NATURE, CULTURE, INFRASTRUCTURE: URBAN AND SUBURBAN HIKING IN NEW JERSEY’S GATEWAY REGION

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ABSTRACT OF THE THESIS
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Our relationship with nature is one that is constantly evolving. This can be evidenced by what we do not consider to be nature as much as what we do consider it to be. In New Jersey, our relationship with infrastructural corridors in the landscape is paradoxical. We want the benefits associated with them, but often wish for their physical forms to be kept out of sight and out of mind. This mindset is exemplified in our attitude towards power lines, which have long been considered the ugly antithesis of nature by many people living in urban areas. However, it could be argued that this interpretation of our infrastructural landmarks is becoming unhealthy, and that a more holistic view of power lines can open up greater opportunities and services that are currently closed off to us.

While a lot of thought has been given towards hybrid systems of humankind and nature in recent decades, ‘nature’ is often still regarded as an external force that exists independently of anthropogenic influence in its most pure form, and human interaction with it is often perceived as ‘unnatural’. However, when the boundary between humankind and nature is questioned, it becomes evident that while electric transmission towers may have represented one particular relationship with nature in the past, it does not have to remain that way. In this thesis, I focus heavily on the role of landmarks and
post-industrial areas to explore the human-nature relationship and the perceptual boundaries between these two categories. This is broken up into two parts.

Chapter 1 delves into a literature review of the concepts of nature and place, ending with a summary of my experience traveling the Route of Industrial Heritage in Germany’s Ruhrgebiet. An explanation as to why this landscape provides a useful comparison for the landscape of northern New Jersey is provided, with the full narrative being located in the Appendix. Chapter 2 utilizes a research by design approach to explore the integration of functioning infrastructure into landscape design, so that power lines become visible to us both as the material and metaphorical conduits that they are. Rather than being perceived as separate from and in contrast to the natural landscape, the electric right-of-way can be viewed as a beautiful harmony in which the arrested succession of the meadow is maintained and framed by maintenance practices associated with the towers. Similar to the way that a host of ‘invisible’ ecosystem services and ecological processes are represented by the meadow, which could also have been considered ugly before its value was understood, electrical infrastructure represents important yet invisible landscape processes that our modern lifestyle depends upon. As a greater amount of attention is being devoted to hybrid systems and ‘4th nature’ today, our idea of the human versus nature relationship is still yet being reborn.
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Research Questions

Context: While a lot of thought has been given towards hybrid systems of humankind and nature in recent decades, ‘nature’ is often still regarded as an external force that exists independently of anthropogenic influence in its most pure form, and human interaction with it is often perceived as ‘unnatural’. The concept of man and nature as a timeless-placeless-binary erases all social and cultural relations from our understanding of nature, and conceals the co-development of natural lands and human communities as they give rise to each other.

What is nature and what is our relationship with it?: The human-nature dynamic is formless and constantly changing. However, when cast through the lens of a particular time, place, community, and cultural context, ‘nature’ takes the form of a narrative that can be read through landscape. This provides the language for representation, both reflecting and evolving the relationship between humankind and nature.

How is narrative conveyed?: Through design, narrative is given spatial form and materiality. This creates a more physical, yet still ever-changing, representation of our relationship with nature. Through landscape design, a medium and a space is provided for the reflection on past relationships with nature, as well as a venue for its future development.

Approach: These two questions will be explored through a case study analysis of the Route of Industrial Heritage in Germany’s Ruhr Region and a design proposal for a trail system in New Jersey’s Gateway Region utilizing electric transmission right-of-ways. While sharing similar industrial pasts, this period of development has manifested and
evolved in different across each region.¹ The related but distinctive natures of these landscapes therefore lend themselves to a comparison that highlights the way that time, place, community, and human culture contribute to the continual reformation of ‘nature,’ and how we can choose to relate to our environment. The research by design approach applied in the second half of this thesis explores the integration of functioning infrastructure into landscape design, so that power lines become visible to us as the physical and cultural conduits that they are.

Chapter 1: Literature Background - Nature and Place

The Route of Industrial Heritage is a 400 kilometer trail that spans the Ruhr Region of Germany. Heralding the evolving human-nature relationship, the route is well known for its success in spurring efforts to revitalize an economically depressed and environmentally polluted post-industrial area. While there are many other parks and trails revolving around this post-industrial cultural identity that exist now, including a larger European trail that lists sites in the Ruhrgebiet as sub-components, the Route of Industrial Heritage is especially applicable as a case study given its prominence as a landscape park as well as its comparability to northern New Jersey (addressed further in Chapter 2). In order to gain a better understanding of the human perspective of the trail, I spent roughly a month traveling the Ruhr Region of Germany between the 25th of May until the 30th of June. During my time there, I lived in the Altenhof II village in Essen, using public transit and a bicycle to get around, as well as the occasional motorbike excursion. In order to prepare myself for the exploration of a post-industrial landscape park, I studied the history of the region centering on industrial activity as well as the concepts of ‘nature’ and ‘place.’

1.1 - Ruhr Region and EmscherPark History

Formerly, the land roughly bounded by the rivers Rhine, Ruhr, and Lippe was synonymous with heavy industrial activity. Ripe with pollution, the Ruhr Region was considered inhospitable to life but a necessary powerhouse for the country. Known for coal mining and steel production, this area developed intensely as a result of the forces of industrialization, with cities such as Oberhausen earning the name of ‘Test Tube Town’ for springing up in the American fashion along railroads to meet the needs of industry.
While the first coal had been mined in Germany way back in the 1100’s, mining did not take off as an industry of its own right until it came into its role as the engine of the industrial revolution. The invention of the steam engine allowed for the penetration of deeper coal reserves, and mining efforts exploded in Germany after the people were united as a nation in 1871. The Ruhr region possessed a large amount of bituminous coal, which takes millions of years to form and would have developed during the Carboniferous period. However, it was a combination of circumstances that led to the rise of heavy industry in the region. First of all, the Ruhr coal field had been the most important coal field in all of Europe, second in the world only to the Pittsburg district in the U.S.. In 1937, the coal mined in the region actually contained more power than that produced by every hydroelectric installation in the world combined annually. In addition, the numerous coal deposits were conveniently located by the North Sea, which was a world trading center, and the Rhine River, which was a large and navigable waterway that could be connected with other canals running through the industrial district.

The exposed coal field was located roughly around the Ruhr River, where the region draws its name from. Vertical strata of coal containing rocks extended up to 9000 feet below the surface near the Lippe basin in the north, but most mines penetrated no further than 2500 feet in the northern regions and not all coal was considered commercially valuable. The city of Essen, where I stayed during these five weeks,

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3 The unification of Germany leading to a sudden growth in the mining industry highlights the way that political boundaries can block collaboration and hinder development. This is of particular note for New Jersey, because while it is unified as a state it is also subject to Home Rule, with 565 different municipalities.
5 Ibid., 195.
6 Ibid., 197.
possessed one of the richest coal deposits, and was one of the first regions that began mining (before the industrial revolution), with rich coal to be found at a depth of 165 feet below the surface.  

The energy derived from coal was used for a variety of purposes ranging from the production of steel and armaments, running locomotives, and heating homes. Coal could be converted into coke, a high carbon-content fuel made from heating coal in the absence of oxygen, and was then shipped off to power iron or steel production. The Krupp firm (today ThyssenKrupp), whose headquarters are located in Essen, was one of the major players shaping the identity of the region and was involved both in the mining and steel industries. Steel production at this time was based off of the Bessemer process first developed in England, which Alfred Krupp introduced to Germany in 1861. Krupp continued to innovate the steel-making process, developing the seamless railroad tyres which now make up the company logo, and influenced the Ruhr region through industrial as well as residential production.

During the second half of the 18th century, the Ruhr Region suffered major economic consequences when most of the easily reachable coal was already mined, and industrial activity began to move out of the country when German markets were no longer as competitive as they once were. The steel crisis of the 70's hit the region particularly hard as well, and unemployment rippled through the sunken soils and smokey skies. Beyond monetary results, years of heavy industry had ripped environmental scars across the land. Willy Brandt, who was the German Chancellor between 1964 and 1987, was famously quoted saying “The sky above the Ruhr must

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7 Ibid., 197.
8 Ibid., 204.
turn blue again,” because smog in the area was so thick one could hardly see through it. 9

One of the most dramatic manifestations of the impact of industrial pollution on the environment was the Emscher River, which flowed between the Lippe and the Ruhr into the Rhine River. Prior to industrialization, the Emscher River was a slow and meandering waterbody that frequently flooded. But as modern development (beginning with agriculture and farmland) began to snake along its banks, marshland was increasingly drained and converted into urban cover, which only worsened the flooding as a result of the decreased wetland area available to absorb the impact. When industrial and manufacturing entities began to settle on the Emscher, the issue of flooding became more and more hazardous as industrial waste would often be discharged into the river, which would then inundate the residential landscape during a rainstorm. To complicate matters, mining activities often disrupted the stability of underground sanitary sewers. The digging of deep shafts many feet below the surface of the land commonly resulted in what is called ‘land subsidence’, where deep depressions or ‘poulders’ would form when unstable land would collapse. This could tear cracks into concrete homes or crush sewage pipes, causing them to explode and leak sewage that would bubble out onto the city surface.

In order to combat flooding and find a solution for the movement of waste, it was decided that the Emscher River would be converted into an open sewage canal, while the Ruhr River would be utilized for drinking water resources. The deterioration of the river was obvious and eventually not acceptable. On December 14th, 1899, the Emschergenossenschaft was formed as a water management board to oversee care for

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9 Emscher 3.0 Von Grau Zu Blau Oder Wie Der Blaue Himmel über Der Ruhr in Die Emscher Fiel, (Kettler, 2013), 148.
the Emscher River, with canalization attempts beginning in 1906. The river was straightened, narrowed, lined with a bed of concrete, and lowered about 10 feet. Over the years, as industrial activity increased and areas of land sunk even further, new dykes were constructed to further mitigate flooding. Additionally, the mouth of the river had to be moved twice in order to keep it flowing downhill into the Rhine. While the original course of the river ran from its spring in Holzwickede out through Duisburg Nord, it was moved north in 1920 and 1949. It now meets the Rhine in Dinslaken, and is carried that way through extensive pumping facilities which also ensure that tributaries of the Emscher do not flood either.

By the beginning of the 1960s, coal was already a fading industry in Germany. The risk of further land subsidence tapered off once the majority of mines closed in the mid 1970's, and the Emschergenossenschaft began to implement a lot of new water engineering techniques in the region including a large wastewater treatment plant constructed in Dinslaken that would help prevent the toxic and biologically dead Emscher River from polluting the Rhine. The first restoration project in the region was attempted in 1981 at a tributary of the river in Dortmund by removing the concrete liner of the surface waterbody and directing sewage into an underground pipe.

The project was a success, and plans for large-scale structural reformation in the region to promote social, economic, and environmental revitalization all at once began to develop. This culminated in the International Building Exhibitions (IBA) Emscher Park exhibition of 1989. The IBA has been present in Germany since 1901. However, up through the post-war period into 1957, the IBA was used as a permanent building exhibition to showcase architecture. The guiding principle was the same though,

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10 Emscher 3.0, 24.
11 Emscher 3.0, 25.
12 Emscher 3.0, 26.
and the movement was used to draw attention and resources into the highlighted area in order to kickstart development or re-construction).

The IBA Emscher Park was used as a tool to facilitate urban renovation, and like the IBA of West Berlin 1979-1987 (which took place shortly before the wall came down), the exhibition sought to juxtapose both new and old development alongside each other while spotlighting city-living conditions and industrial ruins. Ecological awareness and social topics regarding quality of the environment were important components of the movements, earning them a high degree of international visibility.

After the IBA Emscher Park of 1989-1999, the Emschergenossenschaft began the second stage of large-scale ecological conversion in 1991, set for completion in 2020. The meaning of this is that the entire Emscher River system will be re-converted from a sewage canal into a landscape park and biodiversity hotspot, bolstered by the creation of state of the art underground sewage canals, wastewater treatment plants, pumping facilities, and 5 billion Euros. Such a price tag is needed to ensure that the restoration meets European Union Water Framework Directive standards, which requires that all EU members must attain ‘Good Ecological Status’ or a minimum of ‘Good Ecological Status Potential’ on all waterbodies by 2027 at the latest. These standards apply to groundwater, surface water, and biological community regulations, as well as measurements pertaining to ecosystem services such as biodiversity and self-purification capacity which can be utilized for ecosystem management.

Takeaways: Germany’s Ruhrgebiet tells a narrative of the intersection of nature and urban areas evidenced through physical landforms, an overlay of structuring wayfinding elements and signage, as well as digital information that refers to a location

14 Ibid.
15 Emscher 3.0, 26.
16 Emscher 3.0, 38.
but isn't tied to any one particular physical place. This narrative is cast through the lens of a collective regional-political presence that identifies as the ‘Ruhr Region’ and is heavily influenced today by organizations such as the Regionalverband Ruhr and the Emschergenossenschaft. The story told here is one centering around industrialization and its aftermath, allowing visitors to see how former wilderness and agricultural lands were urbanized and made use of for industrial purposes. This largely centered around the highly profitable coal and steel industries, and notably resulted in widespread pollution, land subsidence, and the conversion of the River Emscher into an open sewage canal. After the decline of industry in the region, unemployment and harsh environmental conditions had given the Ruhrgebiet a reputation for being inhospitable to life. However, as concerns became more widely voiced, movements such as the IBA Emscher park sparked efforts to transform the economy, culture, and ecological qualities of the region through revitalization. This next phase in development of the region does not seek to erase or restore the past, but rather builds on it and conveys such moments by allowing the multifaceted nature of the region to shine through the mosaic landscape which can be traversed through the Route of Industrial Heritage.

1.2 - Nature

In this thesis I seek to explore the idea that nature reflects a social narrative that is continuously remade and destroyed. 17 Rather than a static binary, humankind and nature are continuously involved in each other’s development, linked to narratives associated with particular time, place, and community; or a landscape. Our representations of nature display a reflection of how our own value systems and beliefs are structured by and restructure the landscape, changing over time. When addressing

the question ‘What is nature and what is our relationship with it?’, this literature review seeks to showcase the seemingly infinite possible relationships and developments, all while still centering around this idea of a human-nature divide. However, rather than fully erasing the past, subsequent developments build off each other as the narrative continues to evolve.

a. Roots of the Word ‘Nature’

One of the most complex words in the English language, the term ‘nature’ derives from a root in the past participle of the Latin ‘nasci’ - to be born - and means the essential character or quality of something in its earliest sense. Similar to the word culture, nature is one of several major terms we use today that was initially used to describe a process and a quality. Such terms were always followed by a specific reference, ie. nature of the mind or culture of understanding. As an early example, the Roman philosopher Lucretius’ De Rerum Natura, or On the Nature of Things, explores the nature of physics, sensation, thought, the soul, and celestial phenomena in his work. In this sense, the word nature is shown as a ‘quality of x’ describing both the human condition as well as interpretations of the world, rather than referring to an inherent force or the material world.

During the Middle Ages, religious priests shortened the common phrase ‘nature of x’ to the abstract singular ‘nature’ or ‘natura.’ This notably coincides with the development of a singular ‘God’ from ‘a god’ or ‘the gods,’ and reflects the emergence of an idea of a single universal essence. From this interpretation of a singular nature, its use to describe the physical phenomena of the world developed, and took on new

18 Raymond Williams, Keywords: a Vocabulary of Culture and Society, (New York, NY: Oxford University Press, 2015), 219.
meaning as the inferior part (to man) of God’s creation. Nature was often chaotic, dangerous wilderness, and something to be tamed and made productive for human use. This rationale was used as motivation and permission to drain marshes and swamps, also considered wastelands, which would allow man to bring order to the land in the form of plots made ready for agricultural activity. As gardening became a more common practice, this desire for the ordering of nature was also reflected in purposeful and formal arrangements as well. Through gardens, nature was not chaotic or wild, but became a place for relaxation. During the Renaissance, examples in literature portray a range of meanings associated with nature, including nature as a goddess, nature as a sense of original innocence, and nature as the primitive condition of the world before human civilization.

b. The Tamed and the Untamed

Gardens of the Renaissance, and particularly of the Baroque period, showcased the grand order and magnificence that the owner imposed upon nature. These gardens were associated with large and wealthy estates, with the largest and wealthiest being owned by reigning monarchs of the time such as the absolute monarch King Louis XIV. His French Garden of Versailles is considered one of the most well known examples of a Baroque garden, and is rich with intricacies that can only be maintained by the largest fleet of maintenance crews. The Palace of Nymphenburg in Munich, Germany is another example of a grand order imposed by a ruler upon the landscape (and the people), particularly due to the large axis that extends far into the city. As with many estates, the formal gardens behind the palace were later re-shaped in the romantic English Landscape Garden style, as the prevailing trends shifted.

During the Enlightenment Era and the Scientific Revolution, nature became a quantifiable component of the material world around us. Scientific laws that govern nature provide a stable framework that represent our environment at its grandest scale and provide us with the context that we operate within. Through knowledge, man has power, and the ability to discover, control, and manipulate a nature which is separate from us. This kind of relationship is complemented by the Romantic depiction where nature is a positive and healing force corrupted by an artificial and industrial society. This is embodied in many landscape depictions of the mythological Arcadia, a Greek primordial utopia now lost to us in which man lived in harmony with nature. One of the most famous paintings of Arcadia is Nicolas Poussin’s ‘Et in Arcadia Ego’, meaning ‘Even in Arcadia, here am I,’ in which 4 shepards are gathered around a tomb in a pastoral setting. The phrase is usually interpreted with the word ‘I’ referring to death, but it is unclear who or what’s death the tomb is for.

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23 Williams, *Keywords*, 222.
Landscape paintings came to influence the treatment of landscape planning, architecture, and gardening. Nature that drew reference from the notion of Arcadia often bore rolling hills of short grass with gently rounded lakes and meandering paths. The Greek ruins which were so common in Romantic paintings were inserted into landscape gardens in the form of fake ruins and monopteros, and were nestled artistically amongst clumpings of trees for one to stumble upon whimsically. These picturesque ruins reminded viewers of the passing of time, and of their own mortality, within the constructed Eden that lay separate from the hustle and bustle of newly urban and industrial life brought on by the scientific revolution. In time, this style of gardening would come to be associated with ‘people’s parks’, as royal lands were increasingly donated to or taken by the people for the well-being of the community and designed as landscape gardens. This was a movement that began in England around the time that Parliament overthrew the Monarchy, and rippled throughout Europe in notable examples such as the Englischer Garten in Munich, which was one of the first public parks in Europe.

In America, romantic landscapes also took the form of public parks, most notably in the 1853 romantic-pastoral Central Park. However, the New World also had another element that painters such as Thomas Cole and Ascher Durand sought to capture the idea of romantic nature in: American wilderness. This was the primary work of the Hudson River School of Art, which was an artistic fraternity based in New York cited as beginning roughly around the year of Thomas Cole’s arrival from Europe in 1825.

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these paintings, a dark foreground would give way to misty and tumultuous skies, often featured jagged rocks carving their way towards the heavens, stately trees making their way unevenly across the canvas, and reflecting waters in the form of glistening lakes or tumbling waterfalls. Not entirely absent from this powerful imagery, man was often imbedded into the scene as a small and unassuming figure, or symbolized as a tiny cottage nestled between formidable hills. However, while paintings showcased the raw power of nature over man, this is not to suggest that there was no sense of taming here as well.

In these carefully framed paintings, artists like Cole espoused the notion that it was the task of the refined individual to develop a sense of appreciation for landscapes like these, to capture these views, and to teach others for the promotion of health and happiness. While the forces of nature could be terrifying at times, this terror was held at a distance, and being amongst nature had a positive moral influence that would provoke self contemplation. At this time both in Europe and in the New World, areas of wilderness that may once have been considered ‘grotesque’ were now gaining traction as valuable focal points of art and literature through the idea of the sublime. A notable example of this is the changing perception of the Alps, which in the ‘pre-romantic’ period would have been considered a scar upon the landscape and a barrier in the way of Grand Voyagers making their way on a tour across Europe. However, notions of the sublime turned this idea on its head.

Cole and other founding artists, who had been trained in European aesthetic theory, brought this education with them to the Hudson River School of Art. While the sublime was often the romantic sentiment being conveyed, it is best understood as a

part of the 3 major representations of nature in landscape painting at this time: the Sublime, the Beautiful, and the Picturesque. \(^{30}\) While each of these concepts have long histories behind them, when held in contrast to each other the beautiful inspires feelings of harmony, balance, and peacefulness. Here, the experience feels at one with the surroundings. Meanwhile, the sublime conjures up feelings of astonishment that overwhelm the senses, both freezing the mind and filling it with passion. The experiencer becomes at odds with the surroundings when confronted with a powerful force. The picturesque can be thought of as situated between the two, or a synthesis of the serene and the awe-inspiring, often featuring irregular clusters of trees and subtle gradations of light and darkness framing a focal point, the whole scene being worthy of capturing in a picture.

While the sublime was considered that of incomprehensible proportions or monumental forces, even the untamable could become enframed in a landscape painting at the hands of man, observing and capturing it from a safe vantage point. Another important component of these aesthetics was that they were not merely properties of the materials themselves, but universal experiences attainable through the human mind, an idea forwarded by Kant \(^{31}\). This is important for the development of concepts such as the industrial sublime later on, in which not only forces of nature, but anthropogenic forces as well can be viewed as sublime, such as in the 1895 Niagara Falls hydroelectric plant. However, at the time of colonization in the New World, images of the sublime were mostly centered around imagery of wilderness.

c. Nature, Colonization, and Nativity

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\(^{31}\) Smith, "Beautiful, Sublime."
When the colonists began to settle along the American coastline, they did not find a virgin landscape by the standard that it had been unaltered by humankind. However, they considered it to be practically so, as it did not resemble the technologically advanced societies they were familiar with. In New Jersey, the Lenni Lenape, who referred to the land as "Scheyechbi" or "Land Along the Water," were once thought to be savages, giving the colonists permission to do with the land as they wanted since Native American societies did not have the same ownership laws that European societies did. But while early representations of the 'savage' focus on associations with cannibalism and sacrificial cruelty through depictions of Native Americans as 'Anthropophages,' the image of the 'savage' as an untamed wild force evolved over time.

As travel-ethnographers began to depict the foreign peoples of the Americas, what were considered scientific observations became colored by representational strategies that either demonstrated 'alienation from or assimilation to European experiences and values.' The resemblance to Anthropophages, which were a Greco-Roman mythological race of cannibals, exemplifies the distancing strategy that writers had initially taken, while associations with the Greco-Roman Golden Age myth that would become more popular later on were indicative of strategies for assimilation. It is the Golden Age related myth of the Noble Savage, however, that has carried the strongest impact.

Beginning in 1609, the same year that Henry Hudson claimed the Newark Bay for the Dutch, the French author Lescarbot published his *Historie de la Novella France*,

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34 Ellingston, *The Myth of the Noble Savage*, 12.
35 The Golden Age myth refers to a primordial state of existence in which man lived in harmony with nature in the mythological land of Arcadia.
as a narrative of his experiences in the New World, including his ethnographic descriptions of the ‘Indians.’ 36 Here, we can see the beginnings of this alternate depiction of the Native Americans, which is constructed by aligning the people’s ‘nature’ more closely with that of French and European culture in order to elevate them as opposed to aligning their image with the savages associated with other lands.

Ellingson’s *The Myth of the Noble Savage* quotes Lescarbot is saying, “Now leaving there those Anthropohages Brazilians, let us return to our New France, where the Men are more humane...not devouring their like.” 37

Lescarbot, who was a trained lawyer, goes on to describe the ways in which the ‘Indians’ display fine moral qualities such as generosity and proper behavior. However, it is also notable that rather than only building off of stories, Lescarbot was building off of legal standpoints in this reference to the noble savages. While referring to the Native Americans’ subsistence practice of hunting, he reflects upon the legal status of hunting in Europe, which at this time was still a ‘heavenly privilege’ reserved for nobility. 38 A technical legal analysis follows his assertion, in which he describes the way that the ‘Indians’ possess the same ‘right of usage’ for falconry as legal nobility rights, and could therefore be thought of as noble and righteous. However, Lescarbot then goes on to use this association to link it with the myth of the utopian Golden Age, stating that they have no divine or human law, but only that which ‘Nature teacheth them.’ 39 He would use this distinction to separate the rights of the Native Americans from those typically governing European societies, including property rights. By depicting the Native Americans as living in a present day state similar to the ancient European ‘Golden Age’, he distances the colonists from the Native Americans, reasserting the man versus nature dynamic.

37 Ibid., 21-22.
38 Ibid., 23-24.
39 Ibid., p.29.
Lescarbot would use his analyses to urge for the anthropological study of foreign cultures, especially those he considered to be archaic, and also alludes to the intertwinement of Nature and moral values for justification of certain actions. Here we see the idea that Nature is fundamentally good, and that people shaped by certain kinds of environments will display the qualities of those environments, as well as the seemingly conflicting idea that the laws governing human civilizations take precedence over those governing nature. In this period of exploration and colonization, there was a strong impulse to study foreign cultures and wildlife, eventually giving rise to fields of such ethnography and ecology. However, while these sciences today are both crucial to the study of cultural landscapes, it is important to analyze the rich narratives of disagreement that took place during this tumultuous time as well.

This conflict was evidenced most strongly in writings published by the Anthropological Society of London, which was a racist rival breakaway group from the Ethnological Society of London that split off in 1863. The earlier Ethnological Society had formed in 1843 as an offshoot from the Quaker Aborigines Protection Society, which was formed in 1836 to oppose enslavement of native peoples by colonists. The concept of protection for native people in particular was also important at this time, as having a native or ‘natural-born’ status would typically guarantee someone greater social rights in England rather than a foreign-born. This status could make a stronger argument against native peoples’ enslavement by the colonists. During the 1600’s when the Americas were still being colonized, racist anthropology was often considered to be scientific. Debates as to how the nature of these changes amongst human beings arose sparked new concepts in environmental theory, with researchers claiming that humans,

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like animals, could improve or degenerate based on their environmental conditions and that was what gave rise to differences in appearance and character.  

These kinds of ideas were constructed in order to supplant the notion that certain kinds of people were marked out by Nature to be subservient to a chosen group of people who had God-given rights to act. Leading members of the Anthropological Society of London such as Luke Burke would go on to publish works such as the “Early Conditions of Primitive Races,” in which Burke espoused the notion of polygeny and put a sinister twist on the Golden Age myth. Polygeny, now a defunct theory, was the idea that humans did not emerge from one lineage but from several different races, and that primitive humans resided in a time of greatest harmony when they remained in their own segregated ‘native localities.’  

However, rather than using these ideas to promote the extirpation of certain groups, Burke was lobbying for their controlled preservation, so that the cultural images being constructed could be retained to carry on the ideas of subservience and inferiority. At the time, popular opinion in these circles espoused the notion that discoveries brought to light by ‘modern science’ through ‘neutral observation of simple facts’ could overturn ‘outmoded myths of human brotherhood and equality.’  

While ideas regarding human nature may seem initially detached from the place-based nature regarding our physical environments, it is important to recognize the intertwinment of the two as concepts such as nativity and place-belonging reflect across these disparate fields. For context, the designation of native status’ to plant life first began in 1835 through the study of botany. This idea was expanded upon by Hewett Watson in 1847, who derived the terms ‘Native,’ ‘Denizen,’ and ‘Alien,’ directly

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43 Ibid., 243.  
from English Common Law. 45, 46 Today, nativity classification among plant species remains a heatedly debated topic, particularly with regards to the assertion that species classified as non-natives pose a significant threat to habitats or places outside their native locales, with many arguing that the attribution of native status to plant species is not conducive to forwarding the research and management of healthy ecosystems. 47 However, these arguments are also heavily rooted in theories of evolution. Some argue that ‘native plants’ are the components of generations of natural selection that have worked to become the best suited for their environments, informing a sense of balance in nature that humans have disrupted through the introduction of exotic species. Others would argue that nativity is not inherently a sign of fitness or positive effects, and that every species behaves differently. Another idea is that human influence on plant evolution is not unnatural at all, and that humankind and nature are inseparable with regards to evolution. Regardless, it remains that ecology and evolution have been one of the greatest impacts on the concept of nature in the past 150 years.

d. Ecology and Evolution

The term ecology was coined by German zoologist and evolutionist Haeckel in 1866, 48 entering the English language in 1873 as translation from ‘oecology’. 49 Defined as the study of relationships between biological species and their environments, ecology evolved as a transdisciplinary subset of biology incorporating knowledge from the fields of forestry, fishery management, agriculture, nature conservation, and environmental

47 M. Davis et al, “Don’t judge species on their origins.”
planning, mainly focusing on undeveloped areas as settings of scientific examination and discovery. Cities were generally regarded as hostile to life, and therefore not the subjects of intensive inquiry. Though many species could be found living there, they were typically considered pests, and vegetation consisted of weeds sprouting out of urban wastelands.

Through the study of ecology, which developed in earnest after the resulting environmental degradation of industrial society, nature as a form of remnant wilderness became increasingly measureable and directional. As it became evident that urban life was taking tolls on the health of its human inhabitants, people became increasingly aware of the impact that industrial activity was having on the Earth as well. With Darwin, nature became associated with terms such as ‘natural selection’, an evolutionary theory which can be contrasted with the term ‘artificial selection’ in which humans directly breed organisms. The case of the Peppered Moth demonstrates how the concept relates to urbanization. In the late 1800’s it had been discovered that most of Manchester’s white moths were exhibiting darker pigment in order camouflage better on trees, which were blackening as a result of smoke from coal furnaces burning the pale lichen off bark. However, while this example includes man’s activities (industrial development) as a component of ‘natural’ selection on moths, and mankind itself is considered subject to the forces of natural selection, humans were still regarded as fundamentally separate from nature and a special kind of animal in classical ecology.

Following the industrial revolution, we now see one of the most distinct changes in the depiction of nature through the designation of what is considered a wasteland. Prior to urbanization, wastelands were those deemed too swampy or forested to be fit for

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50 Lachmund, Greening Berlin, 49.
51 Williams, Keywords, 217-224.
agricultural and residential life. Post-urbanization, wastelands are those that are polluted by man's industrial activities, while the very lands considered repugnant before are now held under governmental protection. However, both lands possess a similarity in the sense that neither of them were thought to be cared for properly at the time of their designation as a wasteland. In America, interest towards natural lands conservation began in the 1850s with the increasing rise of industrial and urban activity, resulting in the establishment of the nation's first national park in 1872 and later on the establishment of the National Park Service in 1916. 53

e. Urban Ecology, Deep Ecology

Developments in American ecology advanced the ecosystem theory, combining diverse strands of research investigating separate human and natural systems. The word ecosystem was originally coined by British ecologist Arthur Tansley in 1935, but by the late 1960’s, American ecologists were asserting that cities should be viewed as special kinds of ecosystems. 54 Just as global trade and material exchange had become a norm, so had information exchange and knowledge development. Continents apart, schools of thought came together in the shaping of what an ‘urban ecosystem’ is. It was decided that cities were unique in the sense that they drew most of their energy from the extraction of resources in other ecosystems, but at this time human beings and their social systems were still regarded as separate from the biological systems of the environment. 55

54 Lachmund, Greening Berlin, 83.
55 Lachmund, Greening Berlin, 85.
Abion Small founded the first sociology department in the country at the University of Chicago in 1893, and was joined later by Robert Park in 1914. Both Small and Park had studied under Georg Simmel in Germany prior to this, which is notable because at the time, France and Germany were the only countries with professional sociologists. Industrial transformation in the wake of social and political revolution had spurred the development of cities and a new urban way of life, termed urbanism. Just as these changes had prompted London botanists to study the differences in pigment among Manchester moths living in city in the mid-1800s, researchers also sought to study the effects of the city on people. Ecology, which studies the relationships of organisms with each other and their environment, formed the basis for theories which sociologists would use to study the urban ecology within human communities.

Inquiries into the nature of urban human life were pioneered utilizing ecological theories on adaptation and evolution to inform urban development. Industrial transformation, and capitalism in particular, were regarded as the major social drivers affecting relationships and power dynamics in the city. Georg Simmel studied the way that urban life transformed individual consciousness, and was concerned with modernity, or “the transition from a traditional society characterized by social relations based on intimacy or kinship” to “an industrial society situation within cities and dominated by impersonal, specialized social relations based on compartmentalized roles.” However, Simmel was not primarily concerned with the workings of the capitalist system, and focused on social behavior and interaction. He studied emotional reserve and the development of a ‘blasé’ attitude, as well as the importance of money management as a

new skill necessary to survive the urban way of life. Cultivation of the individual, he argued, was the ultimate goal, provided a person had the time and money available for it.

Simmel maintained that the city, as a spatial environment, would influence individual behavior. Small and Park, who studied under him, would take these ideas to develop the ‘Chicago School’ of Urban Sociology in America. Robert Park, who had previously been involved with conferences on race relations, often focused on immigrant adaptation to the urban environment in his studies. This field of study would eventually develop into Human Ecology; the study of the process of human adaptation to the environment. Immigration was a crucial component of the city because the regular influx of labor was necessary to promote economic growth, and Louis Wirth (a student of Park) proposed in 1938 that cities could be defined by their population size, density, and heterogeneity. Wirth described urbanism as a culture characterized by social disorganization, that would “occur as a matter of evolution as cities operated on immigrant groups to break down traditional ways of interacting over time.”

The Chicago School forwarded the notion that biological processes could be used to conceptualize urban life, taking precedence over economic concerns, and that all individuals were caught up in a struggle for survival; they only had different ways of adjusting to it. In the city, the capitalist system presented that struggle, and produced a distinct social order and way of life. However, rather than simply competing for greater monetary resources, Robert McKenzie argued in 1924 in his essay “The Ecological Approach to the Study of the Human Community,” that the fundamental quality of the struggle for existence was the position, or location, of the individual/group. As people

competed for land and resources, this growth pattern could be mapped, and wealth within the city could be predicted through Concentric Zone Theory, which Ernest Burgess coined during the 1920s.

Burgess would use these theories to create maps for the city of Chicago in which social organization could be viewed spatially, mapping clustered areas associated with traits such as mental illness, gang membership, criminal behavior, and racial background. 63 His models were based around the idea that people and businesses who were more prosperous would begin to move away from the city center and create concentric circles of wealth radiating outward, while the inner city would face deterioration. Although Concentric Zone Theory was later deemed too simple for accurate prediction, it formed the basis for what would become the practice of red-lining by the Home Owners’ Loan Corporation or HOLC, which essentially formalized discrimination in the housing market. 64 Through HOLC maps, areas characterized by negatively perceived traits (such as race) could be marked out in red, and residents living there would be prevented from obtaining home loans while the neighborhoods would be marked for disinvestment. With red-lining maps, the seemingly disparate studies of our environment and human psychology can be seem informing each other to shape the landscape in a cycle that feeds back into itself.

The concept of urban ecology pertaining to the nature of the city environment was heavily shaped by Berlin ecologist Herbert Sukopp during the 1970s, and was complemented by developments in the earlier ‘Chicago School’ of urban sociology which would go on to inform the discipline of human ecology. 65 ‘Berlin School’ urban ecology

developed after World War II when field ecologists became interested in studying the vegetative communities that had developed in West Berlin’s wastelands for lack of countryside areas to study. With the abandonment of many industrial centers and conversion of entire cityscapes into ruderal fields, ecologists began noting species being found in geographic locations where they had not previously been seen before, forming ‘novel ecologies’ and species interactions. One such famous study site is the former abandoned Berlin rail yard now known as the Natur-Park Südgelände, which has been designated as a public park known for its ‘4th Nature,’ or new wilderness. With broadening public concern over environmental degradation and the suitability of cities as ‘habitat’ for human beings, urban ecology quickly made its way to the center of political programs to protect biodiversity and open space through the recognition that there was no environment truly free of human influence.

At the time, areas like the post-industrial Südgelände did not have any positive perception or conservation value in the public eye, and the survival of these urban wastelands was dependent on how much support could be garnered for their preservation. During the waves of post-war redevelopment, invaluable wastelands such as the Südgelände would have been vulnerable to clearance and conversion. In response, ecologists sought to re-brand the railyard in order to protect its innate qualities and the conditions that are required for their existence. They did so through a re-establishment of the idea of what constitutes nature, or alternative place-imaging.

The movement of alternative place-imaging for post-industrial nature reserves can be demonstrated well by the coining of the term ‘4th nature’ by Berlin ecologist Ingo

66 Following World War II, Germany was split into the Allied occupied West and the Russian occupied East. Berlin, being the capital of Germany, was split into West and East portions as well despite being located within the Russian occupied section of Germany, leaving the Allied West Berlin stranded. Until the Berlin Wall came down, West Berlin was effectively an island in Eastern Germany.
Kowarik. 67 4th nature, or Natur der Vierten Art, references a continuation of the 3-form nature typology first coined by Cicero in his philosophical text De Natura Deorum (On the Nature of the Gods). By describing 1st Nature as wilderness or ‘the realm of the gods’, Cicero considered this wilderness to be the raw materials that human hands manipulated in order to create a ‘second nature’ (alteram natura) within the natural world. 68 Jacobo Bonfadio further developed this concept in 1541 while writing of third nature (terza natura), in reference to the formal garden as nature with art. 69 These definitions were popularized by landscape historian John Dixon Hunt, with 1st, 2nd, and 3rd nature now being known to mean wilderness, agricultural lands, and parks/gardens respectively. Kowarik’s 4th nature refers to new wilderness, or anthropogenically influenced lands that have since been reclaimed by wildlife, forming novel ecologies and ecological systems that are self-sustaining but have been clearly altered by past/ongoing human interaction.

Figure 2: 1st, 2nd, 3rd, 4th nature. Source: Author Photos in Ruhrgebiet

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The idea of 4th nature as a hybrid system is reminiscent of the Deep Ecology movement, which seeks to break the boundaries between humans and nature. The Norwegian philosopher Arne Naess is credited with introducing the phrase into environmental literature in 1973, as a development from the American environmental movement sparked in the 1960’s after Rachel Carson’s publishing of *Silent Spring* that had kicked off the ‘Age of Ecology’.\(^70\) This period was characterized by fierce environmental awareness of the pollution caused by industrial activity, spurring the birth of the Environmental Protection Agency in 1970, as well as an expansion of the Clean Water Act and later the development of the Comprehensive Environmental Response, Compensation, and Liability (CERCLA) or Superfund Act.

The Deep Ecology movement draws heavily upon Aldo Leopold’s philosophy, which calls for a viewpoint of human and natural systems as a part of one overarching earth community.\(^71\) Here, the idea that species could be ranked based on their relative value was rejected, and Naess espoused the notion that all beings have an inherent right to life which cannot be quantified. Lynn White Jr. had explored this idea in his 1967 paper, tying the worldview of humans as separate from and superior to nature back to the Christian beliefs of human domination on a path of perpetual progress.\(^72\) This human path of progress had been the driving force behind much of the Scientific Revolution and Enlightenment periods, and Deep Ecology took a stance in saying that this path was self-defeating in its mission to conquer nature. Instead, humans are simply members of a biotic community that must be respected. In this regard, the idea of 4th nature aligns with this thinking because it calls for a viewing of human impacted environments as its own kind of natural landscape worthy of preservation, rather than

categorically separate or invaluable due to anthropogenic interference which would otherwise render parks like Südgelände in the limbo-wasteland of neither ‘human’ nor ‘nature’.

Takeaways: When addressing the question ‘What is nature and what is our relationship with it?’, this literature review seeks to showcase the seemingly infinite possible relationships and developments, all while still centering around this idea of a human-nature divide. However, rather than fully erasing the past, subsequent developments build off each other as the narrative continues to evolve. Deriving from the Latin ‘Nasci,’ or ‘to be born,’ the concept of nature originally referred to an essential character or quality, which would always be followed by a specific reference. During the Middle Ages, western religion gave new meaning to nature as a singular entity and a component of God’s creation, which humankind dominated over and could act upon. Through the design of nature into parks and gardens, depictions of it in landscape paintings, and enquiries into the mental experiences one has with nature, new relationships with nature are forged and explored. With colonization, the concept of nativity, which derives from the same latin root as nature, further complicated this narrative to include questions surrounding the interaction with foreign geographies and communities. Following the scientific revolution, nature increasingly became something that could be quantified and measured, and was subject to universal laws that could be studied. Through schools of thought surrounding the physical environment as well as human social organization, ideas regarding nature are further developed, often centering around ideas of ecology and evolution which have since become tied to nature. Today, as our major concerns include topics such as globalization, population growth, and climate change, the boundary between urban and natural lands has been increasingly highlighted. However, this has also led into greater research regarding topics such as hybrid systems of humankind and nature. This kind of hybrid system is represented in
part by post-industrial lands and is presented along the Route of Industrial Heritage. However, to understand how these narratives translate into the physical landscape, it is important to study the topic of ‘place.’

1.3 - Sense of Place

‘Place’ in landscape can mean many different things to many different people. However, commonalities tend to involve aspects rooted in location or position and their interaction with living beings or processes. The significance of this is that despite the wide ranging perceptions of what ‘place’ is or what characterizes a specific place, it involves the relation of certain innate qualities or ‘nature’ and its associated community. Place is also recognized as an evolving concept due to its inextricable association with time. As cycles of growth and decay continue, nature and culture are locked in a dynamic that pushes forms, processes, traditions, ideas, and meanings to be selectively preserved, developed, edited, or erased. As layers of associated narrative accumulate, it generates ‘place,’ or the representation of a relationship between nature and culture. When people perceive this, they can experience a ‘sense of place.’ In this thesis, I am focusing on 3 aspects regarding this in order to better characterize the experience of a regional nature-culture trail such as the Route of Industrial Heritage. Those are: place versus placelessness, preservation, and separation.

a. Place and Placelessness

The concept of place has been extensively analyzed, appearing as focus of study in fields such as phenomenology, sociology, planning, geography, ecology, and landscape architecture. In a much broader sense, it may go under many synonyms including a ‘sense of place’, ‘regional identity’, ‘ecological consciousness’, ‘environmental identity’, ‘place attachment’, ‘social psychology of place’, ‘local
belonging’, and more. In all of these cases though, there involves a relationship between people and their environments looking at the process of identity formation in which a person or group of people decide what a space is and how they relate to it. Within the design and planning fields, a ‘sense of place’ is often referred to with regard to thoughtful design. However, a ‘place’ can only exist under the condition that there are other places that are separate from it, and the areas that we consider ‘non-places’ can say just as much about us as what our ‘places’ do.

The modern sense of place was first studied by phenomenologists such as Bachelarde and Eliade, but more recent work has looked at ‘sense of place’ regarding environmental behavior. 73 Beginning in the 1970s, geographers such as Yi-Fu Tuan and Edward Relph began to investigate phenomenological approaches to studying the concept of ‘place’. While two users may move through the same space, they can form completely different experiences of place, suggesting that ‘a sense of place,’ like the experience of the beautiful or the sublime, is not grounded in material but is instead accessible through the mind. For example, Tuan presents the juxtaposition of an Eskimo women and Eskimo man’s perception of the same island. To the Eskimo women, the island was primarily defined by the distance and location of important points, which are mainly trading posts, whereas the Eskimo men defined the island through a strong sense of boundaries (mainly the coastline) developed during the process of hunting. 74

With regards to the mental relationship of place and self, Relph discusses the concept of insideness and outsideness of places, in which being ‘inside’ a place means that you belong to and identify with it, while existential outsideness reflects an alienation from the world or a sense of ‘homelessness.’ 75 Additionally, Relph writes of the idea of

74 Yi-fu Tuan, Space and Place: The Perspective of Experience, (Minneapolis: University of Minnesota Press, 1977), 13.
75 Edward Relph, Place and Placelessness, (London: Pion, 1976), 49-55.
‘placelessness’, or a cultural and geographical uniformity resultant from ‘mass culture’ and homogenization. 76

Building off of place theories in the social sciences, ecologists refer to a sense of place or placelessness when exploring connection with and stewardship for natural areas. 77 Urban areas are often noted for the globally homogenizing effect they have on culture and biodiversity, and a ‘sense of place’ has been implicated as one of the driving motives in gathering public support for nature conservation and prompting people to care for their environments. However, because the same space may result in many different conceptions of place, the narratives that contribute to a ‘sense of place’ can be conflicting. In the case of Südgelände, the overarching narrative was that an abandoned railyard and its novel ecosystem ecosystem were saved from the destructive effects of post-war urban renewal which would have converted the valuable ecosystem into a commercial lot. However it could also be argued that if restoration efforts were carried out, a historical reference ecosystem could be saved from invading or homogenizing invasive species that are unfamiliar with a particular local. The characters and storyline are dependent on the dominant perspectives of the lobbying conservation groups, because these landscapes cannot speak for themselves.

b. Preservation

Due to this complication of our intrinsic biases regarding what is natural and what belongs to a place, ideas regarding social-ecological systems (SES) seek to find a way to explain the way people relate to place. 78 Studies on SES look at our own mechanisms involving place attachment as well as how this affects the values which go

76 Relph, Place and Placelessness, 79-117.
on inform our behavior towards nature. Many studies examining a sense of place choose to focus on an individual frame of consciousness. However, the concept of a ‘regional consciousness’ describes the meso-scale associations amongst groups of people and their environment. Geographer Anssi Paasi defines a regional consciousness as the multiscalar identification of people with a culture and the way that cultural norms are expressed throughout the region. 79 By contrast, a regional identity such as the Ruhrgebiet would refer to the classifications used to distinguish, name, an symbolize groups/areas, as well as the interpretation of the process through which a region becomes institutionalized.

A regional consciousness is dependent on the identification of individuals with a larger whole, with every individual impacting the development of the whole and the whole impacting the development of the individual, meaning that many conflicting narratives contribute to a regional consciousness, just as many narratives contribute to a sense of place. One way that a regional consciousness becomes expressed is through historic preservation. However, the decision over what will endure and gain its place in the public memory can be highly contested and heavily dependent on who the decision makers are. While fostering a sense of place can entail a lot of conflict, there is also a lot of value to be found in preserving sources of memory and heritage. When met with success, preservation allows for a greater understanding of the land and its memories.

As the American novelist, historian, and environmentalist Wallace Stegner said, “No place, not even a wild place, is a place until it has had that human attention that is the highest reach that we call poetry.” 80

Land can only become associated with a ‘sense of place’ through human attention because a place is a human concept, accessible through the mind rather than

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in material existence. Similar to the universal experience of the sublime, the experience of place can be evidenced from a variety of material forms, and different elements may speak to different people. What constitutes a place for some may feel placeless to others, and what elements make up a certain named place can be disputed. The memories and actions of one person alone are not enough to constitute what that place is to somebody else, and therefore a ‘sense of place’ becomes stronger when it is backed by a community which can relive and continually develop the memory of a place.

c. Separation

Stegner argues that the experiences, memories, and legacies of a community is what makes a place what it is, describing the way that communities always in motion lose their memories and their characters when developmental booms replace cultural practices with new ones. He argues that rootlessness has its risks, and that the existence of a ‘place’ requires the careful attention that comes with years of community experience, and cannot be replaced by impersonal development. Many would agree with Stegner, pointing out the severance of community connections with places of nature as one of the strongest areas of concern for placelessness since globalization. The effects of this separation results in negative physical, psychological, and spiritual effects. Therefore, efforts to reconnect with places of nature, often referred to as the singular ‘nature’ (see Section 1.2), have focused not just on what ‘nature’ is, but what the benefits we receive from it are.

After the industrial revolution, the development of cities and subsequent suburban sprawl rapidly altered land use patterns, and people were confronted with increased density, rampant pollution, and a feeling of separation from places of nature. The untamed wilderness of 1st nature which had gradually given way to the 2nd nature of agricultural lands was now succumbing to the urban landscape of the city. People
began to seek a reconnection with ‘nature’ and its benefits. As early as the 18th century, large tracts of land such as the Englischer Garten in Munich (1789) were designated as public green spaces and grounds for relaxation; an oasis from the city within the city. In conjunction with many public health and sanitation reforms taking place during the late 1800’s and early 1900’s, contact with natural areas was also espoused for its healing and ‘sanitary’ role within the urban matrix. 3rd nature served as green lungs for the city, bringing in fresh air and light, and as recreation grounds to strengthen people’s physical health. The famous Father of American Landscape Architecture, Frederick Law Olmsted, is famously quoted for describing city parks’ role in the “unbending of the faculties,” creating a respite from the physical and psychological stress of urban life. 81

The push for public parks found great traction across the western nations, and by the early 1900s, city planners began to develop criteria for the minimum amount of open space required to keep people healthy. In 1915, German urban planner Martin Wagner began to forward the notion of open space theory, arguing for a new approach to city planning. 82 Prior to this, parks were primarily created from the donation of private lands to the public by powerful rulers. These were often from former hunting grounds that were being given up, rather than a conscious planning decision to preserve and maintain open space. Wagner was significant because he sought to establish a basis for determining the proper ratio of green space per amount of citizens within an urban area, moving towards a statistically based analysis approach for planning purposes.

In addition to benefits on physical health, connection with natural areas was also desired for the beneficial social impact, with one of the most well documented examples.

of this being New York City’s Central Park, created in 1853. Throughout the
nineteenth century, the educated-wealthy widely believed that romantic-pastoral parks
were important instruments for social control. Now one of America’s most well known
and culturally identifiable cities, when influential writers such as Andrew Jackson
Downing and William Cullen Bryant first began lobbying for the creation of a model
public park in New York, the city was quite different. Urban elites returning from trips
abroad would often come to their home city reporting their “embarrassment at the lack of
refinement.” While America was considered a great economic power at this time, it
was considered relatively uncultured, and even the New York Times had compared the
public spaces of major European cities to New York’s own “penurious allotment,” calling
the contrast “mortifying.”

Influencers of the upper class sought to establish a sense of identity for their
proud city, but also to improve the lives of the working class, which would bring civility
and order within the city. Economic disparities created sharp differences in lifestyle
throughout, with immigrant and working class citizens living in dark, cramped, tenements
without sanitation services. Streets were narrow and often unpaved, with animals
roaming freely, and class conflict resulted from disagreements about what constituted
proper public behavior. However, through the creation of a large public park, it was
believed that the morality of the working class could be improved through the soothing
influence of pastoral nature, resulting in ‘fewer assaults on middle class sensibilities.’

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86 Ibid., 23.
The pastoral landscape park was a popular design choice for Central Park for a few reasons. The nature of the park could serve as a place for peaceful contemplation and observation, and was considered more relaxing than the experience of rugged, sublime wilderness. It could also emulate the style of model European parks of the time, harkening to Golden Age myths of Arcadia, while still retaining features that would be characteristic of the land’s own character. Central Park’s rocky outcrops remain a defining feature of the park today, reminding us that the land was once a rocky swampland before it was damned and drained, home to one of the first African American owned communities (Seneca Village), before it was converted into a public park.

In addition to deriving benefits from the observation of nature, the positive influence of the park was also thought to be derived from contact with exemplary citizens. Namely, the educated wealthy desired to set a good example with regards to proper public behavior for the working class by being seen while promenading in their carriages. 88 Among the benefits that could be derived from this influence were moral upliftment, improved civility, socialization into middle class norms and values, cultivation of taste, reduction of anomie (ethical standards), and induction of better attitudes towards work. 89 However, while working class citizens grew very fond of the park when they could find the time in their 6-day work week to visit it, the effect on ‘proper behavior’ generally did not manifest as expected, and people were often found disobeying park rules. This would include fishing in ponds, setting off fireworks, playing musical instruments, displaying flags and banners, posting bills and notices, parading in processions, engaging in commercial activities, possessing inebriating beverages, and of course, walking on the grass. 90

88 Roy Rosenzweig and Elizabeth Blackmar, *The Park and the People*, 246.
90 Roy Rosenzweig and Elizabeth Blackmar, *The Park and the People*, 246.
What is notable about the example of Central Park though is that just as nature is continuously involved in the process of remaking itself with its associated communities, the idea of proper park behavior and the benefits derived from its nature changed as the power dynamics of the city changed. This also indicates a shift in the community being served, and who is separated from or benefited by the nature of the park. Olmsted’s Central Park Commission had originally served as a way of shielding the park’s management from politicians, just as Central Park had been envisioned as a way to shield the public from the conflicts of city life. However, politicians realized that control over the park’s access and usage was a viable strategy to secure the votes of working class and immigrant New Yorkers. Under the control of the Tammany regime, Central Park was placed under the city’s Public Works department the ‘Sweeny Board’ was given control over the aesthetic goals in the park. Olmsted was dismissed, and the natural landscape was re-envisioned in response to criticism over park ‘rusticity,’ now displaying a bright and orderly quality full of colorful flower beds. 91

As a result of the Tammany legacy, from the 1870’s onward, the majority of park commissioners came from middle class backgrounds. While previously, the wealthy reaped most of the benefits from the park, now they were experiencing the separation as the park’s nature and audience changed. ‘Elite, Yankee control’ gave way to ‘New York natives,’ which were often 2nd generation Irish/German Americans, and as power dynamics shifted, different voices gained greater representation in city decision making. 92 This time also saw a strengthening of labor laws, granting the working class not only more money in their pockets but more leisure time to spend at the park. 93 Many of the original park rules regarding proper behavior were overturned, meaning that

91 Ibid., 273.
92 Ibid., 287.
93 After the formation of the Central Labor Union, city laborers were paid a two-dollar-a-day wage for an eight hour work day. Ibid., 272.
Sunday concerts became a well-funded and popular activity, men and women could skate with each other on the ice rinks, tennis courts opened on the North Meadows, and unaccompanied women became an increasingly common demographic in the park. By the progressive era, an increasing focus was given towards the benefits of active recreation in the park rather than pastoral nature as a source of passive contemplation, showing how nature’s cycles of rebirth also signify simultaneous shifts in communities served or separated. 94

While these cycles may be more evident at a local scale, these processes occur at regional and global scales as well. Today, as our concept of nature and how we benefit from it continues to change, many would argue that our increasingly urban lifestyles are further separating us from ‘nature’ worldwide, or at least in urban areas. For the first time in 2008, over 50% of the global human population was living in urban environments, and this number is expected to grow into a greater majority. 95 Studies examining disconnection often focus on city lifestyles and the lack of time spent outdoors as a major component of estrangement from nature, due to the absence of opportunity for place attachment. One such study that sought to quantify this was an experiment by Balmford and Taylor looking at children’s ability to identity Pokemon versus local animal species. They asserted that people showed greater place attachment to virtual biota than local fauna, with children having a success rate of 80% when identifying Pokemon species, but less than 50% at identifying indigenous plant and animal species. 96

This feeling of separation has been termed an ‘extinction of experience’ as well as ‘nature-deficit disorder.’ Coined by ecologist Robert Pyle, the extinction of experience refers to the indifference many people have towards nature, while nature-deficit disorder builds on this viewpoint to describe the diminished senses, attention difficulties, and higher rates of physical/emotional illness some researchers have found in those who become alienated from nature. While nature-deficit disorder is not technically classified as a medical ailment, many studies do bolster the notion that spending time in nature reflects positively on long term health and well-being, cognitive functioning; mood, blood pressure, and stress levels; as well as in countering mental illness and depression.

However, this begs the question of whether the feelings of separation and connection, like a sense of place or the experience of the sublime, are rooted in the mind or materiality. Regardless, researchers have increasingly utilized methods of quantification to assess the benefits of interaction with nature to justify funding for preservation or restoration. The concept of ecosystem services does exactly this, adding another layer to the idea of nature in which it is most valuable to us when it is at its most

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productive. Since the late 1980’s, the economic valuation of nature as green infrastructure providing ‘ecosystem services’ has been increasingly utilized as a strategy to communicate the value of nature focusing on human benefit cast through market-based evaluation methods.  

While many ecologists maintain that the commodification of services is difficult and at times counterproductive for understanding the true value of nature, it has also proved crucial to the implementation of international environmental policy in the face of climate change. For example, in 1997, Robert Costanza’s landmark paper “The Value of the World's Ecosystem Services and Natural Capital” estimated the dollar amount of benefits that the world receives from 17 main ecosystem services to be around $33 trillion per year.  

Today, ecosystem services are increasingly referenced in many major policy documents, such as the Millennium Ecosystem Assessment and the European Water Framework Directive Support Policy (WFD) for reaching ‘Good Ecological Potential’. The WFD is the policy that holds the Emscher Landscape Park to standards for completion, and mandates that all European Union nations abide by these same standards.

Takeaways: As humankind and nature remake and remold each other, they generate a narrative that is evidenced through ‘place.’ Place is a multiscalar concept in the sense that it can be defined differently amongst individuals as well as communities. It is also affected by time, which is what allows us to experience place through motion and perpetuates cycles of growth and decay as decisions are made regarding what belongs or does not belong to a place. As this can be a highly debated topic, many writers such

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as Wallace Stegner have argued that our actions regarding place require careful attention. Stegner warned against the dangers of ‘rootlessness’ that can lead to a sense of placelessness or separation. This concern has been echoed throughout circles regarding the topic of ‘place,’ and continues to hold steadfast as a point of contention regarding who a place is for and how it is serving them. Today, as the urban-rural divide mounts in the face of climate change and population growth, we are feeling an increasing separation from our places of nature, also referred to as the singular ‘nature.’ As we seek to characterize what nature is and who it is for, we engage in practices such as quantification and monetization as well as management and design. These kind of interactions in part define our relationship with nature, and it is this relationship that I shall continue to explore in my travels of the Route of Industrial Heritage and in New Jersey.
**Journey Takeaways - Route of Industrial Heritage Summary**

The Route of Industrial Heritage’s 400 km circuit tells the story of the region’s industrial past and how its nature both shaped and was shaped by that legacy to generate a mosaic of landmarks and sites that evoke a ‘sense of place’ in the viewer. Similar to the 1st, 2nd, 3rd, and 4th nature typology, which refers to degrees of human alteration of an ecosystem, some of these objects and spaces represent a kind of ‘1st nature’ in the sense that they have not been altered since their abandonment (or rebirth), while others have undergone various levels of refurbishment and revitalization to make them suitable for the current desired usage as a regional park. However, equally important as the physical intervention, a strong perceptual shift was required to transition the view of these spaces from places of work and contamination to places of nature, recreation, and cultural symbols. This is a shift which is still in the process of occurring in New Jersey.

The success of this transformation in the Ruhrgebiet can be largely attributed to the IBA Emscher Park, which sought to spark public support for a regional landscape park through a design competition. This led to the work of the Emschergenossenschaft in revitalizing the Emscher River, a former sewage canal which had been a major symbol of the environmental degradation resulting from industrial activity, but is now a symbol of the potential for reactivation. However, while the Ruhr Region presents a unified regional landscape and cycling route, it also possesses strong site specific natures. These places exist in conjunction with one another and their larger context, presenting a multi-scalar experience as one travels throughout, between, and within the region. Landmarks play a large role in spatially highlighting the presence of boundaries and referencing narrative qualities of each site, all while still being emblematic of the same region. (see Figures 3 and 4). The full version of my narrative for the Route of Industrial Heritage can be found in the Appendix.
In New Jersey, brownfield sites are more often hidden and feared for their contamination than highlighted and considered for the opportunities they present. This difference in perception between Europe and the U.S. is one among many reasons why the industrial landscapes of the Ruhrgebiet and northern New Jersey have developed along such different trajectories. Today, differences in management practices and ways of coping with economic transformation after the decline of manufacturing have left less of a post-industrial presence in New Jersey and more of a post-infrastructural quality. However, despite challenges in coordination across a home-ruled state and less public support for the experiential use of such sites, New Jersey still has the potential to host its own cultural-landscape park that showcases both regional and site specific natures. It is this potential that I look to explore in the second chapter of this paper.
Figure 3: Photo Map of the Ruhrgebiet. Source: Author
Figure 4: Panoramic Views of the Ruhrgebiet, and Zoom-In. Source: Author
Chapter 2: A Regional Trail System for New Jersey

In the second half of this thesis, I utilize a research by design approach to explore the continually evolving human-nature relationship. Building off of the changes which took place in the Ruhrgebiet that led to the repurposement of formerly industrial lands as a regional landscape park, I seek to explore New Jersey’s own potential for the utilization of post-urban lands as an open space network. I begin this with a literature background focused on New Jersey’s own history of industrial and post-industrial transformation (2.1) and how this leads to the selection of PSE&G’s historical electric transmission right-of-ways as a suitable backbone for a regional trail system (2.2). Following this, I delve into more detail regarding a portion of that system (2.3) before presenting a design proposal for one site along the corridor (2.4). The research questions for this thesis, which are ‘What is nature and what is our relationship with it?’ and ‘How is narrative conveyed?’ are addressed again in the conclusion (2.5).

2.1 - Literature Background

Intro

New Jersey is a home-ruled state with 565 municipalities, home to the
American Industrial Revolution, the first county parks system in the nation, the first

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110 “Park,” Essex County Parks, Essex County Parks Department, 2019, www.essexcountyparks.org/parks.
community to be lit with an overhead electric wiring system, and numerous other innovations that have shaped and increased the standard of life in modern-day America. Nestled along the Atlantic coastline in between New York City and Philadelphia, New Jersey is the most densely populated state in the country, and is also one of the most religiously and ethnically diverse states. While often referred to as a commuter community for the cities of New York and Philadelphia, New Jersey is home to a rich memory base, particularly surrounding its infrastructural development, which shapes and is shaped by the nature associated with that identity.

Similar to the Ruhrgebiet, northern New Jersey underwent a period of intense industrialization during the 1800s that shifted the economy away from a primarily agricultural and artisanal based society towards one characterized by industrial production. However, while the Ruhrgebiet became known mainly for its work with coal mining and steel production, New Jersey is more often associated with the manufacturing of a variety goods such as textiles, locomotives, machine parts, and more, as well as technological innovations such as the invention of the incandescent lightbulb. This is largely due to the existing landscape conditions, shaped by geological processes that took place over millions of years, which would come to shape the way that urban development took place. In the Ruhrgebiet, the vast deposit of anthracite coal led to a patchwork of industrial settlements located mainly eastward of the Rhine river, which was utilized as a major shipping canal. In New Jersey, industrial development blossomed around navigable waterways, first developing around the Great Falls of

114 Wolfram Höfer, Factors in (Sub-)Urban Landscape Transformation, 125-136.
115 Ibid, 127.
Paterson along the Passaic River for its ability to provide hydropower to run mills, and expanding along conduits such as the Hackensack and the Raritan as well.

As our societies mechanized, landscapes likewise took on a machine-like quality. Canals, railways, roadways, and other infrastructural corridors such as sanitary systems developed out of the need for greater connectivity between cultural centers. With the rise of electricity, these increasingly came to include large scale transmission right-of-ways and eventually telecommunications networks. As we continue to innovate, these patterns of connectivity continue to evolve and generate forms uniquely associated with previous layers of development. This can be seen both through the physical effects that industrialization brought out of each landscape, as well through cultural differences in perception and management.

For example, in the Ruhrgebiet, the land subsidence associated with extensive mining led to the canalization of the River Emscher and its subsequent use as an open sewage canal, as well as a permanent need for water engineering and management in many areas. Wealthy industrialists such as Alfred Krupp shaped the development of city layouts, residential villages, and even the development of a health care system to care for their workers (see Appendix: Chapter 1). Relics associated with steel production and mining generated a host of industrial landmarks scattered throughout the region and served as inspiration for many more artworks to come in the following years as the landscape was revitalized in order to raise ecological function in the wake of industrial decline.

In New Jersey, many former centers of manufacturing are no longer visible. Instead, the landscape is characterized primarily by the network of roadway and electrical infrastructure which allowed for the development of sprawling suburbs, large corporate parks, and strip-mall style shopping centers. Pulled in either direction by the cultural centers of New York and Philadelphia, and heavily fragmented, there is no clear
core area where a regional landscape trail like the Route of Industrial Heritage in Germany ought to run. This physical fragmentation is reflected in the management style of New Jersey’s landscape as well. Compared to the Ruhrgebiet, New Jersey lacks strong organizations which foster regional inter-municipal planning efforts, particularly with regards to open space. 116

In the greater context, European and U.S. policies regarding brownfield and post-industrial land development also differ, with the former placing a greater emphasis on derelict lands’ potential for redevelopment, while the latter treating these areas as potential hazards. 117 This has affected the way these sites become re-integrated into the regional landscape context, and in New Jersey these areas are often regarded as dangerous and unnatural. In similar fashion, infrastructure in New Jersey is not celebrated the same way as it is in the Ruhrgebiet, as evidenced through the treatment of innovations such as the Rhine-Herne Canal and industrial inspired artworks located along the Route of Industrial Heritage. This attitude is explored further in 2.1, d., which deals with stances towards electrical infrastructure and its perceived impact on natural beauty. However, to understand these views, it is important to begin first with an overview of industrialization in New Jersey.

b. Industrialization

Industrialization is what spurred New Jersey, and in particular north-eastern New Jersey’s path to becoming the most urbanized state in the nation. This began with the creation of the first planned American Industrial City, which is credited to Alexander Hamilton in 1792, shortly after the Revolutionary War. 118 During colonial times, industry

116 Ibid, 133.
117 Ibid, 133.
118 “The Birthplace of the American Industrial Revolution.”
was prohibited by English law, but Hamilton argued that industry was necessary for the newly found nation to become financially independent and establish a world presence. Several areas at this time were put forward as potential sites for the development of an industrial powerhouse, including New Brunswick and Newark for their ease of access to the Passaic River. However, both lacked the power source that Patterson had. After becoming appointed the U.S. Secretary of the Treasury, Hamilton co-founded the “Society for Establishing Useful Manufacturers” (S.U.M.). This was a privately operated, governmentally backed entity and would go on to purchase 700 acres of land around the Great Falls in order to establish the city of Paterson.

Hamilton had become inspired by the Great Fall’s potential to drive hydro-powered turbines that could produce energy for the creation of goods. In order to enable the transfer of energy between the Falls and the newly built manufacturing facilities, ‘raceways’ needed to be constructed. These would form the conduit between the 77 foot drop of the falls and turbines in the mills. The first raceway was built in 1794, and was a small canal made to divert and speed up flowing water. As water resources became more readily accessible through the construction of raceways, cotton and wool mills began to open up. Having met with prosperity, the city of Paterson started manufacturing other goods such as rail locomotives, paper, rope, hemp, firearms, and silk. Silk production became Paterson’s dominant industry by the beginning of the 20th century, earning it the name ‘Silk City.’ However, Newark would prove itself to be New Jersey’s most important manufacturing city. Its reputation was initially built off of Seth Boyden’s

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120 “The Birthplace of the American Industrial Revolution.”

121 “The Birthplace of the American Industrial Revolution.”
'patent leather' shoemaking business that promised to retain both durability and shine, but the city quickly expanded into the jewelry making and brewing industries as well.  

From great forces of production grew great cities, and urban development exploded throughout New Jersey’s piedmont lowlands, an area running along the Delaware River north of Trenton (another major industrial city) diagonally towards Bergen County. This area is roughly bounded by the mountain ranges of northwestern New Jersey, including the Watchungs, and the eastern coast line stretching from the Palisades down to the Raritan Bay.  

The land here is characterized by arable soil and flat terrain, making dense urban development possible. However, another important reason this area was so conducive to urbanization was the presence of major water bodies such as the Hackensack, Passaic, and Raritan Rivers, which provided drinking water resources and later served as transportation corridors that could connect to major shipping ports.

Rivers alone were not enough to meet the growing transportation needs of the time, making canal and railroad construction increasingly important in the early 1800s. Although canals were generally considered public works nationwide, they were often funded through the private sector in New Jersey. The state’s first canal was built in the 1830’s, linking Phillipsburg, Newark, and Jersey City. This was called the Morris Canal, and was built to connect the northwestern iron industry to new markets, but was unsuccessful in doing so. New Jersey’s most profitable canal was the Delaware and Raritan Canal, built around the same time as the Morris Canal. It connected Trenton and New Brunswick, carrying anthracite coal from northeastern Pennsylvania to fuel industry, but competition from railroads eventually resulting in its closing during the 1930’s.

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123 Ibid., 1.
124 Ibid., 7.
Today, it is home to a popular greenway and wildlife habitat, constituting the longest completed trail segment in the state.

The Camden and Amboy (C&A) Railroad was the state’s first rail line, and was built in 1834, the same year as the Delaware and Raritan Canal. The Hoboken-based Stevens family had created the C&A Railroad and Transportation Company with the purpose of connecting passengers from Philadelphia to New York City, and were pioneers in the transportation industry. Robert Stevens’ ‘T’ style rail added a broad flanged base to support heavier load, and the rail was shaped so that it could be secured with wood crossties (sleepers) with a hooked spike. This design quickly became the industry standard, and represented a major safety advance over the current technology of iron strapped wooden rails. This was especially important because the line’s primary purpose was for transporting people, the C&A company also introduced vestibule style passenger cars, referring to the enclosed area at the end of each car as opposed to the open platforms of earlier models.

By 1839, the C&A company and its related entities had claimed a monopoly on rail service between Philadelphia and New York. However, by 1871, the Pennsylvania Railroad Company proved itself to be more powerful, absorbing the C&A route. Although rail travel dramatically decreased following the growth of the highway system in the state, the C&A line remains an important transportation corridor today, albeit split between the New Jersey Transit Light Rail River Line and what is now Amtrak’s Northeast Corridor (running through Philadelphia and New York City). It is also listed on the National Register of Historic Places for the important role it played in New Jersey’s development, just like the Morris Canal and the Delaware & Raritan Canal.

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125 Ibid., 7.
127 “The Camden & Amboy Railroad.”
c. Suburban Development

Just as the Chicago School of Urban Sociology had described, population density and heterogeneity are crucial to the understanding of the city because immigration is required for the regular influx of labor and economic growth. 128 When immigration to the United States is studied, it is often divided into three periods. Old Immigration, describing the period between 1830 to 1880, consisted mainly of people from Ireland, Germany, and Great Britain. 129 New Immigration, which took place between 1880 and 1925, brought in waves of Polish, Italian, Hungarian, and Greek immigrants until the U.S. created stricter regulations. 130 Today, in the wave that has occurred after 1960, immigration occurs mainly from Latin American and Asian countries. 131

However, immigration is not without its conflicts, and disagreements during the industrial era indirectly reflected upon ideas of nature through the designation of the term ‘native.’ 132 As new waves of immigrants carried their own cultural backgrounds through the Communipaw railway station and into the state, many of the earlier English colonists began to harbor fears over the un-American values of these new immigrants, who would threaten social orders and erode morality. 133 Referring to themselves as ‘native-borns’, these upper and middle class citizens grew wary of the predominantly unskilled immigrants living in the tenements. In response, semi-secret societies such as the Order

128 see Literature Background: Nature & Place; Section B - Nature; Urban Ecology, Deep Ecology
130 United States Congress, New Jersey Historical Commission, and Douglas V. Shaw.
131 United States Congress, New Jersey Historical Commission, and Douglas V. Shaw.
132 see Literature Background: Nature & Place; Section B - Nature; Nature, Colonization, and Nativity
133 Similar concerns were voiced as rationale for the creation of Central Park as a way to combat this amorality through the education of the working class. (see Literature Background: Nature & Place; Section C - Place, Preservation, Separation; Separation From Nature and Its Benefits)
of United Americans (O.U.A.) were formed for the purpose of ‘keeping American culture free of foreign influence.’ ¹³⁴ Political parties such as the Native American or Know-Nothing Party, called as such because the party instructed its members to claim they ‘knew nothing’ when asked about it, grew out of organizations such as the O.U.A. The party was especially prominent during the 1850’s through the first wave of ‘Old Immigration.’

Tensions like these drove the creation of maps depicting social organization, like Ernest Burgess’ maps from the 1920s that would mark out traits such as mental illness, gang membership, criminal behavior, and racial background in concentric circles of development. ¹³⁵ The idea here was that patterns of urban succession could be predicted through the study of forces driving Darwinian evolution, and that as people competed for land and resources, development would become spatially differentiated into ecological niches. People and businesses who were more prosperous would begin to move away from the city center and create concentric circles of wealth radiating outward, while the inner city would face deterioration. Although Concentric Zone Theory was later deemed too simple for accurate prediction, and entirely omits the concept of gentrification in which the wealthy drive the price of disinvested areas back up, at the time this idea rode the line between observing and actively steering the phenomena of urban development in its own self-fulfilling prophecy.

Although the electric streetcar had been around since the early 1830’s to facilitate pedestrian travel outside the city, suburban development had been relatively limited. This was largely because these areas would not have had access to urban amenities, which didn’t become common until the early 1900s. However, as developments in public utilities and infrastructure began to facilitate services such as

¹³⁴ United States, Congress, New Jersey Historical Commission, and Douglas V. Shaw.
sanitation and the supply of disinfected drinking water, living outside center-city became a viable option for those seeking to escape the stress of urban life. This was around the same time that the automobile became popularized, which would majorly impact the middle class lifestyle in the 1920s, and eventually come to dominate American transportation, as well as the landscape, by the 1950s.  

Major developments in suburban growth began in the aftermath of the Great Depression, when the stock market crashed and many people lost their homes to foreclosure. In 1933, half of all U.S. mortgages were in default. In order to address the catastrophe, Roosevelt’s New Deal created the Home Owners Loan Corporation (HOLC) to begin purchasing mortgages at risk of default and introduce the amortized mortgage. This would allow borrowers to pay back their loans over the course of twenty to thirty years rather than the standard five, and opened the idea of home-ownership to a great number of people through the promise of lower monthly payments. In addition to this, the creation of the Federal Housing Administration fueled the economy by insuring mortgages and protecting lenders in the event of default, sparking a ripple effect that encouraged more and more home loans to be granted.

Suburban development reached its peak during the post-WWII economic boom, and ‘Levittown’-style developments could be seen springing up everywhere. These are characterized by subdivided plots featuring cookie-cutter one or two story homes that are splayed around a network of residential streets, a layout that today we might refer to as ‘suburban sprawl’ in reference to the unnecessarily spread out nature of the arrangement. Every home in a mid-20th century suburban neighborhood would have

136 Green, *The Contours of New Jersey History*, 12.
138 Ibid.
front and back yards featuring a clean-cut lawn of green grass, a triangular shaped roof, and of course, a car: the hallmark feature of the suburb.

Cars were the central feature of the postwar American landscape, and by the 1950’s, the American road network had come to involve transportational super-arteries between major cities and the suburbs called highways. These highways facilitated daily work commutes to cultural centers and made long distance travel possible, becoming majorly successful and spawning linear commercial development or ‘strip-malls’ alongside them. After the New Jersey Turnpike opened in 1951, it quickly became a favored location for shopping centers and corporate campuses, carrying three quarters of a billion vehicles in its first year alone. 139 The Garden State Parkway, which opened in 1954, spurred new developments in New Jersey’s tourism industry, putting the Jersey Shore within the reach of millions of vacationers. 140 This prompted the development of boardwalks, hotels, and casinos, which middle-class Americans flocked to in their leisure time.

However, while the suburbs are a symbol of economic prosperity and the American Dream for many, the perfectly trimmed front lawns of Levittown-style developments hide the tumultuous social conflicts and economic disparities of their times. Although measures taken by the HOLC and FHA granted home-ownership to a large number of Americans, they also indirectly worked against racial minorities, and Bill Levitt only allowed whites to purchase his homes. 141 Building off of the idea that social traits would cluster and could be mapped, real estate appraisers working with the HOLC began the practice of rating the value of neighborhoods in categories of A, B, C, or D grade. Those areas considered to be A grade would be marked in green and signal that residents in the area were safe to lend to, while D grade zones would be marked in red,

140 Ibid., 14.
141 (this was prior to 1948) “US History II (American Yawp).”
often utilizing racially explicit language as a rationale and correlating the credit risk of the neighborhood with the presence of African Americans. 142

Through the practice of red-lining, minorities would not only be barred from obtaining loans and entering the suburbs, but those areas that they were currently residing in would be targeted for chronic disinvestment. This would result in less funding for public infrastructure and education while encouraging wealthier employers to move out. Sharp economic inequality was the result, and as these areas developed into ghettos, the self-fulfilling cycle would feed back into itself because the ghettos would be deemed unsafe to lend to and targeted for further disinvestment. Although the Shelley v. Kraemer Supreme Court case had officially made it illegal to refuse the sale of a home base on racial identity in 1948, informal housing segregation would continue through credit-based discrimination. 143 It wasn’t until the 1960’s that the demographics of the suburbs would begin to shift through the combination of grassroots action and federal policies such as the Fair Housing Act of 1968.

d. Electrical Infrastructure v. Natural Beauty

‘Grid Literacy’ and Climate Change

Despite the orderly facade of these developments, the story of the American suburb is a messy one involving social conflict and sprawling infrastructure. Roads and cars commanded the spotlight as champions of America’s modern landscape through exhibits such as Bel Geddes’ ‘Futurama’ at the 1939 New York World’s Fair, which was a huge success and sparked widespread approval for the creation of superhighways. 144 Geddes’ visionary design was made to market General Motors’ automobiles to the

142 “US History II (American Yawp).”
143 “US History II (American Yawp).”
public, but he was really designing for the city-of-tomorrow in which chaos was overcome through a streamlined rational order imposed over the landscape. Properly embodying the spirit of the times, Geddes’ exhibit made people feel like they were immersed in the future rather than just observing it, depicting a utopia in which the problem of traffic congestion was solved and humankind was unified at the hand of top down planning solutions and marvels of engineering. Slums and ghettos had no place in Futurama, apparently having disappeared permanently after the creation of the highway.

However, while innovations in transportation have certainly been one of the most important features in New Jersey’s urban and suburban infrastructural history, electricity and electric infrastructure have arguably been the most impactful, albeit contentious developments in our modern lifestyle. We rely on electricity to power our lights, appliances, digital devices, regulate the temperature in our homes, and to keep us connected with each other each when we are not present. The grid system, while often detested for its unwanted visual presence, has been vastly influential on how we interact with our environment today, and has left its own physical footprint on the land to show for it. Long distance transmission corridors sweep the country, utilizing towering steel weeds to carry energy along wire conduits. These linear landscapes connect generating stations with substations and transformers, which step energy down to a voltage low enough that it can be transferred to our homes and commercial developments. To do so, our metal gardens must give rise to wooden utility poles which are connected through an aerial root system. From these structures, we can harvest the energy delivered to us, and use it to power our cultural centers.

Despite supplying us with the energy that we crave, our perceptions surrounding electrical infrastructure are notably paradoxical. We want the benefits of electricity, but wish for its associated infrastructure to be kept out of sight and out of mind. On a study regarding the aesthetic impact of residential power lines conducted by Daniel Wuebben,
author of *Power-Lined: Electricity, Landscape, and the American Mind*, only 5% of participants felt that electrical infrastructure should be ‘embraced,’ with an overwhelming 46% wishing for the lines to be buried. When asked to rank 8 different man-made objects with regards to their appeal, power lines almost always ranked last and were considered to have a ‘negative impact’ on the landscape. However, opinions were significantly more tolerant of the larger but less common transmission tower or power pylon, with 51% of respondents saying that the lines didn’t ‘bother’ them.

While the rise of electric power has often been regarded as the harbinger of a new era in human history, electrical infrastructure has been regarded as an unnatural eyesore for nearly as long. One of the goals of the City Beautiful movement, which arose after the 1893 World Columbian Exhibition in Chicago, was to bury utility lines in order to avoid the chaotic entanglements resulting from the artificial wires. Although many prosperous cities and towns may opt to bury wooden utility lines, the larger power pylons usually cannot be placed underground due to cost limitations surrounding their installation and maintenance. Constructing a 500 kV (kilovolt) overhead transmission line costs $1.9 million per mile on average. In comparison, the average costs for putting the lines underground run between six and ten times as much, reaching up to twenty times the cost (or $38 million) per mile in areas of mountainous or rocky terrain. However, as Wuebben notes, our infrastructure is merely where electricity is made visible in the landscape, and the conducting wires represent the fine margin between our visible and invisible landscapes (see Figure 5). In his book, Wuebben argues for a greater ‘grid

146 Ibid., 57.
149 Ibid., xvii.
literacy,’ which requires the understanding of power lines both as material and metaphorical conduits, not only serving practical functions but embodying cultural symbols as well. The acceptance and understanding of infrastructure in the landscape in order to promote the most sustainable outcome with regards to energy generation and distribution will likely be crucial in the following years.

Figure 5: Wire Between The Visible and Invisible. Image Source: Author

In today’s age characterized by climate change and population growth, our current national grid system is expected to undergo dramatic changes over the next several decades. As we move away from fossil fuels and begin to favor energy that comes from renewable sources such as wind and solar (which are then converted into electricity), we will need to develop power lines which can handle an increased load while catering to renewable energy projects. However, due to the non-uniform potential for wind and solar generation across the country, exactly where our electricity should be generated and how it should be distributed is debatable. Computer generated models
studied at NOAA indicate that the U.S. could potentially benefit from the creation of large-scale wind and solar farms located in the center of the country for the purpose of mass-distributing electricity along high-voltage direct current (HVDC) lines. Here, where the flat land is highly suitable for energy generation, electricity can be generated in bulk and transported over energy-superhighways to local communities. However, this presents its own set of challenges such as how to effectively deliver electricity to far-reaching areas.

Simultaneously, as the current grid is being renovated to support higher voltages, we are also looking towards the development of locally distributed power systems as well. These ‘microgrids’, which are typically still connected to the central grid but have the ability to disconnect and function independently, may eventually outmode the centralized system we use today. Among some of the benefits of microgrids are that they are more resilient in the face of super storms, because they can be restored more quickly and result in less blackouts. Under the current centralized system, local disturbances including interference from tree branches, energy overloads, or even cyber attacks can cause ripple effects, resulting in millions of people losing power nationwide. Fear of major blackouts like this, such as the Northeast Blackout of 1965, is what prompted the creation of the North American Electric Reliability Corporation and investigation into the concept of ‘smart grids’ that can react to changes in local energy use.

In addition to this, localized systems are also more efficient at distribution. Currently, long distance transmission lines losing about 5% of their power as a result of the transportation, a percentage that would be even higher if transmitted from a

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150 Wuebben, “From Wire Evil to Power Line Poetics,” 54.
centralized power source in the middle of the country all the way out to the margins of the continent. However, local generation systems may not produce enough energy to meet the needs of their community if they are not ideally situated in areas with good exposure to wind and solar all year long.

Regardless of how our infrastructure develops in the future, it is likely that there is a chapter our urban and suburban development that is now closing: that of the electrical grid as it currently exists, and the story of electricity prior to the climate change movement. Especially relevant to the human/nature divide, our electrical infrastructure represents the synthesis of these two seemingly separate forces in combination of natural resources and human ingenuity. Just as Wuebben described conducting wires as the margin between the seen and the unseen, they also are a symbol for what appears to be a rigid dichotomy of human and natural forces, and illuminate the idea that these powers may not be so separate after all.

The Rise of Electricity and Its Infrastructure

While knowledge of electric shocks and inquiries into this force date back to Ancient Egypt, Thomas Browne was the first person to print the word ‘electricity’ in the Pseudodoxia Epidemica in 1646. This was a book that would inform the vocabulary of the early Scientific Revolution, and described Browne’s experiments with static electricity which he produced by rubbing objects together. Further experimentation over the next hundred years would eventually result in the Leyden Jar in 1745, named after the city in the Netherlands where it was invented. The device consists of a glass jar with inner and outer metal foils, as well as a metal terminal extending vertically through the lid to

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153 Ibid.
connect the foils. The purpose of the Leyden Jar was to show that electric charge could be accumulated and stored, later being released at will. It is considered an early form of a capacitor, which stores electrical energy in an electric field, and was also an important inspiration for Benjamin Franklin’s electric kite experiment.

Benjamin Franklin is often credited with discovering electricity, although what he really did was utilize conductive rods to attract lightning to a leyden jar. In 1752, his experiments proved that lightning was an electric current, which represented an important advancement into the nature of this mysterious force which was known to kill people. However, while Franklin showed that humans could store this energy, at the time these experiments had little practical use for the American lifestyle. This would change in the 1800s, when the Italian physicist Alessandro Volta would invent the electric battery, and the British chemist Humphrey Davy would produce the first continuous arc, or electric lamp. \(^ {154}\) By the 1870’s, the seeds for the AC-DC power war had been planted. Zénobe Gramme of Belgium would invent an electric generator, the dynamo, that produced direct or DC current which could be utilized as an industrial power source. Russian engineer Paul Jablochkoff paired Gramme’s dynamo with an inverter that would supply alternating or AC current to power the Yablochkov candle. With Gramme’s assistance, Jablochkoff would use this invention to light 64 arc lamps at the Paris Exposition of 1878. \(^ {155}\)

A year later, Thomas Alva Edison would invent the ‘first practical light bulb,’ or the incandescent light bulb, utilizing direct current. He had a larger vision for the lightbulb as well, in which a central power station could distribute electricity to city residents along a wire, powering lights and appliances in people’s homes. He established the Edison Electric Light Company in 1878, and opened up the first central commercial power

\(^ {154}\) To Develop the State of New Jersey and Make It a Better Place to Live: Roseland to Bushkill: SR 500kV Transmission Project. (New Jersey: PSE & G, 2014), 4.

\(^ {155}\) Ibid., 4.
station in the country in 1882. 156 This was located at Pearl Street in New York City, and supplied 85 customers with electricity. Edison received recognition worldwide for his inventions, attracting numerous young inventors to his labs such as the electrical engineer Nikola Tesla. Edison, however, failed to see Tesla’s potential, and he left Edison within the year he started work there.

Tesla’s reputation largely surrounds his discovery of the rotating magnetic field or alternating current, in which flows alternate direction between positive and negative terminals roughly 60 times per second. This is opposed to direct current, which always moves in the same direction. Tesla pioneered the use of AC, which is what we currently use today for all long distance transmission. This is due to AC’s ability to be transferred at high voltages that can later be stepped down with transformers for residential use.

However, Edison was adamant that DC was superior, a debate that would come to head at the 1893 Columbian World’s Fair Exposition in Chicago. It was here that Nikola Tesla and George Westinghouse would illuminate the Court of Honor, proving the power of AC. On the evening of May 1st, President Grover Cleveland pushed a button which turned on a hundred thousand incandescent lamps and bathed the neoclassical fairground in light. 157 At that moment, history had been made, and AC was chosen over DC as the current to power America.

However, Edison’s distribution system posed one major benefit over Westinghouse and Tesla’s: he buried his lines underground. In the wake of the Columbian Exhibition, which promoted the idea that cities should enhance the aesthetic environment for its inhabitants, the City Beautiful movement charged itself with tending to the messy task of ordering America’s chaotic cities. This included hiding the utility lines which had begun to form a tangled mat of wires across the skyline. Drawing

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156 Ibid., 6.
157 Ibid., 12.
inspiration from Morse’s telegraph a few decades earlier, electricity was being delivered to homes via wooden poles from which sprays of wire erupted. In an ironic twist of fate, Samuel Morse, who had been one of the original founders of the National Academy of Design along with Thomas Cole and Asher Durand, turned from painting after his work was criticized for its rigid brushstrokes. Although recognized as a fine portrait painter, his paintings were unable to convey the ‘lighting-electric’ energy desired in sublime wilderness paintings. Instead, the New York University professor of painting and sculpture focused his attention towards electrical devices, leaving a lasting impact on the American landscape through an electric presence mounted on rigid wooden poles.

Samuel Morse had received funding from Congress to build the first experimental telegraph line in 1844, which would transmit human intelligence through electric currents via wire conduit. Originally, he had intended to place the wires underground in trenches to protect the lead tubes containing insulated copper wire from climatic conditions. However, after the first lead tubes had corroded and the insulation failed, Morse ordered 500 chestnut poles about 30 feet in height and spaced 200 feet apart to be erected in order to carry the wires. By 1880, roughly 291,213 miles of telegraph wire and 34,305 miles of telephone wire existed, sometimes even preceding rail lines as American settlements pushed further west. The utility poles were so symbolic of a western presence during this time that Native Americans were known to target wires in Nebraska during battles in the 1860s.

As electricity usage continued to increase over the years, so did the impact of associated electrical distribution infrastructure. However, while shorter utility lines can often be buried, the larger pylons often cannot due to the exorbitant costs associated

158 Wuebben, Power-Lined: Electricity, Landscape, and the American Mind, 4-19.
159 Ibid., 2.
160 Ibid., 2-31.
161 Ibid., 48.
with their burial. One of the benefits associated with AC current is that it allows for high voltage transmission over long distances, which can later be stepped down to a lower voltage for connections in residential areas. However, in order to carry the high voltages from generating stations to substations, large steel towers are required to safely support the load. These transmission corridors dotted with soaring power pylons are less frequent compared to the wooden variety, but the towers are over a hundred feet tall, some over two hundred today, and always require a path clear of obstructions to prevent interference with the wires. As the demand for power grew over the 20th century, the size and prominence of these towers only increased, and by the 1960’s it was apparent that urgent action had to be taken to address the destruction of ‘natural beauty’ in the American landscape (see Figure 6).^{162}

![Image of power pylons](image.png)

Figure 6: What is Ugly? Image Source: Author, Route 1

The 1960’s were characterized in part by a growing environmentalism sparked by Rachel Carson’s *Silent Spring* and widespread awareness of pollution. It was clear that

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industrial activity had left dangerous scars, and people also began to implicate electrical towers as an unwanted intrusion upon the landscape for their unnatural appearance. These steel beasts rip their way across open vistas, and conjure up associations with everything detestable about humankind’s destruction of the former New World wilderness. However, there is often more harm done through their appearance than in their presence, and transmission corridors can also serve as important habitats for pollinators and other meadow species.  

America remained steadfastly against the towers though, and after Lyndon B. Johnson’s White House Conference on Natural Beauty, the pressure rose on electric utilities to consider visual impact in their design. While the president admitted the difficulties in determining what is ‘beautiful,’ he also stated, “we do know that nature is nearly always beautiful. We do, for the most part, know what is ugly.”  

In this case, overhead transmission lines fell under the category of ‘man-made objects d’horror.’

In response to the public backlash, the Edison Electric Institute hired the well-known industrial designer Henry Dreyfuss in 1966 to address the widespread discontent with “lattice steel towers striding along the horizon, lines looping over highways and overarching cornfields and deserts.” The concern over the towers’ visual footprint was termed ‘power styling,’ and Dreyfuss proposed a series of futuristic concept designs with a 5-point program focusing on: 1. Safety & Utility, 2. Ease of Maintenance, 3. Cost, 4. General Quality, and 5. Appearance. Through the method of form-follows-function, the goal was ultimately to lead to a sense of orderliness, and posed a serious question regarding the pylons: should they be visibly noticeable or not? While at times it would

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seem that the best designs should render the towers invisible, a strong emphasis on quality, structure, and materiality could leave an impact on almost any landscape. The conflict was heavily intertwined with moral concerns over the destruction of ‘natural beauty.’ Should the towers recede into nature, or should they stand apart as a man-made landmark?

Today, it seems these questions still have not been resolved. Capitalizing on an unoccupied market, the Danish firm BYSTRUP has been designing power pylons since 1994 and is currently the only company in the world to specialize in pylon design for the global market. Their T-shaped towers first gained recognition in 2011 after winning a design competition for the United Kingdom’s electrical grid. Projects like these have been an important part of efforts that encourage tolerance of infrastructure in visible areas. One such example of a design that does this as well as promote the kind of ‘grid literacy’ that Wuebben talks about is the Omaha Public Power District (OPPD) Arboretum. This opened in 2004, and is the only utility owned arboretum in the nation. To Daniel Wuebben, who grew up in Omaha, the OPPD Arboretum is the first benchmark in what Aldo Leopold described as, “the long and laborious job in building a permanent and mutually beneficial relationship between civilized man and civilized landscape.” The 26 acre site is characterized by the presence of an 8 acre electrical substation, located near an interstate highway, with the remaining 18 acres serving as a public green space for the purpose of informing visitors about proper woody plant selection in utility right-of-ways.

171 Wuebben, Power-Lined: Electricity, Landscape, and the American Mind, 185.
The land usage conflict between street trees and residential utility poles is another common reason why utility companies suffer from a negative image. Many homeowners have seen their trees mutilated due to the interference they pose with overhead wires, so in order to mitigate the competition over space, the OPPD launched a public educational arboretum that also acts as a wildlife shelter and community gathering area. This is programmed with a set of interactive exhibits, which display suggested plant species for areas within utility right-of-ways. However, while the OPPD’s primary concern is centered on conflicts relating to wooden utility poles, the arboretum also gives visitors the chance to view the architecture of the electrical substation from the park’s highpoint. Additionally, the steel transmission towers can be spotted between the trees throughout the park.

One might expect that this would prompt a negative reaction to the aesthetics of the arboretum, but it has actually served as a popular green attraction and photoshoot site since its opening. In fact, the space has been named one of the top ten parks/nature attractions in Omaha by Trip Advisor, with an annual average visitor count of 23,400. This is a strong statement because Omaha was given a parkscore rating in 2019 of #36 out of the top 100 cities in America regarding green space accessibility for its residents. 80% of residents in Omaha live within a 10 minute walk of a park, which is high compared to the national average of 54%. This signifies that rather than visiting the arboretum because it is the only open area around, people are actively seeking out this garden of man-made weeds. While the OPPD may still have the title for the only utility owned arboretum though, it is not alone in its hybridization of land uses. Utility corridors are increasingly being implicated as locations where bike and pedestrian trails

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174 Ibid.
can run, and may also present an interesting opportunity for a regional trail system within New Jersey.

2.2 - Suitability

a. Why - Benefits of a Trail

New Jersey is the most densely populated state in the country, with over 1,000 people per square mile on average (see Figure 7). Much of New Jersey’s urban development is centered within the Piedmont region, characterized by flat land and bounded by the Northwestern mountain ranges, the Delaware River, and the coastline (see Figure 8). The Gateway Tourism region (see B-Suitability; Where; NJ Tourism and NJ Historic Register) roughly overlaps the northeastern half of the Piedmont region, and is the most densely populated area within the state. As population continues to grow amidst climate change, alternate modes of transportation to cars are being sought. The NJ D.O.T Transit Village initiative seeks to expand public transportation facilities, while the Safe Streets to Transit initiative provides grants for improved bike and pedestrian travel around transit stations (see Figure 9). In addition to this, the Safe Routes to School Program seeks to implement these measures to encourage walking and biking to school over busing or driving.

Since 2009, New Jersey’s Complete Streets Policy has required all future roadway projects to accommodate bicyclists and pedestrians. However, in the dense matrix of urban development, it is not enough to simply add bike lanes at the sides of streets to encourage walking and biking. Non-vehicular transit is much more appealing when people are provided with long, uninterrupted areas of open space or trails that can provide connections to cultural centers as well as larger tracts of open space. However,

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175 Wee, “Most Densely Populated U.S. States.”
given New Jersey’s density, there are not many areas that are suitable for transportation while also contributing to a sense of place and connection with the environment (see Figures 10 & 11). Despite the difficulty in selecting areas for trail conversion, there are many benefits associated with increased trail usage. Benefits include a decrease in CO2 emissions, as well as a decrease in traffic congestion. Trail users often see physical, emotional, and mental health benefits as well, with their improved health leading to lower medical expenses later on. 176 If well located, trails can facilitate connections to parks and contribute to the Trust for Public Land’s vision for all people to live within a 10 minute walk of green space. 177 Trails can also play an important role in ecotourism, which presents an important opportunity for sharing environmental awareness and increasing connection to nature through a sense of place. If revenue is generated from ecotourism, it can be utilized to increase funding for the maintenance of green spaces and trails.

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Figure 7: 2010 Population Density Map by Municipality. Map By: Author
Figure 8: Density Overlaid with Natural Land Regions. Map By: Author

Much of New Jersey’s urban development occurs within the Piedmont region where the land is flat. The Gateway Tourism region roughly overlaps the northeastern half of the Piedmont.
Figure 9: Gateway Region Density Map and Transit Village Initiatives. Map By: Author
“The highways crisscross through the towns and become manmade geological networks of concrete. In fact, the entire landscape had a mineral presence.”

--- Robert Smithson

Figure 10: Topography Overlaid with Water and Major Transportation Lines. Map By: Author
Figure 11: Residential, Non-Urban, and Open Space Land Usage. Map By: Author
b. Where

NJ Trails

The Gateway Region possesses many significant park spaces which would benefit from connection (see Figure 12). These are semi-connected through a number of major long-distance trails, including the Appalachian Trail in the northwest, the High Point to Cape May trail in the west, the Coastal Heritage Trail in the East which connects to the Hudson River Walkway and the Palisades, the East Coast Greenway which connects from New York to Pennsylvania, and the Delaware Liberty Water Gap Trail which runs east to west (see Figure 13). However, many of these trail segments are unfinished.

The New Jersey State Trails Program is managed by the NJDEP’s Office of Natural Lands under the Division of Parks and Forestry. In 1974, the New Jersey Trails System Act was created to establish trails in natural, scenic areas near urban lands to promote public access to and enjoyment of outdoor areas.\footnote{United States, Congress, Natural Lands Management. “New Jersey Trails Plan Update,” 20.} The NJ Trails Council was created in 1975 as an advisory board to the NJ Department of Transportation (DOT) and NJDEP for the purpose of developing a plan for a coordinated trails system throughout the state.\footnote{Ibid., 20.} The council is also involved in administering Recreational Trail Program funds, which is an assistance program from the USDOT’s Federal Highway Administration. In addition to the State Trails Program, and number of non-profit organizations are also responsible for managing trails, such as the East Coast Greenway, the Delaware and Raritan (D&R) Greenway Land Trust, the NJ Conservation Foundation, the NYNJ Trail Conference, and the Rails-to-Trails Conservancy.
The first trails plan was released in 1982. This primarily categorized trail types and usages, named existing trails, and named proposed trails, such as areas along abandoned railroad right-of-ways. This plan recommended eleven existing trails, nine proposed trails, eleven abandoned railroad rights-of-ways, seven on-road bike tour routes, three beaches, twenty canoeable waterways, and fourteen connector trails as initial components of a proposed Statewide Trails System. The most recent plan update was released in 2009, and focuses on programs such as the USDOT’s Safe Routes to School (see Figure 14). It is also located developing long distance greenways such as the NJDOT High Point to Cape May bike route and the cross-state Delaware Liberty Water Gap Trail.

\(^{180}\) Ibid., 2.
The New Jersey Trails plan was released in 1982 to connect people throughout the state and coordinate local trail-making efforts. In conjunction with organizations such as the East Coast Greenway, several long distance trails have been marked.

Figure 13: Gateway Region Trails. Map by: Author
The U.S. DOT’s Safe Routes to School Program provide grants for improving bike and pedestrian safe routes within 2 miles of K-8 schools.
“NJ Tourism and NJ Historic Register

New Jersey’s Gateway Region represents the densest area of the densest state in America, and stands to reap the most benefit from trail system development. The Gateway region is an NJTourism defined area embodying Bergen, Hudson, Passaic, Essex, Union, and Middlesex counties.  With regards to a trail system, NJTourism can be instrumental in publishing information on wayfinding and points of interest, as well as promoting ecotourism. This is similar to the way that Ruhr-Tourismus acts as a host site for the Route of Industrial Culture in the Ruhrgebiet, and the Emschergenossenschaft hosts information on the Emscher Landscape Park, Emscher Trail, and Emscher Island Trail. This includes directions, diagrams, images, history, and storytelling.

Noted for its intense urban development, New Jersey’s Gateway Region is also known for its industrial history and the culture that formed around this. For example, the Great Falls of Paterson have become a national landmark due to their scenic qualities as well as their role as a source of hydropower. The Gateway is also noted for having the most diners out of any region, an impressive feat given that New Jersey has more diners than any state in America. Developing from Walter Scott’s lunch wagon which served a simple menu to industrial workers, by the early 1900s pre-fabricated diners resembling rail cars were being shipped all over the country. They quickly gained a reputation as casual american eateries open at all hours, cropping up along major transit lines. However, many of these have since been closed or converted into restaurants (see Figure 13).


As urban development increased, so did the need for access to open space. In 1895, Essex County became home to the first county parks system in the nation, starting with the creation of Branch Brook Park in the City of Newark, which is now a national historic site. In fact, many of the Gateway’s highlight attractions are on state or national historic registers, including the Thomas Edison National Historic Park, which encompasses the Edison Labs as well as his home in Llewellyn Park. Thomas Edison played a pivotal role in the development of the urban amenities that we take for granted today, such as electrical lighting. His residence in Llewellyn across the street is also a quintessential high-end suburban neighborhood incorporating romantic landscaping principles, and one of the first known gated communities in the nation.

The National Register of Historic Places is a perpetually updated list which was first created after the passing of the National Historic Preservation Act in 1966, which sought to preserve the nation’s heritage from development. The act set federal policy for preservation, overseen by the National Park Service, and also established State Historic Preservation Officers (SHPO)s to keep state registers. SHPOs play an important role in the nomination process of properties from state registers to the national register, and serve as the initial point of contact for landowners who wish to submit a place for preservation. They determine eligibility of both places as well as districts. Historic districts refer to a geographically defined area possessing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united by past events or aesthetically by plan or physical development. Railroad right-of-ways are some of the most common districts found on historic registers, as well as canals, important roadways, and electric transmission right-of-ways. For example, the rail-to-trails

184 “Parks,” Essex County Parks, Essex County Parks Department, 2019, www.essexcountyparks.org/parks.
186 Ibid.
movement specifically seeks out abandoned railroad right-of-ways for park conversion, but this wouldn’t produce a fully connected greenway in New Jersey where many major lines are still in use (see Figure 16 and 17). Rails-to-trails also sometimes works with utility corridors such as pipelines or overhead transmission lines. For a map of energy generation and transmission centers in the Gateway Region, see Figure 18.

Linear infrastructure corridors like these are included in the state register of historic districts for the role they play in New Jersey’s urban and suburban development. Because places and districts under historic preservation cannot be re-developed, they can often serve as park space. The use of historic preservation titles can be seen along Germany’s Route of Industrial Heritage as well, and most of its park sites were placed under historic preservation before their addition to the trail. In New Jersey, the historical electric transmission lines of PSE&G present a highly desirable opportunity for trail connection, which will be explored more in the next section (see Figure 19).
New Jersey has the most diners per area in the world, with the Gateway Region being home to many of them. Diners are an iconic industrial symbol but are rapidly being replaced today.

Figure 15: Diners in the Gateway Region. Map by: Author
Figure 16: Historic Railroad Right-of-Ways in the Gateway Region. Map by: Author
Urban development often followed rail lines in the 1800’s. New Jersey’s railroad peak was during the 1920’s, but trackage has decreased following the rise of superhighways. This has lead to initiatives such as the rail-to-trails movement.

Figure 17: Current Railroad Right-of-Ways in the Gateway Region. Map by: Author
Renewable energy sources are becoming increasingly common given the climate crisis. Our current network connects cultural centers through long distance energy transmission that creates linkages between generating plants and consumers.

Figure 18: Energy Generation Centers and Right-of-Ways. Map by: Author
As lightbulbs and electric streetcars gained in popularity, urban and suburban developments sprang up along major transmission lines. By 1920, it became clear that pooling power could provide better results, and our electric grid system was born.
c. Selection of PSE&G

Public Service Corporation, now known as Public Service Enterprise Group or PSE&G, formed on May 6th, 1903. Thomas Nesbit McCarter sought to consolidate New Jersey’s currently distinct utilities, including electricity, electric powered trolley lines, and gas, making aggressive company acquisitions over the next several years. At the time, all of the power plants which Public Service acquired operated independently of one another. However, this would change over the next 20 years. In 1906, Public Service built its first steam power plant by the Hackensack River near Jersey City called the Marion Generating Station, intended to relieve pressure on the other central generating stations. McCarter then turned his attention to creating an efficient system of distribution through a network of generating plants and substations. In 1906, the company connected the Marion Generating Station with its Coal Street and Secaucus plants so that they could run as a single unit. This is called ‘power pooling,’ and meant that station or individual generators could be brought on line or switched off in response to changes in demand, increasing reliability and producing more electricity at a reduced cost. This quickly became standard practice. However, regional scale power-pooling as we know it did not begin until after World War I.

At the start of the war, power consumption was higher than it ever was before, and the defense industry created an additional spike in demand which the system was not prepared for. In response, the government encouraged the creation of more generating plants, increasing capacity by 10%. However, this wasn’t enough, and the resulting Emergency Power Bill of 1918 was created to incentivize interconnection in order to combat shortages. By 1920, the advantages of power pooling had become

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188 Ibid., 20.
189 Ibid., 23.
190 Ibid., 8.
clear. Utilities in formal agreements could purchase electricity from the least expensive generating plant of the group and then agree to split the savings from interconnection at the end of each month. On September 16th, 1927, New Jersey and Pennsylvania’s three major utility companies established a formal agreement called the Pennsylvania-New Jersey Interconnection, or the PNJ.  191 This was between Pennsylvania Power & Light, Philadelphia Electric, and Public Service Corporation of New Jersey, forming the biggest power pool to serve two states at the time, which was termed a ‘superpower system.’

The three companies would be linked by a lopsided diamond of 220kV lines, connecting three stations in Pennsylvania with the Roseland switching station in New Jersey. From Roseland, a line would extend southwest towards Plymouth, located near Philadelphia, and another would shoot slightly northwest towards Bushkill, located along the Delaware River near the border of Pennsylvania and New Jersey. The Bushkill and Plymouth stations would be connected with an intermediate station in Siegfried, located almost directly west of but not connected to Roseland. Within the state, lines heading eastward would also connect the Roseland switching station at the western edge of Essex County with the Essex-Marion-Kearny generating station interconnection located near the Newark Bay along the Hackensack and Passaic Rivers. This ring represents one of the landmark accomplishments in American utility history, and has recently been upgraded to 500kv transmission capacity (see Figure 20).  192

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191 Ibid., 37.
192 Ibid., 2.
Today, utility corridors are increasingly being implicated as locations where bike and pedestrian trails can run. Railroad right-of-ways have become a popular choice for trail conversion because many lines have become abandoned due to the dominance of cars. However, electric utilities pose an interesting scenario because these corridors are
often still actively used, unlike when railroad corridors become trails. Rather than complicate matters though, the dual usage of the space typically provides benefits for both electric utility companies and trail managing organizations. Utilities regularly seek out long, linear corridors that run nearby cultural centers, making these areas highly conducive to trail use. When an organization or parks department finds a space they want to utilize, they can form an easement agreement with the utility company, meaning that they pay the utility an annual fee in exchange for the use of the corridor. 193

Typically, maintenance of the trail becomes the responsibility of the trail agency, but the utility reserves the right to access all facilities. This makes facility maintenance much easier for the utility companies because in addition to improved access, utilities can coordinate maintenance efforts with a single partner rather than hundreds of property owners. Many companies are open to working out agreements because it improves their public image, and they may even offer in-kind services such as trail surfacing. In exchange, communities acquire a long and uninterrupted corridor suitable for bike and pedestrian transport. This is especially attractive in the home ruled state of New Jersey because acquiring such a high degree of continuous green space might otherwise require coordinating with many municipalities. By comparison, acquiring an easement from a utility presents a management scenario more similar to that of the Emscher Trail in the Ruhrgebiet, which is managed by the Emschergenossenschaft.

In the Gateway Region, PSE&G’s early historic transmission lines could form a highly suitable trail system because they are both culturally significant as historic districts, as well as well situated due to their connection with major city centers. As a home ruled state with 565 municipalities, utilizing utility lines as a trail could facilitate the process through the obtainment of an easement rather than working directly with every

municipality. In addition to this, the right-of-ways are located nearby but not largely overlapping New Jersey's other incomplete long distance trails, which could ultimately form the basis of a state greenway network when completed (see Figure 21). However, these transmission areas pose the challenge of whether or not it could be an attractive area for people to utilize as a trail, given the negative perception of electrical infrastructure as the antithesis of nature.
Figure 21: Trails and PSE&G Historic Districts. Map by: Author

Sharing space with utilities can provide benefits for both trail users and utility companies. PSE&G’s right-of-ways present an opportunity for greater connectivity along cultural corridors.
2.3 - Roseland Switching Station to Thomas Edison National Historic Park

a. Areas of Interest

Today, as our energy needs consider the microgrid more often, our traditional infrastructure may undergo changes in use value which allow utility right-of-ways to be considered as trails to a higher degree than they currently are. To explore what this experience might be like, I have zoomed in on a leg of PSE&G’s Northern Inner Ring (NIR) running from Roseland to West Orange (see Figure 22). As Daniel Wuebben states (see 2.1,d. ‘Grid Literacy and Climate Change’), the establishment of a ‘grid literacy’ is crucial for creating a positive relationship with our infrastructure which can open up greater possibilities in shared usage and open space reclamation.

Figure 22: Zoom-In of Roseland to West Orange portion of Northern Inner Ring. Map by: Author

This portion of the NIR is especially significant regarding the initial questions of this exploration: “What is nature and what is our relationship with it?” and “How is
narrative conveyed?" Essex County is home to the first county parks system in the nation, and has a lot of open space to show for it. Within the municipalities of Roseland, Livingston, and West Orange, this includes nature preserves such as the West Essex Conservancy, South Mountain Reservation, and Eagle Rock Reservation; golf courses such as the Crestmont Country Club and Essex County Country Club; recreational forest parks such as Becker Park, Riker Hill Art Park, and Prospect Park; a number of smaller neighborhood parks; and the Thomas Edison National Historic Park, which consists both of the Edison labs in West Orange and the gated suburban community of Llewellyn Park (see Figure 23). Running through this mosaic is the electric transmission right-of-way, which connects the Roseland Switching Station in the west with the West Orange Substation in the east.
Figure 23: Roseland Switching Station to Thomas Edison National Historic Park. Map by: Author
The Roseland Switching Station, which can be viewed from the West Essex Conservancy along the Passaic River, is a component of the Pennsylvania-New Jersey power pooling agreement which is integral to the way our national grid system functions. It is the western boundary of the exploration (see Figure 24). In the east, the Thomas Edison National Historic Park is located near South Mountain Reservation and can provide access back onto the Delaware Liberty Water Gap Trail. The National Park consists both of Edison’s residence Glenmont Garage in the famous gated suburb Llewellyn Park (see Figure 25), as well as the Edison Labs across the street where he and numerous other inventors worked (see Figure 26).

Through this patchwork system of preserved lands, a multitude of relationships between humankind and nature can be seen. This is evidenced through place based landscape features which developed over millions of years and shape the sites’ potential for development, wildlife found in the area, historical human usage of the sites, and current management practices which influence the representation of the landscape today as well as its future development. Through this representation, which is displayed through design practices including the conveyance of verbal information as well as physical intervention, a narrative of the evolving human-nature relationship is reflected through landscape form.
Figure 24: View of Roseland Switching Station. Image Source: Watercolor by Author

Figure 25: Glenmont Garage, Llewellyn Park. Image Source: Author
b. Nature of the Right-of-Way

The electric transmission right-of-way casts this boundary between humankind and nature through the landscape forms of the transmission towers and the meadow and beneath them which carve a linear path through the urban matrix. The meadow habitat is characterized by integrated vegetation management practices (IVM) and rotational mowing that leads to arrested succession. 194 This maintains a safe clearance zone around the towers which accounts for movement of the wire due to line sag. Maintenance involves the removal of woody species 3 feet or taller within the wire zone, as well as management for the border zones of woody species removal at 10 feet or

higher (see Figure 27). A diagrammatic estimate of pylon height and distance with wooden utility poles is shown in Figure 28.

However, what is not clearly seen in the right-of-way are the invisible landscape processes taking place here. Regarding the transmission towers, this involves the transference of high voltage power between cultural centers. While the wires connecting towers may represent this process, it is not something we can clearly witness and its value to us is often forgotten when we perceive such structures as visual pollution. Likewise, the electromagnetic radiation or EMR associated with this energy is also invisible to the naked human eye, although other frequencies of EMR present themselves to us in the form of visible light. EMR, according to the Environmental Protection Agency, refers to the waves of electric and magnetic energy moving together through space. The electromagnetic fields (EMF) surrounding these towers are generated by the movement of electrical current passing through a power line, and are considered to be a low frequency, non-ionizing radiation. This means that while the health effects related to the EMF of high tension wires are still being studied, this kind of radiation is considered safer than the energy associated with microwaves and cell phones (still considered non-ionizing) or x-rays (ionizing).

The ecosystem services associated with the meadow are also invisible to us, although it is signified through above ground vegetation. The arrested succession in the transmission zone means that the right-of-way is able to support a meadow habitat, which is an important resource for birds and pollinators, and is framed by the electrical landmarks which sweep across it (see Figure 29). After rotational mowing, PSE&G seeds with a pollinator mix, which is crucial for the maintenance of biodiversity and is necessary for the stabilization of our climate and earth systems. These kind of habitats

are important in highly urban environments like New Jersey, where contiguous meadows do not exist in high degrees. Due to the land’s relationship with the transmission towers, the meadow exists in perpetuity along the right-of-way. The trail area is shown here through a montage of imagery running from the West Essex Conservancy to the Thomas Edison National Historic Park (see Figure 30).

Figure 27: Wire and Border Zones.
Image Source: Author: “Transmission Vegetation Management,” Safety & Reliability - PSE&G
Figure 28: Pylon Height and Distance. Image Source: Author

Figure 29: Right-of-Way Through the Seasons. Image Source: Author
c. Challenges and Opportunities

In order to further refine the area of focus, suitability analysis regarding safety and visibility were conducted. Cyclists and pedestrians hit by vehicles traveling 40 mph stand on average a 95% chance of serious injury, and a 70% chance of fatal injury. 196 This is in comparison with a 65% chance of serious injury and 25% chance of fatal injury at vehicles traveling only 25 mph. Because increased road speeds present exponentially riskier environments, roads immediately surrounding the transmission zone of interest were categorized as 40+, 30-35, and 25-below. Roads at 40+ or higher present significant barriers, and a ring of these higher speed roads form an island around the right-of-way (see Figure 31). Within this island, transmission tower/pylon visibility is marked in green. While the pylons are roughly 180 feet tall, they are sited to minimize visibility impacts in residential areas, and so while glimpses of the tops can occasionally

be viewed throughout the area, they are mostly only visible in a 1,000 foot radius (see Figure 31).

![Figure 31: Road Speed and Visibility. Map by: Author](image)

The further refined area is shown in Figure 32. This base map shows the roadway 'island' zone around the transmission area of interest and the Thomas Edison National Historic Park areas, bordered by the Passaic River in the West. The Northern Inner Ring (NIR) is depicted in purple, with park space in green and golf courses in yellow. Roadways are depicted in grey, with I-287 and its on/off ramps presenting a large barrier to access within the right-of-way as well as between the West Orange Substation and Thomas Edison Park. Eagle Rock Reservation in the north, which
connects to the rest of the Liberty Water Gap trail, is also blocked by the highway. Eisenhower Parkway in the west, running alongside the Roseland Switching Station, presents an additional barrier between the right-of-way and the West Essex Conservancy.

There is an elevation change of a little over 400 feet (see Figure 33). Between Laurel Ave and the Thomas Edison Historic Park, the area is characterized by the Watchung Mountain Range, showing sharp changes in elevation before becoming relatively flat again. The West Orange Substation is built on the Watchung Rideline. While there is not a strong viewpoint here, the higher elevation presents an opportunity for a potential bridge connection into the much lower ground of gated Llewellyn Park community and the Thomas Edison Historic Park. This would bypass the barrier of I-287, which is depressed in comparison to the Watchungs.
Figure 32: Plan View for Refined Area of Interest. Map by: Author
Figure 33: Topographic Plan View. Map by: Author
The road speed suitability analysis not only reveals the presence of a safe-speed island surrounding the right-of-way, but it highlights several discontinuities within the transmission area due to the on/off ramps for I-287, as well as I-287 itself (see Figure 34). These breakages would need to be accounted for through wayfinding measures that reroute users onto lower speed residential streets, the implementation of bike lanes and crosswalks, or bridges and tunnels (see Figure 35). For wayfinding measures, see Figures 36 and 37 for diagrams of wayfinding measures along the Ruhrgebiet’s Route of Industrial Heritage and modified proposed examples of signage that could be implemented when needed in New Jersey. Additionally, the shaded area of Llewellyn Park poses a challenge because of its private nature. Typically, non-affiliated visitors must purchase tickets and check in at a gatehouse to enter the community, so a second gatehouse would be necessary at a new proposed entrance location to ensure that this security is still in place (see Figure 38).

Between the West Orange Substation and the Thomas Edison National Historic Park lies two major barriers: I-287 and Llewellyn Park. However, both of these barriers present substantial opportunities. If road speeds can be decreased surrounding the substation, a bike lane can be run down Mt. Pleasant Ave through the forest near the highway. The sharp elevation change here and depressed highway then allow for a sweeping bridge, which would land in Llewellyn Park. A second visitor gate, similar to the existing gate at the Park Ave entrance to the gated community, can be put in place to ensure that visitors are still screened. From Llewellyn Park, people can visit Glenmont Garage (Thomas Edison’s residence and a component of the National Park), and then exit at Park Ave to travel down Main Street towards the Thomas Edison Labs.
Figure 34: Challenge and Opportunity Map. Map by: Author
### Challenges and Opportunities - Map Key

<table>
<thead>
<tr>
<th>Key</th>
<th>Location</th>
<th>Challenge</th>
<th>Opportunity</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>West Essex Conservancy Park at Passaic River</td>
<td>Unclear path to viewshed</td>
<td>View of Roseland Switching Station</td>
<td>Mark a clearly defined trail with accessible pathway.</td>
</tr>
<tr>
<td>B.</td>
<td>Eagle Rock Ave</td>
<td>High speed roadway, no bikelane</td>
<td>Connection between switching station and West Essex Conservancy park</td>
<td>Create a separated bikelane.</td>
</tr>
<tr>
<td>C.</td>
<td>Ebenhower Pkwy</td>
<td>Major high speed roadway, no pedestrian crossing.</td>
<td>Connection between right-of-way and switching station</td>
<td>Create a short tunnel running under Ebenhower Pkwy between ROW segments.</td>
</tr>
<tr>
<td>D.</td>
<td>Livingston Ave at Essex Fwy Ramp</td>
<td>High speed roadway near Fwy on/off ramps</td>
<td>Connection between right-of-way segments</td>
<td>Trail delineation from Lenape Trail offshoot towards W McCellan Ave intersection.</td>
</tr>
<tr>
<td>E.</td>
<td>Laurel Ave</td>
<td>High speed roadway near Fwy on/off ramps, unclear path to Deerco Tract</td>
<td>Connection between right-of-way segments, potential connection to Deerco Tract</td>
<td>Create crosswalk with button-activated stop lights, mark a clearly defined trail with accessible pathway.</td>
</tr>
</tbody>
</table>
Figure 35: Challenge and Opportunity Key. Image Source: Author
While the connection through Llewellyn Park poses a large difficulty, it is very beneficial to the overall character of the trail because it is representative of the American Romantic suburb, which represents a significant period in the history of the American narrative of nature. Founded in the 1850’s by a wealthy New York businessman, the community is designed in the romantic-pastoral style espoused by Andrew Jackson Downing. This is evident in the spacious layout of the suburb, marked with winding pathways, large expanses of grass covering undulating land, and a common area called ‘The Ramble’ that follows a small brook. Thomas Edison moved into the neighborhood and his residence at Glenmont Garage in the 1880s, enjoying the location so much that he decided to build his labs in West Orange across the street shortly after. This is a sharply distinctive relationship with nature compared to that espoused along New Jersey’s infrastructural corridors.
Figure 38: Proposed Measures – West Orange Station through Llewellyn Park. Image Source: Author
2.4 - *Laurel Ave Substation Park*

*a. Site Selection*

According to Daniel Wuebben, author of *Power-Lined: Electricity, Landscape, and the American Mind*, the establishment of a ‘grid literacy’ involves an understanding of power lines both as serving practical functions as well as embodying cultural symbols. However, the question of how this kind of relationship is to be formed can be answered in many different ways. While positive experience and interaction generally fosters a more holistic narrative of the human-nature relationship, the conveyance of such a narrative can manifest in a multitude of ways. For example, the Route of Industrial Heritage poses a very extensive answer regarding the question of ‘what is nature and what is our relationship with it?’ that is strongly associated with a particular landscape. As an American example, Daniel Wuebben utilizes the Omaha Public Power District (OPPD) Arboretum, the first utility owned arboretum in the nation, as a case study. The OPPD Arboretum works to engage visitors with experiences involving infrastructure and its interaction with the woody plant species that residents plant at their homes. Furthermore, visitors can view the active substation from a high point that allows them to see the relation between the station and the rest of the landscape, forming a different perception of the human-nature boundary based on their experiences in the arboretum (see Figure 39).

In New Jersey, experiences that allow people to interact with the infrastructure in a positive and place-based manner is equally important. In this thesis, the idea I am seeking to convey is that the human-nature dynamic is formless and constantly changing. However, when cast through the lens of a particular time, place, community, and cultural context, ‘nature’ takes the form of a narrative that can be read through

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197 Ibid., xvii.
landscape. This provides the language for representation, both reflecting and evolving the relationship between humankind and nature. It is the second research question, ‘How is narrative conveyed?’ that section 2.4 of this paper deals with. I believe that through design, narrative is given spatial form and materiality. This creates a more physical, yet still ever-changing, representation of our relationship with nature. Through landscape design, a medium and a space is provided for the reflection on past relationships with nature, as well as a venue for its future development. For this exploration, the site I have chosen is Prospect Park, located alongside the Laurel Ave Substation.

Figure 39: Positive Experience. Source: Author

The Laurel Ave substation, located in between the Roseland Switching Station and the West Orange Substation, runs alongside Prospect Park (see Figure 40
for context and Figure 41 for images). Just outside the forest, there is a large mound of dirt. This area could be used to create a sculptural gathering space dedicated to renewable energy, and create a narrative around how renewable energy infrastructure will play an increasingly large role in our power distribution systems in conjunction with traditional generation and transmission systems. The forest itself presents an excellent opportunity for framing the substation and providing a contrast between the invisible services we receive from the forest and the invisible processes involved in our cultural-electrical processes. For a diagrammatic model of the substation, see Figure 42.

Figure 40: Prospect Park at Laurel Ave Location. Image Source: Author
Laurel Ave Substation and Prospect Park

Figure 41: Prospect Park at Laurel Ave Photos. Image Source: Author
b. Inspirations and Goals

The Laurel Ave substation, located in between the Roseland Switching Station and the West Orange Substation, runs alongside Prospect Park (see Figure 40 for context and Figure 41 for images). Just outside the forest, there is a large mound of dirt. This area could be used to create a sculptural gathering space dedicated to renewable energy, and create a narrative around how renewable energy infrastructure will play an increasingly large role in our power distribution systems in conjunction with traditional generation and transmission systems. The forest itself presents an excellent opportunity for framing the substation and providing a contrast between the invisible services we receive from the forest and the invisible processes involved in our cultural-electrical processes. For a diagrammatic model of the substation, see Figure 42.

In the Ruhrgebiet, the presence of landmarks were highlighted in ways that called attention to site specific histories and celebrated the union of nature and
infrastructure that supports our modern lifestyles. Elements that served as landmarks were often either abandoned and repurposed industrial relics such as the mining shaft of the Zeche Zollverein in Essen that now is home to a museum and colonizing vegetation park, pieces of Emscherkunst such as the Bottrop Tetraeder that often sit atop a halde or mining waste heap, or more recent advances in environmental engineering such as the moment where the Rhein Herne Canal passes above the River Emscher in Castrop Rauxel. However, the most well known landmark in the region for many is likely to be the River Emscher itself, which represents a long lineage of evolution in the relationship between humankind and nature in the landscape. Even though at first glance in its revitalized form today, once might mistake the Emscher for a river that never had any industrial past, it is through design that one can allude to this history through interventions that simultaneously create inviting spaces for the present moment while encouraging visitors to look further into the intentionality of the site.

Regarding this site within and surrounding Prospect Park, the goal is to highlight and celebrate electrical infrastructure, namely the Laurel Ave substation and the visible pylons near it, as well as to draw parallels between the invisible landscape processes associated with this kind of infrastructure, the maintained meadow, and the Prospect Park forest. This can be addressed both through circulation throughout the existing conditions of the site to selectively hide and reveal features, as well as through the materiality of the intervening sculptural elements. With respect to materiality, one example from the Route of Industrial Heritage that is particularly relevant to the discussion of electrical infrastructure is that of the Sorcerer’s Apprentice in Oberhausen. Made of steel parts and reaching about 115 feet tall (35 meters), the Sorcerer’s Apprentice or Zauberlehrling resembles a dancing power pylon that has broken free from the rigid row of transmission towers behind it. The Emscherkunst lies in the center of the
larger Riphorst forest garden, which displays a series of woody plantings resembling succession (see Figure 43).

The Sorcerer's Apprentice draws its reference from Goethe's poem of the same name, in which an old sorcerer leaves his apprentice to perform a set of chores. Unsupervised, the apprentice casts a spell to assist him, bringing a broom to life that he quickly loses control of until the sorcerer returns and breaks the magic. The poem ends with his statement that only a master should invoke such spirits, and often serves as a reference today to one who summons political allies that they cannot control. In this case, the dancing pylon can be seen as that broom, which we summoned to assist in the 'chores' of maintenance required to sustain our cities. Broken free from its desired purpose, the pylon appears to be surging with energy as its stream beams twist into a frenzied shape and are meant to provoke questions regarding climate change and energy transition while also serving as a reminder of an industrial past.
Figure 43: Oberhausen - Sorcerer’s Apprentice. Image Source: Author
In New Jersey, we are asking ourselves similar questions regarding energy transition and the increased need for renewables that can sustain our energy usage without further altering our climate. Among many other aspects, the concept of the microgrid is often referenced as a way to aid in this transition. As opposed to the traditional infrastructure of our national grid system today, the microgrid is not a complete rejection of but rather an evolution of that system. While typically still connected to the national grid, the microgrid has the ability to disconnect, making energy production, storage, and distribution more efficient and resilient. One of the difficulties with transitioning to renewable energy such as solar and wind power is that not every location is best suited to the same kind of energy generation, and weather conditions can affect generation on daily and seasonal patterns. For example, solar energy may be easy to generate and store in the middle of the country during the summer, but less so if there is a long streak of cloudy days.

The benefit of the microgrid is the potential to store energy when it's cheap, while still having traditional sources of generation to rely on when local production is unstable. When available, local production means that less energy is lost during long distance transmission, and the energy grid is less vulnerable as a whole in the face of extreme storms or attacks because the microgrid can disconnect. At the Laurel Ave substation, the presence of a large, sunny, unforested area at the edge of the park presents the opportunity for a design that seeks to contrast the idea of the microgrid with our traditional electrical infrastructure, while at the same time highlighting that the two systems are not opposed to each other.

Inspiration sketches are shown in Figure 44, displaying a sculpted mound that gives rise to an elevated photovoltaic structure which supports solar panels within its cup of ‘petals’ angled 40 degrees south towards the sun. The structure lights up at night, displaying its functionality as a generation system which can operate independently of
the substation, and smaller ground lights guide the visitor up the spiraling path that curls inward on itself away from the right-of-way. The lights that would guide users along the forested path to get to the ‘microgrid’ would be powered by traditional means. Rough exploratory designs are seen in Figure 45 with 5 foot contours, with a section cut horizontally through the center of the mound. A full existing conditions plan is shown in Figure 46.

Figure 44: Inspiration Sketches - Day & Night. Image Source: Author
Figure 45: Mound Exploration. Image Source: Author
Figure 46: Existing Conditions Map. Image Source: Author
c. Design Proposal

Several areas of concern are highlighted in the existing conditions map in Figure 46, including the high speed roadway creating a discontinuity west of the substation, a lack of pedestrian crosswalks at the parking lot entrance for the forest, and a steep slope (14.8\%) that hampers ada-accessible access back onto the right-of-way from the forest. In the existing conditions map, the different zones are shown with the park being represented in green, the mound area in brown, and an additional PSE&G owned green space adjacent to the R.O.W being shown in yellow. A plan that both addresses the aforementioned challenges and utilizes techniques that engage visitors with the landscape is shown in Figure 47.

Strategies for solutions include rerouting users off of the R.O.W through wayfinding measures and bike lanes down a lower-speed residential road. They can then cross the street at a low-speed crosswalk located at the parking lot entrance for Prospect Park. After visitors pass through the forest trail, the substation comes into view and is ‘revealed.’ From there, an elevated pathway with an 8\% slope grants visitors a profile view of the substation. This culminates in a round-a-bout overlook platform, which forks in two directions. From one path, the visitor is led up a spiraling path that climbs the small mound, leading to the photovoltaic structure inspired by the ‘microgrid’ which can be seen as a rendering in Figure 48. The other path takes the visitor down a ‘meadow walk’ which sports 3 different planting typologies that utilize integrated vegetation management to maintain meadow ecologies.
Figure 47: Proposed Plan. Image Source: Author
Figure 48: Mound Zoom-In. Image Source: Author
The planting typologies in Figures 49 through 57 seek to highlight the relationship between humankind and nature through the cultivation and management of varying microsites. Figure 50, or 'mound plantings' deal primarily with erosion control and the effect of height. Taller species are planted at the bottom of the mound with shorter species being planted towards the top. The ‘wet zone’ (Figure 51) deals with plantings that fall in the swale area that carries water from the residential land around the mound. Figure 52 addresses the transition between the meadow and the forest, while Figure 53 addresses the transition between the microgrid and the residential area through a selection of buffer plantings. Figure 54 displays a group of small flowering trees and understory plantings that are used to frame but not block views of the substation and microgrid.

The concept of vegetation management and the role this plays in maintaining a meadow habitat is displayed in Figures 55, 56, and 57, termed the Pre-Colonial, Ruderal, and Warm Meadow respectively. Similarly to the OPPD Arboretum, this park space can be utilized to showcase the interaction between vegetation and electrical infrastructure. However, while the educational component at the OPPD focused on the relationship between woody plants and residential utility poles, the relationship showcase here could be one focused on the transmission right-of-way and meadow plants, maintained as such through integrated vegetation management and rotational mowing which leads to arrested succession. After mowing, PSE&G sows the right-of-way with a seed mixture that lends itself to habitat for pollinators. However, maintenance of this habitat is a continual process, and to resist the colonization of land by unwanted species or ‘weeds,’ vegetation management must focus not only on the removal of woody species of a certain height but also on the removal of species which might be considered invasive. In Figure 55, the Pre-Colonial Meadow, the planting palette displays a group of meadow species which would have commonly been found in the
region prior to global trade. The species here are considered to have high habitat value for their associated ecological communities. This is contrasted with Figure 56, the Ruderal Meadow, which is not seeded after mowing but instead allowed to colonize freely. Although not named in the figure, species that colonize here are likely to be Mugwort, Garlic Mustard, Spotted Knapweed, and Shepherd's Purse among others. Maintenance against weeds is not performed in this section, and vegetation management focuses only on removing woody species of a certain height. This represents the meadow scenario with the least human management, and is considered to have a lower habitat value than the Pre-Colonial or ‘native meadow.’

Finally, Figure 57 questions the designation of nativity that is commonly associated with the pre-colonial habitat by bringing up the topic of assisted migration in the face of climate change. The USDA defines a native plant as one ‘that is a part of the balance of nature that has developed over hundreds or thousands of years in a particular region or ecosystem,’ with an additional note that only plants found in the United States prior to European settlement would be considered native to this country. The term native would therefore also always be used in reference to a particular location. However, as discussed in section 1.2, this view of nature and nativity views the two as locked in a static ‘balance,’ rather than a continuously developing system. Today, amidst global concerns of biodiversity loss and climate change, the question of what is nativity when it comes to nature is ever pertinent.

Far from a stable ‘balance,’ vegetation communities have never been static, and have been changing in response to geologic and climatic conditions for as long as we

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have been able to study them. Furthermore, when addressing the concern of rising temperatures, vegetation communities do not simply shift upwards or downwards as entire units either. When species are studied individually, they often display movements that occur at separate rates and spatial patterns from their community members. This can be in response to a myriad of conditions other than temperature, including precipitation, soil conditions, dispersal limiting factors, and associations with mutualist organisms to name a few. Over the course of many years, the result of climate induced migrations are not the same ecosystem shifted one direction or another, but instead a display of novel communities which do not resemble the previous ecosystems of study.

However, while these kind of processes have always took place, they are occurring at a much faster rate today than they have in the past. Currently, climate change projections that track the general northward movement of southerly or otherwise pre-adapted species predict that the rate required to keep up with climate change is 300 to 500 km of movement per century. This is in contrast to the typical rate of migration normally observed at 20 to 40 km per century. In addition to this, the matter is further complicated by land use changes such as the high degree of impervious surface, habitat fragmentation, and other major barriers to pollination and dispersal. This disharmony between the rate of change required to sustain the ecosystems that are valuable to us and the rate of change possible in our current environment without change in human action poses a major challenge. As the problem worsens, we will see greater phenotypic mismatch and probably the extirpation of many species. This is prompted many researchers to further investigate the topic of ‘assisted migration,’ which is the idea that through human intervention and management we can predict what species would be

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best suited to a particular habitat 50 or 100 years from now and plant them, particularly along corridors of open space that may facilitate the movement of wildlife and vegetation.

Figure 57, the Warm Meadow, addresses this experimental form of planting by selecting meadow species that thrive in warmer regions compared to New Jersey such as from the Carolinas. As more attention is devoted to this topic, corridors such as PSE&G’s right-of-ways could become viable areas for assisted migration efforts and spreading awareness of the topic. This planted area stands in contrast with both the Pre-Colonial meadow, which is what our currently held views of nativity today display as a native New Jersey meadow, as well as the Ruderal Meadow, which represents wilderness in anthropogenic New Jersey sans human intervention for ‘weeds.’
Figure 49: Planting Scheme. Image Source: Author

Figure 50: Mound Plantings. Image Source: Author
Figure 51: Wet Zone Plantings. Image Source: Author

Figure 52: Middle Zone Plantings. Image Source: Author
Figure 53: Buffer Plantings. Image Source: Author

Figure 54: Small Trees. Image Source: Author
Figure 55: Pre-Colonial Meadow. Image Source: Author

Figure 56: Ruderal Meadow. Image Source: Author
The remaining figures, 58 through 74, showcase sections and renderings of the site and begin to get into the question of materiality and form. As stated in the research methods section of this thesis, I seek to explore the questions ‘what is nature and what is our relationship with it?’ as well as ‘how is narrative conveyed?’ The ideas I would like to convey is that the human-nature dynamic is formless and constantly changing. However, when cast through the lens of a particular time, place, community, and cultural context, ‘nature’ takes the form of a narrative that can be read through landscape. This provides the language for representation, both reflecting and evolving the relationship between humankind and nature. Through design, narrative is given spatial form and materiality, which in this case revolves around the interplay between electrical infrastructure and vegetation as representing human versus nature. Because of this, the design interventions have chosen mainly to highlight the presence of infrastructure.
through the selective hiding/revealing of the substation and the proposed ‘microgrid.’
This is done through a series of pathways which are partially above ground in order to
provide different vantage points and are framed by vegetation of differing heights.

The spatial quality of these walkways as one progresses through the site is
shown in figures 58 through 65, which are cut roughly every 200 feet apart. Sections
begin at the newly proposed crosswalk and mixed pedestrian and vehicular entrance to
the site, then progress through existing forest pathways. After the substation comes into
view and is ‘revealed’ behind the trees, the visitor is taken up an ada accessible
boardwalk that allows for a profile view of the substation, culminating in a raised round-
a-bout gathering space, mimicking the form of a suburban cul-de-sac to reference the
suburban nature of the surrounding context. This boardwalk could be composed of
galvanized steel and stone, to reference both the materiality of the electrical
infrastructure as well as the rocky terrain that characterizes this land set in the Watchung
Ridgeline. Pathways within the site, similar to pathways along the right-of-way, would be
10 feet to accommodate shared use for bikes and pedestrians.  

At the round-a-bout, the visitor is provided with the option to descend a set of
steps, taking them back onto the forest path (not shown in section), continue on through
the Meadow Walk described above, or venture towards The Microgrid. Along the
meadow path, a stone retaining wall assists in the process of allowing the path to quickly
meet grade again so that the visitor can continue onward through the rest of the right-of-
way. If the users heads towards the Microgrid, they will be carried up a spiraling path
following the landform that curls inwards on itself, representing the micro entity that has
the ability to separate from yet is still set within the ‘macro’ national grid. Sections 67
through 74 display larger sections and renderings of the locations within the site.

201 All Terrain Vehicles (ATV)s would require a seperate path, which would not continue on
boardwalks.
Figure 58: Path Centerline Sections. Image Source: Author
Figure 59: Centerline Sections Entrance. Image Source: Author

Figure 60: Centerline Sections Substation Reveal. Image Source: Author
Figure 61: Centerline Sections Station Profile. Image Source: Author

Figure 62: Centerline Sections Station Overlook. Image Source: Author
Figure 63: Centerline Sections Meadow Overlook. Image Source: Author

Figure 64: Centerline Sections Meadow Walk. Image Source: Author
Figure 65: Centerline Sections Microgrid. Image Source: Author
Figure 67: Microgrid and Right-of-Way Section. Image Source: Author
Figure 68: Microgrid Mound Section - Day. Image Source: Author
Figure 69: Microgrid Mound Section - Night. Image Source: Author
Figure 70: Microgrid Mound Topo Model - Day. Image Source: Author
Figure 71: Microgrid Mound Topo Model - Night. Image Source: Author
Figure 72: Aerial Perspective Topo Model - Day. Image Source: Author
Figure 73: Aerial Perspective Topo Model - Night. Image Source: Author
Figure 74: Right-of-Way as a Regional Trail. Image Source: Author
2.5 - Conclusion

Our relationship with nature is one that is constantly evolving. The perceptual boundary between humankind and nature that forges the basis of our relationship between these two forces reflects a certain time, place, and community. While the character of this boundary and the relationship it entails does not have a physical form in and of itself, these abstract ideas can be represented in ways that generate narrative and can be evidenced through design. Narrative reflects and forwards the evolution of the relationship by casting the human-nature boundary through a lens that filters and ascribes form to the formless. This lens and the subsequent forms are dependent on the context of the present moment, and should not be mistaken for the boundary or relationship itself, which entails limitless possibility despite being cast through a finite material world. Design has the power to make the invisible visible and works with materiality to imbue narrative with spatial qualities.

In this thesis, I have focused heavily on the role of landmarks in the human-nature relationship. In the Ruhrgebiet, towering steel sculptures, preserved settlements, and factory relics tell a story of the region’s industrial history and development patterns. However, while northern New Jersey also possesses a significant industrial past, its landscape and associated landmarks are quite different, as well as the overarching perception of these sites. While revitalization of brownfields has been very successful in Germany through programs such as the IBA EmscherPark, such sites in New Jersey are often covered up or ignored for their potential dangers rather than celebrated for the opportunities they present and narratives they represent. In particular, areas characterized by infrastructure are often considered the ugly antithesis of nature in New Jersey, rather than hallmarks of the material and cultural conduits they embody.

Similar to the way steel factories, mining shafts, and waste heaps characterize the landscape of the Ruhrgebiet, northern New Jersey has been heavily characterized
by infrastructural corridors such as canals, railways, roadways, and utility right-of-ways. Electric transmission towers in particular have received a lot of attention for their perceived disruption of the natural landscape due to their ubiquity and large size. However, when the boundary between humankind and nature is questioned, it becomes evident that while the towers may have represented one particular relationship with nature in the past, it does not have to remain that way. Rather than being perceived as separate from and in contrast to the natural landscape, the electric right-of-way can be viewed as a beautiful harmony in which the arrested succession of the meadow is maintained and framed by maintenance practices associated with the towers. Similar to the way that a host of ‘invisible’ ecosystem services and ecological processes are represented by the meadow, which could also have been considered ugly before its value was understood, electrical infrastructure represents important yet invisible landscape processes that our modern lifestyle depends upon. As a greater amount of attention is being devoted to hybrid systems and ‘4th nature’ today, our idea of the human versus nature relationship is still yet being reborn.
Appendix: Travel Narrative for the Route of Industrial Heritage

Chapter 1: A Place of Heimat - The Altenhofs

When I arrived in Germany it was at Dusseldorf International Airport, a city just outside of the Ruhr region and situated below Duisburg along the Rhine. For the next month, I would be traveling the Ruhrgebiet in search of the landmarks along the Route of Industrial Culture, which is closely associated with the restoration of the River Esmcher and the Emscher Landscapepark, managed by the German water-board called Emschergenossenschaft. In order to facilitate my travels here, I would need to purchase a public transit pass, which would run from the first of the purchase month until the first of the next month, and was available in four different tariff classes. I opted to purchase the Ticket 2000 Tariff D, the largest available monthly pass which would allow me to use any of the public transit services in the RuhrBahn service region as well as the permission to travel with a bicycle. This would start at the first of June.

The destination upon arrival was a small home in the Altenhof II Krupp village, a 10 minute walk from the Krupp hospital and a part of the historical community formerly associated with the Krupp Crucible Steel Company of Essen. The neighborhood has since been privatized and refurbished with modern amenities, at least on the inside, but everything else about the exterior of the homes is required to retain historical accuracy save the street lamps, road surfacing, and parts of the village that have already been demolished. This includes almost the entirety of Altenhof I, which lies on the other side of a small forest in the district of Ruttenscheid, a popular shopping center in Essen. The Krupp hospital also covers much of the original Altenhof I settlement, after it was rebuilt and expanded in the 1970’s.

When I had first seen the brown signs pointing out the Altenhof II last summer, I hadn’t realized they were a part of the Industrial Heritage Trail and that the village was
as well. The village’s location can actually be seen on maps for Theme Route 5: Krupp and the City of Essen, as well as marked with triangles on an overall tour map of the Ruhrgebiet that focuses on settlements. Two eye levels signs that are lightly graffitied and slowly being enveloped by green bushes stand at the side of the entrance to the development, showing the location of the former Altenhof I as well. But this time coming back, I had read up on the history of the village and the Krupp firm’s influence on the city at large.

Prior to industrialization, most urban land use was dedicated to agricultural activities and religious centers formed natural gathering spaces. The name Essen translates to ‘food,’ an interesting parallel to New Jersey’s own reputation as the Garden State, before coal mining in the region caused historians to speculate if the name actually derives from the term ‘esse’ in reference to fireplaces and chimney ash. Mining in Essen had begun before the industrial revolution, but expanded greatly during the 1800s once mining technology improved and the need for energy intensified. Alfred Krupp’s father Friedrich started the first steelworks in the city in 1811, exhausting himself in search of the secret to ‘English Steel,’ ie. the Bessemer process, but Alfred was able to develop this passion into a prosperous firm which he would devote his life to. 202 Starting with 7 employees, the business exploded until roughly one out of every eight people living in Essen lived in a Krupp home, many of which were brought into the city specifically to work for the Krupp coal and steel industries. 203 The legacy of the Krupp industry left a lasting impact on the city as a whole. Alfred Krupp shaped the landscape and culture of the region, developed the first seamless railroad tires, was well known for arms production, and frequently met with the Kaiser. He also took part in implementing

some of the first industrial welfare programs that would later inform the basis for modern
day federal social programs, starting with health care and housing.

The explosion in industrial development created a host of social problems
including hygiene and health disorders, education and housing demands, and other
problems associated with the transition from a rural to industrial lifestyle. At the time, the
City of Essen did not have the resources to address all of these issues on its own, so
industrial employers needed to step in if they wanted to maintain the fleet of laborers that
they so desired to ensure continued growth. Krupp housing development was actually
some of the first concrete instances of city planning that were seen in the region, and by
1913 the company health insurance plan was covering almost 40,000 employees.\textsuperscript{204}
Krupp was by no means the first to enact benefits like these, all benefits represented
only a mere fraction of the company’s profits, but they were nonetheless important
examples of the first steps towards corporate responsibility and welfare programs.

Krupp had been aware that the success of a firm was not only dependent on the
level of output, but involved a complex employer-employee relationship that needed to
be held. In order to ensure the prosperity of the steel company, the goodwill of the
employees had to be retained. During a time of intense competition between
industrialists, Krupp feared that the precious ‘company secrets’ would escape if his
employees left him. He is quoted in a letter saying, ‘Our secrets are our capital, and the
capital is squandered as soon as they are known elsewhere.’\textsuperscript{205} Krupp compensated
workers to a level where he did not think they could leave to better their life positions
elsewhere, and took personal offense if miners of one of ‘his own’ mines went on
company strike. A ‘sense of pride’ in the Krupp community was considered essential, so
that parents would pass on their loyalty to their children, and a sense of harmony was to

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be achieved. Goods in the city central were to be provided better or at cheaper prices than offered by traveling merchants who would try to take advantage of the ‘little people’s ignorance,’ schools were to be kept non-denominational to avoid conflict (open to any Christian denomination), and libraries were to be clear of any incendiary political/philosophical/religious works. Membership to this exclusive working club didn’t come at any small expense, and Krupp’s own words stated that anyone taken on must ‘devote his entire intelligence and activity exclusively to the company.’

Benefits such as health care, schools, disability and retirement programs, and company housing were enacted in exchange for the devotion of a worker’s life to his company. The Altenhof settlements were one of the most notable examples of these. The Krupp company began construction of worker’s housing in 1855, but all of the earliest projects consisted of multi-unit tenements in rigid grid like patterns and did not represent a significant improvement on existing housing conditions. After 1890 though, a break in the style of housing could be seen that favored the detached or semi-detached single family home with a garden. This had been popularized by Ebenezer Howard’s English Garden City, which consisted of carefully planned rings of residential lands, green space, agriculture, and industry. Garden cities were designed to create more hospitable living conditions for industrial workers, and foster a sense of home, which was especially important during a time of mounting nationalism. So when construction of the Altenhof began in 1892, it took the style of a picturesque English Garden cottage community. The houses were meant to serve the retired and invalid workers as a place for them to live out the rest of their lives rent free, and the

development contained all the necessary community centers and shopfronts. 208 When the second Altenhof settlement was constructed a few years later, it was separated from Altenhof 1 by a waldpark or forest-park. The villages were still visually connected by their similar styles, including winding roads, gable roofs, bay windows, and bright red or green shutters. Many of the shutters also have little hearts carved in them.

However, the very sentiment of fostering a sense of home(land) or Heimat is also what brought the village under occasional fire from politicians. Post World War I, preserving a Heimat became a major driver of housing innovation and Besucherpoltik, which is when companies would host tours for important visitors to publicize themselves and show off their role in the preservation of Heimat. The Altenhof and the later Margarentenhohe Garden suburb, which was constructed for middle class workers in 1909, were the highlight of extensive company marketing and Besucherpoltik. 209 Both of these embodied the English Garden City style, and were met with wide praise when toured by the Kaiser or Heimat preservationist teams. But during the years following their construction, critical comment ran the gauntlet of opinions towards the settlements.

Wilhelm Heinrich Riehl, who is sometimes considered the ‘father of the Heimat protection movement,’ directly linked the preservation of German culture with housing in 1858 when he stated, “The house was the last sphere in which the German abandoned his native cultural identity...only residential buildings still preserved some remnants of a natural heritage.” 210 Riehl sought to eschew the promotion of styles specific to other countries, cautioning against overly picturesque or romantic styles, and instead sought to promote the character of the ‘honest German farmhouse.’ When in 1916 it was declared that the ‘Kotten (German cottage) is our ideal,’ earlier housing projects such as the Krupp Dahlhauser Heide in Bochum garnered new praise for their cottage-like

208 Bolz, “Constructing ‘Heimat’ in the Ruhr Valley,” 34.
209 Bolz, “Constructing ‘Heimat’ in the Ruhr Valley,” 34.
appearance despite having previously gone unnoticed, while the Altenhof estates were declared ‘unnatural’ for their pasted on Romanticism and focus of Besucherpolitik.  

Takeaways: The influence of the major industrial entrepreneurs on the sense of Heimat in the Ruhrgebiet landscape have garnered the Altenhofs a point along the Industrial Heritage Trail, along with many other Siedlungen (settlements). While working conditions in the mines and factories themselves also had an equally strong impact on the sense of home and belonging in the community, the narrative of these company settlements showcases a complementary place of home to the partnering the place of work during this time. The development of these settlements raises questions such as ‘what constitutes an improvement in the (living) environment?’ ‘how can a sense of loyalty to one’s community be fostered?’, and even ‘what is considered a natural versus unnatural (depiction of the home environment)?’

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Chapter 2: The City of Essen and Valuable Places

During the days leading up to June 1st, my public transportation ticket was not yet active, so I didn’t travel too far past the neighboring towns. Using a bicycle, I spent the time familiarizing myself with the city of Essen. Starting in the south and heading north towards the River Emscher, distinctions within the city became more apparent that were not immediately evident from the Route of Industrial Culture website. The city is roughly divided in half by a large road called Route 40, where the city central and main train station are. To the north of Route 40 was where much of the mining activity used to take place, and so many of the most heavily altered areas were here as well. Bounded by the River Emscher, points such as the Zeche Zollverein and the Schurenbachhalde can be seen closer to the river. The Zeche Zollverein is one of the largest and most famous coal mines of the Ruhrgebiet, as well a UNESCO site, and has since become a huge museum and public park. It is listed as an anchor point both on the Ruhr Industrial Culture Trail as well as the European Industrial Culture Trail. The Schurenbachhalde was a former mining dump where much of the waste from the Zollverein ended up. The Schurenbachhalde is now also a beautiful public park.

The city central is where the markets and most of the steel industry were located, as well as the Krupp headquarters (now ThyssenKrupp after a merger with major German steel company Thyssen AG in 1999) which still has Alfred Krupp’s original Stammhaus that he grew up in preserved on the property. Several religious buildings can be seen throughout the mixture of shopfronts, and a large statue of Alfred Krupp himself can also be found in front of one of the churches. At the margins of the shopping district, large warehouses that have since been converted into an IKEA and a theatre space can be seen. But while Krupp grew up in the center of the city, he planted his newfound wealth into a home in the southern district by the Ruhr River. This was called the Villa Hugel, which was built in a neo-classical fashion and overlooks the river.
Beyond the forested gardens of the mansion, the Brandenbusch settlement, which is characterized by orange paneled roofing and green shutters, was constructed so that the fleet of hands needed to maintain the estate could be kept near. Much of the preserved green space in the city that has lasted through industrial times is in the south, including the Grugapark which was opened to the public after a 1929 garden show and several large tracts of forest. The settlements Altenhof and Margarentenhohe, the ones which were the focus of Besucherpolitik, were also both located in the south of Essen, with the Margarentenhohe actually being directly across from the Grugapark.

While industry has since moved out of the city and these places now represent a past power, most of the wealthiest homes are still located by the Ruhr, where a large elongated lake called the Baldeneysee has been created by damming the river to create a beach and boating area. Pockets of million dollar mansions dot the landscape in small developments that curl tightly into themselves (they may not be that large, however, the real estate here is expensive). However, with all of the work surrounding the River Emscher and the real estate of the New Emscher Valley, the wealth distribution is changing. This can be seen most dramatically at the Phoenix See in the city of Dortmund, which is actually also linked with the ThyssenKrupp legacy. Located in the relatively poor district of Horde, the River Emscher used to snake its way past one of ThyssenKrupp’s steel mills and blast furnaces. But since the factory’s closing, the area has been excavated and transformed into a beautiful lake, the factory remains being sent straight to China. Once the river Emscher was renatured and the lakes pure water quality had been proved, real estate prices shot up dramatically directly surrounding the new park. It has been rumored that famous soccer players live in the homes surrounding the Phoenix See, and last year I had actually been able to attend a large conference between the Emschergenossenschaft, RuhrTourismus, and RuhrMetropolis which was held in one of the new event spaces overlooking the lake. Where formerly the River
Emscher and anything around it had been associated with pollution, this same area was now some of the most highly coveted land in the region.

A case study report on the Emscher Re-Conversion summarizes a few of the ways that values have been impacted. In total, the Emscher Re-Conversion was estimated to have a direct economic impact of 21,441,572 € per year, and an additional indirect economic impact of 109,121,217 € per year. These estimates were based off of seven different ecosystem services: Self-Purification (of the waterbody), Maintenance of Nursery Populations and Habitats (biodiversity), Reduced Risk of Flooding, Opportunity for Development (and an increase in real estate prices), Opportunities to Understand/Communicate/Educate, and an Appreciation that a Restored Stream Exists. Ecosystem services, a relatively new concept, seeks to quantify the values that nature provides to us in order to call not just for the preservation of any kind of ecosystem, but that which we consider high quality. What’s considered high quality and valuable though can vary depending on the values that we set for them and the methods we use to derive those values. These particular valuations represent one of the possible ways that the River Emscher can now be valued.

Takeaways: As the restoration of the River Emscher nears completion, it is estimated to increase real estate prices in the New Emscher Valley. This creates an interesting demonstration of how values shifts throughout the landscape, as the poorest areas begin to become richer, changing the wealth distribution. While once it was considered more highly valuable to be settled close to drinking water resources, modern day infrastructure can easily transport potable water to far reaching areas. Now, the very places that were once the least desirable for living are becoming one of the most


213 See Section: C - The Need for Open Space and a Sense of Place
This is largely due to the improvements in environmental conditions which are assessed through increases in ecosystem services, but the way these improvements are assessed and how valuable these improvements are considered is largely up to the standard practices and information authorities of the region. In this case, the authorities would include organizations such as the Emschergenossenschaft and the standards set by the European Union. The Emschergenossenschaft and Emscher Re-Conversion as a whole are positive examples of how narrative in the form of ecosystem services can be used to garner support for a river revitalization, but it is still important to keep in mind that these changes in value are not only the result of direct objective observation but the formation of a narrative that connects these disparate observations and assigns value as well.
Chapter 3: Experience of the Trail: Transit Corridors, Paths, and Motion

The NeiderRhein is slightly detached from the Ruhr region, partly because it is less urbanized than the rest of the landscape and partly because it is not connected with the river Emscher or Ruhr. It is located on the other side of the Rhine River, the major waterway that made industrial activity so prosperous, but while it seems geographically apart from the rest of the Ruhrgebiet, it still shares in the mutual industrial history that has united the area. Two of the most memorable sites I'd seen here were the Halde RheinPreussen in Moers and Halde Norddeutschland in Neukirchen Vluyn. Both made use of symbolic structures in the park design that linked them to the industrial culture of the Ruhrgebiet, but much of what made them most memorable was actually related to the method of travel I took to get to and in between the sites rather than the destination sites themselves.

I had decided not to take my bike with me on the day I visited these because it looked like it might have been faster to take the bus on this occasion than to bike, and I wanted to compare the public transit method of getting around by bus as well. It probably still would have been faster to bike, because of the bus delay and the distance that I ended up walking, but the change in transportation methods allowed me to compare a roadway/vehicular mode of transit with a primarily bike/pedestrian mode of transportation.

Prior to entering the bus, the first step to navigating the transportation corridors was to locate the proper bus route and station. I had arrived at the NiederRhein by rail to the central Moers’ bus terminal of Bahnhof, and proceeded to deduce my whereabouts from diagrammatic timelines of bus stop names and route numbers. However, the use of a bus-stop app and google maps became crucial when I realized that not all of the route diagrams were up to date/accurate, and some physical roadside bus stations that claimed to be a stop of a particular route would consistently be passed up by the bus in
favor of another location. I’d encountered this once before last year when trying to visit an old park in Gelsenkirchen that no longer existed. After the opening of the much larger Nordsternpark, the other place I was trying to find had apparently just been rolled into the Nordstern, but still had a bus stop waiting for visitors in search of it. Unfortunately for anyone standing there, the bus would have never picked them up, and for me who kept pressing the stop button trying to get the bus to drop me off, I was very confused when several people stood up at once and tried to explain to me in German why I couldn’t do that.

However, despite the difficulty associated with having to rely on information sources that would tell me which transportation corridors were actually usable, transit by bus brought to focus the way that these transportation corridors created a sense of place in and of themselves. When on a particular bus route, such as bus route 155 heading towards City X, you know that you are on that route as opposed to another and the visual stream you experience will be specific to that route. Signs and information authorities enhance this sense of ‘placeness’ that you know you can rely on with a degree of certainty (and likewise this sense of place-ness is undermined when bus routes become incredible, leading to a sense of placeless-ness or being ‘lost’.) But in addition to the delineation of different transit corridors that provide a select sensory input within a greater realm of possibilities, it is also clear that when on a bus route you cannot experience everything you pass all at once either. Time over space (or space over time) plays a crucial role in the experience of that place, which in this case is a transportation corridor defined by the boundaries of a bus that move throughout the landscape. Additionally, this calls attention to the way that two different places can exist in the same location based upon the experience of time.

As J.B. Jackson, a writer on sense of place said, “Art and architecture can only go so far in the development of a ‘place’, rendered faceless without the input of
experiences that speak to our sense of time."  

Jackson had said this in reference to the fact that most Americans would not feel a sense of place from a town square or political monument, but instead tend to associate ‘places’ with sites of recurring community activities such as soccer games and other daily, weekly, or seasonal events. He went on to describe how recurring events were always necessary for people’s establishment of time and place, and how public spaces such as the market or civic center became places in the past because of the structure they used to bring through the hosting of regularly held events.

Excluding the comparison on European versus American and public versus domestic focuses on place, the message of Jackson’s excerpt was that recognizable patterns over time are necessary for the formation of a sense of place. But while Jackson was focusing on recurring events as a way of differentiating time, it becomes evident that the way we experience time (and therefore place) will be different depending on what mode of transport we elect to take. The experience one has of a place will vary widely whether one is walking, biking, driving, or riding a train. In certain areas, the modes of transportation actually overlap, providing users with different experiences of the same locations. Sometimes they overlap in the present day, as in a sidewalk that follows the same path as a bikeway which follows the same path as a roadway and might even be adjacent to a light rail line, and sometimes they overlap spatially but not

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215 This practice of regular public (and free) events hasn’t stuck as strongly with Americans and the drive for expansion drove people away from urban centers and into the suburbs. According to Jackson, our sense of place tends to linger more strongly in areas regarding domestic life rather than most city centers, but it is notable that in areas of the Ruhrgebiet that carry a strong sense of public ‘placeness,’ such as the Phoenix Sea, the popularity of concrete pre-fab homes (maybe even ‘placeless’ or lookalike homes) surrounding it seems to grow as well, suggesting a potential trade-off.

216 Jackson also cited our modern adherence to mechanical time as another factor that affects the way we interpret our environments, with standardized time becoming the norm to ensure that trains would arrive when people expected them to and efficiency could be increased.
temporarily. An example of this would be a walking and biking trail that was created from the right-of-way of an abandoned rail line.

One other example of the way space and time overlay to affect the perception of place would be through stairs and ramps, or differences in the ways we can change our elevation. Traveling to Haldes (mining heaps) throughout the Ruhrgebiet such as the RheinPreussen and the Norddeutschland created destinations that constantly receded as I approached them. First I had to arrive at the destination of the city, and then from the city I had to arrive at the destination of the hill (or the sign that designated the entrance to the hill), but once I reached the hill it quickly became important to me that I must reach the top of the hill, and then the landmark located somewhere at the top of the hill. Then of course I had to go and locate the next Halde and eventual landmark, but as these singular metal structures began to become the way that I remembered and defined these hills, the methods of circulation I took to reach the bottom to the top of the hill became another place revolving around a transportation: the path.

The Halde RheinPreussen was one of many former mining dumps in the Ruhr Region, all of which sported a different icon at their peaks. Here, there was a large red sculpture several stories high and shaped like a gas lantern. The statue was a bit ironic given the closing of the mines, because generally finding a gas lantern laying around outside had meant that one of the miners was probably down in the mine without his lantern and was now in trouble, but it could also be a memorial for the miners that had died down in the mines. A group of senior citizens with a tour guide were standing at the foot of the statue in the distance, but the group had moved by the time I made it to the lantern myself. I could tell though that they were listening to a talk from the tour guide, who had chosen the statue as the destination gathering point, probably using the statue to emphasize the mining history of the region. This group had highlighted a point though,
that I rarely saw groups standing at the mid-way point of a hill but often saw groups at rest at the top or bottom of a hill which seemed to be the 'natural' resting point.

    From afar, the statue peeking out of the grass behind the trees looked like it wasn’t so large and fairly close by, but on further consideration it was actually quite big and very far away. When I made it to the apex of the halde, I could see the Rhine river flowing below and the largely agricultural landscape of Moers around me. A few large factories were poking out of the hazy horizon of little buildings and trees, including a large chemical factory that I had passed on the walk over here whose sign stated that it had been in business since 1936.

    Satisfied with the view and having reached the miner’s lantern, I began to make my way back to the Moers Bahnhof, so that I could head over to the next town of Neukirchen Vluyn. I had been there once before to see the Halde Norddeutschland, but only at night, and I wanted to experience it during the day. What I remembered of it was that it felt pretty far away, and the statue at the top was of the metal framework of a house, which lit up with LEDs so that you could see the skyline of the city. Little ground lights carved a path through the dark leading to the Hallenhaus statue, but were nonexistent throughout the rest of the hill. What had intrigued me though was the sensation of descending into a massive shadowed bowl, which had been carved at the top of the hill next to the Hallenhaus. When you stood on the edge of the bowl, you could see the entire city around you, but once in the pitch black depression you could see nothing save for the little lights of the Hallenhaus sticking out.

    Today as I approached the Halde Norddeutschland I came by way of a footpath that ran alongside a roughly 45 mile per hour roadway that cut through a swathe of agricultural fields. Here I was in the midst of a juxtaposition of speeds. As the rooted grasses swayed slowly at the urging of a light breeze, I walked briskly past them towards my destination. A ponderous and rumbling tractor eventually overtook me, but was still
outpaced by the cars that blew past it until they were to eventually come to a halt at an intersection. When arriving at the foot of the halde, I was confronted by 300 silver steps, and seeing that as the most commonly tread pathway, I proceeded to the top via stairs as opposed to the circuitous path I took up the Halde RheinPreussen through a Birch forest.

As I proceeded up the staircase I moved quickly through the landscape, stopping only to inspect the panoramic views at each level where the staircase reached a flat platform that branched off onto alternate pathways that wound through the young forest. This was a much faster journey than I had taken on the RheinPreussen, trekking sometimes on and sometimes off path on my way up to the miner’s lantern. But I was also receiving a much more limited view now, experiencing only the staircase corridor and the views immediately surrounding it. My experience of that place would have undoubtedly have been different had it been defined by another pathway rather than the stairs.

When I arrived at the top, I was struck by the sudden feeling that I was near the beach, before remembering that the Hallenhaus landmark at the top of the hill was supposed to represent the framework of an old farmhouse. The colors hadn’t been visible the last time I’d seen this landscape in the dark, and I think it was the grass more than anything else that stood out to me as the beach because the brownish fields appeared the same color as sand and the iconography of a beach is much stronger in my mind than that of an agricultural landscape (having grown up near the shore). The expansiveness of the horizon against a blue skyline also contributed to the feeling, despite the clear contextual clues (being surrounded by ag land and prior knowledge of the landmark’s intention) that the landscape was meant to pay tribute to the heavily agricultural lands around it and former use of the mining dump’s location as a field.
However, the stark contrast provided by my having arrived via stairs is what made this idea that I could have arrived at the beach briefly entertainable, and probably intentional to give the user the feeling that they have been transported to another ‘place’ (though likely not one of a beach). Rather than gradually elevating myself up to the top of the halde, changes in landform and vegetation palette cut the view off from users as they proceed up the steps. A steep staircase flanked by a lush planting of small trees and shrubs abruptly cuts off into an entirely new landscape that is mostly flat and defined by grasses and an open horizon. Had this contrast in movement from primarily upward to primarily forward not occured, the landscape could be perceived in a different way than if a more gradual transformation had occurred or even if landscape views had blended into one another rather than being cut apart.

Takeaways: As transportation networks have complexified, these connections have created linkages through fragmentation and condensed our experiences of these ‘transit places’ into linear corridors. Modes of transportation can create mental separations in terms of what place is distinct from another via the sensory input you experience, as well as through differences in motion which changes your perception of space. The way we perceive time and space through motion can impact the way we interpret place at the site scale level as well. Design elements such as staircases versus ramps, sharp versus gradual transitions, steepness of slope, and framing elements play with the senses to evoke different responses to a place. While these may not affect the literal significance of a symbol such as the Hallenhouse’s representation of a farmhouse or the RheinPreussen’s mining lantern symbol, they can change the way that we interact with and perceive these symbols and the landscapes they are embedded in. They contribute to a sense of distance and size, what feels like an appropriate place to gather, and what kind of subdivisions we choose to make within each place. Just as a destination point can be pushed further into the distance, space can be divided into
smaller and smaller pieces as we make further sense of it through the creation of subdivisions.
Chapter 4: Experience of the Trail: Dividing Space in the Ruhrgebiet

I learned in the NiederRhein that the concept of a place is not static even if the symbolic meaning doesn’t change, because the way I experience the place can affect my sense of a place’s identity and the way I interact with it. In order to remember locational and temporal details, I found myself constantly relying on delineations within overarching places based on names, urban densities, transit corridors, changes in motion, and other perceptual boundaries. While creating these division made a previously ‘whole’ place suddenly appear a lot more fragmented, these delineations did not harm but rather enriched my experience of the Ruhrgebiet, because of the way they allowed me to interpret my surroundings and make new mental connections in a way that I found more personally efficient to remember and make use of later on. In this same fashion, we can see physical divisions in the landscape all around us that exist for the dual purpose of both separating and connecting sub-regions.

a. Name, Color, Form, and Framing

When traveling through the Ruhrgebiet, I tended to divide up locations in a few different ways. City by city was the broadest, and every central station served as the hub for a cloud-like balloon that stretched over the contents of its sub-region whether I knew where the legally defined boundaries were or not. The exact edges of city were less important, since I primarily needed the city names to figure out the first step to finding my way towards the site I wanted to visit on any given day.

When on the Emscher Landscape Park bike path, wayfinding signals became much more important, with color being the first recognizable attribute of a sign that I tended to notice followed by form. There were several major paths I learned to recognize; the first being the red Industrial Heritage Trail route (red also happens to be
the first color after black and white that most cultures name \(^\text{217}\)), followed by the blue Emscherweg markers which usually called out locations rather than giving directions, and then the orange EmscherInsel Tour maps, which ran through the green ‘island’ formed from the space between the Emscher River and the Rhein Herne shipping canal. The Blue Emscherwegs consisted of a variety of elliptical information stands, nametag-like signs, and blue posts that marked entrances to the bike trails. These were complemented by the green Lippe weg signs, the Lippe being the river to the north of the Emscher which was also renatured by the Emschergenossenschaft’s sister-company the Lippe Verband.

The red Industrial Heritage signs either came in post form with a little red hat denoting a number and a splay of arrows listing distances and name locations, or an aerial map with diagrammatic number locations. The two often came paired together, and the map usually showed the contents of an entire city as well as the margins of the neighboring cities. Bike paths were always depicted in red, but brown Industrial Heritage signs were also around though they were targeted more for drivers. ‘Destinations’ were made apparent though heavier signage and descriptions at entryways, including multiple panels that showed plan view information, diagrammatic sections, historical information, design rationale, and larger context maps.

At times, the signs become hard to notice because there are so many of them. When driving a car, the important signs are speed limits, exits, lights, and stop signs among others. Street names litter the intersections, and we have to search for the ones that we need. Advertisements and billboards add to the chaos, eradicating the original purpose of the sign as an attention attractor. Special landmarks and symbols that don’t require verbiage can help with orientation, but can get lost in the clutter if not careful.

From what I saw on the Ruhr Trail though, the go-to solution to make a landmark standout was to make it big and unusually shaped, for lack of other options. This way it could be seen at a distance and signs that contained more detailed information could be placed in such a way that they framed or were framed by the landmark objects.

One of the strongest memories I have of signage framing is at the Nordsternpark in Gelsenkirchen. Both the Emscher River and the Rhein Herne Canal cross through the park, and where the shipping canal runs by there is a bridge with two massive red hoops that towers over the water. The bright red hoops are visible from way outside the park as well, and also happen to be located in front of a point with heavy signage and information about the park. Closer to where the River Emscher lies, blue signage containing information about the Emscher Weg waits for visitors. The most easily recognizable Emscher signage stands are these large blue circles that look like portals, but I remember the portal stand here in particular because it framed another landmark of the park called the Hercules. Hercules was a piece of EmscherKunst or EmscherArt, placed on top of the refurbished Nordstern colliery building which is now the site of the VivaWest business complex. Designed as a symbol of structural reformation, Hercules’ role was one of a hero and problem solver and meant as a tribute to the transformation of the industrial Ruhrgebiet. Hercules becomes even more noticeable when one looks through the blue Emscher portal though, and sees the figure framed between the circular signs. In this way, a visible landmark’s location is linked with the location of iconic information stands, further orienting a user.

In addition to signs placed in the viewpoint of large landmarks, signs at the tops of hills were also very noticeable, so haldes were especially convenient for this. I really enjoyed panoramic signs, when sketches of the horizon were overlaid with points that called out the names of certain structures in the distance. These might include other points on the Industrial Heritage Trail, large factories, or cultural centers. Sometimes
instead of a horizon drawing, a circle of metal plates was nailed to a stone bed, so that if you stood in the middle of it you would face a plaque with a distance and location on it every time you turned. Repeated viewing of different landmarks at different distances helped to solidify the overall sense of place by giving sub-spaces a greater context of how they related to each other.

b. Rivers and Corridors

As I mentioned in the NiederRhein, transit corridors such a bus, train, and bike routes played a large role in the way I perceived the region I was in, both in terms of the way they changed the perception of a place through motion as well as how they can be regarded as separate ‘transit corridor’ spaces. However, rivers and waterbodies are also major space defining corridors (and also used for transportation depending on the waterbody). Because of my focus on the narrative of the Emscher River Reconversion, I often used the Emscher to orient myself from its headwaters at Holzwickede to its confluence with the Rhine River at Dinslaken. Holzwickede is important both as a present day ‘starting’ location for the Emscher spring, but also because it is very close to the Lippe River bike circuit, and I traveled part of the way on the green (as opposed to blue) Lippe Route when traveling to the Ostpol in Unna. While transitions in the landscape are very gradual as one shifts from the Emscherweg to the Lippeweg, the changing signs call to attention the presence of a different place.

At the Emscher Mundung, or mouth of the river, the waterbody flows past a large wastewater treatment plant in Dinslaken before crashing over a tiny concrete waterfall into the Rhine River and the RhineLand nature park. The RhineLand bleeds into the Emscher landscape park via the Rheinaue Walsum nature preserve which currently surrounds the Emscher outlet. However, just as the perpetual motion of the river makes
it difficult to determine where the waters of one body end and another start, the motion of time suggests that pinpointing the Emscher’s end will be difficult due to history as well.

The river’s mouth in Dinslaken currently lies in the Rheinaue Walsum nature preserve, but this is not the original outlet of the Emscher, and the mouth will be moved for a fourth time just slightly north of where the waterfall is now. The reason for the move now is because the concrete falls impede the movement of migrating aquatic species, but in the past the outfall was moved north twice due to land subsidence. The collapse of mine shafts would cause depressions in the landscape during the industrial era, and the Emscher would pool and flood rather than flow into the Rhine, so it was moved from its original location in Duisburg Nord to Dinslaken with the assistance of high power water pumps. The site of the Old Emscher or Emscher Alt runs through the Landscape Park Duisburg Nord, where a former coal and steel production plant has been converted into a park. The Emscher Alt was one of the first renatured sections of the Emscher river, but is no longer connected with the rest of the waterbody. Now, the Emscher veers off at a sharp angle from the path of the Rhein Herne Canal in Oberhausen and heads northwest towards Dinslaken. The Canal, which roughly follows the path of the Emscher between Castrop Rauxel and Oberhausen, outlets at the Ruhort in Duisburg Mitte. The orange slab Rheinorange marks the location where the Ruhr river meets the Rhine, but is located near several major shipping ports of the RheinHerne Canal as well.

Another example of place orientation via waterbody through locational and historical significance is the WasserKreuz (Water Crossing) park in Castrop-Rauxel. Here, the Rhein Herne shipping canal, which was constructed in the early 1900’s and forms one of the boundaries of the Emscher Insel Tour bikeway, passes over the Emscher River before diverging from the Emscher’s course. At this location moving eastward, the canal veers north while the Emscher veers south towards Holzwickede, with the significance of the park being to call attention to the feat of water engineering
undertaken to enable the crossing. The Emscher and the canal loosely follow each
other’s paths moving westward, up until the city of Oberhausen where a massive slingkey
bridge titled ‘A Slinky Springs to Fame’ marks the western edge of the EmscherInsel
Tour Trail and the divergence of the two water bodies again.

c. Beginnings, Ends, and Continuations

Defining where things start and stop help to create a sense of formality and then
establish an outline (or itinerary). For me, the trail ended at the Westpol and Ostpol, a
lighting installation created at two former mining shafts by artist Mischa Kuball. The
yellow LED strips were supposed to be installed at the sides of the shafts so that they
would point directly at each other, all the way across the poles of the region in the towns
of Kamp-Lintfort in the NiederRhein and Bonen in the district of Unna. The two shafts
were standing at different elevations, but came to the same level of height due to
differences in architecture. I’d actually never seen the LEDs lit up, because they were so
far away from where I was staying that it wasn’t easy to see them at night, but I’m not
sure that they would have turned on anyway. I’d noticed already a few light-artworks that
were supposed to turn on but didn’t for some reason, and after seeing the Westpol in
particular I was hesitant to wait around and see what would happen.

If one were to visit the route-industriekultur.ruhr website and go to Themen Route
25: Panoramas and Landmarks, the Westpol would be one of the first images that pops
up on the banner heading the page. However, this is conveniently cropped so that the
visitor cannot see the massive gaping hole that lies directly in front of the tower. When I
went to see the Westpol in person, it was heavily under construction, and I was
surprised to see how different it looked from the image I’d seen online. However, in this
case I was mainly interested in the landmark for the sense of closure it brought to the
region, so I wasn’t that disappointed by the hole. But I was surprised when another light
related artwork I went to see did not light up at night as well. This was the Halde Lothringen in Bochum.

The Lothringen is an interesting case of a landmark in the Ruhr region, because unlike many others there it is longer than it is taller. Taking the shape of a bright yellow pipe, the Lothringen sits on the edge of a gravel hilltop and brings a horizontal structure to the developing shrublands behind it, at least in pictures. A strip of LEDs on the horizontally running bar is meant to give the appearance of a floating ribbon of light at night, but apparently this was installed back in 2003, so over 15 years ago. I went to see the Lothringen at night by motorbike, but the landmark was nowhere in sight. After showing a group of people looking at field frogs a picture of the installation and asking them if they knew where it was, most of them said they did not know and hadn’t seen this enormous landmark despite just having come from its general direction. Eventually, someone did recognize the yellow pipe and pointed back to where the group had just come from. Upon arrival, I realized why.

The vegetation in the images online had grown much taller around the pipes, and the lights were not on at all. In fact, it seemed like the installation had been forgotten already, but I’m guessing that was part of the point of the installation anyway. In another 100 years, the artwork will have taken on a completely different form and function. Fully ensconced in a mature forest, the yellow pipe would serve as a trail marker within the trees rather than a floating beacon to be seen from a clear horizon.

This discovery of the difference between images of a place and their actuality brought to my attention how rapidly these places were changing even now. Even though I knew the transformation of the Ruhr Region was an ongoing process, my surprise at how these places did not resemble their pictures cause me to realize that I had been treating the Ruhrgebiet conversion as a fairly duo-toned before and after. The
expectation that these living landscape should resemble a snapshot of their identities frozen in time was unrealistic.

d. MidPoints

While the light art could not always be counted on, I still chose to view the Westpol and Ostpol as the markers of the westernmost and easternmost points of the Ruhrgebiet for the structure it provides on a map and the notion of the west-east axis. This axis is enhanced by the representation of a north-south axis that intersects it, which is manifested in Richard Serra’s Steel Slab for the Ruhr at the top of the Schurenbachhalde where the Emscher River runs through Essen.

The top of Schurenbachhalde is one of the ‘emptiest’ places I’ve seen around the whole trail, making the 50 foot tall steel slab appear even larger than it already was. This is starkly contrasted by a responding artwork located nearby along the Emscher InselTour trail connecting the cities of Essen and Gelsenkirchen. In between the Schurenbachhalde of Essen and the NordsternPark in Gelsenkirchen, another piece of EmscherKunst named the Carbon Obelisk stands a total of 3 feet shorter than the Schurenbachhalde. However, far from creating the same impression, the Obelisk seems trivial by comparison. The artist McBride left it that way on purpose.

McBride allowing nestled his obelisk amongst the trees and a high tension power line, intentionally hiding it rather seeking it to become the center of attention as his response to the towering Schurenbachhalde. Whereas obelisks had typically functioned as monuments in the past that distinguished certain squares or buildings as important, McBride’s obelisk represents a ‘non-place.’

The irregularity of the scene makes it so that nothing really stands out at all elevation wise, and the obelisk isn’t wide enough to

draw attention either. While 50 feet seemed pretty tall to me at the Schurenbachhalde, it also isn't really that tall in comparison to a tree or the enormous high tension line.

The impact of a monument is relative, and that's why Serra made sure the scene around the Slab for the Ruhr felt barren and desolate. The feeling is heightened by the lush greenness of the birch forest-park and lakes around it, and all the way up the visitor can expect green meadows to be waiting at the top. Upon approaching, the gravel paths become wider and wider, and smokey factories can suddenly be seen in the hazy distance. Smaller woody shrubs become more common, before finally giving way to the charcoal greyness of the top of the halde. Nothing nearby can be seen on the horizon line except for the city in the distance, because all of the taller trees were left at the base of the hill like they would be on a mountain.

When first spotted, the soaring slab in the distance appears tiny given its location in the center of the flat top (it’s not even visible at the bottom of the hill), and grows larger as one approaches it until you are forced to look upwards in order to see it. The sooty colors on the ground plane are reminiscent of the powder that sticks to your hands if you touch coal, and it was as if a mine had exploded, raining ash everywhere. Walking towards the slab, I felt like I was the only one around, and became surprised to see another man bike directly up to the statue and then begin filming a video blog. Shortly after, another man came on his bike, heading directly towards the slab. Soon after, I saw two different pairs of joggers go by, and both pairs showed the same behavior of running straight at the slab and turning promptly around it before heading back. It was as if the steel was a magnet, and we had no other choice but to head only towards it. The design seemed simple, given as though it felt like there was only one object around, but its prominence made it memorable.

Takeaways: The use of sub-delineations within a larger place helped me to gain a richer experience of the Route of Industrial Heritage. In order to orient myself, I relied
on a number of tactics to assist in the establishment of patterns and boundaries that
allowed me to make sense of the landscape and foster a more defined sense of place.
These included framing techniques, the presence of corridors and axis, highlighting
certain definable point locations through symbology, and the use of sensory information
such as color and form.
Chapter 5: Final Stop - The Gasometer Oberhausen

Nearing the end of my month in the Ruhrgebiet, a heat wave passed through the region. Experiencing over 100 F weather (during one of the hottest summers on record), I decided to spend my last venture outside at an air conditioned museum instead of biking. The museum I chose was that of the Gasometer Oberhausen.

The Gasometer, which could be seen at a distance from almost anywhere in the city, hosted a showcase called “Der Berg Ruft” or “The Mountain Calls.” A former gas holder now converted into an exhibition space, the gasometer provided a panoramic view of the city from the roof of the tank and hosted a gallery of landscape artwork and imagery at the bottom. While seemingly unrelated to the Ruhr Region at first, beautiful images had been printed onto laminated sheets and hung from cords in between crossed steel bars supporting the tank’s frame. These were paintings of landscapes, excerpts from Alexander Humboldt's work exploring mountaintops, and photographs of volcanoes, glaciers, deserts, and more. The message became clear after reading an excerpt describing people’s view of the Alpine Mountains, hanging next to a picture of Casper David Friedrich’s famous romantic-sublime painting, ‘Wanderer Above the Sea of Fog.’

Prior to the 1700s, the Alps were a grotesque scar upon the land. Beauty was to be found in the pastoral scenes of Arcadia, not within the treacherous reach of hard jagged rock that dared travelers to cross in order to get to Italy and especially Rome. The mountains were associated with danger, and were often the site of witch hunts which shook through Europe for roughly four centuries. At this time, witches posed a real and serious threat to the peace of the Christian community, both to those who

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feared the satan-worshippers as well as the thousands of ‘witches’ who were wrongfully killed because of it. Many ran to the mountains to try to escape, or were rumored to be practicing witchcraft there already, garnering the Alps another layer of fear beyond the already formidable climate and topography.

Crossing the Alps became a rite of passage for those who embarked on a European ‘Grand Voyage.’ These travelers were often young aristocratic men who had recently come of age (21 years old), and were writers as well. Literature regarded the voyage as an object of writing in its own regard, and so while accounts naturally differed from one another, the journey and destinations were pre-charted. For example, if one were to start in England, the traveler might cross the English Channel to Ostend, Belgium and then Paris, France. From Paris he could head towards Geneva, Switzerland before enduring a long journey across the Swiss Alps in search of Turin, Venice, and Rome. Italy was the ultimate destination during this time for its association with Greek ruins and Arcadia, beautiful nature and the ‘spirit of the times.’ After having spent a month or so in Rome to ‘savor the genius' of the place, the traveler would then cross the Alps again towards Berlin, Potsdam, and Munich in what is now called Germany. Having spent some time in Holland or Flanders, the return to England would be embarked.

Before artists such as Goethe, tourists would cross the Alps without much note, and often disdain for the magnificent terrain as it constituted the great barrier between them and the beautiful land of Rome. However, with the development of such concepts as ‘romantic’ and ‘sublime,’ the Alps came to be viewed in a different light. If the sublime can be considered the antithesis of ‘rational beauty,’ defined by its powerful and

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222 Jackson, “A Sense of Place, a Sense of Time,” 24–27.
dangerous unpredictability rather than by harmony, then the Alps had suddenly become valued for the very thing they were previously despised for. Compared to the picturesque, which might be termed, ‘raw emotion muffled by grace,’ the sublime was terror held at a distance so that it became enjoyable. This marked a decisive development in how we find beauty in nature, coinciding with the burgeoning scientific revolution and industrial development that shifted our power dynamic with the Earth. Previously, wild nature could consistently overpower man, and could be considered dangerous for it. But knowledge and technology gave us the confidence to face our fears directly. Now, even the harshest of climates can appear serene when viewed from above in a secure, flying aircraft. We even say today that we are responsible for the care of nature, and that it is up to our self-control that we not obliterate it, lest nature retaliate again with a new and dangerous climate.

No longer completely afraid, travelers found sublime beauty in the once hideous Alps when they found that they could hold their fear at a distance and marvel in the nature around them. And upon heading downstairs towards the gift shop and cafe area of the museum, the relation to the Ruhrgebiet became clear. A yellowed panoramic drawing of Oberhausen had been split into several panels that spanned an entire wall and showed the city at the peak of industrialization. Black etchings of smokey fumes curled up against a yellow sky and churning factories clogged every inch of the ground plane in site. This formerly formidable landscape was now the site of a beautiful regional park. Sure, many of the original elements had been changed and almost all the factories had been closed, but now a visitor could traverse a post-industrial area such as the Landscape Park Duisburg Nord or the Gasometer Oberhausen, climbing all the way to the top with a sense of enjoyment rather than stress or fear (so long as you’re not afraid

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223 Scaramellini, 52-53.
224 Scaramellini, 53.
of heights). Newer technologies replace the industry with service-sector firms and coal slowly becomes the fuel of another era as attention turns to the development of solar panels and wind turbines (or ‘natural’ gas in the meantime). Aging and abandoned factories again become a part of nature; decomposing into a part of the past we’d left behind. Much as the Greek ruins of former temples from a collapsed society made their way into the picturesque landscapes of romantic era painters centuries later, the ruins of our industrial phase have now become the elements of carefully devised landscape views.

Takeaways: The Gasometer Oberhausen’s exhibition draws parallels between the perspective change on the formerly ‘grotesque Alps’ and the narratives surrounding the post-industrial Ruhrgebiet. Both the Alps and the Ruhrgebiet represent areas once considered inhospitable to life and inherently undesirable, but are now attractive for their association with the sublime. Characterized by immeasurability and awe-inspiring forces that overwhelm the senses, the experience of the sublime can also be thought of as terror held at a distance. Industrial factories and their waste, inherently dangerous to human beings, are now being ravaged by another sublime force: time. After these abandoned factories and waste sites were mitigated, the associated danger is contained, and presents opportunity for play.
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