ATMOTERRORISM AND ATMODESIGN IN THE 21ST CENTURY: MEDIATING FLINT'S WATER CRISIS

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ABSTRACT:According to Peter Sloterdijk, the 20th century begins in 1915, in Ypres, France, where German soldiers unleashed chlorine gas on their enemies. Weaponized air ushered in a new type of warfare, what Sloterdijk calls "atmoterrorism," aimed not for enemy soldiers, but the atmosphere surrounding them. Ypres made explicit what was implicit, the atmosphere where humans are situated, leading the 20th century to develop along three trajectories: the practice of atmoterrorism, the rise of design, and the discovery of the environment.

In 2015, it came to light that residents of Flint, Michigan, were drinking water with toxic lead levels. Resulting from a complex series of actors and histories, Flint reveals the utter failure of 20th century design. Like Ypres, Flint makes explicit what is implicit: the technical apparatus on which humans depend. Employing an analysis of explication and a theory of the accident derived from Sloterdijk and Paul Virilio, this project argues that Flint's accident is the beginning of the 21st century.

Following the wave of explication started by the accident, Flint problematizes and reveals three domains of human experience: ontology, responsibility, and social exclusion. Moving into the next century, this project suggests a theory of "atmodesign" as a way forward.

KEYWORDS: Accident; Catastrophe; Design; Explication; Infrastructure

> The 20th century will be remembered as the period whose decisive idea consisted in targeting not the body of the enemy, but his environment.
>
> Peter Sloterdijk[1]

[1] Peter Sloterdijk, *Terror from the Air* (Semiotext(e) / Foreign Agents). Los Angeles: Semiotext(e), 2009, 14. Multiple citations of Sloterdijk's *Terror from the Air* maybe textually rendered as (TA [page number]).

According to Peter Sloterdijk, the 20th century begins on April 22nd, 1915, in Ypres, France. It was at Ypres where the soldiers of the German western front unleashed a number of canisters containing chlorine gas on their French Canadian enemies and ushered in a new type of warfare that was aimed not for the enemy soldiers but the atmosphere proximal to their bodies. Far from remaining a localized event in the history of military technologies, the use of gas warfare at Ypres provoked a whole series of changes in human self-understanding and cultural development, identified by Sloterdijk under three general headings. "Whoever wants to understand the originality of this age" writes Sloterdijk, "will have to take into account: the praxis of terrorism, the conception of product design, and concepts of the environment."[2] By contrast, the 21st century begins, not in Ypres, but in Flint, Michigan, where over the course of a year citizens were subjected to public water with unsafe lead levels, even after bringing its toxicity to the attention of civic officials. The drinking water crisis is still ongoing at the time of this writing.

Flint is not the beginning of a great war, but a revelation of the complete failure of post-industrial design politics. In 2015-2016, exactly a century after Ypres, we continue to inherit the "originality" of the 20th century. While Sloterdijk and his various interlocutors focus their analyses on air, atmosphere and their interiorization, this project would like to make a brief intervention and include water as a particularly important and timely site of, what Sloterdijk calls, "atmoterrorism," which has consequences for how humans understand ourselves.

To that end, this project brings the theoretical frameworks of atmospheric and design thinking to bear on the current crisis of lead poisoning in US cities, specifically that of Flint.[3] The poisoned water in Flint, like the air in Ypres, is an *explication* of an implicit condition of human existence. In other words, there are events, in Ypres, Flint, and elsewhere, that make the often unquestioned givens of human life visible for inquiry. Explication is the process through which something becomes less discreet and available for human reflection. In following this line of inquiry concerning explication, this project looks to build a clearer hermeneutic of accidents and catastrophe, along with a political response to the explication radiating from Flint in particular.

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[2] Peter Sloterdijk, Airquakes. *Environment and Planning D: Society and Space*, 27, no. 1, 2009, 41. Multiple citations of Sloterdijk's *Environment and Planning* maybe textually rendered as (EP [page])

[3] Flint is not the first case of a post-industrial city that devastated its citizens with lead poisoning. For example, in 2001 there was a similar case of lead poisoning in Washington DC. However, despite these historical nuances, Flint remains the focus of this project because of its spectacular media image and striking political controversy. The point here isn't to make Flint's crisis primary over DC, but simply that the media has pressed the tragedy of Flint into the view of the public and forces us to take up this cause.

Historically, chlorine gas has a far richer and deeper history than the First World War, just as environmental pollution affecting marginalized people goes well beyond the limits of Flint. However, the connection between these narratives serves a rather important purpose. Deriving and connecting the narratives of atmoterrorism from Ypres to Flint are important critical and strategic moves; while global war characterized the previous century, the expansion of public infrastructure in conflict with private interests characterizes the horizon of the present century.

Ypres isn't the only starting place for the 20th century, and neither is Flint the only starting place for the 21st, yet there are good reasons to start there anyway. The environmental violence, what this paper will later deem "infrastructural racism," of Flint is obviously not the only, first, or most important instance of such violence. For example, India has the greatest number of people living without access to clean, safe drinking water,[4] First Nations communities in Canada continue to suffer from issues with water quality, including the presence of lead,[5] etc. Nevertheless, even in light these other events and lasting conditions, the events in Flint are pivotal for an understanding of atmoterrorism and environmental politics.

The explication of water in Flint is not worth consideration because it is factually unique, but instead because of its place in the media landscape. News media plays a large role in the public perception of an event and, regrettably, the intensity with which United States news media covers United States catastrophes pushes the events in Flint forward to the front of conversations on environmental politics (reflected, for example, in Flint's presence as a campaign talking point for both Republicans and Democrats in the 2016 primaries and general election). Jean Baudrillard, the philosopher of simulation and media, comments that "Only the medium can make an event" and—while not following Baudrillard much further than this insight—this is the case for the explication of water in Flint.[6] Flint signals the entrance of environmental politics into the political imagination of those in the United States, and its situation in the historical development and collapse of assembly-line manufacturing marks a break with the previous century.

By extrapolating the revelatory consequences that follow, this project argues, a significant field is opened up to consider the future of environmental politics. Though

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[4]WaterAid, Water: At What Cost?: The State of the World's Water 2016. *WaterAid*, 2016, Available at: http://www.wateraid.org/uk/~/media/Publications/Water--At-What-Cost--The-State-of-the-Worlds-Water-2016.pdf?la=en-GB. [Accessed 3 January, 2017].

[5]Joanne Levasseur, Jacques Marcoux, Bad Water: 'Third World' conditions on First Nations in Canada. CBC, 2015, Available at: http://www.cbc.ca/news/canada/manitoba/bad-water-third-world-conditions-on-first-nations-in-canada-1.3269500. [Accessed 3 January, 2017].

[6] Jean Baudrillard, *Simulacra and Simulation*. Ann Arbor: University of Michigan Press, 1994, 82.

Paul Virilio describes himself as a "revelationary" instead of a revolutionary, and this project continues in that spirit, making revelationary observations need not require a political quietism but functions as a preface to a revolutionary politics that is patently aware of the thoroughly mediated context it seeks to transform. To that end, this inquiry proceeds by first examining the technical and design failures in Flint, including a timeline of its revelatory events. Then, this analysis takes up the question of the accident in an intricately connected society, and how it causes one to re-examine questions of ontology, politics, and social exclusion. Doing so seeks to make publicly explicit the underlying ecology of human life and government. Finally, the project concludes with more explicitly political suggestions as to the possibility of a revolutionary posture toward problems of design, arguing it is only by taking the revelation of Flint seriously that 21st century politics might be able to proceed toward an achievable and equitable goal, moving from the accidents of atmoterrorism to the responsibility of atmodesign.

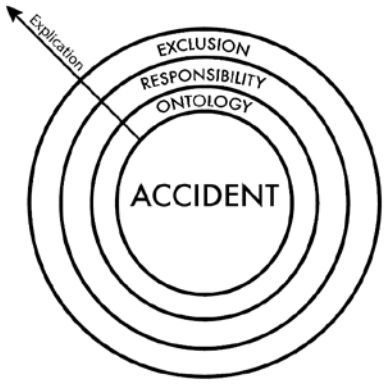
AN EMERGING METHOD FOR INVESTIGATING THE ACCIDENT

We can draw some revelatory conclusions put on display in Flint from at least three interconnected domains. First, ontology: a fault in the delivery of water reveals more clearly not just the dependence of the human body on environmental factors to which is it porous, but also the dependence of the human body on the technical means by which those factors are made available (or not). Second, responsibility: the decisions leading to the eventual toxicity of water in Flint were made by a council constituted primarily by Democrats, alongside financial management and bureaucratic oversight, and the failure to respond to that toxicity was comfortably and willfully undertaken by a republican state government, meaning the poisoning of Flint residents transcends typical American party politics and partisanship. Third, social exclusion: that the victims of Flint's water system were primarily both black and in poverty reveals the ways in which design and infrastructure are situated on a scale of relevance that is fundamentally prejudiced and unequal. Common to all these domains is the revelation of that which is implicit—ontologically, politically, socially—by the dramatic explication of water.

Each of these domains are revealed after the accident in Flint. What is being developed in this project is a more general hermeneutic of accidents that can be applied to the situation in Flint and, we think, to other accidents. To deal with these accidents and their subsequent catastrophic fallouts, theorists and activists have to be agile when it comes making sense of complex and life threatening occurrences. One cannot simply fall back on reductive class analysis or the discourse of power— as we

continually re-negotiate ontological boundaries, and in turn politics, a larger theoretical background is necessary.

This paper finds an emerging method for analyzing complex techno-social situations that does not reduce any of the aforementioned domains (ontology, responsibility, exclusion) to simple and naive causality. As this approach to catastrophe traces out the accident in the diagram below, it begins at the center, where the accident occurs—the center circle represents a complex event full of different actors pushing at the boundaries of space and time. From the accident we recognize a wave of explication pushing outwards. This is a force that, for the spectator, makes an entire regime of actors caught up in explication momentarily present-at-hand.



The accident is an event partly explained in the Deleuzian sense—a complex and diverse amount of multiplicities vibrating against and with one another.[7] A step beyond Deleuze's event, however, the accident is an event that is necessarily catastrophic. The multiplicities enacting their particular realities change relations rapidly which causes a contraction of space and time and, ultimately, their own collapse.

"According to Aristotle, 'the accident reveals the substance,'" observes Virilio, foremost theorist of speed and the accident. "If so, then the invention of the 'substance' is equally the invention of the 'accident'. The shipwreck is consequently the 'futurist' invention of the ship, and the air crash the invention of the supersonic airliner, just as the Chernobyl meltdown is the invention of the nuclear power

[7] Gilles Deleuze. *The Fold: Leibniz and the Baroque*. London: Athlone. 1993. 77.

station."[8] Naturally, the accident of poison water in Flint reveals the substance of the urban water apparatus. The public poisoning of the Flint water supply is the invention of the public water infrastructure.

It is important to disentangle Virilio, and this project's approach, from ludditry or an uncritical rejection of technology. Instead, Virilio is a critical interlocutor with progress. "I am not against progress. I am saying that it is wonderfully catastrophic." (GE 31) Virilio is interested in progress as it brushes up against limits and finitude—and this is exactly where one finds what he calls the "integral accident," the effect of speed on the common world of humans. The ship becomes the shipwreck because physical space is replaced with speed—the relation between phenomena are altered—sped up—and in this contraction of time and space is where the accident erupts. Speed and its effect on physical space is one of the key components across Virilio's work. It comes out most poignantly in his book, *Speed and Politics*, "...the strategic value of the non-place of speed has definitively supplanted that of place..."[9] The culmination of Virilio's thought demonstrates the geographical effects of networked telecommunications. In other words, as communication technology becomes more rapid geography shrinks. In this shrinking, there are inevitably frictions. It is like a jet breaking the sound barrier: the introduction of speed changes the relationship between the jet and the surrounding air which manifests as a sonic boom.

In the movement that deploys a technology, between the contraction of space-time and the eruption of the accident, commentators gain an accidental and revealed epistemology. The eruption of the accident is a movement of non-human philosophy or theory where explication becomes clear. That is, the accident and its revelations are not the products of a predictive or productive mind, but the impinging of external forces and actors on human perception. The explication revealed in the crisis in Flint demonstrates something that would have otherwise remained invisible—in observing and listening to the non-human actors involved in this accident, humans gain insight they would have otherwise missed. There's a resonance between the non-human philosophy of the accident and the way the political philosopher Richard Gilman-Opalsky speaks of insurrection as a philosophical act. Insurrection is doing a type of philosophical critique. In a similar way to what Gilman-Opalsky observes when he writes, "...insurrection says something legible about the system in which it rises up…" one could say that catastrophe says something legible about the system in which it, too,

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[8] Paul Virilio. *Grey Ecology* (University of Disaster Series). Edition. New York: Atropos Press. 2010, p. 5. Multiple citations of Paul Virilio's *Grey Ecology* maybe textually rendered as (GE [page number]).

[9] Paul Virilio. *Speed and Politics* (Semiotext(e) / Foreign Agents). 2nd Edition. Los Angeles: Semiotext(e). 2006, p. 149.

rises up.[10] In other words, the movement of the accident teaches catastrophe, disaster as well as the hard lessons of enclosure, maintenance, and infrastructure.

Following the wave of explication from the accident in the direction it moves, from ontology, to politics, to exclusion, this method is necessarily emergent in so far as it is revelatory. We can only look to those domains which the accident itself explicates. Because the accident is a movement of non-human explication, it is difficult to completely enclose upon the accident theoretically. Questions concerning where the accident begins and end are beyond human theory. Or, in other words, there is a necessary weakness to this way of thinking and the contours of human access have to be understood. So, we move only in certain directions and pay attention to what we can.

FLINT WATER TREATMENT: A BRIEF HISTORY OF FAILURE

In 2015, it was revealed that the citizens of Flint, Michigan, had been unknowingly poisoned by the presence of lead in their water supply. How exactly this situation came to pass is complicated by party politics and finger pointing, but understanding the revelatory effect of such a dramatic failure means first getting an idea of the trajectory of events. It helps to begin, then, with a brief timeline and then move to laying out the technical and design failures of the Flint Water Treatment Plant.

For the first time since 1965, the residents of Flint received water from the Flint River in 2007.[11] Initially, water from the Flint River was distributed as a stop-gap measure while maintenance was performed on the pipes that brought in water to Flint from Detroit. Then, in 2012-2013 a plan is devised to permanently switch the water supply from the Detroit Water and Sewerage Department to the Karegnondi Water Authority. This switch would supply Flint residents with water from Lake Huron as well as reduce costs (the latter being an especially significant factor, since Flint was under the supervision of an "emergency manager," a financial sovereign appointed by Governor Rick Snyder, as a result of its economic straights).[12] However, in the interim, Flint residents would be supplied with water from the Flint River directly—again as a

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[10] Richard Gilman-Opalsky. The Reasonable "Madness" Of Revolt: Isn't it crazier to submit? *Fifth Estate*, 390. 2013, Available at: http://www.fifthestate.org/archive/390-fall-2013/reasonable-madness-revolt/. [Accessed 30 June 2016].

[11] John Foren, Get Ready for a Nice Gulp of Flint River Water. *Mlive.* 2016, Available at: http://blog.mlive.com/flintjournal/newsnow/2007/12/get_ready_for_a_nice_gulp_of_f.html. [Accessed 1 July 2016].

[12] Matthew Dolan and Paul Egan, U.S. Rep. to Snyder: Emergency Manager Law Brought Flint to Its Knees. *Detroit Free Press.* 2016, Available at: http://www.freep.com/story/news/local/michigan/flint-water-crisis/2016/03/17/snyder-defends-emergency-manager-flint/81905614/. [Accessed 1 July 2016].

stop-gap measure. In April of 2013, with the recommendation of the Flint city council, the State Treasurer approved the plan to switch water suppliers.[13]

Later in April-May 2014, work was completed on a disinfectant system for the Flint River system, and Genese County (the county which Flint resides in) began to receive water from the Flint River directly. Throughout the summer and into August, Flint residents complained of a bad smell, taste, color, and rashes accompanying the change in water. In response, the city of Flint issues a boil order and publicizes the presence of fecal coliform bacteria in the water from the Flint River.[14] In an informational document posted online by Michigan's Department of Environmental Quality (MDEQ), we can see the steps Flint takes in reaction to the fecal coliform bacteria. "The city is boosting chlorine disinfectant residual at locations in the distribution system as needed."[15] (SE 40) Though, even after more chlorine disinfectant is added, boil orders continue throughout September, 2014.

The increased chlorine levels cause the General Motors facility in Flint to discontinue use of the municipal water because of its, now heightened, corrosive qualities, rusting the automaker's engine blocks. Increased amounts of chlorine disinfectant are not only harmful to GM's production facility, but the chlorine disinfectant also produces a byproduct (TTHM or Trihalomethanes, the result of disinfectants coming in contact with organic materials) that is possibly carcinogenic to humans. On December 16, 2014, the MDEQ issues a letter explaining the water in Flint has crossed the threshold of safe amounts of disinfectant.[16]

In January 2015, the state of Michigan gives notice to Flint residents that that water is safe, but should be avoided by the elderly and those with a compromised immune system.[17] Following these reports, the Detroit Water and Sewer Department

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[13] Ron Fogner, State gives Flint OK to join Karegnondi Water Authority Project, but Detroit gets to make final offer. *Mlive.* 2013, Available at: http://www.mlive.com/news/flint/index.ssf/2013/04/state_gives_flint_ok_t.html. [Accessed 1 July 2016].

[14] Amanda Emery, Flint Issues Boil Water Notice for Portion of West Side of City. *MLive.* 2014, Available at: http://www.mlive.com/news/flint/index.ssf/2014/08/flint_issues_boil_water_notice.html. [Accessed 1 July 2016].

[15]Snyder-Emails, Snyder-Emails. 2016, Available at: https://www.documentcloud.org/documents/2696071-Snyder-Emails.html#document/p40/a3. [Accessed 10 May 2016.] Multiple citations of the Snyder-Emails maybe textually rendered as (SE [email number]).

[16]MDEQ. City of Flint Violation Notice. *City of Flint.* 2014, Available at: https://www.cityofflint.com/wp-content/uploads/City-of-Flint-Violation-Notice-MCL-TTHM-12_16_14.pd. [Accessed 10 May 2016].

[17] Ron Fonger. City Warns of Potential Health Risks after Flint Water Tests Revealed Too Much Disinfection Byproduct. *MLive.* 2015, Available at:

made an offer to wave a "hook-up" fee and reconnect Genese country to their previous water source in Detroit. However, the City of Flint determined that reconnecting with Detroit would still be too costly even in light of the ongoing crisis.[18]

Throughout the end of January and the beginning of February 2015, the MDEQ notes again in a briefing email to Governor Rick Snyder that the buildup of TTHM in the water is not an immediate health concern—while just weeks prior, Flint community members show up to a community forum with jugs of brown water and stories of sickness, vomiting, and rash. (SE 58)

In light of the continuing crisis, Flint was awarded a two million dollar grant, though only shortly after this it was discovered that on February 26, 2015, there were elevated levels of lead in the water in Flint. The reports of lead in the water came directly from the EPA, rather than the MDEQ. However, it is not until a memo is made public by Miguel Del Torals, a manager for the EPA, that the situation becomes a bit clearer.[19] Del Toral's memo is essential in contextualizing the presence of lead in light of previous fecal coliform and TTHM violations, as it reveals that the presence of lead in the water could not have been a surprise for the MDEQ; as Del Toral says, "the presence of high lead results in the drinking water, ...is to be expected in a public water system that is not providing corrosion control treatment." (DT 2015) Clearly, this is not the end of the story in Flint, but it is a climactic point—from here one can see the complexity of the situation. The network of actors and their agency starts to come into focus, and the poor intentions of those actors also become more obvious.

The MDEQ, EPA, Governor Snyder, fecal coliforms, chlorine, TTHM, and lead are all actors in what this project will later refer to as the *atmoterrorist* event in Flint. Their agencies, trajectories, and intentions are intertwined, and certain direct causal links evade any analysis. However, perhaps the best point of departure for this issue is where water becomes systematized, provisional, or interiorized by human mechanisms of capture in order to get a grasp on the precise complexity involved.

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http://www.mlive.com/news/flint/index.ssf/2015/01/flint_water_has_high_disinfect.html. [Accessed 13 May 2016].

[18] Jason Lorenz. Addressing Flint's Water Concerns: Water System Questions & Answers and Related Documents. *City of Flint*. Lorenz, Available at: https://www.cityofflint.com/2015/01/15/city-of-flint-water-system-questions-and-answers/. [Accessed 13 May 2016.]

[19]Miguel Del Toral. High Lead Levels in Flint, Michigan - Interim Report. *Flint Water Study*. 2015, Available at:http://flintwaterstudy.org/wp-content/uploads/2015/11/Miguels-Memo.pdf. [Accessed 13 May 2016]. Multiple citations of Del Toral's High Lead Levels in Flint, Michigan- Interim Report maybe textually rendered as (DT 2015).

EXPLICATING WATER: ONTOLOGY

> You are on life support, it's fragile, it's technical, it's public, it's political, it could break down—it is breaking down—it's being fixed, you are not too confident of those who fix it.
>
> Bruno Latour[20]

The timeline laid out above demonstrates a rough sketch of the crisis in Flint, but, so far, this is only a reduction of the event. The timeline shows a journalistic report of the water crisis that includes all of the suspected actors: politicians, government organs, and media sources. A crucial element, however, always seems to be missing in these journalistic accounts—what happened in the system of water treatment, that is, the design of water itself? Yes, something to do with corrosion and lead, but what exactly? It will not do simply to note "the facts" of the usual reporting narrative; instead, we must consider the actual complications of the revelation of water's design as they are revealed in Flint, which will yield ontological insights about technically mediated human life in the twenty-first century.

In the transition to the Karegnondi Water Authority and the interim reliance on the Flint River provided a number of usual challenges to water treatment. Take, for example, its use of surface water. According to Terese Olson, an Associate Professor of Civil and Environmental Engineering at the University of Michigan, a system that pulls in surface water, rather than groundwater, will inevitably "tend to contain more particles, microorganisms, organic matter, taste- and odor-causing compounds, and many types of trace contaminants. On average, surface water also tends to be more corrosive than groundwater."[21]

Further, because surface water implicitly carries these additional problems, it also leads to a number of engineering and financial issues. Olson helpfully notes the rising cost in chemicals used to treat water has gone up considerably. From here, we can start to note the precarity of the water system pulling in water from the Flint river. Not only is this an interim solution, but an interim solution in the midst of considerable austerity measures.

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[20] Bruno Latour. Air. in: Jones, C (eds) *Sensorium: Embodied Experience, Technology, and Contemporary Art.* Cambridge: MIT Press. 2006. Multiple citations of Latour's Air maybe textually rendered as (A).

[21] Terese Olson. The Science Behind the Flint Water Crisis: Corrosion of Pipes, Erosion of Trust. *The Conversation.* 2016, Available at: https://theconversation.com/the-science-behind-the-flint-water-crisis-corrosion-of-pipes-erosion-of-trust-53776. [Accessed 28 May 2016]. Multiple citations of Olson's The Science Behind the Flint Water Crisis: Corrosion of Pipes, Erosion of Trust maybe textually rendered as (TO TC).

With these difficulties in mind and with what we already know about the treatment of water in Flint, we can trace back the relations between events. Olson explains that "The Flint River is naturally high in corrosive chloride. Therefore, iron pipes in the water distribution system began corroding immediately after the initial switch from Detroit water." (TO TC) Then, the iron that was released into the water through corrosion reacted with the chlorine added as a disinfectant, which in turn made the chlorine unavailable for actually disinfecting the water.

When the chlorine didn't initially work to disinfect the water and levels of coliform bacteria remained persistent, more chlorine was added that in turn increased the corrosive activity. Olson's engineering perspective is helpful here again, because she says that when the bacteria was seen to still be present, "water utility managers were obliged by law to increase the levels of chlorine." (TO TC) This complication to the narrative is important because it disrupts flows of causality even further. Water is systematized and enframed technically, but also by regulation.

The higher presence of chlorine in the water then gives way to the presence of the carcinogenic trihalomethane the MDEQ mentioned in their press release in 2014. Olson explains that balancing adequate disinfection with harmful byproducts is a formidable task for any water treatment facility, but the rate of corrosion in Flint's pipes signaled a serious departure from the usual balancing act. (TO TC)

The event of corrosion itself occurs when there's a significant change in water source and no corrosion control chemicals are employed. When we speak of corrosion in water systems, what this actually refers to is the breakdown of the mineral deposits on the interior of pipes. The breakdown of the mineral deposits exposes the underlying pipe to oxidization and deterioration. Olson explains, "In iron pipe systems, the released iron corrosion particles are visible, causing colored and turbid water. In older distribution systems, where lead service lines are often still in place, corrosion then releases lead and copper. (TO TC) Olson's description is exactly what has been reported in Flint. Both the discolored water and presence of lead give us some understanding of the infrastructure in place—iron and lead pipes.

Even more than these revelations delivered by the medium of water itself, however, the explication of water comes from the ways in which the latent failures of Flint's water system are inscribed in and on the very bodies of Flint residents themselves. Vomiting and rash became increasingly common, and parents noticed children with good grades slipping inexplicably in school.[22] Concatenations of

[22] Rose Hackman. Flint Water Crisis: Meet the Residents Who Are Feeling the Health Effects. *The Guardian*. 2016, Available at: http://www.theguardian.com/us-news/2016/jan/22/flint-water-crisis-health-effects-michigan-residents. [Accessed 27 June 2016].

mysterious symptoms, like the inability to concentrate, confusion, and brain fog led to misdiagnoses and general anxieties. Bodies in Flint gave expression to their involvement in their own toxification, taking in the poisonous agents through simple acts like drinking a glass of cool water. The effects of lead on the brains of children are likely permanent and irreversible. The water crisis in Flint demands bodily proof, even if government officials are capable of cognitively relegating water to the banality they enjoy every time they get thirsty.

These accounts—both the timeline and technical explanation—are certainly far from complete or exhaustive, but two things are achieved. First, a rough sketch of the slow manifestation of the water crisis in Flint comes into view. Second, through the crisis, the precarity of water systems becomes clear. Water is a systematized resource that is not without substantial frictions and complications. Water might still enjoy some romanticism and mystery, but the banal accessibility of tap water, put on violent display, strips such an integral component of human life of any essential opacity. Our knowledge of water is as translucent as water itself, literally programmable and directable. Since around 65% of the human body, on average, is made of water, the ability to so harness water in mundane and prosaic ways is an incredible feat—and the consequences of error are therefore just as incredible.

In Bruno Latour's short essay *Air*, he announces that "the whole ecology has become part of this explication/management routine." (A) The above explication of water and lead in Flint secures his announcement. Water, like air, is an explicit condition to human life—it is another actor to be interiorized into the life-systems of humans. Unlike the revelation at Ypres, however, the revelation of Flint comes on the heels of the explication of ecology and the resulting systems made possible in the 20th century.

The discovery of the environment made at Ypres brings with it the realization that this environment can be manipulated. It opens what previously seemed opaque—the primary media of breathable air—to better and worse design. As Sloterdijk explains,

> If, in their history to date, humans could step out at will under any given stretch of sky, in- or out-of-doors, and take for granted the unquestioned idea of the possibility of breathing in the surrounding atmosphere, then, as we see in retrospect, they enjoyed a privilege of naivety which was withdrawn with the caesura of the 20th century. Anyone who lives after this caesura and lives within a culture zone in step with modernity is already bound, whether in rudimentary or elaborated forms, to a formal concern for climate and atmosphere design. (TA 50)

Following Ypres, the 20th century saw a proliferation of innovations in design and the technical production of whole worlds of perception, experience, and climatic

conditions. Sloterdijk goes on to show how the discharge of a militarized chlorine cloud would spawn developments from pesticides to gas chambers for civilian and wartime execution. But while these are all rather macabre examples, what Sloterdijk aims to show is that it creates the condition for a view of the world that sets up differing environments, designed to be healthy and breathable on one side of the glass and lethal on the other. Environments are explicated in their vulnerability, and in turn their manipulability, so obvious, now, for those of us accustomed to winter heating systems or shopping mall perfumes, those of us, that is, who are in step with modernity.

In the cultural imaginary, water carries with it primal or elemental connotations—water is an integral component of life—it's natural. We know now, however, that our relationship to water is quite the contrary—just as there are "air conditions," thoroughly mediated ways in which air is made habitable (ventilation), pleasurable (perfumes), deadly (chlorine gas), etc., there are conditions through which water is systematized and mediated. Flint supplies a revelatory spotlight on the interiority of water to human technique—and as the inheritance of what began after Ypres, Flint provides a new kind of revelation and explication, this time a revelation of the consequences of design.

If the 20th century begins with an event that prophesies the future of design systems, the 21st century begins with the identification of accidents in these systems. To be sure, the 20th century had a variety of spectacular failures, for example Chernobyl or the explosion of the Challenger space shuttle. But, at least in the so-called "developed" world, the failures of implicit structures and systems necessary for our very survival were nowhere near as commonplace.

ACCIDENTS AND AGENCY: RESPONSIBILITY

> Responsibility is the decision to answer for things to other people. It is openness to other people. If I decide to answer for something in creating my design, then in the object of use designed by me I emphasize the inter-subjective and not the objective.
>
> Vilém Flusser[23]

In the shadow of catastrophic events, one rarely knows how to act, who to act with, or who one can be held accountable and responsible for the catastrophe itself. Action,

[23] Vilem Flusser. *The Shape of Things*. London: Reaktion Books. 1999. p. 59. Multiple citations of Flusser's *The Shape of Things* maybe textually rendered as (ST).

agency, and accountability are particularly pertinent questions for Flint and the larger intellectual community—is there someone to blame or hold accountable? The timeline and other commentary laid out in previous sections cast a rather damning light across the party lines of the state and local governments. Certainly, the different levels of government had a degree of agency, but how exactly ought one unpack and analyze the events that hold some difficulty and uncertainty? Who or what can one blame or hold accountable for something accidental? Thinking through any relevant proposal for coming to terms with the consequences of Flint and avoiding a repetition of its design failures elsewhere requires interrogating the political revelation. Rhetorically dramatic as it may sound, the identification of "atmoterrorists" helps to fully illuminate the entangled yet specific culpable actors in the atmoterrorist event in Flint. A failure as wide-ranging and significant as poisoned public water is not a negligible or typical event, and its unique revelatory qualities can be drawn out by connecting it with the legacy of the explication of air in the previous century.

What the Flint crisis reveals, lays bare, is the the precarity and intentionality involved in the achievement of the systematization of water. It is here that we can begin to explore the public poisoning in Flint as an event of "atmoterrorism," the progeny of a shift in war strategy that emerges, argues Sloterdijk, with the use of gas warfare in Ypres. Sloterdijk explains the advent of atmoterrorism is a turn to "working on the enemy's environment," involving "new processes, which consist in suppressing the basic prerequisites for life," as exemplified in the case of Ypres with the toxic pollution of habitable air. (TA 15) As a moment in the history of armed conflict and war, this is a dramatic shift from the heroic narrative of discrete bodies encountering each other in space, even through the use of projectiles, for now the *modus operandi* of war becomes a matter of turning the enemy's very environment against them. The destruction of a unique body is little compared to recruiting that body, unavoidably embedded in and dependent on an environment, for its own demise.

The deployment of chlorine gas as a weapon is an epochal rupture. Chlorine gas acts on the frontlines of warfare in such a way that it makes the environment itself into the struggle. (EP 43) The introduction of chlorine gas changes the rules of the enclosure of war—not only is the enemy attacked, but the enemy is completely immersed into unlivable air conditions. In the execution of these new techniques, the importance of the atmosphere is uncovered and takes its place in the arsenal of war.

While it's easy to see the similarity in the ontological issues the events in Ypres and Flint both raise, what may seem contentious is to label both as demonstrations of "atmoterrorism." Is it wrong to call those responsible for Flint terrorists? Perhaps more importantly, is there any critical advantage to the term "terrorist" here? Or can it be relegated to conversations about rhetoric? For example, if demonstrators and activists

co-opt the media narrative and paint Rick Snyder as a terrorist, will it destroy his political career? Is there more to be accomplished with this term? To label the German British and French Canadian forces in Ypres as "atmoterrorist" seems easy and nearly inconsequential. After all, these forces were acting intentionally when they unleashed the 5700 gas canisters of Chlorine gas against their French Canadian German opponents.

In order to avoid an overly contentious rhetorical point, a look into what "atmoterrorism" identifies in particular is necessary. Sloterdijk expounds on the meaning of the term "terrorist" in saying "a terrorist is one who can obtain an explicative advantage with respect to the implicit conditions of life of the opponent and uses them to act," and "'terror' could be anticipated in any possible way of using violence against the environmental conditions of human existence." (EP 49) If one accepts this definition and explanation of terror, then all terrorism is necessarily atmoterrorism and these acts work symmetrically on humans existentially. One very straightforwardly fears for their life, but also moves through the world with an internalized precarity—both material and psychic environments have been changed for those that live under terror.

That the human actors accountable for the water crisis did not fully intend to poison the people of Flint does not excuse them for creating the affect of terror and inducing a heightened understanding of the precarity of life. But exactly what "excusing" might look like in a situation of atmoterrorism, that is, what one might be excused from and how one might be acceptably excused, is transformed just like the means of warfare are transformed with the discovery of the environment. In the same way that a turn toward working on an enemy's environment nullifies the heroic narrative of war, so, too, does atmoterrorism nullify a heroic narrative of blame and responsibility. As we will see, this does not negate the necessary political questions regarding responsibility, but it does mean eschewing both scapegoating a particular figurehead that further ignores the environmental and multi-faceted nature of atmoterrorist events like Flint and refusing to demand any kind of public accountability behind a narrative of complexity (the latter strategy being the one favored by most of those presently involved as potential scapegoats in Flint).

In the domain of politics, explication points us toward something political, but what specifically about politics? This revelatory moment may be just as obfuscating as illuminating. In the accident, it is clear that something has happened, but the contention concerns what exactly has taken place. For political analysis, one has to know more than just that something has happened, but also who has done what and with what motives.The intention here is to crack open the black box of the accident,

perhaps only speculatively, in order that the complex agency of actors might be marginally revealed. Briefly, the common model of agency assumes a direct causal linkage between actors. It is assumed that things happen when A acts on B. I act on dry kindling and start a fire, I act on a wine glass and push it onto the floor, I act on my computer and program an automated work flow, etc. The difficulty with this model is that this is simplistic and materially incorrect—causality is not atomistic or so lonesome, but instead happens across what Jane Bennett describes as a heterogeneous field of humans and non-humans.[24] Not only do I act on the dry kindling, but so does flint, steel, air, and so on: there is an assemblage, in the Deleuzo-Guattarian sense, at play in Bennett's model of agency.

Following this understanding of the agency within the assemblage to its logical conclusion is what Bennett labels distributed agency. Distributed agency "...does not posit a subject as the root cause of an effect. There are instead always a swarm of vitalities at play. The task becomes to identify the contours of the swarm and the kind of relations that obtain between its bits." (JB VM 31-34) This distributed model of agency suits the water crisis in Flint quite well. It is not only the state or municipal government that have agency, but rather their agencies are in competition and confederacy with the agencies of the legislation, the MDEQ, state government, histories of racism and labor disputes in Michigan, iron pipes, lead pipes, chlorine, the process of oxidization, ground water, run off, city planners, fecal coliform bacteria, TTHM, democrats, republicans and so on—all are caught up in the explication and catastrophe.

While agency in assemblages may be complex and distributed, this distribution should not be assumed to be an equitable distribution. Each of the actors listed all have a degree of efficacy or what could be called the power to act on the world or to make something new appear. For example, the chlorine acts on the water treatment system in Flint with a higher degree of efficacy than some of the other actors. As more chlorine was added into the water, the more it acted, created TTHM and caused corrosion. The action of the chlorine and its corrosive potential was more efficacious than that of the mineralized material within the pipes.

On the one hand, this seems like a helpful way to map out the materiality of a system down to its minutia. However, one noteworthy objection is that this consideration of efficacy may absolve the moral culpability of actors with specific intentions and responsibility. This objection raises the question concerning the place of

[24] Jane Bennett. *Vibrant Matter: A Political Ecology of Things*. Durham: Duke University Press. 2010. p. 21. Multiple citations of Bennett's *Vibrant Matter* maybe textually rendered as (JB VM]).

intentionality within these assemblages of actors. Distributed agency does not neglect the consideration of intentionality in actors, but simply displaces it in favor of the consideration of efficacy. This is a helpful explanatory move because it detaches the intention of an actor from the causal equation of an event. Moving forward, we see the political agency that can be derived from this way of thinking is not strong, masterful or autonomous, but rather something diverse and varied.

The conversation necessarily moves from ontology toward responsibility and politics. The question becomes not simply about vulgar blame, but to what extent are humans morally culpable for the situation in Flint? At this level, the onus of the water crisis has to be leveled to the actual degree of efficacy of the human actors. This means there can be no "great man" theory of the event and no scapegoating: instead there are only a number of actors interfolding and being interfolded upon in networks of action. As Latour says in *Pandora's Hope*, "I never act; I am always slightly surprised by what I do."[25] One's actions are never entirely their own, but symbio-poietically developed in confederation with others.

At first, this seems like a way of thinking, were it proposed to the state and local governmental bodies in Michigan, that would be popular with potential suspects of accountability. "Oh, you see our recently poisoned constituents were poisoned by the vibrant and distributed agency of actors—the MDEQ or state cannot be blamed!" The point of distributed agency isn't to give human actors an out, as we will see later on, but to provide a more helpful model of complex systems. However, deploying this theory while not, in some way, attenuating blame is actually quite difficult. In light of this difficulty, humans can still be held accountable for the responsibility of their actions and effects, but they cannot hold sole responsibility. In terms of efficacy, the MDEQ and state government of Michigan are not entirely culpable, though in terms of political responsibility they are responsible to the victims they represent. Politically, the governing and bureaucratic bodies involved must be open to those who their design has wreaked havoc upon. While vitriol, vengeance, and most importantly justice urges one to find accountability, an accountability that results in a material change has to consider the agency and efficacy of multiple actors.

None of this is meant to get elected officials off the hook, as we mentioned, and we aim to draw them into the atmoterrorist event precisely as atmoterrorists, as those who have an explicative advantage over those caught up in the accident, which suggests a grounds on which to stand for assigning responsibility. There are critical junctures in

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[25] Bruno Latour. *Pandora's Hope: Essays on the Reality of Science Studies*. Cambridge: Harvard University Press. 1999. p. 281.

the water crisis that we can hold humans accountable for. For example, the decision to downplay the problematic nature of TTHM in the water or to carry out a tone deaf PR strategy in the face of a strained community toting around gallons of brown water to public forums. Of course, there are more of these spaces where humans may have had more direct agency or not and to continue mining them is essential to understanding the situation. Beyond mere analysis, the governmental bodies of Flint *do* hold political responsibility for the situation—they are elected for the reason of managing these complex systems and take on the burden of public office. While agency and efficacy is complex, political responsibility is monolithic.

Key to establishing the human actors specifically in Flint as atmoterrorists means examining a final revelation of the accident: the social exclusion that made particular persons victims of the accident. We will return to some of the legal and political consequences of accountability following a look at this revealed exclusion. Only by following the accident into this last zone of explication can we think more clearly about how to move from revelation to revolution, with a proper theoretical apparatus in hand.

CULTURAL UNCONSCIOUSNESS: EXCLUSION

In Flint, the direct drama begins to unfold at the level of budgetary crisis and blame—but this drama has a long history of economic decline, white flight, and systematic (though often less subtle) racism. The water situation in Flint is one of those increasingly frequent situations where the supposed mastery of humanity against nature accidentally rubs up against finitude and limits. However, it would be wrong to characterize the situation of poor design as a cautionary Promethean tale of human hubris. The atmoterroism in Flint is not simply a design problem, but also a problem of the network of social relations that enable and disable careful, equitable design.

The crisis in Flint reveals the means through which the entire region has been excluded, which can be triangulated in the interstices of technology/infrastructure, race, and capitalism. Broadly, Flint is excluded from a certain and habitable life. The enclosure of the crystal palace of the US middle class withdraws from the borders of Flint. Of course, this is a selective withdrawal; while citizens of Flint may no longer benefit from the industrial flows of capital, capital does continue to benefit from those in Flint. However, over the course of monumental changes in production habits, Flint has been excluded from that most central enclosure of capital and production.

If we follow the wave of explication created by the accident, then the first vertex of this triangle is technology. Prior to the accident, the lead piping and its corrosion remained an infrastructural secret. As bodies in Flint begin to exhibit the effects of this

secret agent, however, the secret is divulged, and the lead pipes are forced to bear witness to the special interests they represent. There is a double explication here. On the one hand, the lead pipes reveal *themselves*, bubbling up to the surface of cultural awareness as part of our cultural unconsciousness. We learn that water pipes are integral and necessary components of our very lives, that our infrastructure is, literally, our life support, and that this support can and does fail. On the other hand, the presence of lead in Flint water reveals that these pipes are not just acting by themselves, but that they are members of a web of influences, concerns, negligence, maintenance, repairs, historical narratives, etc. While the first revelation has been dealt with at length above, in our section on ontology, this second revelation pushes us to consider the modes of exclusion that allowed Flint's water infrastructure to both become toxic and reveal itself as toxic.

Journalistic narratives concerning the Flint water crisis regularly and rightly focus on at least two specific modes of exclusion, namely race and capital. The trouble with these narratives, true though they certainly are, is that they manage to be historically debatable. In a state like Michigan, where Fordist modes of production were born and decimated, for every story told on the side of workers and/or black people there is a story explaining how corporations had no choice or how race is merely a contingent variable on prior economic determinants or some other stock reply by those in power. But the very presence of toxic piping places a spectacular material argument underneath the two standard arguments for exclusion (even if that material argument is further covered over by cynical narratives of power).

The toxification of Flint's water was neither necessary nor unpredictable. On the contrary, there were several moments in the process of planning the change in water supply, carrying out that change, and learning about the consequences of that change where the water's toxicity could have been avoided altogether and, failing that, at least mitigated. That the pipes were even capable of becoming so toxic in such a short amount of time reveals a profound forgetfulness of and disregard for those who would directly experience and interact with these pipes on a daily basis. The degree of neglect naturally leads to questions about how and why these particular persons were able to be so forgotten in the first place, indeed pushed into a region of cultural unconsciousness not unlike the lead piping itself.

Yet, as was noted above, when one begins to ask these questions the nature of responsibility becomes frustratingly blurred. Appeals to bloodthirsty republicans or incapable democrats are quickly dispatched by recognizing the bipartisan ability to ignore Flint victims, and broader appeals to corrupt government oversight in organizations like the MDEQ are likewise dispatched by observing the malfunctions of

other political oversight bodies and procedures that, were proper attention being paid, could have caught the lead problem before it got out of hand despite any potential corruption or mistakes on the part of the MDEQ. In other words, what the lead pipes reveal *as lead pipes* is a vast network of societal repression, i.e. exclusion, that cannot be so routinely dismissed. Vast as it is, however, this network is not simply mysterious or overly complex in such a way as to render us helpless before some freak event. Instead, we are opened up to consider the logic that allows for the accident to occur. Thus while the toxification of Flint residents is indeed an accident in the qualified sense we explored earlier in this paper, it is no accident that the whole impetus for starting on the path to toxicity comes from the demands of finance, nor that a city that earns financial crisis managers is also predominantly inhabited by black persons. As Virilio observes, the accident reveals the substance—and the substance of Flint's water infrastructure relies on heretofore closeted or seemingly debatable mechanisms of exclusion, namely classism and racism.

This project will forego a rehearsal of the history of race and class exclusion so capably handled at greater length in other studies, even studies devoted exclusively to Flint.[26] However, a brief look at the growing literature on environmental racism and classism is attentive to these dynamics in ways that help to sidestep the problems of responsibility without giving up the precise nature of exclusion along these lines. On the one hand, Flint was a birthplace and integral part of the rise of Fordist modes of production. On the other hand, with the collapse of the automobile industry in Michigan, Flint took its place as a constantly teetering city trying to navigate and catch up to a new context of what David Harvey calls flexible accumulation, a significant change in patterns of production and consumption that privilege mobility, improvisation, and the speed of profitable growth, displacing and outmoding the localized, unionized, and assembly-line procedures that built towns like Flint.[27]Statistical data proposed by the Environmental Protection Agency as early as 1983 showed convincingly how race and poverty correlate directly to environmental waste zones in various places in the U.S.[28] More particularly, however, Flint's history throughout the twentieth century was wrapped up deeply in state-sanctioned subsidies that encouraged white flight by offering money for improved (read: suburban) housing

[26] See, especially, Steven P. Dandaneau, *A Town Abandoned: Flint, Michigan, Confronts Deindustrialization*.

[27] David Harvey. Flexible Accumulation through Urbanization Reflections on "Post-Modernism" in the American City. *Perspecta*, 1990. 26, 251-72.

[28]Environmental Protection Agency. Siting of Hazardous Waste Landfills And Their Correlation With Racial and Economic Status Surrounding Communities. 1983, Available at:http://archive.gao.gov/d48t13/121648.pdf. [Accessed 30 June 2016].

to white persons while intentionally segregating and denying housing subsidies to black persons solely on the basis of race.[29] Following changes in the habits of production that followed after the thorough deregulation of industry in the 1980s, industry on which Flint residents depended, the deliberate pace of capital's evacuation of what became predominantly black geographical spaces further eliminated opportunities for mobility and rendered those spaces largely irrelevant as possible sites of growth, improvement, or concern.

But even these results, histories, and observations are eclipsed by the explication of the effects of the accident in Flint. Put simply, though one might not be able to locate an explicitly stated hatred of black or poor people among, say, a discrete intentional actor like Governor Rick Snyder, who publicly and baselessly denied environmental racism was to blame for the Flint crisis[30], one simply does not have to—Flint bodies speak for themselves. As the NAACP said in a statement, "Would more have been done, and at a much faster pace, if nearly 40 percent of Flint residents were not living below the poverty line? The answer is unequivocally yes."[31] In addition, according to available census data, over 50% of Flint residents are black and less than 40% are white.[32] The stage on which the accident takes place is a group of not *just* bodies, but bodies that are black and poor, doubly marked, doubly excluded by the social constructions of race and class, bodies that cut through the impressive threshold of denial exhibited by Governor Snyder and co., and these bodies become this stage through the abuse of the systems that were taken to be trustworthy mechanisms of life support.

While exclusion is often located at the level of the social, what is typically labeled in cultural studies as systemic or structural racism and class conflict, the dimension of exclusion we are exploring here functions at the level of the technical—an *infrastructural* racism and class conflict. A city and in turn a race and class are excluded, blighted, and afflicted by the infrastructure in which they unavoidably participate. The

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[29] George Fuentes. Flint's Structural Racism: This Is Why Providing Poisoned Water to the City's Citizens Seemed like a Reasonable Idea. *Salon*. 2016, Available at: http://www.salon.com/2016/02/07/flints_structural_racism_this_is_why_providing_poisoned_water_to_the_citys_citizens_seemed_like_a_reasonable_idea/. [Accessed 30 June 2016].

[30] Scott Bixby. Michigan Governor Says Environmental Racism Not to Blame for Flint Water Crisis. *The Guardian*. 2016, Available at: https://www.theguardian.com/us-news/2016/jan/22/flint-water-crisis-michigan-governor-says-environmental-racism-not-to-blame. [Accessed 30 June 2016].

[31] NAACP. NAACP Statement Regarding Flint, Michigan Water Crisis. 2016, Available at:http://www.naacp.org/press/entry/naacp-statement-regarding-flint-michigan-water-crisis1. [Accessed 30 June 2016].

[32] Census Bureau. Population Estimates, July 1, 2015, (V2015). *The United States Census*. 2015, Available at:http://www.census.gov/quickfacts/table/PST045215/2629000,00. [Accessed 30 June 2016].

technical infrastructure of the city acts against the citizens at the behest of the privileged and wealthy. There is a perverse confederacy between the agency of the government, the MDEQ, the machinations of capital, and the pipes themselves which act together on the bodies of the citizens of Flint.

REVELATION AND REVOLUTION: FROM ATMOTERRORISM TO ATMODESIGN

> "We are condemned to being-in, even if the containers and atmospheres in which we are forced to surround ourselves can no longer be taken for granted as being good in nature."
>
> Peter Sloterdijk (TA 108)

The wave of explication has revealed the effect of the accident across the domains of ontology, responsibility and exclusion, but what good is a revelation if this all must remain abstract? How can this accidental epistemology be put to use and deployed toward a more verdant future? While this may sound slightly utopian or at least overly optimistic, rethinking design with the various revelatory domains explored above is an important and necessary move. While the political situation is complex, design is a practice one might employ to re-orient the future of Flint. The response to an atmoterrorist attack is taking the revelation provided and rethinking *atmodesign*—not of just the water system, but of all systems. In this section, we'll attempt to engage in a groundwork for atmodesign through a number of theses that might undergird the practice.

Design is the negotiation of obstacles produced dialectically by nature/culture. Vilém Flusser's philosophy of design sets up the dialectic between the individual designer and the world that the designer encounters. (ST 58) The beauty of Flusser's design thought is that it is fully cognizant that humans come to be in a world that is already designed and generated. The current obstacles emerge from the designs of the already existing and previously designed world. Flusser lays it out saying,

> I come across obstacles in my path (come across the objective, substantial, problematic world); I overturn some of these obstacles (transform them into objects of use, into culture) in order to continue, and the objects thus overturned prove to be obstacles themselves. (ST 58)

Designed objects are thrown into our path by those who have designed before and we throw designed objects into the paths of those who will come after us. Design, then, is a cultural and dialectical engagement moving chronologically toward the design and redesign of obstacles.

Design becomes a way of life and moving through the world while deploying and re-deploying human cultures. In this sense, what it means to be human is to generate one's own surroundings and in turn one's self. This is not to say that there's a mere autopoiesis of the self, but instead a collaborative artificiality to life. Life is artificial as in the latin root word, *artificium,* which denotes the craftedness of life. Though, what is of note here is that while life is artificial and crafted, it is crafted out of the already designed world with the already present material. Perhaps, one could even say that the already existing world is a collaborator in the confederacy of future design: that which is already sets precedent and determines the potentiality for future design projects. Finally, in engaging with this meta-narrative dialectic and the process of real design practices to redesign a system, a water system in this case, is to redesign the atmosphere the human exists within and emerges from.

While this all sounds a bit poetic—isn't it beautiful and romantic to be artificial? – Design and redesign are difficult aesthetic and political works rife with responsibility. The common contemporary myth is one of progress based in rapid developments in science and engineering. In other words, better science, technology, and engineering ought to make life easier, comfortable, and certain. While this is always the hope of the designer and their collaborators, it doesn't seem to be the case. Wading into these responsibilities, we can start to determine some theses on atmodesign.

The uncertainty in evaluating and moving toward new and progressive design might be founded in a general ideology of technocracy. The uncertainty these massive designed systems hoist onto the general public are cultivated and magnified through a public that is made not to know and out of this ignorance to trust in experts to manage the systems which make their home habitable and life possible. Controversies, like Flint, erupt and there's a general ignorant surprise. How could this happen? Isn't it the job of the state to take care of these matters? Why didn't the technocrats foresee this? Especially when, in hindsight at least, the situation was foreseeable. Even Rick Snyder passed the blame to "career bureaucrats," the assurances of experts, and government failure[33] (though the investigative task force he himself formed has not let him off that easily).[34]

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[33] Paul Egan. Gov. Rick Snyder Blames 'career Bureaucrats' for Flint Water Crisis. *Detroit Free Press*. 2016, Available at: http://www.freep.com/story/news/local/michigan/flint-water-crisis/2016/03/17/snyder-blame-water-flint-criss/81900340/. [Accessed 30 June 2016].

[34] David Graham. Who Is to Blame for Flint's Lead Crisis? *The Atlantic*. 2016, Available at:http://www.theatlantic.com/politics/archive/2016/03/flint-task-force-rick-snyder-blame/475182/. [Accessed 30 June 2016].

Atmodesign begins by evaluating the assumed ontological envelopes of the system and surrounding enclosure. From the accident revealed in Flint, one can determine some underlying assumptions that ought to be factored into the rehabilitation of Flint's water system. Namely, that humans are enclosed upon within a habitable sphere with a number of other actors. Things are designed within this sphere and the habitability lies as the membranous dome which keeps the entire enclosure functioning.

If one system among others, like water treatment, becomes toxic, the entire sphere undergoes an atmospheric and existential change. Humans, while deluded into a naive individualism, all require the same underlying conditions. From here, it is clear that design ought to favor the collective rather than the individual. While this could be construed as a formulation of utilitarianism, the brush strokes of design are necessarily atmospheric, rather than primarily quantitative, and at a level so general they may become invisible. This is not utilitarian, but ecosocialist. Utilitarian design would ground its principles in the majority, but even the majority isn't enough for atmodesign—if there is any minority at all threatened, then the enclosure itself becomes uninhabitable for the majority. Atmodesign chooses the wretched and lowly, the despised of the world, as points of departure and return.

Atmodesign also calls for a new political design—how do we introduce a newly founded responsibility and political culpability into highly technical situations where clear cause and effect are not available? One could, as was suggested above, wade in the minutia of the accident and carefully trace the lines of agency back through the network of actors. However, what political action can be taken against these actors if they are not entirely culpable for the accident?

In the 21st century, criminal justice gives no legal status and in turn no culpability to non-humans. Legally speaking, a human can perform a criminal act against an animal—or less contentiously a non-human—beastiality, cruelty, etc. Whereas, non-human animals cannot be held legally responsible for a crime against a human. However, through the medieval period until the 18th century animal trials were a political event in Europe. Pigs, cows, horses, and even insects might have been held legally accountable for crimes against humans.

Animal trials introduce a type of thinking that seems quite bizarre to us, and it is a mode of thinking that is far out of step with our time. What is interesting, though, is that this is one way that humans engaged with the complexity of legal agency among non-human actors. Design, especially city planning and engineering, has to recover some sense of the culpability of non-humans on humans. Bringing the pipes of Flint or the process of corrosion to a legal trial is rather silly, but how can we hold these types of materials and design accountable?

In the revelation of the pipes in Flint, we can clearly see the transgression of these types of materials. As critical atmodesigners, we ought to make the continued use of these materials a social justice issue of some importance. Yes, poverty, hunger, debt, and so on are all pressing issues, but to neglect the infrastructural ills of a community makes other social justice initiatives only a half measure.

Moving forward, in light of the rather bizarre practices of the past, atmodesigners might consider how future design and their materials could be more adequately aligned with the populations they serve. The objective here becomes determining ways that atmodesigners can make the infrastructure advocate for their populations. This is beyond just "can we make non-humans speak?", asking instead "can non-humans speak in advocacy for humans, and vice-versa?" Is there a design solution that can bring the cultural unconsciousness and neglect of a socially determined racial and class group to light?

With the theory of agency and action laid out previously in mind, could an atmodesigner produce an apparatus that can sense lead, TTHM, and chlorine levels in a water supply and then distribute that information to the general public? For example, if a dangerous amount of TTHM was sensed in the water system, then a mobile phone, television, or radio alert would be triggered. Or, even more simply, the amount of chlorine and other disinfectants could be clearly and visibly reported. These suggestions range from the highly technological to the simple and clear reporting of daily procedures of water treatment, but regardless they orient future design thinking toward a trajectory that opens up the black box of infrastructure to the public.

However, until these atmodesign techniques and public policies can be fully imagined, engineered, and deployed, who ought to be held legally and politically responsible? To be a public official is to hold political responsibility over a constituency and to be responsible means that one has to be open to culpability, and to be involved in an atmoterrorist event means recognizing the ways in which one was not ignorant but cognizant of the implicit effects of the impending accident made explicit by bodily witness. Bringing legal action against the MDEQ, Rick Snyder, and so on is certainly a legitimate action. For example, the NAACP has named Rick Snyder specifically as the defendant in a recent lawsuit that "seeks property damages, pain and suffering damages, emotional distress damages, medical monitoring, and other injunctive relief for affected city residents and businesses."[35] Also, activists from Black Lives Matter

[35]NAACP. NAACP Files Lawsuit Over Flint Water Crisis. 2016, Available at: http://donate.naacp.org/press/entry/naacp-files-lawsuit-over-flint-water-crisis. [Accessed 30 June 2016]. However, it's also worth noting that, while the NAACP is attempting to hold Rick Snyder accountable, he has charged his legal fees to the state. For more, see Paul Egan's article 2016. Gov. Rick Snyder's legal tab

have posited a number of political demands such as "Governor Snyder request Flint is named a federal disaster zone," "Refund for all water bills since the switch to the Flint water system," and "The immediate resignation of Governor Rick Snyder." The BLM demands note another completely legitimate political response as well.

With these immediate responses in mind, however, which operate within the currently existing possibilities of Michigan's liberal and legal system, atmodesign needs to consider the revolutionary role of design as it relates to exclusion, a dimension oft-overlooked by the majority of design theory and practice. As traced above, social exclusion manifests in technical exclusion. At the beginning of the 21st century, we must come to terms with the habits and heritage of 20th century design, caught up as it was in proclamations of experts, obvious and latent prejudices, and the perpetuation of hegemonies like bourgeois class interests and white supremacy. These exclusive tendencies are related to the ontological revelation of design failure, revealing a situation in which our infrastructure is incapable of supporting socially demarcated lives. Instead, there must be a politics of design that refuses the pre-packaged social and cultural denials of the 20th century and takes the materially performative revelations of the accident head-on. While legal repercussions are necessary and discussions of accountability must take place, without a consideration of the means by which systems of exclusion might be utterly transformed the politics of atmodesign fail to take seriously the final wave of the accident of Flint.

This project advocates two commitments that move in this direction: First, design must contribute to the active dismantling of 20th century infrastructural oppression, of which classism and racism are two significant but by no means exclusive examples. Second, design must be qualified by collaboration and service rather than expertise and heroism. Moreover, we take for granted that design is a fundamental feature for any future political project or activist work for justice. There can be no return to a pristine "nature" in which all things exist in undisturbed communion, and neither can there be a Heideggerian patience for a God to save us. Atmodesign thus shares with ecosocialist discourses a commitment to collective ownership of the means of production and thus design, democratic planning that allows society to define its values and according productivity, and a revised (rather than abandoned) technological structure that integrates these new productive forces.[36]

$6,500 per day. [ONLINE] Available at: http://www.freep.com/story/news/local/michigan/flint-water-crisis/2016/05/25/gov-rick-snyders-legal-tab-6500-per-day/84859358/.

[36] Micahel Löwy. *Ecosocialism: A Radical Alternative to Capitalist Catastrophe*. Chicago: Haymarket Books. 2015, p. 20.

In a qualified sense, one must not simply talk about the world of design but the design of the world, as designer Bruce Mau has popularly phrased it. For his part, however, Mau never seems to properly inquire into the politically and economically designed context in which all other design takes place. When Mau talks about the need to design economies, for example, he is rightly attentive to problems of waste and sustainability but fails to consider the possibility that the global neoliberal context in which design takes place is unavoidably bound to the production of scarcity and brute efficiency.[37] In the final analysis, Mau routinely fails to consider the pre-existing design of the world, a design that is intentionally exclusive, so dramatically revealed in the accident in Flint. Mau himself argues for collaborative approaches to design, but it always turns out that these collaborations are done among elites, and the benefactors (or victims) of that design are left to be passive recipients of the fruits of these monastic cells of design. As David Stairs observes, such an approach only serves to reinforce a spectacle of unqualified optimism, feigning inclusion all the while only ever addressing and inviting professionals and entrepreneurs.[38]

A truly collaborative approach to design would necessarily be participatory, egalitarian, and democratic. It would treat the designed world it comes into contact with as full of obstacles of entrenched infrastructural exclusion, which need to be replaced and redesigned in life-affirmative ways, all the while understanding that these designs, too, present obstacles for still greater efforts of justice and the realization of habitable interiors for human and non-human life. Further still, the praxis of design itself would be revolutionized in the process, moving intentionally away from the valuation placed on design by speculative financial gains and toward the possibility of alternative metrics for design success and, for that matter, design failure. As Ivan Illich puts it, we need a new collectivity "in which modern technologies serve politically interrelated individuals rather than managers," a collectivity he calls "convivial."[39] Eschewing the thin version of collaborative design that involves a pantheon of designers delivering products from Mount Olympus, a convivial, collaborative design praxis would usher in a kenotic form of design power, where both the processes and products of design would be held in common.

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[37] See, for example, Mau's summation of these themes in the interview http://catalystreview.net/2011/11/conversation-with-bruce-mu-re-thinking-the-role-of-design-in-shaping-of-our-future/

[38] David Stairs. Bruce Mau Revisited. *The Design Altruism Project*. 2016, Available at: http://design-altruism-project.org/2016/05/07/bruce-mau-revisited/. [Accessed 30 June 2016].

[39] Ivan Illich. *Tools of Conviviality*. New York: Harper & Row. 1973, p. 12.

Exclusivist patterns of design permeate our everyday consciousness in alarmingly ubiquitous ways, as all the critiques of ideology developed in the last hundred and more years (alongside the century of design) have shown. The approach offered here recognizes that the call for a design of inclusion is a call for the redesigning of the designers themselves, for designers able to launch what Flusser calls a "critique (of) the entire apparatus culture and all its totalitarian tendencies, including the apparatuses that program us."[40] Designing for inclusion means the confident, collaborative trust in fiduciary relationships between designers, publics, and the tools and technical apparatuses that mediate human experience in the world and enable or disable the very conditions of life itself. An atmodesign approach recognizes, too, that the way in which design offers a "critique" is not via ever-more-detailed lists of analytic problems, but through the active creation of alternatives, along the lines of Kierkegaard's observation that "everything creative is latently polemical, since it has to make room for the new which it is bringing into the world..."[41] Atmodesign needs to be actively attentive to the redesigning, not just the protesting, of the structures, institutions, and cultural systems—the field of politics and economics—that contentedly relegate technical systems and socially marked bodies to a repressed societal unconscious, kept quiet until, like a traumatic memory, they erupt the seemingly settled symbolic order that aims to deny their very presence.

CONCLUSIONS

On this side of the crisis in Flint, the revelation, and wave of explication caused by chlorine, corrosion, politics, and so on have made Marshall McLuhan's insight even more apt: "Environments are not passive wrappings, but are, rather, active processes which are invisible. The ground rules, pervasive structure, and overall patterns of environments elude easy perception."[42] Flint signals the entry into a new paradigmatic understanding of ontology, politics, and exclusion. The infrastructure that was invisible, even buried under ground, now erupts, ruptures, breaks, and strikes against that which it encloses upon. What is novel about the new 21st century paradigm, as revealed in Flint, is not just that it exposes *how* constructed human environments are, but *that* human environments are constructed at all, and that they are breaking down.

Moving forward, the political task becomes creating policies, procedures. and systems that can sufficiently address these problems of infrastructure and environmental breakdown in ways that are democratic, yet efficacious in terms of time

[40] Vilem Flusser. *Writings (Electronic Mediations)*. Minneapolis: University of Minnesota Press. 2002, p. 49.
[41] SørenKierkegaard. *The Present Age: On the Death of Rebellion*. New York: Harper Perennial. 2010.
[42] Marshall McLuhan. *The Medium is the Massage*. Corte Madera: Gingko Press. 2005.

and efficiency. No governmental reform can be established without first designing systems that might equitably distribute and delegate political agency across human and non-human public spheres. Deciding what the specifics of these distributions and delegations are is a project for another time. However, what is essential as a general rule in this forward motion is a positive futurist manifestation that bolsters what we might call the "symbolic atmosphere" produced in atmodesign.

Atmoterrorism carries a symmetry in that it is both an attack on the bodily and existential atmospheres of humans. Not only did lead poison the bodies of citizens in Flint, but it also poisoned the psychic environment and demonstrated the full precarity of life in the shadow of infrastructural collapse. The deep bodily trauma inscribed on Flint residents, and the revelation of multiple nodes of failure and willful ignorance, creates an atmosphere of defensive cynicism, reasonably suspicious of not only elected public officials, but about the very conditions of life itself. Flint is not just a problem of environmental disaster, a "green" problem, but also a catastrophe that participates in what Paul Virilio calls a "grey ecology," a pollution of the self-created world. Activists in Flint have demonstrated a remarkable degree of resolve, commitment, and courage despite the double-sided pollution they endure, but resignation and a negative futurism would hardly be unreasonable responses among Flint communities.

If atmoterrorism carries this symmetry between ontological environments and symbolic ones, it follows that atmodesign does as well. To engage in atmodesign, one works with the enclosure of a habitable human environment in mind, but one also works to achieve a certain symbolic and psychic aesthetic. Atmodesign is not an appeal to austere efficiency or the imposition of whatever trends are happening in the specialized professional world of design, but a recognition that a democratic approach necessarily entails stylistic and aesthetic decisions that must be made within the context of a community interested in participating in the creation of its own surroundings. Such a change in approach to design, even to the design of seemingly innocuous infrastructure like water delivery systems, would provide community members (the direct recipients of the results of that design) with a sense of public ownership, creativity, and confidence. This is not to suggest any technological or environmental determinism, either for atmoterrorism or atmodesign—Flint is a perfect example of people profoundly affected by atmoterrorism who refuse to give up on their own advocacy, and there are sure to be cynics in a space defined by atmodesign. Instead, it must simply be emphasized and acknowledged that environments, habitats, really do shape to a significant degree their inhabitants. Humans live in cultural greenhouses, and they should have the opportunity to auto-operatively work on their own incubators.

If the 20th century gave rise to the three particular insights identified by Sloterdijk—terrorism, design, and ecology—then the 21st century in turn reveals the demilitarization of terrorism, the necessity of atmodesign, and the expansion of ecology to overcome a simplistic divide between "nature" and "culture." By providing a framework for analyzing the accident as a phenomenon, including its accompanying waves of explication, this project has sought to provide a first foray into a rigorous examination of technical accidents and their wide-ranging challenges. It falls now to a new political collective capable of considering the difficulties of design, responsibility, and equality to imagine and construct a better future, not naively or utopically, but carefully and attentively. Refusing to heed the lessons of Flint, which will continue to reverberate as lead-poisoned children grow older and technical failures manifest elsewhere, is something the human community that inherits the lessons of Ypres simply cannot afford. Whether we will keep this explication at the forefront of our consciousness, undeniable as its eruption was, or repress it into a swarming unconscious as we wait for another eruption remains to be seen.

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