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I, Philip T Hummel, hereby submit this original work as part of the requirements for the degree of Master of Architecture in Architecture.

It is entitled:

Memory and the Void

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Memory and the Void

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Abstract

During the course of the 20th century, the practice of memorialization experienced an evolution. In spaces where once victorious statues celebrating glory would have stood, now rise hollow voids, spaces waiting to be filled with the memory of the viewer—the participant. This thesis will explore this transition from memorialization to anti-memorialization and the sublime ability of the void as an architectural space to facilitate the memorialization of trauma. Instead of the memorialization of cultural or war trauma, application of the void and sublime memorialization techniques will be applied to ecological trauma through the creation of an American Industrial Heritage Trail and the development of an anchor site along that trail. The cumulative effect of the project is to establish a categorical means with which to interact with industrial ruins and brownfield sites and propose three elements necessary for industrial rehabilitation: regeneration, utilization, and memorialization.

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01. Introduction

The Ohio River is considered by the EPA to be one of America's most polluted rivers. Barges full of industrial raw goods—steel, coke, coal, and iron—flow ponderously along its winding miles. These materials are the same that built the great American cities and are the economic lifeblood of the Ohio River; the spine of the American Industrial complex. These ships carry upon the tainted water the very products by whose production the river has been slowly poisoned over generations.

Highly industrialized, the 981-mile river flows from Pittsburgh, PA, through Ohio, West Virginia, Kentucky, and Indiana.[1] It eventually merges with the Mississippi River around Cairo, Illinois. Over 30 sites along the banks of the Ohio River are recognized by the Environmental Protection Agency (EPA) in their National Priorities List (NPL) as toxic waste sites.[2] These sites once housed a wide array of programs, including steel mills, military testing grounds, nuclear enrichment facilities, and chemical dumps. What each site has in common, however, is that they each lie in close

1 Caroline Cory,"Advocating for a Clean Ohio River." Environmental Law & Policy Center. March 2, 2020. https://elpc.org/projects/cleaning-up-ohio-river.

2 Environmental Protection Agency, *Superfund National Priorities List (NPL) Where You Live Map,* July, 2024, https://epa.maps.arcgis.com/apps/webappviewer

proximity to a river that provides drinking water to approximately 5 million people.

Modern industry, however, is not the only culprit of the Ohio River's toxification. Generations of unregulated mining along the coal-rich mountains of Appalachia have exposed heavy minerals to the open air, resulting in the oxidation and release of dangerous byproducts into local watersheds. Meanwhile, waste disposal facilities and human businesses toxify the soil with unregulated chemical dumping. Negligence and multigenerational ecological exploitation has resulted in colorful rivers of poison slowly flowing to their inevitable end, the Ohio River.[3] This toxification, the poisoning of waterways, and the displacement of the natural order due to human intervention can only be classified as one thing: ecological trauma.

Society often thinks of trauma as occurring on a personal level; a death in the family or a loss of innocence. It wasn't until the 20th century and the introduction of mass tragedies such as WWI, WWII, the Holocaust, and the Vietnam war that society expanded this lens to be capable of encompassing trauma on a cultural or global scale. Now, in the early 21st century, as we actively see the impact that human waste, pollution, and greed have wrought upon the environment, the lens of trauma must expand once again to encompass ecological trauma.

Fig. 01_A River of Acid

A bright orange river of acid and heavy-mineral laced water flows from an abandoned mine in Oreton, Ohio. Every minute, over 1000 gallons of water flows out of this mine alone.

Fig. 02_Norfolk Southern Derailment

Waterways throughout East Palestine remain filled with hazardous chemicals in the wake of the 2023 derailment, just one example of manmade chemical dumping.

3 Ann Marie Borys, "ImAGE and ToxiCITY: Ars Memoria at an EPA Superfund Site," in *Architecture, Material and Imagined: Proceedings of the 85th ACSA Annual Meeting and Technology Conference,* (New York: Association of Collegiate Schools of Architecture, 1997), 628-630

How then should society respond to this newly recognized trauma? Its scars appear as brownfield sites, but these are easily ignored unless near urban centers. The majority of human civilization is separate from industry which makes its existence possible. Consumers purchase food at groceries, clothes at supermarkets, and homes pre-built. Unless the toxification and pollution reach catastrophic levels such as the undrinkable water in Flint, Michigan or the clouds of smog in the Los Angeles Valley, it is easy for society to ignore the damage industrial greed has wrought on the landscape. Trauma is easy to ignore if it isn't relevant to one's own daily life.

Willful ignorance and forgetfulness are not unique to this modern recognition of ecological devastation. Many of these same questions have been asked before in the wake of war and mass displacement. How to understand trauma and whether it was worth remembering were topics which needed exploration and necessitated the redefinition of one of architecture's most controversial structures: the memorial.

02. The Memorial

The memorial is at the border of architecture and art, of the built environment and human memory, of permanence and change. Early in the 20th century the question of this permanence became one of great criticism. In his *Essay on Art*, Étienne-Louis Boullée elaborates on the temporal nature of monuments, namely their permanence.[4] He celebrates the funerary architecture of the Egyptian pyramids in their immutable melancholy. “This type of building, more than any other, calls for the Poetry of Architecture.”[5]

Towards the turn of the century, however, the very concept of the memorial came under contemptuous observation. In *On The Use and Abuse of History for Life*, Friedrich Nietzsche declares “Away with monuments!” in reference to the oppressiveness of what he calls “monumental history.” In *The Culture of Cities*, Lewis Mumford dedicates a whole chapter to the death of the monument in which he describes the monument as an anathema to the modern city. The memorial, he describes, is intrinsically flawed because it

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4 Etienne Louis Boullée, “Architecture, an Essay on Art,” in *Boullee & Visionary Architecture : Including Boullee’s Architecture, Essay on Art* (London: Academy Editions ; New York, 1976), 81–116.

5 “...this kind of Monument, is the perpetuation of the memory of those to whome it is dedicated. These Monuments should therefore be designed to withstand the ravages of times” Étienne-Louis Boullée, Essay on Art, 105

is not flexible, malleable, or renewable. Culture is changing and civilization is moving, but the memorial is trapped in the moment it was constructed. More often than not, this moment is referring to the grandeur of a civilization long dead, immediately negating the strength and power the memorial was constructed to relay.[6] "The notion of a modern monument is veritably a contradiction in terms: if it is a monument it is not modern, and if it is modern, it cannot be a monument." Mumford's writing lays out the problem: how can we be so ignorant as to create a memorial, something that is supposed to be timeless or permanent, something that has the explicit purpose of encapsulating a moment in time—a memory—when we are daily witnesses to the same tactic being used by past civilizations who, by their very definition, are past? If the monument is to be modern, it cannot continue to represent memory in the same way that it has throughout history. No longer is Boullée's permanence enough—or even desirable; the monument must change from its traditional values.

The monument has classically acted as a method of claiming or reclaiming glory. It does not matter how poorly a battle had gone, the victor could present a memorial dedicated to honor of the victorious dead or the greatness of human civilization and reclaim an element of valor. This association, the connection between the monument and a statement of power or of glory was one of the most pressing concerns for those looking to memorialize traumatic events such as the holocaust. Attempting to glorify the war and loss through the use of memorials would be an utter betrayal to the memory of not only those who were murdered, but also to the surviving peoples' memory of the Great War.[7]

The next controversial element of the traditional memorial is its tendency to displace memory. French historian Pierre Nora argues that rather than being capable of maintaining or encompassing memory, the monument supplants memorialization efforts with its own physical form. Others have explored this failure in alternative ways, such as Andreas Huyssen who explores that our modern society, with its high-speed production and consumption, has an inverse relationship with memorialization; the more that we memorialize, the less time we spend reflecting and actually remembering. Once the material structure of the memorial is built, the onus to remember is removed from all parties involved. The job has been done; we have remembered. Henceforth, society can move past this moment, only to perhaps occasionally glance every at this great stone tomb of memory. It is theorized that the knee-jerk reaction to memorialize in the wake of disaster is an ingrained desire to forget, an unspoken agreement that once the monument has been constructed, society can move on. "It is as if once we assign monumental form to memory, we have to some degree divested ourselves of the obligation to remember."

The third reason for the harsh critique of the traditional monument was its recent and continued association with totalitarian regimes. In the wake of WWI, the need to memorialize was potent,

6 James Young, "Memory, Countermemory, and the End of the Monument," in *At Memory's Edge: After-Images of the Holocaust in Contemporary Art and Architecture,* (New Haven: Yale University Press, 2000), 94

7 Sergiusz Michalski, "Public Monuments: Art in Political Bondage,1870-1997," (London: Reaktion Books, 1998), 93

but no new style or method of memorialization had been determined. This, then, leads to figurative antiheroic themes as represented in the "pathetic" heroes of Wilhelm Lehmbrucks's *Fallen Man* and *Seated Youth*. These antiheroic representations, however, were scorned by the totalitarian regimes of the era, primarily those of Germany and Russia. In their eyes, the grief represented in the sculptures only served to memorialize all that was worth forgetting about the great war. Instead, the traditional memorial worked perfectly for the plans of these two regimes, both of which abhorred abstract art—the Soviet Union going so far as to have the officially mandated art style of socialist realism. In the welcoming environment of these two regimes, the traditional monument even enjoyed a form of revival.[8]

The totalitarian obsession with memorialization is well documented by the likes of Sergie Michalski in his book *Public Monuments*. Within, he details the value obtained by these regimes through the use of the traditional memorial, particularly the Soviet Union, whose monumental efforts were significantly more prolific over their longer lifespan. For the Nazi party, however, Michalski highlights two important facets of the traditional memorial that appealed to Hitler in many of his designs: the dominance of architecture and the recurrence of the allegorical. Hitler often demanded symbolism in his memorialization, a theme that is echoed by German Historian Martin Broszat who suggests that instead of recalling the past accurately, monuments blur the lines between what was real and what we remember, creating a messy haze of "myth and

8 James Young, "Memory, Countermemory, and the End of the Monument," 94-95

Fig. 03_Fallen Man_1915

Fallen Man was Wilhelm Lehmbrucks submittal to the city of Duisburg, Germany for their war-memorial competition. At the time, he was expressing feelings of despair through several mediums, including sculpture and poetry.

Fig. 04_Seated Youth_1917

Set to represent the loss and devastation after WWI, Lehnbruck's Seated Youth is considered his greatest work. It was also his last work, as he committed suicide in early 1919.

explanation," effectively obscuring historical understanding as much as creating it.[9] This obscuring of history worked effectively for the totalitarian regimes, but for the rest of the world, it developed a deep mistrust of memorials in the wake of the Nazi regime's collapse. In the eyes of 20th-century artists and architects, using any form reminiscent of the traditional memorial recalled traits too closely linked to the concept of fascism itself. The response, therefore, was to create a new memorial—a new type of memorial.[10]

It has been called many names: historian James Young, in reference to the work of Horst Hoheisel and other Holocaust-memorial designers, calls them countermonuments; Maya Lin, designer of the Vietnam War Veterans memorial calls them antimonuments; Artist Krzysztof Wodiczko dubs them fearless memorials; Julian Bonder names them ethical-monuments. For this thesis, the name countermemorial or countermonument will be used. Regardless of its title, in each of its many forms the countermemorial invariably uses the void, a sublime concept, as a space with which to encompass memory and render the memorial effective for a post-20th century audience.[11]

9 Sergiusz Michalski, "Public Monuments..." 97

10 James Young, "Memory, Countermemory, and the End of the Monument," 96

11 Julian Bonder, “On Memory, Trauma, Public Space, Monuments, and Memorials,” in *Places.* 21(1). Retrieved from https://escholarship.org/uc/item/4g8812kv

03. The Counter Memorial

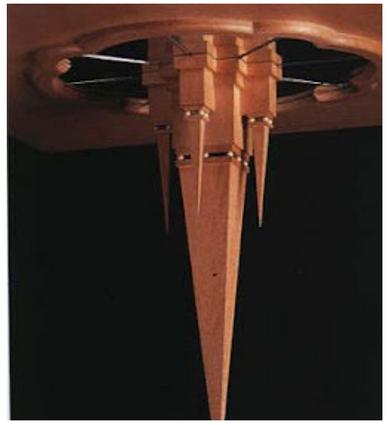

Fig. 05_The Sunken Fountain

This model of Hoheisel’s Aschrott Fountain shows an underground perspective, displaying how the fountain is perfectly replicated upside-down. It is a view impossible to see from above ground.

Countermemorials are monuments that have been designed specifically to challenge the purpose of the traditional monument. They are a direct response to the traditional monument’s controversial element. Instead of seeking to displace memory, they create a space for it to be realized. They reject the consoling or redeeming nature of traditional memorials. Instead of sealing off memory, they are spaces that allow it to be experienced. The origin of the countermonument is in Germany, where it has become somewhat of a “national form” in the pursuit of Holocaust memorialization.

In 1986, Horst Hoheisel was invited to Kassel, Germany to design a memorial. The original monument, the Aschrott Brunnen, was a 12-meter neo-gothic pyramid surrounded by a reflecting pool that was set in the main town square. The fountain’s namesake, Sigmund Aschrott, was a Jewish entrepreneur who presented the feature as a gift to Kassel in 1908. In 1939, however, the “Jew’s Fountain” was destroyed, its rubble carted off soon after. In the years to follow, as the Jewish population was slowly deported and murdered, the empty basin of the fountain was filled in with a garden and was colloquially dubbed “Aschrott’s grave”. By the 1960s, the original fountain had been forgotten and was eventually replaced with a new fountain.

> Only a few of the city's old-timers could recall that its name had ever been Aschrott's anything. When asked what had happened to the original fountain, they replied that, to the best of their recollection, it had been destroyed by English bombers during the war.

In response to this fading memory, the Society for the Rescue of Historical Monuments proposed a new memorial, one which Hoheisel's design won. Hoheisel's design is the quintessential countermonument. A "negative form," it did not seek to restore the original fountain or to preserve its remaining elements. "Its pure reconstruction would have been… offensive: not only would self-congratulatory overtones of Wiedergutmachung (restoration) betray an irreparable violence, but the artist feared that a reconstructed fountain would only encourage the public to forget what had happened to the original." Instead of reconstruction, Hoheisel decided to mirror the form of the original fountain and sink it 12 meters into the ground.

> I have designed the new fountain as a mirror image of the old one, sunk beneath the old place in order to rescue the history of this place as a wound and as an open question, to penetrate the consciousness of the Kassel citizens so that such things never happen again.[12]

The inverted pyramid now exists as an eternally dark funnel, water from the reflecting pool pouring down dark depths in an endless cascade. This drama is intentional, as Hoheisel explains that "with the running water, our thoughts can be drawn down into the depths of history and there, perhaps we will encounter feelings of

12 James Young, "Memory, Countermemory, and the End of the Monument," 96-97

Fig. 06_Kassel Memorial

The depths of the fountain lie open here, showing the flowing water pouring endlessly into its depths.

loss, of a disturbed place of lost form."

The viewer is paramount to the function of the monument. With no human participant, the memorial is simply a hole in the ground. Once one's own physical form is added to the equation, however, the negative form transforms the narrative. Where previously the fountain stood as the monument, now the viewer takes its place. As they dwell, their thoughts, grief, and loss drain down into the abyss. In this, the viewer is invited to become the memorial itself. "The sunken fountain is not the memorial at all… it is only history turned into a pedestal."

Here we see the power of the void in creating a monument that is more capable of containing and transforming memory than a physical structure could ever achieve. Had Hoheisel instead proposed a replication or reimagination of the historical fountain, the viewer would not have the opportunity to participate in the memorial. Hoheisel's fountain allows the viewer to reflect on the absence of what once was and connect with the layers of memory, and it does this by using a void, an architectural space that facilitates the interfacing of body and memorial form.[13]

In June, 1998, the Aschrott Fountain fully revealed its ability to reconnect all aspects of Holocaust memory. After a neo-Nazi rally, demonstrating their "reclamation" of the memorial, Hoheisel shared that "their triumphal striding atop the ruins of the fountain that their forebears had destroyed in 1939, seemed to bear out his dark hope that this would become a negative center of gravity around all

13 James Young, "Memory, Countermemory, and the End of the Monument," 100-102

Fig. 07_Aschrott from Above

Glass plates have been added to facilitate traffic, allowing visitors to stand directly above the pinacle of the memorial.

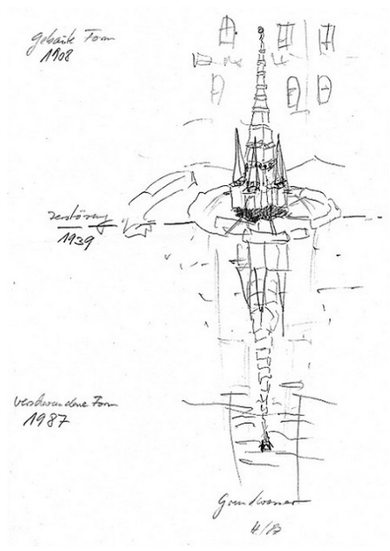

Fig. 08_Hoheisel's Sketches_1987

Artist's sketch of the Aschrott Fountain Memorial.

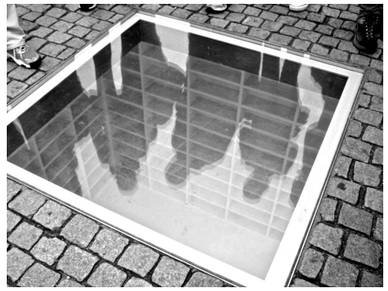

Fig. 09_The Empty Library_1995

Many viewers are reflected in the glass while looking down upon the empty shelves. They are, figuratively, within the library, captured in its blank walls by their reflections.

memory—wanted and unwanted—would now congeal."

While Hoheisel's Aschrott Fountain may be one of the most symbolically powerful counter-monuments, it is not alone in its design of placing the viewer above a sunken form. In commemoration of the infamous Nazi book burning in Berlin's Bebelplatz, the city of Berlin invited Micha Ullman, an Israeli-born installation artist, to propose a monument. Sunken beneath the cobblestone plaza, Ullman hid a "ghostly-white underground room of empty shelves"—the Bibliothek.[14] The room, large enough to fit 20,000 books, is revealed to the sky through a glass surface level with the surrounding cobbles. The symbols of absence are all around; empty shelves, representing not only the burned books but the absence of the People of the Book. Besides the empty white room, the viewer can see only one other thing as they gaze down into the ground through the glass panel: themselves.[15]

Ullman's Bibliothek pursues the same goal as Hoheisel's Fountain—to turn the viewer themselves into the monument. The Bebelplatz stands empty, no monument to be seen except for the viewer, reflecting both literally and figuratively upon the memorial below. This is the power of the absence, the void. A monument in this space would indeed have done its job, to commemorate the

14 Rebecca Comay, "Memory Block: Rachel Whiteread's Holocaust Memorial in Vienna," in *Image and Remembrance,* edited by Shelly Hornstein and Florence Jacobowitz, (Indiana University Press, 2003), 251-273

15 "...the spectator, who necessarily enters the image in order to view it… does so precisely as a stain or blind spot: to approach the pit is inevitably to block the transparency of the window-floor—as shadow, as reflection, and finally as the interference of a solid body—and thus to occult the very ground on which one stands" Rebecca Comay, Memory Block, 264

Fig. 10_Holocost Memorial

A archietct's rendering of the Nameless Library set within the Judenplatz in Vienna, Austria.

burning of May 10, 1933, but that is all it would do. It would stand as a plaque, or a stack of books, or a pile of ash, and people would see it, understand it, and continue. Instead, the Bibliothek, along with the Aschrott Fountain, invites the viewer to participate in the memory process—to become a part of the memorial and to shape its above-ground form and reflection for the brief moments of contact.[16]

Just as the Nameless Library echoes elements of the Aschrott Fountain, so too does Rachel Whiteread's Bibliothek reflect the book symbolism of the Nameless Library. The Bibliothek is a massive rectangular block located in Vienna's Judenplatz, a memorial to the victims of the Shoah. Thirteen feet high and constructed from cast concrete forms resembling that of an "inverted library," The rectangle is an entirely sealed space, inaccessible to the viewer but reflected so perfectly it feels that the doors should open from the inside. Each face of the box displays tightly packed rows of concrete books formed with the spines facing inwards— permanently sealed, closed, and unknown. The monument is a "...stony materialization of an absence—a solid void which evoked the signifying possibilities of the archive only seemingly to revoke them."[17]

Once again we see the language of absence and void, but this time in a different context. Whiteread's monument does not allow the viewer to replace the memorial as the previous examples do, it formalizes absence through its negative. Instead of forming a negative out of the site, the "topography," meaning the Library

16 Rebecca Comay, "Memory Block," 254

17 James Young, "Memory, Countermemory, and the End of the Monument," 109

itself, creates a literally positive but figuratively negative form in the plaza. “It is not the book per se that constitutes her now displaced object of memory, but the literal space between the book and us… Like other artists of her generation, Rachel Whiteread is preoccupied less with the Holocaust’s images of destruction and more with the terrible void this destruction left behind.”[18]

The impression left by the Nameless Library is even more significant when compared to its companion upon the Judenplatz, a 1934 bronze statue of Gotthold Ephraim Lessing—an eighteenth-century dramatist and Enlightenment philosopher. The installation of Whiteread’s counter-monument was a controversial affair, at one point leading to the monument sitting in a warehouse awaiting installation for four years. Even upon its eventual placement, it had many critics. In the summer of 1996, one such critic, environmental spokesman of the Austrian Peoples’ Party Johannes Hawlik, objected to the Library due to Lessing’s statue, leading him to declare “This square’s not big enough for two monuments.” In response, Hawlik suggested moving the statue of Lessing, a statue that had already previously been melted down for ammunition, rebuilt, and relocated to the Judenplatz from its original location in Morzinplatz.

The statue of Lessing is a perfect representation of 20th-century change in memorial mentality. The Holocaust counter monuments are located in places of significance, places of, as Libeskind described them, a “being and non-being… places where one can hardly find traces of a relationship.” While many monuments and memorials are indeed placed in locations of significance, many more are placed simply for aesthetics. They exist, and they fade. They do not invite participation or provide cause for reflection. In them, history is set; it has been remembered through their very creation. Why should the viewer interfere?[19]

18 James Young, “Memory, Countermemory, and the End of the Monument,” 110

19 Rebecca Comay, “Memory Block,” 257

04. Trauma

In order to effectively create a countermemorial, it is imperative to establish the object of memorialization, whether that is a person, place, or concept. Society often thinks of trauma as occurring on a personal level; tragedy and displacement. Even memorials to these personal tragedies are difficult to establish; do they take the form of gravestones or obelisks? Is a cross buried on the side of a road at the scene of a crash an effective trauma memorial? How can the built environment respond to the multifaceted and treacherous nature of trauma work?

In Daniel Libeskind's essay "Trauma," he describes his thought process behind the design of the Jewish Museum in Berlin.[20] Libeskind was one of a few architects uniquely suited to undertake the design of such a contentious and fragile museum. As the child of two Holocaust survivors, Libeskind did not directly witness the tragedy of loss and displacement the genocidal event caused, yet he was a witness to its aftermath. To him, the themes of trauma, the void, and the experience of architecture are not just concepts, but terms that can be expressed in concrete reality. Experiencing trauma in the concrete world is intrinsically experiencing an absence, a

20 Daniel Libeskind, "Trauma" in *Image and Remembrance,* edited by Shelly Hornstein and Florence Jacobowitz, (Indiana University Press, 2003), 43-58

void.[21] The change in the world is not only the direct loss of life and of culture, but the loss of everything each of those lives would have accomplished had theirs not been cut short. Memory-work in the modern world is linked to the subject of trauma because one of the most important aspects of the culture of memory its interaction with justice and human rights and the remembrance of traumatic events.

The experience of trauma is one most easily discussed in conceptual terms, but it is also possible to explore it in concrete reality. There are clear correlations between the conceptual feeling that trauma creates in people's consciences and the aesthetic emptiness that is designed into void spaces. The conceptual feeling of trauma is simple to explore and interpret through a literary context, where the flexibility of literary style and setting can provide connotation. In physical space, however, no amount of literary description can depict the "materiality, opacity, and thickness of the experience of walking, looking, touching, feeling" of where trauma has taken place.[22]

Trauma is both a void and an opacity; it is a space of layers. It is memory and it is null-memory. Trauma has a materiality. It leaves a space where something should be—a displaced people group, a business, a family, a neighborhood, a future that will never be. Instead of a place of 'being,' there is a "gap which in time become obliterated and which generates in itself an even greater emptiness

Fig. 11_Jewish Museum Berlin_2001

Thousands of thick metal plates cut into faces cover the floor within this room of the Jewish Museum. The faces are an installation by Menashe Kadishman called *The Memory Void.*

Fig. 12_Alfred Döblin's Left Hand

"[This] is actually the plan of Alexanderplatz literally." Within this 1920's photo of a hand, Libeskind saw the lifelines of Berlin—love lines, death lines, lines of work—which he used to create his 2nd place proposal. "That hand, which might today still affect our lived experience of Alexanderplatz, is a figure that refers one across the emptiness of that public space."[24]

in the post-historical world".[23] Trauma is emptiness. This emptiness, however, is understandable in a 3-dimensional space, and the role of this space is to make clear the relationship between the void and the absence.

While trauma may be defined as a void, as emptiness, often the spaces of trauma are not empty. While proposing his design for the redevelopment of Alexanderplatz, Libeskind was encouraged by politicians to consider the site as a *tabula rasa*, an idea that he considered an exercise in amnesia. Sites of trauma are not pastless—even if they are empty—and often they are not empty. To treat a site of trauma as a clean slate would be to ignore the materiality of the void, of the opacity of memory.[24]

This idea of exploring the materiality of trauma is even more important when sites truly are not empty, as with many of the industrial sites associated with ecological trauma. To interact with sites of trauma, it is imperative to understand where the texture of memory lies heaviest and to incorporate the materiality of the void into designs. No site, let alone a trauma site, is ahistorical. In fact, the void itself is not ahistorical. According to Libeskind, the historical trajectory of the void is the trajectory of the fatality of Western culture, the embodiment of the literal annihilation of culture and those who create and carry it.

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21 "The theme involves a moment of awareness—a gap which exists among those who are survivors, which includes everyone born after those times—a gap which in time becomes obliterated and which generates in itself an even greater emptiness in the post-historical world" Daniel Libeskind, Trauma, 43

22 Daniel Libeskind, "Trauma," 45

23 Daniel Libeskind, "Trauma," 43

24 AA School of Architecture, "Daniel Libeskind - Alexanderplatz Masterplan," Youtube, May 22, 2015, Video, 1:01:00. https://www.youtube.com/watch?v=KTNxlE38CO8

25 Daniel Libeskind, "Trauma," 46

05. The Sublime

Fig. 13_ Seaport at Sunset_1639

The artwork of Claude Lorrain was often seen as the opposite of the sublime, or rather the epitome of classical beauty—harmony, elegance, luminosity—which was itself set as a foil to the concept of the sublime.

As Libeskind shows, Trauma can be a complex concept to conceptualize or encompass within a defined space. As previously discussed, designing for trauma memorialization requires the implementation of the void as an interface to allow an understanding of the magnitude of loss caused by trauma, the word magnitude being critical here. The question then is this: why are void-spaces capable of relaying, encompassing, and invoking emotions not normally experienced through everyday environments?

The void in its very conception is a sublime space. Attempts at defining the sublime extend back to the first century, but modern discussion and implementation of the sublime aesthetic did not occur until the Romantic era of the 18th century with the rediscovery of Loginus's *Peri Hypsous* (On the Sublime), which was reprinted and translated in Nicholas Boileau's 1672 book *Traité du sublime et du merveilleux*. Sublime theory is paired with discussions of beauty and the picturesque, concepts that make themselves present in artwork and the landscape design of British gardens, as well as modern photography depicting the grandeur and horror of human accomplishment and destruction.[26]

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26 Christine Riding, "British Art and the Sublime," in *The Art of the Sublime*, ed. Nigel Llewellyn (Tate Research Publication, January 2013), https://www.tate.org.uk/art/research-publications/the-sublime/christine-riding-and-nigel-llewellyn-british-art-and-the-sublime-r1109418

Whether historical painting, imagined structure, or aerial photograph, artistic imagery is used to unveil the inherent power of sublime environments to relay meaning and emotion otherwise incomprehensible to the viewer. Understanding the relationship between the viewer and the sublime is integral in designing spaces to encompass and memorialize trauma.

Since its conception, the sublime has been connected with an emotional experience. The word sublime is the combination of the Latin *sub*, meaning below or up to, and *limen*, meaning limit, boundary or threshold. The word itself expresses how the purpose of the sublime is to define something that is nearly indefinable, something that is at the edge of understanding. This definition of the sublime was generally recognized by the 18th century, and it was at this time that artists and philosophers began attempting to visualize the concept.

A critical element in understanding the artistic representation of the sublime is recognizing that its definition has changed from its historical use. In modernity, the word sublime is commonly used to describe something at the peak; it is a word synonymous with perfection. Historically, however, the word was often found paired with emotions such as dread and terror. The sublime is not merely a description, but also an emotion—specifically an emotion related to fear and excitement.[27] In his essay "The Emotional Experience of the Sublime," Tom Cochrane describes this fear and attraction as self-negation, where observation and experience of sublime environments create a terror that is rapidly replaced with pleasure as the viewer comes to understand that sublime imagery cannot hurt them.[28]

Early representations of the sublime often took the form of natural environments, real or imagined—mountains, storms, oceans, cliffs, pits, or the heavens. Edmond Burke, an 18th-century philosopher who wrote on the sublime, defines seven elements of sublime environments that naturally exist in the world: darkness, obscurity, privation (or deprivation), vastness, magnificence, loudness, and suddenness.[29] By using these elements, artists, photographers, and architects have explored how the sublime aesthetic can be used to invoke powerful emotions in their audience.

Along with natural environments, many 18th-century artists chose scenes of historical importance as mediums for their sublime art, most notably scenes from the bible. At this time, historical art was lauded as the most prestigious form of art, above landscape and portraiture. Many scenes from historical texts were ready-made for sublime rendition: divine scenes from Old Testament and Revelations, and also non-biblical scenes from texts such as The *Odyssey, The Iliad*, and *The Divine Comedy* which were deemed similarly viable for artistic rendition.

27 John Dennis describes an "enthusiastic terror", Joseph Addison "an agreeable kind of horror", and Edmond Burke a "fulfilling terror."

28 Tom Cochrane, "The Emotional Experience of the Sublime," Canadian Journal of Philosophy 42, no. 2 (June 2012): 125–48. https://doi.org/10.1353/cjp.2012.0003.

29 Burke is well known for his theories on relief, a concept which he calls 'negative pleasure,' and which is closely related to the 'beatiful terror' of the sublime. Tom Cochrane, "the Emotional Experience of the Sublime," 133

In his three-part series of Revelations-themed paintings, John Martin uses juxtaposing colors and scales to manifest his vision of the sublime. A bright streak of lighting contrasts the deep blackness of the cataclysm, all underlit by the bloody glow of the sun and fiery depths. This destructive moment is portrayed as though from the viewpoint of one stepping over a rise, with the perspective drawing the viewer into the image through the removal of the foreground. The other pictures of this series—*The Last Judgment* and *The Plains of Heaven*—also utilize the sublime, exploring vastness, even the concept of infinity, in different biblical scenes. Similar themes of cataclysm can be seen in other sublime paintings from the era, such as Joseph Wright's *Vesuvius in Eruption (1776)*.

James Ward uses similar Burkian techniques in his landscape rendition of an English property. Contrasting light and shadow, perspective, and depth create a sense of awe and terror at the sheer magnificence of the mountain face. This magnificence was emphasized by the massive scale of the canvas itself, extending over nine feet tall and twelve wide—unprecedented for the time, but a trend that rapidly became popular.[30]

30 Christine Riding, "British Art and the Sublime," https://www.tate.org.uk/art/research-publications/the-sublime/christine-riding-and-nigel-llewellyn-british-art-and-the-sublime-r1109418

Fig. 14_The Great Day of His Wrath_1851

John Martin's Revelations themed painted evokes a deep sense of dread, relaying the gravity of the apocalyptic end-of-times through the use of sublime imagery. The painting utilizes Burke's elements of vastness, darkness, and obscurity to great effect.

Fig. 15_Gordalne Scar (A View of Gordale, in the Manor of East Malham in Craven, Yorkshire, the Property of Lord Ribblesdale)_1812

Cattle graze at the foot of a massive ravine in James Ward's landscape painting. The familiar size of the animals provide scale with which to understand the vastness of the cliff face, while the shadow and perspective work to obscure a true understanding of its depth or features.

The Sublime in Architecture

Bridging the gap between art and architecture is no simple chore, yet one of the unquestionable masters of the task was Étienne-Louis Boullée. Boullée began practicing during political upheaval, resulting in few of his works ever being constructed and, instead, remaining as "paper architecture." Under the monarchy the barrier between public and private life was thin, resulting in a society that looked unfavorably upon Boullée's monumental designs. After the Revolution, however, the desire for new public buildings produced a renewed interest in monumental programs. The Monument changed from a "memorial edifice" to "architecture which presupposes a complete organization of the surroundings and the masses." Boullée rejected the imitation of classical forms and the Vitruvian concept of "the art of Building". Instead, Boullée separated conceptualization from execution and returned to nature as the foundation of art.

Due to the failure of his designs to win awards, Boullee turned from practicing to teaching, writing extensively on monuments, art, and memorialization. Alongside his treatises, Boullee included drawings and designs for massive funerary and civil structures. These designs were based in pure forms, elementary volumes, and sunken architecture. Through the use of smooth surfaces with few penetrations, symmetry, shadows, and scale, Boullée's drawings portray permanence and mass. The result is a minumalized individual who is overshadowed by the built environment which is itself isolated from its surroundings, further emphasizing the juxtaposition of public and private, of the people and the person.[31]

Fig. 16_Egyptian Cenotaph_1790

Boullée's Egyptian cenotaph is a prime example of his use of pure elementary forms, in this case a truncated triangle. The addition of shadows to the entrance adds signifianct depth to the otherwise relatively flat facade, and his suggestion of a sunken form promotes the idea of a greater volume inside.

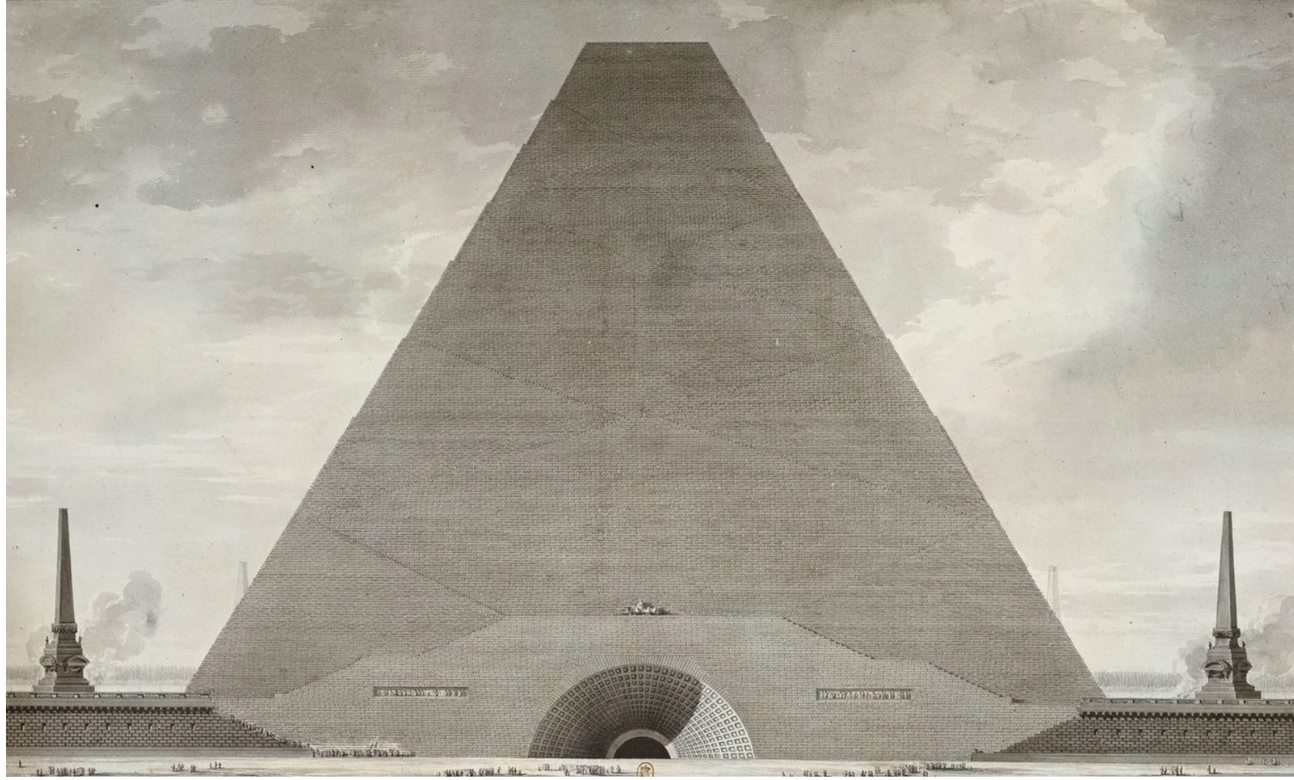
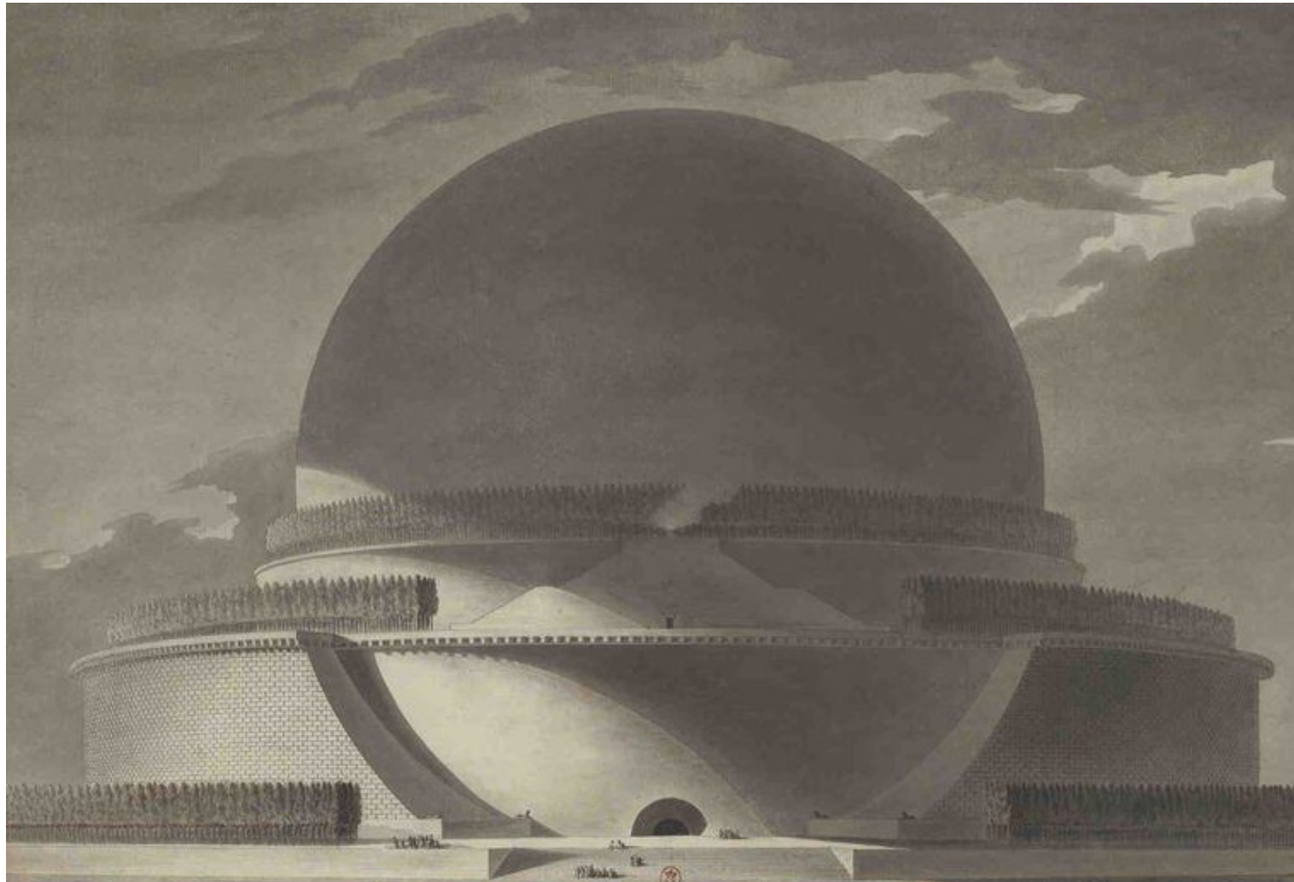


Fig. 17_Cenotaph for Isaac Newton_1784

Perhaps his most significant theoretical work, the Memorial to Newton epitomizes Boullée's ideas on the pure form of the sphere as laid out in his "theory of bodies" wherein he describes the sphere as "the most beautiful and natural bod[y] which combines the most perfect symmetry with the widest variety." In this work, the themes of pure gemoetical forms, symmetry, and shading are on display.



31 Jean-Marie Pérouse de Montclos, "Etienne-Louis Boullée (1728-1799): Theoretician of Revolutionary Architecture," (New York: Braziller, 1974), 11-45

The Sublime in Industry

With the introduction of photography in the 20th century, depiction of the sublime transitioned mediums from paint and paper to digital. Imagination is no longer necessary to depict hellish landscapes and structures of monumental scale; these environments are increasingly present in everyday life. Industry is inseparable from modern living; society depends on a scale of production that is nearly incomprehensible. To capture the scale of this industry, then, requires a decidedly inhuman perspective—an aerial perspective. Photographers such as David Maisel, Edward Burtynsky, Daniel Deltra, David T. Hanson, and Terry Evans have made their careers photographing the sublime and unnatural landscapes of industry and its byproducts.

Visualizing the industrial sublime is not as simple as simply taking a picture. Where Boullée set his structures in isolated environments to highlight their size, these sublime photographers often juxtapose ravaged environments with virgin ones, such as Daniel Beltrá's *Forests* collection. David Maisel, on the other hand, captures the textures and forms of industrial landscapes in such a foreign and incomprehensible way as to nearly eradicate its legibility as natural landscape. The scale of his environments, some of which require photography at atmospheric levels, are more art than documentation. They serve not as a warning of destruction to come, but as an autopsy of dead places.[32]

Fig. 18_Bucket Excavator at Garweiler Coal Mine_2022

Sean Gallup's aerial photography reveals an industrial process which functions at an incomprehensible scale. Set to contrast fertile green fields with lifeless dirt, the image inspires awe at the human ability to transform a landscape and invokes horror at the knowledge that the land will continue to be cut away into a canyon which extends beyond vision.

Fig. 19_Copper Mine 1

The final image in David Maisel's series "Desolation Desert," Copper Mine 1 documents one of the many open pit mines in Chile's Atacoma Desert. Lacking any recognizable human elements, the scale of the mine is lost, becoming a patterned landscape all its own. When put into the context of the other images in the series, this scalar quality takes on additional meaning, as the mine can be read as being not a part of an environment, but the environment itself.

32 David Maisel, "Desolation Desert," 2018, https://davidmaisel.com/works/desolation-desert.

The Sublime in Ecology

The photography of sublime ecology and devastated environments is similar to the photography of sublime industry, but different in significant ways. While also primarily depicted through aerial photography, scale is a less valuable tool in revealing the devastation, though not useless. Instead of scale, emphasis is placed on color. Natural and pure environments are easily understood through color. Green land is fertile and living; blue water is pure and unsullied. Just as artists no longer need to use their imagination to depict hellish depths and massive scales, they also no longer need to imagine fiery red rivers and rainbow pools of water. Those environments are increasingly common, existing in polluted and exploited sites.[33]

In the photography of sublime ecology, initial enjoyment of the imagery is due to an expectation of falsehood; due to social media, we are so overexposed to the manipulation of digital artwork with filters and Photoshop that alien environments are normal. In his series *Tailings*, photographer Edward Burtynsky contrasts red rivers and skeletal, leafless trees with white winter skys and oily black ground. An immediate association can be drawn to natural disasters such as volcanic eruptions with red waters flowing like streams of lava. Instead of awe, however, the images inspire dread upon the realization that the pictures are not doctored, but the direct result of man-made pollution. Unlike the massive industrial sublime images, Burtynsky shows the landscape at an immediately understandable scale with an indefinite border, allowing the viewer to be an active

Fig. 20_Nickle Tailings #24

A red river flows through Edward Burtynsky's foggy, skeletal landscape. This contrast highlights the deadly toxification resultant from the industrial processes of metal mining and smelting. The scene is inherantly chemical, it is immediately understood that this is not a natural disaster scene, but a distintly human one.

Fig. 21_A Ship in the Deepwater Horizon Oilspill_2010

Though taken from a further viewpoint than *Nickle Tailings #24,* Daniel Beltra's imagery from the devastating 2010 oil spill in the Gulf of Mexico keeps people as the focus, contrasting the scenes of pollution and devastation with the lives impacted, both human and animal. Here, the impact of the image is highlighted not only by the contrast of virulent reds and oranges against the blue of the ocean, but also by the ship which provides a sense of scale and added magnitude.

33 Edward Burtynsky, "Tailings," 1995, https://www.edwardburtynsky.com/projects/photographs/tailings

participant in the toxic flow instead of a distant spectator. Color is similarly used in Daniel Beltrá's *Spill* series, where bright reds and oranges contrast on the blue of the ocean, a disaster immediately understandable as inherently human-caused and of devastating effect.

06. Ruins

Of all man-made spaces, few invoke feelings of the sublime as powerfully as those of industry. Due to their shear scale, industrial environments readily invoke multiple of Burke's sublime elements, not to mention the sublime elements associated with ecological devastation so often accompanied by these sites: pools of chemical waste and slag, vast expanses of concrete paving, and train rails segregating and patterning the landscape. Since the Industrial Revolution, sites of industry have been an everyday experience for much of the world, especially those who live near resource-rich areas and transportation lines. As more of the modern deindustrializes, many of the industrial sites that were once important parts of city development and economic prosperity are declining into a sublime state; they are becoming ruins.[34]

The concept of the the ruin is intertwined with the other 18th-century Romantic concepts of the sublime, the picturesque, the beautiful. The Romantic era was the height of the industrial revolution, so few industrial ruins existed. As such, this theorization did not concern industrial ruins, but instead Picturesque landscapes

34 Tim Edensor, "Industrial Ruins: Spaces, Aesthetics, and Materiality," (New York; Oxford: 2005), 1-19

and gardens often included ‘fake’ ruins. These facsimiles were created to resemble either classical, archaic structures or quaint scenes of cottages and farms.

This, often, is where the definition of ruins ends. The focus is on the far and fictional past, a time of fairy castles and fantasies. Restricting ruins to this definition romanticizes them so significantly that there is no room for either reinterpretation or inclusion of modern sites. Instead of being recognized for their value and beauty in the same manor as classical ruins, industrial ruins are regarded as wasted space and sad remnants of an older time.[35]

Within picturesque theory, the definition of ruin has some flexibility, but not much. The ideal ruin has to be “well enough preserved (while retailing the proper amounts of picturesque irregularity) to produce the desired mix of emotions in the beholder” so neither a pile of rubble nor a recently vacated home would qualify as picturesque.[36] Before the application of false ruins to English gardens, the picturesque primarily appeared as painted landscapes. Encoded into the imagery of these picturesque scenes were elements of the sublime: dark stormy skies, steep cliffs, and dizzying heights, all of which served to inspire that terrible pleasure previously discussed. The addition of this sublime emotion invites a sense of melancholia and an understanding of temporality to the landscape. That melancholia is, ultimately, the heart of the ruined aesthetic. It is an understanding of time passing and of loss.

35 Tim Edensor, “Industrial Ruins: Spaces, Aesthetics, and Materiality,” 10

36 Michael S. Roth, Claire L. Lyons, and Charles Merewether, “Irresistable Decay,” (Los Angeles: Getty Research Insitute, 1997), 5

Time is a fickle element to instill within a concept. A ruin cannot be too old or too new lest it lose all interpretability as a picturesque space. A ruin must signify the transient nature of all things, while also remaining in a permanent state of transience. The romantic era fascination with ruins is a logical one since ruins exist as a contradiction to industry itself. They revel in the inevitability of age and waste which growth and expansion cannot outpace. In the modern age, industrial ruins, particularly the increasingly common ruins of the great mills and steel factories, exist at the crux of this conflict. These sites, such as the case studies discussed later in this thesis, exist for so long, often over a century, and experience so much deterioration, weathering, and expansion during their operational years that, by the time they are closed or their operations are shuttered, the industrial fabric of the site immediately achieves the melancholy quality of ruin and transience. In fact, due to their past importance, these sites naturally display the slow decay so valued by the picturesque aesthetic more ideally than any facsimile of a ruin.[37]

37 Tim Edensor, “Industrial Ruins: Spaces, Aesthetics, and Materiality,” 11-13

07. Industrial Heritage

The slow decay of industrial fabric and its transformation into a ruinous form has been the concern of modern civilization now for over 70 years. In the 1950s, the study of industrial archeology swiftly brought the rising issue of utilizing and maintaining the rapidly decaying industrial sites to the public eye.[38] This interest led to the concept of industrial heritage, a movement that caught on quickly and has led to the development of architectural, anthropological, and historical culture trails, specifically industrial heritage trails. These trails are mapped paths that tie together geographic areas with significant industrial sites into cohesive historical and social structures. The concept of cultural routes was added to the World Heritage List in 2005 and, while many countries have museums or other token notions at honoring their industrial past, few countries have taken advantage of their own industrial history and developed such a trail.[39]

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38 Jiahao Zhang, Lingchen Zhuo, Hao Sun, Yuanling Wang, Hanbin Wei, Subin Xu, and Nobuo Aoki, “Construction of the Chinese Route of Industrial Heritage Based on Spatial and Temporal Distribution Analysis,” Buildings 14, no. 4, (February, 2024): 1065 https://doi.org/10.3390/buildings14041065

39 The concept of cultural routes was proposed by the European Union in 1987, but was not accepted until 2005. During this time, the European Route of Industrial Heritage (ERIH) was established, starting in Germany. Currently, the most significant Industrial Heritage Trails are the ERIH and a rapidly developing trail in China which is following the Chinese Industrial Heritage GIS Database (CIHGD)

Since the 1950s, deindustrialization has left cities and sites rusted and polluted shades of their former selves. Consideration of how to manage and reuse these rusted, ruinous ghosts has become an important issue intertwined with other spatial and ecological considerations. The concept of industrial heritage is closely related to that of urban renewal, space optimization, and gentrification; each individually are hot topic issues for modern city growth and development. Regardless of its political and social relevance, the task of developing industrial sites is not a simple one. In order to safely and effectively reuse and redevelop an industrial site, three issues must first be addressed: the toxicity of the land, the buildings themselves, and the memorialization of the site, the good and the bad. Put more succinctly: Regeneration, Utilization, and Memorialization.[40]

40 Sunny Han Han and Amal Zhuo Li, "Introduction: Our Plans, Our Stories - Chapter 1," In *A Hundred Stories: Industrial Heritage Changes China* (Singapore: Springer Nature Singapore, 2023), https://doi.org/10.1007/978-981-19-8614-7_1.

Regeneration

In order to begin any project involving the re-use or revitalization of industrialized land, the first step is to evaluate the site's toxicity. Nearly all industrial sites are considered brownfields, meaning any expansion, redevelopment, or reuse may be complicated by the presence or potential presence of hazardous substances, pollutants, or contaminants.[41] Brownfield is a broad term that can be applied to many modern sites of industry, whether that be agriculture, metal manufacturing, or even a gas station. In the United States alone, there is an estimated 450-600 thousand brownfield sites, many of which were once on the outskirts of cities but are now on valuable urban real estate. Redevelopment of brownfield sites reduces pressure on urban sprawl and the consumption of virgin green space, while also having the added benefit of reducing public exposure to chemical seepage and infiltration into the water table.

Industrial redevelopment is preceded by remediation. Two forms of remediation exist and their application depends on cost, level of toxicity, and time. The first remediation method is *ex situ*, meaning 'off-site" or away from the natural location. This method usually means physically removing toxic material, whether by dig-

41 Environmental Protection Agency, *Brownfields,* May 10, 2024, https://www.epa.gov/brownfields/about

and-haul or pump-and-treat methods. *ex situ* remediation, while simple, is a band-aid solution—it is simply moving the problem somewhere else. Additionally, *ex situ* methods are often expensive, either requiring the importing of clean dirt or using expensive cleaning techniques to remediate the on-site material.

The alternative to *ex situ* is *in situ*. This alternative method is rapidly growing in popularity as developing technology makes it more accessible. Like *ex situ*, there are many *in situ* remediation methods, including chemical additives, microbial bioremediation, and even holistic methods such as crop rotation. The introduction of additives such as Zero Valent iron can be highly effective at removing chlorinated organic solvents, pesticides, PCBs, dye compounds, and heavy metals; mesoporous silica can remove chemical pollutants from groundwater; a variety of oxidants purify water and soils from ammonia and arsenic.

Through the introduction of cleaning and purifying agents, the existing land and water can be treated and purified, becoming a space for life to once again exist. In order to meet the growth of cities in sustainable ways, methods of remediation, both *in situ* and *ex situ* must become more efficient and effective. The ability to sustainably treat and heal toxified land is a necessary development, not only for important industrial heritage sites, but for everyday sites that have been exposed to pollutants.[42]

42 David O'Connor, Deyi Hou, "Sustainable remediation and revival of brownfields" *Science of The Total Environment* 741 (November, 2020) https://doi.org/10.1016/j.scitotenv.2020.140475

Case Study:

Gas Works Park, Washington

One of America's first industrial heritage projects, Richard Haag's Gas Works Park in Seattle, Washington, is a large-scale land remediation project which has gone on to influence and guide nearly every major industrial remediation project since.

The site of the modern-day park is a small promontory at the northern shore of Lake Union once known as Browns Point. The site, once valued for its access to major lines of transportation, now sits in the very heart of Seattle. Browns Point was recognized for its aesthetic value long before Richard Haag transformed it: the native people who lived in the area before Seattle's development considered the promontory a special space and, in 1903, John C. Olmstead—Frederick Law Olmstead's nephew—even recommended that the point be "secured as a local park, because of its advantages for commanding views over the lake and for boating, and for a playground."[42]

This description, however, was applied before Lake Union became the industrial hub of the city. In 1900, the Seattle Gas Light Company began purchasing lots on the northern shore, and, in 1906, began the construction of The American Tar Company (ATCO)

42 The native peoples were known as the Tenas Chuck (small water) and called Browns point "descending from the ridge" as the land sloped down to the marshes

which manufactured tar and ran a refinery and gasification plant on the site until its 1956 closure.[43]

By the 1950s, both Lake Union and its neighboring Lake Washington were too toxic to swim in, subjugated as they were to 50 years of pollution and chemical runoff from industrial sites such as the gasification plant. Changing attitudes in the city meant that by the 1960s, public and civil institutions were taking notice of the now-abandoned site, imagining what could be done with it. Richard Haag, who arrived in Seattle in 1958 and opened Richard Haag Associates (RHA) in 1959, first saw the site from the water on a late autumn night.[44] Immediately, he was smitten:

> When I get a new site, I always want to know, figure out, What is the most sacred things about this site? Well, this site, without the buildings, there was nothing sacred about it. It did have a shoreline, but it would have a shoreline with or without the buildings. So I devised that this big tower, the one right behind me, as the most sacred, the most iconic thing on this site, and that I would go down to the wire to save that structure. Then as I got into it more, I thought, that's kind of silly. Why wouldn't you save the one behind it? You know, husband and wife? And then you start thinking, wait a minute, there's four more: those are the kids. So it would break up a family. So I began to think bigger and bigger about saving more of these structures.

He saw a beauty in the industrial ruins few others saw. In the following years, Haag, who taught architecture and landscape architecture at the University of Washington, began engaging both his and others' students in the program as a studio project. Of

43 Thaïsa Way, "The Landscape Architecture of Richard Haag: From Modern Space to Urban Ecological Design," (University of Washington Press, 2015), 149-150

44 Shannon Sawyer, "Gas Works Park (Seattle)," History Link, March 9, 2020. https://www.historylink.org/File/20978

the 130 student submissions from other schools, every single one proposed demolishing the industrial ruins and carting off the toxic soil, essentially interacting with the sites as a *tabula rasa* project. While the ideas garnered from his own classes were marginally more fruitful, public sentiment was not in favor of Haag's radical goals for remediating and restoring the site. Convinced of his concept though, the next decade found Haag fighting relentlessly to persuade the city of his designs. He fought in creative ways such as moving RHA into an obsolete blacksmith shop on the still-toxic site, then cleaning and transforming the building to show the value and beauty of the old structures. In the end, Haag's powers of persuasion and "guerrilla tactics" won over the doubters, and in March 1972, his team was awarded the project to turn the site into a public park.

Though the project was now his, Haag still had the issue of the site to deal with. More than a decade has passed since the dissolution of the gasification plant, yet no plants had returned. The soil was too toxic to support life. Signs of pollution were all around—pearlescent films of oil lay on puddles throughout the site and digging resulted in visibly separated layers of industrial waste and sludge—clear lasting results of a major oil spill on the site which had been covered up instead of treated. Final damning evidence of the site's condition came when Dan Cole, a fellow professor who used the site as a case study in his Forest Resources course, lowered himself into a test pit, immediately becoming ill from the fumes and having to be rescued.[45]

45 Thaïsa Way, "The Landscape Architecture of Richard Haag," 159-160

At this point, the city proposed several *ex situ* remediation methods, including the removal and replacement of the top 6 feet of soil, which would involve carting over 180,000 cubic yards of toxic material to a dump in Oregon, or 'cooking' the soil with steam. Both methods, however, would have cost nearly the entire project budget and Haag was reluctant to simply relocate the toxic material since that wouldn't solve the problem, just move it.

Instead, Haag and his associates reached out to Richard J Brooks, a chemical engineer, and Willis Lebo, a farmer, businessman, and inventor. With their assistance, Haag's team began treating the site *in situ*, first deeply tilling the soil to allow oxygen to penetrate the clay and mix the soil layers, then introducing purifying agents such as fly ash to treat acidity and biological material such as sewage sludge and sawdust to promote the growth of an oil-eating bacteria. In just a few months, fresh rye grass was growing on the site. The remediation was so effective, Haag took soil home and used it in his own greenhouse, proving the effectiveness of his team's efforts.[46]

With the resounding success of the soil treatment, Haag's team moved on to the next problem: not all of the site's toxic material could be treated or purified. In answer to this, Haag sculpted the physical landscape of the site to accommodate material that could not be recycled or treated. This development resulted in a "great mound," a 35-foot cone with an eighteen-inch clay cap and fresh topsoil treatment as a permanent burial place for the toxic material.

46 Thaïsa Way, "The Landscape Architecture of Richard Haag," 161

Through careful grading of the site, Haag designed a rolling park that allowed water to move slowly and steadily, not remaining in any place long enough to penetrate the capped hills, but long enough to allow the bacterial ecology of the site to interact with and treat the run-off water before it enters Lake Union. Within its first summer, the newly named Gas Works Park was growing tomatoes and marijuana—courtesy of seeds imported unintentionally through the sewage. The tomatoes tested as safe as the San Joaquin Valley tomatoes used for comparison. [47]

Gas Works Park was officially made accessible on August 30, 1973, with the Great Mound's opening. The industrial material of the site, the barns and the towers, opened a few years later in 1975. The boiler house was converted into a picnic shelter; the exhaustion-compressor into a playground. Remnants of the former factory became spaces of play and color, covered in murals and art. Haag's family of towers remain standing and are a popular backdrop for music and events, though they no longer allow climbing.

Gas Works Park was quickly recognized as a success story and won multiple awards, notably the U.S. Department of Housing and Urban Development's Park Award, the Presidential Award for Design Excellence by the American Society of Landscape Architects, and, in 2013, a place on the National Register of Historic Places. Due to his vision and persistence, Haag and his team created a paradise out of pollution and, in doing so, a successful template for the remediation and redevelopment of industrial sites. Gas Works

47 Thaïsa Way, "The Landscape Architecture of Richard Haag," 165

Park is a precedent used by landscape architects across the globe, both for its unflinching memorialization of Seattle's industrial heritage and for its forward-thinking research and development of *in situ* and bioremediation methods.

Case Study:

Freshkills Park, New York

As the world's largest landfill-to-park restoration project, Freshkills Park (FKP) stands as a landmark in the field of remediation and regeneration techniques. An ongoing restoration project, the nearly four square miles (2,300 acres) site is setting precedence for large-scale urban park development worldwide and its continued growth sets the standard for community engagement, multi-phase project development, and experimental regeneration techniques.[48]

Freshkills Park is located on the western edge of Staten Island, one of New York City's five boroughs. Like Browns Point in Seattle, the original land was recognized for its natural beauty long before its industrialization. Frederick Law Olmstead himself argued in 1871 that the site should be developed into a series of "water preserves and public commons." Prior to its conversion to a public landfill, the site had a stream leading through innumerable tidal wetland pools—the word "kill" is based on the Dutch word for river.[49]

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48 Philip Hutchinson, "Exploring the Connection between Landscape and Biopolitics: The Story of Freshkills Park," in *Landscape Review* 1, no. 17 (March 2017), 96-105

49 'Freshkills' is the name of the park, but 'Fresh Kills' refers to the site more generally, including the landfill.

In 1948, however, under a development plan led by Robert Moses, the city converted the wetlands into a landfill with eventual plans to build a parkway between Brooklyn and New Jersey once the site was filled in. Despite 50 years of promises to close the dump, the landfill continued to grow, much to the dismay and anger of the native Staten Islanders who saw themselves as "a working-class borough being unduly saddled with all the city's garbage".[50] The hollow promise of cessation was eventually fulfilled, however, following the 1993 election of Mayor Rudi Giuliani and a rare alignment of republican political powers in the city and state. Finally, on March 22, 2001, the final barge-full of trash was transported to Freshkills landfill.

The decision to convert the landfill into a park was nearly instant. An international design competition was called for in late 2001 with Field Operations, led by James Corner, winning the project.[51] Field Operation's design was dubbed *Lifescape* and it took a new and controversial approach to interacting with the site: instead of designing the park through a pastoral or picturesque lens, *Lifescape* envisioned the park as a "new form of public ecological landscape; a new paradigm of creativity and adaptive reuse. *Lifescape* was to be informed by the voices of an engaged public and shaped by time and process."

From the beginning, it was clear a community-informed design was necessary for a successful project. For over four decades, Staten Islanders had dealt with the sights, smells, and stigma associated with living next to a dump. By the time of development, community sentiment was rock bottom and ideas were met with skepticism and critique born out of decades of neglect. This community interaction was an added layer of complication on top of the already technically difficult task of site remediation and reuse.[52]

In *Lifescape*, Corner uses what he calls the "theater of process" to organize and address the competing needs of the state, regional, city, and borough governments, as well as the needs of local entities—everything from the mall which borders the site to the local ATV users. Convincing these actors to give the project the time needed to be successful was an integral part of the overall design. In order to achieve the desired level of remediation and development, *Lifescape* was planned as a growing project with an estimated end date of 2036.[53]

The technical task of developing a park on top of a landfill is no less complicated than building one on top of a gasification plant. Instead of toxic land requiring purification, however, the issue with FKP was getting the soil to start with. In an operating dump, waste is piled into mounds that, once they reach a certain height, are wrapped with impermeable plastic and capped with a very thin layer of clay soil. At Freshkills, this soil was then seeded with highly aggressive grass species, a tactic that was valued for stabilizing the mounds but

50 Philip Hutchinson, "The Story of Freshkills Park," 98

51 Field operations would later go on to be involved in the design of NYC's High Line, a project which was completed in 2014

52 Jeffery Sugarman, "Environmental and community health: a reciprocal relationship," in Campbell, Lindsay; Wiesen, Anne, eds. *Restorative commons: creating health and well-being through urban landscapes*, (U.S. Department of Agriculture, Forest Service, 2009), 138-153.

now hindered biodiversity and public function. Additionally, as the landfill mounds naturally deteriorate, they deflate and shift, creating uneven terrain that must be continuously filled in.

Removing the waste mounds was not an option. Not only would this be prohibitively expensive, but methane gas and leachate—water that has percolated through the waste material—are harvested from the site and purified, going back into the public utilities to power the city. As an alternative, *Lifescape* explores interacting with the land through a series of layers: engineering, drainage, leachate, methane, and soil. In addition to these existing layers, new layers will be grown over the lifespan of the project: grasses, plants, paths, and playgrounds.[53]

Instead of a comprehensive master plan detailing elements that would likely never be constructed due to funding migration, Corner introduces *Lifescape* as process by which the massive landscape can grow over time. From the beginning stages of design, FKP was never intended to stop developing; the mounds will flatten and the landscape will change no matter what. Instead, the idea is to facilitate and guide this growth by breaking it down into a patchwork series of projects and stages. Once complete, this patchwork can be developed into a unified whole, continually expanding as more of the land is healed and made accessible.

53 Friends of the High Line, "Beyond the High Line: Transforming Fresh Kills, Staten Island," The High Line, Oct. 6, 2013, video, 1:03:18, https://www.thehighline.org/videos/high-line-network/beyond-the-high-line-transforming-fresh-kills-staten-island/

Corner's process is in three parts. The first stage—*Lifescape*—is the reintroduction of life, particularly through the creation of soil layers and restoration landscapes. The draft site strategy called for several soil management strategies: regenerating existing soil, purchasing or manufacturing new soils, adjustment the way still-active mounds are capped, and even experimenting with "industrial scale" crop rotation. Healing the existing land involved many techniques, most creative among them the use of goats to selectively destroy invasive Phragmites grass species, an aggressive and difficult-to-remove plant. The importing of some soil, though costly, was inevitable.

In an attempt to curtail this cost, Corner introduced a method of regenerative farming often seen in Midwest prairie reclamation projects. This method involved the growing of mass-rich crops and repeatedly tilling them, a process which, ideally, can be used to develop 6-9 inches of rich topsoil within 5 years. Unfortunately, this experiment did not create soil suitable for the native species of plants, so was abandoned. Other efforts, such as the recreation of the tidal flats and the utilization of an imprinting machine—a tool that creates divots in the hills, thereby providing space for plant life to grow on the slopes—have revealed themselves to be more successful.[54]

The second stage, labeled *open-scape*, initiated access to the site. Through a selective series of tours, art exhibits, path-making, and small-scale projects, *open-scape* aims to open as much of the

54 Jeffery Sugarman, "Environmental and community health," 147

site as possible to the public, generating interest and beginning the process of developing relationships with Staten Island and the larger city. Several of these projects are currently open, including the revitalized Shule Playground and the Owl Hollow soccer fields. Other prospective projects include the development of gardens floating on a barge, a vast land-art entrance experience, and a bird-watching tower.

The final stage of Corner's process is deemed *place-scape* . This stage will begin when the major regenerative efforts and the landfill operations have begun shutting down. Designs for *place-scape* include large-scale projects such as grand lawns for concerts and outdoor events, spaces to access the waterfront, and a 9/11 memorial that would guide walkers to the top of a large dirt mound, the very same mound that houses the ruined remains of the two towers.

These three stages, planned out over thirty years, will come together in the end to create a cohesive park filled with drives, pathways, meadows, forests, and tidal flats; a biodiverse and ecologically sustainable park set within the confines of one of the earth's largest cities. Instead of a dump, Staten Island will be home to one of the largest urban parks to date.

Utilization

At the most fundamental level, industrial sites are composed of two elements: the land and the structures. The issue of land is addressed through the topic of regeneration and remediation, so the next step is to consider the built fabric of the sites themselves. The built environments of industrial and post-industrial sites are often in a state of ruin or decay, even those rare projects that make use of recently closed sites. Besides the technical complexity associated with historic preservation, these buildings present further issues to redevelopment: their organization, materiality, and safety.

Industrial sites are rarely organized in a manner that is appropriate for redevelopment. Due to the nature of their use, industrial sites are commonly built *ad hoc*, meaning as needed. The natural expansion, demolition, and redevelopment of an operating industrial site necessitates the constant construction of vernacular industrial architecture to fit the present needs, often in the cheapest manner possible. Warehouses in steel mills, for example, are rarely more than corrugated steel paneling over massive steel columns. This issue is somewhat mitigated on historic sites where the vernacular construction techniques lend themselves towards brick, stone, concrete, and mass timber construction. Regardless of materiality, industrial architecture is rarely insulated, well-lit, or up to code in

terms of fire safety and ADA compliance. Transforming and utilizing industrial structures commonly requires the demolition of building elements or even entire structures to make way for necessities such as lighting and restrooms. If done correctly, however, historic structures have the ability to transition from a state of only age-value to one of both age-value and use-value.[55]

55 Alois Riegl, 'Der Moderne Denkmalkultus: Sein Wesen und seine Entstehung' (Vienna:Braumüller, 1903). Republished in Alois Riegl, *Gesammelte Aufsätze*, ed. K. Swoboda and H. Sedlmayr (Vienna-Augsburg: Filser, 1929). Translated as 'The Modern Cult of Monuments: Its Character and Its Origin', trans. Kurt W. Forster and Diane Ghirardo, *Oppositions* 25 (1982): 21–51

Case Study:

MASS MoCa, Massachusetts

Located in the city of North Adams, MA, the Massachusetts Museum of Contemporary Art is the quintessential redevelopment project of an *ad hoc* industrial site. The original building on the site was a lumber mill built in 1768, but rapid industrial expansion led to the eventual development of a closely set series of brick and mass timber structures that would come to be known as Marshall Street.

Throughout the 1700s and into the 1800s, water wheels turned by the Hoosic River powered looms, saws, lathes, the tools of shoe, hat, and wagon manufacturies, cabinet-makers, machine shops, a brickyard, a marble-works, and an iron-works. The Marshall Street complex continued to evolve into the late 1800s, becoming home to Arnold Print Works and as well as cotton manufacturies. Even with the setback of a major fire in 1871, Marshall Street's commanding location and industrial assets led to further expansion that, by the end of the 1890s, developed into an interconnected complex of 28 structures which, other than one modern addition, would remain the same throughout the 20th century.[56]

The site remained an important manufacturing hub into the 1900s. Sprague Electric Company, the primary tenant beginning in

56 John Heon, "History and Change at the Marshall Street Complex," in *MASS MoCa: From Mill to Museum* (North Adams, Mass: 2000), 10

the 1920s, was a major manufacturer of capacitors and high-tech equipment used in WWII and, later, components used in the space race. By that point, Sprague employed almost a quarter of North Adam's 18,000 residents, with nearly every family having at least one member employed in the now city-like complex on Marshall Street. Up until its eventual consolidation and subsequent sale to Penn Central Corporation, Sprague was the linchpin of the North Adams economy. This significance, however, did not protect the company or the site from the rampant deindustrialization that spread throughout the Northeast near the end of the 20th century and led to Marshall Street's abandonment in 1985.[57]

Although Sprague had gutted the interiors of the historic structures to make room for its manufacturing lines and assembly tables, the historic exterior facades remained almost entirely unchanged. This fact, along with the site's significant role in the history of American Industry, were major factors in Marshall Street's 1985 addition to the National Register of Historic Places. The lasting quality of the industrial structures—the original brick and mass timber structure was in excellent condition even a century after construction—also made it an immediate candidate when, in 1986, the Williams College Museum of Art (WCMA) came looking for a space to display their collection.

The WCMA was looking for a mill space, their vision from the beginning to use an expansive, largely blank slate of a site to display large works that would not fit in their conventional museum galleries. This program was perfect for the abandoned complex. Upon looking at Marshall Street, WMCA realized that it had the potential to be even more than its original program. They proposed expanding their original museum concept into a cultural center that would not only be the largest contemporary art museum of its day at 780,000 sq ft but would connect North Adams to the region's other cultural institutions. In 1988, after acquiring the necessary community backing and funding, the newly minted MASS MoCA officially requested design proposals, eventually deciding on a proposal by Simeon Bruner of Bruner/Cott & Associates for Phase 1 of the 3-phase project.

The goal of MASS MoCa was to create a responsive gallery space, one that was freed from the stifling sterility of the traditional museum—its hermetically sealed spaces and exact lighting. Mass MoCa is not the originator of this desire; other adaptive reuse projects in Switzerland, Germany, and Spain have had similar goals, contrasting and combining old and new gallery spaces to allow room for art to exist in a new context. Art itself was no longer restricted to the frame, so why should the gallery be restricted to the white box?[58]

To achieve this new language of art interaction and legibility, Bruner translated the bare industrial spaces of the mills to the language of a studio space: free for grit, creativity, and art to exist on every surface or none, yet scaled up to the level of a museum. His master plan called for as much of the original fabric of the structures

57 John Heon, "History and Change at the Marshall Street Complex," 11

58 Hallen für Neue Kunst, the Skulptur Projekte, and Centro de Arte Riene Sofia respectively

to remain intact and called for a design where the hand of the designers was invisible. Beyond the galleries, the site itself weaves into this new context. New walls grow out of the old where needed and interventions of glazing blend seamlessly with the original lighting scheme. New spaces are arranged to be immediately understood as added elements, yet so seamlessly integrated that it is not immediately apparent what elements are the new ones.

As with any museum project, lighting is a critical aspect of the design process. Many of the structures on Marshall street were built before electric lighting was widely integrated into mill design. As such, the Marshall Street complex was originally built for natural lighting but, with the advent of electricity and the complex's unfaltering growth, many historic windows were slowly filled in or blocked. The site's historic designation complicated demolition, even if it was necessary, but in the end building 3 was demolished to create a courtyard that acts to bring light and air into the complex as well as reinforce the entrance.[59]

Through a careful sequencing of spaces, creative use of materiality to integrate new safety features into the existing context, and the careful restructuring of dilapidated areas, Bruner slowly designed a new way for art and cultural programs to be inserted into the mill. The process was deductive. Instead of transforming the buildings to fit the program, the program shifted to meet the needs of the building. Regarding HVAC, it was immediately apparent that

59 As a brownfield site, other demolition was necessary on a smaller scale. Additionally, extensive removal of toxic material and site remediation was necessary, as should be assumed with nearly all historic brownfield redevelopements.

there was no way to condition the entire space. Instead, a new set of "buildings" were constructed inside of the confines of the historic structure, inserts that could be climate-controlled without requiring major renovation to the historic walls and ceilings. This solution, like many others throughout the project, displayed the gentle hand of the architect and his unfaltering reimagination of the adaptive project.[60]

The design of MASS MoCa is an ongoing project. Bruner/ Cott & Associates finished Building 6 in 2017 and Building 7 in 2018, marking the final structure of Phase I.[61] As of 2024, the cultural center is in the process of preparing for Phase II which is intended to expand the museum's cultural impact through participation events on both a global and local scale. Upon completion, Phase III, which primarily concerns the greening and utilization of open spaces, will begin. The goal is to have these phases completed by 2030, though major events like the 2020 Covid epidemic and the 2021 unionization of the staff have slowed down the initial timeline.[62]

MASS MoCa is a potent example of the ongoing use-value of historic structures, beyond their their purely historic-value or age-value. MASS MoCa is all about changing relationships: the relationship of art to the gallery; the relationship of the gallery to

60 Simon Bruner, "Architects Statement," in MASS MoCa: From Mill to Museum (North Adams, Mass: 2000), 113-121

61 "MASS MoCA Building 6 / Bruner/Cott & Associates," ArchDaily, 20 Nov 2017, https://www.archdaily.com/883699/mass-moca-building-6-bruner-cott-and-associates

62 Kristy Edmunds, "MASS MoCa 2024-2030 Strategic Plan," MASS MoCa, June 24, 2024 https://massmoca.org/strategic-plan/

the museum; the relationship of the museum to the city. No longer the economic linchpin of North Adams, Marshall Street now acts as a cultural hub and a nexus for connection to the larger artistic and cultural framework of the state and country. As the site continues to grow, these relationships grow stronger, further displaying the ability of industrial sites to evolve, welcoming and enhancing new context and use within their historic walls.

Case Study:

Dia:Beacon, New York

The Dia:Beacon Museum in Beacon, New York is a project with the same goal and primary program as that of MASS MoCa: using the context provided by monumental industrial structures to provide a new context for the display of art. Where MASS MoCa proceeds to provide spaces associated with its role as a cultural institution, Dia:Beacon doubles down on its sole mission: the art.

Art is the essence of the Dia organization. Founded in 1974, Dia's purpose has always been to enable its artists to create some of the most monumental and ambitious art from the 1960s onward. Even the name, Dia—Greek for "through" or "between"—is intended to relay the goal of being an enabler of creation. Some of the organization's most significant works include Joseph Beuy's 7000 Eichen (7,000 Oaks), Walter De Maria's The Lightning Field, Donal Judd's Chinati Foundation in Marfa, Texas, as well as works by the likes of James Turrell and Andy Warhol. Their sponsorship has enabled the creation and presentation of world-class art both in their museums and out in the world. Many of their supported artists design pieces that encompass entire landscapes, most of which are in the American Southwest. Few of Dia's supported artists create art that fits neatly within a frame fit for a traditional museum experience—they reject the confines of white walls and direct lighting. Instead,

the Dia foundation, much like the WCMA in Massachusetts, looked to the straightforward and logical aesthetic of industrial spaces to supply the unencumbered volumes within which to present their art.[63]

The desire to use an industrial site largely arose from within the organization. Some of Dia's notable artists, particularly Donald Judd, were practiced in the reimagining of industrial sites as places for art. Judd had already achieved this at his Chinati Foundation, where an abandoned military site has been converted into a museum for contemporary art. Judd was adamant that the new museum be a re-use project, stating that "new land should not be built upon... and existing structures should be saved, "important" and "unimportant" alike."[64] Beyond just considering re-use projects "moral and ecological," Judd believed that reuse provided a "desirable ratio between expenditure on art and expenditure on architecture—giving art preferences by all measure."

The implementation of art into the stark interior of a mill or warehouse allows the art to become the judicator of the space, determining what goes and what stays—the art and the structure can begin to have a conversation between installation and renovation. Judd thoroughly rejected the traditional museum environment, instead remarking that the artists themselves should decide how their works are displayed within the new museum. Judd's ideal created a framework within which the design took place, a task given to

63 Lynne Cooke, Michael Govan, and Dia Art Foundation, "Dia:Beacon" (New York: Dia Art Foundation, 2003) 10-64

another of Dia's artists, Robert Irwin.[65]

Irwin's designated site was the Nabisco box factory in Beacon, New York—a site soon to be nominated for the Historic Register.[66] The historic factory site was ideal for the project: durable concrete columns and maple wood floors filled nearly 300,000 sq ft of gridded gallery space, the perfect blank template that could be partitioned with walls based on each artist's needs. An especially valued element of the building was the extensive system of north-facing saw-tooth skylights that provided blanket natural lighting. Space, light, and movement through that space become the imperative of the project, as well as other topics important to Irwin: time, symmetry, and direction.

To better understand the factory and its spaces, Irwin moved to the Hudson Valley in 1998, seeking to "set up an intimacy with the place for myself and... create that same sense of intimacy for the future visitor of the museum." As the building was already perfect for its intended use, Irwin's objective was primarily to facilitate movement through the installations and the accommodation of necessary building systems, such as fire safety, accessibility, and wayfinding. In 2000, Irwin issued his proposals, namely a system of rules that would organize the spaces (axis of orientation, methods of

65 "The museum should be serious and competent and much is expected but it's a disappointment and a failure...so much money spent on architecture in the name of art, much more than goes to art, is wrong, even if [the] architecture were good, but it's bad."

66 The Nabisco Factory was added to the NRHP in 2003

lighting, and wayfinding) with the acknowledgment that these rules would be broken when necessary to facilitate art.

Along with organizing exhibits and systems, Irwin proposed a holistic treatment for the building and site. This included interventions for the parking lot, an entry vestibule, and a formal garden to the side of the structure to provide circulation and a place of rest. Irwin's solutions to programmatic necessities were creative: the implementation of more than twenty emergency exits became opportunities to bring light into the building and develop axis with which to pull visitors through the building. He did not designate a route through the galleries, nothing is choreographed. Visitors are free to explore and wander, yet through careful consideration of symmetry, balance, and lighting, viewers are inclined onward, seeking to witness more of Dia's collection. To transform Judd's ideas and Irwin's masterplans into reality, Dia hired Open Office and Rice+Lipka Architects to draw up the plans and manage the project, which was finished in 2003.[67]

Dia:Beacon continues to grow. In 2024, Dia announced their partnership with landscape architect Sara Zewde of Studio Zewde to masterplan the museum's 32-acre site into a park. Just as the museum was made to house art of a grand scale, it now will become a piece of art and history set with a designed landscape.[68]

67 Lynne Cooke, Michael Govan, and Dia Art Foundation, "Dia:Beacon, 35

68 Maria-Cristina Florian, "Landscape Architect Sara Zewde Reimagines the Land at Dia Beacon, New York" ArchDaily. 12 March, 2024, https://www.archdaily.com/1014440/landscape-architect-sara-zewde-reimagines-the-land-at-dia-beacon-new-york

Memorialization

Memorialization is simultaneously the most important and most neglected aspect of industrial redevelopment and heritage. Memory is not a simple element to encapsulate. The memorialization of industrial sites, however, has significant relations to the memorialization of cultural trauma, as these sites, like sites of war and death, bear the scars of their pain; the scars of ecological trauma.

Redevelopment of Industrial brownfields and sites of historic heritage is the act of layering, sometimes literally—as in Freshkills—and sometimes in a more metaphorical sense. These sites are made of layers: they are palimpsests. They are places that are erased, then covered, then erased, over and over. One of the first applications of the palimpsest concept was by Peter Eisenman in his design for the Wexner Center for the Arts in Columbus, Ohio.[69]

Here, Eisenman explored the site as a place of writing, erasing, and rewriting. Treating a site as a palimpsest is the acknowledgment that the site itself is capable of holding memory, a theory seen earlier in Daniel Libeskind's "Trauma." Instead of dead things that can be wiped clean and remade, sites are living

69 Amir Arbabiyazdi and Mohsen Zeraat Pisheh, "Context as palimpsest," Journal of Basic and Applied Scientific Research, 2 (2). (2012) https://www.semanticscholar.org/paper/Context-as-Palimpsest-Arbabiyazdi-Pisheh/

spaces that hold their context in the form of peripheral memory. Eisenman's theory, therefore, is that the only way to the future is by bringing that memory to the present.

It is much cheaper and simpler to ignore the history of a trauma site and simply look at its use-value. By looking at their redevelopment as merely another layer interacting with an entire history of context, however, industrial sites become places where use-value, age-value, and historic-value can all come together to become enriching locations of economic prosperity and cultural vitality.

Case Study:

Landschaftspark Duisburg-Nord, Germany

Peter Latz's Duisburg Nord Landscape Park is a project of such magnitude that it defies categorization. It is the pinnacle of industrial redevelopment and memorial heritage projects. It is a seamless blend of regeneration techniques, creative interventions, interactions, and utilizations of the site's built fabric. Most importantly, it is a project that emphasizes memory and memorialization and in doing so sets a worldwide precedent for interacting with industrial spaces.

Duisburg Nord Park is built above, through, and around what was Meiderich Steelworks. Built by August Thyssen in 1902 at the height of Germany's Ruhr region industrialization, the plant thrived through the 20th century, supporting war efforts and industrial expansion. Unfortunately, it too closed in 1985 with the global wave of industrial shutdowns, a wave which ravaged the heavily industrialized Ruhr. During the plant's operation, the 230-hectare steelworks was completely inaccessible to the public even though it lay smoking and rusting in the center of the urban landscape.[70]

No other German landscape was as deeply scarred by industrialization, nor left so impacted by its wake. For this reason,

70 Udo Weilacher, "Syntax of Landscape: The Landscape Architecture of Peter Latz and Partners," (Basel;Boston;Berlin: Birkhäuser, 2008) 105

it was deemed the perfect place to answer the question: What is a 21st-century park and how should we interact with this industrial landscape? To this point, the IBA Emscher Park International Building Exhibition joined in 1989 to look at the Ruhr region and establish a regional policy for the sustainable ecological, economic, and aesthetic renewal of the industrial region that had been so heavily exploited. One of the major points of the convention was evaluating the Duisburg Meiderich steelworks with the specific intention of converting it into a park.

From the beginning, it was understood that the Meiderich site would be an extremely complex task. Apart from its massive size, the plant hadn't been decommissioned upon closure. As such, the highly polluted site was still host to massive service structures, vast storage pits and pools, and the utterly monumental steel fabrication system itself—a collection of blast furnaces, turbines, cooling towers, foundries, and more. Hundreds of rail lines split the yard, crossing over networks of roads, under lines of overhead pipeworks, and across cesspools of toxic open water. To locals, the site was *terra incognita*, an unmapped and unknown foreign landscape.

Given its size and significance, the 1989 Meiderich site project competition was larger and more cooperative than many similar projects. After a year of evaluation and work, however, Donata Valentien, the jury chair for the project, was disappointed in the results. Her issue with the submissions was due to how neutered the site became: "the special qualities of this extraordinary site had been described and appreciated, but had then simply been forgotten

when developing a vision for the future park. 'So the ideas remained essentially random, and could just as well have been realized at other, ' normal' locations..."71 Only one project departed from this "culture of forgetting and suppressing": the syntactical planning approach of Peter Latz.

Latz had already experienced the unfruitful process of designing a 'traditional' park in an industrial landscape in his firm's Saarbrücken project. At Duisburg Nord, he was able to skip this step and strike at the heart of the project: not simply in land renewal and preserving monuments, but "first and foremost in the process-driven, functional transformation of complex landscape structures with an inevitably high proportion of unpredictability... in viewing landscape as a complex structure of meaning and information strata, requiring a complex approach to the design."[72]

Latz understood that attempting a comprehensive master plan for the site was impossible; there were simply too many different elements and areas to work with. Instead, Latz's team separated the site into four abstract categories which defined four different parks. These categories would act as lenses through which to view the site and organize it. The first park was the "water park" made up of canals, pools, and basins throughout the park. The second park was the "rail park," a massive interwoven network of railways and their associated facilities. The third park was made of roads, routes, paths, and over 20 bridges. Finally, the fourth park was made of the land: fields and gardens, both the vast open spaces

71 Udo Weilacher, "Syntax of Landscape,"107

72 Udo Weilacher, "Syntax of Landscape,"109

and small *hortus conclusus* tucked into the coal basins. These four parks layer and intertwine, linked by ramps, stairs, terraces, and gardens. Throughout there is a focus on symmetry, space, light, and, again, movement through that space. By interacting with the site through these ideals and with the utmost goal of "least possible intervention," Latz's team began to design a landscape that was open to interpretation. "The intelligibility of the existing information planes in the industrial landscape was preserved almost completely, carefully complemented with new levels of meaning or "culturally recycled" in places."[73]

The multifarious ways in which these ideals are implemented within the park reflect the chaotic and varied nature of the site itself. As with all toxic brownfield sites, the initial issue was to address the extensive pollution and chemical waste. Duisburg Nord was a large enough site to have mines on property, so for the more toxic areas, waste material was removed and buried within these mines which were subsequently sealed. Some mildly polluted spaces were left to regenerate naturally, an experiment to see how nature would reclaim the steelworks if left alone. Within the mining area, the soil is nearly entirely composed of rocky remnants of mining activity; very little dirt exists. In summer, these unnatural black substrates can reach temperatures of over 140°F, meaning very few species of plant are capable of surviving. In the name of littlest possible intervention, however, these spaces have been left. Now, decades later, pioneer species of birch, echium, and stonecrop have migrated

73 Udo Weilacher, "Syntax of Landscape,"116

to the site by natural means. Over time, either these plants and the sun's heat will revive the waste spaces, or they won't and the site will remain a monument to its exploitation.[74]

Throughout the park, kilometers of paths and roads guide visitors in vast, curving turns made to reinforce the site's original organization and segmentation by the rail lines. Just as how a train cannot suddenly turn left or right but must take vast gentle curves, so too do visitors traverse the park and experience its monumentality through the seemingly endless curving paths. By layering new alongside—not on top—of the original fabric of the site, Duisburg Nord truly acts as a memorial. In the New York Times article *The Anti-Olmsted*, Arthur Lobow highlights Latz's layered approach to the site. He remarks on Duisburg Nord's palimpsestic nature by comparing it to the 19th century parks of Olmsted and Vaux. "Instead of sculpting the land, carving out idyllic pastoral scenes, Latz displays [Duisburg Nord's] temporality as proudly as its artificiality... Any changes that obscured history he found repugnant—an aesthetic and moral violation."[75]

The park's temporality is apparent throughout; rust is a feature. The rust, however, does not limit interaction. Walkways and stairs weave throughout the blast furnaces and pipeways, creating paths at several elevations. At the top of the furnace complex is a viewing platform; at the bottom is an amphitheater. Gardens have

74 Slice Travel, "A post-industrial site turned ecological flagship | WIDE," Youtube, video, 24:46, https://www.youtube.com/watch?v=OrOTMvXWBJU

75 Arthur Lubow, "The Anti-Olmsted," New York Times, 16 May, 2004, https://www.nytimes.com/2004/05/16/magazine/the-anti-olmsted.html

been woven throughout the site, insertions into bunkers and sinters. Basin walls have been converted into climbing areas, gas tanks into world-class diving facilities, and the canal—which was once little more than an open sewer—is now a relaxing space to swim. . Instead of demolishing the original structures and inserting new uses, the spaces of Duisburg Nord are repaired, remediated, and repurposed to fit the new programs. The new does not replace, it exists within and besides, highlighting and being transformed through the site and the memory layers it holds. Much like how Jonathan Park's colored lights accent and reimagine the stacks each night, through proximity and intentionality Duisburg Nord reimagines what the 21st century park can be used for and how recycling of industrial space can provide value beyond its real-estate price tag. [76]

Like all such sites, the Landschaftspark at Duisburg Nord is a continuously growing and evolving space. Much like at Freshkills, as more of the land is healed, more will be made accessible. As gardens and fields grow, they change the way the landscape is interpreted. Rust and deterioration will slowly carve the ruins of industry, revealing new ways for the spaces to be interpreted and interacted with. Inevitably, another layer will be added to the park. The palimpsest will continue to grow, but, because of Latz's systematic categorization and layering of the site and the respect of new programmatic elements to exist in tandem beside historic elements, Duisburg Nord's effectiveness in relaying the historical narrative will still be effective.

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76 Udo Weilacher, "Syntax of Landscape,"136

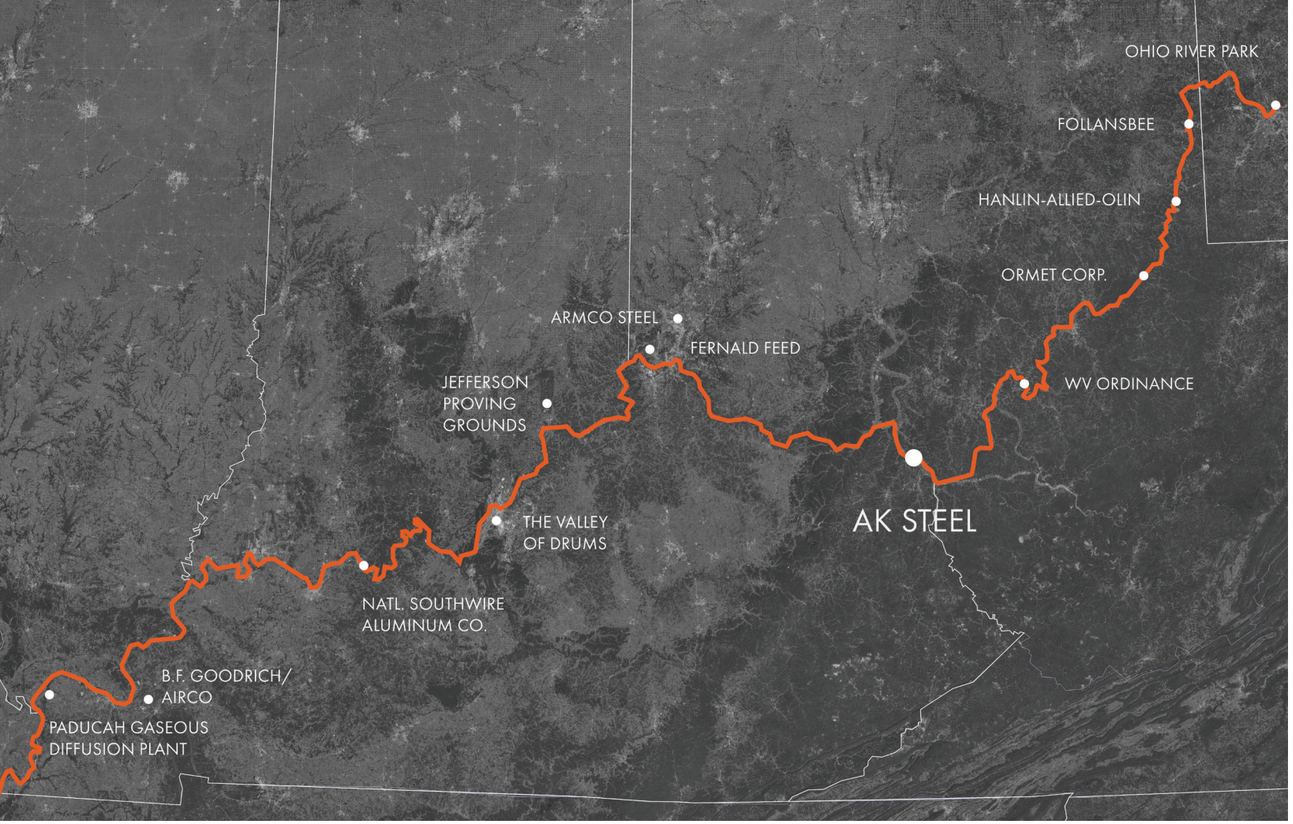


Fig. 22_Ohio River Map

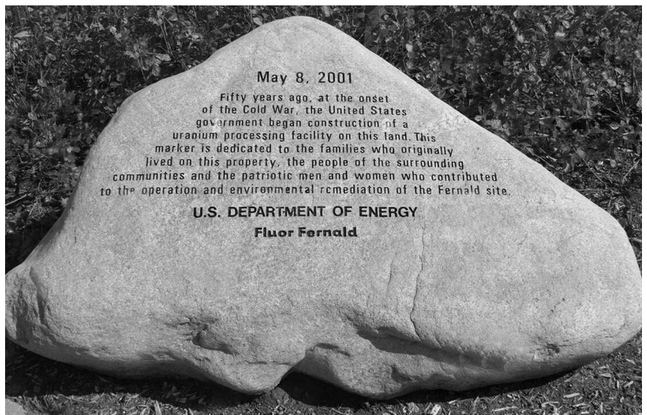
This map highlights the locations deemed of particular value amoung the 30+ NPL sites along the Ohio River. The selected sites include nuclear enrichment facilities, vast industrial dumps, steelworks, and military testing sites. AK Steel, the anchor site in this project, lies in the tri-state area of Kentucky, Ohio, and West Virginia.

ARMCO Hamilton

These images show the first of two "solutions" to Ohio River Industrial sites. This solution is demolish and forget. This site was demolished in 1989.

Fig. 23_Left_The armco site in 1957, still operational.

Fig. 24_Right_A 2023 satellite image of the same site, still largely a barren concrete brownfield 30 years later.



Fernald Feed & Materials

At Fernald, we see the second solution: greenwashing. By covering the nuclear waste site with a park and placing a "memorial", the site's ecological impact is effectivly forgotten.

Fig. 25_Left_The site in 1951

Fig. 26_Right_A memorial rock which sits on the modern park site

08. Project:
The Ashland Steelworks

Growing up in Paducah, KY, I was told to never swim in the river. Paducah—sometimes called the four-rivers city—is located at the nexus of the Mississippi, Cumberland, Tennessee, and, most importantly, the Ohio River. Every day, like many Ohio River cities, billions of gallons of water flows by every day, carrying with it all the waste, chemical run-off, and industrial pollution that impregnate the water.

As of 2015, the Environmental Protection Agency (EPA), considers the the Ohio River to the most polluted river in America.[77] That year alone, the Ohio River discharged over 23 million pounds of toxic waste, the majority of which was directly due to pollution from the steel industry. The steel industry is not the only culprit, however. According to the EPA's Superfund National Priorities List (NPL), there are over 30 superfund sites between Paducah, KY, and Pittsburg, PA. Although not all of these are sites of heavy industry or industrial heritage, many are. Every year, more and more industrial heritage sites along the Ohio River are decommissioned and demolished, eradicating both the historical industrial heritage of the Ohio River Valley, and erasing the scars of ecological trauma that industry has left.

At the largest scale, *Ashland Steelworks* is a proposal for

77 Caroline Cory,"Advocating for a Clean Ohio River." Environmental Law & Policy Center. March 2, 2020. https://elpc.org/projects/cleaning-up-ohio-river.

Fig. 27_ARMCO Steel, Ashland_1949

This aerial photo of the Ashland steel site is dated 1949. Many historic images of this site are from an aerial perspective because aerial imagery was used to estimate on-site raw material quantities. Along the river are the mill facilities and behind the large central pool is where the blast furnaces are located.

the establishment of an Ohio River Industrial Heritage Trail which would string together significant sites of ecological trauma and industrial heritage into a multi-state cultural landmark path. Due to the scope of the project, attention is paid specifically to the AK Steel site in Ashland, Kentucky, a location which, much like Peter Latz's Duisburg Nord Landscape Park, will be treated as an anchor point for the Heritage Trail.

The iron industry first came to Ashland, KY in 1845. The city was ideal for industrial development: directly on the river, located in the heart of coal country, and close to several states. Ashland Iron & Mining, Norton Iron Works Company, and the American Rolling Mill Company (ARMCO) each understood the value of the location for the metals industry. In 1920, ARMCO proposed the consolidation of the three companies and the subsequent construction of an integrated steel mill along the Ohio River, just west of Ashland, KY. It was here that ARMCO Steel revolutionized the steel industry, introducing the world's first continuous sheet steel rolling mill. Throughout the 20th century, the ARMCO continued to grow, developing, demolishing, and redeveloping the industrial facilities. By the 1980s, ARMCO Steel, now ARMCO Inc., had grown the site to include two massive blast furnaces—Amanda and Bellefonte—eight 118-ton open-hearth furnaces, a 600-ton mixes, blooming, plate, and sheet mills, and a sintering plant, a taconite pellet plant, and a tandem cold mill.[78]

The Ashland site was a major steel producer for the US and

78 "Armco Steel Ashland Works," Abandoned Online, 08 May, 2024, https://abandonedonline.net/location/armco-steel-ashland-works/

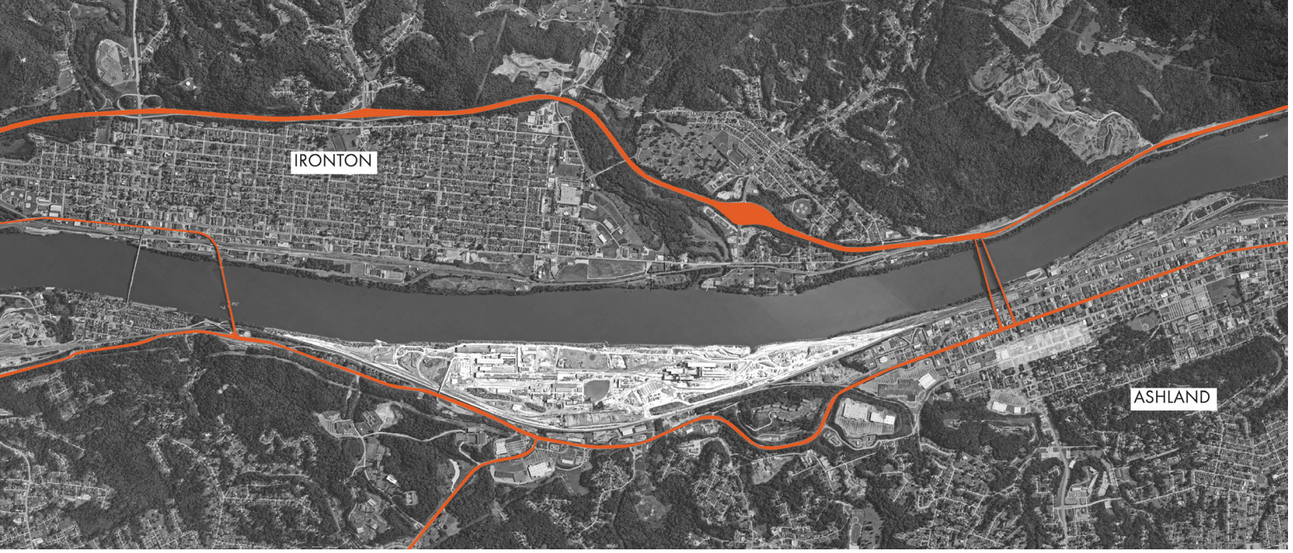


Fig. 28_Urban-Scale Map

The Ashland Steelworks site is located just west of the city of Ashland and across from the city of Ironton. Though in a relatively rural area of the state, it is a prime location for an anchor site due to its central location on the Ohio River and its proximity to each state.

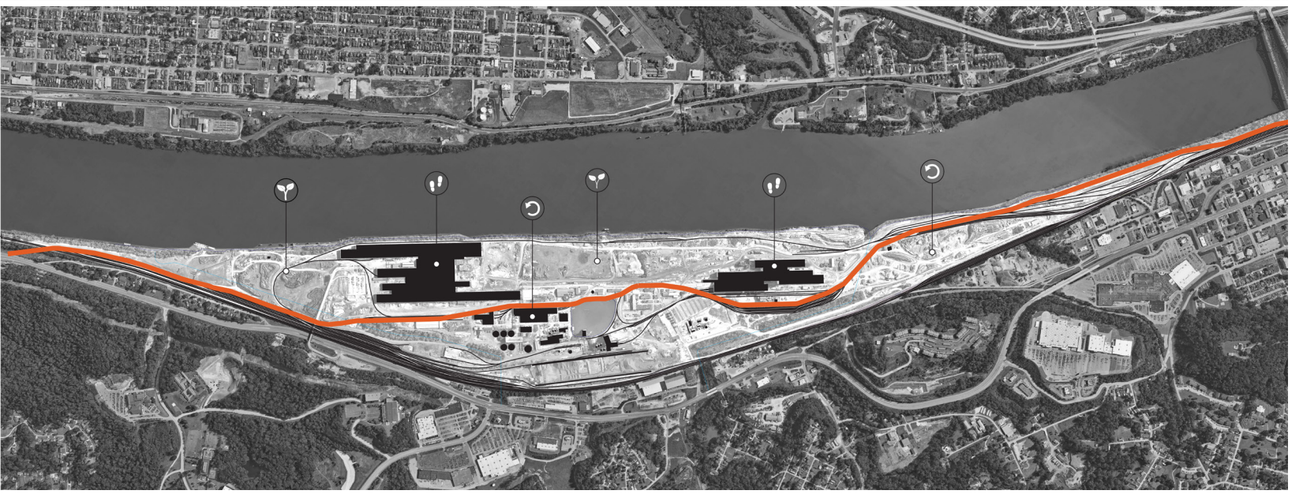


Fig. 29_Site-Scale Map

The site itself can be loosely divided into three catagories, as explored previously in this thesis: places for regeration (plants), utilization (footsteps), and memorialization (arrows). The black areas are significant on-site structures. The rightmost complex is the structure that is explored in Fig. 31-33

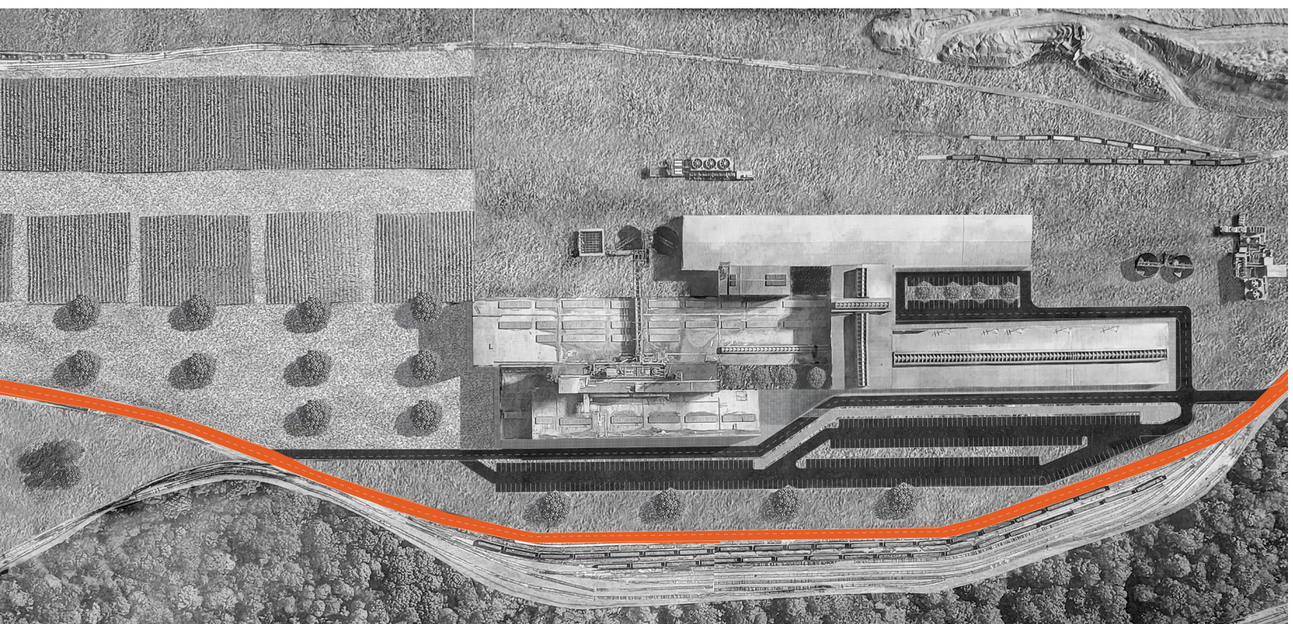


Fig. 30_Local-Scale Map

Developing a site strategy was done through a combination of physical collage and digital editing. Interacting with the site through a process of cutting and pasting layers allowed for an iterative process of priorities. Here, the rails take precedent, organizing the division of paving, gravel, and woods.

it was even more important locally, where it employed a significant number of Ashland's population. Near the end of the century, however, aging facilities and steep international competition began impacting ARMCO. In 1989, more than 40% of the company was sold to Japanese competitors. By 1992, thousands had been laid off due to poor performance from the rapidly aging machines. In 1995, the debt-ridden ARMCO sold the Ashland site to AK Steel, who rapidly began cost-cutting. The steelworks was in a slow death spiral that would eventually end in 2019 with the announcement of permanent closure by the end of the year. At the last minute, Cleveland-Cliffs purchased the site, evaluating potentially restarting the facility. In the end, however, this was not feasible. Demolition would soon follow for the Ashland site.

For the purposes of this thesis, however, I am exploring an alternative: what could this site have been if it were considered as an anchor for an American Industrial Trail?

The Ashland Steelworks is a massive 280 hectares; 2 miles long by half a mile wide. Nearly as large as the neighboring cities, the first step in evaluating the site was, following the precedent set by Duisburg Nord, syntactically analyzing the site and establishing layers, lenses with which to evaluate the park and its 'massing'. Working under this model, it is immediately apparent that there are three major organizing elements to the Ashland site: first are the rails, second is the land, and third are the structures.

Rails and industrial sites are inseparable entities. By looking at the rails as the first organizing layer of the site, clear divisions of space become readily apparent. While is it probable that the

Fig. 31_Entrance Perspective

In exploring the materiality of the structure, it was determined that the best texure to use for the facade was the existing one. The corrugated steel in this image is a collage of the true material photographed from the building.

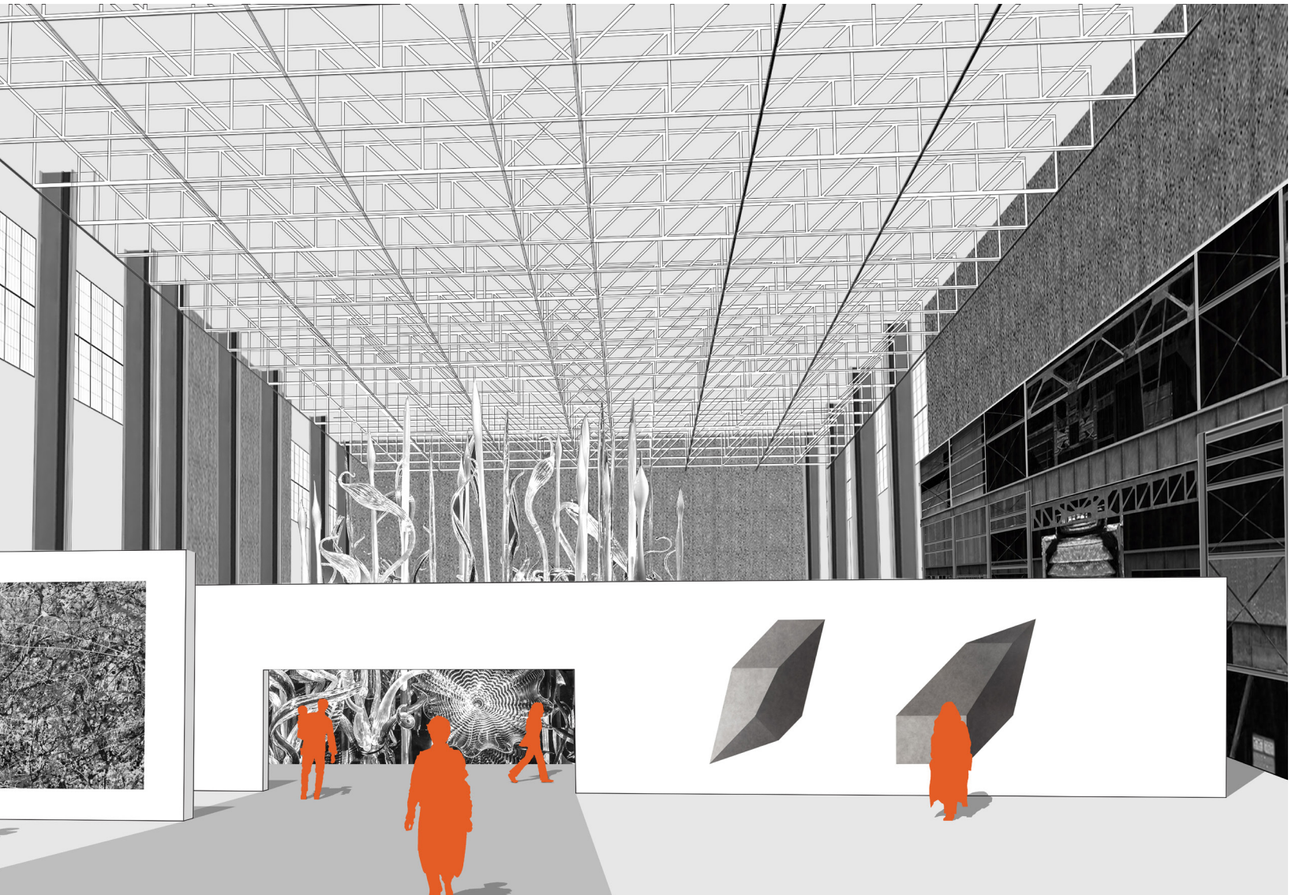


Fig. 32_Gallery Perspective

Changes of materiality on distant walls act as a suble wayfinding method, drawing visitors deeper into the complex of vast spaces.

structures were built first, visually it feels as though the rails are the determining entities on the site; they shape the massive mounds of material, they weave and direct the paths of traffic, and a triple line even acts as a seemingly impenetrable barrier lining the edge of the site, isolating it from intrusion. The rails guide access to and from the site and so are treated with the respect they demand. The rail lines divide the ecosystems, the microclimates of substrate within the park.

The land itself is a critical element of the Ashland site. Surrounded by hills, the topography of the steelworks is incredibly flat by comparison; in fact, it is entirely flat except for the mounds. A hundred years of production results in massive amounts of byproduct waste. Rolling hills of iron buttons—massive plugs of metal resultant from the smelting process—tailings, and slag, along with the piled remains of demolished structures and raw material, have formed a unique topography on the site, one which is reminiscent of picturesque gardens subtly blocking sightlines yet suggesting more behind. Throughout the park, these mounds, which would need to be capped, are included in the design. They are integrated as land-art and they provide elevated spaces for viewing the fields, both those of regeneration and memory. These fields would be treated as they are named: to the east, regenerative techniques would be applied to the land, resulting in verdant fields, spaces to be enjoyed by locals and visitors alike. To the east, the land would be cordoned off, a desolate place to be overtaken by what little nature can claw a life out of the toxic soil. These fields would juxtapose each other, providing context and perspective on the process of brownfield development

Fig. 33_Entrance Lobby Perspective

The industrial scale of steel mills is seperate from that of manufacturing plants like Dia:Beacon or MASS MoCa. At Ashland, there are no forests of columns, just massive open spaces. Here, Cia Guo-Qiang's modern art installation *Innopportune: Stage One*, a massive piece of experiential art, is used to suggest the value of such open space for uses in a museum context.

and showing the scars industrialization leaves on the landscape. In order to enter the site, one must pass by the fields of memory. In order to enjoy art and green fields, the layers of memory must first be respected.

The last organizing elements are the structures themselves. The structures at the Ashland Steelworks are divided into two categories: structures for use and structures for memory. Much like at Duisburg Nord, the structures for memory are the industrial elements; the rusted monumental forms of the blast furnaces and sintering pits. These structures impart their sublime nature by vastness alone, and they stand as relics of a time of ecological extortion.

A notable feature of the Ashland site is the quality of the use-structures. Unlike at any of the case studies previously addressed, the warehouses and mills on the Ashland site are not quality structures. They are bare-bones mills; little more than corrugated steel over monumental structural columns. They are patchworks of rust and bolted metal plates, not quality brick and mass timber. This begs the question: what is the value of the industrial vernacular? Is it strictly in its material value—stone, concrete, wood, and brick—or does it go beyond materiality into aesthetic? Is rust truly a feature when it applies to living buildings? This is the question I sought to answer in reimagining the behemoth mills. By working with existing facade materials yet interjecting horizontal datums and a defined new language of materiality, the monumental exterior facades of the structure were brought to a human level, rendering it understandable and accessible to the visitor.

Bibliography

AA School of Architecture. “Daniel Libeskind - Alexanderplatz Masterplan.” Youtube, May 22, 2015 Video, 1:01:00. https://www.youtube.com/watch?v=KTNxlE38CO8.

Arbabiyazdi, Amir and Pisheh, Mohsen Z. “Context as Palimpsest.” *Journal of Basic and Applied Scientific Research*. 2 (2). (2012) https://www.semanticscholar.org/paper/Context-as-Palimpsest-Arbabiyazdi-Pisheh.

“Armco Steel Ashland Works.” Abandoned Online. May 8, 2024. https://abandonedonline.net/location/armco-steel-ashland-works.

Bonder, Julian. “On Memory, Trauma, Public Space, Monuments, and Memorials.” in *Places* 21(1). (2009). Retrieved from https://escholarship.org/uc/item/4g8812kv.

Borys, Ann M. “ImAGE and ToxiCITY: Ars Memoria at an EPA Superfund Site.” in *Architecture, Material and Imagined: Proceedings of the 85th ACSA Annual Meeting and Technology Conference*. (New York: Association of Collegiate Schools of Architecture, 1997): 628-630

Boullée, Etienne L. “Architecture, an Essay on Art,” in Boullee & Visionary Architecture: Including Boullee’s Architecture, Essay on Art, 81–116. London: Academy Editions; New York, 1976.

Bruner, Simon. “Architects Statement.” in MASS MoCa: From Mill to Museum.113-121. North Adams: MASS MoCa Publications, 2000.

Burtynsky, Edward. “Tailings.” (1995) https://www.edwardburtynsky.com/projects/photographs/tailings.

Cochrane, Tom. “The Emotional Experience of the Sublime.” C*anadian Journal of Philosophy* 42, no. 2 (June 2012): 125–48. https://doi.org/10.1353/cjp.2012.0003.

Cooke, Lynne Govan, Michael, and Dia Art Foundation. “Dia:Beacon.” (New York: Dia Art Foundation, 2003): 10-64.

Comay, Rebecca. “Memory Block: Rachel Whiteread’s Holocaust Memorial in Vienna,” in Image and Remembrance. edited by Shelly Hornstein and Florence Jacobowitz, 251-273. Bloomington: Indiana University Press, 2003

Cory, Caroline. “Advocating for a Clean Ohio River.” Environmental Law & Policy Center. Published March 2, 2020. https://elpc.org/projects/cleaning-up-ohio-river.

Edensor, Tim, “Industrial Ruins: Spaces, Aesthetics, and Materiality.” (New York; Oxford: 2005): 1-19

Edmunds, Kristy. “MASS MoCa 2024-2030 Strategic Plan.” MASS MoCa. June 24, 2024. https://massmoca.org/strategic-plan.

Environmental Protection Agency, S*uperfund National Priorities List (NPL) Where You Live Map*. Accessed July 2024, https://epa.maps.arcgis.com/apps/webappviewer.

Environmental Protection Agency. *Brownfields*. Updated May 10, 2024. https://www.epa.gov/brownfields/about.

Florian, Maria-Cristina. “Landscape Architect Sara Zewde Reimagines the Land at Dia Beacon, New York.” ArchDaily. March 12, 202. https://www.archdaily.com/1014440/landscape-architect-sara-zewde-reimagines-the-land-at-dia-beacon-new-york.

Friends of the High Line. “Beyond the High Line: Transforming Fresh Kills, Staten Island.” The High Line. Oct. 6, 2013. Video, 1:03:18. https://www.thehighline.org/videos/high-line-network/beyond-the-high-line-transforming-fresh-kills-staten-island.

Han Han, Sunny and Zhuo Li, Amal. “A Hundred Stories: Industrial Heritage Changes China.” (Singapore: Springer Nature Singapore, 2023): 1-30. https://doi.org/10.1007/978-981-19-8614-7_1.

Heon, John. “History and Change at the Marshall Street Complex.” in MASS MoCa: From Mill to Museum. 9-14. North Adams: MASS MoCa Publications, 2000.

Hutchinson, Philip. “Exploring the Connection between Landscape and Biopolitics: The Story of Freshkills Park.” in *Landscape Review* 1, no. 17 (March 2017): 96-105

Libeskind, Daniel. “Trauma.” in *Image and Remembrance*, edited by Shelly Hornstein and Florence Jacobowitz, 43-58. Indiana University Press, 2003.

Lubow, Arthur. “The Anti-Olmsted.” New York Times. May 16, 2004. https://www.nytimes.com/2004/05/16/magazine/the-anti-olmsted.html.

“MASS MoCA Building 6 / Bruner/Cott & Associates.” ArchDaily. Nov. 20, 2017. https://www.archdaily.com/883699/mass-moca-building-6-bruner-cott-and-associates.

Maisel, David. “Desolation Desert.” (2018). https://davidmaisel.com/works/desolation-desert.

Michalski, Sergiusz. “Public Monuments: Art in Political Bondage, 1870-1997.” (London: Reaktion Books, 1998): 1-12, 154-171.

O’Connor, David and Hou, Deyi. “Sustainable remediation and revival of brownfields.” *Science of The Total Environment* 741. (November 2020):1-4. https://doi.org/10.1016/j.scitotenv.2020.140475

Pérouse de Montclos, Jean-Marie. “Etienne-Louis Boullée (1728-1799): Theoretician of Revolutionary Architecture.” (New York: Braziller, 1974): 11-45.

Riding, Christine. “British Art and the Sublime.” in The Art of the Sublime, ed. Nigel Llewellyn. Tate Research Publication, January 2013. zhttps://www.tate.org.uk/art/research-publications/the-sublime/christine-riding-and-nigel-llewellyn-british-art-and-the-sublime-r1109418.

Riegl, Alois. “Der Moderne Denkmalkultus: Sein Wesen und seine Entstehung.” (Vienna: Braumüller, 1903). Republished in *Alois Riegl, Gesammelte Aufsätze*, ed. K. Swoboda and H. Sedlmayr (Vienna-Augsburg: Filser, 1929). Translated as “The Modern Cult of Monuments: Its Character and Its Origin.” trans. Kurt W. Forster and Diane Ghirardo, *Oppositions* 25 (1982): 21–51

Sawyer, Shannon. “Gas Works Park (Seattle).” History Link. March 9, 2020. https://www.historylink.org/File/20978.

Slice Travel. “A post-industrial site turned ecological flagship | WIDE.” Youtube. Video, 24:46. https://www.youtube.com/watch?v=OrOTMvXWBJU.

Sugarman, Jeffery. “Environmental and community health: a reciprocal relationship.” in Campbell, Lindsay; Wiesen, Anne, eds. *Restorative commons: creating health and well-being through urban landscapes*.138-153. U.S. Department of Agriculture: Forest Service, 2009.

Roth, Michael Lyons, Claire and Merewether, Charles. “Irresistible Decay.” (Los Angeles: Getty Research Insitute, 1997): 1-23.

Way, Thaïsa. “The Landscape Architecture of Richard Haag: From Modern Space to Urban Ecological Design.” (University of Washington Press, 2015): 149-150.

Weilacher, Udo. “Syntax of Landscape: The Landscape Architecture of Peter Latz and Partners.” (Basel; Boston; Berlin: Birkhäuser, 2008): 105

Young, James. “Memory, Countermemory, and the End of the Monument.” in *At Memory’s Edge: After-Images of the Holocaust in Contemporary Art and Architecture*, 90-119. New Haven: Yale University Press, 2000.

Zhang, Jiahao Zhuo, Lingchen Sun, Hao Wang, Yuanling Wei, Hanbin Xu, Subin, and Aoki, Nobuo. “Construction of the Chinese Route of Industrial Heritage Based on Spatial and Temporal Distribution Analysis.” *Buildings* 14, no. 4, (February 2024): 1-22. https://doi.org/10.3390/buildings14041065