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Integrative Project Thesis

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## Natures of Symbiotic Relationships

### INTRODUCTION

When I begin my creative process, I think of the place I want to be. I think of the people I want to be with. I think of that feeling I get. A feeling of elation, beyond content. I take a step back and acknowledge my surroundings and hold on to that moment so I can target that memory later on. I use that feeling when I need to take myself back to a better place. I have a lot of places among nature, some that I have been to and some that I have only envisioned. One of my most vivid is when I sat by myself on the hood of my 2001 Chevy Suburban to savor in the sun. I pulled over on the side of New Hampshire's remote 104 Highway. I just sat there on the hood, looking at the edge of the vast White Mountain National Forest. The heat of late June started to weigh on me. I was wearing my XXL blue T-shirt with three howling wolves printed on the front



Route 104 in New Hampshire, 2016

on it. I was wearing my moccasins too. The hood of my car was so hot from driving in the sun. I just sat there looking, thinking. Letting my surroundings sink into my senses. I listened to the rustling trees. I felt the steaming hood of my car burning the backs of my thighs. I strained my eyes to see where the sky turned from blue to white at the cusp of the mountain tops. I tasted the dryness in my

mouth. I noticed the wildflowers growing dangerously close to the road and the lichen that bloomed up the boulders and tree trunks. This was all I needed. To be in the vast openness of New Hampshire witnessing the true greatness of nature. It doesn't seem like much. Nothing really stands out when I try to explain it. You just have to be there, a minuet presence in the wild.

I attempt to connect back to that transcendental feeling in order to create work fueled with passion. I dial into my senses, my emotions, my relationships. I am attracted to organic forms and processes of growth seen in nature. My mind wanders to wildflowers entangled, branches of pine trees stretching toward



Cathedral Ledge in North Conway, New Hampshire, 2016

the sky, divine rock formations that water took years to carve into, and the persistence of lichen that roots itself onto endless surfaces. I reflect on my relationship with the natural world, with my environment, with those around me. I began to connect my relationships and interactions with the concept of symbiotic relationships, which is defined as the interaction between two different organisms living in close physical association, typically to the advantage of both.<sup>1</sup> Symbiosis is habitually connected to ecology, but the concept of symbiotic relationships can be applied to relations humans partake in. I examined mutual relationships found within nature, such as fungi working with algae to appear as lichen, as a visual reminder of what it means to be in a beneficial relationship.<sup>2</sup>

<sup>1</sup> US Department of Commerce, and National Oceanic and Atmospheric Administration. "What Is Symbiosis?" What Is Symbiosis? January 28, 2014. Accessed April 24, 2019.

<sup>2</sup> Utah State University. "Lichens." Herbarium. Accessed April 24, 2019.

My integrative project is intended to emulate formations and growth patterns created by different species of fungi. These forms support a glaze that mimics the mutual relationship between fungi and photosynthetic organisms which appear as lichen. This installation provokes viewers to consider their symbiotic relationship with the environment, as well as appreciate the subliminal effects created by nature.

## CONTEXTUAL DISCUSSION

### *Symbiotic Relationships*

Symbiotic relationships are interactions between certain organisms that range from mutually beneficial to inequitably harmful. These relationships are essential to many organisms and ecosystems, and create a cohabitating balance that can only be achieved by working together.<sup>3</sup> An organism's interactions with its environment are fundamental to the survival of that organism and the functioning of the ecosystem as a whole.<sup>4</sup> Even though there is a spectrum within symbiosis, there are six main categories that relationships fall in. These include mutualism, commensalism, competition, predation, parasitism, and neutralism. My project focuses on the mutualistic relationship



Fungi and Lichen, Dexter, Michigan, 2019

<sup>3</sup> Utah State University. "Lichens." Herbarium. Accessed April 24, 2019.

<sup>4</sup> "Ecosystems." NatureWorks. Accessed April 24, 2019.

seen within lichen to create a visual reminder of the mutual relationship humans should sustain with nature.

Mutualism is a symbiotic relationship where both partners benefit and are helped in some way. This relationship is seen in clusters of lichen that appear as single organisms growing on bark, rocks, walls, or even rusty tires in a diversity of environments such as in woodlands, deserts, or tundra. Their forms appear plantlike, mimicking branches, tiny cups, or leaf-like fronds. Although they look like a single plant or fungi, lichens are composite organisms, meaning fungi live with microscopic algae. The lichens are created by symbiosis and forms only when its two partners meet. The fungus benefits from the symbiotic relation because algae produce food by photosynthesis, which is utilized by the fungus. The algae benefit by being protected from the environment by the filaments of the fungus, which absorb moisture and nutrients and provide an anchor.<sup>5</sup>

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<sup>5</sup> Gabriella Hanner, Caden Beroza, Sudhir Kannaujiya, John Jaksich, Stefanie Farrington, and Tenzin Monlam. "Lichens: Symbiotic Relationship Between Algae and Fungus." Decoded Science. July 22, 2013.

US Department of Commerce, and NOAA. "Lake Erie Harmful Algal Bloom." Click for National Weather Service. September 04, 2018. Accessed April 25, 2019.

Saunders, Charles Francis. Edible and Useful Wild Plants of the United States and Canada. Dover Publications, Inc., 1920.

*Human Relationship to Nature*

There is a current crisis with the unsustainable way humans are treating the earth. An ecological footprint is the measure of human impact on Earth's ecosystems. One's footprint is



Harmful Algal Bloom in Lake Erie, Michigan, 2018

typically measured in areas of amount of natural capital consumed each year. Worldwide, the total human ecological footprint in 2.6 gha/cap, meaning we need the resources of 2.6

earths to sustain current human habits.<sup>6</sup> Biological capacity is an ecosystem's capacity to produce biological materials used by people and to absorb waste material generated by humans. As the ecological footprint continues to exceed Earth's biocapacity, humans are depleting future resources and aging the Earth at a rapid rate. This relationship with nature is not mutual and unsustainable.<sup>7</sup> Most people continue with this relationship because it is more convenient, they don't see the effects of their behavior, or they are uneducated of the appropriate way to habitat their environment. The effects of climate change are also taking a toll of the aesthetic beauty of nature. Monumental glaciers are melting, coral reefs with explosive amounts of color and biodiversity are bleaching into ghost towns, picturesque lakes are being contaminated with toxins

<sup>6</sup> "Open Data Platform." Accessed April 25, 2019. <https://data.footprintnetwork.org/>.

<sup>7</sup> "Ecological Footprints & Human Impact Factors." FEW Resources.org. Accessed April 24, 2019.

Donovan, Tara. "Untitled." Digital image. <https://www.mfa.org/collections/>.

from the agriculture industry. A negative relationship with the earth has been formed where humans rapidly deplete the Earth of its resources, and fail to replenish them.

*Artistic Context*

Aesthetically, artists routinely look to ecology as inspiration for form and function. The environmental systems created by microorganisms have proved their aesthetic beauty, routinely being a muse for creative minds. Dutch artist



Tara Donovan, *Untitled*, 2015

Lizan Freijsen explores our relationship to fungi, stains, mold, and moisture through modes of interior design, such as rug and tapestry making. Freijsen creates rugs that mimic the unique patterns of natural fungi formations in states of growth and decay. Installation artist Tara Donovan uses man-made materials to explore the natural world by constructing site-specific works that evoke landscapes and organic forms. Donovan's full wall installation "Untitled", uses Polyester metallized film tape to create a natural growth looking pattern. It is apparent that the material is clear and synthetic, but the form mimics the ecological growth of lichen.



Andy Goldsworthy, *Nested*, 2012

The book, *Stone*, is a collection of images capturing Andy Goldsworthy's remarkable site-specific installations.<sup>8</sup> Goldsworthy takes objects found in nature, such as rock and stone, and reworks the materials back into their environment. These sculptures interact with multiple and diverse environments and display organic

formation. I appreciate how Goldsworthy reworks natural items into a sculpture that is human-made, yet seamlessly integrated with its environment. He creates forms that defy possibility as they test the laws of gravity as well as human capability. I am inspired by his forms and their ability to look natural, nevertheless human-made. I also admire his use of naturally sourced material to form his sculptures. Goldsworthy's use of material contains a sense of minimalism and longing for a natural world.

Ideas of the aesthetics produced by nature first appeared in Edmund Burke's *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful*, first published in 1757. It is the first complete philosophical exposition for separating the beautiful and the sublime into their respective categories. Burke believed that only natural formations could create effects the sublime and that humans could only produce work that reflects aspects of it. Artists do not have the power to create the sublime because the "source of greatness [sublime] is

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<sup>8</sup> Goldsworthy, Andy. *Stone*. Harry N. Abrams, Inc, 1994.

"Lizan Freijssen." BOON. Accessed April 24, 2019. <https://boonparis.com/lizan-freijssen>.

difficulty”, therefore anything an artist creates, no matter how impressive, cannot be considered sublime because they were able to craft it.<sup>9</sup> Philosopher Immanuel Kant focused on the concept as a “mental condition or an aesthetic experience that emerged from a strain in perceiving something boundless or infinite.”<sup>10</sup> He argued that the sensation of sublime depended on each distinctive person because every individual has their own unique set of feelings that can be provoked by different elements. This provoked me to think about the sensations that overcome me when I am immersed in nature. When I am hiking up mountainsides seeking blossomed botanicals, scaling boulders and discovering explosive clusters of lichen, or looking over a vast valley attempting to contain immeasurable amount of wildlife; the senses of elation, curiosity, and astonishment overwhelm me.

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<sup>9</sup> Burke, Edmund. *A Philosophical Enquiry into the Origin of our Ideas of the Sublime and Beautiful: With an Introductory Discourse Concerning Taste*. Cambridge, United Kingdom: Cambridge University Press, 2014.

<sup>10</sup> Kant, Immanuel, and John T. Goldthwait. *Observations on the feeling of the beautiful and the sublime*. Berkeley: University of California Press, 2004.



I am a craftswoman. I sculpt with clay and plaster. I weave and knit with fibers. I pound metal until it does what I want. I think on my feet and experiment with new processes. I use a variety of materials to represent themes of nature, such as color, shape, pattern, and direct imagery. My piece *Tectonic Plates* depicts the relationships between natural formations. The glaze, a struggling symbiotic relationship between the materials within the glaze, fight each other and create crawling, melting, bubbling, and collapsing. The biggest element to crafting this



Dana Campbell, *Tectonic Plates*, 2017

piece was the uncertainty. I applied heavy amounts of glaze, unknowing how they would react once trapped in the scorching heat of the kiln. The chemical compound in the glaze will either bind together in mutualism or reject each other in competition. This relationship is out of my control, and into the power of the natural force of fire. Once the piece comes out of the kiln, I am able to evaluate the mutualism and competition between glazes and application. That sense of unknown gives it anticipation, as well as a sense of surprise when revealed. These are the feelings I seek when I create. When my mindset can be at a place of elation, my work can also embody senses of elation.

## METHODOLOGY

I began with material exploration with the purpose of discovering a method to create a successful artifact that represents a connection with the natural world. I scoured through archives of ceramic glaze test tiles, seeking earth tones and textures. I came across a low fire glaze that had not fully developed which resembled lichen growing on rock. I pulled the recipe for the glaze and started experimenting with the base ingredients. I trialed different colorants and application methods to understand how the color and texture formed. Through cross examining test tiles with different species of lichen, I found a successful color palette and texture form.



Dana Campbell, Lichen Glaze Test Tiles, 2018

After discovering the perfect glaze to represent the mutual relationship found within lichen, I continued to investigate with clay forms that could effectively exhibit this glaze. I went through multiple iterations from hand building to throwing vessels on the wheel, with the purpose of creating a fungus-like form. My first iteration came from fashioning slabs of clay into flat, wavy forms similar to bracket fungus. This method was tested with white and red clay body, both suitably showing the splendor of the glaze. The white clay was more tolerant in building my target form, so I continued using that clay body. I felt these flat figures lacked dimension and interest, so I considered utilizing the throwing wheel to achieve a more dynamic, three-dimensional shape, while still striving to maintain an organic nature. I threw cylinder vessels on

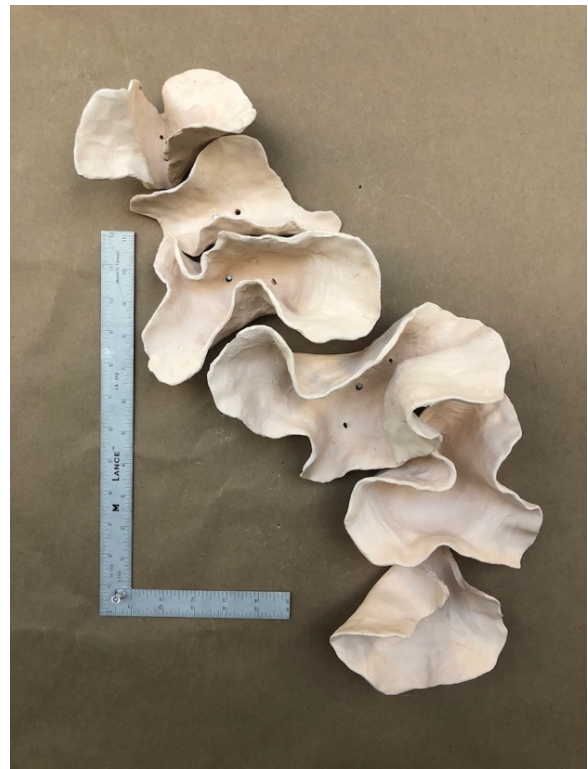


Second Iteration of Clay Forms

the wheel and then transformed the uniform shape by squishing, bending, and pulling at the clay. Once entering the leather hard stage of drying, I scraped away at extra clay and created texture seen on certain species of mushrooms. The homogeneity of throwing on a wheel caused a lack of breadth and opportunity for investigation. For the last major iteration, I returned to hand building with slabs, but pressed the clay into a bowl-shaped mold to prevent the clay from becoming flat. Through this method I was able to achieve a dynamic form that captured the

organic essence and aesthetic of fungi, as well as giving me the freedom to craft diverse forms.

With a successful ceramic form and glaze, I began considering different installation methods. I first contemplated having the sculpture in a natural setting or in a gallery. I concluded that the contrast between the natural form and the artificial space of a gallery would be most affective. I then contemplated the sculpture on the wall or on the floor, reflecting on the places where fungi naturally grow. After testing elements of the sculpture on the wall and on the floor, it was apparent that the details of the forms were more visible and



Installation Test on Wall with Third Iteration Forms

captivating for the viewer at eye level on a wall. I then began testing installation methods to

secure the ceramic forms onto the wall, including epoxying nails onto the back of each form. I found that drilling a pilot hole in the wall, then pushing the nail attached to each sculpture to be most supportive to keep each unit in place.

## CREATIVE WORK

My integrative project, *lichen 1-104*, is an installation composed of one hundred and four ceramic sculptures that emulate formations and growth patterns created by different species of fungi. These forms support a low fire glaze that mimics the mutual relationship between fungi and photosynthetic organisms which appear as lichen.



Details of Installation *lichen 1-104*



Dana Campbell, *lichen 1-104*, 2019

This installation provokes viewers to consider their symbiotic relationship with the environment, as well as appreciate the subliminal effects created by nature. After a week of installing, it exhibited to the public on

April 12<sup>th</sup>, 2019 at the STAMPS Gallery in Ann Arbor, Michigan. The entire installation reaches eight feet in height, and wraps around the outside of corner of a wall stretching six feet one way and two feet the other. It grows no more than six inches off the wall.

The installation processes became a major phase in completing the sculpture. Each small fungi sculpture was unique in it's form and glaze. The glaze created more saturated clusters of color, freckled across each piece. I had to look closely to appreciate the delicate detail. I cautiously attached each fragment to the wall, one by one, examining the relationship between them. I worked off the shapes and shadows that were created by the piece before, creating a sense of mutualism. There was a slow and natural process to creating this installation. I admired the simple and earthy elements allowing space and growth for one another.



Installation in Process

## CONCLUSION

Through natural selection and processes, the earth has developed an infinite amount of symbiotic relations in order to support a healthy ecosystem. Humans have struggled to create a beneficial relationship with the environment. Too often people treat the world parasitically, draining its resources for their profit. Humans are also exhausting the world of its natural beauty, diminishment natural wonders, and slowly becoming more disconnected with nature. The acknowledgment of human destruction began in the early 1900s when John Muir, known as the father of the National Parks and founder of the Sierra Club, witnessed the destruction of

California's massive sequoia trees for industrial use.<sup>11</sup> He advocated for the value of nature as a habitat, rather than a reserve. Since then, there has been a constant struggle between taking from the earth's resources and supporting the natural world to maintain longevity. Humans need to reevaluate their relationship with nature with the hope of creating a more mutual and sustainable relationship. An equal relationship is imperative for the long term survival of humans and the Earth.

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<sup>11</sup> Wood, Harold. "Who Was John Muir?" The John Muir Exhibit - Sierra Club.