TOXIC URBANISM
HEARTH | HEIMOTLOSIGKEIT | HOME

by
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ABSTRACT

In an increasingly toxic world where the average person’s body contains 29/35 of the toxins listed on the restricted and hazardous substance list, toxicity is unavoidable. This thesis asks how toxins can re-imagined to become active agents in design. Through the negotiation between hard and soft boundaries this work speculates on an architecture of gradients, densities, and velocities to produce temporal spaces of occupation.

The year is 2024.

Humanity has settled in a condition of toxic urbanism, contained by the toxic wastelands of the periphery. The Anthropocene has wreaked havoc and produced a world of toxins. Early estimates of the exponential destruction caused by our toxic landscapes of production were misled by constantly shifting metrics of toxicity provided by different agencies, bureaus, and offices. Our remediation efforts were too slow, too costly, and failed to produce any agency in the age of toxicity. We continued to produce superfund sites across the country. Landscapes of toxic air, contaminated soil and polluted water became our second nature. As we shifted from one machine age to the next, the continued autonomy provided to production landscapes allowed increasingly more toxic means of production to be developed, this methodology assured there would be no post-toxic future.

Within the confines of toxic urbanism, people suited up in protective suits every day. They wore protection more for peace of mind than protection of body. As we destroyed the land, the interior was perfected, continuous halls stocked with machinery created a perfectly sterile environment that defined people’s lives, the sprawling mechanized interiors of the no-stop city had finally been realized. We had come a long way. Ever since humanity created the cave fire, toxins had been part of our environment. The hearth, originally acted as both an object of environment and an object of culture. As we followed the flames into modernism we found ourselves in a state of homelessness explicated by the dichotomy between our technological culture and its toxic means of production. Heidegger, described the sensation as Heimatlosigkeit, the signification of our existential orientation in the era of Gestell. Humanity has however always been a risk adverse society, and as they began to reject the sterile environments of safety for toxic environments of experience agency was produced in the design of toxins. In an increasingly toxic world, this thesis explores how toxins can become active participants and drivers for the production of temporal spaces defined by the hard and soft boundaries they operate within. Architectural interests in materiality and dimension are replaced in favor of velocities, gradients, and densities that define zones of occupiability.

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Toxicology Report

In an increasingly toxic world where the average person’s body contains 29/35 of the toxins listed on the restricted and hazardous substance list, toxicity is unavoidable. There has always been a link between architecture and toxicity, starting with the earliest cave fires that traded oxygen for carbon monoxide in exchange for thermal comfort. That relationship has become increasingly complex as our material palette and production methods have evolved. This thesis aims to explore a methodology for understanding and representing the relationship between architecture and toxicity. The thesis re-imagines toxins to become active agents in design. Through the negotiation between hard and soft boundaries this work speculates on an architecture of gradients, densities, and velocities to produce temporal spaces of occupation.

Looking through our history of toxicity, it is clear that our we are trending in an irreversible direction, and even as we know that, we are continuing in that direction. Each successive manufacturing wave produces a more toxic methodology of production that seems to be masked by an increasing autonomy from its toxic waste.

The project is structured through three stages hearth, heimatlosigkeit, and finally home. These three categories parallel the development of modernization. The early hearth that produced a cultural and technical center and ultimately becoming the metaphorical symbol of home. As a result of modernization, a sense of homelessness that represented a binary between our production and destruction through toxicity. It aims to position that architecture will once again produce home once it accepts that their will be no post-toxic future.
The year is 2024.

It’s clear now the Anthropocene fueled an unavoidable world of toxicity. But in fact, our history had always been tied to toxicity. Our early cave fires provided warmth in exchange for carbon monoxide. Yet ours hearths defined our homes, centered our culture, and fueled our evolution. As our legacy of toxicity continued, humanity settled into a condition of toxic urbanism, contained by the toxic wastelands of the periphery. Our conception of our toxic landscapes were misled by constantly shifting metrics of toxicity provided by our various agencies, bureaus, and departments. Our remediation efforts were too slow, too costly, and failed to produce any agency in the age of toxicity.

As we continued to produce superfund sites across the country, landscapes of toxic air, contaminated soil, and polluted water became our second nature. We went forward with new and more toxic production methods while we neglected our existing toxic release sites. Increasing autonomy disguised in the form of “environmental protection” and “controlled environments” continued to mask our growing exposure to a toxic world, while assuring there would be no post toxic future.

Within the confines of toxic urbanism, people suit up day. They were protection more for peace of mind than protection of body. The controlled interior was perfected and promised limited exposure. Continuous halls, stuffed with life support, defined every day life, the mechanized interior of the no-stop city had been realized. Autonomous machines handled the most toxic tasks, seemingly limiting our exposure. We had cured sick building syndrome, but living within the perfectly artificial and controlled environments left a sense of homelessness. Heidegger had described this sensation as Heimatlosigkeit, the signification of our existential orientation in the era of Gestell. This condition was explicated by the dichotomy between our technological culture and its toxic landscapes of production.

The search for a solution to this denaturalization questioned control. The mechanized world we produced removed exposure and created environments but at the cost of spatial experience. We had always been a risk adverse society, we needed more exposure, not the controlled bubbles of the early environmentalists. We wanted something more experiential and less material, a way to manipulate
exposure and produce temporal spatiality.

Looking through the history of our toxic typologies, construction methods, dimensions, and materiality were deprioritized in favor of concentration, density, and velocity allowed the manipulation of exposure. Channeling, flowing, and pooling allowed for the design of spatial qualities related to differences in exposure.

In certain forms, decreasing velocity allowed an increase in concentration and the pooling of density, while in others an increase in velocity produced the same the same effect. Surfaces could be used to concentrate flow while producing areas of empty zones. The work became a mediation between hard surfaces and soft boundaries to produce gradients of occupiability.

The result was a manifestation of gradient zones, defined by their concentrations and controlled by their surfaces. The soft boundaries produced by the currents between these two flows constantly shift but stay in relative zones. The zones are based off toxicity metrics of the EPA such as Immediately Dangerous to Life and Safety Zone (IDHL), Short Term Exposure Limits (STEL), Recommended Exposure Limits (REL), and Permissible Exposure Limits (PEL). These types of exposure all have different time weighted averages and allowable occupation and therefore need an architecture that communicate the toxicity of these spaces by comfort and spatial quality.
HEARTH

"The first sign of human settlement and rest after the hunt, the battle, and wandering in the desert is today, as when the first men lost paradise, the setting up of the fireplace and the lighting of the reviving, warming, and food-preparing flame. Around the hearth the first groups assembled; around it the first alliances formed; around it the first rude religious concepts were put into the customs of a cult. Throughout all phases of society the hearth formed that sacred focus around which the whole took order and shape."

-Semper, Four Elements of Architecture, 1851

The hearth, which Semper described as the first and most important element of architecture has always been forced to play multiple roles in architecture. The first role which corresponded to our evolution around the fire, was to produce comfort. It was the hearth he argued that the three other elements: the roof, the enclosure, and the mound, only acted in service of "the hearth’s flame against the three hostile elements of nature." (Johnson p.167) The hearth also acted as a social center for humanity to gather and socialize. (figure 1) As our control over the fire evolved into a surrounding architecture, the hearth’s design needed to adjust to control its toxic by products.
The Discovery of Fire in Cesariano’s Vitruvius, Fernandez-Galiano, Fire and Memory
p 9(1521) (Figure 1)
As technology evolved so did our relationship the hearth. As Banham showed, coats and layers began to produce different spatial qualities that could be related as a type of architecture. This line of thinking has also been explored by Sean Lally's work on material energies, shape, and gradient forms. This thesis positions these three examples as a new methodology to deal with toxicity in terms of hard and soft boundaries, gradients, and intensities that all relate back to the spatial forms produced by the hearth.
Personal Architecture - Vest to Overcoat, Banham
Design by Choice p. 51 (1981) (Fig 2)

Shaping Energies, Lally
Air from Other Planets p. 39 (1981) (Fig 3)

Carribean Hut
Gottfried Semper, Four Elements of Architecture, p.
51 (1851) (Fig 4)
In researching the typologies of hearths, a wide variety of forms, spatial qualities, and methods for dealing with toxicity emerged. Some like the Rumford Fire place or Incinerator just evacuate the toxins quickly while others like the Masonry Heater actively tries to channel toxins by slowing their velocity which allows the excess heat they carry to warm the space. Others such as the barbeque smoker is specifically meant to pool the toxins in the form of smoke around a certain chamber to produce flavor. This led to an entire geographic food culture based around toxicity and chimney form.
As cities began to grow and modernize, toxicity became a huge problem for manufacturing and sanitation. Three examples are the Seine River in Paris, which became the main source for trash and sewage, the Thames River in London which played a huge part in the Great Smog, and the Cuyahoga River which burst into flames as the result of manufacturing dumping. This led to an increasing push for infrastructural improvement as scene by Pierre Patte's early section of sewer infrastructure.

Case 1
(Figure 5+6)

The Seine River in Paris became so polluted in the 18th Century that the poor who usually bathed in the river were warned not to. This even stopped people from washing clothes in the river. Runoff from the city's only cleaning system, rain, often brought in pollutants, but people also continually dumped solid waste into the river as there was no organized garbage removal from the city. While this represents a relatively early point in history for understanding issues of sewage and pollution we see it continue throughout history.

Case 2
(Figure 7+8)

London often dealt with issues of toxicity in the 19th century, experiencing both the Great Fog and the Great Stink. The great fog, caused by pollutants in the air killed up to 12,000 people but was hard to distinguish from regular fog so a response to the situation happened very slowly. On the contrary, the Great Stink was extremely noticeable, the pollution of the Thames became so extreme that not only was parliament cancelled, but the city started paying people to constantly dump lime into the river to make the smell more tolerable.

Case 3
(Figure 9+10)

The destruction of the Cuyahoga River in Cleveland is probably the most severe example out of the three. On June 22nd, 1969, the Cuyahoga River caught fire from industrial pollutants, in this case oil. While this fire became a spectacle for the nation, it was one of multiple times that the river had caught fire. This is a sig-
Top: Plan of River Pollution in Paris
Bottom: Section Through a Street in a New Town, Pierre Patte (1769) (Fig 5)
Top: Plan of River Pollution in London
Bottom: Great Smog, Klein, History Channel (2012) (Fig 6)
Top: Plan of River Pollution in Cleveland
Bottom: Cuyahoga River Fire, Ohio History Central (1952) (Fig 7)
significant event to consider, because it harbored in the Clean Water Act of 1970/71 which also corresponds to the founding of agencies such as the EPA to coordinate emerging studies of pollution and manage toxicity.

Architects, such as Augustine Rey, began to develop methods for dealing with issues between urbanization and toxicity. In the case of Rey, he entered a competition for a housing project in Paris that used air quality as the main motivation of the project. To represent this he drew plans that showed different types of air flow that would be produced by the form of the building, ultimately providing cleaner air for its occupants. His idea was to use form as a way to increase airflow deeper into the building and allow a channeling affect to pull air into the court-yards. Cleaner air was extremely important at the time because most residents relied on cross ventilation to pull air through their homes. These metrics were developed through an entire series of meteorological explorations and formulas.
HEMEITLOSIGKEIT

As we continued into the Industrial Age we mindlessly produced extremely toxic landscapes, mostly by our manufacturing and energy producing processes. The drawing to the right breaks these down into three categories, land, water, and air. Each of these have a series of different toxins that are common in the aggregation and produce different health conditions for the human body. The autonomy that exists between the techniques of our production and our consumer culture allows the continued and assured increase in toxicity. It has led us to a technical state of stasis. Heidegger describes this as Heimatlosigkeit, or humanity’s existential orientation in the age of Ge-Stell (Slaterdijk p.) This thesis argues that this state of homelessness is in part due to our need to continue developing while unable to full grasp with its outcomes. It argues that we must accept that there is not going to be a post toxic-future and through that acceptance we can find new architectures that engage toxicity as design elements.

The aggregation of these led to over 1300 Superfund sites in the United States alone. Superfund sites are labeled by the EPA as to toxic for human occupation and are designated for remediation. The map on the following page shows the location of superfund sites, as long as likely sites to be designated after the next wave of manufacturing. The map does not show the other 33,000 Toxic Release Sites, designated by the EPA that also exist across the country and are continuing to aggregate until they eventually form superfund sites as well.
We currently have many strategies and architectures that deal with toxicity but it is normally based around removal. The first thing that happens when toxins are discovered in a construction site is to pay for them to be removed and placed somewhere else. Remediation strategies that we use, such as drawn above, use plants that absorb certain toxins like lead. The problem with remediation projects is that they generally cost a lot and work on such a slow time scale that we create more new toxic sites in the same time it takes to remediate one.
Other emerging forms of remediation, like bioremediation use bacteria growth to feed off and reduce toxicity. However, similarly to remediation by plant these operate on relatively slow timescales and are very limited in terms of architectural typologies. The images shown on the next page are from a study by Lateral Office and water storage and remediation typologies.
SEDIMENTATION

DEEP STORAGE

WETLAND

SLOW STORAGE

PURIFICATION

IIventory of Existing and Proposed Water Storage Technologies, Banking on the Border, Lateral Office (2012) (Fig 9)

MOISTURE CONDENSOR
We now live in the era of the clean room. Clean rooms however are very misleading, they operate more to keep the products clean than they do to keep employees from toxins. They keep particulate counts low, but most of the toxins released still permeate the “bunny suits” and enter the human body. Many people currently working in the electronics industries are suing over reproductive and respiratory illness linked to their work. The clean rooms shown on the right show two different air flow strategies. The top operates with a laminar air flow that blows particules down to the ground where they are sucked out of the side of the room. On the bottom a turbulent air flow constantly moves particles until they are pulled out of the room. These thesis speculates that these clean rooms will become everyday life for most manufacturing jobs. The automated interiors will allow us to continue developing more toxic landscapes as we are fooled by the so called clean interior. The mechanized interior of the no-stop city will be realized.
This project proposes an alternate route to the clean room, a search for a more experiential architecture of toxicity. It looks to the environmentalist movements of the past like Banham and the dematerialists like Klein for an architecture that we experience. From Banham, it takes the search for an architecture of occupiability based around the mechanisms that produce the experiential qualities. It does not aim to produce shelter or avoid toxicity like the environmental bubble but rather aims for exposure. Here it seeks a way to be formalized like the fire column. How do we produce an architecture of toxicity? An architecture of the mostly invisible? Architectural form must play a role in producing both the toxic conditions but also a metaphorical role to communicate the safety of its space to the inhabitants.
THE ENVIRONMENT - BUBBLE
Transparent plastic bubble dome inflated by air-conditioning output

Personal Architecture - Vest to Overcoat, Banham
Design by Choice p. 59(1981) (Fig 13)

Personal Architecture - Vest to Overcoat, Banham
Design by Choice p. 56(1981) (Fig 12)
The last chapter of this thesis aims to find home. A home here is not a house, but a reconciliation of our lifestyles and our toxic production. The project proposes a series of spaces that produce different relationships and zones of occupiability within the chimney spaces. It aims to develop a methodology for exploring toxic spatialities. The project evolves through a series of chimney studies of pooling and channeling and attempts to spatialize them. This is to say it aims to develop zones where people could occupy only for transition times of 15 minutes, and others that they can occupy for 8 hours, based on the movement of toxins in the spaces. These thresholds are defined by the EPA standards and while this thesis is not for a chemical engineering degree it aims only to attempt to spatialize these concepts not prove their particulate densities. The following models were tested in an exhaust machine that provided fog for visualization and a fan to pull air from different directions. While the following are still images, videos can be found on my YouTube channel: https://youtu.be/Nd5IxNQ3GyE?t=182
Model A

This model was a test of trying to add three dimensionality to the models, a section cut through the front to the space shows where exhausts would enter as they moved into the spherical space of the middle before finally exiting the top.
Model B

This was the very first model made, and was meant to test the relationship between velocity and density of exhaust. Here the exhaust pooled in the widened area with a reduced velocity, and flowed freely through with a higher velocity.
Model C

This model tested methods for channeling exhaust through space and seeing how it reacts to surface. Here the exhausts wrapped the middle plates and left spaces open along the sides of the model. The dimensions of these space related to the velocity. Lower velocity produced wider spaces will high velocity pulled more exhaust and produced more turbulence that filled the space.
Model D

This model tested a sealed volume at the top and an air source from the side. It was the first model that air was removed from the bottom of the space. It revealed actually that lower velocity pulled exhaust out directly but higher velocity created a back flow that would launch exhaust up into the upper space to fill it. At certain velocities, you could directly control and level the height of exhaust.
Model E

Model E was an attempt to further spatialize model D by producing two outlets. One sectional one at the fron, but also one 3D opening on the other backside. It allowed air to be pulled from two sides but was not very controllable.
Model F

Model F aimed to test a split chimney with slightly different heights to see if height had a relationship to velocity. It found even at low levels that smoke would pool towards the lower side and evacuate through the taller side.
Model G

Based on the BBQ Smoker, this model aimed to relate pooling and channeling by creating two different spatial typologies within the model. The central chamber for pooling on the right and a channeling space to the left. However, due to some casting flows it was not very effective.
Model H

Model H produced a zone for exhaust to pool in while producing a more spatial exhaust system. By this I mean the exhaust entered sectionally from the bottom right, but was pulled through the small opening in the back of the model where the light is coming in. It was also a test for beginning to have multiple levels that could be occupied for different zones.
Model G

This model tested channeling methods that showed exhaust could be pulled through spaces and create certain zones where the body of the figure would be engulfed in toxins but the head could remain in an empty zone above.
Model I

This model tested transit spaces by producing a small path that someone could travel through a very toxic space. Smoke could be pooled below or moved up towards the top of the body for different types of atmospheres but remain safe from consumption.
Model J

This model aimed to spatialize multiple zones. The exhaust coming from the bottom would mostly be pulled to the left and out of the model while leaving two different visible zones that reacted differently due to their formal qualities.
Fog Models

As previously stated the models that were shown were all tested through an exhaust machine to visualize these concepts. The following images are taken directly from the tests and aim to show variance among the different densities and velocities. They are not all shown in the following images but more can be seen at https://youtu.be/Nd5lxNQ3GyE?t=182.
Model B

Medium Velocity Pooling
Density begins to decrease and flow through model.
Model C

Medium Velocity Channeling
Spaces start to fill.
Model B

High Velocity Pooling
Full flow through model
Model I

Low Velocity Pooling
Exhaust quickly escapes.
Model J

Low Velocity Pooling
Exhaust enters lower space and begins to spin before moving up.
Model 1

Medium Velocity Pooling
Exhaust stays at levels consistently below the path of the person.
Model J

Medium Velocity Pooling
Exhaust evacuates lower space and begins to flow up along the left side.
Model I

HighVelocity Pooling
Exhaust moves around the path at most going up the head of the person.
Model J

High Velocity Pooling
Exhaust completely fills left side while leaving the other side occupiable in two different conditions.
Representation

As these types of spaces were explored through modeling, it posed a serious question of representation. How do we draw spaces of toxicity and how do we represent and communicate these spatial typologies and design. The strategy shown over the next set of drawings looks at soft boundaries (toxins and velocities) and hard boundaries (architectural surfaces) to represent these spaces. The project started with designing these spaces first then trying to reverse engineer models that would produce these types of spaces. In this way design of the toxins had to happen before the resulting architecture could be produced. In each example there is a plan, section, and then a drawing placed over the model. The models were also recorded and then drawn over in after effects, which is shown with four screen shots each.
SILICA TOXICOLOGY PLAN
Toxic Urbanism

The final portion of the project acts as a case study to show how these spaces would begin to aggregate in a series of urban chimneys that would invite urban dwellers in to explore their toxic interiors. This thesis proposes these chimneys would happen across the country as a means to produce survivable architectural spaces of toxic habitation produced by our continued toxic manufacturing. The form of the chimneys provide two main functions, first to produce occupiable spaces by controlling the way toxins move throughout them, and secondly to spatially cue visitors in on occupiability. This happens by constrictions happening where toxins are extremely dense and deadly and larger and well lit spaces where people can stay for longer times. The thresholds all fall within the EPA's time weighted averages of exposure limits.
In the bottom plan, the two column like legs on the left are extremely toxic and therefore contained before opening up into an occupiable space on the level above. In the lower chimney, a small threshold happens between two of these toxic spaces that allow visitors to gather and shorter periods of time before moving up to the safe levels above. The chimney on the right moves people through a shallow transit space before opening up into a large space that they can occupy for up to 8 hours. The section shows the different spatial qualities of the exhaust that use their density to represent their occupiability. A larger scale portion of this section is shown on the next page to show the way the space changes in relationship to shifts in velocity that allow the space to function at different exposure limits. Finally concluding with a rendering of the spatial qualities produced in the chimney on the right side.
Conclusion

This thesis aims to raise questions of toxic exposure, aesthetics, and representation. It is in these three realms that further work is needed to understand how we can begin to design spaces of toxicity. To reiterate, we are constantly exposed to toxins in the world we live in and architecture currently has no agency in addressing them besides false ideals about sustainability that simply use definitions that label them inhabitable even though they mostly remain toxic. This project aims to show that toxic spaces can become beautiful and argues that due to our risk adverse nature people would occupy such spaces.
The thesis final review took place on December 22, 2016. My presentation consisted of two of the fog models actively running, along with the other models scattered around the presentation. I played a 6 minute animation for the jury and then proceeded to present a series of curated drawings that aimed to produce a conversation about aesthetics, exposures, and methodologies.
This thesis was born out of an investigation into sensorial aesthetics. While originally looking at relationships between architecture and sensorial envelopes, the project evolved into a methodology and aesthetics of engaging toxicity. It has transformed from a project in Flint, MI to Philadelphia, PA to a siteless project.
This model was a design for an interactive installation in Flnt, MI. The object was filled with toxic lead water and an algea that leeches lead from the water. The lighting reacted both to the algea's needs but also human interaction with the installation, transforming as people used it in different ways.
The object would release clean air to produce an occupiable area surrounded within a toxic landscape. The object aimed to act as an interface with between the toxic and the non toxic to produce an interaction between the two.
As the project evolved, I began to develop scenarios that related toxic manufacturing to public spaces. The research was a development of exploring concentrations, density, and temperature gradients that produced different zones within the project. The section shows a section through one of the silicon ingot machines that released SO2 into the river. While toxic in the air, SO2 becomes practically nontoxic in water supplies and was shown to produce an 11% reduction in Dementia.
This section shows different concentrations and soft boundaries created by airflow that create zones of occupation. Areas below are constantly purified with a laminar flow that allows long term exposure, while the zone towards the top produces a shorter exposure limit by blowing a small concentration of arsenic particles towards the viewer. This will produce headaches after a short amount of time but the user will feel the symptoms before any long term damage can be experienced.
OSHA
2013 - 50 ppm
2012 - 100 ppm, 250 ppm for construction
5000 ppm as liquid
10 milligram - 11 reduction in Dementia
As the thesis developed around toxicity, questions of program in relationship to toxicity and exposure were raised. This diagram explored the ways toxins could be released to produce different exposure zones that would replace our typical notions of programs. For instance work, sleep, and museum programs would be replaced with 12 hour exposure zones, 8 hour exposure zones, and 1 hour exposure zones. It also questioned if the sensorial aspect of these spaces would make them more desirable, even though they are more toxic along the development of Ulrich Beck’s risk adverse society.
In this way, the project would operate as a mega structure that produced occupiable zones of variable toxicity that would eventually spawn and fill with program that could match their occupiable exposure limits.
BIBLIOGRAPHY


Latour, Bruno. “Love Your Monsters -- Why We Must Care for Our Technologies As We Do Our Children.” The Breakthrough Institute.


