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# [Un]Learning: A Dialectical Approach Towards Sustainability from the Ground, Up

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**Abstract**: The predominant understanding of the human relationship to water in the much of the world is symptomatic of a crisis in the broader narrative of "development"—the migration, allocation, and accumulation of wealth. The transactional costs of this phenomenon are often cloaked in our everyday, causing us to lose sight of our responsibilities in our role as the progenitors of the Anthropocene. And yet, if we consider the morphogenesis of mind and matter that characterizes this new epoch to be "design" in the expanded field—in which meaning, making, and memory or learning are *designed*—we can [re]frame our perspectives, and better grasp the complex interdependencies between human and non-human actors.

In this paper, we will explore this theory of action, in action, via *Livestream*—a participatory action research project that we are developing with the Kentucky Geological Survey to collect, monitor, and translate groundwater data into an interactive soundscape and public art installation.

***Key words: Anthropocene, Design, Groundwater, Sustainability, [Un]learning.***

*On Aesthetic: Brackets '[ ]' indicate instances when aspects of the thesis and antithesis of a word seem equally valid. For example, [un]learning is intended to read as learning and unlearning.*

## 1. Introduction: A Crisis Of Contradiction

Jürgen Habermas (1975) defines a severe crisis as one that affects not only the economy, but also the steering of society, generating a dissolution of individuals and

institutions. We are today, everywhere, in crisis—a crisis catalyzed and sustained by an impoverished sense of perception.

The contradictions embedded in our perceived relationship with water are exemplary of this crisis. 71% of the Earth's surface is composed of this chemical compound (United States Geological Survey). It fills our oceans, flows through our cities, floods our fields, and nourishes our bodies. Indeed, between roughly 55% and 75% of any human body is composed of water (United States Geological Survey). And yet, in North America, we perceive water—whether the drought in California, flooding in New Orleans, or shut-offs in Detroit—as a resource that exists separate from ourselves for our consumption. Water is a source of life, and more specifically, of our lives. Yet, in living, we dismiss this interdependency.

In most North American communities, we learn to separate our bodily selves from the water that we drink or the water in which we bathe. Our interactions with water, like our interactions with food and other commodities in our globalized economic system, are mediated many times over. Consider, for example, the water that comes out of the faucet in a typical North American kitchen. The water itself likely comes from one of two sources: surface water (like a lake) or a well that accesses a groundwater aquifer. This water is then treated (by the public water utility) and dispatched to a reservoir, and from there it is piped to water mains, which connect to the plumbing in homes. The delivery of water and the system by which it is delivered is, in a sense, magical. "But in practical life as in ideology, this magic only signifies the illusions men have about themselves and their lack of power. And everyday life is defined by contradictions: illusion and truth, power and helplessness, the intersection of the sector man controls and the sector he does not control" (Lefebvre, 1991, p.21). Our perceptions of the boundaries defining these sectors over which we have—and do not have—control are defined *by design*. Design—whether done by corporations or governmental entities—creates the illusions that show us the edges of the systems over which we have influence. We learn that these boundaries are, in the words of Latour, "matters of fact."

The illusory magic of the design of systems for water delivery deceives and alienates. It treats the result—the pouring forth of the water from the faucet as a singular instance, divorced from the complex of actors and objects (and environments) that produced this outcome. The faucet and the water flowing from it, in this sense, become "matters of fact": they simply exist rather than being a result of the actions of a distributed network of human and non-human actors, in other words, an "assembly" (Latour, 2005; Latour, 2008). Our actions

(turning on the faucet, for example), however, affect much more than just the water flowing from the tap. And the water flowing from the tap that comes from the main that is fed by the reservoir that is filled by the treated water from lakes and aquifers, is affected by a great many things to which I am not privy as I stand at the sink washing my hands or filling my glass of water. Indeed, "the largest part of the webs we draw on and allow us to act are hidden" (Law, 2009, p. 147). As part of a government utility, the manipulation of the waterscape is one of the ways through which a hegemonic ideology—which includes ideas about the human relationship to the environment—is stabilized and legitimated (Loftus and Lumsden, 2008). The construction of the relationship of the typical North American household to water serves specific ideological functions, embedded in which are ideas about the nature of the human-water relation itself. Such a relationship entails a semiological function as well: it serves to structure what the word "water" signifies.

Instead of water being something upon which we act with tools and technologies that merely operate at our service, we (and our designs) are instead simultaneously products and inputs of a system in perpetual flux. Like "the geologic," "water" is a situation we live with and within, not simply a situation or something "out there" that we study (Kruse and Ellesworth, 2013)[1]. We are products of the social, economic, and environmental systems that have contributed to the current state of the bodies of water on planet earth; and we are also inputs to those systems, meaning that we have the ability/responsibility to move these systems towards sustainment.

Our waters (and, consequently, our bodies) are, today, in crisis. Examples abound from across the globe, but, in the United States, one of the most high-profile

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[1] Kruse and Ellesworth (2013) make this point through an ingenious reading of Latour's *Reassembling the Social*, in which they explore what an expanded field of Geology might look like by swapping the word "sociology" for "geology" and "social" for "geologic." Here is an excerpt:

*Even though most geologists would prefer to call 'the geologic' a homogeneous thing, it's perfectly acceptable to designate by the same word a trail of associations between heterogeneous elements. Since in both cases the word retains the same origin — from Latin root geo — it is possible to remain faithful to the original intuitions of the geologic sciences by redefining geology not as the "science of the geologic," but as the tracing of associations. In this meaning of the adjective, geologic does not designate a thing among other things, like a black sheep among white sheep, but a type of connection between things that are not themselves geologic.*

Kruse and Ellesworth (2013) suggest that "this speculative substitution of terms produces a lively outcome — one that springs geology into the realms of everyday actions, movements, and associations among humans and nonhumans."

examples of this crisis is in California, where some 65% of the water used in the state now comes from aquifers (Howitt, et. al., 2015; Borchers and Carpenter, 2014). Such extreme use of underground water reserves changes the way the aquifers themselves operate, often keeping the ground from being able to absorb as much water in the future, therefore affecting the capacity of underground aquifers in the future. This also impacts the land itself—land is filling in where the water used to be, causing the entire region to sink (California Department of Water Resources, 2014). What will the impact of this be on future human and non-human agents in the California region?

The crisis is not limited to places under siege by drought. Fracking for natural gas and pollution from industrial agriculture, for example, have reshaped the hydrogeological character of the entire United States (e.g., see Webb, 2015; Exner, Hirsh, and Spalding, 2014). The state of Kentucky is no exception. Indeed, there is a systemic interdependence between the groundwater that flows beneath the Bluegrass and nearly two million Kentucky residents: families, farms, and entire ecologies depend on it. People in Kentucky are deeply impacted by the changes in water supply and water quality that, to some degree, humans themselves have precipitated. And yet, the interdependence between humans, non-human agents, ecosystems, and the various forms of water in Kentucky is not foregrounded in any substantive way. The crisis of which we speak is not limited to the physical characteristics of the water or the quantity of it—the crisis is in our perception of our relationship to it.

We are the Anthropocene — a dynamic network of human and non-human forces that simultaneously traverse and mold landscape, psyche and soma. If we consider this morphogenesis of mind and matter to be design in the expanded field — in which meaning, making, and memory or learning is an affect and effect of designing — then we can begin to investigate, [dis]assemble, and [re]frame the myriad modalities by which we commune and hence construct our perceived, conceived, and lived realities—in a word, [un]learn.

## 2. [Un]learning: towards a new relationship with water

*In order to design for movement, a whole new system of conceptualizing must be undertaken. Our present systems of design and planning are invariably limited by our techniques and our methods of symbolizing ideas. We know only*

*how to delineate static symbols, so that is all that we do.*
— Lawrence Halprin (1972)

We argue that this crisis calls out for a subversion of the way in which we understand our relationship to water—in other words, an *[un]learning*, in which meaning, making, and memory are transformed by design: a remapping of the semiological signification of the term "water" itself. Water should not signify something outside of ourselves, but rather, we suggest, it should signal in us an element that is, at its core, deeply rooted in ourselves and in our actions as distributed agents in interdependent (eco)systems. Like other aspects of the environment, it is increasingly subject to capitalist development and power structures (Harvey, 1996), but as a thing of which we are made, these relations exert a unique biopolitical influence on us, even as we, in turn, influence water through our own actions. In other words, the *standards* and *forms* (Holifield, 2009) circulating between the actors within the various (eco)systems through which we move in our everyday create specific subjectivities in our relationship to water. We seek to subvert the way in which the understanding of the human relationality to water is produced and instead instigate the consideration of a more complex, material account of it.

Can we use design to catalyze this [un]learning? This question is at the core of our research. The following discussion aims to focus on the first stage of this [un]learning process, which we suggest is the development of an awareness of our relationship (interconnection) with water and a subversion of the more typical "environment"-oriented relationship to water. We will describe some of the key components of the design intervention—entitled, *Livestream*—by which we aim to catalyze this awareness and develop some of the ideas underlying the design of the system itself. Through these descriptions, we hope to suggest the potential for design to build an awareness of the ecological system of distributed agency in which we operate as human agents in our transactions with other human agents as well as non-human agents (Bennett, 2010). We will also describe some pitfalls that such an ambitious designed intervention encounters.

Instead of discussing the "interactions" involved in *Livestream*, we will use sometimes use the term "transactions" in order to underscore the notion of distributed agency that exists within the environment that we are not only a part of, but of which we are constituted as well.

*The Intervention*

Phase 01 of *Livestream* will manifest as a data-driven public art installation at Jacobson Park in Lexington, Kentucky. The installation will operate as both a sculpture and an interactive soundscape. We (Nash, Kaiser, and several collaborators) are working with the Kentucky Geological Survey to install groundwater-monitoring stations in groundwater springs across Kentucky. These monitoring stations will send data about five chemical and physical properties of the groundwater back to the installation, which will sonify[2] this data, using and manipulating sounds composed by local musicians. The physical form of the installation itself is comprised of several large, steel pipes. Each end of every pipe corresponds to one of the properties of groundwater data for the location being monitored. Each pipe will be fitted with speakers as well as proximity sensors that gauge the distance between that pipe and the body of a person approaching it. As an individual moves closer to a given pipe, they shape the sounds being emitted from that pipe. These sounds commingle with the sounds being emitted from the other pipes, with every participant therefore impacting the entire soundscape.

The "default state" for all pipes is to emit the sonified data at a low volume, providing a cue to visitors that the installation is more than just the sculptural forms. When an individual interacts with the installation, and he or she approaches the end of a single pipe, the volume of the sound being emitted from that pipe will increase, providing feedback to the participant and changing the experience of the soundscape for other visitors in the vicinity of the installation.

While this interaction is individualized in the sense that a single pipe (as representative of a property of groundwater) responds to a single individual, the entire experience of the soundscape is impacted by the increase in volume of a single element within the soundscape. This is intended to suggest the interconnected nature of the waterscape. At the same time, the individual nature of the interaction suggests that the direct action on a body of water will indeed impact that body of water most directly.

[2] The data will be translated into sound using bespoke software. For examples of sonification projects, see Alexander, et. al., 2011 and 2012.

This transaction between an individual and the sonified groundwater data (as representative of the different facets of groundwater in a particular location) through proximity is the central interaction in the project. Proximity, while functioning as a parameter for determining properties of sound that an individual hears, also functions as a conceptual stance—that we can more clearly hear the frequencies (the various vibrations (Bennett, 2010)) of the life forms within our water itself the closer we are to it.

At the same time, the impact of an individual's actions on the entire soundscape is not negligible. Any increase in volume of single pipe will change the experience of the installation for all those nearby. The installation has been designed such that the pipes are close enough to one another for this interference to occur. This interruption, which may alter someone else's experience of the work, suggests the interconnected nature of our waterscape and our connection to one another through our waterscape.

Taken together as a whole, the transactions in which individuals engage when interacting with—or even standing nearby—the soundscape/sculpture are intended to suggest the interconnectedness of human and non-human agents in the waters and ecosystems that we and the Kentucky Geological Survey are studying. In designing a system that allows *Livestream*'s visitors to manipulate sounds that are directly representative of the groundwater itself (because they are generated by data about the groundwater), we are suggesting to visitors that they have a direct relationship to groundwater—a relationship that transcends the mediation that normally stands between themselves and the aquifers from which their water originates. Such an [un]learning process would, we hope, begin to challenge the signifcation of the word "water" itself, moving it away from an instrumentalized vision of water—wherein water is just a means to an end, whether the growth of plants or the quenching of thirst.

Like ourselves and our relationship(s) with water, the installation and the individuals participating in transacting with it at any given moment are simultaneously products and inputs of a system in perpetual flux, responding with physical bodies to sounds being generated by data about groundwater, again, also systems that are in perpetual flux (bodies and groundwater) that transact with one another. Through our work, we aim to call attention to these dialectics that emerge from such interdependencies and distributed agencies. At the same time, we seek to advance an understanding of ourselves and intimately more connected and therefore responsible for the health of our groundwater (and

therefore ourselves).

### 3. Challenges and Conclusion

We may not know until years after the completion of the installation whether or not it was "successful" in its ambitions towards a more complex, material awareness of the human interconnection with the non-human and groundwater. Further, to develop analytical measurement tools is to embed the work with certain ideologies that counter the prevailing ethos of the piece itself, in that it is impossible for the work to achieve "success" on its own. It can only be successful through its role in a complex network of relations that may produce a change in the subjectivities of those who experience it. Such a design project could be seen as ineffective or self-indulgent if viewed through the lens of metrics, measurability, or efficiency (lenses through which design is often evaluated). While open to such critique, we suggest that the project itself challenges the ideologies underlying an evaluation strategy that presumes the quantification of the full impact of an intervention in a system at a given place or time is possible in the first place.

Nonetheless, as we march towards Livestream's installation in Jacobson Park, we are excited about the potential of the work, while we remain aware of the project's ambitious agenda and the challenges in assessing its success. Furthermore, we look forward to using this writing as a platform to begin further discourse around the work with participants at Cumulus Mumbai 2015. Writing and reflection is core to our design process, and this document represents not only a documentation of our process but a step in it towards the realization of *Livestream* in its many complexities and contradictions.

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