COLLECTIVE NAVIGATION

TOWARDS (RE)CONCILIATION THROUGH COMMUNAL EXPERIENCE

by

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ABSTRACT

This thesis addresses our shared patterns of behaviors, interactions, cognitive constructs and understanding by exploring how we perceive, interpret, orient ourselves and navigate the world we inhabit. What is widely regarded as mainstream culture is investigated and questioned by bringing together western and indigenous knowledge in order to examine the way we interpret the world and beyond. Through in-depth analyses of the controversial Samuel de Champlain monument located at Nepean Point in Ottawa, Ontario, this research and proposed projects offer and cultivate a direction towards (re)conciliation not only for the monument of Champlain and its Anishinaabe scout, but as an offering for indigenous and mainstream societies collectively. This is achieved through architectural conceptions that address and engage both western and indigenous perspectives as a way to rectify the past and provide a path forward. By employing a holistic approach that recognizes the strengths of mainstream empirically based scientific knowledge and indigenous cosmological worldviews, architectural interventions, at both the personal and communal level, provide both a tool and platform for storytelling while engaging and experiencing celestial phenomena in the pursuit of cultural resonance and (re)conciliation.

CONTENTS

ACKNOWLEDGMENTS

ABSTRACT

TABLE OF CONTENTS

LIST OF FIGURES

1: EXPLORATION

1.1 INTRODUCTION

1.2 rePRESENTATION

1.3 PROBES

1.31 SIGHT

1.32 WELL

1.33 DATUM

1.34 SOUND

1.4 PRECEDENTS

2: IMPLEMENTATION

2.1 SITE

2.2 ORAL TRADITION

2.3 ASTROLABE

2.4 PROJECTIONS

3: COLLABORATION

3.1 COLLECTIVE EXPERIENCE

3.2 INTERVENTION

3.21 AADIZOOKAAN TENT

3.22 GIIZHIG THEATRE

CONCLUSION

BIBLIOGRAPHY

LIST OF FIGURES

- figure 1: CYLINDER [PLASTER]
- figure 2: UNTITLED 1 [OIL ON PAPER]
- figure 3: UNTITLED 2 [OIL ON PAPER]
- figure 4: PHASES IN LIGHT [COLLAGE]
- figure 5: PHASES IN DARK [COLLAGE]
- figure 6: OBJECT 1 [PLASTER]
- figure 7: OBJECT 1 [PLASTER]
- figure 8: OBJECT 1 [PLASTER]
- figure 9: OBJECT 1 [PLASTER]
- figure 10: OBJECT 1 [PLASTER]
- figure 11: OBJECT 2 [PLASTER]
- figure 12: OBJECT 2 [PLASTER]
- figure 13: DIAGRAM OF WELL
- figure 14: HORIZON CAPSULE
- figure 15: VIEW FROM VERTICAL DATUM HELMET
- figure 16: HORIZONTAL DATUM HELMET
- figure 17: HORIZONTAL DATUM HELMET
- figure 18: VERTICAL DATUM HELMET
- figure 19: AUDITORY PROBE [HIGH DENSITY FOAM]
- figure 20: AUDITORY PROBE [HIGH DENSITY FOAM]
- figure 21: AUDITORY CANAL: ELEVATION
- figure 22: AUDITORY CANAL: SECTION
- figure 23: AUDITORY CANAL: VIGNETTE 1
- figure 24: AUDITORY CANAL: VIGNETTE 2
- figure 25: PUEBLO BONITO: CHACO CANYON
- figure 26: CASA RINCONADA: CHACO CANYON
- figure 27: SUN TUNNELS [NANCY HOLT]
- figure 28: SUN TUNNELS [NANCY HOLT]
- figure 29: RODEN CRATER [JAMES TURRELL]
- figure 30: RODEN CRATER [JAMES TURRELL]
- figure 31: RODEN CRATER [JAMES TURRELL]
- figure 32: SITE PLAN: NEPEAN POINT
- figure 33: CHAMPLAIN MONUMENT [ORIGINAL]
- figure 34: MAP OF NEPEAN POINT

figure 35: ANISHINAABE SCOUT
figure 36: CHAMPLAIN'S ASTROLABE
figure 37: ASTROLABE BACK
figure 38: ASTROLABE MOTHER
figure 39: ASTROLABE RETE
figure 40: ASTROLABE CLIMATE
figure 41: ASTROLABE FRONT [PLYWOOD, ACRYLIC]
figure 42: ASTROLABE BACK [PLYWOOD, ACRYLIC]
figure 43: ASTROLABE
figure 44: PROJECTION DIAGRAM [CLIMATE]
figure 45: PROJECTION DIAGRAM [ALMUCANTER]
figure 46: PROJECTION DIAGRAM [LINE OF CENTERS]
figure 47: PROJECTION DIAGRAM [AZIMUTH]
figure 48: PROJECTION DIAGRAM [CLIMATE PLATE]
figure 49: PROJECTION MODEL [ACRYLIC, FILAMENT]
figure 50: PROJECTION MODEL [ACRYLIC, FILAMENT]
figure 51: PROJECTION MODEL [ACRYLIC, FILAMENT]
figure 52: PROJECTION MODEL [ACRYLIC, FILAMENT]
figure 53: AADIZOOKAAN TENT PACK
figure 54: SHADOW MAPPING
figure 55: AADIZOOKAAN TENT ASSEMBLY SEQUENCE
figure 56: AADIZOOKAAN TENT SECTION
figure 57: AADIZOOKAAN TENT: 90 DEGREE APERTURE
figure 58: AADIZOOKAAN TENT: 45 DEGREE APERTURE
figure 59: AADIZOOKAAN TENT SECTION
figure 60: AADIZOOKAAN TENT ASSEMBLY
figure 61: VIEW OF WINTERMAKER
figure 62: GIIZHIG THEATRE ASSEMBLY SEQUENCE
figure 63: GIIZHIG THEATRE COMPONENTS
figure 64: GIIZHIG THEATRE SECTION
figure 65: GIIZHIG THEATRE: FULL PANEL
figure 66: GIIZHIG THEATRE: FULL PANEL
figure 67: GIIZHIG THEATRE: FULL PANEL
figure 68: GIIZHIG THEATRE: SOLAR ASSEMBLY
figure 69: GIIZHIG THEATRE: SOLAR ASSEMBLY
figure 70: GIIZHIG THEATRE: SOLAR ASSEMBLY
figure 71: GIIZHIG THEATRE SECTION AND DETAIL
figure 72: STARGAZING: 20:00h
figure 73: STARGAZING: 23:00h
figure 74: STARGAZING: 2:00h
figure 75: STARGAZING: 5:00h

1 EXPLORATION

INTRODUCTION

The human race has always struggled to make sense of the mysterious external and internal world that surrounds and is within us. Scientific reasoning, through an obsession with the rigor of quantifiable and verifiable calculation, has analyzed and dissected our existence down to the atom in the quest for absolute truth. In the 17th century, French scientist and philosopher Rene Descartes was concerned with instituting a foundation for universal science based on reason alone. He attempted to implement a system of scientifically established truths, determined to put knowledge on an absolutely firm foundation.¹ Thus, rationalist thought would take precedence as definitive, singular, and the symbol of progress. Objective thought can only rectify what it can examine through the physical realm, and thus discounts human experience. This was a major concern of Maurice Merleau-Ponty in *Phenomenology of Perception* by asserting that objective thought “fundamentally distorts the phenomena of our lived experience, the world in which we live, and the other people with whom we interact.”² Widespread implementation of mainstream science and understanding as absolute, has discarded contrasting worldviews that employ a different and holistic understanding of the world.

By establishing our place within the universe a broader lens, an opportunity is offered towards being much more cognizant of our relationship with the world we inhabit. Examining the diversity of cultures from mainstream and indigenous examples, reveals how an adherence to a singular ethos can harm not only human

fig 1 (page 7): Cylinder
plaster
photograph by author

1 Monika M. Langer, *Merleau-Ponty's "Phenomenology of perception": a guide and commentary*. (Springer, 1989), 149.

2 Monika M. Langer, *Merleau-Ponty's "Phenomenology of perception,"* 13.

nature, but the earth as well. Culture in the mid-15th century was defined as “the tilling of land, act of preparing the earth for crops.” Originating from Latin cultura, ‘growing, cultivating,’ and derived from Latin colore, meaning to tend to the earth, or cultivate and nurture.³ Keeping in mind the depletion of the planet’s resources and overall balance as a consequence of mainstream culture, this thesis proposes a collaborative relationship with indigenous worldviews that for thousands of years have fostered and cultivated harmonious existence with the planet.

A conceivable inherent bias exists when using the term “mainstream knowledge” in comparison to indigenous knowledge when it is defined as what is considered normal, and having or using beliefs that are accepted by most people.⁴ It does little to avoid another pedestal for which this thesis intends on removing not only metaphorically, but perhaps literally as it pertains to the Champlain monument. Mainstream in this text is recognized as distinct from indigenous ways of knowing, as presented by the work of Mi’kmaq Elder Albert Marshall. The principal of Two-Eyed Seeing which he has pioneered, recognizes the concepts of mainstream and western knowledge interchangeably when promoting the collaborative efforts with indigenous ways of knowing. Promoting the use of multiple perspectives, Two-Eyed Seeing can benefit not only the relationships between multiple cultures, but all aspects of life including health, environment, and education.⁵ In education, mainstream refers to children who can be taught in the same way as most other children, people or schools.⁶ The opportunity to interrupt the status quo by expanding the idea of a classroom, site, and monument, can challenge “normal” and critique the concept of

3 Douglas Harper, “Culture (n.),” Online Etymology Dictionary, Accessed March 13, 2020. <https://www.etymonline.com/word/culture>.

4 “MAINSTREAM: Cambridge English Dictionary,” Cambridge Dictionary, accessed April 22, 2020, <https://dictionary.cambridge.org/dictionary/english/mainstream>.

5 Albert Marshall, “Two-Eyed Seeing–Elder Albert Marshall’s guiding principle for intercultural collaboration,” Thinkers Lodge 28 (2017).

6 “MAINSTREAM: Cambridge English Dictionary,” Cambridge Dictionary

mainstream altogether. Focusing on a shared experience that can be recognized by people of different backgrounds and cultures, the combination of individual and shared knowledge can come together. In gazing upon the skies, a highly resonant collective experience, analysis, and interpretation has unknowingly occurred for thousands of years.

The initial phase of this thesis investigated human experience through active engagement and participation in the sensory perception of space. The intent was to draw to attention the act of experiencing space by promoting self-awareness, and activate conscious engagement with what was presented. This was achieved through the augmentation of the elements of sensory experience. These examinations attempted to focus attention on natural processes that are constantly active in how we perceive, orient, and navigate our interactions with space. The augmentations were achieved by using light and shadow, the focusing of views, and the altering of scales. By manifesting the conscious acknowledgment of experience, the reality we trust with our senses can approach a reality that we can not trust. By initially removing the constraints of occupiable space and programmatic function, the investigations considered spatial implications without the boundaries of traditional architectural function. The initial and primary goal of these investigations was to trigger the reflective sense of seeing yourself seeing or hearing yourself hearing, thus the user was an actively engaged participant in conciseness rather than a witness. These probes offered conscious acknowledgment of spatial phenomena.

r e P R E S E N T A T I O N

Initial thesis explorations introduced a series of abstract paintings presenting imagery familiar enough to viewers to allow comprehension of what was displayed while offering the opportunity to conceive individual interpretations. The concept of blindsight analyzed by neuroscientist Vilayanur Ramachandran examines the brain's need to block out excessive stimuli, so as not to become overwhelmed with information. If such excessive information is presented to process, the brain limits the ability to efficiently cogitate any of it.⁷ Thus the abstract paintings were not representations, but rather presentations to manifest an effect. Avoiding objective likeness, the observer is invited to interpret the imagery however they perceive it. Positive, negative, light, shadow, solid and void are all brought into question. Spatial effects emerge as the shapes are augmented and thresholds are blurred. The principle of this foundation is to create imagery that be subjectively interpreted. The underlying objective of these initial investigations was to create ambiguous images that require subjective interpretation.

fig 2 (pg 13): untitled 1
oil on paper
diptych

fig 3 (pg 14): untitled 2
oil on paper
diptych

fig 4 (pg 15): phases in light
collection of still images from
film

fig 5 (pg 16): phases in dark
collection of still images from
film

⁷ Vilayanur S. Ramachandran, *The emerging mind: the Reith Lectures 2003*. (London: Profile, 2003), 36.

SIGHT

The investigation was expanded further through the introduction of three-dimensional objects. Plaster forms, cast from single use waste molds, were sanded, sealed and painted. This process ensured a specific surface quality for exploring spatial conditions void of scale. The smooth, minimal forms allowed light and shadow to blend into and reflect from the surfaces of the forms and the ground where they sit. It was once again a presentation of light and shadow effects rather than a representation of an object. The forms are void of scale, focusing attention on the spatial quality alone. They slowly revealed themselves as the light condition changes and layers of light and shadow bring surfaces forward. Edges soften and harden as the singular light source moves closer to, or further from the object. The light source itself is ambiguous as it appears to emit from and upon the object.

fig 6-8 (pg 18): object 1
multiple photographs of same
object and frame with altered
lighting condition
photograph by author

fig 9-10 (pg 19): object 1
object is framed so vertical
walls appear tapered
photograph by author

*fig 11-12 (pg 20):
object 2*
both images are of the
same object showing a
transformation of the shape
and edge condition
photograph by author

The intention of the presentation of these constructions through light and shadow effects was to highlight the obscure and often illogical spatial interpretations and understandings of the occupied or perceived space. The goal was to manifest and reveal such aspects of vision, without removing completely, the contours, density, and spatial relationships of the physical space. There is no grounded reference point leaving the viewer curious about what is situated directly in front of them. In nature, objects in the distance are unclear, sharpening into focus as we approach. The goal here, is to question perception by presenting a composition of visually questionable “objects” at a distance that, under normal circumstances, one would have no issue resolving.

WELL

This exploratory probe is a manifestation of orchestrated light and darkness, created by the theme that shaped the initial explorations. The intention is to provoke curiosity as the site conditions and size of the construction do not allow the user the sightlines to see into the well. One must engage the entire site to achieve this. Investigating the second tower as a possible means to see into the well, the user instead is given the view from within the well. The ability to gaze into the well would reflect the same view up and out of the it. The desired result is achieved through entirely different means.

fig 13: diagram of well
The image depicts the interrupted sightlines of users promoting the activation of the site

Often, the first thing one might do out of curiosity when approaching a well is to throw a stone into it. We experience the space by the time it takes, and the sound it makes as the stone falls to the bottom. There is an emotional response of anticipation, satisfaction, or disappointment as we understand the space through sound. In an interview with *Colon* magazine Kenneth Frampton noted “The experiencing subject resists western division of the mind from the body, that is to say, from a being responsive to the environment. What is the relationship of the subject to the physical environment in terms of an overall experience? It is not only a question of visual stimuli, the tactile issue is also present, as well as acoustical and olfactory phenomena.”⁸

DATUM

As the viewer looks across the well or through the slit cut into it, an artificial horizon is created. The fabrication of a new horizon affects the visual sight line through the site. This focused horizon allows for the opportunity to experience the space differently and prompted a new study on how this could affect spatial experience. The models focused sight lines in a fixed setting where the user would occupy a volume. A sliver of material removed at eye level would allow the person a pinched horizon to view their surroundings. By placing the body at the center, and an object between the viewer and what is observed, this allows for a perceptual alteration in what can be experienced. The object

⁸ Kenneth Frampton “What is Phenomenology?” Interviewed by Barnes, Cecil, and Sharon Leung. *Colon*, Volume 2: Belief Issue 3. March 13, 2014

acts as a reference point and the space around it, unaltered, is perceived differently based on the movement of the individual. It is the act of seeing oneself see that allows the user to realize this effect. The elimination of the periphery awakens the user to focus on the conscious act of seeing. A focused view requires cognizant effort to analyze what one is seeing. A room full of visual stimuli can easily be overlooked as our blindsight protects our brain from becoming overwhelmed. The goal is to concentrate the visual field on a smaller, specific location to promote complete attention to what is observed.

fig 14: horizon capsule

The construction of a wearable piece to test this concept removed the constraints of a single space and allowed the exploration of multiple sites. Several wearable devices were made with slats that varied in length, and orientation. Applying these objects between the body and the surrounding world created a datum: a reference point that alters the way we perceive movement in the world. Under normal circumstances the ability to pan our eyes allows us to follow clouds, for example, as they move across the sky. With nothing to interrupt the view, they often appear to stand still in the sky. Similarly, in the evening, the night sky full of stars appears to stand still. Only a static object, acting as the reference frame, gives us the ability to see that the objects are indeed moving. This effect is heightened with the use of the helmet, manifesting the effect on all objects toward the viewer. Thus, all the activity is framed to the observer and can be perceived to be accelerated. As the fins obstruct the peripheral view, the focused area becomes referentially transformed. In order to perceive what you are seeing, you must realize that you, the viewer, are interrupted by an object.

*fig 15 (right): view from
vertical datum helmet*
photograph by author

*fig 16-17 (pg 25):
horizontal datum helmet*
photograph by author

*fig 18 (pg 26):
vertical datum helmet*
photograph by author

SOUND

The final probe is presented as an opportunity to experience a natural sound amplification device in a new light. Scaling this anatomical body allows for the subjective study of the visual contours and auditory properties. The model begins to blend sight and sound. Photographing specific areas of the model removes the objectivity and allows for the experience of the spatial qualities of the piece. It is again without scale so the observer can focus on the light condition created by the natural contours. The gradual revealing of the recognizable object expands the curiosity of its function at a larger scale.

Scaling this investigation and inserting it into a landscape, the opportunity to hear the landscape comes to the surface. At this scale the objectivity is removed, and the landscape can be experienced subjectively. Concentrating the wind as it approaches the hillside, it is gathered by the natural funnel of intervention and channeled into the canal. The occupiable canal tunnel allows for the opportunity to you to hear yourself hearing. One can occupy the ear canal to experience the natural sound amplification of human anatomy. This large-scale implementation of the model, placed on site, allows for a targeted auditory experience.

fig 19-20 (page 28):
auditory probe
[high density foam]
photographs by author

fig 21 (page 29) : **auditory
canal elevation**

fig 22 (page 29) : **auditory
canal section**

fig 23 (page 30) : **auditory
canal vignette 1**

fig 24 (page 30) : **auditory
canal vignette 2**

ELEVATION

SECTION

PRECEDENTS

The early drawings, sculptural objects, and design, in addition to the possible conceptual ideas leading towards an eventual architectural proposal, all drew inspiration from precedents in the American southwest that have mapped, focused on, and highlighted the occurrences of celestial phenomena. From the ancient Pueblo complex of *Chaco Canyon* in northwest New Mexico, to such contemporary work as *Roden Crater*, by James Turrell, in the painted desert of Northern Arizona. These site-specific examples explicitly highlight the recurring human fascination with the cosmos and how the built form can facilitate and evoke a deeper connection and experience to the world.

Chaco Canyon emphasizes the extensive understanding of astronomy and geometry (meaning *earth measure*) held by indigenous peoples of North America. Some early structures of the complex date from 800 AD, preceding the height of the sites use in the 11th and 12th centuries.⁹ 200 kilometers of overbuilt road systems averaging 9 meters wide, some spanning over 50 kilometers with exceptional linear precision branched from the center. Serving little practical function, the systems in place surrounding Chaco Canyon defy rational explanations.¹⁰ With no consistent water supply, thousands of timbers were transported hundreds of kilometers and elaborate building complexes were

9 Andrew M. Munro and J. McKim Malville. "Ancestors and the sun: astronomy, architecture and culture at Chaco Canyon." *Proceedings of the International Astronomical Union* 7,(2011): 256.

10 Sofaer, Anna. "The primary architecture of the Chacoan culture." *Anasazi architecture and American design*. 230

constructed with the ability to house tens of thousands (though evidence suggests a resident population of roughly 2000 permanent inhabitants.) This exacerbates the mystery surrounding the site and its “decided aura of inefficiency”¹¹

fig 25 (upper right):
Pueblo Bonito, Chaco Canyon
the largest building complex
at Chaco Canyon. The great
kiva in the center could
facilitate over 1000 people.

fig 26 (lower right):
Casa Rinconada
Chaco Canyon
Solar alignment through
multiple thresholds.
Benjamin Oswald, Casa Rinconada Chaco
Canyon, Photograph, June 29, 2018.
https://www.ancient.eu/Chaco_Canyon/

Dozens of dwellings, ceremonial spaces, and most notably fourteen major buildings are meticulously aligned with cosmological events, and solar and lunar cycles. The buildings are oriented to solstices, equinoxes, including the rising and setting angles, denoting where the solar and lunar ecliptic cycles are at a given time with patterns of shadow and light.¹² The elaborate constructions at Chaco Canyon and the impracticality of its location accentuate the curiosity of its function and the events that took place there.

¹¹ Wolcott H. Toll, “Material distributions and exchange in the Chaco System.” *Chaco and Hohokam: Prehistoric regional systems in the American Southwest* (1991): 79.

¹² Sofaer. 231.

Located In the Great Basin Desert of northwest Utah, Nancy Holt's Sun Tunnels is a sculptural installation associated with the earthworks movement of the 1960-1970's. The site-specific work is composed of four occupiable concrete cylinders that frame the sun on the distant horizon during the summer and winter solstices. The fixed views through the tunnels engage the vast surrounding landscape, and when occupied, the user is immersed in a perceptual experience as part of the work itself. Small holes on the upper surface of the cylinders project constellations as beams of light constantly revolving within the tunnels. "In my Land art dealing with astronomical phenomena, I am putting 'centers of the universe wherever I go,'" Holt said. The Sun Tunnels are meant to, "make people conscious of the cyclical time of the universe."¹³

fig 27-28:
Sun Tunnels [Nancy Holt]
Nancy Holt, "Sun Tunnels, at the Great Basin Desert, Utah," 1973-76. Holt/Smithson Foundation and Dia Art Foundation/Licensed by VAGA at ARS, New York. Courtesy of the Holt/Smithson Foundation.

13 "Earth Art Movement Overview," The Art Story, <https://www.theartstory.org/movement/earth-art> (18 March 2020).

Roden Crater is the life-long work of artist James Turrell. Located in the Painted Desert of Northern Arizona, the uncompleted project, started in 1977 when Turrell acquired the cinder cone, is a series of subterranean spaces in the crater of a volcano. Tunnels and chambers are arranged with orchestrated artificial and natural light and contain specific apertures controlling sightlines to the open sky.¹⁴ Numerous celestial events correspond to elements within the project including a lunar phase occurring roughly every seventeen years that illuminates a 854 foot tunnel.¹⁵

fig 29 (upper right):
Roden Crater [James Turrell]
 Turrell, James. Roden Crater, Photograph.
 Skystone Foundation 2020. <http://rodencrater.com/spaces/craters-eye/>

fig 30 (lower right):
Roden Crater [James Turrell]
 view from inside cinder cone
 highlighting celestial vaulting
 Lee, Yvette Y. Photograph. January 25, 2016.

¹⁴ Roden Crater. Skystone Foundation, (14 March 2020).

¹⁵ Eric Fredericksen, "Roden Crater," *Architecture*, April 2002

Specifically orchestrated moments around individual celestial bodies acknowledge a larger system in motion, however the origins of the project come from a constantly achievable experience. “Celestial vaulting” as Turrell calls it is a phenomenon enhanced by the contour of the crater bowl. The sky is perceived as a flat plane of light as opposed to a limitless void extended into space.¹⁶ Though choreographed light fills the interior spaces the site ultimately looks to the skies to unite the work as a lens to the universe. This “naked eye observatory” is universally connected to the ancient pueblos surrounding it and Turrell places his work among them saying, “I’m building a ruin”¹⁷

fig 31:
Roden Crater [James Turrell]
view of *creator's eye*
Turrell, James. Roden Crater, Photograph.
Skystone Foundation 2020. <http://roden crater.com/spaces/craters-eye/>

16 Calvin Tomkins. “Flying into the light: how James Turrell turned a crater into his canvas.” 2003.

17 Fredericksen, “Roden Crater,” 1.

2 IMPLEMENTATION

S I T E

Nepean Point is located in downtown Ottawa on the south banks of the Ottawa river. Situated high atop a limestone cliff, the scenic park overlooks Parliament hill, the Ottawa river, and downtown Hull, Quebec. It is adjacent to the National Gallery of Canada where several permanent sculptural installations occupy the park. There is an amphitheater overlooking Parliament Hill that was built in 1967 to commemorate Canada's centennial.¹⁸ Used for concerts, performances, and as a vantage point for Parliament Hill firework shows, the astrolabe theater has fallen into a derelict state due to a lack of maintenance and has been fenced off since 2011. The site has been under consideration for redevelopment since a 1991 study, commissioned by the National Capital Commission, who maintains Nepean Point and the neighboring Major Hills Park.¹⁹ A second consultation report in 2014 led to a winning proposal for the redevelopment of both parks to begin in 2020.²⁰

*fig 32(pg 38): site plan
Nepean Point*

18 *Majors Hill and Nepean Point.* (Ottawa: Public Affairs Division, National Capital Commission.1983),6.

19 *Major's Hill Park & Nepean Point, Ottawa: Rehabilitation and Redevelopment Study,*(Ottawa: Torrance-Thakar Associates Inc., 1991).

20 "Nepean Point Redevelopment. A 20th Century Greenspace." NCC. National Capital Commission.

NEPEAN POINT

At the crest of Nepean Point sits one of Ottawa's most notable and recognizable landmarks, a monument to French explorer Samuel de Champlain. Champlain, born in Brouage, France in 1567, led several expeditions throughout Atlantic Canada and the great lakes region. He is credited with founding Quebec City in 1608 and is known as the "Father of New France." The monument at Nepean Point was unveiled on May 27, 1915 by the Governor General, the Duke of Connaught.²¹ The Bronze sculpture by Canadian artist Hamilton MacCarthy was commissioned to commemorate the 300th anniversary of Champlain's second ascent of the Ottawa River.

fig 33:
Samuel de Champlain
monument (original)
Jeff Thomas, "Nepean Point,
Indigenous Navigator."
Photograph 1992.

The monument portrays Champlain, sculpted two times life size, overlooking the Ottawa River valley. Held in his hand is an astrolabe, a navigational tool first used in ancient Greece. His valiant stature alludes to his surveying an uncharted and unconquered land. Part of the original composition, but not added

²¹ Robert Sibley, "A River and It's City," *The Ottawa Citizen*. August 14, 2009.

until 1919, was an indigenous scout. Called the “Indian Scout” when installed, the scout is sculpted at life size and is kneeling at the base of Champlain. The scout is barefoot, dressed in loincloth, yielding a quiver, and has feathers in his hair. Although the original composition included a canoe which the scout was to be seated on, funds were never raised for the completed piece and the scout was added without it. The scout was intended to represent the assistance and guidance Champlain received from indigenous communities during his expeditions, with both serving to commemorate the alliances developed in the fur trade, and Champlain’s support for several nations during territory wars with the Iroquois. The obvious tension in the portrayal of this relationship speaks louder than the two individuals themselves. Not only is Champlain twice the size of the scout, He towers nearly 20 feet above him. The scout’s precarious position kneeling without the canoe further stresses a submissive undertone. Champlain’s colonial dominance is substantiated by the original plaque proclaiming him “The First Great Canadian.” The aboriginal scout was not mentioned.²²

Indigenous communities saw the juxtaposition of Champlain and the scout as a belittling, racist, and derogatory representation of their people. Calls for the scout to be removed culminated in a protest on June 21, 1996 led by Assembly of First Nations Chief Ovid Mercredi. On September 30, 1996 NCC Chairman Marcel Beaudry officially met with Chief Mercredi to discuss possible solutions including both the relocation of the scout or a possible reinterpretation of the scout on the existing site. This process took several years and included public consultation with the majority opposing the relocation. The family of MacCarthy also resisted moving the scout rejecting the notion that the representation degraded the first nations of Canada. Eventually in October of

²² Susan Elizabeth Hart, “Sculpting a Canadian hero: shifting concepts of national identity in Ottawa’s core area commemorations,” PhD diss., Concordia University, 2008, 87.

1998 the NCC, along with Martin MacCarthy, the great-grandson of the sculptor, and the Assembly of First Nations Chief Phil Fontaine settled on Major Hill's Park as the new site for the relocation of the scout.²³

fig 34: map of Nepean Point
location 1 denotes the original site for the monument and the current location of Champlain

location 2 denotes current placement of the Anishinaabe scout in Major's Hill park

The scout was moved on October 1, 1999 to his current location in Major Hill's Park roughly 250 meters from its original location. A plaque installed identified him as an "Anishinaabe Scout." In 2013, nearly 100 years after its creation, the scout was finally given a name. Algonquin elder Annie Smith St. Georges named him "Gichi Zibi Omaami Winini Anishinaabe," a traditional Algonquin name. He has yet to receive a new plaque with this designation. However, Smith St. George recognizes the significance of offering him a name noting "this is the most appropriate name that I would have been able to give him—is to bring back our culture, our nation...I think he was a lonely soul down here."²⁴

²³ Ian Grabina, Officer, Public and Community Relations, Email to Patrick McGowan February 5, 2020.

²⁴ "Aboriginal Artists in Ottawa Want Traditional Name for 'Scout' Statue CBC News, CBC/Radio Canada, August 23, 2013.

Many would agree with Smith St. George that the indigenous scout, taken from its original context, is still a lonely soul. The scale of the figures and configuration aside, the two are partners in navigation. The tense relationship between Champlain and the scout is further exacerbated when we look closer at the astrolabe held by Champlain. The device should be held by placing the thumb through a ring and read as the pull of gravity balances the device. Unfortunately, in Champlain's case, he is holding the instrument incorrectly. He is grasping the ring and heaving it proudly to the heavens, upside down.²⁵

fig 35: Anishinaabe Scout
current location of scout in
Major's Hill Park
note Champlain in the
background at Nepean Point
photograph by author

²⁵ Canadian Heritage, "Government of Canada," Canada.ca (Government of Canada, October 2, 2017), <https://www.canada.ca/en/canadian-heritage/services/art-monuments/monuments/samuel-champlain.html>, (15 February 2020).

While it remains a mystery as to how or why this mistake was made, it only adds to the complicated relationship of the two. Champlain, unable to navigate with his upside-down astrolabe, has now lost the scout as well, with his knowledge and understanding taken away with him.

Both Champlain and the scout relied on knowledge of navigation through cosmological references. Each with a complex understanding of celestial bodies in relation to one's location and how to navigate the land accordingly by using the stars. Both employed a set of tools with which to do this, Champlain with his astrolabe, and the scout with his knowledge, passed on throughout generations through traditional oral storytelling. Though the astrolabe stands as a powerful symbol of geo-spatial control and dominance, critical to European colonization, the origins of the instrument exist in the comprehensive reverential knowledge of celestial bodies conveyed through centuries of oral traditions. As technological instruments have superseded the intangible knowledge embedded in them, the narrowing gaze of quantifiable and verifiable calculation disregards the phenomena of lived and engaged experience. Closer examination of each of these tools offers the potential for a proposal that celebrates both western and indigenous knowledge, integrated towards the pursuit of [re]conciliation.

fig 36: Champlain's Astrolabe
upside down orientation of
astrolabe
Jeff Thomas, "Nepean Point, Indigenous
Navigator." Photograph 1992.

ORAL TRADITION

Indigenous peoples of Canada have gathered knowledge from the skies for thousands of years. Not only as a clock, calendar and navigational tool, but as the source of a deeply rich and spiritual worldview filled with stories of creation and life. Day and night, the sun and stars are a constantly revolving compass providing physical orientation and spiritual guidance to indigenous communities across Canada and throughout the world.²⁶ The cosmos are embedded in indigenous cultural identity, and the stories they have inspired live on through traditional oral storytelling. Oral tradition looks to the skies to recount the origins of creation, spirituality, and stewardship of the earth. The values expressed include respect, generosity, wisdom, humility, honor, cooperation, identity, balance, harmony, and connectedness.²⁷ The narrative of these stories connects one through individual experience and allows for communal interpretations of the topics addressed. Unlike many European stories that follow a linear narrative, indigenous stories often do not have a defined beginning, middle or end. They are ongoing, presenting life and the way of things as a continuous journey. A 1996 Royal Commission on Aboriginal Peoples report states, “Oral accounts of the past include a good deal of subjective experience. They are not simply a detached recounting of factual events but, rather, are facts enmeshed in the stories of a

²⁶ Rothney Astrophysical Observatory, “First Nations Skylore of Alberta Skies,” Faculty of Science, April 29, 2019.

²⁷ Roxanne Struthers and Cynthia Peden-McAlpine, “Phenomenological research among Canadian and United States Indigenous populations: Oral tradition and quintessence of time,” *Qualitative Health Research* 15, no. 9 (2005): 1266.

lifetime.”²⁸ These stories are multifaceted, containing layers of knowledge so multiple lessons manifest from a given story. The stories are actively experienced as part of a holistic approach to human existence, offering a continuous interconnected way of life with other people, flora, fauna, our world and that of the spirit.

Individual and communal storytelling varies in the same way written accounts do in western societies. This method should in no way be discounted as myth or fictitious and deserves the same legitimacy as any historical account. Oral tradition is the culture, language, and literature of indigenous people and warrants the same designation of ‘fact’ or ‘science’ used in mainstream convictions.²⁹ This cultural tradition is not to be taken lightly. It is a sacred role to pass on this knowledge and those who accept the responsibility rely on training, memory, and a natural ability to preserve their history for generations to come.³⁰

28 Royal Commission on Aboriginal Peoples, Education, Report of the Royal Commission on Aboriginal Peoples, Volume 1, (1996), 38.

29 Mike Swan, “Who we are as Anishinabe,” <http://anishinaabemodaa.com/data/upfiles/media/Storytelling.pdf> Accessed January 28, 2020.

30 Struthers et al, “Phenomenological research,” 1269.

ASTROLABE

It is widely accepted that the astrolabe was invented in Greece around the 2nd century A.D., although some date the instrument as far back as 150 B.C.³¹ The word astrolabe comes from the Greek word asturlabun or 'star holder.'³² It was used to solve a multitude of problems related to astronomy and navigation by observing the position of celestial objects. It was also used to solve problems related to geometry and surveying, as well as telling local time. The height of the instruments use was during the Islamic golden age from the 8th to 12th century where the most intricate and complex examples from Arab and Persian cultures were constructed.³³ Not only are the terms for the components of the astrolabe Arabic, much of modern astronomical terminology originates from this language.

The astrolabe is comprised of several moving components held together by an axle with two rotating pointers called the rule and alidade at each end. These move independently and are used for sighting-in celestial objects to corresponding information on the astrolabe. The large main portion of the astrolabe which the other pieces move around is called the mother, or mater. The back of the mater contains a degree scale to measure celestial bodies with the movable pointer called the alidade, from Arabic

31 Otto Neugebauer, "The Early History of the Astrolabe," *Studies in Ancient Astronomy* IX, Vol. 40, No. 3 (August, 1949), 240

32 Mohd Hafiz Safini, et.al. "Astrolabe as portal to the universe, inventions across civilizations." *International Journal of Civil Engineering and Technology* 8, no. 11 (2017): 612.

33 Christine Craig, "How to Construct an Astrolabe, Using Your PC," *Astronomy Report, 21st Century Science and Technology*, (Winter 2011-2012): 44.

fig 37: astrolabe back

fig 38: astrolabe front (mother)

fig 39: astrolabe rete

fig 40: astrolabe climate

al-'iḍāda, the revolving radius of a circle.³⁴ The calculated angle of the celestial reference is coordinated with zodiac and calendar information on the back that is linked with information on the front of the device. The front of the mother is divided into 24 hours around the edge with minute divisions depending on the size. Sitting static in the mater is the climate plate. The climate plate is a two-dimensional representation of the visible sky. It is specific to a given latitude and historically an astrolabe would contain several climate plates, stacked within the construction of the astrolabe. The visible plate would represent the latitude of the user at a given time. On top of the climate plate, which remains visible underneath, sits the rete. The rete displays known celestial objects, namely the brightest and most recognizable stars in the sky. Though the rete constructed for this thesis is made from transparent acrylic, historic astrolabes used delicate metalwork framework to point to a star's location while keeping the climate visible beneath. Also on the rete is a ring representing the ecliptic, or the sun's annual path through the sky.³⁵ It is with the ecliptic ring, matched with a corresponding date from the back of the mater, that the rule is aligned with to read the astrolabe.

The astrolabe utilizes mathematical mapping called stereographic projection. Polar and equatorial stereographic projection is credited to Hipparchus who developed the function in the second century B.C.. This function allows a three-dimensional object like a sphere to be projected onto a two-dimensional plane. This is the process used in creating maps and occurs by projecting linear paths from a single point. The projection point for the astrolabe constructed for this thesis is the south pole of the celestial sphere. The linear projections cut through the sphere and onto a flat plane. The climate plate of the astrolabe constructed

³⁴ "Alidade," Merriam-Webster (Merriam-Webster), accessed May 22, 2020, <https://www.merriam-webster.com/dictionary/alidade>.

³⁵ Timothy Mitchell, "Astrolabe, The Missing Manuel Beta Version 0.1" Creating Commons. 2011.

**fig 41 (top):
astrolabe front**

**fig 42 (bottom):
astrolabe back**

astrolabe constructed for
thesis made from plywood
and acrylic

historical astrolabe rete plates
were made from thin metal
pointers to denote celestial
bodies before transparent
materials could be used

photographs by author
template for the astrolabe created by
Dominic Ford
(fig 37-40)

for this thesis is specific to 45 degrees latitude, the location of Ottawa, Ontario. The plate contains several of these projections and can be understood when the individual components are distilled. Weaving western and indigenous knowledge is a series of drawings combining celestial projections with corresponding constellations as they appear in the sky. Connecting mainstream science and indigenous cosmology, these drawings exhibit the ability to interconnect both forms of knowledge. As Hilding Neilson, associate professor at Dunlop Institute for Astronomy and Astrophysics said, “You use western science and Indigenous science to gain greater insight in combination.”³⁶ Noting the importance of preserving indigenous knowledge that has been eroded due to colonialism and understanding its value as equal to western science.

fig 43: astrolabe
photograph by author

³⁶ Hannah James, “Indigenous Star Lore: Night Skies over Turtle Island,” University of Toronto News, November 8, 2017, <https://www.utoronto.ca/news/indigenous-star-lore-night-skies-over-turtle-island>.

T R O P I C S
L O O N
U R S A M I N O R

The tropics of Cancer and Capricorn denote the extents of the sun's annual ecliptic path. They are 23.5 degrees north and south of the equator respectively. These are the boundaries where the sun can be seen directly overhead, occurring at the Tropic of Cancer on the June solstice, and Tropic of Capricorn on the December solstice. A projection from the south pole through the Tropic of Capricorn provides the extents of the climate plate for the astrolabe. The second projection, through the equator of the sphere, generates the second concentric circle on the plate moving towards the center. The third projection, through the Tropic of Cancer, creates the innermost circle. Directly in the center of the plate is north in the celestial sphere. In the night sky, this is where Polaris, the North Star is located. This star appears static as all other celestial objects rotate around it. Polaris is centered in the rete plate containing the stars, and the rest rotate around this point.

The North Star, or Giwedin Anang in Ojibwe was used to map the cardinal directions and navigate the Great Lakes region of the Anishinaabe people.³⁷ This star is found on the back of Maang, the loon constellation. The constellation follows the back and incorporates the head of the loon. This is the constellation Ursa Minor, or the Little Dipper. The black and white back of a loon was seen to resemble the night sky. The transcendent loon sits between the water and land, or the material and spirit world.³⁸

*fig 44 (previous):
projection diagram [climate]
loon abstracted from drawing
by Anette S. Lee*

37 Michael Wassegijig Prince, "Anishinaabe Star Knowledge." *Winds of Change* 17, no. 3 (2002): 52.

38 Annette S. Lee, et al., *Ojibwe Sky Star Map Constellation Guide: An Introduction to Ojibwe Star Knowledge*, (Cloquet: Avenue F Productions, 2014), 6.

ALMUCANTERS

WINTERMAKER

ORION

The almucantar projections on the climate plate represent the local sky from directly above the viewer to the horizon. A second projection point, from the center of the earth through the specific latitude of the plate (user), is projected. The center of the innermost ring denotes zenith, directly above the viewers head. From zenith, ten-degree intervals are shown descending to the horizon line. The drawing shows the full extent of the almucantars, and where the extent of the plate trims the projections. Almucantar projections are fixed on the astrolabe. The constellation is shown beneath the horizon before it would appear in the sky. As the sky (rete plate) rotates about Polaris, it becomes clear how the almucantar projections function. The constellation first appears on the east horizon at the top of the plate and rises in the sky. It moves across the sky before descending in the western sky at the bottom of the plate and out of sight below the horizon line.

Biboonikeonini, or Wintermaker overlaps the Greek constellation Orion and is one of the most recognizable in the night sky. The Wintermaker story is shared in the season he brings each year, the traditional season of storytelling. Many stories are only told in winter. Certain nefarious animals and spirits like snakes and frogs are not allowed to listen to these stories and they are only told when they are hibernating.³⁹ Thousands of miles and years separate interpretations of the Wintermaker and Orion, but both harness the same belt, spanning across the heavens.

*fig 45 (previous):
projection diagram
[almucanters]*
Wintermaker abstracted from
drawing by Anette S. Lee

39

Annette S. Lee, et al., *Ojibwe Sky Star Map*, 26.

LINE OF CENTERS

HOLE IN THE SKY SEVEN SISTERS

PLEIADES

If the almucantar projections divide the heavens by increments of altitude, the azimuth projections partition vertical angle sections: east to south, west, north, and back to east like segments of an orange.⁴⁰ These lines are drawn from zenith to nadir, the point directly opposite the location of the user, through the sphere. The line of centers, perpendicular to the line from zenith to nadir, provides the baseline to generate the azimuth circles. The constructed astrolabe will use ten-degree azimuth circles, although this can vary from construction to construction. The radius of the azimuth circle is created by the intersection of the ten-degree interval line, drawn from the azimuth projection, and the line of centers. The azimuth circles become very large and only a small portion fits on the astrolabe. This is fine because the visible portion of the sky is recorded on the plate and is all that is required for viewing.

The Wintermaker's left arm reaches towards the Hole in the Sky, also known as the Seven Sisters or the Pleiades. In the drawing, this compact cluster of stars is magnified off the plate to be seen in greater detail. To the Anishinaabe, the hole in the sky is a portal from the earth to the spirit world, where people descended from to the earth. The seven sisters are ubiquitous across the world and throughout time. How dozens of civilizations without contact perceived this cluster of stars so similarly remains a mystery. In Hindu culture, they are seven nurses tending to

*fig 46 (previous):
projection diagram
[line of centers]*

40

Craig, "How to Construct an Astrolabe," 47.

a son of Shiva. In parts of the Southwest, seven wives fleeing to the sky from malicious spouses or from the trickster coyote. In Greek mythology, the seven sisters of Atlas and Pleione were pursued by Orion. The gods turned them to doves to flee from him, where they continue to evade his advances as they traverse the heavens.⁴¹ The Arabic interpretation differs in that the entire cluster of the Pleiades depict the single figure *al-Thurayâ*, the most famous of all Arab imagery.⁴² Likely a result of the Islamic prophet Muhammad's ability to see 12 stars in the constellation with the naked eye rather than the seven seen by countless other civilizations.⁴³

Anishinaabe stories of the seven sisters vary. One story tells of the seven daughters of the moon who danced on earth when their father was low in the sky. One sister fell in love with a human and she stayed on earth. Therefore, only six stars are visible.⁴⁴ The aboriginal Australian story of Ngarrindjeir depicts a mother who stays on earth and sends her daughters to the sky. The compelling synthesis of science and storytelling is how most of the stories interpret the Pleiades as young women, and the stars themselves are relatively young in cosmological reality.⁴⁵

41 Susan J Tweit, "The Pleiades." In *Search For A Common Language: Environmental Writing And Education*, edited by Graulich Melody and Crumbley Paul, 149-62, University Press of Colorado, 2005. 149

42 Roland Laffitte, "Our Arabic Heritage in the Celestial Vault," Muslim Heritage, May 1, 2008, <https://muslimheritage.com/our-arabic-heritage-in-the-celestial-vault/>.

43 Martin Lings and Sean Barrett, *Muhammad: His life based on the earliest sources*. London: Islamic Texts Society, 1983, 31.

44 Heritage Information Network 1, "The Seven Daughters of the Moon and Sun - The Pleiades," Indigenous Astronomy: Government of Canada, Department of Canadian Heritage, Canadian Heritage Information Network, 2003

45 Munya Andrews, *The Seven Sisters of the Pleiades Stories from Around the World* (North Melbourne, Vic: Spinifex Press, 2004), 16-17.

AZIMUTHS
FISHER
URSA MINOR

The lines of equal azimuth create very large circles. The finished astrolabe plate contains only a small portion of the larger azimuth circle projections. These arcs will intersect the almucantar projections at ninety degrees and allow the viewer to divide the skies both vertically from horizon to zenith, and compass direction: north at the bottom of the plate clockwise to east, south and west.

While much of the world understood the Ursa Major or the Big Dipper as a bear, the Anishinaabe story is of a fisher. Ojiig in Ojibwe, the fisher is a small mammal similar to a weasel. The fisher was tasked with finding and returning summer to earth in the depths of an endless winter. The fisher successfully apprehended summer from an island guarded by other animals and hunters who quickly pursued it along with its prize. The fisher was struck with an arrow as he climbed a tree and jumped to the sky where it still remains. Eventually the animals agreed that summer would be shared, six months each of summer and winter.⁴⁶

*fig 47 (previous):
projection diagram
[azimuth]*
Fisher abstracted from
drawing by Anette S. Lee

⁴⁶ Frank Dempsey, "Aboriginal Canadian Sky Lore of the Big Dipper." *Journal of the Royal Astronomical Society of Canada* 102 (2008): 59.

CLIMATE PLATE

Compiling all the projection components and trimming them at the Tropic of Capricorn generates the finished climate plate for the astrolabe. Held flat with the almucantar projections pointed away from the user, a complete map of the heavens is produced in the palm of the hand. A three-dimensional model built to illustrate the mechanics of stereographic projection, contextualizes how the projections function. Originating from the south pole, projections of almucanters in black, climates in white, and zenith/nadir in gray filament illustrate how through the sphere, the locations are represented on a two dimensional plane. The model not only clarifies how stereographic projection functions, it served as a form-finding instrument in the development of architectural interventions.

*fig 48 (above):
projection diagram
[climate plate]*

*fig 49 (pg60):
projection model
acrylic model
[acrylic, filament]*

*fig 50-51 (pg61):
projection model
acrylic model
[acrylic, filament]*

*fig 52 (pg62):
projection model
acrylic model
[acrylic, filament]
fig 48-52
photographs by author*

3 COLLABORATION

COLLECTIVE EXPERIENCE

The collaborative effort combining mainstream and indigenous knowledge can provide a powerful way to educate and enlighten. This principal has been pioneered by Mi'kmaq elder Albert Marshall which he calls Etauptmumk, or Two Eyed Seeing. He explains this as "learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing ... and learning to use both these eyes together, for the benefit of all."⁴⁷ Marshall, along with his wife Murdena who is a spiritual leader and clan mother of the Muin (Bear) Clan, have been pursuing this philosophy in collaboration with others since 2004 when Albert first introduced the concept of two eyed seeing.⁴⁸ Marshall recognizes the difficulty implementing this principal into established educational curriculum, however the opportunity to implement this concept into architectural representation provides a new avenue to highlight its importance. Implementing indigenous knowledge can positively contribute to the practice of architecture through the way we interact with people, and how we regard the planet. Marshall adds "Two-Eyed Seeing is hard to convey to academics as it does not fit into any particular subject area or discipline. Rather, it is about life: what you do, what kind of responsibilities you have, how you should live while on Earth...i.e., a guiding principle that

⁴⁷ "Two Eyed Seeing," Guiding Principles (Two Eyed Seeing) Integrative Science. Institute for Integrated Science and Health, <http://www.integrativescience.ca/Principles/TwoEyedSeeing/> (12 March 2020)

⁴⁸ Cheryl Bartlett et al., "Two-eyed seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing," *Journal of Environmental Studies and Sciences* 2, no. 4 (2012): 331-332.

covers all aspects of our lives: social, economical, environmental, etc. The advantage of Two-Eyed Seeing is that you are always fine tuning your mind into different places at once, you are always looking for another perspective and better way of doing things.”⁴⁹

Through the medium of architectural design, collaborative interactions and dialogue centered around western and indigenous knowledge are fostered and cultivated by means of the agency offered via two unique proposed interventions. This goal is accomplished by combining diverse cultural perspectives within the program and built form of the architecture. The projects incorporate western scientific principles of stereographic projection as spatial design and navigational tools, with the programmatic function of storytelling as a means to expand awareness of diverse cultural knowledge, worldviews, and their possible commonalities through shared resonances. Inspired by the controversy surrounding the Nepean Point monument of Samuel de Champlain and the Anishinaabe Scout, the architecture addresses the diversity of both of these cultural perspectives by offering nomadic designs and programmatic venues for individual and communal participation, engagement and discourse.

Initial schematic concepts explored site specific interventions on Nepean Point, addressing, and possibly integrating, the controversial symbolism of both Champlain and the Scout. This direction was discarded due to the historic symbolic tradition, significance and importance of such monuments and statues, which would only add to and exacerbate the existing controversy. This became insignificant and contradicted the conceptual design investigation which by then was seen as an opportunity to address the related, critically relevant and current Canadian initiative towards (re)conciliation, or more accurately, conciliation between the two sides as depicted in the original

⁴⁹ Bartlett et al., "Two-eyed seeing," 336.

version of the monument. Both Champlain and the Scout lived a nomadic life: Champlain, as a European explorer on behalf of France, lead expeditions throughout the Great Lakes and St. Lawrence River regions; the Scout, representing First Nations and sacred traditions much in tune with the cycles of the land, sky and stars, resettled and traveled through cyclical and seasonal periods in order to allow for land regeneration and wildlife reproduction.⁵⁰ Both their nomadic individual lives and communal relationship involved continuous navigation and exploration of the land, and so too does the design and programmatic function of the architectural interventions.

⁵⁰ “Nomadic: Algonquin Anishinabeg Nation Tribal Council,” Conseil Tribal, 2016, <http://www.anishinabenation.ca/en/nomadic/> (25 February 2020).

AADIZOOKAAN TENT

Anishinaabe for storytelling, the Aadizookaan tent is a kit of parts, carried on the backs of the two individuals who will operate it. It is a tool, harnessing the ability to place the user on a specific location and provide an intimate stage to display the skies above. The site is the cosmos, the tent is the lens, and the user is the participant, experiencing the heavens unfolding: A specifically orchestrated performance based on the location of the aperture. From the placement of the first stake, the entire process engages the user in the theatrics of the operation. The experiential gratification of erecting the tent promotes the embodied knowledge of place, establishing a firm foundation for the discourse of the individuals who use the tent.

fig 53:
aadizookan tent pack

Two backpacks contain the components of the tent, as well as sufficient storage for necessary camping equipment. The process of erecting the tent differs from day to night. During daytime, the first tent pole is placed into the earth. The end of the shadow cast by this pole is marked with a tent stake, later used for securing the canopy. After roughly thirty minutes the shadow will have moved to one side of the stake and gotten longer or shorter. The end of the new shadow is marked and a line drawn between the tip of the two shadows is an accurate east-west configuration.

Facing away from the original tent pole and standing on the east-west line, the first stake is west, second stake east, and perpendicular to this line is north.⁵¹ A large structural perforated tent pole is placed on this line and will direct the position of the aperture according to the desired latitude position.

fig 54:
shadow mapping

⁵¹ Gen Zod, "Finding North with Stick-and-Shadow," Useful Glyphs, Survival, November 23, 2009, <https://usefulglyphs.wordpress.com/2009/11/23/finding-north-with-stick-and-shadow/> (1 March 2020).

At night, the same tent pole is inserted into the earth. A second, shorter tent pole is placed at the edge of the tent footprint. Star recognition is not required, and any bright celestial body will work for orientation. Aligning the tip of the shorter pole with the tip of the larger to any bright star. After roughly ten minutes the star will have moved in a noticeable direction to the alignment. If it moves down the individual is facing West, up facing East, right facing South, and left facing north.⁵² Now the perforated structural pole can be oriented according to the compass. The tent is now correctly positioned and can be assembled.

The second main structural pole is placed perpendicular to the first and now the cardinal directions are correctly mapped. Secondary structure rings enable the tent to keep its spherical shape adding additional space within the interior. These rings are placed according to the same ten-degree intervals of the almucantar projections. From azimuth directly above the center of the structure, they divide the sky and create a datum. The fixed points alter the perception that the sky is moving in a much more accelerated system then with the naked eye. Not only will this provide reference points to locate celestial bodies, but similar to the helmet constructions, it will create a static grid for celestial objects to pass behind.

*fig 55:
aadizookan tent
assembly sequence*

⁵² Leo Kent, "5 Ways to Find North without a Compass," HERE 360, May 29, 2015, <https://360.here.com/2015/05/29/5-ways-to-find-north-without-a-compass/> (1 March 2020).

The shell of the tent contains a large circular aperture. This acts as a portal to the cosmos, which are invited into the tent to exhibit their nightly performance. The aperture moves along a perforated tent pole with a central vertical bracket. This contains a pin that locks into one of the holes along the pole based on the latitude of the user, illustrated at 45 degrees for the position of Ottawa. The opening can be fixed from zenith directly overhead in ten degree intervals to the horizon. Once in position, locked with a cotter pin, the 'skirt' around the opening can be staked in place and the construction of the tent is complete. The two chairs that house the components of the tent are equipped to recline in the same degree increments of the almucantar rings. The angle of the aperture is mimicked in the angle of recline of the chairs. Now the viewer is affixed to the tool itself. From the center of the floor of the tent through the center of the opening points directly to Polaris. As mentioned earlier, this star appears fixed and the night sky will rotate about this point. Circumpolar constellations that never breach the horizon such as the loon will rotate about the center of the aperture throughout the evenings procession.

*fig 56:(below)
aadizookaan tent section
aperture and chair set to
45 degrees*

*fig 57: (following, top)
aadizookaan tent
aperture set to 90 degrees
center of aperture is zenith*

*fig 58: (following, center)
aadizookaan tent
aperture set to 45 degrees*

*fig 59:(following, bottom)
aadizookaan tent section*

The intimacy of the Aadizookaan tent connects not only the individuals with each other but promotes a deeper connection with the landscape and beyond the boundaries of earth. It is a microcosm fastened to the earth, with a gateway to the heavens. It promotes a spiritual connection while maintaining function as a navigational tool. The participatory nature in both the assembly and disassembly of the tent reflect not only the ephemerality of the experience but highlight the itinerant nature of those who inspired the project. It is a synthesis of the knowledge held by both Champlain and the scout, equipped with the capacity to both experientially teach and inform.

fig 60:
aadizookaan tent assembly
fig 61: (following)
view of wintermaker
stargazing from interior of
aadizookaan tent

GIIZHIG THEATRE

The second intervention proposes a larger construction for community engagement. Preserving the programmatic function of storytelling, this portable installation can be assembled for a single event, or an extended residency. The Giizhig theatre translates the sky or heavens and like the Aadizookaan tent, it is a lens, concentrating the attention of the viewer to the cosmos. The theatre is portable, allowing the presentations to reach remote locations and follow cosmological phenomena. Community outreach is substantially greater as the mobile viewer can travel to isolated locations. With seating for roughly 50 observers, the semi-enclosed fully adjustable assembly can adapt to the conditions of the sky, story, weather, and site.

Built and transported on a twenty-foot tandem axle trailer, the components of the construction are contained within the road-ready apparatus. The floor of the construction, made from $\frac{3}{4}$ inch floor sheathing mounted to a two-inch square aluminum structural grid, unfolds as the sides of the trailer to make the floor of the construction. Housed beneath the floor is curved aluminum framework. When fully constructed the extents of the structure coincide with the earths elliptical, or the tropic extents from the astrolabe. The center of the framework representing the equator and the top and bottom 23.5 degrees above and below respectively.

*fig 62: (following)
giizhig theatre assembly sequence
fig 63: (pg 76)
giizhig theatre components*

1

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3

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Placed in grooved channels of the structure are a series of panels tailored to the presented performance. The panels range from opaque, transparent, or shaded tiles. Void of tiles, the structure acts as reference point to locate celestial bodies, as well as a datum similar to the framework of the Aadizookaan tent. Opaque tiles can be projected upon so a presenter could highlight their perspective and visualize a representation of a constellation before it rises behind the theatre into the night sky. Shaded tiles similar to a welding helmet lens can be used for sun path mapping, eclipses, and other solar phenomena.

*fig 64: (below)
giizhig theatre section
full canopy assembly*

*fig 65-67: (following)
giizhig theatre
full panel assembly*

*fig 68-70: (pg 79)
giizhig theatre
solar assembly
shaded panels installed for safe
viewing of solar events*

Wilfred Buck, member of the Cree Nation of Northern Manitoba, is a dedicated leader in the effort to implement indigenous cosmology in education. He co-curated the permanent exhibition ‘One Sky, Many Astronomies’ at the Canada Science and Technology Museum in Ottawa and travels extensively hosting events where he teaches oral traditions, keeping the stories alive.⁵³ Not only teaching traditional stories of the cosmos, Buck incorporates western science in combination with indigenous knowledge supporting the Two-Eyed Seeing efforts put forth by Elder Marshall. The indigenous understanding of The Hole in the Sky or the Pleiades as a portal from the spirit world to the earth realm is contemplated in mainstream quantum physics as a physical spatial anomaly. A wormhole or gateway to an alternate reality is a contemporary argument in modern astronomy. Referring to his ancestors on the topic he says, “They meditated on these things, they dreamed about these things, they debated on these things, and they philosophized on these things.”⁵⁴

Relating the orbits of Earth and Mars to the sun, Buck notes “Earth orbits the sun faster than Mars, at certain times Earth passes Mars, and it looks like Mars does a circle in the sky. Retrograde motion. So they call it ‘kiton pampaniw’—circles back. Another name is ‘mooswa acak’—moose spirit. Because when a moose is startled, it’ll run in a big, huge circle and then continue on its way.”⁵⁵ Through understanding of science including ecliptic paths and the axis of rotation incorporated in these presentations from Buck are just an example how the extents of the Giizhig theatres construction heightens the capacity to teach and provides a microcosm to actually experience the cosmos at the human scale. The knowledge of the scout continues to be shared and the theatre provides the stage to experience it.

*fig 71:(previous)
giizhig theatre section and
detail
ecliptic assembly
fig 72-75:(following)
stargazing
interior view of giizhig theatre
showing celestial vaulting and
variance of natural lighting
effects*

⁵³ Christie Taylor, “Relearning The Star Stories Of Indigenous Peoples,” Science Friday, September 6, 2019, <https://www.sciencefriday.com/articles/indigenous-peoples-astronomy/> (29 January 2020)

⁵⁴ Nicole Mortillaro, “‘We Come from the Stars’: How Indigenous Peoples Are Taking Back Astronomy,” CBCnews. CBC Canada, March 30, 2019.

⁵⁵ Taylor, “Relearning The Star Stories,” 1.

20:00h

23:00h

2:00h

5:00h

CONCLUSION

Although the development of this thesis unfolded from a simple foundation, the seeds of a complex examination were planted. Questions provoking human curiosity and consciousness were slowly revealed through the far-reaching boundaries of the cosmos. From the early explorations of spatial experience rooted in the phenomenological awareness of the individual, to the journey of Champlain and the Anishinaabe scout experiencing this together, examining natural processes and human experience is at the core of the investigation.

Nepean point was explored as a site for its commanding geographic location overlooking Ottawa, elevated to maximize exposure to solar and lunar events. Closer examination of the site's history and landmarks revealed an underlying tension that transformed the research from individual experience and interaction with space, to how the interaction with space can traverse cultural boundaries and bring people together. The article "A Scout's Life: English-Canadian Nostalgia, Colonialism, and Aboriginality in Ottawa," by Tonya Davidson was a critical to this investigation, highlighting the history of the Samuel de Champlain monument and its controversy. Regardless of an individual or communities position of whether or not the scout should have been removed, his absence can serve to quiet the conversation not only surrounding the controversial monument, but the contribution of indigenous

people to the building of Canada. The intent of this thesis is to create a point of departure for future conversations, serving as a voice for the scout and those he represents.

Just as the early plaster explorations of the thesis were presentations of light and shadow rather than representations of objects, the nomadic interventions are again, not a representation of the night sky, but a presentation. An invitation for people of all backgrounds to present themselves, converse, and engage through shared experiences in response to the vast mystery of the universe. Intertwining mathematically abstract methods and processes with valuable cultural perspectives, tools were created to navigate the tangible and intangible. Using architecture to contribute to the principal of Two-Eyed-Seeing and the built form to strengthen this principal. By creating spaces that highlight existing mainstream scientific understanding integrated with the diversity of indigenous understandings of cosmological phenomena, the conversation will continue with future inclusive gatherings of all people, regardless of background, coming together, sharing stories, perspectives, and experiences.

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COLLECTIVE NAVIGATION

TOWARDS (RE)CONCILIATION THROUGH COMMUNIAL EXPERIENCE

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