PROVOCATION

Anxieties of Access

Remembering as a Lake

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Abstract This article explores the nature of remembering as a lake, with a lake, or through a lake; the differential relationships, knowledge, and perspectives contained within; and the potentially troubling implications found at the intersection of scientific and humanistic perspectives on lake being. It also reflects on the totalizing nature of assuming a single form of memory, of archiving, or of trauma in a world of lakes riven with partially occluded, subsumed, ever-present, and retrieved stories expressed through water. Memory for whom? Recollection for whom? Archiving is never simple, never complete, and never without ingrained and intersecting structures of suppressed and channeled violence. Waters leave a trail of their own, writ on and in water. It contains stories that are recorded and relived. It has ontologies that are plural, overlapping, and multiple modes of memory captured in a hydrocommons where perspectives pool. Rather than asserting that a lake is an *archive*, this article concludes by proposing that it is a *counterarchive* where archival modes and anxieties can be exposed and explored. This is true of all waters, but lakes offer an ideal case study.

Keywords anxiety, archives, lakes, limnology, memory

What do observers see when they gaze into a lake? Is it a reflection, or a glimpse of something deeper? Perhaps a flash of cultural memory and history mingled with the silt? The answer depends on who the observer is, their positioning and environmental mentality, and the socio-natural interactions and practices that define their relationship with place. The anxieties and disquiet provoked are also differential and deeply felt. Memory and archiving are as plural, problematic, and political in the terr-aqueous sphere as they are in the world of paper, shelves, and databases. This article is about remembering *as* or *with* a lake, its complexities, and its unhealed traumas. There is beauty and romance to be retrieved from lakes by those seeking to enjoy them at their leisure, percolating in the depths with expressions of environmental degradation, death, loss, and pain. The retrieval process evokes both, a troubling and plural insight

Environmental Humanities 13:1 (May 2021)
DOI 10.1215/22011919-8867296

into nonhuman and more-than-human memory. Hidden within the lake and its memories is what Jeffrey Jerome Cohen describes as an ecology of the inhuman, a "summons to shared space, to an embroiled expanse beyond easy partition."[1] What enters this space defines the problems and anxieties of lake memory.

What is shared has often been arbitrarily partitioned in the past by exercises of power returning to haunt the present. This is elegantly captured by the Canadian Mississauga Nishnaabeg writer Leanne Betasamosake Simpson in her poem "Big Water," in which the poet imagines an encrypted text message conversation with an activist and personified Lake Chi'Niibish (Lake Ontario), who is "full, too full, and she's tipsy from the birth control pills, the plastics, the sewage, and the contraband that washes into her no matter what."[2] The lake speaks and tells of her story, angry, swollen, and ready to flood. The degradation of the lake, given nonhuman voice by poetry and cultural memory, recalls a history highlighting instrumentalizing mistreatment and mismanagement under settler colonialism. Magical realism frames a timely political statement and provides an outlet for memory in a pressing, urgent, and activist mode. It is an arrangement of human and lake in the mode of an intimate friendship, clashing and mingling with other epistemes that see the lake as Lake Ontario rather than Lake Chi'-Niibish, a dumping ground rather than a body, a catchment area rather than an ally, a resource rather than a relative. It is at the intersection of these heterogeneities that lake memory has come to reside.

Lakes do not have a single being; instead, they consist of accreted layers, centuries upon centuries of sedimented narratives. Water, mud, flora, fauna: a lake merges them all. Expression of the overlaps and juxtapositions within and between these layers and their relationship to one another is complex and contested. As Sonja Boon has explored with mud as memory, murky interstitial places are where ideas congeal and coalesce.[3] When seeking eternity and timelessness, the lacustrine observer experiences layer upon layer of embedded time instead. When seeking scientific objectivity, the observer finds a passionately contested social sphere. When seeking normative consensus, the observer finds parallel visions and relationships. The traces of human activity and their effects sketch ephemeral outlines that never fully coalesce into a single neat vision. These nebulous outlines span time, space, culture, and knowledge. The environment traces its effects on human visitors in turn, encountering them. It is the substrate for a storied and fragmentary identity, or, more accurately, so many identities in the plural that they are scarcely intelligible.

Waters have a sedimentary archival quality, internalizing and making known in a disruptive and challenging manner. What is returned extends human cognition and broadens memory, but also troubles many preexisting assumptions.[4] Aqueous

1. Cohen, "Introduction," ix.

2. Simpson, "Big Water."

3. Boon, "Memories," 36.

4. For more work on the haunting of twenty-first-century waters by ideas long submerged, see Morgan and Smith, "Premodern Streams of Thought in Twenty-First-Century Water Management."

engagements with, between, and across categories of being are fickle and unruly. Part of this unruliness stems from what Lorraine Daston and Peter Galison term *epistemological worries*: anxieties around what it is possible to know and how it can be known.[5] In *Along the Archival Grain*, Ann Laura Stoler frames this anxiety in the context of colonial archives, places that are "less monuments to the absence or ubiquity of knowledge than its piecemeal partiality, less documents to the force of reasoned judgment than to both the spasmodic and sustained currents of anxious labor that paper trails could not contain."[6] Archiving is never simple, never complete, and never without ingrained and intersecting structures of suppressed and channeled violence. Waters contain messages of their own, writ on and below the surface.

Responding to stories of place is part of the experience of anyone walking through the history of a place, but as William J. Turkel puts it, the reading of place is a specialist endeavor, requiring "experience or special training or expensive equipment."[7] What does this mean in practice? Specialism reveals new connections but also raises many more imponderable questions. The most obvious question is, What constitutes expertise? The framing of the narrative implies that only scientific expertise constitutes "special training," and yet the histories and knowledge of First Peoples and the lakes that frame and shape worlds and identities are also expertise of a comprehensive nature. There is more going on in a place than can be read or recalled by a singular mode alone. Blue humanists are beginning to explore these modes and learn from their affordances, with examples including Jessica J. Lee's *Turning: Lessons from Swimming Berlin's Lakes*, which explores a wealth of seasonal, embodied, changeable content juxtaposed elegantly across a range of swimming interactions with lakes.[8]

Socio-natural memory such as that found within water is a fluid medium of partial knowledge, concealing a frenzied history of often confrontational sense making and anxieties over knowledge. Renisa Mawani has argued that the ocean, the greatest water body of them all, is an archive, a record of legal violence and slavery articulated in material, figurative, human and nonhuman registers and existing "beyond text and file."[9] Her intervention cautions that bodies of water hold memory, but that they offer a form of recollection that is not entered into on easy terms as a "moving, living, and present" entity, "even if these forms of life are not fully visible."[10] Unlike the conceptually vast nature of the ocean, lakes present a seemingly delimited profile. This makes for a compelling case study. This essay explores the nature of remembering as a lake, with a lake, or through a lake; the differential relationships, knowledge, and perspectives contained within; and the potentially troubling implications found at the intersection of scientific and humanistic perspectives on lake being. It also reflects on the

5. Daston and Galison, *Objectivity*, 35.
6. Stoler, *Along the Archival Grain*, 19.
7. Turkel, *Archive of Place*, 5.
8. Lee, *Turning*.
9. Mawani, "Archival Legal History," 7.
10. Mawani, "Archival Legal History," 7–8.

totalizing nature of assuming a single form of memory, of archiving or of trauma in a world of lakes riven with partially occluded, subsumed, ever-present, and retrieved historical violence expressed through water. Memory for whom? Recollection for whom?

The pooling of waters in the crevices of the earth—be they salt or fresh, oceanic or inland—creates a combination of the culturally and ecologically visible and invisible. These visibilities and invisibilities mirror those on land, and in societies and cultures. The reservoirs of identity are a fusion of external drivers and internal processes, combining to create a balance of persistence and change.[11] Meaning emerges, memory surfaces, identity is adumbrated, and yet nothing ever permanently coheres or resolves. Its implications are often alarming when unexpected. Expecting a predictable and orderly epistemic relationship with a lake plays into what Carolyn Steedman describes as the nineteenth-century trials and hardships endured by the new scientific generation of historians delving the archive for "many princesses, possibly beautiful" to rescue from their prisons in the stacks.[12] The quest for what medievalist Jacques Le Goff described as the textual necromancy of the archive—bringing the sources to life and wresting them from their tombs—has parallels with the anxious and fevered quest for cultural memory in the waters of the world.[13] Lakes give a superficial impression of being static containers—they are not, but they do have a coherent identity despite their mutability. This causes them to resemble a book or archive, both in their affordances as custodians of memory and the problematics of attempting to archive them. How do lakes remember? And how can we know what they remember?

Anxieties of Episteme and Extent

Each lake is a bubble of stories and a bundle of processes linked to a wider world through flows and folkways, watersheds and histories. The inland waters of the world move, live, and persist, settling in the low places of the earth to endure for a time. Lake memory sinks below the vicissitudes of its warm and turbulent upper layers, sitting deep, cold, and still in the darkness. Nothing deposited in the cultural memory of a lake ever truly goes away, reoccurring in social life with the shifting of political ecology and expressed through a prism of modes. It speaks on a more intimate scale than that of the ocean floor yet is no more amenable to easy interpretation by humans. One of the most contested areas of lake memory—and ecology—is that of extent: what should be considered relevant to a lake, how are its processes to be epistemically coded, and who is the arbiter of memory?

The disciplinary border between the study of the ocean and the study of inland waterways is largely one of scale, since no body of water is ever studied without also

11. For historical context of studying interconnected lakes in Long-Term Ecological Research (LTER), see Kratz et al., "Making Sense of the Landscape," 50.

12. Steedman, *Dust*, 10.

13. See Le Goff, *Time, Work, and Culture in the Middle Ages*, 4.

exploring its terrestrial surrounds and ecology.[14] The source of lakes as the case study for this essay can be found in their similarity to archives—or participation in the nature of an archive—through epistemic anxieties over scope and scale. The nineteenth-century origins of limnology—the integrated science of inland waters—are rooted in claims to precise delineation and typology. Early limnologists such as Stephen A. Forbes saw the lake as a microcosm of a larger whole, to be studied in isolation, a "comprehensive survey of the whole as a condition to a satisfactory understanding of any part," and yet this view has been long-since discarded by limnologists.[15] There is no "inside" or "outside" of what is in scope within the study of a lake, and the kind of comprehensive knowledge that Forbes sought quickly dissolves into a complex of further frontiers. This echoes the discussion within lim*i*nology, the study of edges, as Edward S. Casey discusses:

> Does landscape (and, as a corollary, seascape) lend itself to quantification? Does it have a proper unit? How is its extent to be measured? And, threading through all this . . . how are we to think of the edge of a given landscape or seascape? Assuming that it exists—something we cannot take for granted—is it a limit, a perimeter, a periphery? What is it, and how are we to think of it?[16]

Lakes, by defying expectations of limit, extent, or boundary, become what Susan Leigh Star has termed *boundary objects*, existing together with other objects in "a shared space, where [a] sense of here and there [is] confounded."[17] It is here, Leigh Star proposes, that "these common objects form the boundaries between groups through flexibility and shared structure," becoming "the stuff of action."[18] They perform different tasks for different actors, existing at the boundaries of epistemes and knowledge, where the anxiety of memory is raw. They stitch together worlds, just as they often stitch together adjacent cities and cultures across national and regional borders. As a mediating repository of knowledge, then, lakes perform an important task, testing the applicability and usefulness of concepts and categories. As Sverker Sörlin discusses in the context of glaciers, natural objects can expand the frontiers of what is considered "relevant knowledge." Because of the need to understand something like a glacier—or a lake—as "a natural, cultural and social phenomenon" simultaneously, they take part in "an ongoing expansion, or molding, of concepts."[19] However, categorizing the dimensions and extent—material, epistemic, and ontological—of bodies of water from either a monodisciplinary or monocultural perspective asserts an epistemic master narrative dictating what can be known or remembered of or with a lake. As a result, lakes make

14. International Society of Limnology (SIL), "What Is Limnology?" limnology.org/what-is-limnology/.
15. Forbes, "Lake as a Microcosm," 14.
16. Casey, "The Edge(s) of Landscape," 91.
17. Leigh Star, "This Is Not a Boundary Object," 602–3.
18. Leigh Star, "This Is Not a Boundary Object," 603.
19. Sörlin, "Do Glaciers Speak?," 23.

for a good thought experiment within the environmental humanities: they are both small and delimited enough to invite restrictions of extent and simultaneously defy delimitations.

The instrumentally imposed limits and characterizations of what a lake means, where it begins and ends, and what it can tell the observer are internalized socio-technical power dynamics that cannot go unexamined. To do so would be an expression of aggressive and anxious epistemic hegemony and selective memory that serves lacustrine cultures poorly in the Anthropocene. The hydrosocial cycle offers a useful frame, interrogating the relationship between water and society as a transactional arrangement.[20] Jamie Linton and Jessica Budds characterize the cycle as prompting three crucial questions.[21] First, What is water? This is a primary and complex question, since "the hydrosocial cycle is a process that relates water and society internally, which implies the presence of different waters in different assemblages of social circumstances." Second, How is water made known? Answering this question requires "attending to how water is constructed through discursive practices (e.g., a 'resource'), as well as through alternative ways of knowing . . . acknowledging that representations of water are politically charged and have political effects." Finally, "how does water internalize social relations, social power and technology?"[22] If one applies the hydrosocial model to the memory of lakes, one must ask, What is lake memory? How is it made known? How does it come to internalize relations, power, and technology?

The global environment participates in what Andy Clark and David Chalmers famously termed the *extended mind*:[23] the desperate and anxious urge to archive points to an equally desperate urge to colonize with the mind, to extend cognition into everything and make it part of the memory, to be a useful tool. As Joy Parr describes the relationship, the answer is mediated through the conduit of human embodiment:

> Our bodies are the instruments through which we become aware of the world beyond our skin, the archives in which we store that knowledge and the laboratories in which we retool our senses and practices to changing circumstances. Bodies, in these senses, are historically malleable and contextually specific.[24]

A gap exists between what it is like to remember as a lake or as a human, a mingling point not dissimilar from a tidal lagoon, the place where inland waterway meets ocean. Lowell Duckert points out the etymological ancestry of *lagoon*, *lake*, and *lacuna* within *lacus*, a Latin word of Proto-Indo-European origins denoting a reservoir—or in

20. See Boelens et al., "Hydrosocial Territories"; Schmidt, "Historicising the Hydrosocial Cycle"; Swyngedouw, "Political Economy and Political Ecology of the Hydro-Social Cycle."

21. Linton and Budds, "Hydrosocial Cycle," 179.

22. Linton and Budds, "Hydrosocial Cycle," 179.

23. Clark and Chalmers, "Extended Mind." See also Clark, *Supersizing the Mind*.

24. Parr, *Sensing Changes*, 1.

the case of the diminutive *lacūna*, a hole, pit, or void—as well as a body of water in general. Duckert continues by describing "the co-implicated bodies of creatures that pool together, or the possibilities of love and strife in the lakes," and the bleeding together of middle spaces as beings combine.[25] The need to coimplicate, to combine, to fill the lacuna, is another fevered epistemic tic. Mingling knowledge in the lacuna/lagoon of being is remediation in that it allows new flattened relationships between knowledge and agencies, but also an act of barely examined postcolonial desperation for sense making. Acknowledging the agency of lake being is fundamental to respecting its power, its affordances, and its limitations. Acknowledging that there is no such thing as lake "being" in the singular is equally important.

Complexity is reflected in the scientific discourse as well, providing another perspective to the notion that there is more to recall than can be easily captured. Limnology posits that every lake has its own dynamics, and as Katherine E. Webster et al. point out when exploring the lake-groundwater system, a lake is a stopping point in an "amazingly complex and mostly invisible" hydrological cycle:[26]

> The seasonal and interannual changes in lake water level might be your only visible access to the underlying complexity. If instead . . . you could follow the pathway of a single water droplet falling from the sky and moving through the landscape, a very different story could be told. For each droplet, an infinite number of pathways and subsequent transformations by chemical interactions with soils and the aquifer by biological uptake and by evapotranspiration are possible.[27]

As limnologists rely on the methodology of long-term ecological research (LTER) to explore these intermingled dynamics,[28] so too can humanists merge these trends and interconnections with cultural dynamics. The mediating membrane of long-term socioecological research (LTSER) brings the social and the ecological together into an amalgamated network of memory and ecosystem dynamics that are ontologically inseparable.[29] As Simron Jit Singh et al. explore in their introduction to LTSER, the link between "contemporary problems such as climate change, loss of biodiversity and valuable ecosystems"[30] and long-term social trends and histories are intertwined because "the effect of how societies interact with their environment has a bearing not only on ecosystems but also upon social systems and human wellbeing."[31] As Sara B. Pritchard has argued, knowledge making and technological development and interactions with nonhuman

25. Duckert, "Lacuna," 210.
26. Webster et al., "Understanding the Lake-Groundwater System," 19.
27. Webster et al., "Understanding the Lake-Groundwater System," 20.
28. Magnuson, Kratz, and Benson, *Long-Term Dynamics of Lakes in the Landscape*.
29. See Singh et al., *Long Term Socio-Ecological Research.*
30. Singh et al., "Introduction," 1.
31. Singh et al., "Introduction," 2.

nature go hand in hand.[32] Furthermore, long-term socio-ecology is more than the relationship between STEM and the Western humanities: it is a pattern wider and deeper that generates an often traumatic contestation of environmental memory.

The landscape has been used as an imperfect token of memory, a mediator of cultures and ecologies. Like the forlorn hope of cultural immortality, entrusting memory to a watery medium has always been a dream. A great many uncomfortable truths wait beneath the veneer of unreadability that instrumentalism has given to water: their discursive *construction* and *constructing* are equally confrontational. The result, in a hydrosocial sense, is that the lake has internalized a power structure and become part of a dense political ecology. Reading into the text of the lake should not be a comfortable experience, for it brings the reader directly into confrontation with hydrosocial structures of power. Martin Drenthen has characterized the landscape as a problematic and challenging palimpsest, scraped and added to over centuries.[33] Katie Ritson discusses the history of this mode of landscape reading in the British context, tracing it back to the work of William George Hoskins in 1955.[34] Moving beyond the scale of the human takes the process of reading the text to new temporalities and new modes of being:

> An awareness of the landscape's past is the foundation of understanding its present incarnation; and whereas Hoskins concentrated primarily on the human timescale and human impact on the landscape, current nature writers also display their understanding of both the deep-time geological forces that have shaped the world around them, and also of the non-human agencies that have left traces on the land.[35]

The act of interacting with these accreted histories and forces can make for uncomfortable reading. Whatever it is that those living within a twenty-first-century society of petroculture, resource extraction, unsustainability, and mass extinction expect to find is unlikely to give the reaction intended. If a lake were able to speak with a human tongue, romantic Western observers might hope that it would murmur hidden knowledge in a quiet and comforting tone. Perhaps the lake would scream. The ecophobia hypothesis advanced by ecocritic Simon Estok proposes that the emotions associated with human relationships with the environment are underpinned by fear and a reckoning with the consequences of our actions as much as they are linked to biophilic or positive drives.[36] There are confrontational and traumatic memories within landscapes questions with profoundly disturbing answers. The scraping and reapplication of meaning suggested by the model of the palimpsest implies that the subsumed or abraded layers beneath might speak of meanings the upper layers have obscured, and

32. Pritchard, "Joining Environmental History with Science and Technology Studies," 2.
33. Drenthen, "Rewilding in Layered Landscapes as a Challenge to Place Identity."
34. Ritson, *Shifting Sands of the North Sea Lowlands*, 98.
35. Ritson, *Shifting Sands of the North Sea Lowlands*, 100.
36. Estok, *Ecophobia Hypothesis*.

it directs us to ask how and why these erasures came about. Social relations, patterns of social power, and technological regimes are remembered by a lake and return to challenge us.[37]

In the realm of cultural memory, another act of remembering and forgetting is taking place. There is a postcolonial lacuna at play, where some forms of knowledge and memory—the scientific, the touristic, the instrumental, the majoritarian—suppress or devalue other forms of memory. Dorothy Christian and Rita Wong provide a useful way forward, seeing Euro-Western ways of knowing as a form of cultural memory and storytelling that sees itself as objective, underpinned by the "individualism, land ownership, and utilitarianism" tied up in the Enlightenment and the birth of the natural sciences.[38] As a result, it is crucial to understand the stories told by scientific and settler colonial perspectives on lakes—extent, boundaries, entanglements, temporalities—and juxtapose them with other knowledge traditions and stories about the same lakes. Only by giving knowledge equal audition and flattening the ontologies of water memory—as Selena Springett has put it in an Australian context—can the question of what it means to remember as a lake be fairly discussed.[39] This mode of understanding must, as Dian Million puts it, make stories a "useful form of knowledge" for all, valuing affective experience as "a felt knowledge that accumulates and becomes a force that empowers stories that are otherwise separate to become a focus, a potential for movement."[40] The arrangements with lakes intertwine stories that imagine themselves as occupying differing positions of power and authority, some suppressing others, but the lake archives all equally and returns them in its own configurations.

Limits matter in the study of lakes but are also endlessly porous and amorphous. The natural sciences recognize an evolving and changing vision of this fact. Although lakes are "more closed than most terrestrial and marine biomes," as Lars-Anders Hansson et al. argued on the 125th anniversary of Forbes's microcosm essay, they are not entirely so, serving as mirrors for their catchment as a whole and exchanging nutrients, pollutants, and fish biomass with other biomes.[41] The same might be said in human terms: memory pools at the low points of the earth, carried by rivers, springs, or oceans and coalescing for a time in a self-contained world, and yet always reaching out to connect. Lakes are catalysts of metabolic processes—aerobic and anaerobic photosynthesis, aerobic chemosynthesis, and aerobic and anaerobic respiration[42]—and are likewise catalysts of socio-ecological metabolisms of cognition, memory, affect, and emotion, the processes of thinking *with* water.[43] The process is hydrosocial, a cyclical arrangement of

37. See Smith, "Rural Waterscape and Emotional Sectarianism in Accounts of Lough Derg, County Donegal."

38. Christian and Wong, "Introduction," 3.

39. Springett, "Going Deeper or Flatter."

40. Million, "There Is a River in Me," 32.

41. Hansson et al., "Lake as a Microcosm," 122.

42. Lewis, "Lakes as Ecosystems," 3–4, fig. 3, table 2.

43. See Chen et al., *Thinking with Water*.

social and hydrological forces that exists in its own category. By insisting on a flat ontology of knowledge, perspectives, relationships memories, and practices, hydrosocial arrangements allow what it means to remember as a lake to become a more capacious and less problematic endeavor.

Anxieties of Retrieval

Asking about the archival qualities of lakes poses several questions at once. First, what is expected of a lake as a component of shared cultural memory, and how are human lives extended into and entangled with it? Second, what is the nature of the memory or memories extracted or retrieved from a body of water? Third, how is memory recorded, rewritten, and retrieved? The expectation that water is more than H_2O is a discourse on the unthinkable occurring within Western philosophy and jurisprudence. Many forms of agency have been unthinkable in the past, and the demos of democracy continues to grow.[44] Nonhuman agency is fundamental to a variety of knowledge and cosmologies still part of the world and worthy of equal standing.[45] A spectrum of beings and agencies complicates the story of the archive, complicated and traumatized by colonial violence. The very nature of imagining archives, as Stoler reminds us, is entangled with the bureaucratic violence of colonial land use, record keeping, and memorialization practices.

The imperfection of storage is part of the depth of water as archive. It is also part of a process by which a lake is changed. The process of deposition which leads to the input of elements such as pollen, dust, metals, acids, and nutrients into terrestrial aquatic ecosystems—including the Anthropocene deposition of sulfur and nitrogen compounds released into the atmosphere by the burning of fossil fuels and the runoff of agricultural pollutants.[46] They change the lake: its nutrient levels, pH, and water quality. The same might be true of the deposition of memory: another transformation but in a different register. Anxieties of access and retrieval are at the core of lake memory.

Access and retrieval are processes of socio-natural interaction, of an extended cognition and memory system tied into the aqueous environment and its surrounds. Taking a lead from Arne Naess, founder of deep ecology, it may be these dynamics and tunings that are the reality of a connection to the material world, and not sensory data.[47] Deep ecology posits that the primary qualities of things (size, shape, dimensions) are human intellectual constructs and that secondary qualities such as relational engagements arising through human encounter with natural entities are real because they are not independent from either subject or object. If this is the case, then the memory mechanisms of water have power because they reside not within "objective" qualities

44. See Smith, "I, River?"
45. Stone, *Should Trees Have Standing?*
46. Weyhenmeyer, Psenner, and Tranvik, "Lakes and Reservoirs of the World," 317.
47. See Naess, "Shallow and the Deep, Long-Range Ecology Movement."

that can change in the measuring, but in the subjective entanglements of human experience with everything else.[48]

Archives are about preservation, but they are also an arbiter of Western modes of authority. The same is true of an entity such as a lake.[49] By taking up the challenge of Francis X. Blouin Jr. to look beyond the archive as authenticator of historical narrative, a fragile and multifaceted identity emerges.[50] Composite and generative, mutable and plural, archives defy expectations and perform unexpected roles. They bundle and shape identities and are a site of trauma, remediation, and change. Archives document openness in democracies and guard against the manipulation of histories; inland waters are no exception. Jacques Derrida saw archives as a *place* from which narrative emerges, the locus of authority where the records are kept and the proclamations made. They were guarded by the *archons*, their curators and protectors and those "accorded the hermeneutic right and competence" to interpret.[51] They *become known* through mediations between the locus of memory and its interlocutors. As Steedman reminds us, Derrida's archival fever is the desperate need not for an archive to be entered, used, or had, per se, but simply for it to *exist*.[52] Thus, the very notion that a lake is archivable is an expression of desperate and anxious epistemic posturing, a feverish scrabble to document and dominate.

The digital life of lakes adds an additional layer of entanglements. Exploring the relationships between lakes and digital archives is fundamentally part of the digital environmental humanities, defined by Finn Arne Jørgensen as "the simultaneous use of digital tools and methods for analyzing historical and contemporary natures . . . and the study of how the digital has become part of nature."[53] In the case of a lake, the relationship between digital and material is so intertwined as to be inseparable. What we know of lakes is captured in stories and qualitative accounts but also in the reams of government-generated maps, surveys, GIS Shapefiles, diagrams, and sensor readings that monitor and characterize lakes as cadastral subjects. The notion that there is a stable relationship between what is proper to the world of human cognition and what is a facet of computation does not stand up to scrutiny. Computers were mathematically able human beings who computed from the inception of computation itself, as were programmers.[54] The word *calculus* comes from the *calculi*, or rounded stones used in mathematics. And yet, as Cohen reminds us, "the power of objects to disrupt human endeavors by refusing to be reduced to tidy equations and known-in-advance formulae

48. See Hodder, *Entangled*.
49. See Derrida, "Archive Fever."
50. Blouin, "History and Memory."
51. Derrida, "Archive Fever," 9–10.
52. Steedman, *Dust*, 2.
53. Jørgensen, "Walking with GPS," 295.
54. Grier, *When Computers Were Human.*

hinges upon a small stone."[55] The lake is also a part of the analog history of human assisted cognition, together with other aqueous entities such as springs, rivers, or oceans.

The notion of a lake as a cultural archive or repository of accumulated culture and memory takes on an additional dimension when considered within the context of digital curation. When a place is measured, visualized, mapped, and investigated with the tools and technologies of the twenty-first-century spatial humanities, its stored memories are captured—in a partial fashion but also generatively—within the new digital archive formed from its material and social analog. Like a degraded copy of a copy it loses its original context, but certain affordances and limitations of memory and its record are retained, and the collection gains new meanings when translated into the realm of the heritage collection, the digital habit, the database, and the visualization. But the desperate need remains for there to *be* an archive, for the data to be gathered, for the accounting to be made. What it means to remember a lake *through computing* is a topic only partially overlapping the scope of this essay, but one of crucial future critical importance.

If lakes are large nonhuman archives, then notions such as sustainability and unsustainability cannot be wholly captured without a seamless incorporation of the humanities, the social sciences, and the natural sciences. The memory of a lake spans the full spectrum of *capta* (that which is taken) and *data* (that which is given) readable and retrieval by human means. The distinction—as given by Johanna Drucker—is that the notion of data as an objective, measurable, and quantitative representation of reality requires modification in a humanistic context.[56] Lakes return both forms of measurement: culture is taken and adapted through qualitative analysis, and yet limnology, or paleolimnology, deals with data as given by scientific inquiry. And yet, this perception of lakes is built on, managed by, and underpinned by a worldview that brooks no rivals, and the datafication of lake memory leaves no room for other modes. How can this be reconciled with other modes of memory in the Anthopocene?

And yet, there are other bodies that enter porous worlds, send and receive the knowledge of archives across a membrane of human subjectivity. These bodies, in assemblage with human bodies, are agential, malleable, and coherent. They enter into the world and merge with it through what Astrida Neimanis has termed posthuman "bodies of water"—the hydrologics within and without the human body—arranging themselves into what Stacy Alaimo characterizes as "bodily natures."[57] As Hayden Lorimer reminds us, affect is mediated by a complex of dynamics that shape life, "properties, competencies, modalities, energies, attunements, arrangements and intensities of differing texture, temporality, velocity and spatiality, that act on bodies, are produced through bodies and transmitted by bodies."[58] The archive of the lake is an archive

55. Cohen, "Introduction," ix.

56. Drucker, "Humanities Approaches to Graphical Display."

57. See Neimanis, "Bodies of Water, Human Rights, and the Hydrocommons"; and Alaimo, *Bodily Natures*.

58. Lorimer, "Cultural Geography," 552.

made up of bodies, processes, flows, and energies that make a nonsense of the separation among memories, beings, ecologies, and natures. It is lake being, lake memory, lake embodiment, a pooling of categories in the protean mass of a deep ecology. They are what anthropologist Veronica Strang terms a "re-imagined community," rearrangements of human-nonhuman alliances and relationships.[59] The result is what Clark terms a process of "active externalism," a human organism (or in this case, collections of human organisms) linked to an external entity in a two-way interaction or ongoing coupled system. All components in the system play an active role and jointly govern behavior.[60] A more capacious memory of lakes might be multinodal, with multiple pathways of externalization from multiple humans to multiple understandings of what a lake is and remembers.

Anxieties of the Anthropocene

The memory of lakes often becomes known through degradation and destruction. In some extreme cases, socio-natural sites are literally submerged and drowned in artificial bodies of water, villages, forests, houses, entire landscapes. So often the memories uncovered by remembering with water are of absence, or of new presence tinged with horror. The ghosts, corpses, and polluted revenants of lakes are archives depleted of place: a macabre sentiment reminiscent of the eco-Gothic, the horror stories of the Anthropocene we tell ourselves.[61] They may have been dried up, reshaped, reclaimed as land, or simply built over. A notable example would be the former Lake Texcoco in Mexico, site of the Aztec island-polities of Tenochtitlan and Tlatelolco, themselves situated on a partially artificial island. This extensive lake system—including marshes, salt and fresh water—has now vanished, covered by the sprawl of Mexico City. Hita Unnikrishnan and Harini Nagendra give the example of the former Dharmambudhi lake in Bangalore, India, once a site of Hindu water devotion but now a bus station still surrounded by traces of its spiritual past.[62] Nagendra and Unnikrishnan note that "[over time] the former watery identity of the lake thus began to be just a memory, one probably made even more distant through successive renaming."[63] Sampangi Lake, another Bangalorian water body, was partially drained and became the site of Sri Kanteerava Indoor Stadium.[64]

The methods and concerns of the environmental humanities assist us in the perception of dynamics at play within situated and space-specific memory and knowledge. By taking the time to parse difference genres, a more capacious composite vision of a

59. See Strang, "Re-Imagined Communities."

60. Clark, *Supersizing the Mind*, 222.

61. See Smith and Hughes, *EcoGothic*.

62. Unnikrishnan and Nagendra, "Lake That Became a Bus Terminus," n.p.

63. Unnikrishnan and Nagendra, "Lake That Became a Bus Terminus," n.p.

64. Unnikrishnan and Nagendra, "Lake That Became a Sports Stadium," n.p. See also Unnikrishnan and Nagendra, "Lost Lakes of Bangalore."

place emerges. In the case of water, this is an endless bidirectional hydrosocial negotiation, an exchange of messages from the realm of the social into the language of place and space, and back again. The Anthropocene allows for no separation or clean lines; all is entangled, everything is cocomposed. This was ever the case, but the climate crisis makes this reality inescapable. Nothing can be done or has been done that does not shift the delicate balance of the lake as a place of remembering and forgetting, trauma and reconciliation. Harriet Mercer has pointed out that the archive of culture in the twenty-first century is always also the archive of the natural sciences—the "ice cores, tree rings and fossil pollen"—and that combining the two has great potential for humanists.[65] Shannon Mattern sees a more integrated notion of the archive in the age of big data, and an acknowledgement of the complex nature of curation in an age of climate crisis and big data:

> It's time for curators—of cores, codes, and codices; manuscripts, machine-learning models, and mud—to think across their collections, recognizing their shared commitment to resilience and social responsibility. Together, they can honor the variety of "natural" and textual documents that yield critical data about geological, climatic, and related cultural processes—and that bring those processes to life for patrons.[66]

Waters envelop and archive events and experiences, sometimes erasing them—in whole or in part—and sometimes revealing them to haunt the consciousness and worldviews of the present and future. At other times, they tell us something unexpected about human impermanence on this planet. Ian Donohue et al. discovered through the sampling of pollen cores that aquatic ecosystems rapidly recover from human intervention: Lough Carra in the west of Ireland shifted to a new equilibrium within two to ten years after the rapid depopulation—and thus reduction in deposited pollutants and nutrients—caused by the 1840s Great Irish Famine and the mass emigration of the 1840s and 1850s.[67] Trauma resides within the archive of the natural sciences, both the long temporalities of Anthropocene violence and in the remembering of cultural disruptions and behaviors in the legacy of the built and material environment. A lake remembers the effects of human interventions and habitations, but also bears the imprimatur of historical disruptions and degradations.

A place can become exhausted, thin, exsanguinated and desiccated of once-rich spatial and cultural interdependencies by climate crisis, overuse, or pollution. It is replaced by complexity of a troubling nature. A husk of place or the shell of a lake—the desiccated remnants of Lake Chad, for example—is sad and dead and peripheral to the stories of progress told throughout the period following the Western Industrial Revolution, but it is indicative of furious and rapid Anthropocene change.[68] As Iovino puts it,

65. Mercer, "Archives of the Anthropocene," n.p.

66. Mattern, "Big Data of Ice, Rocks, Soils, and Sediments," n.p.

67. Donohue et al., "Rapid Ecosystem Recovery from Diffuse Pollution after the Great Irish Famine."

68. For the desiccated remnants of Lake Chad, see Purvis and Trif, "Lakes of the World Are Disappearing."

place fades and is worn down through the abrasive effects of instrumentality, but it is an evolving story:

> In a landscape of suburban countryside made of houses, industrial sites, electric power plants, and decommissioned nuclear reactors, the "stories" and "wisdom" of places seem on the verge of extinction. Once the familiar bond that connected people and their landscape has been worn out, a growing sense of alienation takes over."[69]

Depleted resource no longer, the poisoned industrial wastelands of the world become tortured bodies that cannot be ignored. The ghosts of lakes still shout memories of their pasts, presents, and futures. The cultural trauma subsumed by instrumentalization of the environment becomes visible and immediate once more. Legally, for legal personhood for natural objects is an idea that is fast gaining mainstream currency. The future entails more of what Christopher D. Stone terms the *discourse of the unthinkable* about nonhuman rights.[70]

A lake speaks truth to power, sometimes by dying. Its water acidifies, its biodiversity declines, its waters sometimes disappear entirely. The alliances between lake and city that define many large metropolises are disrupted by messages delivered by water. A lake has its own extent, register, messages, and genre of memory. Like all entities of memory, it has qualities that make it distinct from a pond, river, a coastline, an ocean: scale, ecology, society, extent, temporality. It has stories that are not data but are recorded and relived. It has ontologies that are plural, overlapped, and multiple: what Neimanis has described as the *hydrocommons*.[71] Rather than asserting that a lake is an *archive*, I propose that it is instead a *counterarchive*, where archival modes and anxieties can be exposed and explored. This is true of all waters, but lakes offer an ideal case study. To respond to Linton and Budd's assertion that the nature of lake memory contains embedded political structures, normative regimes and assertions, it is necessary to document counterarchival properties that "disrupt the linear unfolding of time, and the delimitation of space."[72]

Just as long-term socio-ecological perspectives teach that there is no end to the extent of a lake, so too is the memory of a lake not singular, limited to a set temporality, alone, reliable, predictable, or convenient. Lakes are not convenient to remember with, and this is the heart of the anxieties of episteme and access that haunt their interlocutors. The challenges of the Anthropocene make a capacious sense of lake memory—and of the blue humanities more broadly—more crucial than ever. Rather than seeking to parse or divide memory captured in lakes and other bodies of water, we can instead

69. Iovino, "Restoring the Imagination of Place," 102.

70. Stone, *Should Trees Have Standing?* See also Hillebrecht, Leah, and Berros, eds. "Can Nature Have Rights?."

71. Neimanis, "Bodies of Water, Human Rights and the Hydrocommons."

72. Motha and van Rijkswijk, "Introduction," 2.

embrace its pooling in the hydrocommons, a place without hierarchies where traumas and problems can be counterarchived and critically engaged with. If water is not portioned and sequestered into reservoirs of power but held in common, it becomes a space of shared dialogue, but also of a shared tragedy of the commons, compounded by Anthopocene realities. The blue humanities has as many genres of water being as there are patterns of water—that is to say, infinite—and lakes are one expression, but it is a case study with its own affordances that are of critical interest to all scholars of the lacustrine. Moving beyond the language of singular definition, datafication, commodification, and instrumentalization filling a shared space of identities and stories with parity is only the beginning.

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Acknowledgments

This article was funded by a 2018–20 Irish Research Council Government of Ireland Postdoctoral Fellowship Award. I would like to thank Dolly Jørgensen, Finn Arne Jørgensen, and the staff of the Greenhouse Environmental Humanities Initiative at the University of Stavanger for hosting me during the short writing fellowship that led to the creation of this article and for their thoughtful feedback and comments. Finally, I would like to thank the associate editors and coeditors of this journal and the two anonymous peer reviewers for extensive, thoughtful, and formative feedback.

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