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ABSTRACT

Title of Document: NATURE | BEING | CONTEMPLATION:
FRAMING HUMAN EXPERIENCES IN
ZION NATIONAL PARK

Rochelle Heyworth, Master of Architecture,
2014

Directed By: Professor, Garth Rockcastle, FAIA, School of
Architecture, Planning, and Preservation

For almost two centuries, people have traveled to America's National Parks to experience the majesty and grandeur of nature. In a physical search for renewal and truth, many people turn to the American landscape to reap the benefits of nature's revitalizing qualities. These spiritual and enlightening experiences unite humans to a particular place and invite them to perceive their environments through all their senses harmoniously. This analysis will characterize the contributing perceptual systems and natural phenomena to explore new ways of instigating powerful experiences in Zion National Park in order to create a set of architectural principles that can improve the transcendent experiences in the splendor of nature. Through the introduction of a welcoming interpretive center in the Kolob portion of Zion, this thesis will set a framework for future generations of artists and architects to continue to enhance the phenomena of the park with minimal disruption.

NATURE | BEING | CONTEMPLATION:
FRAMING HUMAN EXPERIENCES IN ZION NATIONAL PARK

By

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Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Architecture
2014

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Preface

This thesis came into being from my childhood experiences with my family. Every summer we would travel to camp in natural parks, removing ourselves from the cities in which we lived. My grandparents would take my father to natural parks when he was a child, and since then it has become a tradition for my family to turn to nature for relaxation and to experience its majesty. I was fortunate to experience and realize the majesty and beauty of the natural world early in my life. At a young age, this beauty and grandeur led me to contemplate where I belonged in the mix of the impressive world I was experiencing. The memories I have of these trips with my family grew into a passion for nature and the transcendent abilities nature holds.



Figure 1: Grand Tetons, 1999

I remember playing with the friends in my neighborhood and building forts and rooms in the woods behind my house. Although it was just a small patch of a forested area that hadn't been developed into homes, I felt safe and at peace in those forts. As I have grown, I began to desire an understanding of *why* nature has this stilling effect on so many people. Throughout the process of this thesis I have recalled my many trips to National Parks and can still remember moments in time as if it were yesterday. Whether it was the sulfuric smell of the geysers of Yellowstone, the blackness of the night sky, the chill of the evening breeze by the warmth of the campfire, or the deafening sound of nearby crickets, these memories will be ingrained in my mind for eternity.

Because no two people experience or remember the same thing identically, it is important to understand the ability of our perceptual systems to identify with an environment. This thesis will explore the human senses and elements found in nature as lenses for architecture to enhance the transcendent experiences in the majesty of nature.

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Introduction

For almost two centuries, people have traveled to America's National Parks to experience the majesty and grandeur of nature. Iconic figures such as John Muir discovered this beauty before the industrialization of America, a time when the American wilderness was thought of as filled with wild beasts and uninhabitable. People such as John Muir, Henry David Thoreau and President Roosevelt agreed that these lands were worth preserving for future generations and resulted in the establishment of the National Park Service. As society realized the potential of these lands, they became major tourist attractions where visitors would mug for the camera.

Yi-Fu Tuan argues, "tourism has social uses and it benefits the economy, but it does not enjoin man and nature. The appreciation of landscape is more personal and longer lasting when it is mixed with the memory of human incidents" (95).¹ These memories might include the sound of the rushing river nearby, the warmth of the canyon stone on a crisp fall day, or the pungent smell of the desert marigolds. As an ocularcentric society, Tuan's statement provides the opportunity to enhance the visitor experience in a natural setting, or more specifically, in Zion National Park.

In contrast, not all tourists visit these parks strictly for the breathtaking views. Others travel as if on a pilgrimage to temporarily remove themselves from their everyday lifestyle and place themselves in an environment that can be thought of as sacred. In a physical search for renewal and truth, the definition of a pilgrimage has evolved in this

¹ Tuan, Yi-fu. *Topophilia: a Study of Environmental Perception, Attitudes, and Values*. Englewood Cliffs, N.J.: Prentice-Hall, 1974. Print.

modern era. Timothy and Olsen confirm, “As a result of both of these secularizing trends and the changing use of the word religion, religion is being seen more and more as a privatized and pluralized experience where the ‘spiritual’ and the ‘religious’ are separate” (4).² Today, people are able to be *spiritual* without being *religious*. The distinction between spiritual and religious travel has provided the opportunity for people to turn to the American landscape and reap the benefits of nature’s renewing spiritual qualities.

A spiritual experience invites humans to perceive an environment through all their senses harmoniously. Our senses unite us with our environment and, as a result, become critical for an enlightening experience in nature. Looking at how people perceive and interact with their environments will provide the opportunity to create a set of architectural principles that can improve the transcendent experiences in the splendor of nature. Mircea Eliade explains the revelation: “man becomes aware of the sacred because it manifests itself, shows itself, as something wholly different from the profane” (11).³ By accepting the aforementioned, how can architecture in a natural setting improve the spiritual and transcendent experiences in the majesty of nature?

This thesis will analyze the senses, natural phenomena and archetypal forms in a historical, psychological and phenomenological context. The exploration will characterize the contributing factors and explore new ways of instigating sacred moments to qualify a transcendent experience. Reconnecting to a primordial, or essential, way of life will provide a heightened awareness of our surrounding environment affording the

² Timothy, Dallen J, and Daniel H. Olsen. *Tourism, Religion and Spiritual Journeys*. London: Routledge, 2006. Print

³ Eliade, Mircea, and Willard R. Trask. *The Sacred and the Profane: The Nature of Religion*. New York: Harcourt, Brace, 1959. Print.

opportunity for people to contemplate and focus on their being in this world. This thesis will result in the architecture becoming a lens to frame an already beautiful setting, ultimately establishing a deeper connection of humans to nature. With the introduction of a new welcoming interpretive center in the Kolob portion of Zion National Park, this thesis will set a framework for future generations of artists and architects to continue to enhance the phenomena of the park with minimal disruption.

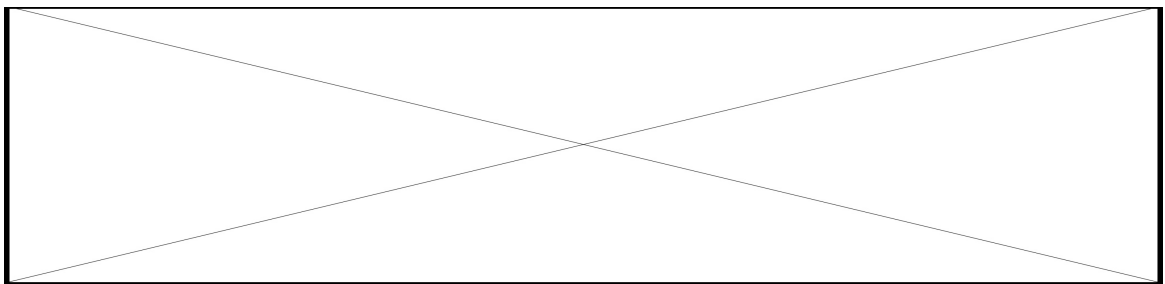


Figure 2: Creating a Narrative of Scale, [Image Sources: National Park Service. *Hall of Doorways of Pueblo Bonito*. www.nps.gov, Kerr, Doug. *Zion National Park - Utah*. 2013. www.flickr.com, Galens, Kevin. *Night Sky III*. 2011. www.flickr.com, Altered by Rochelle Heyworth

Chapter 1: The American Wilderness

Definition and Etymology

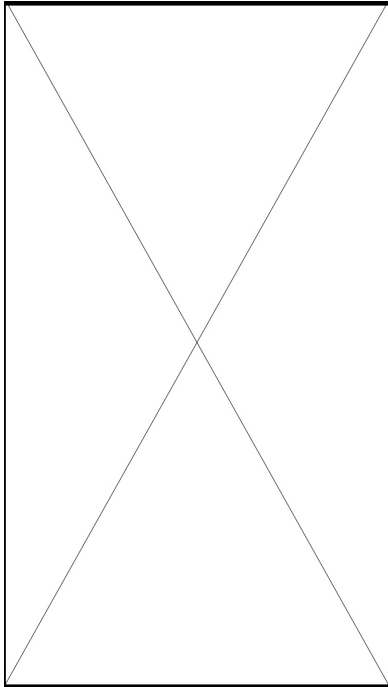


Figure 3: Wilderness: Thomas Cole, *The Scene from the Last Mohicans Cora Kneeling at the Feet of Tanemund*, [Image Source: Wadsworth Atheneum, Hartford, CT. www.wikipaintings.org, Altered by Rochelle Heyworth

For centuries the meaning of wilderness has evolved from a harsh and inhospitable environment to a place of refuge and spiritual renewal. Roderick Nash explains, “the usual dictionary sense of wilderness implies hostility on man’s part, but the term also has developed a favorable connotation. On one hand it is inhospitable, alien, mysterious, and threatening; on the other, beautiful, friendly and capable of elevating and delighting the beholder. Involved too, in this second conception is the value of wild country as a sanctuary in which those in need of consolation can find respite from the pressures of civilization” (4).⁴ The term might seem clearly defined initially, but it is a difficult term because

the word is a noun but behaves like an adjective.

The 1827 painting by Thomas Cole *The Scene from the Last of the Mohicans Cora Kneeling at the Feet of Tanemund* depicts wilderness. Although the usual definition suggests that humans are merely visitors and not present in the long term, Cole

⁴ Nash, Roderick. *Wilderness and the American Mind*. New Haven: Yale University Press, 1967. Print.

portrays the Mohicans immersed in the scene. This painting poses the question of how distant humans truly are from wilderness.

In early Teutonic and Norse languages, from which the English word, wilderness, has derived, it seems to have been rooted to the term “will” or “willed”, meaning willful or uncontrollable. From “willed” came the term “wild” with a description of being unruly and disordered. In his *Wilderness and the American Mind*, Nash explains that people attached the Old English word “deor”, meaning animal, to “wild” to describe uncontrollable creatures. The derivation of wilderness is clear. Wildeor contracted to “wilder,” gave rise to “wildern” and finally “wilderness.” Etymologically, the term means “wild-deor-ness,” the place of wild beasts.



Figure 4: Wilderness, Etymology, [Diagram Created by Rochelle Heyworth]

History of the American Wilderness

As civilization in America began, wilderness was thought of as a threat, a place untamed. Civilizing the New World led to the idea that wilderness was the villain and the pioneer played the conquering role as hero. Conquering of these unruly landscapes became a source of pride for the pioneers as they shined a new light onto the darkness of the evil chaos known as wilderness. This redemption of the wilderness resulted in the expulsion of Native Americans who considered this wilderness their homelands. These landscapes had a strong historical and spiritual significance to the Native American.

By the eighteenth century the idea of wilderness shifted from a place inhospitable to humans to a place of retreat to which many people would travel to get away from the industrialization of the city. Henry Adams completely reversed the meaning of wilderness when he wrote his 1880 novel, *Democracy: An American Novel*, about a wilderness of men and women.⁵ Nash confirms, “the implication is that modern man feels as insecure and confused in an urban setting as he once felt in the forest among wild beasts” (3).⁶ The appreciation of wilderness began in the cities and the concept of the sublime and picturesque began to flourish. When the lifestyle of a society moved past the threshold of sacred to profane, city leaders would look to the wilderness as a place of refuge.

DeWitt Clinton found the romantic scenery of the American landscape to be a place to elevate the mind and exalt the feelings of the heart. Going back to wild nature was thought of as restorative. John Muir, too, found these landscapes to be sublime and sacred. In Ken Burn’s film *America’s Best Idea* we note that going to wilderness became a way to link to transcendent qualities of nature. “We are not worshiping the name of something, but the presence of something. We don’t need a reminder that the world is bigger than you are, because you can see it,” claims Burns.⁷

As word spread across the world, the American landscapes began to attract many tourists to have their own view of the America’s natural cathedrals. What was once a place for contemplation, these National Parks became a place where tourists mugged for

⁵ Adams, Henry. *Democracy: An American Novel*. New York: New American Library, 1961. Print.

⁶ Nash, Roderick. *Wilderness and the American Mind*. New Haven: Yale University Press, 1967. Print.

⁷ Duncan, Dayton, and Ken Burns. *The National Parks: America’s Best Idea : an Illustrated History*. New York: Alfred A. Knopf, 2009. Print.

the camera. The ideas of John Muir and the notions behind the Romantic movement led to an urgency in the need to preserve these sacred landscapes “to be preserved for their children, and their children’s children...all unmarred” (128).⁸



Figure 5: Wilderness and the City, Sacred and Profane [Image Sources: Photographs by Rochelle Heyworth, Diagram Created by Rochelle Heyworth, Inspired by Mircea Eliade and Roderick Nash]

As more tourists sought the wilderness as merely a landscape to be looked at for its beauty, the effectiveness of the term sublime diminished as it became domesticated. William Cronon agrees in his article *The Trouble with Wilderness*: “The wilderness was still sacred, but the religious sentiments it evoked were more those of a pleasant parish church than those of a grand cathedral or a harsh desert retreat” than it once was.⁹ Despite this newly adopted setback, many believed that these primitive landscapes were still worthy of our preservation. George Catlin was convinced that keeping it mattered because “the further we become separated from that pristine wildness and beauty, the

⁸ Roosevelt, Theodore, and Patricia O’Toole. *In the Words of Theodore Roosevelt: Quotations from the Man in the Arena*. Ithaca: Cornell University Press, 2012. Print.

⁹ Cronon, William. *Uncommon Ground: Toward Reinventing Nature*. New York: W.W. Norton & Co, 1995. Print.

more pleasure does the mind of enlightened man feel in recurring to those scenes” (101).¹⁰ Reviving the sense of the sublime provides the opportunity for humans to reawaken their inner selves.

Conclusions

It is important today that we reestablish National Parks as being a place of refuge, a place of healing, and a means to transcend our everyday lives. It is critical to reclassify these parks as distinct from the countryside, landscape and scenery. There is a loss of the dimension of height and depth, and the austere qualities of charm that these National Parks once symbolized.

¹⁰ Nash, Roderick. *Wilderness and the American Mind*. New Haven: Yale University Press, 1967. Print.

Chapter 2: Zion National Park

History

Nearly 12,000 years ago Zion's first peoples tracked mammoth, giant sloth and camel across what is known today as Utah. These first peoples of the late Pleistocene period practically disappeared due to a lack of resources because of climate change. Those who remained adapted from hunting large animals to mid-sized animals and gathered foods. These gatherers settled in the Zion area 2,600 years ago and implemented a farming tradition. These gatherers are known as Virgin Anasazi by archaeologists. Around 1150 the Anasazi moved southeast, due probably to drought and overuse of the land.¹¹ Not too long after, the Paiute peoples established themselves in the Zion area and learned to thrive in the desert environment.

In the mid-1800's Mormon settlers established and sustained a life in Utah that was frequently destroyed by flash floods and drought. The National Park Service agrees, "only the will to survive saw Paiute, Anasazi, and European descendants through great difficulties. Perhaps today Zion is again a sanctuary, a place of life and hope".¹² The immense human and geologic history of the Zion and Kolob Canyon regions and the idea of wilderness preservation led the National Park Service to establish Zion National Park as a place to be preserved for future generations in 1919.

¹¹ Cordell, Linda S, and George J. Gumerman. *Dynamics of Southwest Prehistory*. Washington, D.C: Smithsonian Institution Press, 1989. Print.

¹² Peoples, In A Haven of Habitats. *National Parks Service*. National Parks Service, 01 Nov. 2013. Web. 23 Nov. 2013.

Location

Zion National Park is located at the junction of the Colorado Plateau, the Great Basin, and the Mojave Desert. The diversity of the American southwest has afforded the area to preserve much of the land through the National Park Service or the State Park systems. Zion is one of several preserved natural landscapes located in the Grand Circle, an area that consists of over 40 natural parks. Because of the extent of park systems within the Grand Circle, Zion National Park tends to be one of several destinations for visitors and among many itineraries including the Grand Canyon and Bryce Canyon. This provides the opportunity to allow Zion National Park to be a test case for future development to enhance the visitor experiences in other National Parks for the next several centuries.

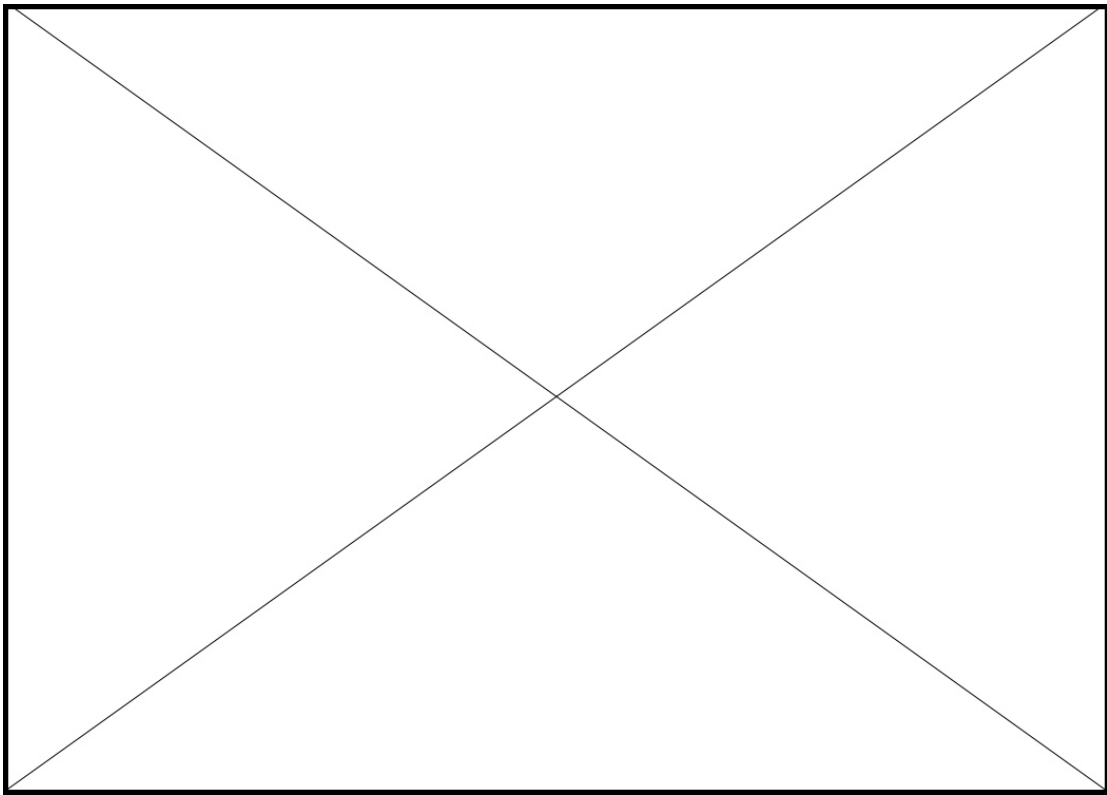


Figure 6: Locating Zion [Image Sources: <http://www.vecteezy.com/map-vector/5937-united-states-map-vector>, <http://www.grandcircle.org/images/stories/graphics/travel-planner-map2.pdf>, Altered by Rochelle Heyworth]

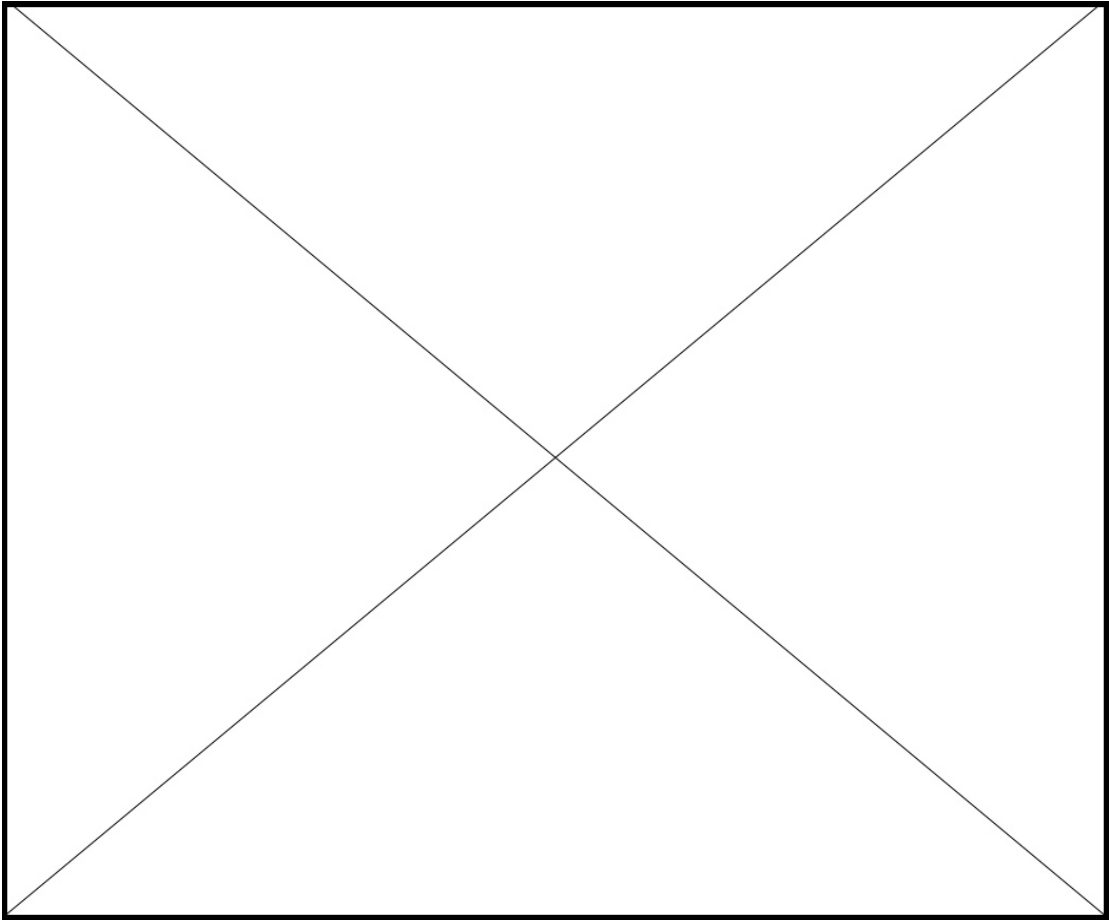


Figure 7: The Grand Circle [Image Source: <http://www.grandcircle.org/images/stories/graphics/travel-planner-map2.pdf>, Altered by Rochelle Heyworth]

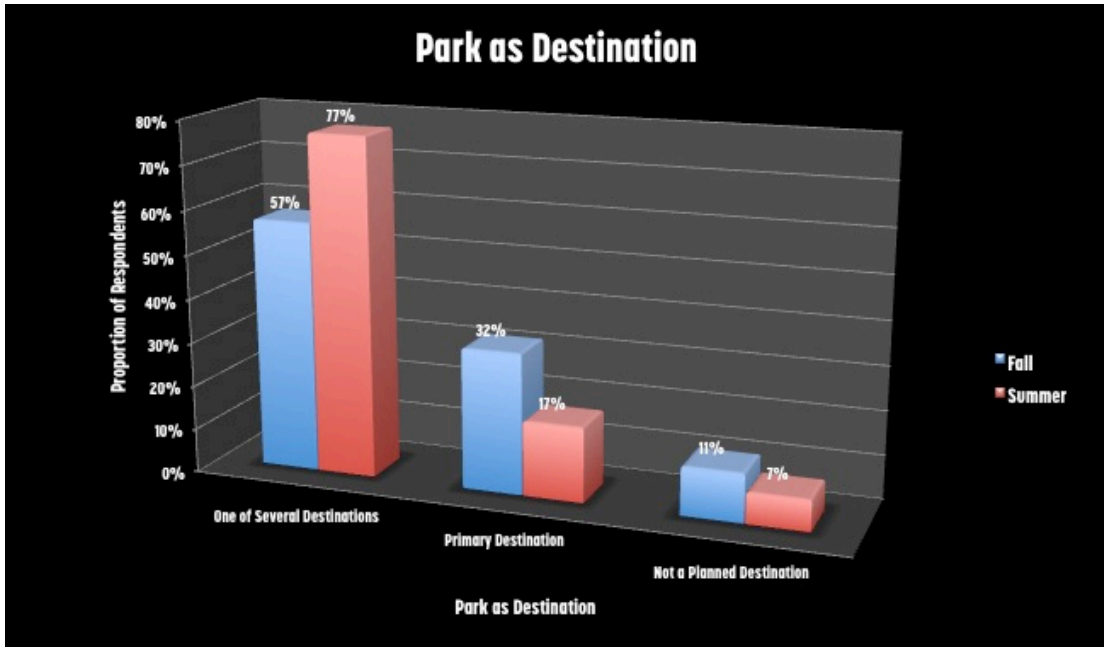


Figure 8: Park as Destination [Data Source: National Park Service, U.S. Department of the Interior, Social Science Program. *Zion National Park Visitor Study*, 2006. University of Idaho, Created by Rochelle Heyworth]

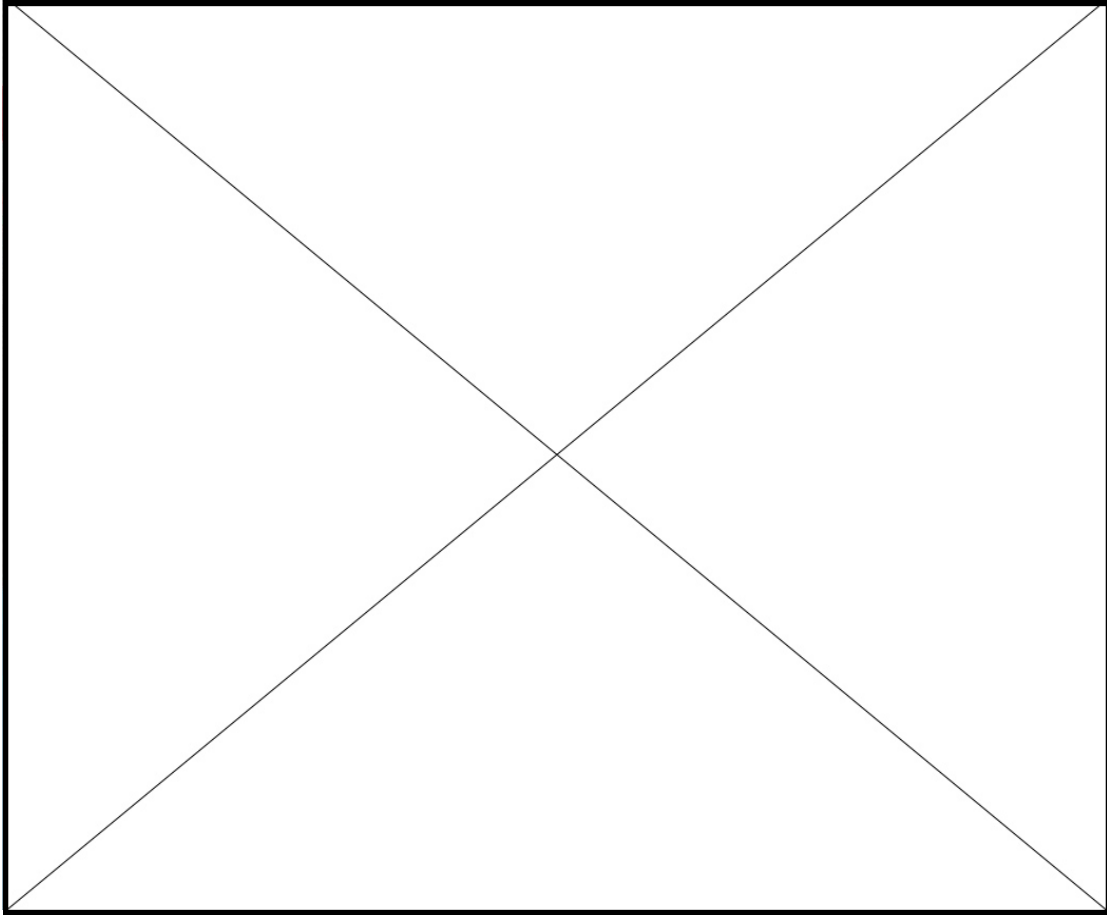


Figure 9: Junction of Geography [Image Source: <http://www.grandcircle.org/images/stories/graphics/travel-planner-map2.pdf>, Altered by Rochelle Heyworth]

Due to the geographic diversity, Zion National Park is home to natural sandstone canyons, plateaus, rock sculptures, and the Virgin River, all of which lie within 229 square miles. The 160 mile long Virgin River is a major contributor to the beauty of the Zion Canyons and “originates on Cedar Mountain in southwestern Utah, flows through the northwestern corner of Arizona and into Nevada where it joins the Colorado River at Lake Mead.”¹³ The river’s gradient in Zion Canyon is about 71 feet per mile, with an average gradient of about 48 feet per mile. The average gradient of the Virgin River is

¹³ Eves, Robert L. *Water, Rock, & Time: The Geologic Story of Zion National Park*. Springdale, Utah: Zion Natural History Association, 2005. Print.

much greater than the Colorado River, which has contributed to the erosive power visible in Zion National Park. Today, Zion's elevation ranges from 3,666 feet to 8,726 feet above sea level.

Geological Development

Zion National Park has evolved in unique geological ways over 250 million years of history. The story of Zion has created a fascinating landscape for visitors to view geologic time. The park is part of the geologically termed Grand Staircase, which includes the well-known Grand Canyon and Bryce Canyon. This means that the top layer of Zion Canyon is the bottom layer of Bryce Canyon; and the bottom layer of Zion Canyon is the top layer of the Grand Canyon. Each layer tells a different story of history's geological processes. Four major processes have caused the formation of Zion National Park. These developments include sedimentation, lithification, uplift and erosion.

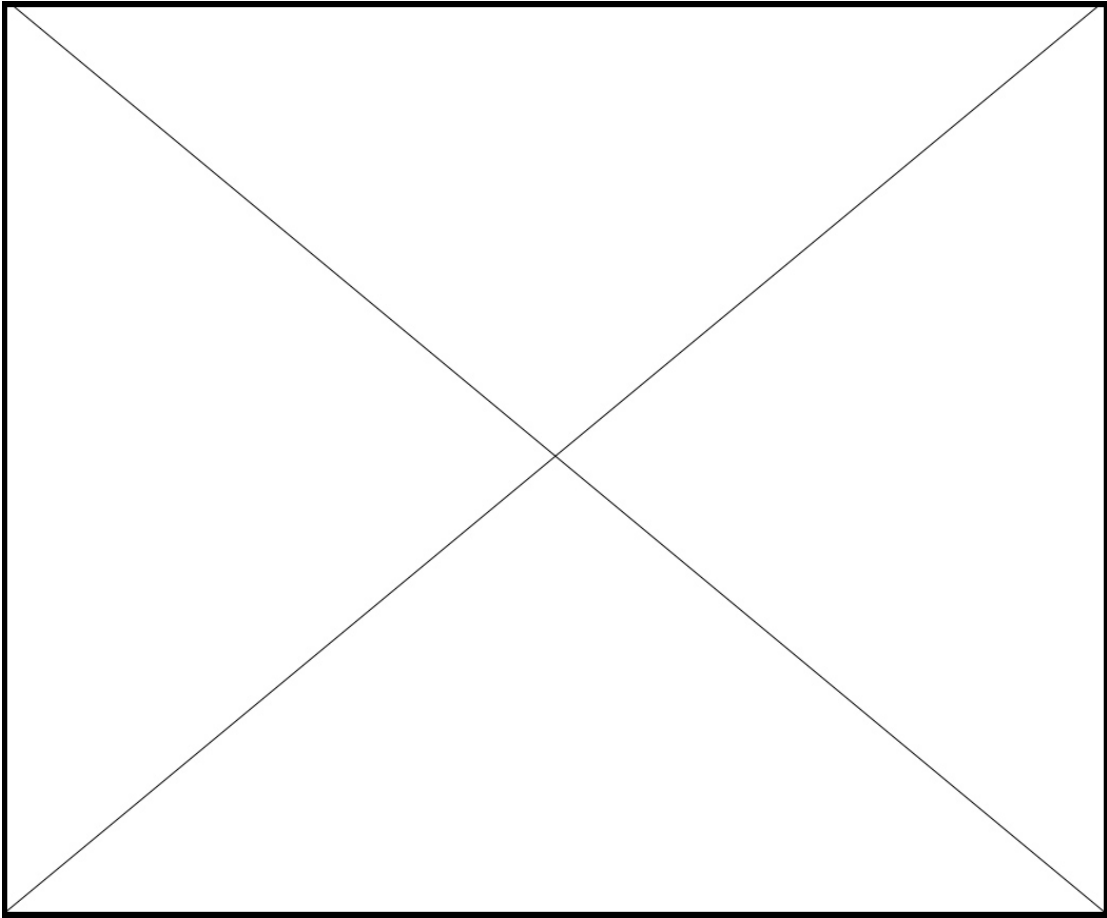


Figure 10: The Grand Staircase [image Source: <http://www.grandcircle.org/images/stores/graphis/travel-planner-map2.pdf>, Altered by Rochelle Heyworth]

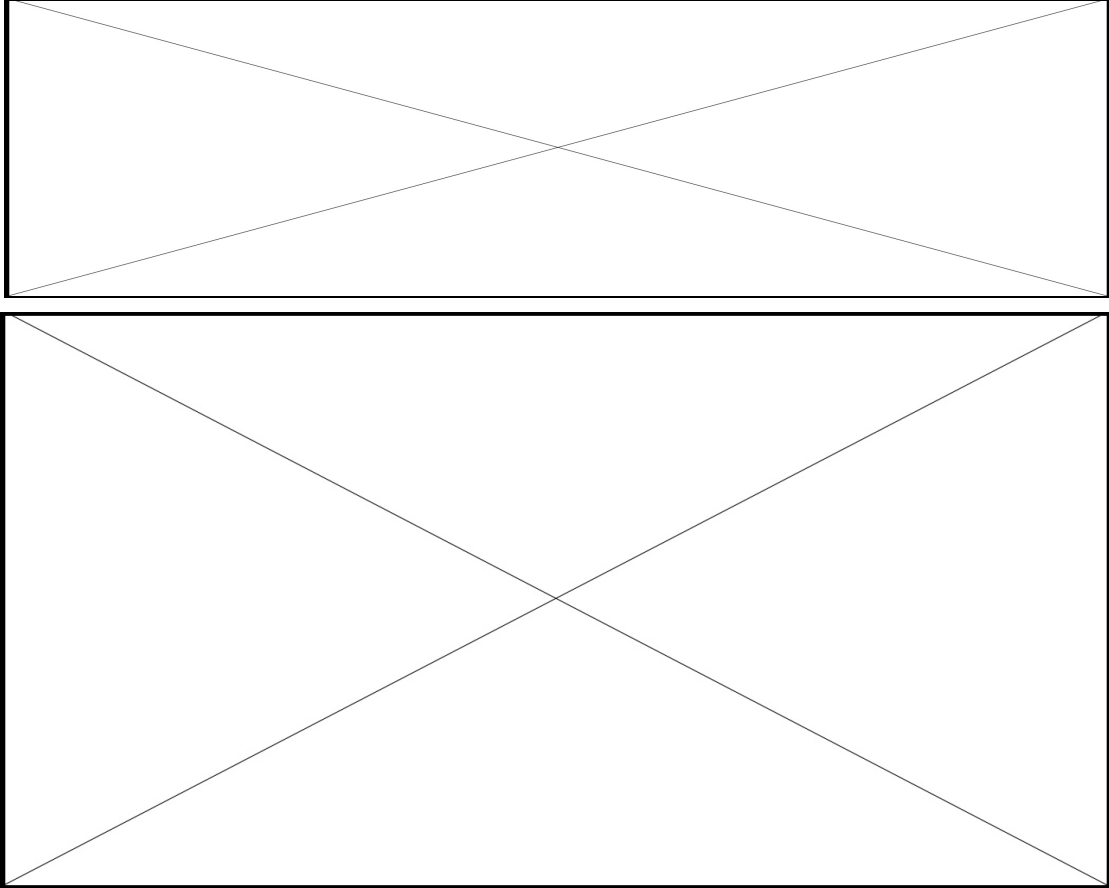


Figure 11: Sectional Cut of the Grand Staircase [Image Source: http://en.wikipedia.org/wiki/File:Grand_Staircase-big.jpg, Altered by Rochelle Heyworth]

Figure 12: Geological Layers of Zion [Diagram Created by Rochelle Heyworth, Inspired by Eves, Robert L. *Water, Rock, & Time: The Geologic Story of Zion National Park,*]

240 million years ago Zion was a relatively flat basin, and as sand, gravel and mud eroded from nearby mountains, the streams began to carry these materials into the basin and deposit them into layers. As the weight of these layers accumulated, the basin began to sink. Through the process of lithification, mineral-laden waters transformed the deposits into stones. The uplift of the earth's crust lifted Zion's elevation to 10,000 feet above sea level. This uplift gave the stream greater cutting force and began the excavation of the rock layers, forming canyons.¹⁴

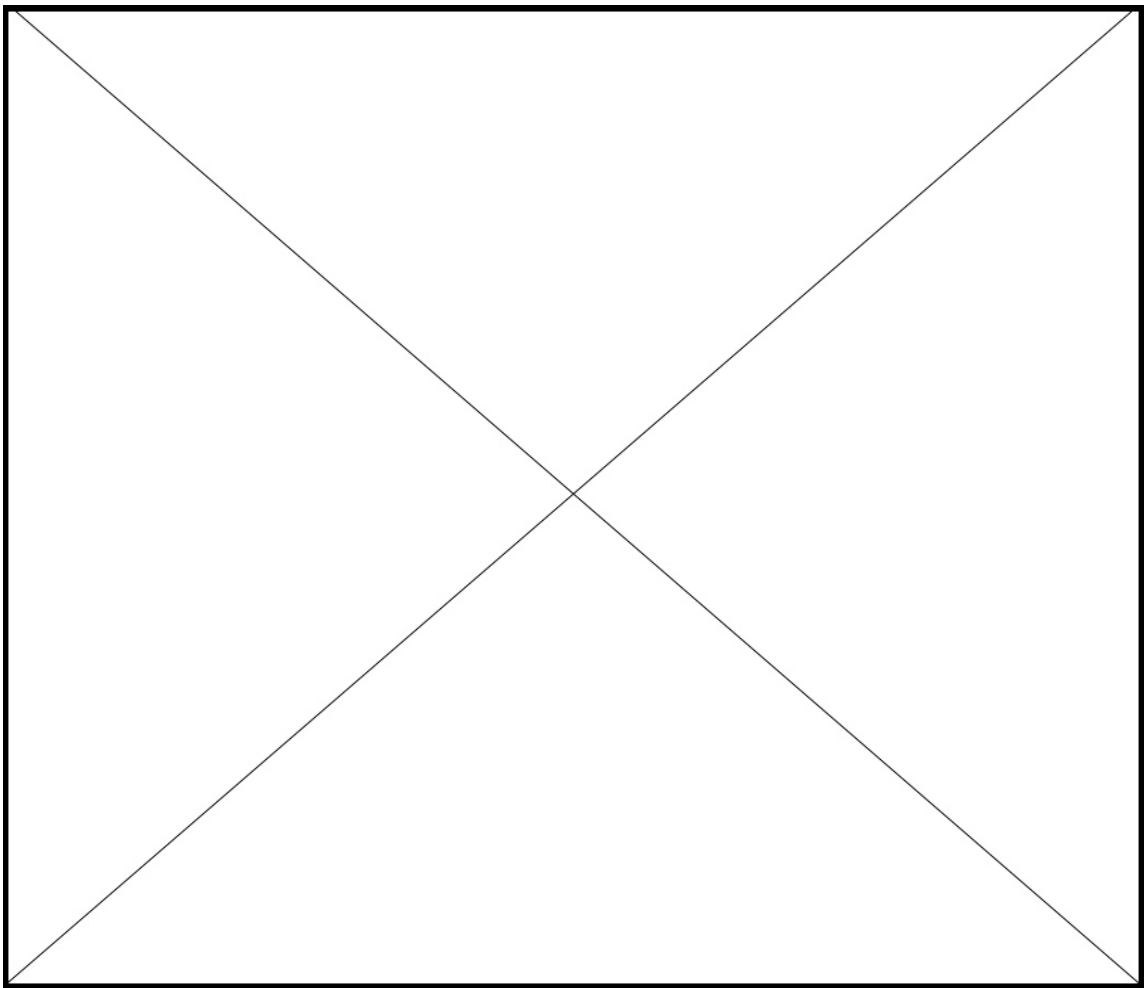


Figure 13: Formations of Zion Canyon [Image Source: Eves, Robert L. *Water, Rock, & Time: The Geologic Story of Zion National Park*, Altered by Rochelle Heyworth]

¹⁴ Geologic Formations. *National Parks Service*. National Parks Service, 20 Nov. 2013. Web. 24 Nov. 2013.

The geological formations and layers of strata color the cliff faces so that as the sun moves, rises and sets throughout the day, the colors drastically change as the shadows rise and fall on the canyon surfaces.



Figure 14: Colors of Zion [Image Source: Zion National Park Web Cam, Altered by Rochelle Heyworth]

Current Trends

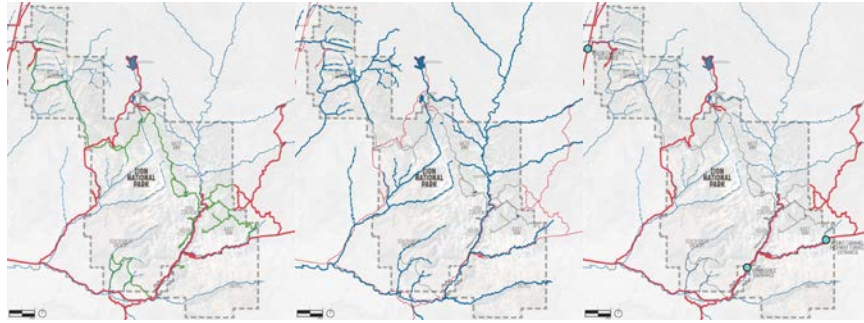


Figure 15: Movement, Water and Entrances [Images Source: <http://www.nps.gov/zion/playourvisit/upload/Zion-Park-Map-Website.pdf>, Altered by Rochelle Heyworth]

Zion National Park is one of the Nation's most visited parks, bringing in nearly three million visitors a year. Millions pass through the gateway community of Springdale, located just outside the southern entrance to the park. For a clearer perspective, approximately five million people venture into the Grand Canyon each year.

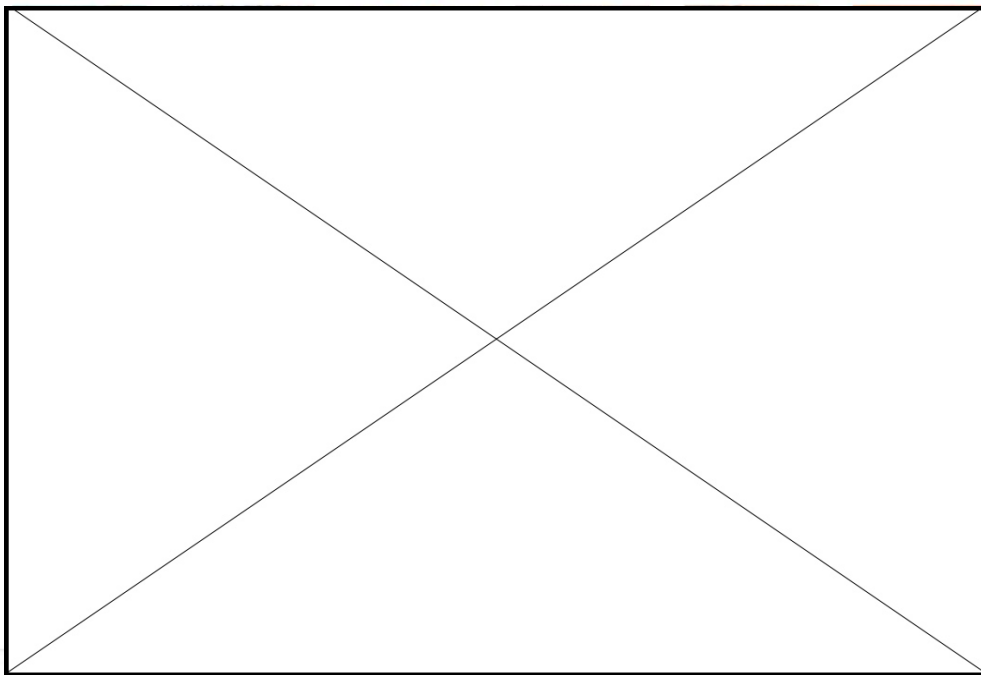


Figure 16: Materials of Zion [Image Sources: Eves, Robert L. *Water, Rock, & Time: The Geologic Story of Zion National Park*, Photographs by Rochelle Heyworth, Altered by Rochelle Heyworth]

Today a new propane-powered shuttle that serves both Springdale and the park has replaced the private cars of Zion during the months of April to October. Although visitation is on the rise, without the noise pollution of cars, Zion National Park is now quieter than it has been in over 30 years.¹⁵ The rustic architecture of Zion National Park uses materials found in the park to fit in contextually with the park.

Site Experiences

In Mid-November of 2013 I spent 2 days in Zion National Park. Taking the highly traveled route through Springdale, the character of the small town proclaimed that I was in fact close to entering Zion National Park. After passing through the gateway, my first stop was at the new visitor center. The building proved to be sustainable with the cooling towers and an overabundance of signs advertising the “green” design.

The first day was spent alone and involved exploring the Zion Canyon area. My father, an engineer, highly recommended passing through the Mount Carmel Highway Tunnel, which was carved into the side of a cliff. This tunnel was completed in the 1930s and linked Zion to Bryce and the Grand Canyon’s North Rim. The tunnel was begun in the 1920s by drilling small shafts into the north-facing cliff. Those shafts later became the tunnel’s windows or galleries. There are four galleries that provide a source of light and air, but also were places for workmen to expel rubble as they tunneled toward one another from both ends.

After passing through the tunnel, I hiked the Overlook Trail. I noticed the texture of the earth, sand, and the warmth of the red sandstone. Descending the rock stairs for

¹⁵ Sorvig, Kim. "Renewing Zion [Zion National Park, Utah]." *Landscape Architecture* 92.2 (2002): 72-79. Web.

the last few steps on the return from my first hike, I was overwhelmed by a large group of international tourists of about 15 people. Their focus did not seem to be on their current experience, but reaching a final goal, the scenery at the end of the trail. This ensured the issues discussed in this thesis. Providing a deeper physical connection to the environment by the use of architecture could enhance the experience of a tourist.

Next I rode up the Zion Scenic Drive and stopped along the way at each shuttle point. At each point there were large parking lots filled with cars and tourists gathering hiking gear and picnicking. These parking lots have the potential of being transformed into a better or more appropriate use. The parking lot became a distraction to the surrounding beauty and took away from the wilderness. Perhaps the shuttle should run year round to eliminate these personal cars.

On my second day, I visited the Kolob Canyons, about an hour drive from the Springdale entrance. It was a cold and cloudy day due to a cold front that just came through the area. The visitor center at the Kolob entrance was much smaller than the visitor center of Zion Canyon and practically lacked any presence. My father and I began our ascent into the park in his truck. We both looked at each other in disappointment, as all we saw was the result of being in the high desert, lacking color and vegetation. As we continued, Kolob Canyons revealed itself to us. The sun appeared and warmed the dashboard of the car and the red canyons glistened in the sun's rays. Along this scenic drive I noticed a series of parking lots that yet again took away from the grandeur of this portion of Zion National Park. At the very end of the Kolob Canyon scenic drive was a parking lot worse than the rest, leading me to my decision to introduce a welcoming interpretive center.



Figure 17: Kolob Canyon Scenic Drive [Image Source: Google Earth, Altered by Rochelle Heyworth]

After our visit in Kolob Canyons, my father and I took another lengthy drive to the Lava Point Overlook in the north portion of the park. The path was filled with gravel roads not suitable for any small car without 4-wheel drive. At the top the clouds had covered the horizon and the temperature had dropped another 20 degrees. The view over the park was far from spectacular but had a clear ephemeral presence as the clouds passed over the plateaus.

Chapter 3: Defining a Language of the Metaphysical

This chapter seeks to define a language to promote clarity for the purpose of this argument. To create spatial and material attributes that will aid in visualizing these metaphysical words, this section will also look at landscape paintings illustration and hopefully for clarity.

Transcendental

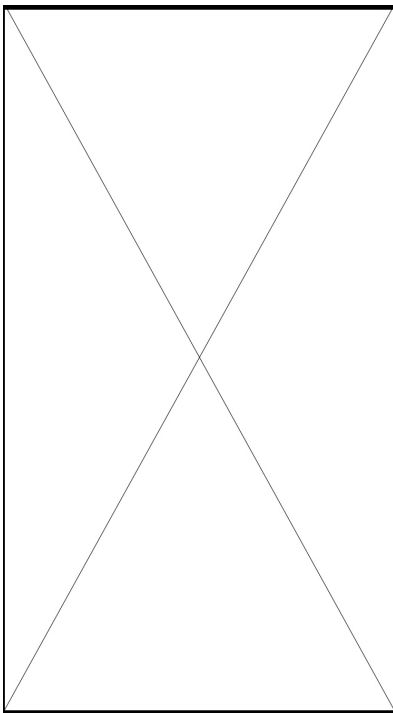


Figure 18: Transcendent: Caspar David Friedrich, *Chalk Cliffs on Rugen* [Image Source: Museum Oskar Reinhart, <http://en.wikipedia.org>, Altered by Rochelle Heyworth]

In the late 1820s a religious and philosophical movement developed that promoted the goodness of both people and nature. Coincidentally, as the movement grew so did the movement toward preserving America's National Parks. Nash explains, "The core of Transcendentalism was the belief that a correspondence or parallelism existed between the higher realm of spiritual truth and the lower one of material objects. For this reason natural objects assumed importance because, if rightly seen, they reflected universal spiritual truths".

(85)¹⁶ In his essay, Karsten Harries argues that architecture must engage with the idea of the sacred if it is to address the human person.

¹⁶ Nash, Roderick. *Wilderness and the American Mind*. New Haven: Yale University Press, 1967. Print.

Definition and Etymology

The term transcendental is derived from the word transcendent, meaning extending or lying beyond the limits of ordinary experience.¹⁷ For the purpose of this thesis, this term will mean the realization of the presence of something emotionally moving and inspiring. One must reach this level of being to be aware of and connected to a particular experience in nature. In Friedrich's *Chalk Cliffs on Rugen* we see an expansive horizon framed by trees and cliffs in the foreground. The figures in the painting each represent different phases of life looking upon the abyss, symbolizing eternity.



Figure 19: Transcendental, Etymology, [Diagram Created by Rochelle Heyworth]

Enlighten and Spirituality

This section explores two terms, enlighten and spirituality, which for these purposes have similar meanings. As noted earlier by Timothy and Olsen, people are able to be *spiritual* without being *religious*. The authors take this a step further by adding, “spirituality is an individual experience that is outside ‘preconstituted discourses[s] of meaning’, where experimenting with the mixing of various religious traditions – both traditional and alternative – is seen as both accepted and encouraged;

¹⁷ Merriam-Webster's Collegiate Dictionary. Springfield, MA: Merriam-Webster, Inc., 2003. Print.

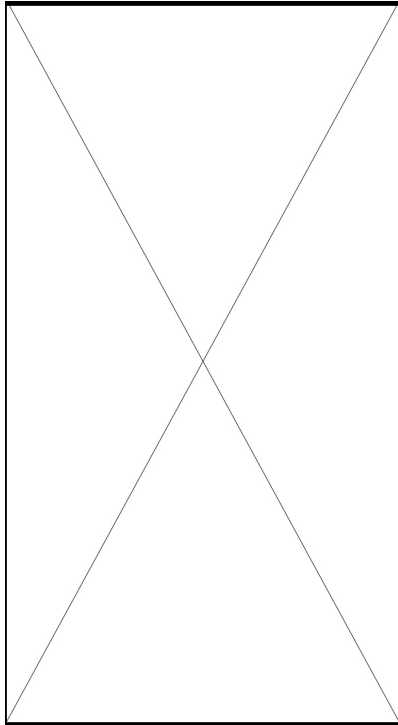


Figure 20: Enlighten: Caspar David Friedrich, *Wanderer above the Sea of Fog* [Image Source: Hunsthalle Hamburg, Altered by Rochelle Heyworth]

thus making ‘real’ religion identifiable with personal faith outside of religious institutions” (4).¹⁸ Those who are able to recognize their place in the universe are able to express a spiritual life. In other words, spirituality is consistent with the meaning of enlightenment.

Enlightenment means to illuminate and give spiritual insight to a situation. The notion of enlightenment can be seen in Friedrich’s *Wanderer above the Sea of Fog*. In this painting the viewer is drawn into the scene and views it from the figure’s perspective. It appears that the figure is experiencing some sort of awakening.

Definition and Etymology

Although the roots of the terms spirituality and enlightenment are different, the modern day definition is rather similar. Spirituality can be derived from spiritual, meaning of or relating to sacred matters. Whereas enlighten can be defined as to give spiritual insight to, thus, meaning enlighten and spiritual revolve around the term sacred.¹⁹

¹⁸ Timothy, Dallen J, and Daniel H. Olsen. *Tourism, Religion and Spiritual Journeys*. London: Routledge, 2006. Print.

¹⁹ *Merriam-Webster’s Collegiate Dictionary*. Springfield, MA: Merriam-Webster, Inc., 2003. Print.

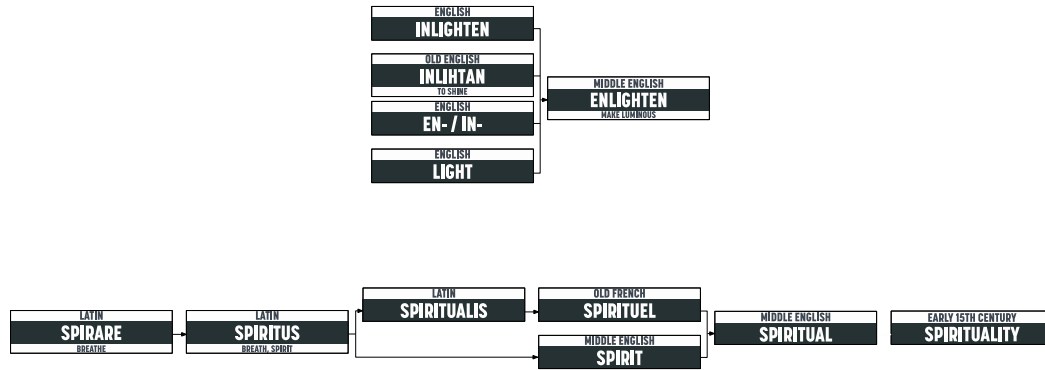


Figure 21: Enlighten and Spirituality, Etymology, [Diagram Created by Rochelle Heyworth]

Sacred

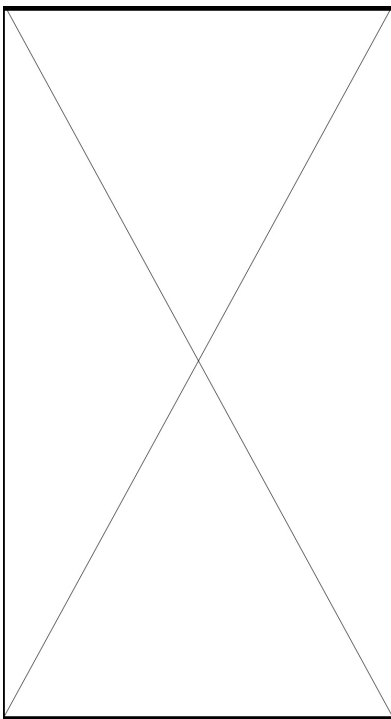


Figure 22: Sacred: Thomas Hill, *Great Canyon of the Sierra, Yosemite* [Image Source: Crocker Art Museum, Altered by Rochelle Heyworth]

The meaning of sacred in modern society has expanded, allowing for the reinterpretation of what constitutes the “sacred”. This has allowed for pilgrimage journeys to be deemed sacred in their own right because these journeys are “undertaken by a personal quest of a place or a state that he or she believes to embody a *valued ideal*” (5).²⁰ In Karla Britton’s book *Constructing the Ineffable* we begin to look chronologically at the history of sacred architecture and find that sacred forms tend to imitate natural forms or defer to them. Quoting Karsten

Harries, Britton writes, “the sacred needs architecture if it

²⁰ Timothy, Dallen J, and Daniel H. Olsen. *Tourism, Religion and Spiritual Journeys*. London: Routledge, 2006. Print.

is not to wither, and that similarly architecture needs the sacred” (49).²¹

Definition and Etymology

For the purposes of this thesis, sacred can be defined without having a religious connotation and simply be regarded as something valued and highly important, deserving great respect.²² During the Romantic Movement of the 1800’s it is common to find paintings similar to Hill’s *Great Canyon of the Sierra*, where the mountains are viewed as the cathedrals of the New World, not unlike, perhaps better than, those cathedrals sited throughout the European continent. We shall turn to Mircea Eliade’s definition of sacred in his writing *The Sacred and the Profane*.



Figure 23: Sacred, Etymology, [Diagram Created by Rochelle Heyworth]

Sublime

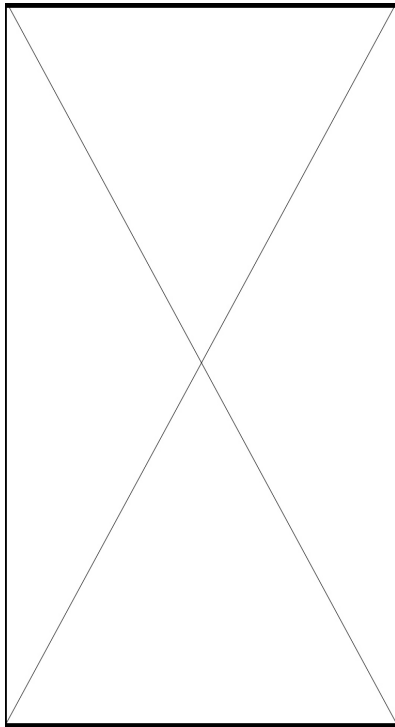
The term sublime has been used since the movement of transcendentalism and preservation of America’s National Parks. The sublime and the frontier merged to remake wilderness in their own image, giving it moral values and cultural symbols that remain today. Cronon agrees, “it is not too much to say that the modern environmental movement is itself a grandchild of romanticism and post-frontier ideology”.²³

²¹ Britton, Karla. *Constructing the Ineffable: Contemporary Sacred Architecture*. New Haven, Conn: Yale School of Architecture, 2010. Print.

²² *Merriam-Webster's Collegiate Dictionary*. Springfield, MA: Merriam-Webster, Inc., 2003. Print.

²³ Cronon, William. *Uncommon Ground: Toward Reinventing Nature*. New York: W.W. Norton & Co, 1995. Print.

Unfortunately the term has become watered down by the tourism and commercial hype that has been occurring since the eighteenth century. This thesis aims to reawaken the true meaning of the sublime by means of architectural application.



Definition and Etymology

The spark that the term sublime once held meant, by the Merriam-Webster definition, being of such excellence, grandeur, or beauty as to inspire great admiration.²⁴



Figure 24: Sublime: Albert Bierstadt, *A Storm in the Rocky Mountains, Mt. Rosalie* [Image Source: Brooklyn Museum, Altered by Rochelle Heyworth]

Figure 25: Sublime, Etymology, [Diagram Created by Rochelle Heyworth]

Conclusions

Defining these intangible words will always be subjective. It is important, however, to note the relationship of the four words. Something sublime, or something of wonder has the ability to be deemed sacred. Because of the beauty and surreal qualities of a place or object, people discover them as deserving great respect, thus terming them sacred. When a person is aware of their relationship to a sacred place or object they become enlightened or have a spiritual connection. Once the level of enlightenment is

²⁴ Merriam-Webster's Collegiate Dictionary. Springfield, MA: Merriam-Webster, Inc., 2003. Print.

reached, a person is able to grasp a transcendent experience; a person is not only able to observe his or her relationship to a sacred object or place, but extend to a broader context and examine their being in the world.

Chapter 4: The Senses

Just as individuals may perceive the definition of metaphysical words such as spirituality differently, no two people will perceive an experience identically. The intent of this chapter is to analyze the perceptual systems and stimuli. By understanding the basic human senses, we can begin to understand what makes for a fulfilling spiritual experience. A human being perceives the world through all his or her senses harmoniously. As Yi-Fu Tuan explains, “the eyes explore the visual field and abstract from it certain objects, points of focus, perspectives. But the taste of lemon, the texture of warm skin, and the sound of rustling leaves reach us as just these sensations” (10).²⁵ By moving about, touching, and manipulating a child learns the authenticity of substances and the structuring of space.

The word *stimulus* is used to signify an object that is presented or applied to an individual. These physical forces fall on the sensory receptors, which fall into two categories: the distance receptors (those concerned with the eyes, ears, and the nose) and the immediate receptors (those used to examine the world up close, especially concerned with touch).²⁶ This chapter looks to Gibson’s book, *The Senses Considered as Perceptual Systems*, to organize the classical concepts of sense organs into five systems. These systems of sensations “should correspond to these three types of receptors, (a) sensations of external origin, (b) sensations of movement, and (c) vague sensations of the internal organs. These were considered, respectively, the bases for (a) perception, (b)

²⁵ Tuan, Yi-fu. *Topophilia: a Study of Environmental Perception, Attitudes, and Values*. Englewood Cliffs, N.J.: Prentice-Hall, 1974. Print.

²⁶ Hall, Edward T. *The Hidden Dimension*. Garden City, N.Y.: Doubleday, 1966. Print.

kinesthesia, or the awareness of movement, and perhaps (c) feeling and emotion, although this last idea is debatable” (33)²⁷

The following chart analyzes the perceptual systems based upon Gibson’s discoveries in the aforementioned book. To understand the perceptual system it is critical to note the components of the environment, which are considered to be the sources of stimulation. The components that make up the environment are land, water, and air. Thus, it is clear that matter exists in one of three states: solid, liquid, or gas. These three forms of matter are manifestations of energy, which ultimately are the causes of stimulation.

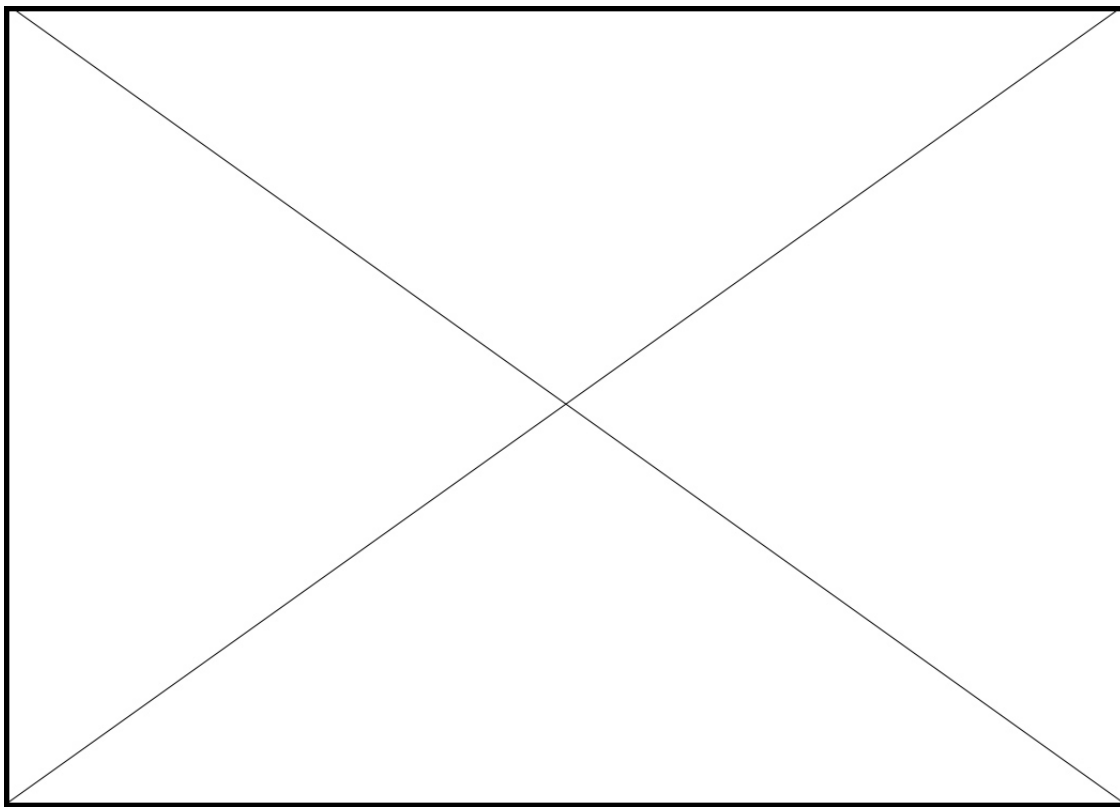


Figure 26: The Perceptual Systems [Image Sources: See Figures 27- 31, Altered by Rochelle Heyworth, Inspired by J.J. Gibson]

²⁷ Gibson, James J. *The Senses Considered As Perceptual Systems*. Boston: Houghton Mifflin, 1966. Print.

There are three types of energy that carry stimulus information: mechanical energy, chemical energy, and energy from radiation. These types of stimuli can be received by imposed or obtained perception and proprioception. Imposed perception arises from the skin, nose, mouth, ears or eyes when these organs are passive and the stimulation is applied to them. Imposed proprioception occurs when joints, vestibular organs, or the eyes are stimulated without any participation of the muscles. A clear example of imposed proprioception occurs when the body is transported in a vehicle and the eyes are stimulated by motion perspective. Obtained perception and proprioception is an active means of attaining stimuli. Obtained perception occurs when the sense organs are oriented to the environment by means of exploring to obtain stimuli. Obtained proprioception occurs when the individual performs with any motor systems of the body, such as jogging.²⁸ In other words, obtained proprioception occurs during any physical movement.

The Basic Orienting System

The basic orienting system is the fundamental action system and perceptual system. This system depends strictly on the environmental properties surrounding the being – the direction of gravity, the distinction between the skies above and the water or earth below, the distinction from here and there, the location of the ground, and the location of major stimuli in the environment.²⁹ This system is dependent upon a specific mode of attention, which might include being awake, alert, and upright. According to

²⁸ Gibson, James J. *The Senses Considered As Perceptual Systems*. Boston: Houghton Mifflin, 1966. Print.

²⁹ Reed, Edward. *Encountering the World: Toward an Ecological Psychology*. New York: Oxford University Press, 1996. Print.



Figure 27: The Basic Orienting System [Image Sources: Filonenko. *One Old Compass*. www.flickr.com, <http://bizibly.wordpress.com/2011/01/01/henry-mintzberg>, Altered by Rochelle Heyworth

Gibson, “the postures of the sensitive organs in the head depend on the posture of the head, and the postures of the extremities depend on the posture of the body. Hence the exploratory searching of the eyes, ears, nose, mouth, and hands depends on an upright body, and the orienting of these organs rests on orientation to gravity” (51).³⁰

The basic orienting system provides a framework for the other perceptual systems. It picks up forces of acceleration in the inner ear, which translate to specify the direction of gravity, force, beginnings and endings of movements, and transient forces. This system works concurrently with the haptic system to ensure a double registration of the ground plane.

People have the ability to differentiate their environment ethnocentrically, distinguishing between the sacred and the profane, the center and periphery, the home and the common range. Humans do not need to be in a determined setting consisting of land or water, mountains or plains, forests or savannas to identify with an environment. The functions required to differentiate environments involve orientation and identification. Once people can orientate and identify themselves with an environment, they are then able to dwell. “To gain an existential foothold man has to be able to *orientate* himself; he has to know *where* he is. But he also has to *identify* himself with

³⁰ Gibson, James J. *The Senses Considered As Perceptual Systems*. Boston: Houghton Mifflin, 1966. Print.

the environment, that is, he has to know *how* he is a certain place” (19).³¹ When one is able to observe or orientate himself or herself within a place the person is able to understand their being in the world

In the homogenous and infinite expanse orientation is not possible until a point of reference reveals itself. This reveal would be a hierophany showing a fixed point, or center.³² The Pyramids of Gizeh is an example where, in the expanse of the desert plane, the pharaohs orientated to the cardinal points. In this case, the cosmos revealed itself to the pharaohs and became a major factor in Egyptian architecture.

The Visual System

Based upon the beliefs of evolution, in the ancient seas, life forms developed patches of skin that were sensitive to light. The ability to distinguish light from dark had been a quintessential tool causing the eyes to evolve to judge motion, form, and colors.³³ Thus, the faint reminder of our evolution is found with the realization that our eyes must constantly be bathed in salt water.

Humans, like apes and monkeys, see the environment as a collection of things providing a vast amount of information concerning our environments. People possess and benefit from stereoscopic vision, delivering frontal eyes and binocular vision. Binocular vision helps people see things as three-dimensional bodies. These mechanisms

³¹ Norberg-Schulz, Christian. *Genius Loci: Towards a Phenomenology of Architecture*. New York: Rizzoli, 1980. Print.

³² Eliade, Mircea, and Willard R. Trask. *The Sacred and the Profane: The Nature of Religion*. New York: Harcourt, Brace, 1959. Print.

³³ Ackerman, Diane. *A Natural History of the Senses*. New York: Random House, 1990.

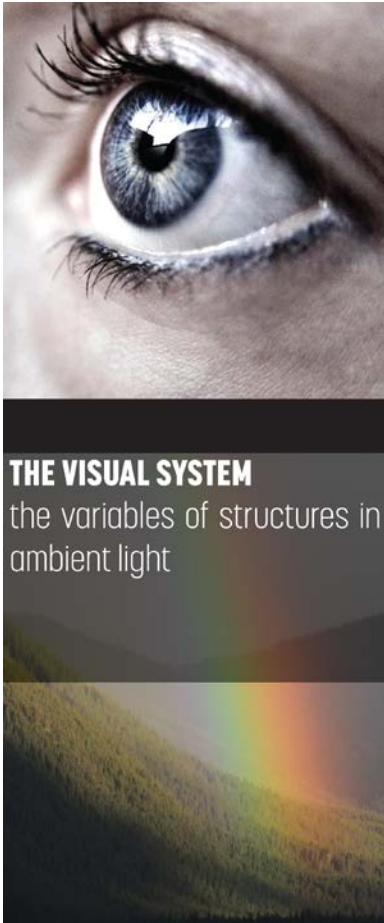


Figure 28: The Visual System [Image Sources: Jonasdottir. *Eye*. www.flickr.co. Klerks. *Rainbow*. www.flickr.com, Altered by Rochelle Heyworth]

gather light, pick out an image, focus it, locate it in space, and follow it.³⁴ Seventy percent of the body's sense receptors cluster in the eyes, thus, these receptors overlap with the other perceptual systems to register objective facts. All that we see is because of ambient light; our environment is *in* the light.

Of the five perceptual systems, people are most dependent upon sight to find their way in the world. Because the eye loves novelty and can get used to almost any scene, much of our life can fall to the background of our attention. The sky, for example, is a visual constant in our lives, but it tends to be thought of as absent. By opening an experience to the celestial sky, one is able to observe the diurnal changes to make for a clear observation of time. The visual system relies on light to *show* us anything. Light has the ability to affect our

moods, rally our hormones, and trigger our circadian rhythms.³⁵ Even people who have been blind since birth are affected by light.

Norberg-Schulz's perspective on man-made places shows that they are related to nature in three ways. People want to *visualize* their "understanding" of nature; consequently they *build* what they have seen to express a position in their environments.

³⁴ Tuan, Yi-fu. *Topophilia: a Study of Environmental Perception, Attitudes, and Values*. Englewood Cliffs, N.J.: Prentice-Hall, 1974. Print.

³⁵ Ackerman, Diane. *A Natural History of the Senses*. New York: Random House, 1990.

Second, humans have to *complement* their environment by adding any missing pieces. The human understanding of nature must be *symbolized* to imply that an experienced meaning is “translated” to another medium.³⁶

The Auditory System



Figure 29: The Auditory System
[Image Sources: Rennie. *Hear*.
www.flickr.com, Bdamon, *Rain Falling Hard*,
www.flickr.com, Altered by
Rochelle Heyworth]

This apparatus evolved from the primitive statocyst found in some aquatic animals. The statocyst is a balance sensory receptor and consists of a sac-like structure with microscopic sensory hairs. The deflections of the hairs respond to gravity and allow for the animal to remain balanced. It responds to vibrations in the air and our ears are then able to process this information to determine the direction of the shaking air. For survival, land animals had to develop a way of admitting sound pressures in the air and sending the energy to the receptors of the water-filled chamber inherited from their ancestors of the ocean.³⁷

The average human has a range of hearing extending from 16 to 20,000 cycles per second. If a person is sensitive to a pitch lower than 16 cycles, he or she may be in constant displeasure of hearing his or

³⁶ Norberg-Schulz, Christian. *Genius Loci: Towards a Phenomenology of Architecture*. New York: Rizzoli, 1980. Print.

³⁷ Gibson, James J. *The Senses Considered As Perceptual Systems*. Boston: Houghton Mifflin, 1966. Print.

her own heartbeat. What we call sound is really an onrushing and withdrawing of air molecules.³⁸ These vibrations of air molecules pass around obstacles, is slower than light, and glides with the breezes. Sound is transmitted in three stages. First the outer ear acts as a funnel directing the sound waves to the eardrum. Once the eardrum vibrates it moves the three tiniest bones in the body called the hammer, the anvil, and the stirrup.

The sound of rain pattering against the window, the whistling of wind blowing through a field of dandelions, and the laugh of a child excite our senses in a way that cannot be accomplished in a purely visual state. With deafness life seems to lack progression and appears frozen in time. However, research suggests that many who are legally deaf can hear loud noises, such as gunfire, motorcycles, thunder, and airplanes. Even if we don't hear the outside world, we hear the organs within our bodies. At Harvard University John Cage experimented in a soundproof room to determine what true silence was like. He left the room declaring that there is no such state as silence. Although there are no means to eliminate all sounds in order to achieve a pure state of silence, we can chant "om," or another mantra in a strong and sustained tone and it will cancel out external noises, making the body a soundproof compartment.³⁹

"There is a geographical quality to listening," explains Ackerman (178).⁴⁰ Sounds are identified by type, intensity, and location in space. The sounds of the leaves *brushing* against a tree, the *whirling* of wind passing through a canyon, the *rushing* of the river, for example, are acoustically distinct and evoke particular experiential memories.

³⁸ Tuan, Yi-fu. *Topophilia: a Study of Environmental Perception, Attitudes, and Values*. Englewood Cliffs, N.J.: Prentice-Hall, 1974. Print.

³⁹ Ackerman, Diane. *A Natural History of the Senses*. New York: Random House, 1990.

⁴⁰ Ackerman, Diane. *A Natural History of the Senses*. New York: Random House, 1990.

Architecturally sounds can be accentuated or diminished by form, spatial characteristics and materials.

The Taste-Smell System



Figure 30: The Taste-Smell System
[Image Sources: Wong. *Smell*.
www.flickr.com, Lilley. *Cookies*.
www.flickr.com, Altered by Rochelle
Heyworth]

Ackerman explains that smell was the first of our senses, and it was so successful that the buds from the olfactory stalks evolved into our cerebral hemisphere. Every day, we breathe about 23,040 times and move about 438 cubic feet of air. It takes two seconds to inhale and three seconds to exhale, allowing molecules of substance to pass through our systems.⁴¹

Although taste and smell maintain their own receptors they work together to transmit an intertwined experience. Most people are unaware that what they call taste is actually an olfactory experience. The receptors of the mouth and nose work together when tasting food, yet food can be sniffed to trigger strictly the receptors of smell. Gibson points out that eating also induces the haptic system in order to *feel* the food.⁴²

Smells have the ability to connect people to emotionally charged memories.

Historically smells have provided animals with survivor skills to detect nearby danger.

Modern humans tend to neglect the olfactory senses. Although we are aware of smell,

⁴¹ Ackerman, Diane. *A Natural History of the Senses*. New York: Random House, 1990.

⁴² Gibson, James J. *The Senses Considered As Perceptual Systems*. Boston: Houghton Mifflin, 1966. Print.

we don't react to it as most animals would. Especially in America are we fearful of the word 'odor' which seems to describe a bad odor. We mask our environments with pleasant smells, ultimately suppressing our range of experiences and memories.

Our sense of smell can be heightened by our surroundings. Water has the ability to heighten our sense of smell. Perfume, for example contains 98 percent water and alcohol, and only 2 percent fat and perfume molecules. The Egyptians invented the art of the bath, which was thought of as restorative, calming, sensuous, and religious due to the hygienic benefits of these activities. Wind also has the ability to carry a scent from a nearby area, bringing with it particles of the plants to the scent receptors of humans.

The Haptic System

Touch is the oldest sense and has provided animals the ability to defend against the environment. There are four main receptors of touch: mechanoreceptors, thermoreceptors, pain receptors, and proprioceptors. Mechanoreceptors allow us to perceive sensations such as pressure, vibrations, and textures. Temperature can be detected by the use of our thermoreceptors. Our pain receptors provide the ability to determine stimuli that can or does damage the skin. Proprioceptors allow us to sense the location of our different body parts.

Pallasmaa and Ackerman argue that the skin is, in fact, alive. It shields us from harmful rays, insulates us from thermal changes, regulates blood flow, defines our individuality and acts as a frame for our sense of touch.⁴³ Touch and vision often combine to provide a double assurance of input information.

⁴³ Pallasmaa, Juhani. *The Eyes of the Skin: Architecture and the Senses*. Chichester: Wiley-Academy, 2005. Print.

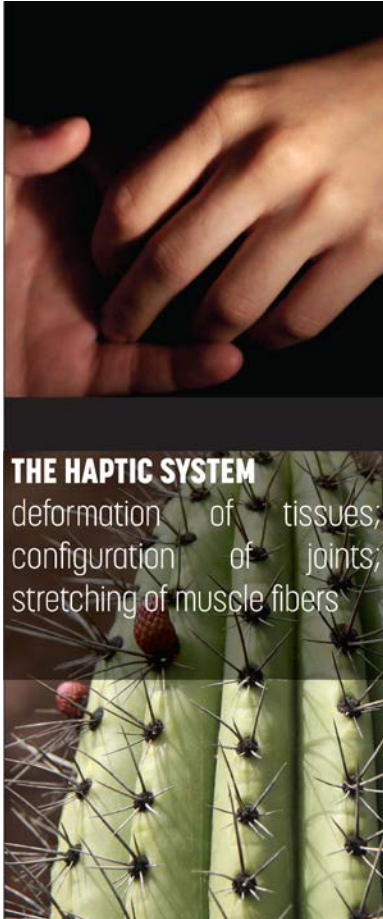


Figure 31: The Haptic System
[Image Sources: Rosell. *I Wanna Hold Your Hand*. www.flickr.com, Snelson. *Cactus*. www.flickr.com, Altered by Rochelle Heyworth]

Our stereoscopic vision shows us that we live in a three-dimensional world and touch clarifies this information. Touch allows us to find our way in a dark room. Without sight a person is still able to function with a high degree of efficiency, but without the haptic system, it is doubtful that a person could survive. As a child we begin to distinguish objects in our environments and become able to determine the matter of the objects, whether it be gaseous, solid, or liquid. Understanding a space through our mechanoreceptors and thermoreceptors we can navigate through a space without utilizing the visual system.

The body of architecture and material compatibility create an atmosphere. Peter Zumthor expands on the notion of material compatibility saying, “materials react with one another and have their radiance, so that the material composition gives rise to something unique” (25).⁴⁴ He uses the example of stone: drill it, saw it, grind it, polish it, the characteristic becomes different each time. As it is held up to light, the qualities change again. Materials of space extract the energy and warmth from our bodies, so temperature is also integral to defining a haptic sensory experience in architecture. Zumthor’s bath complex in Switzerland, Therme Vals, creates a haptic experience out of the ordinary through the varying temperatures water and the experience from dry to wet.

⁴⁴ Zumthor, Peter. *Atmospheres: Architectural Environments, Surrounding Objects*. Basel: Birkhäuser, 2006. Print.

Conclusions

To reiterate, no two people perceive an experience identically. Biologically every human is unique, and while two people might have a similar experience, it will never be the exact same. The senses and the perceptual systems are critical to understanding our environments. Harmonious usage allows for a tactile, acoustic, visual, and olfactory experience with an understanding and awareness of place. Our senses unite us with our environments and tune us into the elements that make up the places we inhabit and visit for refuge. The senses can be awakened by architecture through spatial characteristics, materials, adaptability to temperature, and aesthetics. With the perceptual systems in mind, this framework can be used to enhance phenomenal experience within Zion National Park. With this intention, future generations of artists and architects would be able to isolate these perceptual systems for a profound experience not only in Zion, but other National and State parks for centuries to come.

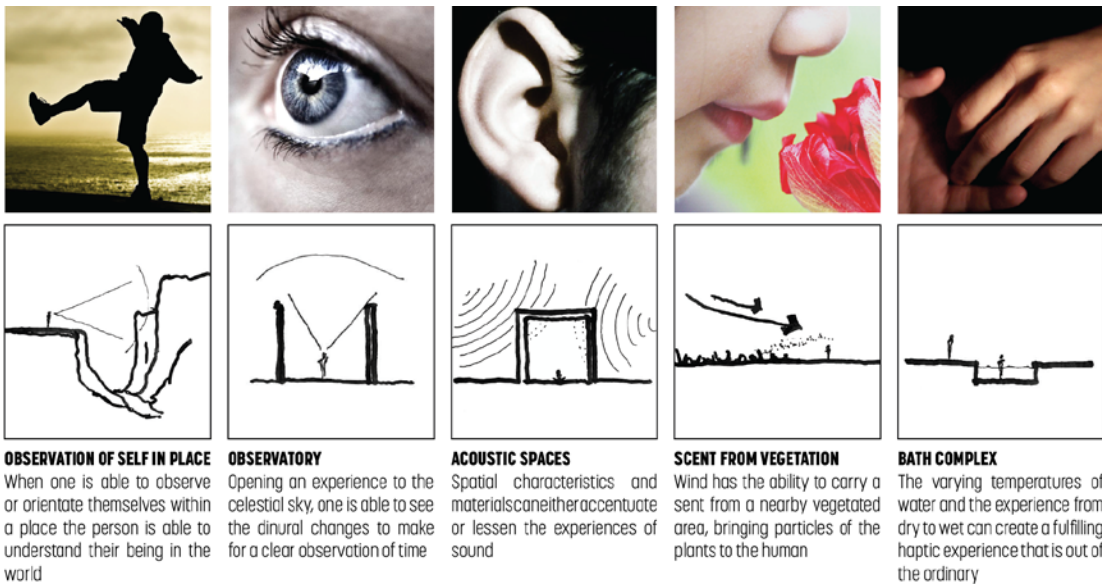


Figure 32: Sensory Conclusions [Image Sources: See Figures 26-30, Drawings by Rochelle Heyworth, Altered by Rochelle Heyworth]

Chapter 5: Natural Phenomena

This chapter will explore elements found in nature, and more specifically, in Zion National Park. To establish principles for creating enlightening spaces one must explore the developmental, symbolic, phenomenological, and architectural aspects of elements found in nature. To reiterate and paraphrase Norberg-Schulz, man cannot dwell until he is *orientated* in his environment and is aware of *how* he is in the environment. Therefore, it is critical to understanding what *makes* our environment.

Land, water, and air are the main components of an environment, and they can be thought of as representing the three states of solid, liquid or gas. Matter manifests energy, which clings to our sensory receptors creating a particular experience in a particular environment. Gibson adds, “the principle solid is earth and its furniture, the principle liquid is the waters of the earth, the principle gas is the air, and the most obvious example of energy is fire” (7).⁴⁵ Life began when the surface of the earth cooled, water vapors condensed, and atmosphere was created. Life became dependent upon light and water, from which evolved the life of the plants that would later invade land.

Our everyday life consists of concrete phenomena; it consists of people, animals, flowers, trees and forests, stone, earth, wood, water, towns, streets, and furniture. It also consists of the sun, moon, and stars that are unreachable but are capable of producing an emotional response. Norberg-Schulz explains these phenomena as what is given; “this is

⁴⁵ Gibson, James J. *The Senses Considered As Perceptual Systems*. Boston: Houghton Mifflin, 1966. Print.

the *content* of our existence” (6).⁴⁶ Interpretations of natural phenomena such as sky, earth, water, rock and vegetation are similar regardless of cultural, religious, social, and economic differences. According to Eliade, elements have revealed themselves to humans as deserving of respect and important in societies. Though we might not know *why* particular things have become a hierophany, it is clear that anything people have ever loved, felt, or come in contact with *can* reveal itself as a sacred object. This section will explore the symbolic connotations of natural elements that have the ability to create a transcendent experience.

Natural elements such as rock, vegetation and water make a place meaningful or “sacred”. Such sacred places are never selected by people, but revealed to them.

Time



Figure 33: Time [Image Sources: See Figures 27-31, Krejci. *Fallen Leaves*. www.flickr.com, Altered by Rochelle Heyworth]

Time, like space, is neither alike nor continuous. There is sacred time, seen in the form of festivals marking periodical moments, and there is profane time that moves in a linear fashion. Sacred time is reversible in the sense that an event that took place in the past can be re-actualized by festivals, thus returning to the beginning again. Time constitutes a human’s deepest existential dimension and is intrinsically linked to their life. In other words, for people, time has a beginning and

⁴⁶ Norberg-Schulz, Christian. *Genius Loci: Towards a Phenomenology of Architecture*. New York: Rizzoli, 1980. Print.

an end that overlaps with aspects of a circular and regenerative sacred time.

Landscapes possess character, some of which is a function of time as it changes with the seasons, the course of the day and weather. The effects of light, moon and life provide opportunities to understand time.

Light

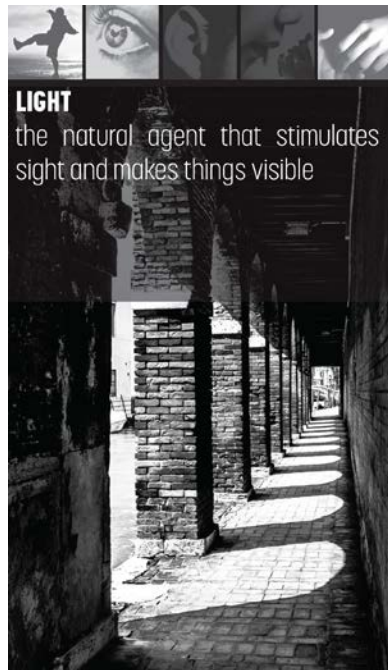


Figure 34: Light [Image Sources: See Figures 27-31, Bussato. *Lights and Shadows*. www.flickr.com, Altered by Rochelle Heyworth

Light is linked to darkness, and there must be darkness to allow light to reveal its power. Light has always been experienced as a basic part of reality, but as Norberg-Schulz says, “ancient man concentrated his attention on the sun as a *thing* rather than the more general concept of *light*” (31).⁴⁷ It is no accident that light feels alive and it almost has a spiritual quality. Light is life enhancing and affects the moods we feel and colors we see. We see light change throughout the day as the earth turns away from the sun and we are faced with the black and starry expanses of

the sky. The moonlight and stars cast all light that is seen at night, thus, night is a shadowed world.

Light is transmitted in an outward direction. Gothic architecture has introduced a splendor of light as we move from the dark shadows of the earth to

⁴⁷ Norberg-Schulz, Christian. *Genius Loci: Towards a Phenomenology of Architecture*. New York: Rizzoli, 1980. Print.

the bright heavens. The Abbey Church of Ste. Marie-Madelene, we see the dematerialization of the architectural surfaces to what appears to be a growing forest. The glazing allows light to penetrate the church and deem it sacred, but it also convinces us that nature itself is sacred.

Life

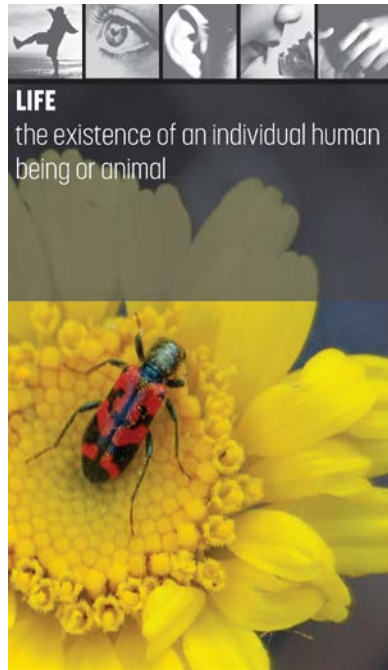


Figure 35: Life [Image Sources: See Figures 27-31, Zion National Park. *Ornate Checkered Beetle on Desert Marigold*. www.flickr.com, Altered by Rochelle Heyworth]

Light is paired with shadows as life is paired with death; in other words birth is paired with death. Life can be understood as a timeframe in which a person dwells upon the surface of the earth. Seasons are directly related to the changing sun and position of the stars, thus life on earth depends on events in the sky. Although life is thought of as having a beginning, middle and end, life is a reality that completes our conscious minds. Eliade explains, “time constitutes man’s deepest existential dimension; it is linked to his own life, hence it has a beginning and an end,

which is death, the annihilation of his life” (71).⁴⁸

⁴⁸ Eliade, Mircea, and Willard R. Trask. *The Sacred and the Profane: The Nature of Religion*. New York: Harcourt, Brace, 1959. Print.

Moon

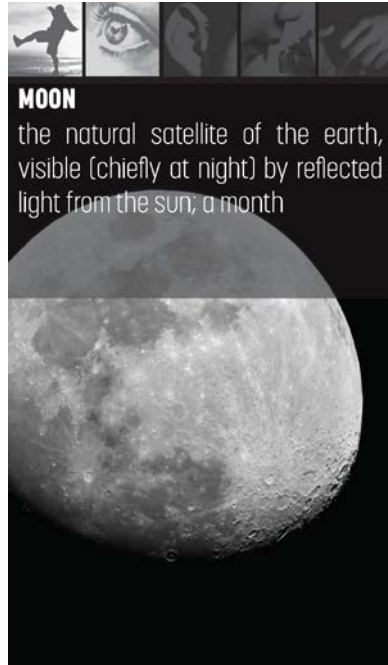


Figure 36: Moon [Image Sources: See Figures 27-31, Familiar. *Moon*. www.flickr.com, Altered by Rochelle Heyworth]

Time, as seen in the tides of water, is directed and measured by the phases of the moon. The phases of the moon showed early humans the most concrete sense of time. It governs all spheres of nature that fall under recurring cycles, such as water, rain, plant life, and fertility. The moon is perceived as returning to its beginnings. Eliade explains this phenomena: “The moon, on the other hand, is a body which waxes, wanes and disappears, a body whose existence is subject to the universal law of becoming, of birth and death.

The moon, like man, has a career involving tragedy, for its failing, like man’s ends in death. For three nights the starry sky is without a moon. But this “death” is followed by a rebirth; the “new moon”. The moon’s going out, in “death”, is never final” (154)⁴⁹

⁴⁹ Eliade, Mircea. *Patterns in Comparative Religion*. Cleveland: World, 1963. Print.

Water

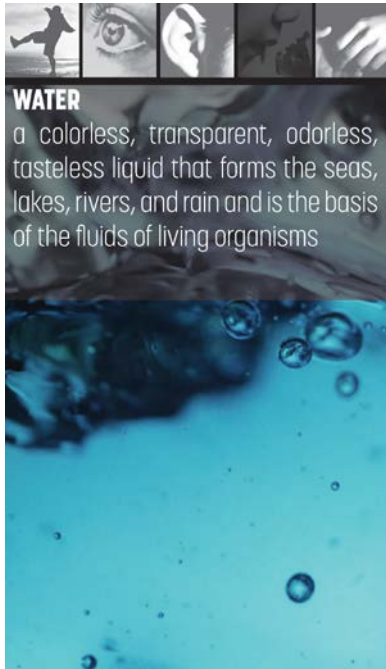


Figure 37: Water [Image Sources: See Figures 27-31, Fox. *Blue Water*. www.flickr.com, Altered by Rochelle Heyworth]

Carl Jung has argued that water is an archetypal symbol of the unconscious and the unknown, and Mircea Eliade confirms that the symbolism of water directly correlates to the moon. The rhythms of water, such as rain and tides, are results of the waxing and waning of the moon. Metaphysically, water contains life, strength and eternity. The ephemeral reflections on the surfaces of water suggest a parallel world, denoting transcendence and another realm that exists just beneath the surface of reality. This parallel world compliments the duality of death coexisting with life. Immersion in water does not necessarily mean death, but “a temporary reintegration into the formless, which will be followed by a new creation, a new life or a new man” (212).⁵⁰

Unlike the churches and monasteries of the west, Japanese religious buildings include, but transcend, the world of nature. Tadao Ando’s Water Temple contains water in an elliptical reinforced concrete basin. The basin also holds a concrete stair allowing for the visitor to descend into the temple. The symbolism held with this temple is that one would immerse oneself into water going in to the temple and return as a reinvented being.

⁵⁰ Eliade, Mircea. *Patterns in Comparative Religion*. Cleveland: World, 1963. Print.

Earth and Sky

According to Mircea Eliade, the sky and earth are commonly seen as a primordial pair throughout the world. It is inherently believed that the sky fertilizes the earth with rain, and the earth produces grains and grass.⁵¹ Heidegger has introduced concepts of earth and sky and explains that we dwell upon the earth while our heads are in the sky; the “Earth is the serving bearer, blossoming and fruiting, spreading out in rock and water, rising up into plant and animal...The sky is the vaulting path of the sun, the course of the changing moon, the glitter of the stars, the year’s seasons, the light and dusk of day, the gloom and glow of night, the clemency and inclemency of the weather, the drifting clouds and blue depth of the ether...” (147)⁵²

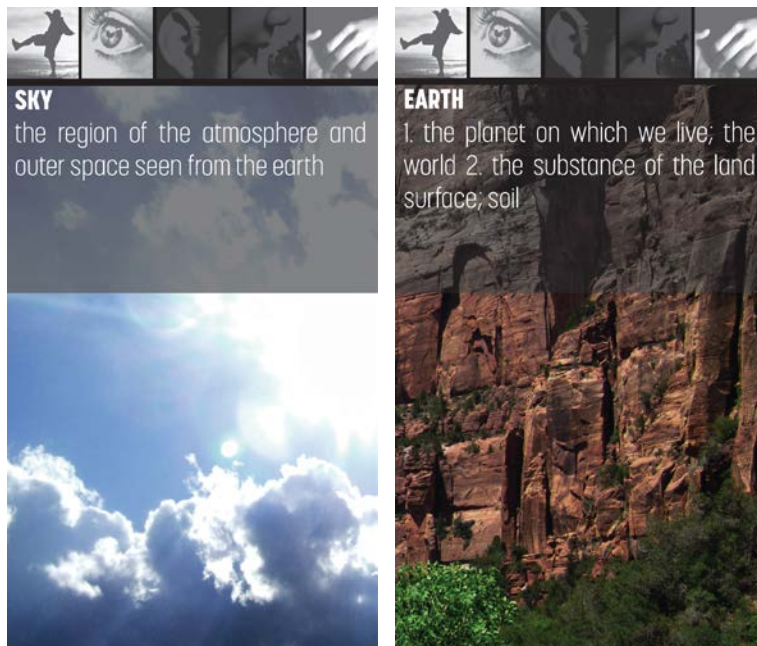


Figure 38: Sky [Image Sources: See Figures 27-31, Connelly, Kevin. *Sun through Clouds*. www.flickr.com, Altered by Rochelle Heyworth]

Figure 39: Earth [Image Sources: See Figures 27-31, Kerr, Doug. *Zion National Park – Utah*. 2013. www.flickr.com, Altered by Rochelle Heyworth]

⁵¹ Eliade, Mircea. *Patterns in Comparative Religion*. Cleveland: World, 1963. Print.

⁵² Heidegger, Martin. *Poetry, Language, Thought*. New York: Harper & Row, 1971. Print.

The earth and sky are constant backdrops to our lives and constantly overlooked. Earth is the foundation of existence, while the sky is high and inaccessible. Where the earth and sky meet at the horizon are denoted as sacred because it symbolizes transcendence from the human world to another realm. An opening in the upward direction ensures a communication with the unattainable sky so, symbolically speaking, the gods can descend to the earth and humans can ascend to the heavens. The Ziggurat of Ur, constructed in 2100 BC, was the first true ziggurat to connect the earth to the sky by a continuous stairway or ramp.

Earth

Rocks, dirt and stones are major components that make up the earth surfaces. There is a sense of permanence when conscious of stones. The ruggedness and hardness of stone was a primitive hierophany in religious consciousness. Nothing is more filled with strength and solidity than majestic rock. It is imagined that the properties of rock do not change and will forever *dwell* on the surface of this earth. In Medieval paintings, rocks and mountains were seen as symbols of wilderness, thus mountains remained distant and somewhat frightening to people even in the time of Romanticism and Transcendentalism. To clarify, not all stones are held to be sacred. Because of rituals, rarity, or particular shapes and sizes make *some* stones valued.

Sky

Like earth, and more specifically stone, the sky shows itself as an infinite vault *above* the earth. Eliade describes the sky as a symbol of transcendence due

to its infinite height. The symbolism calls for an immediate realization of a person's place in the universe. Before any sacred or divine values are applied to the sky, it reveals its transcendent nature. Although its height attributes to its sacredness, the sky "exists because it is high, infinite, immovable, powerful" (39).⁵³ Visually, the sky appears high, but in fact we *stand* in the sky. The sky actually begins at the horizon of the earth.

Cosmos

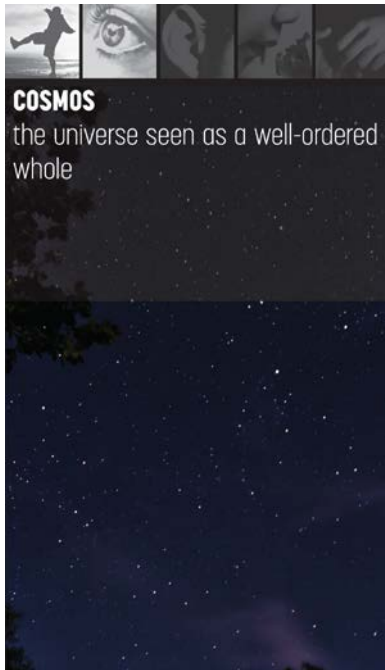


Figure 40: Cosmos [Image Sources: See Figures 27-31, Galens, Kevin. *Night Sky III*. 2011. www.flickr.com, Altered by Rochelle Heyworth]

The cosmos can also be seen as spanning time. For some North American Indian languages the term *world* means *cosmos*; the cosmic is conceived as a living thing that dies and is reborn at the ending and beginning of each year.⁵⁴ From the beginning of humanity people looked to the cosmos to give meaning to the territories and homes they constructed. By giving value to the cosmos, a house or territory was projected to the four cardinal directions from a central point. The notion of the cosmos has been a major contributor to archetypal formations filled with symbolic meaning.

⁵³ Eliade, Mircea. *Patterns in Comparative Religion*. Cleveland: World, 1963. Print.

⁵⁴ Eliade, Mircea. *Patterns in Comparative Religion*. Cleveland: World, 1963. Print.

Chapter 6: Archetypal Forms

Because humans have the ability to question their existence, they create symbols as a means of communication to express the extraordinary themes of their sacred lives. Yi-Fu Tuan best explains the symbols of transcendence saying, “As a symbol of the cosmos, the city takes on the regular geometric shape of a circle, square, rectangle or some other polygon. An architectural index of the vertical such as the ziggurat, the pillar, and the dome also serves to highlight the city’s transcendental significance” (153).⁵⁵ This section will look at *how* these archetypal forms achieved sacred connotations and *why* we perceive them as having transcendent powers. These forms will become a tool to enhance activities within Zion National Park

Cosmic Mountain, Pyramid and Ziggurat

Mountains, Pyramids and Ziggurats have been merged into one category because as seen in the most archaic cultures, sacred temples imitated the mountains, which symbolized the highest point where one can pass from one cosmic level to another. At an early stage in human history, the mountain was viewed with awe as it towered above the plains and was difficult to approach. The mountains, pyramids and ziggurats hold a central point, the world’s axis, infusing the places with sacred power.

⁵⁵ Tuan, Yi-fu. *Topophilia: a Study of Environmental Perception, Attitudes, and Values*. Englewood Cliffs, N.J.: Prentice-Hall, 1974. Print.

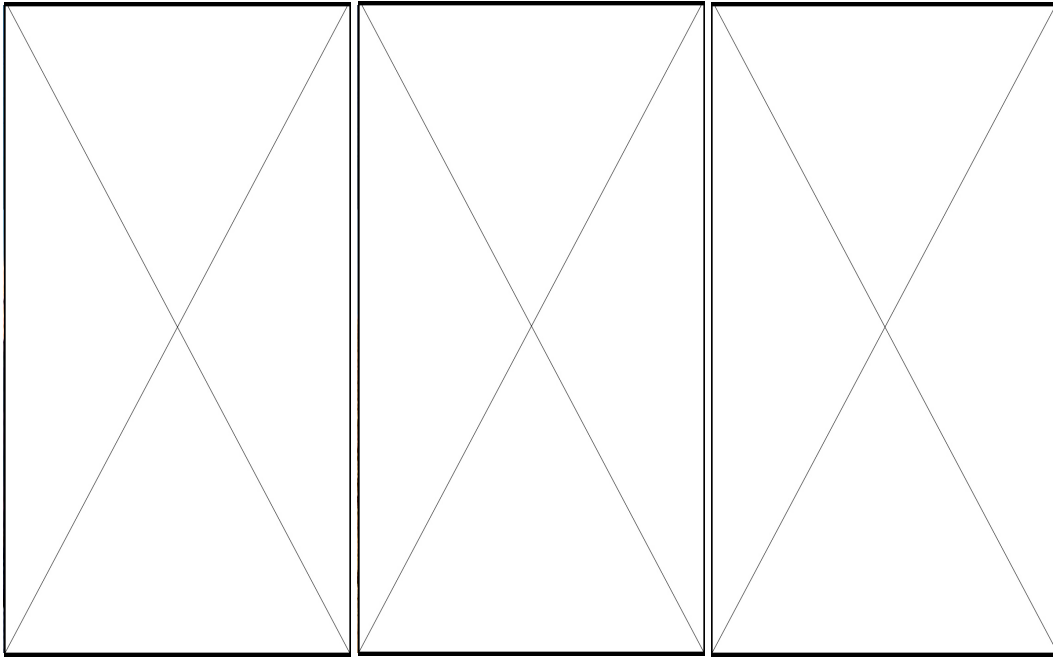


Figure 41: Cosmic Mountains [Image Source: <http://wikitravel.org/en/File:FujiSunriseKawaguchiko2025WP.jpg>, Altered by Rochelle Heyworth]

Figure 42: Pyramid [Image Source: <http://en.wikipedia.org/wiki/File:Kheops-Pyramid.jpg>, Altered by Rochelle Heyworth]

Figure 43: Ziggurat [Image Source: http://en.wikipedia.org/wiki/File:Chichen-Itza_El_Castillo.jpg, Altered by Rochelle Heyworth]

Axis Mundi and Center

Symbolism of the center plays a critical role in all great religions of history. Like the cosmic mountains, pyramids and ziggurats, the center and axis mundi provide a point of communication between the earth on which we live to the underworld below us and the heavens above us. Communication with these cosmic regions can be expressed by a pillar, ladder, mountain, tree or vine. All these images refer to the axis mundi.

In Britton's *Constructing the Ineffable* Emilie Townes explains the power of the center. She claims "architecture that remembers this aspect of the immaterial does not sit there glorying in itself. It evokes or provokes or invites and not simply to get a reaction, but to respect the ways in which humanity looks for meaning and purpose and often finds

this in pursuit of the sacred, the center” (79).⁵⁶ Power radiates from the center and returns. Architecture that respects this can give authenticity and coherence to those who experience these sacred architectural spaces.

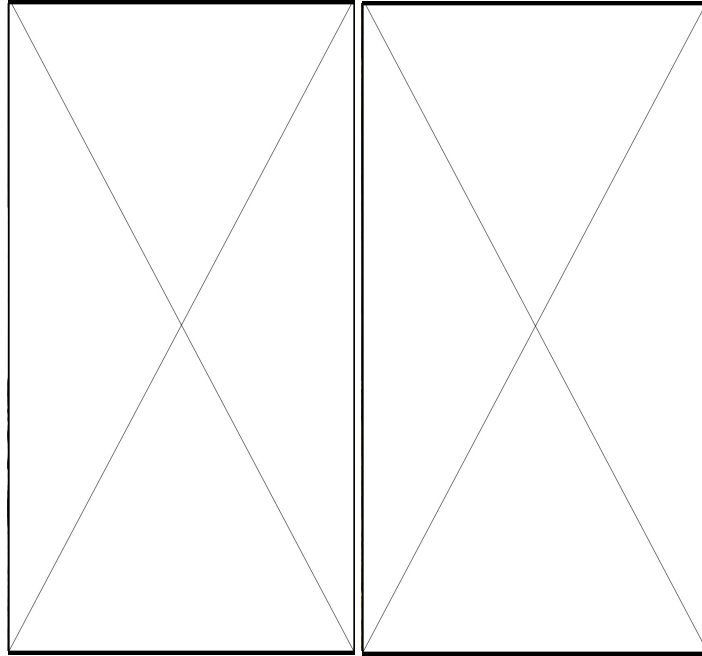


Figure 44: Axis Mundi [Image Source: <http://sunnysideup2006-7.blogspot.com/2011/02/asda.html>, Altered by Rochelle Heyworth]

Figure 45: Center [Image Source: Photograph by Rochelle Heyworth, Altered by Rochelle Heyworth]

Oculus and Opening

The most archaic level of transcendence is express by various openings, thus there must be a door to the world above to ensure communication with the world of the gods. Examples of openings can be seen as an oculus, smoke hole, or any other hypethral opening.

⁵⁶ Britton, Karla. *Constructing the Ineffable: Contemporary Sacred Architecture*. New Haven, Conn: Yale School of Architecture, 2010. Print.

The dwellings, or kivas, of the Anasazi peoples of the American Southwest utilized the hearth as the function of the central pillar. This pillar is assured by the opening in the roof through which smoke escapes.

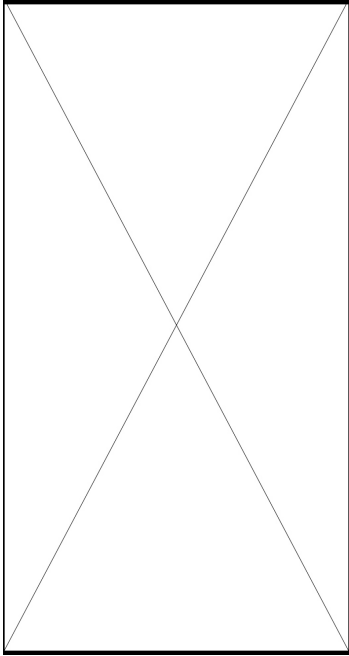


Figure 46: Oculus [Image Source: Photograph by Rochelle Heyworth, Altered by Rochelle Heyworth]

Mandala and Circle

The mandala is considered a diagram of the cosmos where the center holds sacred powers. The mandala takes form in petals of a lotus, rays of the sun wheel, the healing circle of the Navajo, rose windows of churches, halos of Christian saints, and layouts of certain Indian and Chinese temples and idealized cities.⁵⁷ The ancients believed that movement in nature followed a circular path causing the circle to symbolize perfection.

⁵⁷ Tuan, Yi-fu. *Topophilia: a Study of Environmental Perception, Attitudes, and Values*. Englewood Cliffs, N.J.: Prentice-Hall, 1974. Print.

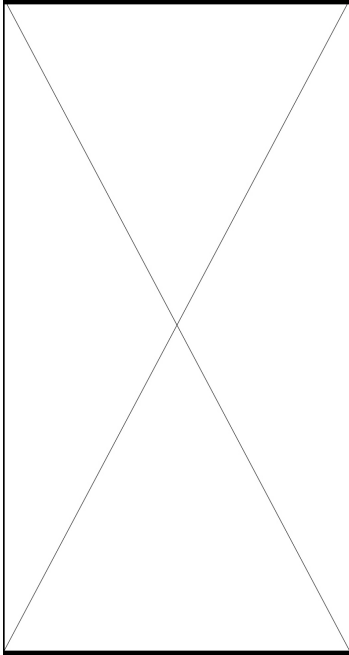


Figure 47: Mandala [Image Source: http://commons.wikimedia.org/wiki/File:COLLECTIE_TROPENMUSEUM_Luchtfoto_van_de_Borobudur_T_Mnr_10015636.jpg, Altered by Rochelle Heyworth]

Frame and Threshold

The act of framing a place or an object eliminates extra stimuli making the place or object of higher importance. For example, by the horizontal planes separated by glass in Philip Johnson's Glass House, the architecture is able to frame the horizon showing where the earth and the sky meet. Framing of the horizon line allows for one to observe diurnal changes as the sun rises and sets and the blackness of the night sky begins to fall.

A threshold separates the outside from the inside or one space from another. In many religions, cultures used thresholds as points along a path to be passed before reaching the inner sanctuary. According to Thomas Barrie, a threshold may be the first of many points of separation between the sacred and the profane. He explains, that the

entry of a precinct gains access to a path, which holds a sequence of defined spaces, place, or events that grow increasingly more sacred.⁵⁸

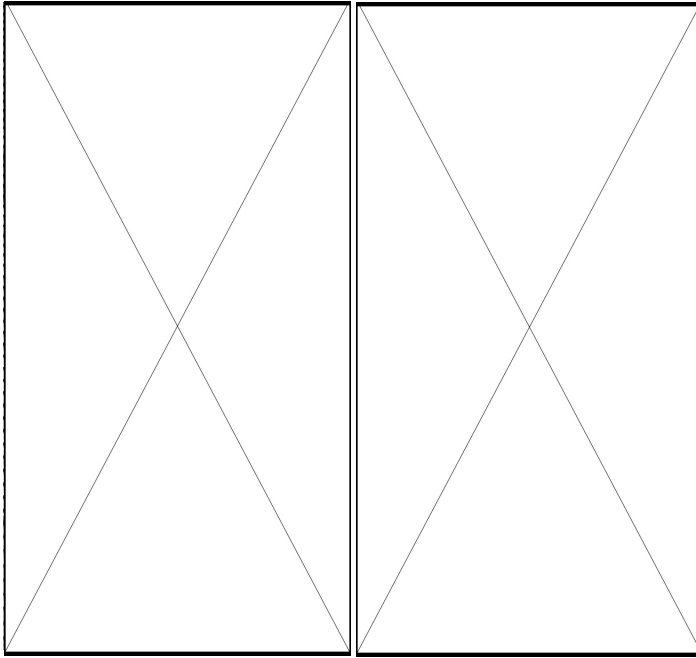


Figure 48: Frame [Image Source: <http://www.flickr.com/photos/16728847@N00/163553354/in/photolist-fsfHq-4wiP4m-4wiXQb-6KKTLs-73GWuW-7nbZfT-7nbZuv-7nbZvk-cj2VEj-aSPSmT-aSPTkF-bQgbHR-dM4Fy6-9QQJ9X-djbAGJ-9fFzpa-aSPPST-aSPFYT-bcWS18-bcWRhT-8r7gFv>, Altered by Rochelle Heyworth]

Figure 49: Threshold [Image Source: National Park Service. *Hall or Doorways of Pueblo Bonito*. www.nps.gov, Altered by Rochelle Heyworth]

Conclusions

The importance of understanding archetypal forms will impact and be seen throughout the design approaches of this thesis. Archetypal forms are universal across most cultures, ultimately allowing future interventions throughout National Parks to evoke a meaningful memory to visitors from all over the world.

⁵⁸ Barrie, Thomas. *Spiritual Path, Sacred Place: Myth, Ritual, and Meaning in Architecture*. Boston: Shambhala, 1996. Print.

Chapter 7: Precedents

Therme Vals

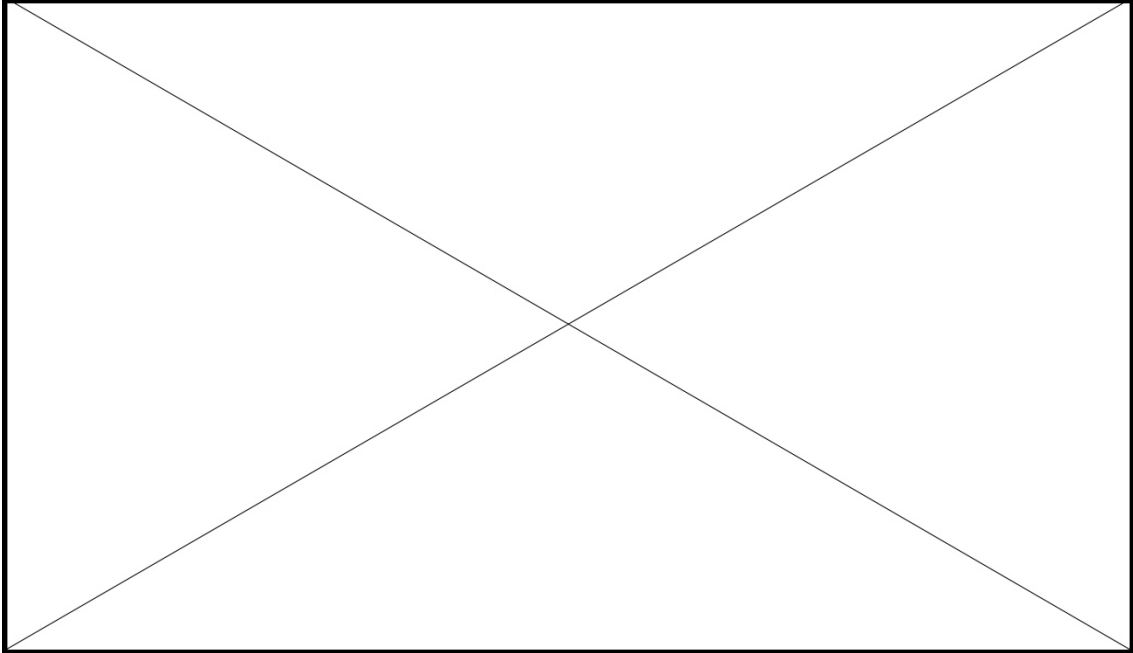


Figure 50: Therme Vals [Image Source: <http://www.archdaily.com/13358/the-therme-vals/>, Altered by Rochelle Heyworth]

Brion-Vega Cemetery

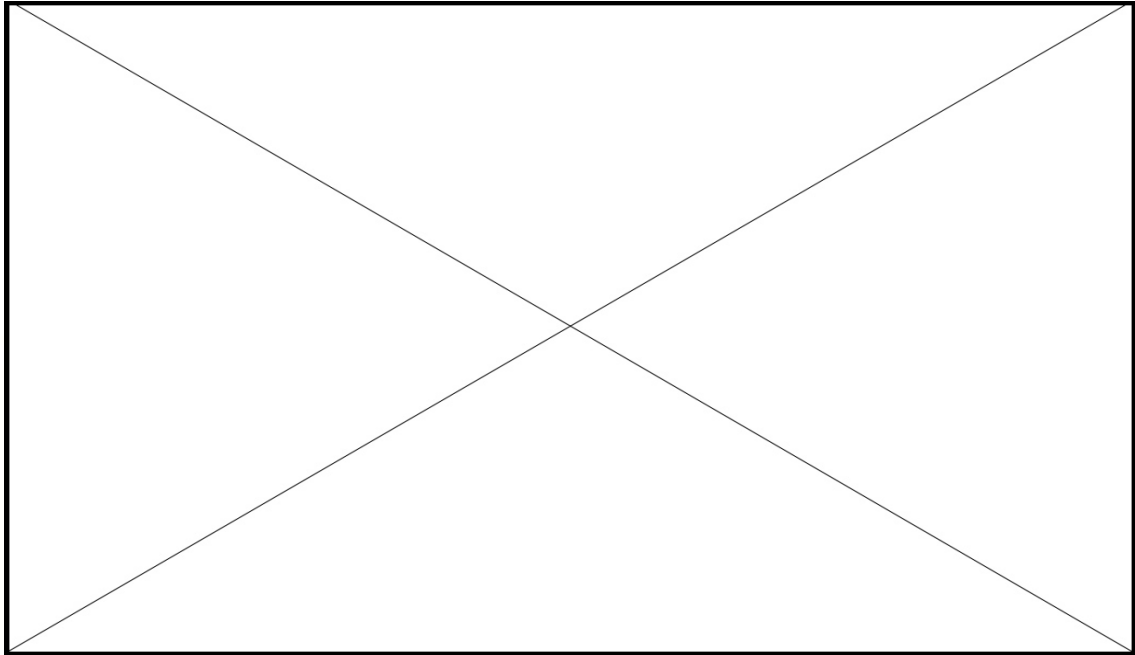


Figure 51: Brion-Vega Cemetery [Image Sources: Photographs by Rochelle Heyworth, <http://rupalsourendre.wordpress.com/category/history-and-theory/>, Altered by Rochelle Heyworth]

Roden Crater

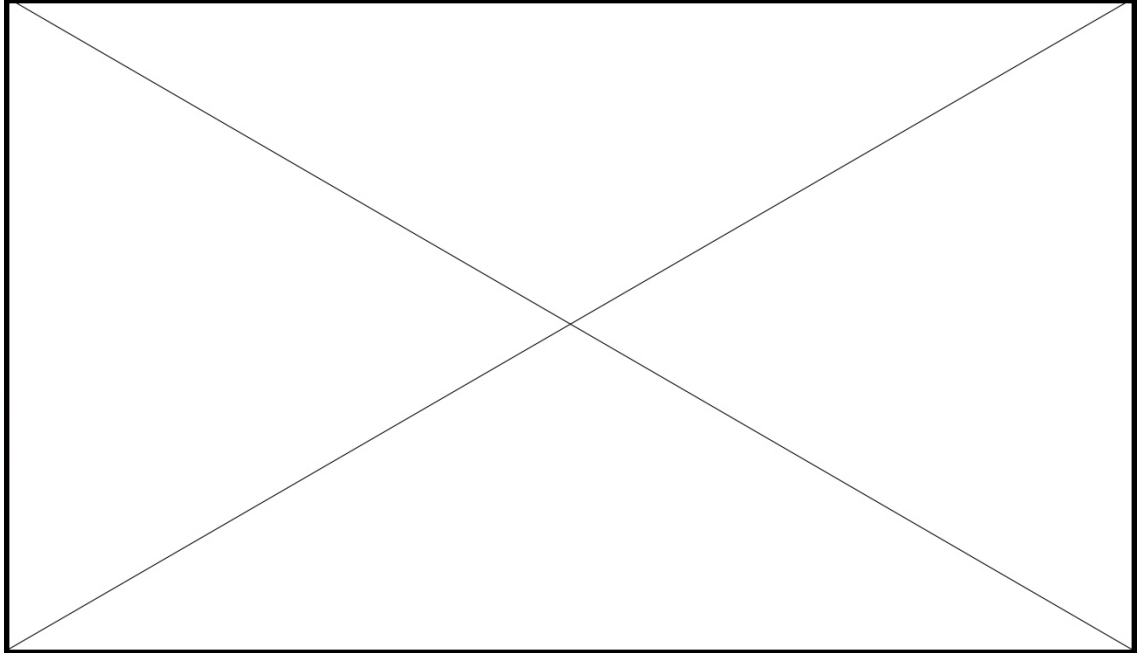


Figure 52: Roden Crater [Image Sources: <http://rodencrater.com/>, Altered by Rochelle Heyworth]

Bruder Klaus Field Chapel

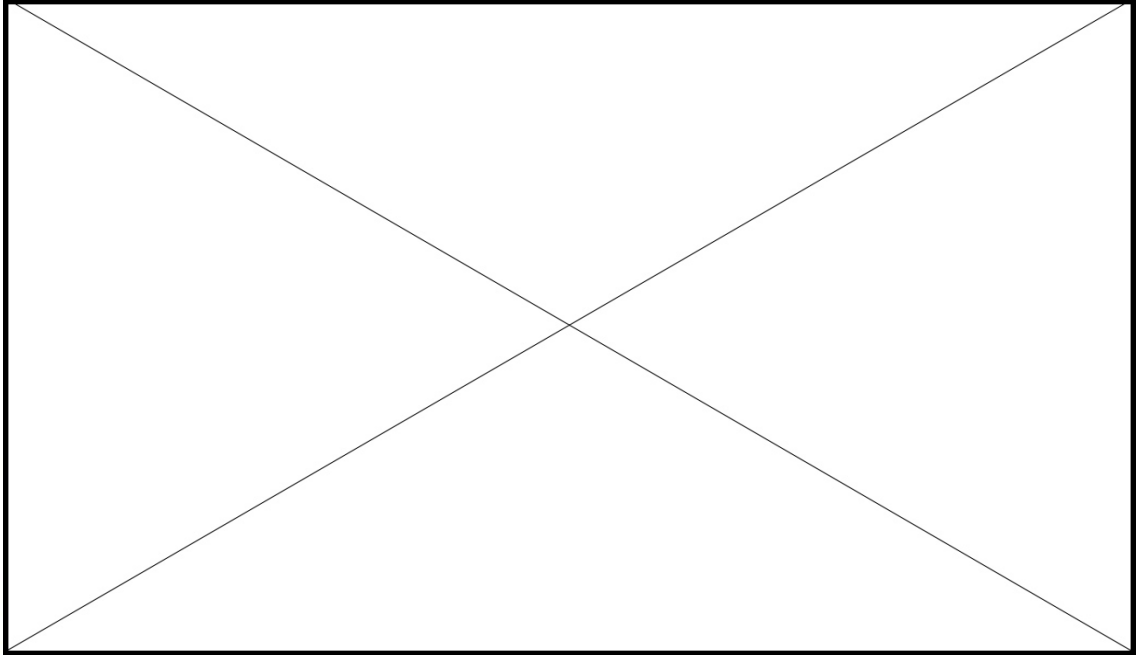


Figure 53: Bruder Klaus Field Chapel [Image Sources: <http://www.archdaily.com/106352/>, Altered by Rochelle Heyworth]

Chapter 8: Program Analysis and Activities

Upon my observations in Zion National Park and data gathered on the park's visitors, I was able to create a matrix of activities that might be incorporated into architectural applications throughout the park. But before I was able to determine activities, I needed to understand the types of people that visit the park, the length of their stay, and their group size. From this research I was able to determine two types of activities: physical and sedentary. Physical activities typically occurred along trails, while sedentary activities could occur anywhere throughout the park. The following charts explore physical and sedentary activities, the senses utilized during the activity, and the elements that enhance the experiences within the park. Each activity has the potential to be enhanced by spatial characteristics, material, and framing methods. The following charts will also look to precedents that spatially or programmatically address these activities.

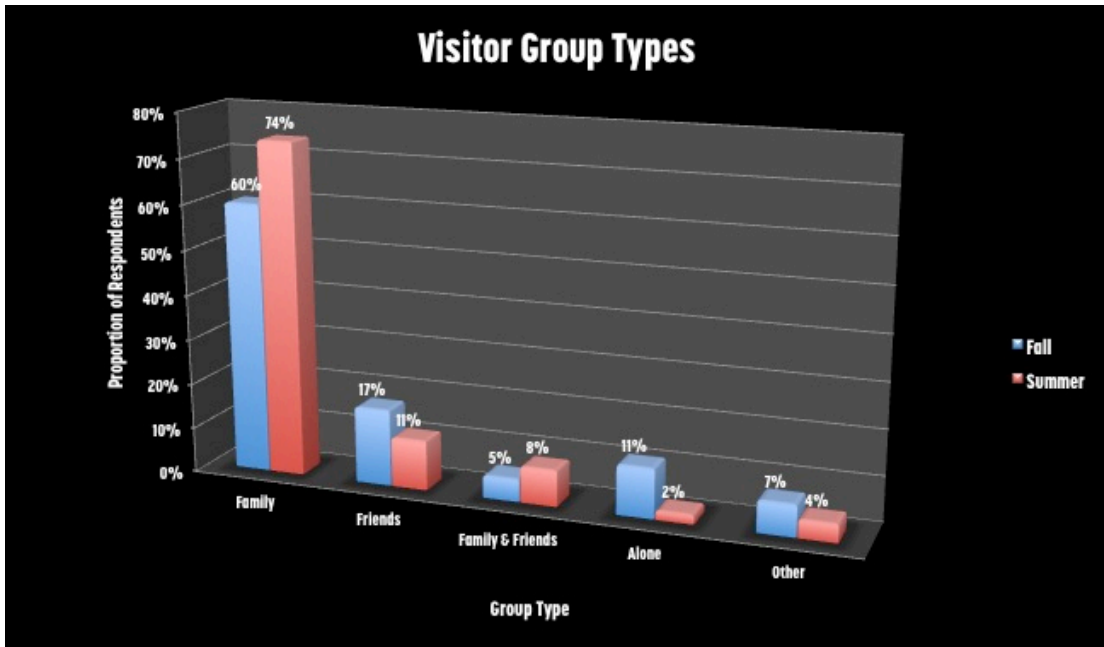


Figure 54: Visitor Group Types [Data Source: National Park Service. U.S. Department of the Interior. Social Science Program. *Zion National Park Visitor Study*. 2006. University of Idaho, Created by Rochelle Heyworth]

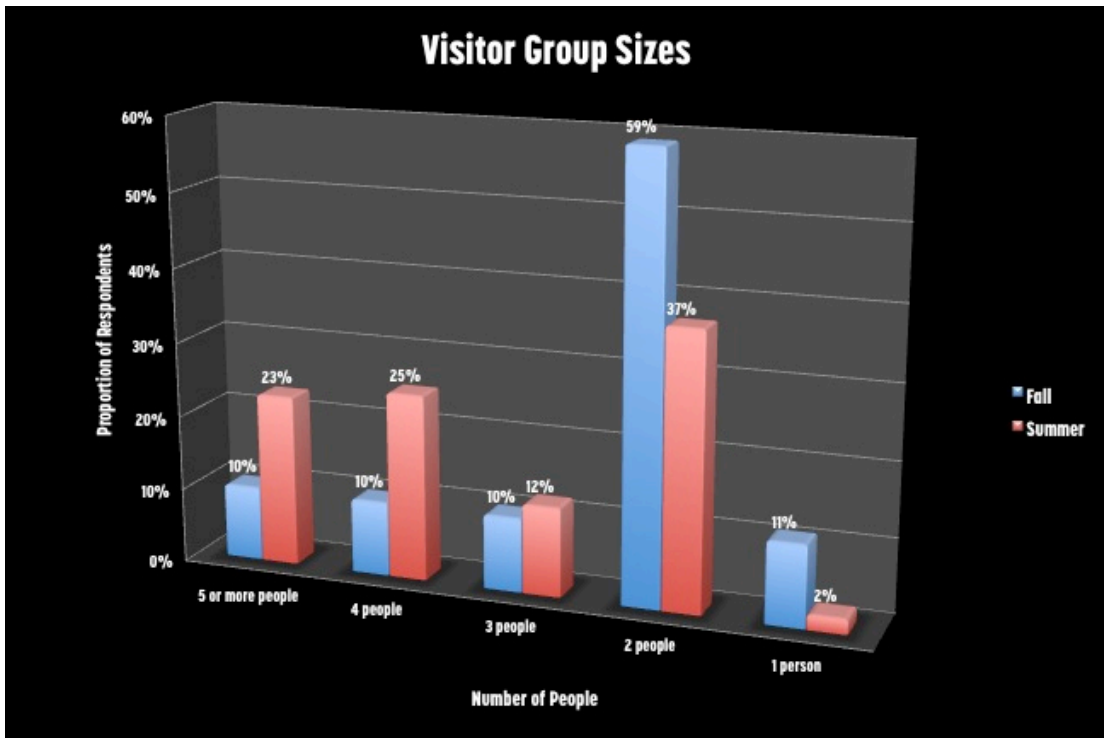


Figure 55: Visitor Group Sizes [Data Source: National Park Service. U.S. Department of the Interior. Social Science Program. *Zion National Park Visitor Study*. 2006. University of Idaho, Created by Rochelle Heyworth]

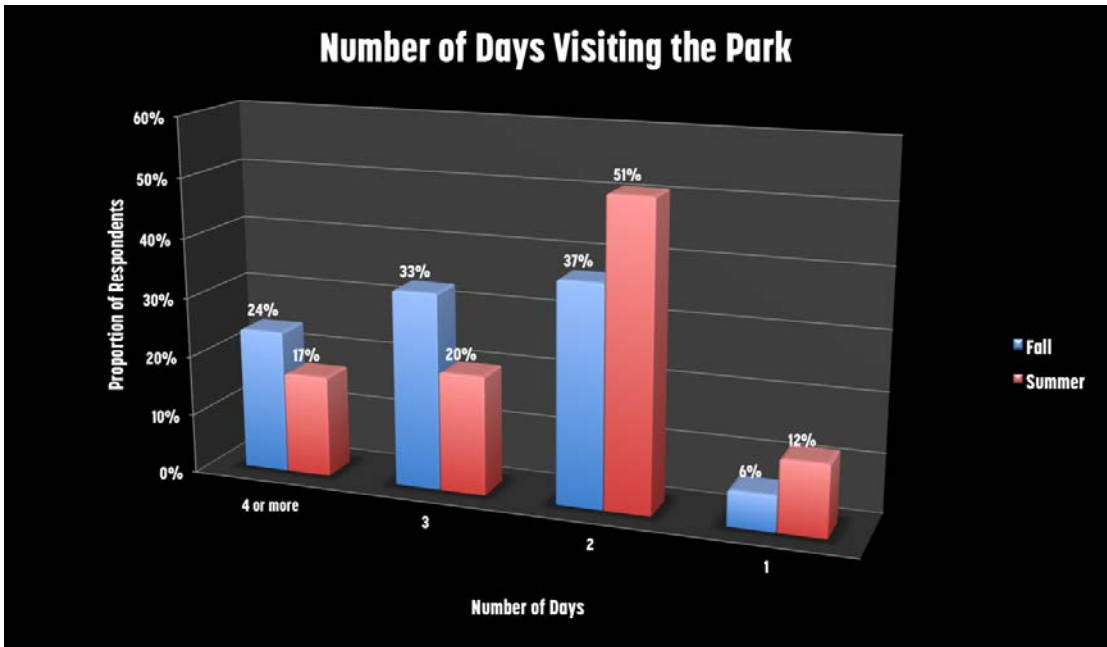


Figure 56: Number of Days Visiting the Park [Data Source: National Park Service. U.S. Department of the Interior. Social Science Program. *Zion National Park Visitor Study*. 2006. University of Idaho, Created by Rochelle Heyworth]

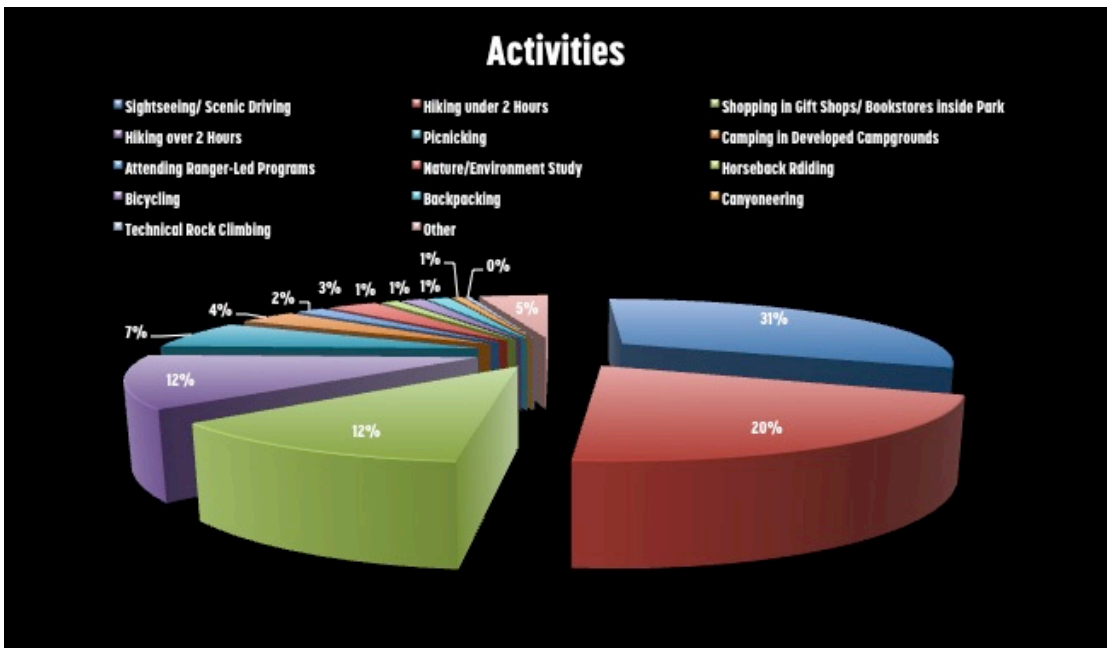


Figure 57: Activities in Park [Data Source: National Park Service. U.S. Department of the Interior. Social Science Program. *Zion National Park Visitor Study*. 2006. University of Idaho, Created by Rochelle Heyworth]

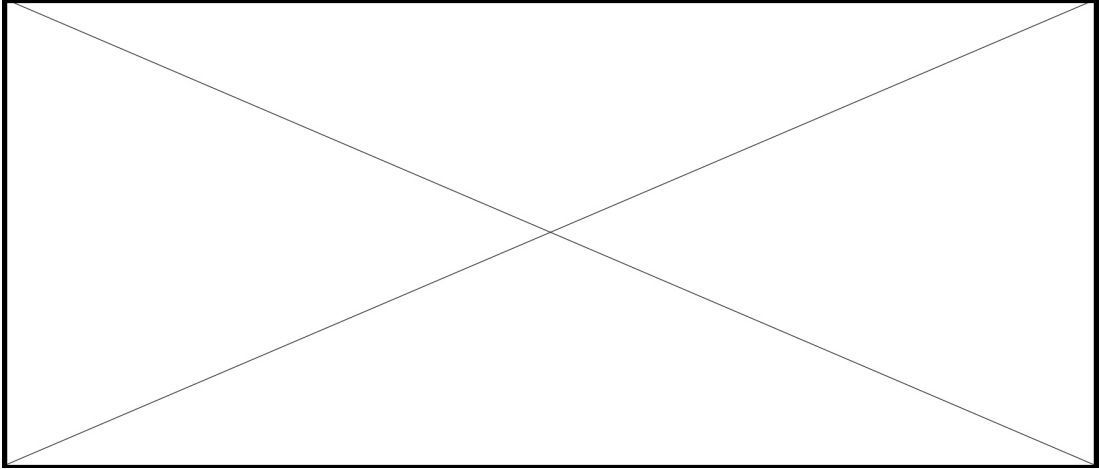


Figure 58: Types of People [Diagrams Created by Rochelle Heyworth]

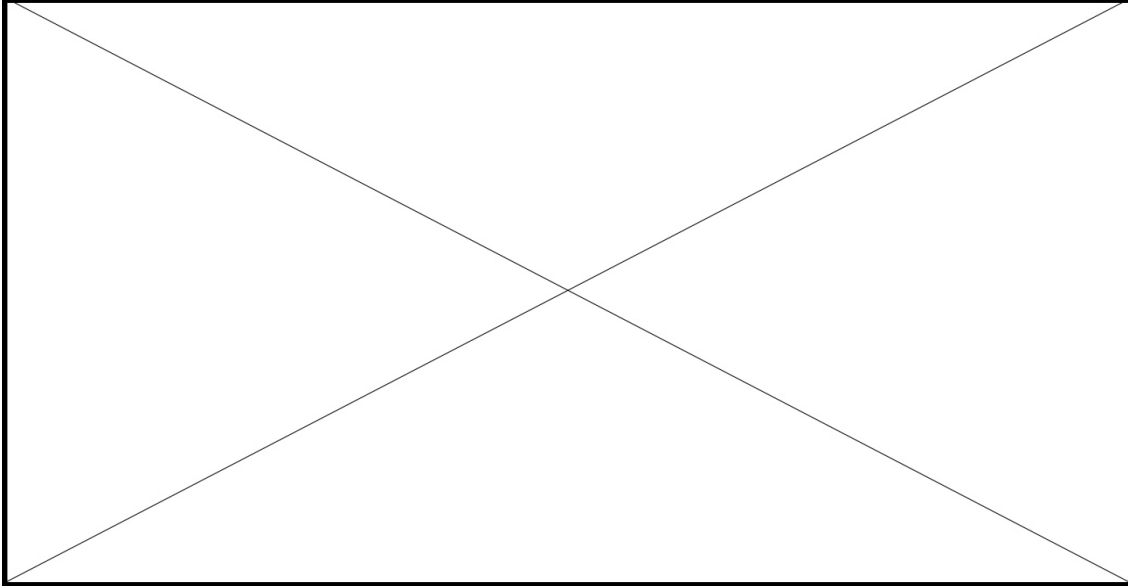


Figure 59: Physical Activities [Image Sources: See Figures 25 – 29, 31 – 33, 35 – 37, Granata. DSC07116. www.flickr.com, Garduno. Peacock. www.flickr.com, Dahlstrom. Sunset Cycling. www.flickr.com, Latteda. Hiking Silhouette. www.flickr.com, Mullen. Silhouettes on the Beach. www.flickr.com, <http://www.archdaily.com/61288/>, <http://www.archdaily.com/33902/>, <http://www.flickr.com/photos/16728847@N00/163553354/in/photolist-fsfHq-4wiP4m-4wiXQb-6KKTLs-73GWuW-7nbZtT-7nbZuv-7nbZvk-cj2VEj-aSPSmT-aSPTkF-bQgbHR-dM4Fy6-9QQJ9X-djbAGJ-9fFzpa-aSPPST-aSPFYT-bcWS18-bcWRhT-8r7gFv>, <http://vi.sualize.us/tag/luis%20barrag%C3%A1n/>, <http://www.archdaily.com/13358/the-therme-vals/>, Diagrams Created by Rochelle Heyworth]

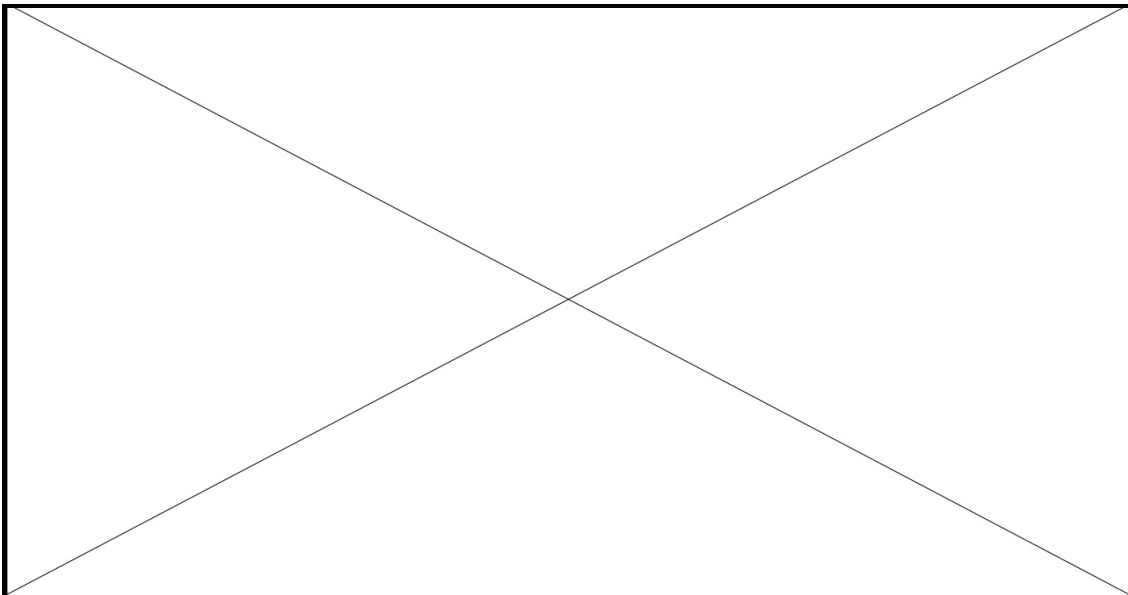


Figure 60: Sedentary Activities [Image Sources: See Figures 25 – 29, 31 – 38, <http://www.theopenedbox.com/spiritual-disciplines/deepak-chopra-the-7-spiritual-laws-of-success-videoblog/>, <http://www.tourism-review.com/travel-tourism-magazine-the-best-star-gazing-destinations-around-the-world-article1515>, Pearce. *Watching the Sunset*. www.flickr.com, Proembinski. *Reading*. www.flickr.com, <https://picasaweb.google.com/lh/photo/pZ6Ozs0TLz47suAnv4izpg><http://www.archsource.info/2488/nasu-history-museum>, <http://rodencrater.com/>, Vaughan. *Glass House*. www.flickr.com, <http://www.archdaily.com/161522/ad-classics-koshino-house-tadao-ando/>, Photograph by Rochelle Heyworth, Diagrams Created by Rochelle Heyworth]

Chapter 9: Design Approaches

Creating a Network of Sites

Zion National Park consists of 229 square miles of pedestrian and vehicular paths. Some of the pedestrian paths throughout the site would require an overnight stay via backpacking. The paths are ranked from easy, moderate, to strenuous which can determine the people who are able to access certain areas within the park. To enhance a transcendent or spiritual experience in the park for all types of visitors I will create a set of parameters for future development of over half a dozen sites ranging in accessibility, elevation, and amenity. Whether in shadows due to deep canyons most of the day or 2000+ feet above the canyon floor, each offer a different opportunity to amplify these experiences. Based upon my research, and the desire to preserve all natural environments, I've established a set of parameters for selecting sites within Zion National Park and other parks in the future. Sites that will have a minimal impact with a major potential to enhance the visitor experience any of these criteria, individually or combined will be great parameters for future projects, they include: designated campsites, panoramic views, tourist areas, established trails, parking lots, and/or unique geological features. When I propose that over time artists and architects could introduce interventions throughout the park, I say that with the intention that they would follow the framework that I have provided in this thesis. It is important to reiterate that any architectural interventions would enhance the visitor experience and look to the perceptual systems to create unique transformative experiences. Ultimately each site must be handled with care to evaluate the current characteristics and spatial qualities in order

to determine building strategies. It is important to determine the way that the architectural applications sit within the site because of the symbolic connotations that arise when building with the landscape.

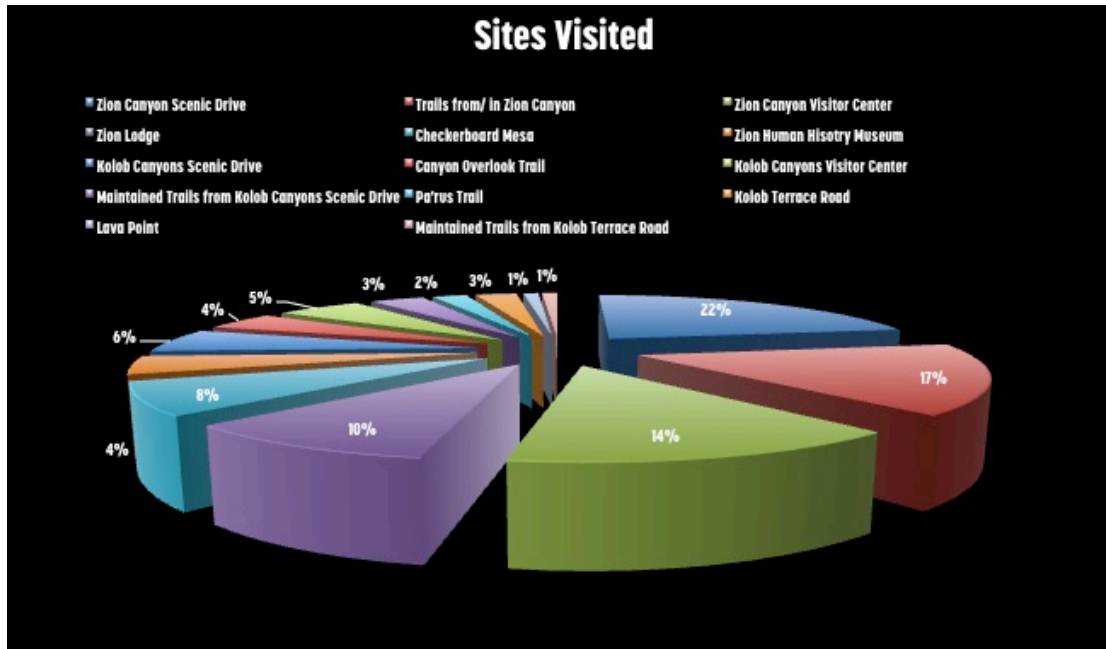


Figure 61: Sites Visited [Data Source: National Park Service, U.S. Department of the Interior, Social Science Program. *Zion National Park Visitor Study*. 2006. University of Idaho, Created by Rochelle Heyworth]

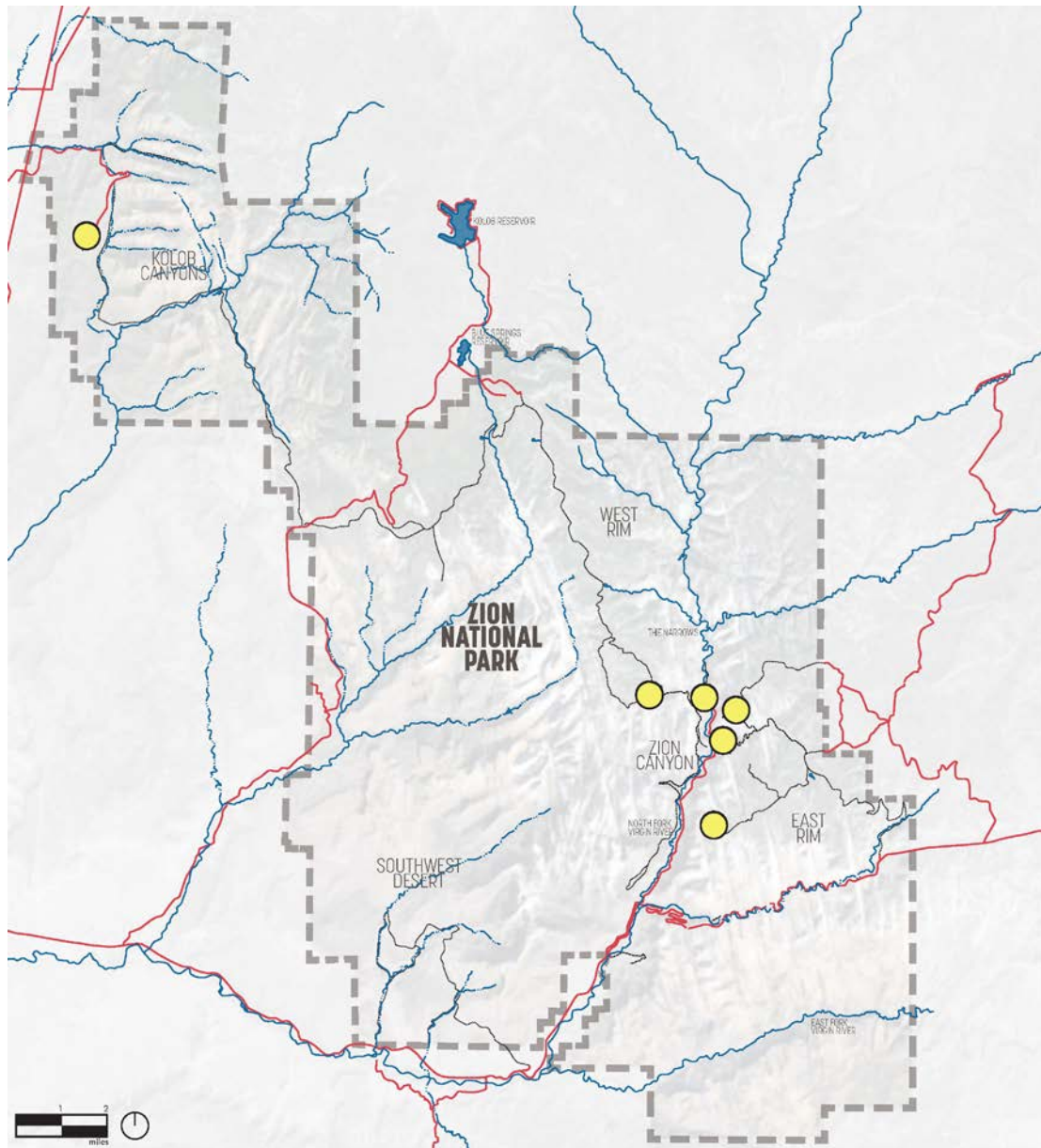


Figure 62: Sites in Zion [Image Source: <http://www.nps.gov/zion/playourvisit/upload/Zion-Park-Map-Website.pdf>, Altered by Rochelle Heyworth]

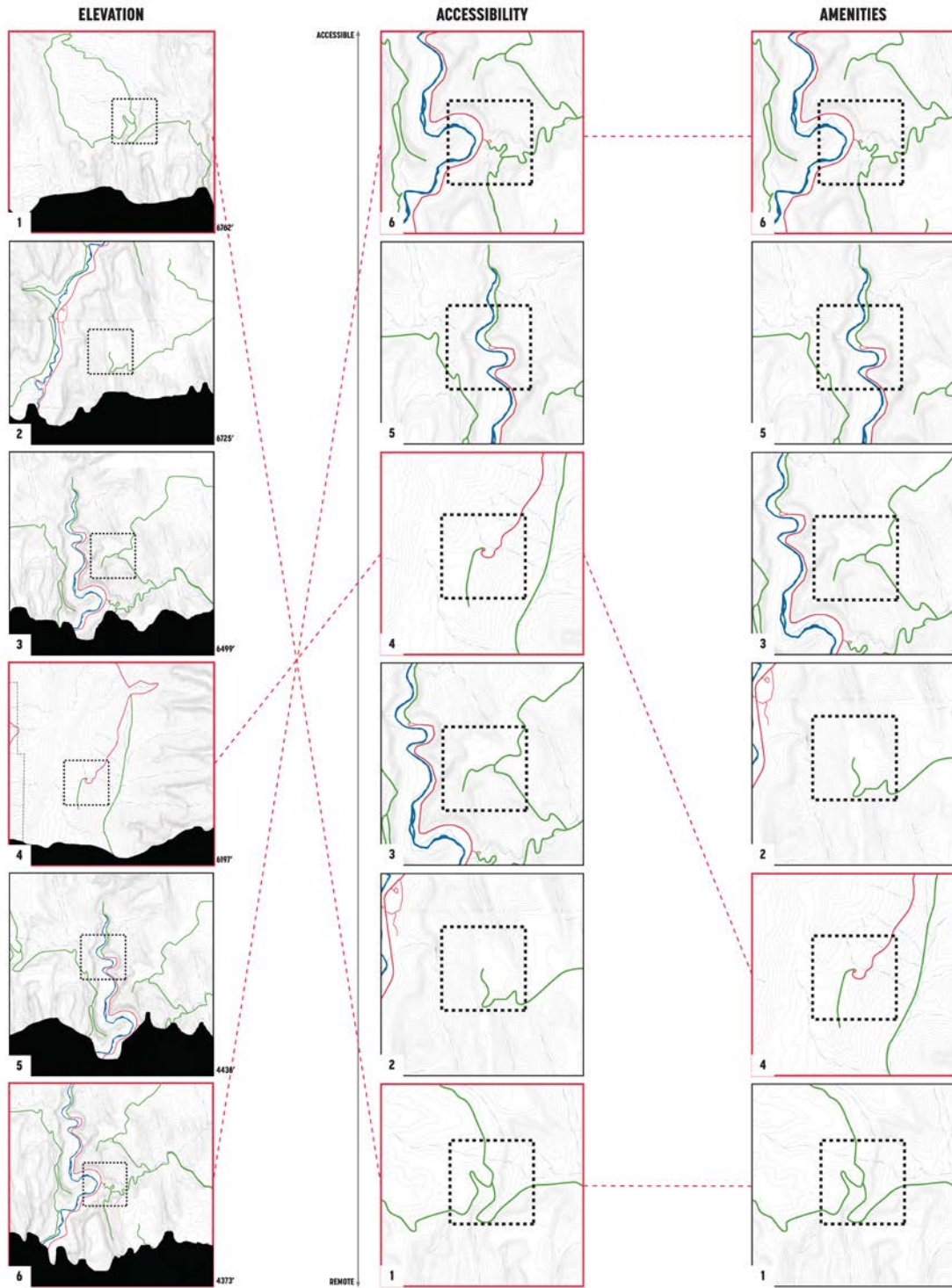


Figure 63: Site Analysis (Elevation, Accessibility, Amenities) [Image Source: USGS GeoPDFs of Zion National Park Area, Altered by Rochelle Heyworth]

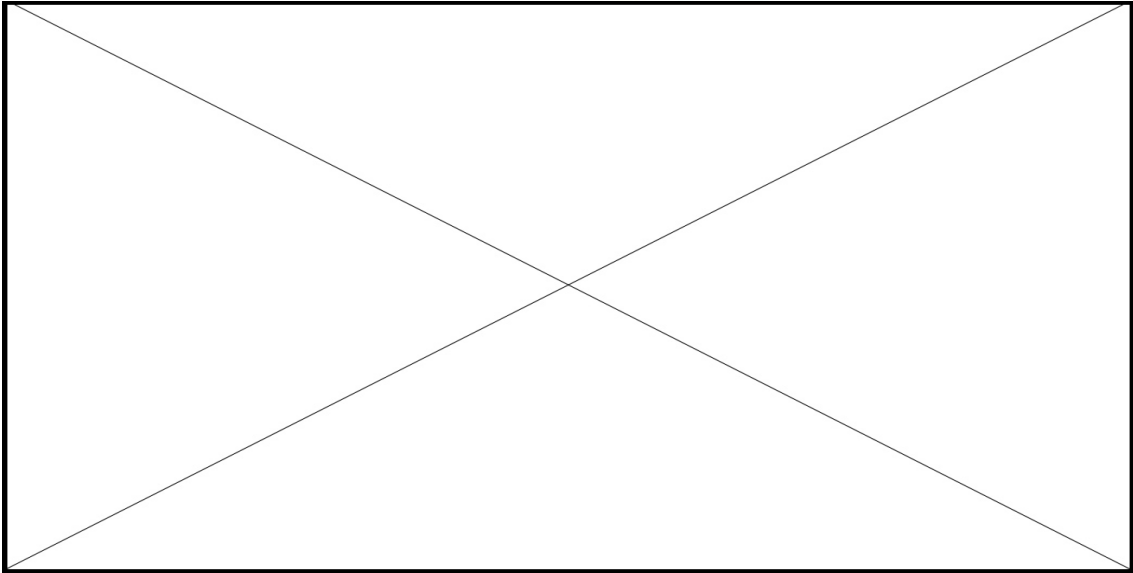


Figure 64: West Rim Trail [Image Sources: USGS GeoPDFs, Google Maps, Photographs by Rochelle Heyworth, Altered by Rochelle Heyworth]

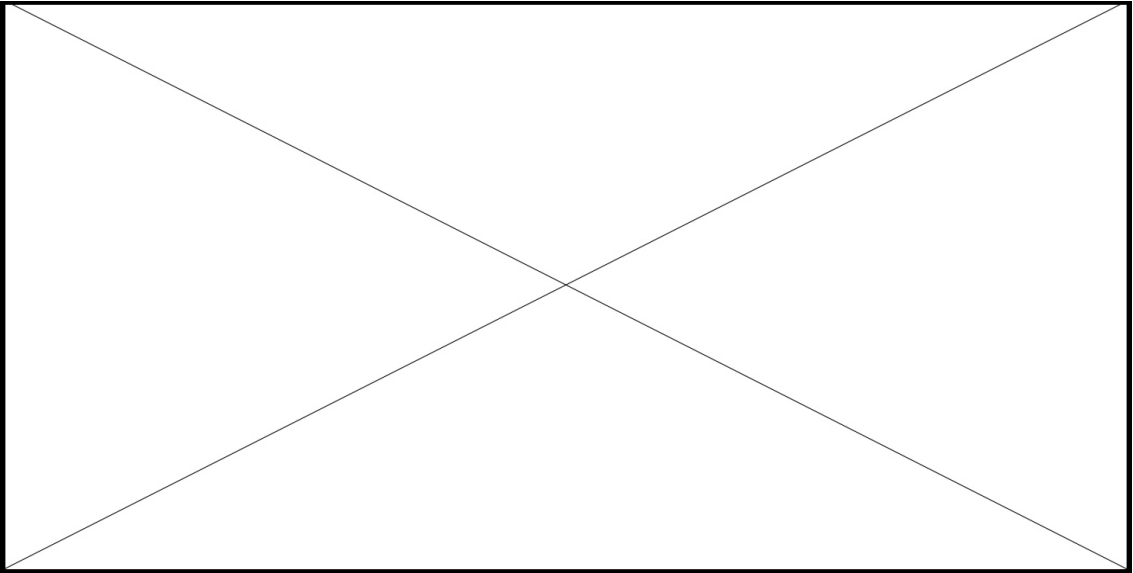


Figure 65: Deer Trap Mountain [Image Sources: USGS GeoPDFs, Google Maps, Photographs by Rochelle Heyworth, Altered by Rochelle Heyworth]

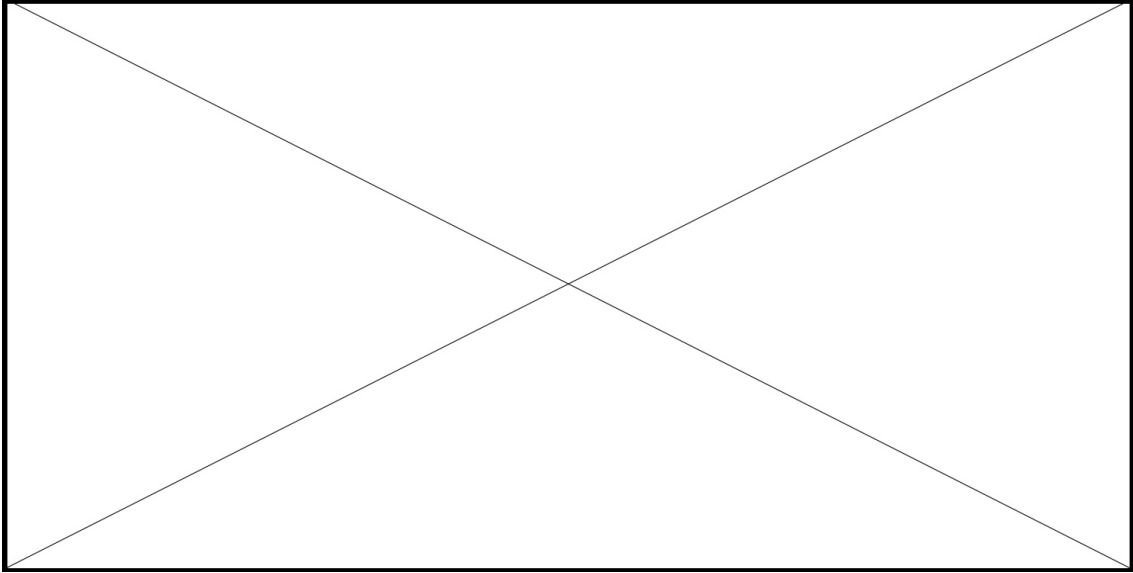


Figure 66: Observation Point [Image Sources: USGS GeoPDFs, Google Maps, Photographs by Rochelle Heyworth, Altered by Rochelle Heyworth]

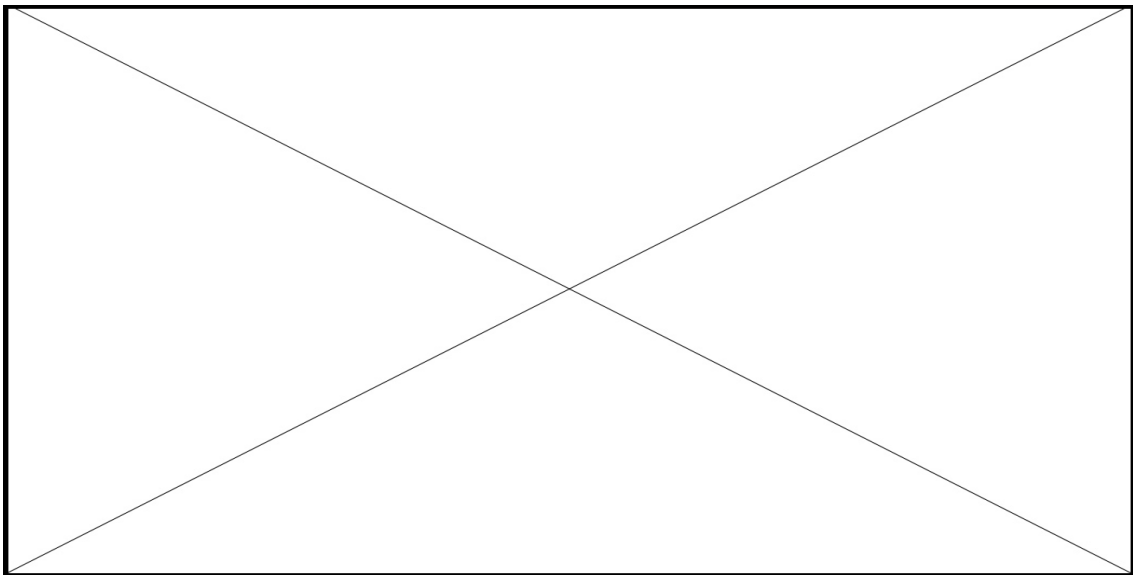


Figure 67: Kolob Canyons [Image Sources: USGS GeoPDFs, Google Maps, Photographs by Rochelle Heyworth, Altered by Rochelle Heyworth]

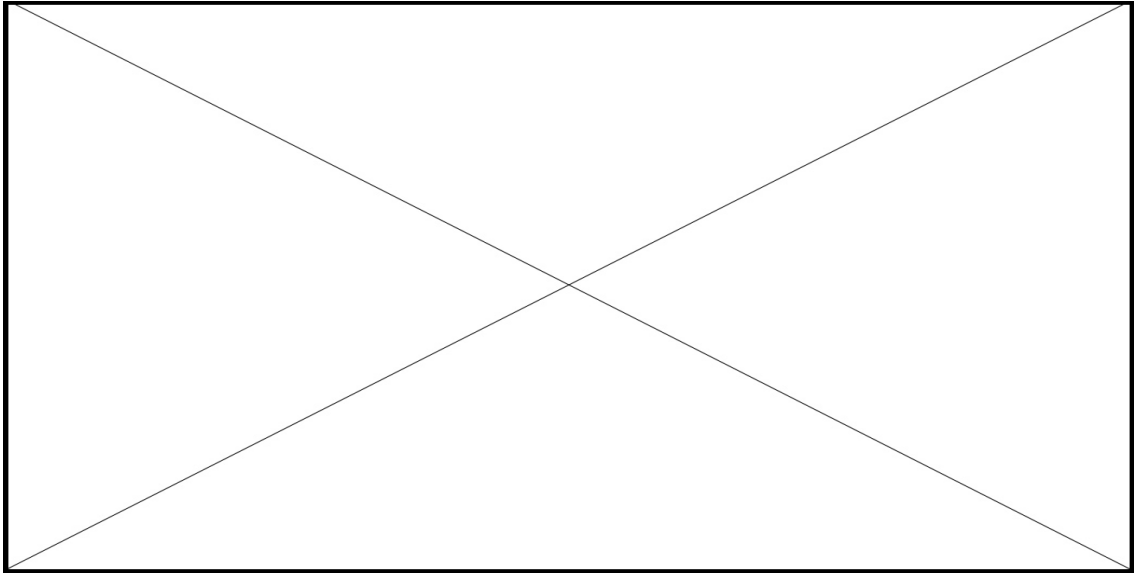


Figure 68: Temple of Sinawava [Image Sources: USGS GeoPDFs, Google Maps, Photographs by Rochelle Heyworth, Altered by Rochelle Heyworth]

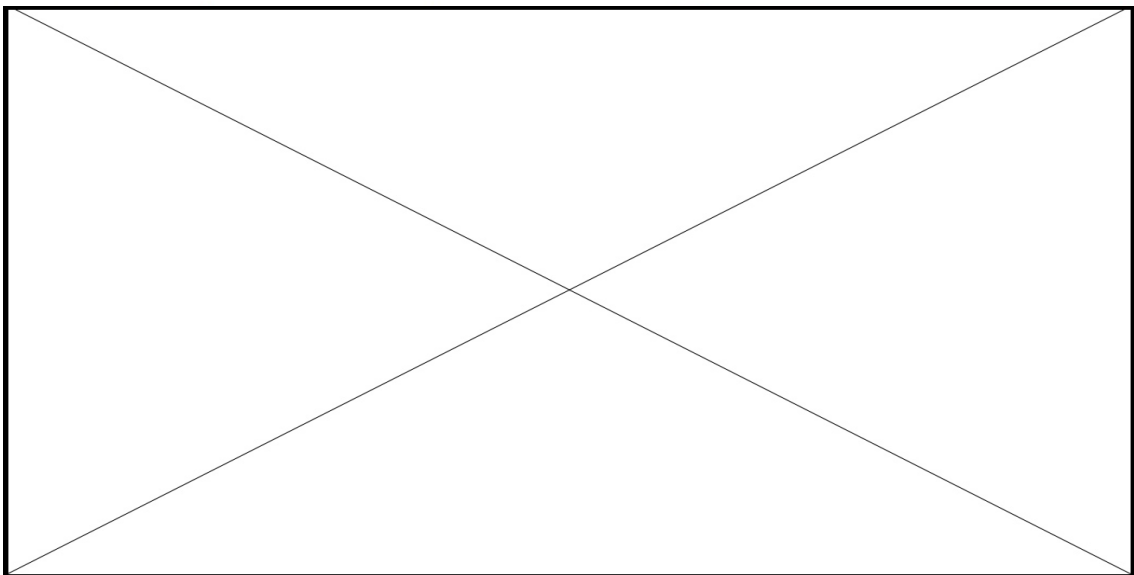


Figure 69: Weeping Rock [Image Sources: USGS GeoPDFs, Google Maps, Photographs by Rochelle Heyworth, Altered by Rochelle Heyworth]

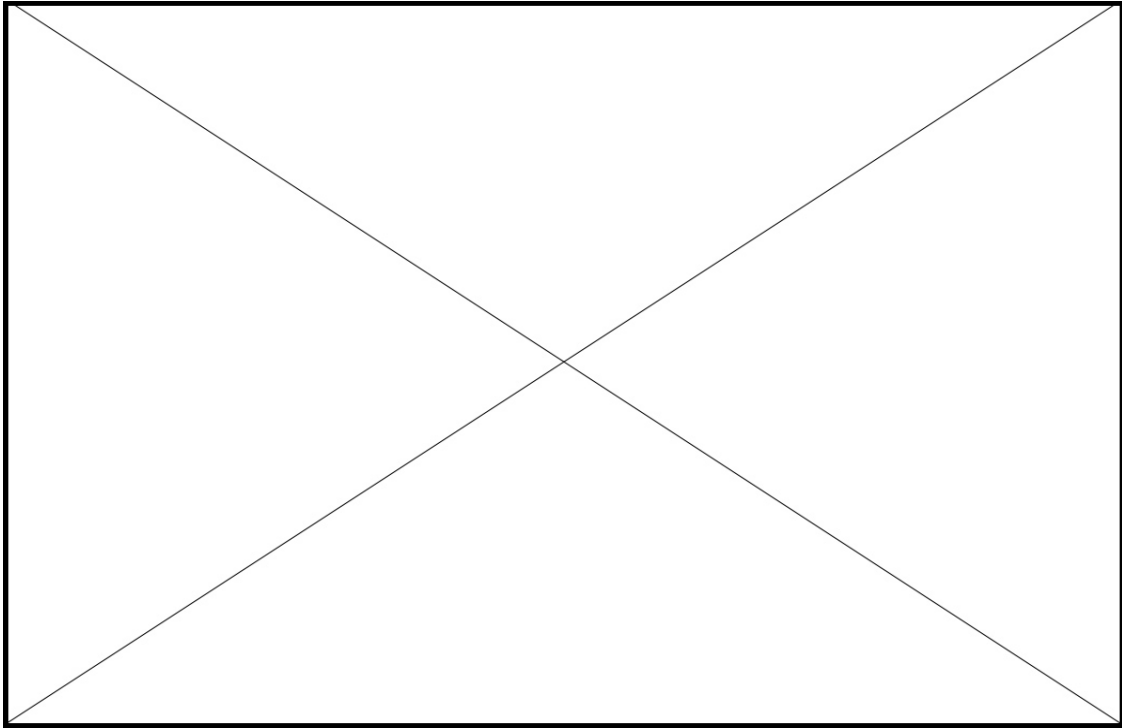


Figure 70: Parameters for Site Selection [Image Sources: <http://www.nps.gov/zion/planyourvisit/upload/Zion-Park-Map-Website.pdf>, Google Earth, Photographs by Rochelle Heyworth, Altered by Rochelle Heyworth]

Selecting Kolob Canyon

With much consideration, I selected the Kolob Canyon portion of Zion National Park to introduce a welcoming interpretive center. This center would act as a hub of inspiration and a grounding framework for future smaller interventions by architects and artists of later generations. Rather than introducing a new hub in the center of a highly toured area, I've selected the Kolob section of the park to draw visitors to this under-appreciated area.

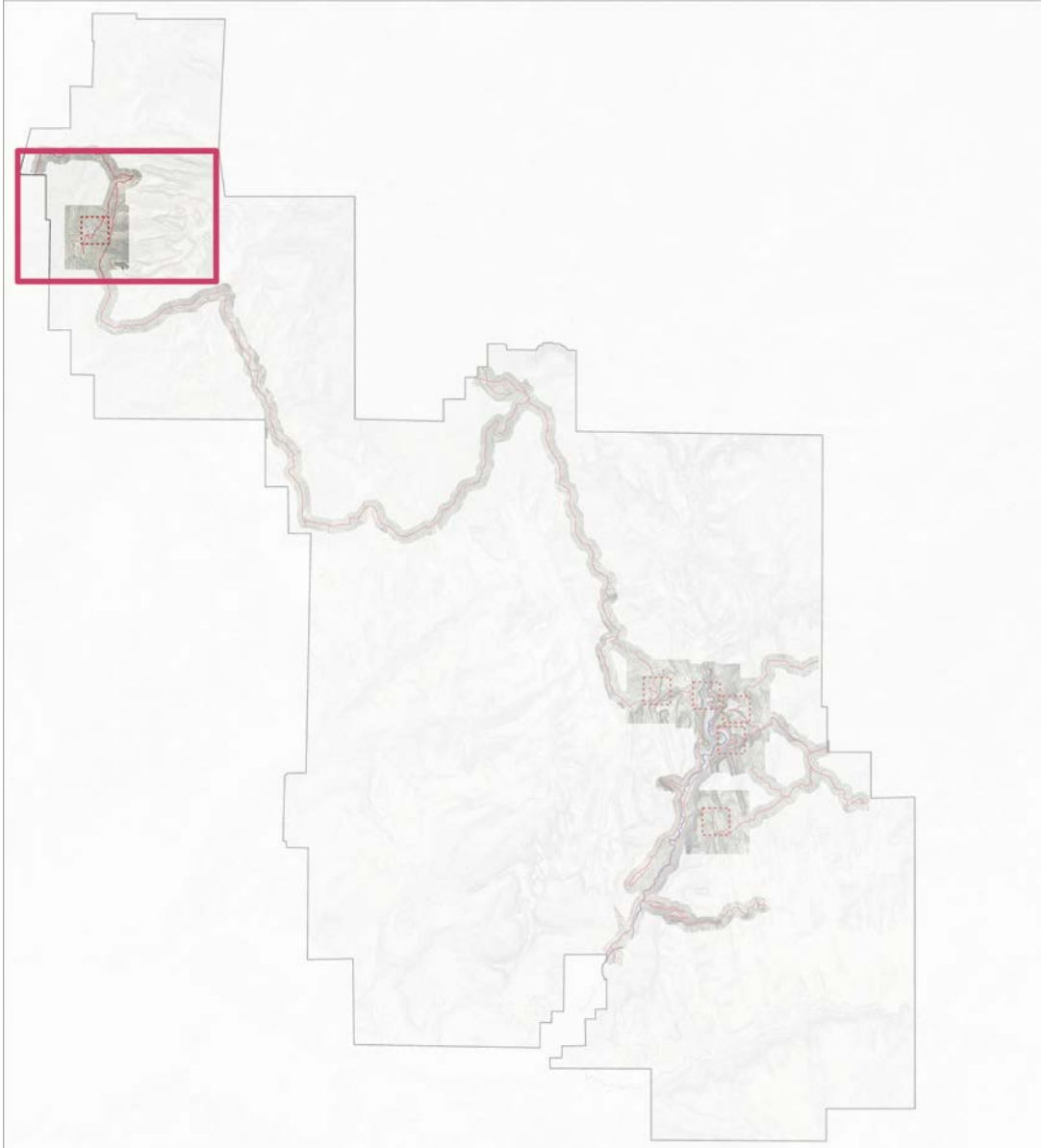


Figure 71: Kolob Canyon Location [Image Source: <http://www.nps.gov/zion/planyourvisit/upload/Zion-Park-Map-Website.pdf>, Altered by Rochelle Heyworth]

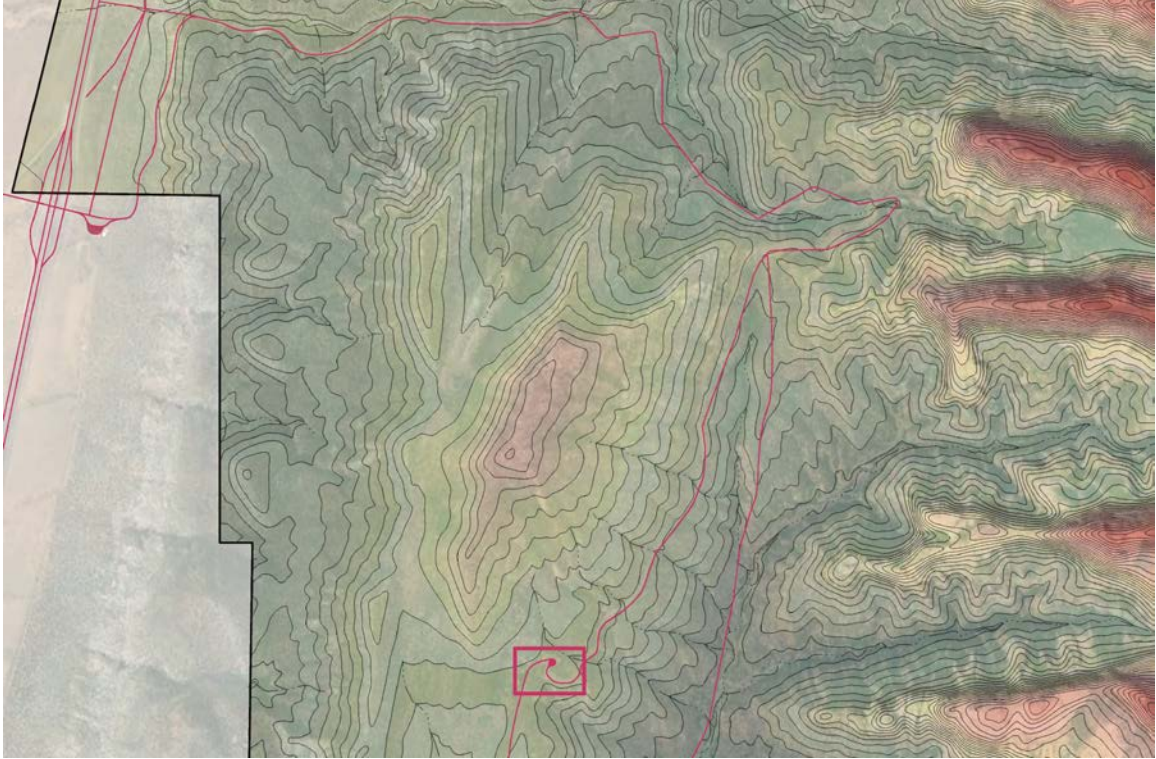


Figure 72: Kolob Canyon Topography, Visitor Center and Site [Image Source: <http://www.nps.gov/zion/planyourvisit/upload/Zion-Park-Map-Website.pdf>, Altered by Rochelle Heyworth]

This portion of the park is accessible off Interstate 15. Immediately upon exiting the interstate there is a small visitor center just outside the park boundary. After travelling through the park along the Kolob Canyon Scenic Drive, the view drastically shifted from that of a high desert, to a spectacular view with colorful cliffs and mesas. Along the road were a series of distracting parking lots. I began to realize the missed opportunity in the park to enhance the beauty. Perhaps, instead of private vehicles, a low emission shuttle could run most of the year with stops along the road for visitors to get out and explore. The final parking lot at the end of the Kolob Canyon Scenic Drive was filled with a parking lot that offered a 180 degree panoramic view of mountains, mesas, and points. With this in mind, I was able to orient the building to relate to each of these

views. To fully understand the relationship of the site to the cliffs and mesas, the following image will showcase the shadows of the winter solstice on the site.

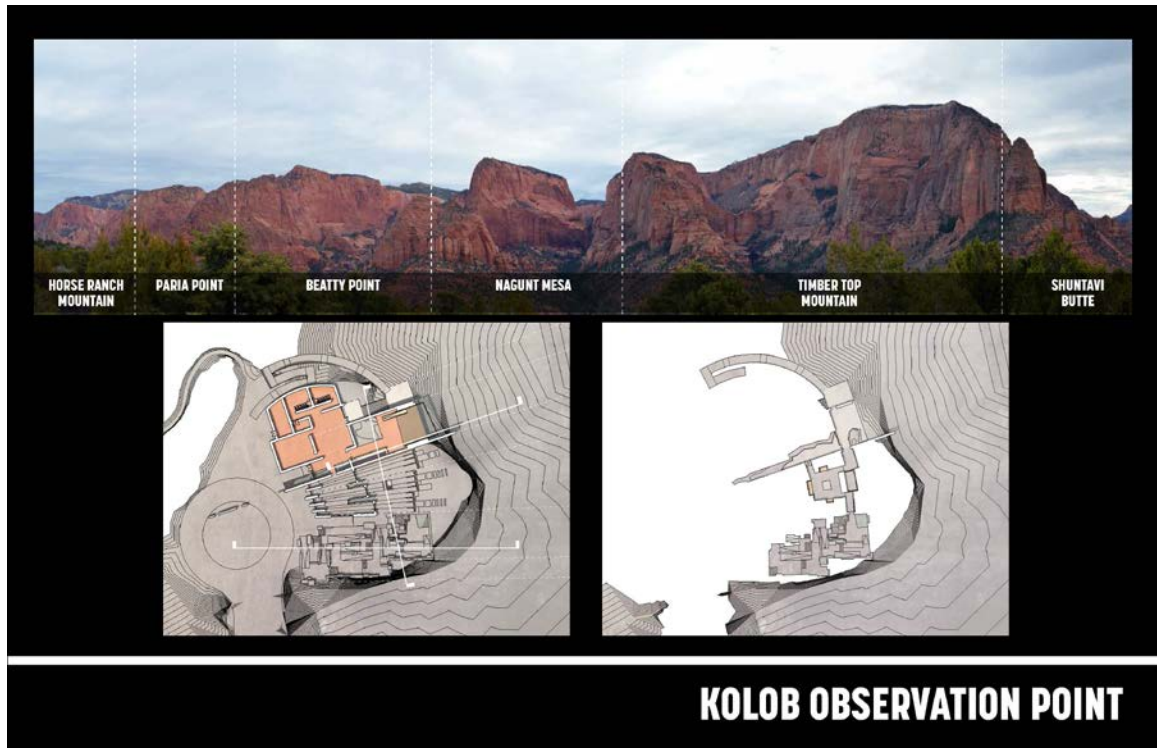


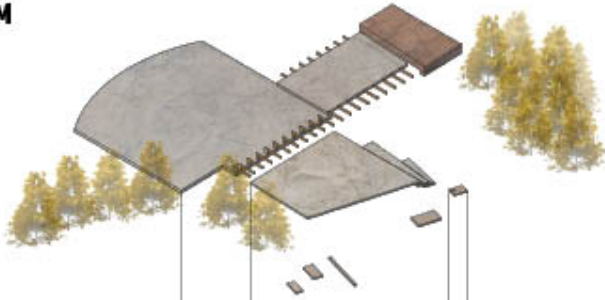
Figure 73: Kolob Canyon Site Orientation [Image Sources: Photographs by Rochelle Heyworth, Drawings by Rochelle Heyworth]



Figure 74: Kolob Canyon Topography during Winter Solstice [Image Source: Diagram Created by Rochelle Heyworth]

After observing the beauty of the parks geological features, I allowed that to become a point of inspiration, or lens through which I looked at the relationship of building and site. By using excavation or quarrying processes I would be able to remove the sandstone and limestone earth material and use that as a building material in the zone of spatial framing and cosmic stratum. This would create a dichotomy between three very different environments.

COSMIC STRATUM



SPATIAL FRAMING

- 1. OBSERVATION DECK
- 2. SOCIETY TERRACE
- 3. MEDIA ROOM
- 4. VIEW PORTS
- 5. COURTYARD
- 6. TERRACES



TERRA FIRMA

- 7. CANYON SLOT
- 8. REFLECTION SPACE
- 9. MIST PASSAGE
- 10. TERRACES

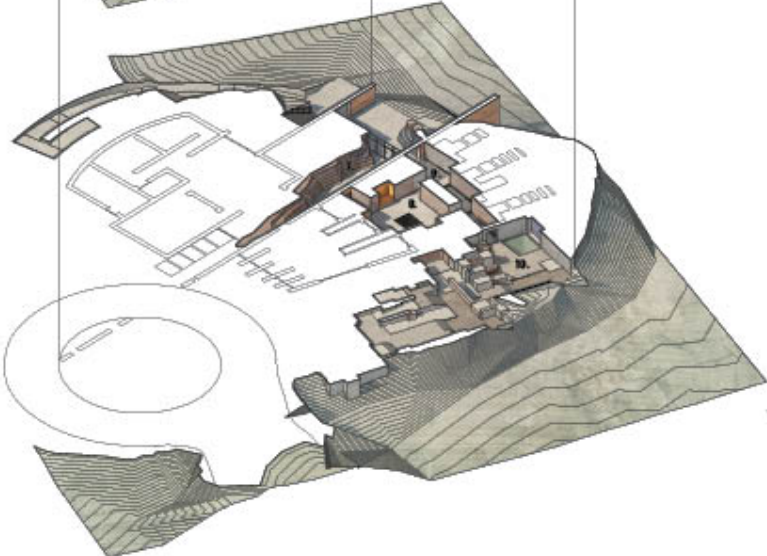


Figure 75: Site Axon [Image Source: Created by Rochelle Heyworth]

Introducing the Interpretive Center

To explain this building, this next section will go through a series of spaces throughout the building. Because this interpretive center is in fact used to interpret, there is very little prescriptive program, but rather a series of spaces that activate certain perceptual systems to create a more intense experience.

Observation Box

This portion of the building was inspired by recalling experiences at the top of a cliff at Zion National Park. It was a long hike and once I got to the edge, I wanted to go just a few steps further. This space allows visitors to do just that. After passing through a series of thresholds, the visitor will reach a point of compression before entering a glass structure which will enhance the basic orienting system. This cantilever will allow the visitor to feel and see the sky above them, the earth below them, and feel closer to the mountains near them.

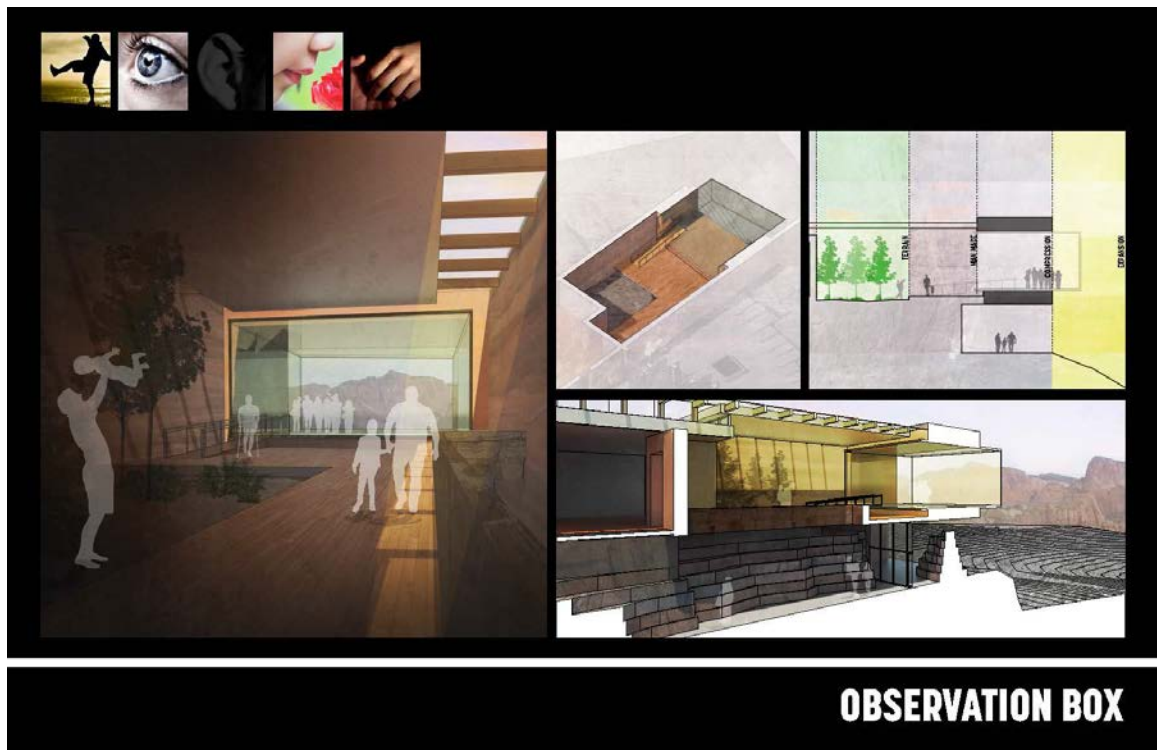


Figure 76: Observation Box [Image Sources: See Figures 26-30, Photographs by Rochelle Heyworth, Created by Rochelle Heyworth]

Canyon Slot

Just below the observation box is the canyon slot. This space was specifically designed by the memories of passing through narrow canyons of Zion National Park. By being enclosed between an excavated earth wall and a rammed earth wall, the visitor may notice symbolism of the geological processes of Zion. The rammed earth wall will show layers of color while the excavated wall will show the man-made processes of stone removal. The height of the space and the heaviness of the stone pathway above enhances this narrow effect, allowing sunlight to penetrate deep into the space during particular parts of the day.

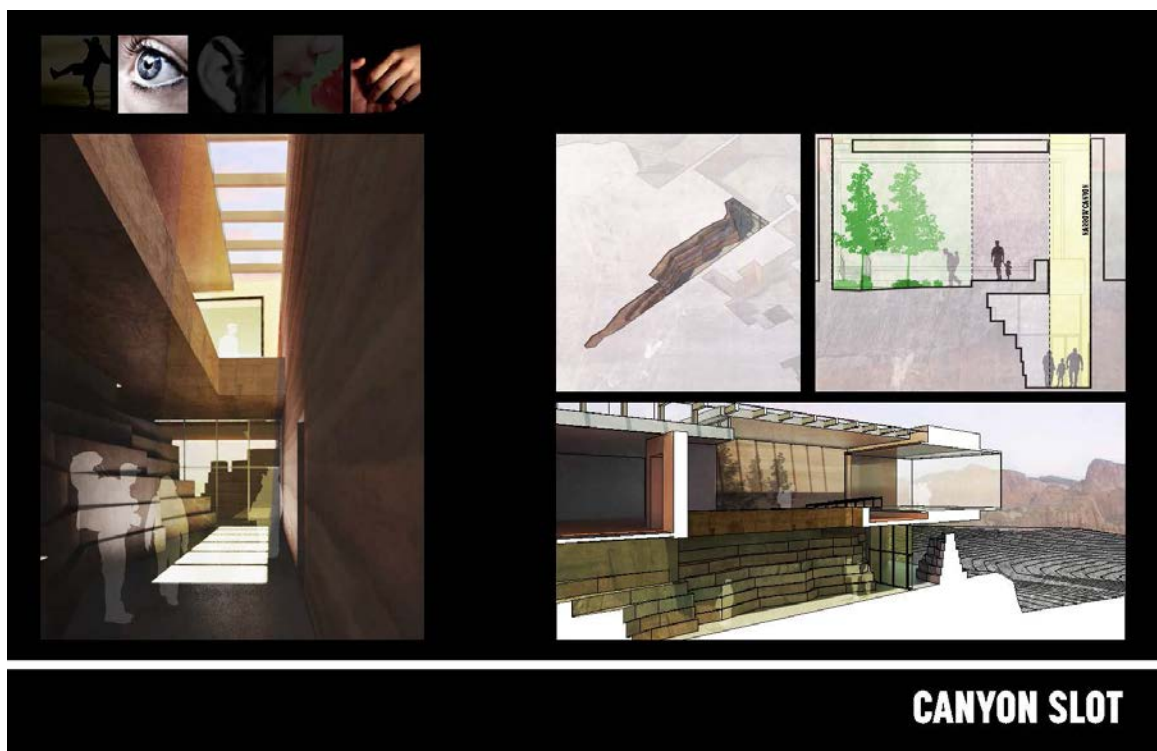


Figure 77: Canyon Slot [Image Sources: See Figures 26-30, Photographs by Rochelle Heyworth, Created by Rochelle Heyworth]

Mist Passage

Although in a semi-arid environment, Zion National Park has many seeps that cause water to mist along canyon walls. Small openings in this underground space would allow water to seep in, creating a misting effect. Visitors might notice that the haptic nature of passing through a dry-arid space to a damp-cool space. Because of the dampness of this space it would also have an earthy smell and feeling of being within the earth. As the water lightly drips into the space, the sound will echo. Here the visitors would pass through a series of spaces, all of which increase in size when passing through causing the sound of the water to reverberate differently in each space.



Figure 78: Mist Passage [Image Sources: See Figures 26-30, Photographs by Rochelle Heyworth, Created by Rochelle Heyworth]

Reflection Space

Just off the mist passage is the reflection space. This space aims to remove people from the phenomena of Zion. The earth and sky are a primordial pair, often creating an axis mundi when intercepted by humans. This space creates a visual void to allow visitors to sense this axis mundi from the centering plaza above to the reflection space below. Light will enter into this space to allow visitors to observe the light from the sky as time passes. One might begin to imagine the temperature of this space as shifting drastically throughout diurnal and seasonal changes.



Figure 79: Reflection Space [Image Sources: See Figures 26-30, Photographs by Rochelle Heyworth, Created by Rochelle Heyworth]

Terraces

The last series of spaces, or terraces, is an open air portion of the building. From my hiking experiences within the canyons of the park, I recalled the intense heat from the sun, but the moment I stepped into shade, it felt about 10 degrees cooler. This space is meant to activate the haptic sense, but more specifically the ability to feel temperature. This series of ramps and stairs will allow visitors to take numerous paths from top to bottom, but also affords the opportunity to climb the sculptural stone features.



Figure 80: Terraces [Image Sources: See Figures 26-30, Photographs by Rochelle Heyworth, Created by Rochelle Heyworth]

Conclusions

This thesis began with the premise that architecture can serve as a means to enhance the transcendent experiences in the majesty of nature. National Parks afford the opportunity introduce architecture that frames the perceptual systems to enjoin humans to their environment on a deeper level. This study tried to create a framework that can be implemented over the next centuries at Zion National Park and other National Parks. With the introduction of this new architectural interpretive center, Zion National Park would have groundwork set for future generations of artists and architects to look to the natural phenomena and perceptual systems to intensify experiences, such as the sound of the wind or the cooling temperature of the rushing Virgin River.

Bibliography

- Ackerman, Diane. *A Natural History of the Senses*. New York: Random House, 1990.
- Barrie, Thomas. *Spiritual Path, Sacred Place: Myth, Ritual, and Meaning in Architecture*. Boston: Shambhala, 1996. Print.
- Britton, Karla. *Constructing the Ineffable: Contemporary Sacred Architecture*. New Haven, Conn: Yale School of Architecture, 2010. Print.
- Cordell, Linda S, and George J. Gumerman. *Dynamics of Southwest Prehistory*. Washington, D.C: Smithsonian Institution Press, 1989. Print.
- Cronon, William. *Uncommon Ground: Toward Reinventing Nature*. New York: W.W. Norton & Co, 1995. Print.
- Duncan, Dayton, and Ken Burns. *The National Parks: America's Best Idea : an Illustrated History*. New York: Alfred A. Knopf, 2009. Print.
- Eliade, Mircea. *Patterns in Comparative Religion*. Cleveland: World, 1963. Print.
- Eliade, Mircea, and Willard R. Trask. *The Sacred and the Profane: The Nature of Religion*. New York: Harcourt, Brace, 1959. Print.
- Eves, Robert L. *Water, Rock, & Time: The Geologic Story of Zion National Park*. Springdale, Utah: Zion Natural History Association, 2005. Print.
- Geologic Formations. *National Parks Service*. National Parks Service, 20 Nov. 2013. Web. 24 Nov. 2013.
- Gibson, James J. *The Senses Considered As Perceptual Systems*. Boston: Houghton Mifflin, 1966. Print.
- Hall, Edward T. *The Hidden Dimension*. Garden City, N.Y: Doubleday, 1966. Print.

- Heidegger, Martin. *Poetry, Language, Thought*. New York: Harper & Row, 1971. Print.
- Jellicoe, Geoffrey, and Susan Jellicoe. *The Landscape of Man: Shaping the Environment from Prehistory to the Present Day*. New York: Viking Press, 1975. Print.
- Lyneis, Margaret M. "The Virgin Anasazi, Far Western Puebloans." *Journal of World Prehistory*. 9.2 (1995): 199-241. Print.
- Merriam-Webster's Collegiate Dictionary*. Springfield, MA: Merriam-Webster, Inc., 2003. Print.
- Nash, Roderick. *Wilderness and the American Mind*. New Haven: Yale University Press, 1967. Print.
- Norberg-Schulz, Christian. *Genius Loci: Towards a Phenomenology of Architecture*. New York: Rizzoli, 1980. Print.
- Odgers, Jo, Flora Samuel, and Adam Sharr. *Primitive: Original Matters in Architecture*. London: Routledge, 2006. Print.
- Pallasmaa, Juhani. *The Eyes of the Skin: Architecture and the Senses*. Chichester: Wiley Academy, 2005. Print.
- Peoples. In A Haven of Habitats. *National Parks Service*. National Parks Service, 01 Nov. 2013. Web. 23 Nov. 2013.
- Reed, Edward. *Encountering the World: Toward an Ecological Psychology*. New York: Oxford University Press, 1996. Print.
- Roosevelt, Theodore, and Patricia O'Toole. *In the Words of Theodore Roosevelt: Quotations from the Man in the Arena*. Ithaca: Cornell University Press, 2012. Print.
- Ross-Bryant, Lynn. "Sacred Sites: Nature and Nation in the U.S. National Parks." *Religion &*

American Culture 15.1 (2005): 31-62. Print.

Sorvig, Kim. "Renewing Zion [Zion National Park, Utah]." *Landscape Architecture* 92.2 (2002): 72-79. Web.

Timothy, Dallen J, and Daniel H. Olsen. *Tourism, Religion and Spiritual Journeys*. London: Routledge, 2006. Print.

Tuan, Yi-fu. *Topophilia: a Study of Environmental Perception, Attitudes, and Values*. Englewood Cliffs, N.J: Prentice-Hall, 1974. Print.

Zumthor, Peter. *Atmospheres: Architectural Environments, Surrounding Objects*. Basel: Birkhäuser, 2006. Print.