ABSTRACT

Title of Thesis: MORE LEVEL

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Thesis Directed By: Full Professor, Foon Sham, Department of Art

More Level is an exhibition of sculptures in The University of Maryland Art Gallery. The three sculptural works explore ideas in form, craft, space, and time. In the following, I describe my processes, personal experiences and thought patterns as I create art. I also provide descriptions of the work in the show.

MORE LEVEL

by

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Advisory Committee:
Professor Foon Sham, Chair
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Preface

This following text is a translation of a few of my many thought patterns and processes as I make art. The culmination of my three years in graduate school cannot be summed up in words. Because I don't think in words, this text is limited by the very nature of text itself. Words act as an approximation of ideas limited by a definition. Words are one form of communication. I express myself through actions and objects more than with written or verbal language.

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Chapter 1: Nature and Evolution

Like all things, language is mutable and evolutionary. Even the word evolution evolved from its original meaning. The Latin word "*evolutio"* meant the unraveling of a scroll. The English word evolution came to mean the process of opening or revealing information. Charles Darwin was reluctant to use the term "evolution" as it may have connotations to that of revealing a predetermined omniscient plan.[1]

Everything from language, matter, life, and ecosystems to planets and galaxies undergoes evolution and unpredictable changes. The changes that are "successful" will continue and live on to create more changes, while the changes that are "unsuccessful" will cease to exist. There are many different types of evolution. Matter can be neither created nor destroyed,[2] the evolution of rock could be the transformation of space debris into a planet, into tectonic plates, into a mountain, into a pebble, into sand. The rock will eventually become space debris again creating an endless cycle of transformation. Natural selection and hereditary mutations give an individual an advantage over those vying for the same resources, giving them a better chance at reproducing and passing these genes on to their offspring.

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[1] "The Etymology of the Word 'Evolution'." *OxfordWords Blog*, 10 Jan. 2017, blog.oxforddictionaries.com/2015/05/08/evolution-etymology/.

[2] "Law of Conservation of Matter - Conservation of Mass." *Nuclear Power*, www.nuclear-power.net/laws-of-conservation/law-of-conservation-of-matter/.

While it is commonly known that natural evolution doesn't have a specific goal in mind, the outcome is an adaptation that will effectively lead to an increase in the efficiency of the species. Whether it be the teeth on the great white shark, the neck on the giraffe, or the overall size of a redwood tree, these traits give the species an advantage over other species competing for the same resources. A mutation is formed through random chance. Most mutations are either neutral or harmful. "Beneficial" genetic mutations are context-dependent, meaning their environment determines whether the outcome of the mutation is beneficial.[3]

Nature has no plan. When using the word nature I don't necessarily mean rivers and trees and the great outdoors, but rather the universe, natural forces and reality itself. Though humans are part of nature, there are limitations on what we can create. My relationship with nature is one of awe, fascination, and metaphysical spirituality. Through sculpture I strive to be closer to nature. I do this through pushing my own limitations of creation and learning about how I use my body and mind as an artist. I experience great joy and a sense of accomplishment in creating. I feel a sense of enlightenment in knowing that I've brought something into reality that would not have existed if I did not exist.

Evolution not only exists in nature, but in my work as well. The processes of conceptualizing, designing, planning and implementing a work of art are all mutable. It is much easier to change an idea than it is an object, and because of that I tend to lose some aspect of control with each step in the process. In my work I like to commit to a process for each specific sculpture. If I find a technique

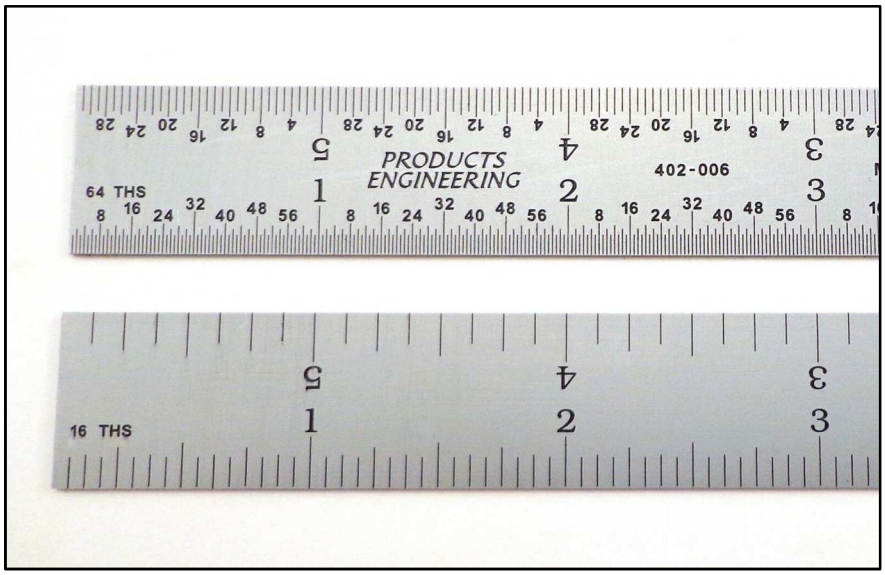
[3] Purdom, Georgia. "Are There Beneficial Mutations?" *Answers in Genesis*, 25 Apr. 2008, answersingenesis.org/genetics/mutations/are-there-beneficial-mutations/.

or process that is more efficient than the process that I started with I am reluctant to use it as it may interfere with the overall cohesion of the work. For example, I'm using type A glue to adhere pieces to my sculpture and I run out. I could use the type B glue that I have on my shelf to stick the rest of the pieces on. I do a quick test only to find out that this glue dries quicker and holds the pieces on stronger. I've already done two-thirds of my sculpture with the first glue and I plan on painting it after all the pieces are stuck on. Do I take the risk of the paint not sticking to the second glue? What if the humidity changes in the summer and all the pieces with type B glue fall off? Are there any other variables that I'm even aware of? Am I overthinking this? Inevitably I go to the store and buy more type A glue. I can't take the risk of losing cohesion in the work. However, I have learned that if I make another sculpture similar to this one, using type B glue from the start would increase the efficiency in making that sculpture.

In my own practice, each specific artwork or series of works is prescribed by a set of rules. These rules exist to guide me through my repetitive meditation as I work. The less I have to think about after the concept and design phases, the better. However, if the time comes when a rule detracts from the overall aesthetic of the piece, it can be broken. After all, I am the creator of the piece, the rules are not.

Chapter 2: Efficiency and Process

Nothing in nature can be measured. A measurement is never exact. The distance between two objects can always be broken down into a more precise measurement. Everything measured is broken down into degrees of accuracy. A tape measure broken down into 1/128ths would be so full of lines that it would become impractical to use.



Two rulers with different degrees of precision. (Figure 1)

When making a 90° cut, it may look like a right angle to the human eye, but it may be 89.9965°. This is not to say that this cut will not suffice for an accurate right angle, it will, but an 87° cut will not work. Somewhere between these two measurements lies the point where accuracy affects the outcome of the object being created. Systems of measurement are intended to be accurate relative to their need. For example, a lightyear is the distance traveled by light

during one revolution of the earth around the sun. While the speed of light is constant, what is a year? Is a year from midnight January 1st to midnight January 1st the next year? Or is it 365.24219 days, as NASA data suggests?[4] Now let's take into account that the speed of light may not be as constant as Einstein thought it was. According to new scientific research, light speed fluctuates as it travels through different areas of space and depends on the structure of its pulses.[5] Should we get rid of the use of lightyears? Of course not. The minute light fluctuations and accuracy of a year to a hundredth of a decimal place are so infinitesimal that we still use them to accurately describe how far something is billions of miles away. The practical applications of limited precision outweigh the infinite exactness that can't even be measured. This can also be said of a tape measure, a protractor, or a level. Precision and accuracy are an important part of my work. When I make something, I try to make it to the best of my ability. Sometimes outside factors get in the way. The floor may not be level. The stock material may be warped. The saw blade might be dull. In addition to physical factors, my emotional states also come into play

Just as many factors can contribute to a reduction in precision and accuracy, many factors also contribute to the development of precision. Computer aided drafting and automated cutting tools can be beneficial in the creation of precise objects. These tools are new to me. In the past, I have used

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[4] Kahn, Ralph A. "Practical Uses of Math And Science (PUMAS)." *NASA*, NASA, pumas.jpl.nasa.gov/.

[5] Grant, Andrew. "Speed of Light Not so Constant after All." *Science News*, 8 Mar. 2016, www.sciencenews.org/article/speed-light-not-so-constant-after-all.

skills acquired throughout my art-making career to craft precise objects and these tools are no different in that respect.

When creating sculpture, I try to be as efficient as possible. By planning out stages of construction, making material lists and using past experiences to guide my creation, I can use my time more efficiently.

Craftsmanship and skillful technique play a major role in my art. Ever since I was a child I have been making things. My father, a builder, taught me early on how to use tools properly, and gave me plenty of appliances to take apart, with the occasional successful reconstruction. My mother was always encouraging my creative side. In high school I was focused more on music and music theory than on visual art, a different non-verbal art form. I have always enjoyed learning new instruments and figuring out how they work. Tools are similar to musical instruments in that they can both be used to create something beautiful with the proper knowledge, technique, and creativity. They are both bridges between the mind of the creator and the attention of the observer. Just as I love learning new instruments, I love learning new tools and techniques in art-making.

The process of learning and perfecting a craft is evolutionary. Just as a baby needs to learn how to crawl before it learns how to walk, the use of tools needs to be developed in order to successfully create the intended concept. By knowing the capabilities of the tools in one's repertoire, the less one is limited by constraints in the building of their work.

I believe in four main principles in the construction of my sculpture: concept, design, plan and implementation. The following is an explanation of these four steps and a few of the questions that I ask myself along the way.

Concept- In the concept phase I think more about the overall idea or feeling that I'm trying to convey. Will this make someone feel a certain way? What will the viewer gain from this experience? How can I get my point across without being too obvious or too mysterious?

Design- The design phase is where I begin to approach how the sculpture will be built. What will the sculpture look like? How big will it be? What materials should I use to convey my ideas and allow the sculpture to withstand the stresses of its own existence?

Plan- The planning phase is a more technical and practical approach than the first two phases. This step involves taking a non-physical idea or a two-dimensional drawing and bringing it into three dimensions. What tools do I need? How much material do I need to get? How will I move the piece once it is built? Will the sculpture fit through the doors in the exhibition space? If not, how can I make it so it does? What is the most efficient way of making this sculpture, in terms of time management and technical knowledge?

Implementation- After completing the first three steps I can finally begin to construct the sculpture. In this phase I can use all of the prior knowledge gained from conceptualizing, designing and planning the piece to assemble and construct the sculpture. What adjustments do I need to make? Where do I store this thing? Does it still fit through the doors of the exhibition space?

These steps rarely occur in an orderly or linear process. Tweaks and adjustments need to be made to the piece along the way. The rules are ultimately a tool to help me in generating art.

An important part in the planning and design phases of my process is the exploration of materials. By combining, manipulating, and using materials in ways other than their intended purposes, I can explore their capabilities and add them to my collection for future use. I can learn what to do and what not to do to make a successful sculpture. I feel like a scientist when doing tests to see which tool is best at melting plastic without it burning or which tape is flexible and can withstand water. The problem-solving aspect of making art is one of the most rewarding to me. I like to refer to parts of my sculpture as “altered found objects”.

I like to think of found objects as anything that could be used to make art, that also have an intended non-art function. By altering these objects, I can take advantage of the viewer’s familiarity with the object without it being overtly obvious as to what the material is, leading to a sense of curiosity and wonder. In the past I have used fluorescent surveyor’s tape, fencing, window screen, automotive parts, and yarn to name a few. I alter these objects through experimentation and trial and error until I have discovered an appropriate use for them.

From the middle ages to the end of the 17th-century, alchemists attempted to create the philosopher’s stone. This fabled item was said to be all around us, only it was unrecognizable and unrefined. The philosopher’s stone

was said to be able to turn base metals (iron, copper, lead, etc.) into precious metals such as gold and silver. The pursuit of this legendary substance eventually led to chemistry, metallurgy, and other scientific disciplines that we use to this day.[6]

Cornelis Bega, *The Alchemist*, 1663, National Gallery of Art, Washington, From the Collection of Ethel and Martin Wunsch (Figure 2)

I regard the search for the philosopher's stone and the stone itself to be a metaphor for my own art and art making. My goal as an artist is to take everyday common materials, base metals being among them, and turn them into

[6] Britannica, The Editors of Encyclopaedia. "Philosopher's Stone." *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., 2 May 2018, www.britannica.com/topic/philosophers-stone.

something that I hope will inspire original thought and open-mindedness to the world around me. I hope to bring something into nature that will complement it. If I can get some gold out of it too that’s even better.

Chapter 3: Meditation

My work is often made by using a repetitive and meditative process. This meditation puts me in a place I like to inhabit. By focusing exclusively on my craft and my set of rules, I can eliminate all other distractions. Repetitive meditation can exist in many forms. Whether it be knitting a sweater, fly fishing, chanting or even counting sheep before bed, repetitive meditation is both calming and pleasurable. Scientific studies have also shown that meditation may ease symptoms of depression and anxiety, and may help people with insomnia.[7]

When crafting work of a repetitive nature, my mind is free to wander. Time is meaningless. One question I often get asked about my art is “How long did that take to make?” I often reply “my whole life,” not to be a smart-ass, but to show them that time is irrelevant. The evolution of my life and art-making have grown from the day I was born. Experiences, feelings, thoughts and interactions with others have all shaped who I am and what my art is about to this day.

Many cultures throughout the world have practiced and continue to practice meditation. The techniques involved may be different, but the idea is generally the same.

The Tibetan Buddhist tradition of the creation and ritualistic destruction of sand mandalas is one example of an object of focused meditation. The monks will lay out a plan or blueprint, usually related to the successions of incarnations

[7] “Meditation: In Depth.” *National Center for Complementary and Integrative Health*, U.S. Department of Health and Human Services, 2 Jan. 2019, nccih.nih.gov/health/meditation/overview.htm.

of the Buddha. They will then fill in this blueprint with individual grains of sand, taking many days or even weeks until the “map” is complete. By focusing solely on the placement of the grains, the steadiness of their hands and the following of the blueprint instructions they aim to clear their minds and focus on individual enlightenment and the spiritual well being of humanity.

Completed sand mandala (Figure 3)

Sand mandala in progress (Figure 4)

Upon the completion of the mandala, the monks ritualistically destroy it. The sand is swept into the middle in a specific order to release the deities inside

it, collected, and returned to a nearby body of water. They also give small amounts of the sand to visitors of the dismantling ceremony. The destruction represents the cycle of life and the flow of positive energy back into the universe.[8]

I have had the opportunity to witness the creation and destruction of a sand mandala when working at the Plattsburgh State Art Museum. The monks would come in early everyday, do a ritualistic prayer, and then get right to work on the mandala. As someone who was just starting out as an artist, this was a very impactful moment for me. The dedication involved in the creation of an object that would benefit them spiritually was very inspirational. The monks gave me a small jar of the sand when they were finished, which I have kept to this day.

I in no way proclaim to be a master of meditation. I have chosen to better myself through the creation of objects. I cannot describe in words the feeling of meditation involved in my process nor the benefits from it. I like to think of this feeling as being similar to that of the monks making the sand mandala.

[8] "Tibetan Sand Mandala." *Ancient History Encyclopedia*, Ancient History Encyclopedia, www.ancient.eu/image/6518/tibetan-sand-mandala/.

Chapter 4: The Past

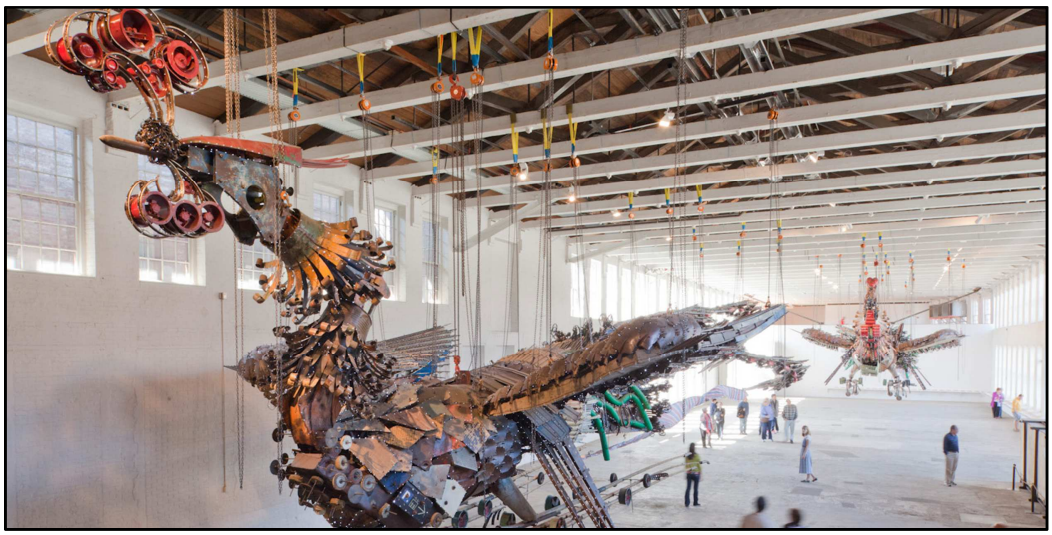
In a culture of social commentary and conceptual critique I strive to evaluate and assess nature and reality themselves and how they influence me, not only as an artist but also as one small fragment of an inconceivably large universe. A great deal of contemporary art focuses on issues related to the past. The past is immutable; we can learn from the past and I hope we do. What I strive to do with my work is to look towards the future. How will I grow as an individual? How can I challenge myself to create something that pushes my limits and helps me to learn?

I had the opportunity to experience many facets of the art world prior to attending graduate school. At my undergraduate university, SUNY Plattsburgh, I worked in both the art museum gallery and the outdoor sculpture park. Working at the gallery taught me many preparatory skills including but not limited to hanging works of art, handling art, preparing walls, and archiving collections. Not many students looked forward to their work-study assignment as much as I did. Working in the outdoor sculpture park taught me some of the skills involved in the restoration and upkeep of large outdoor sculpture.

Upon graduation, I had the opportunity to work at Salem Art Works as an intern. This experience gave me the opportunity to continue working with other artists, engage in critiques, and live in a communal art residency center. Through hard work and developing skills, I was asked to stay on staff after my internship, as the growing organization's first sculpture park manager. At first, the position

seemed to be out of my wheelhouse. Moving multiple-ton sculptures, installing new works on the site, and helping to turn the park from a contemporary art graveyard into a thriving sculpture park helped both Salem Art Works to grow as an institution and myself to grow as as an artist and an adult. The talented and genuine people that I met and interacted with at SAW are still friends of mine, and it goes to show the relatively small size of the sculpture community that I run into people I met there all the time at various art functions. After two and a half years of communal living, I realized that it was time to move on.

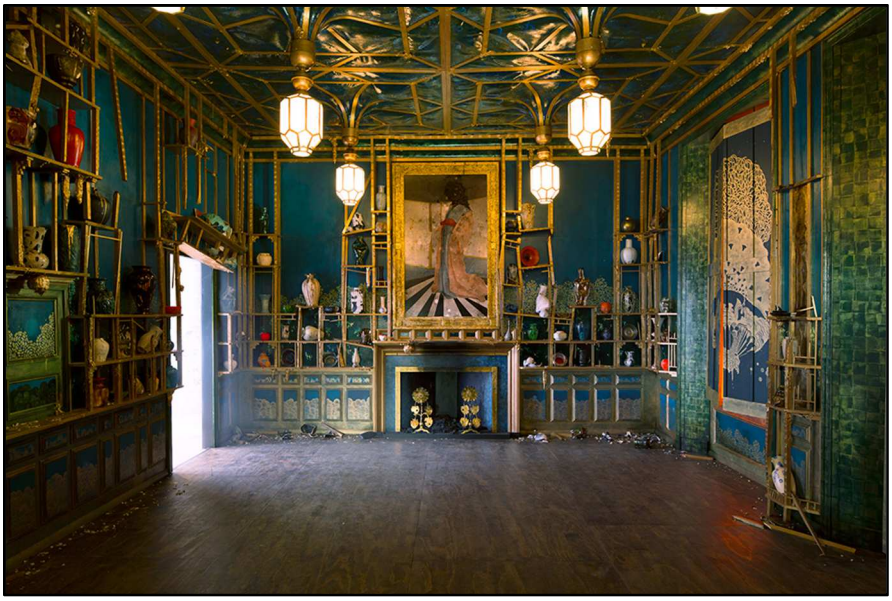
The skills that I learned at Salem Art Works led me to a temporary position at the Massachusetts Museum of Contemporary Art. The museum was installing two enormous, 12-ton sculptures in their largest exhibition space.



Xu Bing, *Phoenix*, 2012, (Figure 5)

The sculptures by Chinese artist Xu Bing are representations of two phoenixes made from construction debris. Upon the completion of this installation

I was asked to stay on full-time as a preparator/fabricator for the museum. I would soon find out that this job would be less about hanging paintings and painting walls, and more about making artists concepts come into reality. I learned more about the installation and making of artwork in my two years as a employee of MASS MoCA than I ever would have been able to imagine. From making a suspended waterfall in a three story tall gallery, to helping construct a dark, dramatic recreation of James Whistler's *Peacock Room*, I learned that with the right amount of planning, foresight, and a skilled crew, anything imagined can be built.



Darren Waterston, *Filthy Lucre,* 2014 (Figure 6)

There were downtimes between installations when I had to make other art-related objects. I made pedestals, shipping crates, vitrines, and even permanent museum furniture. I love making pedestals and crates. By focusing on

the craft and the precision of an object, my mind is free to wander. When I go to a gallery or museum I look at the pedestal construction as well as the art. A poorly made pedestal can distract from the intention of the pieces placed upon it. Building these items as well as I could helped to hone my craft in making. My time at MASS MoCA not only helped my with my fabrication and installation skills, it helped with my interpersonal skills as well. Helping an artist to realize a work of art would be impossible without clear communication. Throughout this experience I met many artists whom I respect and admire.

After falling in love in Massachusetts, I moved to Maryland to be with my partner. Trying to find a job with my art fabrication skill set proved to be difficult, so I started applying to jobs that were in a similar vein. I got hired as a temporary staff carpenter at Studio Theatre in Washington D.C. At first I was skeptical of my ability to do this job, not knowing the theater lingo or even the difference between house-right and stage-right. After a few weeks I got the hang of it and was eventually added to their staff full-time as the Master Carpenter. Many of the techniques used in my previous jobs were the same. Rigging and lifting a heavy object, making other artists' visions tangible, and developing camaraderie with my fellow co-workers were all familiar. One aspect of theatre work that was totally different than art work was synthesizing the input of many different artists. The set designer has a say, the lighting designer has a say, the sound designer has a say, the director of the play has a say. It often felt as though there were too many cooks in the kitchen and the overly collaborative nature of theatre led to confusion and misdirection on many different levels. This job also highlighted

how the use of computer aided drafting could be beneficial in the creation of art. I'm glad I had had my theatre experience because I had the opportunity to learn a new skill set. I use many of the techniques and tools that I learned at Studio Theatre in making art today.

Through my previous places of employment, I have gained valuable skills that I use in creating art.

Chapter 5: Artist / Designer / Engineer / Fabricator

I have recently become interested in the use of three-dimensional modeling as a tool in the creation of sculpture. This tool is tremendously beneficial to me in the design and plan stages in my practice. Being able to see what a sculpture looks like before it is built enables me to see potential fabrication problems, aesthetic concerns, and size in relation to a space, among other things. However, being able to see what a sculpture looks like before it has even begun to be built has made me aware of a personal dilemma of two distinct but complementary personalities.

The first personality is of the artist's mind (the designer). The designer has the freedom to imagine, push, pull, and tweak forms to his liking. He can discard plans just as easily as deleting an email. By using his aesthetic judgement and creativity he brings his ideas into being, from nothing. The second personality is of the artist's skills (the fabricator). The fabricator receives the blueprints that the designer has created. By using his patience, the skills of his craft, his physical coordination, and his swift knowledge of tools and techniques he can bring an intangible concept into reality.

The designer longs for physical stimulation. He sits behind a desk all day looking at a computer screen becoming mentally fatigued. He has no time to think about more abstract ideas unrelated to the model or drawing he is making. The fabricator, by contrast, has no say in what is being made. When he comes across a design problem caused by a lack of practical experience, he has to go

back to the designer and have him sign off on a change. The fabricator is physically exhausted at the end of the day.

As an artist, I am both the designer and the fabricator. When I am designing, I sometimes wish I was fabricating, getting lost in my work, to meditate, and to be proud of what I have accomplished. When I am fabricating I sometimes wish I could go home to lay down and rest, without having to shower first. As someone who has primarily been a fabricator and is beginning to understand the designer's world, I can appreciate that my design is influenced by my knowledge of technical tool usage, including new three-dimensional modeling skills. I am aware of what materials can and cannot be attached together, and how to do so. I am also aware of what errors can occur in the modeling phase, leaving me only to blame myself if something goes wrong. Essentially, three-dimensional modeling programs and computer controlled machines are tools. Working with them may be different than learning how to use a table saw or learning how to weld, but adding another tool to my skill set that will help in making sculpture is always a positive.

Chapter 6: The Developable Ellipsoid

For all three sculptures in my show, I chose the ellipsoid as the main structure. According to Encyclopedia Britannica an ellipsoid is "a closed surface of which all plane cross sections are either ellipses or circles. An ellipsoid is symmetrical about three mutually perpendicular axes that intersect at the center".[9] I have chosen this shape because it represents simplest of all natural forms. A mass whose own attractive force is evenly distributed will create a sphere. For a given surface area, a solid sphere has the largest volume.[10] A sphere with an even force applied to any specific direction will become an ellipsoid. For example, the earth was formed into a sphere through gravity and became a spheroid because of its rotation. The centrifugal force applied to the mass of the rotating earth causes it to be wider at the equator than at the poles. A drop of liquid in zero-gravity will wobble in spheroidal form until becoming a sphere when no forces are acting upon it. The ellipsoid is revealed by nature in many different configurations. A cell, a planet, seeds, and even an atom are all different types of ellipsoids.

Examples of ellipsoids in nature

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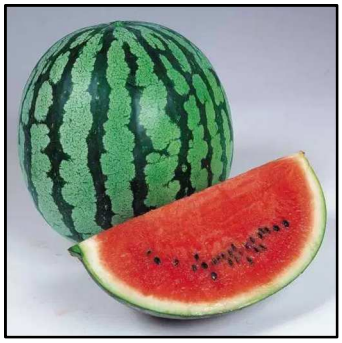
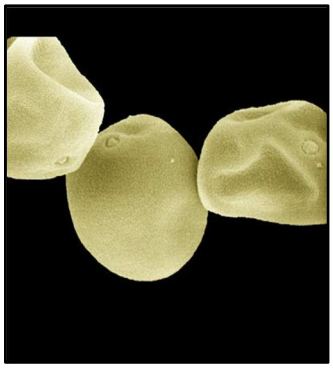
[9] Osserman, Robert. "Ellipsoid." *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., 25 Aug. 2006, www.britannica.com/science/ellipsoid.

[10] "Volume of a Sphere." *Volume of a Sphere - Math Open Reference*, www.mathopenref.com/spherevolume.html.



Watermelon (Figure 7)

Chicken Egg (Figure 8)

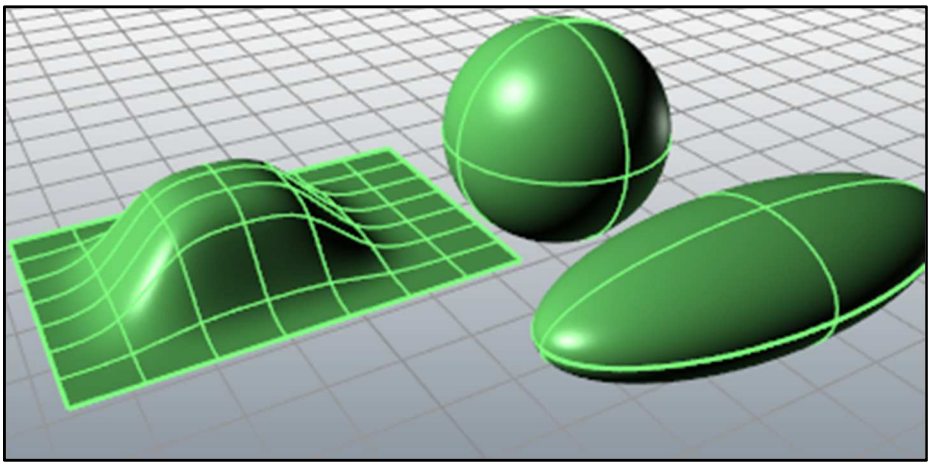


Grass Pollen (Figure 9)

The ambiguity of the ellipsoid is one of the main reasons that I was drawn to it. Because of this ambiguity, when a viewer sees an ellipsoid, their perception is influenced by their own past experiences. A peanut farmer might think of a peanut, an astronomer may think of a celestial body, a sailor might think of a buoy. My work is less about employing the use of a fixed narrative and more about sharing a way of thinking.

The three sculptures on display all have faceted planes instead of one continuous non-developable surface akin to most spheroids. A non-developable

surface is a curved plane that when unrolled cannot lay flat. It is also known as a compound curve.[11](7)



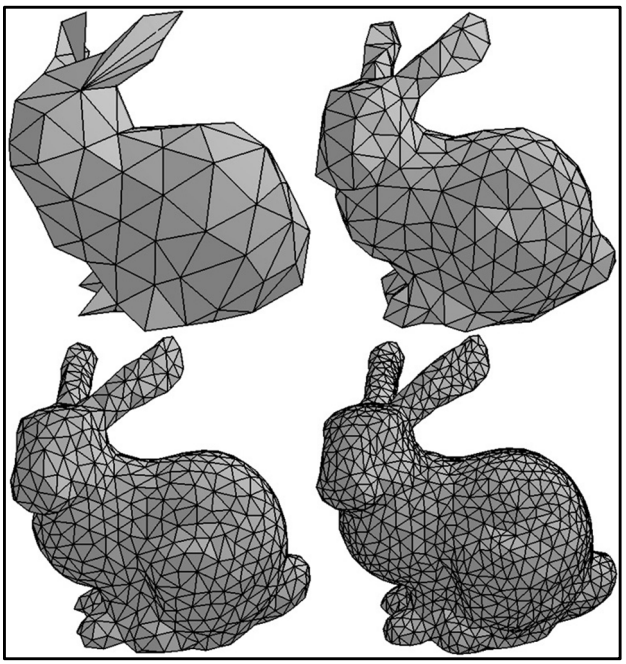
Non-developable surfaces (Figure 10)

The more developable planes that an object has in relation to its scale, the more organic and natural the shape looks. Many computer generated models of organic shapes need to be broken down from non-developable surfaces into developable ones. This is due to the infinite nature of the compound curve. It is much easier for a computer or a human to fabricate a series of connected polygons (mesh) than it is to create a compoundly curved surface.

I have decided to take the organic ellipsoidal form and break it down into developable surfaces as a representation and exaggeration of my inevitable inability to make the perfect organic shape. By simplifying the number of planes

[11] *9.7.1 Differential Geometry of Developable Surfaces*, web.mit.edu/hyperbook/Patrikalakis-Maekawa-Cho/node190.html.

in a shape, I can focus more on the craftsmanship of the angles and edges to enhance the elegance of the form.



Connected Developable Surfaces (Mesh) (Figure 11)

The three sculptures in my show are also fragmented. They are parts of an imagined whole. They are broken by elements of the manufactured world. The pieces give the illusion of extending through the floor, walls and architectural elements. The works are imitations of nature, created by and fragmented through the limitations of a built environment.

Chapter 7: The Work

Upon entering the gallery, the first sculpture seen is titled *Ovum*. The large ellipsoidal form corresponds to a biological monolith as it attempts to rise out of the ground into open space. The sculpture's surface is covered with protrusions analogous to the overall shape of the piece itself. The texture of these protrusions is reminiscent of the surface of the sculpture. The multiple scales of these similar shapes relate to fractal geometry. The different scales of the similar shape were created by three distinctly separate processes.

In progress image of *Ovum* (Figure 12)

The first scale, the overall form of the sculpture, was created with the help of computers. After creating a digital version of an ellipsoid, I transformed the single non-developable surface into multiple developable surfaces to create the "skin" of the sculpture. I then used the digital version of this skin to design a wooden frame to hold the pieces together. The masonite panels and the curved plywood frames were then made on a CNC router. Measurements were taken from the computer software to create the other wooden parts of the frame that would have been inefficient to make with the CNC router. The frame and the panels were then assembled relatively easily.

This first scale is representative of the design being in my control, even though the shapes of the pieces were not. Putting together the pieces of the puzzle, I had no use for the measurements or angles of the panels as they lined up with their corresponding frame edge.

The second scale of *Ovum* is the small protrusions formed on the sculpture. These small hemi-ellipsoids are altered found objects made of plastic. The largest are made from ball-pit balls, the smallest from ping-pong balls and the medium, most common size are made from Easter eggs. The different sized balls were cut in half and adhered to the sculpture using a self-prescribed rule system. First the largest were attached in a random, but semi-evenly spaced manner until all of them were used. Next I attached the smaller ball-pit balls in the center of the triangles formed from the earlier pieces. My technique for the egg pieces was to fill in every area the I could, working from the bottom of the sculpture up using a circle packing method. Circle packing is "an arrangement of

circles inside a given boundary such that no two overlap and some (or all) of them are mutually tangent."[12]

Detail of "*Ovum*" (Figure 13)

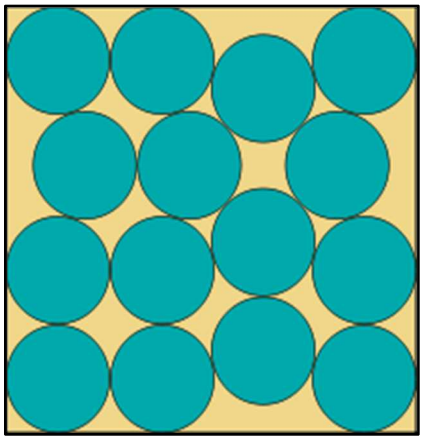


Illustration of circle packing (Figure 14)

By being limited to the voids that were created from the previous attachments, I had to decide where the best place to adhere the eggs were to leave as small a void as possible afterwards.

I then filled any void that I could with the ping-pong ball sized pieces. Upon covering the entire structure, I made the decision to remove the largest ball-pit ball sized pieces and replace their void with either two or three egg-sized pieces. This was due to the large pieces looking too organized and systematic, an example of my willingness to break my system of rules for the overall aesthetic of a piece.

The placement of the pieces in the second scale of the sculpture, the halved plastic balls, relates to chaos theory as a natural phenomenon.

[12] "Circle Packing." *From Wolfram MathWorld*, mathworld.wolfram.com/CirclePacking.html.

Mathematician Henri Poincaré describes chaos theory as follows: “It may happen that small differences in the initial conditions produce very great ones in the final phenomena. A small error in the former will produce an enormous error in the latter. Prediction becomes impossible.”[13] The initial arrangement of the pieces affects where the abutting pieces could potentially be placed. If I used all similarly sized pieces, the pattern would have been much more regular, forming a honeycomb pattern. My conscious decision of where to place the first piece, and the following pieces ultimately produced the randomness of the pattern.

The third scale of *Ovum* is that of the texture put onto the plastic. After coating everything in black paint, I applied glue to small areas at a time and sprayed the glue with a mist of small carbon pieces. This layer added to the sense of mystery and physicality of the sculpture.

By adding millions of small pieces, I took a step away from my hand in the placement of the pieces. Adding each individual speck would not only be highly impractical and inefficient, it would ultimately end up looking the same as the second scale. The randomness of chance and the randomness of my process would be indistinguishable.

Each of the three scales of *Ovum* coincidently took about the same amount of time to do, being indicative of my human scale with regards to the fractal-like nature of the piece. If I were the size of an ant, the second scale would become the first and the third scale would become the second.

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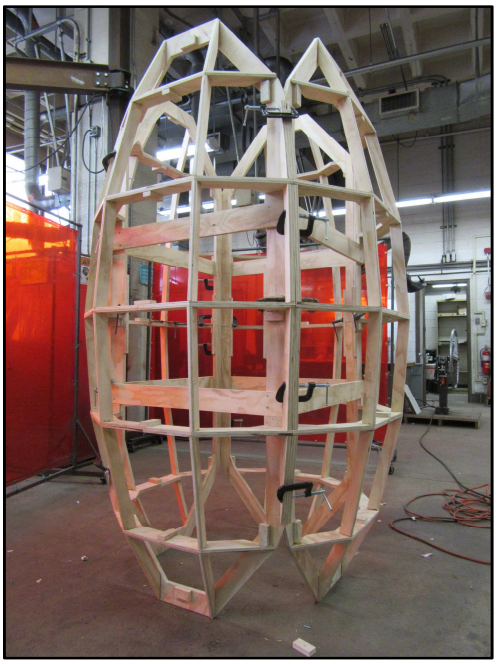
[13] “Chaos Theory.” *Learning Theories*, 23 Sept. 2017, www.learning-theories.com/chaos-theory.html.

Plinth, the second sculpture that the viewer comes to in the gallery alludes more to the architectural and the precise rather than the biological. By encapsulating the column in the gallery, I attempt to utilize architectural features to exhibit the divide and convergence of human and nature. Humans tend to create buildings out of stock material with a predisposition for right angles. This is due to the ease and efficiency in which right angle structures can be built. The ellipsoid has not only been truncated by the column, but it has been faceted from its original form into a more planar, developable surface. This has been done to represent the ease and efficiency with which I can make the sculpture from stock material, as opposed to making a non-developable ellipsoid from stock material. I take this one step back by using the reverse side of the stock material, the side that was intended to be hidden (bar codes, manufacturing defects, patches) as the exterior of the sculpture.



In process view of *Plinth* (Figure 15) - *Plinth* installed (Figure 16)

I then sanded, filled and painted the surface until it was precise to my liking. In using the opposite, usually hidden, side of the melamine panel as the exterior of the piece, I intentionally created a struggle for myself through the transformation of this “imperfect” stock material into a “flawless”, pedestal-like object intersected by the right-angled nature of humanity.

The third and largest of the three sculptures in the show is titled *Arca*. Arca is the Latin word for box or enclosure. Breaking away from the symmetry created in the first two sculptures, in *Arca* I attempt to create a more organic form that still adheres to the theme of the developable ellipsoid. Its placement in the gallery leads the viewer alongside the exterior of the installation first, prior to

discovering the opening. My intention was to create a feeling of mystery and curiosity prior to discovery.

This is by far the most challenging and ambitious sculpture that I have ever created. This is also one of the sculptures that I have learned the most from, not only about construction methods but about myself in general. Rarely an hour would go by during the time of planning and fabrication that I was not thinking about this sculpture. Errors would occur and I would have a hard time concentrating on other tasks until those errors were addressed.

Side view of *Arca* (Figure 17)

By creating an environment that the viewer can inhabit, I strive to give them a look into the construction of the forms. The contrast between the interior and the exterior are indicative of the balance between the organic and the geometric. The exterior is a skin made of wrinkled aluminum tape adhered to the panels haphazardly. The wrinkling texture of the tape gives *Arca* a more

cohesive, unified finish. Through the wrinkling of the tape, each piece is unique. The pieces that are applied first determine the placement of the following pieces. The interior is comprised of a highly constructed puzzle of panels that fit together naturally. The panels on the interior of *Arca* are reminiscent of the panels of a shipping crate. Having built many crates in my previous jobs, I've become fairly good at constructing them. Using this familiar technique was important in keeping me calm and sane during the construction of this piece.

Front view of *Arca* (Figure 18)

By placing this sculpture in the corner of the gallery, I strive to create an illusion of something that is even larger than it is, extending through the walls and floor to create an object that transcends the limits that the space puts on it.

Chapter 8: Conclusion

Making art requires patience, knowledge and an open mind. An artist should be curious about the how the world works. Although nature raises many questions, nature provides few definative answers. My understanding that questions don't necessarily need to have answers pushes me towards a goal that has no end. I will always strive to learn new things, be curious about the world and question my preconceived notions about reality. I will never "figure it out".

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