

Chapter 3

Material Agency, Skills and History: Distributed Cognition and the Archaeology of Memory

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Introduction

If cognition is distributed as well as embodied, then explanation in cognitive science must often highlight more or less transient extended systems spanning embodied brains, social networks or resources and key parts of the natural and the cultural world. These key parts of material culture are not simply cues which trigger the truly cognitive apparatus inside the head but instead form “a continuous part of the machinery itself”, as “systemic components the interaction of which brings forth the cognitive process in question” (Malafouris, 2004:58). On this view, cognitive science is thus not just the study of the brain: indeed, even neuroscience cannot be the study of the brain alone, for brains coupled with external resources may have unique functional and dynamical characteristics apparent only when we also attend to the nature of those resources and the peculiarities of the interaction. This chapter argues that if cognition is indeed thus distributed, then cognition is also historical and heterogeneous and must also be analysed diachronically and differentially. If mind is extended, that is to say, then historical cognitive sciences are essential to the interdisciplinary enterprise.

This is not just because individual brains themselves are “biosocial organs permeated by history” (Cowley, 2002:75) but also on the longer scale because of dramatic historical diversity in the nature, properties and use of cognitive artefacts. According to Andy Clark, “the single most important task” for “a science of the bio-technological mind” is to understand “the *range and variety* of types of cognitive scaffolding and the *different* ways in which non-biological scaffolding can augment (or impair) performance” (Clark, 2002:29, my italics). Unique historical and cultural features of human beings extended cognitive make-up are thus not accidental extras added to a basic biologically given mind. Rather, such changing media, objects, routines, institutions and practices have

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long been integral parts of the coordinated, interactive cognitive systems in which our characteristic plasticity is revealed, engaged and transformed.

Although Clark and other enthusiasts of distributed cognition push on to analyse our couplings with *new* cognitive technologies, there is nothing ‘post-human’ about the framework itself: if we are natural-born cyborgs now, we always have been. So while some historical, anthropological and archaeological investigations of independent interest can be given a new twist in the light of distributed cognition, they should also help us further develop specific ideas within that theoretical framework (Sutton, forthcoming, a). The nature and extent of diversity in activities of remembering and reasoning, imagining and decision-making, acting and feeling has to be tested across detailed case studies of specific historical periods and cultural contexts. Because neural, bodily, material and social resources can *complement* one another while retaining their own dynamics in making their distinct contributions to integrated cognitive systems, the extent of such integration with external resources varies on a range of dimensions: the context-dependence of flexible intelligent activity itself varies with context, and on occasion – for some individuals or in some unique cultural situations – some activity of embodied brains will be relatively shielded from their environment.

A key current task, then, is the identification of these significant dimensions of variation in constructing better typologies of distributed cognitive systems. What are the synchronic and diachronic principles of coordination between diverse components? What are the different forms of coupling, involving distinct forms of availability and use of external resources? How truly interactive are particular emergent systems and how durable? Cross-cultural and historical data, understandably, have not typically been consulted by those theorists currently working towards a multidimensional framework by addressing these questions (Clark and Chalmers, 1998; Kirsh, 2006; Poirier and Chicoisne, 2006; Sutton, 2006; Wilson and Clark, forthcoming). But alongside relevant work in more recent cultural and cognitive history, which I discuss below, cognitive archaeology can contribute directly to this task both by offering detailed case studies and by broadening theoretical horizons in cognitive science. There are rich resources for these debates, resources of which the broader cognitive scientific community should be better aware, in research on memory in traditions of archaeology which have not explicitly or deliberately engaged with distributed cognition (Alcock, 2002; Ingold, 1998:40–42; Olsen, 2003; Rowlands, 1993; Van Dyke and Alcock, 2003; Williams, 2004). But for now, I focus on a series of related challenges which have already been put directly to the distributed cognition/ extended mind frameworks by cognitive archaeologists, challenges which for the purposes of this chapter I take to be crystallised in an important recent discussion by Lambros Malafouris (2004) of “the cognitive basis of material engagement” (compare also Knappett, 2004, 2005). I develop my case hereby seeking to clarify these challenges and to begin to address them. I deal with issues about history and dynamics, about interactivity and material agency and about skills and skill memory.

Exograms, History and the Cognitive Life of Things

Culturally specific technologies and media, according to Merlin Donald's influential scheme, have constituted part of human cognitive architecture since the upper Palaeolithic period. In particular, changes since then in external symbol systems, which consist of arrays of retrievable traces or 'exograms', have dramatically altered the capacity and operation of human memory (Donald, 1991:308–333; 1998a). Identifying certain common features across the diverse history of external representations – body markings, grave decorations, hieroglyphics, maps, musical scores, writing systems, architectural diagrams and so on – Donald focussed our attention on the new cognitive profiles that characterise creatures (and societies of creatures) who can draw on these exograms in addition to neural engrams. Thoughts and memories, for example, become more durable and more easily transmissible and reformattable across media and contexts and are plugged in to vastly larger databases of inherited knowledge (Donald, 1991:314–9). Mark Rowlands built on Donald's work to argue that much of human memory is essentially (not accidentally) environment-involving and primarily consists in our ability to interface with a range of different collective memory networks (Rowlands, 1999:119–147, also drawing on important work by Rubin, 1995).

Because Donald's substantial treatment of extended memory systems did draw on a wealth of historical and cross-cultural evidence, it drew critical engagement and commentary from cognitive archaeologists interested in material agency (Renfrew, 1998, 2003; Thomas, 1998). Malafouris builds on this work in arguing that Donald's scheme is problematically restricted and incomplete. Due to his "preoccupation with 'exographic storage'", firstly, Donald cannot accommodate cases in which artefacts have "a dynamic cognitive biography", and neglects the unique and idiosyncratic socio-technocultural histories which archaeologists must study (2004:56). As a result, Malafouris suggests, Donald fails to allow for the active role of objects in coordinated interaction, his scheme too rigid in its assumption of "a passive external 'long-term' store" (2004:57). Further, Donald retains too much from classical cognitivism in his focus on straightforward, explicit information transmission, and thus his scheme is blind both to the nonsymbolic cognitive roles of artefacts and to the centrality of know-how and embodied skill in the many diverse ways we "think through things, in action" (2004:57–58). For these reasons, Malafouris thinks we need alternative frameworks to do justice to "the causal efficacy of materiality in the enactment and constitution of a cognitive system or operation" (2004:55). Such views of distributed cognition, he implies, unhelpfully treat the cognitive life of things in artificial isolation from their social life (2004:56).¹

¹ Malafouris repeatedly insists that analysis must include simultaneous attention to material, social and cognitive dimensions, and my responses in this essay seek to show that this is possible. Our views contrast with certain other strands within material culture studies in which the social and the cognitive are decentred or excluded: one recent collection advertises that its

In contrast, I will argue that we can and should, for the moment, rest content with the conceptual resources already in place in the conjunction of the general distributed cognition framework with Donald-style treatments of memory. The required modifications and extensions are more likely to emerge in the hard work of applying these frameworks to detailed cognitive- archaeological (or historical or anthropological or media-theoretic) case studies, than through any further theoretical radicalisation.² To make this case here I must address each of Malafouris's concerns in turn: but first, I need to supply some further background on the recent history of the extended mind hypothesis.

Despite its obvious interest to social scientists and archaeologists, Donald-style anti-individualism has been harshly criticised in mainstream philosophy of cognitive science. Adams and Aizawa, for example, assuming that exograms would have to be just the same as engrams to count as cognitive, argue that Donald's careful analyses of the many "ways in which the processing of exograms differs from the processing of engrams" in fact demonstrates that external representations are *non*-cognitive and that the mind is not extended after all (2001:58–59). They thus find it bewildering that Donald agrees with them that internal and external resources differ dramatically in representational format and dynamics, yet still sees cognition as distributed.

The skewed dialectic here results from an overemphasis, by critics and enthusiasts alike, on one route to the extended mind hypothesis, that based on 'Parity'. Clark and Chalmers' 'parity principle' (1998:8) states that an artefact is part of a cognitive process if it performs a function which would thus count as cognitive, if done, in the head. Among other problems with a sole reliance on parity to get the mind out of the skull (Menary, 2006; Sutton, forthcoming, a), this principle seems to allow for uncoupled material-cognitive agency, for things thinking or remembering away quietly by themselves. This encourages critics to scoff – "the black tie I wear at the funeral isn't doing my grieving for me" (Harris, 2004:729) – and tends to discourage attention to full and complex cognitive ecologies. This tendency was perhaps not helped by the way I initially introduced the notion of "the cognitive life of things" (Sutton, 2002) in an analogy which was as yet insufficiently attentive to the subtleties of its sources in Arjun Appadurai's edited collection *The Social Life of Things* (Appadurai, 1986; Kopytoff, 1986; see also Appadurai, 2005). Failing then to stress the assembled, interactive, reciprocal, integrated and integrative nature of distributed cognitive systems, I allowed material agency to appear isolated and self-sufficient. But of course invocations

constituent essays "signal the need to decenter the social within social anthropology in order to make room for the material" (Miller, 2005: back cover).

² Here I do not discuss one such radicalisation mentioned by Malafouris, the turn to 'enactivism' and to the work of Maturana and Varela. In another critical response to Malafouris, Mike Wheeler (forthcoming) argues that this tradition is in some tension with the extended mind hypothesis. Although I offer a different reading of Malafouris' discussion of skills and embodied know-how below, my response is compatible with Wheeler's and ends on a similar point.

of exograms and of the extended mind do not entail that external resources do the cognitive work on their own, as if the naked, uncoupled thing were any more autonomous than the naked, uncoupled brain.

Parity does capture the central anti-individualism of the Appadurai-Kopytoff framework: cognitive artefacts, like other socially embedded and culturally transmitted things are not merely passive commodities for the use and pleasure of the active mind (even though they can be thus constructed at specific times within their biographies). But for other central features of Appadurai-style analyses we need to move beyond Parity, to construe the relevant relation between inner and outer resources more as complementarity than as parity. Parity, for Clark, is best taken as an informal test, a place-holder for a “more interesting and plausible argument” for the extended mind, which turns on “the way external elements may play a role different from, but complementary to, the inner ones” (Clark, 1998:99). In the key cases, quite ‘alien’ and ‘disparate’ inner and outer components cooperate: while the brain does not need to replicate external forms of storage and computation, for example linguistic forms (Clark, 1997:220; 1998, 99), neither (as Donald shows) must artefacts operate in precisely the same way as brains do nor exactly mimic neural processing profiles.

Complementarity, then, explains why it is natural for cognitive archaeologists or media theorists interested in the extended mind actively to investigate differences between inner and outer resources. But it does not yet sufficiently flesh out the diachronic, biographical or historical aspects of the cognitive life of things. Appadurai and especially Kopytoff had underlined the utility of studying “things-in-motion”, entangled in complex networks of use which alter through time and across contexts. Indeed social motion is the medium from which the identification of artefacts can proceed by abstraction, for “all things are congealed moments in a longer social trajectory” (Appadurai, 2006:15). In analyses of case studies like the *kula* system of the Western Pacific and the trade in relics in early medieval Europe, these writers urged attention to the *processes* of engagement or detachment by which, over distinct phases of their “cultural biographies”, artefacts come to be more or less integral to social practices and identities. There is often intense labour and difficulty involved, both culturally and cognitively (Kopytoff, 1986:64), in making things act and in acting with things or indeed in stopping them acting or disposing of them. Actors actively couple collective or personal goals and projects to the life of things or play their parts in transferring artefacts from one social zone to another as they are singularised or commodified, as their history is either accumulated and highlighted or stripped away and flattened.

Distinct temporal scales are in play, further, when we analyse the cultural biography of specific things, on the one hand or the broader dynamics of classes or types of thing over a longer historical ebb and flow, on the other. Although cognitive archaeology must also deal with both of these “two dimensions of the temporality of things” (Appadurai, 1986:34–36), Malafouris is right to note that the complex framework of this kind of social theory just has

not yet been translated to the study of the cognitive dimensions of the life of things. Even Donald's scheme, based as it is on attention to diverse and tangled forms of coordinated complementarity between distinct inner and outer resources, remains in Malafouris' view too general. Using the example of Linear B clay tablets in the Mycenaean context, Malafouris argues that Donald is too focussed on passive exograms storing discrete contents: it thus neglects the diversity of materials which interact in culturally specific ways with socially embedded actors. The role of mnemo-technical artefacts, in particular, "is far more dynamic and dialogical than the one implied by the notion of a passive external 'long-term' store": instead, such artefacts "engage memory according to the interactional properties which they afford to particular actors in particular settings" (2004:56–57). Donald's "concept of storage" offers little help, Malafouris suggests, in understanding the active and diverse roles of objects in coordinated interaction.

Later I will address Malafouris's positive contributions about the centrality of skills and know-how in thinking-through-things. But first I sketch the resources available within distributed cognition to respond to his reasonable concerns, and discuss a parallel debate about distributed cognition and the cognitive life of things in early modern cultural history which may be instructive and of considerable interest to archaeologists. Initially it is worth pointing out that Donald himself already sought to answer similar criticisms directly. Discussing Thomas' (1998) reading of his work as classically computationalist, Donald confirms that his term 'external symbolic storage' was not "meant to exhaust all the functions of external symbols" and that "the 'storage' function of symbols can neither be isolated from their other functions nor from the minds that use them": further, he sees cognitive artefacts in use as "drawn into a maelstrom of shared cognitive activity in any culture" and argues that "their functions in the larger cultural matrix go well beyond mere storage, because they are in dynamic interaction with the entire cognitive-cultural system" (Donald, 1998b:184).

Yet legitimate worries remain, despite these disclaimers. In repeatedly stressing the radically different properties and dynamics of engrams and exograms,³ Donald remains primarily focussed on a certain class of external symbol systems, those which do retain as their key function the discrete storage of information even when they also play many other roles. Exograms in such systems have no *intrinsic* dynamics or activity, are not intrinsically integrated with other stored information and do no cognitively work in their standing or dispositional form (when not being currently used, manipulated or activated). This stress makes good sense in the context of mainstream philosophy of cognitive science, where we need to move beyond Parity considerations in motivating

³ Even in the response to critics quoted above, Donald's way of articulating the complementarity between inner and outer resources is to characterise the "biological memory" with which symbols engage as "a creative, constructive, dynamic force" in sharp contrast to artefacts which "are static things" (1998b:184).

distributed cognition. And Donald's historical point about the cultural-cognitive significance of this core difference also holds good: unlike the constantly moving contents of biological working memory, the products of thinking when reformatted exogrammatically could "be frozen in time, held up to scrutiny at some future date, altered, and re-entered into storage, in a repetitive, iterative process of improvement" (Donald, 1991:316). But this does not mean that we should homogenise all external cognitive resources or see that particular kind of storage as essential and inevitable.

A better way to see the stress on complementarity as a route to distributed cognition is as offering a typology or framework in which many quite different relations (and kinds of relations) between inner and outer resources can be understood (Sutton, 2006; forthcoming, a). External resources with different formats, dynamics and functions permit and encourage quite different kinds of interaction and coupling: the extended mind thesis, thus understood, is more an invitation to give detailed attention to such differences in particular contexts and case studies than a rigid new metaphysics of mind. Not all systems of exograms are meant to be permanent or of unlimited capacity or endlessly reformattable; and not all systems which are intended to endure actually do so in historical and cultural practice. Objects and media, both ancient and modern, may actively change in various ways which shape and influence potential coordinated cognitive interactions. And as soon as we acknowledge that other people may (in certain circumstances) form part of our external memory fields, with their own dynamic engrams potentially acting as exograms for us, it becomes clear that passive external words and images in no way exhaust the media in which cognition and remembering are situated and that materiality can have many different kinds of causal efficacy.⁴

In putting complementarity at the heart of distributed cognition, then, we acknowledge that relations between agents and artefacts may be asymmetric and tangled in different ways and thus that such relations are often dynamically reconfigured or renegotiated over time. But this means that a diachronic dimension will be inevitable in many analyses, because examining the cognitive role of things at a particular isolated time alone will precisely omit the *life* of that thing or class of things. Just as we cannot assume that every individual in some shared cultural context will couple and recouple with cognitive artefacts

⁴ In Sutton (forthcoming, a) I build on this point and on more recent work by Andy Clark, to outline an extra twist by which cognitive technologies do not have to be external at all, but include a range of internalised representations and symbol systems which we have learned (historically and developmentally) to manage with both idiosyncratic and culturally specified techniques. Language is just one of these inner prostheses: in that essay, I look at the medieval and Renaissance arts of memory as a further case study which problematises Donald's neat dichotomy between fluid engrams and stable exograms even further, and I suggest that the extended mind thesis can thus encourage us to develop 'a deterritorialized cognitive science which deals with the propagation of deformed and reformatted representations, and which dissolves individuals into peculiar loci of coordination and coalescence among multiple structured media'.

in the same ways, so we cannot assume that every such artefact will retain the same affordances across the various phases of its biography (De Léon, 2003; Knappett, 2004, 2005:35–63). Among the many relevant dimensions here are issues about design, control and power. The assignments of artefacts to roles and to users in distinctive complex cognitive economies may involve processes which are highly contested or which involve unintended consequences of other processes, which then constrain subsequent affordances and possibilities of use and interaction.⁵ So an interdisciplinary and historical cognitive science should expect to find deep heterogeneity not only in the nature and properties of media and objects which enter into distributed cognitive systems, but also in the available and actual modes of engagement with such objects over time.

Early Modern Material Agency

Before addressing further issues raised by Malafouris about our taxonomies of memory and about action and know-how, I want to digress by examining a parallel debate in early modern cultural history. Simply announcing that a diachronic dimension is essential or entailed by our conceptual framework, does not of course make it at all easy to identify or provide in particular cases. My claim that we are not far away from having adequate conceptual resources within current versions of distributed cognition will stand or fall on how well they motivate and fit with successful case studies across the disciplines. So only interactive dialogue between the theoretical frameworks and specialist studies of specific rich cognitive ecologies will allow us to extract a more mature and comprehensive approach to the socio-culturally embedded cognitive life of things.

Material culture studies and ‘thing theory’ have influenced recent cultural and literary-historical studies of early modern Europe, just as they have cognitive archaeology. As in archaeology, some of this work has been explicitly linked to the extended mind and distributed cognition approaches, but more has been motivated by independent developments within the field. A further striking parallel is that such studies have also been criticised for failing to incorporate evidence of diversity and change in the role of cognitive technologies over time across groups and cultures. Jonathan Gil Harris, for example, explicitly complains of the “synchronic bias” of the new object-oriented early modern scholarship (Harris, 2000:114). Because “the current wave of object scholarship” has “largely ignored” Appadurai’s stress on “the diachronic trajectories of things through time and space”, it remains merely antiquarian and sentimentalist, stuck in a “frozen, glittering present” (Harris, 2000:117–8, 123; 2001:480, 485; compare Klein, 2000).

⁵ I draw this Heideggerian sense of ‘assignment’ from Beth Preston’s rich account of cognition and tool use (Preston, 1998).

Yet a number of works on material agency and cognitive artefacts in the early modern period explicitly address issues about historical development and the peculiar cognitive biographies of certain objects. Elsewhere I have discussed Evelyn Tribble's detailed studies of the changing techniques, symbol systems and practices imposed laboriously (and with far from uniform success) on the things, media, buildings and congregations of the new Protestant churches of post-Reformation England, in the wake of new cognitive-mnemonic challenges set by the disappearance of Catholicism's rich multimodal engagement with the sacred (Tribble, 2005a; Sutton, forthcoming, b). Like her groundbreaking reinterpretation of the mnemonic objects and practices of the Renaissance theatre (Tribble, 2005b), this work is explicitly inspired by the distributed cognition frameworks developed by Hutchins (1995) in which neither the information nor the sequences of actions to be remembered need "be explicitly represented anywhere" (Clark, 1997:77). But other work arising from material culture studies also takes early modern scholarship into specifically cognitive domains. The work of Peter Stallybrass and his colleagues, for example, should be of considerable interest to cognitive archaeologists, because while it is thoroughly anchored in a Kopytoff-style biographical approach, it takes this and its other theoretical ingredients into a new and cognitive register by applying them to an ambitious narrative about the changing "materials of memory" in early modern England. I sketch two components of Stallybrass' programme in terms which should be equally pertinent to archaeologists and cognitive scientists.

In brilliant techno-historical detective work, Stallybrass, Roger Chartier and others have reconstructed an early modern technology of memory which had been almost entirely forgotten – 'writing-tables' or 'table-books' with erasable leaves which were increasingly common in England from the 1580s (Stallybrass, Chartier, Mowery and Wolfe, 2004). These are the 'tables', for example, for which Hamlet calls in order to record the ghost's command. Their pages could be wiped clean with sponges, but faint traces of earlier entries remained. Information in these memory artefacts met most of the criteria set by Clark and Chalmers (1998) for genuine extended cognition: they were ubiquitous across English culture over the period of their heyday; they were portable (small enough to fit in a pocket and be carried about); and they were convenient in use, in that the stylus required was much easier than pen and ink. Yet, in sharp contrast to the permanence of exograms in Donald's paradigmatic external symbol systems, the key characteristic of these tables was the erasability of their contents. Comparing our reliance on erasable memory systems such as computers and electronic organisers, Stallybrass and colleagues however argue that these tables 'shaped and were shaped by a structure of memory different from our own' (2004:410). They trace new pedagogical, practical and rhetorical features of table-books around 1600, examining, for example, commonplacing strategies for the regular redeployment of knowledge and publishers' new strategies for selling calendars or almanacs with extra erasable pages. Different sets of comparisons also

became available between these erasable table-books and other technologies of memory. Whereas ‘tables’ still also meant the stone tablets of God’s commandments, the capacity of writing-tables to record information while remaining reusable and open to new pressures opened up new interactive relations with the biological forms of memory, for information held in brains as well as on external surfaces is “vulnerable to the material form on which it is inscribed” (2004:416). Stallybrass and colleagues note too that despite the standard practice of patching together plays from existing models and borrowed fragments, this period also saw the beginning of new concerns about information overload and over-reliance on imitation: the true dramatist is one who does not rely on a table-book (2004:413–4).

This hint about the gradual emergence of a newly individualist conception of imagination as independence from external source materials is filled out in extraordinary detail in Stallybrass’ work with Ann Rosalind Jones on “Renaissance clothing and the materials of memory” (Stallybrass, 1993; Jones and Stallybrass, 2000). Drawing on the histories of fashion and of the fetish, Jones and Stallybrass argue that early modern England was a “livery society” in which clothes were “forms of memory that were transmitted”. Where we see the person as prior to the clothes worn, then wearers’ identities were partly constituted (and constantly renegotiated) by the ‘material memories’ they wore. Cloth was not only a valuable medium of exchange, but also a key means of incorporation or of binding into social and psychological networks. “The particular power of cloth to effect these networks is closely associated with two almost contradictory aspects of its materiality: its ability to be permeated and transformed by maker and wearer alike; its ability to endure over time. Cloth thus tends to be powerfully associated with memory. Or, to put it more strongly, cloth *is* a kind of memory” (Stallybrass, 1993).

As well as tracing the trajectories – both the paths of social circulation and the uncomfortable or triumphal historical journeys – through their period of specific clothes, textiles, portraits and technologies of fabric, Jones and Stallybrass develop an ambitious diachronic account of “the end of livery”. As colonialist contact with new worlds brought abundant exotic goods back to Europe, civilised autonomy gradually became newly imagined as “the detachment of the European subject from those goods”. Clothes, along with other increasingly disavowed things, were no longer to be the materialisations of history, memory and desire, for a true individual was “unhampered by fixation upon objects” (2000:11, 269–277). However imperfectly, clothes were reimagined and thus reinhabited as commodities alone.

Questions about how best to theorise and live with memory as literally extended into objects are directly addressed by these early modern case studies. Here, the social and the cognitive life of things are appropriately interwoven; not all cognitive artefacts are passive and not all leave discrete or explicit contents stored in unchanging format; many are not in the information-transmission business in any obvious way at all; the analyses of clothes, artefacts and memory are neatly integrated with approaches to embodiment

through the related tradition of “historical phenomenology” which examines the surprising interweaving of humoral psychophysiology with lived early modern bodily experience (Paster, 1993, 2004; Yates, 2006; Sutton, 2007a); and there is room for careful tracing of the changing kinds and levels of material agency among particular kinds of object over time. Despite his critique of other early modern object-oriented history for its blindness to diachronic dimensions, Harris singles out Stallybrass’ examination of the transmigrations of costumes between the institutions of church and theatre as a clear example of alert historical method (Harris, 2001:488).

Of course, the artefacts available to cognitive archaeologists are less abundant and often more enigmatic than the diverse things, texts and traces surviving from early modern culture. But, I submit, similar difficulties, nonetheless, arise in each context in seeking to fuse high theory in the philosophy of cognitive science with specialist case studies.⁶ Archaeologists may better spy both the potential and the pitfalls of such ambitious attempts in their own field if they keep an eye on their disciplinary neighbours’ quests. If I have not provided sufficient detail in this brief account to convince doubters that diachronically sensitive treatments of material agency are possible, I hope at least to have encouraged occasional curious straying. But now I want to return to address some further suggestions made by Malafouris about how we might understand “the constitutive intertwining of cognition with material culture” (2004:57–60). Two outstanding issues remain: the classification of forms of memory and the significance of practical skill.

Skill Memory

Malafouris argues that, as well as shifting the basic analytic unit for theories of memory beyond the individual, cognitive sciences which do justice to material agency will require “a more subtle classification of mnemonic

⁶ A distinct but equally rich parallel debate can be found in eighteenth-century studies, where (in the wake of earlier historical work on the vastly expanded cultures of consumption and commercialisation) scholars have for some time addressed the quite different ways in which “material culture formed identity through the ownership and display of luxurious possessions” (Benedict, 2007:193). For more on Enlightenment ‘it-narratives’ in relation to personal ads and wigs, for example, see respectively Lamb (2004) and Festa (2005). Benedict’s analysis of eighteenth-century “thing-poems” is particularly suggestive in demonstrating the pervasiveness of the work of purification, detaching subjects from objects and depsychologising things, at least in an elite culture in which the object “holds no memory, no allegiance, no partiality” (2007:202). A fuller treatment of the history of things from the perspective of the extended mind would seek better to trace historical links between these discussions of early modern and Enlightenment artefacts: the incomplete modern erasure of the mediating work of things counterbalances and drives the invention and maintenance of the ideal autonomous agent understood as a “distinct inner locus of final choice and control” (Clark, 2003; Latour, 1993; Schneewind, 1997:3–11).

operations enacted in the context of material engagement” (2004:57). I interpret this as requiring three shifts: away from a unitary conception of memory; away from thinking of encoding, storage and retrieval as three neatly distinct phases; and away from an exclusive focus on the most explicit, representational or symbolic forms of remembering.⁷ Neither Donald nor mainstream cognitive psychologists of memory see memory as a unitary phenomenon, and there is widespread consensus about the constructive nature of remembering, such that there are no sharp lines between encoding, storage and retrieval in terms of the dynamics of information-processing (Sutton, 2003). So far so good, then. Malafouris does not explicitly address the more pervasive distinction between episodic or personal memory and semantic or factual memory, as the two key forms of declarative memory, so I will not discuss the implications of the extended mind hypothesis for these classifications here.⁸ Instead I focus on Malafouris’ third and main aim, the theoretical decentring of *all* forms of declarative memory in favour of skill memory and know-how. No matter what mental representations we may also construct and employ, he argues, “the efficacy of material culture in the cognitive system lies primarily in the fact that it makes it possible for the mind to operate without having to do so: i.e., *to think through things, in action, without the need of mental representation*” (2004:58, italics in original).

I agree fully with Malafouris that the study of practical skills should be central to the cognitive sciences and to theories of memory and that the extended mind hypothesis should offer us a particularly relevant angle on skills, habits and know-how. Again, I do not see that this emphasis requires us to decentre or to drop our attention to content or to internal and external representations: indeed, as I will argue, successful fusions of phenomenological and cognitive scientific accounts of complex embodied skills will often need precisely to retain the invocation of inner and outer representations, once these are appropriately reconceived as dynamical, active and context-sensitive. So I close

⁷ It is not obvious which targets Malafouris has in mind here and I am not certain of this interpretation. Malafouris argues that we should not adopt “ready-made psychological models and classifications” derived from a (classical cognitivist) paradigm in which material culture is treated as “external and epiphenomenal to the mnemonic system proper” (2004:57). But he later suggests that the extended mind hypothesis “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” (2004:60). I will understand his emphasis as being on the earlier, more revisionary take on existing classifications.

⁸ On this point, intriguing and controversial suggestions in Donald’s and especially in Rowlands’ work (1999:123–9), about the increasingly vestigial role of episodic memory in a world full of exograms, might be countered by a social ontology of memory in which genuinely plural episodic or quasi-episodic, memories are held by groups or by plural subjects, rather than by collocations of individuals (Sutton, forthcoming, c, applying Gilbert, 2004 to the case of memory; compare Wilson, 2005; Tollefsen, 2006).

this essay by identifying one concern about pushing too far the idea that skills and grooved habits are entirely independent of explicit memory, so far that we might end up inadvertently reinstating “the methodological separation between reason and embodiment” which we sought to reject (Malafouris, 2004:59) and mentioning a couple of lines of thought which suggest positive ways to avoid this reinstated dualism.

Malafouris offers a rich descriptive picture of embodied “cognition enacted at the potter’s wheel” to illustrate his account of a typical “dance of agency” between technical objects, cultural norms, raw materials, muscles and nerves (2004:59–60). Because this kind of expertise relies on an immense reservoir of practical skill memory, embodied somehow in the fibres and in the sedimented ability to sequence technical gestures appropriately, verbal descriptions of it (by either actors or observers) will be inadequate. As with other complex acquired skills such as those involved in many forms of music, dance and sport, what the expert remembers is in large part consciously inaccessible as well as linguistically inarticulate. One challenging consequence for archaeology is that cognitive ethnography must thus be based in apprenticeship (2004:59); another that, as practitioners of music, dance and sport know from bitter experience, thinking too much about the skills in question can disrupt the flow of successful performance.

These considerations are reminiscent of Hubert Dreyfus’ phenomenology of everyday expertise: Dreyfus argues that there are two entirely “distinct kinds of intentional behaviour: deliberative, planned action, and spontaneous, transparent coping” (2002:417). The slow transition from novice to expert status in a practical skill, according to Dreyfus, involves gradually relinquishing any reliance on explicit rules or on conscious deliberation. Like equally extreme interpretations of Merleau-Ponty’s phenomenology of embodiment or of dynamical models in cognitive science (his two most relevant theoretical neighbours), Dreyfus thus sees explicit thinking and memory as wholly epiphenomenal in the exercise of genuine expertise: psychological principles or maxims are like training wheels which an expert cyclist has long abandoned.

But this sharp separation of knowing and doing cannot be the whole story about the grooved embodied engagement in material culture of potter or musician or sportsperson. What is striking about the exercise of kinaesthetic memory in such complex acquired skills is that there is never a simple repetition, but rather a contextually appropriate distinctive felt movement dynamics “that is at once both familiar and yet quintessentially tailored kinetically to the particular situation at hand” (Sheets-Johnstone, 2003:71; compare Bartlett, 1932:201–2). The minutely adaptable exercise of embodied skills precisely requires an openness to and awareness of the specifics of a situation. So experts have not in fact entirely isolated and insulated action from thought, but instead have forged active and flexible links between doing and knowing (Stevens and McKechnie, 2005; Sutton, 2005, Sutton, 2007b). To think, with Dreyfus, that all declarative thinking – such as fleeting yet explicit memories of particular

relevant past experiences, or a swift, affectively charged reconsideration of the aim of the current practical activity – is merely confabulatory and disconnected from the true embodied sources of that activity, is to risk again cutting embodiment off from reason and making it entirely mysterious that we ever do, imperfectly and fallibly, influence ourselves (compare Selinger and Crease, 2003).

Malafouris is clearly aware of this risk and keen to avoid it. In attacking the “analytically minded archaeologist” who retorts that know-how “should be clearly differentiated from the discursive level of rational thinking”, Malafouris asks merely that we do not seek genuine mind *behind* tools and activities, but allows that “mental models, schemata and internal planning procedures” can be “active in the course of any creative process” as long as we “recognize them as the temporally emergent and dynamic products of situated activity” (2004:60). This seems exactly right: thought is not an inner realm behind practical skill, but itself an intrinsic and worldly aspect of real-time engagement with the tricky material and social world. Yet along with other excellent work on habit and skill in the social sciences and philosophy (Casey, 2000; Connerton, 1989; Warnier, 2001), Malafouris’ position remains in one respect potentially in tension with any attempt to cash out this perspective in more detail.

Pointing out that many forms of engagement with objects cannot be formulated linguistically, Malafouris cites with approval Renfrew’s discussion of implicit memory, in which Renfrew asks archaeologists to move “beyond the deliberately communicative or mnemonic role of some classes of artefact” (Renfrew, 2004:29). Once we see the cognitive system as an integrated whole spanning brains, bodies and the social and artefactual world, and we become sensitive to the variety of operations in which mnemo-technical artefacts and practices are involved, we are rightly rejecting the inevitability of deliberately or linguistically or “explicitly inscribed” information (Malafouris, 2004:57). Malafouris points out that objects can, for example, “force you to remember, without including the content of what precisely is to be remembered” (2004:57). But it does not follow, as Malafouris is tempted to suggest, that no content is involved at all.

In fact, we often need to analyse the transformations and distortions of identifiable representations across a variety of people and media in order to understand particular cognitive and social processes. Thus reconceiving information-transmission as “a gradual propagation of organised functional properties across a set of malleable media” (Hutchins, 1995:312; compare Latour, 1996:58) can give us a grip on how to analyse know-how without falling into that further dualism between skill memory and declarative memory. It is puzzling that experts in many domains, whether acting singly or in group settings, do talk to themselves and to each other in ways which, on our picture, are not to be understood as giving the body explicit instructions from the mind. Not just beginners, but experts in open ball sports, for example, mutter ‘watch the ball’, while improvising jazz pianists find themselves saying ‘sing while you’re playing’ or, simply, ‘jazz hands’ (Land and McLeod, 2000; Sudnow, 2001). While

such hints and labels are not the top-down reprogramming of a merely mechanical skill, neither are they entirely epiphenomenal noise. The pianist David Sudnow brilliantly characterises them as ‘instructional nudges’, embodied maxims which have condensed all kinds of history and a variety of ‘caretaking practices’ into, for example, the arms and shoulders (2001:127–9). Such nudges, which can take an enormous variety of forms, are not instructions, in that they do not do their embodied-cognitive work by imposing their explicit contents on the body: they are material symbols with temporary but crucial causal roles as “a new fulcrum for the control of action” which may (or may not) work temporarily to dampen or recalibrate certain habits and tendencies (Clark, 2005; 2006:294; Sutton, 2007b).

Such verbal or quasi-verbal instructional nudges, operating in the context of anchored, well-navigated embodied routines, take their place alongside an even broader array of other more or less idiosyncratic material, somatic and social anchors. Ed Hutchins has recently sought to add detailed analyses of bodily interaction in shared gesture and talk to the distributed cognition approach (Hutchins, 2005; forthcoming). The spatial and temporal sequencing of gestures, for example, can play a key role in imagining or communicating the dynamics of a complex situation or set of (real or potential) material objects. The one point I have space to note here from Hutchins’ persuasive case studies of bodily motion as the medium of thinking itself, rather than merely the indicator of thought, is that again they require us to think of extended and embodied cognitive systems in representational and computational terms. Hutchins demonstrates, for example, that there is a key dimension of commitment along which environmentally coupled, socially situated and materially anchored gestures can vary, with some representings being more tentative (and perhaps more transient), others more firm or tangible. The material or gestural activity in these case studies seeks to integrate or stabilise shared or shareable conceptual information for further manipulation or interaction. This is far from the kind of classical cognitivism which Malafouris (like Hutchins himself) criticises for reducing distributed problem-solving operations to “an isolated individual mental template that precedes and defines the operational sequence” (Malafouris 2004:60): but it is almost as far from wholly anti-representationist versions of phenomenology, enactivism or dynamicism.

In the study of practical know-how as in connection with other questions of material agency, there can be mutually beneficial interaction between cognitive archaeologists and other researchers working in the extended mind/ distributed cognition framework. This is a particularly useful framework within the philosophy of cognitive science just because, when properly understood, it motivates attention to a diverse range of dimensions on which cognitive artefacts and the extended systems to which they contribute, differ. In this chapter, I have attempted to open up some shared space for more ambitious empirical and theoretical development across the disciplines.

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