

CULTURAL MEMORY IN THE DIGITAL AGE

Nanna Bonde Thylstrup

Radio archives are central sites of cultural memory. They contain records that can be consulted to understand our past and project our future. Today, most of these institutions are in the process of digitization or seeking to digitize their collections, often responding to political and popular calls of bringing analogue cultural memory artefacts online. This chapter seeks to examine the politics of this process, asking: how can we conceptualize sound and radio archives as sites of cultural memory? What politics does digitizing it produce? And what are the implications of it for radio research?

FROM NATIONAL TO TRANSNATIONAL CULTURAL MEMORY

Cultural memories are, by definition, mediated memories (Ong 2013[1982]; Assman 2008; Erll 2008); they need vehicles of memory to transport them across space and time beyond the finite human bearer of memory, such as books, buildings, radio programmes, the body, visual art works, natural objects, museum institutions, media institutions, natural landscapes, and so on. Via these vehicles, cultural memories allow individuals and groups to orient themselves in time and space by constructing and connecting to their past. Until recently, cultural memory vehicles were primarily confined to movement within the nation-state paradigm. (see for example Nora 1996)¹ The main reasons for this confinement were two-fold: firstly, the cultural technologies mediating cultural memory often had limited geographical reach; secondly, the

1 | Importantly, there was always an asymmetry between the nation-state and cultural memory, however. This is for instance outlined in Jay Winter's *Remembering War* in which he notes: "Collective remembrance – or, if you will, collective memory – is rarely what the state tells us to remember. There are always too many people who construct their own narratives which are either at a tangent to those constructed by politicians or their agents, or which are totally inconsistent with what the state wants us to believe happened in the past." (Winter 2006, 277)

political-legal frameworks regulating these technologies were rooted in the nation-state apparatus.

Digitization processes and the connectivity of digital technologies are reshaping the nation-state paradigm of cultural memory, bringing it from a national to a transnational framework that allows both global circulation of cultural memories as well as research on the dynamics of this circulation. As Aleida Assman notes, this new transnational cultural memory paradigm is not only dependent on new technological structures, however; the work of new transnational actors and institutional networks also need to be taken into account (Assman, 2014). The transnational cultural memory paradigm thus raises not only technological questions about *how* to develop new forms of cultural memory circulations; it also raises political questions about *why* and for *whom*.

If one wishes to examine the implications of the transnational memory paradigm for radio research, one is required to work from an analytical framework that includes both technological infrastructures (memory artefacts included) and the actors that construct and perform these infrastructures. Such an endeavour carries a promising potential not only for memory studies, but also for inquiries into the relationship between cultural memories and their technological infrastructures. This contribution will outline central issues to consider in this respect, focusing on the infrastructural transformations of cultural memory brought on by digitization, and the political contexts in which these transnational memories are being formed.

THE IMPLICATIONS OF DIGITIZATION FOR SONIC CULTURAL MEMORY INFRASTRUCTURES

The dynamic infrastructures of radio archives present a special case study of transnational cultural memory. Radio archives are archives in motion (Røssaak et al 2010) that collect not only static objects such as static texts and images, but also dynamic streams of information. The dynamic nature of radio archives presents specific infrastructural archival conditions that have significant implications for its migration into the digital sphere as well as the legal-political questions this migration raises.

The infrastructural cultural memory work of radio archives operates in two modalities of content and infrastructure. Listening to an old recording brings back memories much like Proust's famous madeleine cookie: the diction of the presenter, the hit-list music, the covering of a major political event can all transport one from the present to the past in a split-second. Indeed, archival artefacts are logistical entities that operate not only across space, but also across time, bringing historic moments into the present as well as the listener into the past. Old radio recordings are not only vehicles for cultural memory through

the content they transmit, however, but also through the audible dimension of its infrastructural construction: the distinct noise of the rotating cylinders, the muffled sounds of long-wave, the bodily noises of speakers (e.g. coughing, huffing, laughing).

Until recently, these two levels of memory were inherently entwined by an indexical tie between the infrastructure of cultural memory (e.g. lacquer, magnetic tape and vinyl) and its content. Today, however, digitization processes convert these media archaeological artefacts into digital streams of malleable ones and zeros. This conversion has significant implications for how we might understand sound archives as sites of cultural memory. While digitization may appear to merely transpose audio recordings from one medium to the other, it in fact forcefully restructures its entire being. Indeed, as Wolfgang Ernst notes, the conversion of analogue to digital media archives represents not just another mode of cultural memory, but rather a dramatic infrastructural transformation of its essence (Ernst 2014). The following sections will examine this infrastructural transformation focusing on three central points: storage capabilities, spatio-temporal regimes and connective affordances.

STORAGE

Storage space is a basic condition for cultural memory, whether it is the storage space of a scroll that holds a bureaucratic record, a building that shelters a vast archival collection, a vinyl record whose groove holds a recording, a polaroid strip that offers a tune or a hard-disk that saves a life's worth of work and play. Within these storage spaces, time becomes space, exempting memory objects from the flow of time to keep them in a dormant state. Yet digitization has radically altered this dormant premise, partly because it radically transforms its storage capacity and partly because it transforms the storage space from static to dynamic mode of existence.

A brief glance at the accelerating evolution of the storage capacity of external memory and some arbitrary numbers of the relation between digitized and non-digital memory indicates how conditions for memory storage have changed: the quantity of data that humankind has stored to an external memory medium so far (i.e. not just created but saved to some medium that still makes it accessible, including material such as clay tablets) is today estimated in two-digit zettabytes. Yet, less than 1% of this information is in non-digital form. While these numbers are arbitrary, and outdated almost as soon as they

are put on paper, they signal a fundamental shift in the storage paradigm of cultural memory from a regime of scarcity to a regime of ubiquity (Hayles 2005).²

Cultural memory brings together memory and storage, the machinic and the biological, into a constantly evolving cultural archive (Chun: 133ff). As Wolfgang Ernst emphasizes, all these storage spaces, as vehicles of cultural memory, differ from human memory; where the human brain re-members through complex biological and intellectual processes of association, the technologies of cultural memory sites rather re-call data through mathematical and alphabetical principles (Ernst 2010). The differences between storage occur not along a man-machine axis, however, but also along a material axis of medium specificity: if old phonographic cylinders could store around 2-4 minutes' worth of audio recording, the 45 rpm record up to six minutes per side, the audio cassette up to 60 minutes per side and reel-to-reel up to 48 hours. The development of various uncompressed and compressed digital audio file formats and inexpensive mass storage have revolutionized audio storage, allowing days', even months', years' and decades' worth of audible cultural memories to be stored on servers, ready to be activated at the user's behest.

Digitization thus radically alters the storage sites of cultural memory, in both temporal and material terms. While phonographic cylinders and vinyl records house dynamic cultural memories that require motion to be activated, they are themselves relatively stable modes of inscription: apart from the entropy that befalls any earthly material, they remain in a stable material state. The digital, as Wendy Chun notes in her astute analyses of the storage capabilities of digital archives, is different: "If our machines' memories are more permanent, if they enable a permanence that we seem to lack, it is because they are constantly refreshed – rewritten – so that their ephemerality endures, so that they may 'store' the programs that seem to drive them" (Chun 2011: 170). Digitization thus changes the nature of sound storage from a relatively stable mode of preservation to highly dynamic processes of constant regeneration. Cultural memories are no longer preserved in static terms, but rather depend on constant infrastructural migration. Hence, electronic memories represent a paradox: they become more permanent the more they are constantly refreshed, so that only "their ephemerality endures." (ibid.)

The dynamic quality of digital storage also has implications for how we think about storage. As an EU bureaucrat working with audiovisual archives once confided in me: "digitizing films is not a way of preserving films... you need to ensure to keep software, ensure migration, that you keep the media. So when you go into digitization you enter an active process that never ends." This active process helps to preserve cultural memories in an enduring ephemeral

2 | As Viktor Mayer-Schönberger notes this reversal has implications not only for the circulation of cultural memory, but also for its legal and ethical frameworks (Mayer-Schönberger 2005).

state, yet the active processes of digital remediation and regeneration often also introduces a constant process of memory loss: the loss of metadata, context, materiality. The dynamic nature of digitization thus produces not only new modes of cultural memory; it also produces new modes of cultural forgetting.

SPATIO-TEMPORAL REGIMES

As the above section shows, digital forms of storage change the archival function from one that arrests time to one that requires constant motion. This infrastructural transformation also has significant impact on the spatio-temporal regimes of sound archives.

Cultural memory archives that operate on the level of listening are temporal technologies belonging to a specific time and place. Thus, while some archives such as libraries and natural history museums span millennia, some even millions of years, the temporal regime of sound and radio archives by comparison has a much shorter lineage, reaching back only a few centuries (see Carolyn Birdsall's chapter in this volume). Yet, despite its limited temporal scope, the temporal experience of sound archives is arguably much more transgressive than that of the written letter because of its ability to perform the sounds of men and women in a-historically present ways. Thus, as Ernst notes, rather than relying on textual witnessing, people with sound recordings actually "can listen to the voice of the dead."³ (Ernst 2015: 103) The effect, Ernst argues, is a "technologically induced trauma" rooted in a conflict between the intellectual experience of listening to history and a phenomenological experience of listening to someone who is with one here. This shock, Ernst notes, "has not been epistemologically digested yet." (ibid.)

The resonance of the past isn't only a site of trauma, however. It is also a point of more productive connection. Foregrounding the corporal dimension of sound and the ways in which it brings human bodies together across time and space, Brandon LaBelle suggests that everyday "acoustic territories" are "full of dynamic resonance" that create "connective moments" (LaBelle 2010: xxiv).⁴ Apart from their macro-temporal scale, sound archives are, as Wolfgang Ernst reminds us, also premised on the microtemporalities of their capture, production and storage sites. Magnetic tape recordings of sound thus contain temporal

3 | Indeed, as Peter Krapp notes, radio was regarded, in its infancy, as a possible means to contact the dearly departed (Krapp 2004, p. 78)

4 | In this sense digitized sonic archives not only provide new vehicles of cultural memory but also bring about new opportunities to research the audibility of history (Walraven 2013). Important new questions emerging with these new opportunities revolve around how to transform sonic artifacts from cultural memory objects to historiographical sources (Smith 2001; Bijsterveld 2008).

layers within their very materiality: they rely on a chemical process of developing; a time consuming processes of editing and limited modes of manipulation. Transferred to the digital environment, however, these temporal layers are radically reconfigured and laid bare to time manipulation in new ways; digital regimes thus offer new modes of stretching, delaying, replaying and sharing time. Digitization often also lifts cultural memory collections from a regime of preservation to a “regime of anticipation” (Mackenzie 2013) in which our cultural memories and the way we access no longer concerns our relation to our pasts, but also attains a future dimension in the form of probabilistic outcomes: ‘If you like this, you might also like...’

If sonic archives are temporal technologies on both macro- and microscales, they are also territorial and spatial technologies. They thus manifest the territorial dimensions of, for instance, the ethereal imaginary of radio waves, linking it to its technical and legal infrastructures. As Brandon LaBelle points out, radio was always veiled in “a set of aerial fantasies whereby transmission features as means for emanation and transformation” but these fantasies also always came “hand in hand with the radio tower” as a marker of an infrastructural networks (Labelle 2010: 207). Radio transmission was thus always equally about “imaginary emanations” and ‘national infrastructures of communication networking’ (ibid.). Sonic archives often exacerbate the national infrastructural component, circumscribing the ethereal radio waves in an archival collection circumscribed by a nation-state paradigm that both gave rise to the archives and govern their content. Thus, for instance, the sonic collections in the Danish state library reflect the cultural and regulatory trajectory of its territory, mostly containing records spoken in Danish, about Danish affairs, displaying Danish music tastes and operating according to Danish regulatory frameworks and taxonomies (see Badenoch’s chapter in this volume on the fate of international broadcasting archives).

Digitization rehearses the dual order of ethereal fantasy and territorial reality. Most striking is the ability of digital sound environment to provide immediate and direct access to, and interaction with, the digitized sounds across time as well as disciplinary and geographic borders. As Wolfgang Ernst notes, “being always-on is an affordance of electronic media. (Ernst 2014, 17). As opposed to magnetic tape recordings held in an analogue storage facility, which requires the potential listener to travel to it and perhaps also to facilitate the correct apparatus to play it, digital sound files can be retrieved instantly via a number of points and routes. This is, for instance, visible in the digital cultural memory platform Europeana, which allows the listener to enter into its audio collections

through a wide variety of entry points, from sound and genre-based categories to mapping tools⁵ such as time mapper.⁶

Yet, while these new digital collections appear to release the latent ethereal nature of radio from the temporal and spatial constraints of the analogue archive, digitized collections are in fact constrained by new spatio-temporal regimes of bandwidth and copyright frameworks. In the case of Europeana, these constraints appear in the form of a lack of radio recordings. As Sonia Leeuw notes in this volume, access to radio programs is rather limited, primarily due to national policies on copyright and privacy. Thus, while digitization often gives rise to new forms of “aerial fantasies” that might provide transnational access, these fantasies are again reined in by territorial realities, this time in as a lack of transnational copyright regimes but also new technological challenges.

Hence, while digitization offers the possibilities of circulating cultural memory objects outside the production environment, the territory that gave rise to them and the temporal frame of most broadcasting institutions’ regular websites, as well as new ways of modulating and manipulating sound files, digitization has not done away with temporal and spatial regimes. Rather, digitization poses new challenges to audio-visual memory institutions, raising questions about who has the right to access and circulate digitized material, in what forms, and whose voices are allowed to take part in narrating cultural memories of the past and present.

CONNECTIVE CONDITIONS

If aerial fantasies are hampered by spatial and temporal conditions, access nevertheless remains a central mantra in cultural memory circles concerned with digitization, reverberating under slogans such as “sharing is caring” and “freedom of access.” (Sanderhoff et al 2014) As an EU bureaucrat shared with me in 2010, “digitization is giving us is the possibility of providing access in a way that we have never imagined before. So that is the point of digitization, of providing access.” What access opens up is not only the possibility of processes of inscription and reading, but also of connecting. The technical development of the digital has thus offered new ways of connecting objects and users.

The connective paradigm has led some memory researchers such as Andrew Hoskins to suggest that we should understand memory in the framework of the *connective turn*. What this means is emphasizing the fluidization of digital content and acknowledging its malleability and flexibility. Within this paradigm, memory institutions are no longer prescribed only through clusters

5 | <http://www.europeanasounds.eu/sounds>.

6 | <http://timemapper.okfnlabs.org/anon/yumuul-travelling-through-times-with-sounds>.

of static institutions and organizations. Rather, they connect with objects, individuals, institutions and corporations to form new distributed digital domains of sociality. This is visible in Europeana, in which projects such as Europeana Sounds have emerged as an assemblatic EC-funded project that connects and aggregates 24 partners from 12 countries to not only enrich the platform with sound and sound-related material, but also increasingly to include social and cultural participation from users in its curatorial practices. Europeana Sounds' turn from 'mere' connectivity to sociality is part of a larger digital tendency where online services have shifted from offering channels for networked communication to becoming interactive, two-way vehicles for engineered networked sociality. (Dijck 2013)

As the previous section pointed out, connective memory upends the traditional temporal and spatial metaphors of memory. It thus not only provides new memory infrastructures but also prompts a rethinking of concepts that were previously a staple in cultural memory research vocabularies. In cultural memory theory, for instance, the spaces of cultural memories are often described as relatively stable sites such as a concert hall, a museum space, a park or even one's living room in front of the radio or television. It is often clear who the sender, or at least, the benefactor, is: a state, a figure of authority, a charismatic voice. Often, the receiver's part is often a receiving audience, first taking in and digesting the memories and only later performing remembrance again. And the governance framework of cultural memories would often be delineated clearly as public and private domains.

The deconstruction of the walls and voices of traditional cultural memory institutions produce new forms of governance and authority. Thus public institutions that once served as the primary stage for cultural memory are now increasingly embedded in private and privatized networks through public-private initiatives and digital communication channels such as social media (Huang 2015; Thylstrup in press). These infrastructural transformations also impact the ontological status of cultural memory institutions. Thus, digitization repositions what were once conceived of as central memory institutions to merely representing another node in increasingly complex memory ecosystems. As Marianne Ping Huang notes, this shift from closed – and often publically funded – circuits to networked commercial channels is among other things illustrated by a new cultural memory discourse in which the concept of “resource” branches out into new “communities of practice,” just as it is made evident by the new emphases on “new markets,” “new stakeholders” or “new partners” for emerging “value chains” within in business plans for digital cultural heritage organizations. The infrastructural modulations of cultural memory also have significant impact on the delineations of cultural memory: if collective memories on the one hand were formerly internalized as personal recollections, private memories are today also increasingly externalized in cultural

memory sites for all to trace, share, and mine. The digital archiving of cultural materials thus acts as a vehicle for memory but also brings these memories into the public sphere by the social activity of its users.

THE POLITICS OF CULTURAL MEMORY IN THE DIGITAL AGE

As the sections above show, digitization gives rise to new questions for transnational cultural memory research. Digitization alters the storage space of cultural memory institutions and their relations to active processes of remembering; it transforms their territorial and spatio-temporal regimes; and it produces new cultural paradigms of connectivity. These transformative processes raise a final question: what kind of memory politics do these transformations produce?

The infrastructural changes of cultural memory brought on by digitization, and the transnational implications it presents cultural memory with, do not happen magically by themselves in a political vacuum. Rather, digitization and its connective teleology, have been – and continue to be – undergirded by national and transnational policy frameworks that support digital transformation of access to digital-based resources, materials and knowledge production. This support is visible for instance in the discursive shift from history to memory in cultural memory institutions, and in the developments in transnational policy regimes such as copyright.

Memory has become a key concept in institutional initiatives for digitization (Stainforth 2016). While the discursive shift from history to memory has a distinct historical backdrop in the analogue world⁷, it is, as Stainforth notes,

7 | As Jay Winter notes, the memory discourse that dominate cultural heritage institution today had its own political motivation, spurred on by a series of 20th century events and movements, of which one of the most important ones was the idea of the ‘duty to remember’ after the Holocaust. Emerging in the 20th century as a historical category in its own right, consolidating in the academic discourse in the 1970s, and the institutional discourse in the 1990s the 20th century thus saw an increased interest in the subjective aspects of history, that is, in collective and cultural memory. This shift in perspective from the objective tradition of historical positivism to the subjective perspective of cultural memory also implied a general semantic shift in the professional and political discourse on repositories of public knowledge such as libraries, archives, museums and galleries; they were now no longer addressed as historical institutions, but rather framed as ‘memory institutions’. The semantic shift from history to memory not only gave rise to a new discourse, but also implied a methodological shift in curatorial practices; if historical institutions were seen as objectively mediating historical facts, cultural memory institutions were rather framed as active co-constructors of cultural memory. The implications of these theoretical and practice-based changes also implied new institutional questions. Informed by the topical common denominator in scholarship concerned with memory, namely the ways in which people construct a sense of the past (Confino 1997), institutional questions no longer

also symptomatic of a political framework that wishes to foreground the connective power of digital media and promote transnational cultural integration, in particular in Europe. As Sonia de Leeuw notes in this volume, Europe has thus long sought to create financial and cultural frameworks to undergird and advance transnational collaboration in Europe by developing common data models and services that national initiatives could speak into.

Transnational memory projects such as Europeana not only link platforms in technical terms, however; they are also *programmed* with a specific objective. The new cultural memory environments draw on the ideological and technological foundation of new media in which creation and exchange of user generated content, for instance through participatory indexing as mentioned by de Leeuw, is key. In many ways they thus act as continuations of existing memory politics with its inclusive and dynamic scope. They thus often build on already existing institutional ideals drawing on cultural memory theory that position people as individuals that increasingly seek to properly understand their own existence in the grand scheme of historical events by means of sharpening their own remembered experience and the testimonies of others against available state-sanctioned versions – official documents, exhibits, text books etc. It also continues the agenda and methodological approach of cultural memory theories that recognize – formally at least – that the primary institutional objective is no longer to construct authoritative canons and official narratives, but rather to discover and construct different cultural indexes in the archives such as gender, race, class and sexuality among others. The digital continuation of the institutional turn to cultural memory is reflected, among other things, in the way digital platforms of cultural memory increasingly include personal accounts, ‘small histories’ and other ego documents to reflect and refine the complexities of grand historical narratives.⁸ Such weaving of ‘my story’ and ‘everyone’s story’ into a coherent whole, as well as an exact marking of time, has long been a core aspect of radio (Scannell 1996), and radio archives in the digital age potentially offer vast resources for including such material. The BBC’s recent online publication of the back catalogue of the program *Desert Island Discs*, where famous people tell their life stories using a series of their

revolved primarily around ‘what happened?’ but rather ‘what do we remember?’ and focus changed accordingly from notions of objective truth, source criticism and sobriety to the use of things and the emotions attached to the use history.

8 | See for instance the online exhibition project *Europeana 1914-1918* which aggregated content from national collections and combined the material with European roadshows where memory professionals collected citizens’ manuscripts and memorabilia from the war to be digitized. In addition to the roadshow, the exhibition project also featured an online collections form, where personal stories and images could be uploaded.

favorite records is a case in point.⁹ Long a go-to resource for BBC producers as a source of instant soundbytes of celebrities, it is now open for inclusion and interpretation in any number of digital stories. Yet the connective potentials of the digital domains allow transnational sociality to become an even more pronounced factor of cultural memory institutions accelerating a merging of the creation of cultural artifacts, their production and distribution, their curation, preservation and consumption across borders. Arguably these convergences have given rise to new forms of transnational audio cultures, new ways of engaging with those cultures and new modes of more inclusive and more transnational memory cultures.

The connective turn has also prompted criticism about the politics of digital cultural memory, however. Bernard Stiegler, for instance, examines new memory technologies as “technologies of power,” focusing on the loss of control we face when submitting our memories to the control of digital platforms (Stiegler 2006). With the exteriorization of memory, argues Stiegler, comes a loss of sovereign memory and of knowledge, which is experienced in our daily lives in the feeling of powerlessness, if not of impotence, when it comes to acting without these devices. Paradoxically, he notes, this impotence arrives at the exact moment when the extraordinary mnemonic power of digital networks make us all the more sensible to the immensity of human memory, which seems to have become infinitely reactivatable and accessible. Other prominent criticisms focus on the ways in which participatory cultures increasingly resembles new forms of digital labor (Terranova 2006), while yet others examine the ways in which mass digitization, rather than doing away with territorial politics, instead gives rise to new forms territorial memory politics. (Thylstrup, in press)

The most important political issue of digital radio archives from a transnational perspective remains, however, the politics of copyright regimes. The latent transnational dimension of cultural memories still in many instances confronts the new bordering mechanisms of immaterial rights, copyrights, and standards for digitized resources that uphold institutional gatekeeping of access, use and re-use of archival material. The most remarkable thing about this political problematic is that it shifts the questions of borders from a public question about state policies to a privatized terrain involving industry stakeholders and memory professionals. Understanding the implications of this shift from public policy to private governance for transnational memory research remains a main task for anyone interested in conducting research into the politics of sonic cultural memories.

9 | <http://www.bbc.co.uk/programmes/articles/5qhJd1byxhTBYbSCFmw580y/desert-island-discs-podcasts>.

REFERENCES

- Assmann, Aleida (2014): "Transnational Memories" *European Review*, 22/4, pp. 546-556.
- Assman, Jan (2008): "Communicative and Cultural Memory." In: Astrid Erll et al. (eds.) *Cultural Memory Studies: An International and Interdisciplinary Handbook*, Berlin and New York: Walter de Gruyter, pp. 109-118.
- Cock, Buning/Bruin, M, R W./Belder, Lucky (2015): *Cultivate!: Cultural Heritage Institutions, Copyright & Cultural Diversity in the European Union & Indonesia*, Amsterdam: DeLex,
- Bijsterveld, Karin (2008): *Mechanical Sound: Technology, Culture, and Public Problems of Noise in the Twentieth Century*, Cambridge, Mass: MIT.
- Chun, Wendy (2011): *Programmed Visions Software and Memory*, Cambridge, MA: MIT Press.
- Confino, Alon (1997): "Collective memory and cultural history: problems of method," *American Historical Review* December, pp. 1386-1403.
- Dijck, José Van. (2013): *The Culture of Connectivity: A Critical History of Social Media*, New York: Oxford University Press.
- Erll, Astri (2008): "Literature, Film, and the Mediality of Cultural Memory". In: Astrid Erll et al. (eds.) *Cultural Memory Studies: An International and Interdisciplinary Handbook*, Berlin and New York: Walter de Gruyter, pp. 389-390.
- Ernst, Wolfgang, (2010): "Cultural Archive versus Technomathematical Storage," In: Eivind Rossaakm (ed.) *The Archive in Motion*, Oslo: Novus Press, pp. 53-73.
- Ernst, Wolfgang (2014): *Temporalizing the Present and Archiving Presence: The Impact of Time-critical Media Technologies*. Textual material, related to lecture at Concordia University, Montreal (Canada), Department of Communication Studies, 2014. <https://www.musikundmedien.hu-berlin.de/de/medienwissenschaft/medientheorien/ernst-in-english/pdf/micro-temporealities-montreal.pdf>
- Ernst, Wolfgang, (2015): "History or Resonance? Techno-Sonic Tempor(e)alities," *Journal of Visual Culture*. 14/1, pp. 99-110.
- Hayles, N. Katherine (2005): *My Mother Was a Computer: Digital Subjects and Literary Texts*, Chicago: University of Chicago Press.
- Huang, Marianne Ping (2016): "Archival Biases and Cross-Sharing," *Nordisk Tidsskrift for Informationsvidenskab og Kulturformidling* 5/1, pp. 53-62.
- Krapp, Peter (2004): *Déjà vu: Aberrations of Cultural Memory*, Minneapolis, MN: University of Minnesota Press.
- LaBelle, Brandon (2010): *Acoustic Territories: Sound Culture and Everyday Life*, New York: Continuum.
- Mayer-Schönberger, Viktor (2009): *Delete: The Virtue of Forgetting in the Digital Age*, Princeton: Princeton University Press.
- Nora, Pierre (1996): *Realms of Memory: Rethinking the French Past*, edited by Lawrence D. Kritzman. New York: Columbia University Press

- Ong, Walter J. (2013[1982]). *Orality and Literacy: The Technologizing of the Word*, New York: Routledge.
- Røssaak, Eivind (2010): *The Archive in Motion New Conceptions of the Archive in Contemporary Thought and New Media Practices*, Oslo: Novus Press.
- Sanderhoff, Merete/Edson, Michael Peter (eds.) (2014): *Sharing is Caring: Openness and Sharing in the Cultural Heritage Sector*. Copenhagen: Statens Museum for Kunst.
- Scannell, P. (1996): *Radio, Television and Modern Life*, Oxford: Blackwell.
- Smith, Mark Michael. (2001): *Listening to Nineteenth-century America*. Chapel Hill: Univ. of North Carolina Press.
- Stainforth, Elizabeth (2016): "From Museum to Memory Institution: The Politics of European Culture Online," *Museum and Society* 14/2, pp. 323-337.
- Stiegler, Bernard (2006): "Anamnesis and Hypomnesis: The Memories of Desire," In: Louis Armand/Arthur Bradley (eds.), *Technicity*, Prague: Litteraria Pragensia, pp. 15-41.
- Terranova, Tiziana (2006): "Of Sense and Sensibility: Immateriality Labour in Open System," In: Joasia Krysa (ed.) *Curating Immateriality: The Work of the Curator in the Age of Network Systems*, pp. 27-37.
- Thylstrup, Nanna, (in press): *The Politics of Mass Digitization*, Cambridge, Mass: MIT Press.
- Walraven, Maarten (2013): "History and its Acoustic Context: Silence, Resonance, Echo and Where to find Them in the Archive." *Journal of Sonic Studies*, 4/1 <http://journal.sonicstudies.org/volo4/nro1/a07>
- Winter, J. M. (2006): *Remembering War: The Great War between memory and history in the twentieth century*, New Haven: Yale University Press.

