. the cognitive and the social. Choosing to speak about the 'cognitive' rather than the 'social' life of things is a methodological, or else, an analytical strategy. To a large extent the two types of life remain inseparable aspects of human intelligence. What changes is our perspective: it is one which we hope will help us reshape how we understand the richness of expression and variation of the human mind *through* the material world.

How can things have cognitive life?

As the title of this book states, and as the philosopher of memory J. Sutton has also very successfully underlined, 'things, natural as well as artificial, also have a *cognitive* life' (2002; 2008). But how can things have cognitive life? How can such a term, i.e. the cognitive life of things, be best understood? One common way to answer this question is to think in terms of concepts, categories and internal representations (e.g. Margolis & Laurence 2007). Things, then, become what the human mind and language makes of them, e.g. images, percepts, concepts or mental tokens. This is how most analytical philosophers, anthropologists and developmental psychologists would approach the role and meaning of things in human life and cognitive development. We should also keep in mind that a similar representational or referential logic has been the grounding premise of symbolic archaeology which understands the meaning of a thing as a 'signifier' object that 'stands for' a preformed idea or concept (the signified) (see Preucel 2006; Renfrew 2001a,b; Knappett 2002; Coward & Gamble this volume). On this construal, the cognitive life of things is reduced to their ability to act as semiotic mediums of representation and to amplify cognition. Indeed, one basic sense in which one may speak of the cognitive life of things and which is familiar within cognitive science is that of the 'cognitive artefact'. Cognitive artefacts, either in the sense of 'exograms' (Donald 1991; this volume), 'tools for thought' (Dennett 1996), or 'epistemic actions' (Kirsh & Maglio 1994) are essentially cognitive amplifiers or what Don Norman (1993) would call 'things that make us smart'.

We do not wish to deny, of course, that people do often think, talk about and use things in the above ways. We suggest, however, that representational phenomena and properties of the above sort are at best the shadows of what in this volume we call 'the cognitive life of things'. What we are after in this volume is something deeper. Our conception about the cognitive

life of things encompasses much more than a simple reconfiguration or spreading of our modes of mental encodings (from in-the-head to in-the-world). Our vision of the cognitive life of things is inspired more by the hybrid image of the potter skilfully engaging the clay to produce a pot, than by the linear architecture of a Turing-machine (Malafouris 2004; 2008c). In this book we seek to outline a fundamentally new outlook that will enable us to view the above issues in a new light. The problem is that when it comes to the question of how one approaches the cognitive life of things, most of our conventional ideas offer limited if any help. The reason is simple enough: most of the grounding assumptions on human psychology and the nature of human mind have been premised and discussed in the absence of material culture (see also Costall & Dreier 2006). Cultural experience and social parameters were generally there to exert some influence at least in some schools of thought (e.g. the Russian activity theory school: see Vygotsky 1978; 1986; Wertsch 1991), but things were always missing. The 'cognitive life of things' is our way of rethinking how to conceive the existence of material objects and the role of humans in their mutual **technosocial** transformations (Clark 2008a,b; Latour 2005).

How then should we proceed? Obviously, things, like minds, are notoriously difficult to define. At one extreme, philosophy seems to struggle embedding the 'ghost in the machine' in its new embodied environment, and to redefine its material status in the light of new ideas and findings in cognitive and social neuroscience. At the other end, the recognition, in archaeology and anthropology, of the 'active' nature of material culture, opened new avenues of interpretation but also gave rise to a number of ongoing controversies about the precise meaning and use of terms like things, objects, materiality, material culture, material agency, materials etc. (e.g. Buchli 2004; Gosden 2004; 2005; Ingold 2007a,b; 2008a; Knappett 2002; 2007; Knappett & Malafouris 2008a; Latour 1999; 2005; van der Leeuw 2008; Meskell 2005; Miller 2005a; Olsen 2003; Shanks 2007; Thomas 2004; 2007; Webmoor 2007; Webmoor & Witmore 2008). To take a recent example, consider Tim Ingold's wet-stone experiment from his 'Materials against materiality' (2007a). In this paper Ingold urges us to find a stone, immerse it in a pail of water and place it before us on our desk, so we can observe its gradual transformation from wet to dry. Ingold's purpose in this example appears to be twofold. On the one hand, he wants to remind us of the need to engage directly with the very stuff (in the sense of materials and physical properties) of the things we want to understand and their constant transformations. On the other hand, he wants to underline what he considers

as the principal problem and obstacle to the study of things, i.e. our slippage from materials to materiality. For Ingold, so long as our focus is on the materiality of object ‘it is quite impossible to follow the multiple trails of growth and transformation’. Thus we remain unable to account for why, over time, stone changes as it dries.

It is becoming increasingly recognized that even basic words like ‘things’, ‘objects’ and ‘artefacts’ are not as neutral and unproblematic as they may appear in our everyday use of them. What, for instance, is that thing which in archaeology we call ‘material culture’? Is it a modern archaeological invention (Thomas 2004; 2007) which we have placed between the past and our modern conceptual apparatus? Is it a new name for the old Aristotelian *hylomorphic syntheton* of matter and form? How does this term, i.e. material culture, relate to other similar terms we use to describe the world of material things? As Carl Knappett observes in his contribution (this volume), our tendency to use these terms interchangeably often does not allow us to glimpse a **more nuanced vision of their subtle differentiations**. For instance, the inalienable, ambiguous and unquantifiable character of ‘things’ can be contrasted with the alienable, named and quantifiable character of ‘objects’ (Gosden 2004, 38–9; cf. also the growing literature of so-called ‘thing theory’: e.g. Brown 2001; 2003; Mitchell 2005; Schwenger 2006). Consider one specific example: the term artefact. Obviously ‘artefact’ implies some kind of human intervention, planning or intentional modification. But, and returning to Ingold’s wet stone mentioned above, one could ask: Is having been moved and placed on our desk sufficient modification to call this stone an artefact? If it is not, would there be a difference if we had use the stone instead as a paper weight? These questions may sound trivial and removed from the reality of current archaeological problems, but consider a classical example with huge archaeological implications, i.e. the ‘Acheulean handaxe’. When and how did this thing become an artefact? (see Malafouris this volume; cf. Sperber 2007, also Ingold 1998).

We suggest that the way to proceed in tackling those issues is by shifting our attention away from the sphere of isolated and fixed categories (objects, artefacts etc.) to the sphere of the fluid and relational *transactions or relations between* people and things.

But certain clarifications are in order before we proceed. As mentioned, things, like minds, are hard to define. The ‘thingness of things’ is a highly unsettled and ontologically fluid state. One could say that things exist in a constant state of *ontological deprivation*. They remain fluid, formless and plastic; waiting to take the shape of our cognitive projections which inevitably

vary in different times and places. Thus, no precise and closed definition of things should be expected. But this lack of analytic precision about necessary and sufficient conditions is not, however, a reason to abandon our current enterprise. **On the contrary, methodologically speaking**, it can offer a tactical advantage well fitted to our purpose in this book, which is to refine our conceptual tools and categories. For one thing, a common-sense understanding of these terms is sufficient to identify the target of our investigation and to serve our theoretical purposes. For another, the lack of analytic closure enables us, when necessary, to transgress or violate some of our common-sense assumptions about what minds and things are, and about how they relate and connect to each other. More importantly, this can help us highlight the key problem of the meaning of minds and things. This problem arises because we keep seeing minds and things as separate categories. A common thread that runs through and unites most chapters in this book is that minds and things are in fact continuous and *inter-definable processes* rather than isolated and independent entities. By knowing what things are, and how they become what they are, you gain an understanding about what minds are and how they become what they are — and vice versa. Unfortunately, the possibility of such an ontological coalition, or, in fact, co-extension of the mental with the physical has been all but ignored. In this book we seek to encourage attention to the complex ‘cognitive ecologies’, by which, as Hutchins discusses (this volume) cultural things domesticate the embodied imagination. Inside these ‘cognitive ecologies’ ‘all of the elements and relations potentially interact with one another and ... each is part of the environment for all of the others’.

Obviously then, if a more precise definition or delineation of minds and things is to be sought, this will have to come at the end of our investigation. For the present we suggest that there are two principal ways in which the meaning of the term ‘cognitive life of things’ can be understood.

Firstly, and ontologically speaking, things can be said to have a cognitive life insofar as things are constantly implicated in networks, or better ‘meshworks’¹ of material engagement. More simply, things have a cognitive life because minds have a material life. Thus, very often, what we call an ‘object’ is part of what we call a ‘subject’. In short, things *are* us or can *become* us (cf. symmetrical archaeology: e.g. Webmoor & Witmore 2008). Things have a cognitive life because intelligence exists primarily as an enactive relation between and among people and things, not as a within-intracranial representation (Gosden this volume). In that sense, the cognitive life of things denotes

the mode of being of the 'active mind' which is to be contrasted with 'objecthood' as the mode of being of the 'passive mind'. The way to understand this is by starting to see materials, objects and artefacts as gradations or ontological moments in the cognitive life of things. This means very simply that the cognitive life of a thing can be that of an object (via objectification) or an artefact (via intentional use and/or modification). The above process, of course, is far from linear and fixed, although it may seem so in a given context and portion of space-time that characterizes their historical conception, production and consumption. For instance, any artefact can become a thing in a different context. As Goodwin nicely illustrates discussing the processes through which archaeologists makes sense of their findings, situations in which an actor encounters a thing in the world and is faced with the task of classifying it, determining 'What kind of thing is that?', are central to the cognitive life of things (this volume). It is amongst these fine distinctions between thing, object, and artefact that the meaning of the cognitive life of things can be found, that is, as a process that characterizes and allows for the passage and interaction between the states of *thingness* and *objecthood*.

Which brings us to the second major sense in which the term 'cognitive life of things' can be understood: as with the term 'Material Agency' (Malafouris 2008c; Knappett & Malafouris 2008a,b) it acts as a wake-up call. That is, it is introduced to counteract the prevailing assumption that only humans have cognitive lives, or agency (see also Knappett this volume). As mentioned previously, Appadurai used the notion 'social life of things' to express, but also stimulate, a kind of *methodological fetishism*, i.e. a return to the things themselves as socially alive and active in a primary sense (1986, 5). We believe that if we are to develop a discourse able to penetrate the mutual constitution of cognition and material culture, and thus radically reconfigure our image of the boundaries between persons and things, then a kind of methodological fetishism is perhaps the necessary pre-condition. Such a 'methodological' fetishism will enable us to think about interfaces in terms of mutual permeability and binding rather than separation (cf. Ingold 2008a). The cognitive life of things embodies the spirit of such methodological fetishism, essential in undertaking this key task of recasting the boundaries of mind. We do not animate things by putting a 'spirit' in matter; instead we seek to discover the 'spirit' of matter (see also Pels 1998, 91).

Having set out the basic conceptual and theoretical background of this book let us now turn to some key issues about archaeology and the extended mind that seem to underline and connect all the chapters of this book.

Archaeology and the extended mind: prospects, worries, challenges

At the nub of this book, as well as of the material-engagement approach itself, lies the so-called hypothesis of the extended mind. In fact, what we call the 'cognitive life of things' would make little sense and would be of limited cross-disciplinary value and applicability were it not for the philosophical background of current theorizing about the extended, distributed and embodied mind. A key question to ask then, is what exactly *is* the Extended Mind Hypothesis, and how precisely does it relate with the perspectives advanced and the examples discussed in this book?

Put simply, the extended mind is a new, radical and much contested thesis over the mind's *location*. A useful way to illustrate this thesis, is to place it against the divide between, what are known in recent philosophy of mind as *internalism* and *externalism* (see e.g. Wilson 2004; Wheeler 2005; Clark 1997; 2007; 2008a,b; Clark & Chalmers 1998; Adams & Aizawa 2007). Very briefly, internalism is the position which sees the content of mental states as determined by features of the subject without resource to 'external', 'non-biological' conditions. The methodological implication of this is that cognition can be studied independently of any consideration of the external environment, the body or the material world. Internalism can be contrasted with the view of externalism which recognizes that the content of a mental state is in part determined by elements of the external world, and thus, that cognition cannot be studied independently of the external environment (social or technological). The extended-mind thesis takes the externalist outlook a step further by arguing that not only the mental content but also the mental process (or at least part of it) can be external to the subject. This perspective became known as 'active externalism'. At the nub of this perspective lies the famous and much debated 'parity principle':

[I]f, as we confront some task, a part of the world functions as a process which, were it to go on in the head, we would have no hesitation in accepting as part of the cognitive process, then that part of the world is (for that time) part of the cognitive process (Clark & Chalmers 1998, 8).

To illustrate this principle let us use the case of memory in Clark & Chalmers's (1998) original example of Otto and Inga. Both Inga and Otto want to visit MOMA in New York but they forget where the museum is. Inga stops, consults her memory, after a moment or two remembers the museum's location and goes on her way there. But Otto is an Alzheimer patient. He, thus, keeps all necessary information (in our case the museum's address) in a notebook, which he

carries around everywhere he goes, so he can look it up whenever needed. In contrast to Inga, then, Otto needs to consult his notebook, rather than his biological memory, to find the museum's address. It would not be an exaggeration then to say that for Otto, his notebook plays a special, constitutive role in his ability to remember. Thus, the following question confronts us: Should we see Otto's notebook as an instrument or substitute of his memory system or as, literally, a 'part' of Otto's mind and self (Clark & Chalmers 1998)? Or to put it another way, so far as the function of memory as a cognitive process is concerned, what is the difference between the two cases of Otto and Inga?

There are many different ways to answer this question, and many potential pitfalls in any attempt to spread the operations of mind beyond skin and skull. One fundamental issue relevant to the parity principle which is addressed explicitly in the chapter by Michael Wheeler (this volume) but also taken up in many other chapters, concerns the question of deciding 'what the benchmarks are by which parity of causal contribution is to be judged'? Wheeler suggests that the *wrong* way to answer this question is first to 'fix the benchmarks for what it is to count as a proper part of a cognitive system' and then 'look to see if any external elements meet those benchmarks'. In other words, first to take the properties of the brain as the yardstick of what is to count as cognitive and then see whether there are things that manifest those properties. This strategy, although useful in some respects, must be wrong because it deprives us of the ability to discover whatever unique properties might differentiate the cognitive life of things from the cognitive life, let's say, of neurons.

To understand better this problem consider again the case of memory. This time let us use the example of a Mycenaean Linear B clay tablet (Ventris & Chadwick 1973) as a prototypical 'exographic' device and cognitive artefact. One way to read the parity principle is the following: If 'exograms', that is, Linear B tablets, *act* as engrams do, then 'exograms' count as parts of memory. At a certain level this might appear precisely the point that the extended mind and the material-engagement approach are making. But such a simplistic isomorphic reading of the parity principle is far from what we advocate, and can be considered to embody a number of serious drawbacks. For instance, what if what we call an 'engram' was first described on the analogue of what we now identify as an 'exogram'? Or, more important for our present purposes, what if 'exograms', although active and constitutive parts of memory, are different in important respects from what we know concerning the function of the engrams? What if, in other words,

clay tablets and brains store information in radically different ways?

Indeed, it cannot be too strongly emphasized that a Linear B tablet, like many other technologies of remembrance or forgetting, seen as an 'external' memory resource, differs a great deal from what we know about the workings of biological memory (for a more detailed discussion see Malafouris *in press*; 2004). As Merlin Donald was one of the first to point out and lucidly discuss in his contribution 'unlike the constantly-moving and fading contents of biological working memory, the contents of this externally-driven processor can be frozen in time, reviewed, refined, and reformatted' (Donald 1991, 308–19; 2001; this volume). The reformattable nature of exograms allows for information to be altered and then re-entered into storage in ways that an engram clearly cannot afford. Meanwhile, although in the case of exographic storage, recall, is determined primarily by the nature of the stored representation, in the case of engrams, the context of recollection is as important as the nature of encoded traces (see Malafouris *in press*). Finally, although we can assume that whatever properties an engram might have they will remain constant between humans, in the case of exograms there is a great cultural diversity in their properties. For instance, knots, rituals, and khipu strings differ a great deal in how they activate human memory and thus in the possibilities of cultural transmission that they offer (e.g. Connerton 1989; Van Dyke & Alcock 2003; Jones 2007; Kwint *et al.* 1999; Mack 2003).

These problems of the 'parity principle' need to be underlined, or else, we run the risk of committing three serious category mistakes which can be described as: (a) failure to recognize the important differences between the 'internal' or 'biological' and 'external' or 'technological' aspects of human memory (see also Donald this volume; 1991, 315); (b) failure to identify the ongoing and often irreducible structural coupling of the 'internal' and 'external' element in the social construction of memory; and finally (c) failure to recognize that external resources really matter (causally and ontologically) in their own specific ways, and thus, need careful attention and examination in the study of memory. One of the biggest challenges for archaeology then, is to reveal the variety of forms and the diversity of feedback relations between objects and the embodied brain (Sutton 2002; 2008). This also implies that neither the claim for functional isomorphism nor the sort of structural or ontological isomorphism that the parity principle embodies can do full justice to the constitutive intertwining of mind with the material world (Malafouris 2008a). Instead of seeing the Linear B tablet or Otto's notebook as

the artificial cultural equivalent of a hippocampus we need to look for the peculiar emergent properties of these brain–artefact interfaces (BAIs) (Malafouris 2009). Both engrams — seen as internal ensembles of neurons — and exograms — seen as external ensembles of material structures and scaffoldings — taken in isolation in their well-confined and neatly articulated environments of brain and culture, are lifeless. The cognitive life of things, like the cognitive life of brains, can be found where engrams and exograms start spiking, interacting and complementing each other, so that memory emerges.

It is important to clarify here that for MET and the version of the extended mind that this theory advocates, the parity of outer and inner cognitive elements does not mean to imply an identity but instead a synergy; a constitutive intertwining of brains, bodies and things that unfolds in real time and space (Malafouris 2008a,b; 2009). What ought to count as part of the mind is not to be found either by looking inside the head or by trying to find those ‘outside’ processes or material structures that resemble the ‘inner’ process of the human brain (Malafouris 2004). The parity principle in the context of MET does not require or imply an identity of mental causal contribution. It is introduced, instead, as a measure to ensure what Clark (2007, 167) would call ‘equality of opportunity’, or else, a ‘non-anthropocentric’ (Knappett & Malafouris 2008a) ‘symmetric’ (Shanks 2007) view of mind, self and agency. The parity principle is there to remind us that quite often, although it escapes our conscious attention, the implications of removing or damaging a part of the world, equals that of removing or damaging a part of the brain. Are we not, by removing the blind-man’s stick, preventing him/her from seeing?

But let us return to Wheeler’s question about how to decide ‘what the benchmarks are by which parity of causal contribution is to be judged’? Given our previous points is there any way that such question-begging can be avoided? Wheeler proposes an alternative strategy. First, and independently of location, we define what elements, entities or properties should count as proper parts of a cognitive system. Then, we look to see where these cognitive components happen to be located with respect to the internal–external boundary. The question that arises then is what is a proper part of the cognitive system and what sort of things can really be *parts of the machinery of thought*?

The chapter by Andy Clark (this volume) addresses directly the heart of that issue by advancing a new, interesting proposal, which focuses on the idea of ‘surrogacy’ or of ‘surrogate situations’. In particular, Clark introduces the term ‘surrogate material structures’ referring to any kind of real-world structure,

artefact or material assemblage that is used to stand in for, or take the place of, some aspect of some target situation, thus, allowing human reason to reach out to that which is absent, distant or otherwise unavailable. He points out two interesting and often unnoticed properties of many surrogate situations. The first property is the way they highlight key features by *suppressing* concrete detail; the second pertains to the way they relax temporal constraints on reasoning. It is these properties of surrogate material structures, Clark argues, that make it possible for the human mind to come to believe things that it would never otherwise come to believe or imagine. Religious artefacts, for example, enable us to use basic biological skills of perception and manipulation to penetrate absent, abstract or non-existent cognitive domains that we would otherwise find impassable. This is the way, according to Clark, that ‘mere things’ come to participate richly in our cognitive life, as parts of the extended circuitry of human thought.

In a complementary way, Edwin Hutchins (this volume; 2005) shows in his paper, that physical relations, even those realized in the modern sophisticated hi-tech environment of a modern flight copkit, can become proxies for conceptual relations, or, what he calls, ‘material anchors for conceptual blends’ (Hutchins 2005). These physical relations and interactions between the body and cultural artefacts should not be taken as mere ‘indications’ of ‘internal’ and invisible mental processes, they should rather be taken themselves as an important form of thinking. This is also why for Hutchins — Goodwin also makes a similar argument (this volume) — the understanding of the cognitive life of things, requires, above all, that we understand the full range of commitment of our embodied engagements with things. It is these embodied engagements and not the isolated brain which creates mechanisms for reasoning, for imagination, for ‘Aha!’ insight and for abstraction. Cultural things provide the mediational means to domesticate the embodied imagination.

At this point, a further potential problem with the extended-mind hypothesis should be discussed. This possible drawback with the extended-mind thesis is that it remains overwhelmingly computational. Although ‘active externalism’ has drastically expanded the territory of mind into the material world, it fails to move beyond its computational heritage: minds are being recognized and reconfigured as dynamic embodied machineries, but remain, above all *problem-solving* machines. The computational system is now ‘wide’ and extends beyond the limits of ‘the organismic boundary’ (e.g. Wilson 2004, 165), but still, it remains a computational system. Things

are simply the long-neglected parts of our problem-solving economies and computational routines. Seen from such an angle, the cognitive life of things remains primarily a computational life (Wheeler 2005; Wilson 2004). Things emerge as 'genuine' parts of extended but nonetheless problem-solving regimes (see Clark 2008a, 47). Or, put in evolutionary time, things are simply a good and efficient way to promote fluid and efficient problem-solving and adaptive response. But, one could ask, why this over-emphasis on the transformative power of non-neural structures to the human problem-solving capacities? The answer is simple: because this is primarily what a human mind supposedly does — at least this is what a big part of contemporary philosophy and cognitive science thinks that it does.

We suggest that such a narrow focus is deeply problematic leaving 'a lingering ghost within the machine' (Gosden this volume). In order to overcome this residual cognitivism a temporal, agentic and affective dimension must be added to the initial spatial metaphor of an inner mind that is being extended in the outside world. We need to look at the ways in which things inhabit space and explore inter-artefactual relations and object/thing communities (Knappett this volume). As Chris Gosden rightly points out, a notion of mind, even when extended, is not helpful if it does not take under serious consideration the sensual, affective and emotional aspects of human intelligent behaviour. Things have a strong affective response. The recent collection of autobiographical stories on the evocative nature of things by Sherry Turkle (2007) nicely illustrates that the true power of everyday objects and things lie in their ability to become our emotional companions as much as they become our intellectual anchors. When it comes to object relations and material engagement, thought and feeling are inseparable. For Turkle things, above all, are companions in life experience that can take multiple and fluid roles (2007, 5–6). Moreover, as archaeology and anthropology can amply testify, things are not simply tokens or surrogates in some 'external' or 'internal' problem-solving activity. Things also, if not primarily, act as material agents to be seen, exchanged, deposited, owned, valued, priced, manipulated, feared, fetisished, revered, ridiculed etc. The sensual properties and aesthetic experience of things are key elements here (e.g. Gosden 2004; 2005; Jones 2007; Renfrew 2003; Thomas & Pinney 2001). Thus these elements should be foregrounded rather than become subsumed under the information-processing and problem-solving ideals of what was for many decades the dominant way of thinking about human mind in philosophy, archaeology and cognitive sci-

ence. If the idiosyncratic abilities of objects, past or present, to make us forget and remember, guide our everyday action, channel and signify social experience, and sustain our embodied routines, are to become understood, then our modern representational or computational preoccupations should be resisted if not entirely by-passed.

Implications for the archaeology of mind and the philosophy of matter

As it can be seen from the discussion so far, in this book, we have tried to reformulate the question of human cognition in a manner that would probably have puzzled most archaeologists, anthropologists and philosophers some decades ago. Drawing on the hypothesis of the extended mind we have depicted human cognitive processing as sometimes quite literally extending into the extra-organismic environment. As we saw, this is not simply the view, much more compatible with common sense, of a cognitive agent that depends heavily on organismically external props and tools. Instead it is the more radical idea that human cognitive, affective and emotional states and/or processes, literally, comprise elements in their surrounding environment; a view that even at this very moment few people are willing to defend.

But why does it matter, for archaeology, where the boundaries of mind are being drawn? How precisely does this relate to the study of material culture? What is it that the emphasis of this book in the cognitive life of things has to offer in the ways we understand the human past and its cultural variation? We want to end our paper with some remarks on the implications of the perspective advanced in this book for the future of archaeological thinking and the study of mind and material culture. We are confident that, especially for the archaeology and anthropology of mind, the focus on the cognitive life of things and the hypothesis of extended mind, far from a simple terminological shift, carries with it major implications in terms of how we go on to study human cognition past or present.

Here, in summary, are some of the envisaged transformative effects and implications.

Starting at the level of method, one immediately obvious consequence, and potential pay-off, as Wheeler also recognizes (this volume), is nothing less than a reconfiguration of the intellectual landscape inhabited by the archaeology of mind. Embracing and beginning to understand the cognitive life of things means that archaeology no longer condemns material culture to a life outside of cognition proper. As a consequence of that, past ways of thought need

not just be *expressed in* material culture, but now can also be seen as partly *constituted by* material culture (see esp. Malafouris's discussion of the Acheulean handaxe, this volume). Thus, past ways of thinking can be now studied in a more direct fashion with material culture furnishing 'literally parts of (no longer functioning) minds' (Wheeler this volume). This puts material engagement at centre stage in the study of mind and cognitive evolution. The archaeologist, thus, 'needs not be reduced to the unhappy state of being a frustrated mentalist condemned to materialism' (Knappett 2005, 169). Mind and matter are one. This stance also qualifies material culture as an analytic object for cognitive science, warranting the use of methods and experimental procedures once applied to internal mental phenomena for use upon those that are external and beyond the skin. At the same time, a cognitive archaeology that is no longer committed to an 'in-the-head' ontology of mind is better protected also from the recently emerging neurocentric attitudes. This is particularly important in the developing field of 'neuroarchaeology' where there is a strong temptation to locate all that really matters in human cognitive evolution inside the head (see Malafouris & Renfrew 2008; Malafouris 2008a; 2009; Renfrew *et al.* 2008). MET and the extended-mind thesis reminds us that the role of brain-imaging, however convincing and enchanting as a statement about the inner workings of the human brain it might be, should under no circumstances be confused, as mainstream neuroscience often seem to suggest, with that of a device able to delimit the realm of the 'truly cognitive'.

Another transformative effect that the focus on the cognitive life of things has is that it forces archaeology, and other disciplines, to take *material culture seriously*. We have seen that the spreading of mind transforms material culture to an important cognitive extension, not in some symbolic or other representational sense, but in a more immediate and organic way. Obviously, this has major implications for our understanding of the role of things in the context of human evolution, technology, ethics and the modern laboratory. Moreover, the study of things is important not simply for the ways they can extend the properties of mind to the external world (and possibly vice versa), but importantly, because they are capable of changing the established ways these cognitive properties are approached and defined. Take for instance the example of a house as an intelligent object: 'houses are not mental extensions, but containers, shapers and complex products of human action all at once' (Gosden this volume). Such a conception also carries with it a complex, and altogether distinctive, understanding about the temporality of human thought.

We hope that the cognitive life of things will also help us to understand better the qualities of time and the complex ways these become embodied and realized in different cultural processes. No doubt time, and thus consciousness and human intelligence, operates at different speeds, ranging from the millisecond of neural activity to the slower rates of muscular time to the millennia of human evolution. Focusing on the cognitive life of things will help us move across the scales of time and construct valuable analytic bridges between temporal phenomena that operate at different experiential levels (see Gosden's paper this volume).

Furthermore, a key issue in recent discussions over materiality, especially in anthropology and archaeology, has been about whether the focus of material-culture studies should be on objects as 'end products' and their consumption or on the processes responsible for the formation of things and objects. The cognitive life of things calls into question this deeply embedded analytical divide and offers the building blocks for a cross-disciplinary unifying framework. This framework ascribes no analytic primacy and, when possible, blends production and consumption. The concern is now with the dynamic flow, transformation, transmutation and transubstantiation of hybrid materials between person and things, nature and artifice, biology and culture.

This has also a great impact on our conceptions of agency and persons. It offers archaeology and anthropology a whole new means to approach the embodied and environmentally situated character of human and non-human agents. Last but not least, it has major implications on what it means and how we came to be human. The vision of cognitive evolution that the cognitive life of things may help us bring into focus is one that does justice to the symbiotic triad of brains, bodies and things that occupies the crux of the Material Engagement approach and our vision of 'neuroarchaeology' (Malafouris & Renfrew 2008; Malafouris 2008a,b; 2009). The cognitive life of things *is about things in motion*; it is about hybridity, fluidity and genuinely interactive relationships between brains, bodies and things. Finally, it is about the active mind as a process of *tectonoetic awareness*, i.e. *being at the same time mental and physical* (Malafouris 2008b). Of course, simply to speak about dynamic connections and symbiotic relations is not, nowadays, saying or assuming much. What is needed is a method that will enable us to penetrate the specific dynamics through which these connections are effected and sustained as well as an efficient way to describe the cognitive properties which arise from the interaction of people and things. A change of focus and a new conceptual vocabulary is required. In this book we propose that

the cognitive life of things may offer such a conceptual means for doing away with conventional ideas of mind and replacing them with a new perspective that will enable us to think differently about the place of the material world and of human embodiment within it.

Note

1. The idea of 'meshwork' derives primarily from the philosophical materialism of Deleuze & Guattari (1987) and their basic sense of 'rhizomatic' thought. The concept of 'meshwork' suggests a network of heterogeneous elements that grow in unplanned directions as well as a partnership and interaction with the material in morphogenetic production (see also Varela 1991). For extensive discussion of the concept of 'meshwork' see de Landa (n.d.); for its differences with the notion of 'network' as discussed especially in the context of Actor-Network theory (ANT) see especially Ingold (2007a).

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