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Joshua Synenko

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Geospatial Memory: An Introduction

JOSHUA SYNENKO

Trent University, Canada

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Abstract

This introduction to the special issue situates memory research within the expanded fields of geography, mapping, GIS and mobile media.

Keywords

Collective memory, Geography, Location, Mapping, Media theory, Space

A lot of people in memory studies are invested in questions of space and in spatial phenomena like cities, but lack a detailed vocabulary with which to examine digital spatial mediations in particular, while others doing work in geography, mapping, GIS and mobile media frequently touch on issues that are important for memory research but don't fully appreciate what memory studies offers. By acknowledging these divides, this special issue (SI) provides supplementary theoretical support for analysing geospatial media with a focus on the ontological, epistemological and political stakes involved in geospatial collective memory. It examines the latter both in its capacity as a gatekeeper of official remembrance, including practices of commemoration, musealisation and preservation, and as the basis for expressing a multitude of socio-technical determinations within everyday life.

The issue comprises a grouping of polyvocal contributions that draw from research in archival studies, architecture and urban planning, critical GIS, cultural studies and film studies, and media archaeology, as well as from mobile communications, to address the geoweb's increasing role in producing and reproducing aesthetic, cultural and historical knowledges and practices. Specific articles identify the critical

infrastructures that sustain the geoweb with its ability to shape navigational (or broadly spatial) as well as sensory experienced reality, whereas others explore the power relations that have arisen from this influence. Again, while it is true that spatial analyses have been developed within memory research, and collective memory within the expanded fields of geography and media studies, the specific relationships between them ought to be further explored. On that basis, the larger purpose of this SI is to support the argument that both collective and cultural memory, diverse and unwieldy though they may appear at times, should be provided with a stronger foothold in discussions regarding the geoweb in its experiential, discursive and disciplinary contexts.

Spatial Turns, Locations and Locative Media

Not surprisingly, scholars of memory studies have made repeated attempts to substantiate their work as a discipline of thought with its own canon of literature, to establish a coherent link between the academic and practical (i.e. curatorial) wings of memory research, and to negotiate the linkages between “memory research” and “memory culture” (Radstone, 2008; see also Kansteiner, 2002; Levy, Olick, and Vinitzky-Seroussi, 2011; Radstone, 2000). At a certain point in this process, the shapers and definers of the field were confronted by an additional challenge to acknowledge the inherent spatiality of its subject matter, and participate in a broader “spatial turn” impacting the humanities and social sciences from the 1980s and 1990s up to the present (Arias and Warf, 2009; Ayers, 2010; Bodenhamer et al., 2010; Crouch and Nieuwenhuis, 2017; Soja, 1996). Certainly, people working on issues of collective memory have never been shy to casually drop mentions of “space and time” in their publications – whether to describe a commemorative ritual in experiential terms, or to interrogate a site of atrocity through the frame of a memory “landscape” (Jakubowicz, 2009). In other cases, however, as evident in terms like “archive cities” (Roberts, 2015) or “cartographies of place” (Darroch and Marchessault, 2014), the spatial metaphor gains stronger definition as a specific marking of memory *in situ*. Although, far too often, the situated memory content will be referenced in the absence of exploring the onto-epistemological dimensions of the space actualised in the process. Finally, on the practical or professional side of memory research, spatial analysis tends to be evoked to describe the arrangement of curated museum objects

(Crane, 2000), and the implications of infusing museum-going experiences with new media (Huysen, 1995).

While each of these approaches attempt to grapple with spatial questions and are valuable on their own, I argue that memory researchers should continue to intensify their engagement, especially given the urgency to address media ecologies in which collective memory appears to be an enduring factor (as described below). In many cases, descriptions of memory in spatial terms suffer from a lack of specificity. One need only consider the sense of obligation many might feel to reference Pierre Nora's (1989) deceptively congenial term, "*lieux de mémoire*" or "memory sites." At the height of postmodernism, Nora developed this term to identify what he considered to be the loss of collective memory by individuals living in contemporary societies. Historical recollection, he argued, has become the exclusive means by which individuals, atomized into populations, seek to understand the embeddedness of the past within present experience. For Nora, history and memory are competing terms, and indeed he takes pains to identify historical representation as the culprit for displacing "tradition...custom...the ancestral" (1989: 7). Above all, whereas "memory" is living, vulnerable, changeable, and connects generations through precarious rituals, traditions, and the acquisition of naturalized social roles, "history" is written, representative, durable, linear and factual.

Nora's work reveals a deep investment in the conceptual engagements of Maurice Halbwachs (1992), who argued that because memory is founded on intergenerational transmissions, it is ultimately sustained by familial bonds, oral history, and the linkages between family and nation – all of these, for Nora, have been imperilled by historical (i.e. spatial) forms of thought and culture. Through the prism of historical time, the work of memory becomes a rarefied activity. That is, by seeking to recover a sense of the collectively shared past, individuals are forced to engage, not with each other, but with the austere *lieux* that surround them, to re-establish the personal significance and resonance of urban exteriors, including facades, monuments, parks, curves in the street, and so on. Nora's use of spatial metaphor is therefore a symptomatic response to displacements in temporality. In other words, while he presses on the necessity of transforming *lieux* into identifiable *places* – into locations supplemented by a necessary but insufficient semiotic anchor – the spatialisation of

memory as evoked by Nora's *lieux* is a direct consequence of instability in our episteme of passing time. Memory, like history, is spatialised.

Perhaps, for obvious reasons, it is tempting to evoke Nora's overtly spatial descriptions of memory as a heuristic for navigating the expanded field of research into mobile and locative media, particularly if we consider the latter's potential for theorising a geospatial memory of "sites." In "Anthropocene Elegy and GeoSpatial Presence," Jon Dovey and Duncan Speakman engage in sited memory of a sort by initiating a controlled experiment in which users are meant to engage in highly individualised sonic "elsewheres." Through the materialisation of located experiences and diverging timescales, Dovey and Speakman's hope is to confront "hyperobjects" (Morton, 2013) such as human-initiated climate change. In "BATTERCTRAX," Matthew Flintham takes a different approach by positioning our investment in "place" against a media archaeology of film. He reflects on a project that involves deploying locative techniques, such as geofencing, to encourage multisensory effects among a sample of visitors at Battersea Park (London, U.K.), an approach that inadvertently harkens back to the obsession with "counter-memorials" (cf. Young, 1993, 2016). In "Between Landscape and the Screen," Jill Didur and Lai-Tze Fan explore the impact of environmental placemaking and transitive reading strategies with an aim to counter repeated historical erasures of indigenous knowing, particularly at Montreal's Mile End, and to develop narrative transformations at the site of neighbourhood-enhancing "urban wilds." Finally, the section devoted to locative media concludes with "Looking for 'in between' Places," in which Manuel Portela, Albert Acedo, and Carlos Granell-Canut develop a theory that challenges the limitations of working through "place attachment," to understand the liminality – and idiosyncrasy – of collective placemaking through the processual flow of everyday life in Lisbon, Portugal.

In one way or another, this collection of articles exposes various *lieux de mémoire* to address questions of temporality, memory and identity from the vantage of mobile and locative media, encompassing lab experiments, artistic projects and phenomenological engagements with mediated localities. The sonic, somatic, visual and haptic dimensions of these projects speak to Nora's insistence that memory

work is necessarily individual, experiential and situated. On the other hand, the breadth of this research alone might provide us with at least a suspicion that Nora's core argument is unable to address the diversity of questions that are raised here. Although aspects of the argument might be valuable and applicable, it's impossible to avoid the fact that Nora's driving concern is to tangle with historiographical representations of pastness, and ultimately to reassert the significance of memory as somehow entropically "communicative" (Assmann and Czaplicka, 1995). The nostalgic flavour of Nora's obsession with a particular experience of the present is simply not transferable in all instances. In fact, the overall framing of memory, with its presumed authenticity objectivised in a very particular vision of collective identity, is a problem.

Topologies of Memory

Given this, memory researchers urgently need to develop forensic approaches to space that depart from this diagnostic model, or at least aim to contextualise it as one topology of memory among many others. "Conceptions of space are intimately linked to those of time" (Shields, 2013: 7), and yet space itself is not unchangeable, or even tangible; instead, it is "real but not actual" (Shields, 2013: 8), and it is therefore engaged in a process of becoming, maturation, entropy. As Rob Shields points out (2013: 103), insofar as it is multi-dimensional, phased, connected, and, indeed, virtual, space is topological as opposed to absolute. Methodologically speaking then, in accordance with Adriana de Souza e Silva and Eric Gordon (2015), a geospatial memory of location should examine spatial topologies to address the way in which locative media organises spatial relations, and therefore to provide a semiotic outline with which to express the "organizational logic" (3) of space through its technological layers. In other words, by acknowledging the "net locality" (de Souza e Silva and Gordon, 2011) exhibited by the devices and codes that comprise such media, perhaps the phenomenological and broadly experiential approaches like those introduced above can be complemented or blended with competing approaches that address topologies of space, and that focus in particular on the materiality of the networks through which "experiences" are legislated.

Jason Farman addresses some of these considerations by taking a materialist approach to questions regarding the "Invisible and Instantaneous," in which he

draws a media archaeological link between the pneumatic tube infrastructure of the late 19th century and the cultural imaginaries surrounding the early days of the Internet. Farman analyses shifts in our collective perception of achievable instantaneity by comparing two apparently distinct networks of communications infrastructure. Following this, in “Modes of Address and Ontologies of Disconnection,” Florian Sprenger takes a materialist approach to the deterritorialization of mobile networks, arguing that by marking place through multiple technologies of addressing, the ontology of networks no longer depends upon specific geographies of location, but rather upon connectivity and movement. Finally, in “Tracing Tempor(e)alities in the Age of Media Mobility,” Wolfgang Ernst offers a rich and yet dichotomous vision of geospatial memory. By holding to a sharp distinction between phenomenological and materialist approaches, Ernst develops an architecture of media memory that is grounded in topology. In a formula repeated elsewhere (cf. 2000, 2004, 2012), Ernst draws from cybernetic research and applied mathematics to argue that “signal processing rather than...semiotics” (2004: 2) provides us with necessary clues into mobile media’s restructuring of space in accordance with the time of mediation. Beyond the murmur of a “retro-effect” (Ernst, this issue, and 2004: 2), media topologies of memory become inseparable from the operation of distributed networks of data storage, algorithmic codes, predictive technologies, and statistical operations.

Certainly, media-archaeological approaches are crucial in terms of emphasising the urgency to develop methods and critiques of media infrastructure in all aspects of media theory (for more on this urgency, see Parks and Starosielski, 2015). This emphasis, however, also represents a point of convergence with locative media research. I argue that by identifying location-aware data processing through the lens of geospatial media infrastructure, for instance, the movement and circulation of information – and the multi-scalar distribution of the material networks that comprise it – can be defined as conduits embedded in a phenomenological account of the very mediations involved in constructing a sense of place. Materialist approaches can therefore help to counter the onset of amnesia that threatens to emerge in response to the messiness of “place” as expressed through its semiotic register (cf. Augé, 1995; Koolhaas, 1997). Quoting Didem Özkul (2015), it is only by

the force of these material operations that locative media can begin to “change the sense of a place, how we perceive it and what a place means to us” (101). Leighton Evans (2015), too, addresses these connections between strata through a reading of “experience design” (20), which he situates within the broader “computationality” (Berry, 2011) of contemporary culture. More specifically, Evans argues that “experience design” is focused on the techno-mathematical determinations that lie “under the surface” (Ernst, this issue), as well as “between” or “through” experience, and indeed it is through this focus that experience design aims to address “the needs, emotions and meanings of people’s everyday experiences” (Evans, 2015: 20). If we put aside the ethical questions raised here for a moment, I argue Evans’ use of this particular term adheres to criteria that match both ends of the methodological spectrum (i.e. phenomenological/archaeological), not one or the other.

Malcolm McCollough’s (2013) contribution to the discursive arena of “smart cities” provides an illustration of experience design. McCollough proposes a multidisciplinary initiative aimed at generating solutions to the overwhelming sense of placeless distraction (i.e. amnesia) that results from the growing prevalence of mobile media. Addressing “information superabundance” (2014: 41), a phenomenon that refers directly to human experience, McCollough suggests that urban design technologies ought to take a page from contemporary neurosciences and find ways of responding to the limited human brain capacity for consuming information. Similar to Evans, McCollough argues that urban planners and designers should begin to focus less on the aesthetic, semiotic or “semantic” layers of the city, as on the layer of “intrinsic information;” in other words, on information “inherent to the material, structure or constitution of something” (2013: 37). By developing an “ambient interface” (2013: 7-25) based on the application of materialist principles, McCollough argues that planners and designers can manage to avoid developing technologies that aim to *grab* our attention, or create a spectacle that redirects our attention to particular sites of urban encounter, because this result would only contribute to the initial problem. Rather, through a subtle deployment of design solutions, McCollough insists that a civic culture can reemerge by retooling the environment in such a way that citizen-subjects can begin to physically and psychically forget the mediation of their devices – and the infrastructures that sustain them – to reinvest in placemaking activities that are responsive to the specific needs

of their communities (2013: 285-95). Beyond amnesia, then, this would be to transform smart city design initiatives into engines of collective memory. Or, to use Evans' framing of this question in the form of an argument, "technological devices can reveal the world *poetically* rather than simply technologically" (2015: 19).

Not surprisingly, the rosy vision put forward by McCollough and others invites detractors. For instance, Rob Kitchin and Martin Dodge (2007) explore the "ethical implications of machines that never forget" (431), whereas Mark Shepard (2011) focuses on the oncoming threats associated with non-human sentience as read through the prism of algorithmic control, while Benjamin Bratton (2016) offers a description of the sovereign foreclosures inscribed into the planetary architectures of "the stack." More narrowly, these formulations cast further light on the fact that unequivocal separations between phenomenological and materialist approaches are viable only as a polemical means to an end. Methodologically speaking, the separation between them ought to be as small as possible. If there is to be anything resembling an encyclopedia for geospatial memory, for instance, it would necessarily have to include an acknowledgment of the contradictory impulses, sites of conflict, and transformations that factor in any discursive engagement with space. Given this, I argue the convergence of diverse approaches and methods delivers a model of spatial analysis enriched not only by thick description, but by a multi-dimensional category of space that is unevenly ontological, epistemic, practical and aesthetic, as well as rhetorical and polemical or ideological. For Doreen Massey, this fact signals "the contemporaneous heterogeneities of space" (2005: 5). She writes:

The trajectories of others can be immobilised while we proceed with our own; the real challenge of the contemporaneity of others can be deflected by their relegation to a past (backward, old-fashioned, archaic); the defensive enclosures of an essentialised place seem to enable a wider disengagement, and to provide a secure foundation. In that sense, each of the earlier ruminations provides an example of some kind of failure (deliberate or not) of spatial imagination. Failure in the sense of being inadequate to face up to the challenges of space; a failure to take on board its coeval multiplicities, to accept its radical

contemporaneity, to deal with its constitutive complexity. What happens if we try to let go of those, by now almost intuitive, understandings? (Massey, 2005: 8).

Encounter, Mediation, Mediumability

In the spirit of Massey's appeal, it is worth pointing out that memory researchers have taken approaches entirely distinct from Nora's. Most importantly, Jan Assmann and John Czaplicka (1995) have developed a methodology that is responsive to memory's spatial turn and to spatiality in perhaps a different way. Through challenging the orthodoxies of "communicative memory" (cf. Halbwachs, 1992; Nora, 1989), Assmann and Czaplicka urge us to reconsider the neglected (and often coded "historical") domain of "objectivized culture" (1995: 128-29), which refers to a material realm of cultural artifacts that condenses into the striations and patterns of the historical present. By Assmann and Czaplicka's description, objectivised culture exceeds the intergenerational transmissions that occur between members of a group or between groups, and acts to supplement such transmissions with a material realm including "texts, images, rites, buildings, cities, landscapes" (1995: 128). Unlike Nora's diagnostic approach, then, the field of situated objects and artifacts can be approached through their relationality, and less through nostalgia and the sense of irredeemable loss.

Assmann and Czaplicka support their argument for prioritising "cultural" as opposed to "communicative" memory with a reference to *The Mnemosyne Atlas*, an eccentric art historical project authored by Aby Warburg in the first quarter of the 20th century. In this project, which has recently become more widely known to readers of English (cf. Didi-Huberman, 2018), Warburg sought to illustrate the hidden paganist themes and motifs of Renaissance-era art. Warburg would curate images and objects in a pastiche design before posting them to a collection of boards intended for gallery viewing. Warburg's aim, however, was not only for the *Atlas* to materialise sinews of resemblances between objects, or the networks inhered within them, but more specifically to concretise "the forces of primitive creation" (Gombrich, 2001: 50) that connected art in the Renaissance period to the past. Assmann and Czaplicka use the architecture of Warburg's project as a way of illustrating the spatialisations of "cultural" memory, including the sediments and gradations impossible to capture by

extolling or lamenting “collective” or “communicative” practices. This demonstrates the fact that such memory crystallises, both within objects and through their particular arrangement, in ways that exceed (if not precede) the living bonds that might otherwise exist. Through this, Assmann and Czaplicka’s project develops a kind of archeology of memory-work.

Marianne Hirsch’s (2008, 2012) take on these questions goes one step further by attempting to bridge the “communicative” and “cultural” divide.¹ Recalling a fraught relationship with her Holocaust surviving mother, Hirsch describes an intensely personal experience of having embodied a spatial reality hampered by the persistent denials of unconscious revelation. Citing Eva Hoffman (2005), Hirsch explores her own physical embodiment of her mother’s traumatic experience in terms of a “deeply internalised but strangely unknown past,” (6), and of symptoms unexplained and yet paradoxically relieved in the process of using photographs as a means of indirectly engaging with her mother’s concealments. For Hirsch, the disclosure of recorded images makes the encounter with memory a practical device with which to heal from the silent pain of inherited violence. Hirsch seeks to exploit this potential in ways that foregrounds the importance of framing memory, not as a procedure of individual recollection or even experience, but as a collective process. To be more specific, it is that photographic mediation which provides a space of encounter between bodies, and therefore an opening, a mechanism for symbolising the unknown. Hirsch refers to “postmemory” as exhibiting “a sense of afterness within collective experience,” a concept that demonstrates “a generational structure of transmission deeply embedded in...forms of mediation” (2008: 114).

These questions form an important thread between several contributions in this SI. For instance, in “Memory Expurgation?” Mona Abaza offers her own position on the spaces of encounter by detailing the circulation of “vernacular” (cf. Westmoreland, 2016) street photographs during the social and political upheavals in Egypt c. 2011-13, noting the myriad oscillations between revolution and restoration that occurred throughout. For Abaza, photographic images depicting Egypt’s uncertain future should be put toward countering the nostalgic feelings that continue to be held by many Egyptians, and can, as a result, become a means of bracketing the

troublesome iconicity of so-called revolutionary images. Photography also illustrates the complexity involved in forging together space for those belonging to opposing generations, and of groups holding deep antipathies toward each other. In “The Psychogeographies of Site-Specific Art,” Shana MacDonald pushes back against the ideologically-driven and corporately-financed urban street art campaigns designed to extoll the virtues of the “creative class” (Florida, 2002), and instead focuses on projects that emphasise “site-specific, socially-oriented content situated in direct collaboration with audiences.” Through site-specific analysis focusing on projects in Montreal, Quebec, and Kitchener-Waterloo, Ontario, MacDonald revisits the canon of literature exploring the dimensions of socially produced space, socially engaged art, and psychogeographic placemaking activities. Finally, in “Socially Engaged Archive,” Lu Pan pursues a similar line of thought with an analysis of East Asian digital archives as created both during moments of social and political change, and in response to ongoing environmental uncertainties. In addition to noting adjustments within the architectures of storage and preservation, Pan highlights the significance of democratising the archiving process through digital media, as well as its potential for advancing social engagement. Focusing part of her contribution on sound, Pan calls to mind the specificity of the digital archive in terms of its *mediumability*, or communicativeness via diverse sensory channels.

Cityness,² Imageability,³ Gentrification

Taken as a whole, the subset of contributions described above begins to reveal (and reveal in) the liminal spaces of encounter between archives and city streets, and, in doing so, allows for an opportunity to further push Assmann and Czaplicka’s provocative methodology toward the urban. Kevin A. Lynch (1960) famously argued that cities, like objectivised culture, are the product of relationships – relationships that exist not only between the people who inhabit a city space, who become familiar with it, but also those exhibited by the network of artifacts that materialise the city itself. Lynch’s particular demand was that urban planners, architects and designers should begin to challenge the austerity and fetishism for efficiencies, and ultimately to reimagine the city’s “imageability” (1960: 9-14), to demonstrate care and attention toward shape, directionality, capacity for integrating cultural practices, rituals and memories, capacity for sustaining social ecologies, and so on. For Lynch this demand boiled down to honing inspiration from the path, landmark, edge, node, and district

(1960: 46-91), and therefore to draw inspiration from the elemental or generic properties of urban environments. By connecting this appeal to Warburg's energised networks and Assmann and Czaplicka's obsession with the artifact and relationality, I argue Lynch's desire for a new urban design programme can be linked with similar memory research. Above all, the city should be examined not only in terms of its capacity to be a storehouse of memory – which, after all, amounts to a rather simple concretisation of “objectivised culture” – but also in its capacity to be a canvas for the memory *of* cities, whether accumulated through walking, feeling and remembering, or, indeed (cf. Lozowy, 2016), through returning and documenting.

In “Memory, Movement, Mobility,” Danielle Drozdewski offers a unique approach to the memory of cities by investigating commemorative memorials in Singapore with a deliberate emphasis on the sensory aptitudes of the human body. Drozdewski conceives of embodiment less through the lens of identity and culture as a locus of Deleuzian intensities and affect. Tactility in particular is linked to memory in ways that cognition and conceptual elaboration could never be. It provokes a set of questions regarding the potential for researchers – sensory ethnographers – to access dimensions of the city that are otherwise underexplored by methodologies hampered by single-channel receptors. In “CityCenter, Las Vegas,” Kurt Kraler considers another aspect of imageability by looking to the streets of Las Vegas, Nevada, during a period of stealth transformation marked by the de-theming of its iconic strip beginning in the 1990s and subsequent efforts to preserve the dismantled signage at the city's Neon Museum. Evoking canonical works such as *Learning from Las Vegas* (Brown, Izenour and Venturi, 1977) and Deleuzian themes of de/reterritorialization, Kraler examines the phenomenon of de-theming through the indices of violence, erasure and musealisation, the re-centering of traditional powers, and the exultation of capital over labour. Kraler writes, “urban rejuvenation and gentrification rely on a select set of images, reproducing the same urbanism for the express purpose of accelerating consumption and speculative value.” Finally, in “Ruts of Gentrification,” Markus Reisenleitner explores questions of urban transformation from the vantage of present-day Vienna, Austria, focusing on the inclusion of digital media, including GIS and cartography, to aid in the planning and promotion of new development projects. However, Reisenleitner also examines

particular surfaces of urban gentrification throughout Vienna in search of the “ruts;” that is, “unintended remnants of overlooked or deliberately concealed habitual movement and directionality from the past that are part of urbanity’s memoryscapes.”

Taken as a whole, these contributions approximate a kind of “deep mapping” (Mattern, 2015, 2017) of the media city. They engage multi-dimensional, multi-scalar and multi-sensory approaches to examine the surfaces of cities, to trace their perceptible and imperceptible changes, and ultimately to create a map that not only traverses different urban geographies (i.e. Singapore, Las Vegas, Vienna), but one that also highlights the sediments of different timescales and forms of media. Perhaps these contributions signal the potential for a “psychogeophysics” (Parrika, 2015: 61-7) of the urban, in the sense of amplifying the city’s nonhuman dimensions, and offering ways to engage with the linkages between technology and nature. For Shannon Mattern (2015), “deep mapping” accomplishes four methodological aims: it puts old and new media into dialogue (“Our cities have been mediated, and intelligent, for millennia,” xiii); it recognises the tangible connections that exist between urban and media infrastructures (“Our media histories are deeply ‘networked’ with our urban and architectural histories,” 12); it diversifies our single-channel urban imaginaries (“Much existing work on the media city presents it as a visual entity,” 22); and finally, it challenges the conceptual assumptions of media archaeology (“What if we took media and network archaeology literally...?” xiii). On this basis, a geospatial memory of the urban ought to encourage “deep mapping” as a means of bringing further attention to the spatial themes persistently muted throughout memory research in general.

Digital Memory and the Restoration of Historical Time

While some groundwork has been laid to establish connections between memory and media, including film (Garde-Hansen, Hoskins, and Reading, 2009; Hoskins, 2018; on film, see Lansberg, 2004), there is still considerable lack in terms of addressing digital media and memory in relation to space in particular, and in fact, many of the attempts to explore these relations betray a strong bias in favour of historical time. While notions of space and time are obviously situated and historically specific in themselves, I argue that by privileging historical frameworks, memory research by and large disallows sufficient spatial understanding to emerge (Soja, 1989). Granted,

historical time may rightly be associated with a range of spatial phenomena, yet the persistent lack of identifying these on their own terms tends to reify abstractions and common-sense assumptions regarding space in general. For example, in *Save As...Digital Memories* (2009), one of the earliest volumes on digital memory to appear in English, the editors offer a description of memory that clearly, but implicitly, foregrounds the space of artifacts. These include:

online mementos, photographs taken with digital cameras or camera phones, memorial web pages, digital shrines, text messages, digital archives (institutional and personal), online museums, online condolence message boards, virtual candles, souvenirs and memorabilia traded on eBay, social networking and alumni websites, digital television news broadcasts of major events, broadcaster websites of archival material, blogs, digital storytelling, passwords, computer games based on past wars, fan sites and digital scrapbooks” (Garde-Hansen et al., 2009: 4).

Arguably, the list clearly establishes the range of any future digital memory studies, yet notably absent from this description is any acknowledgement of the spatial dynamics that might otherwise be clearly present in specific items. Space is addressed more deliberately in a subsequent volume, titled *On Media Memory: Collective Memory in a New Media Age* (Neiger et al., 2011), in which the editors express the desire to put forward “a concept of digital memory as one that rethinks time as linear and moves toward a concept of time and memory as spatial...” (20). Yet in the volume’s individual contributions, references to space don’t go much further beyond a discussion of global media flows. Beyond this, the volume’s subheadings, such as “Digital memory: the end of history – the beginning of memory,” further cement the fact that any conceptual development will from this vantage point bear the mark of debates concerning the limitation of methodologies associated with the discipline of history, or, alternatively, with the integration of sociology and psychology.

One of the strongest efforts at coming to terms with digital memory can be found in a recently published volume, *Digital Memory Studies: Media Pasts in Transition* (2018). In

it, Andrew Hoskins addresses the “connective turn” both from the vantage of memory studies and popular culture. He describes the shift toward “participatory” models fueled by ubiquitous digital and social media, and the associated imperative of being constantly plugged in to what he describes as “a new coercive multitude” (Hoskins, 2018: 2). Predictably, connectivity has been explored at length from the vantage of mobile media (cf. Wilson, 2014; Licoppe, 2004). However, as Hoskins explains, the imperative to connect not only includes the demands made on individuals and groups to archive and document their everyday lives through mobile devices. It also includes demands made on organisations to digitise their archival collections (Hoskins, 2018: 3) and the push to align academic funding streams with open access publishing models.⁴ By acknowledging these, Hoskins wants to raise the possibility that the digital has become integrated with knowledge production, not simply with ideological reproduction.

The digital creates a situation in which individual and collective memory are simultaneously over-present and under threat, and, on this basis, the argument goes, we need new approaches to address the digital through collective memory. Hoskins in particular wants to emphasise the ontological and epistemological implications of this shift. He writes that the digital “transcends the time of now and then, reconnecting, reimagining, and reconstituting the past as network, archive, present” (Hoskins, 2018: 5). He then describes this realignment in terms of a collective experience of losing the ability to make critical and conceptual distinctions regarding digital media, at least in the same way that was imagined possible during other media revolutions. Cultural memory, likewise, has become tethered to an infinitely retrievable data-driven topology, and, as such, the mediated form that memory takes can no longer be understood simply as a “carrier” (Hoskins, 2018: 6) of information regarding the past. Undoubtedly, the digital has the effect of opening memory-work to a host of new threats surrounding privacy and security, to say nothing of the durability of digital preservation (5-7). Hoskins’ final aim, however, is to redirect these issues toward analyzing the deep entanglements of media memory. He writes:

A new ontology for memory studies is needed that is cognizant of media, and not as some partial or occasional or temporary shaper of

memory, but as fundamentally altering what it is and what is possible to remember and to forget (Hoskins, 2018: 7).

Hoskins is undoubtedly correct to make this point, yet his subsequent attempts at ontological reframing tend to reinforce long-held assumptions of historical time, and as I argued above, this reinforcement prevents us from exploring dimensions of space. At one point, Hoskins supports his claim by referencing the Gutenberg parenthesis (2018: 12-14), in which he argues that the “connective turn,” which defines media memory today, concretises an epochal dislocation from the age of print or literate culture, and signals the dawn of a “secondary orality,” evoking the ontological claims put forward by Walter J. Ong (1982: 135), and, to a lesser extent, by Marshall McLuhan (1962). Not including critics of this approach (see below, “spatial mediations”), the Gutenberg parenthesis ultimately prevents Hoskins from fully examining how digital media acts to transform space as opposed to simply eliminate it.

Hoskins, however, situates the “connective turn” even further within the confines of historical time by referring to a “second memory boom” (2018: 15), referencing Andreas Huyssen’s (1995) attempt at working through the obsession with memory that accompanied postmodernism beginning in the 1970s. For Huyssen, the memory boom was “a sign of the crisis of that structure of temporality that marked the age of modernity with its celebration of the new as utopian, as radically and irreducibly other” (1995: 6). Yet that obsession was expressed in highly contradictory ways, given that “cultural amnesia” (Huyssen, 1994: 21) was pervasive despite the fact that there were more techniques and tools than ever with which to reconstruct and engage the past. The argument here is that every successful attempt at establishing a durable link between present and past necessarily leads to deepening the memory crisis. Huyssen hypothesised a number of reasons for this crisis, including “technological change, mass media, new patterns of consumption, work, mobility,” and so on (1995: 21). For Hoskins, then, a “second memory boom” is defined as one that responds to the amnesic foreclosure of a convulsive historical moment, as digital media “affords a synchronic and diachronic unlimited depth of vision

that...makes us aware of the limits of the human capacity to arrest and to hold and to keep the archive..." (2018: 5).

Historical representations of pastness, and historical rupture, can be found throughout the canon of memory studies, particularly in reference to European traditions. Prominent examples include Richard Terdiman's (1993) description of the memory crisis as an amplification of 19th century-era fears over the disruptive potential of new technologies, or, on a different register, Susannah Radstone's (2000) claim that memory research began during a cultural moment in which memory was no longer something to be recollected so much "as actively *produced*, as representation, and as open to struggle and dispute" (7). While any of these variations may be instructive for different reasons, the prevalence of historical time in each of them suggests that memory research is deeply informed by its disciplinary ties, in particular to history. On the one hand, this effort at "disciplinary embedding" (Radstone, 2008: 35) is necessary, because without it there would be no viable way in which to separate "memory research" from "memory culture," and therefore memory could be used as a means to refer to anything whatsoever. Radstone (2008: 32) draws a parallel between a generational debate within cultural studies to support her argument that disciplinary embedding is a prerequisite to achieving any of the political and ethical aims that memory research has put forward. However, given the shortcomings of this research, whether dealing with analog or digital formats, to engage with questions of space or spatiality, perhaps significant gains can be made by embedding memory studies in alternative disciplinary formations, such as geography, mapping, GIS, and mobile media.

Spatial Mediations

Above all, memory researchers need to find ways of acknowledging, together with geographers, that "digital media are becoming progressively spatialized" (Leszczynski, 2015: 732). The spatialisation of digital media stems in part from the deregulation of Geographic Information Systems (GIS), and the subsequent effort to diversify the application of related technologies, such as Global Positioning Systems (GPS), web-based geindexing and location-based services (LBS), and social media platforms. Hoskins may be correct to point out that there has been a "connective turn" (2018), and that it deserves more attention in the scholarship on collective and cultural

memory; yet, as Agnieszka Leszczynski (2015: 736) points out, “connectivity is brokered on the basis of location.” Proprietary platforms that depend on user-generated data have created an entirely different online experience than could have been imagined prior to the integration of geo-locative technologies. These platforms are particularly useful for illustrating that “our position, defined by latitude and longitude coordinates, becomes our entrance to the internet” (de Souza el Silva and Sheller, 2015: 4). In turn, the geospatial metrics embedded in web-based applications and mobile devices have become crucial to understanding our cultural heritage, identity, sense of belonging and relation to the past.

Not surprisingly, the term “spatial media” (Crampton, 2010; Kitchin, Lauriault and Wilson, 2017) has been controversial among geographers for different reasons. At bottom, it refers to the integration of spatial technologies and forms of spatial representation with networked, web-based services and mobile devices. As Leszczynski (2015) writes, spatial media encompasses “location-capable/enabled mobile devices; algorithms that underwrite the burgeoning complex of location-based advertising practices; proprietary interactive web-based mapping services and platforms for the crowdsourcing of spatial content” (730). It is therefore a sufficiently broad term with a host of different implications, and, in that sense, it faces many of the same practical and methodological problems as collective memory.

Spatial media undoubtedly provides a measure of freedom for people to behave differently in spaces (Licoppe, 2004), but, in a surreptitious way, they also mobilise geographical content – maps, coordinates, points, locations, addresses – to act as determinants of behaviour. As several geographers have pointed out (Crampton, 2010; Leszczynski, 2015; Kitchin, Perkins and Dodge, 2009), spatial media encourage users to participate both in using and creating geographical tools like maps. They give rise to new actors – political and non-political – who contest the authority of experts and expert knowledge, while at the same time amplifying cultural practices in ways that challenge experts to develop relevant methodologies. One notable aspect of this expanded participation is the way in which it is captured by proprietary platforms. For instance, Scott McQuire (2016) examines Google Street View not as a superfluous application, but rather as concealing a larger initiative to link web-based

activities to location-specific data generated by its users, and ultimately to become “Google *in maps*” (66-90). As the commercialisation and monetisation fostered by proprietary data-collectors is obviously motivated by profit and control, these actions have wide-ranging implications for the restructuring of global economies (see Srnicek, 2016). From an experiential perspective, Street View illustrates this restructuring but from the vantage of how we orient ourselves as individuals and collectives in space, such that proprietary platforms come to determine at least in part the actions we consider to be possible.

On the other hand, Jeremy W. Crampton (2009) argues that “free and open source software (FOSS) is a major component and indeed philosophy of the geoweb” (93). Equipped with open source software, amateur geographers gain the ability to participate in mashups (Crampton, 2010: 25-39) and artistic projects (Hemmet, 2006), and, in general, to foster “Dionysian” (Kingsbury and Jones, 2009) interpretations that trouble the cartographic distinctions between truth and fiction. This range might suggest that geospatial applications, regardless of whether they are proprietary, offer “possibilities for new readings of techno-culture that are far from the dystopic options of Apollonian control” (Kingsbury and Jones, 2009: 505). Spatial media may also otherwise be applied in a more disciplinary nature to the study of literature (Offen, 2012; Rossetto, 2014), and inspire different approaches to narrative (Caquard and Cartwright, 2014). There are several applications of spatial media, particularly GIS, involved in historical projects of various kinds. Finally, as a crowdsourcing technology, spatial media has the potential to introduce forms of community participation in the guise of “citizens as sensors” (Goodchild, 2007).

Although some have pointed out that spatial media like GIS are significantly limited in their potential to create new narratives (cf. Wilson, 2017: 35-38), the general consensus has been to challenge the received idea that recorded geographical content is knowable primarily through scientific practices which evaluate representations on the basis of whether they adhere to notions of accuracy or truth (for more, see Pickles, 2004; Harley, 1989). For Rob Kitchin (2010), geographers need to reject the idea that maps in particular be judged by the territories that precede them, to consider instead that “mapping is a process of constant re-territorialisation” (3). Whether “post-representational” (Kitchin, 2010; Caquard, 2014) or “non-

representational” (Thrift, 2007), practices involving elements of geography are now broadly conceived as dynamic as opposed to static, made and re-made as opposed to unchangeable, and perhaps defined by “performativity” in the Derridean sense of actively producing the world through iteration (1984: 309-330; see also Rose, 1999: 248, qtd. in Kitchin and Dodge, 2005: 172).

While the methodological issues over representation have been clearly established if not resolved, other issues continue to linger. Leszczynski (2015) points out, for instance, that the “media” of “spatial media” has aroused controversy within geography and GIS for a generation (cf. Sui and Goodchild, 2011). She writes that “spatial media are genealogically distinct from GIS developments” (Leszczynski, 2015: 730), and yet spatial media remain yoked in procedures and classifications that stem directly from GIS research. The contradiction is in the way that spatial media behave, the social practices in which it becomes embedded, the means by which they circulate information, and the particular forms of agency it creates – all of these, as Leszczynski writes, require a different critical perspective than GIS research has been able to offer:

There is a pressing need...for theoretical, empirical, and conceptual apparatuses for apprehending and evaluating the implications of and extent to which networked location-aware devices and spatial content have assumed pervasive presences in individuals’ daily lives, and of the material effects of associated spatial big data-based productions of living (Leszczynski, 2015: 731).

In effect, Leszczynski calls for a multidisciplinary effort to come to terms with the thornier problems spatial media has invariably raised. In this, I argue memory studies can add an important layer by introducing new forms of critique and interpretation. Ubiquitous spatial media dramatically alter the ways in which human communities function, grow, disappear and are remembered, and the implications of this change not only concern how memory content is transmitted over generations (although it does), but also how networked cultural artifacts are constituted. Memory is clearly an important factor in this stealth alteration.

On the other hand, by noting the danger involved in casting a wide net for spatial media, Leszczynski (2014) makes an argument that is oddly equivalent to Radstone's (2008) regarding the potential for memory studies, unmoored from particular academic disciplines, to deplete its critical potential. Leszczynski explores these questions by rejecting "neogeography" (cf. Turner, 2006), a field of study which positions spatial media practices beyond the conventions of critical GIS in particular, and which extolls the virtues of revising geography on terms that are not its own. Above all, neogeography (which Leszczynski retitles "neo, geography,") amounts to "a discursive tactic that works to preempt critique" (2014: 65). By elevating the value of the "new," proponents of neogeography depoliticise critical perspectives that originate both in geography and studies of GIS; they engage in pragmatic or "instrumentalist" (Leszczynski, 2014: 63) appropriations of technology; and they monetise the field by attempting to profit from developing and circulating location-based services (LBS) (63). In other words, it "reifies" (Leszczynski, 2015: 743) the enterprise of critical geography in general by reproducing the conditions of possibility of systems and knowledges that preexist it.

Leszczynski insists that geographers develop a theory of mediation to determine "what it is about these particular assemblages [of spatial media] that makes them 'knowable' as media" (2015: 732). Drawing from Peter-Paul Verbeek (2005) and Alexander R. Galloway (2012), she writes:

Mediation theory emphasizes how it is that we experience 'things' in the world (and indeed the world itself), and how those experiences are influenced, punctuated, affected, marked, and/or structured by our living-with technology, as well as our being-with each other in a social reality that is constituted as much by the technical as by the human (Leszczynski, 2015: 741).

In similar terms, Brendan Hookway (2014) describes mediation through the lens of fluid dynamics – that is, of patterned instabilities between inside, outside and in-between, of identities that are "fragmented" in one moment and "augmented" the next (17), of transitions that refuse to adhere to stabilisations of any kind, of actions mitigated by the openness of the system, and so on. Applying these different

perspectives to geomediation invites questions of an epistemological nature regarding the virtual layer as participating in material reality. For Leszczynski (2015), this results in her voicing strong opposition to theories that rely on assumptions of spatial hybridity, in which the “digital” is considered to be “a priori epistemologically distinct” (732). Leszczynski outlines a number of different approaches that amount to variations on this theme, whether in reference to direct mentions of “hybridity” (cf. de Souza e Silva and Frith, 2012), or spatial “doubling” (Leszczynski, 2015: 732), or to critical approaches that don’t necessarily arrive at a sufficient answer to the underlying question (cf. Hayles, 1999).

Beyond these variations on hybridity, in which the virtual is regarded as diminished, degraded or lacking reality, David Morley (2014), in some ways echoing Matthew Zook and Mark Graham’s (2007) hypotheses of “DigiPlace,” insists that the rise of so-called “virtual geographies” need not prevent us from acknowledging the ontological claims that should be made on their behalf, nor should they lead us to consider that “material geographies” are somehow less important than they were a generation ago. Morley (2014) draws from several examples to argue that the virtual and material are interlinked in a complex and corrugated fashion, suggesting that there exists a “co-presence of multiple worlds,” and that both layers push up against each other in such a way that they are constantly redefined and open to contestation. I argue that Morley’s characterisation of the tangle between “virtual” and “material” registers is reflected in Leszczynski’s (2015) demand that spatial mediations be understood as “ontogenetic” in character, that is, by means of “a material and social reality that is constantly brought into being through embodied socio-technical practices” (734). This description is at least partially informed by Henri Lefebvre’s (1992) rejection of the ever-present potential to fall back on notions of “absolute” space, and of imaginaries in which space is conceived as a container of objects. Lefebvre troubled these assumptions by insisting that space is actively produced through the engagement between social actors and through the staging of social encounters. However, in a critique of Lefebvre’s implicit formalism, Shields (2013) adds to this a Deleuzian assertion that space is itself imbued with “intangible relationships” (21), suggesting that virtualities are by necessity anchored in the real through a process of actualisation.

Rob Kitchin and Martin Dodge (2007) offer a unique and yet parallel interpretation of this debate through the notion of “code/space.” Evoking Gilbert Simondon and others to argue that “space *needs* to be theorized as ontogenetic,” Kitchin and Dodge propose that spatialisations of any kind follow a process of transduction, or “the constant making anew of a domain in reiterative and transformative practices” (162, emphasis added). Importantly, Kitchin and Dodge’s intervention places an explicit emphasis on code as a principle mobiliser of this process. In other words, code “conditions existence” (Kitchin and Dodge, 2005: 164) and it does so at the level of human experience but also at the various levels of different systems, or, as Kitchin and Dodge write, through “objects, infrastructures, processes [and] assemblages” (164). Moreover, code/space refers to situations of situated conflict that cannot be solved without drawing from the coded layer, whereas “coded space” can be mitigated by other factors (Kitchin and Dodge, 2005). The implications of this claim are obviously diverse, especially considering the power of algorithmic codes, automated technologies, and the proprietary nature in which a lot of coded activity is manifested. On this basis, I argue that Kitchin and Dodge’s articulation of these questions invites us to reinterpret particular modes of operation in which geospatial media is implicated, especially considering the ubiquity of code throughout each of them. In other words, geospatial media, like code/space, implicates how “people and things are located within complex networks of mobilities, interactions, and transactions that bind them together across scales” (Kitchin and Dodge, 2005: 174).

Planetary Memory

Given this, developing a geospatial memory of the planetary could be beneficial in terms of enabling us to reference the multi-dimensional, multi-scalar and multi-sensory aspects of geospatial media overall. In fact, some of the first encounters we have with geospatial media are aesthetic and marked by vertical planetary views, and we tend to react based on their capacity for abstraction (cf. Graham, 2016). For example, in the satellite views of Google Earth (GE), the magnitude of scale is put on display to encourage forms of vicarious witnessing (see, for example, Parks, 2005: 77-109), which requires a countervailing force to examine how incisive critiques are foreclosed in the process of the digital’s ever-receding horizon of planetary control. As Laura Kurgan (2013) writes, GE manifests a highly constructed space developed from a sophisticated composite of satellite images. Kurgan (2013) argues that

through our repeated engagement, and despite its irrefutable claims to accuracy, the interface becomes a factor in shifting our personal sense of spatial “disorientation” (36). Some of these issues are addressed in Jessica Becking’s “Records of Representation,” in which she briefly delves into Clement Valla’s exposure of errors in the GE archive through his project, *Postcards from Google Earth*. By observing the refracted images of a planetary memory landscape, Becking reflects on the limitations of photographic realism and artistic authorship as evidenced by the motifs of journeying, spectatorship and tourism. On a different register, in “Bergson’s GIS,” Rob Shields explores the limitations of Historical GIS in terms of its treatment of time. In particular, Shields returns to Bergsonian and Deleuzian interrogations of time-space in which memory is understood less through the contested criteria of recollection as through an experienced process of the flow of time in which memories are actualized or “worked up.” Beyond its Cartesian confines, Shields argues that our definition of temporality should be opened to the potential for infinite fabulations, and GIS to forms of kinaesthetic experience.

Both the aesthetic and ontological concerns provoked by the existence of planetary views have been interrogated at least since the Apollo missions of the 1960s and 1970s (see, for example, Cosgrove, 2001), and the contributions in this section of the SI reflect that work in different, if implicit, ways. The shift identified by Kurgan (2013), however, also implicates policy and state activity, as planetary data visualisations have been a crucial factor guiding territorial transformations of significant scale. In “Earth Constellations,” Abelardo Gil-Fournier offers a fascinating case study of Spanish inner colonisation, in which he emphasises the role of vertical imaging technologies in the distribution of agricultural techniques. By focusing on the 20th century-era cart module, in which agricultural production was magnified through a water distribution strategy, Gil-Fournier develops an alternative perspective on the ontogenesis of “infrastructure space” (Easterling, 2016). In “The Undergrounds and Overgrounds of Pure and Applied Science,” Jamie Allen continues this thread by examining the planetary view in terms of how it implicates commonly-held assumptions about the criteria of scientific practices from the earliest days to the present, arguing that some measure of mythology lies at the core of any rigorous or “pure” scientific knowledge. Referencing the diversity of ways in which

science has been “applied,” Allen focuses on a crucial parallel between geology and astronomy which he conceives as equivalent practices of extraction akin to scientific history and memory.

If a science of geospatial memory were to exist, it would have to be one that is “always much dirtier than their naming implies” (Allen, this issue). Indeed, the purpose of this SI is to bridge a gap between collective and cultural memory – both in its “pure” and “applied” iterations – together with critical perspectives in geography, mapping, GIS and mobile media. As Leszczynski and Wilson (2013) remind us, “scholarship about the geoweb has not...yet made the leap to coming into conversation with a much broader series of literatures and discussions about digital culture...this is not an option for geographers but rather an urgent necessity” (916). I argue that the same holds true for memory studies in its convergence with digital media and space. Given that, perhaps it’s time to acknowledge the ways in which memory research is co-implicated in a host of distinct and yet open knowledges, but that it’s also possible to shift the investments that created the field in the first place, and that the driving force behind such research will therefore never gain the kind of purity that has otherwise been cast as the ultimate value.

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Notes

- ¹ Hirsch's provocative approach is based on an earlier attempt by Aledia Assmann to bridge the "cultural" and "communicative" divide that was reinforced by her husband. For more, see Assmann (2006).
- ² See Sassen (2005).
- ³ See Lynch (1960).
- ⁴ For more information on the shifting priorities of national funding of open access formats in Canada, see http://www.sshrc-crsh.gc.ca/about-au_sujet/policies-politiques/open_access-libre_acces/index-eng.aspx

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Joshua Synenko is an Assistant Professor in the Department of Cultural Studies and the Media Studies program at Trent University. He is Vice President and Program Chair of the *Canadian Comparative Literature Association (CCLA)*, Review Editor for the *LAFOR Journal of Cultural Studies*, and is an Editorial Board member of *Media Theory*. His research interests fall under media theory, media infrastructure, memory studies, visual studies, and space. He has recently published in *Popular Communication*, *PhiN: Philologie im Netz*, *Networking Knowledge*, *M/C: A Journal of Media and Culture* and *Drain: A Journal of Contemporary Art and Culture*.

Email: josh.synenko@gmail.com