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I, Giovanna Carlini Lang, hereby submit this original work as part of the requirements for the degree of Master of Architecture in Architecture.

It is entitled:
A New Paradigm: The Cemetery for the 21st Century

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A New Paradigm
The Cemetery for the 21st Century

A thesis submitted to the
Graduate school of the

University of Cincinnati

in partial fulfillment of the
requirement for the degree of

Master of Architecture

In the School of Architecture and Interior Design
Of the College of Design, Architecture, Art, Planning
By

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Regardless of the change and evolution in religion, culture, and economy throughout the past century, cemetery design has been left behind in history and has become an obsolete element of the modern lifestyle. The research and evaluation of cemetery design throughout American history, their design changes, reasons for the changes and the social outcome of the design, proves that a new approach to burial is desperately needed for the society of the 21st century.

This thesis looks at redesigning the environment and spaces where the remains of the dead are honored and put to rest by providing a new example for the next paradigm shift in cemetery design. Looking at examples of innovative designs that have already begun to change the cemetery landscape, elements from these case studies are used to inform and shape the design of this new project.

This thesis provides a design that further challenges the environment of the cemetery by revitalizing a piece of urban infrastructure that is currently under question for its structural integrity. By removing the cemetery’s direct relation to the ground, a fresh meaning can be given to our final resting place.

In rapidly growing urban areas, this design could be the next step to change the outlook on the traditional and provide an example of a modern and environmentally cautious way to honor and bury the dead. A design which does away with utilizing vast expanses of open land for the single purpose of burial. The Brent Spence Columbarium brings together two facets of the urban fabric by rehabilitating a compromised bridge into a suspended cemetery.

ABSTRACT
As an immigrant, I have a hard time accepting traditional in-ground burial as a viable option for myself or my family members that are living here in the USA, because I realize that this practice is incompatible with the transient reality of many people who are “passing through” an area, without plans to set roots in a particular place for generations to come.

When I first set out on exploring this topic and trying to change the landscape of the final resting place, I didn’t have much experience with the process or the sentiments that came with the typology of the cemetery. This past summer drastically changed my connection to my thesis project and gave me further reason to attempt to challenge this topic.

This thesis is an attempt at manifesting my sentiment towards death and the conflict that immigrants, modern nomads, and transient families face when it comes to choosing a final resting place.

It is also an attempt to create a more environmentally conscious design for an element of the urban fabric that currently uses vast expanses of open land. By serving as a cemetery this land is not being utilized to its fullest potential. The more I think about it, the stronger my resentment towards this unused land becomes. On the one hand, it is natural open land that is saved from being developed, on the other hand it is open land that is not being utilized by its communities because of the fact that it is a cemetery.

I would like to dedicate this thesis to my grandparents Vovó Lelia and Vovô Eolo, whose talents were passed on to me and have led me to pursue architecture as a passion.

I’d like to thank my parents Marcelo and Luciana and my brother Dante for all the support and encouragement throughout my entire life.

Also thank you to my professors Udo Greinacher, Vince Sansalone and Steven Slaughter.
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The only event that is 100% certain for all living things.

I have never visited the grave of a dead relative outside of a funeral. I don’t think I have ever visited a grave of someone I’ve known. Maybe it’s because, luckily, I haven’t lost people that were close to me, but also because those closest to me that I have lost, are in a different country. My family never took me to visit those graves when we traveled back to Brazil. We had so many living relatives and friends to go see and not a lot of time. I’m very curious to see, now that my grandmother on my mother’s side and my aunt on my dad’s side have passed away, what we do as a family.

Burial

The practices of intentional burial and memorialization of the dead are uniquely human traits.

The earliest definite traces of such disposal of the dead appear about 70,000 years ago, in the Middle Paleolithic era. They mark the beginning of mortuary practice in one of its basic forms—inhumation.

Burial rites and practices have been fundamental events in most, if not all cultures, since the beginning of human existence.

The practices and beliefs of what happens once a person passes away are vast and different yet, most share the common desire - the need to memorialize, in an attempt to defeat death - their ancestors, families, or royalty in some form or another. Burial practices manifested throughout multiple cultures and became more elaborate over time.

Remembrance

Remembrance and memorializing the dead became a common custom and an important part of life in most cultures around the world. Grave markers, however crude, started appearing in cultures as early as the upper Paleolithic era. Practices, rituals and rites quickly escalated during the Bronze Age, with the prime example being that of the Great Pyramids for the Egyptian Pharaohs. In certain cultures, family names were passed on from grandparent to grandchild to continually remember their ancestors. The development of different attitudes, practices, and rites led to the common era with major monuments being erected in honor of those who have fallen after war or genocide in lieu of a monument for a single ruler.

As an immigrant, I have a hard time accepting traditional in-ground burial as a viable option for myself or my family that is here in the USA. This project is an attempt at manifesting my sentiment towards death and the conflict that immigrants, modern nomads, and transient families face when it comes to choosing a final resting place.

I am designing a project that could change the way we approach the death landscape. A project that changes the unsustainable practices of in-ground burial and to show that...

Figure 1: Burial Timeline

Throughout history there have been three predominant types of burial practices: inhumation (ground burial/entombment), cremation (ashes), and exposure (sky burial). Each of these practices, throughout the development of cultures and religions, were accepted and rejected at some point in time. Cremation has become a more widely accepted form of burial in Western countries since the 1900s and is gaining popularity among many religious and non-religious burial practices.

THE AMERICAN APPROACH

The American Shifts

Two centuries of interaction between the cemetery and American society has left the cemetery, once central to the urban scene, a necessary, but not necessarily desirable neighbor in the suburbs.1

By taking a closer look at American culture and attitudes from the 17th century through the 20th century, the evolution and development of cemetery design and the connection [or in this case the disconnect] that society had with its dead become clear. In his book, The Last Great Necessity, David C. Sloane examines and explains the change in attitude and sentimentality of the American culture towards death and the final resting place of the dead. He uses four cemeteries as prime examples of the paradigm shifts that occurred in the design/planning/involvement and management of the cemetery through American burial history.

As the location and structure of the graveyard changed, so did the funeral ceremony. The cemetery evolved as much from the changing attitudes towards death and the manner of handling the dead as it did from the development of urban society.2

17th Century -

Colonial funerals were both social and religious events, which showed the unity of a community. They were events that lasted a longer stretch of time (a week or so), a celebration; from the home burial party, to the burial itself; to a sermon at church. The ministers were not at the center of the ceremony, they were a part of the community as everyone else.

With colonial communities being small and not occupying much of the land surrounding their main buildings and home, farm plots and church graveyards were common places for the burial. These spaces were that were not fenced off or secured for the most part, once a settlement resolved conflicts with the Native Americans in the area. The ornamentation was simple, if there was any, and at times the plot of land could be shared by local farmers as pastures or even markets and community meetings.

18th Century -

Change occurred as colonial settlements grew into larger towns and cities. Funerals became more of a religious event as families couldn’t afford to throw large celebrations and invite the entire community. The clergy took on a more central role when it came to performing the service before the burial, even if the service was held at the home of the family. Post burial feasts became more popular and gifts were given/presented to the clergyman and other religious leaders. The increasing numbers of various religious helped formalize the funeral and burial process, as churchyards started to become crowded. Customs changed further when dealing with different types of deaths such as suicide, which had not been previously accepted and individuals were not allowed to be buried in religious graveyards. Eventually, the community became more accepting of these individuals and their families. Meanwhile legislature cautioned against excessive spending and people questioned if elaborate funerals were morally justifiable.4

Historical example of the 18th century: New Haven Burial Grounds established 1796 in New Haven, Connecticut

Being a product of overcrowded coastal American colonial towns, New Haven Burial Grounds was the nation’s first planned burial ground. The new burial grounds design was an experiment that stemmed from campaigns led by concerned American citizens, who were following the developments of science and medicine concerning epidemics, disease, and death during the European Enlightenment period. The city of New Haven was undergoing civic improvement of natural beautification during this time and the urban residents of New Haven viewed the reintroduction of nature as a moral virtue (destined to make city life less harsh, less immoral, and less barren).5

James Hillhouse, long time Connecticut legislator, congressman, and senator was the one to come forward and put this plan into motion. He, alongside 30 other of the wealthiest families in New Haven, formed the first private corporation that dealt with the purpose of burial in the post revolution America. This corporation established ownership and control of the decisions made, and gave the legal member entitlement to one vote for every lot that they owned or possessed. It belonged to the families who joined together to protect the safety of their dead.6

Figure 2.
The New Haven Burying Ground was only a partial solution. It was a first alternative to colonial churchyards, with Americans becoming more willing to take the environment in which they were burying their dead into consideration and were less open to placing them in temporary storage in the middle of the city. They were still, however, uneasy about the separation of the burial grounds and church, because religion was considered to be essential for comprehending and dealing with death.7

OUTCOME
- First private corporation established
dealt with the purpose of burials
- Corporation was exempt from state
taxes
- Took away rights of local ministers/
religious leaders/governmental
authority to decide who could be
buried.
- Yet legally recognized as sacred place
- Separated the dead from the church/
state leading to
centering the burial
with the family

MOTIVE
- Fear of insecurity with privately
owned farmland
- Concerns about epidemics
- Mindfulness of inappropriateness
of burial plots on open public green space
- Situation away from the congested
parts of town
- Naturally attractive

PARADIGM SHIFT
19th Century –
Social changes caused by population growth changed the sentiment of death during the 1800s. These changes brought to the attention away from the community and family to the individual with the purpose of honoring them, regardless of the cause of death. A distance emerged between the deceased and the wider community in the funerary proceedings and there was no longer a face to face communication, but a written message sent to tell relatives and friends of a death in the family. Death turned impersonally personal (meaning it was just a family affair); neighbors might not know immediately and community would find out via newspaper (obituaries being a new development of the time). Overcrowding of in-city graveyards led to more campaigns to move graveyards outside of the town limits. Americans changed the way they spoke about burial places; they adopted the word cemetery (meaning “sleeping chamber” in Greek), which suggested that death was akin to sleep.8

Historical example of the 19th century:
Mount Auburn Cemetery established 1831 in Cambridge, Massachusetts

Mount Auburn Cemetery was a product of the French and English gardening and landscaping theories of the latter half of the 1700s, along with the organizational structure of the New Haven Burying ground; Mount Auburn Cemetery’s innovative design began the rural-cemetery movement.9 With the continuing problem of increased urbanization and cities becoming overcrowded and unsanitary, the government of Boston was unprepared to provide adequate services and infrastructure for burial needs, which led to privatized development. Bostonians along with other New Englanders were open to make a change in their burial practices due to the disgraceful state of many graveyards, caused by relocation, vandalism and abandonment.10 Graveyards had become one of the most neglected civic structures in the American cities. Again, it was the work of private citizens joining together to establish a new cemetery. John Bigelow, Harvard professor and a founder of the Massachusetts Horticultural Society, acquired a 72-acre parcel of land 10 miles away from the city center.11 This was the biggest parcel of land at the time that had been designated to the burying practice. New Haven Burying Ground was only 6 acres and was already seen as large for its time.

Western expansion, along with the emergence of new religious ideas, a rise in industrial

Figure 3.
manufacturing and other changes in the society of New England, caused the deeply rooted colonial traditions of the region to be shaken, which resulted in the experimental nature of this new burial ground.14

Joining forces with the Mass. Horticultural Society, the founders and the society combined garden and cemetery to create the “garden of graves”. Its success and imitation throughout the nation was due to;

The public’s acceptance of the physical isolation of the dead from the living. The public accepted such a change only within the naturalistic landscape that the founders carefully created from the hills and valleys of the new cemetery. Mount Auburn’s planners altered the conventional perspective of the grave and reestablished the cemetery as an important cultural institution within the society.14

Mount Auburn inspired many other rural cemeteries throughout the country with its family centered design to provide a safe burial place where there would be no threat of remains being moved, forgotten or vandalized. Adolph Strauch redesigned Spring Grove Cemetery into one of the first pastoral cemeteries.15 With the rapid growth of Cincinnati, the previously existing portions of Spring Grove Cemetery were faced yet again with the problem of being overcrowded and disorderly. Strauch’s design took the focus from fascination with the picturesque to simplify it and unified the landscape with its purpose. Spring Grove spurred an important step in the evolution of the modern cemetery by creating a partnership between a superintendent and a board of directors. Strauch’s development of the management of the cemetery was eventually accepted and can still be seen influencing modern cemetery design. Spring Grove Cemetery was an example of the professionalism of cemetery management that was changing as the views and attitudes towards death was isolating the burial ground from the individual lot-holders. The civic society became more separated from church life and the fear of death was becoming stronger than the sentimentality of the American people towards the cemetery. As a way of pushing that reality away, they began to rely on others to take care of their passed relatives.

The immigrant communities, some of which had a closer relationship to death, were very opposed to this new system and still believed that it was the family’s responsibility to take care of their dead.18

PARADIGM SHIFT

MOTIVE
- Urbanization/overcrowding
- The disgraceful state of many graveyards due to relocation, vandalism, and abandonment.
- Emergence of new religious ideas and a rise in industrial manufacturing
- Growing interest in horticulture and beautifying the landscape
- Democratic design to offer burial plots to a variety of buyers and put limits on ostentation

OUTCOME
- Created a backdrop onto which individuals could develop their piece of the landscape
- Family-centered: safe place to keep their memories
- Physical isolation of the dead from the living
- Social distinctions were still evident in grave ornamentation

PARADIGM SHIFT

MOTIVE
- Overcrowding and disorder
- To simplify the landscape and the purpose
- Limit the individual’s development of the plot
- Society was becoming secularized and fear of death was becoming stronger than the sentimentality

OUTCOME
- Creation of a partnership with a superintendent and a board of directors
- Further developed the management of the cemetery
- Increased the isolation between the burial ground and the family of the deceased
- Reliance on professionals to take care of the dying and the dead

Historical example of the 19th century: Spring Grove Cemetery 1855 Cincinnati, Ohio

Nurses and doctors cared for the dying, morticians handled the dead and cemetery superintendents beautified the grave.17

The immigrant communities, some of which had a closer relationship to death, were very opposed to this new system and still believed that it was the family’s responsibility to take care of their dead.18

Figure 4.
20th Century -

3 broad categories of cemeteries emerged:

1. Ethnic, racial, and religious, opting for headstone, individual markers and family monuments.19

2. Immigrants and native-born Americans continued using the design and ideals of the rural cemetery with individuals maintaining and curating the graves.20

3. The lawn-park cemetery: professional, uniformed, sleek and streamlined.21

They, however, were all beginning to encounter both old and new problems that would further push people away from the necessity of the cemetery. City growth was once again enclosing and surrounding the cemeteries, and vandalism, abandonment and overcrowding were a constant challenge.22 With industrialism in full swing, technology and scientific advancement were shaping the American society.

The business of death was becoming complex.23

Historical example of the 20th century:
Forest Lawn Memorial-Park 1917, Los Angeles, California

Forest Lawn Memorial-Park had a newness about it while still evoking the traditional values of cemetery design. The distance between Americans and death increased, causing professionals to become a large and prominent part of the entire process; dying, death, burial, and maintenance. Cemeteries were emerging as a multiservice business and most traces of death were being removed from the landscape, while still offering lot-holders a safe and well-maintained secure burial place.24 It was criticized as extravagant, a diversion from the true purpose of a cemetery, and an insult toward the sentiment of death. It was a model for modern day cemeteries but it was also an attraction and created a new atmosphere, with artwork, ornamented grounds and open commercialism. It was now not only a site for burial but also a site for weddings and profitable tourism.25 In Forest Lawn Memorial-Park, the grave became equivalent to real estate. It was an establishment that looked both forward, to new ways of attracting customers, and backwards, to the traditional sentimentality of the cemetery.

<table>
<thead>
<tr>
<th>PARADIGM SHIFT</th>
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<tbody>
<tr>
<td>MOTIVE</td>
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<tr>
<td>- The acceptance of eternal life</td>
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<tr>
<td>- Individuals wanted to live in the memory of their living family</td>
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<tr>
<td>- Rejection of solemn and somber</td>
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<tr>
<td>- Professional management controlled the appearance of the landscape and insured unity among the plots and markers</td>
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<tr>
<td>- Memorials emphasized the community of the dead no the individual or the family</td>
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<tr>
<td>- Memorials were designed to evoke values of joy</td>
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<td>- Graves became equivalent to real estate</td>
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Figure 5.
Paradigm Shift Conclusion

It is very interesting to see how social customs are directly connected to how Americans deal with their final resting place. With these four historic examples, Sloane explains that the evolution and change of cemetery design was a direct reflection of how American culture distanced itself from the reality of death. The professionalization of the process of death—hospitals and doctors, nursing homes, and other types of elderly care—has taken the burden of caring for and living with someone whose life is ending completely out of the American lifestyle. When once it was a family affair to take care of their dying elders, society has changed so drastically that many households with two working parents, who barely have time to invest in their own children, find it much easier to delegate death in their families to others. Death has become a business that not many people are interested in being a part of and would rather hire a stranger to take care of the messy details.

It is clear that in current society cemeteries are not part of a normal daily routine. The custom of visiting cemeteries has vanished and due to medical advancements and longevity, most youth of America only see cemeteries as eerie and desolate places. They need not know what death is and may not even go to a funeral for most of their young life.

I do remember my grandfather’s funeral, or was it my great-grandmother’s? I was 4; mostly what I remember is my cousin crying, but I do remember the sadness that was in the room. It’s still hard to think back about these memories; how do you design for moments like that? Moments that have a great chance of staying with you for the rest of your life. Can the funeral environment have a positive effect on the living that are having to cope with loss by evoking a more calming memory?
NOTES

2. Ibid 25.
4. Ibid 27.
5. Sloane. The Last Great Necessity, 30-32.
6. Ibid 32.
7. Ibid.
8. Sloane. The Last Great Necessity, 55
9. Ibid 56.
10. Ibid 44.
11. Ibid 46.
12. Ibid.
13. Ibid.
14. Sloane. The Last Great Necessity, 46
15. Ibid 97.
16. Ibid 106.
17. Ibid 113.
18. Ibid.
19. Sloane. The Last Great Necessity, 125
20. Ibid.
21. Sloane. The Last Great Necessity, 126
22. Ibid.
The Contemporary

In our contemporary culture, the significance of cemeteries as cultural institutions has yet again changed. In his book, Sloane attributes the weakening of cemetery practices to the various changes in American customs, demographics, modern methods of health-care and attitudes towards nature and death. The isolation of the cemetery, restructured families, as well the rise of cremation and continuing alienation from death (both furthered by raising prices and strict management policies that discouraged the involvement of mourners), dictated that the grave had less cultural importance than a century ago.

These changes are difficult parameters to design for and with. When an infrastructure that is needed in every community has become an element that isn’t used by most individuals in that community most of the time it is hard to justify why it exists. It is safe to say that cemetery design hasn’t changed since the early 1900s and that current cemeteries are still being designed in the same fashion as ones of the 18th and 19th centuries.

Yes, they were innovative and revolutionary at the time of their inception, but are they models that should continue to be used?

The Modern Condition

Figure 6. Cemetery Mapping

By design, there are no cemeteries near the city center of Cincinnati; they have all been pushed out into the surrounding suburbs. Most of these cemeteries are large swatches of open land with a singular purpose. Some have tree buffers for possible expansion, while others are completely enclosed by the surrounding neighborhoods and have become limited.
The Disconnect

Being an immigrant to the United States, I have personal experience in the disconnect that one can feel when it comes to a final resting place. Having been born in Brazil and moved to the USA at young age, the US is where I find myself at “home”. However, I have grown up, been educated, and have lived in different parts of the US itself. I could say that I have no real ties to any one place, but my roots run deep in the family and friends that I have, and in places that have impacted my growth. To choose any one place or the idea of paying for a plot in just a single place where it isn’t certain that I’m going to end up, seems a little absurd. Even with the relatives that have passed away in my family, they are all in Brazil, where they are still close to most of my family. This distance has already posed a big challenge when it comes to a last-minute need to travel to a funeral, and makes it hard for me to visit and pay my respects.

Migration has become common and most societies in which we live, work and grow include a large number of immigrants. This is the foundation upon which some countries were formed and have developed into the cultural melting pots that celebrate and accept such diversity.

Migration has become common and most societies in which we live, work and grow include a large number of immigrants. This is the foundation upon which some countries were formed and have developed into the cultural melting pots that celebrate and accept such diversity.

After World War II, people began to move around far more than ever before, and the graves of ancestors and families were often left behind in communities from which the surviving members had become detached, both mentally and physically; neglect and erosion threatened the evocative nature of existing cemetery mausoleums and tombstones. Increasing emphasis on youth culture since the mid-century has been perceived as one of the factors that forced this isolation. The relationship between the dead and the living has, therefore, become ever more distant and the collective memories nurtured by generations have slowly vanished as close-knit communities have dispersed.

This movement of people has affected the attitudes towards where and how families are buried. With a wider religious acceptance of cremation there has been an increase in popularity of this form of funeral practice among the recent generations. Many are now opting for cremation as it is a more economical option and makes it easier to travel and move around. If it was someone’s dying request that they are taken back to their country of origin, transportation of a casket is very expensive whereas ashes is much cheaper.
NOTES

Columbarium

A group or set of niches or shelves that store or house cremation ashes or bones. Comes from the Latin words columbiæ or Dovecote which is a house or niches for Doves.

Dove: in reference to a person is someone who does not want war but wants peace.

When a person passes away one says “rest in peace”

Thus, the deceased can be symbolized as a dove going to rest in their niche.

Environmental Impacts of Traditional Ground Burials

Religious, social and health reasons all played a vital part in shaping the cemetery landscapes of the modern society. It is hard to ignore the obvious truth that traditional cemeteries not only take up a lot of open land, but they also have major negative environmental impacts that lie hidden below the surface.

The environmental impact of “full-service” burial, including a casket, vault, tombstone, and flower wreaths, is considerable. According to the nonprofit Centre for Natural Burial, 10 acres of cemetery contains nearly 1,000 tons of casket steel, 20,000 tons of concrete for vaults, and enough wood from buried coffins to build more than 40 homes.1

During my grandmother’s funeral, I was told off for having momentarily stepped on the grass over someone else’s grave. This solidified my sentiments that in-ground burial is a waste of space. Not to mention the thought that my grandmother’s body would be laying in a concrete tomb inside a heavily fabric-lined varnished wood casket, decaying very slowly. And that in a few years some poor grounds worker will have to dig her back up, rummage through her remains and put her fleshy bones in a smaller box for long term storage elsewhere. Seriously, WHY?!

This practice should be called into question for being wasteful and incompatible with current day sensibilities and knowledge about death.

Figure 7. Kabutar Khaneh Dovecote.
Apart from the raw materials used and buried in the ground there are also dangerous chemicals pumped into the deceased’s body that are frequently used in the embalming process that affects not only the environment but also poses a health risk to morticians. Embalming fluid is usually comprised of the carcinogen chemical formaldehyde, which has been proven to pose health risks in funeral homes. A study by the National Cancer Institute released in late 2009 revealed that funeral directors have a much higher incidence of myeloid leukemia.

There are environmental advantages to naturally burying the human body which the traditional casket and embalmment burial prevent from happening all together. According to one estimate, an average human body consists of 50–75% water, and every kilogram of dry body mass eventually releases 32g of nitrogen, 10g of phosphorous, 4g of potassium and 1g of magnesium into the soil. Initially, it kills off some of the underlying and surrounding vegetation, possibly because of nitrogen toxicity or because of antibiotics found in the body, which are secreted by insect larvae as they feed on the flesh. Ultimately, though, decomposition is beneficial for the surrounding ecosystem.

Natural burials were for a long time seen as unsanitary and dangerous to watersheds, mostly due to disease epidemics, but as health and disease prevention have advanced so much in the past century, “Green Burials” are gaining popularity in the United States. With the major improvement in human health and technology to examine a deceased body for diseases, there are many new and innovative options in the 21st century market for “green burials”. One of these options is worth mentioning purely because it is so innovative.

The Capsula Mundi is still a conceptual project with an environmental consideration, which can be appreciated by all.

Capsula Mundi is a cultural and broad-based project, which envisions a different approach to the way we think about death. It’s an egg-shaped pod, an ancient and perfect form, made of biodegradable material, where our departed loved ones are placed for burial. Ashes will be held in small Capsulas while bodies will be laid down in a fetal position in larger pods. The pod will then be buried as a seed in the earth. A tree, chosen in life by the deceased, will be planted on top of it and serve as a memorial for the departed and as a legacy for posterity and the future of our planet. Family and friends will continue to care for the tree as it grows. Cemeteries will acquire a new look and, instead of the cold grey landscape we see today, they will grow into vibrant woodlands, sacred forests.

**Figure 8. Capsula Mundi Project**
Cremation

: to reduce (as a dead body) to ashes by burning

Cremation has been gaining in popularity as the preferred method of burial over the past 50 years and among many religious and non-religious people. Many religious practices that had once forbidden cremation are accepting it and considering it as a respectable form of burial. The many advantages of cremation over those of inhumation have attracted many to use it and have given families of all walks of life the ability to honor their relatives in an affordable and respectable way.

According to the funeral-industry sponsored Wirthlin Report from 2006, the five primary reasons why cremation is chosen are as follows.5

1. Saves Money (30%)
2. Saves Land (13%)
3. Simpler (8%)
4. Body Not in Earth (6%)
5. Personal Preference (6%)

Cremation combats many of the concerns that the modern family, be they immigrants or not, face when choosing a final resting place for their relatives.

'Families no longer stay in the old hometown the way they used to... Having the traditional family plot in the hometown cemetery just doesn’t make sense for people who might never be there anyway,' Josh Slocum, executive director of the nonprofit Funeral Consumers Alliance.'
There Will Always Be a Critic

Cremation is not the perfect solution to the environmental crises that the modern world is facing. The two major environmental implications that cremation causes are carbon emissions/fossil fuel consumption and mercury emissions.

Cremation uses far fewer resources than almost any other disposition option but it certainly has an environmental impact. Cremation burns fossil fuels, and some older cremation facilities can use significantly more energy compared to newer ones. Mercury is also emitted when a person with dental amalgam fillings is cremated, but effective filtration devices that can fully mitigate mercury pollution should come on the market in the very near future. While no standards yet exist that allow consumers to determine which cremation retorts produce the most pollution and carbon emissions, there are several things that can be done to “green” cremation such as recycling medical parts, and making a contribution to a carbon fund. 8

As with all technology, improvements are constantly being made and advancements are achieved with demand. As death is inevitable and land to bury those who have passed away becomes more scarce, consolidated means of disposing of the dead are ever more necessary and cremation offers a respectable and flexible solution.

Sustainability of Cremation

Choosing cremation over traditional in-ground burials can be argued as being an act of sustainable development:

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. 9

Cremation can help make the change that needs to be made to create the next paradigm shift in American burial practices. Cremation balances the three factors that play a role in achieving sustainable development. From a social point of view, cremation provides a method of disposing the dead in a respected and accepted way among many religious and non-religious communities. It also provides a way for transient families and people to transport their deceased relatives with them if they choose so when they relocate, and not leaving their bodies forgotten in the ground in a city they may never go back to, save for the reason of visiting. From an economical point of view, cremation provides a financially viable option for many more income groups than a traditional in-ground burial, even with a full funeral service. Finally, from the environment’s standpoint, it is a compact method of disposing of the dead that does not need as much land space to store urns as traditional in-ground burial does. In addition to saving space, it also saves natural resources used for coffins/ headstones.

Cremation is a method that is:

Compact – land is a commodity which should be used productively and not left abandoned
Clean – one time process, no decomposition process: therefore, more hygienic
Economical – even with a full funeral service, cremation costs less than inhumation
Respectable – seen as an honorable way to dispose of the remains of the dead by religious and non-religious people
Versatile – many options are available for housing and commemorating the dead
Portable – can be transported easily and not left behind in the ground if relatives relocate
NOTES

Breaking Away from Tradition

Many options and parameters were taken into consideration when choosing a site to house this project. Chief among these were: increasing value and scarcity of open land in urban areas, zoning consideration for the crematorium, and sustainable reuse over development.

It is necessary to choose a site that will move the typology of a cemetery as far away from tradition to challenge the current ways and establish a new paradigm. Existing urban space or infrastructure was a top option to house the next paradigm shift that can make the move to bring cemeteries out of the ground. The most interesting options are less traditional, such as surface/garage parking lots, vacant buildings or degrading infrastructure such as abandoned factories, tunnels, or bridges.

The Site

Bridge — A structure carrying a [pathway or roadway] over a [depression of obstacle] A time, place, or means of connection or transition

The Brent Spence Bridge is an excellent testing ground for rehabilitation and the site for the next shift in cemetery design.

The Brent Spence Bridge crosses over the Ohio River connecting the city of Cincinnati, OH with the town of Covington, KY. Its current use is the interstate highways I-71 and I-75. Built in the 1960s the bridge has gone through a renovation and currently is carrying twice the vehicular load per day that it was designed to take. There have been concerns with the structural integrity of the Brent Spence Bridge and renovation and replacement plans have already been proposed to the city and are being decided upon. One of these new scenarios is the construction of a new bridge that would leave the current bridge without a purpose and possibly lead to its demolition. Assuming the bridge goes out of commission, it would be a piece of infrastructure that would just be left to ruin, seeing as it is very expensive to demolish a bridge. The bridge is part of the historic character of the city and of this stretch of the Ohio river as it is one of 7 bridges. There

is a historic value to keeping the Brent Spence Bridge in this area’s context, as well as touristic and commercial benefits to the river fronts on both sides of the Ohio river.

THE STRUCTURE

Figure 10. Brent Spence Bridge || Cincinnati, OH
Riverfronts

The location of the bridge on the Cincinnati side provides an end cap to the Smale Riverfront park that is expanding along the banks of the Ohio in front of the football and baseball stadiums and is an urban and river front revitalization project that has changed the fabric of downtown Cincinnati.

The park is intended to reconnect downtown to the river and to link with the existing riverfront parks to the east. It is a place to view the river and river traffic, gather and celebrate as a community, and be inspired. The park has been built as a series of terraces that accommodate seasonal flooding along the river edge, which includes areas lifted out of the floodplain.

On the Kentucky side of the Ohio the bridge would also provide an end cap to the commercial and entertainment area of the city of Covington.

Our riverfront is our community’s front door and it’s our turn to make the most of it. Newport and Cincinnati have both done great work with their riverfront property and we owe it to our community and the region to be part of that effort. I think what we’re really trying to do is open up the vista, be part of the regional effort and let people enjoy that site. ~ Assistant City Manager for Development Larisa Sims

The conversion of the bridge from a highway to a possible pedestrian bridge could create larger amounts of movement between the two commercial areas that would help with further developments for both sides of the river.

Another important creative aspect of the project is the river below, with its running waters symbolizing the passage of time and the permanence of the river itself. This scenery invites reflection and contemplation and this feature will not be lost in the design proposal.
Zoning

Cincinnati RF-M (riverfront – manufacturing) & MG (manufacturing general)

Queensgate is zoned as manufacturing and industrial neighborhood. There are primarily industrial buildings, building material sale yards and railway tracks near the intended access point for the site.

Current zoning of the site accommodates the programmatic need of a crematorium and a high-tech facility which would ensure that the fumes from the furnaces are cleaned and filtered before it is discharged. The manufacturing neighborhood of Queensgate on the Cincinnati side of the river has an existing electricity distribution building that would be repurposed to house the high-tech equipment to clean the fumes and smoke from the cremation kilns.

Covington Commercial and Entertainment

Central Business District is zoned as commercial and residential neighborhood. Near the Brent Spence Bridge there are several hotels, restaurants and retail store. There are no residential houses or apartments directly adjacent to the bridge and the intended access points for the site.

This current zoning would be ideal for the main entrance to the site as family and friends from out of town could stay at one of the many hotels.
NOTES


The Igualada Cemetery has a strong connection to the site. It follows a processional route which has as a strong focus on connection to memory. The design uses material rawness and has an unfinished quality to its design and is void of any religious symbolism.

Miralles intended the cemetery to be closer to those still alive than to the dead, but with some kind of interplay between the dead and the living. Therefore the cemetery would display an acceptance of the cycle of life, to enable a link between the past, present and the future.¹

The Igualada Cemetery was designed by Enric Miralles and Crame Pinos to be nestled into the hillsides outside of the city of Barcelona. Completed in 1994, this was meant to be a project that would challenge the traditional notions of what makes a cemetery.² Miralles and Pinos designed a place where not only could one be buried but also a place that assisted the visitors in the process of reflection by providing solitude and serenity in the landscape.

The materials used in this project reflect the landscape and create a connection between the visitors and their surroundings, making them feel integrated and part of everything that they are experiencing. In a project like this, integration of the user is a vital piece in the design for the success of the space. If the users feel that they are immersed in an activity, such as reflection, they will be able to focus and be less easily distracted.

¹ Miralles, Enric. ² Pinos, Crame.
San Cataldo Cemetery // Aldo Rossi

In the design of the San Cataldo,

Rossi has found a way to make architecture metaphysical; the visitor is inevitably confronted with the thought of death, where truths are constant and irrevocable.²

As a cemetery project, Rossi’s design is extremely confrontational and unapologetic to the visitor. With the fact that it is an unfinished project and has not reached its capacity, it gives off the feeling of an “abandoned house”.³

The design of the central columbarium at San Cataldo cemetery is a monolithic box with punched openings for window and doorways. From the outside, it looks very solid, but as you move through the many openings on the ground floor you see that it is open to the sky above. The niches are integrated in the exterior walls and one moves through the dark to get to the central lightness. The walls are lined completely with niches which are individually dedicated to the deceased. All have names and some have a photo.
Urnario Municipal del Norte // Nelson Bayardo

The Urnario Municipal del Norte is an ossuary that is part of the large North Cemetery of the city of Montevideo, Uruguay. It was designed to give lower class citizens a public place to place their relatives remains in a respected and secure location. Seeming to be floating in space, its monolithic exterior hides the open and airy interior.

The structure is composed of a simple, unornamented and unfenestrated reinforced concrete volume raised on a series of triangular supports. The seemingly floating box creates an open lower level accessible from all sides that appears, on first impression, as a dark and somber loggia-like space while allowing for the landscape to pass uninterrupted underneath it.

The path that the visitor takes evokes a mysterious experience, while one moves through a dark ground level under the main structure, a ramp that takes them up into the volume where the shelves are located. The interior center of the massive structure is hollow and bright. At the center a courtyard serves as a contemplative space which has an immense connection to the heavens as it is sunken in the ground and is open to the sky above. The procession path promotes family involvement as it is the family that choose where to place their relatives’ remains.

Figure 16. Urnario Municipal del Norte || Montevideo, Uruguay
Communal Crematorium // Henning Larsen Architects

Designed by Henning Larsen Architects the Ringsted Crematorium is an intriguing project that celebrates cremation at the center of its design. It is designed for the family to follow the full procession of the body. Starting in quiet rooms for final goodbyes to windows that look into the furnace room to observe the cremation. From the outside, the building program is long and low, surrounding the double-story furnace room at the center of the building. The design provides a flexibility for its function and to sensitively accommodate all types of memorial gatherings. The crematorium was built to meet the new standards for flue gas purification and uses high-tech equipment to ensure that the fumes from the furnaces are cleaned and filtered before they are discharged.

Figure 17. Communal Crematorium || Ringsted, Denmark
As Burial Field // Karres En Brands

Designed by Karres en Brands architects, this columbarium is a part of a third phase expansion of an existing, very traditional, Dutch cemetery. The overall design of this phase is robust yet simple; a design of parallel strips of varying widths each with its own design principle. It is a testament to the adaptation of changing customs and rituals in society. Located on one of the strips, the columbarium is an elongated volume dissected by pathways that internalize the niches and the visitors but is open to above. The columbarium volume also incorporates a contemplation space in a covered seating area that provides views to the surrounding landscape.

The design allows for a flow through the linear volume of the columbarium, providing moments for both external and internal views. Each “block” is unique in plan and entrance sequence, with the shelves all facing the interior of the volume, giving the sense of intimacy and protection. The shelf heights are around eye level with some rows slightly higher and some lower, but unlike the other precedent examples, there isn’t a need for a ladder and maintains the human scale.

Figure 18. As Burial Field // Amsterdam, Netherlands
Guiding Principles Taken from Case Studies

Each of these designs challenge traditional landscape and architecture that houses the final resting place. Miralles and Pinos created a design that was heavily driven in its connection to the site. By manipulating the site, they bring the visitor’s focus on the processional path and keep the visitor’s attention on the memory of their relative. Aldo Rossi design is simple yet unapologetic, the visitor is aware of where they are and how they feel. Nelson Bayardo’s columbarium is an economical and honorable place for the lower income families in the city to have somewhere they can house their relatives and pay their respects. Henning Larsen Architects create a functional yet intimate crematorium that allows and encourages the visitors to accompany the full procession of the body and feel involved in the whole experience. Karres En Brands’ minimal impact on the environment provides a design that is recognizes the social changes of the community they serve and provides personal spaces for reflection and remembrance.

Guiding Principles Taken from Case Studies

- Challenges the paradigm
- Strong connection to the site
- Strong focus on the connection to memory
- Visitor procession and involvement
- Intimacy of personal grieving
- Minimize building impact on surrounding landscape
- Contemplative niches that provide views to the surrounding landscape
4. Ibid.
Create

This project takes the cemetery out of the ground and suspends it between earth and sky. Moving away from traditional inground burial and turning to the more sustainable practice of cremation, the design creates a columbarium that shifts towards a modern understanding that land has a high value and is coveted in urban areas, yet still provides a respectful environment for remembrance and introspection. The site chosen, the Brent Spence Bridge, connects the cities of Cincinnati and Covington, KY as an example of urban infrastructure that is no longer suitable to serve its intended purpose, so instead of it being demolished (which is expensive) or letting it become abandoned and derelict, this project revitalizes the bridge to serve as a new paradigm in cemetery design. Housing the columbarium on the bridge takes advantage of the symbolic aspects of the bridge representing a passage while the river flowing below suggests powerful images of impermanence and continuity.

This project aims at creating a refreshing atmosphere for the safeguarding and collection of funerary urns and personal memories. A program that encourages the procession of death. A design that is environmentally conscious, clean and compact. A respectable process where disturbance to the remains are little to none. The creation of a pedestrian connection to both sides of the site and a powerful visual connection to the water below and to the cities beyond. Lastly a creation of private and intimate spaces for remembrance and reflection.

THE SYNTHESIS
Design Concept
The design concept for this project is that of a funeral procession. The program is designed to follow the paths of both the body of the deceased upon arrival to the columbarium and of the family and friends that are participating in the funeral ceremonies.

Site
Current zoning of the site accommodates the programmatic need of a crematorium and a high-tech facility which would ensure that the fumes from the furnaces are cleaned and filtered before it is discharged. The manufacturing neighborhood of QueensGate on the Cincinnati side of the river has an existing electricity distribution building that would be repurposed to house the high-tech equipment to clean the fumes and smoke from the cremation kilns.

Access Points
Four access points bring both the living and the dead up onto the suspended columbarium. The formal processional paths start on the Covington side of the Ohio River. Here two of the former highway ramps are used to create a gradual and processional path up onto the bridge. One ramp services the bottom deck of the bridge which is for the hearse to bring the body up to the administrative zone for identification, cold storage and preparations for a wake and service. The second ramp leads up to the top deck of the columbarium, and is for the formal funerary procession on the day of a service. A plaza at the base of the ramp serves as a formal parking and gathering place for the family of the deceased to begin their processional walk up onto the columbarium.

The other two access points are located on each side of the river at the foot of the bridge, to bring workers and visitors up directly onto the columbarium.

THE DESIGN // A NEW PARADIGM

The Program

The design houses the functions of funeral home, crematorium, and urn niches.

Top deck of the bridge houses the niches and the bottom deck is divided into three zones: administration, visitation, and service.

For mourning the loss, the wake/visitation rooms are designed in an elliptical footprint to provide maximum space for family and friends to gather, share memories and say farewell in comfort. The walls of the wake room would double as digital displays showing photos, home movies and social media message boards with messages from all those who had known the deceased, allowing family and friends to become immersed in the experience. This virtual memorial would help create uplifting moments when old memories and funny stories were recalled and shared with those who are there to say their final goodbyes. A grieving room is connected to each visitation room to provide a quiet and private place to mourn individually or with a more intimate number of people.

A non-denominational hall is set up for more formal memorial or services to be held. During this part of the procession the body is taken to the crematorium, a large open hall where the cremation kilns are located and operated. The visitors have the option to accompany the body to this hall and view the cremation process through a window into the crematorium. Once the cremation is complete the family is presented with the urn to head up onto the top deck of the bridge and through the niche garden to the chosen niche.

In the days and years that follow, the relatives of the deceased can come back to the niche garden to pay their respects and spend time in one of the many contemplation balconies that are nestled with the burial niches. These balconies break the rhythm that the bridge structure creates. They provide views to the river and the surrounding cities and allow for a removed and quiet place for thinking and reflection. This landscape would also provide a space for the public to visit and enjoy.
The Niches

After the ashes are collected and placed in an urn, they are presented once more to the family that then makes their way up to the top deck of the bridge and the niche garden to be placed in their family niche.

For the design of the niche garden shelves, a motif inspired by a portion of the city plan of Zurich from 1860 was created. A datum down the center was created to provide a clear visual through the maze of geometries that came from the city streets. This datum also provided a place to locate the elliptic light wells that bring natural light into the program spaces below. The geometries were then carved to create a meandering path across the span of the bridge. Lastly, varying the heights of each geometric shelving unit creates a third dimensional texture along the path that creates a sense of wonder and mystery.

Four different heights - 4ft, 8ft, 16ft - as well as an 18in seating height for the contemplation areas and balconies. 4ft shelves accommodate planters to create an inviting natural environment suspended above the Ohio River.

Figure 19. Niche Heights.
Digital Memorial

Niches are of various sizes for individual use or family niches and digital memorial and message boards.

What was missing from my grandmother’s funeral were photos and old home videos. There were points where her children, my mother and aunts and uncle, would start telling stories and it would lighten the mood. After my father’s sister passed away, that same summer, he approached me to show me her Facebook page and all the messages people were leaving on it; he said “It’s nice to see how many people’s lives she touched.” This also reminded of a Facebook group page that was made in honor of a girl from my high school class that had passed away junior year; how every year her friends and family post on the page with messages and memories.

These niches would have the option to be equipped with a digital photo frame or a transparent display to enclose the niche that could allow the user to interact with photos, videos, and social media message boards. Memorialization of the deceased is a historical trait that should not be forgotten; traditionally tomb stones gave some background information of the deceased. Social culture has evolved to people sharing events and memories of their lives on the internet for their families and friends to see and keep in touch with. Facebook can memorialize a person’s account, after death, allowing family and friends to continue to share memories and look through photos. This would be a very pleasant way to create a sense of community and closeness to those who are being honored in the columbarium, but also to their families and friends that are still living.
In conclusion, the design proposes a new paradigm by taking the cemetery out of the ground and suspends it between earth and sky. It proposes a more sustainable solution to expensive and wasteful graveyards that take up precious and scarce urban lands. It creates a refreshing atmosphere for the safeguarding and collection of funerary urns and personal memories. The design integrates well with the development plans for the riverfront sites of two localities creating a bridge that further connects and encourages developments. It is a place that respects and celebrates both the deceased as well as the living, inspired by the processional and funeral rites. Finally, the design reconciles the oldest of all human ceremonies with the needs and aspirations of 21st century America.

I can picture myself coming to visit the Brent Spence Bridge Columbarium. Walking along the Smale Riverfront Park, climbing the stairs to the niche garden with a view to the rolling hills of Kentucky and Ohio to the west and looking back to the skylines of Cincinnati, Covington and Newport to the east; I am well aware that I am no longer on the ground. As I am walking along the niche garden, I am surrounded with the memories of those who came before me and have now past. One niche catches my attention with their family photos flashing on the digital display; I realize that their family is very similar to mine, they even vacation in Hilton Head Island. I continue walking and notice a couple sitting in one of the contemplation balconies, they’re sitting in silence watching the river flow beneath them. Every so often the heights of the niches block the views to the outside world and the massive structure of the bridge creates skeletal enclosure with the open sky above and a sense that this whole place was floating in the sky comes over me.

To be continued

This design is only the first attempt at creating the new paradigm of burial practice for the 21st century. This thesis provides the foundation upon which design and new ideas need to be developed further, by increasing focus on the use of urban infrastructures to replace open land for burial storage in a way that is respectable, symbolic and socially accepted. There needs to be an enforcement in the burial practice for an environmentally responsible process in terms of not only land use but also cremation practices. Currently there are two other methods of breaking down human remains, Alkaline Hydrolysis and Promession; these two technologies are being developed as environmentally sound ways of "bio-cremation", an alternative to flame based cremation that is eco-friendly. Lastly, designing for how the living want to honor their families and create architectural burial environments that are pleasant and inviting to visit. This could be done by keeping up with social, cultural, and technological evolutions, that can help cater to the living with interactive ways of remembering their dead. As death is inevitable and disposal necessary, this design topic in not one that can be forgotten in time as it already has been. There needs to be an evolution to the design of our final resting place. The Brent Spence Bridge Columbarium design and the research done in this thesis can serve as an inspirational launching point for the future of cemetery design in America.
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