

Landscape Evolution: Grounds for an Altered Perspective of Infrastructure Ruination in a Time of Ecological Crisis

By

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**INTRODUCTION**

With every day that passes in the Anthropocene, the Earth’s governing climate cycle becomes more agitated. The greenhouse gas effect heating our atmosphere has a cumulative, exponential impact. Until we implement a global stop on emissions, we continuously contribute more and more to the future effects of climate change, amassing a long term chain reaction. Considering the severity of dependence on fossil fuels, political circumstance, and a lack of global prioritization of and action on the climate crisis, we won’t be able to end emissions for many years. Most of today’s sustainability plans set their zero-carbon target year as 2050, with the more ambitious aiming for 2030. From the date of authorship, that means we have another 30 years of emissions to add to the atmosphere. This does not consider the number of very likely scenarios where we cannot reach zero-carbon by 2050; as the impacts of climate change become more severe, our progress towards renewable energy dependence, sustainable and resilient societies, and mitigation technologies like carbon capture could be harshly impeded.

The daunting truth is that we cannot be sure what will happen. In fact, that’s the only thing that we *do* know. Headlines these past few years have continually reported that, despite what climate scientists previously projected, the window of time to minimize the damages of climate change is decreasing faster than we expected. We know to some extent what challenges we will face; the primary unknown variable is the severity with which each region will be hit. While we can look at our current projections and tend to the areas pointed to as vulnerable, projections made in a month will tell us something different. The unpredictability grows every day, committing only to a future with no guarantee that any area will be spared from harsh effects. Therefore, we must be prepared for anything.

Sustainability and resilience research and discourse has surged within the past few decades in efforts to adapt our societies to the incoming instability. One of the areas championing these values most influentially is that of cities. Currently, half of the world’s population lives in urban area, and that number is projected to rise to five billion by 2030 (United Nations Sustainable Development 2020). While they only take up three percent of the Earth’s land, they are collectively responsible for more than half of global emissions. It is of necessity to continue making cities operate more efficiently and minimize their environmental externalities, exemplified as a priority by the UN as one of their 2015 Sustainable Development Goals. As a further parameter, the next few decades will see ninety-five percent of all global urban expansion take place in the developing world. This extra factor is crucial – should we continue building our cities as we’ve done, the impact will be catastrophic, even if we do reach carbon neutrality by 2050.

We must create new technologies that will work for the Global South, avoiding the emissions of previous growth without unjustly impeding their development. However, the vast majority of urban resilience research has been more concerned with adapting established cities to their projected impacts, and, as such, we see a large vulnerability for growing urban areas in the coming years (United Nations Environment Programme 2007). The poorest regions are the most vulnerable to climate change, as they have the least infrastructure and resource to deal with the effects. This is an issue of justice; the climate crisis was caused overwhelmingly by wealthy nations, and the people most at risk are the least responsible. The technologies and systems that built past cities will not work for the ones of today nor tomorrow. A concerted effort must be made to fundamentally change our understandings of what the city is, does, and *how*.

This paper provides a new lens for pondering the city as both ephemeral and eternal by re-examining the process of urban decay and proposing that such processes are not indicative of the end of a structure’s existence. Rather, ruination is a natural progression that we have come to fear over time due to the connotations we believe it carries. Instead of working to avoid or delay that phase, we can *embrace* it as part of the infrastructure design process and plan for the natural decay of structures, buildings, or entire cities so that they invigorate their surrounding environments, instead of further harming them. Furthermore, accepting urban ruin as an eventual part of the city’s design broadens our own mental capacity for what the future may hold, including our own place within it. This paper will further dissect the many capacities that infrastructure has to perform, particularly in so-called “ruined” stages, and culminate in a new understanding of the potential relationship between place and the passage of time: landscape evolution.

Because there is no certainty in the climate crisis, we must be prepared for anything. This includes the possibility of evacuating populated areas that will be made uninhabitable from changes in climate. Already, the movement of climate refugees is a major concern, with 21.5 million people displaced every year between 2008 and 2016 (Environmental Justice Foundation 2020). The number of populations that will have to leave their homes will only grow in the coming years. We will witness mass migrations, enormous refugee camps, and, inevitably, the remains of communities forced to abandon their homes. As the Earth shifts above and below us, we have to be ready to move if there is no other option, and, simultaneously, adapt to an idea of place that is much less permanent and anthropocentric than we’re used to: a place exists before, during, and after it is occupied.

This leads to the crucial question of this thought experiment: what happens to the city once its humans have gone? The city, as we know it, is built by and for humans. Only with man’s maintenance does a city continue to stand. In the event that residents leave, any building or infrastructure will be at the mercy of its surrounding environment. Many works have analyzed the abandoned place and the ruination of man-made structures in a scenario without people. Alan Weisman’s *The World Without Us* is the most exemplary text, narrating a deep dive into the decay and deterioration of our built environment, and what the world might look like when it returns to an equilibrium after centuries of human exploitation. He describes the possibility of a future entity discovering the remains of our built environment: a collapsed bridge deeply buried under the river sediment it used to cross, unnatural masses of copper where we lay cabling. Weisman’s analysis takes place in a timeline where all people disappear, but this paper is not predicting the annihilation of the human race. What is gained from Weisman is a completely different perspective on our infrastructure. By removing all people, we are forced to watch a world play out in which we are not the protagonist, and there are many lessons to learn from this that we can apply to the city to make it a better place. For us, the rest of the Earth, and the Anthropocene.

How we perceive our cities and their futures impacts how we create them. If we are able to adapt to an understanding of occupying place that allows for the possibility of leaving it, then we can imagine the city that exists *after* and *without* people. While the humans can move, all infrastructure erected becomes taken over by the ecosystem. With no upkeep, weathering increased natural disasters and changing climate will slowly destroy the structure, and, dependent on the specifics of material and climate, that will happen in many different ways. As the ecosystem has an effect on the structure, *so does the structure on the ecosystem*.

We cannot be so inconsiderate to think that any leftover infrastructure from the Anthropocene to this point will have a continued neutral effect on its surrounding environment. Perhaps in the least modern style of locally-sourced and handmade structures, these materials are familiar to the ecosystem and would not alter the dynamic, and the finite power limits how impactful the structure would be. However, the vast majority of the world’s cities are built with materials sourced from all around the world and with an ambition to be innovative, without regard for the consequences. Just as we’re told not to litter on a walk, we cannot not leave behind our physical remains so haphazardly. A building does not stop existing when its builders stop going inside it. There is a whole chapter of the life of infrastructure that we do not include when we plan and build our cities. What if we built cities with their post-human use in mind? Why can’t a city continue to serve the life that exists in its surrounding ecosystem? What would it mean to change the narrative of urban exodus from one of abandonment to one of a natural forwarding, to let the city become something new? Just as a species must adapt and evolve to survive, so must the city.

If we go into this next phase of the Anthropocene continuing our urban expansion business as usual, we risk increasing emission levels past any hope of survival, perpetuating a violent cycle of systematic land and resource exploitation, and intense political and social fracturing that very quickly leads to armed conflict. Without a critical look at how we make cities, we hurdle towards a dystopia where land is occupied, ravaged, and left, competition for resource is fierce, collaboration is minimal, and all living creatures wander through the remains of temporary civilizations, unable to find land untouched by human occupation. This reads like a science fiction setting, and is often the narrative we ascribe to environmental devastation. But we do not have to construct that post-apocalyptic world. This moment that we live in now can be a turning point. Once we are able to understand why we have learned these patterns of development and the damages that come from it, we can begin to build a better way.

In this paper, I work to uncover this overlooked phase in the lifecycle of infrastructure, explore why it is excluded from our development process, and how we can use our knowledge of it to build a city for the more-than-human. It will begin with a brief history of development, give an overview of more favored contemporary planning theories, and interrogate why the idea of the post-human city is difficult for us to accept at first glance. The analysis of two case studies illustrating different relationships to ruin will serve as the main structure of the argument. The research conducted covers an evidence base of personal testimony, documents, images, UNESCO nominations, gallery exhibits, and news articles. These sources provide an opportunity to inspect different peoples’ approaches and responses to grappling with an evolving landscape. By studying these examples, we see what is valued throughout the process and what they hope to retain in the face of change. Through the lens of two case studies – the Dheisheh Refugee Camp and the U.S.S. *Spiegel Grove* – this paper will examine the holistic lifecycle of infrastructure and contrast that with the industry standard service life, resulting in a proposal for a socially and environmentally stronger understanding of urban ruin and temporality through the conceived notion of landscape evolution.

**BACKGROUND INFORMATION**

**Unpacking our held perspective of place**

Why are we mired in urban presentism and ill-equipped to think of the city’s long-term future? Our history of development, both of the human race and the dwellings we construct, is told through the lens of revolutions, when some technological advancement enables growth at an unprecedented rate, and this narrative resulted in an obsession with constant expansion and turnover in our built environment that we’ve made synonymous with the idea of collective human ‘progress’ (Seixas 2012). With the early ability to use and innovate tools came a sense of conquering nature, as well as human exceptionalism, and this has been reinforced through every problem eventually solved with human ingenuity and the creation of new tools and technologies. This positive linear association of progress and technology that we have been raised with has created a cultural value for the ‘new’ – things that are new are generally seen as good, or progressive, or at least better than what preceded it. This notion of improvement, of making something better than what it was before, is a natural desire, but whereas most species progress through adaptation and learning new behaviors, the human race has mistakenly intertwined progress and production. We have grown accustomed to innovating tools that act as mediators between ourselves and obstacles, rather than practicing introspection of our own actions, thinking about consequences external to ourselves, and altering our processes moving forward. This enticing phenomenon of produced progress, progress as a built product, is most physically illustrated in the maintenance of cities. Populations have managed to stay in one place for hundreds, sometimes thousands of years because they are able to collectively solve problems of living and enact change on their surroundings – paving roads, building shelters, creating water systems, etc. Under the dominant narrative of technological process, all infrastructure was originally created to solve a problem within or improve the operations of the city, and that is the sole function it may serve.

The implications of new infrastructure as a measure of progress grew stronger with the transition to modernism – there grew an appetite for constant development and redevelopment for the co-benefits of expansion, mainly economic, even when the previous structures were adequate and enjoyed (Berman 1983). Work produces attachment, and this especially holds true for the modernist city, where the city is always under labor and producing new means of physical connection, as well as the death of the city one might have known. Continual work gives the impression that the city is a living, evolving thing, and from the beginning of their study, cities have been thought of as permanent objects (Wirth 1938). Immediately, we can notice a tension. All living things die; however, we understand our cities as permanent.

Theoretically, a city’s permanence is guaranteed as long as more generations are born, ensuring it will have the human resources it needs to keep growing. Following this train of thought, one can extrapolate that the aliveness and, therefore, permanence of the city is dependent upon the persistence of its human population, specifically its growth. A city with decreasing or stable population is less grandiose, majestic, productive, or merely *less* than it was previously, which has been associated with a lack of progress – a regression to a worse, previous state. A city abandoned by its people is not considered alive – we know such places colloquially as “ghost towns”. The structures of abandoned places, ruins, have been documented as capable of inspiring a fearful fantasy of a world after human life has ended (Dobraszczyk 2015). We can interpret this as the deepest fear of humanity, and the ruin, the abandoned city, has been painted as an omen of our own demise. Because we associate new infrastructure with progress, there is an inverse condemnation and fear of ruination in structures, as it forebodes the possible decline of human society. We have believed that cities are alive as long as people are alive, and, by reversing that logic, in believing that the city is permanent, we translate that staying power to our successors, which soothes us. The narrative of progress has allowed us to assuage our fears about the vulnerabilities and barbarisms of mankind by giving an account of where we were previously and a projection of where we are going, and the physical city serves as a literal foundation for people to bolster that history through their own experience of it.

This narrative that promotes expansion, progress, innovation, and the passage of time as synonymous has formed how we understand urban space and its purpose. The city as we know it is an amalgamation of the intense urbanization we’ve witnessed over the past two centuries and *depends* on the very notion that it will continue to grow, which incentivizes greater activity across every urban transect, promotes extreme fossil fuel consumption, and stimulates population growth. Generations have passed on their learned experience that industrialization is the answer to large-scale human problem-solving, and urbanism has operated under that ideology so unchecked that we’ve altered the planet’s biogeochemical cycles far beyond the capability of any species prior. The way we have been taught to operate the city is clearly at odds with how the world is changing before us – ecosystems have been eradicated for development, atmospheric and ocean pollution are at dangerous levels, and global population is at a greater capacity than what the planet can support. Acknowledging the impact of our entrenched urban industry also requires us to refrain from seeking a purely technological solution to climate change and turn instead to a review of our processes and fundamental understanding of how the city may exist, especially in the approaching dynamic world.

 The effects of climate change will occur over a massive timescale, one that we as a species have never had to wrap our heads around before. The tendency of modernist reasoning to perceive change as a direct relationship between cause and effect is an obstacle to understanding the cumulative reality of climate change. There is another approach, which pulls focus on the distributed and gradual violence this process causes, known as “slow violence” (Nixon 2009; Nelson 2016). Our global society values immediacy, particularly in the post-Internet moment. Daily social saturation desensitizes us to atrocities occurring across the world, our focus shifts abruptly frequently, and our attention spans narrow and become more particular for each individual. Exacerbated by our inclination towards immediate satisfaction, we can find it challenging to comprehend the consequences of an issue that have not yet transpired, especially in a situation with no precedent. Embracing slow violence recognizes that damage has already been caused, the results will be seen over time, and that, within a larger global system that operates on a different timescale, we cannot rely on immediacy as a depiction of cause and effect.

Climate change is also extremely complex, with several variables and cycles interacting with each other in ways that we don’t see and creating unpredictable outcomes. We tend reduce the problem to charismatic representation – for example, the polar bear as the poster species for climate change – but the melting of polar ice only tells one aspect of the story. Every part across every scale is interconnected, so the more we learn, the more we don’t understand, making it an inherently difficult topic to comprehend (Adger and Barnett 2009). The intricacy is tough to understand individually, and disseminating a complex topic to the general public comes with truncates, fragments, and omissions. This is heightened with the spread of the Internet, as we independently navigate a digital space of mass media, “fake news”, and conflicting news sources. Every individual curates their own Internet and news experience to suit their preferences, which can produce a feedback of reinforcing prior held beliefs, and differences in approach to Internet use have been proven to influence an individual’s awareness and opinion of the climate crisis (Taddicken 2013). Social structures have proven the ability to reinforce climate denial (Bowden, Nyberg, and Wright 2019), and our preparedness for social and environmental adaptation is limited by the configurations of social and political institutions (Adger and Barnett 2009; Adger et al. 2009; Corotis 2009). The deep enculturation of constant growth is impossible to overcome without recognizing its roots and thinking external of those systems. We cannot imagine, much less build, a world we have never experienced unless we know exactly what we want it to be and what we exclude. We must part from the expired frameworks of linear progress and the ever-expanding industrial city. Reflecting this, scholars have made multiple calls for more imaginative and non-anthropocentric ways of climate thinking to inform a different approach (Pereira et al. 2019; Yusoff and Gabrys 2011).

**Moving towards a transtemporal understanding of place**

 Landscapes that connect across time by preserving elements of different eras give a place tangible identity and reproduce their histories, which makes for an ideal human experience in engaging with the location (Neimanis and Walker 2014; Neimanis 2014). Most cultural landscapes have not been preserved, destroyed by colonizers or subsequent societies, and we witness the demolition of natural landscapes every day, from human action as well as natural disasters. Decisions of landscape preservation have historically centered the needs and desires of humans with power over any other parties. For instance, the continued battle to construct the Keystone XL Pipeline across the territories of multiple Indigenous groups prioritizes the economic benefit of natural gas transfer over the rights of the tribes, their health, and the egregious environmental impact. However, a range of non-dominant yet varied literature provides powerful perspectives for rethinking what landscape is and can be.

 Deep ecology provides a separate framework that understands all objects, beings, elements, or other planetary bodies as equal (Devall and Sessions, 1999). It shows us how to pay specific to the presence of the more-than-human within the city and the extent to which they influence the political and social human spheres, contrasted with how little their interests are represented within such spaces (Franklin 2017). Ecofeminist methods of embodied care propose a radical alternative to today’s neoliberalism and established gendered human hierarchy by acknowledging the interconnectedness of all beings and the core responsibility of attentiveness to the more-than-human (Phillips 2016). One powerful example of this is Neimanis, (2012) who discusses the connectedness of the world as one, continual body of water in her chapter *Hydrofeminism*. She pushes for a thinking of bodies and the earth as watery, as we are made of mostly water, are grown within amniotic water, share the need for it with all species, and benefit from its transfer of heat and nutrients that runs the world, among other things. To recognize that we are all a body of water is to recognize a sameness, fluidity, and flow between all things in the world, living and non-living. We understand the importance of preserving a body of water, particularly when it is a drinking source, but to understand the world as *one* body of water is a more holistic view that honors the importance of the element in every incarnation and the continued recycling of water that makes the Earth habitable. It imbues a longevity within it that isn’t fully comprehended when seeing a body as an isolated and solely present object. The notion of embodying the past, present, and future has been called “thick time” (Neimanis and Walker 2014; Neimanis 2014), and, upon embracing the re-cycling of all earthly things and the potential of an abandoned structure, thick time becomes a crucial tool for us to examine a landscape beyond our engrained approach.

 The progression of urban decay is an opportunity to apply these concepts that see equal value of all life, material, and spaces and simultaneously replace the fantasy of approaching doom. New possibilities erupt when one sees evolution in place of deterioration. A recent trend in urban space shows the willingness of communities to not just accept but *embrace* a fluid relationship between the city and nature. New York City’s High Line (former elevated rail turned contemporary park) is the most famous instance of what has been termed an imbricated place – one where city and nature are both considered active agents in the production of a place through the decay of the built environment and the growth of the natural one (Loughran 2016). For those of us unable to enjoy the High Line, we experience a similar, less high-profile, and more ordinary instance of the imbricated space in the unmaintained vacant lot. These spaces are filled with overgrowth and the debris of surrounding structures and often serve as habitat or unregulated space for neighbors, including parking, storage, meeting place, or garden patch. An urban dweller is quite familiar with the vacant lot, and, while it is often labelled as a sign of economic disparity or a failing of the government (Millington 2013), it conversely shows the multiple opportunities that can arise when we allow nature to breathe within the city fabric. Nature-based solutions to urban issues, as opposed to standard development, improve the physical environment but also provide social co-benefits, such as increased community identity and resilience (Kabisch et al. 2016).

 While we respect and embrace the process of growth, all life, urban and biological, is followed by the process of decay and the object of ruin, and how we perceive these degraded states is central to our understanding of the evolution of place. Ruins have been mostly considered for their ability to inspire particular doomsday fantasies within a traveler – the fear of urbicide, the annihilation of the city, reinforced by aesthetic tropes of warfare and apocalypse in film, TV, and video games; the fantasy of being the last human and final witness to humanity; and the imaginary of a world post-human life (Dobraszczyk 2015). The decay of buildings is culturally stigmatized as the visual representation of unraveling social order and a harbinger of increased crime, illustrated in the infamous criminological broken windows theory (Wilson 1982). Later research systematically analyzed over 23,000 street segments in Chicago against police, census, and survey data to test the relationship between physical and social disorder and definitively found that localized visual disarray (vandalism, debris and decay, abandoned vehicles, etc.) does not correlate to increased crime (Sampson and Raudenbush 1999).

 Other analysis has shown that ruins can offer a unique critique on the capitalist and state powers they were born from and provide alternatives to the dominant narratives of those histories (DeSilvey and Edensor 2013). Ruins also provide rich comparisons against contemporary methods of organization and structure by physically capturing the design, style, and arrangement of a former society in an accessible space that allows us to experience other constructed social systems (Dale and Burrell 2011), and, when open to the activity of urban exploration, serve as a tangible connection to the past and provide immense recreational and cultural value, which has been argued as another use-life for abandoned structures within the city (Garrett 2011).

**Current Life Cycle Analysis Structure**

 The construction industry utilizes the term “service life” to define an infrastructure’s period of use, from deployment to dismantling. The notion of life-cycle management for a structure is the rough prediction of its service life: envisaging the longevity and stability of materials and construction, analyzing wear-and-tear, recognizing critical points of deterioration, and, at those moments, determining whether the best course of action is repair and maintenance or dismantling and replacement (Blok et al. 2002; Yang and Frangopol 2019; Frangopol 2019). The primary focus of this management process is two-fold – maximizing infrastructure safety and performance and maximizing return on investment (ROI) (Frangopol et al. 2003; Frangopol and van Noortwijk 2004). A professional services company, One Click LCA, has created software to analyze a structure’s life-cycle, specifically with the draw of capitalizing on investment for the developers, with the added benefit of minimizing environmental impact. This company divides the “lifespan” of a building into 5 stages: concept planning, design, construction, operations, and replacement or disposal. Following these guidelines, we can understand the operations stage as the building’s service life.

 The concept of service life offers a limited understanding of what structures can be and accomplish. It confines all projects to this restrictive, linear cycle that allows it to perform one sole function and condemns it to dismantling immediately after. Plenty of infrastructure has been dismantled or destroyed when it can still serve, either in its original function or repurposed into something else. The layout of a structure’s life cycle centers not around functionality, but maximizing ROI. The timeframe for return is considered in financial quarters or several years, at best, for the chance to make the greatest profit, so each structure created from this process automatically has a very narrow window of potential existence and a prescribed demolition. Developers apply planned obsolescence, the pre-planned end of an object’s usability to motivate purchase of a replacement, to help maximize their ROI. Pre-determining the service life of infrastructure promotes the idea that our built environment is another disposable product designed to be consumed and superseded, and the continual replacement of infrastructure contributes significantly to pollution. Whereas life cycle analysts are concerned with the near-term financial future, there must be a greater prioritization and examination of the long-term and *thick* ontologies of the built and natural environment within the planning cycle. Some life cycle analysts have proposed methods of extending the use of infrastructure through circular economy, adaptable design, and salvaging materials, but these all maintain the status quo of dismantling as the only option following service and do not adequately offer alternatives for the end of a structure’s service life (Andrade and Bragança 2019; Blok and Teuffel 2019; Guest et al. 2019). There are myriad ways in which most structures, even at the end of their primary service life, can still serve, and we will explore such examples in the case studies.

 It is imperative to point out that the repeated, wasteful cycle of dismantling and replacing is employed nearly entirely within the Global North, where resources are seemingly abundant, excess is seen as luxury rather than waste, and the priority of development is skewed towards economic benefit rather than pragmatic solutions. Re-use is common in the Global South, even with large scale infrastructure. A primary school in Mysore, India saw significant increase in attendance after refurbishing two old train cars into permanent classrooms (Good News Network 2020). This is a clear illustration of a structure having an entirely separate service life after its primary phase, the potential of the structure unfettered by cultural bias. We must delve deeper into examples of infrastructure forwarding to understand that not only is it possible to repurpose and reshape landscape, but to know why and how certain communities have chosen to redefine their space and history by nurturing their landscape decay in a new way.

**CASE STUDY: DHEISHEH REFUGEE CAMP**

 The refugee camp is a globally recognized entity with increasing presence in our forceful world. While it may seem like an odd place to begin a discussion on alternative urban processes, the camp is a structured settlement that operates in contradiction of our predispositions to what a city is. Whereas cities of the Global North are built on permanence and primed for continual growth, the refugee camp is constructed as a temporary place intended to be abandoned. Their very existence implies displacement and the desertion of another place, supposedly a home, for a new, makeshift site. Relocation severs the way of life and imposes loss of connection to the former landscape, yet the refugee camp demands perseverance and reflection from its inhabitants in the face of their loss. They must actively construct their surroundings, find solidarity within a new community, and reconcile what they’ve been through and how they will move forward.

We tend to conceive displacement as the fleeing of a home and reception in another country, and mass refugee movements have certainly had a significant cultural impact over the past several decades. Images of families in boats and children in cages have pervaded global dialogue and given us an extreme vision of displacement, one that appears to happen after immense political turmoil or some unforeseeable crisis that requires the evacuation of large populations to another country with the capacity to care for their immediate safety. However, the vast majority of persons who leave their homes to avoid disaster, conflict, or some other threat stay within their country’s borders – at the end of 2016, of the 65.6 million forcibly displaced worldwide, 40.3 million were internally displaced persons (IDPs) (“Global Trends - Forced Displacement in 2016” n.d.). They still face similar challenges of finding suitable shelter and other resources for survival, as well as the shared trauma of losing a home and the cultural ties that accompany it. The global prioritization of refugee assistance is merely due to the inherent involvement of other countries upon reception or rejection of arriving refugees.

 Indubitably, from increasingly severe natural disasters and ongoing or potential future conflicts, the entire world will continue to see the emergence of the displacement crisis camp. The UN General Assembly’s 2018 Global Compact on Refugees acknowledged that “climate, environmental degradation and natural disasters increasingly interact with the drivers of refugee movements” (G. A. United Nations 2018). There will be overwhelming construction of settlements intended to house displaced populations *temporarily*, and, as the effects worsen, we will see less and less capacity for countries to take in other refugees, as they will prioritize responsibility to their citizens who may very well end up in mass displacement within their borders. While we may feel individually or collectively comfortable in our current location, be it in terms of climate adaptation or political stability, displacement is a very real possibility for every person on the planet, and that requires us to seriously reflect on our understanding of place and permanence as well as temporary dwelling.

This inherent impermanence core to the identity of a displacement camp unexpectedly sheds light on the topic of urban ruination. While global modernity urges us to view our societies as permanent, the intentional temporary existence of these settlements demonstrates a very different logic to our occupation of space. Moreover, the retention of culture is intrinsically complicated. The ability to interact with the history of a place and have a grounding, physical connection to its past are lost in the flight from a former home. This aspect can be augmented when existing in a refugee camp in another nation with vast cultural differences. The questions of how to honor the history of a place left behind and how to construct another life from scratch in a newly erected one are daily meditations within the camp. A further question arises in the case of Dheisheh: what happens when a place constructed for temporary occupation becomes a lifelong home and settlement in and of itself? And how can that history be honored?

**History of Dheisheh**

 Dheisheh refugee camp was created in 1949 to temporarily house 3,000 total Palestinians from forty-five different villages forced from their homes in the 1948 Arab-Israeli War. The camp takes up 0.31 sq km on the southwestern edge of Bethlehem. Upon reception, refugees gathered in an open field adjacent to the city’s main road, where tents were distributed by the Red Cross. Humanitarian responsibility for the camp transitioned in 1950 to the United Nations Relief and Works Agency (UNWRA). During the first intifada, the Israeli security forces (ISF) fenced in the camp entirely, cutting off access to the road, and created a single point of entry regulated by a turnstile. Over time, the fence was removed, but Dheisheh would continually be subject to incursions, persecution, and restriction in their movement and liberties by the ISF.

 Seventy-one years later, Dheisheh’s population has grown to 15,000, but its boundaries remain the same. Its estimated density is 45,454 people per sq km (UNRWA n.d.). If Dheisheh camp were compared to the world’s densest cities, it would rank second, only behind Manila, which carries an average density of 46,178 residents per sq km (Republic of the Phillipines n.d.).[[1]](#footnote-1)

 UNRWA replaced tents with constructed concrete shelters by the mid 1950s. Every family was provided with a nine square meter shelter, each with an intended service life of five years (“Refugee Heritage (Part I)” 2019). Bathrooms were built to be shared between fifteen families. The land on which the camp exists is leased to UNRWA by the host government. Legally, this means that there is no private nor public property within Dheisheh, and residents are not able to sell, rent, or transfer any aspect of the property. However, from the camp’s inception, its occupants have taken matters into their own hands and established their own housing market. As the population grew, development could only occur vertically, with new units being constructed atop existing ones. The result is a highly dense, compact urban space dedicated almost entirely to housing with minimal open space. Children play in the street because it is the only outdoor space in the camp.

 Dheisheh presents a novel form of urban space and organization. The residents exist in a paradox of prescribed agency. While UNRWA has legal ownership of the land, they have a strictly limited role in the operations of the camp based off their mandate as a humanitarian service. Their self-listed duties include “education, healthcare, relief and social services, camp infrastructure, microfinance and emergency assistance to Palestine refugees” (UNRWA n.d.). Notably, these commitments have been vastly improved or prioritized over the course of seventy years. Dheisheh currently has four schools (although no afterschool activities), a health center (also offers counselling and dentistry), a sewage network built in 1994 (however, five percent of residents are unconnected and use cesspits), a cultural center, a coalition-run center for diseases, and limited social, work, and food programs, all provided by UNRWA. However, that leaves many aspects of municipal life unaccounted for, and the responsibilities of creating a livable place fall to the families of Dheisheh or to the ground.

The first paved roads in the camp were created by its residents, but there’s no authority to run waste collection, so the vital streets that serve as the location for all activity were long covered in garbage. Literally building on top of UNWRA’s original concrete shelters, residents skirted the formal legal and economic bindings placed upon them and constructed their own homes, and in doing so, created their own neighborhood, culture, and history. The camp’s development illustrates the process of peripheral urbanization (Caldeira 2017), academically documented from analyzing the worldwide patterns of communally self-produced urban neighborhoods in the Global South. Caldeira argues that peripheral urbanization encompasses a particular sense of agency and temporality, in that residents are “agents of urbanization”. By constructing their homes and communities on a constant, continuing process, the place is never complete, but always existing undergoing improvements while actively serving as shelters. For cities in the Global North, such an act of living in a residence undergoing construction would break myriad laws and codes and be considered an unacceptable living scenario for citizens. Wealthy industrial cities create a neighborhood through formal planning processes, often limiting community input and agency, for the opportunity to construct an imagined place to ‘completion’ and then formally grant public access to it. It is considered a *permanent* place only after its grand opening, just now ready to be occupied and imbued with life by those who can afford the amenities, as though the walls could not adequately shelter before the ribbon was cut.

By constructing a place together through communal labor, in a subversion of the systems that formally govern, neighbors become politicized and build strong community ties (Holston 1991), and these effects are present in Dheisheh. Political and social activism are core to the camp’s identity, physically and socially. Residents founded and operate several grassroots community organizations dedicated to improving aspects of daily life inside the camp and working for better conditions for all Palestinian refugees. The original popular committee service system was implemented in 1967, when nineteen camps created committees to care for their own people and coordinate action with the other camp committee leaders (IMEMC 2011). Dheisheh Popular Committee, founded in 1995 and led with communist and popular values, is responsible for the wellbeing of Dheisheh residents, as well as representing them in matters with the UN and Palestinian Authority.

The community’s activism is embedded in the camp infrastructure: the walls of Dheisheh are covered with graffiti and communal art, nearly all of it political in nature. Murals of Palestinian martyrs who died in the struggle against occupation are some of the most prevalent. These painted walls are an active memorial to those lost souls, but also act as an education and a role model for the kids born and raised in Dheisheh (Hopper 2016). Furthermore, the works on the wall are curated by communal consent, and they function as a learning environment and de facto curriculum for children, engendering a visual and historical identity for the camp. The event of painting is a “community performance”, where people will gather, watch the painters work, and often offer their opinion. This single act, the painting of a mural, defines and reinforces the camp’s past against its presence, creates a recreational opportunity for those currently living there, and provides a marker of history for those who are still to come. It’s an intricately complex transtemporal creation of place.

Dheisheh’s peripheral urbanization shows a comfortable paradox of inhabiting a place yet not suggesting its permanence. Children are raised with the story of their family’s exile, know the name and location of their home village, and are taught to believe that they will return (Becker 2010). The UN universally affirmed Palestinian right to return in the 1948 General Assembly resolution 194 (G. A. United Nations 1948). Therefore, both the legal and de facto operators of the camp both agree that its existence is (ideally) temporary. While occupation is unpredictable, the residents of Dheisheh do not despair nor wane in their passion for returning home. That, however, does not undermine their ability to create an autonomous space for themselves to adapt to current circumstance. The individual and agglomerated actions of autoconstruction saturate the infrastructure of a neighborhood with an inherent sense of place, community, and history (Holston 1991; Caldeira and Holston 2008; Caldeira 2017), illuminated by the spatial and visual identities of Dheisheh. Each additional act of construction adds to a material history of the camp, and further serves as a physical manifestation of social mobility (Caldeira 2017). Because the constructed camp is the clearest chronicle of the families who occupied it over the past seventy years, the object of the camp itself can be seen as “the living memory or archive of displacement” (Abourahme and Hilal 2009).

**Embodying the heritage and power of refugees**

 In 2017, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) received a dossier nominating Dheisheh Camp as a World Heritage. The proposal derived from a collaboration of Dheisheh peoples, leaders, and organizations within and external of the camp, most significantly Decolonizing Architecture Art Residency (DAAR), a pragmatically radical architectural collective based 2.5 miles away from Dheisheh. Co-founder Sandi Hilal served as the head of Infrastructure and Camp Improvement Program in the West Bank at UNRWA from 2008 to 2014. DAAR has worked with and inside Dheisheh for many years, undertaking projects to identify and implement opportunities for public space interventions as well as hosting an experimental education program for nearby universities on site, breaking the formal structures of knowledge production and grounding it in a place of stronger potential impact. DAAR’s website hosts the full nomination, and an accompanying photographic dossier, and informs of the larger campaign and conversation surrounding the act: *Refugee Heritage*. The firm has presented *Refugee Heritage* at myriad Architecture Biennials and in other public spaces, featuring the photos framing Dheisheh as a UNESCO site and the richness of the community. They describe the movement as an effort to recognize refugees beyond humanitarianism, as the pavilion “traces, documents, reveals, and represents refugee history beyond the narrative of suffering and displacement” (“Refugee Heritage (Part I)” 2019).

 UNESCO’s rules for nomination relies on the site having “outstanding universal value” and meeting at least one of ten cultural landscape criteria (UNESCO World Heritage Centre n.d.). Dheisheh’s justification names its value under criteriaa (IV) *be an outstanding example of a type of building or architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history* and (VI) *be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance.* Their brief reasonings read as follows:

“(IV) Dheisheh Refugee Camp typologically embodies the memory of the *Nakba*, the longest and largest living displacement in the world today, and is at the same time the expression of an exceptional spatial, social and political form.

(VI) Dheisheh Refugee Camp is associated with an exceptional belief in the right to return that has inspired both refugees and non-refugees from around the world in the struggle for justice and equality.” (3.1.a)

 Their claims for Dheisheh’s value permeate from the *Nakba*, translated as “Day of Catastrophe”, referring to displacements preceding and following the Israeli Declaration of Independence on May 15, 1948. They argue that the site itself is a testimony to the original atrocities of expulsion, the following seven decades of political failure, the right to return, and the resilience and heritage of the millions of Palestinians that have created their new homes in prescribed communities and, in doing so, have created an ‘architecture of exile’. Dheisheh exemplifies the unique physical and social urban fabric that has developed as a result of political inaction and social abandonment of these communities. The camp’s origin and continued existence is clearly a physical manifestation of the displacement these Palestinian families endured and a testament to the lives they were forced from. This narrative of loss and liminality is what the world primarily understands refugeeness to be, but *Refugee Heritage* seeks to contextualize the trauma within the mundane realities of everyday life. While the origins are tragic, the reality of Dheisheh is not a lament – it is a triumph. In facing total loss and no bedrock for the future, families from all across the region united in a completely new cultural landscape and created a strong, caring community. They organize, work, go to school, play, build the homes they want for themselves, and have rich lives. While the continued existence of Dheisheh is a result of political inaction, the success of it is entirely the result of the residents. The camp infrastructure is a physical manifestation of their efforts to assert their right to a good quality of life. It is proof of their agency within the face of abandonment. With no larger entity providing adequate care, they organized as a community and developed a collective efficacy of creating the best possible lives they could, because it was their right. The inhabitants have made Dheisheh into more than a livable temporary dwelling; it has become a major urban center, cultivating neighboring suburbs, and is a symbol for many Palestinian refugees. Most refugee camps are built to be abandoned, forgotten, to leave no historical trace. Conversely, there is a strong belief amongst refugees that the existence of the camp is *proof* of the right to return, in both the injustice and the power it embodies, and, as a result, there is a strong desire to preserve and protect camps from external changes that might appear to undermine that right they hold or erase the history that they have lived there.

The goal of this project was not official UNESCO recognition. The primary purpose was to create a political statement about the permanent temporariness of refugee camps and acknowledge the rich cultures and complexities that exist within them, while criticizing the global standards of what is considered worthy of preservation and creating a channel for honoring marginalized heritages (“Refugee Heritage (Part I)” 2019). The conversation has gained a global audience, so they achieved that goal. However, the UNESCO nomination was rejected. How does Dheisheh, an actively occupied, continually constructed and ever crumbling mesh of ruin compare to the chosen, “ideal” UNESCO site?

Some of the most renowned sites recognized by UNESCO are large, ancient structures in a state of ruination and preserved as such – the Acropolis, Babylon, Chichen-Itza, etc. In these cases, the interaction with ruin is understood as very beneficial. They have a nearly magical quality of bringing us into contact with those past societies and allowing us to imagine those structures in their full, former glory. It’s the millennia in between their lives and ours that make us recognize their ruins as valuable. Specifically, it is the fact that they have stayed standing for so long without human intervention that makes us see them as valuable and worth preserving. If a ruin is altered, either damaged or maintained, it is seen as less “authentic”, because it has been affected by humans after succumbing to the larger process of natural decay. Here, we can see that we are impressed with ruins because of their independence and longevity external from human life. We respect the resilience of outstanding structures, more so as their existence continues, yet we often choose to preserve a ruin in as early a state of decay as possible. Why does that intrusion not impact the “authenticity” of the ruin? According to the laws of nature, it should sustain more ruin. Does the value of a ruin increase the longer we wait to begin preservation or the longer it decays? Would this imply that the most impressive phase of witnessing ruin is the very final moment, when it has withstood everything it possibly could and finally collapses into dust? Such questions illustrate the depth of cultural connotations we assign to ruins without actively consider what inspires us about them.

When we appreciate ruin, we simultaneously consider the essence of the world it physically arrested against our own with the effects of passed time, and we gain transcendent perspective unavailable to us otherwise. Ruin and decay are natural processes that occur at inconsistent speeds from multiple actors, and numerous environmental factors contribute to and modify the particular decay of any object. We could not possibly plot a linear relationship between the effects of time and the value of structures, nor claim that the longer a ruin spends decaying the more value it accrues. In fact, a ‘fresh’ ruin has the potential to elicit greater emotional impact than an ancient one – a bombed city, full of crumbling buildings and burning memories, might have a more intense effect on a witness than observing the tranquility of Stonehenge. That is to say, the value and authenticity of a ruin comes not from a single measure of time weathered, but from the context that surrounds it, the history it carries, and its capacity to emotionally connect us with that moment in substitution of the people who occupied it. In the case of the bombed city, would one call those ruins “inauthentic” because they were caused by warfare, an exclusively human interference? No, to do so would be ludicrous. Ruination from the hand of another human is still a form of ruination that causes damage and decay to other beings and the environment. UNESCO is not averse to selecting sites with similar origins of man-made atrocities – Auschwitz Birkenau was inscribed to the list in its second year of existence, 1979, only thirty-four years after the camp’s closure.

A commonality of sites selected for UNESCO, besides their historical and cultural substance, is a considerable period of time between their mainstream cultural significance or use and their honoring as a World Heritage site. Ancient cities are treated with universal contemporary acclaim; the Statue of Liberty has been an American icon for more than a century; Le Corbusier’s work invigorated architectural Modern Movement in the early-to-mid 20th Century. To be fair, the list is a recent human development, but there is a clear desire in UNESCO’s selection process to wait and see which heritages stay dominant and influential in the narrative of human history rather than make a decision to honor a moment *in* its moment. Letting a structure have a period of ruin before acknowledging it distances global consciousness from the moment that structure embodies and can change the way a structure is related to. The passage of time changes human perspective, and reflecting on the recent past in terms of the present invites us to draw a linear connection and plot our progress. Allowing a structure to decay also changes the physical attributes, further affecting its presentation in ways that may make a structure more palatable to certain audiences.

Dheisheh, on the other hand, was born of and into ruination. Its ruination occurred not with the luxury of time following a successful service life, but instantaneously and repeatedly from political failure. The camp being an object that should not exist in the first place, its perseverance and hosting of thriving communities is a socio-political phenomenon that deserves to be honored in its own right. The logic behind honoring ancient ruins is a testament to their staying power, their permanence that outlasted their peoples’. Palestinian refugees and the residents of Dheisheh were denied the chance to see the full potential of the societies they cultivated when forced from their homes and cultural landscapes. There is equal value in honoring the contributions of ancient societies through their ruins and those of a modern society whose heritage has *been* ruined. The structure of Dheisheh is a physical monument to the heritage of all Palestinians displaced in the *Nakba*, but because we so desperately cling to stationary permanence and longevity as prerequisites of heritage, its continued use as residence and permanent temporariness make many unable to recognize it as such. Because we exist under a world order that wants to maintain the status quo of the industrialized, financially-motivated city and discourages thinking critically about our moment or how we can alter our direction, the foremost celebration of displaced people, their struggle, and their ability, is a travelling exhibition offered at museums.

Although UNESCO did not choose to recognize it as a World Heritage site, Dheisheh and its infrastructure offer multiple opportunities for designating distinct service lives within the evolving, ruined camp, which will be further detailed in the discussion. With no major institutional support committed to helping them, the residents and their allies must continue their campaign on a grassroots level. And, certainly, until a solution is found, the camp will continue to serve as an active residence to those who live there. Therefore, this case illustrates the potential of broadening our definition of service life, the power that can come from redefining a narrative within our moment, and the intricacies of ruins and ruination, but no formal implementation of another service life has come to fruition. It does, however, motivate questions that can propel us further into the idea of alternative service life. What would a proper forwarding to a new service life look like? Would there be consensus enough to approve and fund the transformation? Could it even become an industrialized process with concrete steps and actors repeated on a large scale? How does the relationship to a structure change when it undergoes a transformation into a new object? These illustrate just a few of the considerations that creating an alternative service life for a piece of infrastructure inspires. While we cannot extrapolate how the process would work for Dheisheh, we can move our focus to a structure that has similar historical, emotional, and spatial complexities that has *already* undergone a transformation reprioritizing its function for primarily non-human service. We will examine a decommissioned Navy vessel sunk to create an artificial reef: the U.S.S. *Spiegel Grove.*

**CASE STUDY: U.S.S SPIEGEL GROVE**

**History of Spiegel Grove**

Construction of the U.S.S *Spiegel Grove* began on September 7, 1954 and it was commissioned as a US Navy vessel on June 8, 1956. The amphibious warfare ship was one of eight landing ship docks (LSD) in its class. LSDs are classified by the presence of a well dock at the back of the ship that is able to take on water, flooding the deck enough so that smaller landing craft or amphibious vehicles are able to cruise off and on the ship without the use of a crane. LSDs were appreciated in the 1950s for their ability to launch and land craft in rough seas and transport myriad vehicles at high speeds. The *Spiegel Grove* was also equipped with six 3-inch/50-caliber Mk-33 dual gun mounts (for a total of twelve guns, although the ship retired with six), capable of firing 45-50 rounds per minute, and a helicopter landing pad.

*Spiegel Grove* actively served in the Navy for thirty-three years, completing many operations around the world, although a majority of the time was spent conducting amphibious landing exercises along the east coast of North America and the Caribbean (Flatley 2020). The ship deployed to Guantanamo Bay multiple times, it was the flagship for a 1961 good-will tour of Africa named Solant Amity II, and conducted a second tour, Solant Amity IV, two years later. It participated in Operation Steel Pike, the largest peacetime amphibious landing exercise in history, and a large-scale evacuation of foreign nationals from Beirut to Piraeus, Greece during the Lebanese Civil War in 1976 under Operation Fluid Drive.

The ship was given numerous commendations during its decades of service, including multiple Armed Forces and Navy Expeditionary Medals. In 1981, the crew received a Meritorious Unit Commendation and an Energy Conservation Award from the Secretary of the Navy for exemplary leadership in minimizing the ship’s energy consumption. In the same year, they brought home a stowaway from the Dominican Republic. Months after its 30th birthday, which was celebrated with a full party, the *Spiegel Grove* was awarded the Golden Anchor Award, honoring the ship’s sustained military retention and career progression for its crew. Shipmates lovingly referred to the ship by its nickname – “Top Dog”.

The *Spiegel Grove* ended its naval duties and was decommissioned on October 2, 1989. Immediately afterwards, the ship was delegated to the James River Reserve Fleet in Virginia, under the United States Maritime Administration (MARAD). Retired ships are often kept in such reserves, termed “Mothball Fleets”, in the case that their service be needed in emergency. Ships are kept together in a row, side by side, and form long chains of vessels that sit in the river, but can be removed from the pack for maintenance or use. However, most mothballed ships sit in their reserved state with minimal upkeep or use and eventually become obsolete, so their presence in the fleet is merely a holding place until their fate is decided. Usually, ships are eventually sold for scraps or used for target practice. However, vessels have previously been petitioned for donation as memorials or for museum use, or, with increasing popularity, purposefully sunk to create an artificial coral reef.

The *Spiegel Grove* would, ultimately, be selected for this purpose. The community of Key Largo, Florida, created a campaign in 1994 to allow the ship to be scuttled off their coast (Upper Keys Artificial Reef Foundation n.d.; Flatley 2020; Monroe County Tourist Development Council n.d.). The drive of the project was dually economic and scientific. The Florida Keys depend nearly entirely on tourism for economic stimulus, and scuba diving is one of their most lucrative industries. The Key Largo Chamber of Commerce organized an Artificial Reef Committee to work on bringing the ship to their shores, predicting that the ship-turned-reef would be a major attraction and investment for the community. Their case was reinforced by proposing the new site as a test on whether an artificial reef could decrease human impact on a nearby natural reef, which would be officially monitored by their partners, the Upper Keys Artificial Reef Foundation, the Reef Environmental Education Foundation, and the Florida Keys National Marine Sanctuary.

While the local community was strongly in support of this project, the process was held up for years as the project stalled passing through multiple levels of bureaucracy. Legal title was officially passed to the State of Florida in 1998, committing the ship to the project, but a combination of stringent EPA restrictions, bad weather, red tape within the Florida Fish and Wildlife Conservation Commission, and technicalities of cleaning the ship meant that the *Spiegel Grove* did not actually leave the James River until June 15, 2001. It was towed to a facility in Portsmouth, Virginia to remove parts of the ship that might cause danger to divers and receive a final scrub. Former crewmember Kevin Flatley visited the ship in Portsmouth on September 21, 2001. He reported that the cleaning was at an estimated forty-five percent completion and documented broken glass, piles of electrical cable strewn across the ship, leaks, and a few vintage mid-80s “girlie magazines” (Flatley 2020). While the cleaning process was originally predicted to take four months, stripping the massive ship proved to require a lot more time, leading to a funding shortage of five hundred thousand dollars. The Key Largo Chamber of Commerce began selling medallions to divers as a pre-requisite to dive once the ship was ready, and Monroe County committed to covering the rest of the cost. Due to the massive delay, they switched contractors and towed the ship across the river for the final few months of work. It seemed to many like it might never happen, but the *Spiegel Grove* left Virginia for Florida (for the last time) on May 8, 2002 and arrived one week later.

The ship was set to sink by low-level explosives on May 17th. There was a large crew preparing the ship for scuttling. In a move seemingly rebelling against its prior delays, however, the *Spiegel Grove* sank on its own, four hours before the scuttling was scheduled. Welders were working on the ship when it began descent, but were safely evacuated, although their equipment was left behind and drowned with the ship. While the plan had calculated a sink that would allow the ship to settle upright, the premature sinking caused the ship to plunge stern first, keel over, and land upside down on the ocean floor. A month later, a team successfully turned the ship onto the starboard side. Divers were expected to be able to dive the wreck on June 18, but that date was postponed once the ship began leaking unknown fluid. After days of testing and cleaning, the fluid was determined to be a small engine lubrication oil non-harmful to divers or the ecosystem, and the wreck was opened to divers on June 26, 2002. Within the first week, the site received over 1,000 visitors. At the time, it was the largest retired vessel turned artificial reef in the world. Followers of the ship received a special surprise on July 9, 2005, when Hurricane Dennis created currents so powerful that they turned the *Spiegel Grove* right-side-up.

**Impacts of the sinking of the *Spiegel Grove***

Economic

 The *Spiegel Grove* attracted over 50,000 divers in its first two years as a site (Clark 2013). A study comparing the ten months following the opening with the preceding ten months found that there was a net $2.6 million expenditure within the diving and snorkeling industries, and ninety percent of that increase was attributed to non-residents, suggesting an immediate increase in tourism (Leeworthy, Maher, and Stone 2006). Within the same time frame, sixty-eight new jobs were created, and total local income increased by $961,800. Dive shops saw a 3.7% increase in sales, and total recreation increased in the wake of *Spiegel Grove*. The study partnered with all local dive and snorkel shops to get accurate data and compared observations against the 1997 Monroe County Census data to control for fluctuations in season and other variables.

Environmental

 Within a month of sinking, forty-six fish species were documented on the wreck, and within a year, 123 total species had taken residence on the reef (Semmens 2005). A follow-up study tracked the reef for five years post-sinking. The report stated a total of 191 species had been seen at the site (Semmens 2007). Species persistence between monitoring events had been fairly low in the first year, forty-one percent, but increased after three years to a level more akin to neighboring reefs, and now the species makeup is similar to nearby deep, natural reefs. Repeated sightings of Blackcap Basslet were notable, as this is a rare species in the Keys; ten total sightings have been confirmed, with four of them on the *Spiegel Grove* and one in a neighboring wreck, suggesting a possible habitat niche for a species that is otherwise absent in the area.

 The original hypothesis of local resource management was also proven a success: in the ten months following deployment, nearby natural reefs witnessed a 13.7% decrease in users (divers, snorkelers, other) (Leeworthy, Maher, and Stone 2006). Artificial reefs saw a 118.1% increase in scuba divers, and the total reef use increased by 9.3%. It is clear that the artificial reef drew interest away from neighboring natural reefs, but the effects of an overall increase in diving tourism is unclear.

Emotional

 The *Spiegel Grove* had eighteen officers, three hundred crew, and multiple other passengers on its decks at any given time. Over the course of thirty-three years of service, that amounts to a lot of people who had an intimate relationship with the ship, as is common in Naval service or other occupations on the sea. Previously mentioned former crewmember, Kevin Flatley, is so dedicated to the ship and fond of the time he spent on it that has fashioned himself as the de facto *Spiegel Grove* expert. His personal website (kevinflatley.com) hosts all the information he’s been able to gather over the years about the ship’s history. It includes records of each deployment, each exercise, date and locations of docking, to the best of his ability. Much of it has been collected from former crewmembers who find the archive and send him every tidbit that they’re able to remember, including personal stories and photos.

 Flatley’s history of the *Spiegel Grove* does not end with its decommissioning though – he documented the life of the ship all the way up until 2017, when it received a plaque (although he updates the other sections of the website, most recently on May 11, 2020). He recorded sometimes daily correspondences with parties involved in the campaign and published them so that others could follow the ship’s status. It seems as though he was the central unifier for all former shipmates still interested in the well-being of the ship, as he gives instruction on how others could help, asks for clarifications when he needs them, and publishes other people’s firsthand accounts of the ship.

 One of the longest entries details a trip he took with his family to see the ship stationed at the James River Reserve on September 11, 1998. This is a selected passage:

 “All in all, we spent approximately an hour and a half combing her now dark and quiet passageways in search of our Navy past. Paint hung in off-white strands from the overheads, was rusted through on the bulkheads and the decks were littered with the debris of age and neglect. We were not permitted into the engineering spaces due to water, and other dangers. Paint chipped off in our hands as we grabbed handrails going up and down ladders. The well deck was moldy and plants had sprouted between the planks. Broken glass was strewn about as well as various pieces of metallic debris.

While I was prepared in advance that she 'was in real bad shape', and I expected it to some extent, it really hit home as I was leaving: this was it. No more Spiegel Grove. I have to keep in mind that when I left the ship in Valparaiso, Chile in 1983, I never figured I'd see her again, anyway...

Again, too I think that I've come to grips with her fate: to be a reef; it's gotta be better that having her act as a target for some tin can or sub's missiles...” (Flatley 2020)

 His account shows the complexity that anyone might feel when facing the decay or loss of a structure that contains close, personal connections. In opposition to the wonder felt at UNESCO ruins, Flatley is clearly dismayed at the status of the ship he once sailed. He took great pride in the shape of the vessel, and to see it in such a liminal state was difficult for him. In the last sentence, we see him begin to find acceptance through the transition to reef. While he experienced pain at seeing the ship gutted and grimy, he is able to alleviate his grief by remembering that it could certainly be worse, and we see the importance to an individual of having a multiple service options for infrastructure that retains personal sentiment. Out of the eight LSD vessels in the *Thomaston*-class, only the *Spiegel Grove* was repurposed as a reef. Four were sold for scrap, two were sold to Brazil, and the last was sunk as a target during a warfare exercise. Certainly, the emotional toll that any of these options takes on a former crewmember with as much fondness for the ship as Kevin is much more difficult to reconcile.

 Throughout the years of emailing for more information and relaying that it, once again, has been delayed, his accounts are increasingly frustrated with the lack of clarity and inaction on the ship project. One entry reads as follows:

“16 April 2001: And even more of the same. It seems that Florida is in a quandary (still) over whether or not they have the authority to accept FREE property from the US Government. After the YEARS of extremely hard & tedious work of navigating the EPA, MARAD, BEIC, etc, the hardworking men & women involved in getting our ship to her final destination is bogged down FOR THE DURATION in bureaucratic mumbo-jumbo.”

 He posts a “1 year on the bottom” update, written by a man named Bob Serata, who was able to dive the site and give a complete firsthand account, that seems to achieve the closure the website set out to find:

“Today, she's got a quiet dignity, as if she was just resting, waiting for the ever-growing list of life cycles to build. In years to come, the thousands of divers who visit her will lose sight of the great ship and see a great reef. She'll have served mankind in the greatest manner possible on this planet -- by giving birth to an entire ecosystem.”

This quote illustrates the emotional power of infrastructural repurposing inherent to the forwarding process. Bob describes closure in ending the first service phase of the *Spiegel Grove’s* life by saying the ship rests with ‘quiet dignity’, honoring the strong, military background but letting it ‘rest’ after that action-oriented service.He is able to blend that ending with the beginning of a new service life, using words implying an evolution into something greater - ‘life cycles’, ‘giving birth’. Interestingly, he sees this new service life as still serving human interests, which it certainly does, but the more meaningful service is undoubtedly to the ecosystem it will support over a long period of time. There is a literal and poetic gain from the forwarding, in that we see a vessel of destruction become a host for new life. The fact that he uses such prominent, poetic language proves the ability to not just understand, but value and be awed by the process and potential of forwarding infrastructure. It suggests that interaction with successful instances has the ability to penetrate our learned bias for constant replacement.

**DISCUSSION**

We can physically adjust our mark on the world and make our moment known as one that refused to follow the insidious patterns of the past by creating a new, responsible perception of service life that does not solely serve immediate human interests. In the increasingly likely event that we must evacuate our cities, it would be far preferable to plan for this outcome and equip urban infrastructure with the potential for succeeding service lives, rather than let it sit and be a detriment to the evolving ecosystem as well as a monument to our hubris. This change in perspective requires a reframing of the climate narrative from one of loss and devastation to one of growth and evolution. To overcome the morbidity that is immediately felt when discussing the long term decay of cities, we must confront the sense of permanence we feel in our settlements and come to terms with the temporality of societies, the thick time of movement, and how we can retain cultural identity through the forwarding of infrastructure to another service life.

Examining the process of infrastructure decay offers an opportunity to rethink how we relate to the natural effects of passage of time, fighting the linear narrative of ‘continual progress’ that sees ruination with negative connotation and immediately requires intervention. The standard of a singular service life within a structure is under critique and exposed as an extremely narrowed view of the potential of our built environment. Through the case studies, we have seen the various facilities infrastructure is able to retain in a deteriorated state. We will now discuss the implications that the projects carry beyond their base instance of infrastructure forwarding and complex, evolving landscapes. The capacity that structure has to preserve human history, cultural and political importance, to physically bind a community, and to reshape the narrative of our current moment is housed within the fabric of Dheisheh camp. *Spiegel Grove* similarly illustrates strong emotional depth and the various complexities that can come into play from such an ambitious project. In both cases, we witness a relation to ruin that is not as simple as inspiring doomsday fantasies or appreciating a monolithic achievement. Such views of ruin are detached from the gritty process of ruination and solely look at the ruin as object. Our studies are situated within the daily, continual crumbling of a meaningful fabric, and they demonstrate more than anything that coping with ruin, even when we see it in a positive light, is inherently complex and increasingly unavoidable. Our extreme perceptions of ruin may be a protective attempt to evade the cognitive dissonance they innately arouse. However, in order to properly move beyond the order we were given, we must commit to embracing the process of ruination in all its complexities. In doing so, we are able to find a new perspective of our current moment, in terms of thick time (as opposed to linear), that aids us in moving through the process of grief in moments of intense change. Through re-examining our relationship to ruination, our view of our own mortality morphs as well, and we become more soothed about our position and receptive to the concept of transtemporality in the long term.

The camp illustrates the complexities of our ties to temporality and location. While it stands as a monument to the continued suffering of Palestinian refugees and their still-unrealized right to return to the homes they fled long ago, it is simultaneously a testament to their strength and continued cultural activity, not only in spite of but also by virtue of displacement. The camp has become a home, a bonded community, and a place where people are proud to live and be from, even if they move away. It also stands strongly as living political symbol, acting in a role similar to the Berlin Wall. Beyond those, it will stand as a landmark to the displaced persons of the *Nakba*. Every structure within the camp is a physical embodiment of their lives, and, as they developed their home through resilience in a time of great peril, their history was written in a literal, physical manifestation of growth.

The infrastructure of this camp is imbued with significant life, history, and grounds for further cultivation. It would be impossible to claim that it serves in merely one, static way. These structures perform multiple ends that are not restricted to their means as shelter and imply a much more complicated life cycle than a singular service life culminating in immediate dismantling. Even as they continually serve their purpose as shelter, they evolve every day into something greater. The irrepressible vitality that we see in the growth of this camp, serving the people there physically as well as with greater emotional and memorial content, is a shining example of what I term landscape evolution. Akin to imbricated spaces, the power of nature and the decay of the built environment are both agents in the continual evolution of this landscape, through the constant give and take between the fluid and non-fluid entities of the planet, this one body of water we all swim in. Landscape evolution builds upon that with further emotional meaning imbued within the objects that help those related to it reconcile difficult emotions of tragedy, loss, and change. The structures connect their communities to the previous era, but are manipulated through myriad combinations of natural growth, structural decay, and human guidance to be further used in new forms relevant to the future of the landscape, and, in doing so, provide a physical vessel that can enable grief to become acceptance.

There is immense cultural and memory value imbued within the concrete walls of Dheisheh. The ability of infrastructure to perform emotional and commemorative duties in addition to the structural complicates the notion of service life by illustrating that infrastructure is able to serve in multiple ways. If there are multiple functions that infrastructure maneuvers, then there are multiple categories on which we base an edifice’s worth, and all should be equally considered as executors of a structure’s service life. The prioritization of human use filters our perception of what a structure can do, or have done to it, in any given condition, but particularly those showing deterioration. Our current operations privilege the aspect of infrastructure that solely serves human activity. Countless developments have erased history and damaged their natural surroundings, all under the guise of ‘human progress’.

Furthermore, Dheisheh demonstrates the difference between formal and informal channels for discussing infrastructure repurposing. UNESCO stands as the dominant narrator for human history, and the people of Dheisheh have been globally neglected and are fighting for their voice to be heard. UNESCO is criticized as a Euro-centric, western-dominant entity with a greater intent of tourism than authentic cultural preservation. 47.19% of its sites are located in Europe and North America (UNESCO World Heritage Centre n.d.), and many honor colonial societies that eradicated other histories to become the dominant, recognized heritage of that region. In fact, the right to nominate a site is only given to nation-states who have signed the World Heritage Convention. Is a marginalized polity, such as the camps specifically carved as exceptions from the nation-state systems, unworthy of global recognition? Does their lack of political authority, which is clearly no fault of their own, but an oppressive symptom of larger political inaction, remove their capacity to live in a way that cultivates outstanding universal value? Categorically, the answer to both of these is no, and the nomination of Dheisheh subverts these ideas conflating political might with cultural value and illustrates the need for deeper conversation on cultural preservation and how we understand heritage.

 The case of *Spiegel Grove* illustrates another moment of landscape evolution. A vessel that carried thousands of people, sailed across the world multiple times over, embodied and enacted the United States’ Cold War demeanor eventually sheds itself of most of that life, save for its husk and visual cues like the flag, name, and logo. While the ship still bears its name, we see a stark constant between the actions of its former life and its evolving one, but also a certain thread of consistency throughout its existence, a true identity. Its forwarding characterizes a shift in values of this time period – after decades of devastating war and increasing environmental concern, the choice to turn the ship into a reef reflects a desire to move beyond conflict and destruction and begin to actively nurture and reinvigorate the world and ecosystems we’ve abused for centuries. This kind of landscape evolution – submitting a structure fully to serve as host and habitat to environment – is notably different than what is seen in Dheisheh. The camp is still actively serving as residence and will continue to do so for the foreseeable future. *Spiegel Grove* went through years of planning to carefully adapt it as humans wanted, and a primary takeaway from this case is that plans, especially within ruination, will always need to change. No matter how well they cleaned and prepared, the ship sunk on its own after sailing successfully with other vessels on board, and it was only put into the ‘right’ position by natural forces, the currents of Hurricane Dennis. It will ideally stay in this state and develop into a thriving, stable reef for generations to come, but the truth is that the ship has been given it over to its environment entirely, and things may change. And that is okay. We will overcome any grief through the successful service that these structures provide for not just us and our emotions, but for the entire global ecosystem.

The life cycle of a structure can be made up of multiple phases – numerous service lives, perhaps phases where it does not serve at all (we may consider the time the *Spiegel Grove* sat in the James River a phase of non-service), and, potentially, live and serve eternally, if it is elected to be dedicated to the environment. Service lives may overlap and not be cleanly linear, as evidenced by Dheisheh camp. There may be gaps, or overlap, or transitional phases. The life cycle of a structure is always particular to that structure. It cannot be forced to follow a prescribed template. While we can create a design process that we use as a starting point, every project must adhere to the context that defines it to properly determine in what any number of ways it can serve.

At the same moments where a team considers maintenance or dismantling, forwarding should also always be a consideration, as well as a deliberate part of the planning process from the very beginning. By incorporating the notion of infrastructure forwarding into the planning process, we normalize the idea, and give ourselves time to adjust to it by merely considering it, even when it is not the correct or selected option. When we make the decay of a structure part of the plan, we take control of our position within the narrative and begin to reckon with the future of its ruin, which allows for superior emotional interaction and management across times of change and enables us to contribute purposefully and fruitfully to the process of landscape evolution.

**CONCLUSIONS AND OPPORTUNITIES FOR FURTHER RESEARCH**

 A structure can perform many service lives throughout its life cycle, as exemplified within Dheisheh camp and *Spiegel Grove*. The norm of a singular service life is a wasteful product of the era of consumption that has catapulted us into the climate crisis. We can alter our practices and leave a better mark on the world, one that is not destructive but that contributes to the invigoration of future environments. By re-adjusting our understanding of service life and the life cycle to a more fluid, emotionally and environmentally conscious process, we are able to find another way of dwelling to prepare for upcoming climate devastation and purposefully control which remnants of this era are memorialized in an active, beautiful, life-giving way. If we accept this assessment and agree on the benefits of landscape evolution, we can start thinking about the long term plans for our cities without a fear of how that impacts our lives now.

It is a responsible choice to make, as opposed to one that benefits us immediately. Incorporating landscape evolution into urban planning provides the opportunity for a healthier emotional separation from that place, leaves a responsible monument to what it was, and provides a tangible moment for this turning point in our history. It will remove some burden of adaptation from future generations that already will receive impacts far worse than we would encounter. It could be considered a form of atonement, one that, I believe, history would look upon quite kindly in the context of all the devastation this era has caused. The possibilities for the world that can emerge from impending climate change are beautiful once we imagine how this evolution can occur. The coastal cities we love could become massive coral reefs, home to thriving ecosystems. Cities at risk of fire perhaps could be purposefully built so that the burning contributes to the soil makeup and stimulates growth that will thrive in the changing climate. Urban areas facing desertification might similarly provide much needed resource through an area over time as a result of natural decay and weathering. Each city should be planned according to the projected impacts of climate change to their specific region. The numerous possibilities give us a new purpose and allow us to see into a world *beyond* the climate crisis that paralyzes so many of us. We’ve already left a heavy mark on the world that will be burdened by every future generation. The best thing we could do to improve the world they will be born into is to clean up our development patterns and create a living landscape, rich in heritage and lush in ecosystem.

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1. Manila’s population of over 1.7 million spreads across 38.55 sq km. Many Palestinian refugee camps have similarly high levels of density as a result of definitive camp borders and growing populations over the decades. Even though they cover a small surface area, these pockets of density are thriving examples of rich urban centers and can be socially analyzed as such. [↑](#footnote-ref-1)