which recognize "fusions between the past and the present, between the present and the present" (Toft and McKieh 1998, 10, original emphasis), is a natural part of the project. Brief essays into the history of theories and practices of memory can, I hope, both justify and temper our attention to provocative and pointed points of contact between new media theory and recent dynamical cognitive science.

The delicious story of message transmission by sponge brings home the difficulty we have in remembering just how magical it is, in a world of flux and mixture, that information can ever be enduringly stored, transmitted without distortion, and precisely reproduced. Our lives are irretrievably tangled with artificial systems which keep their contents ordered and immune from melting, and we trust that our computers won't creatively blend our files overnight. The media we use to fix, transmit, and record information, and to shift or transform representations from one context to another, are often more subtle, less porous, than these sponges. But durable information storage is a cultural and psychological achievement, not a given, and it depends on the construction and exploitation of social and technological resources. In writing a paper, for example, I toggle between yesterday's handwritten scribbles, printed notes from months back, a few words which I jotted down during a phone conversation with a colleague this morning, and the crisp on-screen fonts in which I chum out, obliterate, and rewrite each version. The process involves multiple feedback loops as I rely on external jottings of yesterday's work, jottings which are more enduring and less context-sensitive than any traces overlaid on others in my brain. My brain and body can temporarily couple with external tools or media, forming an integrated cognitive system with capacities, characteristics, and idiosyncrasies quite different from those of the naked brain (Clark and Chapman 1998).

In art, science, and ordinary life we construct, lean on, parasitize, and transform artifacts and external symbol systems. And in turn our bodies and brains are infected and contaminated by the material supplements and cognitive prostheses which we incessantly internalize. Marius Kwint, recently urging us to address the nervous and physiological dimensions of embodied memory, puts the point this way:

"Human memory has undergone a mutual evolution with the objects that inform it ... the relationship between them is dialectical. Not only does the material environment influence the structure and contents of the mind, but the environment must also have been shaped along the lines of what persists in the mind's eye (Kwint 1999, 4)."

Kwint acknowledges that the attempt to fathom such loops must be specific, historically anchored, and insistently interdisciplinary.

So the cognitive life of things takes shape not only in their roles as storage aids or tools at the caprices or aggregated disposal of the creator. An abstract artist, to take another example, may work incessantly with a sketchpad, because imagining an artwork 'in the mind's eye' will not successfully allow the perception, creation, recognition, and transformation of the kind of hidden patterns which support surplus structure in the work. Just as the aesthetic appreciation of the layered meanings in the finished artwork may take prolonged interactive viewing, so the initial creation of such hidden regularities may have to be an iterative process of sketching and perceptually (not imaginatively) re-encountering the forms. The sketchpad here isn't just a convenient storage bin for pre-existing visual images: the ongoing externalizing and re-perceiving is an intrinsic part of artistic cognition itself. The artist and the sketchpad may be so tightly coupled that it's possible to see them more as a single temporally integrated system.
than as an agent operating on a distinct passive medium (Van Leeuwen, Verstegen, and Hegkert 1999; Clark 2000, 147-150).

In attending to this dynamic interplay between brain and world, we don't need to identify internal with external resources. Post-connectionist cognitivist scientists like Andy Clark argue, on the basis of everyday cases like these, that the brain is a highly associative engine, good at pattern-matching and pattern-transformation, but poor (in isolation) at the permanent storage or logical manipulation of individual items (Clark 1993; 1995; 1997: 53-69). The classical neuroscientific search for the engrams failed because there are no enduring single memories stored alone at local fixed addresses (one neuron for my grandmother, one for my grandfather). Since brain traces are dynamic, we often lose information out in the environment, using the world as its own best representation (Brooks 1991). Brains don't replicate, but rather complement, the alien formats and media of external resources. It's just because representations in the brain are partial and action-oriented that external cognitive scaffolding and tools of many varieties supplement our relatively unstable internal memories. As Clark puts it, "our brains make the world smart so that we can be dumb in peace" (1997, 100). In a range of couplings with other people, instruments, machines, and objects, bodies come into what Clark calls relations of "continuous reciprocal causation" (1997: 163-166). In dance, improvisational music, interactive theatre, and ordinary conversation, or in working, feeling, and thinking with cars, computers, airplanes, and skethces, there can emerge a mutually modulatory dynamics. Each component in the larger system is continuously responsive to the activity of the other components, and at the same time feeds back its own influences into the web of causal complexity (Haugeland 1998).

These concerns may seem remote from cultural history and theory, but the methodological revolution implied by these new sciences of the interface, which must combine cognitive science and media theory, is far-reaching. Cognitive systems can genuinely extend across brain, body, and world, and are potentially scattered across the natural, technological, and social environments. As Clark says:

The cash value of the emphasis on extended systems (comprising multiple heterogeneous elements) is thus that it forces us to attend to the interactions themselves, to see that much of what matters about human-level intelligence is hidden not in the brain, nor in the technology, but in the complexes and integrated interactions and collaborations between the two ... The pay-off, however, could be spectacular: nothing less than a new kind of cognitive scientific collaboration involving neuroscience, physiology and social, cultural, and technological studies in about equal measure (2001: 133-154).

This means that the particular histories of cryptography and codes, perspective, autobiographical norms, tattoos, roads, diagrams and graphs, photography, artificial memory techniques, laboratory practices, maps, clothes, and religious ritual (to name just a few) now become an integral part of a historical and comparative cognitive science, rather than mere humanistic curiosities. Careful analysis of historical theories and practices with a cognitive-scientific eye, then, may find problems in the past unlike those perceptible by the more cautious historian. Some straightforwardly enigmatic accounts of Augustine's philosophy of memory, to take one emblematic prehistorical example, focus on his attitude to Platonic doctrines of remembrance and his efforts to parallel the Holy Trinity with the psychological triad of memory, understanding, and will (Tetska 2000). Others examine the role of memory in his account of our awareness of time as a "distention of the mind," or investigate the significance of his theory of memory in light of the autobiographical structure of the Confessions (Kriell 1990; 52-55; Lloyd 1993, 14-22; Mendelsohn 2000). These are important and fascinating projects, but they do not rule out a different, more present-centered kind of cognitive-cybercultural history.

The Renaissance arts of memory can be vividly described in Frances Yates' The Art of Memory (1966) and Mary Curnan's The Book of Memory (1990) form case of two prehistorical case studies. I sketch in more detail below. Augustine's attitude to the classical arts of memory is unclear (Yates 1966, 61-62; O'Donnell 1992, 177-178). But his notoriously spatial images of memory in Book 10 of the Confessions as a field, a palace, or a picturesque drive is a less commonly noticed demand that in memory "everything is preserved separately," items channelled through the different senses, for Augustine, are captured by (perspectival) memory which swiftly "stores them away in its wondrous system of compartments." Augustine knows that control over the contents of memory is not always easy, for sometimes unwanted past experiences "come spilling from the memory, thrusting themselves upon us when we want something quite different." But his regulatory ideal is to be able at will to gather (agglutinate) the scattered items in memory from the "most remote calls [and] ... old data," so that a mind which "has the freedom of them all" can "glide from one to the other" effortlessly surfing this strange virtual inner place which is yet not a place.

I want now to consider two other sets of historical doctrines and practices of memory for their answers to these distinct questions we already glimpse in the case of Augustine, questions about subjective control of memory, and about the format of the vehicles or medium of "storage." Firstly I suggest that it's not unique to any modern crisis of memory to think of the inner components of memory systems as porous and active, rather than fixed in archives. Then I go back to one great era of the cognitive use of artifacts and imaginal places. These analyses only begin to apply the cybercultural grid which the historical material warrants, but they bring some tantalising topics in the history of memory to the attention of new media theorists.

T H E C A R T E S I A N P H I L O S O P H Y O F T H E B R A I N

Just at the time the story of the sponge was circulating in France, a little-known anatomist and proponent of the new mechanical philosophy was completing a strange book on the philosophy of the body. After an extensive program of dissection in which he had opened the "heads of various animals [to] explain what imagination, memory, etc. consist in," René Descartes described the brain as "a rather dense or compact net or mesh," composed of "tissue" or flexible filaments with "pores or intervals" between them (Descartes 1996: I, 263. 11.171). Through these pores or conduits flow nervous fluids, the "fluting of animal spirits," which "trace figures in these gaps," patterned traces which somehow represent remembered objects and events (1996, 11.171).
These animal spirits, which are the medium of memory and the passions, are derived from blood. Their particular state — their agitation, abundance, and purity — depends on the balance of bodily fluids (blood, semen, spirits, humors, sweat, tears, milk, fat) in the individual's internal environment; and this balance in turn depends on a ceaseless cosmological exchange of vapors between body and world (Descartes 1649, 216-276; compare Carter 2005). Descartes' body-machines, animated statutes that dream, imagine, feel, and remember (Descartes 1649, 212-217; 202-203), are embedded in the same fluid dynamics which drive the whirling vortices of Cartesian cosmology (Geikie 1925, 261-286; Sutton 1998, 82-90). The body, like the cosmos, is full, so that every motion is inevitably coupled with other motions, in a physics of circulation and displacement, which is quite unlike a system of isolated atoms colliding in a void.

Thought through the blood and animal spirits, as Descartes' follower Malebranche (1674-1680, 340-343) wrote, after the Fall we are all "to some extent joined to the entire universe," for each man is linked "through his body to his relatives, friends, city, prince, country, clothes, house, land, horse, dog, to this entire earth, to the sun, stars, to all the heavens.

So the Cartesian body is not rigid and dull, its behavior 'automatic' in the sense of endlessly repeatable, rather, "with its instructive openness," it is the means by which difference is introduced into the human compound (Foucault 1986, 76; compare Rorty 1988, Reiss 1996, Sutton 2000a). External parameters like diet, climate, social interactions, and stress, which change at a relatively slow rate, directly affect the fast dynamics of the internal state variables of blood and spirits. But because the spirits are the medium of perception, passion, memory, and imagination, and thus cause our behavior, changes in those external parameters are themselves partly caused by the internal processes with which they are coupled (for the terminology compare Van Gelder and Port 1995, 23-25).

Every act of remembering, then, as the reconstruction of patterns of flow in the animal spirits rolling through the pores of the brain, is context-dependent and causally holistic. Several different figures, Descartes notes, are usually "traced in [the] same region of the brain" (1649, 218), so that every reconstituted memory pattern is composite, just as every sensation dangerously carries the perceptual history of the perceiver. A single "food of the brain" can "supply" many of the things we remember. Descartes thus dismisses any worries about the problem of finding room in the brain for all our memories, as they are "stored" only superpositionally and implicitly (Descartes 1649, 185-186; Sutton 1998, 164).

Missassociation and imagination are thus intrinsic to the fluid dynamics of the Cartesian brain. Order is not built in to memory. Descartes hoped nevertheless to clear exact distinctions between memory and imagination externally, by recourse to the guidance of reason. But few contemporaries found this at all plausible, and Descartes' theory of memory was thus one of the most fiercely criticized strands of his natural philosophy in the second half of the 17th century. Many natural philosophers in particular complained that Descartes couldn't guarantee personal control over the preservation of the personal past. On Descartes' view of memories as motions, argued Joseph Glanvill, remembering anything would at once "put all the other images into a disorderly floating, and so raise a little Chaos of confusion, where Nature requires the exacte order" (1661, 170, 36). The 1650s and 1660s, on either side of the Restoration of the monarchy after the regicide and Commonwealth, saw a terrible crisis of public memory in England.

Reflected in neglected yet obsessive debates among natural philosophers about the neurophysiology of individual memory. After the uncontrolled multiplicity of opinions allowed free rein in the Interregnum, unity had to be imposed not only in worship, ideas, and conduct, but in narratives of the personal and political past. "Memory is a slippery thing," wrote a preacher in 1657 (quoted in Crevoy 1991, 68), and the reception of Descartes' physiological morphology in England was driven, in a sense, by the desire not to slip (Sutton 1998, 125-146).

Because the mere roving of the fickle fluids and spirits through the brain's networks would allow memories to interface and blend with each other, the English instead constructed systems of internal fixity. In a lecture of 1682, the Royal Society technician Robert Hooke, for example, saw each item in memory as separately stowed in order on physical coils of memory in the brain, spirals down which the soul could radiate its attention in calculating the temporal sequence of past experiences (Hooke 1705, 1971, 140). Descartes' innards, then, were too wet, his brain too porous for the English, making memory hostage to fluid animal spirits which, complained Henry More, are "nothing else but matter very thin and liquid." The brain can't reconstruct motions by itself, as Descartes' theory required, since it is just a "soothe Psyche" of a "bare constancy" which is no more fit to perform our noble cognitive operations than it is "a Cake of Suet or a Bowl of Curry" (More 1653, 178, 53-34).

The naturalizing of localist or archival models of memory was thus a wishful resistance to Cartesian confusion. For Hooke, individual memory ideas must be "in themselves distinct," so that "not two of them can be in the same space, but that they are actually different and separate one from another" (Hooke 1705, 1971, 142). Even though Hooke himself used external aids to memory remonstrantically and was an invertebrate list-maker, recording the weather, his health, and his every action (Midgley 1993), his theory of human memory also imposed pure, "cleansed" order on our internal "repository." If memory traces were active patterned motions, as Descartes argued, bar of control was inevitable. Glanvill complained that "one motion would cross and destroy another ... and there would be nothing within us, but Sway and Disorder" (1661, 170, 39). For, rather, thought the English, for ideas in memory to be themselves passive and independent, to leave it up to the soul or the will to read, decode, and maniputate them (Sutton 1998, 135-136).

Kendal Digby (1664-1676) was the first to argue in English that Descartes' philosophy of the brain could not explain "how things are conserved in the memory." (285). Digby wanted every memory idea, on its entry into the brain, to "find some vacant cell, in which they keep their names and files, in great quiet and order; all such sticking together, and keeping company with one another, that entered in together: and there they lie still and are at rest, until they be stirred up" by appetite or by the will (284-285). But the task of the cognitive agent in rasing the spongy brain's caches and compartments is not easy: when it has trouble recollecting some particular idea from memory:

[It] shaketh again the liquid medium they all float in, and soothes every species lurking in remotest corners, and rummages over the whole beauteur of them: and continueth this inquisition and motion, till either it be satisfied with retrieving at length what it required, or that it be grown weary with toasting about the multitude of little inhabitants in its numerous empire, and so giveth away the search, unwillingly and displeasurely (Digby 1770, 285-286).

Prose to boredom and petulance, lost in its own archive, Digby's soul is unable to navigate its own liquid empire. Disputes between dynamic and static accounts of memory traces are political as well as empirical, the historical distance afforded by examining these quaint and alien 17th
The Art of Memory

One reason preliminary is useful is that it’s often difficult to see the mutual contaminations operating between brain and technology in the present. Historical case studies offer a better grasp on the ways in which machines like us are naturally cultural, flexibly coining and hooking up with a variety of norms and artifacts. The medieval and Renaissance arts of memory, way back beyond Descartes’ propositional memory, offer an example of the way humans can free their thoughts into making relatively stable forms of scaffolding in the quest for self-mastery. But where the English critics of Cartesian confusion tried to believe that stability was natural to the brain’s storage systems, these earlier practitioners were sensitive to the inevitability of prosthetic supplements in anchoring human memory. The monks, scholars, and magi described by Yates and Carruthers can be seen as laborsiously disciplining their use by the use of specific inner objects.

Cybernetic theorists return analogously to these early forms of intelligence augmentation. They may calculate the memory artists’ architectonic immersion in an array of virtual inner data spaces, strange interactive habitats of the imagination (Davis 1994), or query new media hype by carefully teasing apart analogies and dissimilarities between old and new forms of artificial memory (Toffs and McKieh 1998, 82-82). My brief remarks here seek to look to this kind of “institutionalization of the artificial” (Scurry 1988, 95-96, 101-102) with my prehistorical topos, porous memory and the mnemonic role of things, as I try to historicize what the historians themselves tend to see only as “certain enduring requirements of human recollection” (Carruthers 1990, 150; compare Coleman 1990, 600-604).3

The techniques of local or place memory involve the internalization of a memory architecture, most simply a set of palace corridors with rooms on each side, but alternatively grids, theaters, houses of hexagrams, and wheels. I must insert a permanent set of memory locations or niches—two, perhaps, in each memory room—which I will mentally place items when I’m learning a speech or a set of instructions. Then in recall I mentally walk down the corridor, entering each room in my chosen sequence and reading off whatever is stored at each address. Then I can erase this set of items and store new ones in the same locations for future use.

Initially the process seems to enable the cognitive load: what’s the point of remembering this memory palace as well as having to remember your speech? But the system is highly flexible: once locations are laid in to my own memory architecture, I can use them for any purpose. The art of memory allows me to construct, or to turn my mind into, a random access memory system (Carruthers 1990, 17).4 Items are kept rigidly ordered by their location, to be inspected and manipulated only at will. Whether “stored” as images or as text, pictorially or linguistically, the key to success is the rigidity and the static nature of the format. Even when the images used to chunk encoded information were strikingly affective, bloody and violent, each atonic item was to remain independent of all others, isolated at encoding. These are not external objects, yet they are clearly artifacts, interposed promises intended to revive the brain to render it susceptible to voluntary control. The desire is to trap intensity in the memory room. So the system has no intrinsic dynamics: the point is to eliminate the activity endemic in what was called “natural” memory because it leads inevitably to the confusion of items. Semantic stability is thus built in, to allow only deliberate combination and recombination. These men’s fantasy of total voluntary memory, so the Renaissance arts of memory were not yet proto-hypertextual schemes for the free flow of information, but the disciplined purging of what Bernard called “fitter tricks” (see Coleman 1992, 182-241) from the past. Adeptly imposed (an approximation of) rigidity and indiscernibility on their own mental representations, by freeing the contents of memory, monks and scholars sought to tame and recrystallize their minds. The control of items in memory was to be guaranteed by separating data from process, memory from executive self. Artifice was required just because of the whole, the result of sin or of embodiment, where one effect of the fall was loss of control over the personal past. We are immersed in matter and in time: where angels constantly have in view the whole scene of their former actions, humans need to scramble for the past in the face of oblivion (Locke 1690/1975, bk. 2, chap. 10). Hamlet assures the Ghost that he’ll wipe away all trivial records from the table of his memory: woeing that the Ghost’s urgent command “all alone shall live / With the book and volume of my brain, / Unvisited with hollow bearer” (Hamlet 1.5.102-104). The arts of memory were a moral quest, so that the true memory artist would never be haunted by remembrance and the intrusion of unwanted thoughts. Escaping the sixty forests of natural memory, the artist aspires to the angelical, using his artificial memories to resist the crowding, interfering, and overlapping of traces in the brain (compare Tofts and McKieh 1998, 80-82).

Material Memories and Extended Minds

But of course the binding of memory on the mind was always wishful. Hamlet fails to flatten his past out, to eradicate affect from memory, to act as a free or sovereign executive. What is memory in a whimsical goal, for the putative autonomous memory artist is already caught up in a vast and uneven world of objects inside and outside the skin (compare de Grazia, Quilligan, and Stiblyn 1996). As I’ve argued, we can’t avoid leaning on artificial systems whether inside or outside of skull and skin. There’s a continuousness between the relatively mindless inlaying of the local world in which most animals engage and these highly socialized and socially-charged quests for mastery of the self by the self. Many evolving processes require a kind of self-opposition, in which control of the brain involves the assimilation of symbolic props and points. As Deleuze argues, it’s not as if evicting every such “passivity of the inside” would leave subjective remembrance as “spontaneous, alive and internal experience” (1996, 11, 19; compare Wills 1995).

To celebrate the intelart as “a chaotic memory system” (Locke 2000, 30) is to be overinflated by the decentralizing of memory, and to forget how familiar it is the Net’s primary model of information storage. As Tofts notes, “sites are simply ‘there,’ located at a particular address” (Tofts and McKieh 1998, 115). Not only does the hyper discourse issue about control with quite distinct issues about the activity of the heads or vehicles of information, it also takes our attention from the deep contingency of the dynamic historical and developmental processes by which we extend our minds with various forms of external scaffolding.

Somatic Two

Virtuality: Webworlds and Cyberplaces

3 For a more detailed treatment of these themes, in particular on the neglected role of perspective in Renaissance accounts of memory, see Lutten 2002. There are emerging essays on early modern information storage and retrieval in Kilduff and Laneve 2006.

4 Carruthers here speaks “right order” with “early recollection, old order.” But these methods are not generically mnemonic, for other useful local ordering of the memory images are always already there, waiting to be freed for active, something constructive or aesthetic, and do not (like elements of discursive memory arrangement) require themselves to be unearned nor need they.

5 The Internet is in fact an interesting case here, demonstrating that one of control doesn’t withdraw all knowledge from the reader as the rhetoric of representation. Books in the virtual environment of the net were more often read passively specifically in order to edit the quest for meaning. And it’s because of the discursive memory arrangement that it is that the distributed post-usability of written or spoken text in the internet fast becomes like a usual course to these with the limits of choice and will. In this, the wordquest is the
Just as infants learn to walk by leaning on objects and by holding others’ hands, until they achieve some fragile motor autonomy, so our cognitive skills require scaffolding. The development of autobiographical memory exemplifies this process (Sutton 2002a). Children learn to remember in company, with their initial narratives of experienced episodes being prompted and heavily guided by parental intervention and shared reminiscence. This scaffolding doesn’t then simply disappear with the inevitable triggering of a blueprint for autobiographical memory. Instead, the parental scaffolding is internalized, often in some idiosyncratic detail. Developmental studies show that the particular emotional tone, and the elaborative or pragmatic style of talk about the past in the child’s local narrating environment, influences not just the expression but the contents of the child’s own memories (Nelson and Bruch 2000). A child’s autobiographical memory, then, isn’t the product of an automatic unfolding of autonomous capacities; rather it’s already sculpted by and embedded in specific and unique narrative worlds.

Questions about the location of the cognitive technology in this kind of scaffolding thus become less pressing, for there may just not be constant or determinate interfaces between brain, body, and world (Flanagan 1998). More interesting are the idiosyncratic cognitive trajectories along which our particular cultural and institutional learning aids allow us to go. We can understand the old arts of memory as one culturally-anchored way to “minimize controllability” (Clark 1997, 210). Clark’s description of the cognitive function of the mnemonic, relatively stable linguistic media in which we learn to fix our mental representations could be applied equally well to the special fluid pictorial images with which the Renaissance memory artists sought to order their minds.

By freezing our thoughts in the mnemonic, content-resistant, modality-transcending form of a sentence, we thus create a special kind of mental object—an object that is amenable to scrutiny from multiple cognitive angles, and is not doomed to change or alter every time we are exposed to new inputs or information (Clark 1997, 210).

The biggest challenge, then, in constructing a genuinely dynamical framework to analyze the cognitive life of things in memory, is to acknowledge the diversity of feedback relations between objects and embodied brains. Just as architects can occasionally be too confident that buildings or monuments can act as simple analogues or substitutes for memory (Eco 1999), so cognitive anthropologists and psychologists can too easily neglect the sheer variety of the formats of media and programs which humans have developed since the Paleolithic emergence of notations and external symbol systems. Media Donald’s initial classification, for instance, strongly contrasts the fading, constantly-moving contents of biological working memory with the enduring, unlimited, supramodal, context-independent, and reformattable nature of conceptions (1991, 316-319).

Certain formats do freeze information, allowing it to be held up to multiple scrutiny in future, transmitted more widely across a variety of networks, altered and then re-entered into storage, and these properties of programs have had essential roles in the development of artistic and theoretical culture. But of course different external media hold information in quite different ways, on quite different timescales, and interact quite differently with individual memories.

Information in notebooks, sketchpads, and word-processing systems, whether really external or interiorized, may normally sit passively on call, awaiting mobilization. But other kinds of memory objects are themselves dynamic, like pets and landscapes and cars and friends and ghosts, or will themselves decay or fade or break, like films and knots and bowls and buildings and unreliable machines. Information and emotional memory are held also in ruins which occur only once, or in the dynamic singularity of a group performance, or in other human minds, unpredictable and fragile. It’s just because our bodies and brains are porous, our memory thus opened up to time, sensation, and pain, that objects don’t just trigger and unlock memory retrieval, but can also trigger it, halt it, haphazardly twist it, and leave it in disarray.

The desire to attend to artifacts, media, and brains all at once does not require a unitary view of memory along classical redactionalist lines, rather, the idea is the construction of parts of a partial but potentially integrated framework within which different memory-related phenomena might be understood (Sutton 2002b). Memory may have to be studied in both natural and human sciences, where such institutional distinctions remain; but nature is as patchy and idiosyncratic as culture, and the social and technological products of human cognition and action in turn “have direct effects upon individual cognition” (Donald 1991, 10). I suggest that, in the bewilderingly interdisciplinary future of the sciences of memory, from neurology to narrative theory, from the computational to the cross-cultural, historical and prehistorical studies should play a significant role.

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representation, the more disconnected the access and evaluation processes. But the Internet’s much-handled resistance to global control is a counterexample to this sort regulation at least in practice, after some critics issued it as an "unavoidable lack of sophistication, opportunism, and strategic planning" (Orbell 1999, 88) otherwise claimed to be the panacea of social, local, pay-per-page representations (ibid.). The distinctions between local and distributed representation, though, is essentially hard to draw (Jasiewicz 1998, 268-270), and more recently the increased central pressure by some digital Web technologies may encourage the use of increasingly dynamic formats of information.

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