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EIVIND RØSSAAK

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Memory in Motion

Archives, Technology, and the Social

Edited by Ina Blom, Trond Lundemo, and Eivind Røssaak

Amsterdam University Press

The book series RECURSIONS: THEORIES OF MEDIA, MATERIALITY, AND CULTURAL TECHNIQUES provides a platform for cutting edge research in the field of media culture studies with a particular focus on the cultural impact of media technology and the materialities of communication. The series aims to be an internationally significant and exciting opening into emerging ideas in media theory ranging from media materialism and hardware-oriented studies to ecology, the post-human, the study of cultural techniques, and recent contributions to media archaeology. The series revolves around key themes:

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*Ina Blom,
Trond Lundemo,
Eivind Røssaak.*

Introduction

Rethinking Social Memory: Archives, Technology, and the Social

Ina Blom

Memory and containment

‘The languages of containment have taken a deep hold over our thinking on memory, whether it is the brain or the computer that provides the container that cribs and confines memory.’ This is Keith Ansell Pearson discussing Bergson’s theory of memory, with reference to a key point in Edward Casey’s *Remembering: A Phenomenological Study*.¹ If Bergson’s account of memory has at times been described as hard to ‘grasp’, it is precisely due to its vehement resistance to all concepts and metaphors of grasping and holding, the very notion that memories are object-like entities that we keep safely stored away in some archival system whose stability, durability, and accessibility are always the critical point. The brain, for Bergson, was certainly not such an archive, not a separate object or organ that produces and stores representations of the world. It was an integral part of the material world, and more specifically – thanks to its ability to receive and distribute the stimuli that prepare the body for movement – part of the essential mobility of matter itself. If the brain seems to contain images or memories, it is only because the world itself is an aggregate of image sensations that constantly receive and produce the movement of stimuli. Images or memories are essentially actions, points of connection and disconnection, relays that draw sensations together.²

But the concept of container memory is also increasingly being challenged, on a practical and well as philosophical level. The reason is simple: for a long time now, we have been surrounded by technologies of memory that are premised on the constant activity of circuits and relays. Officially, these technologies may speak the language of storage and containment. They tend to promote an unprecedented capacity for storing memory, now accounted for in the precise mathematical language of ‘bytes’ – a unit of digital information in computing, most commonly defined as a combination of eight zeroes and ones. Today we are all ‘counting’ storage space in terms of a thousand bytes to the power of two, three, four, five, and so on – megabytes, gigabytes, terabytes, petabytes. Yet the mathematical terms betray the

ambivalence of the promise of storage. With digital technologies, nothing is stored but code: the mere *potential* for generating an image of a certain material composite again and again by means of numerical constellations. Forget to update the software through which an encoded material is made visible, and there is little left – at least from the point of view of the cultural interface. This is not because information is ‘immaterial’ but because visibility is not a measure of its specific forms of material inscription: inscription is simply some kind of modification of an electromagnetic substratum.³ If archives used to be described in terms of principles of ordering, they are now, as Wolfgang Ernst has pointed out, better understood through concepts such as ‘fields’ and ‘dynamics’. With digital archives, documents and contents are no longer separated from the archival infrastructure: once the archive is based on networked data circulation, its emphatic form dissolves into the coding and protocol layer, into electronic circuits or data flow. Archival data have, of course, always been in circulation: the whole point of an archive is to allow documents to be mobilized for the shifting needs and inquiries of the present. But with the networked digital archive, this circulation becomes a feedback circuit whose material structure is that of vectorial dynamics and electromagnetic fields.⁴ And this accounts for some of the ambivalences surrounding digital memory, the fact that computer archives are targeted as the source of archival destruction and loss of cultural memory. As Wendy Chun points out, software enables a logic of permanence that conflates memory with storage, the ephemeral with the enduring. Through processes of constant regeneration or ‘reading’, it produces an enduring ephemeral that promises to last forever, even as it marches toward obsolescence or stasis.⁵ The conflation of memory with storage is, in other words, undermined by a technical emphasis on dynamic processes of memorizing. To the extent that computer memory exists, it is essentially activity; virtual as well as actual, and its images are electronic events.

This technical conundrum presents numerous dilemmas for the various institutions of cultural memory that are the hallmark of modern, dynamic societies and their anxious obsession with memory in the face of always potential memory loss.⁶ Pierre Nora named them *lieux de mémoire* in order to emphasize their desire to fix and monumentalize memory in terms of *space* and *place* and to distinguish them from the *milieux de mémoire* of premodern, rural societies, where memory – the unbroken bond with the past – was organically embedded in every gesture of a society’s members and where the question of safekeeping and memory

loss was not an issue.⁷ To digitize archives, records, and collections is in many ways to lighten the burden of archival site specificity, the problem faced by every memory institution as ever more materials from an ever wider range of sources are deemed memorable and of public value. Servers, which present their own type of spatial challenges, nevertheless seem to exchange the question of space with that of time: expensive square metres are remediated as processing time, volumes as information, subjected to varying degrees of 'compression' or 'resolution'. There are other benefits as well: digitization facilitates searchability, making memory materials more or less instantaneously available to anyone, anywhere in the world. Digitization seems, at least in theory, to promote a radical democratization of memory: everything may, potentially, belong to everyone. A proliferation of digital paywalls and passwords is the reality; vestiges of a bounded, territorial concept of space, just like the duplicitous concept of storage.

Yet issues of fragility and ephemerality that come with informational transformation of space perennially haunt digital archives. How safe is cultural memory if it depends less on locked, temperature-controlled vaults than on software updating, compatibility, synchronization, energy flow, and channels of transfer? And how to select what to remember when the exponential growth in the processing power of microchips seems to promise that there will, in principle, be 'capacity' for everything?⁸ The question pertains not just to the encoding of non-digital objects and documents but – even more pertinently – to how digital society will memorize itself and the constant stream of instantaneous communications and interactions that seem to be one of its key features. If the traditional archive is premised on the selection of a few original, exemplary, finite objects and documents, each one attesting to one time and place,⁹ how can a world of networked mobilities, – relays, updates, negotiations, associations, and speculations – even be archived? How to decide where connectivity starts and where it ends?

These concerns are practical ones, challenging archives, libraries, and museums all over the world. Enormous efforts are invested in handling the numerous dilemmas of informatization. But they are also ontological, challenging not just ideas of what it means for societies to remember, but what concepts we have of 'the social' in the first place.¹⁰ Archival anxiety and the preoccupation with memory loss on a grand scale is not a universal condition but premised on a very specific image of sociality. It is premised, in the first instance, on a particular concept of reflexivity:

that society, in order to exist, must have a self-image. Cultural memory, we are often told, is a portrait: it allows us to see who we are and who we have been. Aspects of this line of thinking emerged in Émile Durkheim's *The Elementary Forms of Religious Life*, where he described religion as a celebration of a mythical past that confers identity on individuals and groups. Religion then allows us to understand shared memory as a key element of social life. Society is memory, and memory is recognition, identity.¹¹ This emphasis on the way in which shared images and imaginations of the past produce collective identity in the present was reinforced and deepened in Maurice Halbwachs' *On Collective Memory*, where he described all those things handed down by tradition – languages, rituals, myths, songs, monuments, institutions – as the material frameworks through which collective memory and collective self-images assert themselves.¹² But what if the material frameworks of memory seem to lack the type of stability and durability that confer identity on things? What is a society's self-image if this image may be the object of instantaneous erasure, dispersal through multiple relays or information overflow, or transmutation through dynamic feedback circuits? What is society if its memory images are perhaps not even representations?

In many ways, it might seem as if modern societies' accelerating monumentalization of memory – its obsession with storage and safekeeping – is intimately connected with a type of reflection 'on' the social that is a key characteristic of the same modernity. The role of the modern social sciences has notably been that of picturing society 'as such', as a distinct, finite entity or substance that can be represented and hence also theorized, analyzed, compared, questioned, and managed. The more fundamental challenge posed by the contemporary changes in memory technologies then touches on the very relation between memory, representation, and social ontology. If radical technological changes compel us to understand memory in new ways, will this not have consequences for how we understand whatever it is that we call collective or social phenomena?

This is the question informing the collection of texts in the present volume. Our aim has not been to add to the numerous and brilliant studies of the various aspects and complexities of social or collective memory practices but rather to provide some examples of recent mobilizations of memory that should compel us to rethink social memory from the ground up. These mobilizations are, as already indicated, at once technical and theoretical: radical changes in the material frameworks of memory are intimately interwoven with changes in the conceptualization of memory.

The material frameworks in question are, as already noted, a series of technologies that not only store time (in the sense that magnetic tape and film could be seen to contain distinct passages of time) but produce and manipulate time in ways that may have certain rudimentary traits in common with the way in which the brain itself produces time.

This new emphasis on the material frameworks of time *production* is all-important. As Barbara Misztal has underscored, Durkheim understood time and space as social constructions, i.e. as objectively given social categories of thought produced within societies. The time of collective memory is primarily characterized by its abstract and strictly impersonal quality; it is precisely as a universal force that cannot be questioned that it can have an integrative function and be a social institution that is immobilized in the group memory. Halbwachs contributes to this perspective by describing how tradition is upheld by an illusion of timelessness – an effect of the way in which groups order important dates within a commemorative sequence.¹³ Yet it is precisely this abstract, impersonal, timeless memory time that is taken apart with the increasing dominance of technologies that exposes us not only to a multiplicity of temporalities and measures but, even more pertinently, to a sense that time and events are a matter of technical production. From this point onwards, memory time is no longer a common given but a ‘gift’ in Derrida’s sense of the term – i.e. an excess production or game shifter that breaks open the habitual cycle of exchanges.¹⁴ No longer a neutral background or foundation, time and temporalization has become a dynamic foreground, a critical object in its own right.

Many have pointed out the fundamental change to social organization that came with the introduction of the mechanical clock – not least, as Robert Hassan puts it, as ‘a scheduler and organizer of everyday life’ that ‘struck deeper and deeper into the world’s cultures and societies and capitalism spread and suffused modernity in its wake’. The power-time of capitalist industrialism universalized and standardized the measuring of time, colonizing or displacing the world’s variety of changing, context-dependent timescapes.¹⁵ Clock time subtends networked electronic and digital machineries as well, for instance through their all-important synchronization processes which depend on universal and mathematically precise standards of measure. Yet there is a qualitative difference between the type of clock time that is used to organize and synchronize human labour and keep track of mechanical technologies of production, and the clock time subtending media and information machineries whose ‘raw materials’ and ‘product’ is time itself.

For one thing, machine clocks at work in such technologies organize an 'open-ended spectrum of temporalities measured from a picosecond (one trillionth of a second) upwards'.¹⁶ A huge number of these temporalities, then, have nothing to do with any human sense of scheduling and organization, and knowledge about their existence promotes visions of a quasi-autonomous realm of machine operationality and machine agencies. They exemplify Dominique Janicaud's claim that there is no unified phenomenon that can be called 'time', since any sense of time is dependent on some kind of measure and since such measuring instances are all highly different technological entities with their own distinct purposes and procedures.¹⁷ Many such operations complicate the idea of an apparent 'flow' of time, just as the periodical series of frequencies in an alternating current breaks with the idea of electrical power as a continual flow. Here, time flow is broken up into counted regularities or measures that make the electromagnetic waves discrete and the electrophysical event of the 'spark' (the moment of interaction between an electrical conductor and an electromagnetic field) a borderline phenomenon between singularity and repetition.

But the same spectrum of microtemporalities underpins a time production that is marked not just by quantification but also by qualitative intensities, the free, measureless consciousness that Bergson called 'duration'. In fact, Janicaud claims that Bergson's distinction between quantitative and qualitative forms of time – a distinction between what he saw as 'spatially oriented' mathematical time and 'time as time only' – should be seen as a subtle differentiation rather than a principled divide.¹⁸ With machine additions happening in the fifth millionth of a second, the most microscopically precise of measures also present themselves as in some sense 'immeasurable' or incommensurable: it is hard to see how electronic events at this scale could be said to privilege spatiality over time or in what way they actually differ from the infinitely rapid movements that underpin perception and thinking. The contractions and distributions of time material in electronic and digital media productions have therefore been viewed in the light of their structural resemblance to – and association with – human perceptual and affective capacities and mental/intellectual work. Real-time technologies operate on the single plane of the present as mechanisms that receive and return movement, contracting and dilating time matter by transforming asignifying flows into signifying flows (signals and code): these are then also the key machineries at work in the industrial organization and exploitation of memory.¹⁹

Archive, media archaeology, and individuation

Once the ‘social frameworks of memory’ include time-producing or time-critical media – i.e. media constructed around technologies that modulate, compress, distribute, and differentiate time – the abstract sense of time subtending collective memory refracts into a myriad of different timescapes. Advanced synchronization clearly produces its own a-synchronicities. Such a scenario might provide another set of footnotes to the familiar narratives of modernity – the story of fragmentation, lack of social cohesion, loss of communal memory causing the ‘fabric’ of the social to fall apart, and so on. Another approach – the one we take in this book – is to ask whether social memory studies ever had a concept of the social that was equal to the *technical* dynamics and arrangements of memory. Robert Hassan touches on this issue when he writes that the truly revolutionary thing about the new information technologies and the network society they are rapidly constructing may be something social science has not yet given much thought to: notably the creation of a new form of time and a new relationship with temporality.²⁰ This may well be true, but the focus needs to be radicalized with respect to the purported task of social theory. For the question is not just that of a new relationship with temporality but how this new sense of time may produce different understandings of what it actually means to say that something is ‘social’ or ‘collective’. We could in other words ask, with Maurizio Lazzarato, to what degree sociology ever gave much thought to memory – its ‘technical-mental’ aspects. It could seem as if it raced to the description of the thing called ‘the social’ without stopping to ask more fundamental questions about the temporalizing phenomena that actually produce mental links between people and make them think and behave in similar ways, over time and across distances. What exactly *is* the thing we call memory? And how does knowledge about technologies of memory impact social theory? What is, in other words, the connection between memory and social ontology?

A point of departure for elucidating this question may perhaps be found at the intersection of media archaeology, archive theory, and a social philosophy informed by (among other things) process ontology and new materialist perspectives. If the archive is in many ways the paradigmatic object of these inquiries, it is in large part because of its ambivalent status within the field of memory studies. For while the archive is often intuitively associated with the safekeeping of cultural memory, already its original, pre-digital modes of organization were based on a principle of generative technicity that is different from the collective memorizing of the past and

the construction of historical consciousness.²¹ From its Greek and Roman origins to its role as the instrument of the expanding nineteenth-century bureaucracies, the archive was, as Cornelia Vismann has shown, designed for the efficient performance of law and government. It was all at once obdurate and generative, topological and nomological: a *place* where documents are ordered so as to be able to perform and produce law. An archive would only become an object for historical research and memory once it was no longer in active political use.²² Despite the obvious differences between paper files and computer files, there is, in other words, some degree of continuity between the non-human topologies of the digital archive and its pre-digital orders.²³ And for this reason the archive can also be approached as a discursive site where alternative conceptions or formulations of 'the social' may emerge.

The significance of media archaeology in this context is precisely its 'archival' bias in favour of technics over history. Media archaeology studies the generative laws of technical media at the expense of media history and its emphasis on technical development. Already here, two distinctly different approaches to memory present themselves. Media history traces technical traditions and innovations, developmental lines and accumulation of knowledge over time, inscribing media within the narrative horizon of historical memory. Media archaeology, in contrast, focuses on the strictly operational memory of technical machines and their various components – a form of operability that may attest to historical context but that also radically ignores it, in the sense that a functioning machine, however 'dated', may produce effects in ever-new contexts. It may, in fact, *generate* ever-new contexts: as long as it can be made to work, its performative potential is in principle unlimited.²⁴ From such a perspective, we are focussing on the diagrammatic aspects of media technologies, an operational power that

makes history by unmaking preceding realities and significations, constituting hundreds of points of emergence or creativity, unexpected conjunctions or improbable continuums. It doubles history with a sense of continual evolution.²⁵

The deep significance of the concept of the diagram in this context is not only its resistance to (media) history as a representation of 'preceding realities' but also, even more pertinently, its emphasis on concrete, empirical situations of 'emergence' or 'creativity'. There are, as Deleuze puts it, many diagrammatic functions and matters – as many as there are social fields in history – because every diagram is a spatio-temporal multiplicity.²⁶ The

diagrammatic functions of media technologies reside in their technical-mathematical operability, a special case of the 'materiality in action' that has been the focus of much recent theory. Diagrams are generally understood as ways of visualizing the 'information patterns, circuits and relations that give an idea of how the otherwise so complex machines work'.²⁷ But the circuit diagrams of electrical and electronic engineering might also be paradigmatic examples of what Deleuze indicated with the term diagram: notably an abstract outline for the production of new events, new instantiations of reality. Media archaeology focuses precisely on the multiplicity of temporalizing operations and spatiotemporal constellations that can be found in technical media, the many different ways in which time is made productive. Obviously, machines that operate on time scales equivalent to a millionth of a second produce different realities than machines counting seconds and minutes, and they activate pre-existing materials and contexts in very different ways. Beyond a 'purely' technical fascination with machines, the critical impetus behind media archaeology resides in the possibility of paying attention to a multiplicity of memory forms, events, and operations that cannot be accommodated by the narrative framework of media history and its emphasis on past realities. This pertains in particular to the miniature dimensions of the time-axis manipulations that Friedrich Kittler saw as a key feature of modern media technologies in general.²⁸ Once time-axis manipulation is no longer just a mechanical feature, as in the sound-reversing phonograph of Edison, but an effect of signal processing, the notion of static objects of memory is replaced by an understanding of technical memory as temporal events, defined by a dynamics of difference and repetition.

It might be argued, of course, that the memory forms of signal-based processes have little to do with social memory since they so radically undermine the normal frameworks of human perception (as Kittler was always happy to point out). Yet it is precisely on this point that we have to interrogate what exactly it is that is 'emergent' in the diagrammatic operability of microtemporal machines. From a strictly machine perspective – as represented for instance by the work of Wolfgang Ernst – media archaeology essentially focuses on the active agencies of a machine reality whose complexity cannot be reduced to a set of standardized operating systems underpinning the familiar culturally oriented interfaces based on iconographic, theatrical, literary, and journalistic modes of presentation and interaction. A supplementary term, media *archaeography*, is introduced in order to further underscore the reality of machine autonomy and to save the realm of machines from always being explained in terms of

anthropomorphic figures and modes of understanding. Hence the concept of media archaeography indicates a sort of epistemological reverse engineering in which the 'media archaeologist' is not necessarily a human scholar discovering the generative principles of technical operations. In contrast, technical media are seen as active inscription machines that may also figure as archaeologists of their *own* forms of knowledge: the feedback systems in cybernetic technologies point to the pertinence of such perspectives.²⁹

Yet this all-important emphasis on machine autonomy, complexity, and reflexivity must not be confused with machinic solipsism. The emergent properties of technical operations – the events of machine memory – cannot be restricted to the realm of technical machines in the limited sense of the term. It is, in fact, difficult to see how a viable delimitation of the machinic and the technical could ever be made without returning to substantialist and representational terminologies. To speak of technical agency is to recognize that machines become specific and autonomous precisely through their interaction with their 'associated milieus' – environmental factors that may include anything from minerals and microbes to plants, animals, and humans. The term 'associated milieu' is taken from Gilbert Simondon's foundational work on the modes of existence of technical machines – a forceful critique of facile humanist oppositions between culture and technics that blind us to a technical reality 'rich in human effort and natural forces'.³⁰ For Simondon, a technical object is, essentially, a unit of becoming: a fleeting moment in always ongoing processes of individuation or differentiation.³¹ There is such a multiplicity of machines that they are difficult to define as a species: similar technical structures have very different functions in different machines, and the interrelations between particular machine functions and human actions further complicate attempts at definition.³² The most general feature of the process of becoming machine is the process of concretization through which formerly separate functions converge in new and more specific technical beings. Simondon's key example is the modern car, in which each piece is connected with the rest by reciprocal exchanges of energy – very much in contrast to the early car engines, where each element comes into play at a certain moment in the cycle of operations without affecting the others.³³ Such processes are a result of feedback, or relations of circular causality, between technologies and their milieus, resulting in the sudden crossing of a threshold and the emergence of a new coupling. Associated milieus are here understood as the very conditions of possibility of innovation and are never simply external to the technical objects as such.³⁴ The autonomous technical object is, as Brian Massumi has underscored, the

very *relation* that clicks in as different functions or elements converge. A new and highly specific technical ‘individual’ may have been produced, but the process of individuation, which starts out from less-differentiated, pre-individual fields, creates all at once a new individual and a new collective or relationship.³⁵

Social memory, social ontology

The question of individuation and concretization in Simondon provides a perspective that honours media archaeology’s emphasis on the autonomy, specificity, and performativity of machines (against preformatted anthropocentric interpretations) while recognizing that technologies do not constitute a separate, self-explanatory reality. This perspective becomes crucial once we try to reframe the question of social memory from a perspective that takes the various technicities of memory into account – for the simple reason that such reframing must necessarily challenge the comfortable divide between the technical and the cultural. This divide may well be operative at the level of social discourses (historical narration and the cultural obsession with the past are, obviously, living practices that are radically different from the technomathematical logic that makes machines work³⁶), but this does not imply that it provides the most valid ontological framework for understanding what the social actually is. Jussi Parikka has pointed out the potential limitations of a media archaeological perspective in which the analytic emphasis on hardware and technomathematical operability remains too isolated from everything else: it might, he suggests, benefit from a closer dialogue with the perspectives of political economy, among other things in order to ‘articulate more tightly the wider networks in which the techno-mathematics of media take place’.³⁷ This may obviously be relevant when it comes to deepening our understanding of phenomena such as the new forms of labour that emerge in the age of digital networks or the relation between electronic microtemporalities, global markets, and the financialization of the economy, to take just two examples.³⁸ Yet when it comes to rethinking social memory from the ground up, the key concepts of political economy – labour, capital, and exchange – may actually also serve to defuse the problem by having resolved it in advance, in the sense that everything pertaining to the social relation is understood to derive from the question of useful production and how the means and fruits of production are distributed. As it happens, insights into the material/technical forces of memory may outline a more primary relationality – an ontological ground

on the basis of which the production and distribution of necessities (and all related asymmetries and forms of subjugation) may be reframed.

Here, Maurizio Lazzarato's reading of the 'psychological economy' of nineteenth-century social theorist Gabriel Tarde provides a distinct alternative.³⁹ The advantage of reading Tarde in the context of radical technological change comes in no small part from the fact that he was writing at a time when sociology had not yet hardened into a discipline with close institutional connections to the practical concerns of modern government: the question of what constitutes social facts was, in other words, still very much open. Where Durkheim defines social facts as the values, norms, and structures that transcend the individual and provide real constraints on human behaviour, Tarde casts his net much wider, refusing to define the social in terms of interhuman relations only. In *Monadology and Sociology*, originally published in 1893, he promotes the idea of the essentially social behaviour of all phenomena in the universe, from atoms and chemical substances to all living beings.⁴⁰ In the first section of the book, he argues that Leibniz's monads – designed to bridge the philosophical gap that separates mind and matter, movement and consciousness, object and subject, the mechanical and the logical – have slipped 'into the heart of contemporary science'. Newton's theory of gravitation and Schwann's cellular theory provide him with examples of how the apparent unities of an older science (planets, organisms, and cells) 'pulverize' into multiple distinct elements that are not only linked to each other but also to the elements of other aggregates. Every form of being is a non-containable multiplicity.⁴¹ The capacity for constant aggregation or association is then not a special property of higher-level living beings (so-called 'social animals') but takes place at every level of material organization, down to the infinitesimally small. Two terms – *belief* and *desire*, ordinarily associated with mental properties only – are now used to account for the essential *striving* that informs all forms of material aggregation or ordering.⁴² No theory of a mystical vital force distinct from matter is needed. Social facts are, in other words, not predefined constraints on behaviour but the *techniques of association* that come into play with each new aggregation of elements.

The details of Tarde's monist argument are of some interest when it comes to the relation between technology, human memory, and social ontology. Movement and consciousness are neither seen as two aspects of a single fact nor as heterogeneous phenomena that flow from a single source. For Tarde, the only tenable position is that matter *is* mind. Belief and desire play exactly the same role in the psyche, with respect to sensations, as do

space and time in the external world with respect to material elements. The concepts of belief and desire thus resolve the wavering between psychology and mechanism that is found in the monist thinking of biologist and philosopher Ernst Haeckel. The lack of resolution in Haeckel derives from the fact that movement is defined in quantitative terms, whereas mental properties – sensations – are defined in qualitative terms. However, the concepts of belief and desire indicate mental states that also vary quantitatively: we have more or less belief, stronger or weaker desire.⁴³ And this *technical* property, which regulates every act of association – including memory's task of connecting one sensation with another for the purposes of bodily action – invalidates the principled difference between the movement of matter and the states of mind.

Tarde's brand of sociology is, in other words, based on an identity between matter and mind that places the basic, associative *forces* of memory at the heart of the social. And, as Maurizio Lazzarato has shown, this has wide-reaching implications for the theory of the social frameworks of memory on which the major body of research on collective memory is founded. Languages, institutions, rituals, artwork, and habits obviously play a major role in connecting the collective past with the present. The question is only what explanatory power these frameworks, as such, actually have. For without the basic temporalizing forces of memory/matter – the ability to produce delays between sensations and to pull them together in new crystallizations of time and sensation – institutions, languages, and rituals would simply be dead forms. To explain social memory in terms of social frameworks or (in Bourdieu's case) habitus is to end up in a circular argument, and moreover one that is not really able to account for change. Social frameworks only persist as living practices to the extent that they are continuously animated by the temporalizing technicity of memory – or, more precisely, the *events* of new associations.⁴⁴ In fact, Lazzarato shows that Durkheim, in contrast to Halbwachs, is aware of this fact: in a little known text from 1898, Durkheim actually comes close to a Bergsonian description of memory as a quasi-independent and creative force of associations that is not in itself imparted by social institutions and whose effects go beyond that of being an epiphenomenon of neuronal activity. And his sociological conclusion echoes important aspects of the social ontology of Tarde: the creative independence of memory shows that collective life cannot be reduced to the world in which it resides.⁴⁵ Collective life is, in other words, not defined or contained by given forms but is a function of more fundamental processes of invention.

With these philosophical perspectives, we may return to the contemporary memory scenario that we are trying to address in this book. Here we have, first, a widely felt crisis in the institutional frameworks of human memory thanks to the increasing dominance of technologies that appear to turn all that was stable and contained into the fleeting events of transfer and updating in digital networks. Second, we have the theoretical and empirical discipline of media archaeology that provides insight into a host of machine agencies that constitute, each in their own way, forms of machine memory and machine realities. And third, we have the intuition that the dominant formulations of the ontological premises of shared memory are not adequate to the technological and technopolitical changes that are taking place. From a traditional cultural perspective, the prevalent descriptions of a new condition of memory loss or a disappearance of emphatic memory may be true and relevant, but is this really the best set of conceptual tools for a situation in which memory is, ever more emphatically, change or invention?

What needs to be considered, in other words, is how attention to the general technicity of social memory (over and above specific memory contents or pre-established institutional or ritual frameworks) may allow us to discover new types of aggregation across the spectre of human and electronic capacities. Tarde's monadology suggests that there is no principled difference between the events of association/invention in different material composites: the electrochemical reactions that cause the contractions and distribution of time and sensation in the neuronal system of humans is simply one very particular aspect of the contractions and distributions of matter/memory taking place across the board. All are equally social – i.e. connective. This is also why he resists the anthropomorphism of political economy, which opposes human and machine work as the work of the living vs. the work of the dead. Instead, Tarde's thinking is in many ways consistent with the much more finely differentiated conception of machines that emerge in media archaeology, where cooperation between various types of 'internal' or 'external' machines may become visible. Such perspectives do not imply that brains (for instance) are like digital networks or that the operations of computing resemble those of the brain – that would be a gross misreading of all the very different technical processes involved here. To speak of the social character of brains and information technologies implies no identity between them, only a basic recognition of the fact that both may be approached in terms of a general capacity for production of time/difference that is the technical basis for all forms of association or aggregation. And this, by extension, affects the understanding of the social nature of the institutions, languages, artwork, and rituals that they animate or mediate.

Such perspectives are not simply theoretical or philosophical but impact research and practical organization as well as socio-political imagination. It makes a difference, for instance, whether or not the memory crises faced by large and small archiving institutions are instantly framed by the implicit terminologies of a managerial/sociological tradition designed to handle very different types of 'social problems', not to speak of the interests and terminologies of the expansive memory industries that turn cognitive and affective capacities into new types of products. To question social ontologies at a critical moment of archival reorganization is, at the very least, to insert a necessary margin of indecision – or delay – into the negotiations over the various forms of 'care' for memory.⁴⁶

Sites of archival reflexivity

One of the tasks of this book has been to present and discuss a number of sites where such questioning or re-inscription of social memory has already taken place or is currently being performed. These are sites marked by what we may perhaps call 'archival reflexivity', in the sense that the various technologies of the modern mobilized archive are foregrounded in ways that may indicate not just memory crisis but new collective modalities. What these sites demarcate or reflect is the distinctly social reality of aggregations that extend across the boundaries between the human and the non-human, the spiritual and the material, the individual and the 'dividual', the qualitative and the quantitative, the living and the dead. Wendy Chun touches on these issues when she discusses how the packaging of programming capacities in the notoriously elusive entities we call software has turned all information into a thing – with the proviso that 'thing' here is not simply used to indicate a commodity but should be understood in its older sense, which is that of gathering or amalgamation. Software and the related logic of programmability then point to profound changes in our understanding of what is internal and external, subject and object, tangible and intangible.⁴⁷ And while such sites of archival reflexivity may be symptoms of, or responses to, the broad shift in inscription technologies called informatization – underway since (at least) Charles Babbage and Ada Lovelace's early nineteenth-century work on the difference engine and the analytical engine – they also extend beyond the realm of digital technologies in the strict sense of the term. For the emphatic mobilization of the archive and the increasing displacement of the metaphor of container memory is a process that involves all the new media technologies of the

nineteenth and twentieth centuries – telegraphy, telephony, photography, film, radio, sound recording, and video/television as well as the wider ecologies or processes of individuation of which they are a part. These are all privileged objects of digital remediation, but their various ways of facilitating transmission and distribution of cognitive and affective materials across time and space have been closely interlinked with processes of informatization, both technically and discursively. On a technical level, the discrete worlds of bits and bytes never actually separated from the analogue world of continuous signal modulation: not only was the concept of signals the point of departure for the theory of information but electronic signal modulation also remains a vital component of computational operations.⁴⁸ And while some theories of informatization have launched the reductionist hypothesis that the technical basis of media specificity disappears on digital platforms that subsume all previously separate media under the logic of zeroes and ones, a more viable hypothesis is that programmability programs or individuates in unforeseeable ways, producing a proliferation of new situations of mediation, association, or aggregation. Such perspectives in turn fuel a new interest in the programming and individuating affordances of pre-digital media, whose various technical affordances are now understood in terms of their performative or processual powers rather than as a set of stable or formal ‘properties’.

Such approaches distinguish the contributions in this book from the main tenets of social memory research – including work on the relation between social memory and new media, where the emphasis is often less oriented toward the machinic or operational aspects of media memory and the nature of collectivity than on the specific contents of media memories and the new types of group boundaries and definitions they engender. Interest in technological change (such as the Internet revolution) therefore mainly serves to map new collective identities related to various types of networked users.⁴⁹ Collectives are here essentially understood as associations between humans and based on ideas of a shared past that is invented or made relevant by means of material frameworks that have a certain capacity for repetition and propagation. As Jeffrey K. Olick and Joyce Robbins have put it, the expansion of social memory studies after 1980 is related to the persistent modern emphasis on mobilities and shifts in the realm of human association and marked by three major tendencies: multiculturalist critiques of the memories of dominant cultures, postmodernist critiques of essentialist approaches to questions of truth and identity, and hegemony theory’s focus on a class-based politics of memory.⁵⁰ In addition, the growing sensitivity to issues of time and temporality provides a horizon

for bringing forth a modernity characterized by a 'crisis of memory' and a problematization of tradition: the loss of 'living memory' embodied by the everyday rituals of premodern societies, as described by Pierre Nora, or the dissolution of time in an age of simulation and high-speed information networks, as described by Andreas Huyssen.⁵¹

For all the evident merits of these approaches, they give relatively few clues as to how to think the collective in an age when intelligence and the capacity for memorizing are increasingly distributed among humans and machines. Yet such issues evidently touch on the question of agency – the ability of groups and individuals to act upon each other and the world – that is at the heart of the social sciences and which must also be key to any concept of social or collective memory. The media archaeological study of the way in which microtemporal operationality formats emergent realities beyond the scope of human intention (and power of attention/explanation) obviously extends the range of potential social agents to be 'counted' as part of 'a collective'. But, more significantly, the concomitant focus on technical individuation and associated milieus serves to reframe the focus on agency as such. No longer an inherent property of certain predefined social beings (whether they are called human individuals, robots, groups, structures, or fields), agency is a moving target that only expresses itself in the event of new associations: these are now a function of technical performance in both the narrow and wider sense of the term.⁵² These are perspectives that inform approaches to social memory that take a more pointed interest in the wide range of technical functions in new media.

From this overarching focus, a number of different approaches and concerns emerge. This collection of texts revolves around a series of distinct technological-social sites related to sound recording, film and photography, analogue video/television, and computational technologies. Sound and sound recording perhaps represent the most obvious challenges to paper-based archives and monument-based memory frameworks. A paradigm of temporality, the series of frequencies that constitute sound had no means of storage before the age of electromagnetic technologies. Melodies and rhythms were relayed through repetition by memory or had to be transcoded into notational systems; the contextual, embodied, and environmental aspects of sound itself were, apparently, beyond the grasp of ostensive memory. In their contributions, Wolfgang Ernst and Sónia Matos explore different memory scenarios related to the affordances of sound recording. Emphasis on the specific media channels of storage reformulates the concepts of cultural tradition and collective memory as

a non-anthropocentric and technomathematical theory of transmission, Ernst asserts, before discussing Milman Parry and Albert Lord's mechanical and electronic recording of the oral poetry of the southern Yugoslavian *guslari* culture in the 1930s. This oral tradition had caught Goethe's interest, yet he accessed this culture through transcriptions that focused on words only: philology neglected the one-stringed Gusle instrument that was integral to the performance of a material that Leopold von Ranke saw as the sonic essence of nationalism. However, Ernst's key point is that it is not national history that is recounted in such performances: rather, the past is made present by means of the type of reverberative memory that only the servo-motoric feedback circuits of live sound can engender. The sonicist relation between present and past is based on resonance: a non-historicist figure of time that is itself temporal in its articulation. Sonicity, with its time-critical qualities, is here a metonym for the temporality of the world as event. This perspective is further underscored by the *mnemo-generic* capacities of recorded sound and in particular digitized sonic materials that are susceptible to the operative memory of algorithmic procedures. Sónia Matos has studied the archival potentials of a purely sonic language in danger of extinction, namely the whistle language known as *Silbo Gomero* that is still partly in use on the La Gomera island in the Canarian archipelago. Not only is this language composed of sounds that have no relation to alphabetic transcription, its articulation is also very much a function of the spatial context, i.e. the exact placement of the speaker in the hilly landscape of the island. This means that generic recording and storing of linguistic units fail to convey the actual functioning of the language. How can such a language be 'saved' for cultural heritage? What type of technical storage might provide it with a continued, dynamic life? In her effort to approach this problem, Matos had to discard traditional ideas of archival preservation that usually support the protection of endangered languages. To gain a situated and embodied understanding of the whistled language and the different media needed to study it, she outlines an interactive digital approach to language transmission that draws on (among other things) bioacoustics and neurological data so that the ecological acoustics of the language's sonic heritage becomes the key element. Ultimately, her analysis results in a reformulated concept of heritage as constantly disrupted by both temporal and spatial phenomena, and a call for linguistic archives in general to be more open to ambiguity and change.

Key to Matos' work is both a practical and critical approach to the archival functions of software, reflecting the increasing significance of software as agents of social memory. This is also a significant issue in the work of

Matthew Fuller, who has helped establish software studies as a critical discipline where close attention to the materialities and propensities of applications intersects with political, economic, aesthetic, and speculative concerns. In such a context, software are no longer simply finished tools but seen to comprise 'a social relation made systemic and unalterable' – all the more natural since the techniques of structuration are often imperceptible.⁵³ To counter such naturalization, the strategy of software studies is therefore to interrogate the multiple scales of operation enmeshed in a particular technology. This is the approach taken in Matthew Fuller, Andrew Goffey, Adrian Mackenzie, Richard Mills, and Stuart Sharple's research on the archival properties of Github, one of the largest dynamic repositories of software online, providing a platform for software sharing for millions of programmers around the world. As a sophisticated, distributed way of writing code in groups, Github could be studied from a perspective that tracks and analyzes the behaviours of a programming meta-community – a flow of practices that include patterns of work (coordination, development, and group structure) as well as the migration of such patterns across different settings. With a double emphasis on the granularity of this meta-community *and* its large-scale aspects, the software archive is here not just seen as a place of storage but as a veritable media ecology, a social site that produces fine-grained analysis as well as increasing divergence and incoherence. Following Jacques Derrida's emphasis on the way in which the technical structure of the archive determines the structure of archivable content in its very coming into existence as well as in its prehension of the future, David M. Berry, for his part, approaches the digital archive as a producer of new abstractions that are closely related to its functionality. To make a material computable implies that it is abstracted twice over: first it must be encoded in a symbolic language, and second it must be captured in a grammar of actions, an algorithmic procedure that can be prescribed back onto physical activity. 'Capture' here implies the creation of a model of the underlying processes that are objectified in the physical world. The processes of abstraction that underpin the digital archive are therefore not technical processes in the limited sense of the term: they radically reshape the world, 'transmitting the social bit by bit'. Algorithms recast the world into the shapes dictated by computational analysis and algorithmic processes: the expanded design thinking embedded in all aspects of computational production – exemplified by Apple's new 'flat design' grammar and Google's 'material design' counterpart – makes it possible to trace the application of the logics of computation in the organization of knowledge and action.

The relation between biological and technical life forms is a longstanding concern that has become more acute in an age of bioengineering and ecological crisis where the question of human futures and life itself is increasingly at stake. With his recent research into the mineral and chemical aspects of media technologies, Jussi Parikka reviews human communicational history and the concept of the archive in light of the geological timescapes of the natural resources that make up our media technologies as well as the critical futures that are evoked when the same technologies return to the ecosystem as toxic waste. In his text, Parikka revisits planetary futures that could be seen as instances of 'programmed history', demonstrating how various media technological contexts open for a production of future memories of the past, and how such memories may envelop both scientific knowledge production and political narratives in a technological culture facing possible collapse due to an ecological crisis. The span between the dystopic ecopolitical narratives of authors and scientists Naomi Oreskes and Erik Conway and media art pioneer Erkki Kurenniemi's concept of future life as information give some idea of the various technical/geological timescapes underpinning the contemporary political moment as well as the complex collective of agents involved in the handling of our planetary crisis. While such perspectives have been radicalized in recent years, they are not new: my own chapter in this volume documents how experimentation with video technologies in the late 1960s produced a series of analogies between video feedback and basic life processes. The microtemporal operations in analogue video exposed artists and activists to the fact that memory is not just a function of humans handling a world of more or less stable or ephemeral things but a property of the myriad of cognizing systems that make up the material world. In this context, video came to figure as a quasi-biological entity, a key mediator between biological and technical memory systems in the context of the early 1970s ecocrisis and the concomitant organization of political action. In particular, a curious alliance between video and water resulted not only in new conceptions of nature but also of social ontology. The concept of technical/mediatic life is also at stake in Eivind Røssaak's discussion of a contemporary attempt to reanimate Kurenniemi's concept of extended informational futures in terms of today's digital networks. Taking a transversal approach to Kurenniemi's vast and heterogeneous personal archive, which comprises a vast range of media technologies and types of inscription, members of the Constant group's Active Archive initiative use the principles of database interactivity and software sharing to transform Kurenniemi's files into new social aggregates. Kurenniemi's concept of bio-informational life is no longer premised on the idea of finite

informational 'bodies' floating in some kind of post-planetary space but on a principle of distributive imitation and invention that activates files on multiple levels of sharing. The combined effects of sharing files, sharing the knowledge of sharing, and sharing the knowledge of the users promote a vision of digital networks as living systems where memory above all figures as a mode of action.

If digital technologies may have spurred the new inquiries into the archive and the question of social memory, they also shed new light on the infrastructural properties of photographic and cinematographic technologies. Trond Lundemo compares the Paris conjured up in the world-mapping cinematographic archive of Albert Kahn (1908-1931) with the Paris of relays, circuits, control, surveillance, and points of transit produced in Bruno Latour and Emilie Hermant's digital interactive installation *Paris ville invisible* (2004). Both projects bypass the representational primacy that marks most mapping projects, constituting heterogeneous media networks or diagrams that produce distinct collective individuations. While Kahn assembled photographs and cinematographic snippets from cultural sites around the world in order to produce a recombinable, event-based cartography for a future when the locations would be irrevocably changed, Latour and Hernant bring out the invisible connective underpinnings of contemporary Paris, drawing out the new non-human incarnations of Paris in action that operate below the more famous Paris of memory images. In this context, photographic and cinematographic images are mainly discussed in terms of their unique capacity for propagation, for quickly relaying the belief and desires at work in the production of new social realities. This is the focus in Pasi Väliäho's analysis of a gesture observed in a random shot from a semi-private celebratory occasion found in a photographic archive. Yet this modest image-gesture – emerging as if it were a still from a film that was never made – is not alone but could be seen to weave in and out of the expanded cinematographic networks of Nazi Germany, part of an affect-based, dream-like flux that is never contained by any one medium but that mould actions and make history. It is, in short, an exemplary instance of the reality and agency of images.

Yet another mode of photography-related mobilization can be found by tracing the history of the international passport, and particularly the shift to the contemporary biometric passport, where personal information encoded in a microchip makes the passport into a digital archive in instantaneous communication with a host of official databases. As Liv Hausken argues, passports have contained biometric information all along, but the connectivity of their current digital incarnations have made the boundaries

between police registries and other governmental registries far more fluid, increasingly inscribing mobile bodies into a global archive of pre-criminals.

The two final chapters of the book are devoted to more in-depth studies of the philosophical sources for the social ontologies brought forth in this volume. Drawing on Leroi-Gourhan's theory of the technical milieu as a membrane between the interior and the exterior world, Yuk Hui returns to Simondon's concept of the associated milieu of technologies in the light of industrial globalization and its impact on the concept of social memory. A key point here is that the technical milieu no longer functions as a membrane but increasingly becomes the force that determines all syntheses and hence loses its more limited function as a medium of exchange and protection. Simondon observes this qualitative shift in technical progress and proposes a new way of understanding the interaction between culture and technics. Tiziana Terranova returns to the Leibnizian roots of Tarde's *Monadology* in order to outline an alternative to the neoliberal interpretation of social production, or peer-to-peer production, that has been presented in the work of Yochai Benkler among others. Acts of social memorization – the sharing of feelings, ideas, and values – are examples of a form of voluntary cooperation that is greatly facilitated by the peer-to-peer architecture of digital networks and that has become an important source of revenue, most famously through so-called social media. The falling cost of computer equipment has amplified the power of decentralized individual action so that economic production in the realm of information is to a large extent based on the coordinate effects of non-coordinate actions. Yet while neoliberal economists usually explain such uncoordinated voluntary work in terms of the pleasure it gives each individual actor, post-workerist Marxists do not just see such cooperation as a source of value. It is, more significantly, the specific expression of living labour in an information economy where labour does not just involve the completion of predefined tasks but is also a socialization of invention and the production of new values. Terranova argues that the concepts of individual pain and pleasure cannot explain the connective, viral dynamic of social production and hence are not able to account for the genuinely creative or inventive aspects of voluntary collaboration. Peer-to-peer production depends first of all on the flow of basic affects that mobilize all mnemonic work and only secondarily on capital and the division of labour. And this is why Tarde's psychological economy and his emphasis on the ontological priority of the connective forces of belief and desire are uniquely placed to explain what is genuinely

'social' in an economy that exploits the memorizing affordances of humans and technical machines alike.

With this final contribution, the present volume draws together at least three alternative approaches to the question of the archive: a media archaeological inquiry into the agencies of technical machines, a series of empirical sites in which the archive seems to question or reformulate its own practices, and a sociological critique of the memory industries that go beyond the well-rehearsed perspectives of political economy. Together, they provide a glimpse of what is at stake in the effort to rethink social memory from the ground up.

Notes

1. Ansell-Pearson, p. 64.
2. Bergson.
3. In Matthew Kirschenbaum's study of computer storage (2008), he draws a distinction between formal materiality and forensic materiality and uses the latter to study the many varieties of material traces and forms of inscription that exist in digital media. The study counters the myth of a new immaterial culture and also the privileging of the interface in the interpretation of digital objects.
4. Ernst, 2013, pp. 95-101.
5. Chun, pp. 137-140.
6. According to Aleida Assman (in Ebeling and Günzel, pp. 165-75), cultural memory is informed by both functional memory and storage memory. The latter injects cultural memory with a dimension of forgetting (storage is about hiding as well as safekeeping) – a forgetting that is made more dramatic with the mass of archival materials available through the Internet. In her view, the Internet then opens up for a redefinition of memory as forgetting.
7. Nora, pp. 7-24.
8. Cf. 'Moore's law': Intel founder Gordon Moore's observation that the number of transistors in a dense integrated circuit doubles approximately every two years. The history of computing hardware has so far confirmed the observation (Moore 1965).
9. Spieker, pp. 17-34.
10. It is impossible to account for the vast and rich field of recent social memory studies in this brief introduction. An excellent overview of the development of the field and its various lines of inquiry is provided in Olick and Robbins (1998). Misztal (2003) provides an introduction to the classic and contemporary theoretical foundations of the field, while expansive anthologies such as *The Collective Memory Reader* (eds. Olick, Vinitzky-

- Seroussi, and Levy) and *Memory: History, Theories, Debates* (eds. Radstone and Schwarz) assemble a rich body of classic texts on the subject as well as critical reflections on historical memory practices, memory and modernity, the physiological, subjective, and public workings of memory and memory practices as sites of controversy and contestation.
11. Durkheim, 1976.
 12. Halbwachs.
 13. Misztal, 2003. See also Halbwachs.
 14. Derrida, 1992. Wolfgang Ernst (2012) repeatedly returns to the theme of the giving or producing of time in electronic technologies.
 15. Hassan. See also Landes.
 16. Hassan.
 17. Janicaud.
 18. Ibid., pp. 116-125.
 19. Lazzarato, 2007.
 20. Hassan.
 21. As Wolfgang Ernst (2009: 182) points out, archives are not listed among Halbwachs' 'social frameworks of memory'.
 22. Vismann.
 23. The structural ambivalence of the archive was also the topic of the first section of Jacques Derrida's *Archive Fever*. Returning to Freud's concept of the death drive and his description of the psychic machinery as a 'mystic writing pad' (Wunderblock), Derrida describes the archive as an exteriorized technique of repetition that takes place *at the original place* of the structural breakdown of living memory and recollection. This is, he asserts, a fact that becomes even more pertinent with the electronic technologies that seem much closer to memory operations than Freud's mystic writing pad. The archive therefore represents the non-human forces of 'unprecedented rhythms' or events that operate in the midst of the apparatuses of cultural memory and the general search for archivable meanings. The increasing dominance of electronic technologies of inscription and their production of events show that the archive is more than a technique in the limited sense of the term: to fully acknowledge archival forces is thus to be open to juridicial and political transformations.
 24. Ernst 2013, pp. 55-59. See also Ernst, 2002.
 25. Deleuze, p. 35.
 26. Deleuze, p. 34.
 27. Parikka, 2011, pp. 52-74.
 28. Ibid., 58-59. See also Kittler, pp. 34-36.
 29. Ernst, 2013, pp. 55-73.
 30. Simondon 1989, p. 9. English quotes taken from Mellamphy, Mellamphy, and Mellamphy's translation in progress (2010).
 31. Simondon's account of technical becoming must, as Brian Massumi has pointed out, be seen in the light of his theory of individuation (Massumi

in De Boever, Roffe, and Murray 2009) See also Gilbert Simondon, 'The Genesis of the Individual', in Crary and Kwinter (1992). Simondon understands individuation as ontogenesis rather than a process of becoming within a general state of being. For this reason, individuation can only be approached in terms of the principle of individuation and the related concept of metastability and not with reference to the finished individual (which is always a provisional phenomenon). It follows from this idea that the true principle of individuation is mediation and that it is the function of memory to operate the mediation between different orders of magnitude in the living individual.

32. Simondon, 1989, p. 19.
33. *Ibid.*, pp. 19-23.
34. Mitchell. In this article, Mitchell problematizes Simondon's distinction between machines and living beings (which might make his work seem less relevant to the recent development of biotechnologies). Simondon's concept of associated milieus may, on the one hand, be related to Lamarck's concept of the milieu as a condition of possibility of organic innovation and on the other hand to Claude Bernard's idea that milieus are never simply 'outside' the animal.
35. Massumi in De Boever, Roffe, and Murray, p. 39. See also Simondon, 2007.
36. Ernst, 2013, pp. 55-73.
37. Parikka, 2011, p. 67.
38. See, for instance, Terranova or Boutang.
39. Lazzarato, 2002.
40. Tarde, 2012.
41. *Ibid.*, pp. 6-10.
42. *Ibid.*, p. 16.
43. *Ibid.*, pp. 16-21. Significantly, Tarde takes care to note that belief and desire are not anthropomorphic figures (they include unconscious states) and are not felt 'by themselves' but are applied to any sensation whatever and may therefore also apply to unknown and even unknowable phenomena. Ultimately, Tarde argues that belief and desire must be understood as forces that are objectifiable to the highest degree (18-20). At the level of human relations, belief and desire underpin the basic psychological and 'intensive' connection between human beings without which no form of exchange, communication, or collaboration is possible. This last point is elaborated in Tarde's writings on sociology and economy (see Tarde 2010: 73-135).
44. Lazzarato, 2002, pp. 211-247. This emphasis on the primary technicity of memory and desire in Tarde (over the various discursive frameworks of emphatic memory) resolves the principled divide between the archive and social memory set up in the work of Wolfgang Ernst. Ernst references Halbwachs' claim that memory is always a function of its social frameworks but states that in the archive these frameworks are not the result of individual desires but rather of medial formats. This means that subsuming

- the archive under the agencies of collective memory and its discursive processes prevents us from paying attention to the difference of the archive as a set of technical procedures. In Tarde, such a distinction becomes devoid of meaning: like the archive, social memory is first of all a set of technical procedures of connectivity and distribution (Ernst 2009).
45. Lazzarato, 2002, p. 222. See Durkheim, 1898.
 46. For a discussion of one particular form of care for memory, see Parisi and Goodman's discussion of mnemonic control and the exploitation of future memories in an economy organized around the affective relation to brands.
 47. Chun, pp. 4-9.
 48. Ibid., pp. 142-157.
 49. See, for instance, Neiger, Meyers and Zandberg, 2011.
 50. Olick and Robbins, p. 108.
 51. Huyssen, 1995: 1-12.
 52. See for instance the discussion of agency in Bruno Latour, pp. 44-86.
 53. Fuller, pp. 3-4.

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